ACURA

INTEGRA

Service Manual 1998

INTRODUCTION

How to Use This Manual

This manual is divided into 23 sections. The first page of each section is marked with a black tab that lines up with its corresponding thumb index tab on this page and the back cover. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each section includes:

1. A table of contents, or an exploded view index showing:
   - Parts disassembly sequence.
   - Bolt torques and thread sizes.
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

WARNING **Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.**

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTICE
The purpose of these messages is to help prevent damage to the vehicle, other property, or the environment.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard workshop* procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause PERSONAL INJURY, damage a vehicle, or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of every conceivable way, not could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

First Edition 11/97 1416 pages
HONDA MOTOR CO., LTD.
Service Publication Office

Specifications apply to U.S.A. and Canada

As sections with * include SRS components; special precautions are required when servicing.

General Information

Chassis and Paint Codes

U.S. Model

Vehicle Identification Number

JH4 DB7 5 5 * W S 000001

Manufacturer, Make and Type of Vehicle
- JH4: HONDA MOTOR CO., LTD. ACURA Passenger vehicle

Line, Body and Engine Type
- DB7: INTEGRA 4-door/B18B1
- DB8: INTEGRA 4-door/B18C1
- DC2: INTEGRA 3-door/B18C1, B18C5
- DC4: INTEGRA 3-door/B18B1

Body Type and Transmission Type
- 3: 2-door Hatchback/5-speed Manual
- 4: 2-door Hatchback/4-speed Automatic
- 5: 4-door Sedan/5-speed Manual
- 6: 4-door Sedan/4-speed Automatic

Vehicle Grade (Series)
- 1: Type R
- 4: RS
- 5: LS
- 6: GS
- 8: GS-R
- 9: GS-R with leather seats

Check Digit

Model Year
- W: 1998

Factory Code
- S: Suzuka Factory in Japan

Serial Number

Engine Number

B18B1 - 5300001

Engine Type
- B18B1: 1.8 ℓ DOHC Sequential Multiport Fuel-injected engine
- B18C1, B18C5: 1.8 ℓ DOHC VTEC Sequential Multiport Fuel-injected engine

Serial Number

Transmission Number

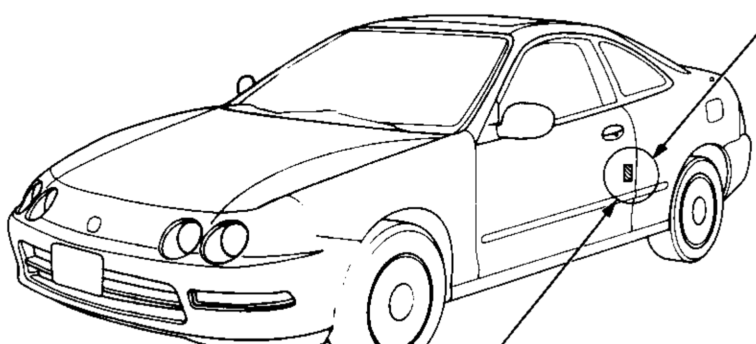
S80 - 3000001

Transmission Type
- S80: Manual
- S4XA: Automatic

Serial Number

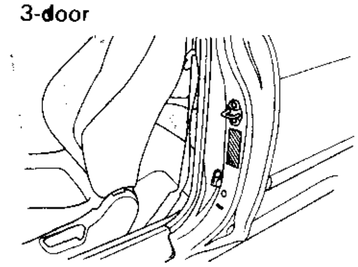
Paint Code

COLOR
G-82P



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification

3-door



4-door

Paint Code

Paint Code	Color
B-74P	Adriatic Blue Pearl
B-90P*3	Supersonic Blue Pearl
G-82P	Cypress Green Pearl
NH-0*3	Championship White
NH-538	Frost White
NH-583M*3	New Vogue Silver Metallic
NH-592P*3	Flamenco Black Pearl
R-505P	Cayenne Red Pearl
R-81*3	Milano Red

*3: 3-door

Canada Model

Vehicle Identification Number

JH4 DC2 3 8 * W S 800001

Manufacturer, Make and Type of Vehicle
- JH4: HONDA MOTOR CO., LTD. ACURA Passenger car

Line, Body and Engine Type
- DC2: INTEGRA 3-door/B18C1, B18C5
- DC4: INTEGRA 3-door/B18B1

Body Type and Transmission Type
- 3: 2-door Hatchback/5-speed Manual
- 4: 2-door Hatchback/4-speed Automatic

Vehicle Grade (Series)
- 1: Type R
- 4: RS
- 5: LS
- 6: LS with moonroof
- 7: GS
- 8: GS-R

Check Digit

Model Year
- W: 1998

Factory Code
- S: Suzuka Factory in Japan

Serial Number

Engine Number

B18B1 - 5700001

Engine Type
- B18B1: 1.8 ℓ DOHC Sequential Multiport Fuel-injected engine
- B18C1, B18C5: 1.8 ℓ DOHC VTEC Sequential Multiport Fuel-injected engine

Serial Number

Transmission Number

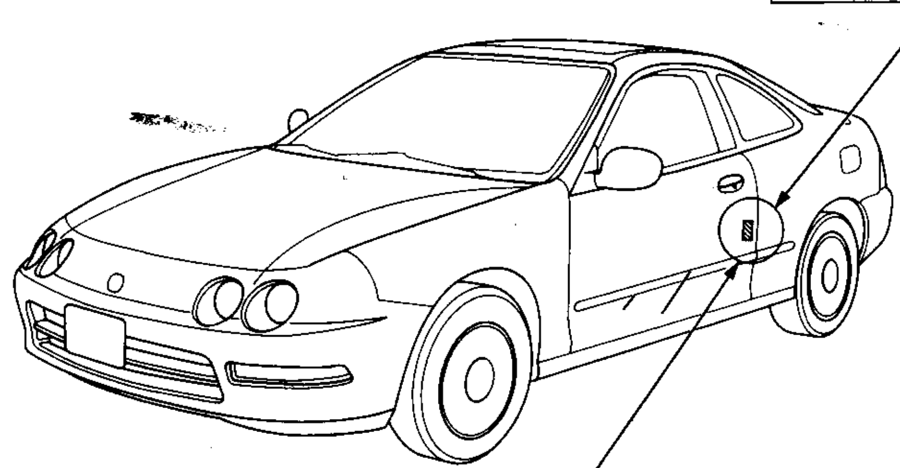
S80 - 3000001

Transmission Type
- S80: Manual
- S4XA: Automatic

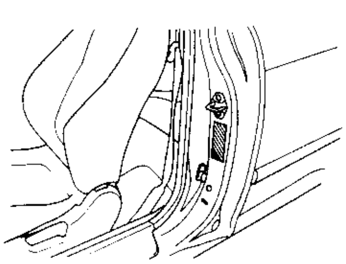
Serial Number

Paint Code

COLOR
NH-0



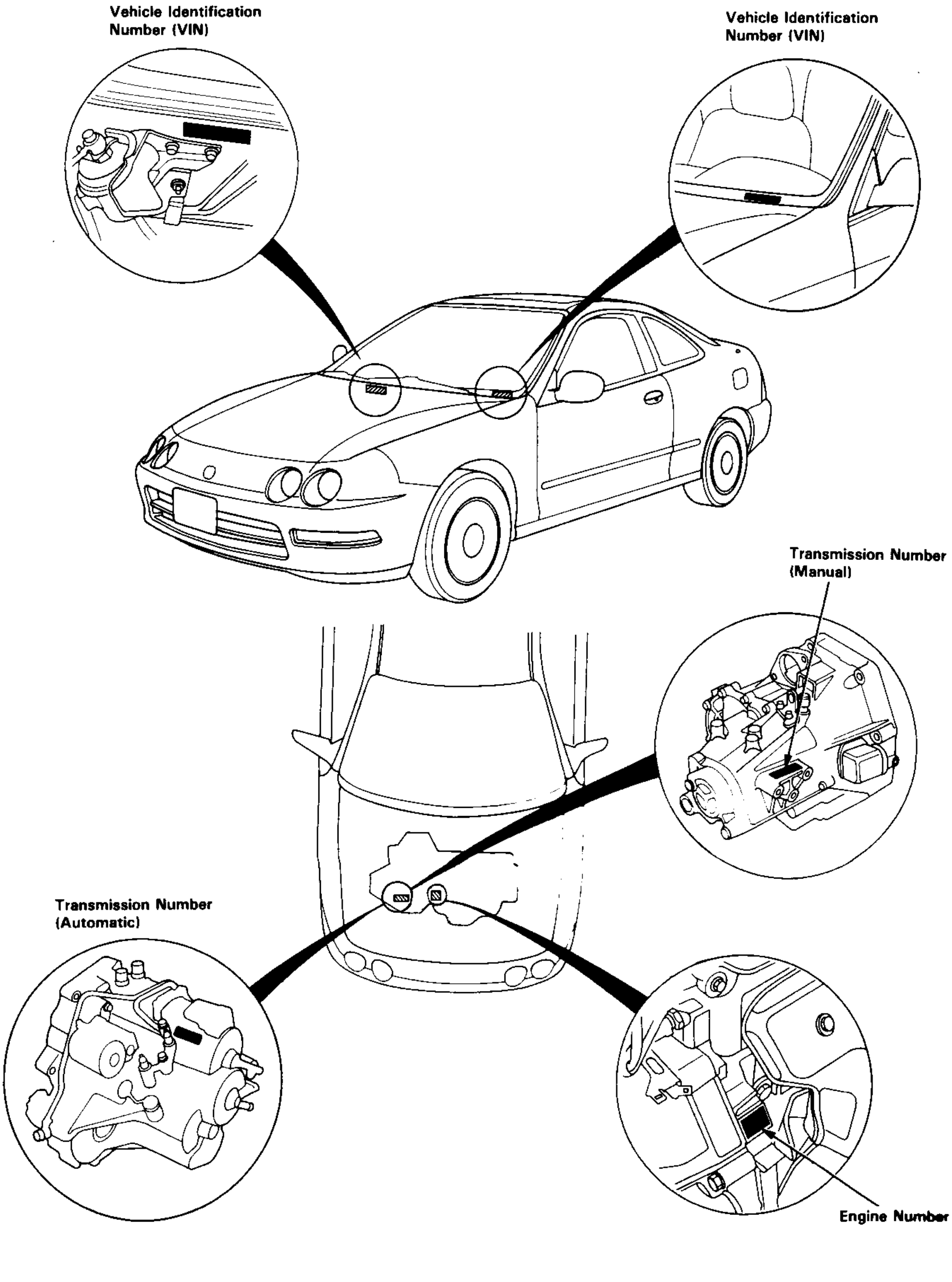
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification



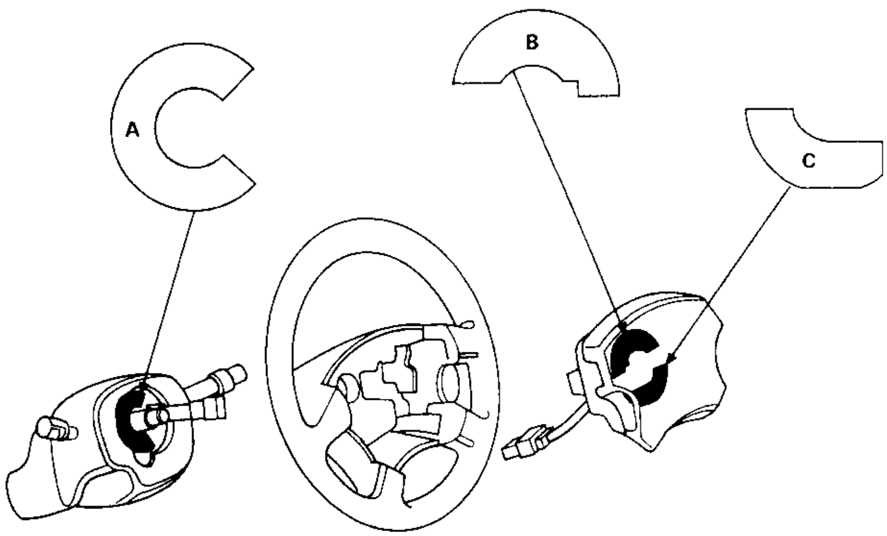
Paint Code

Paint Code	Color
B-90P	Supersonic Blue Pearl
G-82P	Cypress Green Pearl
NH-0	Championship White
NH-592P	Starlight Black Pearl
NH-597M	Citrus Silver Metallic
R-81	Milano Red

Identification Number Locations



Warning/Caution Label Locations



A: CABLE REEL CAUTION

> SRS
> INSTALLATION OF THE SRS CABLE REEL IS CRITICAL TO THE PROPER OPERATION OF THE SRS SYSTEM, REFER TO THE SERVICE MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS.

B: DRIVER MODULE DANGER

> ⚠DANGER
> EXPLOSIVE/FLAMMABLE
> STORAGE TEMPERATURES MUST NOT EXCEED 200°F (93°C). FOR PROPER HANDLING, STORAGE, AND DISPOSAL PROCEDURES REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
> FIRST AID
> IF CONTENTS ARE SWALLOWED, INDUCE VOMITING.
> FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES. IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
> KEEP OUT OF REACH OF CHILDREN.

C: DRIVER MODULE WARNING

> ⚠WARNING
> THE AIRBAG INFLATOR IS EXPLOSIVE, AND IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.
> - DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES. THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.
> - NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
> - PLACE AIRBAG UPRIGHT WHEN REMOVED.
> - FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

D: SRS INFORMATION
U.S. Model

> WARNING
> DEATH OR SERIOUS INJURY CAN OCCUR.
> - CHILDREN AGES 12 AND UNDER CAN BE KILLED BY THE AIRBAG.
> - THE BACK SEAT IS THE SAFEST PLACE FOR CHILDREN.
> - NEVER PUT A REAR-FACING CHILD SEAT IN THE FRONT.
> - SIT AS FAR BACK AS POSSIBLE FROM THE AIRBAG.
> - ALWAYS USE SEAT BELTS AND CHILD RESTRAINTS.

Canada Model

> CAUTION
> TO AVOID SERIOUS INJURY:
> - FOR MAXIMUM SAFETY PROTECTION IN ALL TYPES OF CRASHES, YOU MUST ALWAYS WEAR YOUR SAFETY BELT.
> - DO NOT INSTALL REARWARD FACING CHILD SEATS IN ANY FRONT PASSENGER SEAT POSITION.
> - DO NOT SIT OR LEAN UNNECESSARILY CLOSE TO THE AIRBAG.
> - DO NOT PLACE ANY OBJECTS OVER THE AIR BAG OR BETWEEN THE AIR BAG AND YOURSELF.
> - SEE THE OWNER'S MANUAL FOR FURTHER INFORMATION AND EXPLANATIONS.

E: ASSISTANT INFORMATION
U.S. Model

> AIR BAG WARNING
> FLIP VISOR OVER

F: STEERING COLUMN NOTICE

> NOTICE
> TO PREVENT SRS DAMAGE, REMOVE STEERING WHEEL BEFORE REMOVING STEERING SHAFT CONNECTING BOLT.

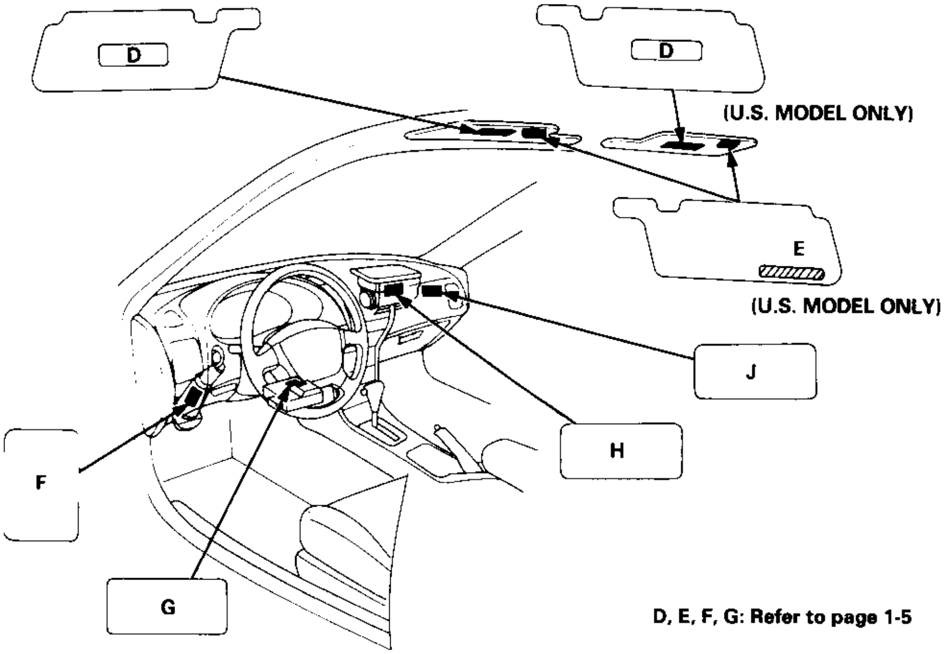
G: MONITOR NOTICE

> NOTICE SRS
> - NO SERVICEABLE PARTS INSIDE
> - REFER TO SERVICE MANUAL FOR DETAILED INSTRUCTIONS.

(cont'd)

Warning/Caution Label Locations

(cont'd)



D, E, F, G: Refer to page 1-5

H: FRONT SEAT PASSENGER MODULE DANGER

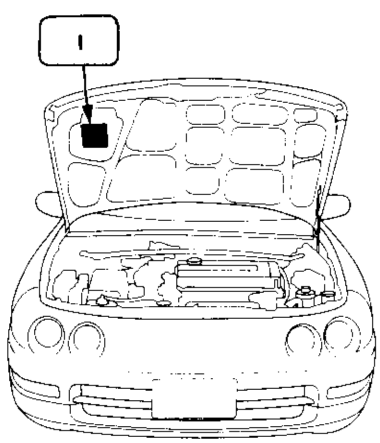
> ⚠DANGER
> EXPLOSIVE/FLAMMABLE
> STORAGE TEMPERATURES MUST NOT EXCEED 200°F (93°C). FOR PROPER HANDLING, STORAGE, AND DISPOSAL PROCEDURES, REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
> FIRST AID
> IF CONTENTS ARE SWALLOWED, INDUCE VOMITING.
> FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES.
> IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
> KEEP OUT OF REACH OF CHILDREN.

> ⚠WARNING
> THE AIRBAG INFLATOR IS EXPLOSIVE, AND IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.
> - DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES.
>   *THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.*
> - NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
> - PLACE AIRBAG UPRIGHT WHEN REMOVED.
> - FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

I: SRS WARNING (ENGINE HOOD)

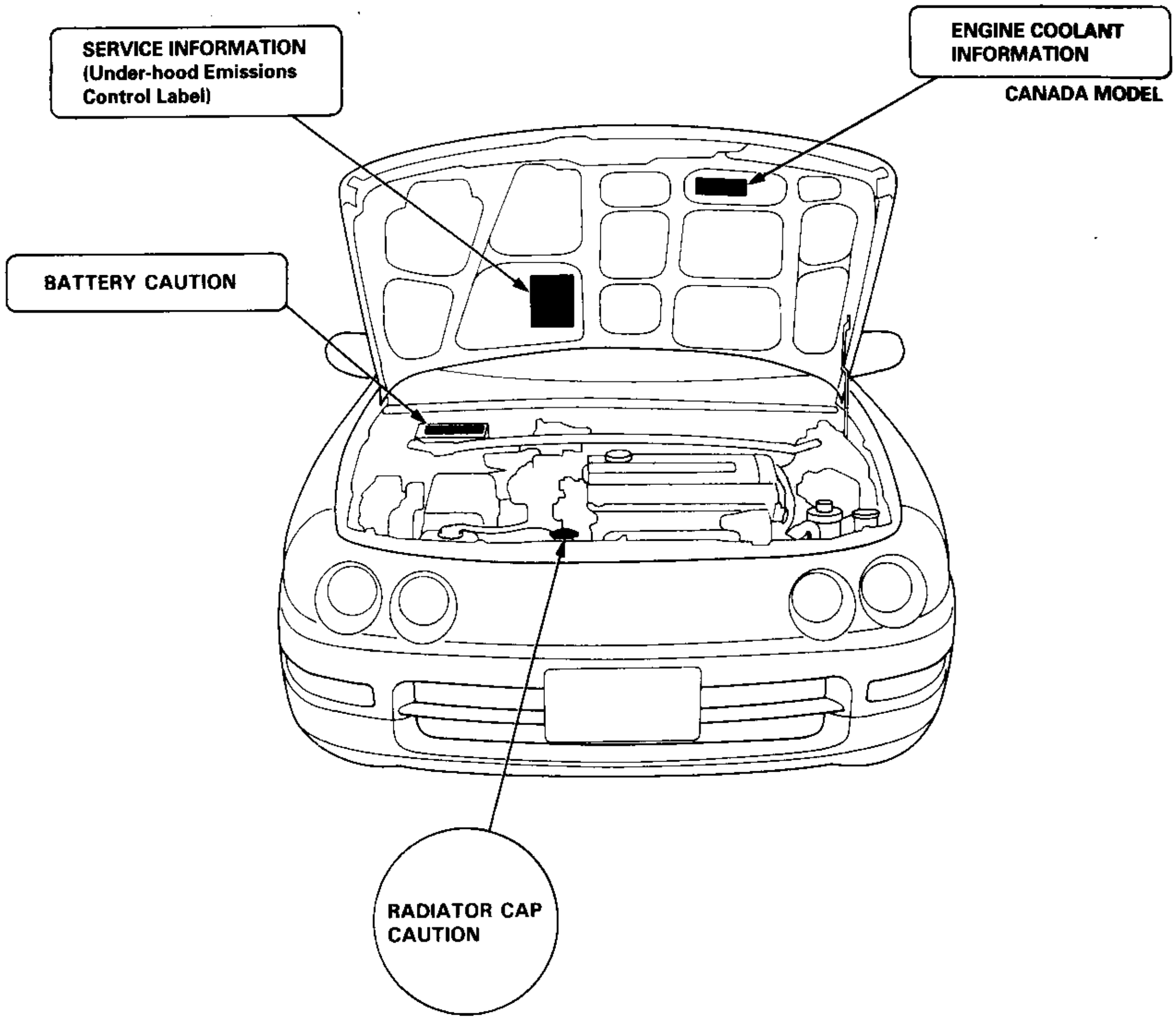
> SUPPLEMENTAL RESTRAINT SYSTEM (SRS)
> THIS VEHICLE IS EQUIPPED WITH DRIVER AND FRONT SEAT PASSENGER AIRBAGS.
> ALL SRS ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW.
> TAMPERING WITH, DISCONNECTING, OR USING ELECTRICAL TEST EQUIPMENT ON THE SRS WIRING CAN MAKE THE SYSTEM INOPERATIVE OR CAUSE ACCIDENTAL FIRING OF THE INFLATOR.

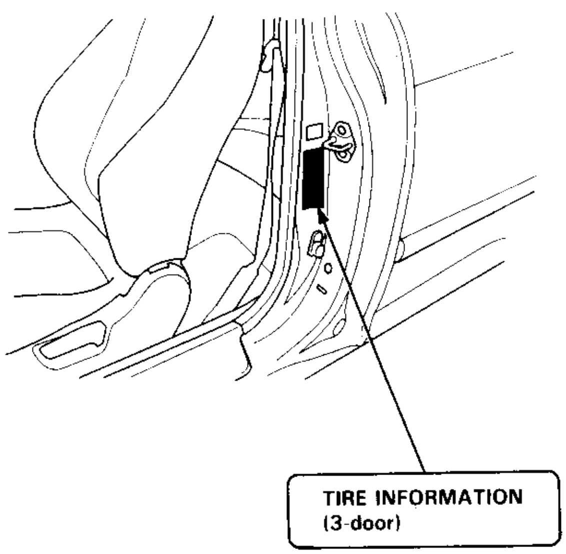
> ⚠WARNING
> THE AIRBAG INFLATOR IS EXPLOSIVE, AND IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT YOU.
> FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

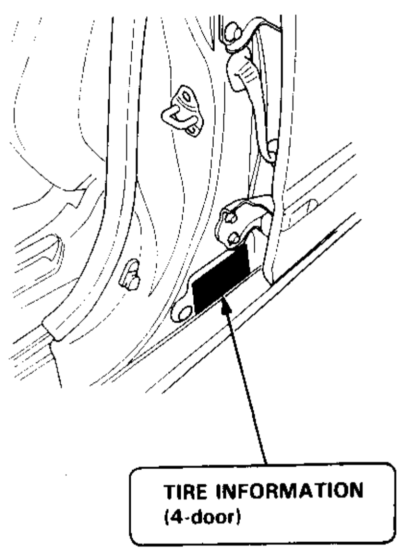


J: PASSENGER AIRBAG CAUTION
U.S. Model

> WARNING
> CHILDREN CAN BE KILLED OR INJURED BY A PASSENGER AIRBAG.
> THE BACK SEAT IS THE SAFEST PLACE FOR CHILDREN. AGES 12 AND UNDER. MAKE SURE ALL CHILDREN USE SEAT BELTS OR CHILD SEATS.


SERVICE INFORMATION
(Under-hood Emissions Control Label)
ENGINE COOLANT INFORMATION
CANADA MODEL
BATTERY CAUTION
RADIATOR CAP CAUTION

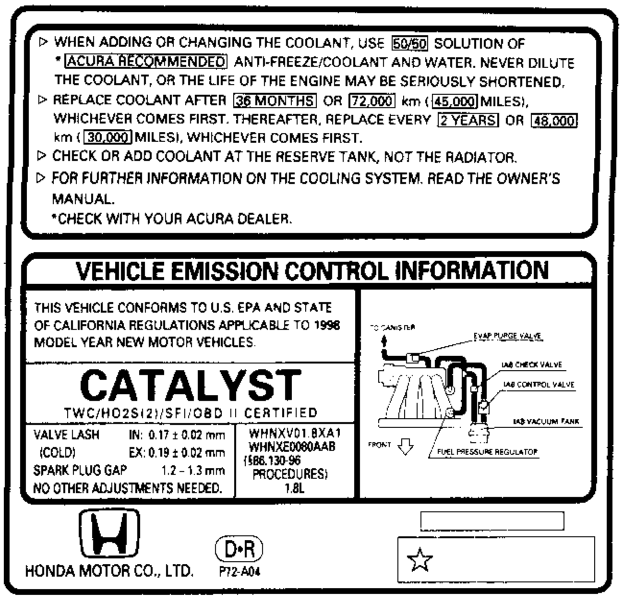

TIRE INFORMATION
(3-door)


TIRE INFORMATION
(4-door)

Under-hood Emissions Control Label

Emission Group Identification

Example:



50ST (50 States):
THIS VEHICLE CONFORMS TO THE U.S. EPA AND THE STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW MOTOR VEHICLES.

49ST (49 States/Federal):
THIS VEHICLE CONFORMS TO THE U.S. EPA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW MOTOR VEHICLES.

CAL (California):
THIS VEHICLE CONFORMS TO THE U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW PASSENGER CARS PROVIDED THAT THIS VEHICLE IS ONLY INTRODUCED INTO COMMERCE FOR SALE IN THE STATE OF CALIFORNIA.

Engine and Evaporative Families

Engine Family: W HNX V 01.8 XA1

Model Year
W: 1998
Manufacturer
HNX: Honda
Type
V: Light Duty Vehicle/Passenger Car
Displacement
Sequence Characters

Evaporative Family: W HNX E 0080 AAB

Model Year
W: 1998
Manufacturer
HNX: Honda
Type
E: EVAP
Canister Work Capacity (grams)
Sequence Characters

Lift and Support Points

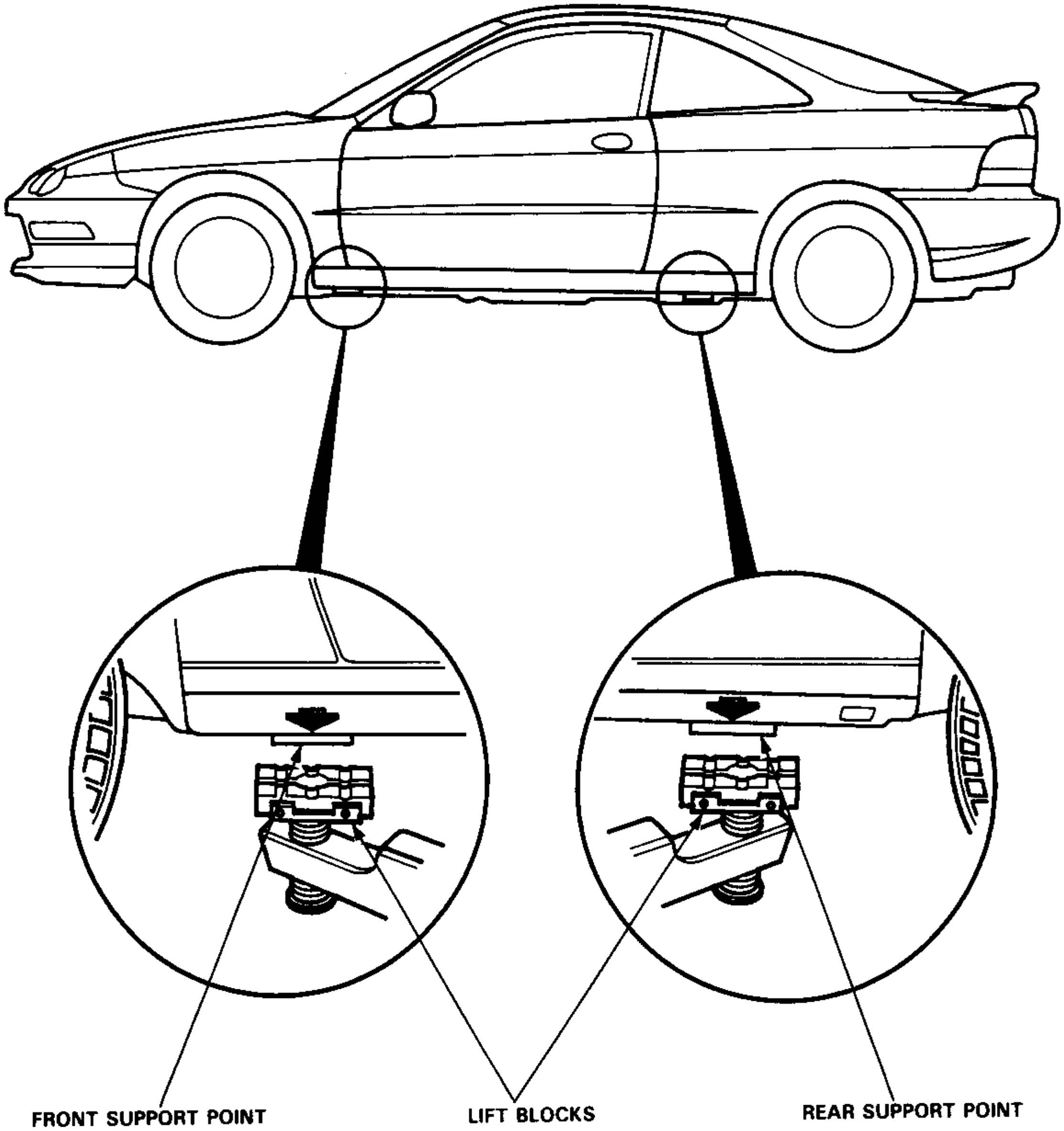
Lift and Safety Stands

⚠WARNING When heavy rear components such as suspension, fuel tank, spare tire hatch and trunk lid are to be removed, place additional weight in the luggage area before hoisting. When substantial weight is removed from the rear of the vehicle, the center of gravity may change and can cause the vehicle to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weighs approximately 30 lbs (14 kg), placing the front wheels in the luggage area can assist with the weight distribution.

1. Place the lift blocks as shown.
2. Raise the hoist a few inches (centimeters), and rock the vehicle to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid support.

NOTE: Use the same support points to support the vehicle on safety stands.



Lift and Support Points

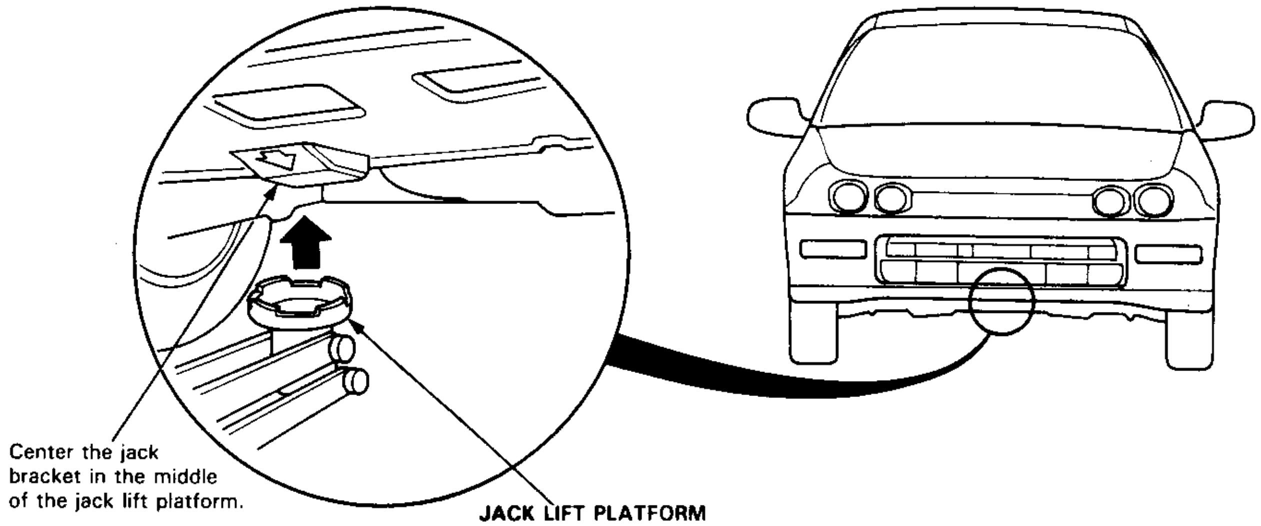
Floor Jack

1. Set the parking brake, and block the wheels that are not being lifted.
2. When lifting the rear of the vehicle, put the gearshift lever in reverse (Automatic transmission in [P] position).
3. Raise the vehicle high enough to insert the safety stands.
4. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.

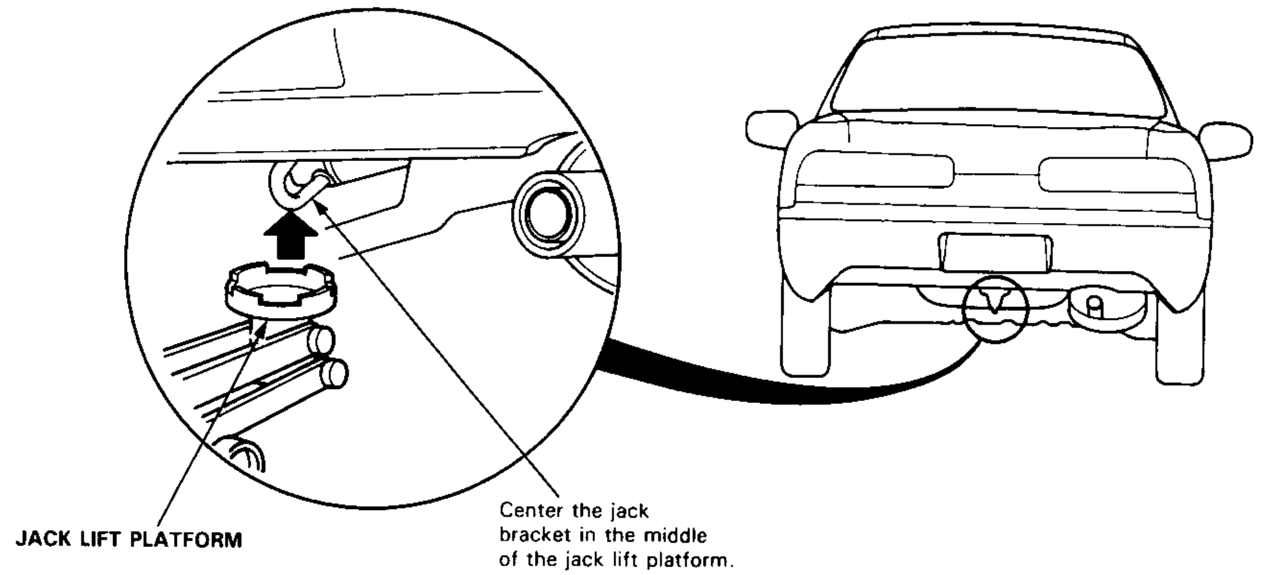
⚠ WARNING

- ***Always use safety stands when working on or under any vehicle that is supported by only a jack.***
- **Never attempt to use a bumper jack for lifting or supporting the vehicle.**

Front



Rear



If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

Emergency Towing
There are three popular methods of towing a vehicle:

Flat-bed Equipment — The operator loads the vehicle on the back of a truck. This is the best way of transporting the vehicle.

Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tires (front or rear) and lifts them off the ground. The other two wheels remain on the ground.

Sling-type Equipment — The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted.

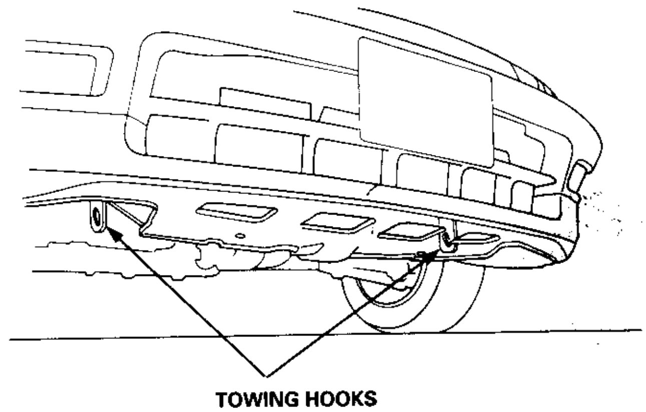
If the vehicle cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, do the following:

Manual Transmission
- Release the parking brake.
- Shift the transmission to Neutral.

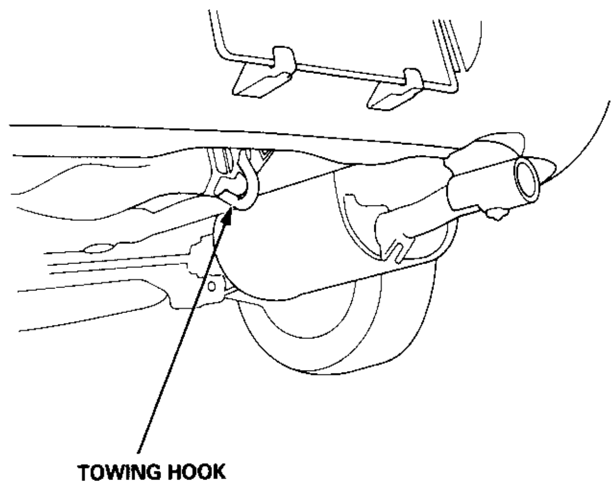
Automatic Transmission
- Release the parking brake.
- Start the engine.
- Shift to D4 position, then to N position.
- Turn off the engine.

CAUTION:
- **Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), your vehicle must be transported on a flat-bed.**
- **It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).**
- **Trying to lift or tow your vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.**

Front:



Rear:



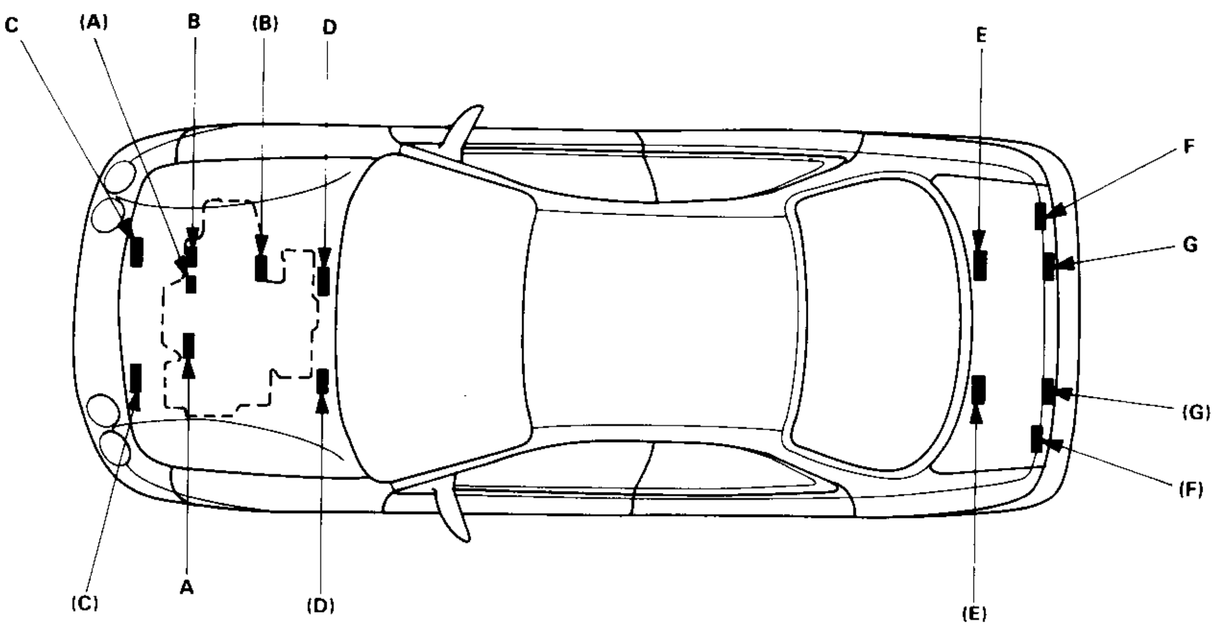
Service Precautions

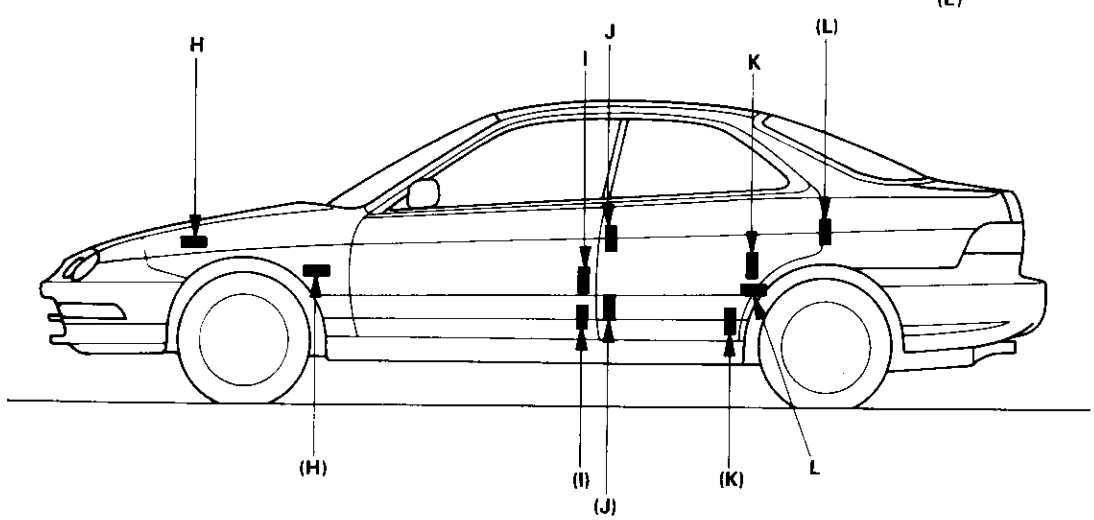
Parts Marking Locations

To deter vehicle theft, certain major components are marked with the vehicle identification number (VIN). Original parts will have self-adhesive labels or labels attached with a break-off bolt. Replacement body parts will have self-adhesive labels, and replacement engine and transmission parts will be stamped with a code for spare parts.

NOTE
- Be careful not to damage the parts marking labels during body repairs, and mask the labels before repainting.
- Label location letters without parenthesis indicate original parts. Letters with parenthesis indicate replacement parts.

Label Locations
A or (A): Engine
B or (B): Transmission
C or (C): Front Bumper
D or (D): Hood
E or (E): Trunk Lid (4 Door)
F or (F): Tail Gate (3 Door)
G or (G): Rear Bumper
H or (H): Front Fender
I or (I): Front Door
J or (J): Outer Rear Panel (3 Door)
K or (K): Rear Door (4 Door)
L or (L): Outer Rear Panel (4 Door)





specs

Specifications

Standards and Service Limits

Cylinder Head/Valve Train (B18B1 engine) — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm and wide open throttle kPa (kgf/cm², psi)	Nominal Minimum Maximum variation	1,370 (14.0, 199) 930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height		—— 131.95 – 132.05 (5.195 – 5.199)	0.05 (0.002) ——
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	 IN EX	0.05 – 0.15 (0.002 – 0.006) 0.030 – 0.069 (0.0012 – 0.0027) 0.03 (0.001) max. 33.716 (1.3274) 33.528 (1.3200)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) —— ——
Valve	Valve clearance (Cold)* Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX	0.08 – 0.12 (0.003 – 0.005) 0.16 – 0.20 (0.006 – 0.008) 6.580 – 6.590 (0.2591 – 0.2594) 6.550 – 6.560 (0.2579 – 0.2583) 0.02 – 0.05 (0.001 – 0.002) 0.05 – 0.08 (0.002 – 0.003)	—— —— 6.55 (0.258) 6.52 (0.257) 0.08 (0.003) 0.11 (0.004)
Valve seat	Width Stem installed height	IN EX IN EX	1.25 – 1.55 (0.049 – 0.061) 1.25 – 1.55 (0.049 – 0.061) 40.765 – 41.235 (1.6049 – 1.6234) 42.765 – 43.235 (1.6837 – 1.7022)	2.0 (0.08) 2.0 (0.08) 41.485 (1.6333) 43.485 (1.7120)
Valve spring	Free length (Reference)	IN NH CH EX	41.27 (1.625) 41.28 (1.625) 44.32 (1.745)	—— —— ——
Valve guide	I.D. Installed height	IN EX IN EX	6.61 – 6.63 (0.260 – 0.261) 6.61 – 6.63 (0.260 – 0.261) 13.75 – 14.25 (0.541 – 0.561) 15.75 – 16.25 (0.620 – 0.640)	6.65 (0.262) 6.65 (0.262) —— ——

*: Measured between the camshaft and rocker arm.
NH: NIHON HATSUJO manufactured valve spring
CH: CHUO HATSUJO manufactured valve spring

Unit of length: mm (in)

Engine Block (B18B1 engine) — Section 7

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface			0.07 (0.003) max.	0.10 (0.004)
	Bore diameter			81.00 – 81.02 (3.189 – 3.190)	81.07(3.192)
	Bore taper			——	0.05 (0.002)
	Reboring limit			——	0.25 (0.010)
Piston	Skirt O.D. at 15 mm (0.6 in) from bottom of skirt			80.98 – 80.99 (3.188 – 3.189)	80.97 (3.188)
	Clearance in cylinder			0.01 – 0.04 (0.0004 – 0.0016)	0.05 (0.002)
	Groove width (For ring)	Top		1.030 – 1.040 (0.0406 – 0.0409)	1.06 (0.042)
		Second		1.230 – 1.240 (0.0484 – 0.0488)	1.26 (0.050)
		Oil		2.805 – 2.820 (0.1104 – 0.1110)	2.84 (0.112)
Piston ring	Ring-to-groove clearance	Top		0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
		Second	R	0.040 – 0.065 (0.0016 – 0.0026)	0.13 (0.005)
			T	0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
	Ring end gap	Top	R	0.20 – 0.35 (0.008 – 0.014)	0.60 (0.024)
			T	0.20 – 0.30 (0.008 – 0.012)	0.60 (0.024)
		Second		0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
		Oil	R	0.20 – 0.50 (0.008 – 0.020)	0.70 (0.028)
			T	0.20 – 0.45 (0.008 – 0.018)	0.70 (0.028)
Piston Pin	O.D.			20.994 – 21.000 (0.8265 – 0.8268)	——
	Pin-to-piston clearance			0.010 – 0.022 (0.0004 – 0.0009)	——
Connecting rod	Pin-to-rod interference			0.013 – 0.032 (0.0005 – 0.0013)	——
	Small end bore diameter			20.968 – 20.981 (0.8255 – 0.8260)	——
	Large end bore diameter	Nominal		48.0 (1.89)	——
	End play installed on crankshaft			0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter				
	No. 1, 2, 4 and 5 journals			54.976 – 55.000 (2.1644 – 2.1654)	——
	No. 3 journal			54.970 – 54.994 (2.1642 – 2.1651)	——
	Rod journal diameter			44.976 – 45.000 (1.7707 – 1.7717)	——
	Taper			0.005 (0.0002) max.	0.010 (0.0004)
	Out-of-round			0.005 (0.0002) max.	0.010 (0.0004)
	End play			0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Runout			0.03 (0.001) max.	0.05 (0.002)
Bearing	Main bearing-to-journal oil clearance				
	No. 1, 2, 4 and 5 journals			0.024 – 0.042 (0.0009 – 0.0017)	0.050 (0.0020)
	No. 3 journal			0.030 – 0.048 (0.0012 – 0.0019)	0.060 (0.0024)
	Rod bearing-to-journal oil clearance			0.020 – 0.038 (0.0008 – 0.0015)	0.050 (0.0020)

R: RIKEN manufactured piston ring
T: TEIKOKU PISTON RING manufactured piston ring

Standards and Service Limits

Cylinder Head/Valve Train (B18C1, B18C5 engines) — Section 6

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm and wide open throttle kPa (kgf/cm², psi) Nominal	1,860 (19.0, 270)	
	Minimum	930 (9.5, 135)	
	Maximum variation	200 (2.0, 28)	
Cylinder head	Warpage	——	0.05 (0.002)
	Height	141.95 – 142.05 (5.589 – 5.593)	——
Camshaft	End play	0.05 – 0.15 (0.002 – 0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance	0.050 – 0.089 (0.0020 – 0.0035)	0.15 (0.006)
	Total runout	0.03 (0.001) max.	0.04 (0.002)
	Cam lobe height IN Primary B18C1/B18C5 engine	33.411 (1.3154)/33.088 (1.3027)	——
	Mid B18C1/B18C5 engine	36.377 (1.4322)/36.865 (1.4138)	——
	Secondary B18C1/B18C5 engine	34.547 (1.3601)/34.732 (1.3674)	——
	EX Primary B18C1/B18C5 engine	33.111 (1.3036)/32.785 (1.2907)	——
	Mid B18C1/B18C5 engine	35.720 (1.4063)/36.333 (1.4304)	——
	Secondary B18C1/B18C5 engine	34.381 (1.3536)/34.691 (1.3658)	
Valve	Valve clearance (Cold)* IN	0.15 – 0.19 (0.006 – 0.007)	——
	EX	0.17 – 0.21 (0.007 – 0.008)	——
	Valve stem O.D. IN	5.475 – 5.485 (0.2156 – 0.2159)	5.445 (0.2144)
	EX	5.450 – 5.460 (0.2146 – 0.2150)	5.420 (0.2134)
	Stem-to-guide clearance IN	0.025 – 0.055 (0.0010 – 0.0022)	0.08 (0.003)
	EX	0.050 – 0.080 (0.0020 – 0.0031)	0.11 (0.004)
Valve seat	Width IN B18C1 engine	1.25 – 1.55 (0.049 – 0.061)	2.0 (0.08)
	B18C5 engine	0.85 – 1.15 (0.033 – 0.045)	2.0 (0.08)
	EX B18C1 engine	1.25 – 1.55 (0.049 – 0.061)	2.0 (0.08)
	B18C5 engine	0.85 – 1.15 (0.033 – 0.045)	2.0 (0.08)
	Stem installed height IN	37.465 – 37.935 (1.4750 – 1.4935)	38.185 (1.5033)
	EX	37.165 – 37.635 (1.4632 – 1.4817)	37.885 (1.4915)
Valve spring	Free length (Reference) B18C1 engine: IN Outer	41.05 (1.616)	——
	Inner NH	36.16 (1.424)	——
	CH	36.19 (1.425)	——
	EX NH	41.96 (1.652)	——
	CH	41.94 (1.651)	——
	B18C5 engine: IN Outer	43.19 (1.700)	——
	Inner	36.84 (1.450)	——
	EX Outer	41.05 (1.616)	——
	Inner	36.16 (1.424)	——
Valve guide	I.D. IN	5.51 – 5.53 (0.217 – 0.218)	5.55 (0.219)
	EX	5.51 – 5.53 (0.217 – 0.218)	5.55 (0.219)
	Installed height IN	12.55 – 13.05 (0.494 – 0.514)	——
	EX	12.55 – 13.05 (0.494 – 0.514)	——
Rocker arm	Arm-to-shaft clearance IN	0.025 – 0.052 (0.0010 – 0.0020)	0.08 (0.003)
	EX	0.025 – 0.052 (0.0010 – 0.0020)	0.08 (0.003)

*: Measured between the camshaft and rocker arm.
NH: NIHON HATSUJO manufactured valve spring
CH: CHUO HATSUJO manufactured valve spring

Unit of length: mm (in)

Engine Block (B18C1, B18C5 engines) — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.05 (0.002) max.	0.08 (0.003)
	Bore diameter		81.00 – 81.02 (3.189 – 3.190)	81.07 (3.192)
	Bore taper		———	0.05 (0.002)
	Reboring limit		———	0.25 (0.010)
Piston	Skirt O.D. at 15 mm (0.6 in) from bottom of skirt		80.98 – 80.99 (3.188 – 3.189)	80.97 (3.188)
	Clearance in cylinder		0.01 – 0.04 (0.0004 – 0.0016)	0.05 (0.002)
	Groove width (For ring)	Top	1.030 – 1.040 (0.0406 – 0.0409)	1.060 (0.0417)
		Second	1.230 – 1.240 (0.0484 – 0.0488)	1.260 (0.0496)
		Oil	2.805 – 2.820 (0.1104 – 0.1110)	2.840 (0.1118)
Piston ring	Ring-to-piston groove clearance	Top	0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
		Second	0.040 – 0.065 (0.0016 – 0.0026)	0.13 (0.005)
	Ring end gap	Top	0.20 – 0.35 (0.008 – 0.014)	0.60 (0.024)
		Second	0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
		Oil	0.20 – 0.50 (0.008 – 0.020)	0.70 (0.028)
Piston Pin	O.D.		20.994 – 21.000 (0.8265 – 0.8268)	———
	Pin-to-piston clearance		0.010 – 0.022 (0.0004 – 0.0009)	———
Connecting rod	Pin-to-rod interference		0.017 – 0.036 (0.0007 – 0.0014)	———
	Small end bore diameter		20.964 – 20.997 (0.8254 – 0.8267)	———
	Large end bore diameter	Nominal	48.0 (1.89)	———
	End play installed on crankshaft		0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter			
	No. 1, 2, 4 and 5 journals		54.976 – 55.000 (2.1644 – 2.1654)	———
	No. 3 journal		54.974 – 54.998 (2.1643 – 2.1653)	———
	Rod journal diameter		44.976 – 45.000 (1.7707 – 1.7717)	———
	Taper		0.005 (0.0002) max.	0.010 (0.0004)
	Out-of round		0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Runout		0.03 (0.001) max.	0.05 (0.002)
Bearing	Main bearing-to-journal oil clearance			
	No. 1, 2, 4 and 5 journals		0.024 – 0.042 (0.0009 – 0.0017)	0.050 (0.0020)
	No. 3 journal		0.030 – 0.048 (0.0012 – 0.0019)	0.060 (0.0024)
	Rod bearing-to-journal oil clearance		0.032 – 0.050 (0.0013 – 0.0020)	0.060 (0.0024)

Engine Lubrication — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US qt, Imp qt)	B18B1 engine	4.6 (4.9, 4.0) for engine overhaul 3.8 (4.0, 3.3) for oil change, including filter 3.5 (3.7, 3.1) for oil change, without filter	
		B18C1, B18C5 engines	4.8 (5.1, 4.2) for engine overhaul 4.0 (4.2, 3.5) for oil change, including filter 3.7 (3.9, 3.3) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance		0.04 – 0.16 (0.002 – 0.006)	0.20 (0.008)
	Pump housing-to-outer rotor clearance		0.10 – 0.19 (0.004 – 0.007)	0.20 (0.008)
	Pump housing-to-rotor axial clearance		0.02 – 0.07 (0.001 – 0.003)	0.15 (0.006)
Relief valve	Pressure setting at engine oil temp. 176°F (80°C) kPa (kgf/cm², psi)	At idle	70 (0.7, 10) min.	
		At 3,000 rpm	340 (3.5, 50) min.	

Standards and Service Limits

Cooling — Section 10

	MEASUREMENT		STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) [Including engine, heater, cooling line and reservoir] Reservoir capacity: 0.6 ℓ (0.63 US qt, 0.53 Imp qt)	B18B1 engine	M/T: 6.4 (6.8, 5.6) for overhaul 4.4 (4.6, 3.9) for coolant change* A/T: 6.7 (7.1, 5.9) for overhaul 4.7 (5.0, 4.1) for coolant change*
		B18C1 engine	M/T: 6.7 (7.1, 5.9) for overhaul 4.7 (5.0, 4.1) for coolant change*
		B18C5 engine	M/T: 6.5 (6.9, 5.7) for overhaul 4.5 (4.8, 4.0) for coolant change*
Radiator cap	Opening pressure kPa (kgf/cm², psi)		93 – 123 (0.95 – 1.25, 13.5 – 17.8)
Thermostat	Start to open °F (°C) Fully open °F (°C) Valve lift at fully open		169 – 176 (76 – 80) 194 (90) 8.0 (0.31) min.
Cooling fan	Thermoswitch "ON" temperature °F (°C) Thermoswitch "OFF" temperature °F (°C)		196 – 203 (91 – 95) Subtract 5 – 14 (3 – 8) from actual "ON" temperature

*: Including the coolant in the reservoir and that remaining in the engine.

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm², psi)	B18B1 engine B18C1 engine B18C5 engine	270 – 320 (2.8 – 3.3, 40 – 47) 329 – 378 (3.35 – 3.85, 48 – 55) 320 – 370 (3.3 – 3.8, 47 – 54)	
Fuel tank	Capacity ℓ (US gal, Imp gal)		50 (13.2, 11.0)	
Engine	Idle speed with headlight and cooling fan off rpm		B18B1, B18C1 engines 750 ± 50 (M/T: neutral) 750 ± 50 (A/T: N or P position) B18C5 engine 800 ± 50 (M/T: neutral)	
	Fast idle rpm		B18B1, B18C1 engines 1,600 ± 200 (M/T: neutral) 1,600 ± 200 (A/T: N or P position) B18C5 engine 1,500 ± 200 (M/T: neutral)	
	Idle CO %		0.1 max.	

Clutch — Section 12

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height Stroke Pedal play Disengagement height	to floor to floor	164 (6 7/16) 130 – 140 (5.12 – 5.51) 12 – 21 (1/2 – 13/16)* 83 (3.27) min.	—— —— —— ——
Flywheel	Clutch surface runout		0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth Thickness		1.2 – 1.7 (0.05 – 0.07) 8.3 – 9.0 (0.33 – 0.35)	0.2 (0.01) 6.0 (0.24)
Pressure plate	Warpage Diaphragm spring finger alignment		0.03 (0.001) max. 0.6 (0.02) max.	0.15 (0.006) 0.8 (0.03)

* Including the pedal play 1 – 10 mm (0.04 – 0.39 in).

Unit of length: mm (in)

Manual Transmission — Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US qt, Imp qt)	2.2 (2.3, 1.9) for oil change 2.3 (2.4, 2.0) for overhaul	
Mainshaft	End play Diameter of ball bearing contact area (clutch housing side) Diameter of 3rd gear contact area Diameter of ball bearing contact area (transmission housing side) Runout	0.11 – 0.18 (0.004 – 0.007) 27.977 – 27.990 (1.101 – 1.102) 37.984 – 38.000 (1.495 – 1.496) 27.987 – 28.000 (1.1018 – 1.1024) 0.02 (0.0008) max.	Adjust 27.93 (1.10) 37.93 (1.493) 27.94 (1.10) 0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D. End play Thickness 3rd B18B1 engine B18C1, B18C5 engines 4th B18B1 engine B18C1, B18C5 engines	43.009 – 43.025 (1.6933 – 1.6939) 0.06 – 0.21 (0.0024 – 0.0083) 34.42 – 34.47 (1.355 – 1.357) 34.92 – 34.97 (1.375 – 1.377) 30.92 – 30.97 (1.217 – 1.219) 31.42 – 31.47 (1.237 – 1.239)	43.08 (1.696) 0.3 (0.012) 34.3 (1.350) 34.8 (1.370) 30.8 (1.213) 31.3 (1.232)
Mainshaft 5th gear	I.D. End play Thickness	43.009 – 43.025 (1.6933 – 1.6939) 0.06 – 0.21 (0.0024 – 0.0083) 31.42 – 31.47 (1.237 – 1.239)	43.08 (1.696) 0.3 (0.012) 31.3 (1.232)
Countershaft	Diameter of needle bearing contact area Diameter of ball bearing contact area Diameter of 1st gear contact area Runout	33.000 – 33.015 (1.299 – 1.300) 24.980 – 24.993 (0.9835 – 0.9840) 36.984 – 37.000 (1.4561 – 1.4567) 0.02 (0.0008) max.	32.95 (1.297) 24.94 (0.982) 36.93 (1.454) 0.05 (0.002)
Countershaft 1st gear	I.D. End play Thickness	42.009 – 42.025 (1.6539 – 1.6545) 0.045 – 0.205 (0.0018 – 0.0081) 31.45 – 31.50 (1.238 – 1.240)	42.08 (1.657) ——— ———
Countershaft 2nd gear	I.D. End play Thickness B18B1 engine B18C1, B18C5 engines	47.009 – 47.025 (1.8507 – 1.8514) 0.07 – 0.14 (0.003 – 0.006) 34.62 – 34.67 (1.3630 – 1.3650) 28.92 – 28.97 (1.1386 – 1.1405)	47.08 (1.854) 0.20 (0.008) 34.5 (1.358) 28.8 (1.134)
Spacer collar (Countershaft 2nd gear)	I.D. O.D. Length	36.48 – 36.49 (1.4362 – 1.4366) 41.989 – 42.000 (1.6531 – 1.6535) 29.07 – 29.09 (1.1445 – 1.1453)	36.5 (1.437) 41.94 (1.651) ———
Spacer collar (Mainshaft 4th and 5th gears)	I.D. O.D. Length A B	31.002 – 31.012 (1.2205 – 1.2209) 37.989 – 38.000 (1.4956 – 1.4961) 56.45 – 56.55 (2.2224 – 2.2264) 26.03 – 26.08 (1.0248 – 1.0268)	31.06 (1.223) 37.94 (1.494) ——— ———

(cont'd)

Standards and Service Limits

Manual Transmission (cont'd) — Section 13

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Reverse idler gear	I.D.	B18B1 engine B18C1 engine B18C5 engine	20.016 – 20.043 (0.7880 – 0.7891) 20.028 – 20.049 (0.7885 – 0.7893) 20.030 – 20.110 (0.7886 – 0.7917)	20.09 (0.7909) 20.09 (0.7909) 20.09 (0.7909)
	Gear-to-reverse gear shaft clearance	B18B1 engine B18C1 engine B18C5 engine	0.036 – 0.084 (0.0014 – 0.0033) 0.028 – 0.053 (0.0011 – 0.0020) 0.030 – 0.117 (0.0012 – 0.0046)	0.16 (0.006) 0.16 (0.006) 0.16 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)		0.85 – 1.10 (0.033 – 0.043)	0.4 (0.016)
Double cone synchro ring *	Clearance (ring pushed against gear) Outer synchro ring-to-gear Inner synchro ring-to-gear Outer synchro ring-to-synchro cone		 0.95 – 1.68 (0.037 – 0.066) 0.5 – 1.0 (0.02 – 0.04) 0.5 – 1.0 (0.02 – 0.04)	 0.6 (0.024) 0.3 (0.01) 0.3 (0.01)
Shift fork	Shift fork finger thickness Fork-to-synchro sleeve clearance		7.4 – 7.6 (0.291 – 0.299) 0.35 – 0.65 (0.014 – 0.026)	—— 1.0 (0.039)
Reverse shift fork	Shift fork pawl groove width Fork-to-reverse idler gear clearance "L" groove width	 at 5th gear side at reverse gear side	13.0 – 13.3 (0.512 – 0.524) 0.5 – 1.1 (0.020 – 0.043) 7.40 – 7.70 (0.291 – 0.303) 7.05 – 7.25 (0.278 – 0.285)	—— 1.8 (0.07) —— ——
	Fork-to-5th/reverse shift piece pin clearance	at 5th gear side at reverse gear side	0.4 – 0.9 (0.016 – 0.035) 0.05 – 0.45 (0.0020 – 0.018)	—— ——
Shift arm	Groove width of change piece contact area Change piece-to-shift arm clearance		11.8 – 12.0 (0.46 – 0.47) 0.05 – 0.35 (0.002 – 0.014)	—— 0.80 (0.031)
Shift piece	Groove width of shift arm contact area Shift piece-to-shift arm clearance I.D. Shift piece-to-shaft clearance Diameter of shift fork contact area Shift piece-to-shift fork shaft clearance		8.1 – 8.2 (0.319 – 0.323) 0.10 – 0.30 (0.004 – 0.012) 14.000 – 14.068 (0.551 – 0.554) 0.011 – 0.092 (0.0004 – 0.0036) 11.90 – 12.00 (0.469 – 0.472) 0.20 – 0.50 (0.008 – 0.020)	—— 0.60 (0.024) —— 0.150 (0.0059) —— 0.80 (0.031)
Selector arm	Diameter of change piece contact area Arm-to-change piece clearance Groove width of interlock contact area Arm-to-interlock clearance		11.8 – 12.0 (0.46 – 0.47) 0.05 – 0.35 (0.002 – 0.014) 10.05 – 10.15 (0.3957 – 0.3996) 0.05 – 0.25 (0.002 – 0.010)	—— 0.50 (0.020) —— 0.50 (0.020)

*: B18C1, B18C5 engines

Automatic Transmission — Section 14

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)		5.9 (6.2, 5.2) for overhaul 2.7 (2.9, 2.4) for fluid change	
Hydraulic pressure kPa (kgf/cm², psi)	Line pressure at 2,000 rpm (N or P position)		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	2nd clutch pressure at 2,000 rpm (D4 position)		420 – 480 (4.3 – 4.9, 61 – 70) throttle fully closed | 830 – 880 (8.5 – 9.0, 120 – 130) throttle more than 1/4 opened	400 (4.1, 58) throttle fully closed | 780 (8.0, 110) throttle more than 1/4 opened
	3rd clutch pressure at 2,000 rpm (D4 position)		440 – 480 (4.5 – 4.9, 64 – 70) throttle fully closed	400 (4.1, 58) throttle fully closed |
	4th clutch pressure at 2,000 rpm (D4 position)		830 – 880 (8.5 – 9.0, 120 – 130) throttle more than 1/4 opened	780 (8.0, 110) throttle more than 1/4 opened
	2nd clutch pressure at 2,000 rpm (2 position)		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	1st clutch pressure at 2,000 rpm (D4 or 1 position)		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	1st-hold clutch pressure at 2,000 rpm (1 position)		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	Throttle pressure B (D4 or D3 position)	Throttle fully closed Throttle fully opened	0 – 15 (0 – 0.15, 0 – 2.1) 830 – 880 (8.5 – 9.0, 120 – 130)	—— 780 (8.0, 110)
Stall speed rpm (Check with vehicle on level ground)		B18B1 engine	2,500	2,350 – 2,650
		B18C1 engine	2,400	2,250 – 2,550

Unit of length: mm (in)

Automatic Transmission — Section 14

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Clutch	Clutch initial clearance	1st, 2nd	0.65 – 0.85 (0.026 – 0.033)	——
		3rd, 4th	0.40 – 0.60 (0.016 – 0.024)	——
		1st-hold	0.5 – 0.8 (0.020 – 0.031)	——
	Clutch return spring free length	1st, 2nd, 3rd, 4th	31.0 (1.22)	29.1 (1.15)
		1st-hold	34.6 (1.36)	32.6 (1.28)
	Clutch disc thickness		1.88 – 2.00 (0.074 – 0.079)	Until grooves wear out
	Clutch plate thickness	1st, 1st-hold	1.55 – 1.65 (0.061 – 0.065)	
		2nd, 3rd, 4th	1.95 – 2.05 (0.077 – 0.081)	Discoloration
	Clutch end plate thickness (1st, 2nd, 3rd, 4th)	MARK 1	2.05 – 2.10 (0.081 – 0.083)	Discoloration
		MARK 2	2.15 – 2.20 (0.085 – 0.087)	↑
		MARK 3	2.25 – 2.30 (0.089 – 0.091)	
		MARK 4	2.35 – 2.40 (0.093 – 0.094)	
		MARK 5	2.45 – 2.50 (0.096 – 0.098)	
		MARK 6	2.55 – 2.60 (0.100 – 0.102)	
		MARK 7	2.65 – 2.70 (0.104 – 0.106)	
		MARK 8	2.75 – 2.80 (0.108 – 0.110)	
		MARK 9	2.85 – 2.90 (0.112 – 0.114)	↓
		MARK 10	2.95 – 3.00 (0.116 – 0.118)	Discoloration
	Clutch end plate thickness (1st-hold)	MARK 1	2.05 – 2.10 (0.081 – 0.083)	Discoloration
		MARK 2	2.15 – 2.20 (0.085 – 0.087)	↑
		MARK 3	2.25 – 2.30 (0.089 – 0.091)	
		MARK 4	2.35 – 2.40 (0.093 – 0.094)	
		NO MARK	2.45 – 2.50 (0.096 – 0.098)	
		MARK 6	2.55 – 2.60 (0.100 – 0.102)	↓
		MARK 7	2.65 – 2.70 (0.104 – 0.106)	Discoloration

(cont'd)

Standard and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Diameter of needle bearing contact area		
	On mainshaft stator shaft bearing	23.980 – 23.993 (0.9441 – 0.9446)	Wear or damage
	On mainshaft 2nd gear	35.975 – 35.991 (1.4163 – 1.4170)	↑
	On mainshaft 4th gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On mainshaft 1st gear collar	30.975 – 30.991 (1.2195 – 1.2201)	
	On countershaft (left side)	36.004 – 36.017 (1.4175 – 1.4180)	
	On countershaft 3rd gear collar	35.980 – 35.996 (1.4165 – 1.4172)	
	On countershaft 4th gear	27.980 – 27.993 (1.1016 – 1.1021)	
	On countershaft reverse gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On countershaft 1st gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On sub-shaft (left side)	25.991 – 26.000 (1.0233 – 1.0236)	
	On sub-shaft 4th gear collar	27.980 – 27.993 (1.1016 – 1.1021)	↓
	On reverse idler gear shaft	13.990 – 14.000 (0.5508 – 0.5512)	Wear or damage
	Inside diameter of needle bearing contact area		
	On mainshaft 1st gear	35.000 – 35.016 (1.3780 – 1.3786)	Wear or damage
	On mainshaft 2nd gear	41.000 – 41.016 (1.6142 – 1.6148)	↑
	On mainshaft 4th gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On countershaft 1st gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On countershaft 3rd gear	41.000 – 41.016 (1.6142 – 1.6148)	
	On countershaft 4th gear	33.000 – 33.016 (1.2992 – 1.2998)	
	On countershaft reverse gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On sub-shaft 4th gear	32.000 – 32.016 (1.2598 – 1.2605)	
	On reverse idler gear	18.007 – 18.020 (0.7089 – 0.7094)	
	On stator shaft (ATF pump side)	29.000 – 29.013 (1.1417 – 1.1422)	
	On stator shaft (stator side)	27.000 – 27.021 (1.0630 – 1.0638)	↓
	Reverse idler gear shaft holder I.D.	14.416 – 14.434 (0.5676 – 0.5683)	Wear or damage
	End play		
	Mainshaft 1st gear	0.05 – 0.16 (0.002 – 0.006)	——
	Mainshaft 2nd gear	0.05 – 0.13 (0.002 – 0.005)	——
	Mainshaft 4th gear	0.05 – 0.16 (0.002 – 0.006)	——
	Countershaft 1st gear	0.1 – 0.5 (0.004 – 0.020)	——
	Countershaft 3rd gear	0.05 – 0.17 (0.002 – 0.007)	——
	Countershaft 4th gear	0.10 – 0.18 (0.004 – 0.007)	——
	Sub-shaft 4th gear	0.05 – 0.17 (0.002 – 0.007)	——
	Reverse idler gear	0.05 – 0.18 (0.002 – 0.007)	——
	Countershaft reverse gear	0.10 – 0.25 (0.004 – 0.010)	——
	Selector hub O.D.	51.87 – 51.90 (2.042 – 2.043)	Wear or damage
	Mainshaft 4th gear collar length	49.50 – 49.55 (1.949 – 1.951)	——
	Mainshaft 4th gear collar flange thickness	4.435 – 4.525 (0.175 – 0.178)	Wear or damage
	Mainshaft 1st gear collar length	27.00 – 27.05 (1.063 – 1.065)	——
	Countershaft distance collar length	38.97 – 39.00 (1.534 – 1.535)	——
		39.02 – 39.05 (1.536 – 1.537)	——
		39.07 – 39.10 (1.538 – 1.539)	——
		39.12 – 39.15 (1.540 – 1.541)	——
		39.17 – 39.20 (1.542 – 1.543)	——
		39.22 – 39.25 (1.544 – 1.545)	——
		39.27 – 39.30 (1.546 – 1.547)	——
		38.87 – 38.90 (1.530 – 1.531)	——
		38.92 – 38.95 (1.532 – 1.533)	——
	Countershaft 3rd gear collar length	20.65 – 20.70 (0.813 – 0.815)	——
	Countershaft reverse gear collar length	14.5 – 14.6 (0.571 – 0.575)	——
	Countershaft reverse gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage
	Countershaft 1st gear collar length	14.5 – 14.6 (0.571 – 0.575)	——
	Countershaft 1st gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage
	Sub-shaft 4th gear collar length	24.0 – 24.1 (0.945 – 0.949)	——
	Sub-shaft 4th gear collar flange thickness	2.95 – 3.10 (0.116 – 0.122)	Wear or damage

Automatic Transmission — Section 14

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Mainshaft 2nd gear thrust washer thickness	3.97 – 4.00 (0.156 – 0.157)	Wear or damage
		4.02 – 4.05 (0.158 – 0.159)	
		4.07 – 4.10 (0.160 – 0.161)	
		4.12 – 4.15 (0.162 – 0.163)	
		4.17 – 4.20 (0.164 – 0.165)	
		4.22 – 4.25 (0.166 – 0.167)	
		4.27 – 4.30 (0.168 – 0.169)	
		4.32 – 4.35 (0.170 – 0.171)	
		4.37 – 4.40 (0.172 – 0.173)	
		4.42 – 4.45 (0.174 – 0.175)	Wear or damage
	Thrust washer thickness		
	Mainshaft ball bearing left side	2.95 – 3.05 (0.116 – 0.120)	Wear or damage
	Mainshaft 1st gear right side	2.43 – 2.50 (0.096 – 0.098)	
	Countershaft 3rd gear splined washer thickness	4.95 – 5.00 (0.195 – 0.197)	
	Sub-shaft 4th gear thrust washer thickness	2.93 – 3.00 (0.115 – 0.118)	
	One-way clutch contact area		
	Countershaft 1st gear I.D.	83.339 – 83.365 (3.2811 – 3.2821)	
	Parking gear O.D.	66.685 – 66.698 (2.6254 – 2.6259)	Wear or damage
	Mainshaft feed pipe A, O.D. (at 15 mm from end)	8.97 – 8.98 (0.353 – 0.354)	8.95 (0.352)
	Mainshaft feed pipe B, O.D. (at 30 mm from end)	5.97 – 5.98 (0.2350 – 0.2354)	5.95 (0.234)
	Countershaft feed pipe O.D. (at 15 mm from end)	7.97 – 7.98 (0.3138 – 0.3142)	7.95 (0.313)
	Sub-shaft feed pipe O.D. (at 15 mm from end)	7.97 – 7.98 (0.3138 – 0.3142)	7.95 (0.313)
	Mainshaft sealing ring thickness (29 mm and 35 mm)	1.87 – 1.97 (0.0736 – 0.0775)	1.82 (0.072)
	Mainshaft bushing I.D.	6.018 – 6.030 (0.2369 – 0.2374)	6.045 (0.2380)
	Mainshaft bushing I.D.	9.000 – 9.015 (0.3543 – 0.3549)	9.03 (0.356)
	Countershaft bushing I.D.	8.000 – 8.022 (0.3150 – 0.3158)	8.03 (0.316)
	Sub-shaft bushing I.D.	8.000 – 8.022 (0.3150 – 0.3158)	8.03 (0.316)
	Mainshaft sealing ring goove width	2.025 – 2.075 (0.0797 – 0.0817)	2.095 (0.082)
Regulator valve body	Sealing ring contact area I.D.	35.000 – 35.025 (1.3780 – 1.3789)	35.050 (1.3799)
Shifting device and parking brake control	Reverse shift fork finger thickness	5.90 – 6.00 (0.232 – 0.236)	5.40 (0.213)
	Parking brake ratchet pawl	——	Wear or other defect
	Parking gear	——	
	Throttle cam stopper height	27.0 – 27.1 (1.063 – 1.067)	——
Servo body	Shift fork shaft bore I.D.	14.000 – 14.010 (0.5512 – 0.5516)	——
	Shift fork shaft valve bore I.D.	37.000 – 37.039 (1.4567 – 1.4582)	37.045 (1.4585)
ATF pump	ATF pump gear side clearance	0.03 – 0.05 (0.001 – 0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance Drive	0.210 – 0.265 (0.0083 – 0.0104)	——
	Driven	0.070 – 0.125 (0.0028 – 0.0049)	——
	ATF pump driven gear I.D.	14.016 – 14.034 (0.5518 – 0.5525)	Wear or damage
	ATF pump driven gear shaft O.D.	13.980 – 13.990 (0.5504 – 0.5508)	Wear or damage

(cont'd)

Standards and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Springs	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	87.8 (3.457)	16.5
	Regulator valve spring B	1.8 (0.071)	*6.0 (0.236)	44.0 (1.732)	7.5
	Stator reaction spring	4.5 (0.177)	26.4 (1.039)	30.3 (1.193)	1.92
	Modulator valve spring	1.3 (0.051)	9.4 (0.370)	39.3 (1.547)	12.4
	Torque converter check valve	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
	Cooler check valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
	Relief valve spring	1.1 (0.043)	8.6 (0.339)	37.1 (1.461)	13.4
	2-3 orifice control valve spring	0.9 (0.035)	6.6 (0.260)	33.0 (1.299)	14.9
	Throttle valve B adjusting spring	0.7 (0.028)	6.2 (0.244)	34.0 (1.339)	15.2
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4
	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
	2-3 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
	3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	52.0 (2.047)	26.8
	1st-hold accumulator spring	4.0 (0.157)	21.5 (0.846)	71.7 (2.823)	8.3
	1st accumulator spring	2.5 (0.098)	16.3 (0.642)	105.4 (4.150)	16 + 8.6
	2nd accumulator spring	3.6 (0.142)	22.0 (0.866)	108.9 (4.287)	15.2
	3rd accumulator spring	2.8 (0.110)	17.5 (0.689)	105.2 (4.142)	19.1
	4th accumulator spring	2.6 (0.102)	16.3 (0.642)	103.3 (4.067)	21.2
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
	Lock-up timing B valve spring	0.8 (0.031)	6.6 (0.260)	60.8 (2.394)	22.1
	Lock-up control valve spring	0.8 (0.031)	6.6 (0.260)	41.6 (1.638)	27.6
	CPC valve spring	1.3 (0.051)	9.4 (0.370)	35.3 (1.390)	12.4
	4-3 kick-down valve spring	1.0 (0.039)	6.6 (0.260)	28.5 (1.122)	14.7
	3-2 kick-down valve spring	1.3 (0.051)	8.6 (0.339)	45.6 (1.795)	17.0
	Servo control valve spring	0.9 (0.035)	6.4 (0.252)	34.1 (1.343)	17.5
	4th exhaust valve spring	1.0 (0.039)	7.1 (0.280)	60.3 (2.374)	18.5
	Orifice control valve spring	0.8 (0.031)	6.6 (0.260)	48.2 (1.898)	33.0

*: Inside Diameter

Differential (Manual Transmission) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Differential carrier	Pinion shaft contact area I.D.	B18B1 engine	18.000 – 18.016 (0.7087 – 0.7093)	———
		B18C1, B18C5 engines	18.000 – 18.018 (0.7087 – 0.7094)	———
	Carrier-to-pinion clearance	B18B1 engine	0.013 – 0.045 (0.0005 – 0.0018)	0.1 (0.004)
		B18C1, B18C5 engines	0.013 – 0.047 (0.0005 – 0.0019)	0.1 (0.004)
	Driveshaft/intermediate shaft contact area I.D.	B18B1 engine	28.000 – 28.021 (1.1024 – 1.1032)	———
		B18C1, B18C5 engines	28.005 – 28.025 (1.1026 – 1.1033)	———
	Carrier-to-driveshaft clearance	B18B1 engine	0.020 – 0.062 (0.0008 – 0.0024)	———
		B18C1, B18C5 engines	0.025 – 0.066 (0.0010 – 0.0026)	———
	Carrier-to-intermediate shaft clearance	B18B1 engine	0.050 – 0.087 (0.0020 – 0.0034)	———
		B18C1, B18C5 engines	0.055 – 0.091 (0.0022 – 0.0036)	———
Differential pinion gear	Backlash		0.05 – 0.15 (0.002 – 0.006)	Adjust
	I.D.		18.042 – 18.066 (0.7103 – 0.7113)	———
	Pinion gear-to-pinion shaft clearance		0.055 – 0.095 (0.0022 – 0.0037)	0.15 (0.006)
Set ring-to-bearing outer race clearance		B18B1 engine	0 – 0.10 (0 – 0.004)	Adjust
Differential taper roller bearing preload Starting torque N·m (kgf·cm, lbf·in)		B18C1, B18C5 engines	2.11 – 3.04 (21.5 – 31.0, 18.7 – 26.9)	Adjust

Differential (Automatic Transmission) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Differential carrier	Pinion shaft contact area I.D.	18.010 – 18.028 (0.7091 – 0.7098)	———
	Carrier-to-pinion clearance	0.023 – 0.057 (0.0009 – 0.0022)	0.1 (0.004)
	Driveshaft/intermediate shaft contact are I.D.	26.025 – 26.045 (1.0246 – 1.0254)	———
	Carrier-to-driveshaft clearance	0.045 – 0.086 (0.0018 – 0.0034)	0.12 (0.005)
Differential pinion gear	Backlash	0.05 – 0.15 (0.002 – 0.006)	———
	I.D.	18.042 – 18.066 (0.7103 – 0.7113)	———
	Pinion gear-to-pinion shaft clearance	0.055 – 0.095 (0.0022 – 0.0037)	0.15 (0.006)
Set ring-to-bearing outer race clearance		0 – 0.15 (0 – 0.006)	Adjust

Unit of length: mm (in)

Steering — Section 17

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotational play at steering wheel circumference Starting load at steering wheel circumference N (kgf, lbf) Engine running	0 – 10 (0 – 0.39) 34 (3.5, 7.7)
Gearbox	Angle of rack-guide-screw loosened from locked position	20° MAX
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm², psi)	6,400 – 7,400 (65 – 75, 924 – 1,067)
Power steering fluid	Recommended fluid Fluid capacity GS, GSR, Type R ℓ (US qt, Imp qt) RS, LS Reservoir	Honda Power Steering Fluid-V or S 1.06 (1.12, 0.93) 1.0 (1.06, 0.88) 0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	11.5 – 13.5 (0.45 – 0.53) with used belt 8.0 – 10.0 (0.31 – 0.39) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge	390 – 540 (40 – 55, 88 – 120) with used belt 740 – 880 (75 – 90, 170 – 200) with new belt

* When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension — Section 18

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber Front Type R All except Type R Rear Caster Front Total toe Front Rear Front wheel turning angle Inward wheel Outward wheel	$-0° 30' \pm 1°$ $-0° 10' \pm 1°$ $-0° 45'^{+0°45'}_{-1°15'}$ $1° 10' \pm 1°$ 0 ± 2 $(0 \pm 1/16)$ IN 2^{+2}_{-1} $(1/16 \pm 1/16)$ $36° 00' \pm 2°$ 30° 30'	
Wheel bearing	End play Front Rear	0 – 0.05 (0 – 0.002) 0 – 0.05 (0 – 0.002)	
		STANDARD (NEW)	SERVICE LIMIT
Wheel	Rim runout (Aluminum wheel) Axial Radial Rim runout (Steel wheel) Axial Radial	0 – 0.7 (0 – 0.03) 0 – 0.7 (0 – 0.03) 0 – 1.0 (0 – 0.04) 0 – 1.0 (0 – 0.04)	2.0 (0.08) 1.5 (0.06) 2.0 (0.08) 1.5 (0.06)

Brake — Section 19

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke at 196 N (20 kgf, 44 lbf) lever force	To be locked when pulled 6 –10 notches	
Foot brake pedal	Pedal height (With floor mat removed) M/T A/T Free play	160 (6 5/16) 165 (6 1/2) 1 – 5 (1/16 – 3/16)	
Master cylinder	Piston-to-pushrod clearance	0 – 0.4 (0 – 0.02)	
		STANDARD (NEW)	SERVICE LIMIT
Disc brake	Disc thickness Front Type R All except Type R Rear Disc runout Front Rear Disc parallelism Front and rear Pad thickness Front Type R All except Type R Rear Type R All except Type R	22.9 – 23.1 (0.90 – 0.91) 20.9 – 21.1 (0.82 – 0.83) 8.9 – 9.1 (0.35 – 0.36) ——— ——— ——— 10.5 – 11.5 (0.41 – 0.45) 9.5 – 10.5 (0.37 – 0.41) 8.5 – 9.5 (0.33 – 0.37) 7.0 – 8.0 (0.28 – 0.31)	21.0 (0.83) 19.0 (0.75) 8.0 (0.31) 0.10 (0.004) 0.10 (0.004) 0.015 (0.0006) 1.6 (0.06) 1.6 (0.06) 1.6 (0.06) 1.6 (0.06)

Standards and Service Limits

Air Conditioning — Section 22

	MEASUREMENT		STANDARD (NEW)
Air conditioning system	Lubricant capacity mℓ (fl oz) Lubricant type: ND-OIL8 (P/N 38897 – PR7 – A01AH or 38899 – PR7 – A01)	Condenser Evaporator Line or hose Receiver/Dryer	25 (5/6) 40 (1 1/3) 10 (1/3) 10 (1/3)
Compressor	Lubricant capacity mℓ (fl oz) Lubricant type: ND-OIL8 Stator coil resistance at 68°F (20°C) Ω Pulley-to-pressure plate clearance		140^{+15}_{0} (4 2/3 $^{+1/2}_{0}$) 3.4 – 3.8 0.5 ± 0.15 (0.02 ± 0.006)
Compressor belt*1	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.5 – 9.5 (0.30 – 0.37) with used belt 5.0 – 7.0 (0.20 – 0.28) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge		390 – 540 (40 – 55, 88 – 120) with used belt 740 – 880 (75 – 90, 170 – 200) with new belt

*1: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Electrical — Section 23

	MEASUREMENT		STANDARD (NEW)	
Ignition coil	Rated voltage V Primary winding resistance at 68°F (20°C) Ω Secondary winding resistance at 68°F (20°C) kΩ		12 0.6 – 0.8 12.8 – 19.2	
Ignition wire	Resistance at 68°F (20°C) kΩ F: ring order		25 max. 1 – 3 – 4 – 2	
			STANDARD (NEW)	SERVICE LIMIT
Spark plug	Type Gap	 B18B1, B18C5 engines B18C1 engine	See Section 23 1.0 – 1.1 (0.039 – 0.043) ——	—— —— 1.3 (0.051)*1
Ignition timing	At idling ° BTDC (Red) – rpm	M/T Except B18C5 engine B18C5 engine A/T	16 ± 2 –750 ± 50 (Neutral) 16 ± 2 – 800 ± 50 (Neutral) 16 ± 2 –750 ± 50 (N or P position)	
Alternator belt*2	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	 Except B18C5 engine B18C5 engine	9.0 – 11.0 (0.35 – 0.43) with used belt 6.0 – 8.0 (0.24 – 0.31) with new belt 7.0 – 9.0 (0.28 – 0.35) with new belt	
	Belt tension N (kgf, lbf) Measured with belt tension gauge	 Except B18C5 engine B18C5 engine	340 – 490 (35 – 50, 77 – 110) with used belt 690 – 880 (70 – 90, 154 – 198) with new belt 540 – 740 (55 – 75, 121 – 165) with new belt	
			STANDARD (NEW)	SERVICE LIMIT
Alternator (Except B18C5 engine)	Output 13.5 V at normal operating temperature A Coil resistance (rotor) at 68°F (20°C) Ω Slip ring O.D. Brush length Brush spring tension N (kgf, lbf)		90 2.9 14.4 (0.57) 10.5 (0.41) 3.2 (0.33, 0.73)	—— —— 14.0 (0.55) 1.5 (0.06) ——
Alternator (B18C5 engine)	Output 13.5 V at normal operating temperature A Coil resistance (rotor) at 68°F (20°C) Ω Slip ring O.D. Brush length Brush spring tension N (kgf, lbf)		85 2.6 – 2.9 22.7 (0.89) 19.0 (0.75) 3.3 – 4.1 (0.34 – 0.42, 0.75 – 0.93)	—— —— 21.2 (0.83) 14.0 (0.55) ——
Starter	Output Mica depth Commutator runout Commutator O.D. Brush length Brush spring tension (new) N (kgf, lbf)	 M/T A/T	M/T: 1.2 kW, A/T: 1.4 kW 0.5 – 0.8 (0.02 – 0.03) 0 – 0.02 (0 – 0.0008) 29.9 – 30.0 (1.177 – 1.181) 15.0 – 15.5 (0.59 – 0.61) 12.7 – 20.6 (1.3 – 2.1, 2.9 – 4.6) 17.7 – 23.5 (1.8 – 2.4, 4.0 – 5.3)	—— 0.2 (0.008) 0.05 (0.002) 29.0 (1.142) 10.0 (0.39) —— ——

*1: Do not adjust the gap, replace spark plug if it is out of spec.
*2: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Design Specifications

	ITEM		METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length	3-door	4,380 mm	172.4 in	
		4-door	4,525 mm	178.1 in	
	Overall Width		1,710 mm	67.3 in	
	Overall Height	3-door	1,335 mm	52.6 in	
		4-door	1,370 mm	53.9 in	
	Wheelbase	3-door	2,570 mm	101.2 in	
		4-door	2,620 mm	103.1 in	
	Track F/R		1,475/1,470 mm	58.1/57.9 in	Except Type R
			1,480/1,470 mm	58.3/57.9 in	Type R
	Ground Clearance		150 mm	5.9 in	Except Type R
			140 mm	5.5 in	Type R
	Seating Capacity		Four (3-door), Five (4-door)		
Weight (USA)	Gross Vehicle Weight Rating (GVWR)		——	3,680 lbs	
Weight (CANADA)	Gross Vehicle Weight Rating (GVWR)		1,670 kg	——	
ENGINE	Type	B18B1 engine	Water-cooled, 4-stroke DOHC gasoline engine		
		B18C1, B18C5 engines	Water-cooled, 4-stroke DOHC VTEC gasoline engine		
	Cylinder Arrangement		Inline 4-cylinder, transverse		
	Bore and Stroke	B18B1 engine	81.0 x 89.0 mm	3.19 x 3.50 in	
		B18C1, B18C5 engines	81.0 x 87.2 mm	3.19 x 3.43 in	
	Displacement	B18B1 engine	1,834 cm³ (mℓ)	112 cu-in	
		B18C1, B18C5 engines	1,797 cm³ (mℓ)	110 cu-in	
	Compression Ratio	B18B1 engine	9.2		
		B18C1, B18C5 engines	10.0		
	Valve Train	B18B1 engine	Belt driven, DOHC 4 valve per cylinder		
		B18C1, B18C5 engines	Belt driven, DOHC VTEC 4 valve per cylinder		
	Lubrication System		Forced and wet sump, trochoid pump		
	Oil Pump Displacement	B18B1 engine	50 ℓ (53 US qt, 44 Imp qt)/minute*1		
		B18C1, B18C5 engines	71 ℓ (75 US qt, 62 Imp qt)/minute*2		
	Water Pump Displacement	B18B1 engine	140 ℓ (148 US qt, 123 Imp qt)/minute*1		
		B18C1, B18C5 engines	140 ℓ (148 US qt, 123 Imp qt)/minute*2		
	Fuel Required	B18B1 engine	UNLEADED gasoline with 86 Pump Octane Number or higher		
		B18C1, B18C5 engines	Premium UNLEADED gasoline with 91 Pump Octane Number or higher		
STARTER	Type		Gear reduction		
	Normal Output		M/T: 1.2 kW, A/T: 1.4 kW		
	Nominal Voltage		12 V		
	Hour Rating		30 seconds		
	Direction of Rotation		Clockwise as viewed from gear end		
	Weight	M/T	3.5 kg	7.7 lbs	
		A/T	3.7 kg	8.2 lbs	
CLUTCH	Clutch Type	M/T	Single plate dry, diaphragm spring		
		A/T	Torque converter		
	Clutch Facing Area	M/T B18B1, B18C1 engines	203 cm²	31 sq-in	
		B18C5 engine	176 cm²	27 sq-in	
TRANSMISSION	Transmission Type	M/T	Synchronized 5-speed forward, 1 reverse		
		A/T	Electronically controlled 4-speed automatic, 1 reverse		
	Primary Reduction		Direct 1 : 1		

*1: At 6,000 engine rpm
*2: At 7,600 engine rpm

(cont'd)

Design Specifications

(cont'd)

	ITEM		METRIC	ENGLISH		NOTES
TRANSMISSION	Type		Manual transmission			
		Engine type	B18B1	B18C1	B18C5	
	Gear Ratio	1st	3.230	3.230	3.230	
		2nd	1.900	1.900	2.105	
		3rd	1.269	1.360	1.458	
		4th	0.966	1.034	1.107	
		5th	0.714	0.787	0.848	
		Reverse	3.000	3.000	3.000	
	Final Reduction	Gear type	Single helical gear			
		Gear ratio	4.266	4.400	4.400	
	Type		Automatic transmission			
	Gear Ratio	1st	2.722			
		2nd	1.468			
		3rd	0.975			
		4th	0.638			
		Reverse	1.954			
	Final Reduction	Gear type	Single helical gear			
		Gear ratio	4.357			
AIR CONDITIONING	Cooling Capacity		3,570 Kcal/h	14,200 BTU/h		
	Compressor	Type/Make	Swash-plate/DENSO			
		No. of Cylinders	10			
		Capacity	150 mℓ/rev	9.15 cu-in/rev		
		Max. Speed	7,600 rpm			
		Lubricant Capacity	140 mℓ	4-2/3 fl oz 4.73 Imp oz		
		Lubricant Type	ND-OIL8			
	Condenser	Type	Corrugated fin			
	Evaporator	Type	Corrugated fin			
	Blower	Type	Sirocco fan			
		Motor Input	200 W/12 V			
		Speed Control	4-speed			
		Max. Capacity	450 m³/h	15,900 cu ft/h		
	Temperature Control		Air-mix type			
	Compressor Clutch	Type	Dry, single plate, poly-V-belt drive			
		Power Consumption	40 W max./12 V at 68°F (20°C)			
	Refrigerant	Type	HFC-134a (R-134a)			
		Quantity	700^{0}_{-50} g	$24.7^{0}_{-1.8}$ oz		
STEERING SYSTEM	Type		Power assisted, rack and pinion			
	Overall Ratio		16.1			
	Turns, Lock-to-Lock		2.98			
	Steering Wheel Dia.		380 mm	15.0 in		
SUSPENSION	Type	Front	Independent double wishbone, coil spring with stabilizer			
		Rear	Independent double wishbone, coil spring with stabilizer			
	Shock Absorber, Front and Rear		Telescopic, hydraulic nitrogen gas-filled			

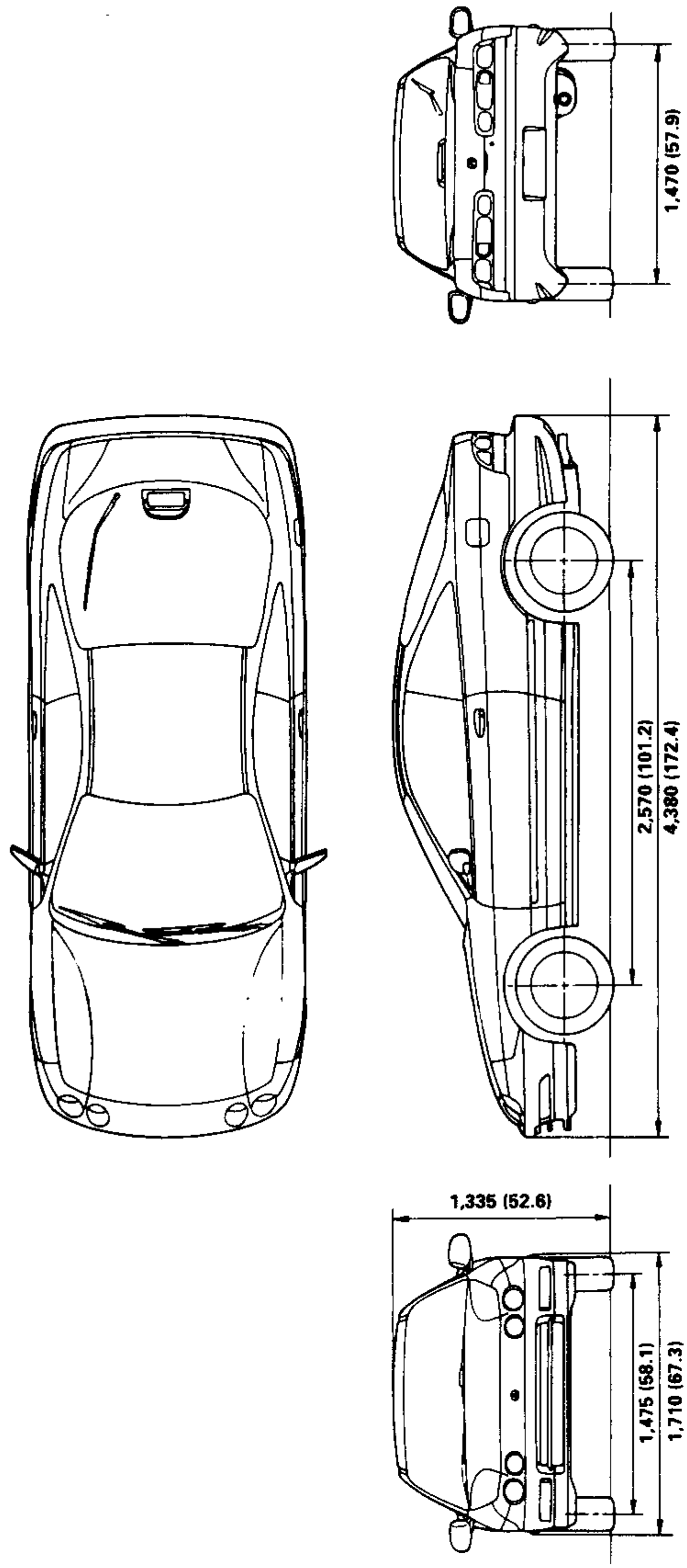
	ITEM				METRIC	ENGLISH	NOTES
WHEEL ALIGNMENT	Camber	Front	B18C5 engine		−0°30′		
			Except B18C5 engine		−0°10′		
		Rear			−0°45′		
	Caster	Front			1°10′		
	Total Toe	Front			0 mm	0 in	
		Rear			In 2 mm	In 1/16 in	
BRAKE SYSTEM	Type	Front			Power-assisted self-adjusting ventilated disc		
		Rear			Power-assisted self-adjusting solid disc		
	Pad Surface Area	Front			50.0 cm² x 2	7.75 sq in x 2	
		Rear			21.0 cm² x 2	3.26 sq in x 2	
	Parking Brake	Type			Mechanical actuating, rear two wheel brakes		
TIRE	Size			Front and rear	P195/60R14 85H*1		
					P195/55R15 84V*2		
				Spare Tire	T115/70D14*3		
					T125/70D14*4		
					T125/70D15*5		
ELECTRICAL	Battery				12 V – 36 AH/5 HR		
	Starter				12 V – 1.2/1.4 kW		
	Alternator				12 V – 90 A/85 A		
	Fuses						
	In Under-dash Fuse/Relay Box				7.5 A, 10 A, 15 A, 20 A, 30 A		
	In Under-hood Fuse/Relay Box				7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A 50 A, 100 A		
	In Under-hood ABS Fuse/Relay Box				10 A, 15 A, 20 A, 40 A		
	Headlights			High	12 V – 60 W (HB3)		
				Low	12 V – 51 W (HB4)		
	Front Side Marker Lights				12 V – 3 CP		SAE 168
	Front Turn Signal/Parking Lights				12 V – 32/3 CP		SAE 1157
	Rear Turn Signal Lights				12 V – 32 CP		SAE 1156
	Brake/Taillights				12 V – 32/3 CP		SAE 1157
	High Mount Brake Light*6				12 V – 21 W		SAE 7440
	Rear Side Marker Lights				12 V – 3 CP		SAE 168
	Back-up Lights				12 V – 32 CP		SAE 1156
	License Plate Lights				12 V – 8 W		
	Ceiling Lights				12 V – 5 W		
	Cargo Area Lights (3-door)				12 V – 3.4 W		
	Trunk Lights (4-door)				12 V – 3.4 W		
	Spotlights				12 V – 5 W		
	Glove Box Light				12 V – 3.4 W		
	Gauge Lights				12 V – 3.4 W		
	Indicator Lights				12 V – 0.84 W, 0.91 W, 1.12 W, 1.4 W, 3 W		
	Illumination and Pilot Lights				12 V – 0.84 W, 0.91 W, 1.4 W, LED		
	Heater Illumination Lights				12 V – 1.4 W		

*1: RS, LS
*2: GS, GS-R, TYPE R
*3: RS
*4: LS, GS-R
*5: TYPE R
*6: Except high mount brake light installed in rear spoiler.

Body Specifications

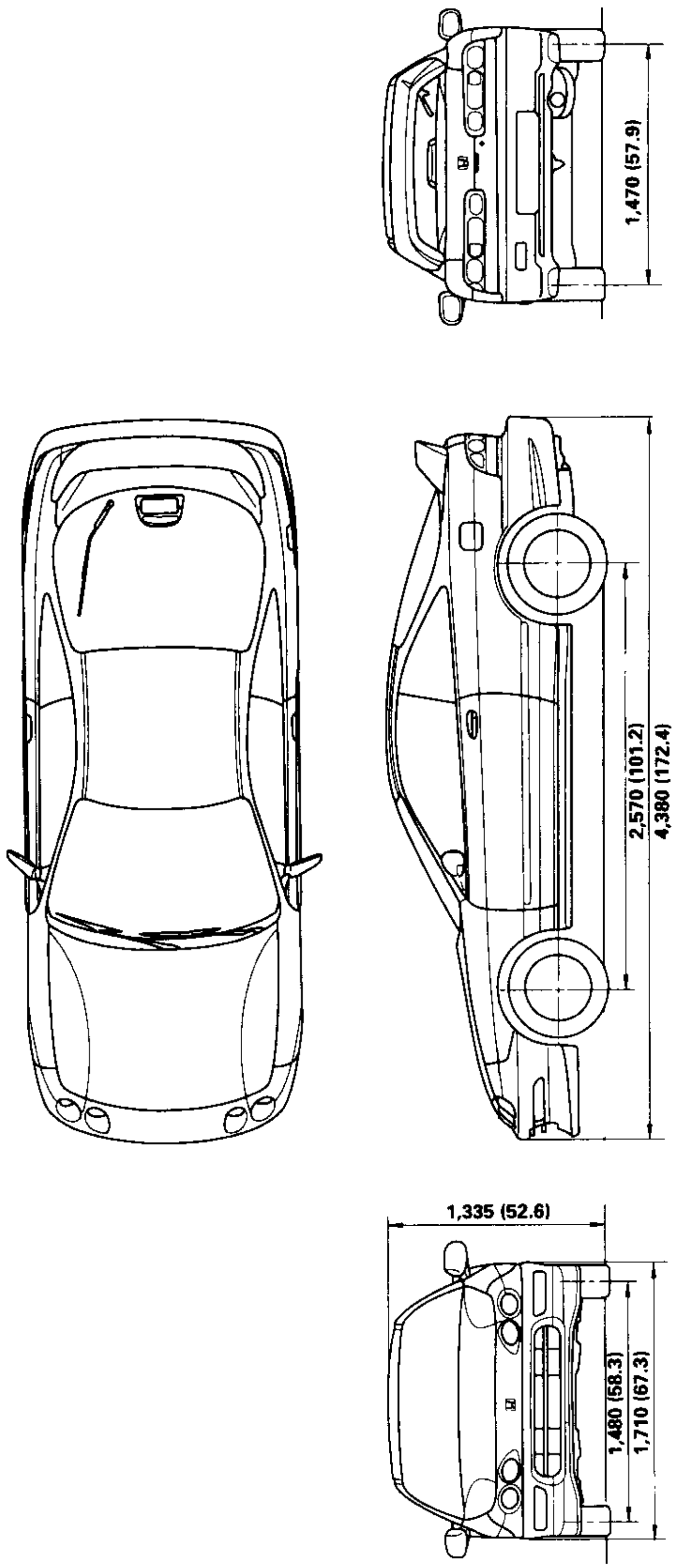
3-door (All except Type R):

Unit: mm (in)



3-door (Type R):

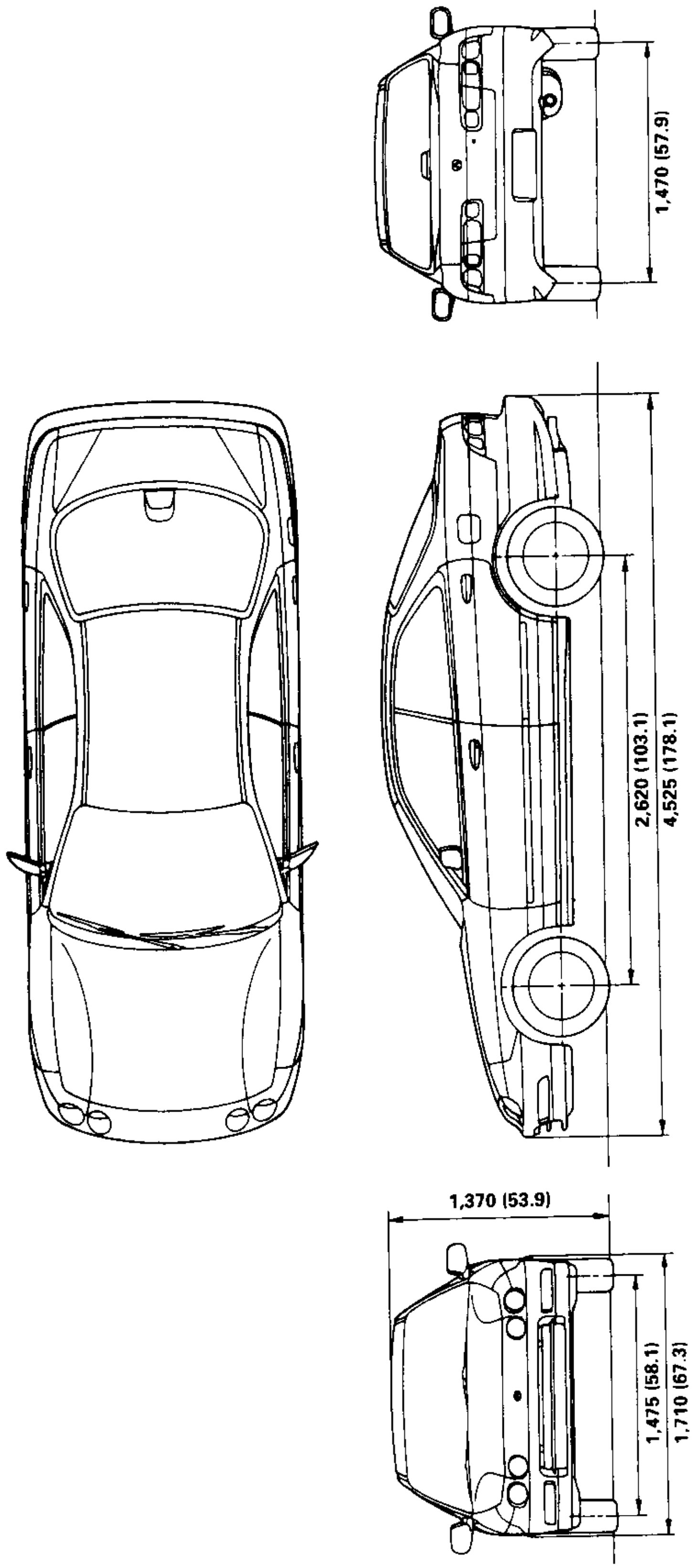
Unit: mm (in)



(cont'd)

4-door:

Unit: mm (in)



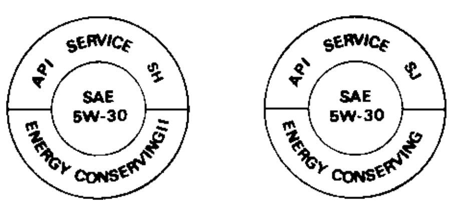
Maintenance

Lubrication Points

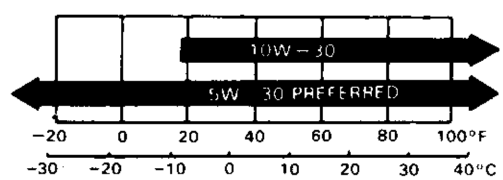
For the details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedure (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: Use SJ "Energy Conserving" or SH "Energy Conserving II" grade oil. The oil container may also display the API Certification mark shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Manual	Honda Genuine MTF*1
		Automatic	Genuine Honda Premium Formula Automatic · Transmission Fluid (ATF)*2
3	Brake line (Includes Anti-lock brake line)		Genuine Honda DOT3 Brake Fluid*3
4	Clutch line		Genuine Honda DOT3 Brake Fluid*3
5	Power steering gearbox		Steering grease P/N 08733 – B070E
6	Release fork (Manual transmission)		Super High Temp Urea Grease (P/N 08798 – 9002)
7 8	Throttle wire end (Dashboard lower panel hole) Cruise control actuator wire end (Dashboard lower panel hole)		Silicone grease
9 10 11 12 13 14	Throttle cable end (Throttle link) Cruise control actuator cable end (Actuator link) Brake master cylinder pushrod Clutch master cylinder pushrod Battery terminals Fuel fill lid		Multi-purpose grease
15 16 17 18	Engine hood hinges and engine hood latch Hatch hinges and latch or trunk hinges and latch Door hinges, upper and lower Door open detent		Honda White Lithium Grease
19	Rear brake calipers		Silicone grease
20	Power steering system		Genuine Honda Power Steering Fluid-V or S*4
21	Air conditioning compressor		Refrigerant oil ND-OIL8 (P/N38897 – PR7 – A01AH or 38899 – PR7 – A01) (For Refrigerant: HFC-134a (R-134a))

API SERVICE LABEL

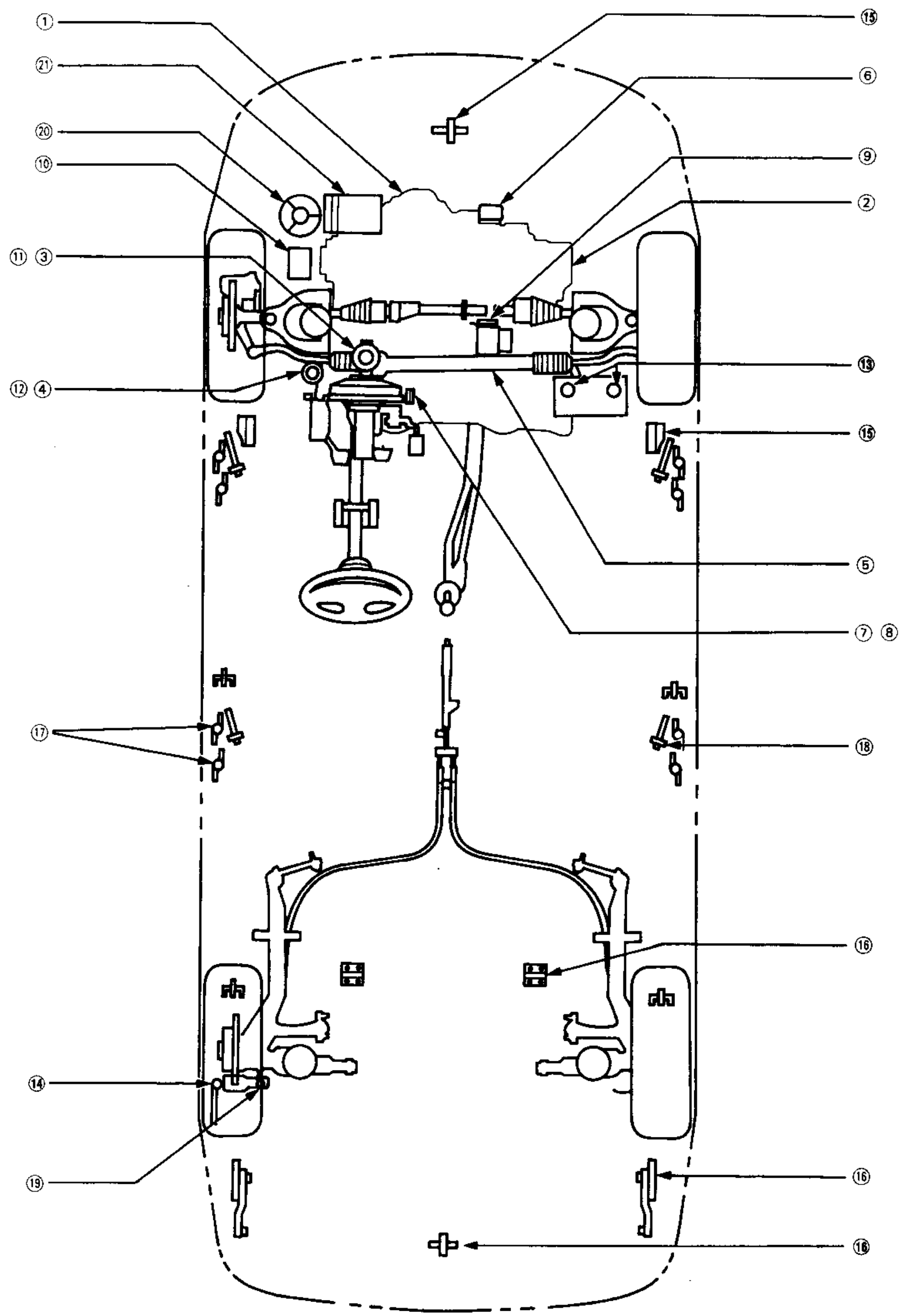


API CERTIFICATION SEAL



Recommended engine oil
Engine oil viscosity for
ambient temperature ranges

*1: Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.
*2: Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.
*3: Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
*4: Always use Genuine Honda Power Steering Fluid-V or S. Using any other type of power steering fluid or automatic transmission fluid can cause increase wear and poor steering in cold weather.



NOTE: Lubricate all hinges, latches, and locks once a year.
In corrosive areas, more frequent lubrication is necessary.
We recommend Honda White Lithium Grease.

Follow the Normal Conditions Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 4-6 and 4-7 do not apply.

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil		Every 7,500 miles (12,000 km) or 12 months								Capacity for change with filter: B18B1 engine: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) B18C1, B18C5 engines: 4.0 ℓ (4.2 US qt, 3.5 Imp qt)	8-4 8-5
Replace engine oil filter		●	●	●	●	●	●	●	●		8-5
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 8-5, 10-5
Replace air cleaner element			●		●		●		●		11-129
Inspect valve clearance*2			●		●		●		●	B18B1 engine: Intake 0.08 – 0.12 mm (0.003 – 0.005 in) Exhaust 0.16 – 0.20 mm (0.006 – 0.008 in) B18C1, B18C5 engines: Intake 0.15 – 0.19 mm (0.006 – 0.007 in) Exhaust 0.17 – 0.21 mm (0.007 – 0.008 in) Measured when cold.	6-3, 43
Replace spark plugs	non platinum-LS, RS, GS		●		●		●		●	NGK: ZFR5F-11, DENSO: KJ16CR-L11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)	23-98
	platinum-GS-R, Type R	Every 60,000 miles (96,000 km) or 72 months								NGK: PFR6G-13, DENSO: PK20PR-L13 Gap: 1.2 – 1.3 mm (0.047 – 0.051 in)*1	
Replace timing belt and inspect water pump								●			6-10, 48 10-10
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.0 mm (0.35 – 0.43 in) P/S pump belt: 11.5 – 13.5 mm (0.45 – 0.53 in) A/C compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	17-20 22-36 23-115
Inspect idle speed								●		Manual transmission: B18B1, B18C1 engines 750 ± 50 rpm B18C5 engine 800 ± 50 rpm Automatic transmission: 750 ± 50 rpm (in N or P position)	11-111
Replace engine coolant				●		●		●		Capacity for change: Manual transmission: B18B1 engine: 4.4 ℓ (4.6 US qt, 3.9 Imp qt) B18C1 engine: 4.7 ℓ (5.0 US qt, 4.1 Imp qt) B18C5 engine 4.5 ℓ (4.8 US qt, 4.0 Imp qt) Automatic transmission: 4.7 ℓ (5.0 US qt, 4.1 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid							●			Manual transmission: Genuine Honda MTF 2.2 ℓ (2.3 US qt, 1.9 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Genuine HONDA Premium Formula ATF	13-3 14-98
Inspect front and rear brakes		●	●	●	●	●	●	●	●	• Check the brake pad, disc thickness, and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.	19-4, 8, 10, 11, 12, 16, 18, 19, 20
Replace brake fluid				●			●			Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 10 clicks.	19-6
Rotate tires (Check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	——

*1: Do not adjust the gap, replace the spark plug if it is out of standard gap.
*2: Measured between the camshaft and rocker arm.

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:										• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	——
Tie-rod ends, steering gear box, and boots										• Check rack grease and steering linkage. • Check the boot for damage or leaking grease. • Check the fluid line for damage and leaks.	17-19
Suspension components											18-8, 27
Driveshaft boots										Check boots and boot band for cracks. Check rack grease.	16-3
Brake hoses and lines [including ABS]											19-20
All fluid levels and condition of fluid		●	●	●	●	●	●	●	●	Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, clutch fluid, windshield washer fluid, power steering fluid, and battery fluid.	10-5 13-3 14-98
Cooling system hoses and connections										Check all hoses for damage, leaks, or deterioration. Check all hose clamps. Retighten if necessary.	10-2
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-4 9-5
Fuel lines and connections*										Check fuel lines for loose connections, cracks, and deterioration. Retighten loose connections and replace any damaged parts.	11-113

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For Canadian models: Follow the Maintenance Schedule for Severe Conditions on pages 4-6 and 4-7.

Maintenance Schedule (Severe Conditions)

Follow the Severe Conditions Maintenance Schedule if the car is driven MAINLY under one or more of the Severe Driving Conditions (page 4-7):

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil and oil filter		Every 3,750 miles (6,000 km) or 6 months								Capacity for change with filter: B18B1 engine: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) B18C1, B18C5 engines: 4.0 ℓ (4.2 US qt, 3.5 Imp qt)	8-4 8-5
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 8-5, 10-5
Clean (○) or replace (●) air cleaner element — Use normal schedule except in dusty condition		○	●	○	●	○	●	○	●		11-129
Inspect valve clearance*2			●		●		●		●	B18B1 engine: Intake 0.08 – 0.12 mm (0.003 – 0.005 in) Exhaust 0.16 – 0.20 mm (0.006 – 0.008 in) B18C1, B18C5 engines: Intake 0.15 – 0.19 mm (0.006 – 0.007 in) Exhaust 0.17 – 0.21 mm (0.007 – 0.008 in) Measured when cold	6-3, 43
Replace spark plugs	non platinum-LS, RS, GS		●		●		●		●	NGK: ZFR5F-11, DENSO: KJ16CR-L11 Gap: 1.0 1.1 mm (0.039 – 0.043 in)	23-98
	platinum-GS-R, Type R	Every 60,000 miles (96,000 km) or 72 months								NGK: PFR6G 13, DENSO: PK20PR-L13 Gap: 1.2 1.3 mm (0.047 – 0.051 in)*1	
Replace timing belt*3 and inspect water pump								●			6-10, 48 10-10
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of flolowing belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.0 mm (0.35 – 0.43 in) P/S pump belt: 11.5 - 13.5 mm (0.45 – 0.53 in) A/C Compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	17-20 22-36 23-115
Inspect idle speed								●		Manual transmission: B18B1, B18C1 engines 750 ± 50 rpm B18C5 engine 800 ± 50 Automatic transmission: 750 ± 50 rpm (in N or P position)	11-111
Replace engine coolant				●		●		●		Capacity for change: Manual transmission: B18B1 engine 4.4 ℓ (4.6 US qt, 3.9 Imp qt) B18C1 engine 4.7 ℓ (5.0 US qt, 4.1 Imp qt) B18C5 engine 4.5 ℓ (4.8 US qt, 4.0 Imp qt) Automatic transmission: 4.7 ℓ (5.0 US qt, 4.0 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid			●		●		●		●	Manual transmission: Genuine Honda MTF 2.2 ℓ (2.3 US qt, 1.9 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Genuine Honda Premium Formula ATF	13-3 14-98
Inspect front and rear brakes		Every 7,500 miles (12,000 km) or 6 months								• Check the brake pad, disc thickness, and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.	19-4, 8, 10, 11, 12, 16, 18, 19, 20
Replace brake fluid				●			●			Use Genuine Honda DOT 3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 10 clicks.	19-6

*1: Do not adjust the gap, replace the spark plug if it is out of standard gap.
*2: Measured between the camshaft and rocker arm.
*3: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:
- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under –20°F, –29°C).

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Lubricate locks and hinges		●	●	●	●	●	●	●	●	Lubricate all hinges, latches and locks	3-2, 3
Clean antenna mast		●	●	●	●	●	●	●	●	Clean antenna mast and check the movement	23-203
Rotate tires (check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	——
Visually inspect the following items:										• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	——
Tie rod ends, steering gear box, and boots		Every 7,500 miles (12,000 km) or 6 months								• Check rack grease and steering linkage. • Check the boot for damage or leaking grease. • Check the fluid line for damage and leaks.	17-19
Suspension components											18-8, 27
Driveshaft boots										Check boots and boot band for cracks. Check rack grease.	16-3
Brake hoses and lines [including ABS]											19-20
All fluid levels and condition of fluid										Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, clutch fluid, windshield washer fluid, power steering fluid, and battery fluid.	10-5 13-3 14-98
Cooling system hoses and connections										Check all hoses for damage, leaks or, deterioration. Check all hose clamps. Retighten if necessary.	10-2
Exhaust system*		●	●	●	●	●	●	●	●	Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-4 9-5
Fuel lines and connections*										Check fuel lines for loose connections, cracks, and deterioration. Retighten loose connections and replace any damaged parts.	11-113
Lights and controls										Check all lights functions and headlight position.	23-170
Vehicle underbody										Check the paint for damages, scratches, stone chipping, and dents.	——

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

Severe Driving Conditions:

- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

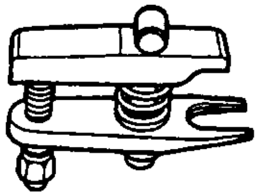
NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule on pages 4-4 and 4-5.

Engine

Engine Removal/Installation

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07MAC – SL00200	Ball Joint Remover, 28 mm	1	5-10



①

⚠ WARNING

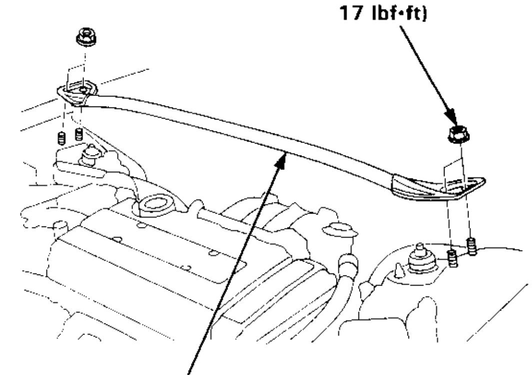
- **Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine (see section 1).**
- **Make sure the car will not roll off stands and fall while you are working under it.**

CAUTION:

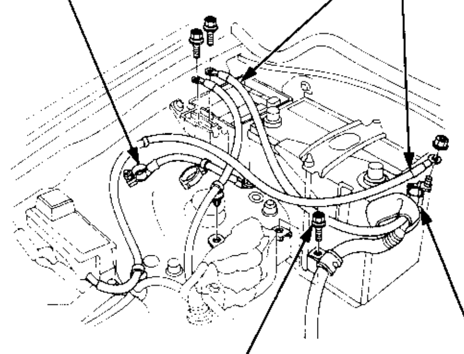
- **Use fender covers to avoid damaging painted surfaces.**
- **Unplug the wiring connectors carefully while holding the coupler and the connector portion to avoid damage.**
- **Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.**

NOTE: Anti-theft radios have a coded theft protection circuit. Be sure to get the customer's code number before
— Disconnecting the battery.
— Removing the No. 32 (7.5 A) fuse from the under-hood fuse/relay box.
— Removing the radio
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Remove the hood (see section 20).
2. Remove the strut brace.

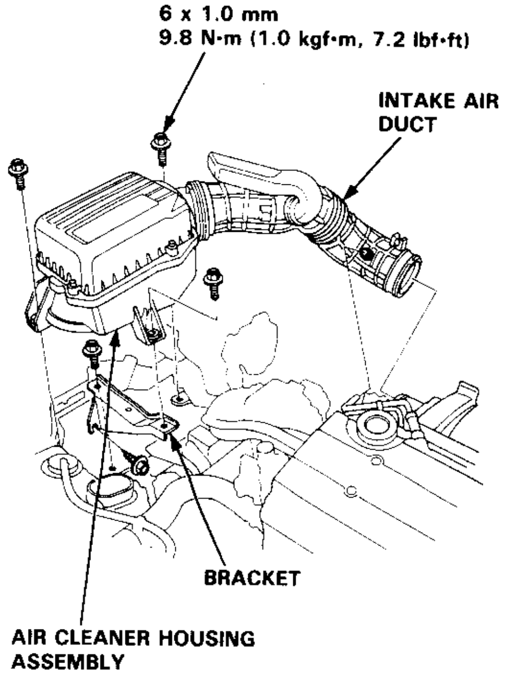


3. Disconnect the battery negative terminal first, then the positive terminal.
4. Disconnect the battery cables from the under-hood fuse/relay box and under-hood ABS fuse/relay box.

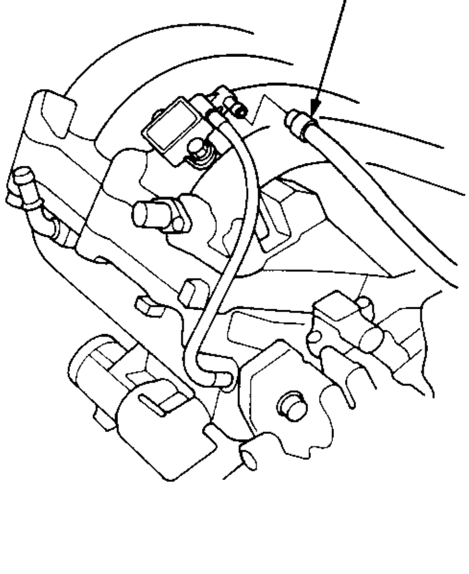


(cont'd)

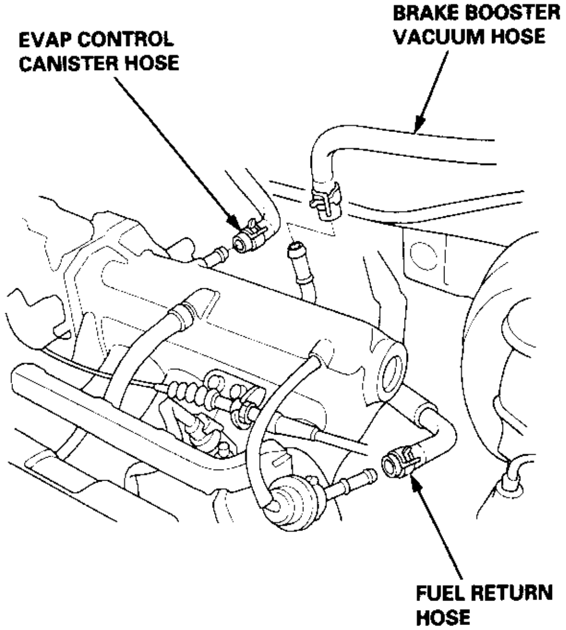
5. Remove the intake air duct, air cleaner housing assembly and the bracket.



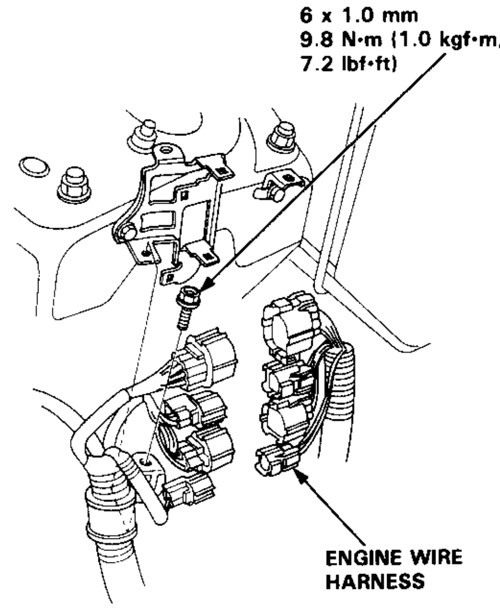
6. Remove the evaporative emission (EVAP) control canister hose (B18B1, B18C1 engines).



7. Remove the brake booster vacuum hose, evaporative emission (EVAP) control canister hose and fuel return hose (B18C5 engine).



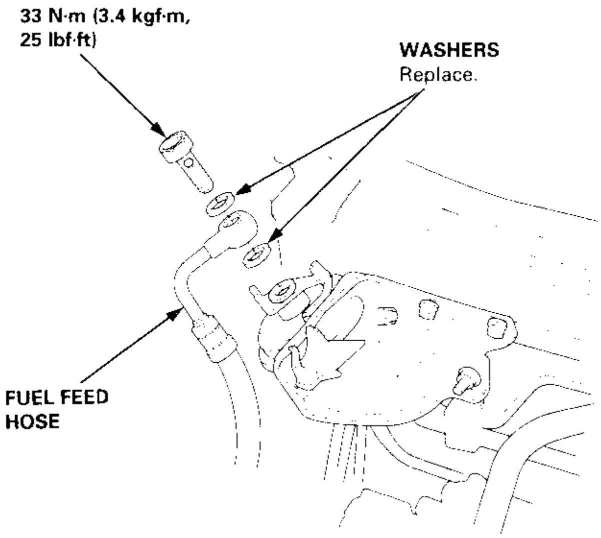
8. Remove the engine wire harness connectors on the right side of engine compartment.



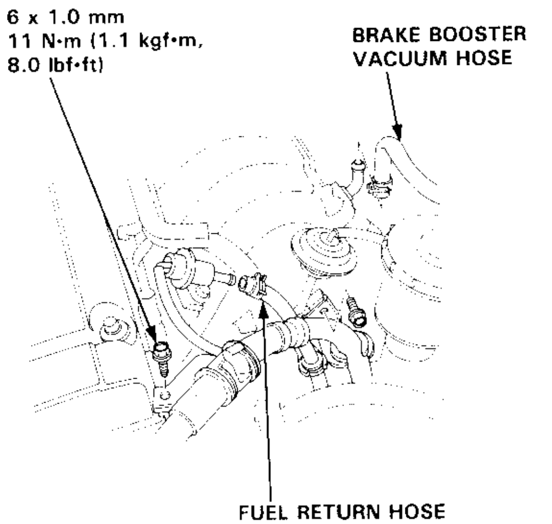
9. Relieve fuel pressure (see section 11).

⚠WARNING Do not smoke while working on the fuel system. Keep open flame or spark away from the work area. Drain fuel only into an approved container.

10. Remove the fuel feed hose.



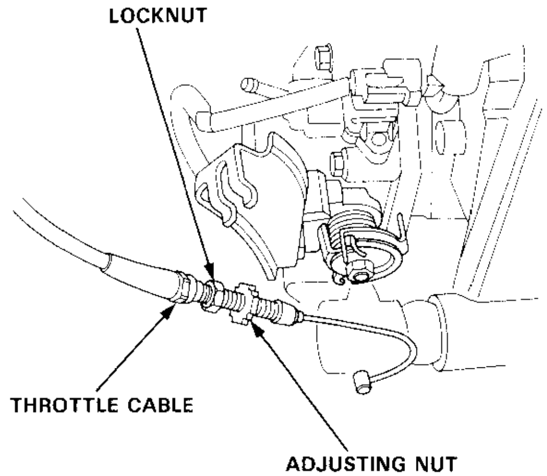
11. Remove the brake booster vacuum hose and fuel return hose. (B18B1, B18C1 engines).



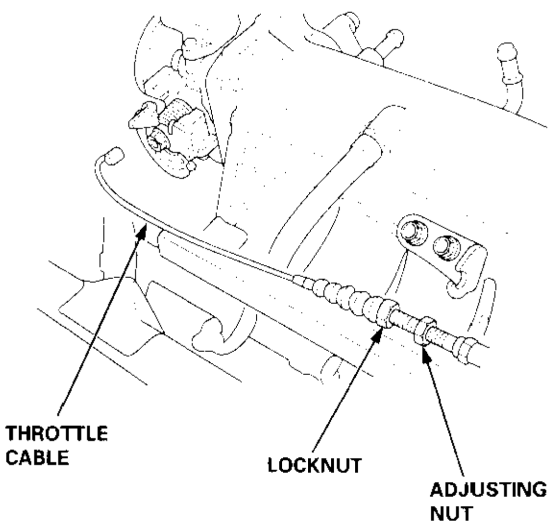
12. Remove the throttle cable by loosening the locknut, then slip the cable end out of the accelerator linkage.

NOTE:
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing (see section 11).

B18B1, B18C1 engines:

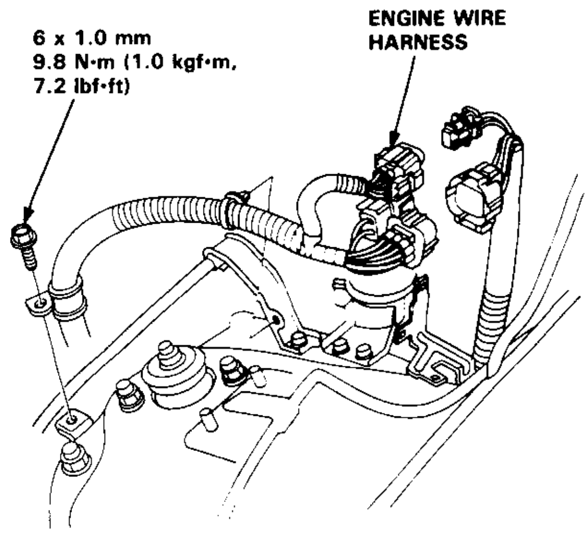


B18C5 engine:

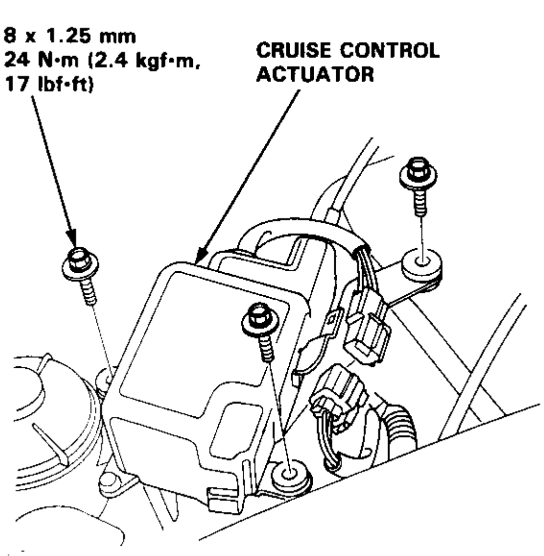


(cont'd)

13. Remove the engine wire harness connectors, terminal and clamps on the left side of engine compartment.

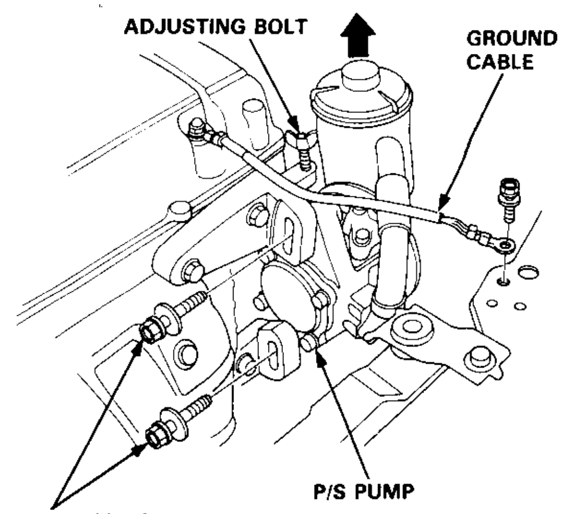


14. Remove the cruise control actuator.

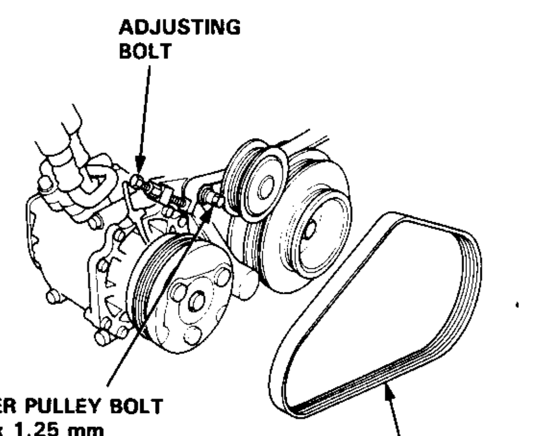


15. Remove the engine ground cable at the body end.

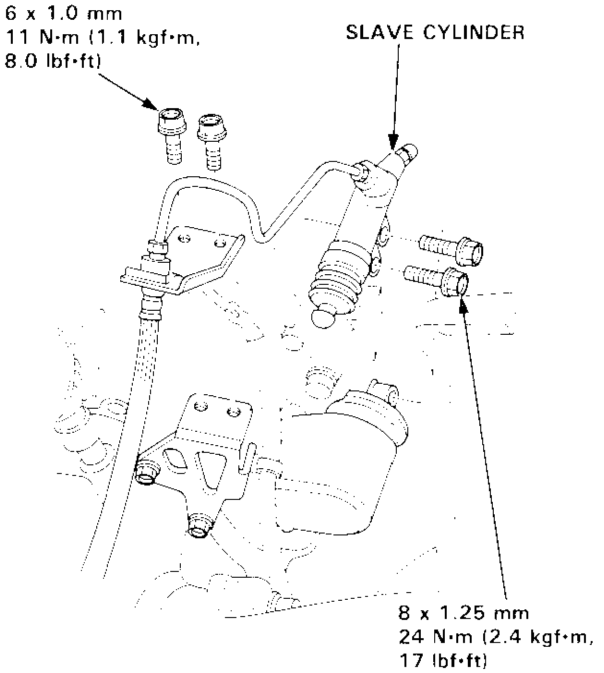
16. Remove the adjusting bolt and mounting bolts, then remove the power steering (P/S) pump belt and pump.
   - Do not disconnect the P/S hoses.



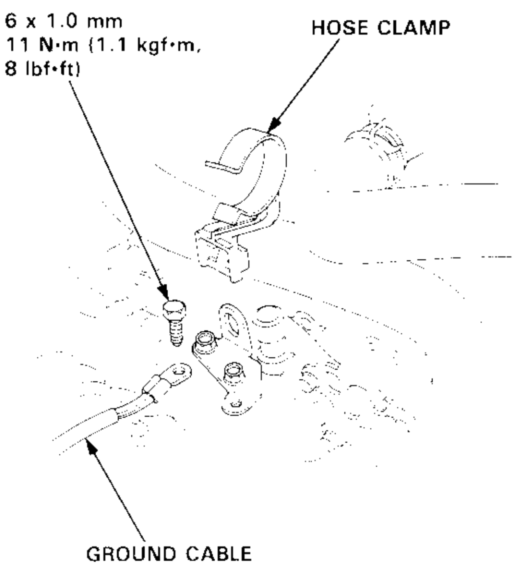
17. Loosen the idler pulley bolt and adjusting bolt, then remove the air conditioning (A/C) compressor belt.



18. (Manual transmission) Remove the clutch slave cylinder and pipe/hose assembly.
    - Do not disconnect the pipe/hose assembly.



19. Remove the transmission ground cable and hose clamp.

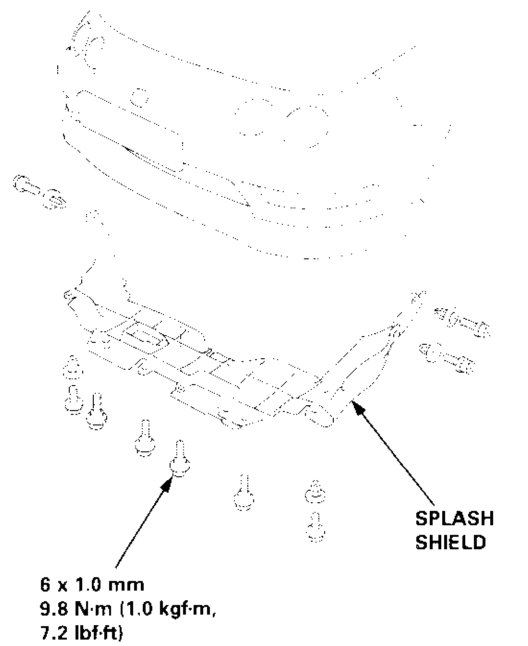


20. Remove the radiator cap.

⚠WARNING Use care when removing the radiator cap to avoid scalding by hot engine coolant or steam.

21. Raise the hoist to full height.

22. Remove the front tires/wheels and the splash shield.



23. Drain the engine coolant (see page 10-6).
    - Loosen the drain plug in the radiator.

24. Drain the transmission oil or fluid. Reinstall the drain plug using a new washer.

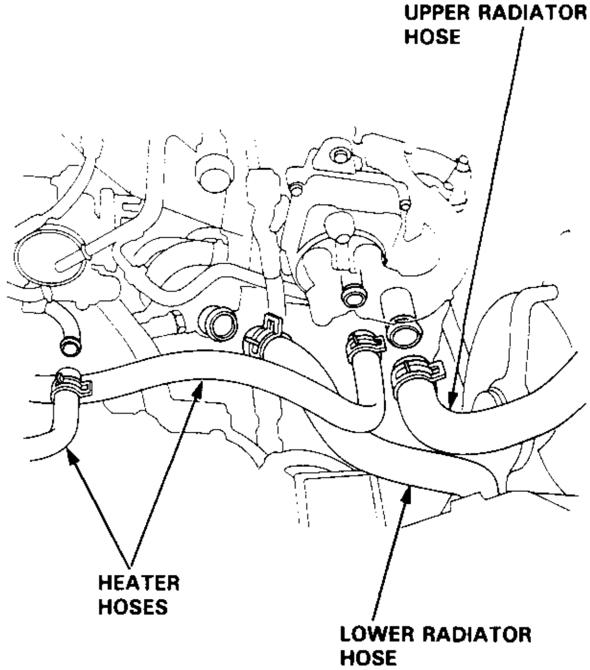
25. Drain the engine oil. Reinstall the drain plug using a new washer.

CAUTION: Do not overtighten the drain plug.

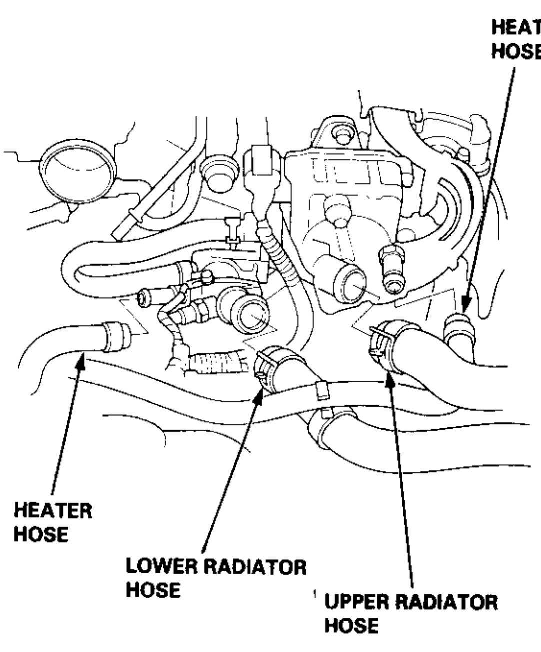
(cont'd)

26. Remove the upper and lower radiator hoses and the heater hoses.

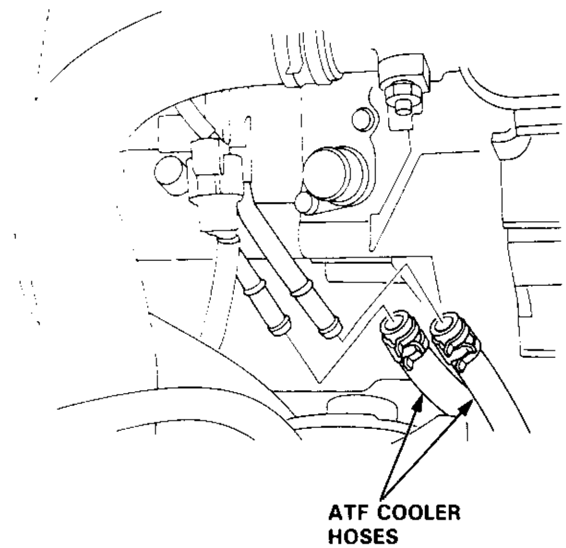
B18B1, B18C5 engines:



B18C1 engine:

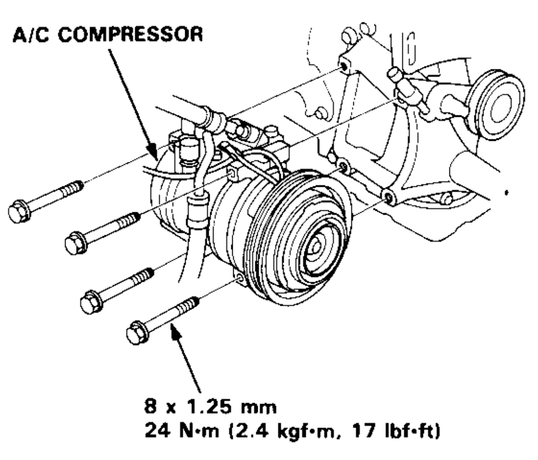


27. (Automatic transmission) Remove the ATF cooler hoses.



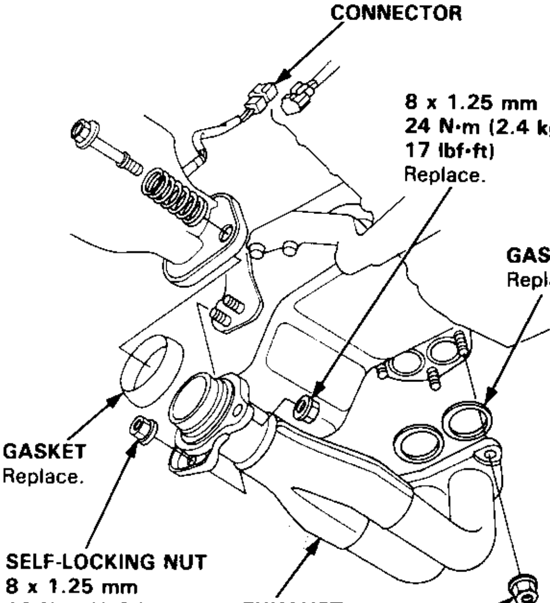
28. Remove the radiator assembly (see page 10-5).

29. Remove the A/C compressor.
    - Do not disconnect A/C hoses.

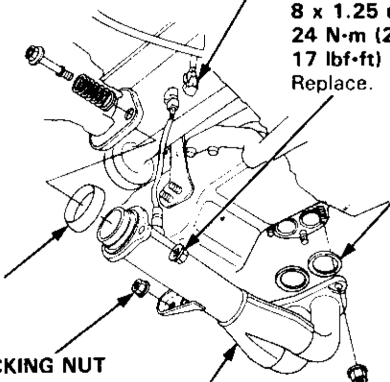


30. Disconnect the primary heated oxygen sensor (Primary HO2S) connector, then remove exhaust pipe A.

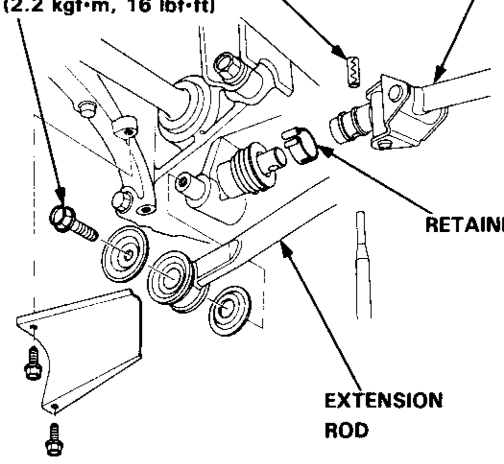
B18C1 engine:



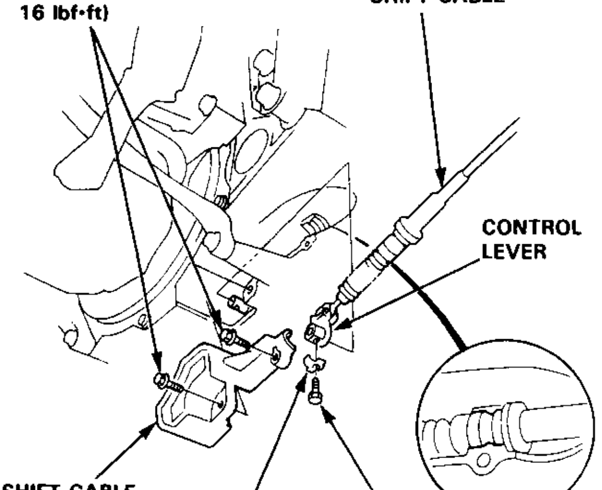
B18B1, B18C5 engines:



31. Remove the shift rod and extension rod (M/T).



32. Remove the shift cable (A/T).



(cont'd)

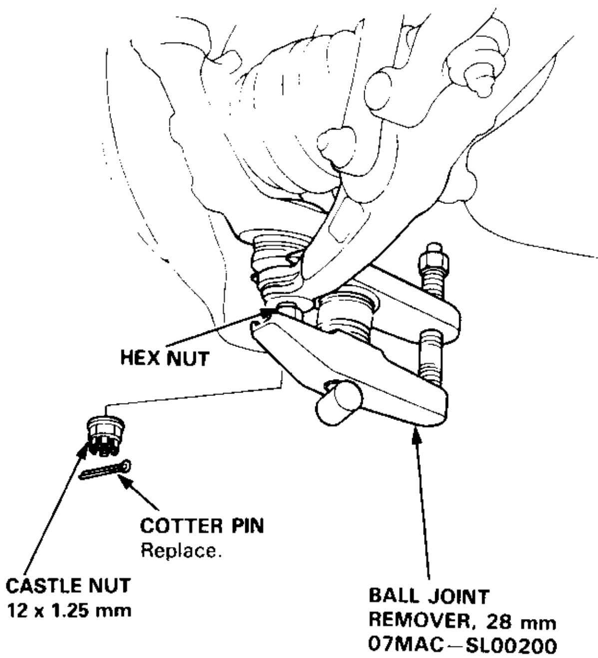
Engine Removal/Installation

(cont'd)

33. Remove the damper fork.

34. Disconnect the suspension lower arm ball joints using the special tool. Refer to section 18 for the proper procedure.

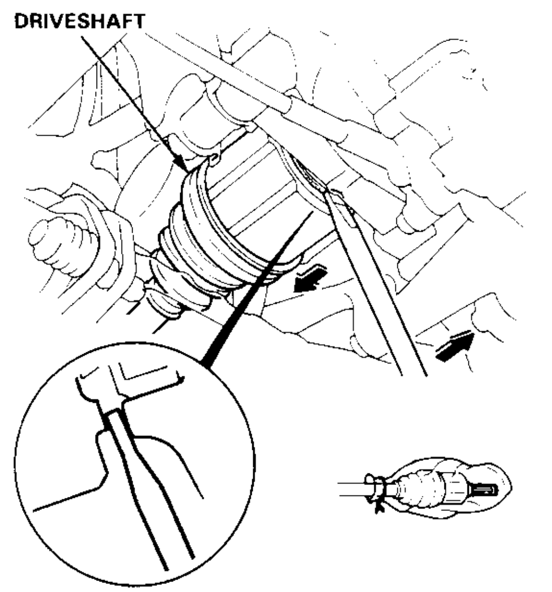
    NOTE: Adjust the tool so the jaws are parallel to each other.



35. Remove the driveshafts.

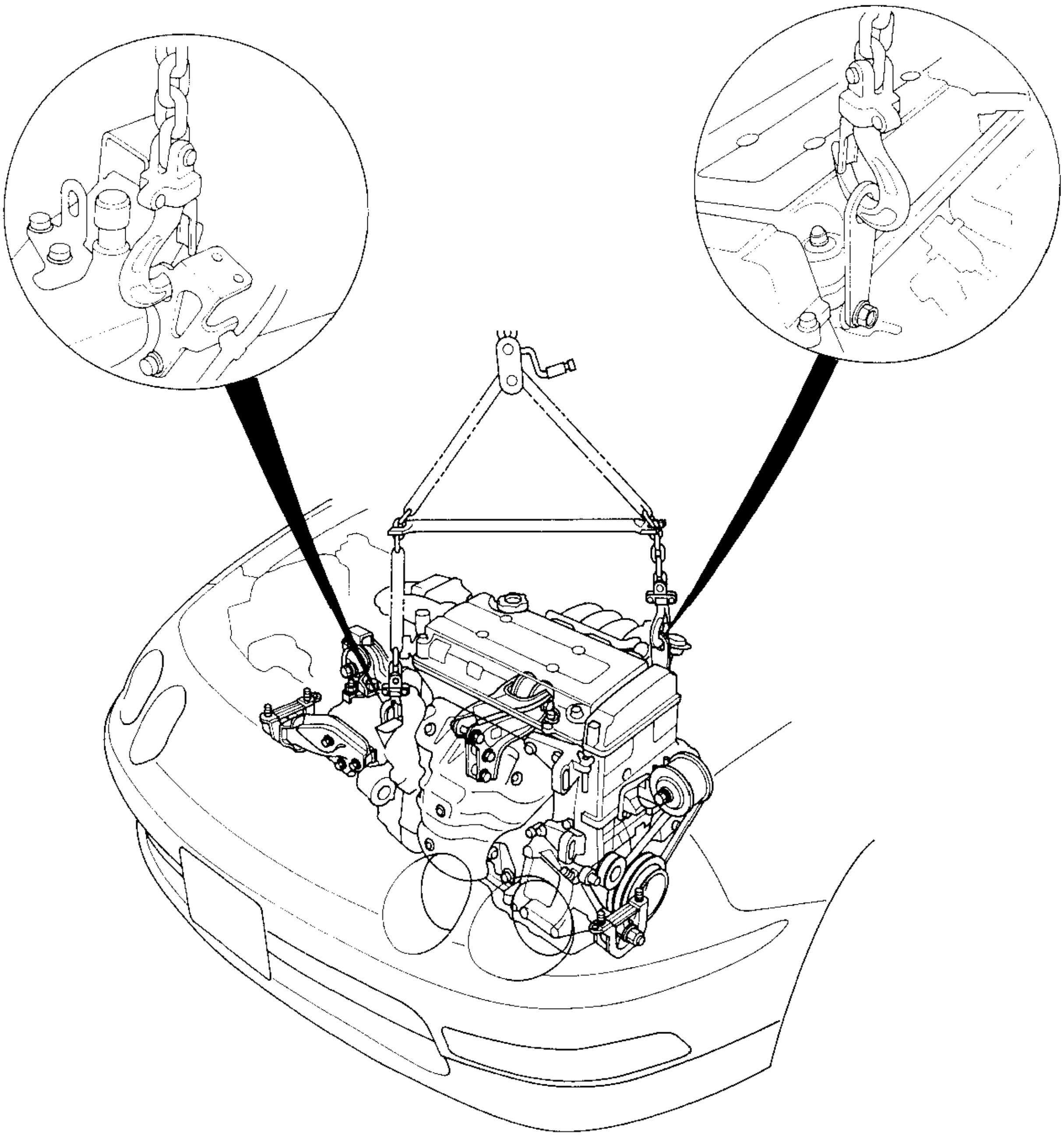
    CAUTION:
    - **Do not pull on the driveshaft, the CV joint may come apart.**
    - **Use care when prying out the assembly. Pull it straight to avoid damaging the differential oil seal or intermediate shaft dust seal.**

    NOTE: Coat all precision finished surfaces with clean engine oil.



36. Lower the hoist.

37. Attach the chain hoist to the engine.

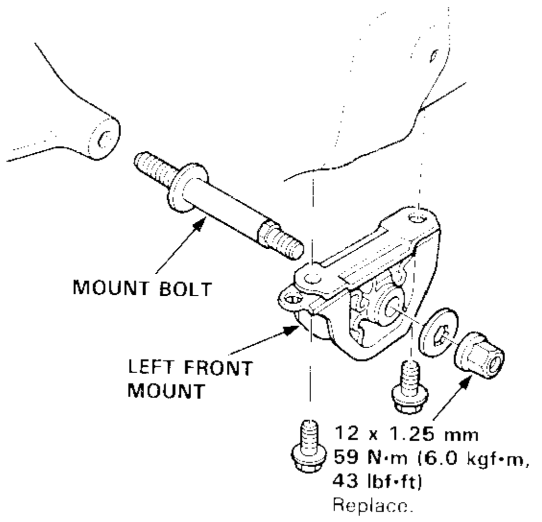


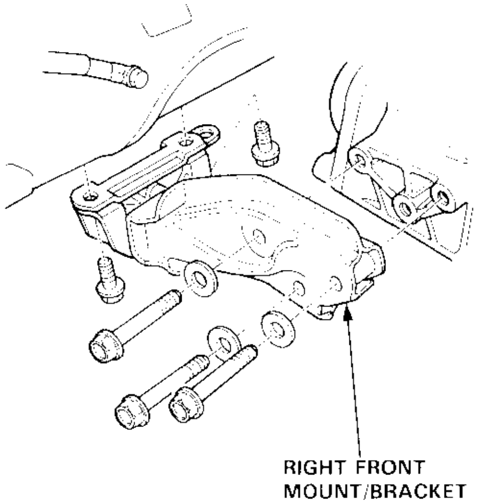
(cont'd)

Engine Removal/Installation

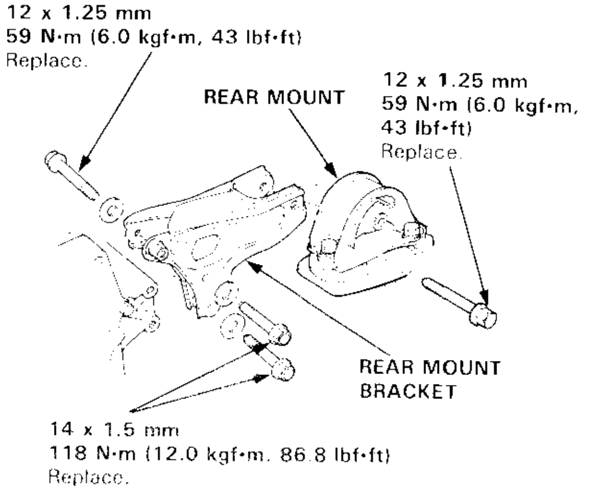
(cont'd)

38. Remove the left and right front mounts and brackets.

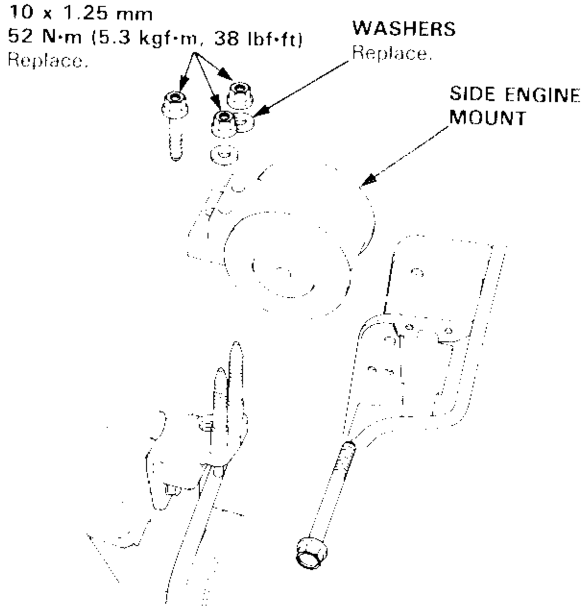




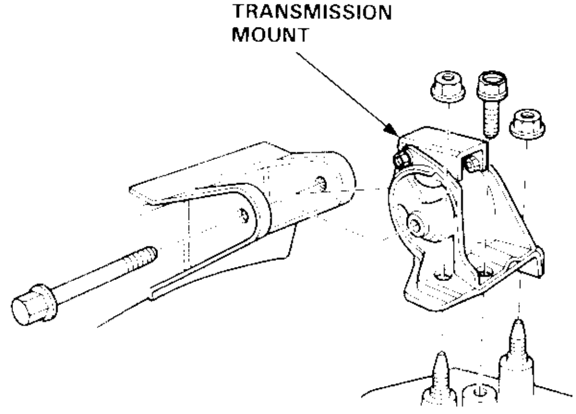
39. Remove the rear mount bracket.



40. Remove the side engine mount.



41. Remove the transmission mount.

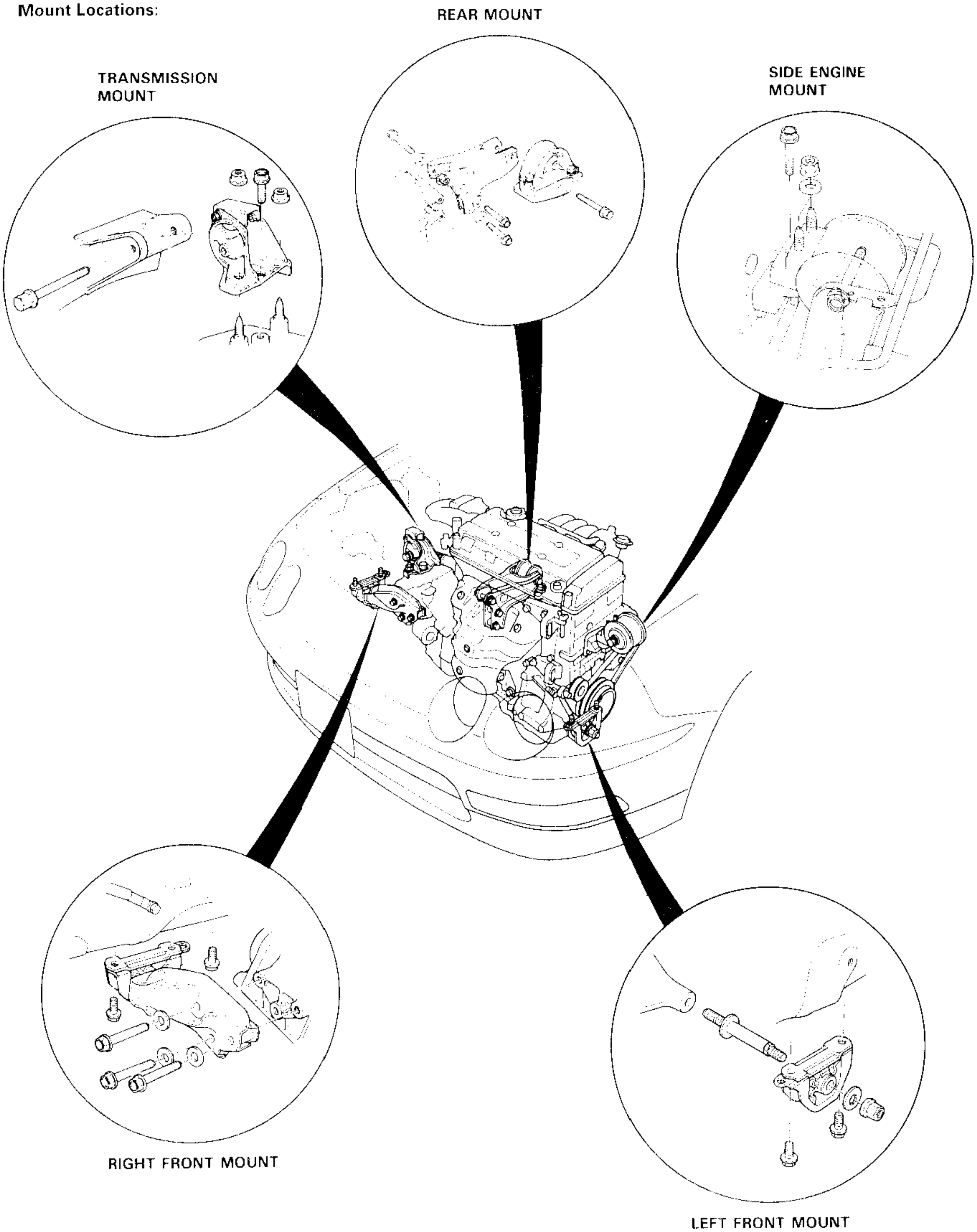


42. Check that the engine is completely free of vacuum hoses, fuel and engine coolant hoses, and electrical wiring.

43. Slowly raise the engine approximately 150 mm (6 in). Check once again that all hoses and wires are disconnected from the engine.

44. Raise the engine all the way and remove it from the car.

Mount Locations:



(cont'd)

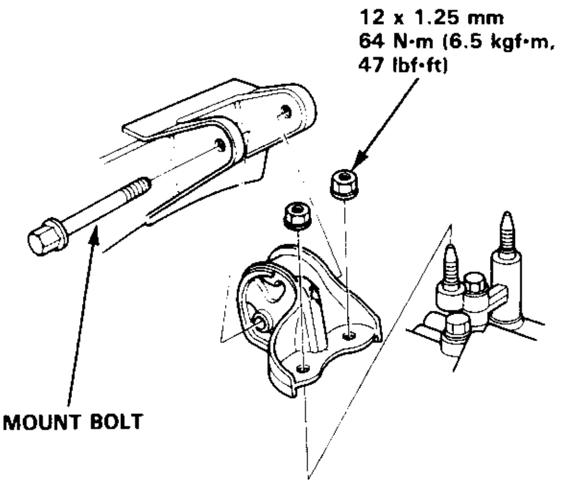
Engine Installation

Install the engine in the reverse order of removal.

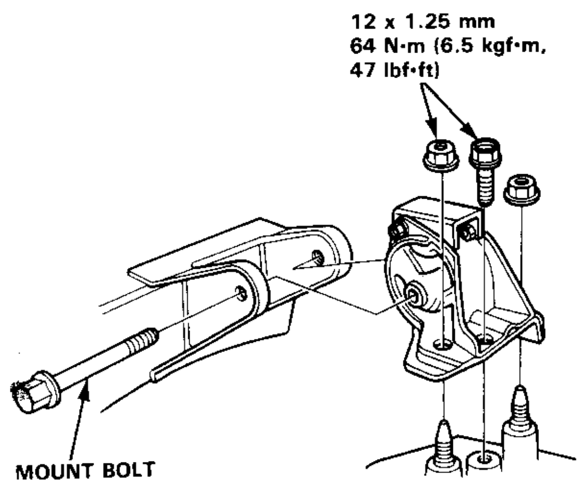
Reinstall the mount bolts/nuts in the following sequence. Failure to follow these procedures may cause excessive noise and vibration, and reduce bushing life.

1. Install the transmission mount, then tighten the bolt/nuts on the transmission side. Leave the mount bolt loose.

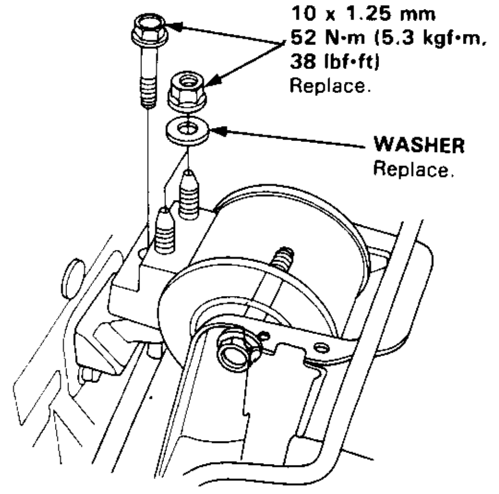
A/T:



M/T:

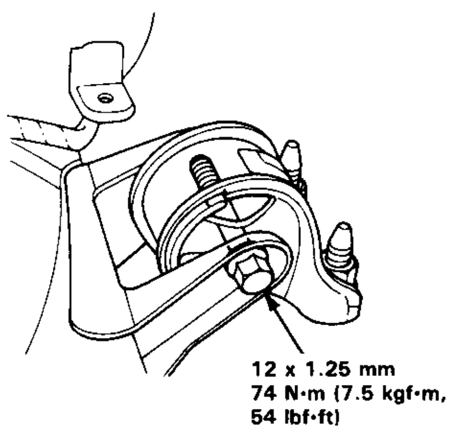


2. Install the engine side mount, then tighten the bolt/nuts on the engine side. Leave the mount bolt loose.

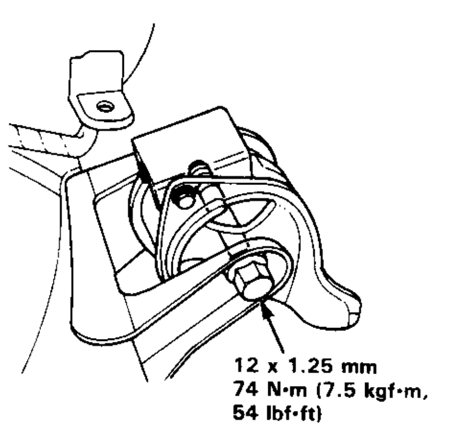


3. Tighten the mount bolt on the transmission mount.

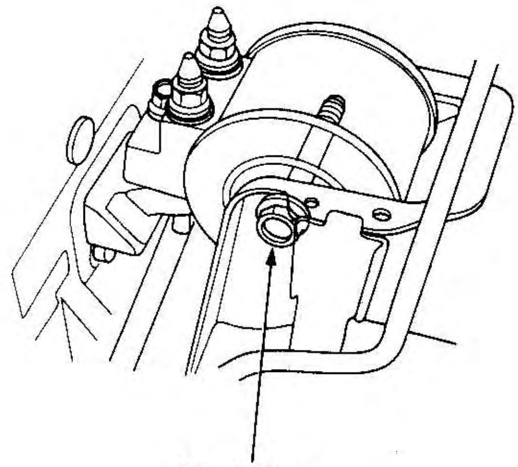
A/T:



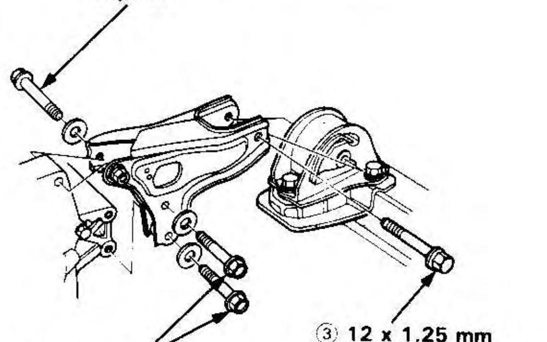
M/T:



4. Tighten the mount bolt on the side engine mount.

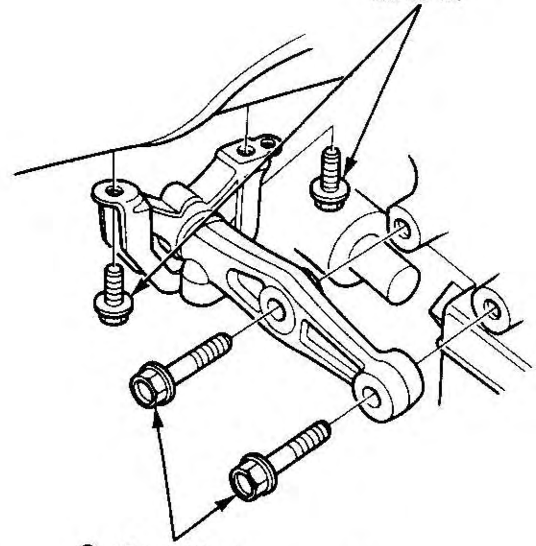


5. Install the rear mount bracket, then tighten the bolts in the numbered sequence shown (① – ③).

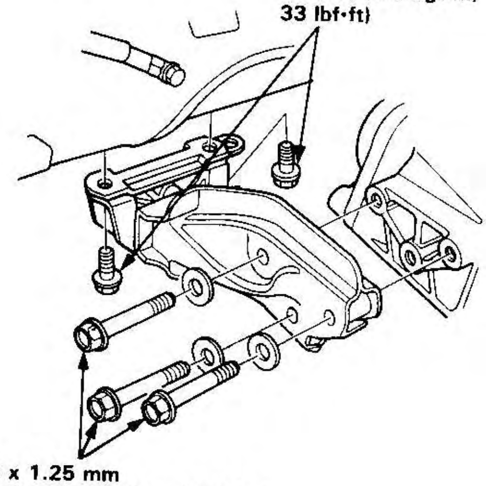


6. Install the right front mount/bracket, then tighten the bolts in the numbered sequence shown (① – ②).

A/T:

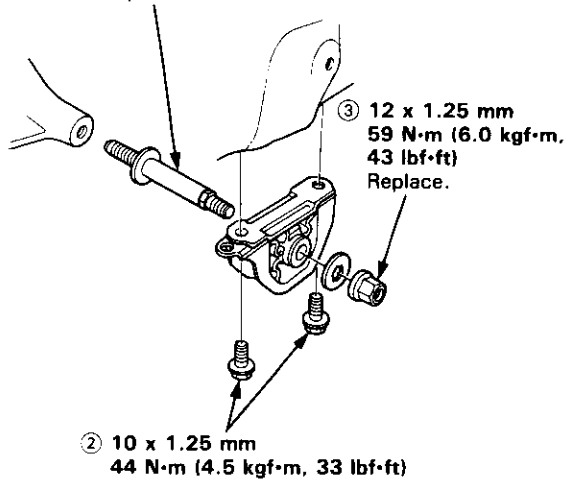


M/T:



(cont'd)

7. Install the left front mount, then tighten the bolts in the numbered sequence shown (① - ③).

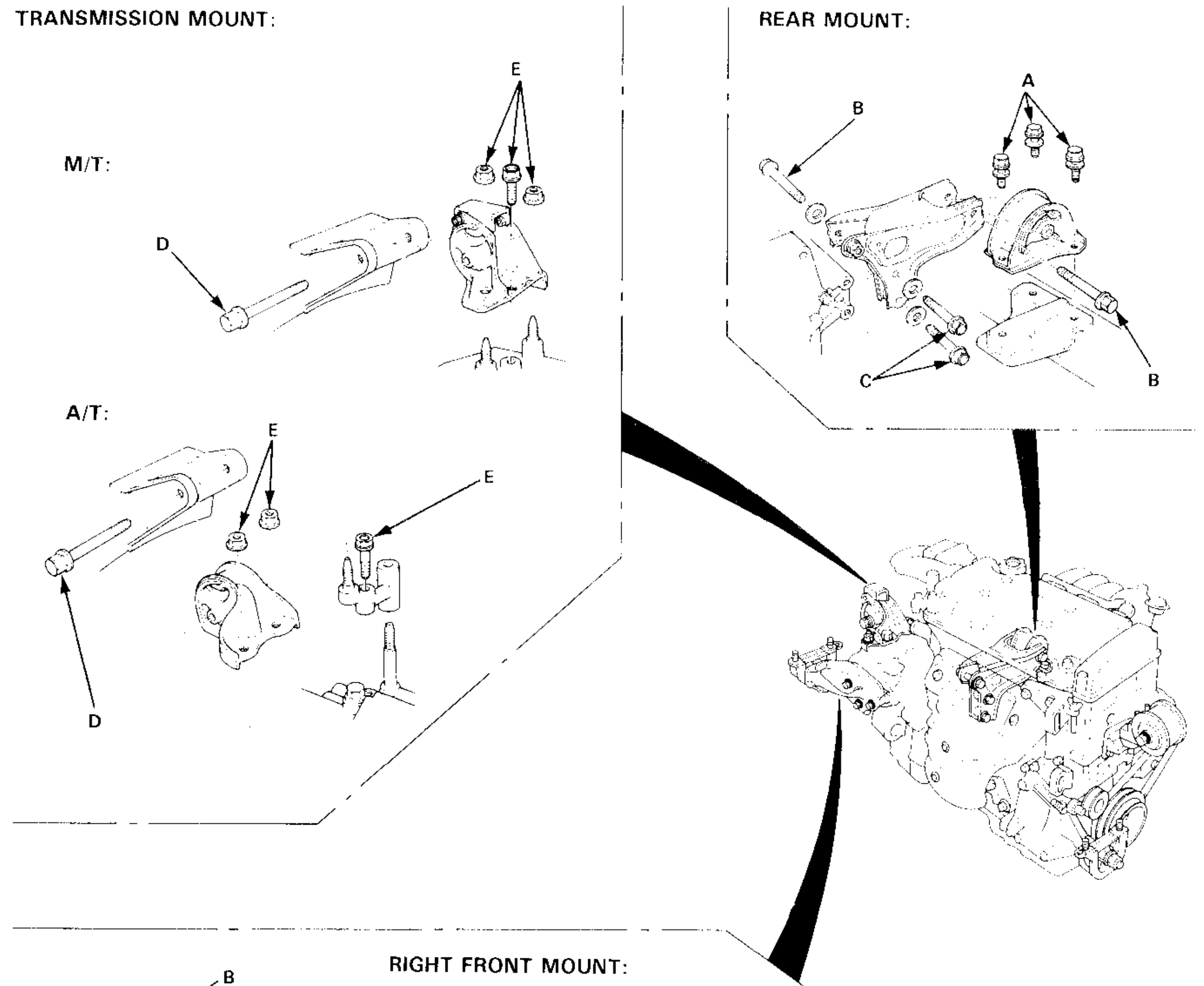


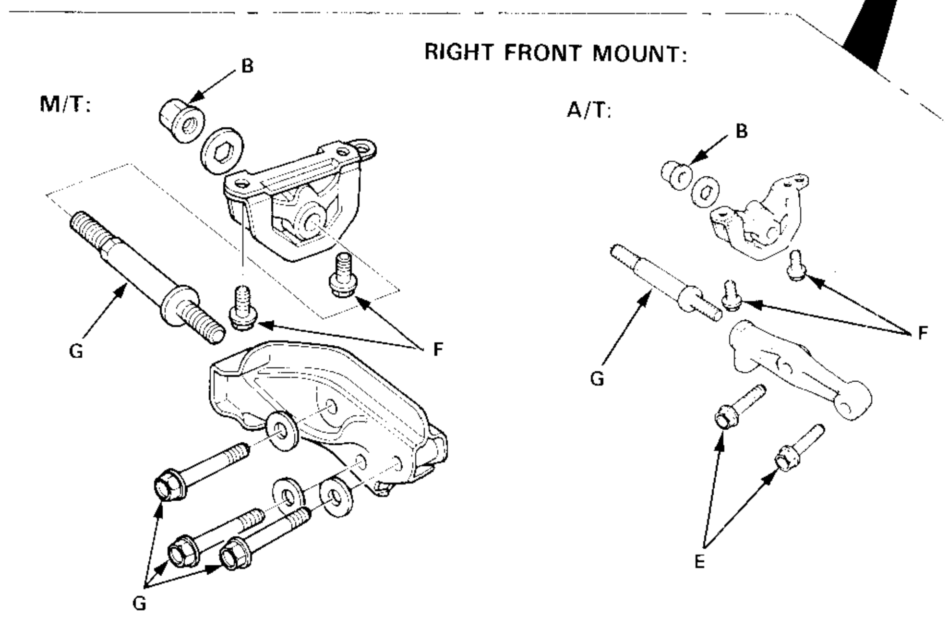
- Check that the spring clip on the end of each driveshaft clicks into place.

CAUTION: Use new spring clips.

- Bleed air from the cooling system at the heater valve open (see page 10-6).
- Adjust the throttle cable (see section 11).
- Check the clutch pedal free play (see section 12).
- Check that the transmission shifts into gear smoothly.
- Adjust the tension of the following drive belts.
  Alternator belt (see section 23).
  P/S pump belt (see section 17).
  A/C compressor belt (see section 22).
- Inspect for fuel leakage (see section 11).
  - After assembling fuel line parts, turn on the ignition switch (do not operate the starter) so that the fuel pump operates for approximately two seconds and the fuel line pressurizes. Repeat this operation two or three times and check for fuel leakage at any point in the fuel line.

Mount and Bracket Bolts/Nuts Torque Value Specification:





Torque Specifications:

A: 10 x 1.25 mm
59 N·m (6.0 kgf·m, 43 lbf·ft)

B: 12 x 1.25 mm
59 N·m (6.0 kgf·m, 43 lbf·ft)
Replace.

C: 118 N·m (12.0 kgf·m, 86.8 lbf·ft)
Replace.

D: 12 x 1.25 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)

E: 12 x 1.25 mm
64 N·m (6.5 kgf·m, 47 lbf·ft)

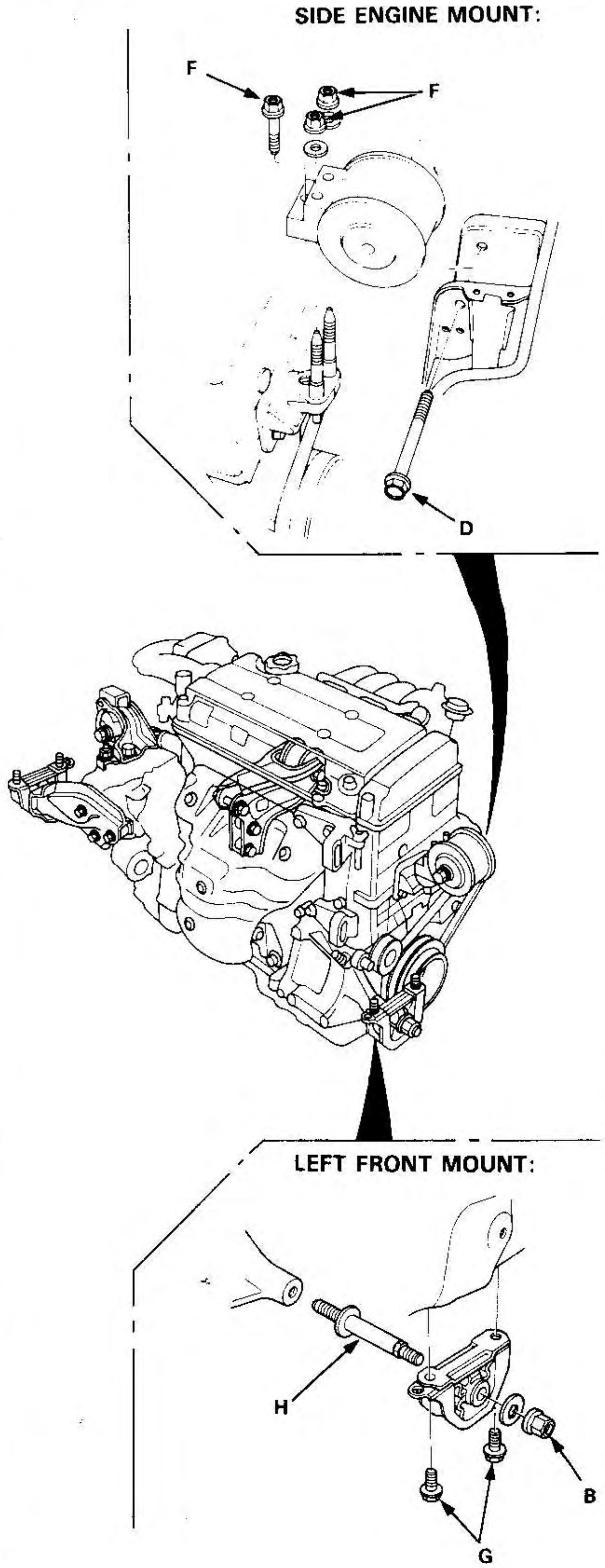
F: 10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

G: 12 x 1.25 mm
83 N·m (8.5 kgf·m, 61 lbf·ft)

(cont'd)

Mount/Bracket Torque

(cont'd)



Torque Specifications:

A: 10 x 1.25 mm
59 N·m (6.0 kgf·m, 43 lbf·ft)

B: 12 x 1.25 mm
59 N·m (6.0 kgf·m, 43 lbf·ft)
Replace.

C: 14 x 1.5 mm
118 N·m (12.0 kgf·m, 86.8 lbf·ft)
Replace.

D: 12 x 1.25 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)

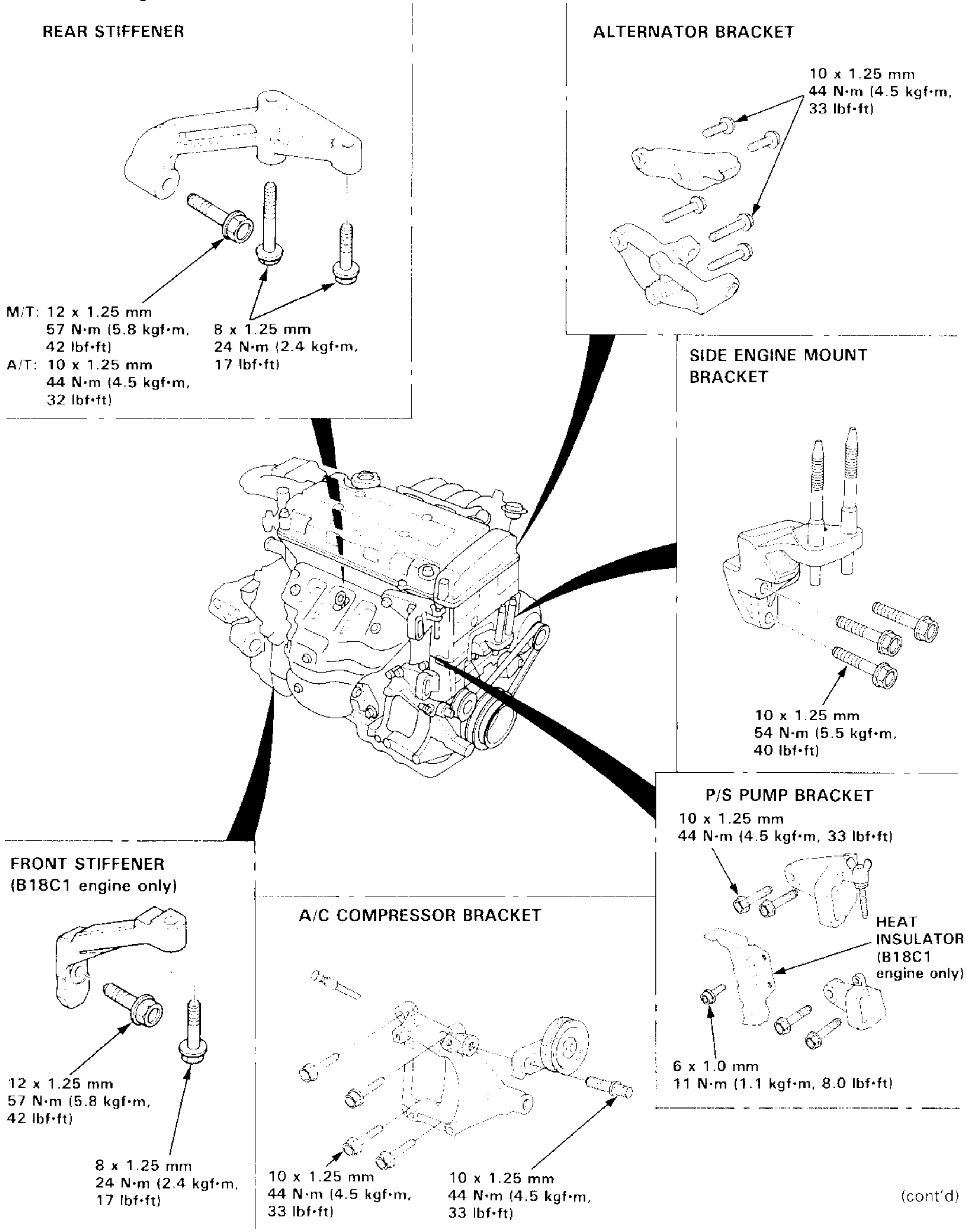
E: 12 x 1.25 mm
64 N·m (6.5 kgf·m, 47 lbf·ft)

F: 10 x 1.25 mm
52 N·m (5.3 kgf·m, 38 lbf·ft)
Replace.

G: 10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

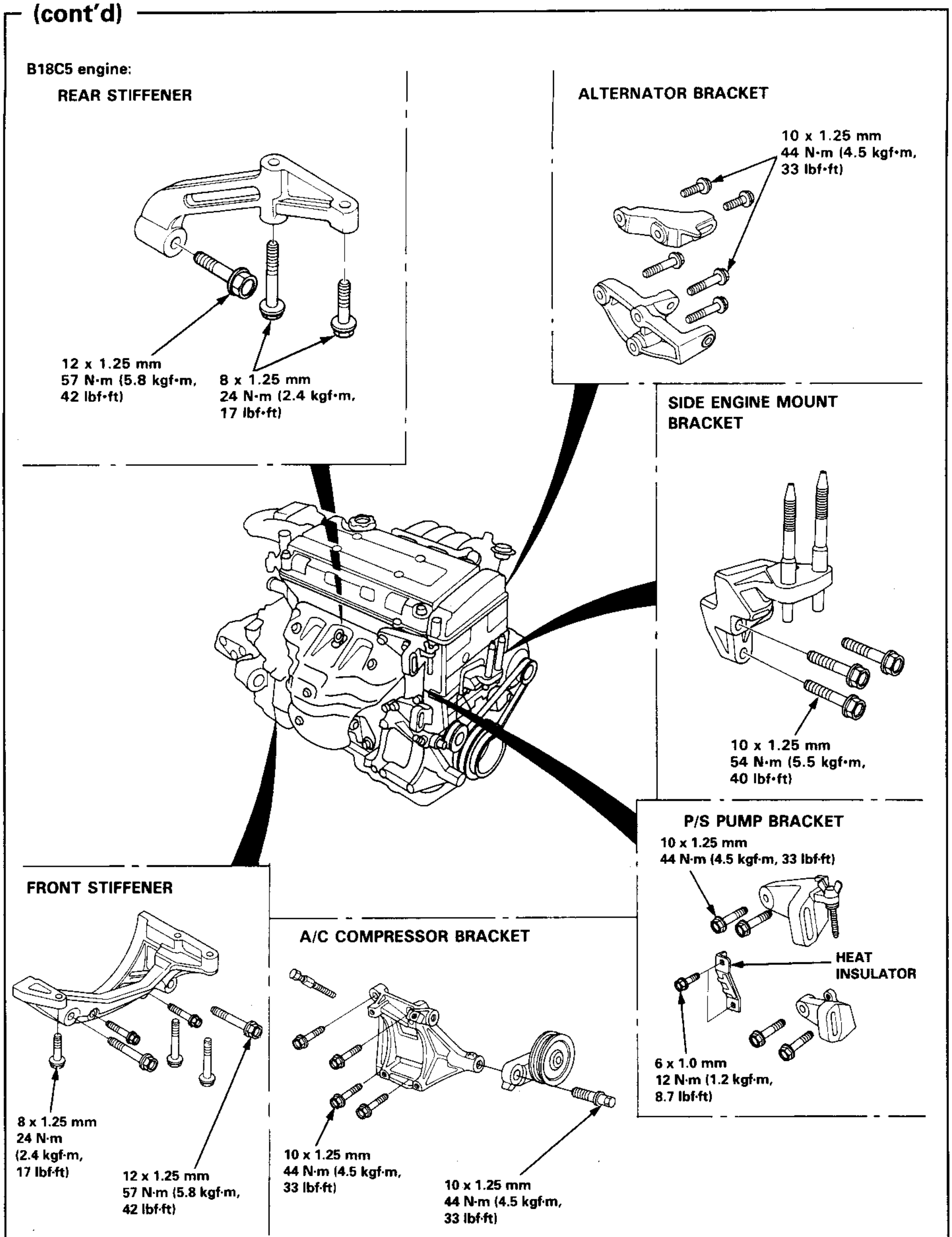
H: 12 x 1.25 mm
83 N·m (8.5 kgf·m, 61 lbf·ft)

B18B1, B18C1 engines:



(cont'd)

(cont'd)



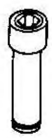
B18C5 engine:
REAR STIFFENER
12 x 1.25 mm
57 N·m (5.8 kgf·m, 42 lbf·ft)
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)
ALTERNATOR BRACKET
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
SIDE ENGINE MOUNT BRACKET
10 x 1.25 mm
54 N·m (5.5 kgf·m, 40 lbf·ft)
P/S PUMP BRACKET
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
HEAT INSULATOR
6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
FRONT STIFFENER
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)
12 x 1.25 mm
57 N·m (5.8 kgf·m, 42 lbf·ft)
A/C COMPRESSOR BRACKET
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

Cylinder Head/Valve Train
B18B1 engine

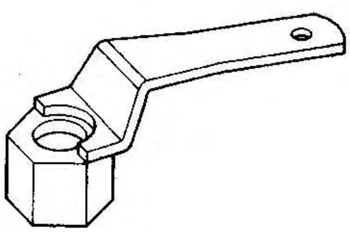
Special Tools

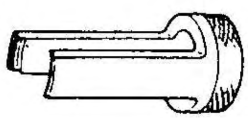
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD – PH70100	Valve Guide Seal Installer	1	6-25
②	07JAA – 001020A	Socket, 19 mm	1	6-8
③	07JAB – 001020A	Holder Handle	1	6-8
④	07MAB – PY3010A	Pulley Holder Attachment, HEX 50 mm, Offset	1	6-8
⑤	07757 – PJ1010A	Valve Spring Compressor Attachment	1	6-23
⑥	07942 – 6570100	Valve Guide Driver, 6.6 mm	1	6-27, 28
⑦	07984 – 657010D	Valve Guide Reamer, 6.6 mm	1	6-28

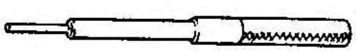

①


②


③


④


⑤


⑥


⑦

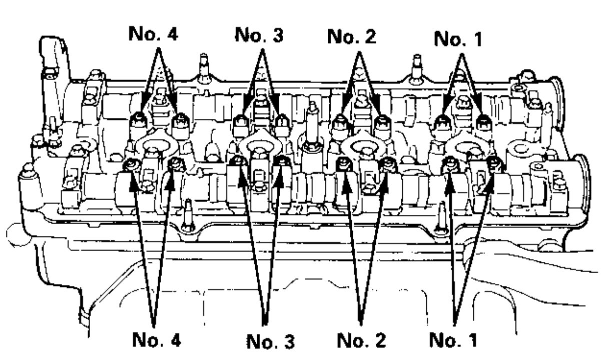
Valve Clearance

Adjustment

NOTE:
- Valves should be adjusted cold; at a cylinder head temperature of less than 100°F (38°C).
  Adjustment is the same for both intake and exhaust valves.
- After adjusting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

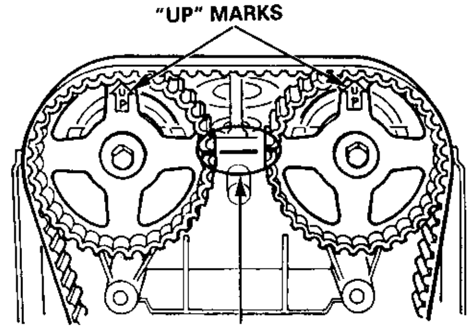
1. Remove cylinder head cover.

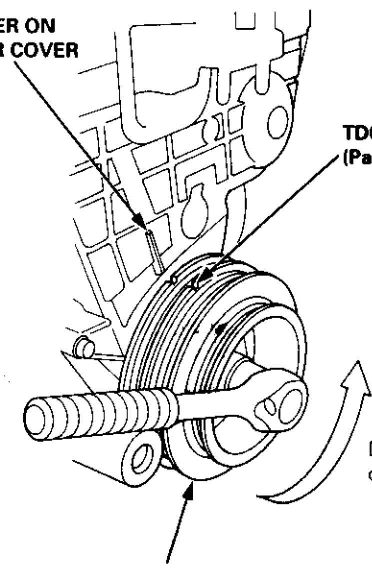
ADJUSTING SCREW LOCATIONS:



2. Set the No. 1 piston at top dead center (TDC) (see page 6-12). "UP" mark on the pulley should be at the top, and the TDC grooves on the pulley should align with the TDC groove on timing belt back cover. TDC mark (painted white) on the crankshaft pulley should align with pointer on the timing belt lower cover.

Number 1 piston at TDC:





(cont'd)

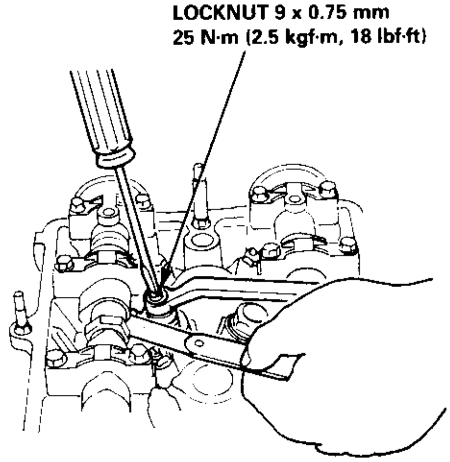
Valve Clearance

Adjustment (cont'd)

3. Adjust valve clearances on No. 1 cylinder.

   Intake: 0.08 – 0.12 mm (0.003 – 0.005 in)
   Exhaust: 0.16 – 0.20 mm (0.006 – 0.008 in)

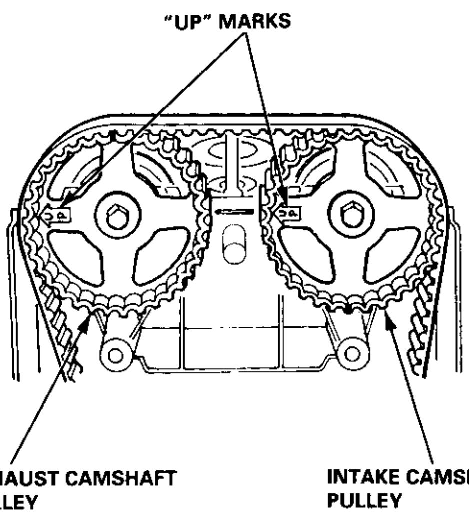
4. Loosen the locknut and turn the adjusting screw until feeler gauge slides back and forth with a slight amount of drag.



5. Tighten the locknut and recheck clearance again. Repeat adjustment if necessary.

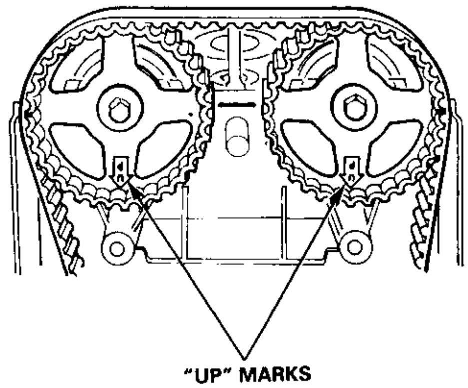
6. Rotate the crankshaft 180° counterclockwise (camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust valves on No. 3 cylinder.

Number 3 piston at TDC:



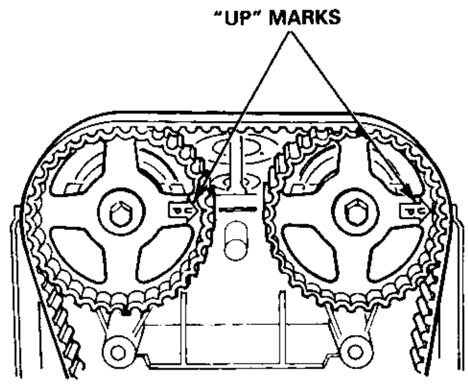
7. Rotate the crankshaft 180° counterclockwise to bring No. 4 piston to TDC. The "UP" mark should be pointing straight down. Adjust valves on No. 4 cylinder.

Number 4 piston at TDC:



8. Rotate the crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" mark should be on the intake side. Adjust valves on No. 2 cylinder.

Number 2 piston at TDC:



NOTE: Refer to page 6-31 when installing cylinder head cover.

Valve Seals

Replacement (cylinder head removal not required)

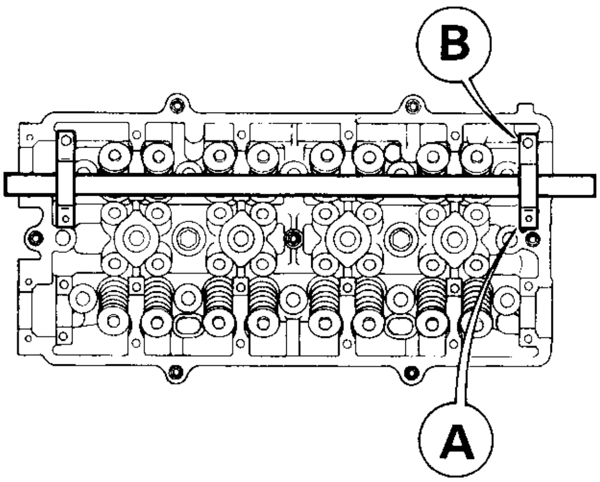
The procedure shown below applies when using the in-car valve spring compressor (Snap-on YA8845 with YA8845-2A 7/8" attachment).

WARNING When using this tool, as with any tool, always use approved eye protection. Using the right tool for each job helps increase productivity while safeguarding tools, equipment and the user.

1. Turn the crankshaft so that the No. 1 and the No. 4 pistons are at top dead center (TDC).
2. Remove the cylinder head cover.
3. Remove the distributor.
4. Loosen and disconnect the timing belt from the camshaft pulleys.
5. Remove the camshaft holder bolts, then remove the camshaft holders, the camshafts and rocker arms.

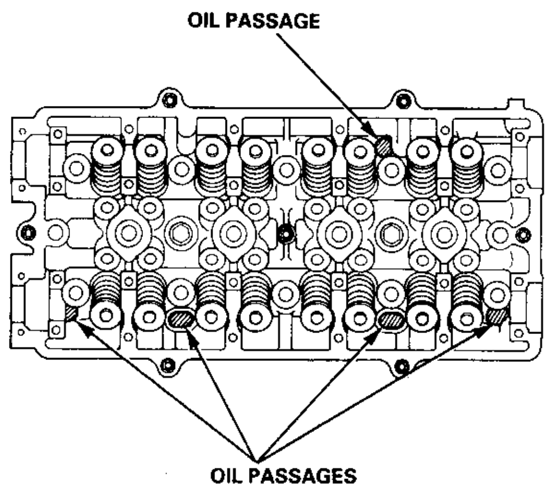
Intake Valve Seals

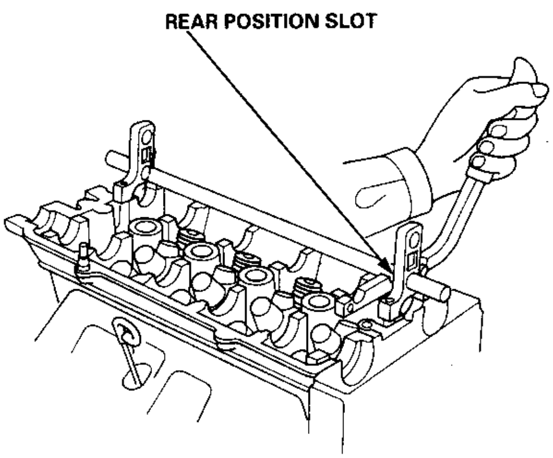
6. Using the 6 mm bolts supplied with the tool, mount the two uprights to the cylinder head at the end camshaft holders. The uprights fit as shown.
7. Insert the cross shaft through the bottom hole of the two uprights.



8. Select the 7/8 in. diameter long compressor attachment and fasten the attachment to the No. 4 hole of the lever arm with the speed pin supplied.
9. Position the piston at TDC and insert an air adaptor into the spark plug hole. Pump air into the cylinder to keep the valve closed while compressing springs and removing the valve keepers.
10. Position the lever arm under the cross shaft so the lever is perpendicular to the shaft and the compressor attachment rests on top of the retainer for the spring being compressed. Use the rear position slot on the lever as shown.

NOTE: Put shop towels over the oil passages to prevent the valve keepers from falling into the cylinder head.





(cont'd)

Valve Seals

Replacement (cylinder head removal not required) (cont'd)

11. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.

12. Repeat step 11 for the other valve in that cylinder.

13. Remove the valve seals (see page 6-24).

14. Install the valve seals (see page 6-25).

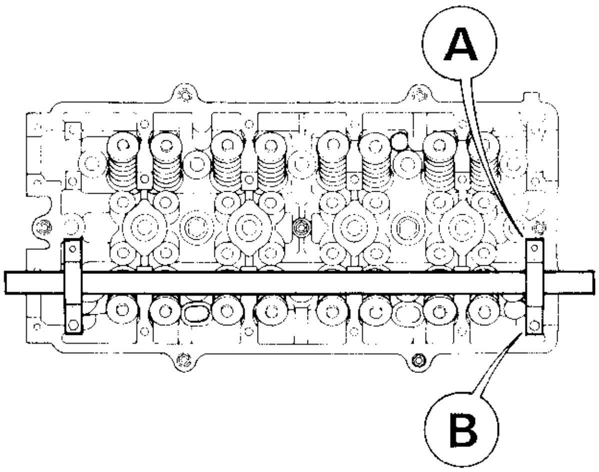
15. Install the springs, the retainers and the keepers in reverse order of removal.

16. Repeat steps 9 to 15 for the other three cylinders.

Exhaust Valve Seals

17. Using the 6 mm bolts supplied with the tool, mount the two uprights to the cylinder head at the end camshaft holders. The uprights fit as shown.

18. Insert the cross shaft through the bottom hole of the two uprights.

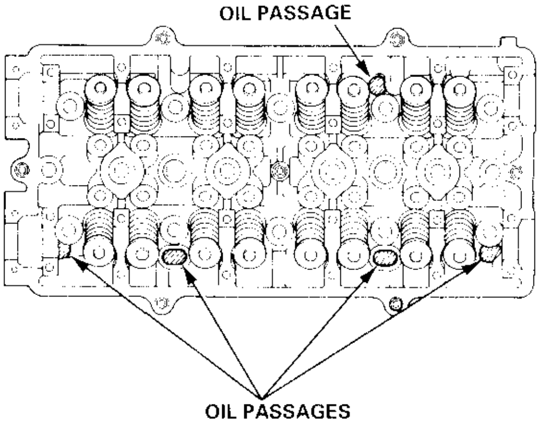


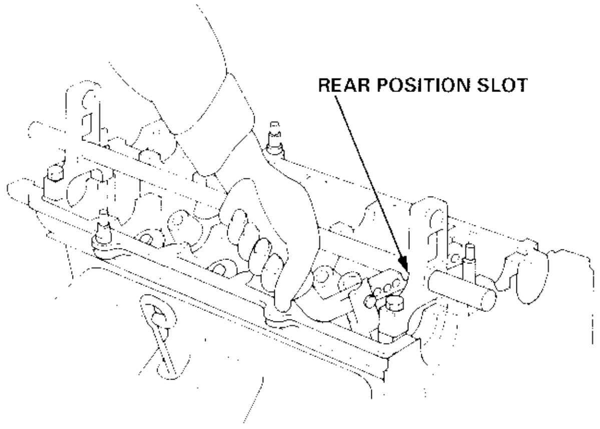
19. Select the 7/8 in. diameter short compressor attachment and fasten the attachment to the No. 4 hole of the lever arm with the speed pin supplied.

20. Position the piston at TDC and insert an air adaptor into the spark plug hole. Pump air into the cylinder to keep the valve closed while compressing springs and removing the valve keepers.

21. Position the lever arm under the cross shaft so the lever is perpendicular to the shaft and the compressor attachment rests on top of the retainer for the spring being compressed. Use the rear position slot on the lever as shown.

NOTE: Put shop towels over the oil passages to prevent the valve keepers from falling into the cylinder head.





22. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.

23. Repeat step 22 for the other valve in that cylinder.

24. Remove the valve seals (see page 6-24).

25. Install the valve seals (see page 6-25).

26. Install the springs, the retainers and the keepers in reverse order of removal.

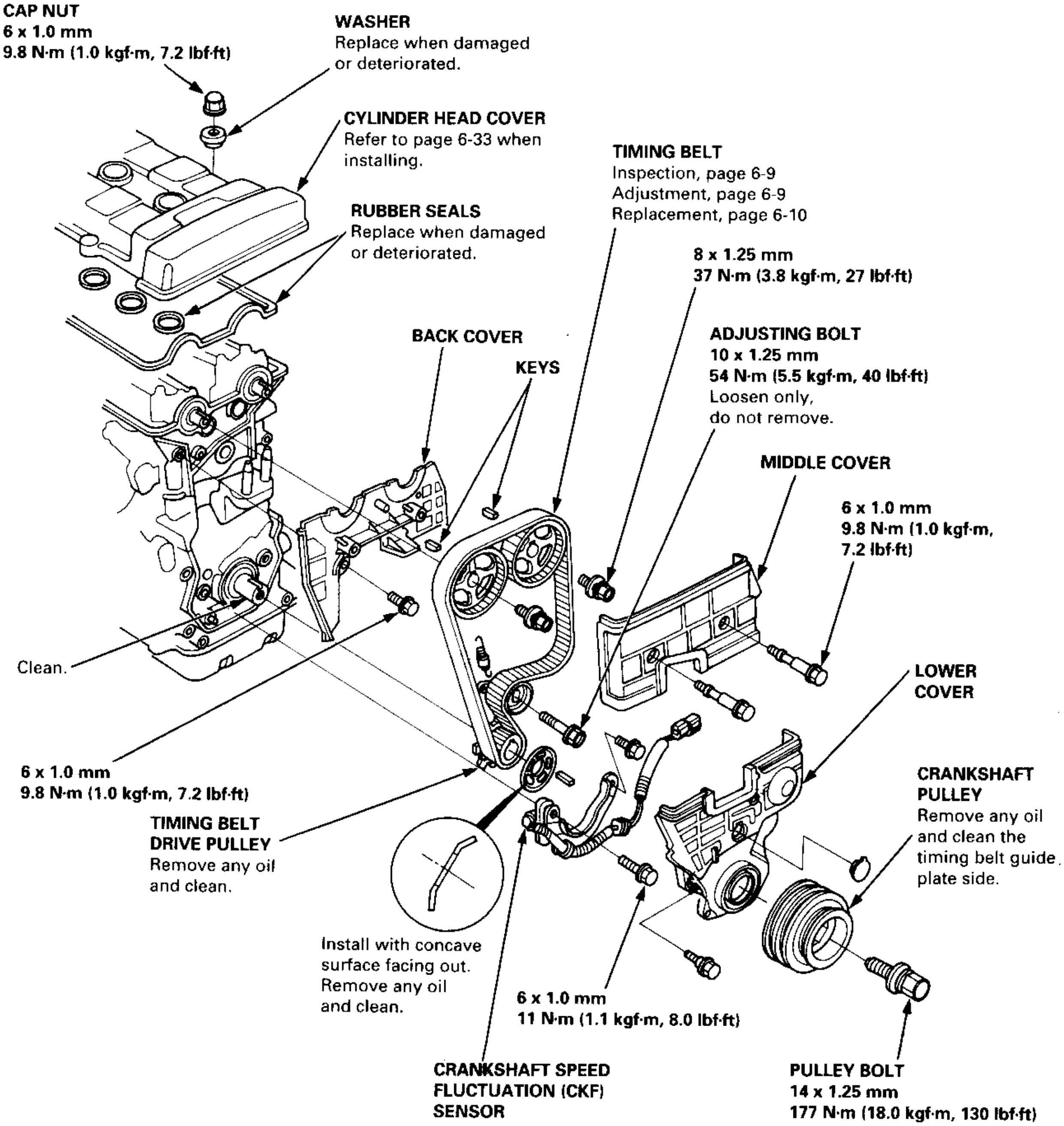
27. Repeat steps 20 to 26 on the other three cylinders.

NOTE: Refer to page 6 33 when installing cylinder head cover.

Illustrated Index

NOTE:

- Refer to page 6-12 for positioning crankshaft and pulley before installing belt.
- Mark the direction of rotation on the belt before removing.
- Replace the rubber seals if there is oil leakage between the cylinder head and cover.
- Do not use the middle cover and lower cover for storing removed items.
- Clean the middle cover and lower cover before installation.



NOTE: When installing a new crankshaft and/or new bolt:
① tighten the crankshaft pulley bolt to 196 N·m (20.0 kgf·m, 145 lbf·ft),
② loosen bolt,
③ retighten it to 177 N·m (18.0 kgf·m, 130 lbf·ft).

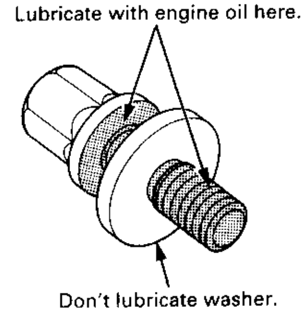
Crankshaft Pulley Bolt

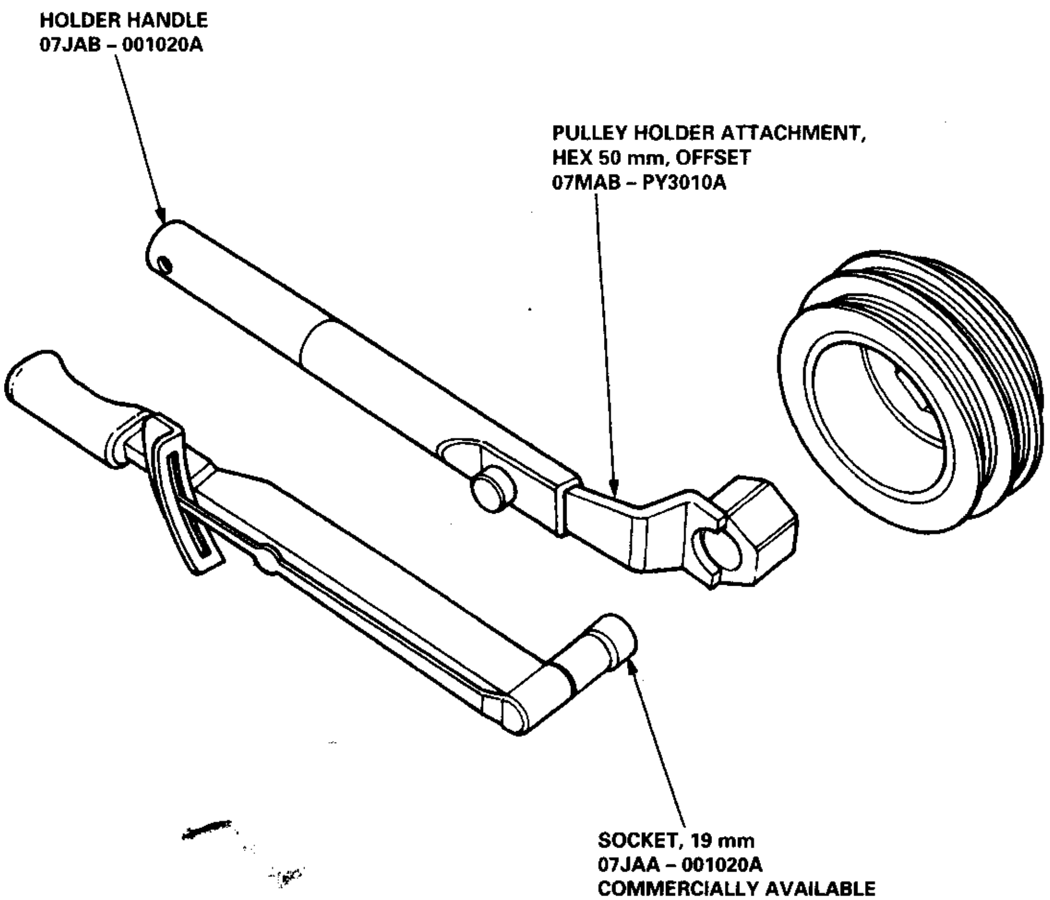
Replacement

NOTE:
- Crankshaft pulley bolt size and torque value:
  14 x 1.25 mm
  177 N·m (18.0 kgf·m, 130 lbf·ft)
- When installing a new crankshaft and/or new pulley bolt:

  ① tighten the pulley bolt to 196 N·m (20.0 kgf·m, 145 lbf·ft),
  ② loosen the bolt,
  ③ retighten it to 177 N·m (18.0 kgf·m, 130 lbf·ft).

- When installing the bolt, lubricate the threads and flange with engine oil, but don't lubricate the washer and pulley.

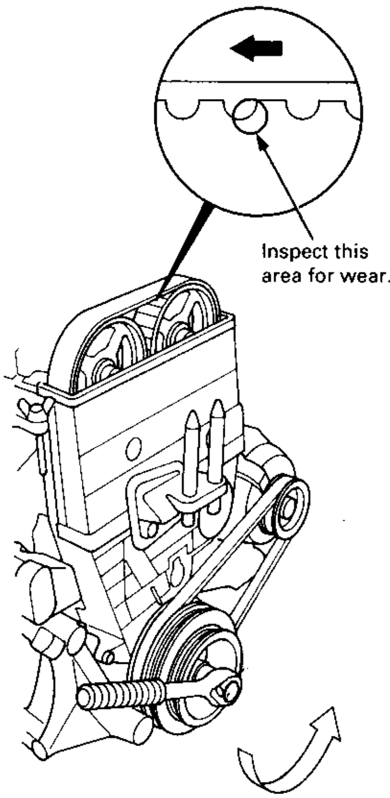




Inspection

1. Remove the cylinder head cover.
   - Refer to page 6-33 when installing.
2. Inspect the timing belt for cracks and oil or coolant soaking.

   NOTE:
   - Replace the belt if oil or coolant soaked.
   - Remove any oil or solvent that gets on the belt.



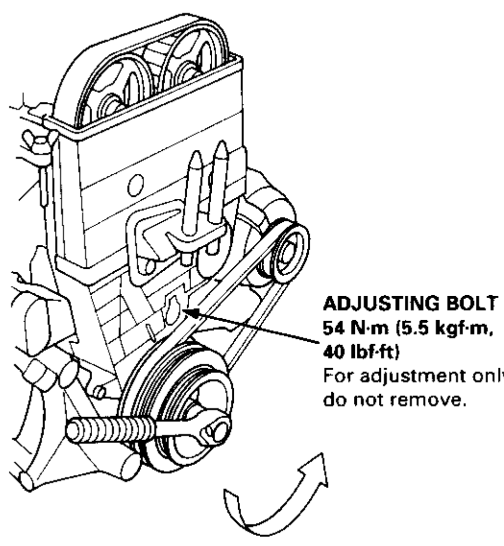
3. After inspecting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

Tension Adjustment

CAUTION: Always adjust timing belt tension with the engine cold.

NOTE:
- The tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment.
- Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.

1. Remove the cylinder head cover. (Refer to page 6-33 when installing.)
2. Set the No. 1 piston at TDC (see page 6-12).
3. Rotate the crankshaft five to six revolutions to set the belt.
4. Set the No. 1 piston at TDC.



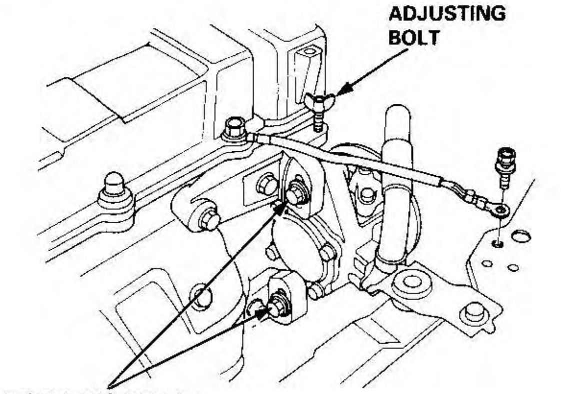
5. Loosen the adjusting bolt 1/2 turn (180°) only.
6. Rotate the crankshaft counterclockwise 3-teeth on the camshaft pulley.
7. Tighten the adjusting bolt to the specified torque.
8. After adjusting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

Timing Belt

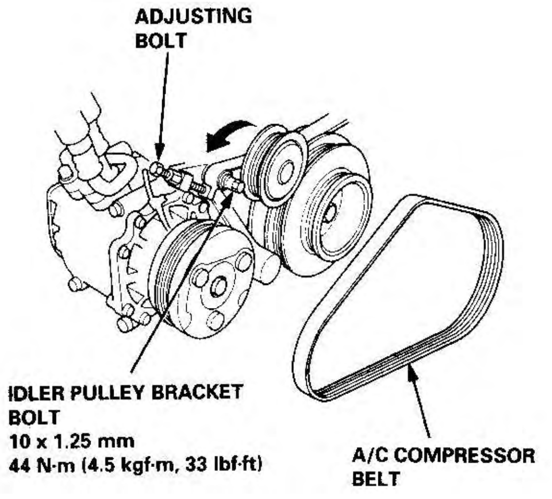
Removal

NOTE:
- Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (see page 6-12).
- Inspect the water pump after removing the timing belt (see page 10-10).

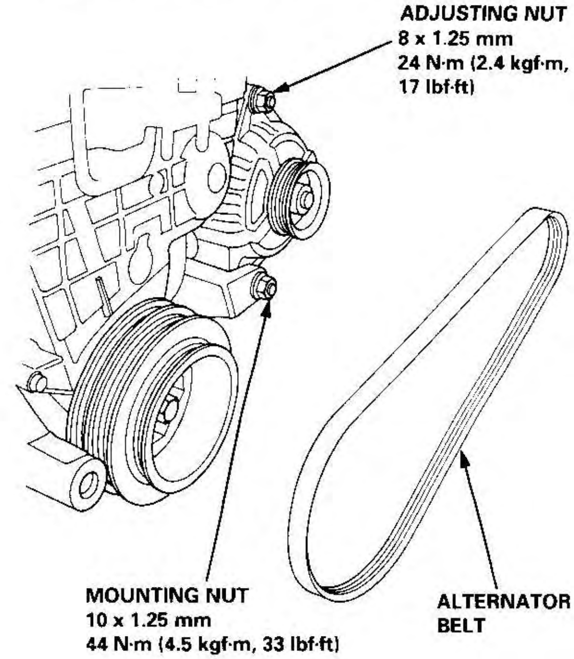
1. Remove the wheel well splash shield (see page 6-19).
2. Loosen the adjusting bolt and mounting bolts, then remove the power steering (P/S) pump belt.



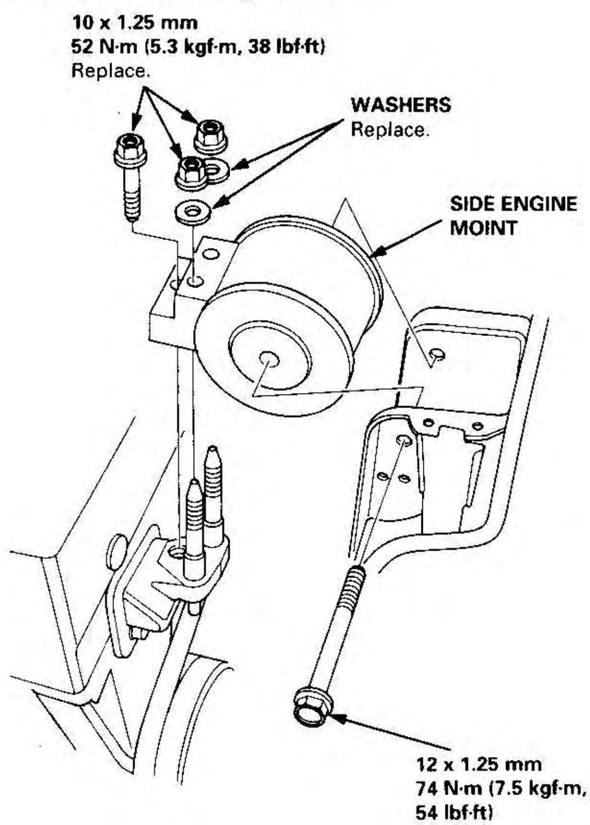
3. Loosen the adjusting bolt and idler pulley bracket bolt, then remove the air conditioning (A/C) compressor belt.



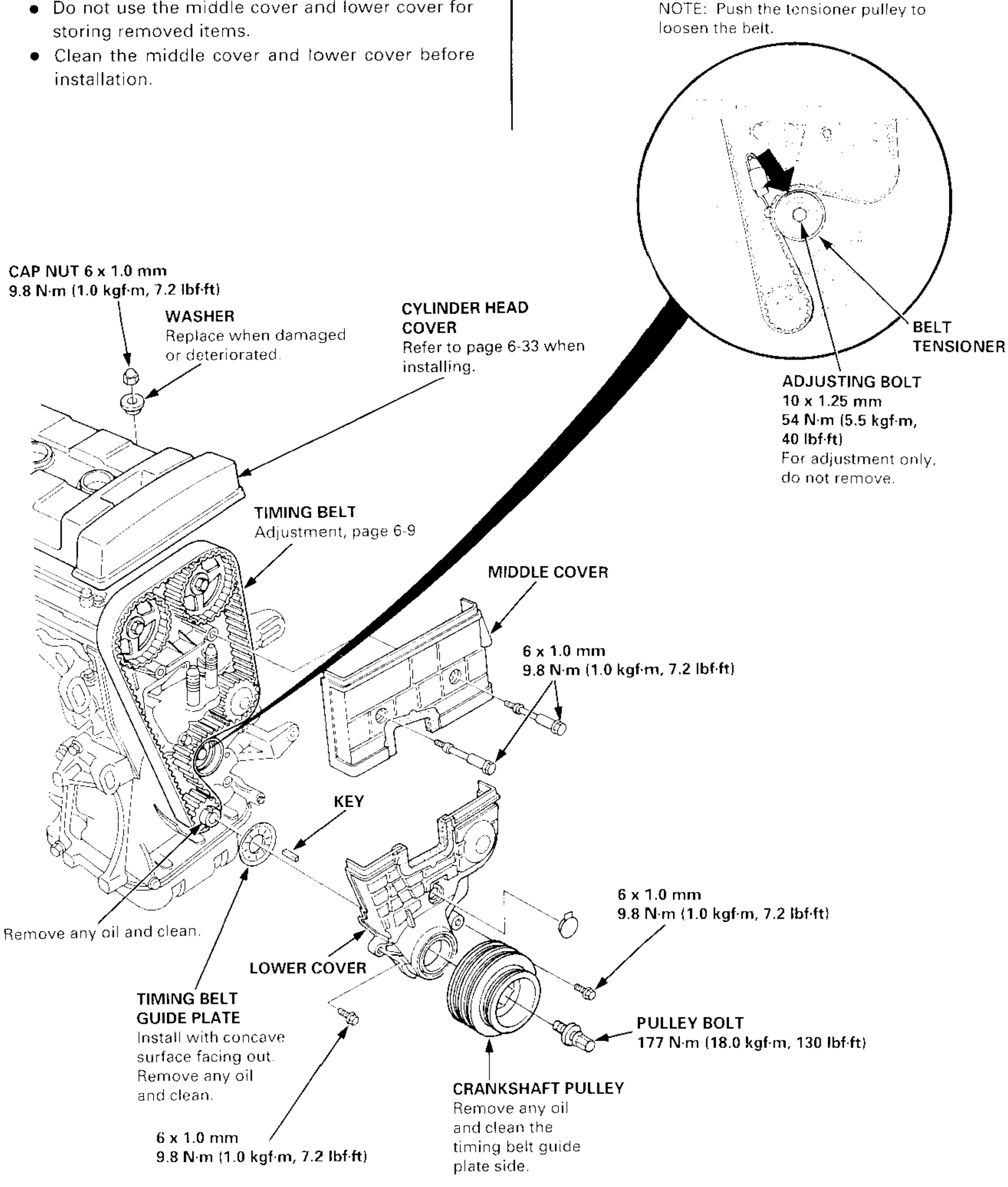
4. Loosen the adjusting nut and mounting nut, then remove the alternator belt.



5. Remove the cruise control actuator (see page 6-19).
6. Remove the side engine mount.



7. Remove the cylinder head cover.
   - Refer to page 6-33 when installing.
8. Remove the pulley bolt and crankshaft pulley (see page 6-8).
9. Remove the middle cover and the lower cover.
   NOTE:
   - Do not use the middle cover and lower cover for storing removed items.
   - Clean the middle cover and lower cover before installation.
10. Loosen the adjusting bolt 180°.
11. Push the tensioner to remove tension from the timing belt, then retighten the bolt.
12. Remove the timing belt from the pulleys.
    NOTE: Replace the camshaft and crankshaft seals if there are signs of oil leakage.



Installation

Install the timing belt in the reverse order of removal. Only key points are described here.

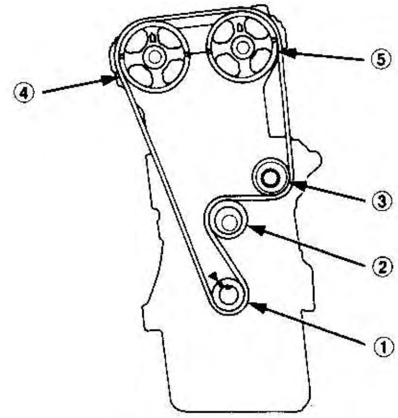
NOTE: Clean the middle cover and lower cover before installation.

1. Position the crankshaft and the camshaft pulleys as shown before installing the timing belt.

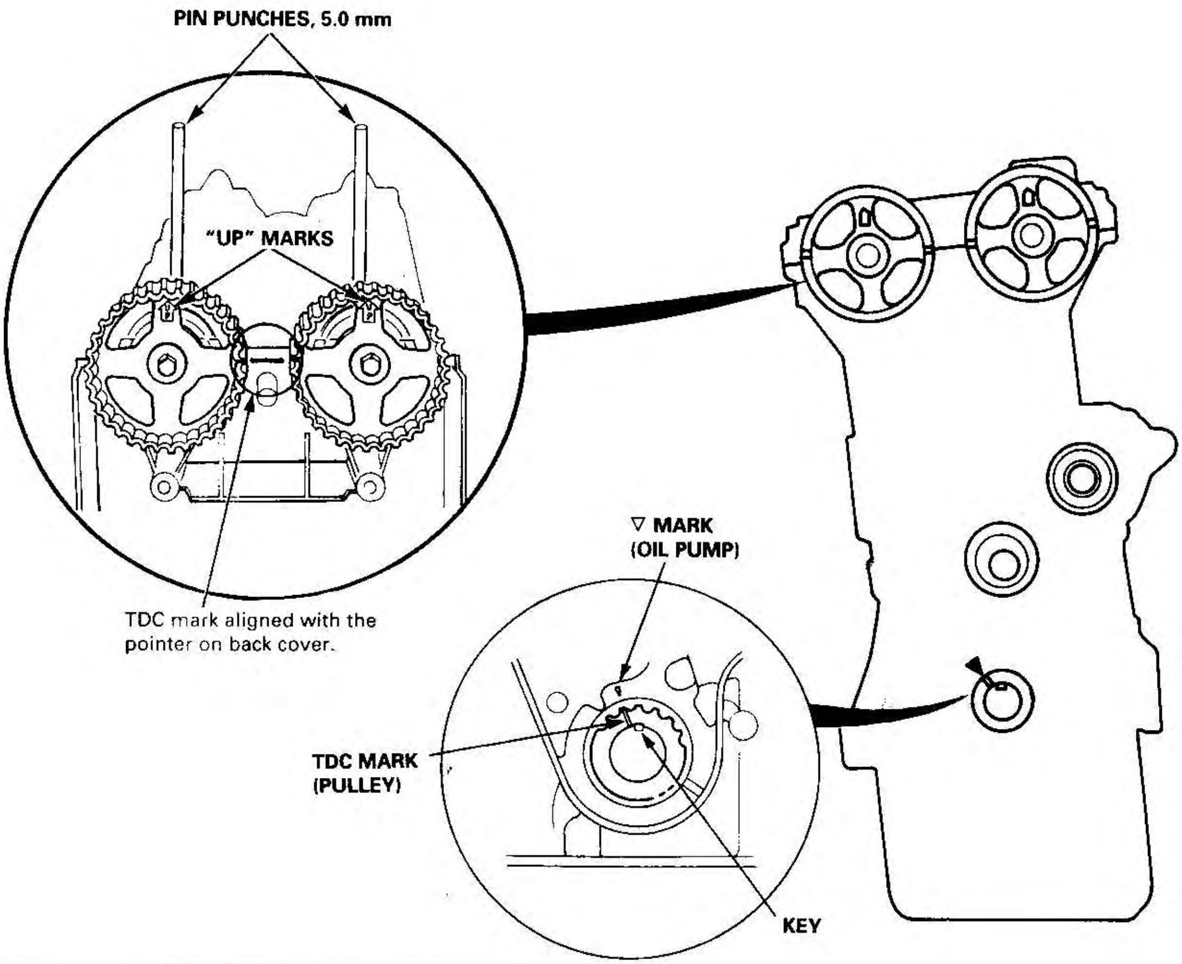
   A. Set the crankshaft so that the No. 1 piston is at top dead center (TDC). Align the groove on the teeth side of the timing belt drive pulley to the ∇ pointer on the oil pump.

   B. Align the TDC marks on intake and exhaust pulleys.

   NOTE: To set the camshafts at TDC position for No. 1 piston, align the holes in the camshafts with the holes in No. 1 camshaft holders and insert 5.0 mm pin punches in the holes.



2. Install the timing belt tightly in the sequence shown.
   ① Timing belt drive pulley (crankshaft) → ② Adjusting pulley → ③ Water pump pulley → ④ Exhaust camshaft pulley → ⑤ Intake camshaft pulley.



3. Loosen and retighten the adjusting bolt to tension the belt.

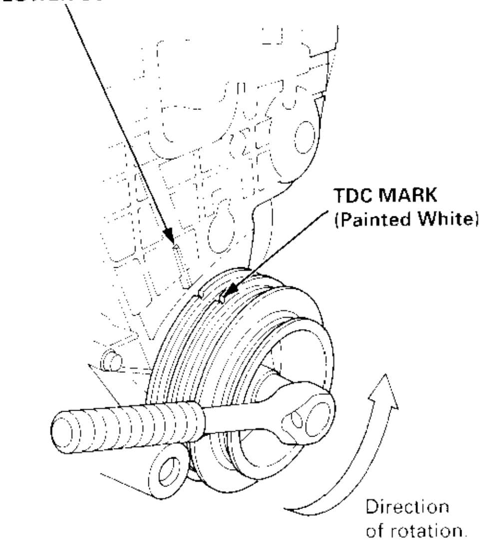
4. Remove the pin punches.

5. Rotate the crankshaft about 4 to 6 turns counter-clockwise so that the belt positions on the pulleys.

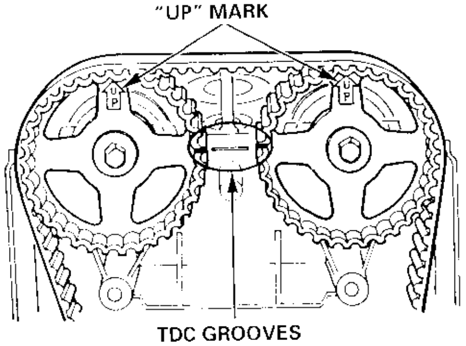
6. Adjust the timing belt tension (see page 6-9).

7. Check the crankshaft pulley and the camshaft pulleys at TDC.

CRANKSHAFT PULLEY:



CAMSHAFT PULLEY:



8. If a camshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure on page 6-12, then reinstall the timing belt.

NOTE: Refer to page 6-10 for timing belt removal.

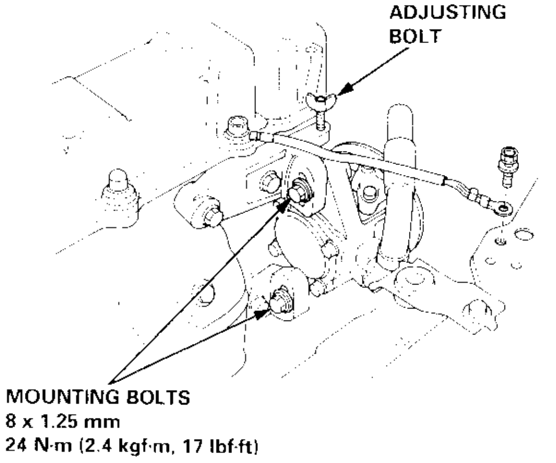
After installation, adjust the tension of each belt.

- See section 23 for alternator belt tension adjustment.
- See section 22 for A/C compressor belt tension adjustment.
- See section 17 for P/S pump belt tension adjustment.

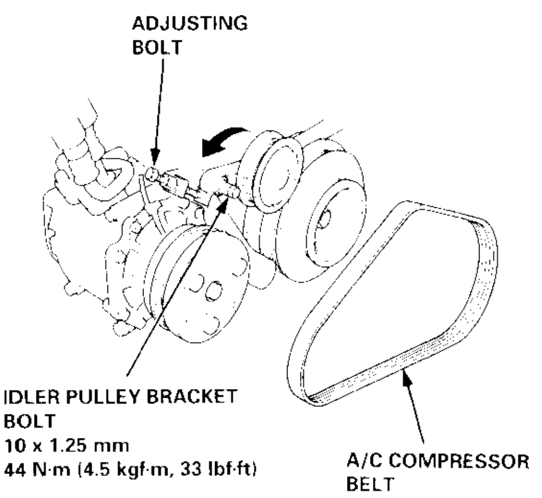
CKF Sensor

Replacement

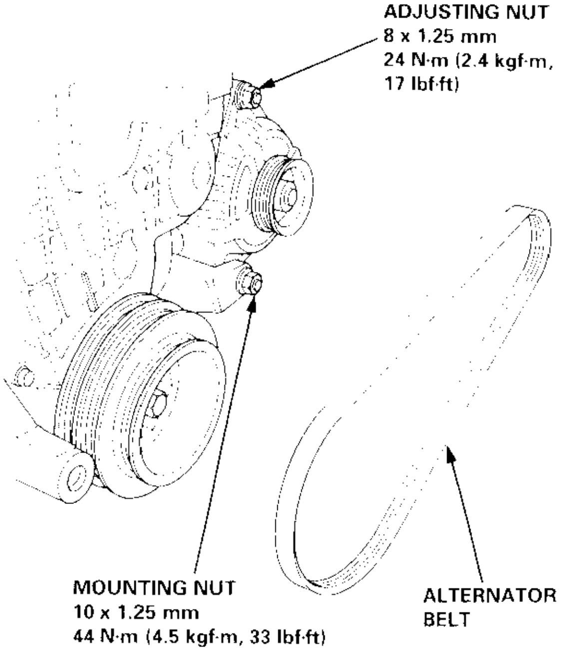
1. Remove the wheel well splash shield (see page 6-19).
2. Loosen the adjusting bolt and mounting bolts, then remove the P/S pump belt.



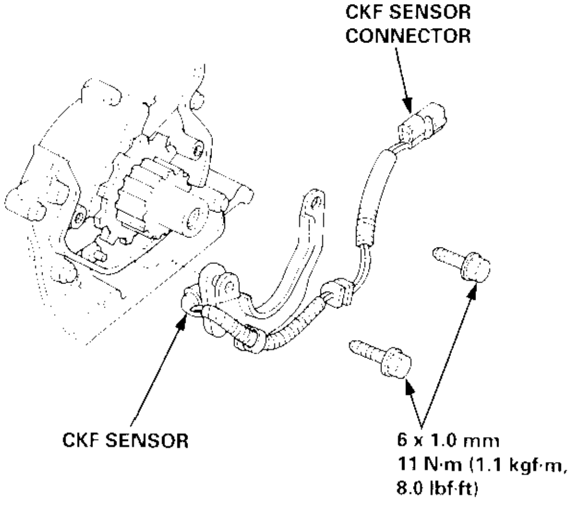
3. Loosen the adjusting bolt and idler pulley bracket bolt, then remove the A/C compressor belt.



4. Loosen the adjusting nut and mounting nut, then remove the alternator belt.



5. Remove the cylinder head cover.
   - Refer to page 6-33 when installing.
6. Remove the crankshaft pulley (see page 6-8).
7. Remove the middle cover and the lower cover.
   NOTE:
   - Do not use the middle cover and lower cover for storing removed items.
   - Clean the middle cover and lower cover before installation.
8. Disconnect the CKF sensor connector, then remove the CKF sensor.

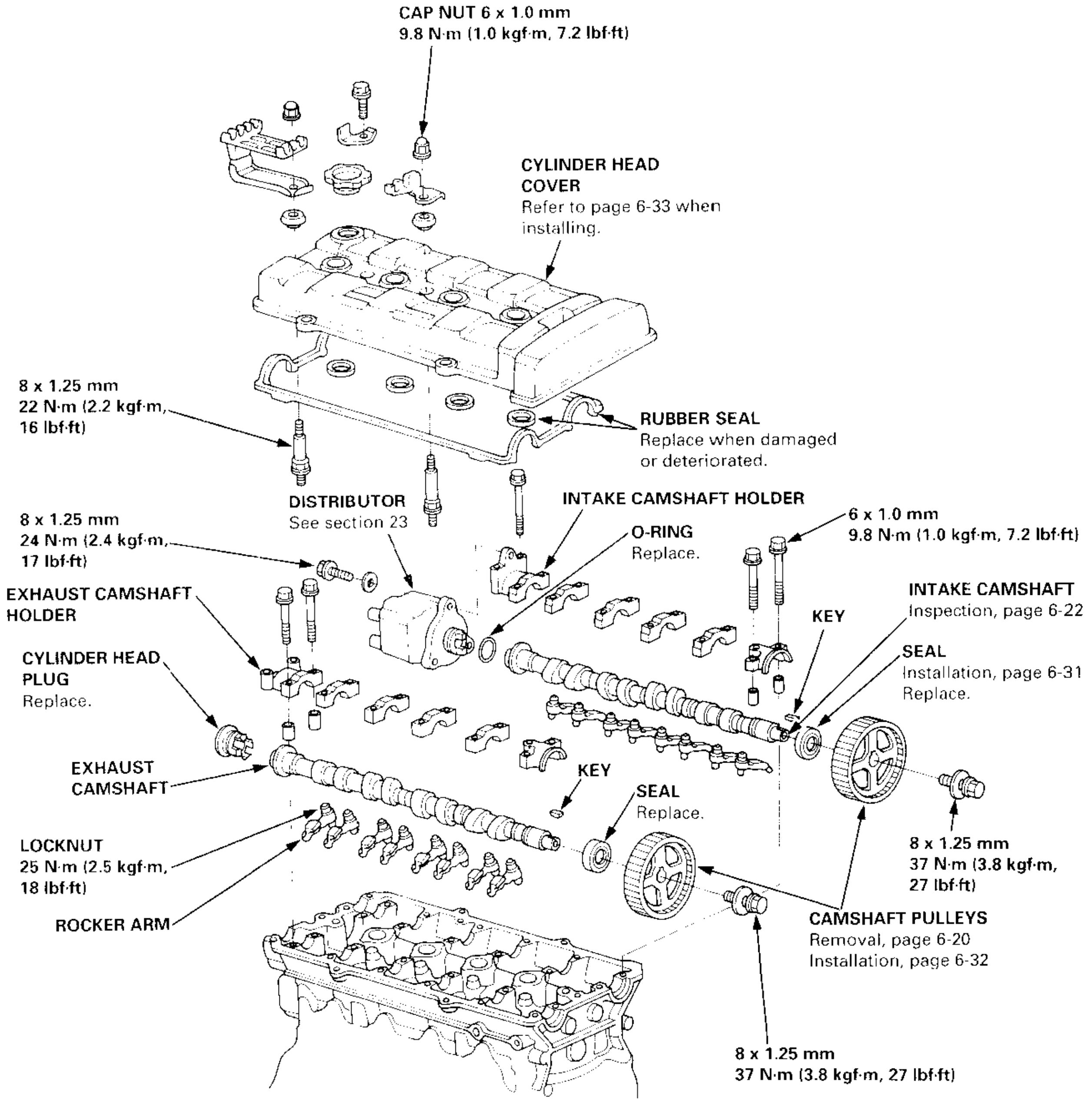


9. Install the CKF sensor in reverse order of removal.

Illustrated Index

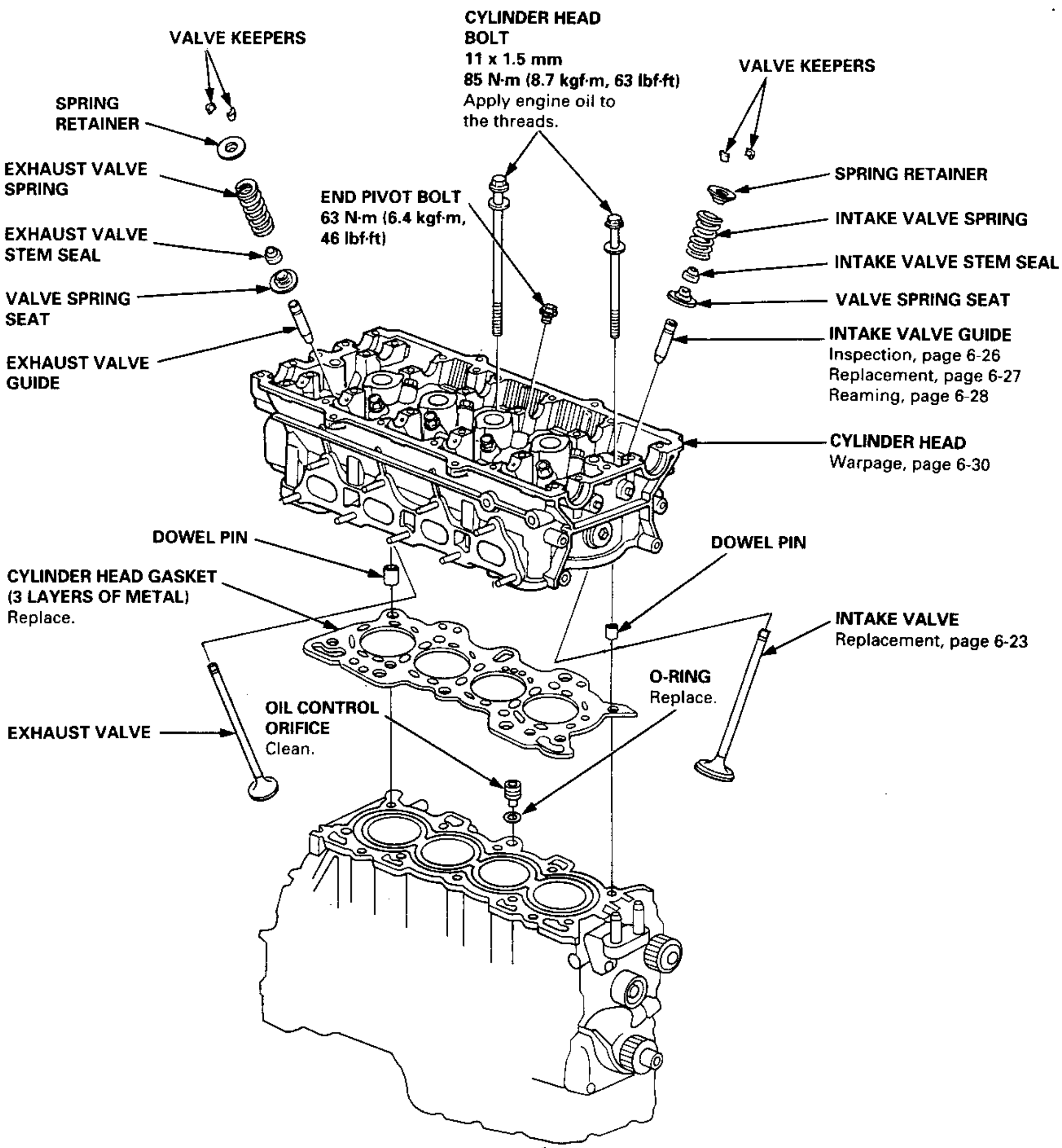
CAUTION: To avoid damage, wait until engine coolant temperature drops below 100°F (38°C) before removing the cylinder head.

NOTE: Use new O-rings and gaskets when reassembling.



(cont'd)

CAUTION: When handling a metal gasket, take care not to fold it or damage the contact surface of the gasket.



Removal

Engine removal is not required for this procedure.

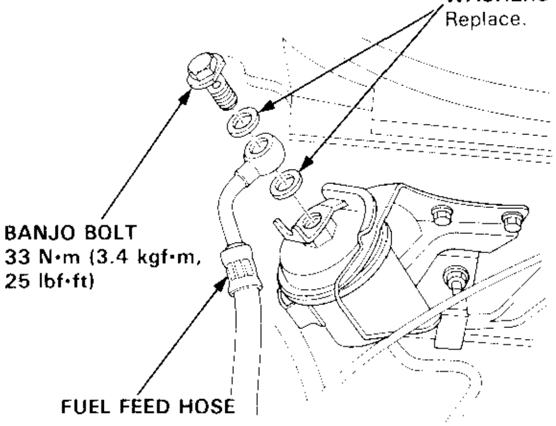
CAUTION: To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100°F (38°C) before loosening the retaining bolts.

NOTE:
- Inspect the timing belt before removing the cylinder head.
- Turn the crankshaft pulley so that the No. 1 piston is at top dead center (TDC) (see page 6-12).
- Mark all emissions hoses before disconnecting them.
- Anti-theft radios have a coded theft protection circuit. Be sure to get the customer's code number before.
  - Disconnecting the battery.
  - Removing the No. 32 (7.5 A) fuse from the under-hood fuse/relay box.
  - Removing the radio.

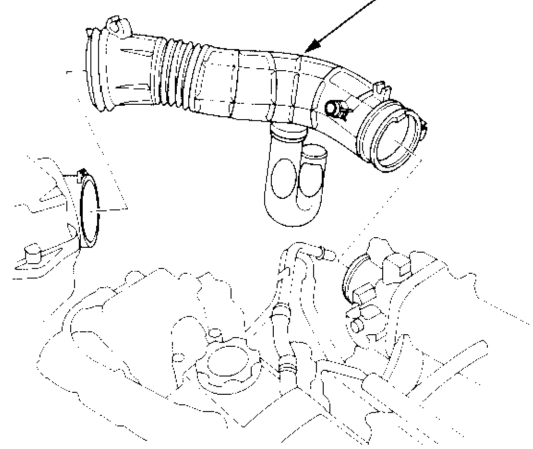
  After service, reconnect power to the radio and turn it on.
  When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the negative terminal from the battery.
2. Drain the engine coolant (see page 10-5).
   - Remove the radiator cap to speed draining.
3. Relieve fuel pressure (see section 11).

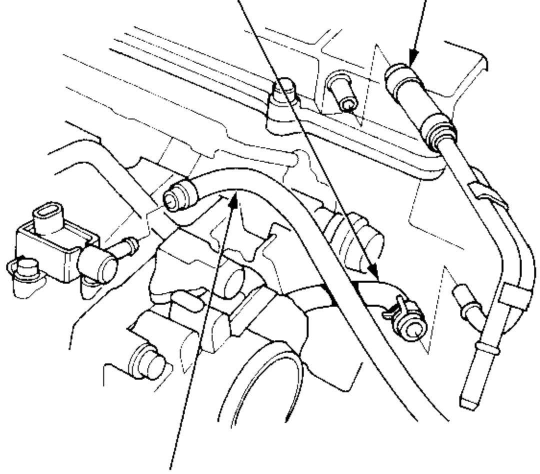
   ⚠WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.
4. Disconnect the fuel feed hose.



5. Remove the intake air duct.



6. Remove the breather hose, water bypass hose and evaporative emission (EVAP) control canister hose.

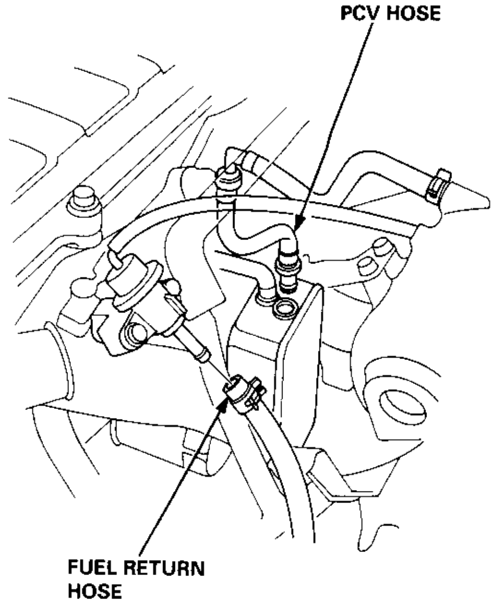


(cont'd)

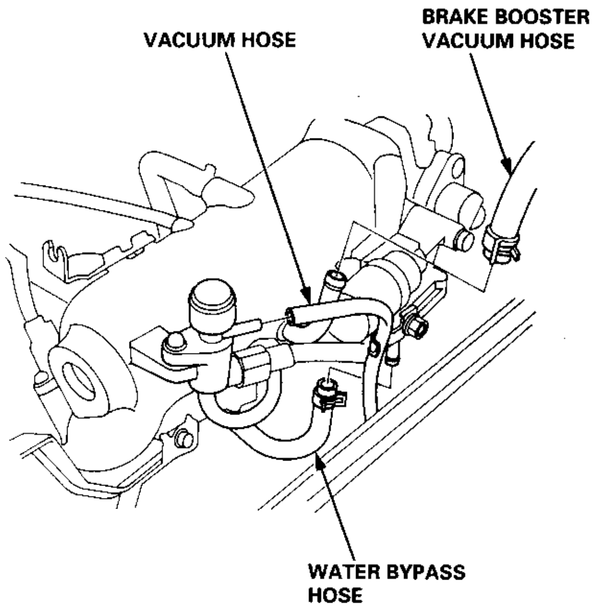
Cylinder Head

Removal (cont'd)

7. Remove the fuel return hose and positive crankcase ventilation (PCV) hose.

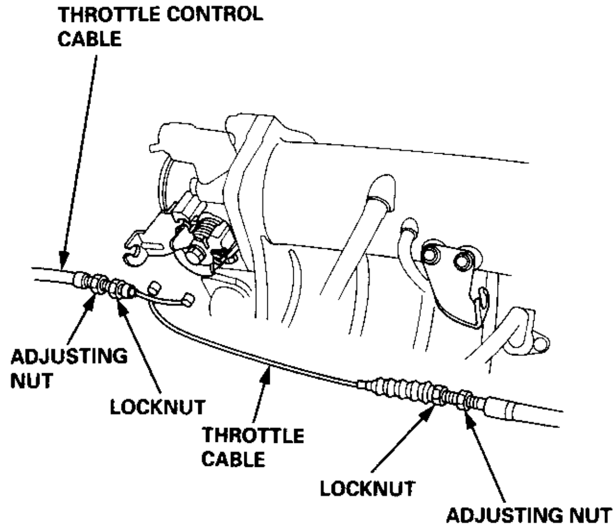


8. Remove the brake booster vacuum hose, water bypass hose and vacuum hose.



9. Remove the throttle cable.
10. Remove the throttle control cable (automatic transmission only).

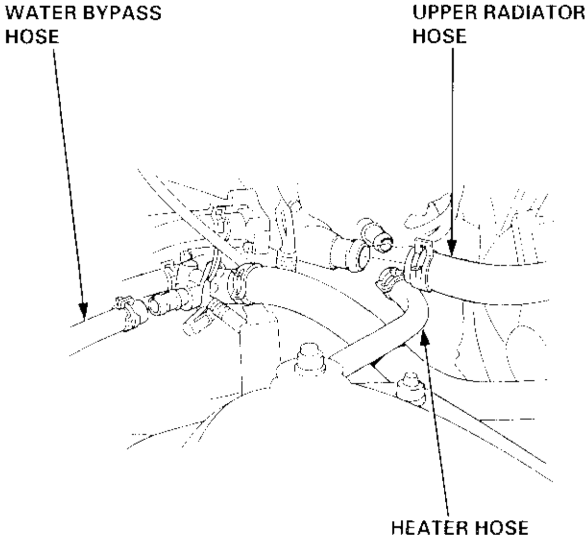
NOTE:
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable and throttle control cable when installing (see section 11 and 14).



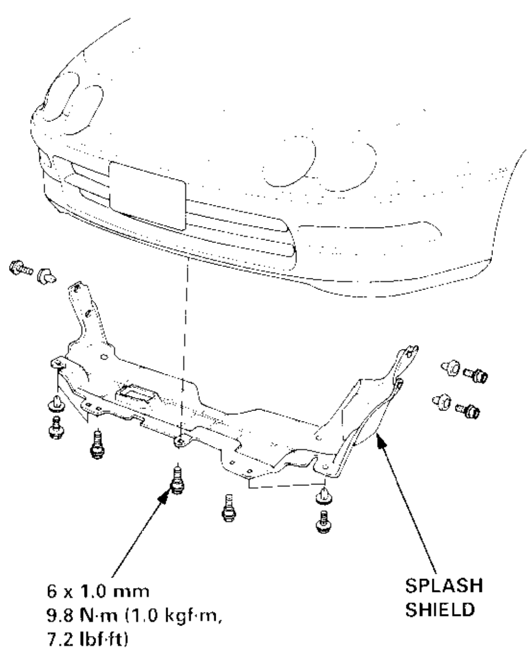
11. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
    - Four fuel injector connectors
    - Intake air temperature (IAT) sensor connector
    - Engine coolant temperature (ECT) sensor connector
    - TDC/CKP/CYP sensor connector
    - Ignition coil connector
    - ECT gauge sending unit connector
    - Throttle position (TP) sensor connector
    - Manifold absolute pressure (MAP) sensor connector
    - Idle air control (IAC) valve connector
    - EVAP purge control solenoid valve connector
    - Crankshaft speed fluctuation (CKF) sensor connector

12. Remove the spark plug caps and distributor from the cylinder head.

13. Remove the upper radiator hose, heater hose and water bypass hose.

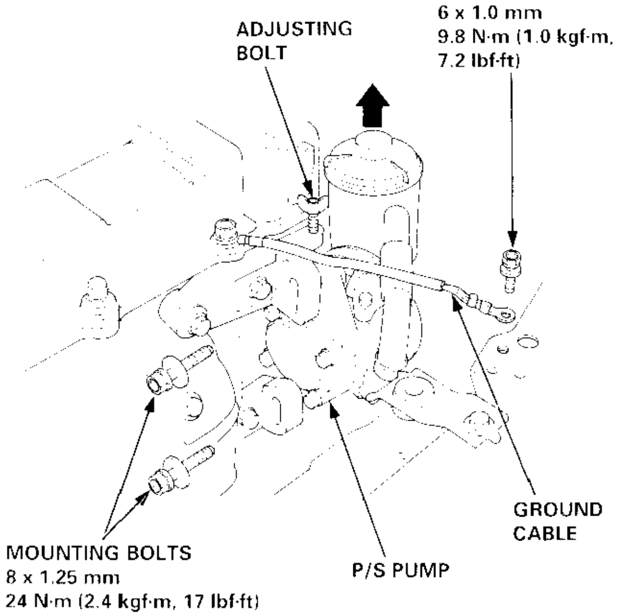


14. Remove the splash shield.



15. Remove the engine ground cable.
Remove the adjusting bolt and mounting bolts, then remove the power steering (P/S) pump belt and P/S pump.

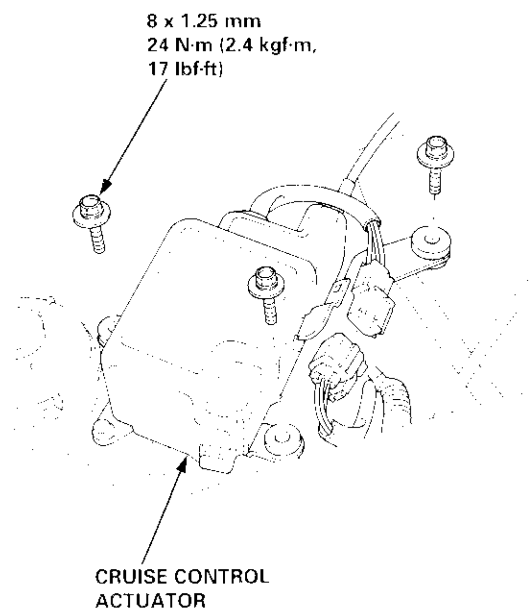
- Do not disconnect the P/S hoses.



16. Remove the air conditioning (A/C) compressor belt (see page 6-10).

17. Remove the alternator belt (see page 6-10).

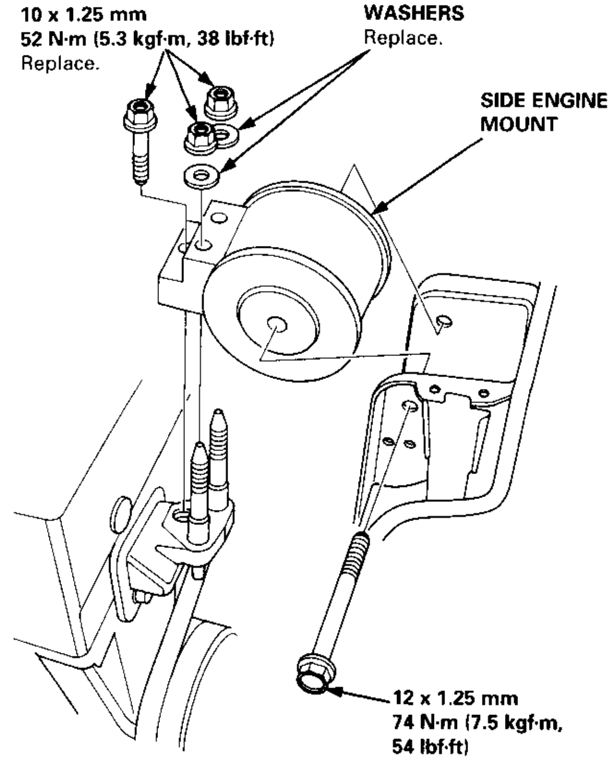
18. Remove the cruise control actuator.



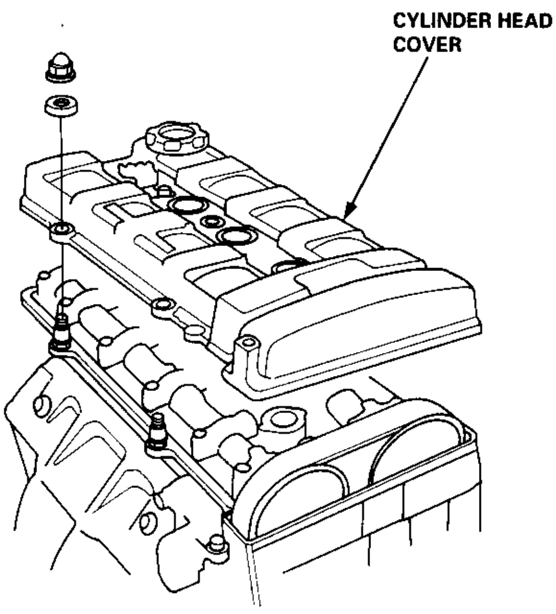
(cont'd)

Removal (cont'd)

19. Remove the side engine mount.

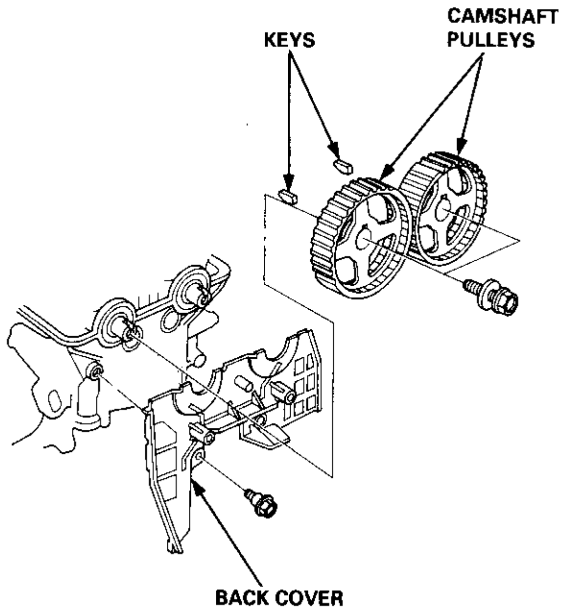


20. Remove the cylinder head cover.

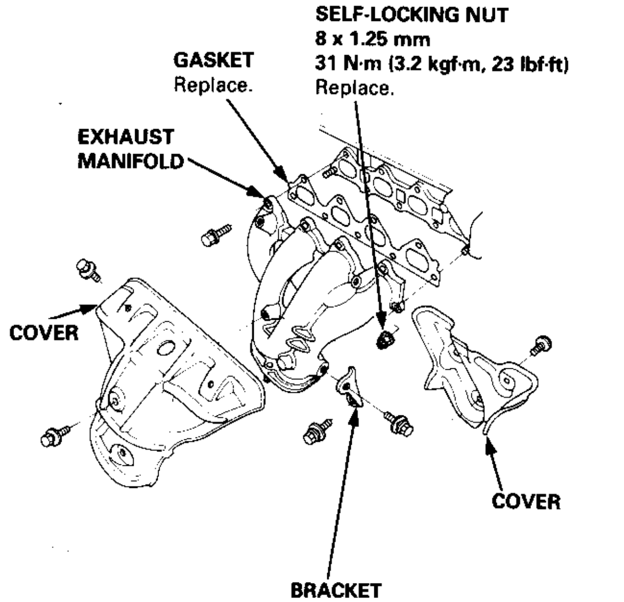


21. Remove the timing belt (see page 6-10).

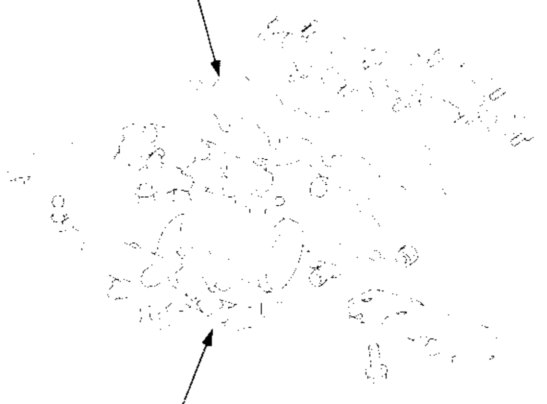
22. Remove the camshaft pulleys and back cover.



23. Remove the exhaust manifold.

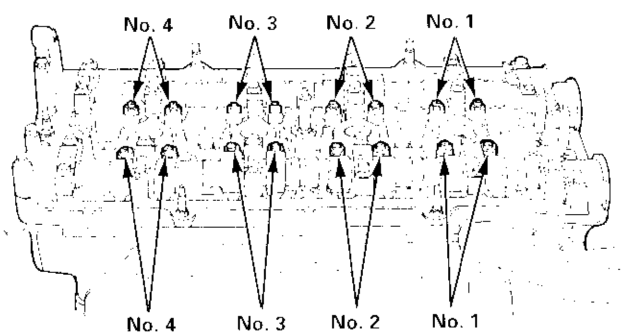


24. Remove the intake manifold.

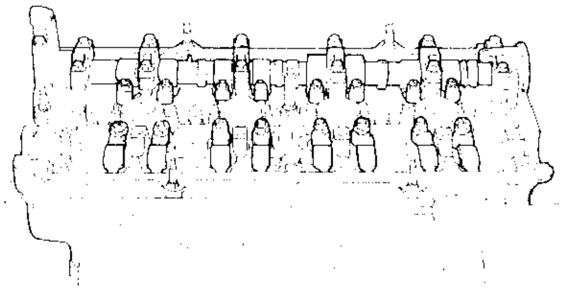


25. Loosen the locknuts and adjusting screws.

ADJUSTING SCREW LOCATIONS:



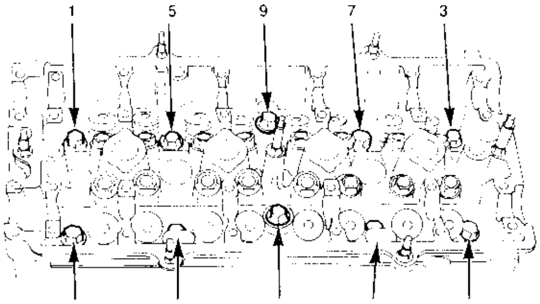
26. Remove the camshaft holder bolts, then remove the camshaft holders, camshafts and rocker arms.



27. Remove the cylinder head bolts, then remove the cylinder head.

CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLTS LOOSENING SEQUENCE



Camshafts

Inspection

1. Loosen the adjusting screws.

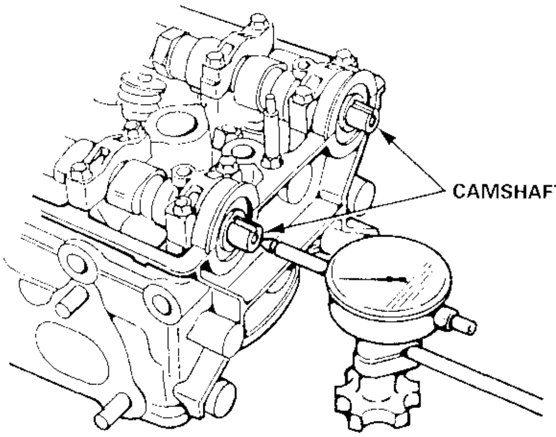
2. Remove the camshaft holders and the rocker arms.

   NOTE: Mark the rocker arms before removing them.

3. Reinstall the camshaft and holders. Tighten the camshaft holder bolts in a crisscross pattern, beginning with the inner bolts.
   9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

4. Seat the camshafts by pushing them toward the distributor end of the head with a screwdriver.

5. Zero the dial indicator against the end of the camshaft, push the camshaft back and forth and read the end play.
   Camshaft End Play:
   Standard (New): 0.05 – 0.15 mm
   (0.002 – 0.006 in)
   Service Limit: 0.5 mm (0.02 in)



6. Remove the camshaft holder bolts from the cylinder head.

   NOTE: Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern.

7. Lift the camshafts out of the cylinder head, wipe them clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worm

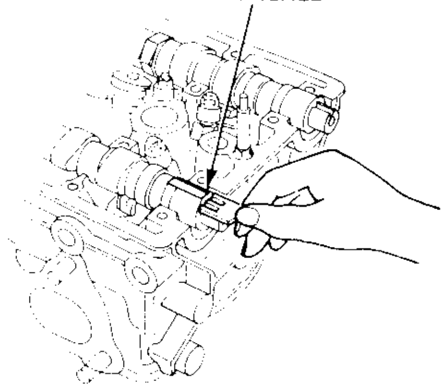
8. Clean the camshaft journal surfaces in the cylinder head, then set the camshaft back in place. Place a plastigage strip across each journal.

9. Install the camshaft holders and torque the bolts to the values and in the sequence shown on page 6-32.

   NOTE: Do not rotate camshafts during inspection.

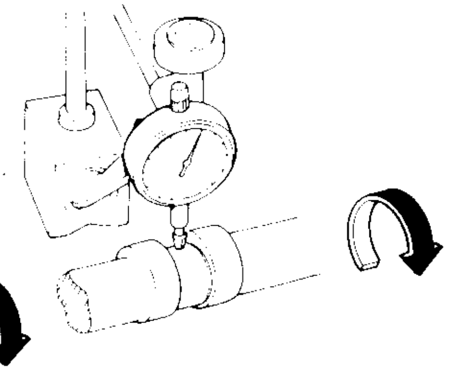
10. Remove the camshaft holders. Measure the widest portion of plastigage on each journal.

    Camshaft-to Holder Oil Clearance:
    Standard (New): 0.030 – 0.069 mm
    (0.0012 – 0.0027 in)
    Service Limit: 0.15 mm (0.006 in)



11. If camshaft-to-holder oil clearance is out of tolerance:
    - And the camshaft has already been replaced, you must replace the cylinder head.
    - If the camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

    Camshaft Total Runout:
    Standard (New): 0.03 mm (0.001 in) max.
    Service Limit: 0.04 mm (0.002 in)

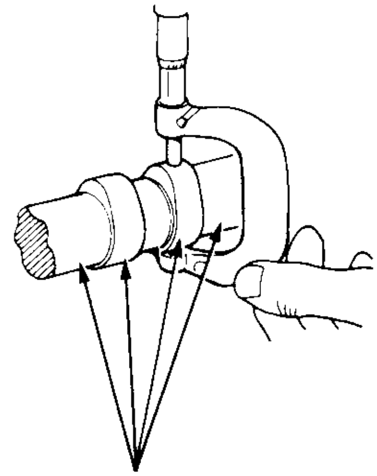


— If the total runout of the camshafts is within tolerance, replace the cylinder head.

— If the total runout is out of tolerance, replace the camshafts and recheck. If the oil clearance is still out of tolerance, replace the cylinder head.

12. Measure cam lobe height.

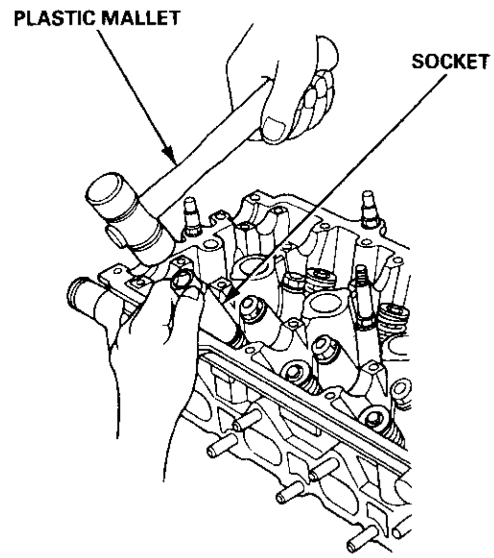
    Cam Lobe Height Standard (New)
    INTAKE: 33.716 mm (1.3274 in)
    EXHAUST: 33.528 mm (1.3200 in)



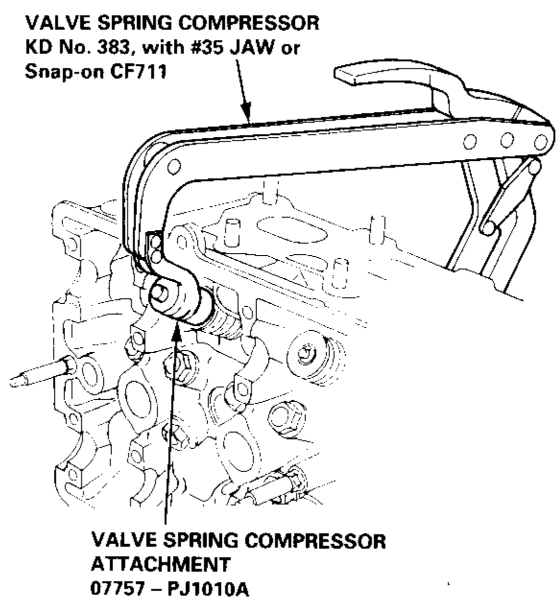
Removal

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing the spring compressor.



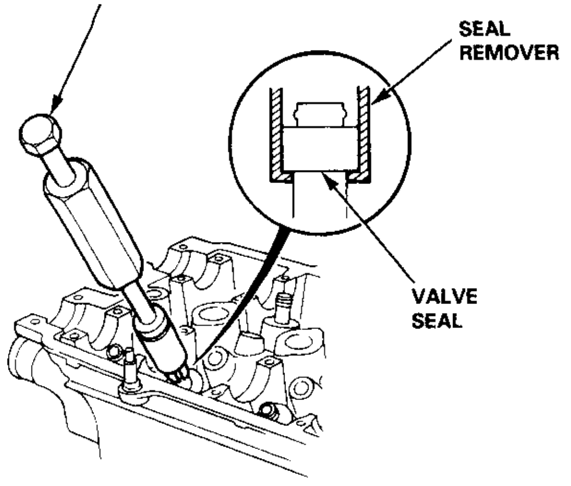
2. Install the spring compressor. Compress spring and remove valve keeper.



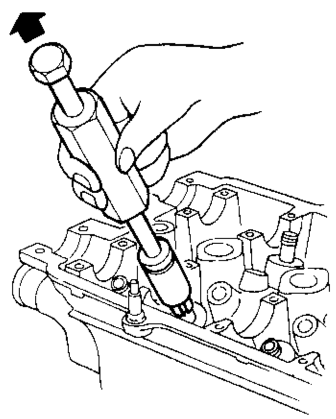
Valves, Valve Springs and Valve Seals

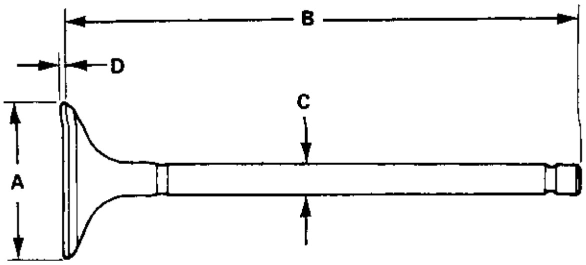
Removal (cont'd)

3. Install the special tool as shown.



4. Remove the valve seal.





Intake Valve Dimensions

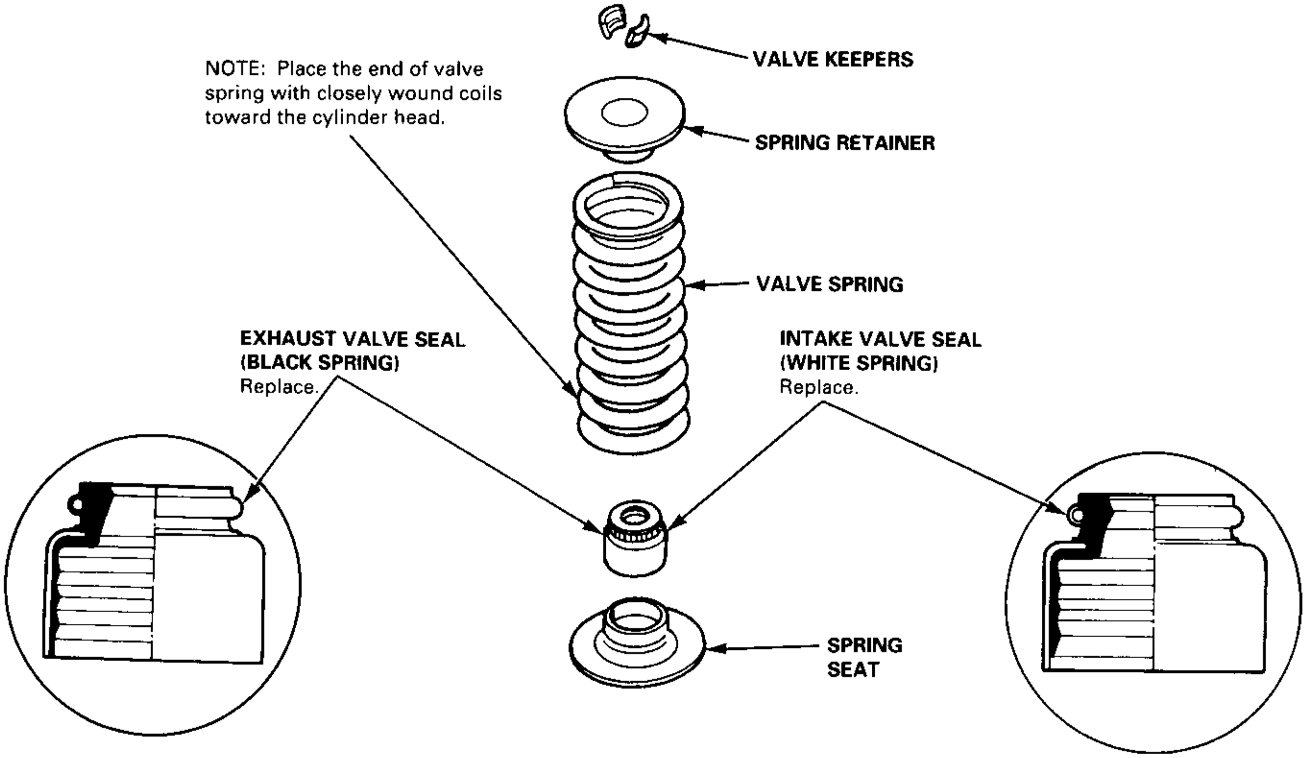
A Standard (New):	30.90 – 31.10 mm (1.217 – 1.224 in)
B Standard (New):	103.80 – 104.10 mm (4.087 – 4.098 in)
C Standard (New):	6.580 – 6.590 mm (0.2591 – 0.2594 in)
C Service Limit:	6.55 mm (0.258 in)
D Standard (New):	1.35 – 1.65 mm (0.053 – 0.065 in)
D Service Limit:	1.15 mm (0.045 in)

Exhaust Valve Dimensions

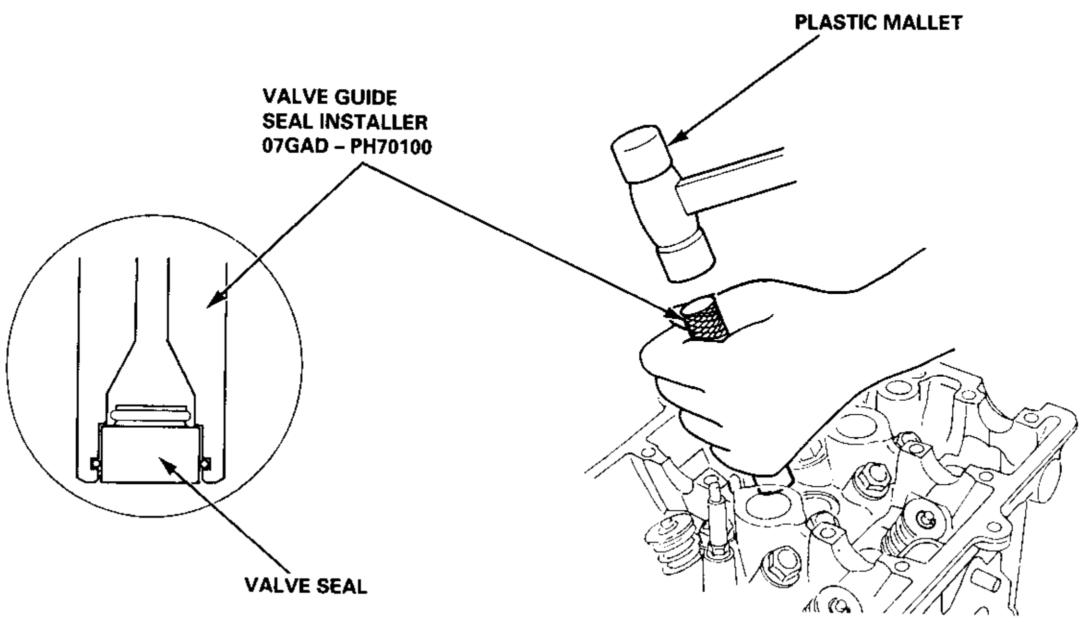
A Standard (New):	27.90 – 28.10 mm (1.098 – 1.106 in)
B Standard (New):	104.00 – 104.30 mm (4.094 – 4.106 in)
C Standard (New):	6.550 – 6.560 mm (0.2579 – 0.2583 in)
C Service Limit:	6.52 mm (0.257 in)
D Standard (New):	1.65 – 1.95 mm (0.065 – 0.077 in)
D Service Limit:	1.45 mm (0.057 in)

Installation Sequence

NOTE: Exhaust and intake valve seals are NOT interchangeable.



NOTE: Install the valve spring seats before installing the valve seals.

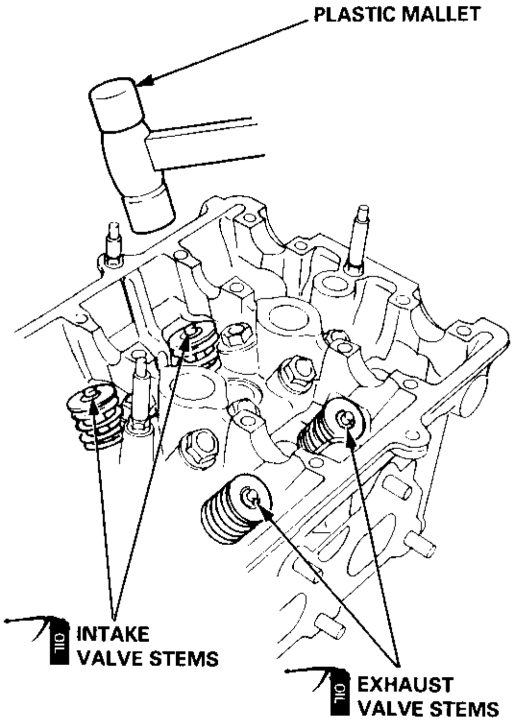


Valves, Valve Springs and Valve Seals

Valve Installation

- When installing valves in the cylinder head, coat valve stems with oil before inserting them into valve guides, and make sure valves move up and down smoothly.
- When valves and springs are in place, lightly tap the end of each valve stem two or three times to ensure proper seating of valves and valve keepers (use plastic mallet).

NOTE: Tap the valve stem only along its axis so you do not bend the stem.



Valve Guides

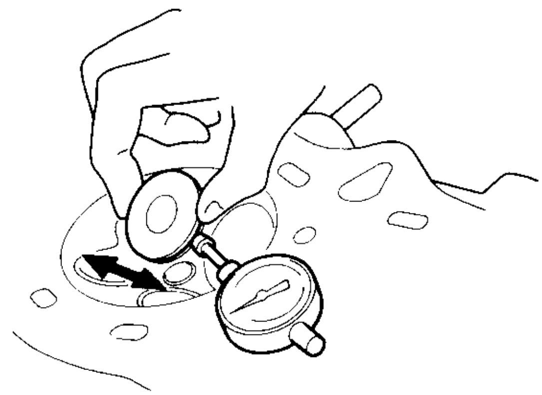
Valve Movement

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:
Standard (New): **0.04 – 0.10 mm (0.002 – 0.004 in)**
Service Limit: **0.16 mm (0.006 in)**

Exhaust Valve Stem-to-Guide Clearance:
Standard (New): **0.10 – 0.16 mm (0.004 – 0.006 in)**
Service Limit: **0.22 mm (0.009 in)**

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using a new valve.
- If measurement is now within the service limit, reassemble using a new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

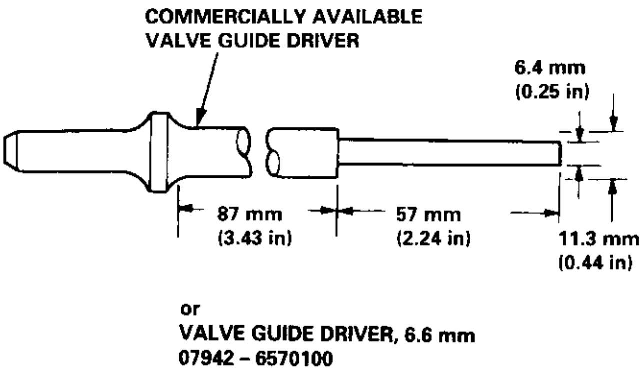
NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.
Take the measurements in three places along the valve stem and three places inside the valve guide.
The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit

Intake Valve Stem-to-Guide Clearance:
Standard (New): **0.02 – 0.05 mm (0.001–0.002 in)**
Service Limit: **0.08 mm (0.003 in)**

Exhaust Valve Stem-to-Guide Clearance:
Standard (New): **0.05 – 0.08 mm (0.002 – 0.003 in)**
Service Limit: **0.11 mm (0.004 in)**

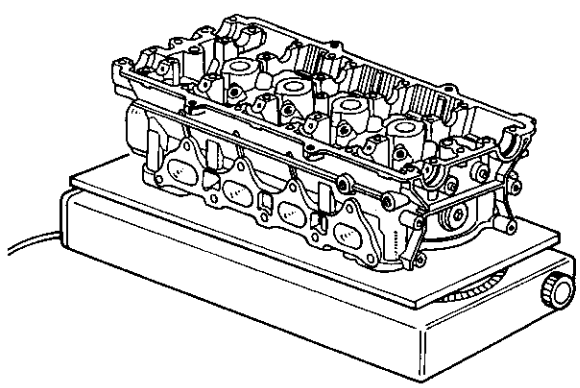
Replacement

1. As illustrated below use a commercially available air-impact valve guide driver attachment modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



2. Select the proper replacement guides and chill them in the freezer section of a refrigerator for about an hour.

3. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a cooking thermometer.

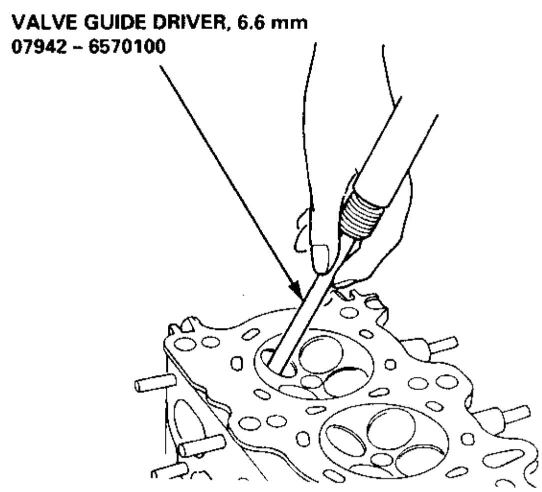


CAUTION:
- **Do not use a torch; it may warp the head.**
- **Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.**
- **To avoid burns, use heavy gloves when handling the heated cylinder head.**

4. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in) towards the combustion chamber. This will knock off some of the carbon and make removal easier.

CAUTION:
- **Always wear safety goggles or a face shield when driving valve guides.**
- **Hold the air hammer directly in line with the valve guide to prevent damaging the driver.**

5. Turn the head over and drive the guide out toward the camshaft side of head.



If a valve guide still won't move, drill it out with a 8.0 mm (5/16 in) bit, then try again.

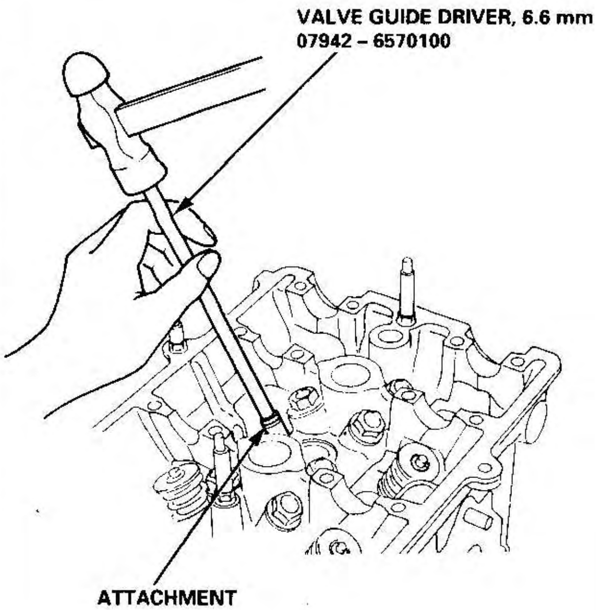
CAUTION: Drill guides only in extreme cases; You could damage the cylinder head if the guide breaks.

6. Remove the new guide(s) from the freezer, one at a time, as you need them.

(cont'd)

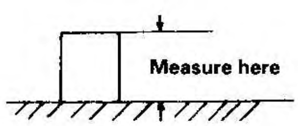
Replacement (cont'd)

7. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height. If you have all 16 guides to do, you may have to reheat the head.



Valve Guide Installed Height:

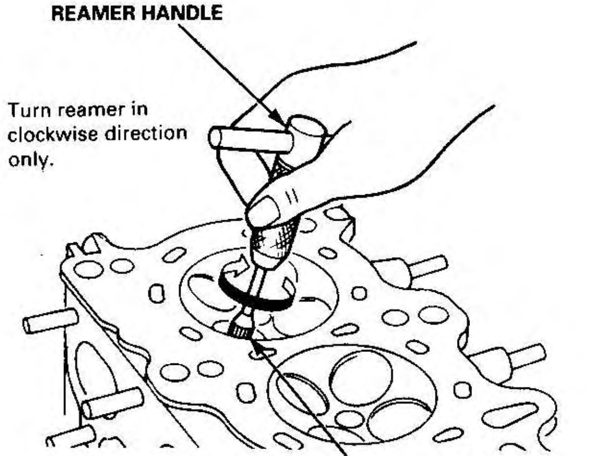
Intake:	**13.75 - 14.25 mm (0.541 - 0.561 in)**
Exhaust:	**15.75 - 16.25 mm (0.620 - 0.640 in)**



Reaming

NOTE: For new valve guides only.

1. Coat both reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with a valve (see page 6-26).
   - Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.



Valve Seats

Reconditioning

1. Renew the valve seats in the cylinder head using a valve seat cutter.

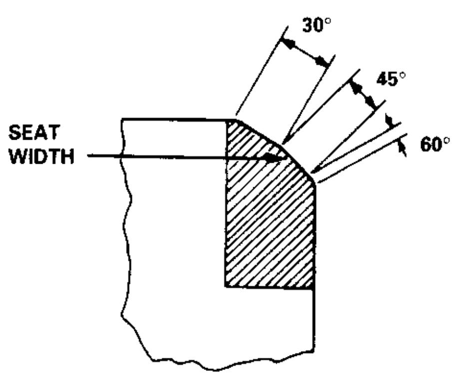
   NOTE: If guides are worn (see page 6-26), replace them (see page 6-27) before cutting the valve seats.

2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.

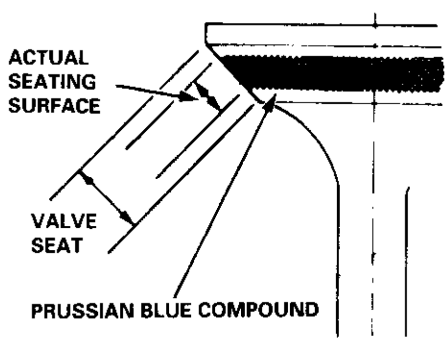
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check width of seat and adjust accordingly.

4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width (Intake and Exhaust):
   Standard (New): 1.25 – 1.55 mm (0.049 – 0.061 in)
   Service Limit: 2.0 mm (0.08 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.

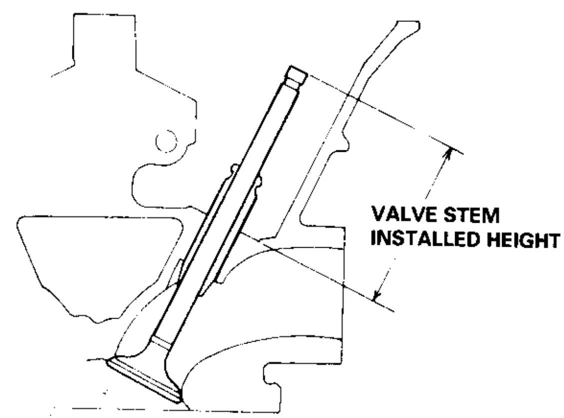


6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.

   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.
     NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in the head and measure valve stem installed height.

   Intake Valve Stem Installed Height:
   Standard (New): 40.765 – 41.235 mm (1.6049 – 1.6234 in)
   Service Limit: 41.485 mm (1.6333 in)
   Exhaust Valve Stem Installed Height:
   Standard (New): 42.765 – 43.235 mm (1.6837 – 1.7022 in)
   Service Limit: 43.485 mm (1.7120 in)



8. If valve stem installed height is over the service limit, replace valve and recheck. If still over the service limit, replace cylinder head; the valve seat in the head is too deep.

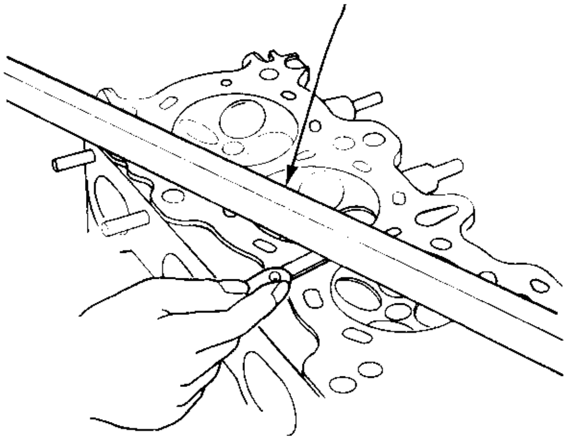
Cylinder Head

Wapage

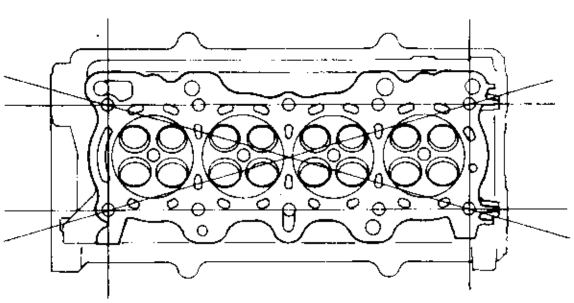
NOTE: If camshaft-to-holder oil clearances (see page 6-22) are not within specification, the head cannot be resurfaced.

If camshaft-to-holder oil clearances are within specifications, check the head for warpage.

- If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 132.0 mm (5.20 in).



Measure along edges, and 3 ways across center.



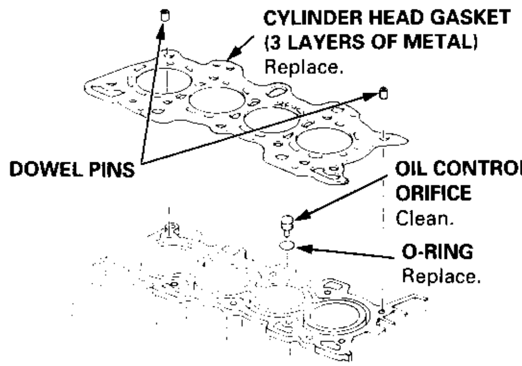
Cylinder Head Height:
Standard (New): 131.95 – 132.05 mm
(5.195 – 5.199 in)

Installation

Install the cylinder head in the reverse order of removal:
NOTE:

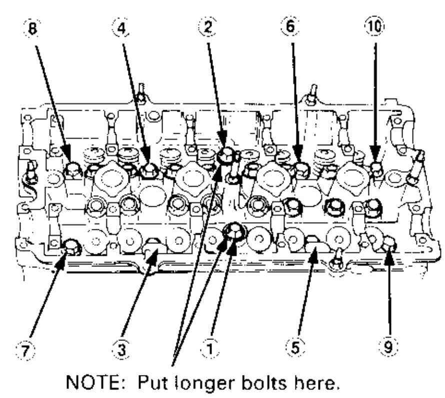
- Always use a new head gasket.
- Cylinder head and cylinder block surface must be clean.
- "UP" mark on the camshaft pulleys should be at the top.
- Do not use the middle cover and lower cover for storing removed items.
- Clean the middle cover and lower cover before installation.
- Replace the washer when damaged or deteriorated.

1. Cylinder head dowel pins and the oil control orifice must be aligned.
   NOTE:
   - When handling a metal gasket, care should be taken not to fold it or damage the contact surface of the gasket.
   - Clean the oil control orifice when installing.



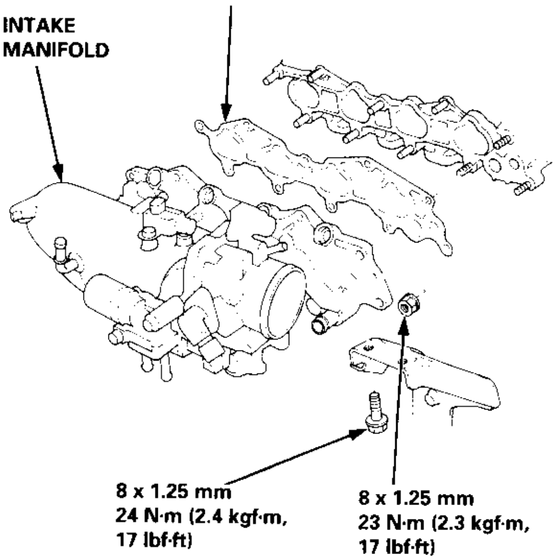
2. Tighten the cylinder head bolts in two steps. In the first step tighten all bolts, in sequence, to about 29 N·m (3.0 kgf·m, 22 lbf·ft); in the final step, tighten in the same sequence to 85 N·m (8.7 kgf·m, 63 lbf·ft).
   NOTE:
   - Apply engine oil to the cylinder head bolts and the washers.
   - Use the longer bolts at positions No. 1 and No. 2 as shown.

CYLINDER HEAD BOLTS TORQUE SEQUENCE

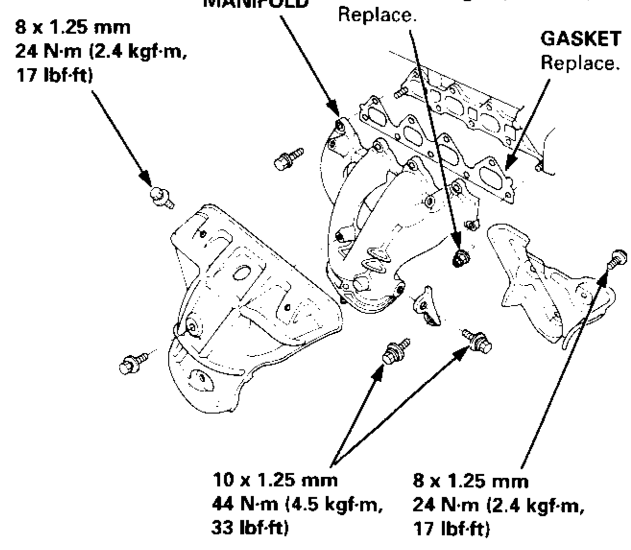


3. Install the intake manifold and tighten the nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nuts.

CAUTION: Check for folds or scratches on the surface of the gasket. Replace with a new gasket if damaged.

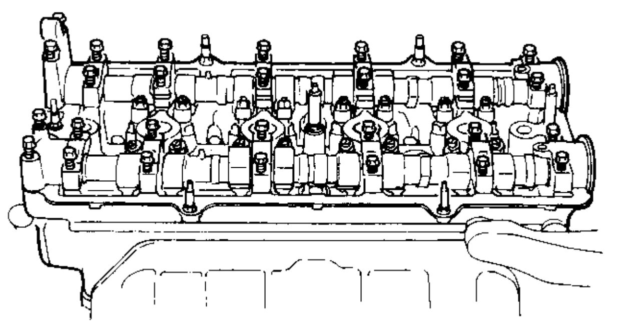


4. Tighten the intake manifold bracket bolts.
5. Install the exhaust manifold and tighten the new self-locking nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nuts.
   - Use new self-locking nuts.



CAUTION:
- **Make sure that the keyways on the camshafts are facing up and No. 1 piston is at top dead center (TDC).**
- **Replace the rocker arms in their original positions.**

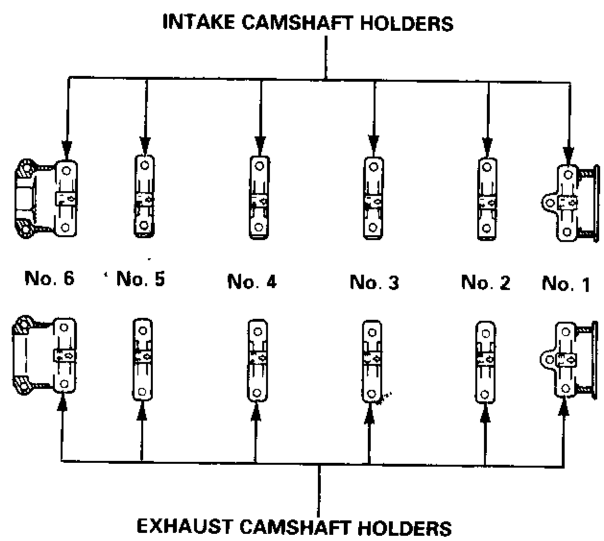
6. Place the rocker arms on the pivot bolts and the valve stems.



7. Install the camshafts, then install the camshaft seals with the open side (spring) facing in.

8. Apply liquid gasket to the head mating surfaces of the No. 1 and No. 6 camshaft holders, then install them, along with No. 2, 3, 4, and 5.

   NOTE:
   - "I" or "E" marks are stamped on the camshaft holders.
   - Do not apply oil to the holder mating surface of camshaft seals.
   - Apply liquid gasket to the shaded areas.
   - The arrows marked on the camshaft holders should point to the timing belt.
   - Clean and dry the cylinder head mating surfaces before applying liquid gasket.

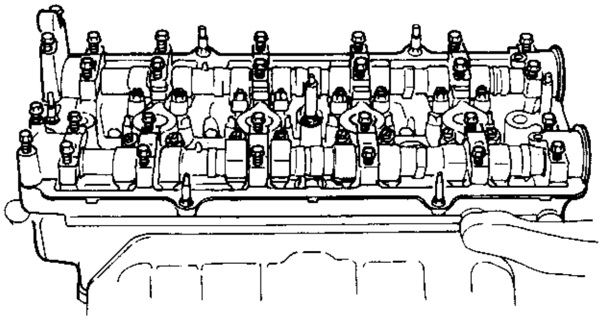


(cont'd)

Cylinder Head

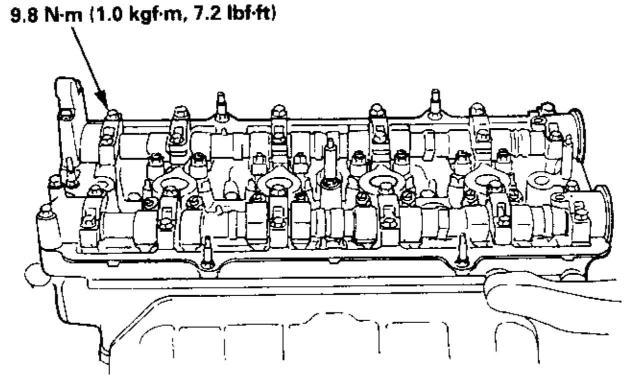
Installation (cont'd)

9. Tighten the camshaft holders temporarily.
   - Make sure that the rocker arms are properly positioned on the valve stems.

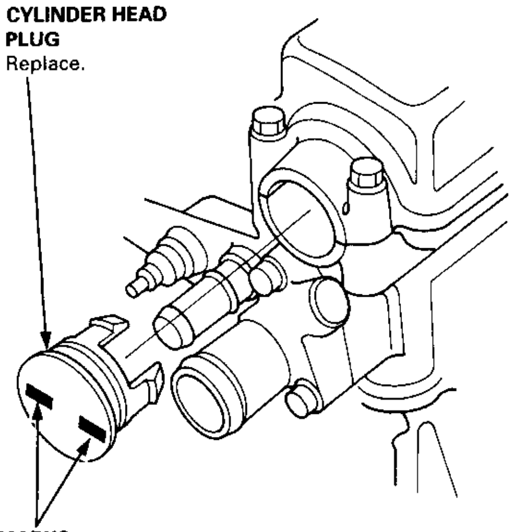


10. Tighten each bolt in two steps to ensure that the rockers do not bind on the valves.

    NOTE: Wipe off the excess of liquid gasket from No. 1 and No. 6 camshaft holder with a shop towel.

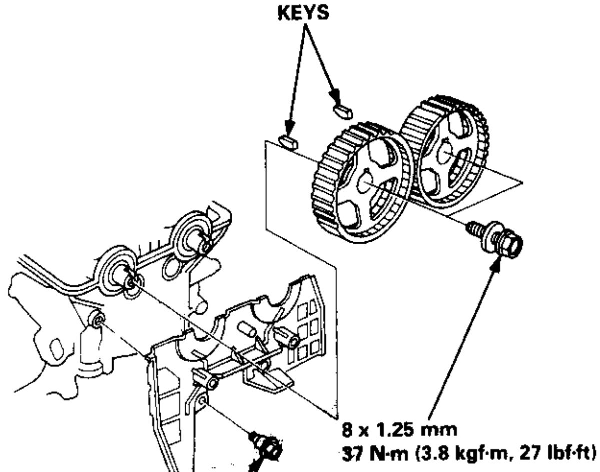


11. Align the marks on the cylinder head plug to the cylinder head upper surface, then install the cylinder head plug in the cylinder head to the end.



12. Install the back cover.
13. Install keys into camshaft grooves.

    NOTE: To set the camshafts at TDC position for No. 1 piston, align the holes in the camshafts with the holes in No. 1 camshaft holders and insert 5.0 mm pin punches in the holes.



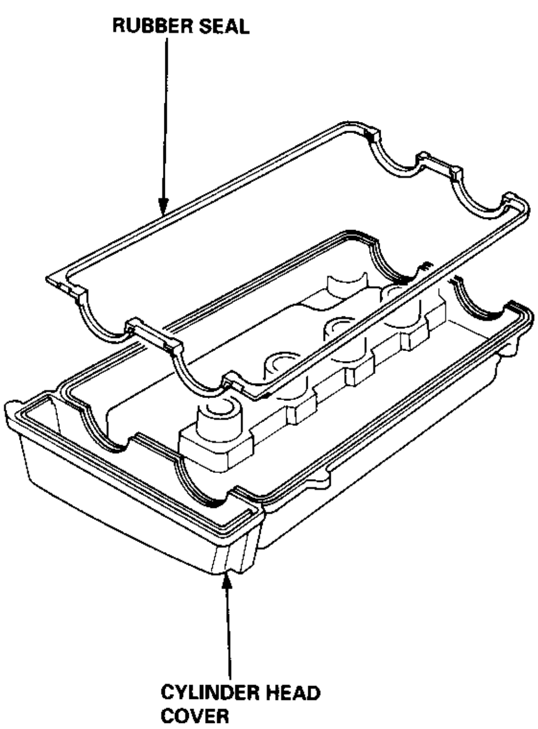
14. Push camshaft pulleys onto camshafts, then tighten the retaining bolts to the torque specified.

15. Install the timing belt (see page 6-12).

16. Adjust the valve clearance (see page 6-3).

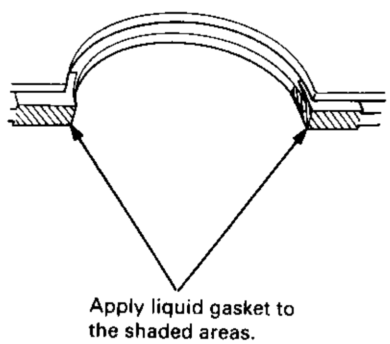
17. Install the rubber seal in the groove of the cylinder head cover. Seat the seal in the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:
- Before installing the rubber seal, thoroughly clean the seal and the groove.
- When installing, make sure the seal is seated securely in the corners of the recesses with no gap.



18. Apply liquid gasket to the rubber seal at the eight corners of the recesses.

NOTE:
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.

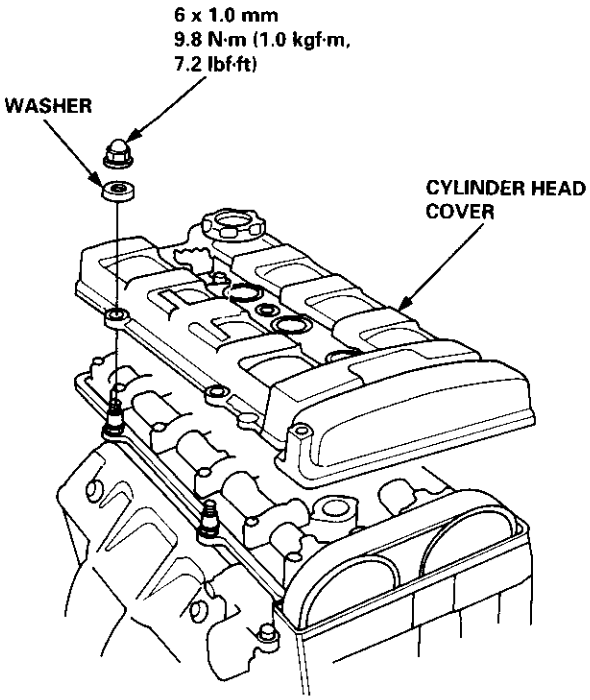


(cont'd)

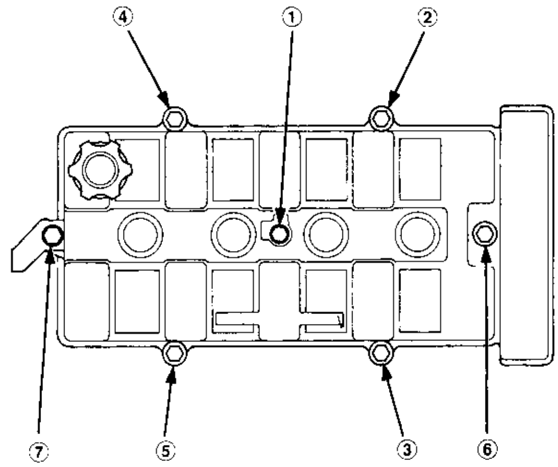
Installation (cont'd)

19. When installing the cylinder head cover, hold the rubber seal in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).
Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the rubber seal.

NOTE:
- Before installing the cylinder head cover, clean the cylinder head contacting surfaces using a shop towel.
- Do not touch the parts where liquid gasket was applied.



20. Tighten the nuts in 2 or 3 steps. In the final step, tighten all nuts, in sequence, to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft).



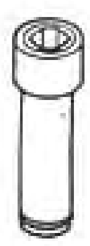
21. After installing, check that all tubes, hoses and connectors are installed correctly.

Cylinder Head/Valve Train
B18C1, B18C5 engines

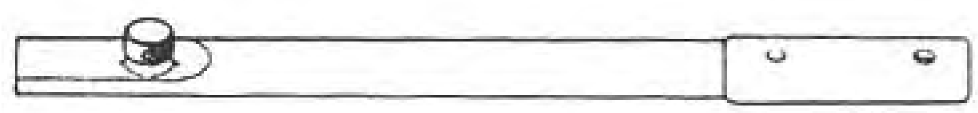
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAH – PJ7010B	Valve Guide Reamer, 5.5 mm	1	6-75
②	07JAA – 001020A	Socket, 19 mm	1	6-46
③	07JAB – 001020A	Holder Handle	1	6-46
④	07LAJ – PR3020A	Air Stopper	1	6-42
⑤	07MAA – PR70110	Tappet Adjuster	1	6-43
⑥	07MAA – PR70120	Tappet Locknut Wrench	1	6-43
⑦	07MAB – PY3010A	Pulley Holder Attachment, HEX 50 mm, offset	1	6-46
⑧	07MAF – PR9010A	Valve Spring Compressor Attachment Extension	1	6-69
⑨	07742 – 0010100	Valve Guide Driver, 5.5 mm	1	6-74, 75
⑩	07757 – PJ1010A	Valve Spring Compressor Attachment	1	6-69

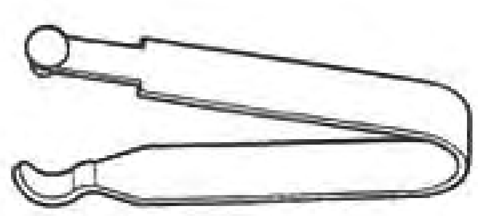
①



②

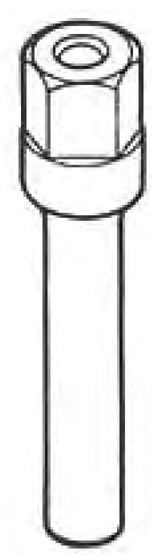


③

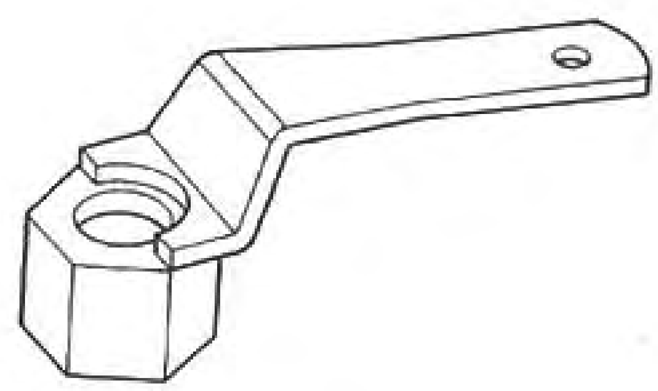


④

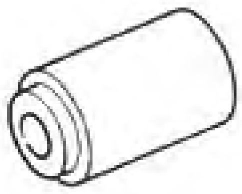
⑤



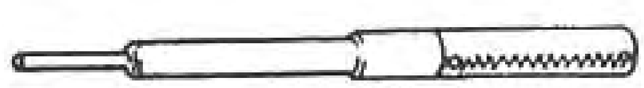
⑥



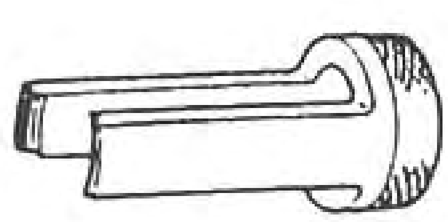
⑦



⑧



⑨



⑩

VTEC Control System

Troubleshooting Flowchart

P1259 The scan tool indicates Diagnostic Trouble Code (DTC) P1259: A problem in the VTEC Pressure Switch circuit or VTEC Solenoid Valve circuit.

Refer to page 11-28 through 11-45 before troubleshooting.

— The MIL has been reported on.
— DTC P1259 is stored.

Check the VTEC Control System:
1. Do the engine control module (ECM) Reset Procedure (see section 11).
2. Start the engine.
3. Warm up the engine to normal operating temperature (cooling fan comes on).
4. Do the Road Test.*

* Road test:
Accelerate in 1st gear to an engine speed over 6,000 rpm.
Hold that engine speed for at least two seconds.
If the DTC P1259 is not repeated during the first road test, repeat this test two more times.

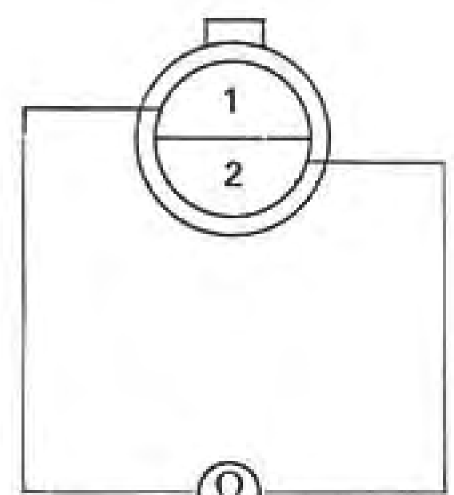
Is DTC P1259 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTEC pressure switch, VTEC solenoid valve and ECM.**

YES ↓

Test the VTEC Pressure Switch:
1. Turn the ignition switch OFF.
2. Disconnect the VTEC Pressure switch connector.
3. Check for continuity between VTEC pressure switch connector terminals No. 1 and No. 2.

VTEC PRESSURE SWITCH CONNECTOR



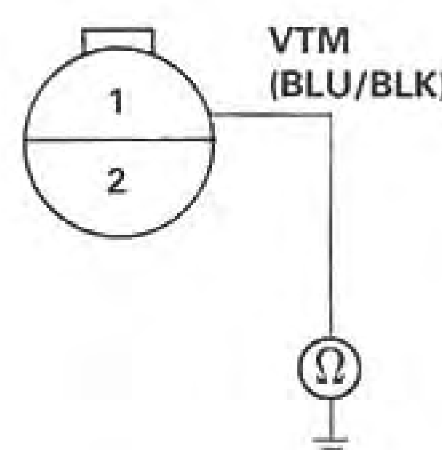
TERMINAL SIDE OF MALE TERMINAL

Is there continuity?

NO → **Replace the VTEC pressure switch.**

YES ↓

Test the VTEC Pressure Switch Wire:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the VTEC pressure switch connector terminal No. 1 and body ground.



WIRE SIDE OF FEMALE TERMINAL

Is there approx. 12 V?

NO → **Inspect for an open or short to ground in the wire between the VTEC pressure switch and the ECM (C15). If the wire is OK, substitute a known-good ECM and recheck.**

YES ↓

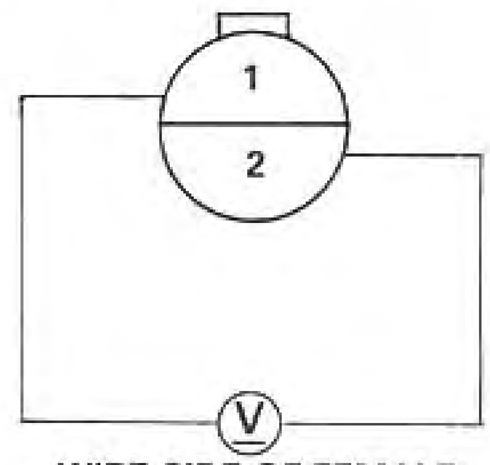
(To page 6-38)

(cont'd)

Troubleshooting Flowchart (cont'd)

(From page 6-37)

Test the VTEC Pressure Switch Wire:
Measure voltage across the VTEC pressure switch connector.

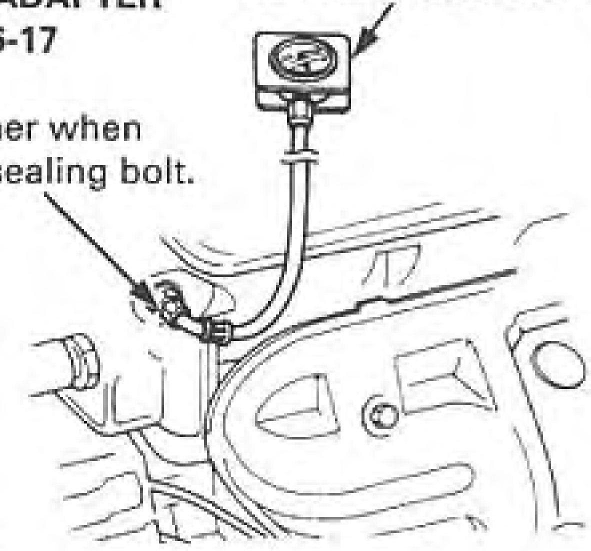


Is there approx. 12 V?

NO → **Repair open in the wire between VTEC pressure switch and body ground.**

YES ↓

Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Remove the 10 mm bolt, install the special tools as shown.
3. Connect a tachometer (see section 11).
4. Start the engine.
5. Warm up the engine to normal operating temperature (cooling fan comes on).
6. Check oil pressure at engine speeds of 1,000, 3,000 and 5,000 rpm.



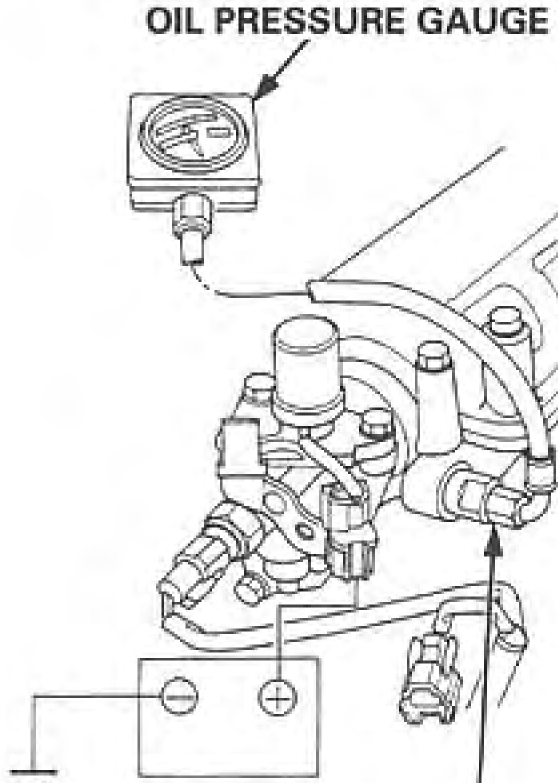
NOTE: Keep measuring time as short as possible because engine is running with no load (less than one minute).

Is pressure below 49 kPa (0.5 kgf/cm², 7 psi)?

NO → **Inspect the VTEC solenoid valve.**

YES ↓

Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Disconnect the VTEC solenoid valve connector.
3. Attach the battery positive terminal to the GRN/YEL terminal.
4. Start the engine and check oil pressure at an engine speed of 5,000 rpm.



Is pressure above 400 kPa (4 kgf/cm², 60 psi)?

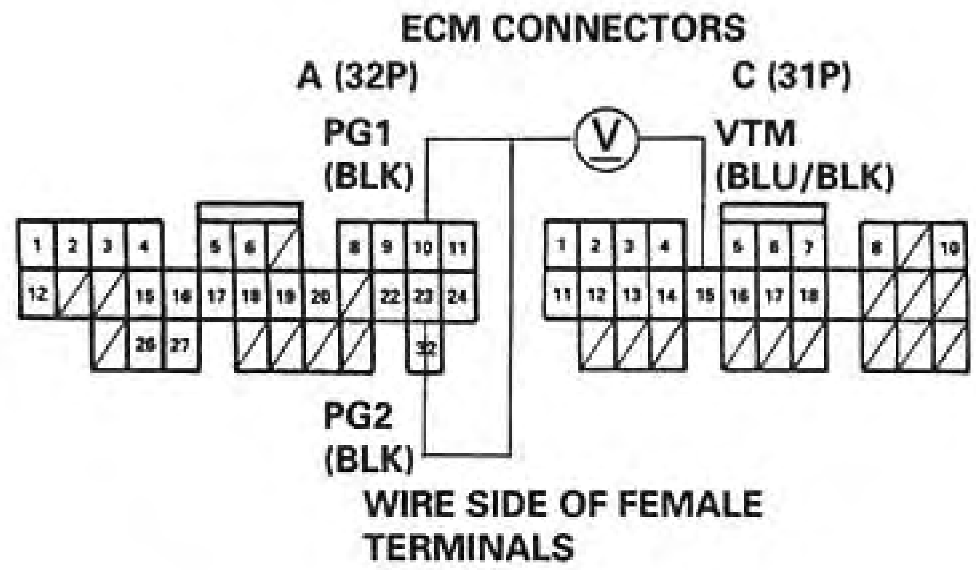
NO → **Inspect the VTEC solenoid valve.**

YES ↓

(To page 6-39)

(From page 6-38)

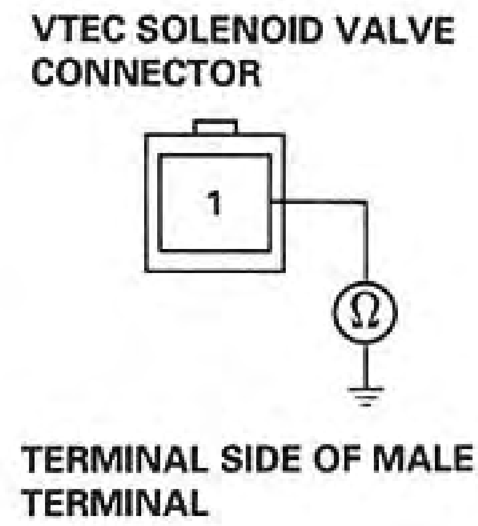
Test the VTEC Pressure Switch:
1. Turn the ignition switch OFF.
2. Reconnect the VTEC pressure switch connector.
3. Start the engine.
4. With the battery positive terminal connected to the VTEC solenoid valve, measure voltage between C15 and A10 or A23.



Is there approx. 12 V above 5,000 rpm?

- NO → **Replace the VTEC pressure switch.**
- YES ↓

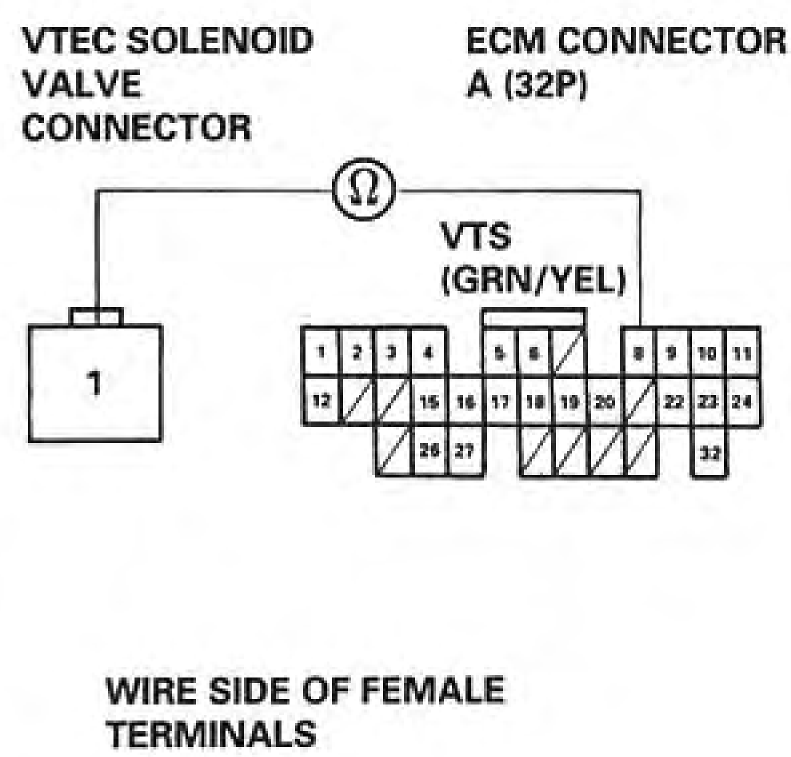
Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Disconnect the battery positive terminal from the VTEC solenoid valve.
3. Check for continuity between the VTEC solenoid valve connector terminal No. 1 and body ground.



Is there 14 – 30 Ω?

- NO → **Replace the VTEC solenoid valve.**
- YES ↓

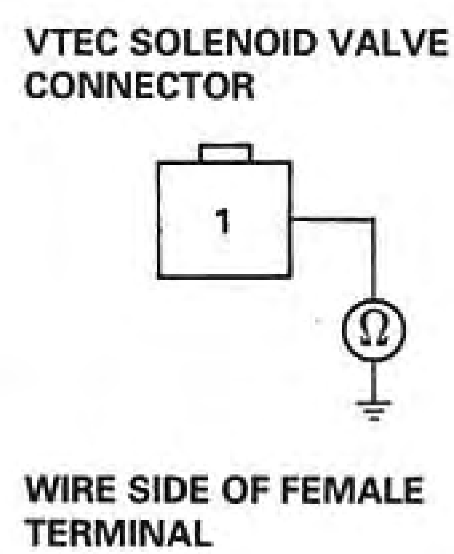
Test the VTEC Solenoid Valve Wire:
Check for continuity between the VTEC solenoid valve connector terminal No. 1 and A8.



Is there continuity?

- NO → **Repair open in the wire between the ECM (A8) and VTEC solenoid valve connector.**
- YES ↓

Test the VTEC Solenoid Valve Wire:
Check for continuity between the VTEC solenoid valve connector terminal No. 1 and body ground.



Is there continuity?

- YES → **Repair short in the wire between the ECM (A8) and VTEC solenoid valve connector.**
- NO ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM

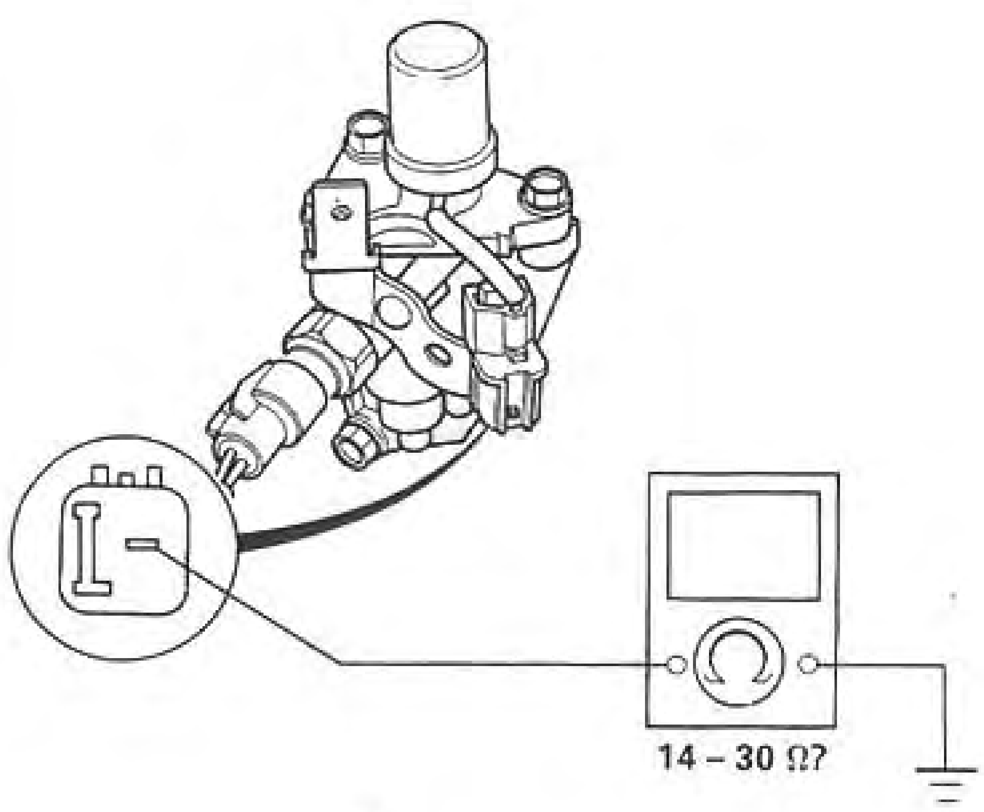
VTEC Solenoid Valve

Inspection

1. Disconnect the 1P connector from the VTEC solenoid valve.

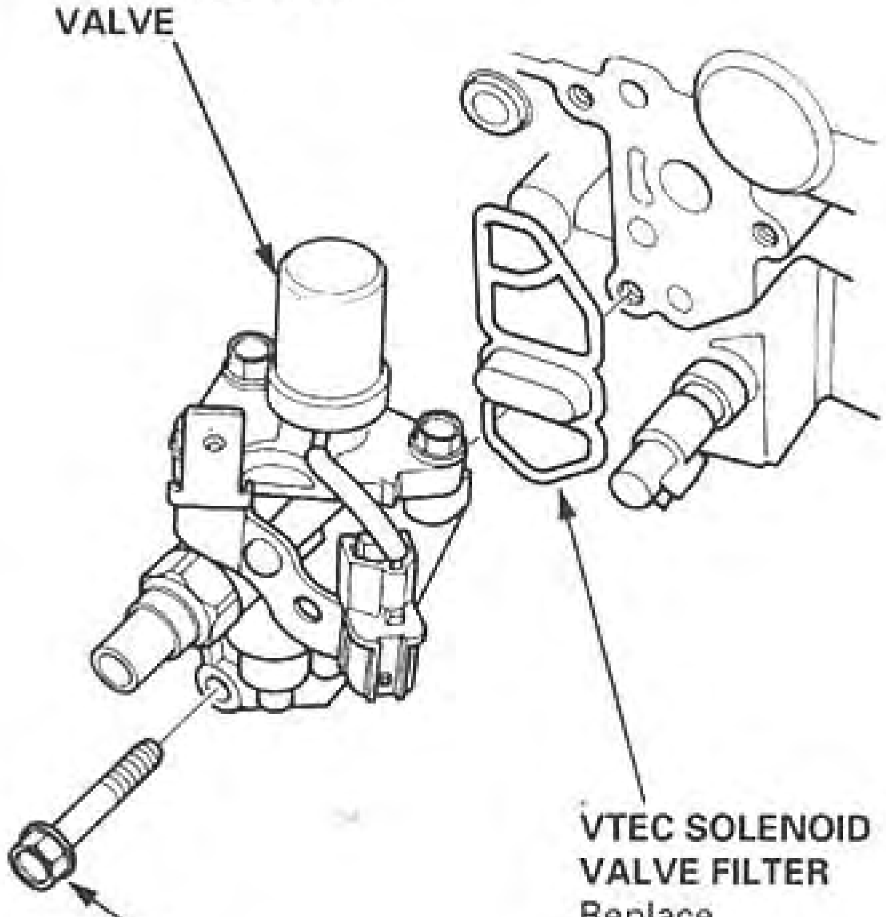
2. Measure resistance between the terminal and body ground.

   Resistance: 14 – 30 Ω



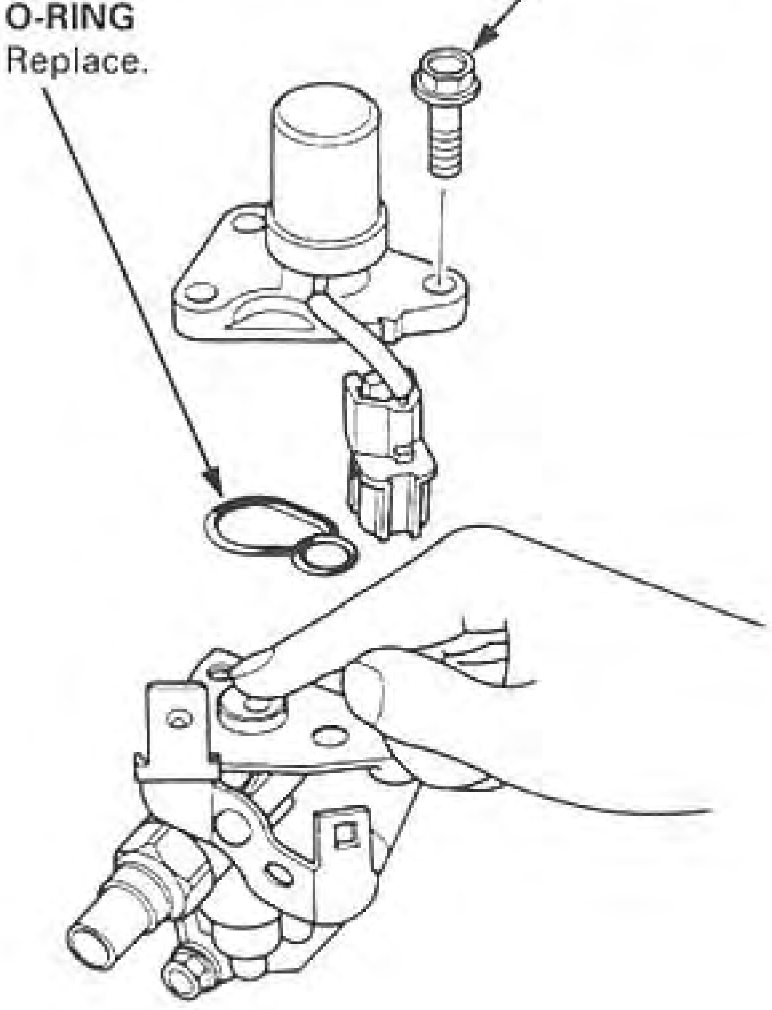
3. If the resistance is within specifications, remove the VTEC solenoid valve from the cylinder head, and check the VTEC solenoid valve filter for clogging.

   - If there is clogging, replace the engine oil filter and the engine oil.



4. If the filter is not clogged, push the VTEC solenoid valve with your finger and check its movement.

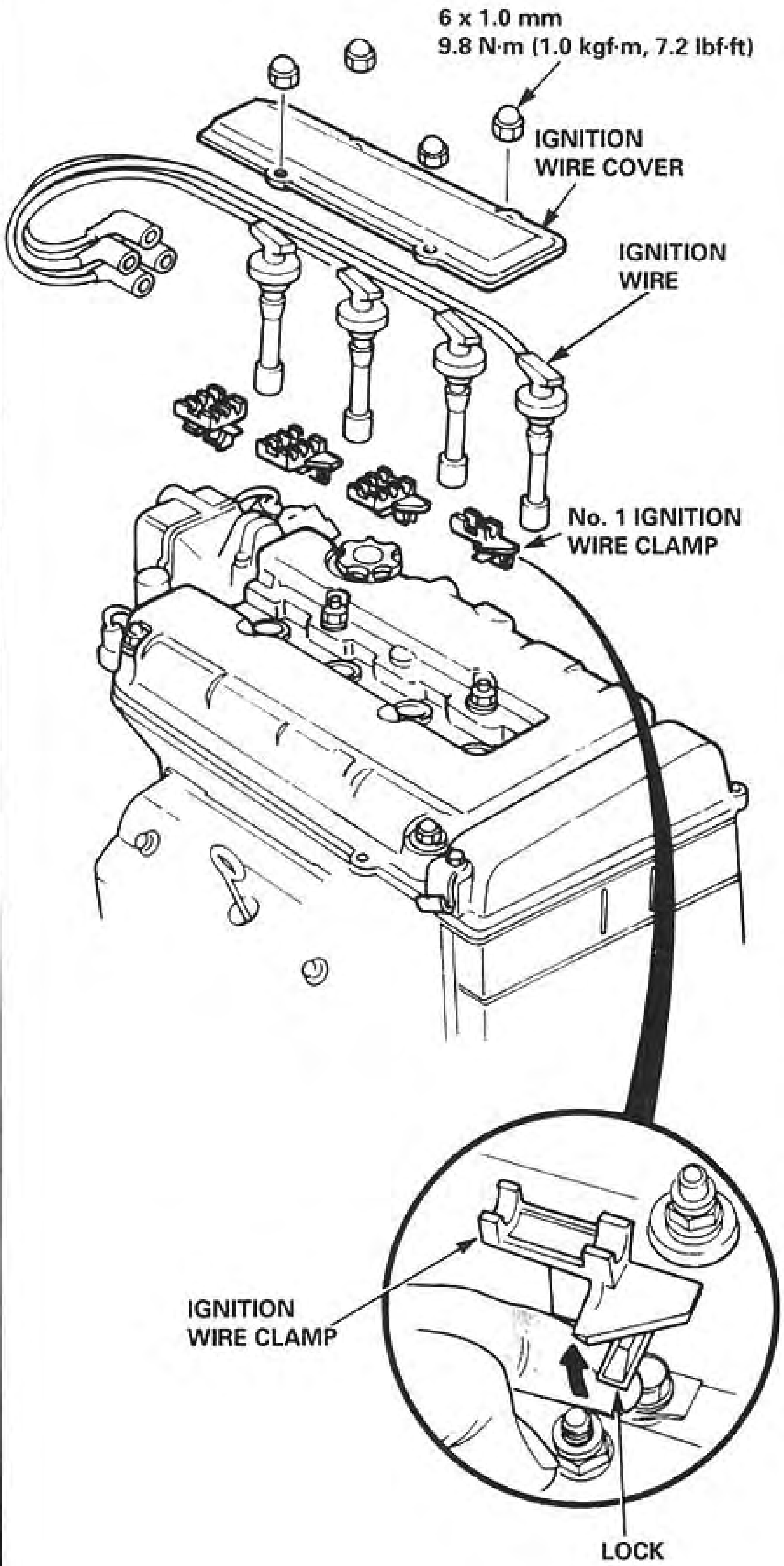
   - If VTEC solenoid valve is normal, check the engine oil pressure.



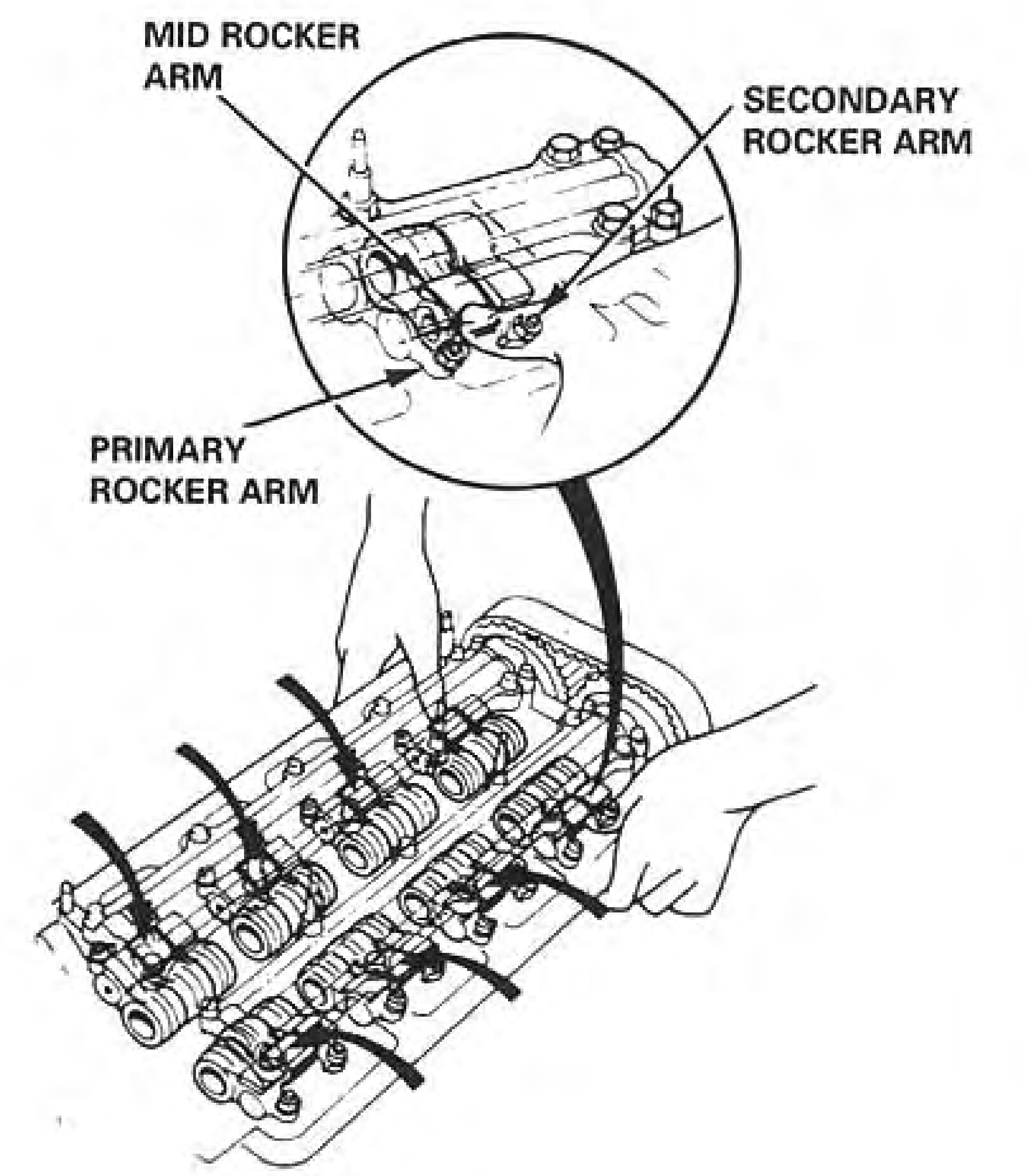
VTEC Rocker Arms

Manual Inspection

1. Set the No. 1 piston at TDC.
2. Remove the ignition wire cover and the wires.
3. Remove the ignition wire clamps while pulling up on the lock.



4. Remove the cylinder head cover.
5. Push the mid rocker arms on the No. 1 cylinder manually.
6. Check that each mid rocker arm moves independently of the primary and secondary rocker arms.



7. Check the mid rocker arms of each cylinder at TDC.
   - If the mid rocker arm does not move, remove the mid, primary and secondary rocker arms as an assembly and check that the pistons in the mid and primary rocker arms move smoothly.
   - If any rocker arm needs replacing, replace the primary, mid, and secondary rocker arms as an assembly.

NOTE: Refer to page 6-81 when installing cylinder head cover.

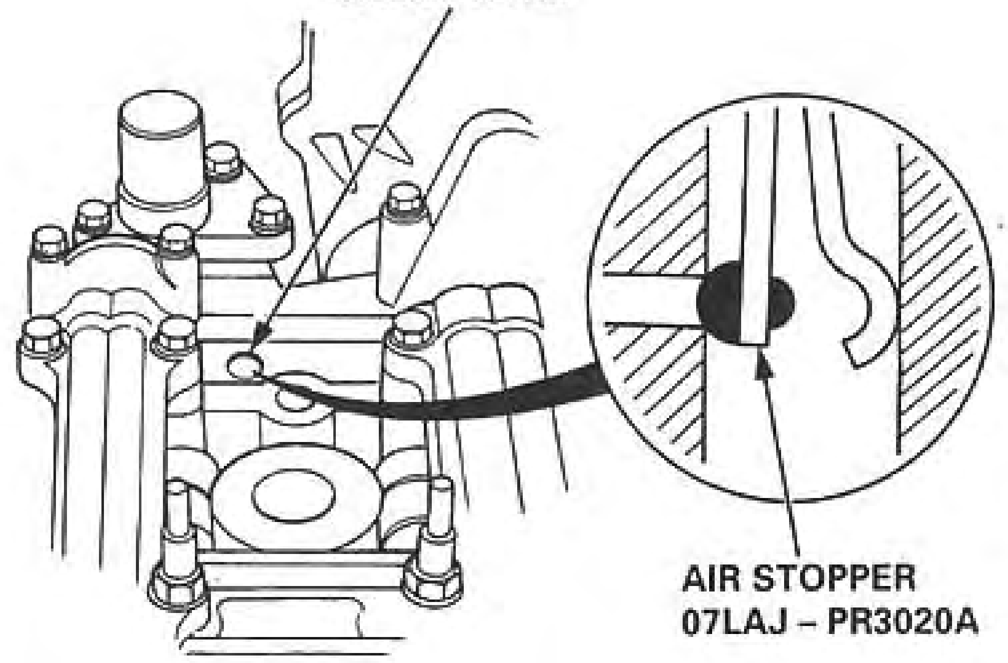
VTEC Rocker Arms

Inspection Using Special Tools

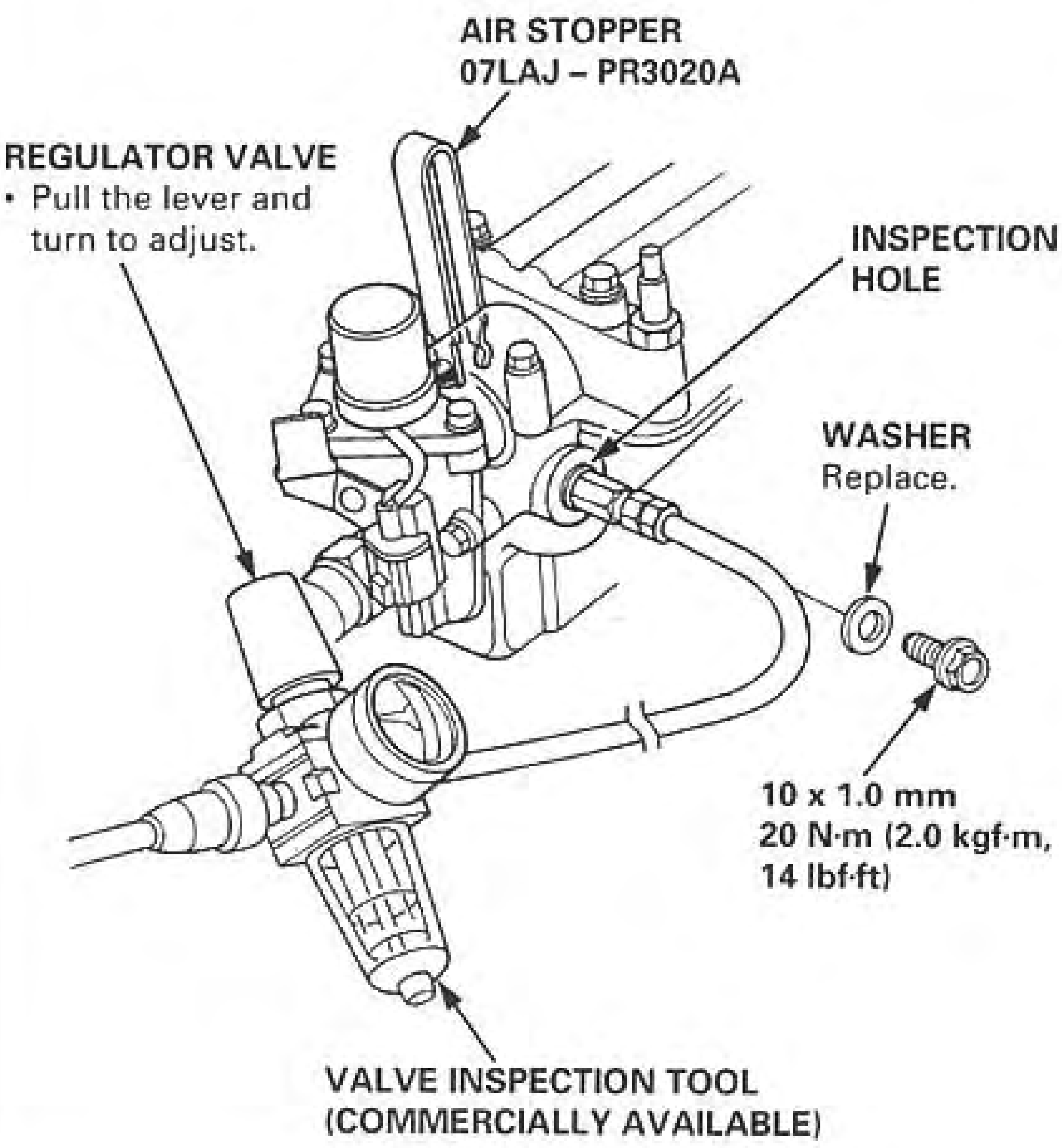
CAUTION:
- **Before using the valve inspection tool, make sure that the air pressure gauge on the air compressor indicates over 400 kPa (4 kgf/cm², 57 psi)**
- **Inspect the valve clearance before rocker arm inspection.**
- **Cover the timing belt with a shop towel to prevent getting oil on the belt.**
- **Check the mid rocker arms of each cylinder at TDC.**

1. Remove the cylinder head cover.

2. Plug the relief hole with the special tool (Air Stopper).



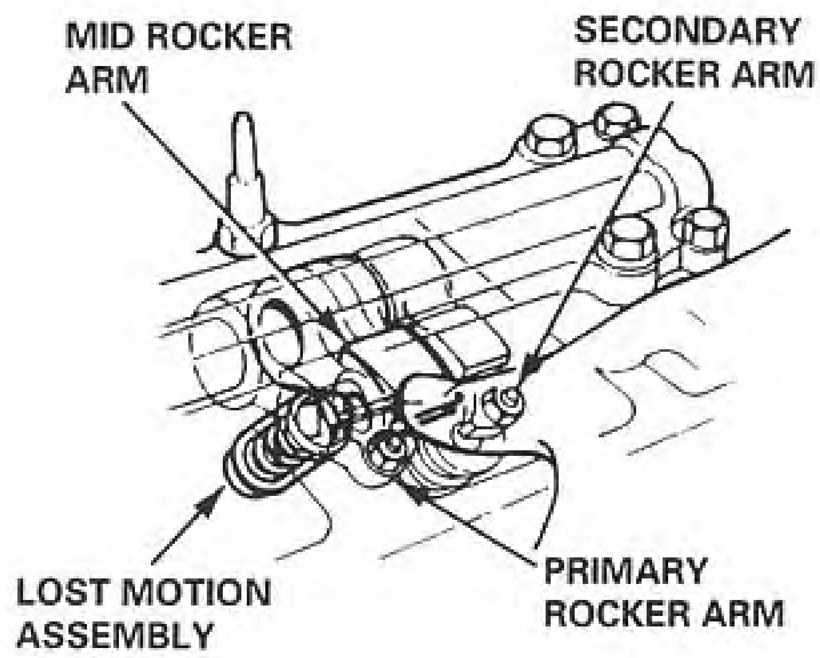
3. Remove the bolt and washer from the inspection hole and connect the valve inspection tool.



4. Apply specified air pressure to the rocker arm pistons after loosening the regulator valve on the valve inspection tool.

   Specified Air Pressure:
   250 kPa (2.5 kgf/cm², 36 psi)

5. Make sure that the primary and secondary rocker arms are mechanically connected by the pistons and that the mid rocker arms do not move when pushed manually.



- If any mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.

6. Remove the tools.

7. Check the operation of the lost motion assembly by pushing on the mid rocker arm. The lost motion assembly should compress fully and operate smoothly through its full stroke. Replace the assembly if it does not work smoothly.

8. After inspection, check that the Malfunction Indicator Lamp (MIL) does not come on.

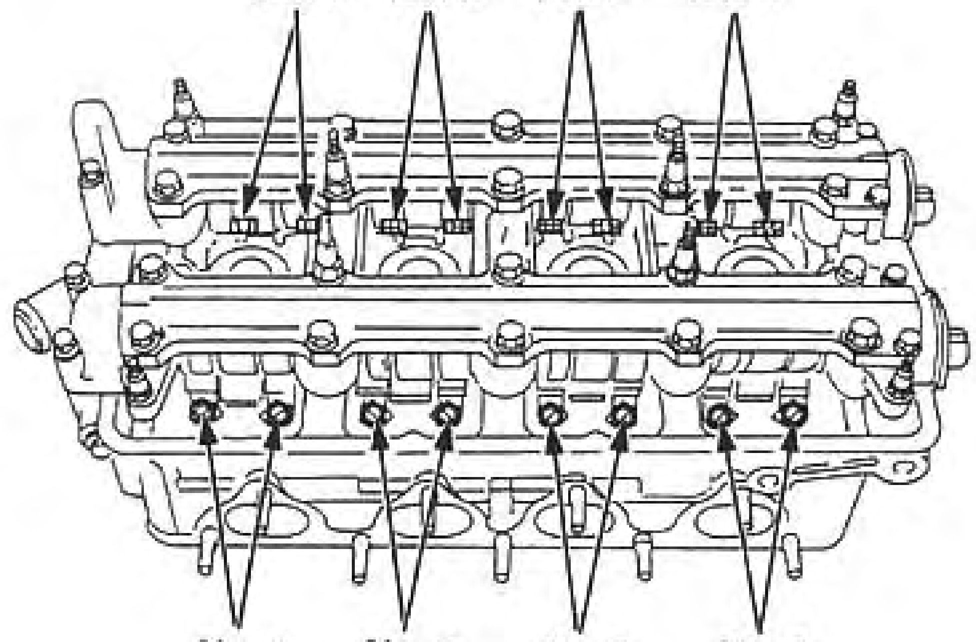
NOTE: Refer to page 6-81 when installing cylinder head cover.

Adjustment

NOTE:
- Valves should be adjusted cold; at a cylinder head temperature of less than 100°F (38°C).
- Adjustment is the same for intake and exhaust valves.
- After adjusting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

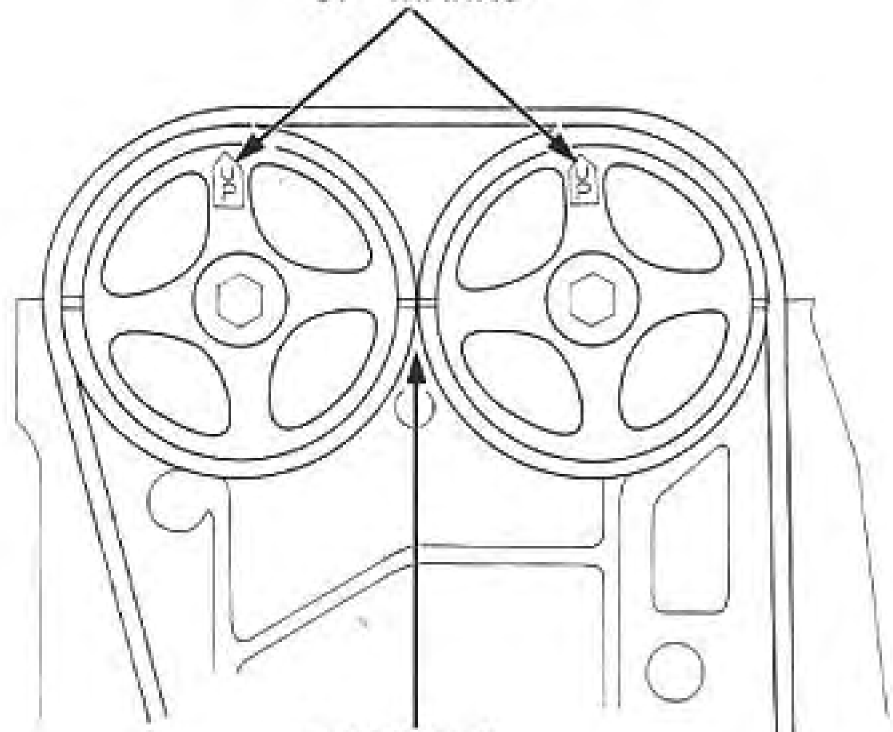
1. Remove cylinder head cover.

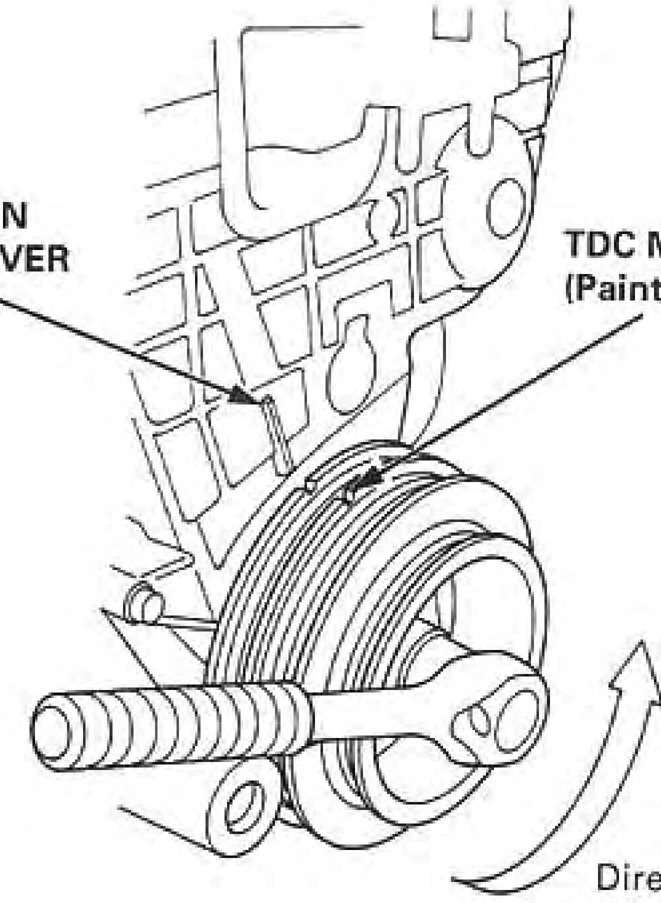
ADJUSTING BOLT LOCATIONS:



2. Set No. 1 piston at TDC. "UP" mark on the pulley should be at top, and TDC grooves on the pulley should align with the pointer on back cover. TDC grooves (white paint) on the crankshaft pulley should align with pointer on the timing belt lower cover.

Number 1 piston at TDC:

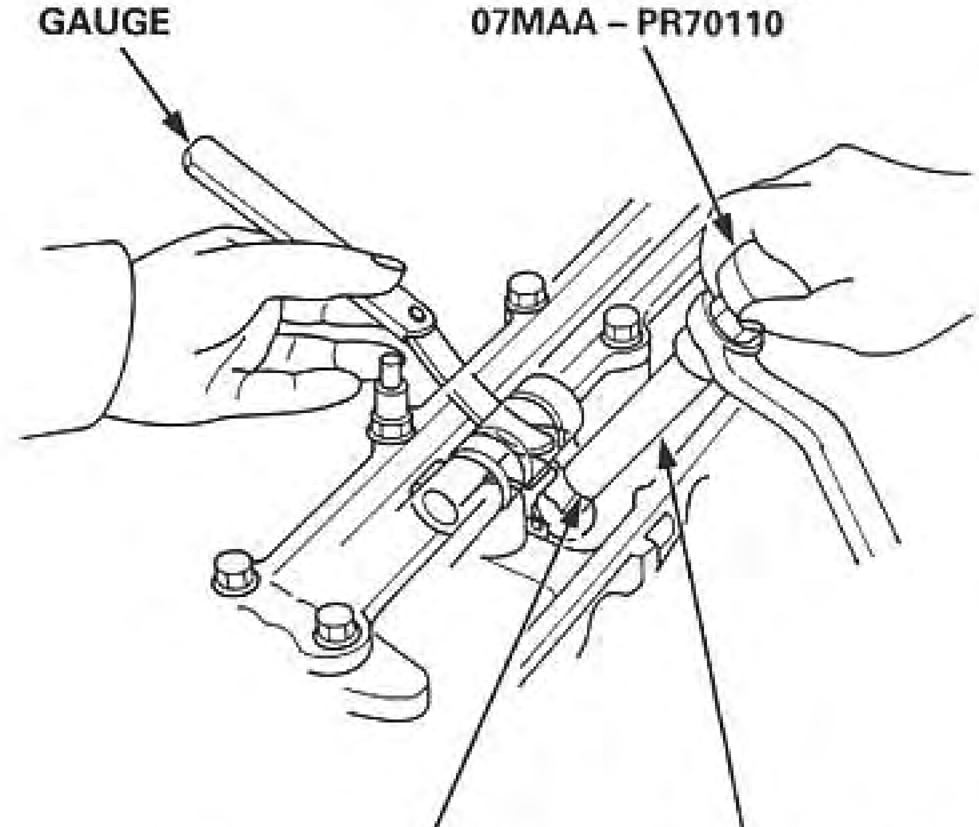




3. Adjust valve clearance on No. 1 cylinder.

Intake: 0.15 – 0.19 mm (0.006 – 0.007 in)
Exhaust: 0.17 – 0.21 mm (0.007 – 0.008 in)

4. Loosen the locknut and turn the adjusting screw until feeler gauge slides back and forth with a slight amount of drag.

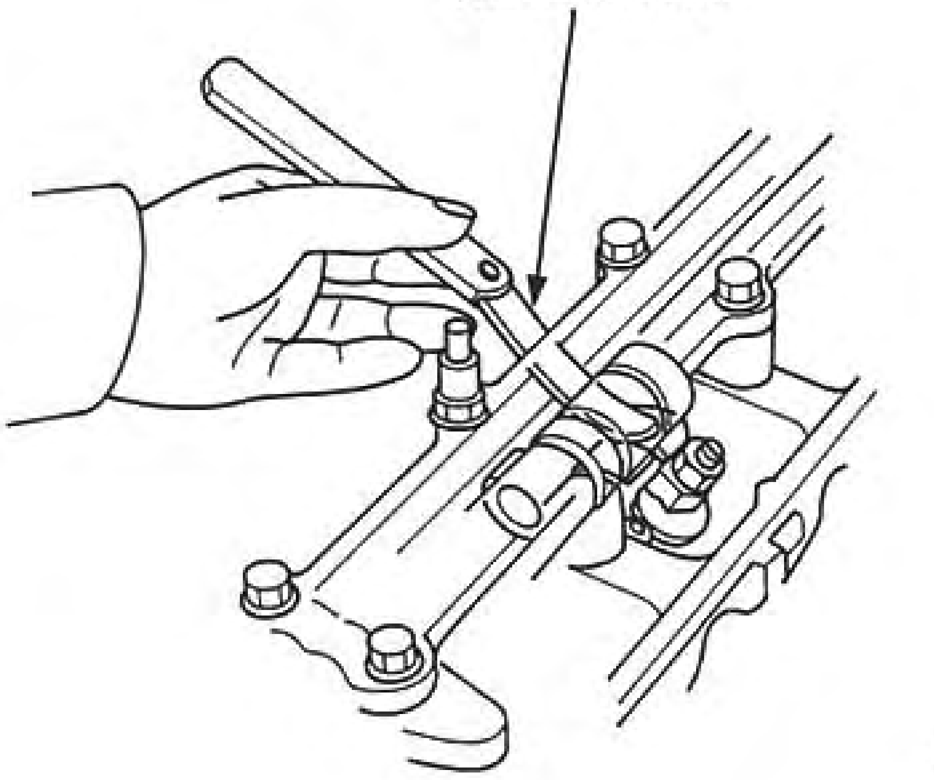


(cont'd)

Valve Clearance

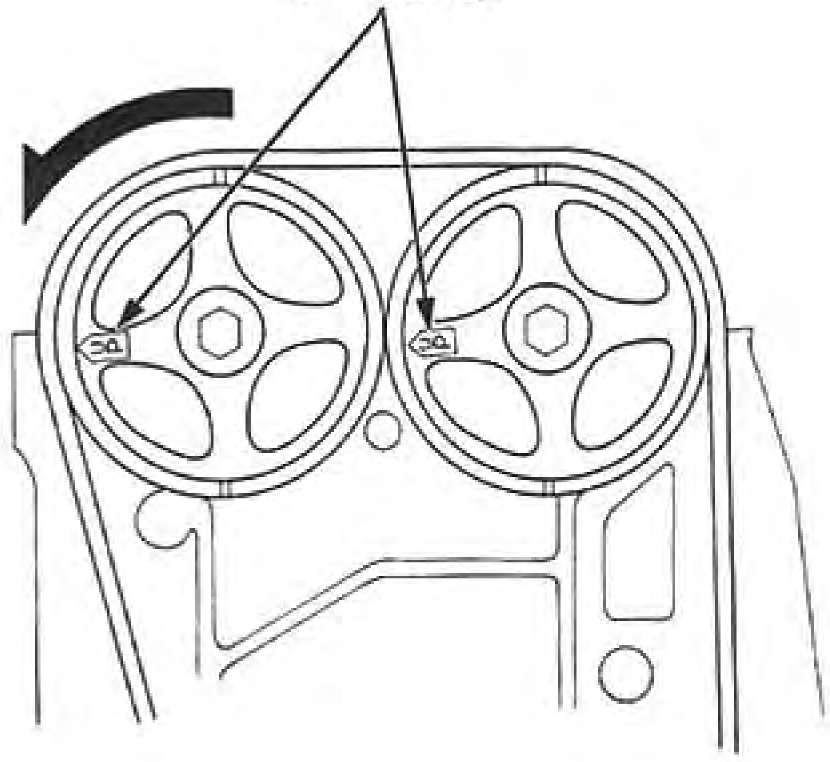
Adjustment (cont'd)

5. Tighten the locknut and recheck clearance again. Repeat adjustment if necessary.



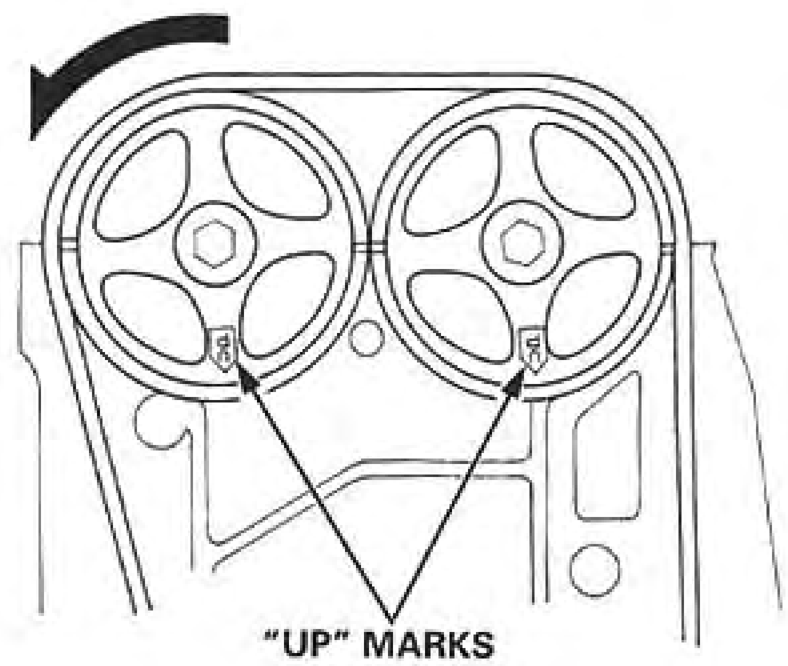
6. Rotate the crankshaft 180° counterclockwise (camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust valves on No. 3 cylinder.

Number 3 piston at TDC:



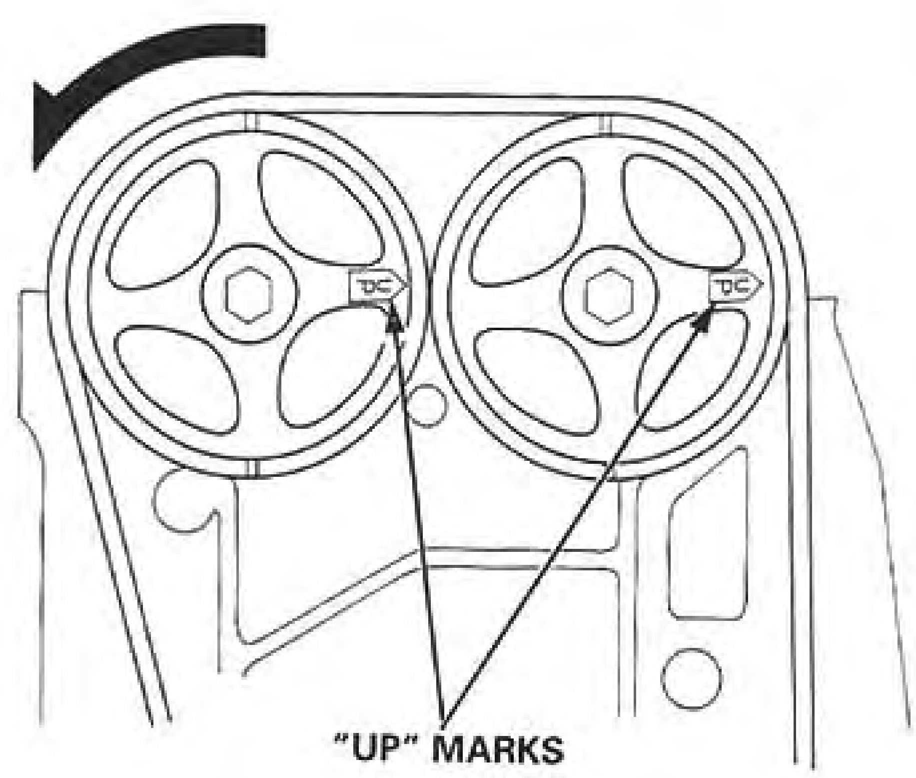
7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. The "UP" mark should be pointing straight down. Adjust valves on No. 4 cylinder.

Number 4 piston at TDC:



8. Rotate crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" marks should be on the intake side. Adjust valves on No. 2 cylinder.

Number 2 piston at TDC:

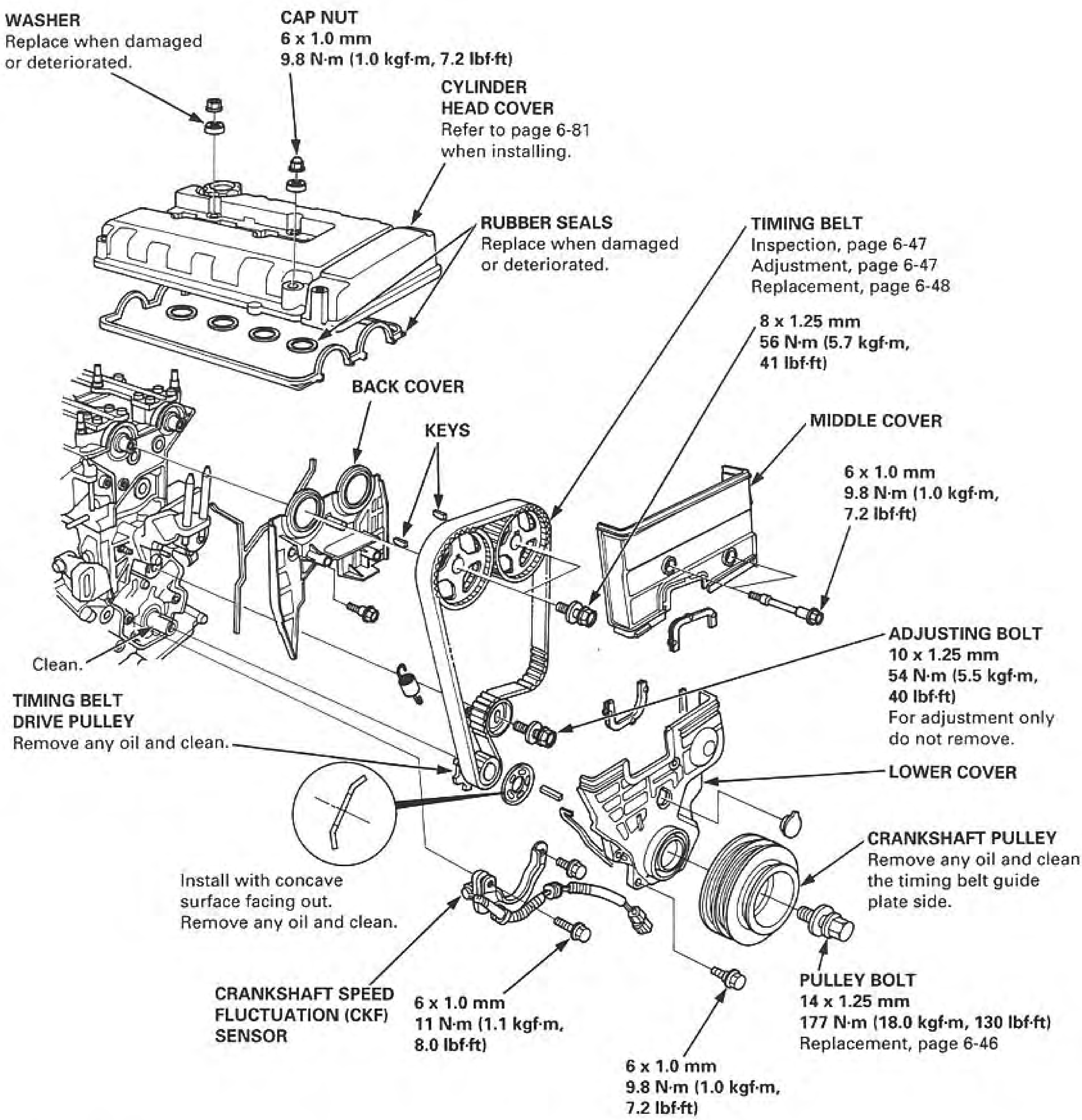


NOTE: Refer to page 6-79 when installing cylinder head cover.

Timing Belt

Illustrated Index

NOTE:
- Refer to page 6-50 for positioning crankshaft and pulley before installing belt.
- Mark the direction of rotation on the belt before removing.
- Replace the rubber seals if there is oil leakage between the cylinder head and cover.
- Do not use the middle cover and lower cover for storing removed items.
- Clean the middle cover and lower cover before installation.



NOTE: When installing a new crankshaft and/or new bolt:
① tighten the crankshaft pulley bolt to 196 N·m (20.0 kgf·m, 145 lbf·ft),
② loosen bolt,
③ retighten it to 177 N·m (18.0 kgf·m, 130 lbf·ft).

Crankshaft Pulley Bolt

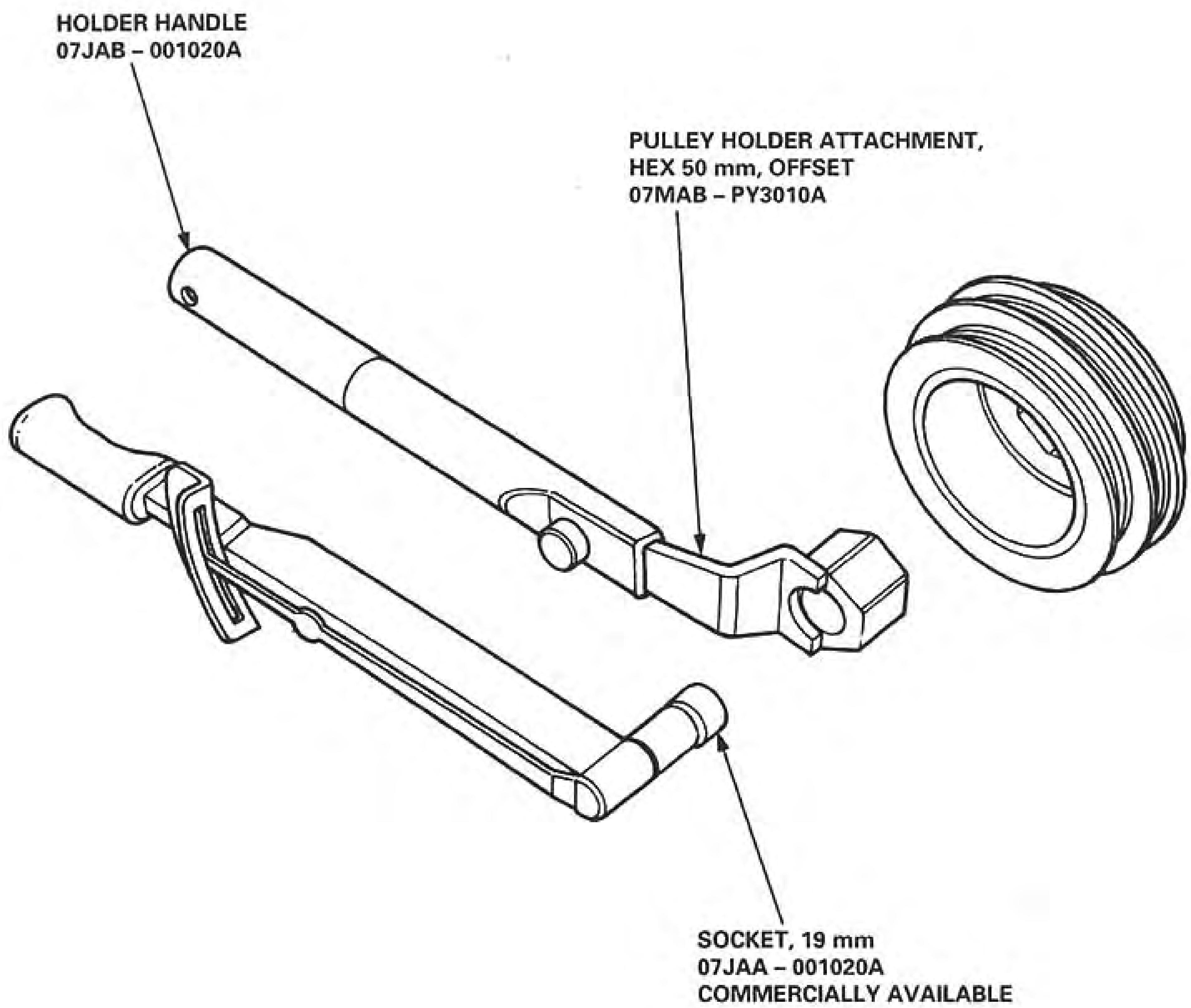
Replacement

NOTE:

- Crankshaft pulley bolt size and torque value:
  14 x 1.25 mm
  177 N·m (18.0 kgf·m, 130 lbf·ft)
- When installing a new crankshaft and/or new pulley bolt:

  ① tighten the pulley bolt to 196 N·m (20.0 kgf·m, 145 lbf·ft),
  ② loosen the bolt,
  ③ retighten it to 177 N·m (18.0 kgf·m, 130 lbf·ft).

- When reinstalling the bolt, lubricate the threads and flange with engine oil, but don't lubricate the washer and pulley.

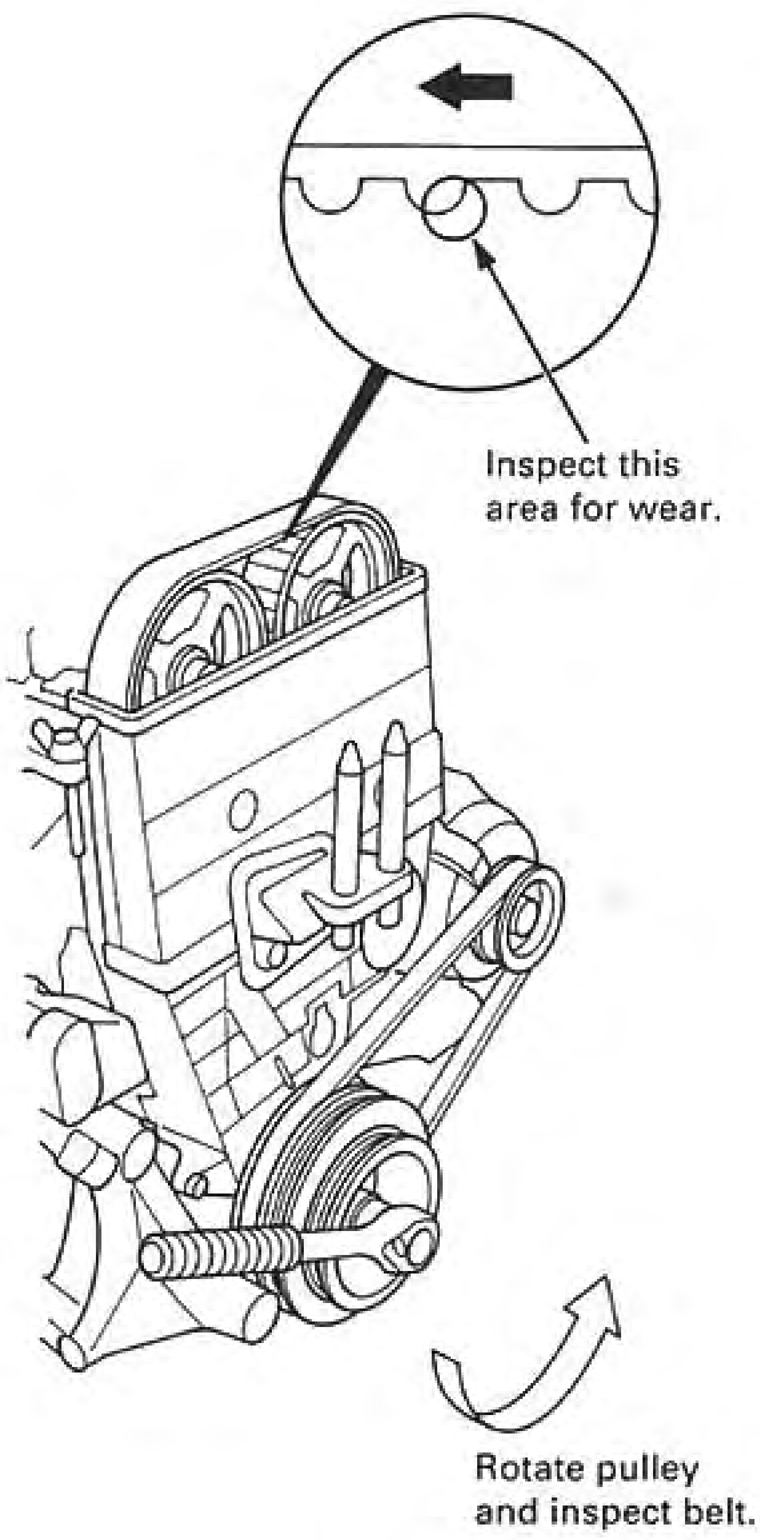


Timing Belt

Inspection

1. Remove the cylinder head cover.
   - Refer to page 6-78 when installing.
2. Inspect the timing belt for cracks and oil or coolant soaking.

   NOTE:
   - Replace the belt if oil or coolant soaked.
   - Remove any oil or solvent that gets on the belt.



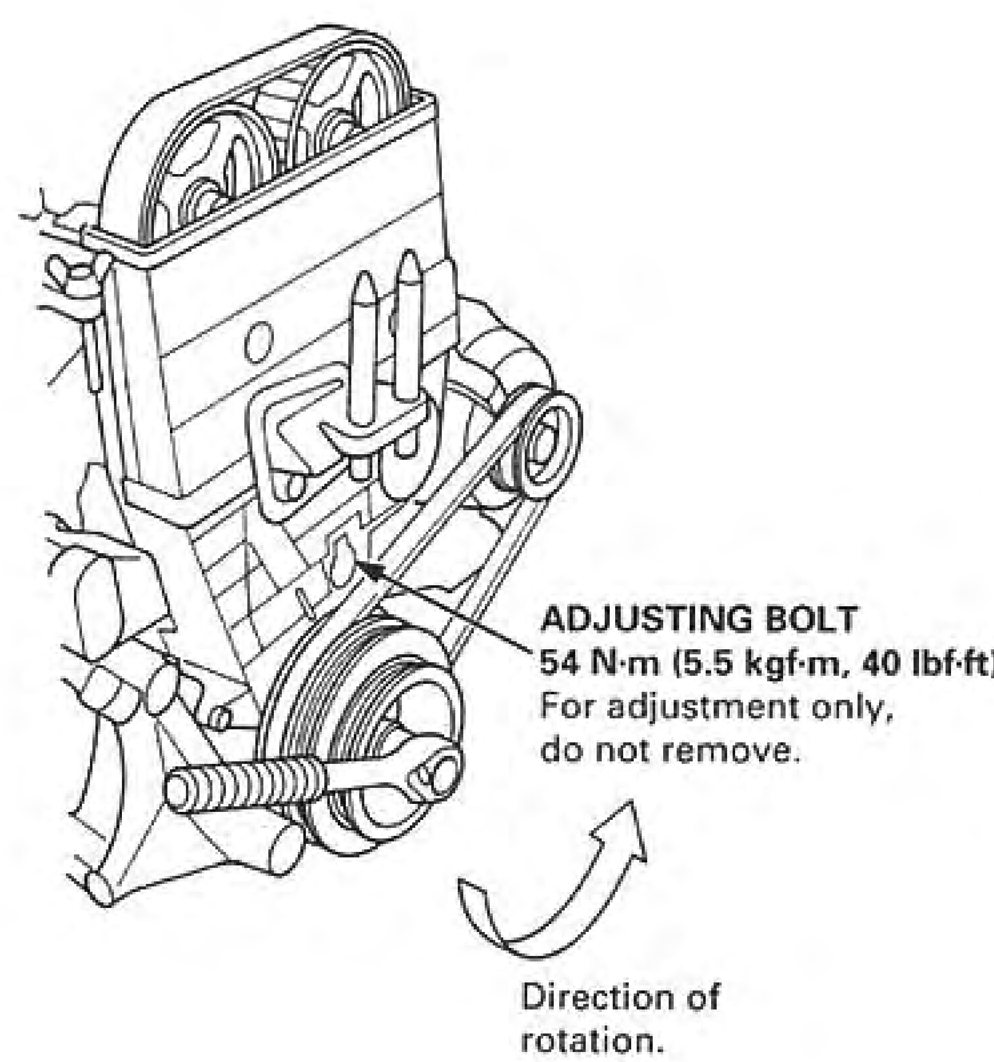
4. After inspecting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

Tension Adjustment

CAUTION: Always adjust timing belt tension with the engine cold.

NOTE:
- The tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment.
- Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.

1. Remove the cylinder head cover. (Refer to page 6-78 when installing.)
2. Set the No. 1 piston at TDC (see page 6-50).
3. Rotate the crankshaft 5-6 revolutions to set the belt.
4. Set the No. 1 piston at TDC.



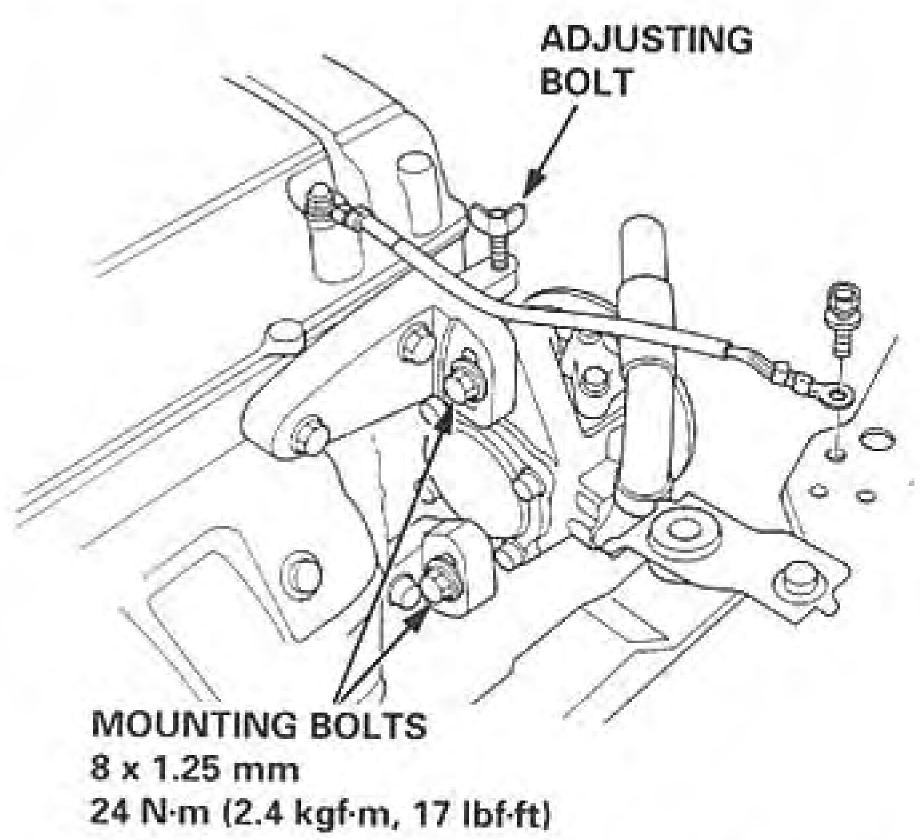
5. Loosen the adjusting bolt 1/2 turn (180°) only.
6. Rotate the crankshaft counterclockwise 3 teeth on the camshaft pulley.
7. Tighten the adjusting bolt.
8. After adjusting, retorque the crankshaft pulley bolt to 177 N·m (18.0 kgf·m, 130 lbf·ft).

Timing Belt

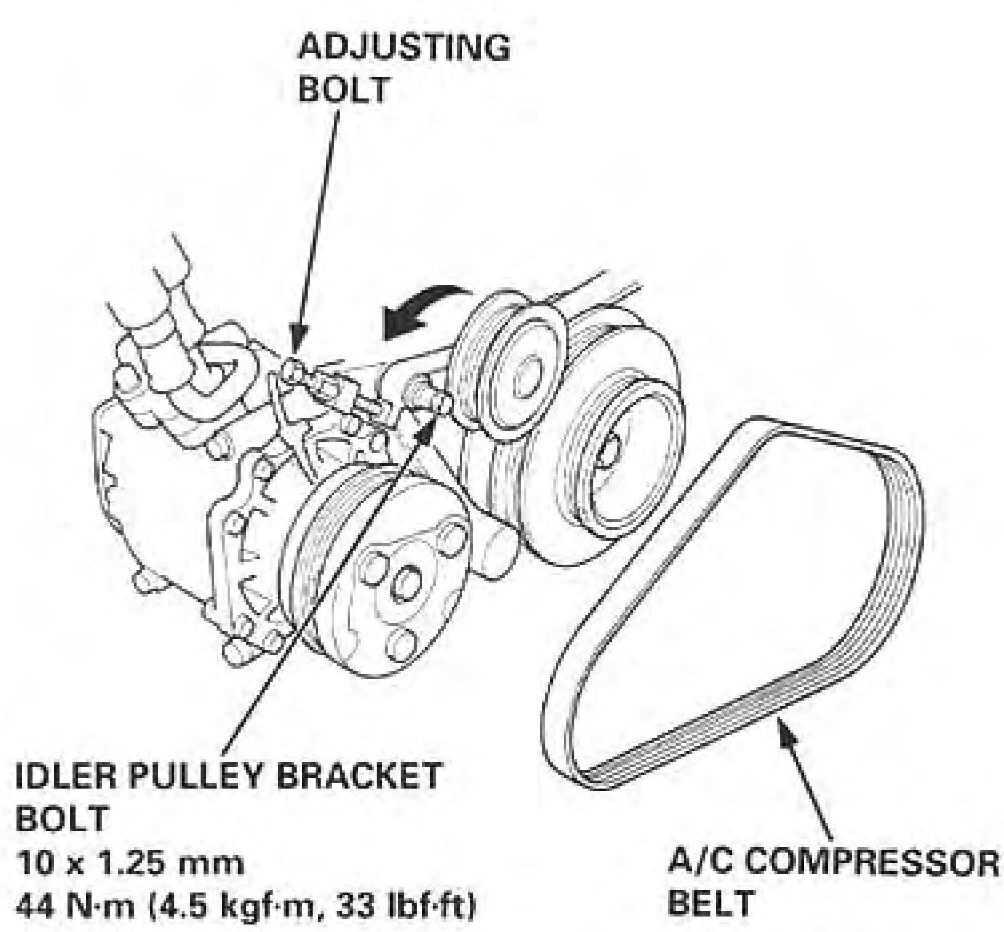
Removal

NOTE:
- Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (see page 6-51).
- Inspect the water pump after removing the timing belt (see page 10-10).

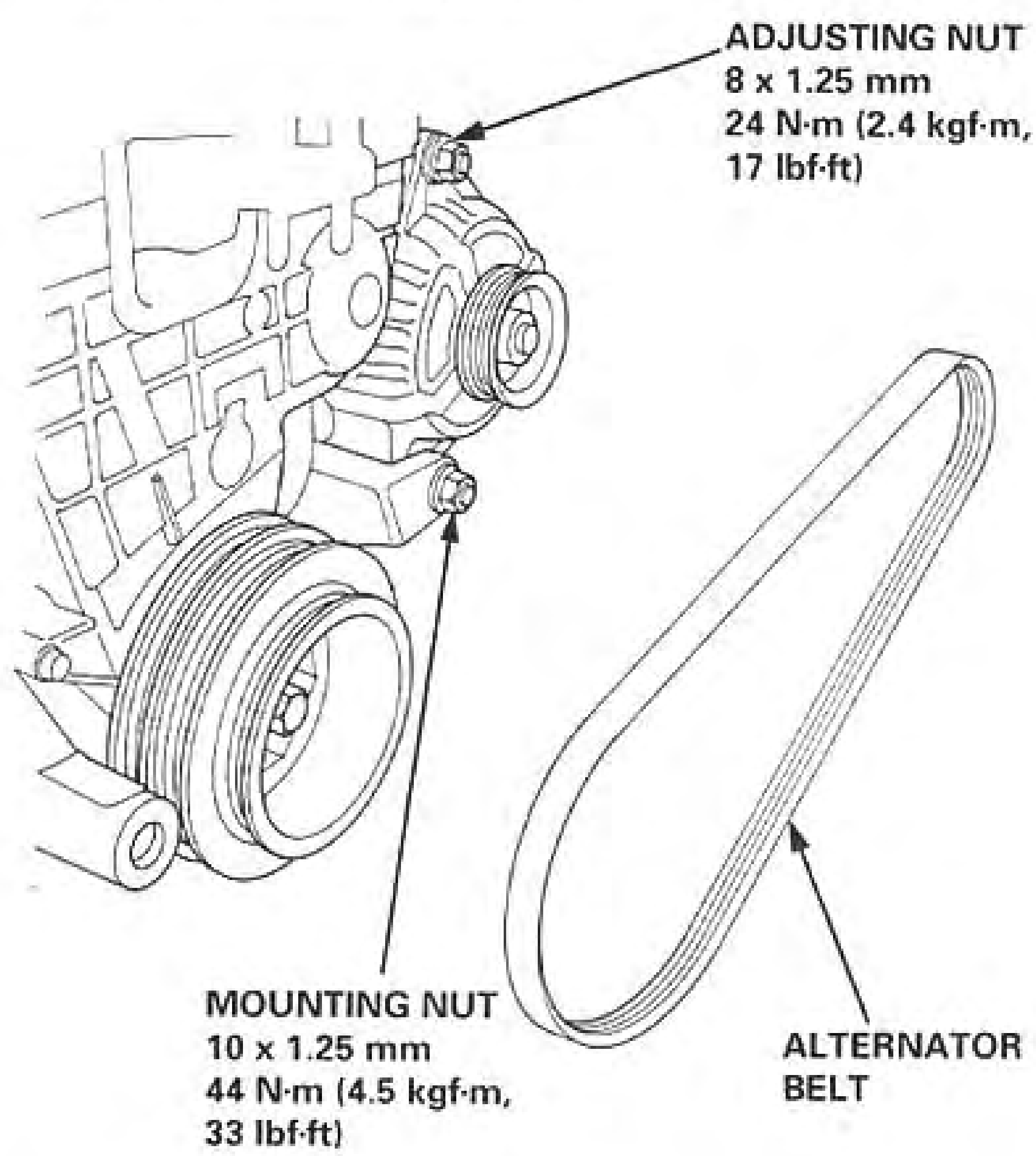
1. Remove the wheel well splash shield (see page 6-59).
2. Loosen the adjusting bolt and mounting bolts, then remove the power steering (P/S) pump belt.



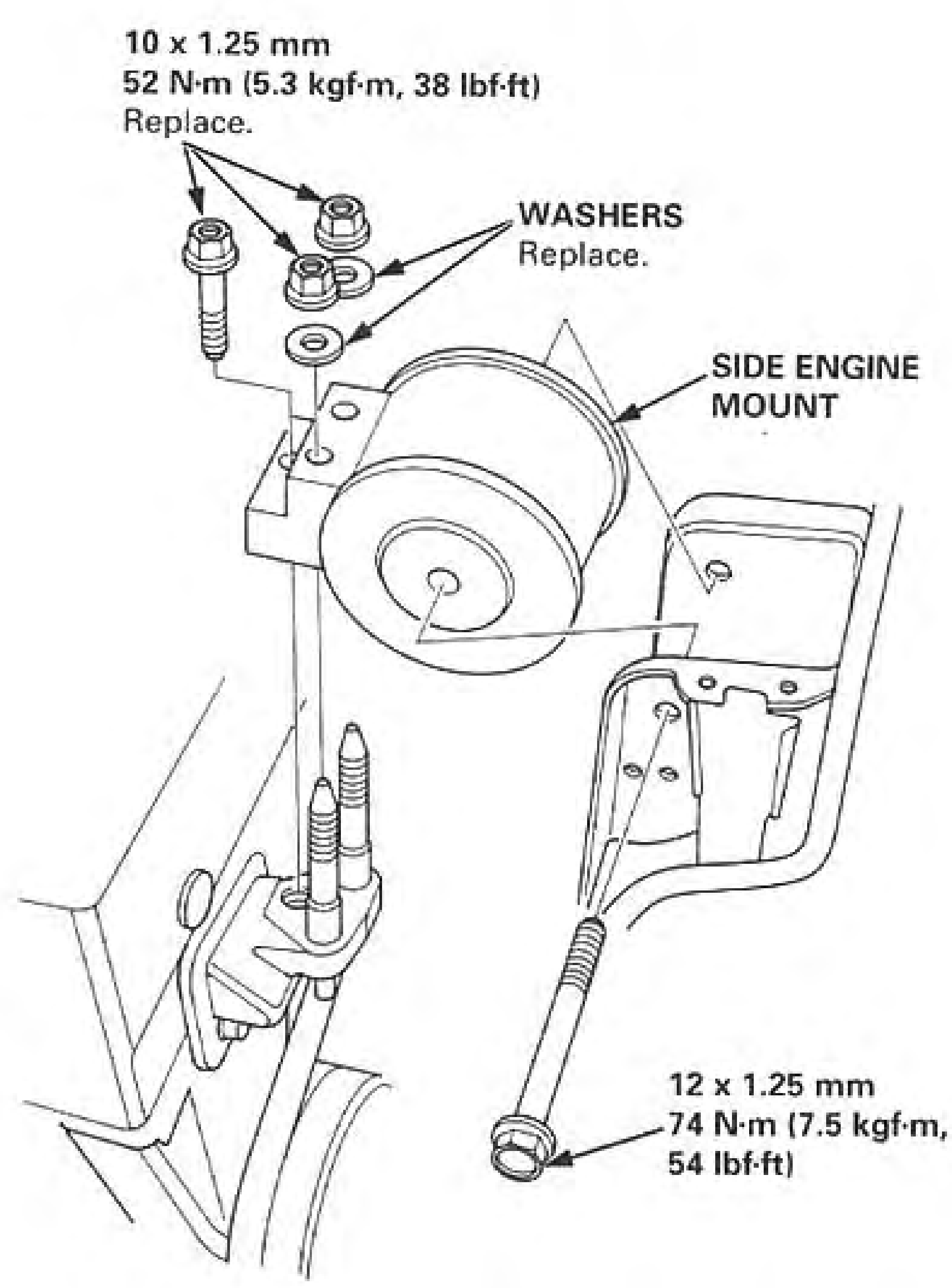
3. Loosen the adjusting bolt and idler pulley bracket bolt, then remove the air conditioning (A/C) compressor belt.



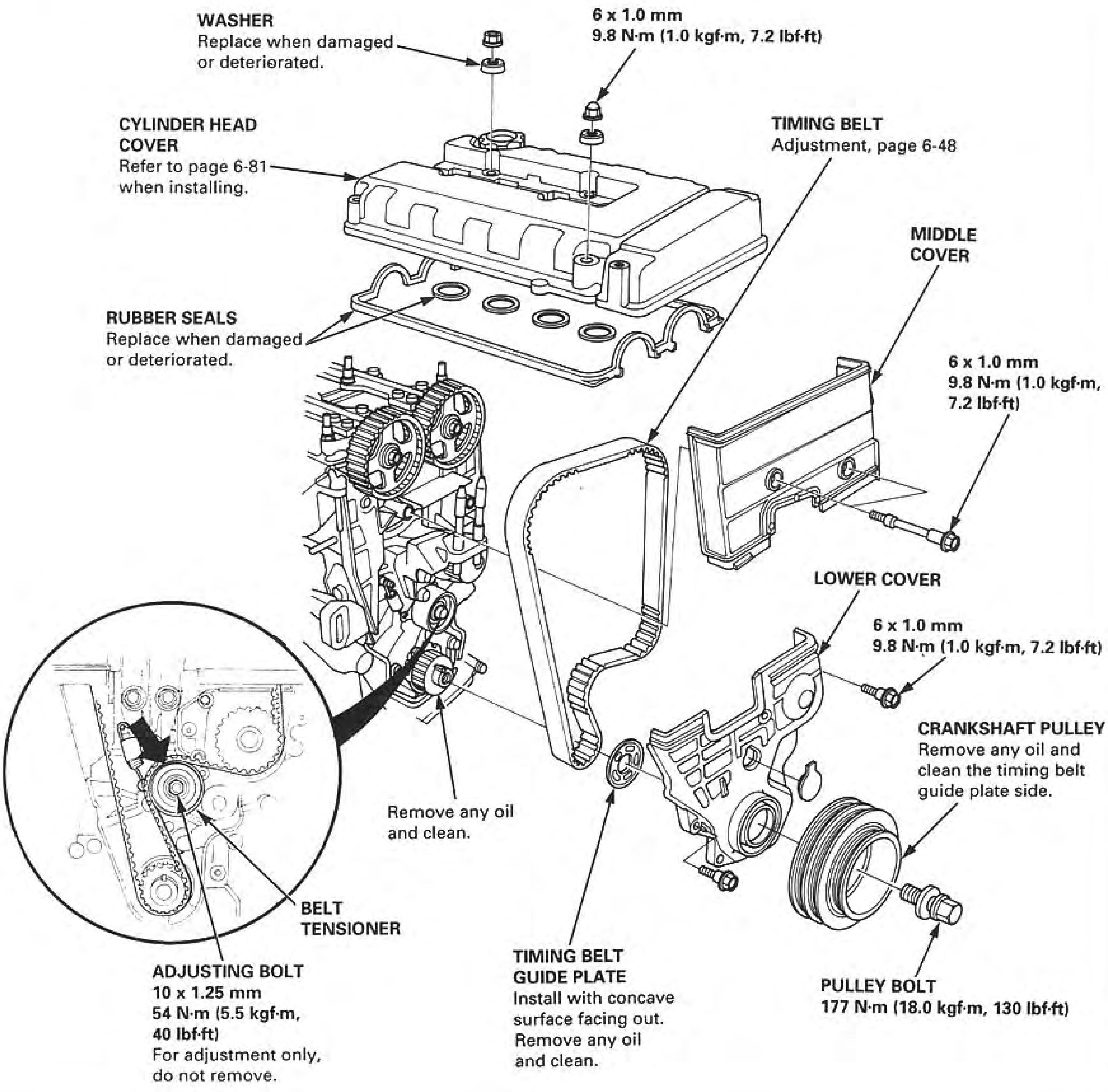
4. Loosen the adjusting nut and mounting nut, then remove the alternator belt.



5. Remove the cruise control actuator (see page 6-59).
6. Remove the side engine mount.



7. Remove the cylinder head cover.
   - Refer to page 6-81 when installing.
8. Remove the pulley bolt and crankshaft pulley (see page 6-46).
9. Remove the middle cover and the lower cover.
   NOTE:
   - Do not use the middle cover and lower cover for storing removed items.
   - Clean the middle cover and lower cover before installation.
10. Loosen the adjusting bolt 180°.
11. Push the tensioner to remove tension from the timing belt, then retighten the bolt.
12. Remove the timing belt from the pulleys.
    NOTE: Replace the camshaft and crankshaft seals when oil leakage.



Timing Belt

Installation

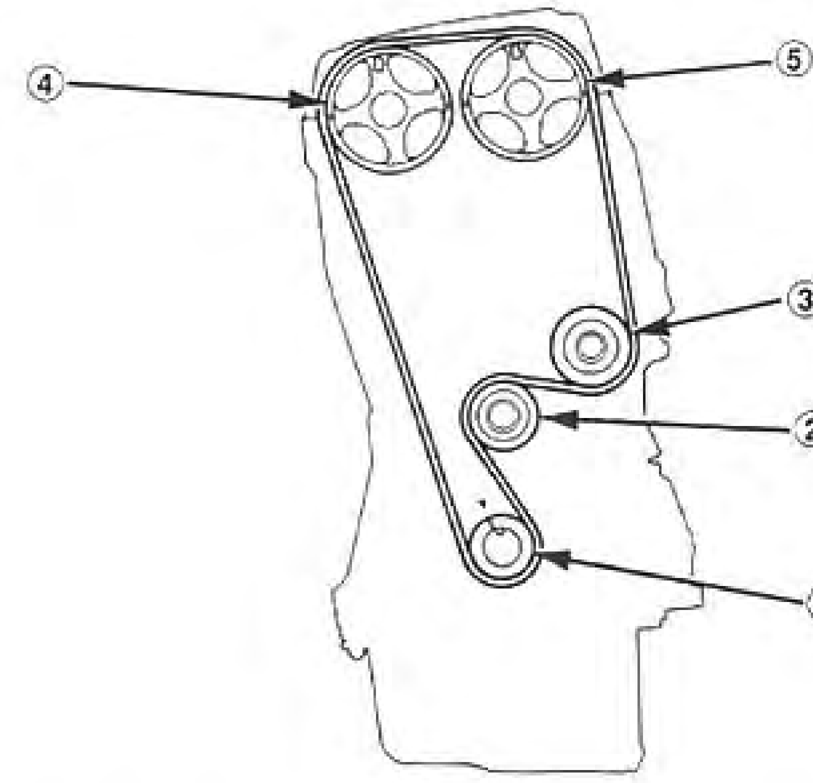
Install the timing belt in the reverse order of removal. Only key points are described there.

NOTE: Clean the middle cover and lower cover before installation.

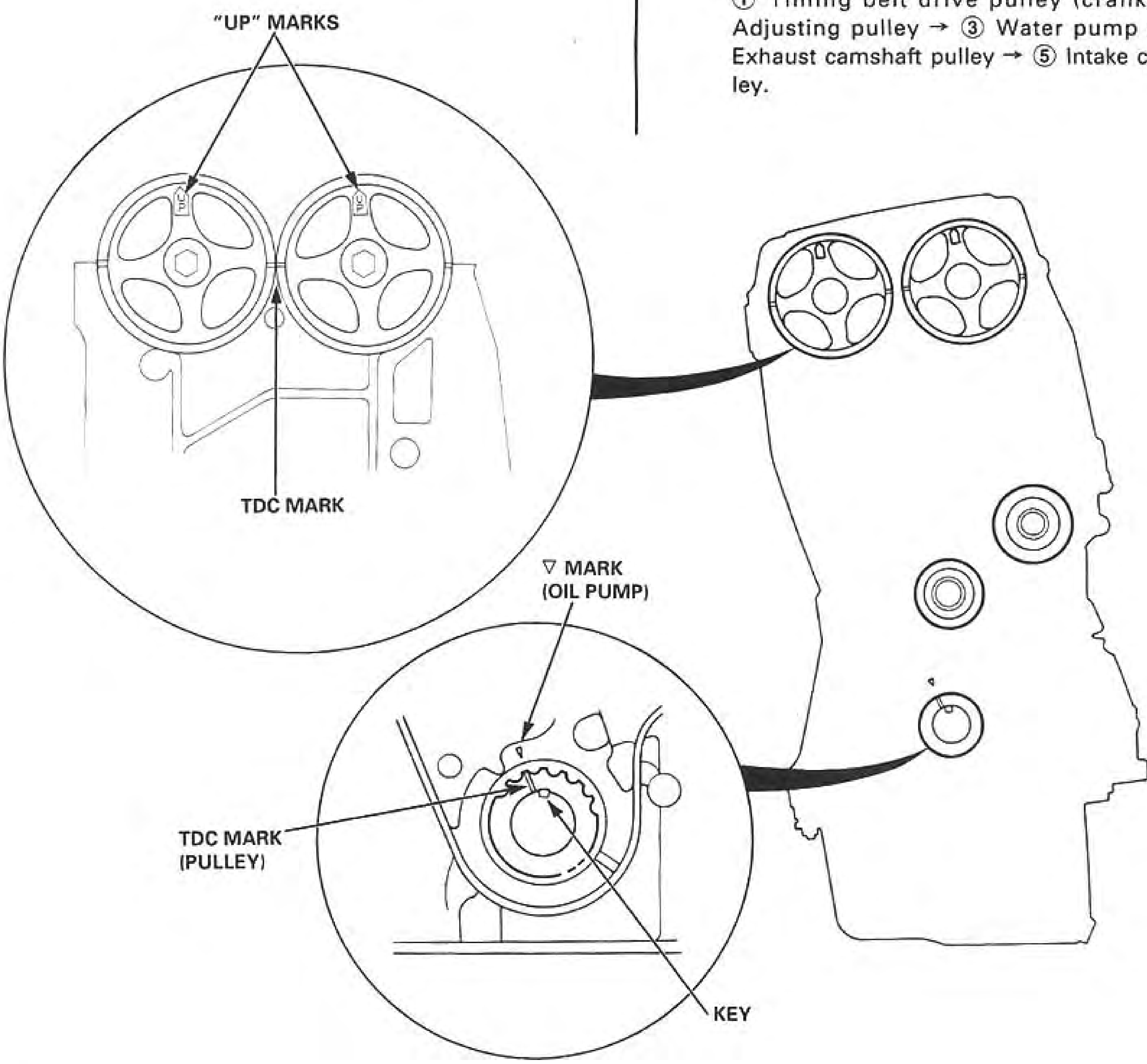
1. Position the crankshaft and the camshaft pulleys as shown before installing the timing belt.

   A. Set the crankshaft so that the No. 1 piston is at top dead center (TDC). Align the groove on the teeth side of the timing belt drive pulley to the ∇ pointer on the oil pump.

   B. Align the TDC marks on intake and exhaust pulleys.



2. Install the timing belt tightly in the sequence shown.
   ① Timing belt drive pulley (crankshaft) → ② Adjusting pulley → ③ Water pump pulley → ④ Exhaust camshaft pulley → ⑤ Intake camshaft pulley.



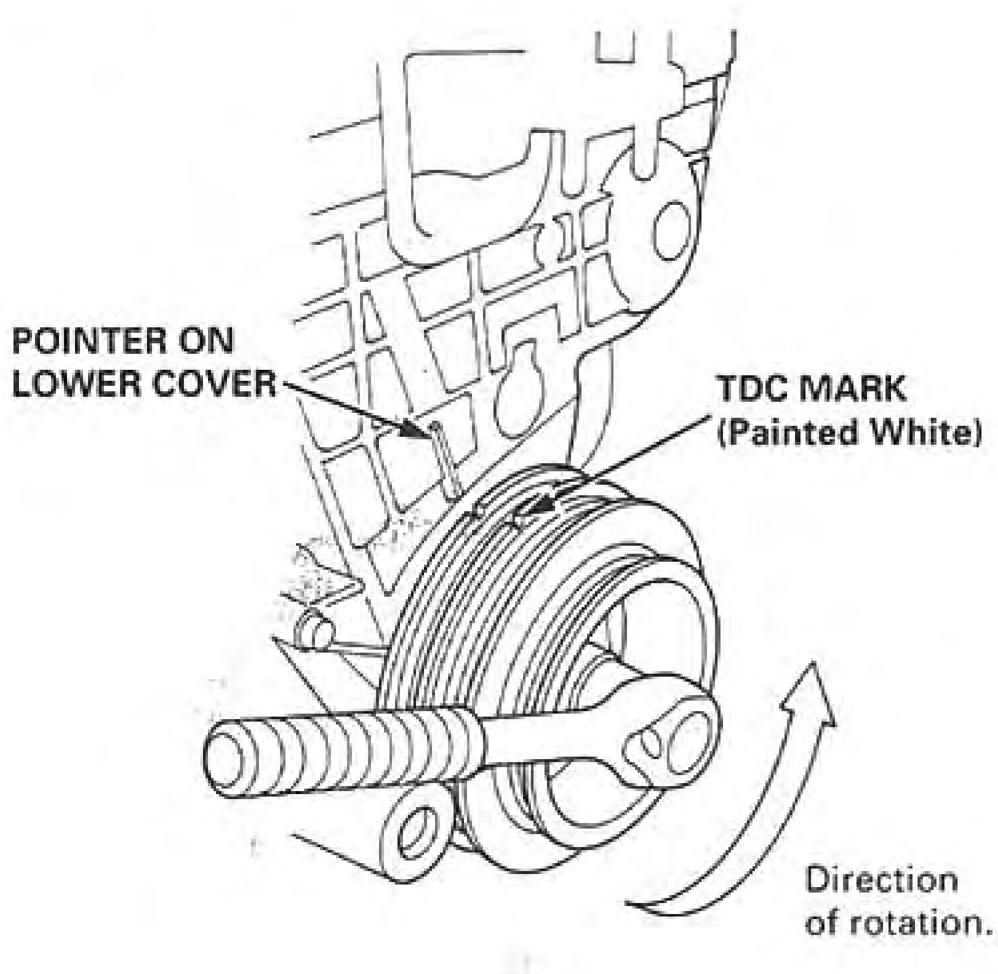
3. Loosen and retighten the adjusting bolt to tension the belt.

4. Rotate the crankshaft about 4 to 6 turns counterclockwise so that the belt positions on the pulleys.

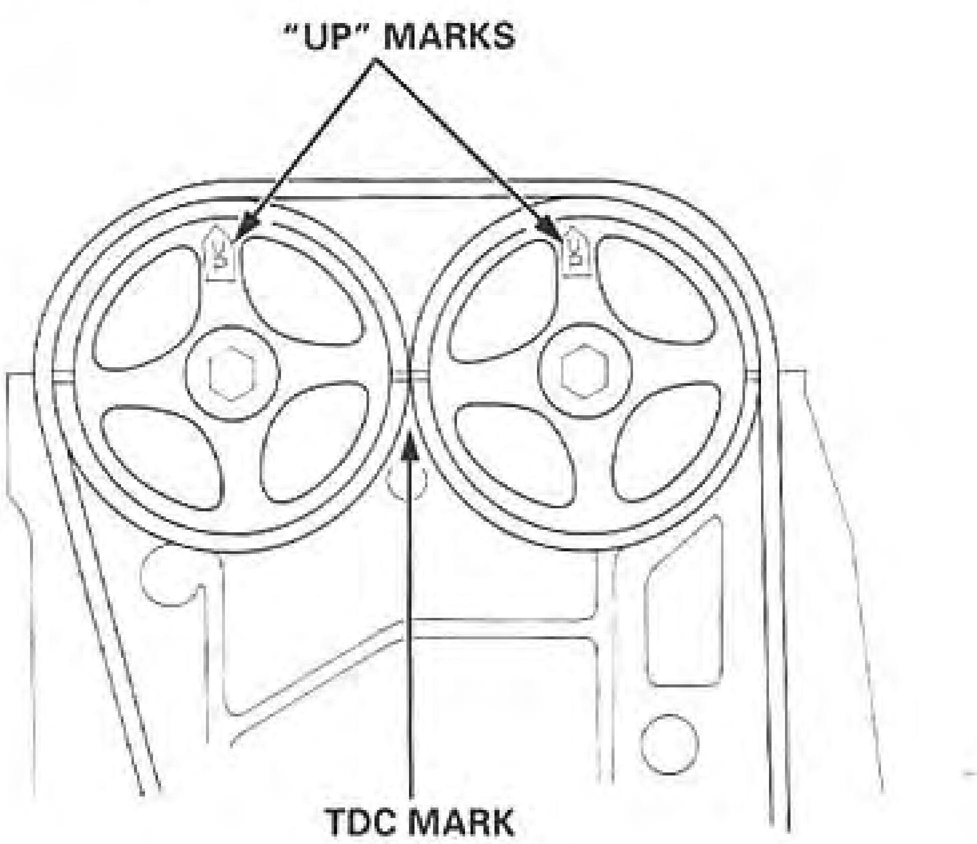
5. Adjust the timing belt tension (see page 6-47).

6. Check the crankshaft pulley and the camshaft pulleys at TDC.

CRANKSHAFT PULLEY:



CAMSHAFT PULLEY:



7. If a camshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure on page 6-50, then reinstall the timing belt.

NOTE: Refer to page 6-48 for timing belt removal.

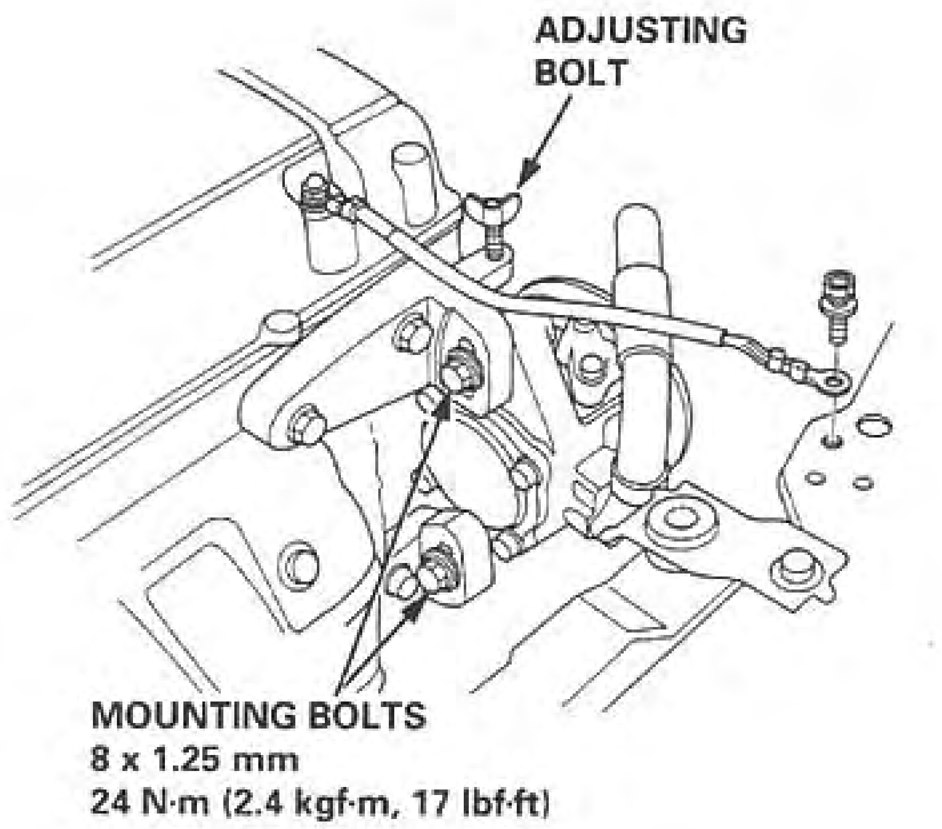
After installation, adjust the tension of each belt.
- See section 23 for alternator belt tension adjustment.
- See section 22 for A/C compressor belt tension adjustment.
- See section 17 for P/S pump belt tension adjustment.

CKF Sensor

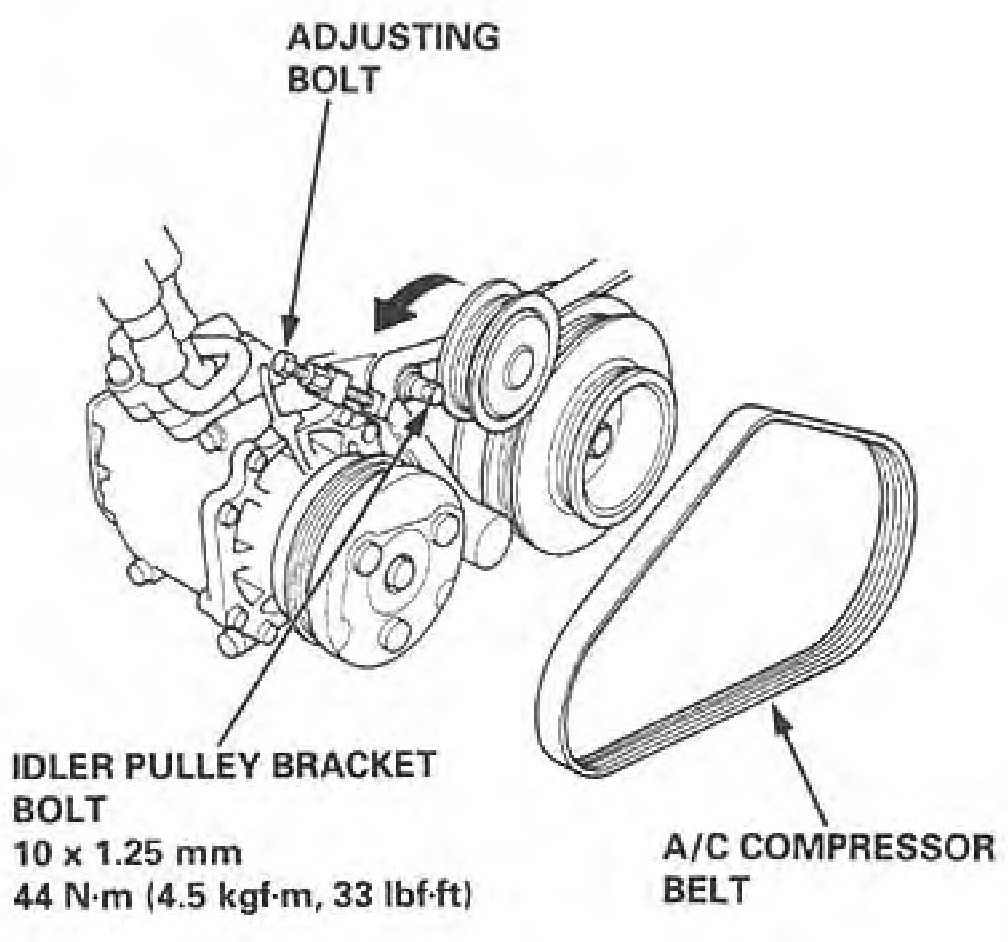
Replacement

1. Remove the wheel well splash shield (see page 6-59).

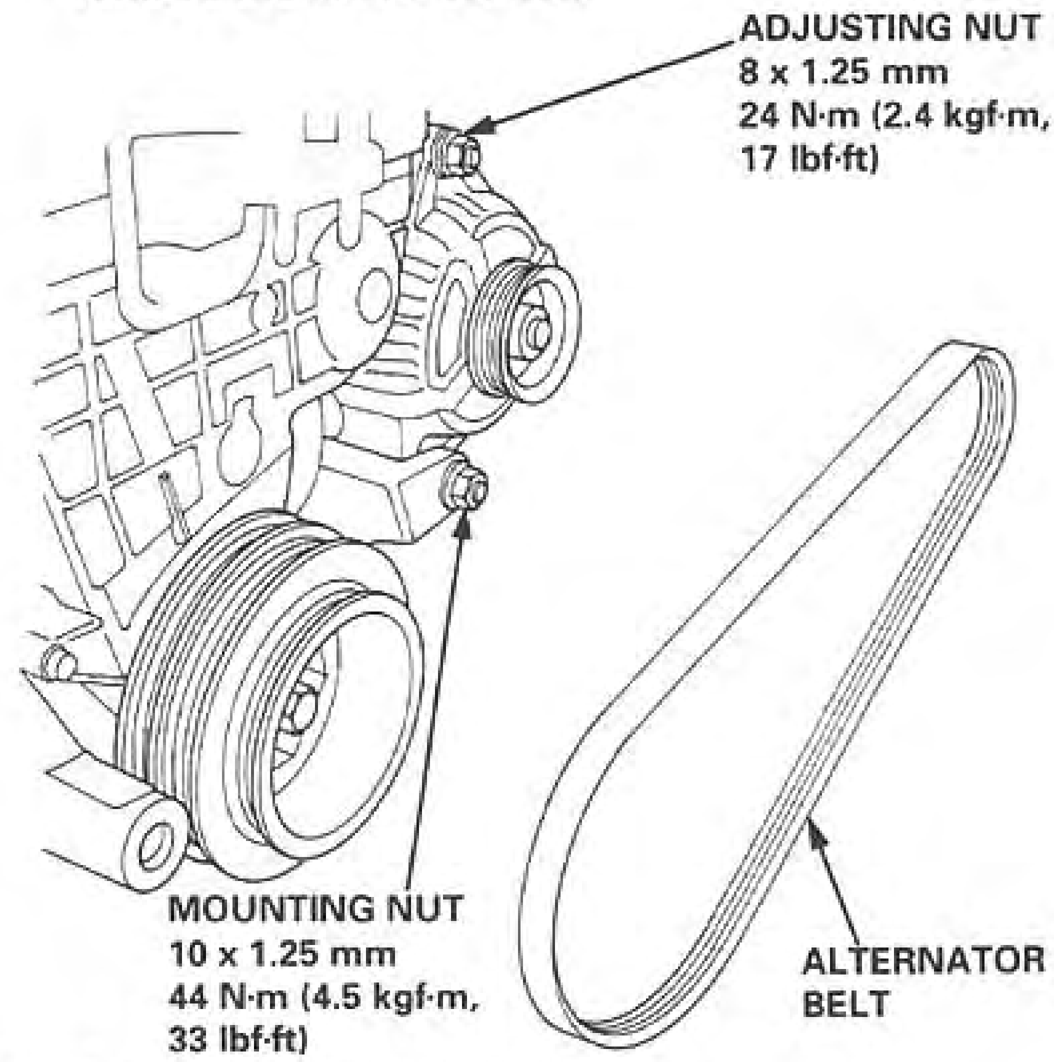
2. Loosen the adjusting bolt and mounting bolts, then remove the P/S pump belt.



3. Loosen the adjusting bolt and idler pulley bracket bolt, then remove the A/C compressor belt.



4. Loosen the adjusting nut and mounting nut, then remove the alternator belt.



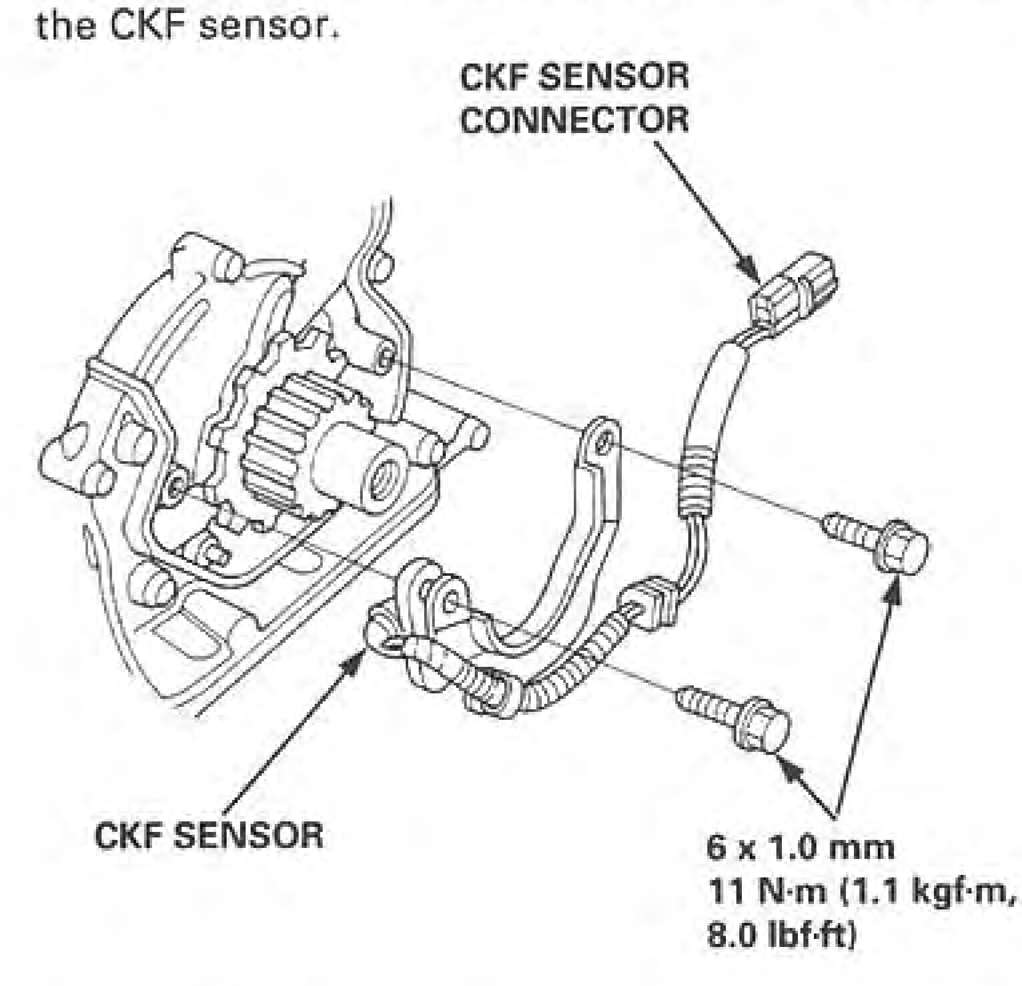
5. Remove the cylinder head cover.
   - Refer to page 6-81 when installing.

6. Remove the crankshaft pulley (see page 6-46).

7. Remove the middle cover and the lower cover.

   NOTE:
   - Do not use the middle cover and lower cover for storing removed items.
   - Clean the middle cover and lower cover before installation.

8. Disconnect the CKF sensor connector, then remove the CKF sensor.



9. Install the CKF sensor in reverse order of removal.

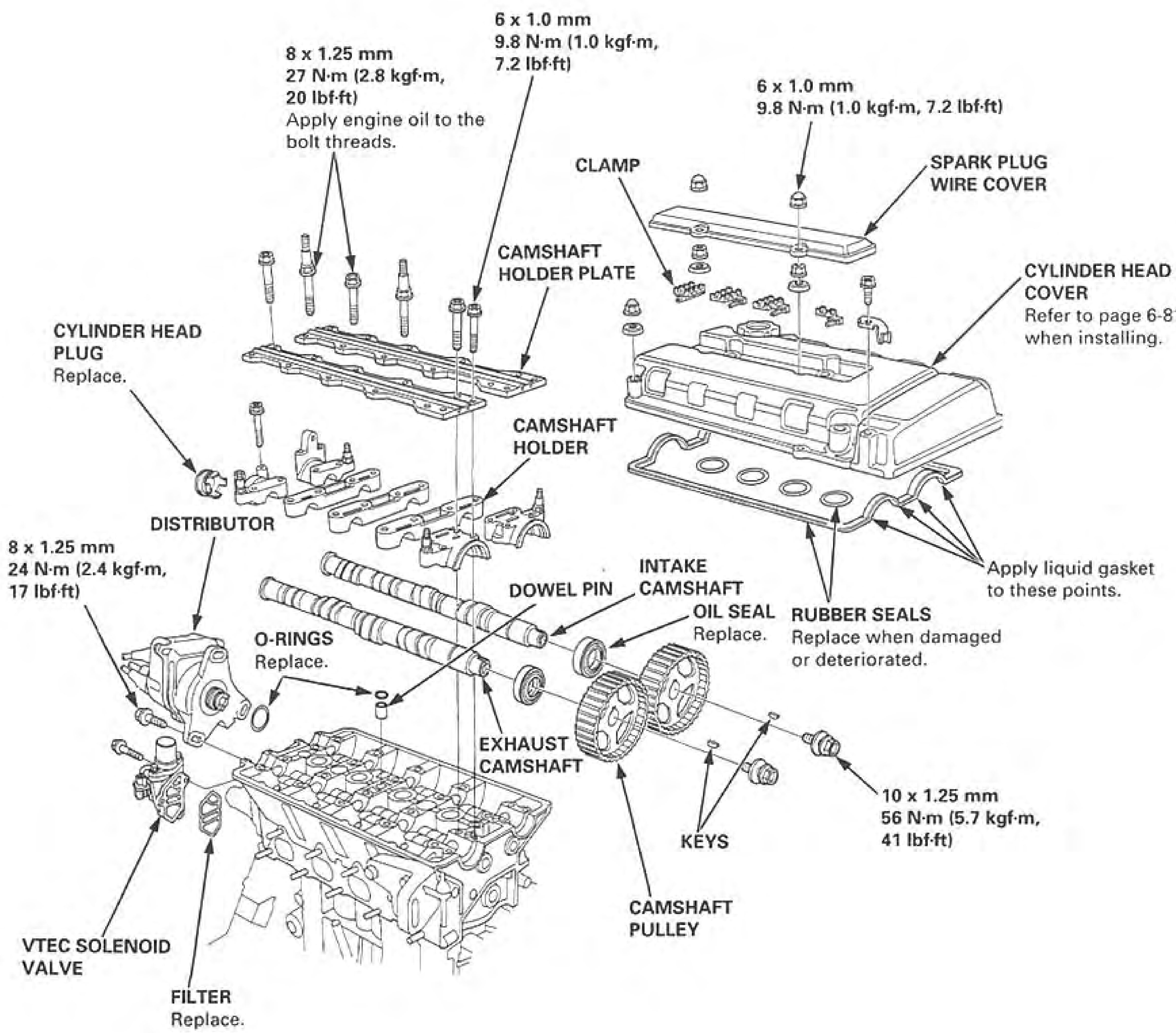
Cylinder Head

Illustrated Index

CAUTION: To avoid damage, wait until the engine coolant temperature drops below 100°F (38°C) before removing the cylinder head.

NOTE:
- Use new O-rings and gaskets when reassembling.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Replace the rubber seals if there is oil leakage between the cylinder head and cover.

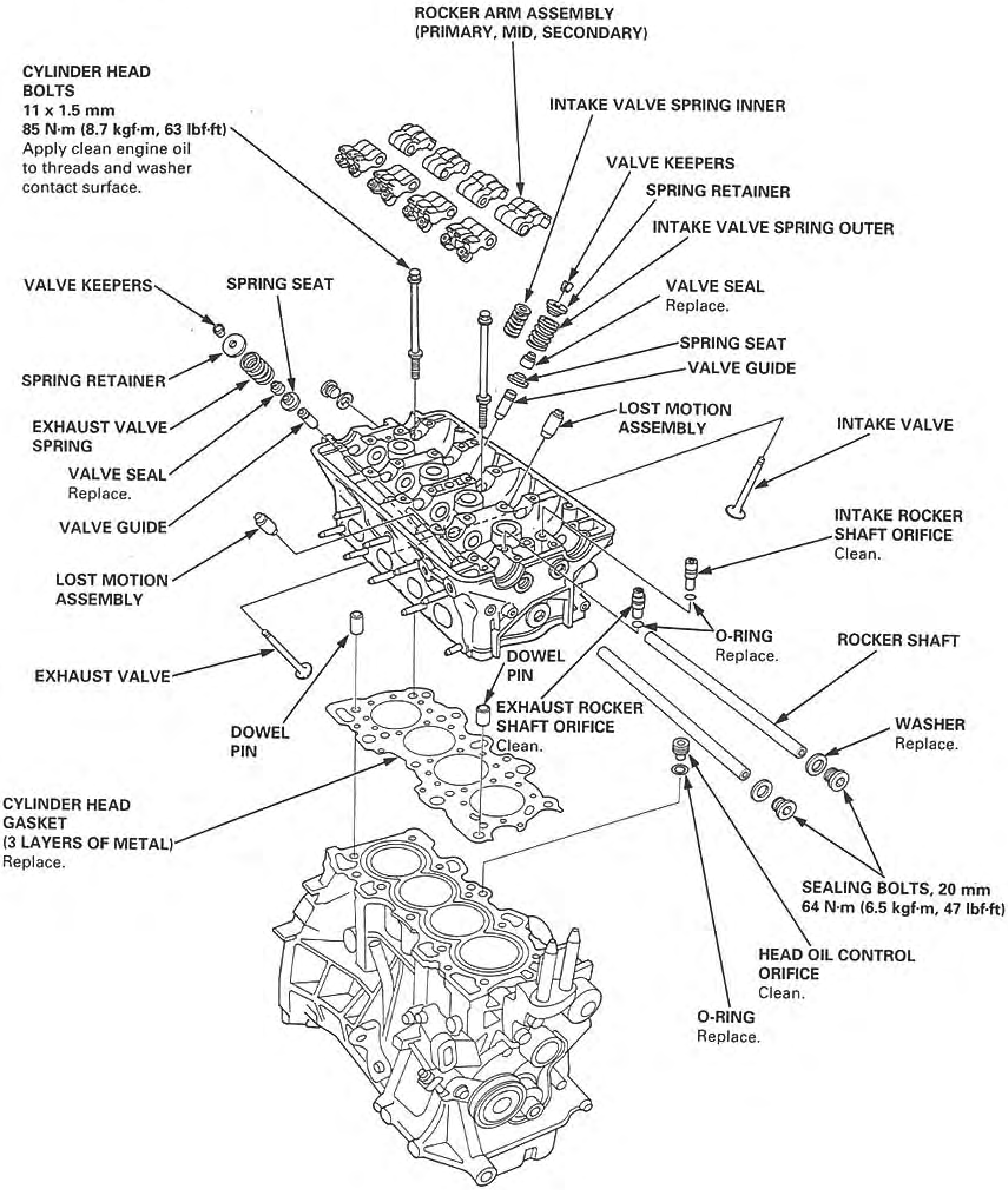
OIL Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



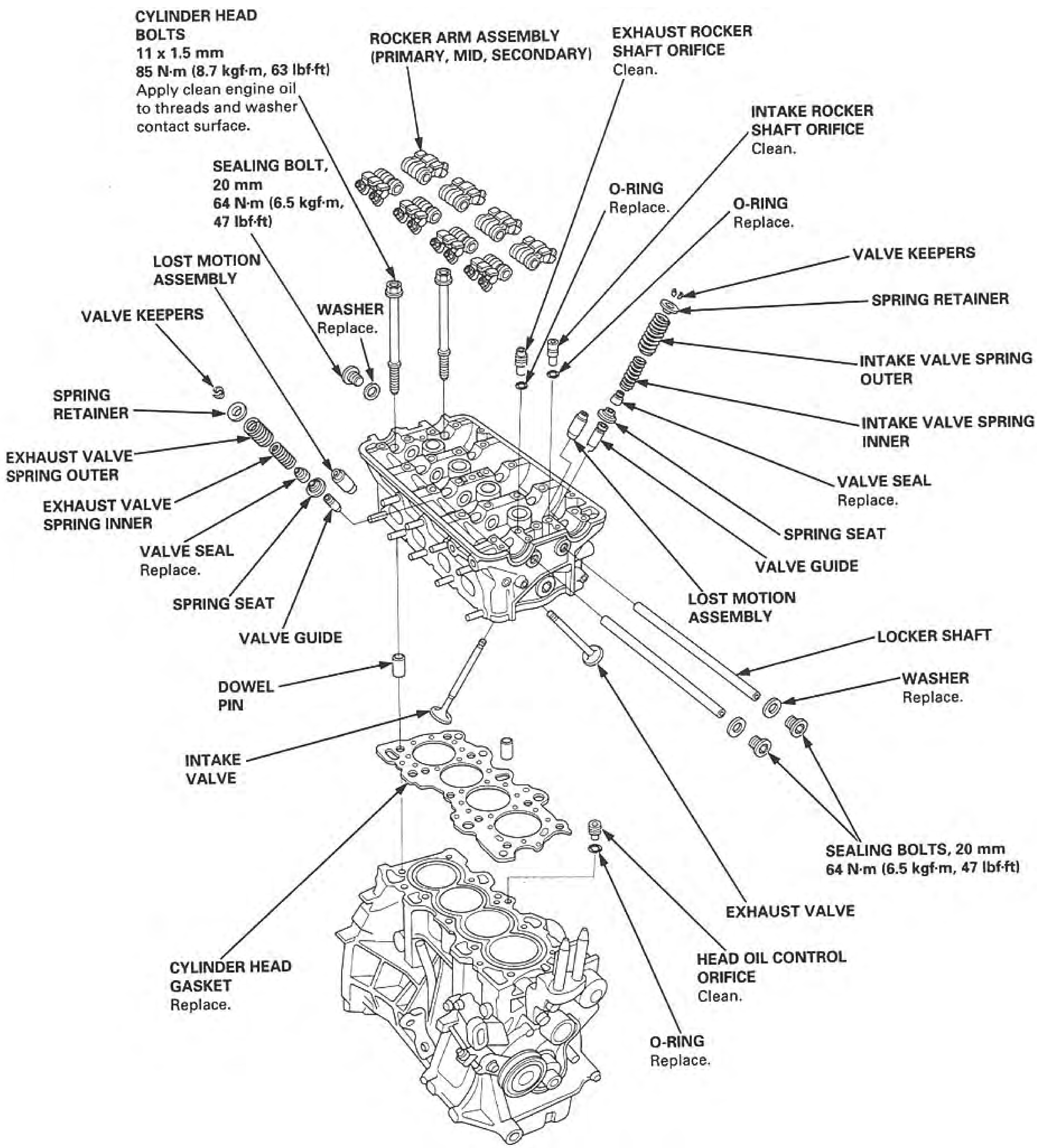
Cylinder Head

NOTE: Clean the head oil control orifice and the rocker shaft orifices when installing.

B18C1 engine:



B18C5 engine:



Cylinder Head

Removal

Engine removal is not required or this procedure.

CAUTION: To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100°F (38°C) before loosening the retaining bolts.

NOTE:
- Inspect the timing belt before removing the cylinder head.
- Turn the crankshaft pulley so that the No. 1 piston is at top dead center (TDC) (page 6-51).
- Mark all emissions hoses before disconnecting them.
- Anti-theft radios have a coded theft protection circuit. Be sure to get the customer's code number before
  — Disconnecting the battery.
  — Removing the No. 32 (7.5 A) fuse from the under-hood fuse/relay box.
  — Removing the radio.
  After service, reconnect power to the radio and turn it on.
  When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the negative terminal from the battery.

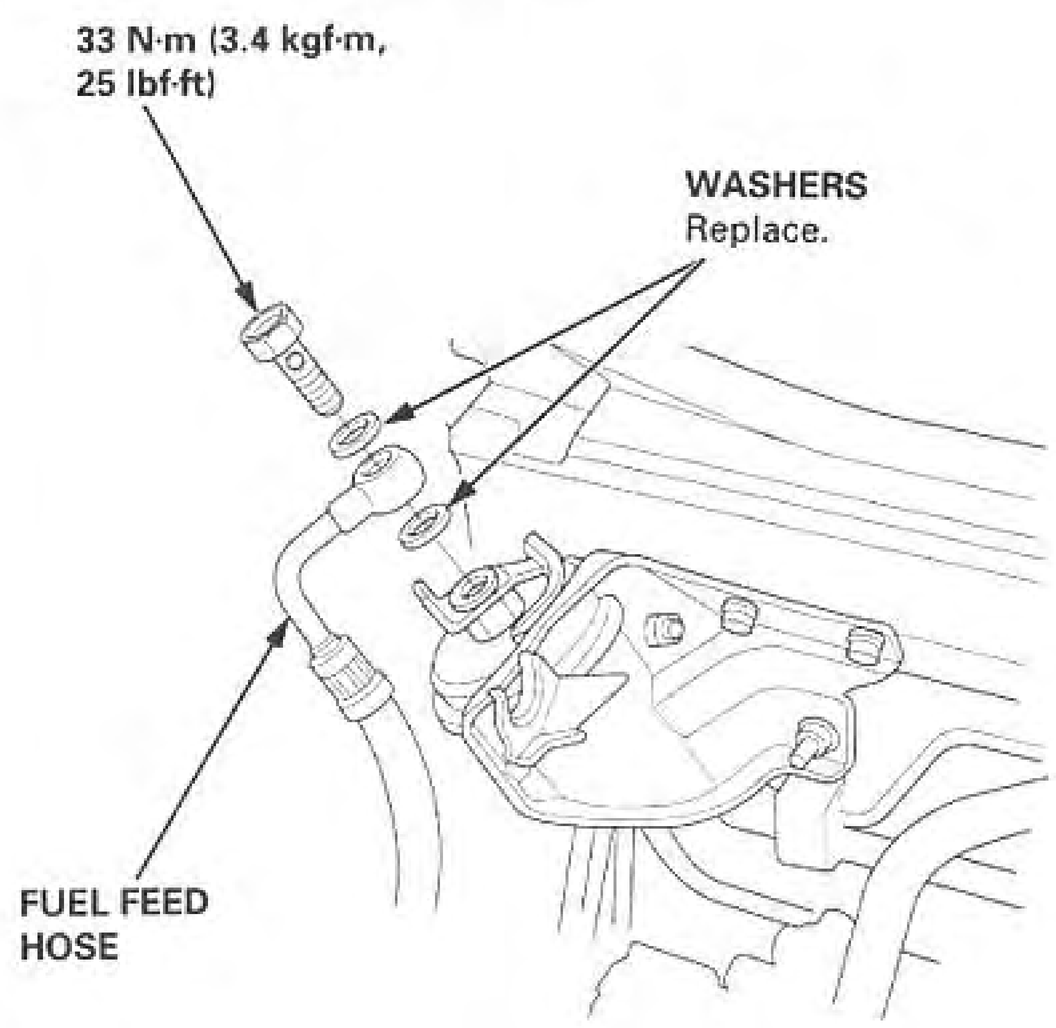
2. Drain the engine coolant (see page 10-6).

   - Remove the radiator cap to speed draining.

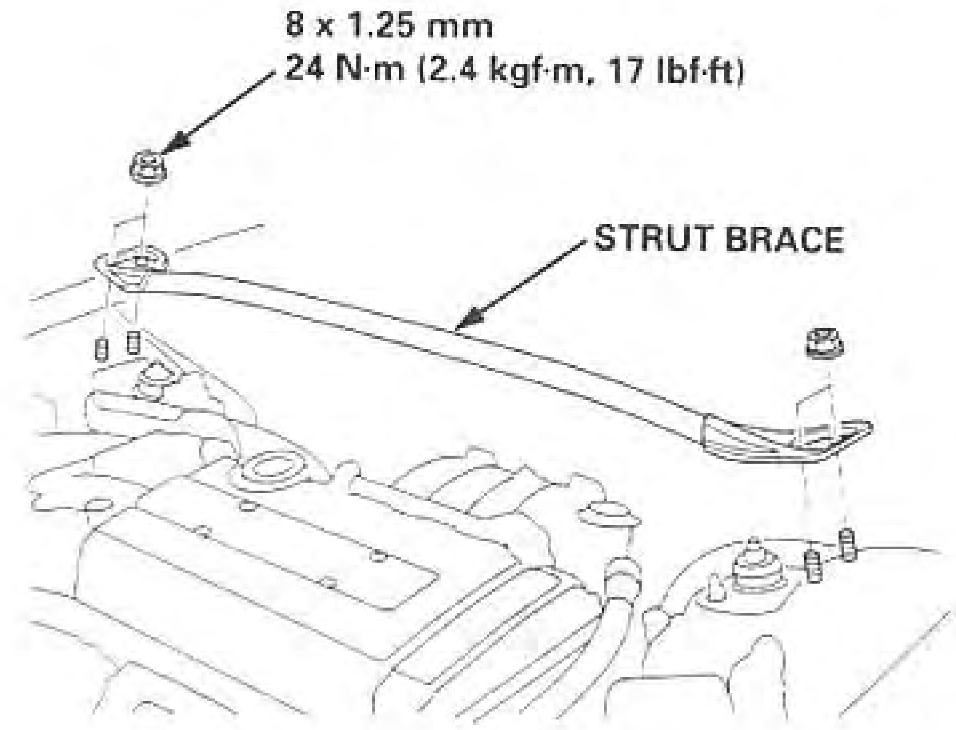
3. Relieve fuel pressure (see section 11).

   ⚠WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.

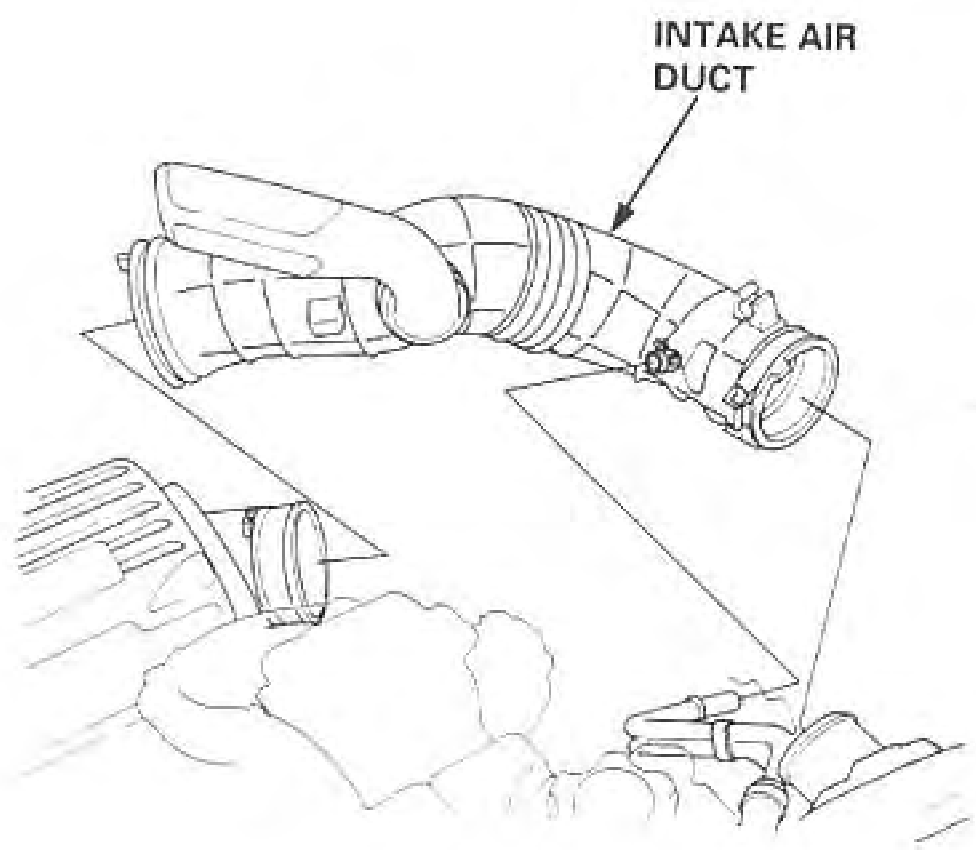
4. Disconnect the fuel feed hose.



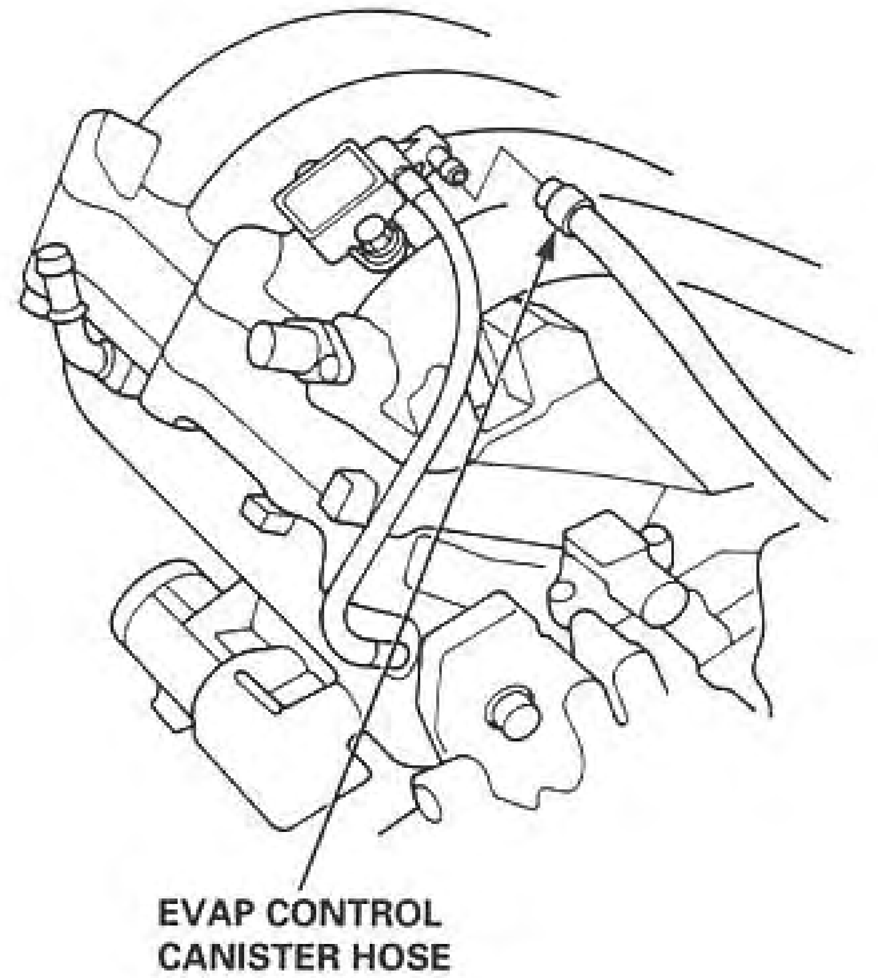
5. Remove the strut brace.



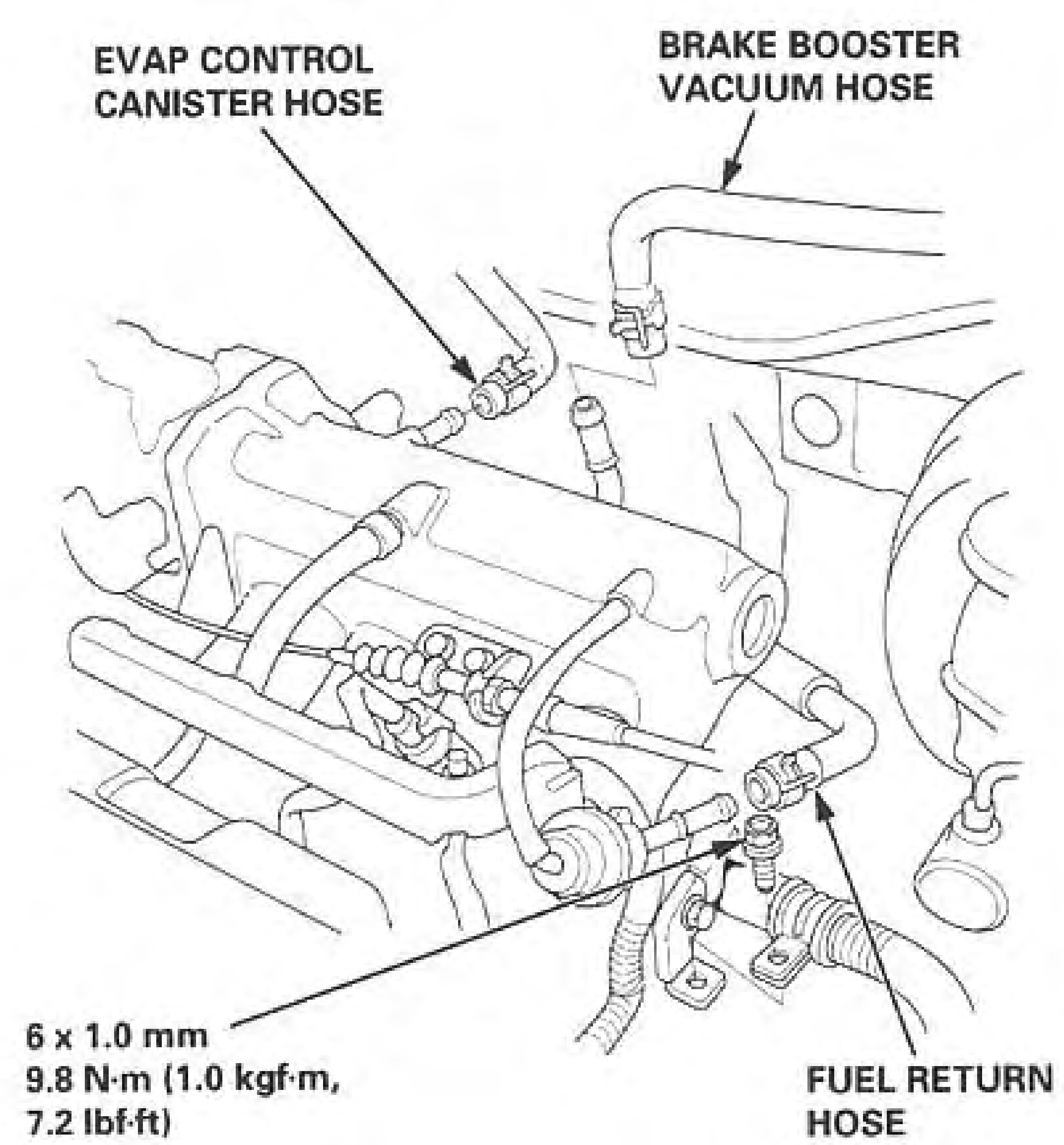
6. Remove the intake air duct.



7. Remove the evaporative emission (EVAP) control canister hose (B18C1 engine).

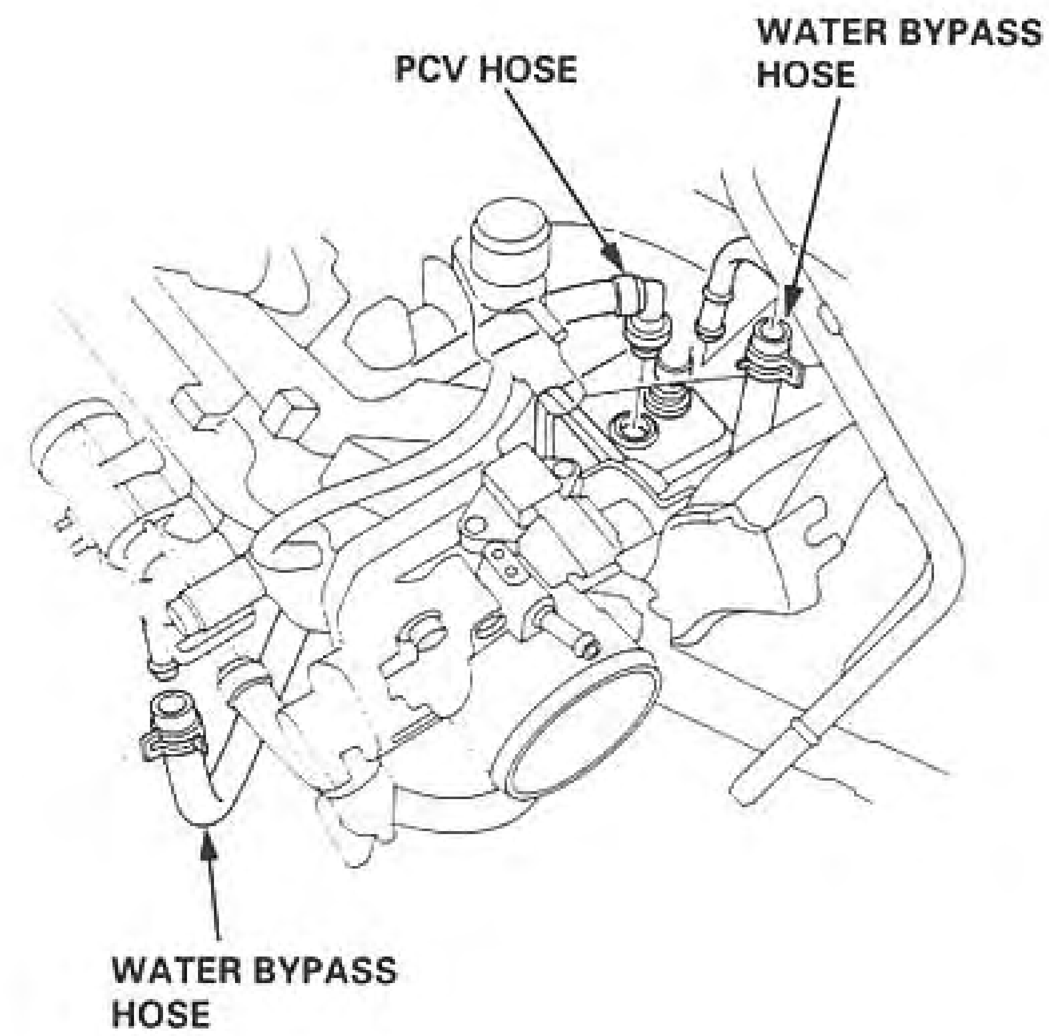


8. Remove the brake booster vacuum hose, evaporative emission (EVAP) control canister hose, fuel return hose and harness clamp (B18C5 engine).

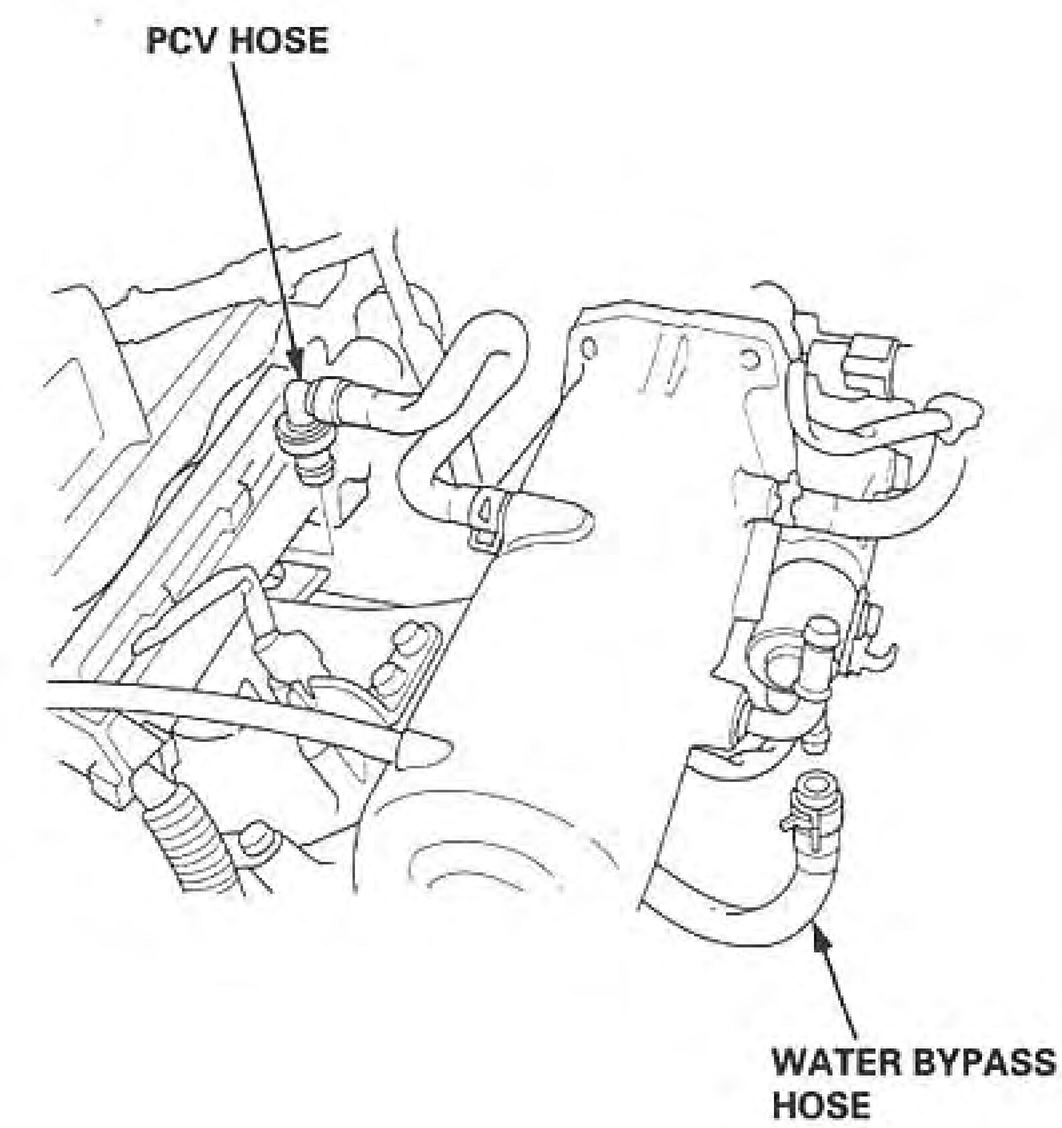


9. Remove the water bypass hose and positive crankcase ventilation (PCV) hose.

B18C1 engine:



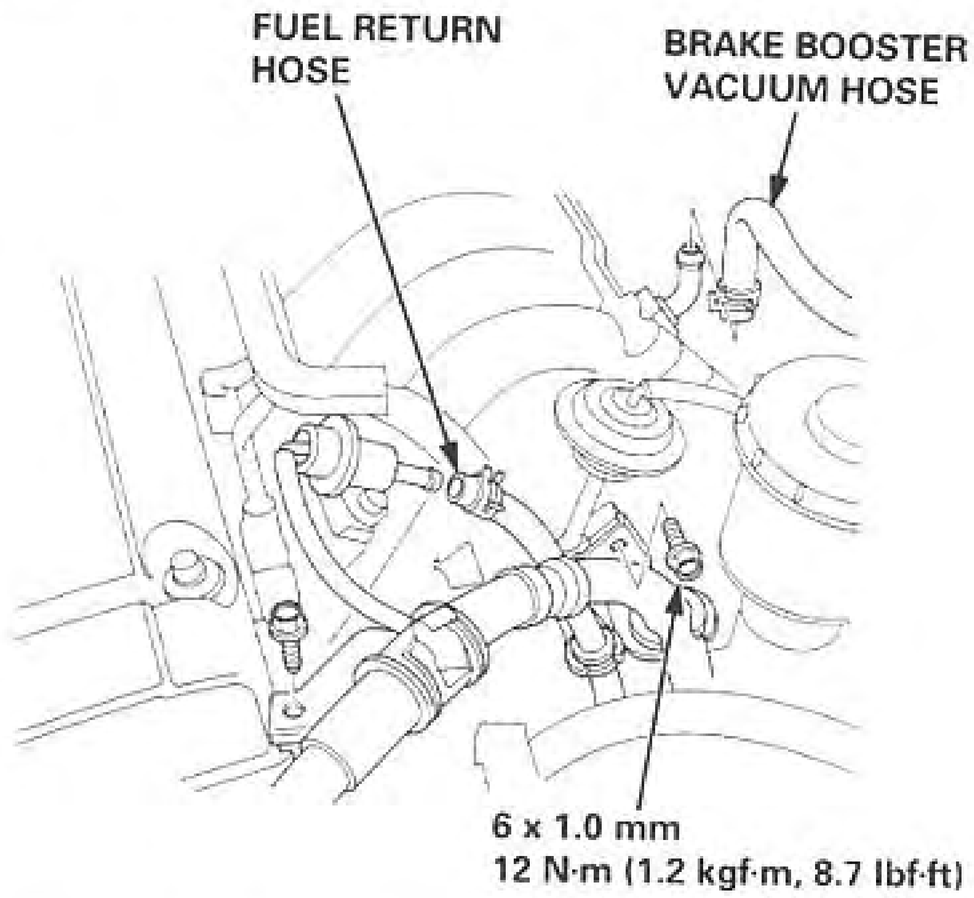
B18C5 engine:



(cont'd)

Removal (cont'd)

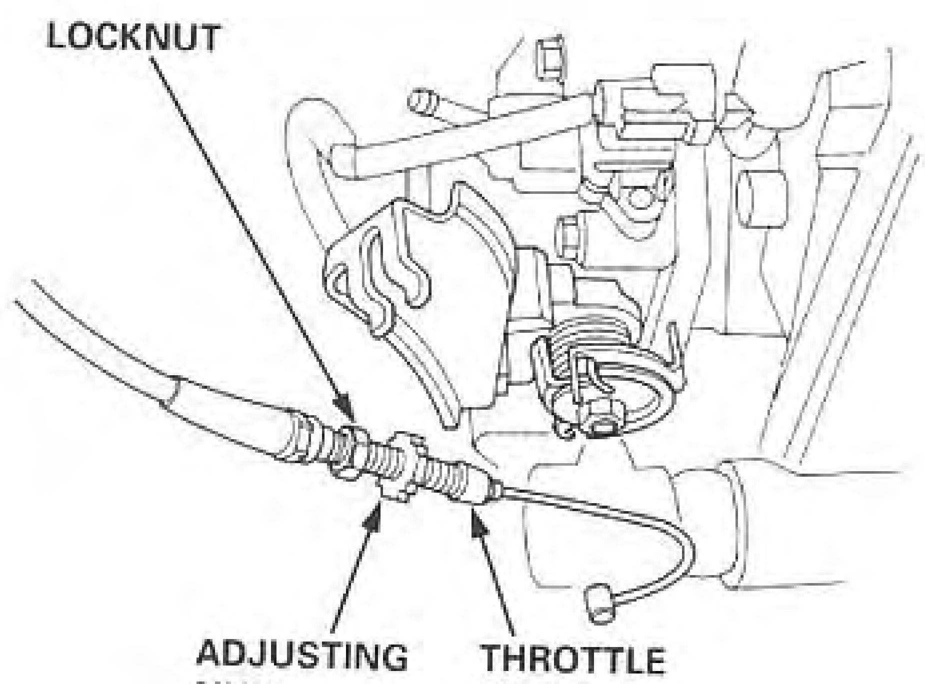
10. Remove the brake booster vacuum hose and fuel return hose (B18C1 engine).



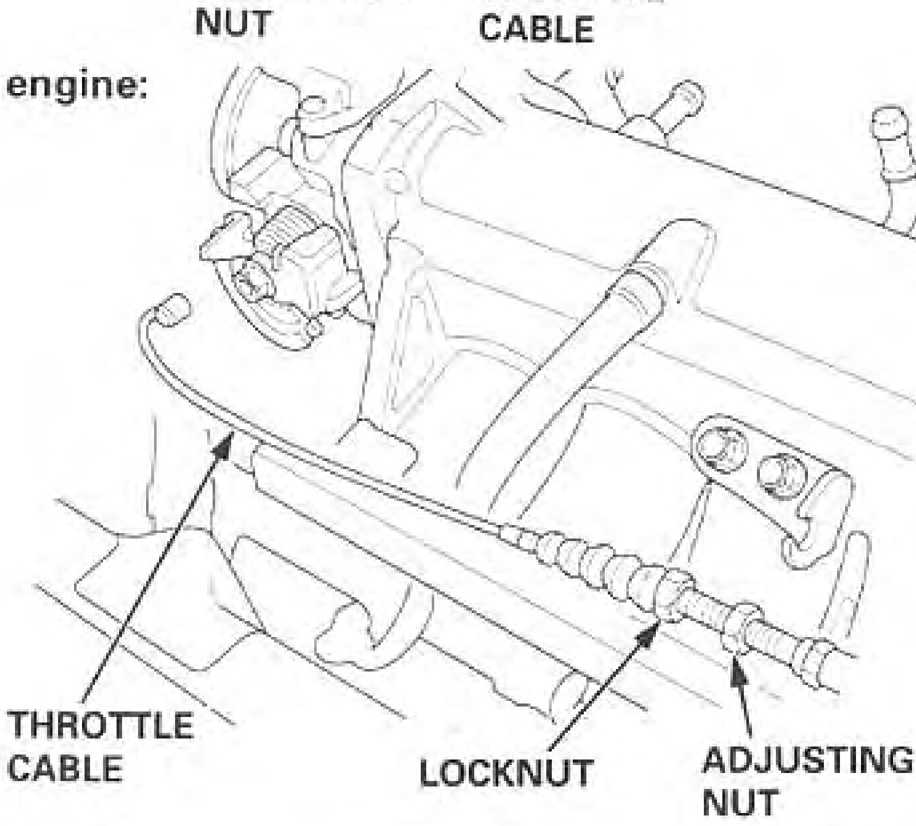
11. Remove the throttle cable.

NOTE:
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing (see section 11).

B18C1 engine:



B18C5 engine:



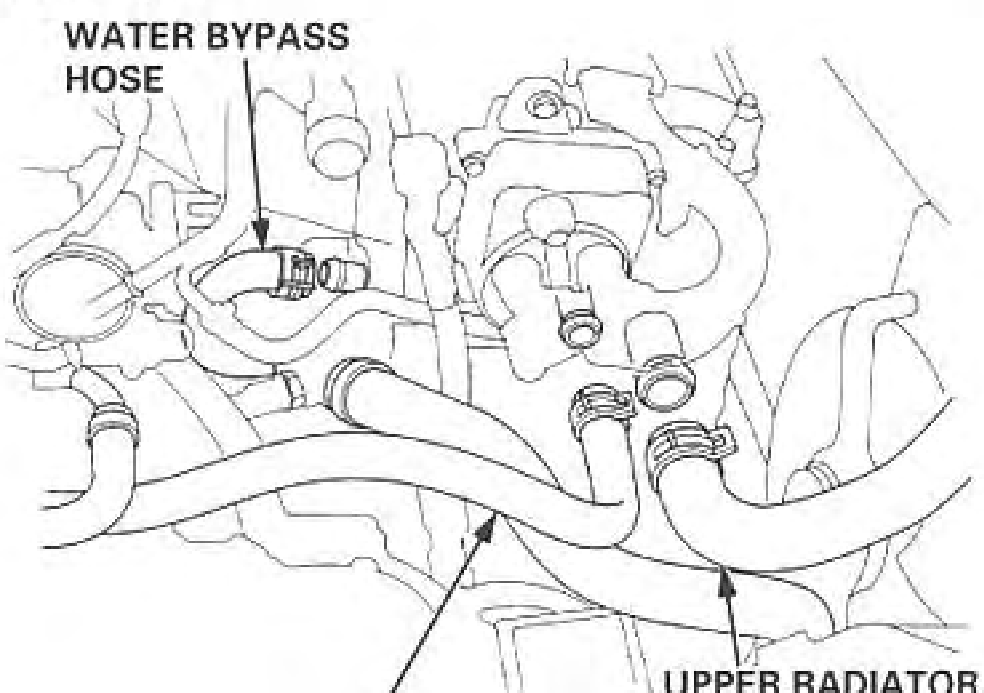
12. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.

- Four fuel injector connectors
- Intake air temperature (IAT) sensor connector
- Engine coolant temperature (ECT) sensor connector
- TDC/CKP/CYP sensor connector
- Ignition coil connector
- ECT gauge sending unit connector
- Throttle position (TP) sensor connector
- VTEC solenoid valve connector
- VTEC pressure switch connector
- Manifold absolute pressure (MAP) sensor connector
- Idle air control (IAC) sensor connector
- EVAP purge control solenoid valve connector
- Intake air bypass (IAB) control solenoid valve connector
- Crankshaft speed fluctuation (CKF) sensor connector

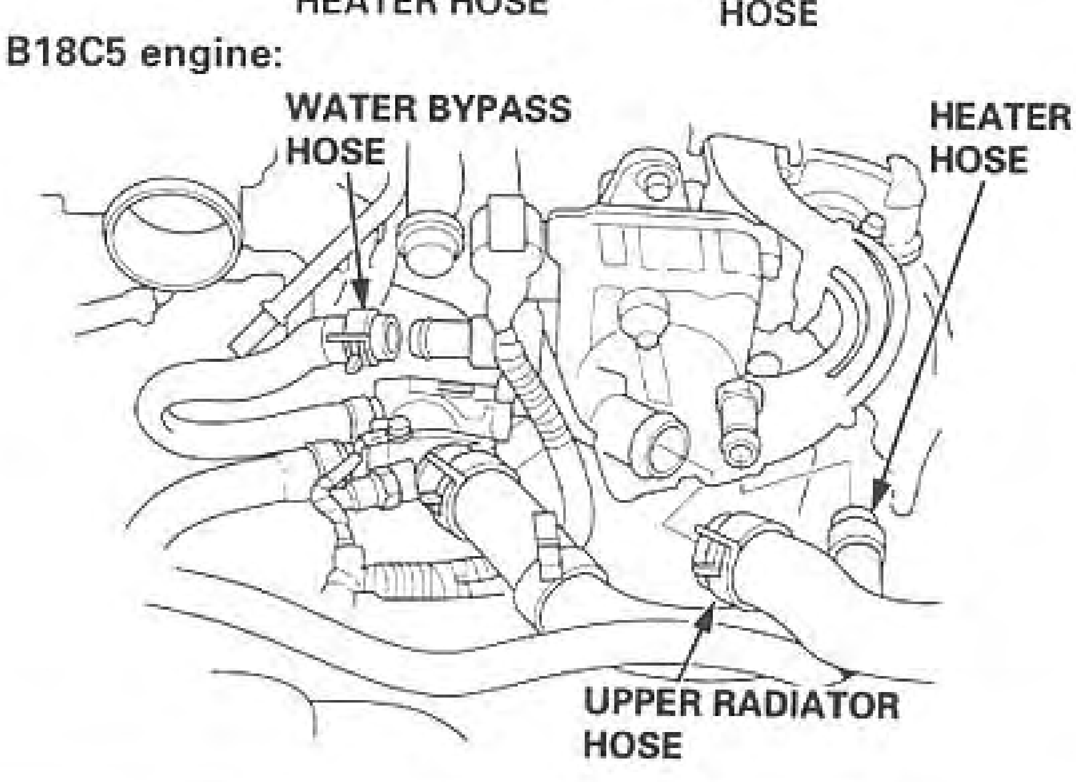
13. Remove the spark plug caps and distributor from the cylinder head.

14. Remove the upper radiator hose, heater hose and water bypass hose.

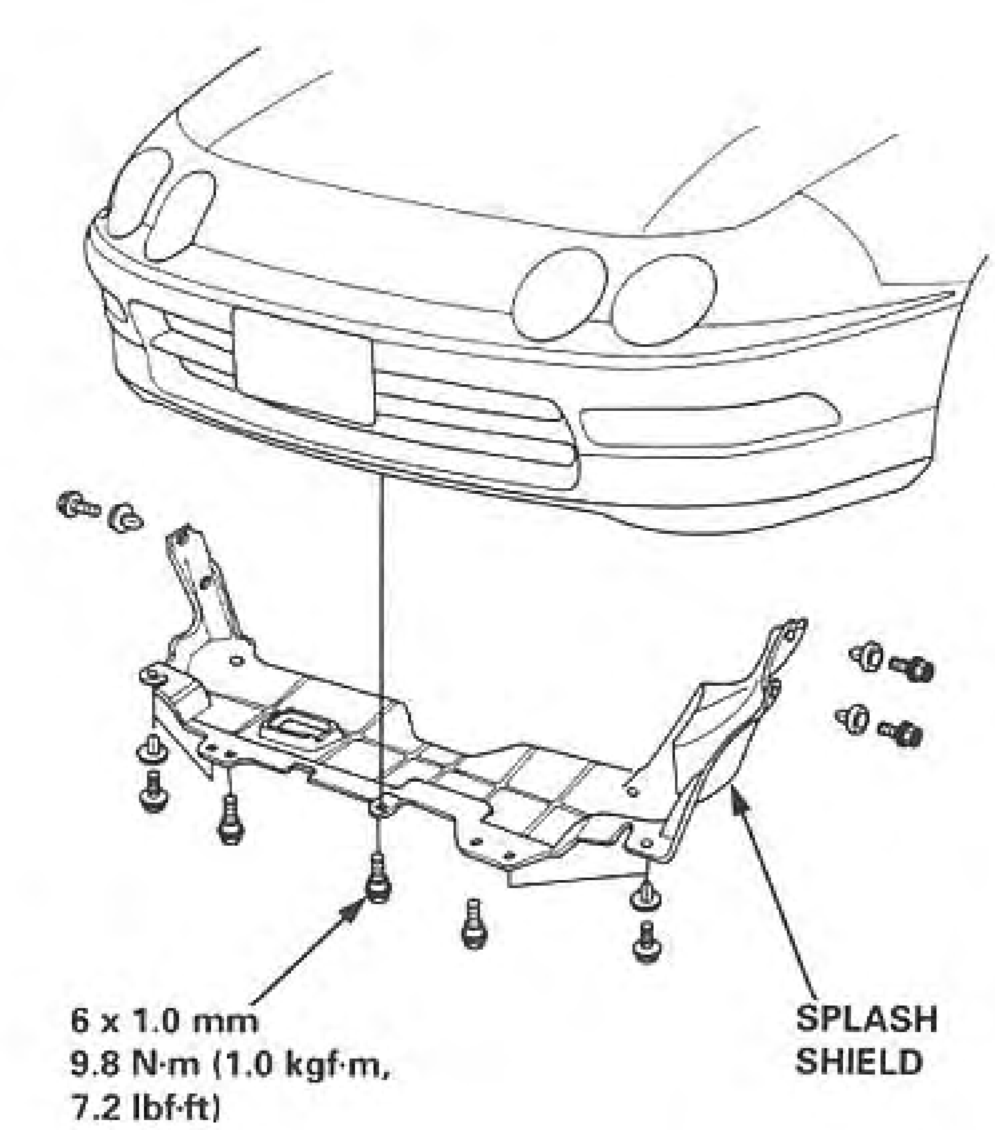
B18C1 engine:



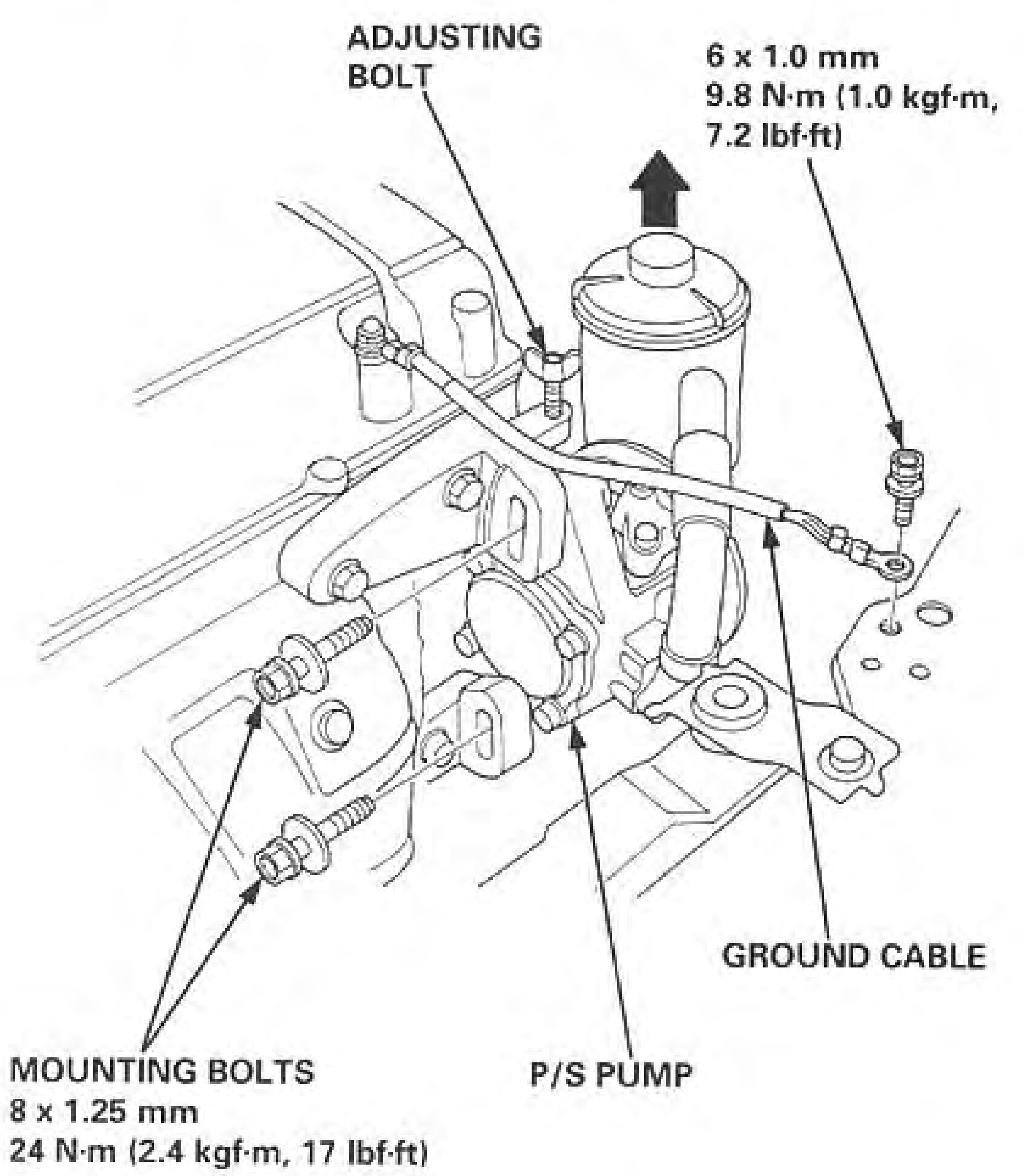
B18C5 engine:



15. Remove the splash shield.



16. Remove the engine ground cable.
Remove the adjusting bolt and mounting bolts, then remove the power steering (P/S) pump belt and P/S pump.
   - Do not disconnect the P/S hoses.

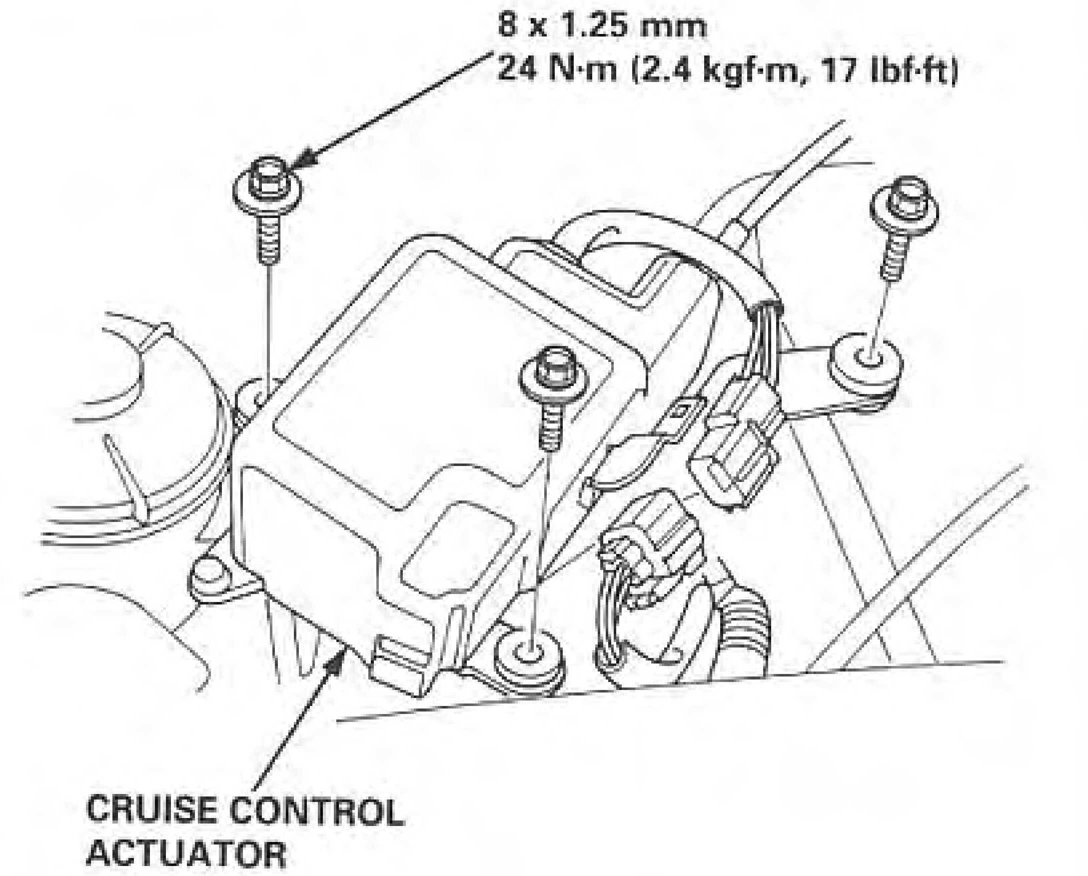


17. Remove the heat shield from the P/S pump bracket (see page 5-18).

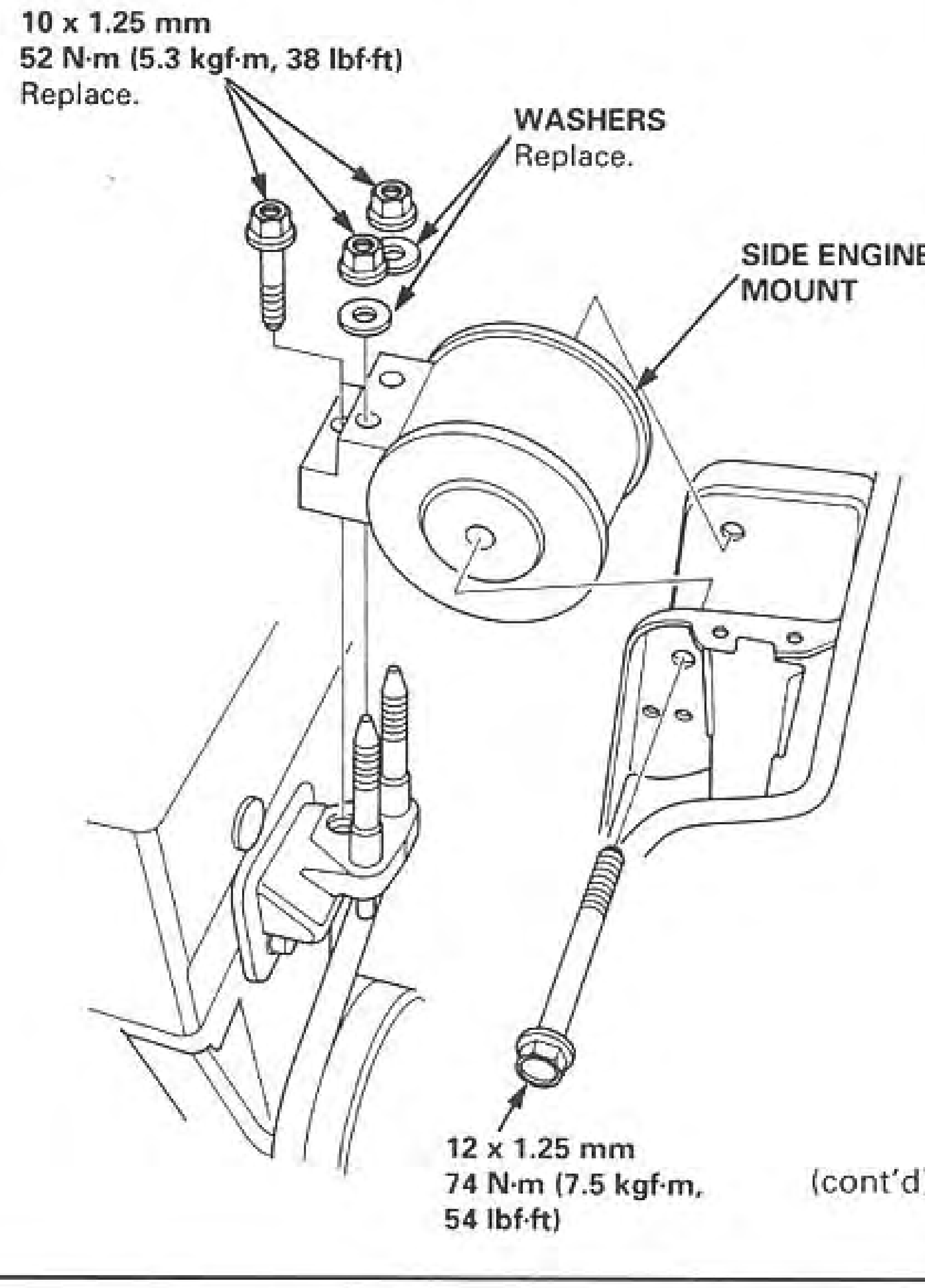
18. Remove the air conditioning (A/C) compressor belt (see page 6-48).

19. Remove the alternator belt (see page 6-48).

20. Remove the cruise control actuator.



21. Remove the side engine mount.



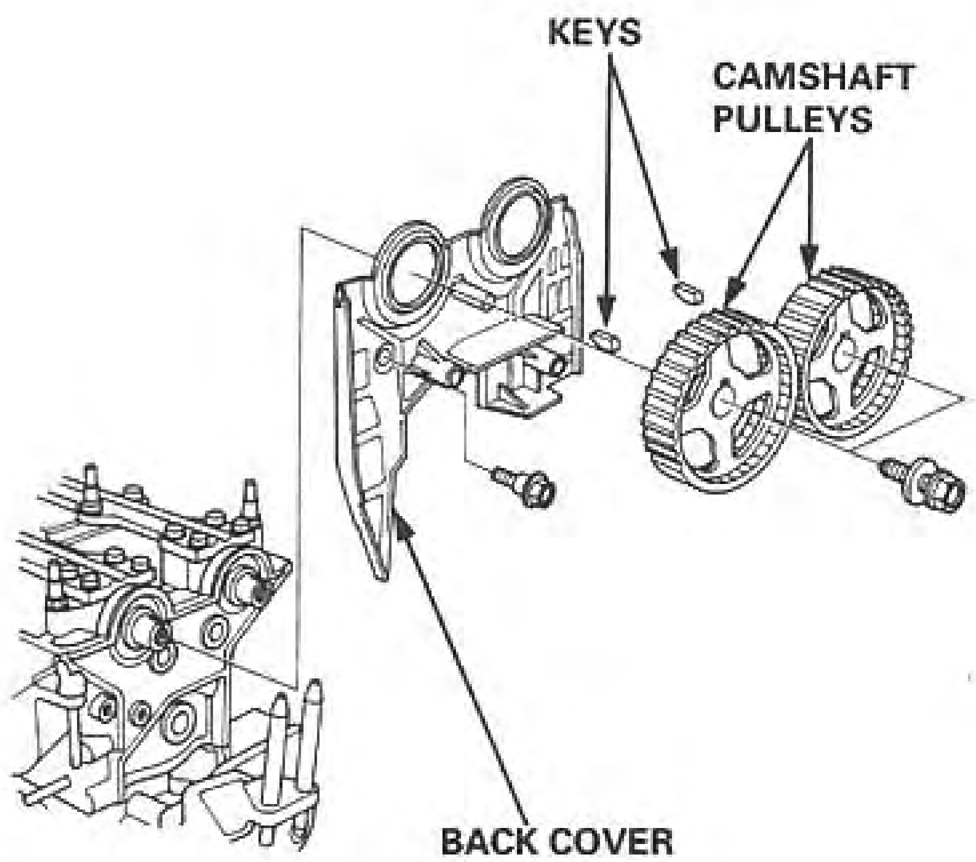
(cont'd)

Removal (cont'd)

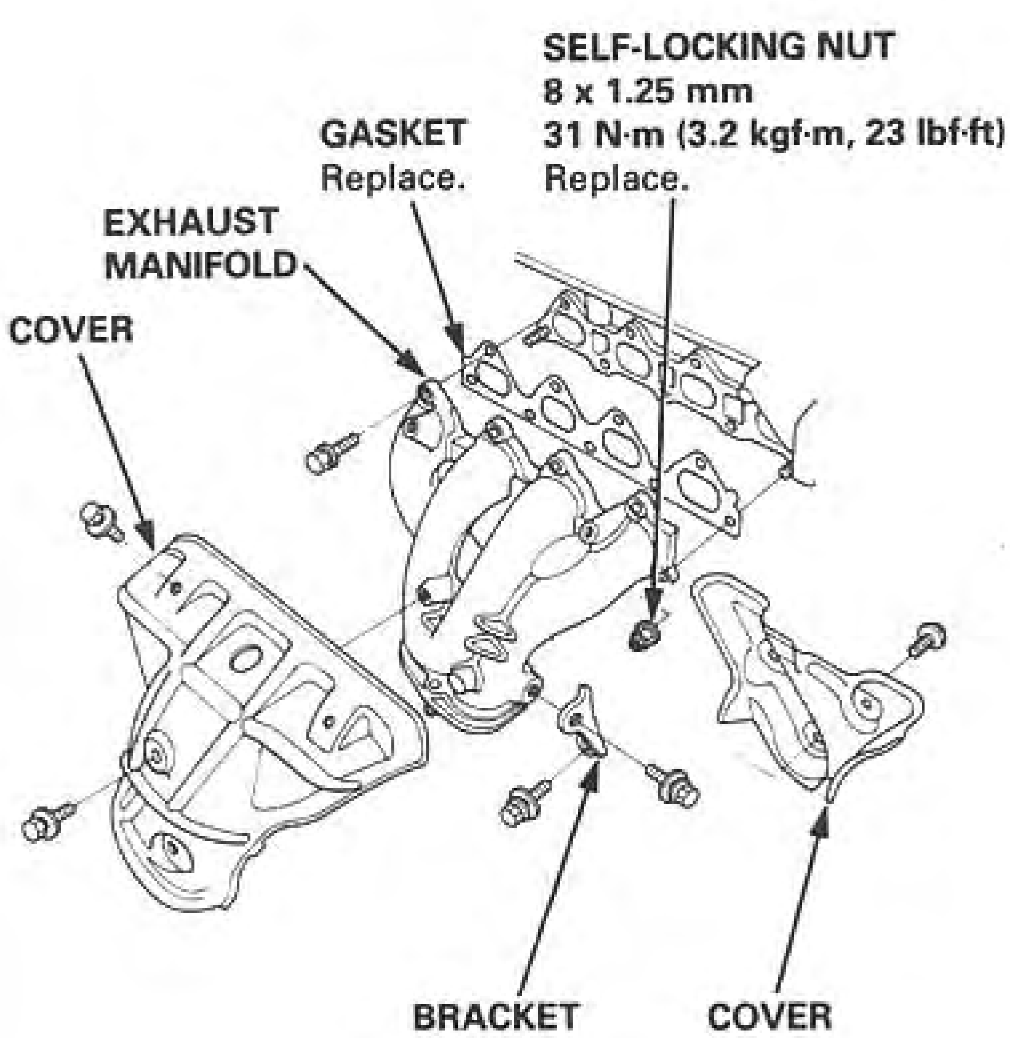
22. Remove the cylinder head cover.

23. Remove the timing belt (see page 6-48).

24. Remove the camshaft pulleys and back cover.

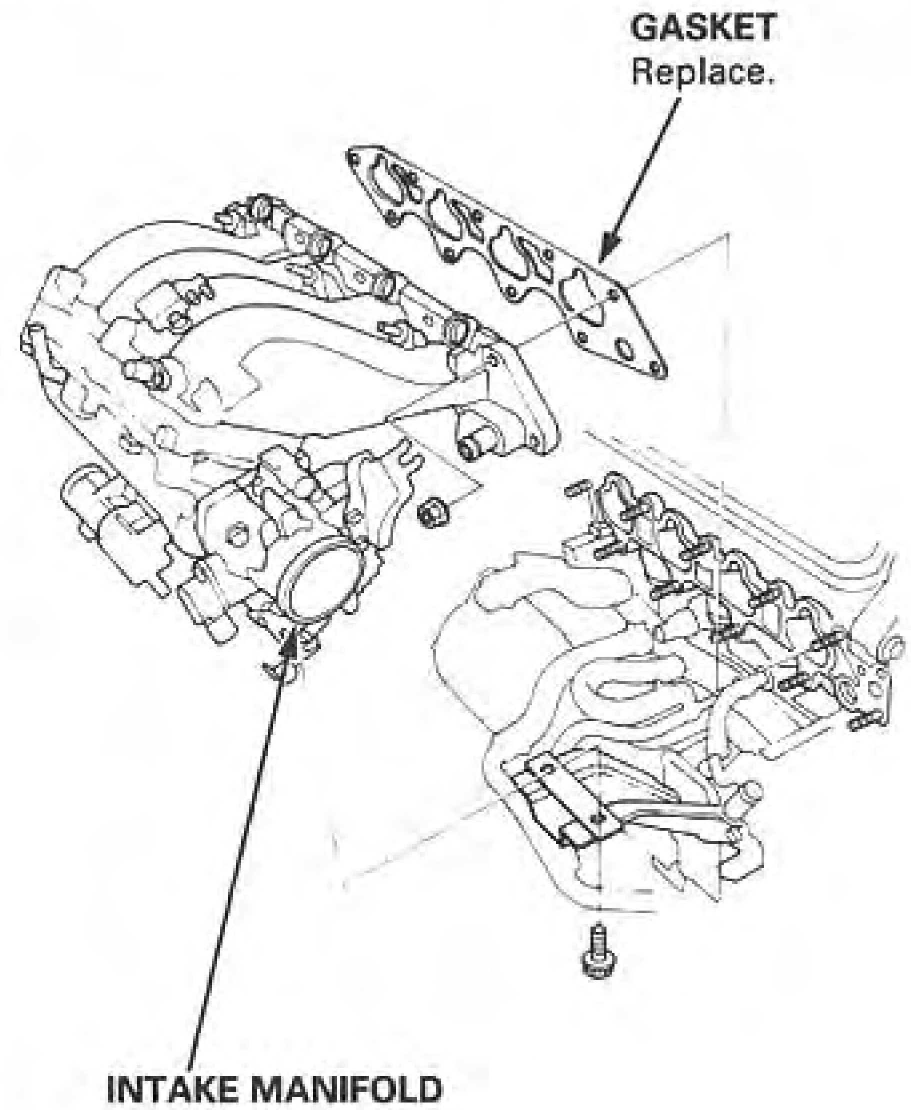


25. Remove the exhaust manifold.

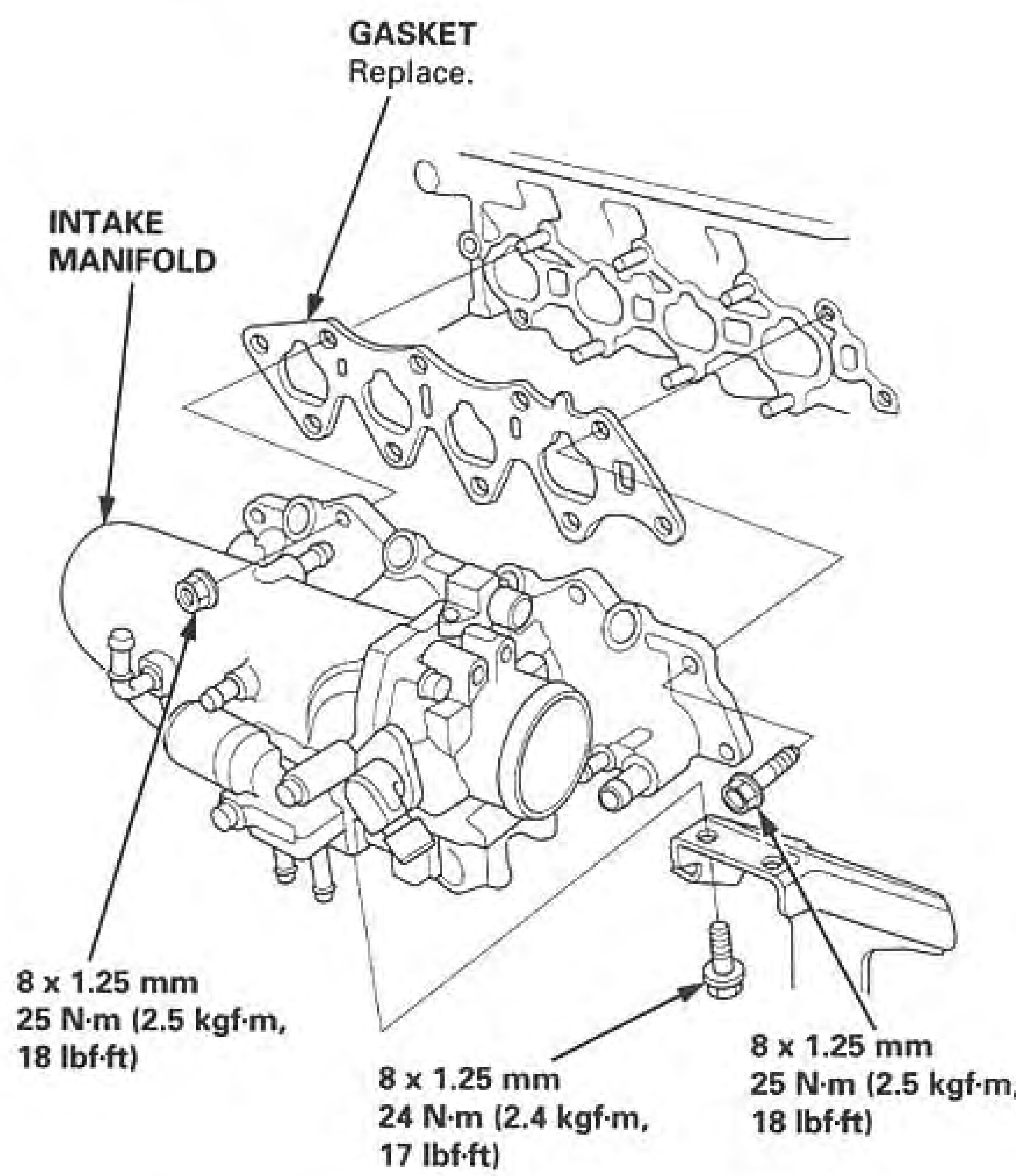


26. Remove the intake manifold.

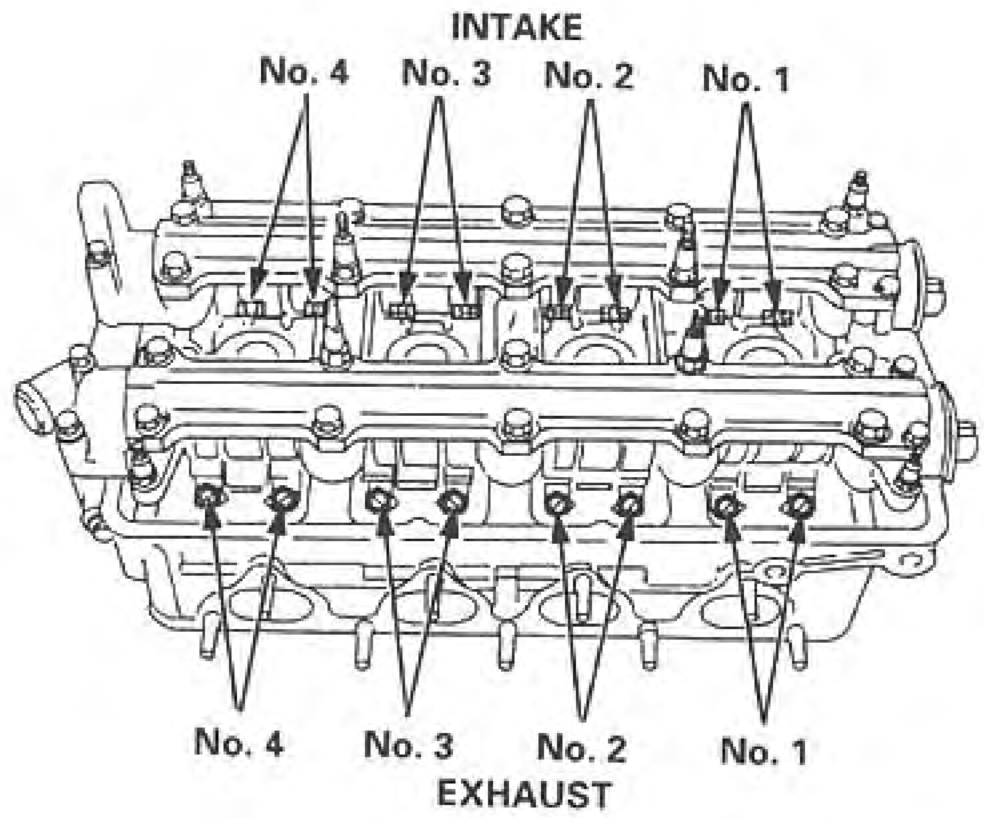
B18C1 engine:



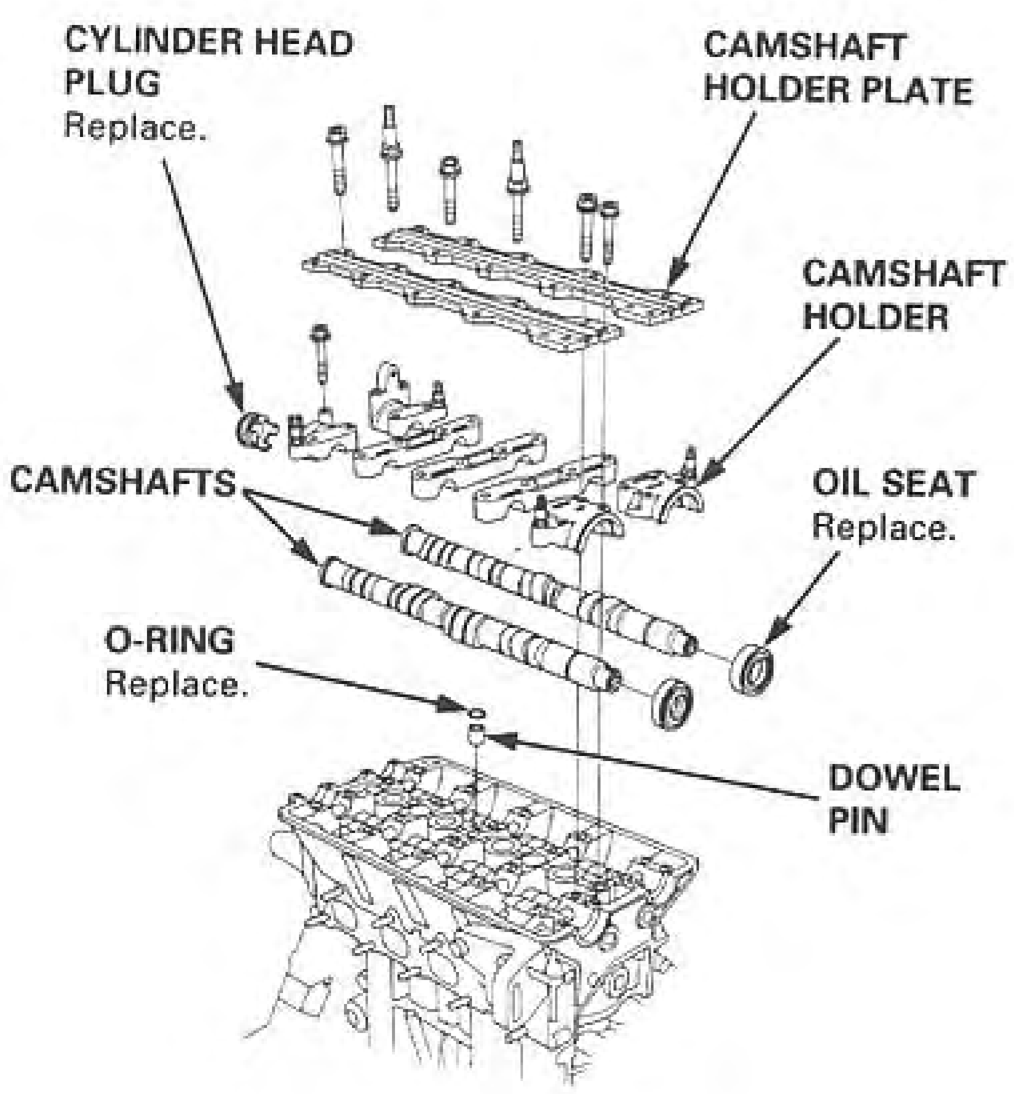
B18C5 engine:



27. Loosen the adjusting screws.



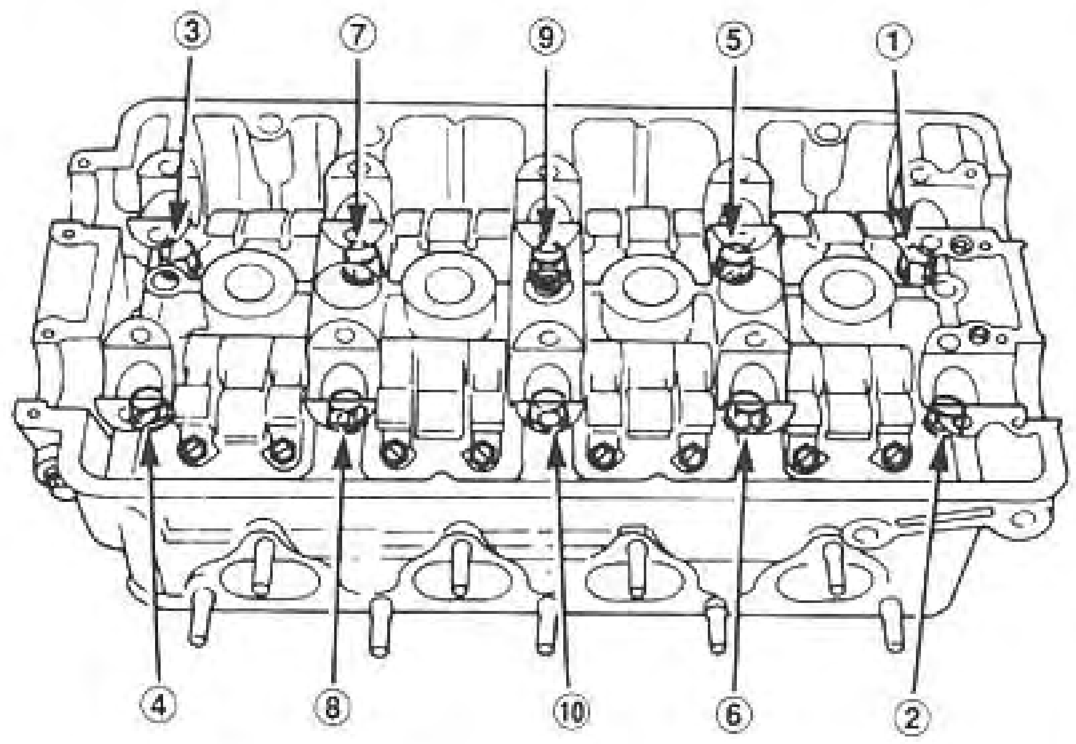
28. Remove the camshaft holder plates, camshaft holders, and camshafts.



29. Remove the cylinder head bolts, then remove the cylinder head.

CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat until all bolts are loosened.

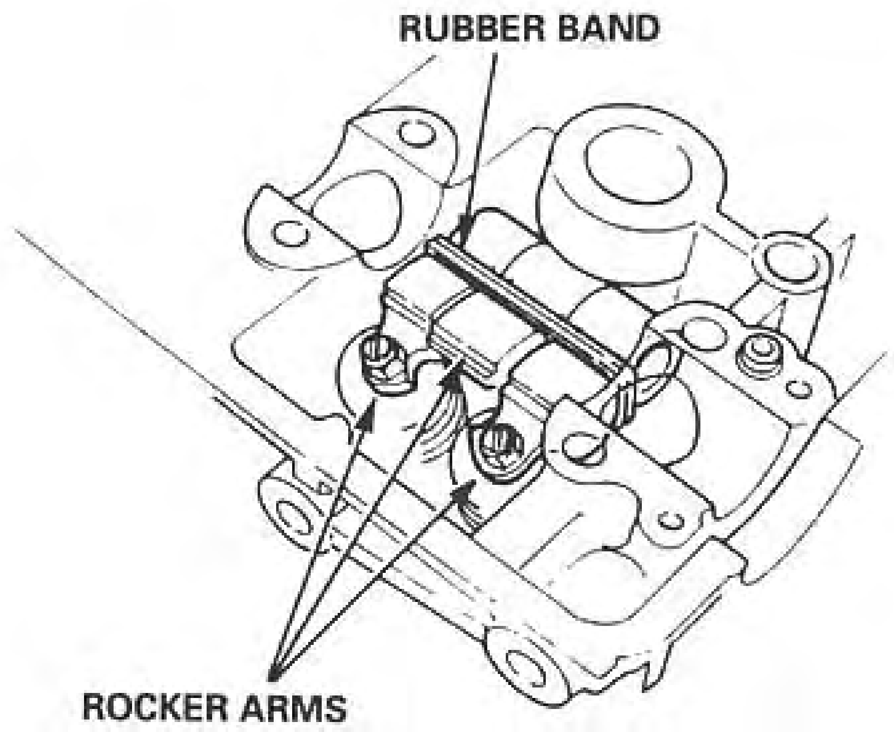
CYLINDER HEAD BOLT LOOSENING SEQUENCE



Rocker Arms

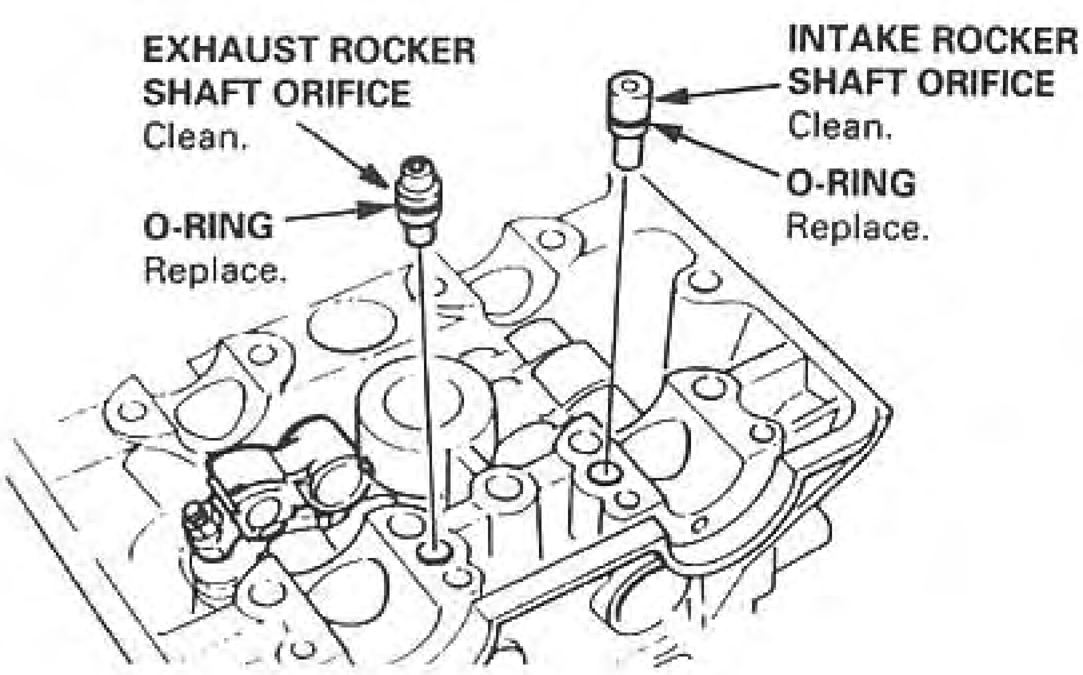
Removal

1. Hold the rocker arms together with a rubber band to prevent them from separating.

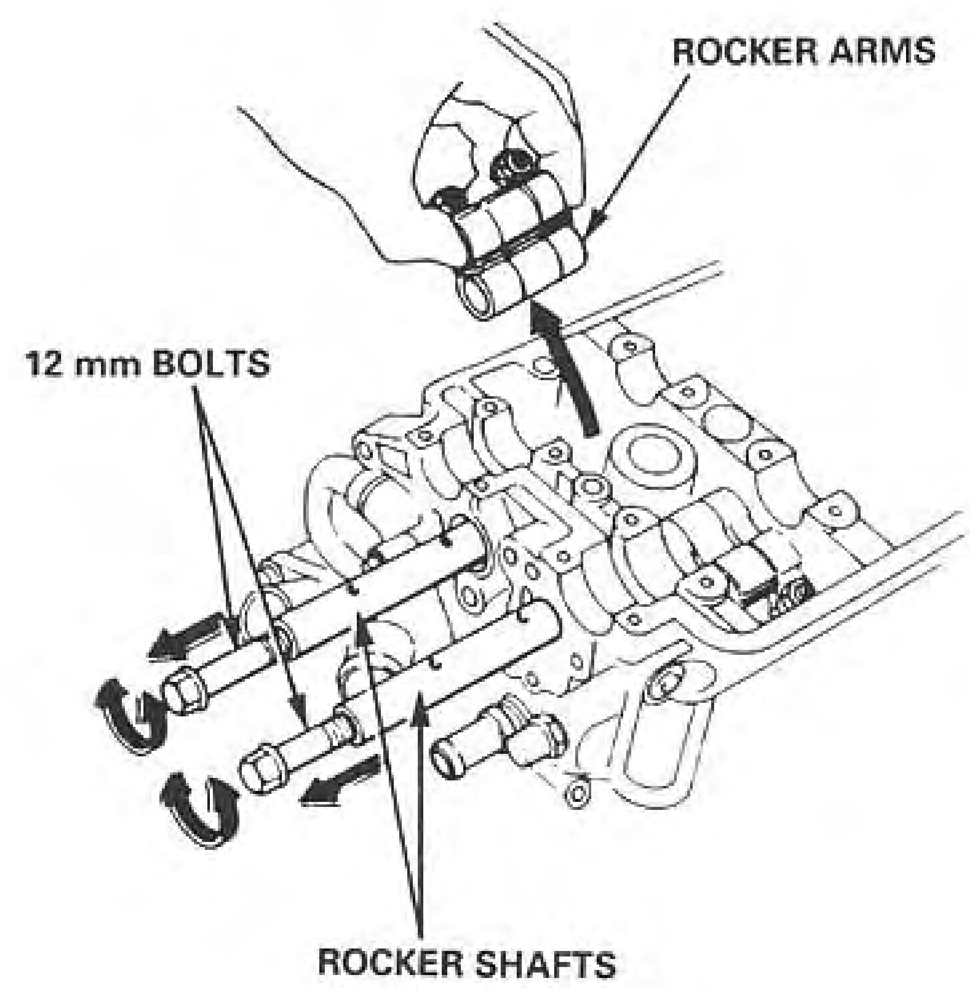


2. Remove the intake and exhaust rocker shaft orifices, then remove the VTEC solenoid valve and the sealing bolts.

   NOTE: The shapes of the rocker shaft orifices of the intake and exhaust are different. Identify the parts as they are removed to ensure reinstallation in the original locations.



3. Screw 12 mm bolts into the rocker arm shafts. Remove each rocker arm set while slowly pulling out intake and exhaust rocker arm shafts.

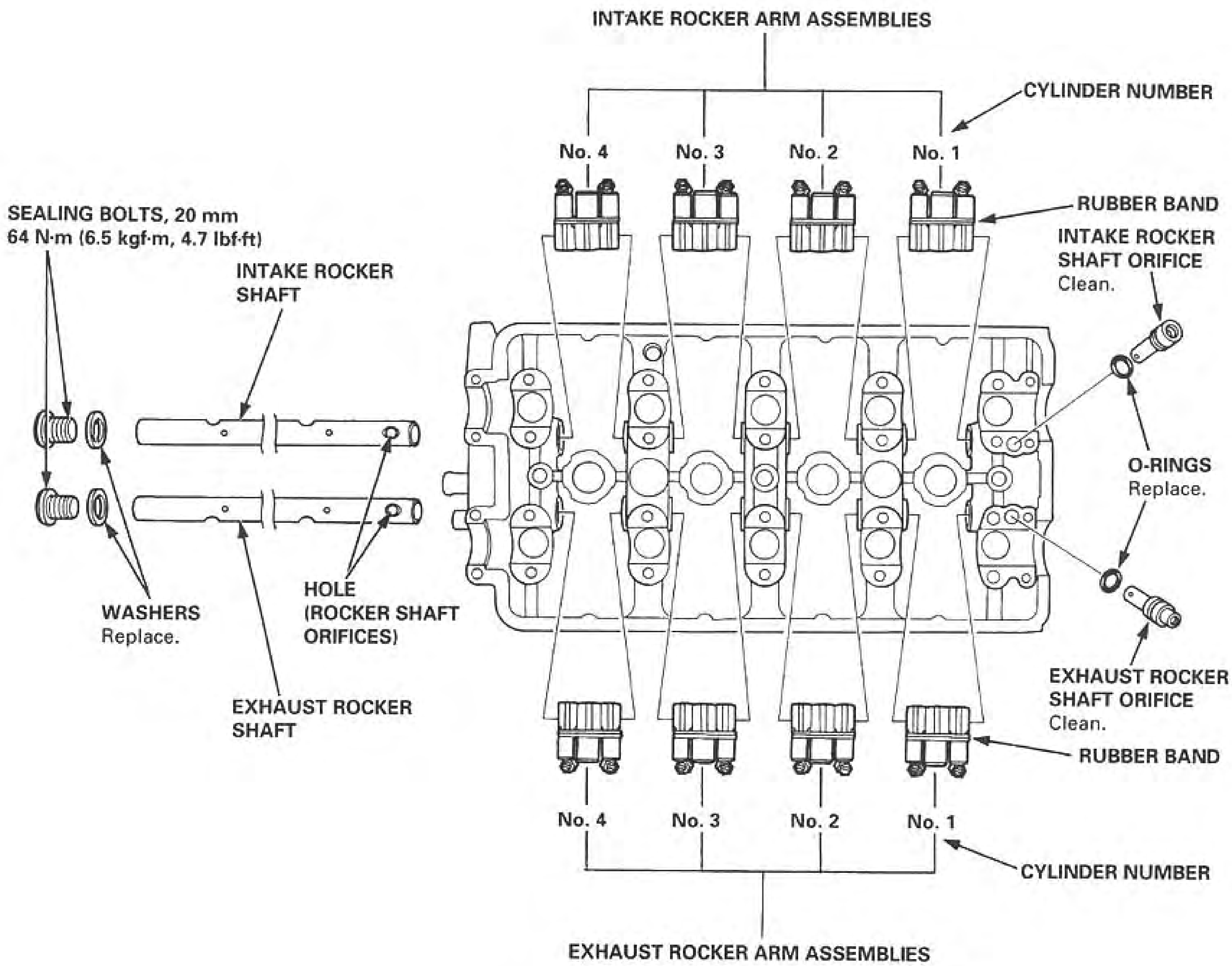


Locations

CAUTION: After installing the rocker shaft orifice, try to turn the rocker shaft to make sure that the orifice is correctly inserted in the hole of the rocker shaft. If the orifice is in place, it should not turn.

NOTE:
- Identify parts as they are removed to ensure reinstallation in original locations.
- Inspect rocker shafts and rocker arms (see pages 6-64 and 65).
- Rocker arms must be installed in the same position if reused.
- Clean the rocker shaft orifices when installing.

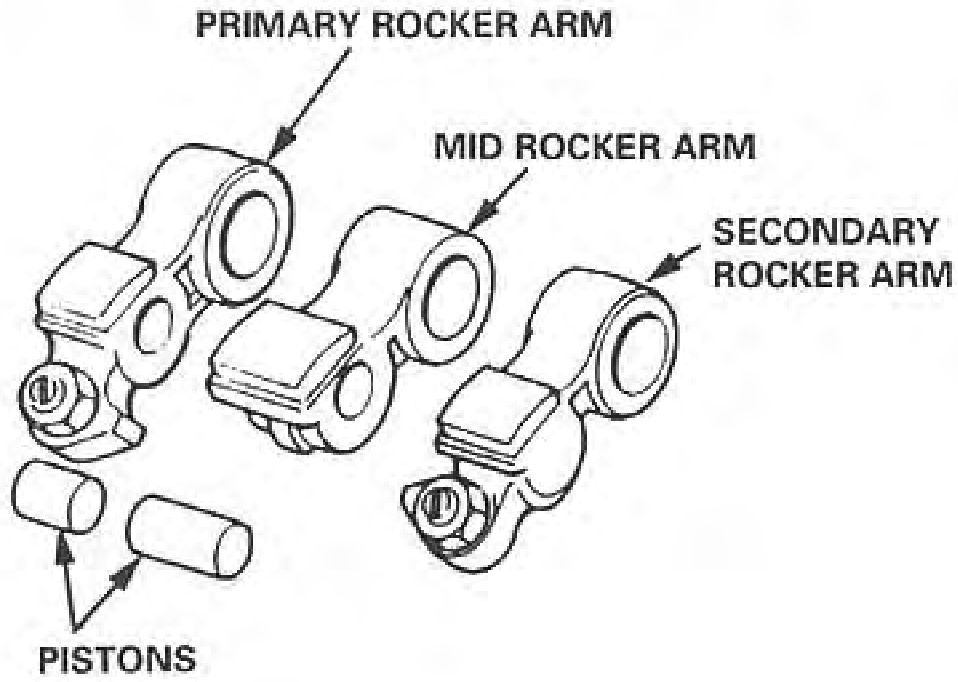
Prior to reinstalling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces.



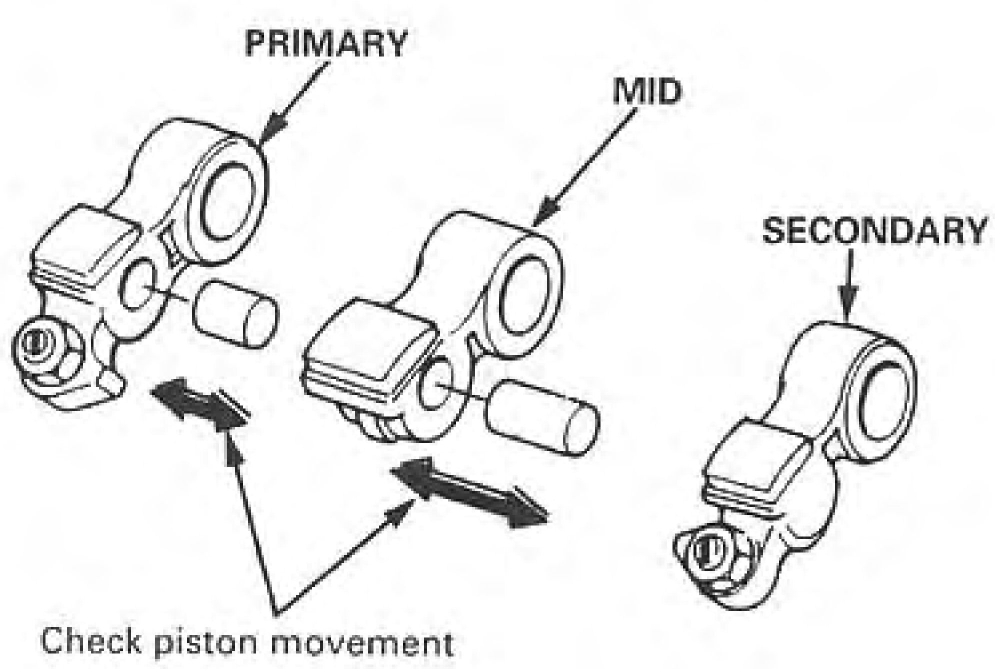
Rocker Arms

Inspection

NOTE: When reassembling the primary rocker arm, carefully apply air pressure to the oil passage of the rocker arm.

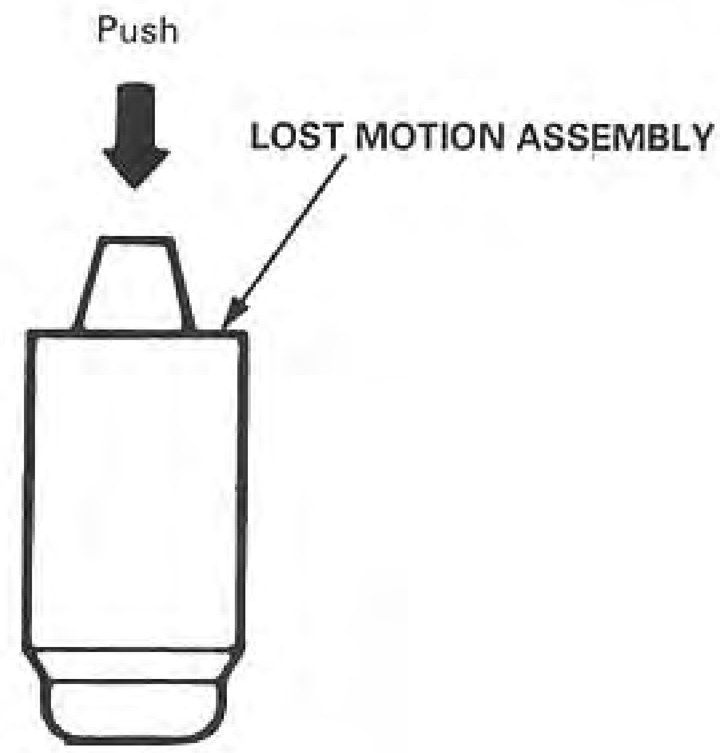


1. Inspect the rocker arm piston. Push it manually.
   — If it does not move smoothly, replace the rocker arm assembly.



NOTE:
- Apply oil to the pistons when reassembling.
- Bundle the rocker arms with a rubber band to keep them together as a set.

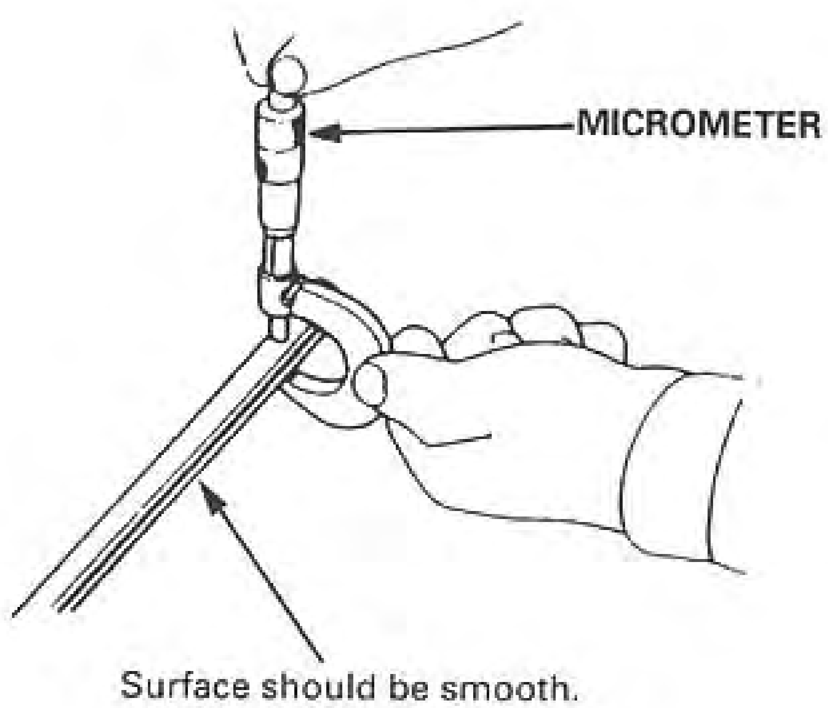
2. Remove the lost motion assembly from the cylinder head and inspect it. Test it by pushing the plunger with your finger.
   — If the lost motion assembly does not move smoothly, replace it.



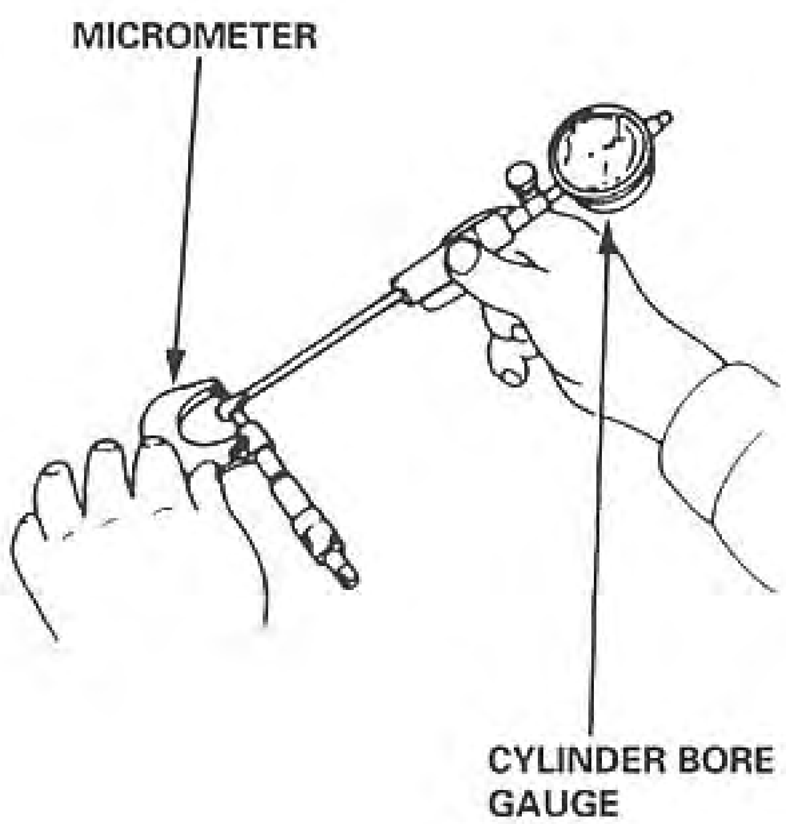
Arm-to-Shaft Clearance

Measure both the intake rocker shaft and exhaust rocker shaft.

1. Measure diameter of shaft at first rocker location.

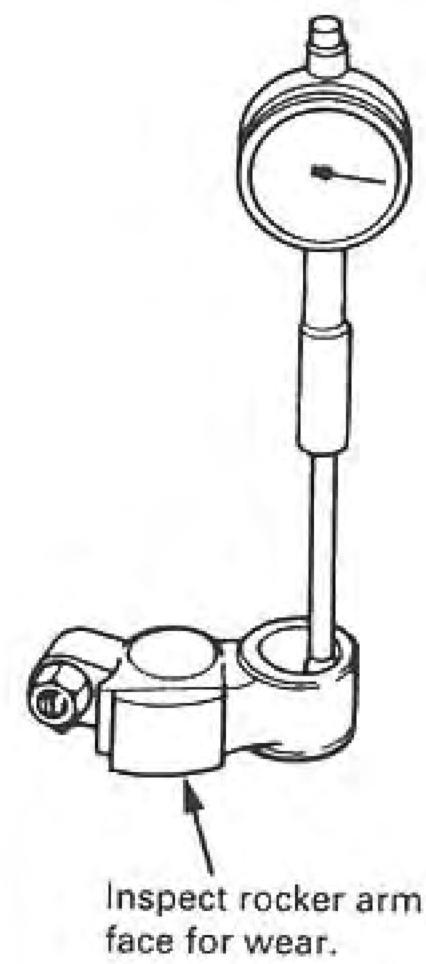


2. Zero gauge to shaft diameter.



3. Measure inside diameter of rocker arm and check for out-of-round condition.

Rocker Arm-to-Shaft Clearance:
Intake and Exhaust
Standard (New): 0.025 – 0.052 mm (0.0010 – 0.0020 in)
Service Limit: 0.08 mm (0.003 in)



Repeat for all rockers.
— If over limit, replace rocker shaft and all over tolerance rocker arms.

NOTE: If any rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

Rocker Arms

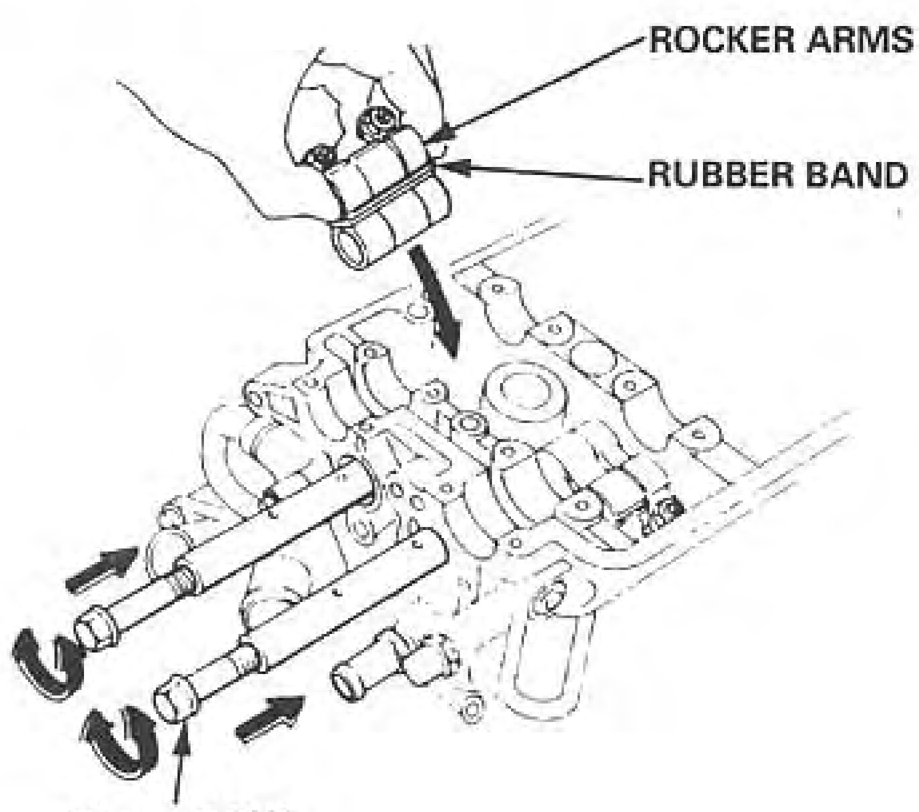
Installation

1. Install the lost motion assemblies.

2. Install the rocker arms in the reverse order of removal:
   - Valve adjusting locknuts should be loosened and adjusting screw backed off before installation.
   - The component parts must be reinstalled in the original locations.

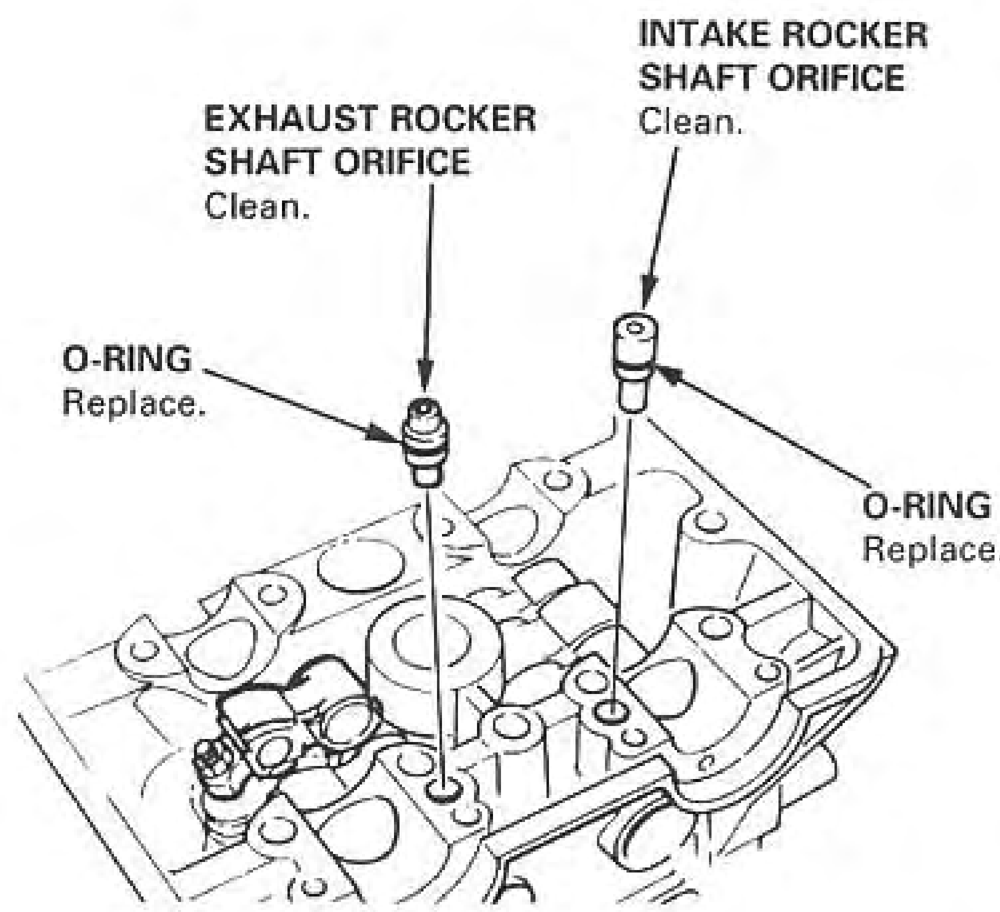
3. Install the rocker arms while inserting the rocker arm shaft into the cylinder head.

   NOTE: Remove the rubber band after installing the rocker arms.



4. Clean and install the rocker shaft orifices with new O-rings. If the holes in the rocker arm shaft and cylinder head are not in line with each other, screw a 12 mm bolt into the rocker arm shaft and rotate the shaft.

   NOTE: The shapes of the rocker shaft orifices for the intake and exhaust are different. The orifices must be installed in the original locations.



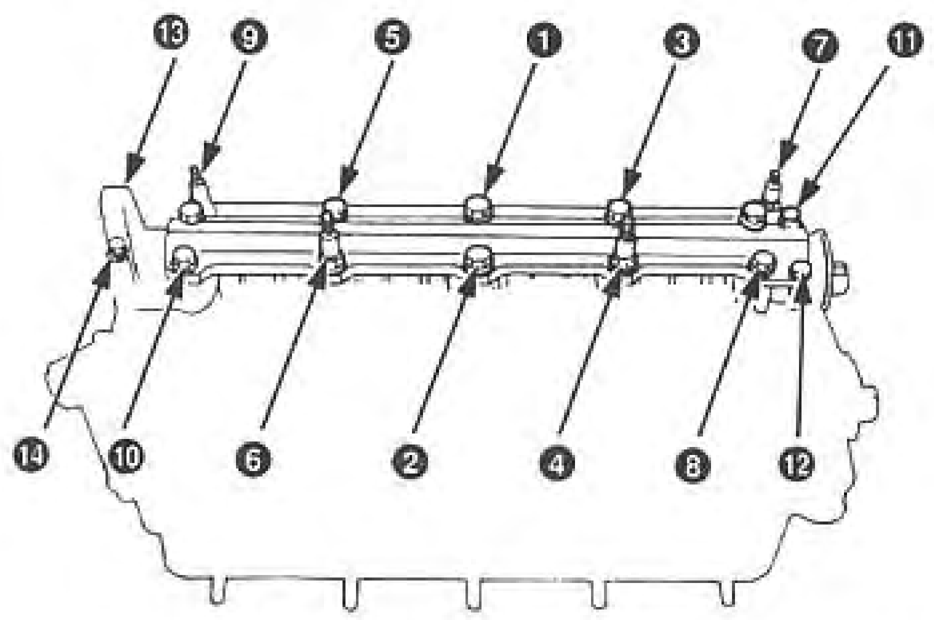
Camshafts

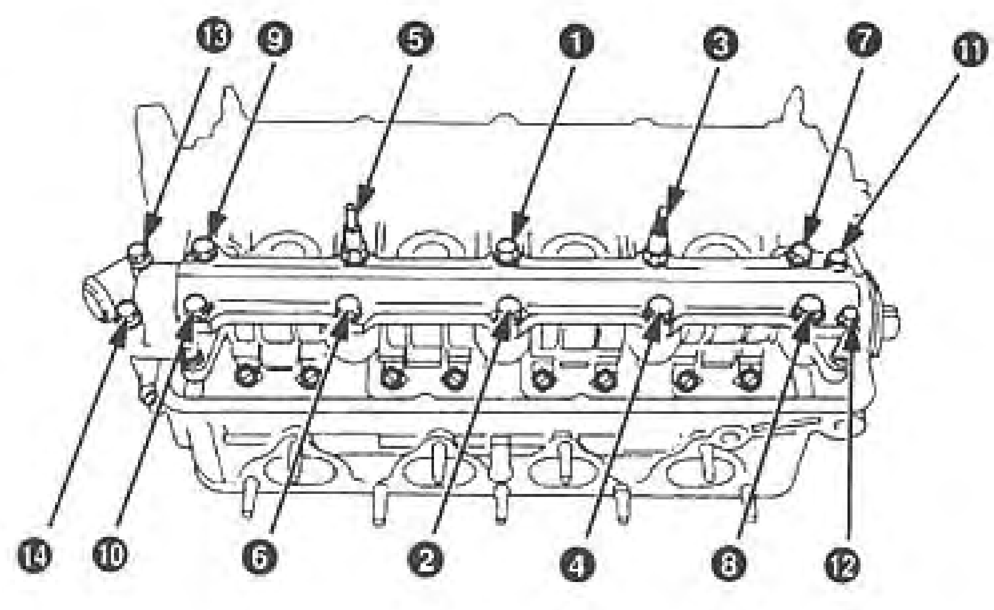
Inspection

NOTE:
- Do not rotate the camshaft during inspection.
- Remove the rocker arms and rocker shafts.

1. Put the camshafts and camshaft holders on the cylinder head, and then tighten the bolts to the specified torque.

   Specified Torque:
   ❶ – ❿: 8 mm bolts 27 N·m (2.8 kgf·m, 20 lbf·ft)
   Apply engine oil to the bolt threads.
   ⓫ – ⓮: 6 mm bolts 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

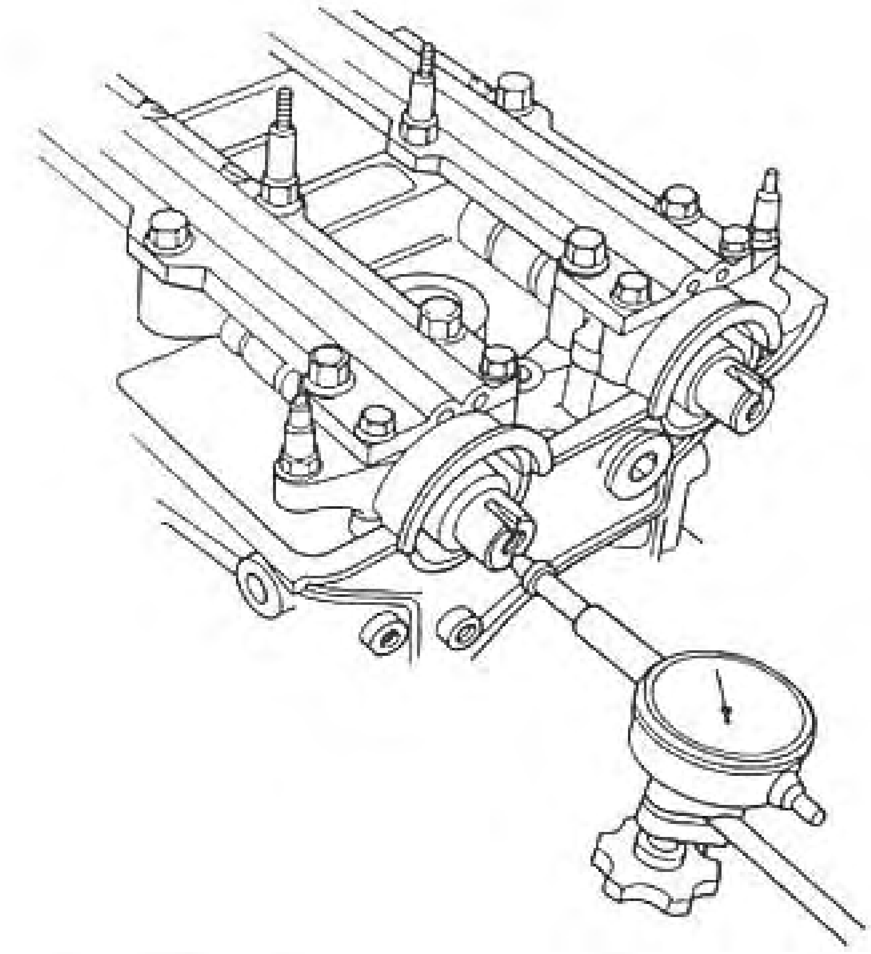




2. Seat each camshaft by pushing it toward distributor end of the cylinder head.

3. Zero the dial indicator against the end of the camshaft drive, then push the camshaft back and forth and read the end play.

   Camshaft End Play:
   Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)
   Service Limit: 0.5 mm (0.02 in)



4. Remove the bolts, then remove the camshaft holders from the cylinder head.

   NOTE: Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern.

5. Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.

6. Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.

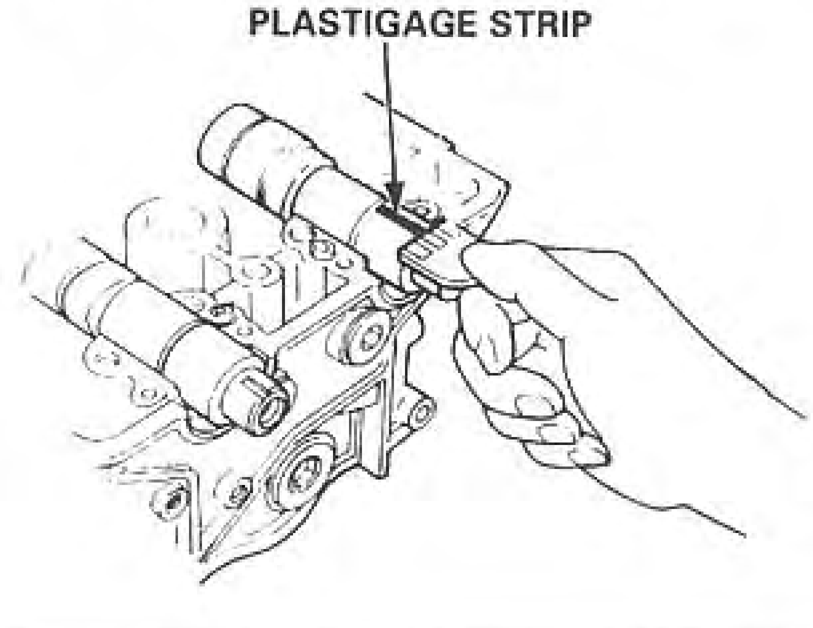
7. Place a plastigage strip across each journal.

8. Install the camshaft holders, and then tighten the bolts to the specified torque as shown in the left column on this page.

   NOTE: Do not rotate camshafts during inspection.

9. Remove the camshaft holders. Measure widest portion of plastigage strip on each journal.

   Camshaft-to-Holder Oil Clearance:
   Standard (New): 0.050 – 0.089 mm (0.0020 – 0.0035 in)
   Service Limit: 0.15 mm (0.006 in)



(cont'd)

Camshafts

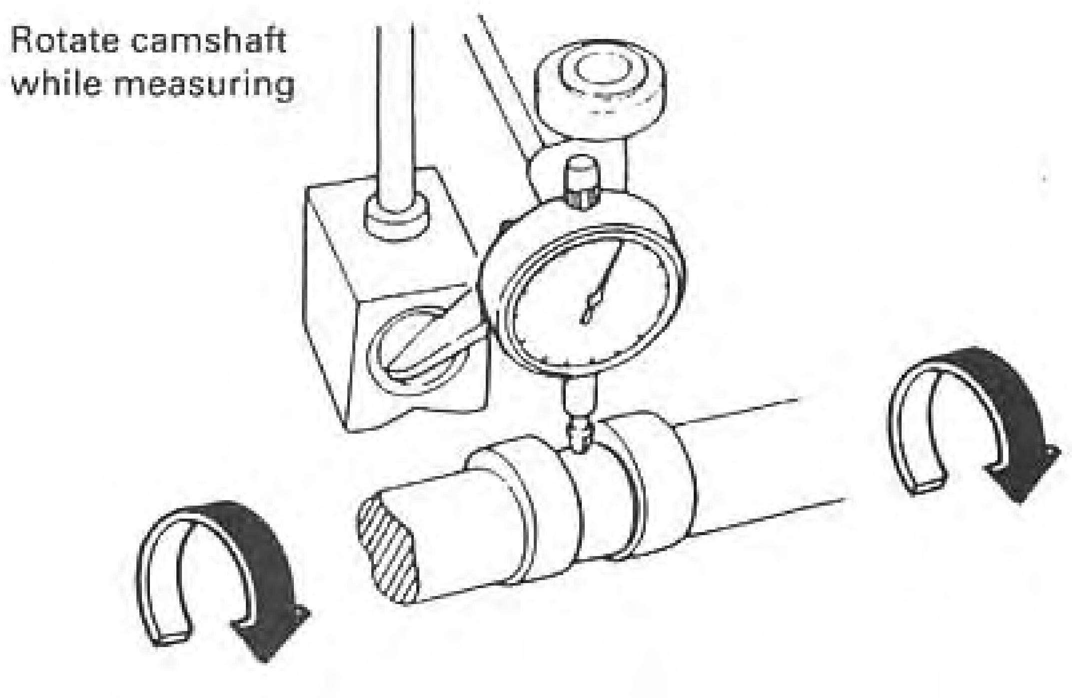
Inspection (cont'd)

10. If camshaft-to-holder oil clearance is out of tolerance:

    — And camshaft has already been replaced, you must replace the cylinder head.

    — If camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

    Camshaft Total Runout:
    Standard (New): 0.03 mm (0.001 in) max.
    Service Limit: 0.04 mm (0.002 in)



— If the total runout of the camshaft is within tolerance, replace the cylinder head.
— If the total runout is out of tolerance, replace the camshaft and recheck. If the oil clearance is still out of tolerance, replace the cylinder head.

11. Check cam lobe wear.

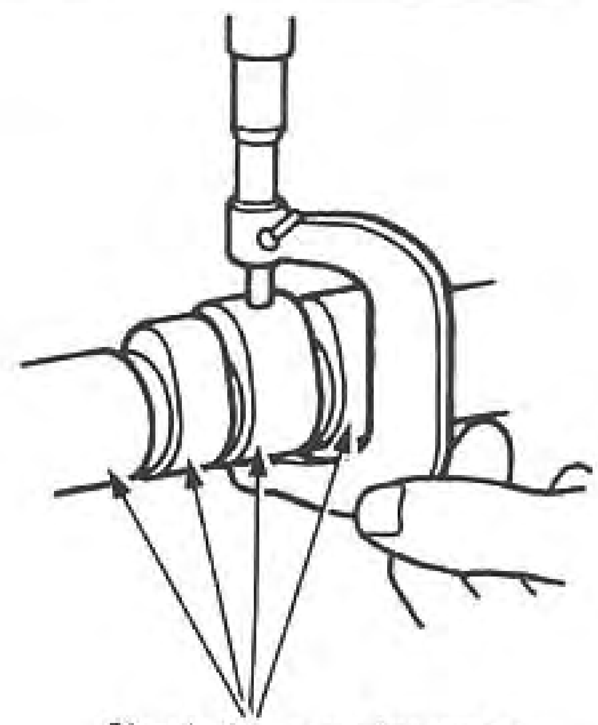
Cam Lobe Height Standard (New):

B18C1 engine:

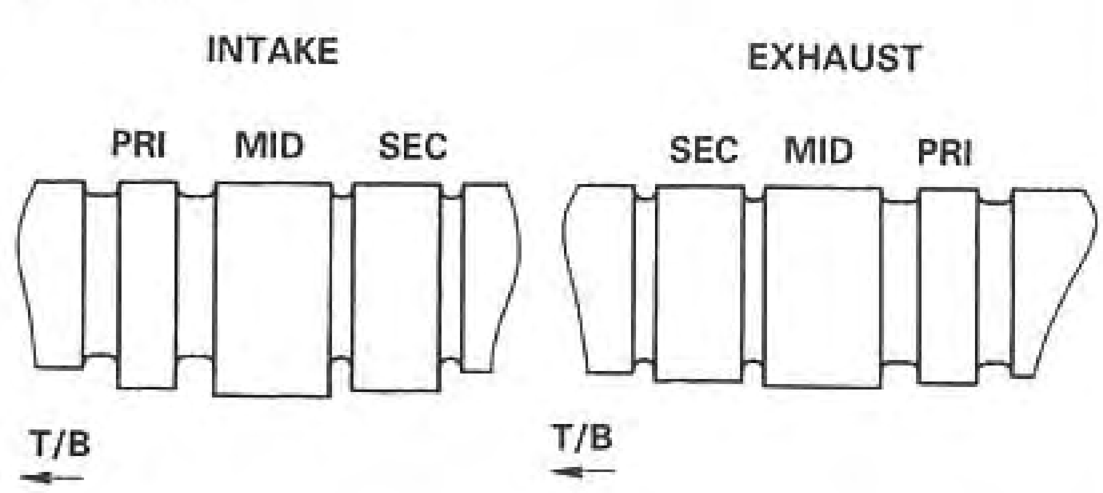
	INTAKE	EXHAUST
PRIMARY	33.411 mm (1.3154 in)	33.111 mm (1.3036 in)
MID	36.377 mm (1.4322 in)	35.720 mm (1.4063 in)
SECONDARY	34.547 mm (1.3601 in)	34.381 mm (1.3536 in)

B18C5 engine:

	INTAKE	EXHAUST
PRIMARY	33.088 mm (1.3027 in)	32.785 mm (1.2907 in)
MID	36.865 mm (1.4514 in)	36.333 mm (1.4304 in)
SECONDARY	34.732 mm (1.3674 in)	34.691 in (1.3658 in)



Cam Position

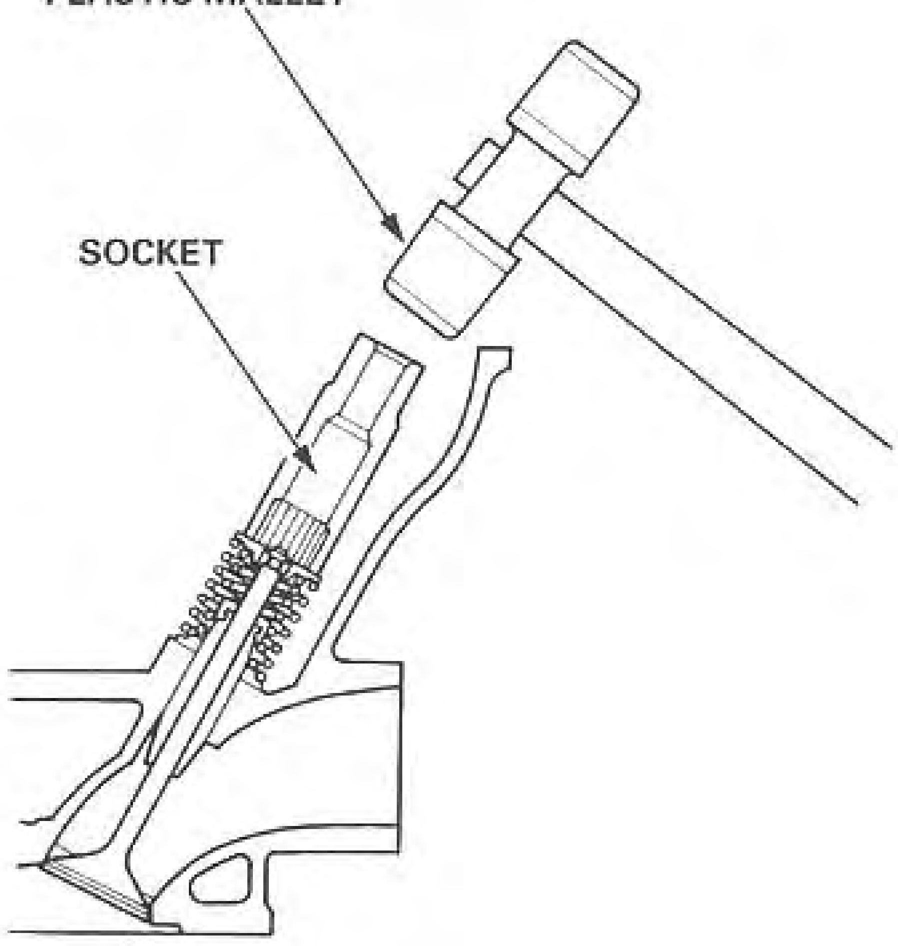


T/B: TIMING BELT
PRI: PRIMARY
MID: MID
SEC: SECONDARY

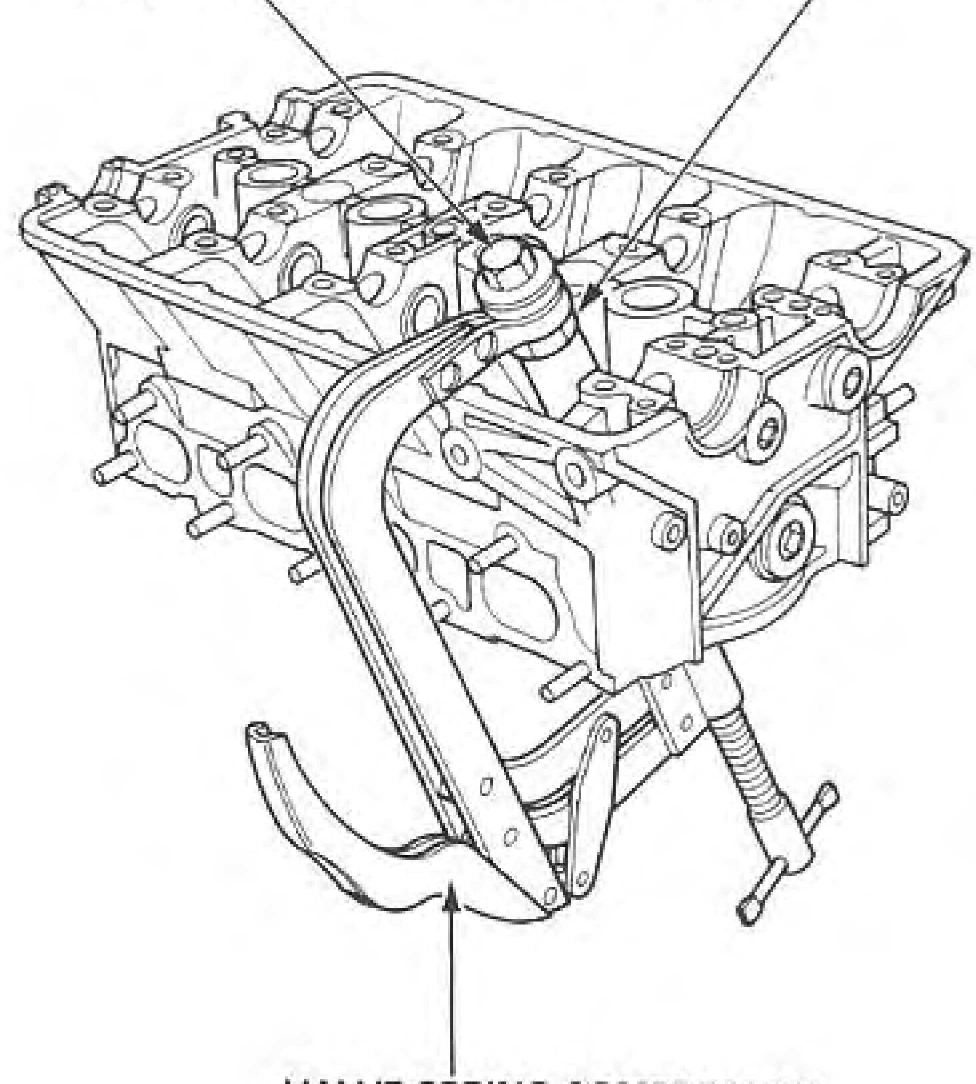
Removal

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Using an appropriate-sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers before installing the valve spring compressor.



2. Install spring compressor. Compress spring and remove valve keeper.

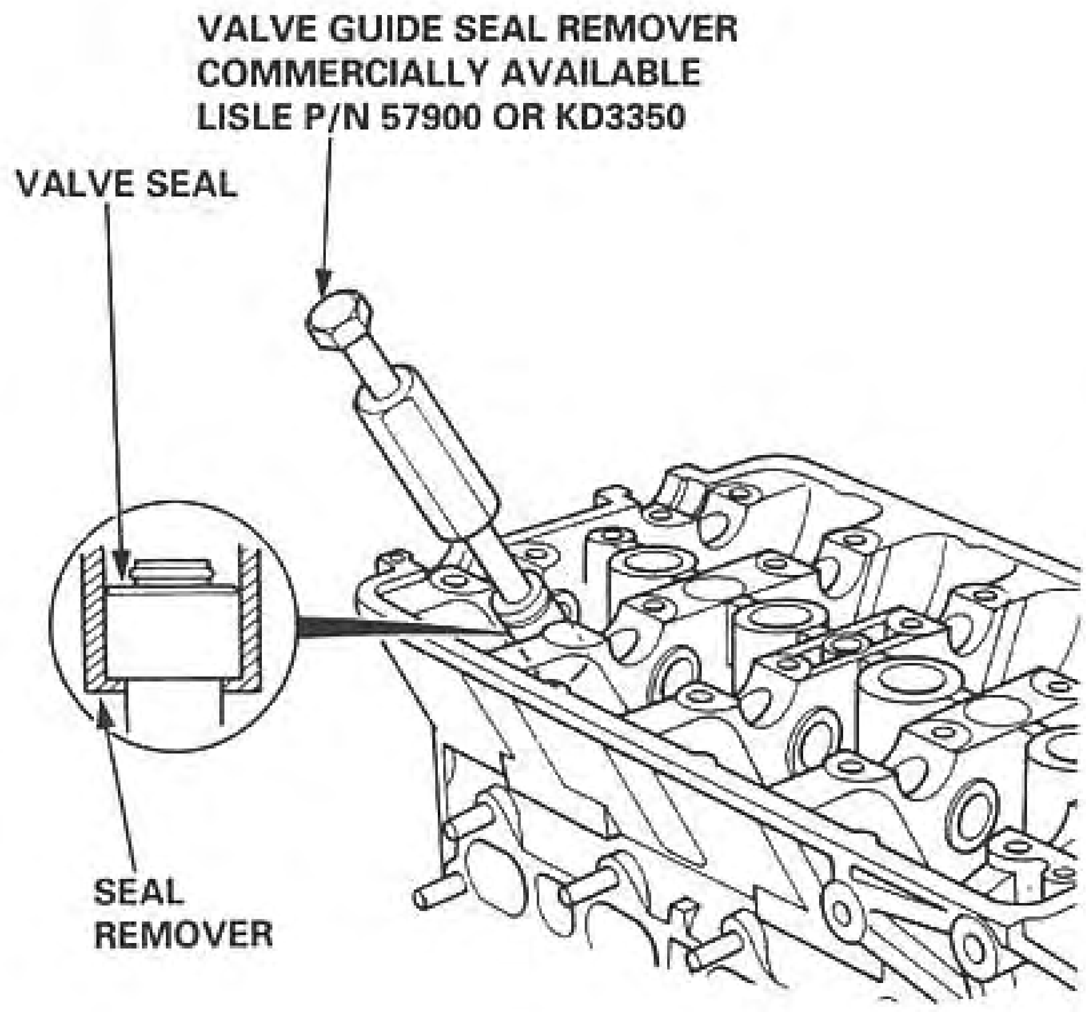


(cont'd)

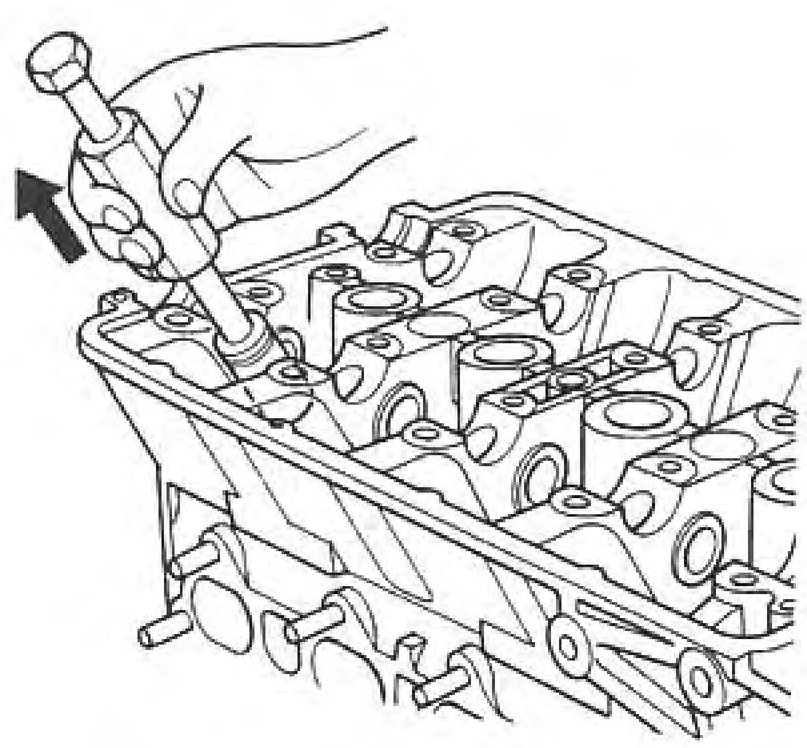
Valves, Valve Springs and Valve Seals

Removal (cont'd)

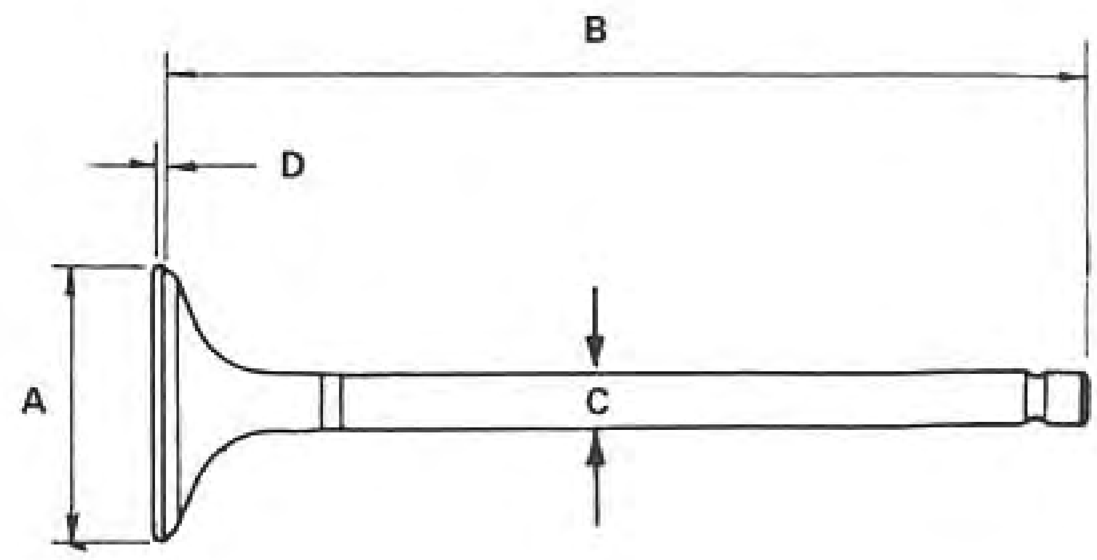
3. Install the special tool as shown.



4. Remove the valve guide seal.



Valve Dimensions



Intake Valve

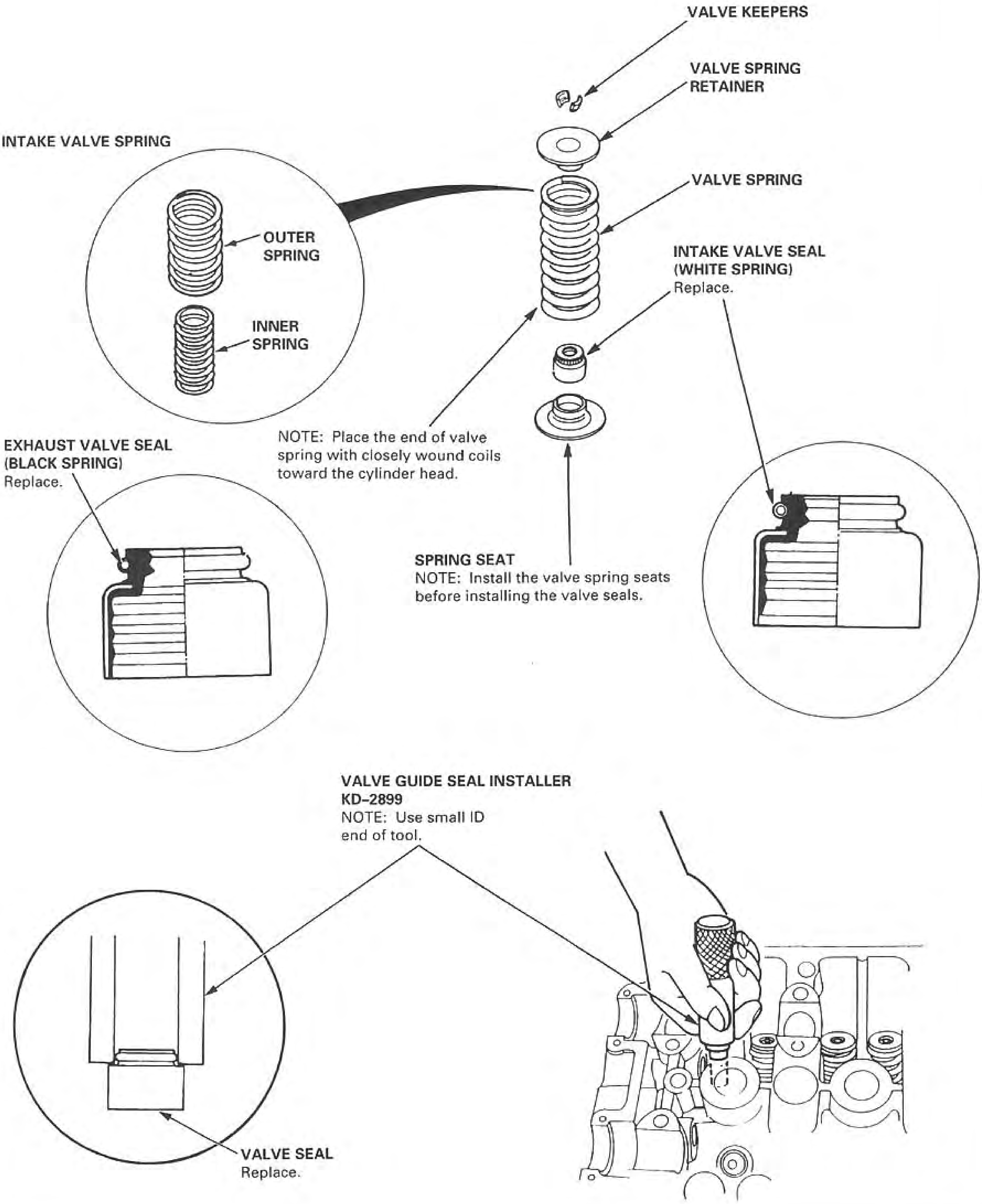
A Standard (New):	32.90 – 33.10 mm (1.295 – 1.303 in)
B Standard (New):	101.00 – 101.30 mm (3.976 – 3.988 in)
C Standard (New):	5.475 – 5.485 mm (0.2156 – 0.2159 in)
C Service Limit:	5.445 (0.2144 in)
D Standard (New):	B18C1 engine: 1.05 – 1.35 mm (0.041 – 0.053 in) B18C5 engine: 0.60 – 0.90 mm (0.024 – 0.035 in)
D Service Limit:	B18C1 engine: 0.85 mm (0.033 in) B18C5 engine: 0.40 mm (0.016 in)

Exhaust Valve

A Standard (New):	27.90 – 28.10 mm (1.098 – 1.106 in)
B Standard (New):	100.60 – 100.90 mm (3.961 – 3.972 in)
C Standard (New):	5.450 – 5.460 mm (0.2146 – 0.2150 in)
C Service Limit:	5.420 (0.2134 in)
D Standard (New):	1.65 – 1.95 mm (0.065 – 0.077 in)
D Service Limit:	1.45 mm (0.057 in)

Installation Sequence (B18C1 engine)

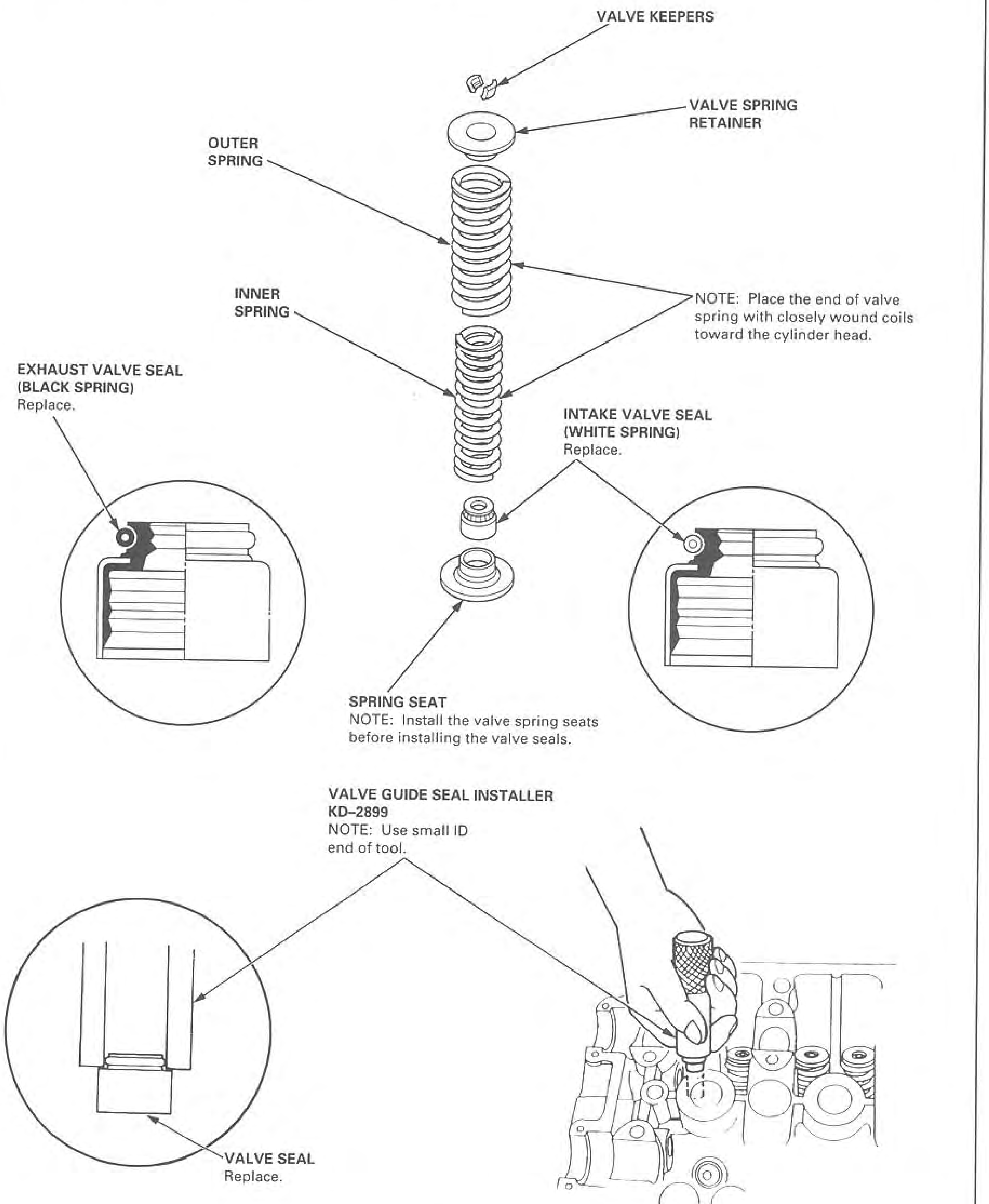
NOTE: Exhaust and intake valve seals are NOT interchangeable.



Valves, Valve Springs and Valve Seals

Installation Sequence (B18C5 engine)

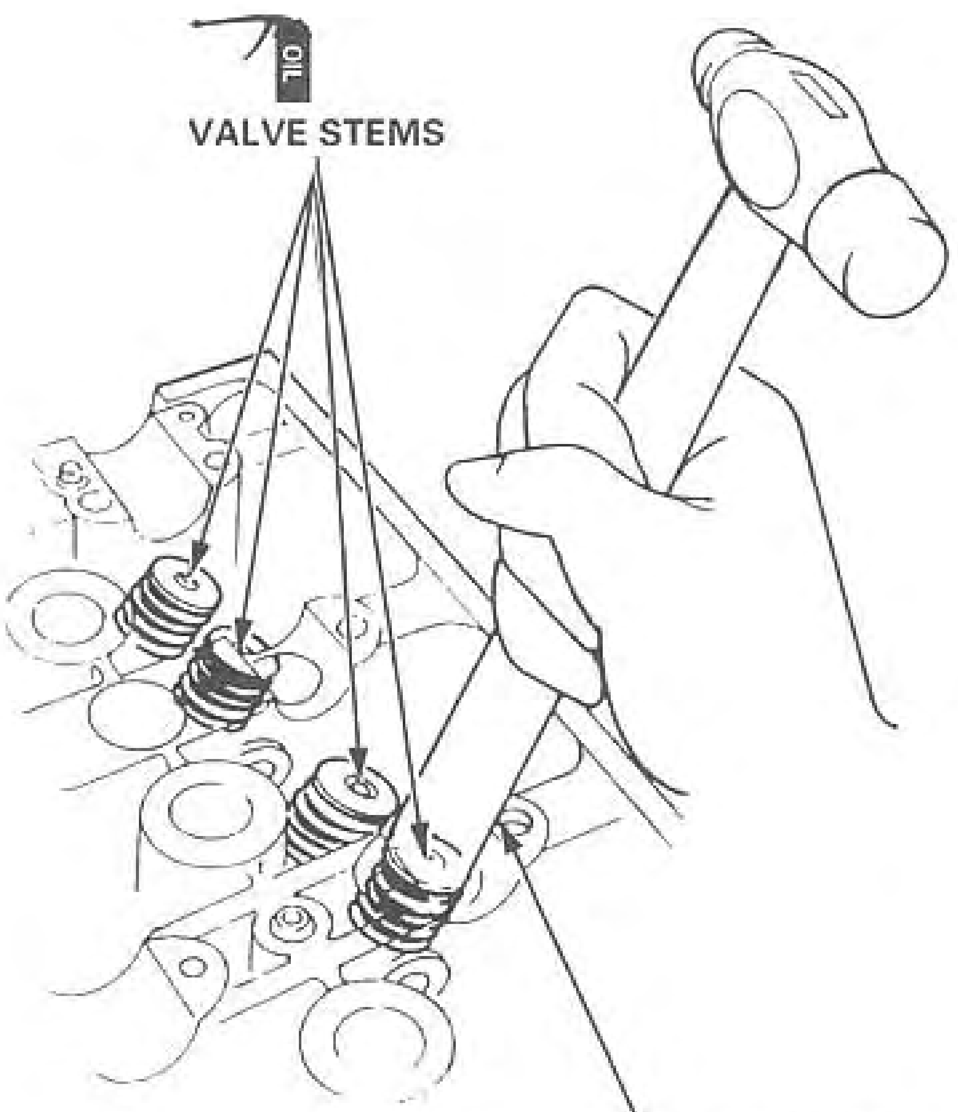
NOTE: Exhaust and intake valve seals are NOT interchageable.



Valve Installation

- When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.
- When valves and springs are in place, lightly tap the end of each valve stem two or three times to ensure proper seating of valve and valve keepers (use hammer handle).

NOTE: Tap the valve stem only along its axis so you do not bend the stem.



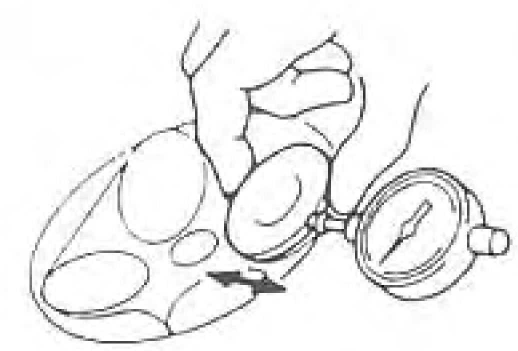
Valve Movement

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:
Standard (New): 0.05 – 0.11 mm (0.002 – 0.004 in)
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:
Standard (New): 0.10 – 0.16 mm (0.004 – 0.006 in)
Service Limit: 0.22 (0.009 in)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using a new valve.
- If measurement is now within the service limit, reassemble using a new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.
Take the measurements in three places along the valve stem and three places inside the valve guide.
The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

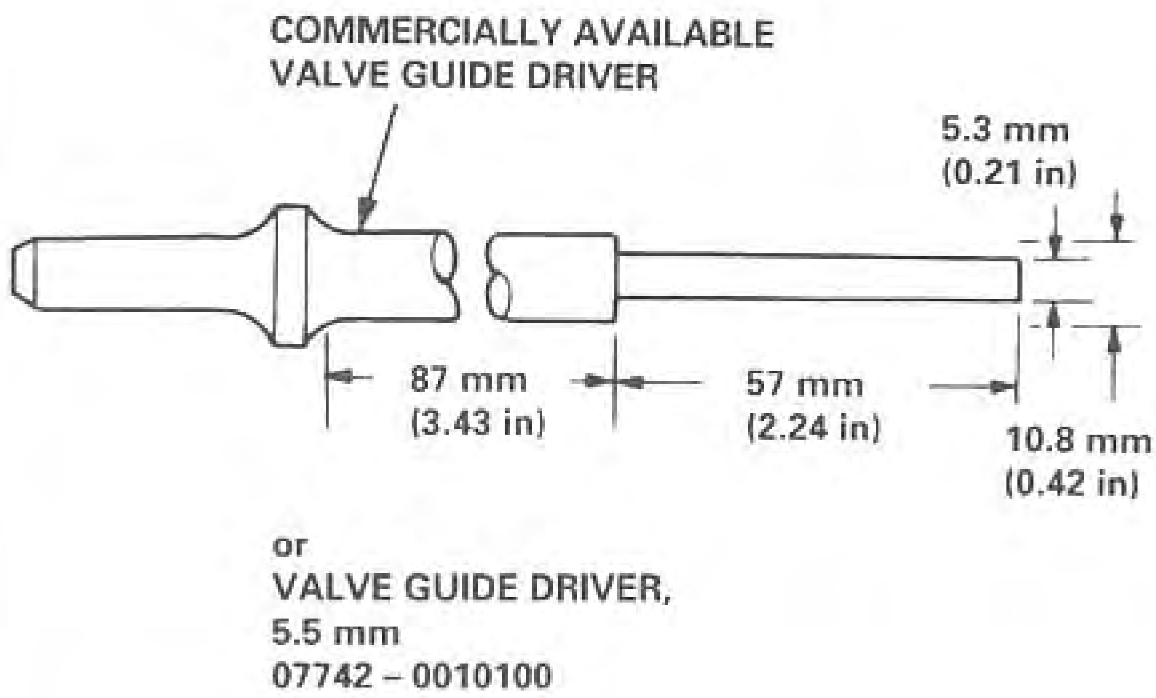
Intake Valve Stem-to-Guide Clearance:
Standard (New): 0.025 – 0.055 mm (0.0010 – 0.0022 in)
Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:
Standard (New): 0.050 – 0.080 mm (0.0020 – 0.0031 in)
Service Limit: 0.11 mm (0.004 in)

Valve Guides

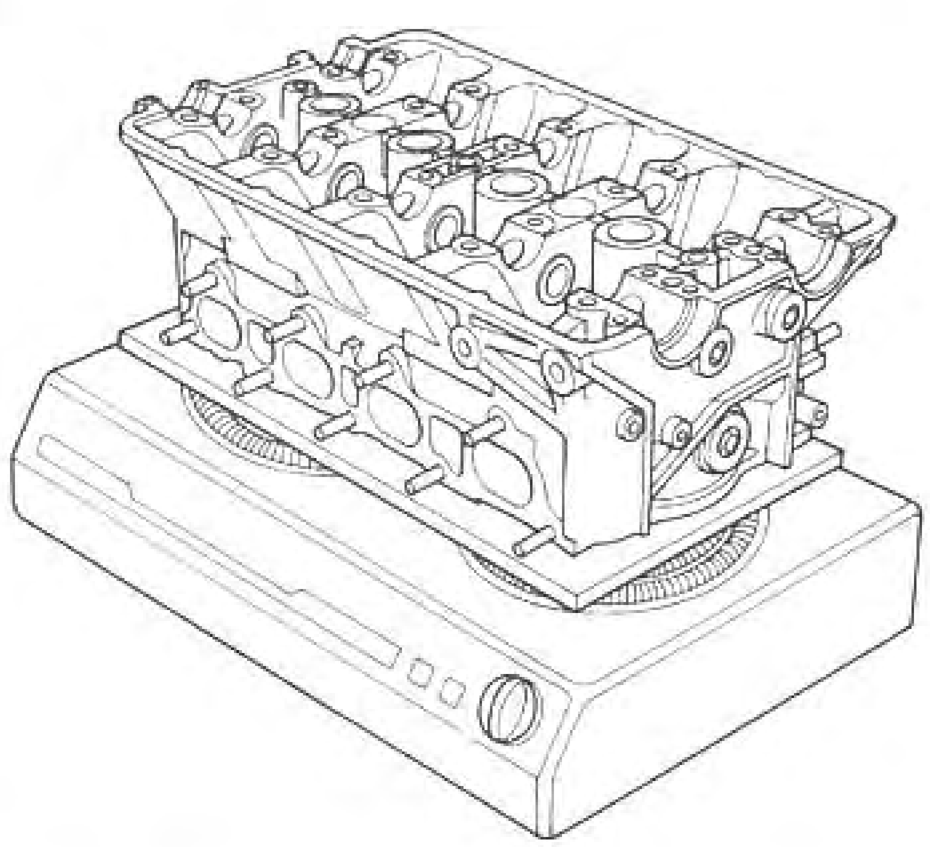
Replacement

1. As illustrated below use a commercially available air-impact valve guide driver attachment modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



2. Select the proper replacement guides and chill them in the freezer section of a refrigerator for about an hour.

3. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a cooking thermometer.

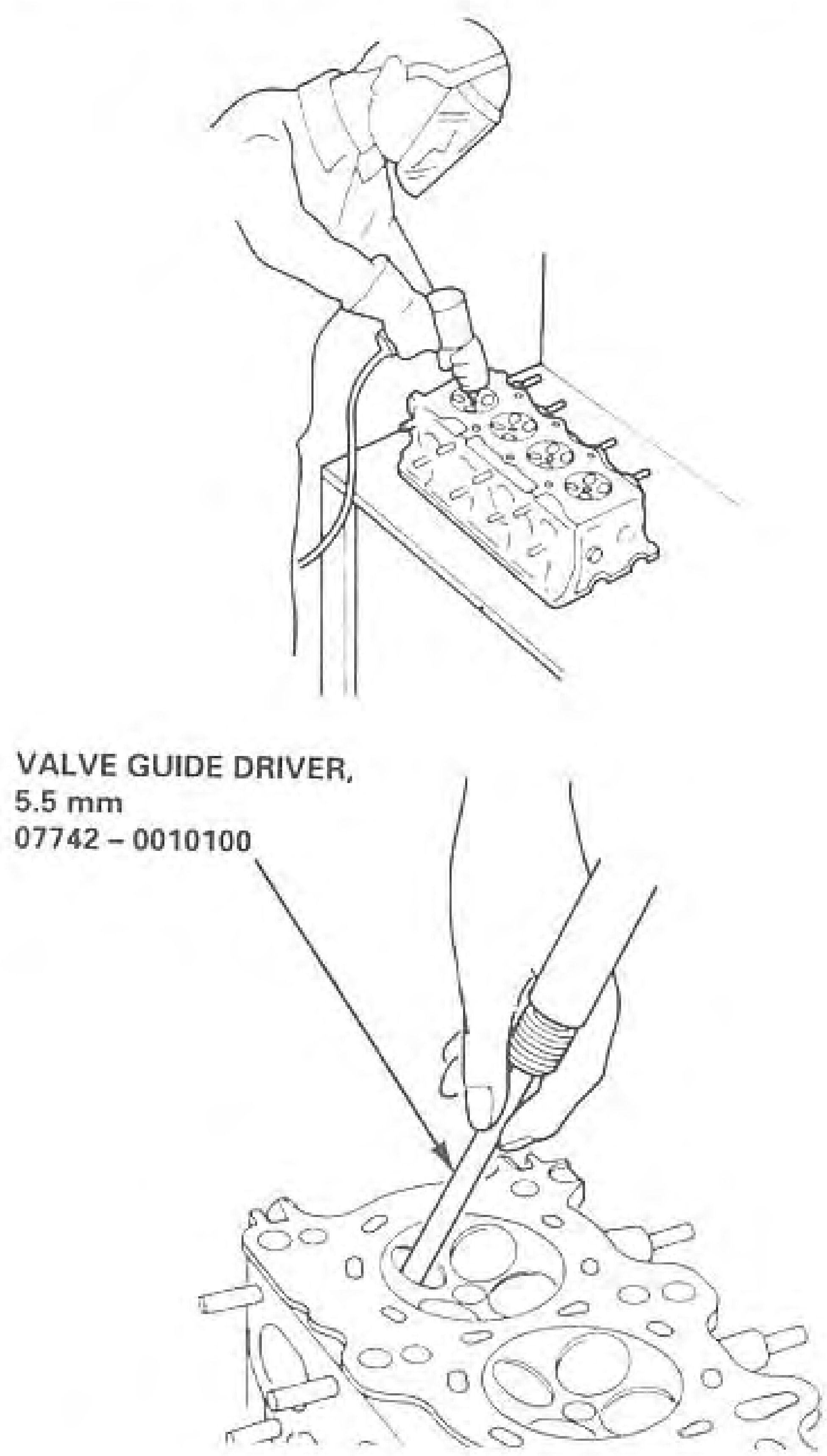


CAUTION:
- **Do not use a torch; it may warp the head.**
- **Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.**
- **To avoid burns, use heavy gloves when handling the heated cylinder head.**

4. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in) towards the combustion chamber. This will knock off some of the carbon and make removal easier.

CAUTION:
- **Always wear safety goggles or a face shield when driving valve guides.**
- **Hold the air hammer directly in line with the valve guide to prevent damaging the driver.**

5. Turn the head over and drive the guide out toward the camshaft side of head.

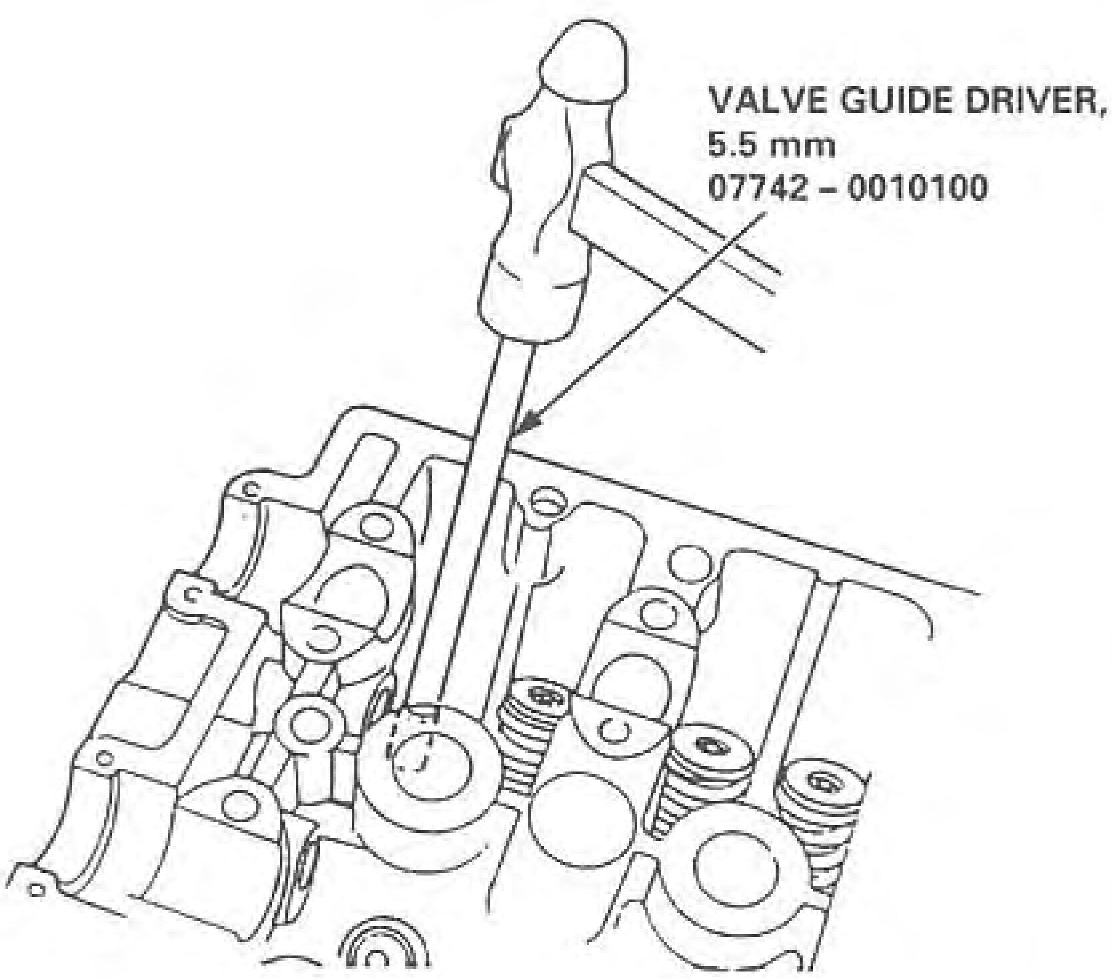


If a valve guide still won't move, drill it out with a 8.0 mm (5/16 in) bit, then try again.

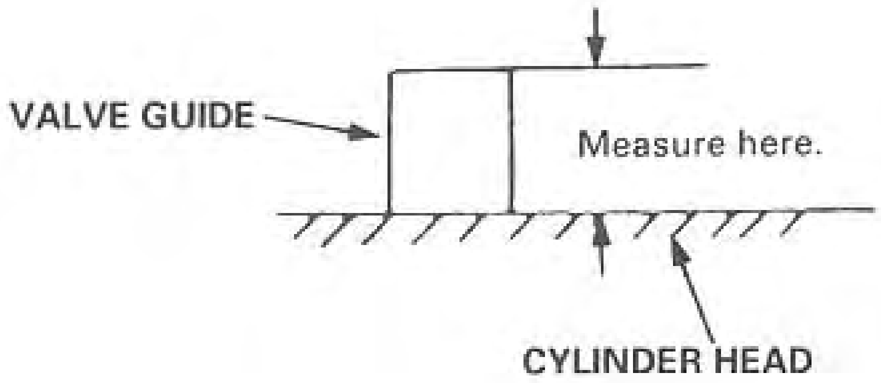
CAUTION: **Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.**

6. Remove the new guide(s) from the freezer, one at a time, as you need them.

7. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height. If you have all 16 guides to do, you may have to reheat the head.



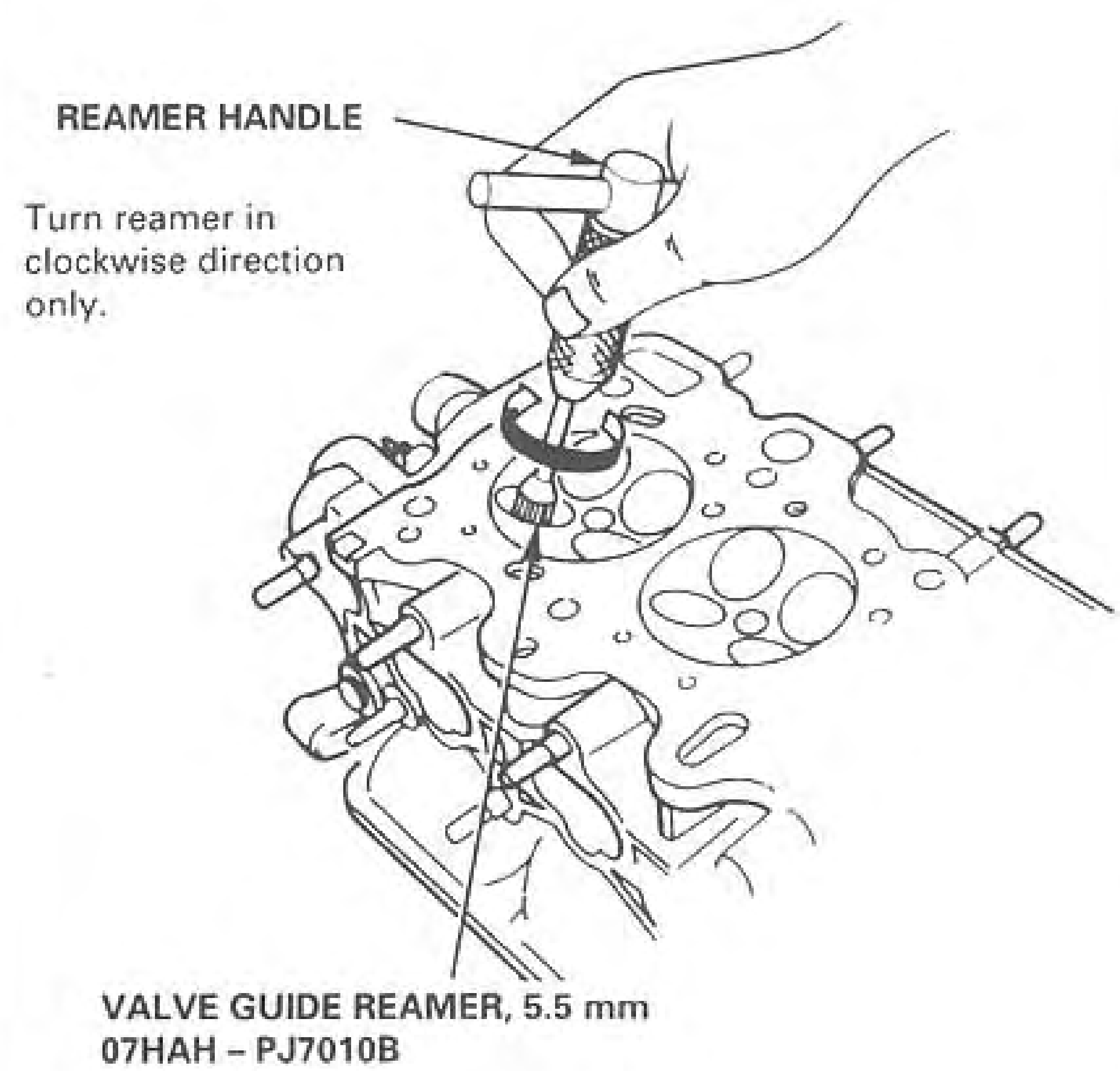
Valve Guide Installed Height:
Intake: 12.55 – 13.05 mm (0.494 – 0.514 in)
Exhaust: 12.55 – 13.05 mm (0.494 – 0.514 in)



Reaming

NOTE: For new valve guides only.

1. Coat both reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with a valve (see page 6-73).
   - Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

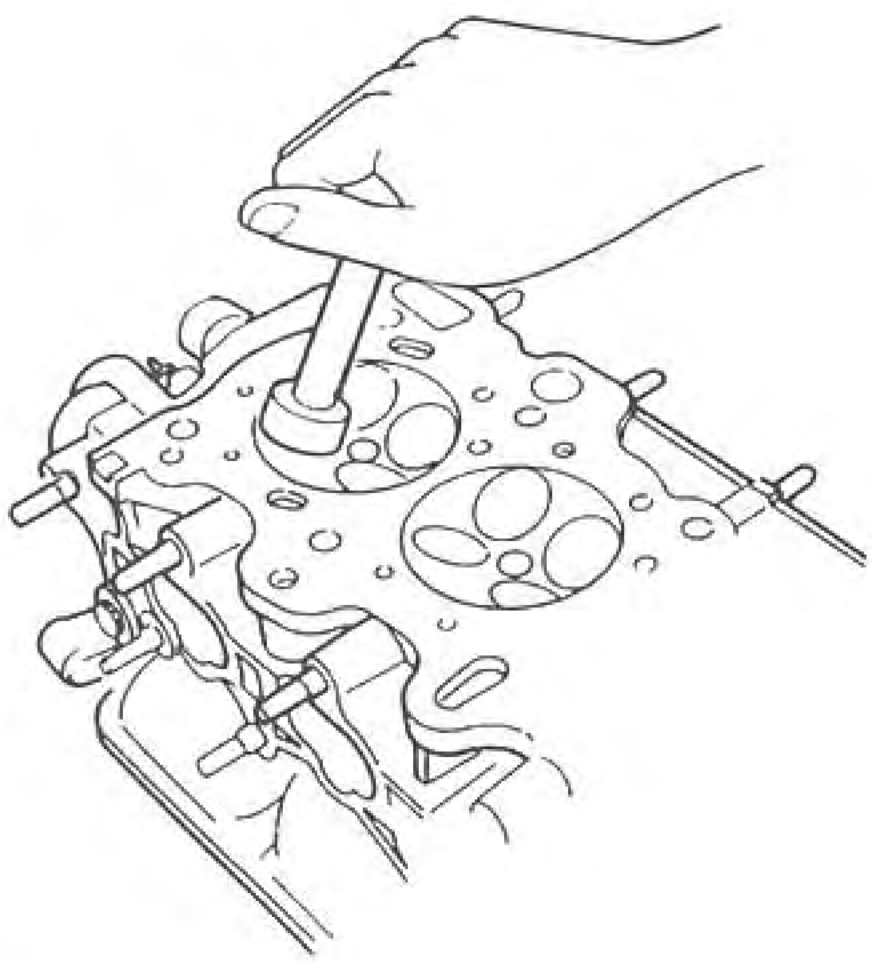


Valve Seats

Reconditioning

1. Renew the valve seats in the cylinder head using valve seat cutters.

   NOTE: If guides are worn, replace them before cutting the valve seats.

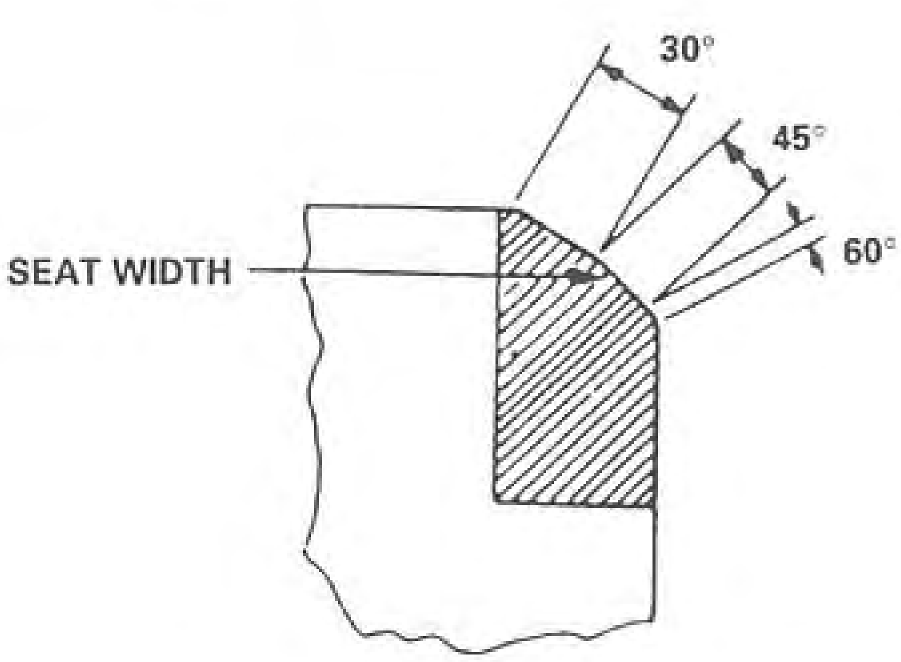


2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.

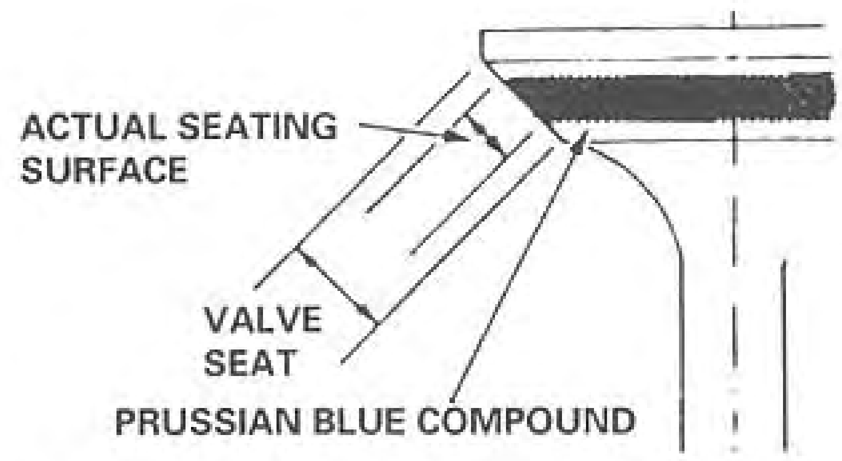
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check width of seat and adjust accordingly.

4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width:
   Standard: 1.25 – 1.55 mm (0.049 – 0.061 in)
   Service Limit: 2.0 mm (0.08 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue Compound to the valve face, and insert valve in original location in the head, then lift it and snap it closed against the seat several times.

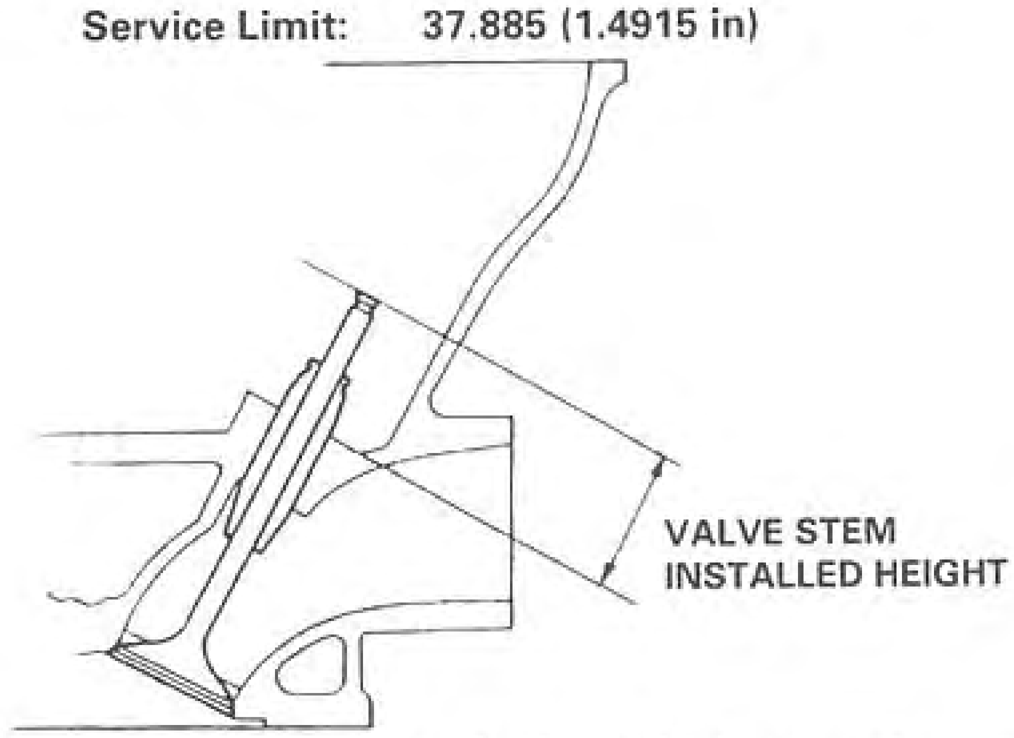


6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in the head and measure valve stem installed height.

   Intake Valve Stem Installed Height:
   Standard (New): 37.465 – 37.935 mm (1.4750 – 1.4935 in)
   Service Limit: 38.185 mm (1.5033 in)
   Exhaust Valve Stem Installed Height:
   Standard (New): 37.165 – 37.635 mm (1.4632 – 1.4817 in)
   Service Limit: 37.885 (1.4915 in)



8. If valve stem installed height is over the service limit, replace valve and recheck. If still over the service limit, replace cylinder head; the valve seat in the head is too deep.

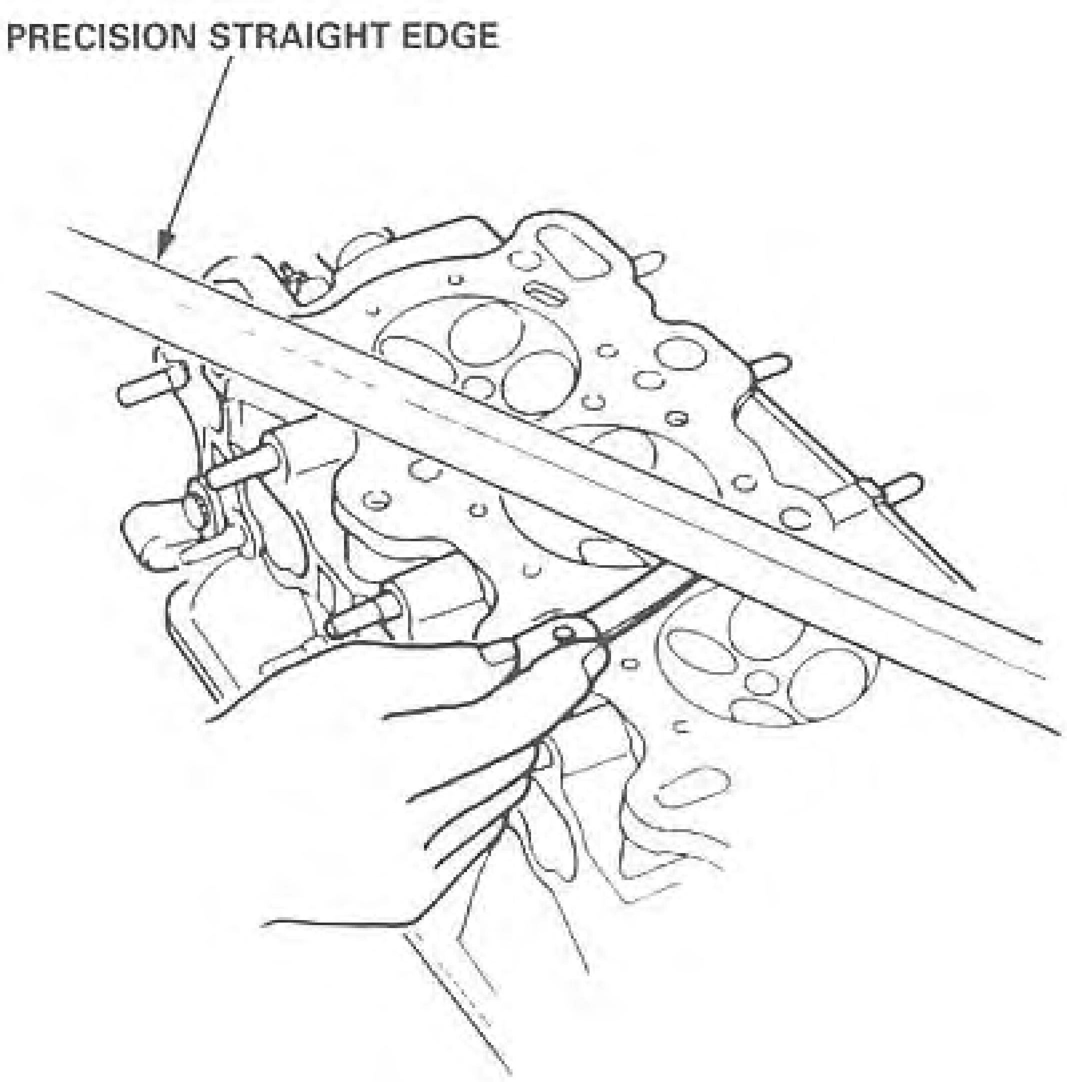
Cylinder Head

Warpage

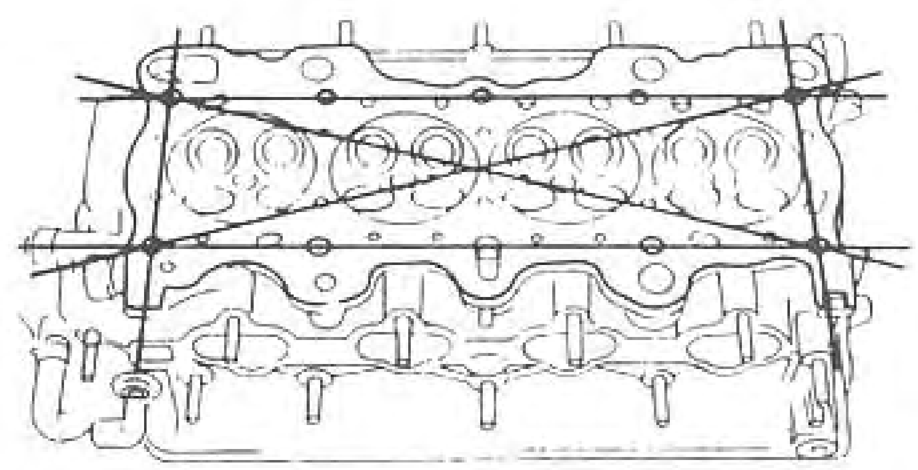
NOTE: If camshaft-to-holder oil clearances (see page 6-65) are not within specification, the head cannot be resurfaced.

If camshaft-to-holder oil clearances are within specifications, check the head for warpage.

- If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 142 mm (5.59 in).



Measure along edges, and 3 ways across center.



Cylinder Head Height:
Standard (New): 141.95 – 142.05 mm
(5.589 – 5.593 in)

Cylinder Head

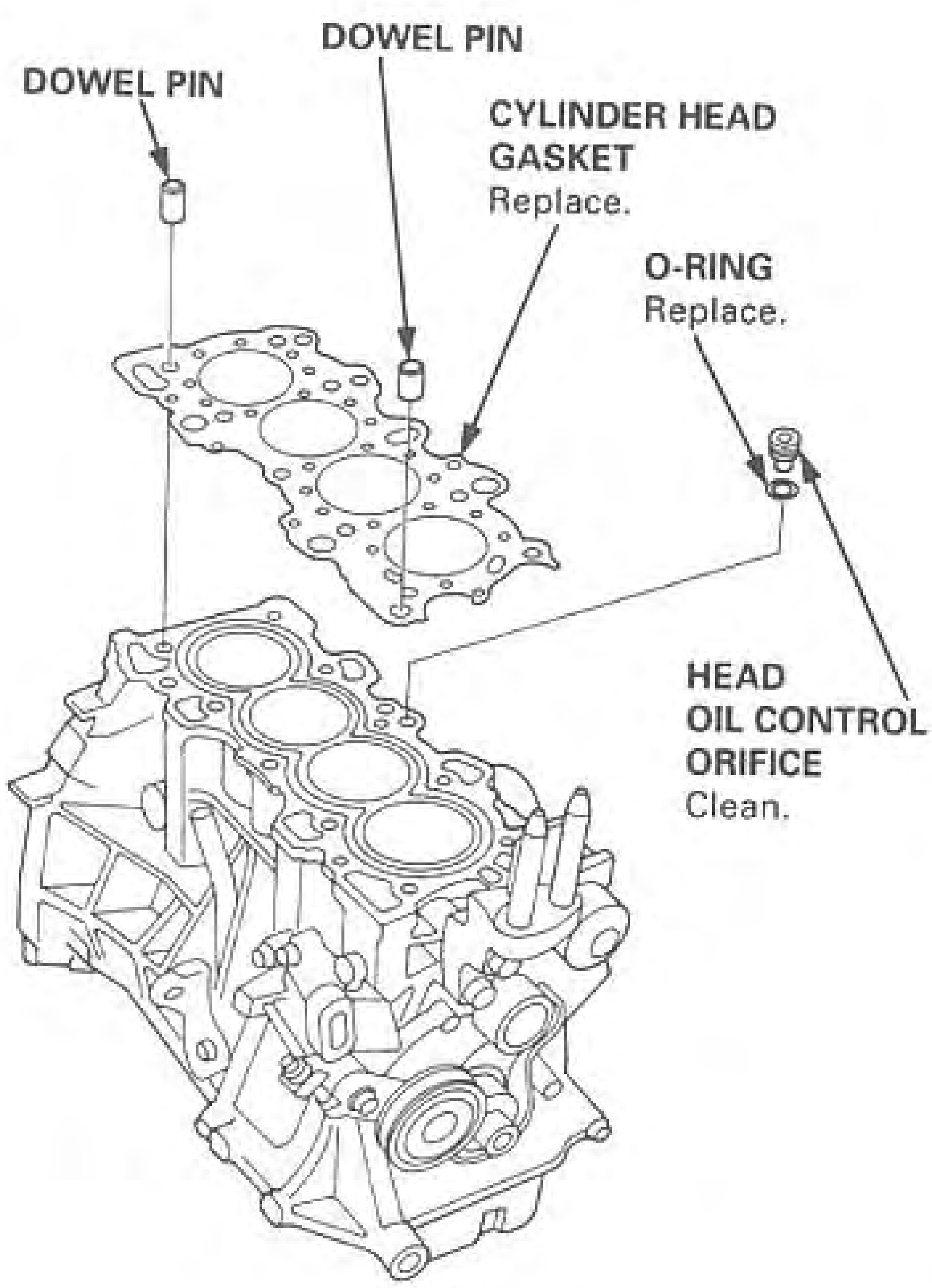
Installation

Install the cylinder head in the reverse order of removal:

NOTE:
- Always use a new head and manifold gasket.
- The cylinder head gasket is a metal gasket. Take care not to bend it.
- Rotate the crankshaft, set the No. 1 piston at TDC (page 6-51).
- Do not use the middle cover and lower cover for storing removed items.
- Clean the middle cover and lower cover before installation.
- Replace the washer when damaged or deteriorated.

1. Install the cylinder head gasket, dowel pins and the head oil control orifice on the cylinder block.

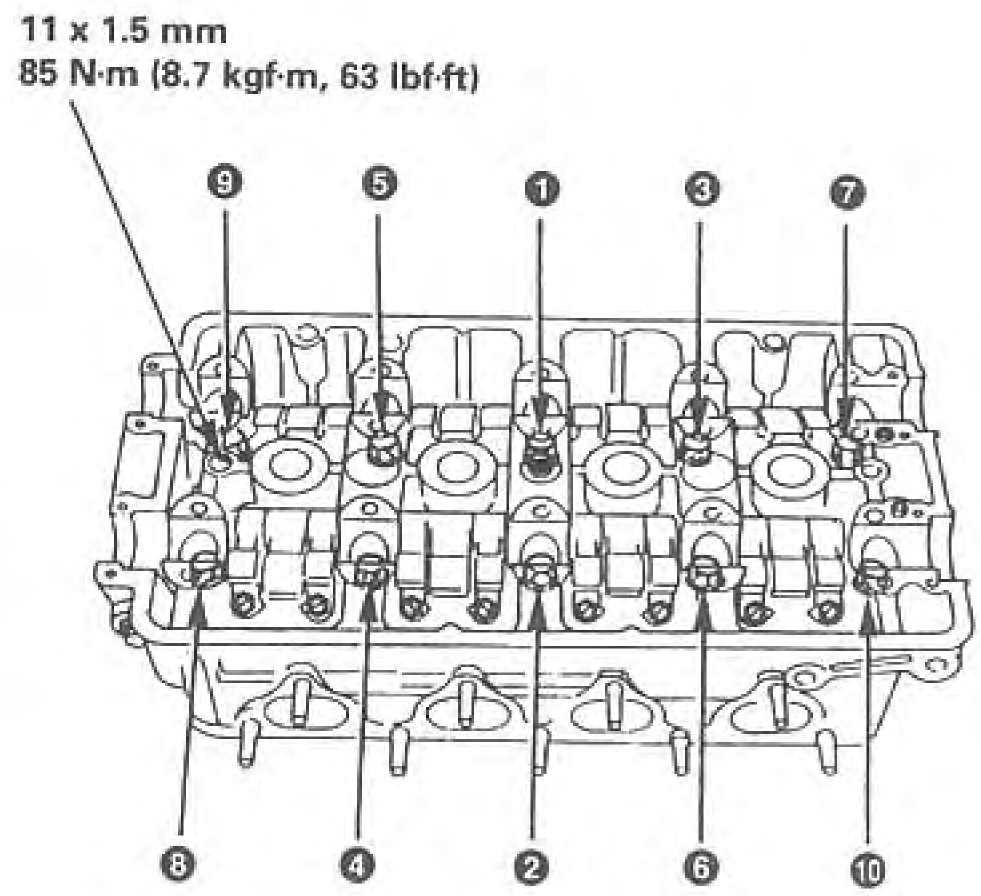
   NOTE: Clean the oil control orifice when installing.



2. Tighten cylinder head bolts in two steps. In the first step, tighten all bolts in sequence to about 29 N·m (3.0 kgf·m, 22 lbf·ft). In the final step, tighten in same sequence to 85 N·m (8.7 kgf·m, 63 lbf·ft).

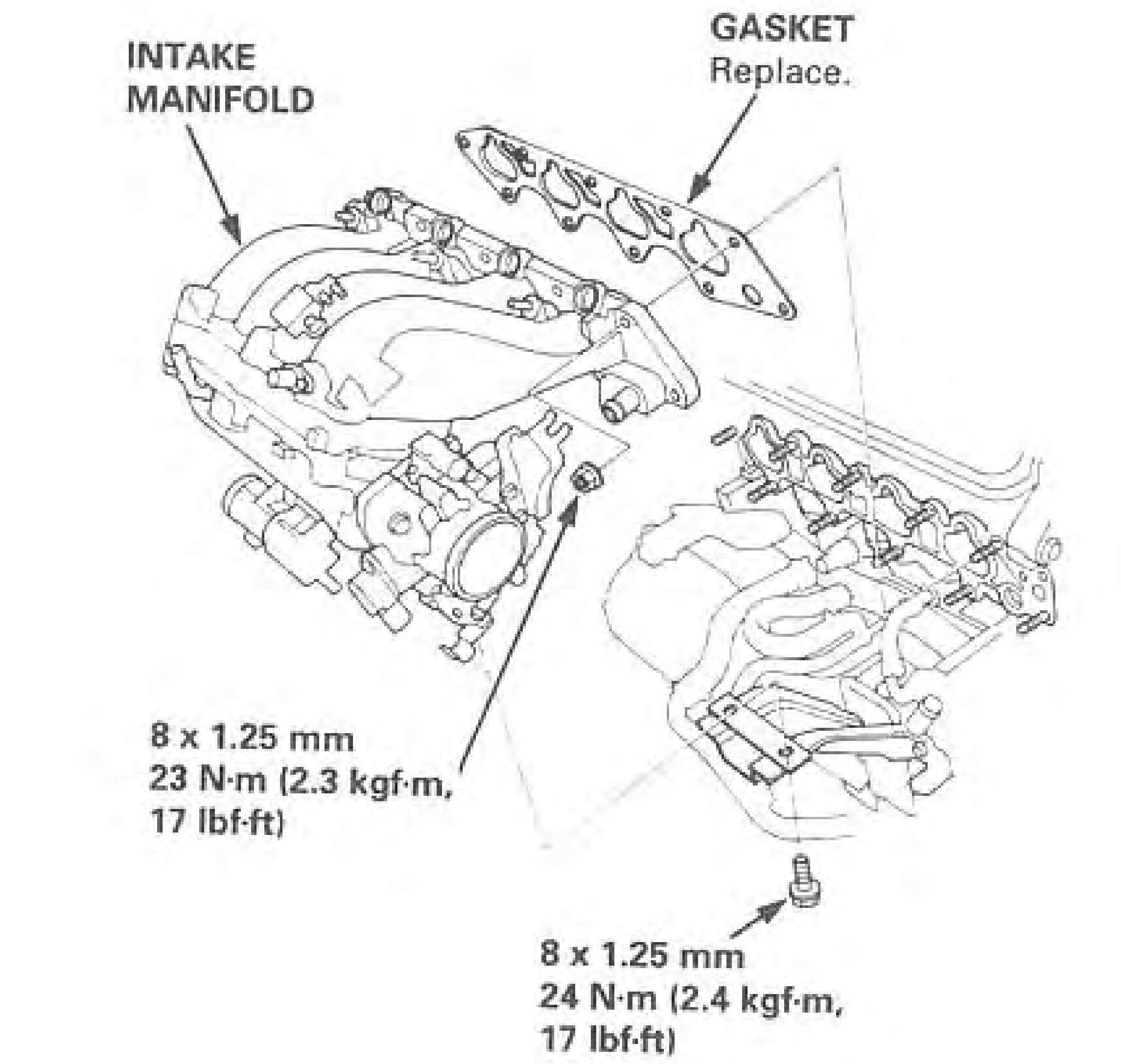
   NOTE: Apply clean engine oil to the bolt threads and under the bolt head.

CYLINDER HEAD BOLT TORQUE SEQUENCE

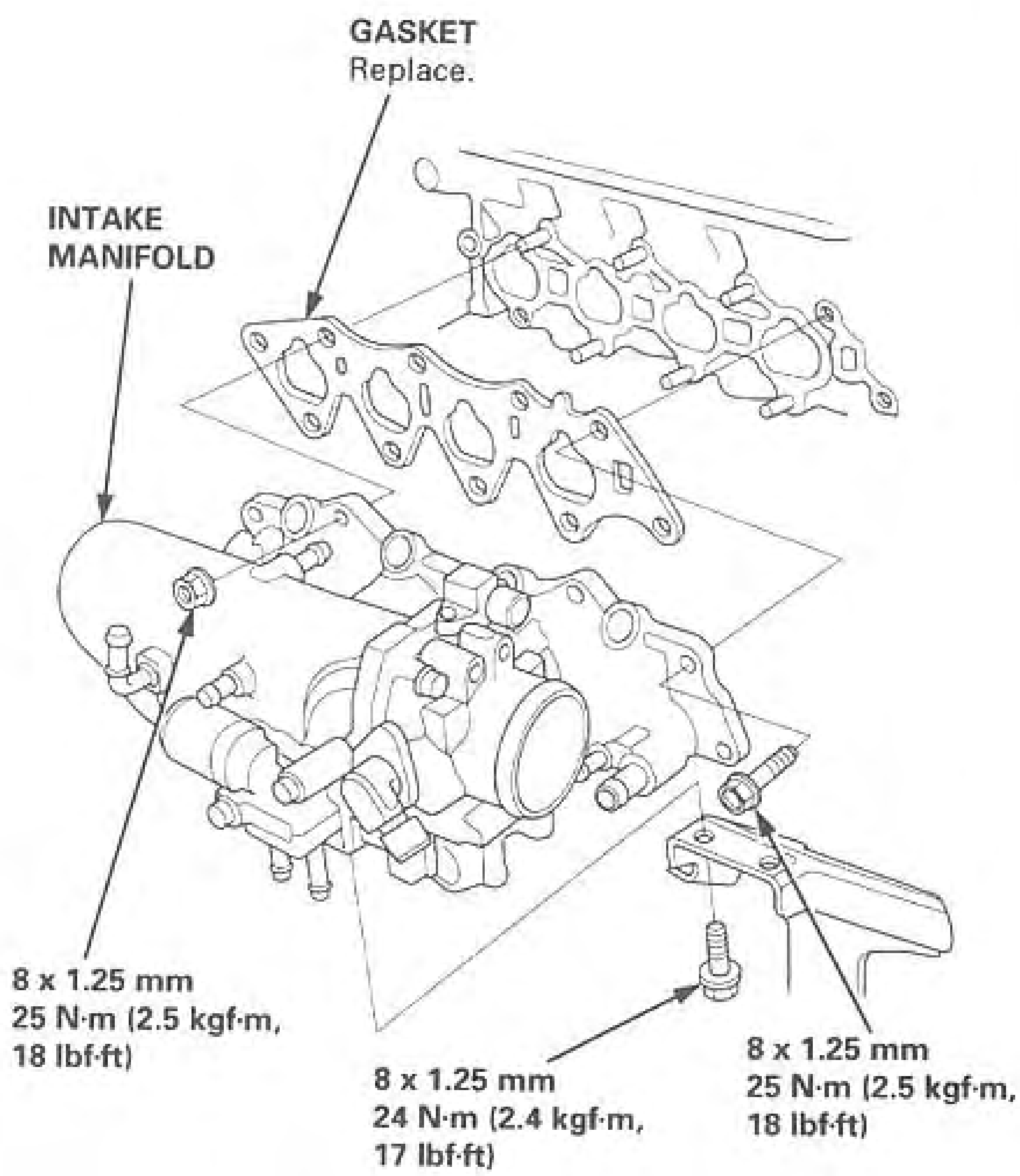


3. Install the intake manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nuts.

B18C1 engine:



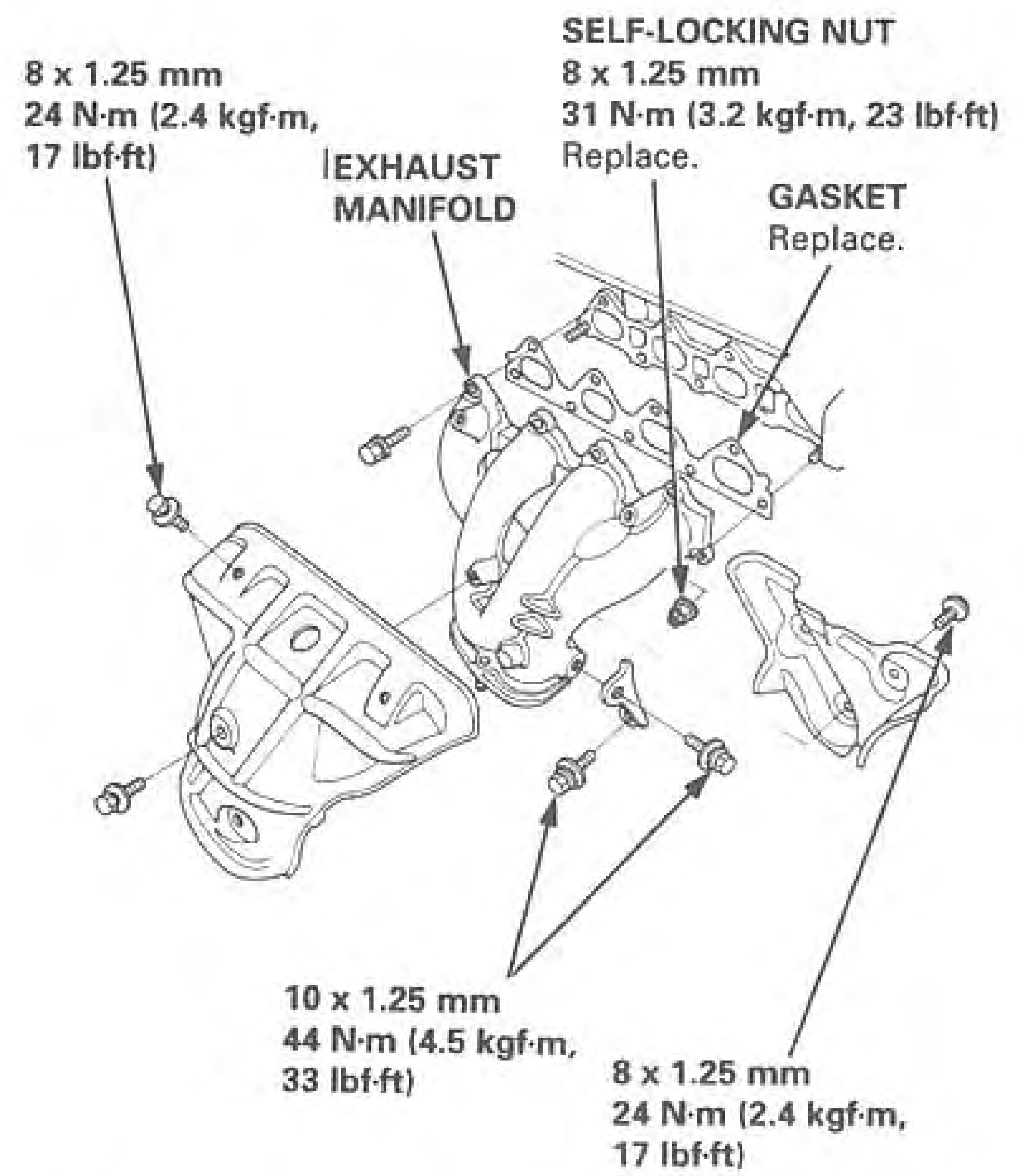
B18C5 engine:



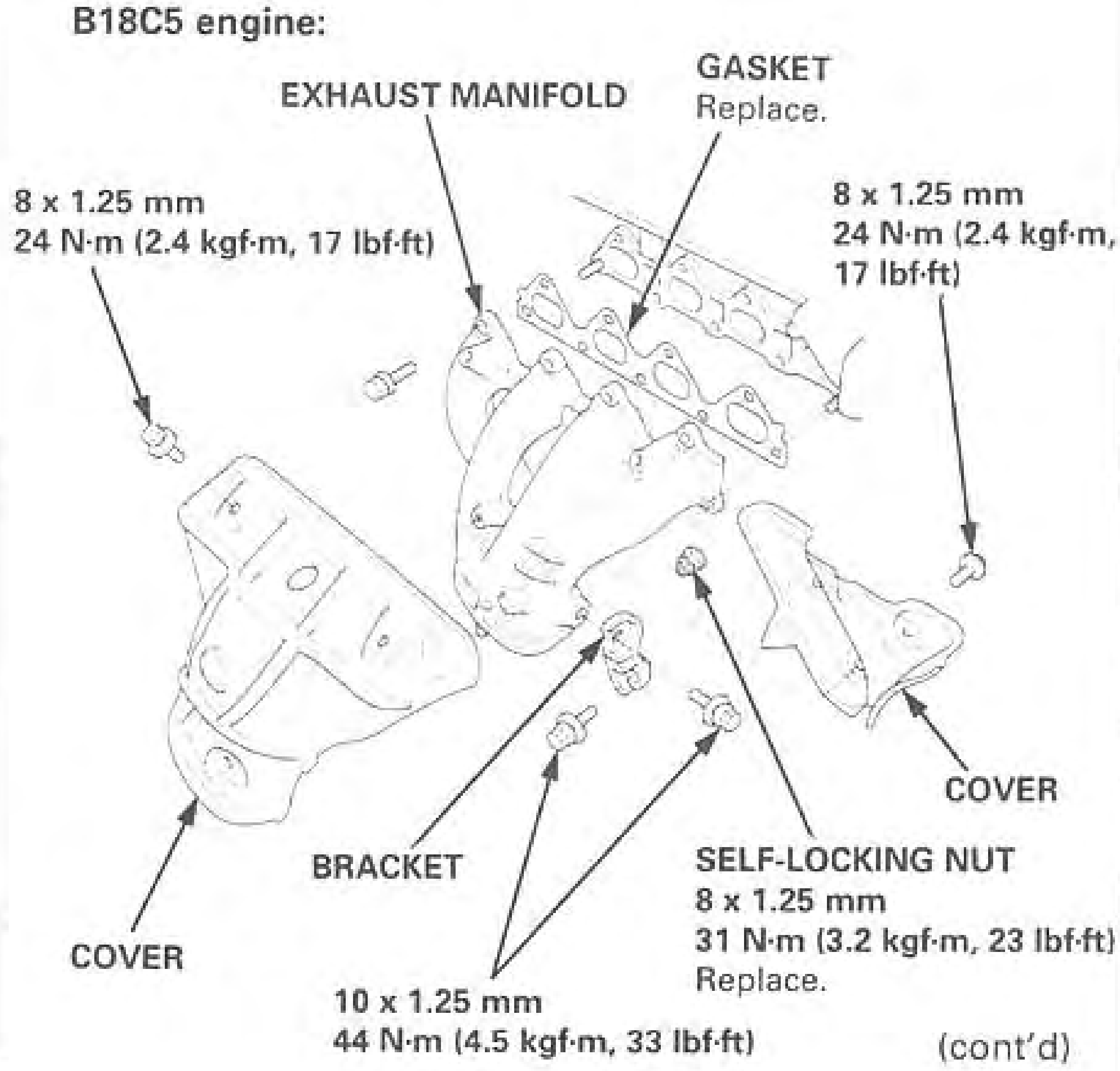
4. Install the exhaust manifold and tighten the new self-locking nuts in a crisscross pattern in two or three steps, beginning with the inner nuts.

- Use new self-locking nuts.

B18C1 engine:



B18C5 engine:



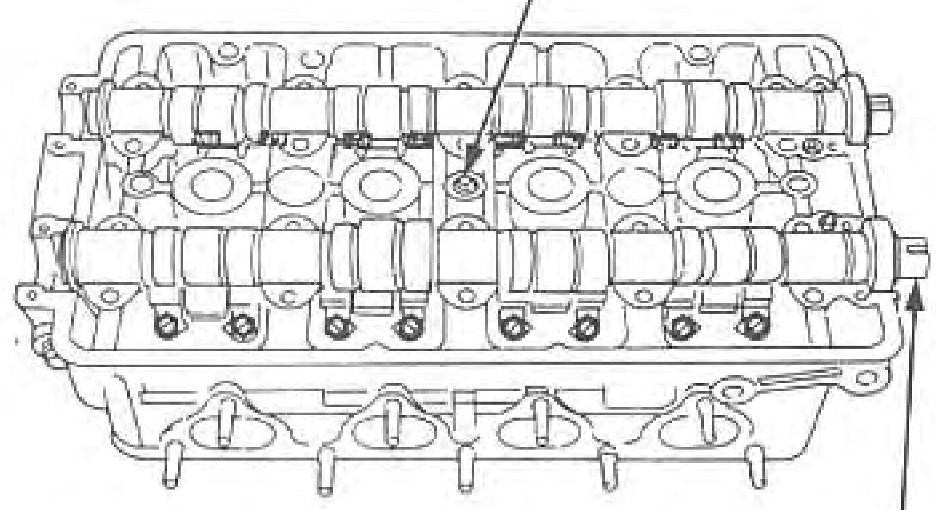
(cont'd)

Cylinder Head

Installation (cont'd)

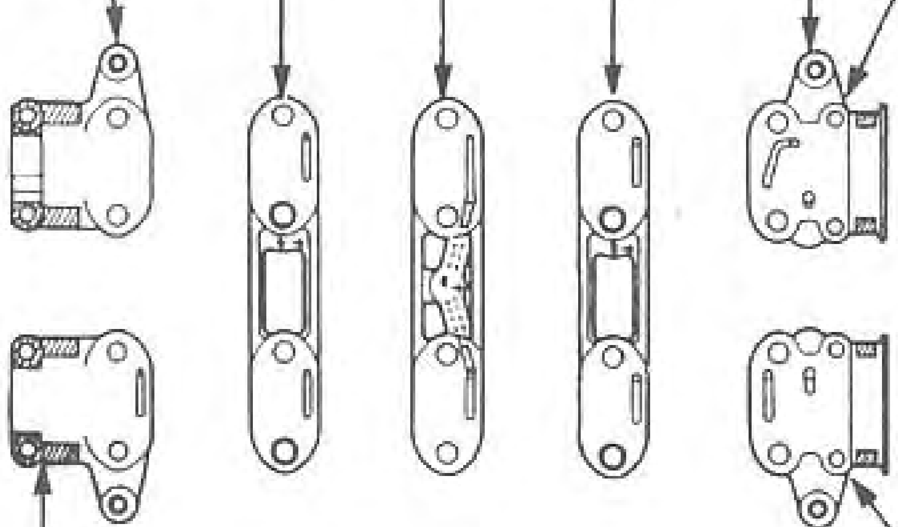
5. Install the camshafts and camshaft oil seals.

   NOTE:
   - Install the camshafts with keyway facing up.
   - Install the oil seal with the spring side facing in.
   - The oil seal housing surface should be dry.
   - Set the O-ring and dowel pin in the oil passage of the No. 3 camshaft holder.

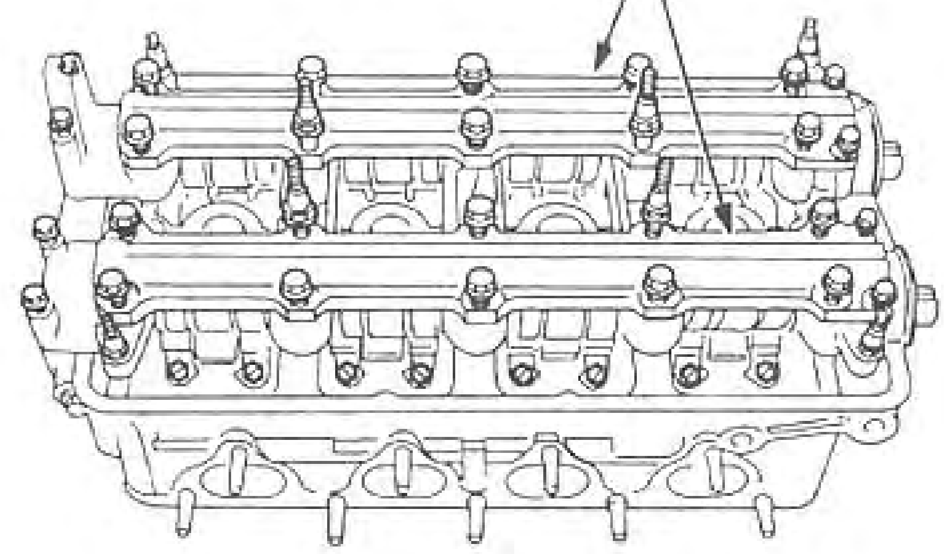


6. Apply liquid gasket to the head mating surface of the No. 1 and No. 5 camshaft holders on both the intake and exhaust side. Confirm that the camshaft keyways face up, then place those holders, together with the No. 2, No. 3 and No. 4 camshaft holders, on the cylinder head.

   NOTE:
   - The arrows marked on the camshaft holders should point to the timing belt.
   - Clean and dry the cylinder head mating surfaces before applying liquid gasket.

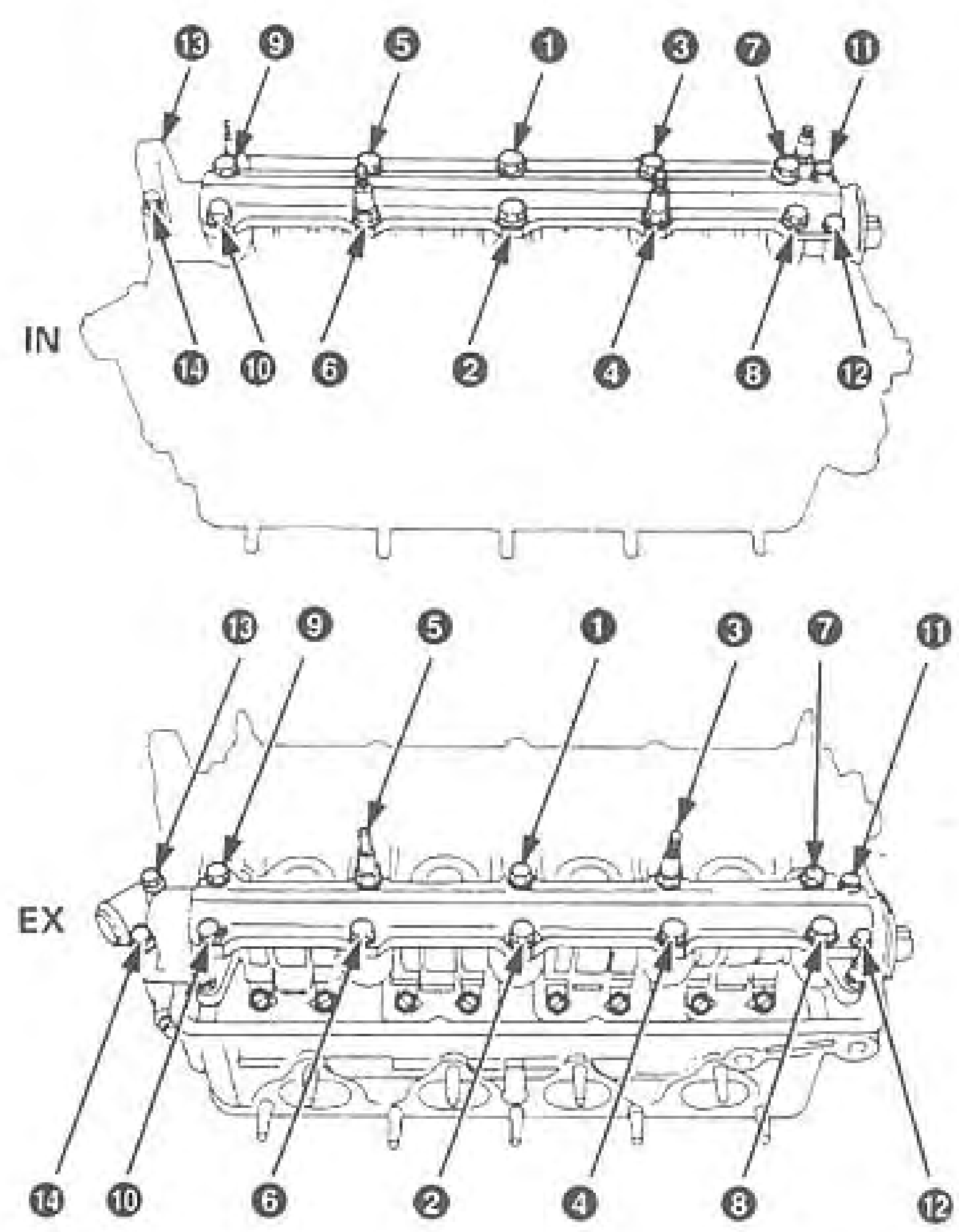


7. Temporarily tighten the bolts of the camshaft holders and the camshaft holder plates.



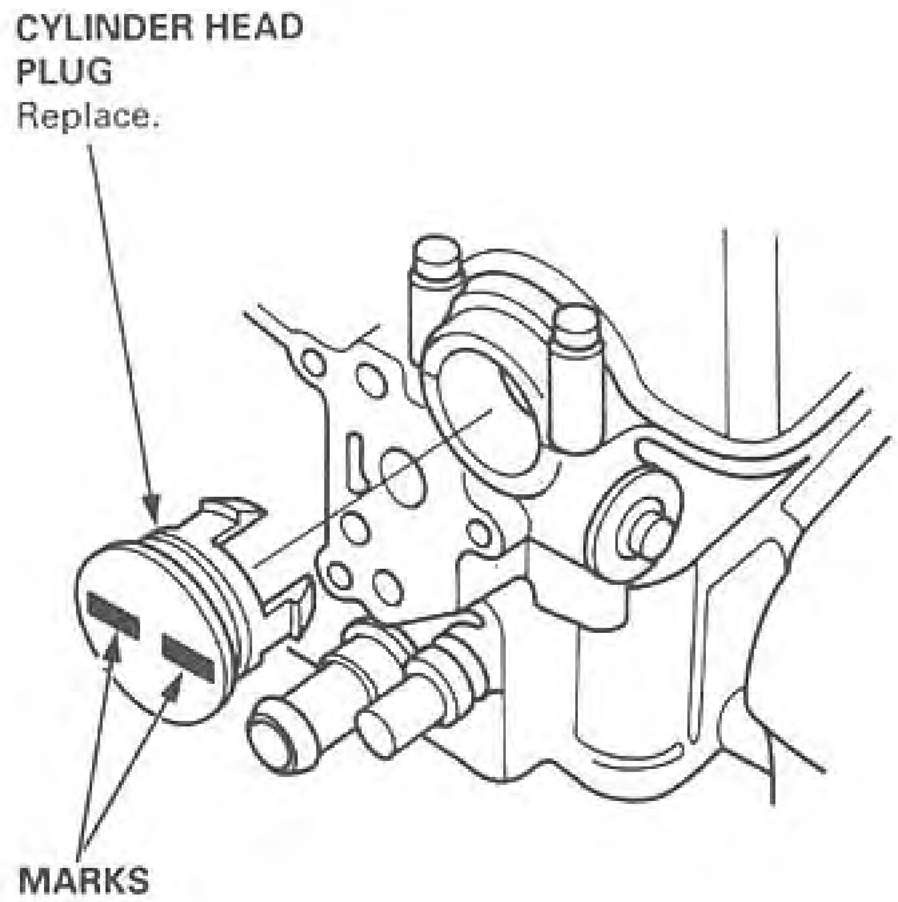
8. Tighten the bolts in the sequence shown below.

   NOTE: •Wipe off the excess of liquid gasket from No. 1 and No. 5 camshaft holder with a shop towel.

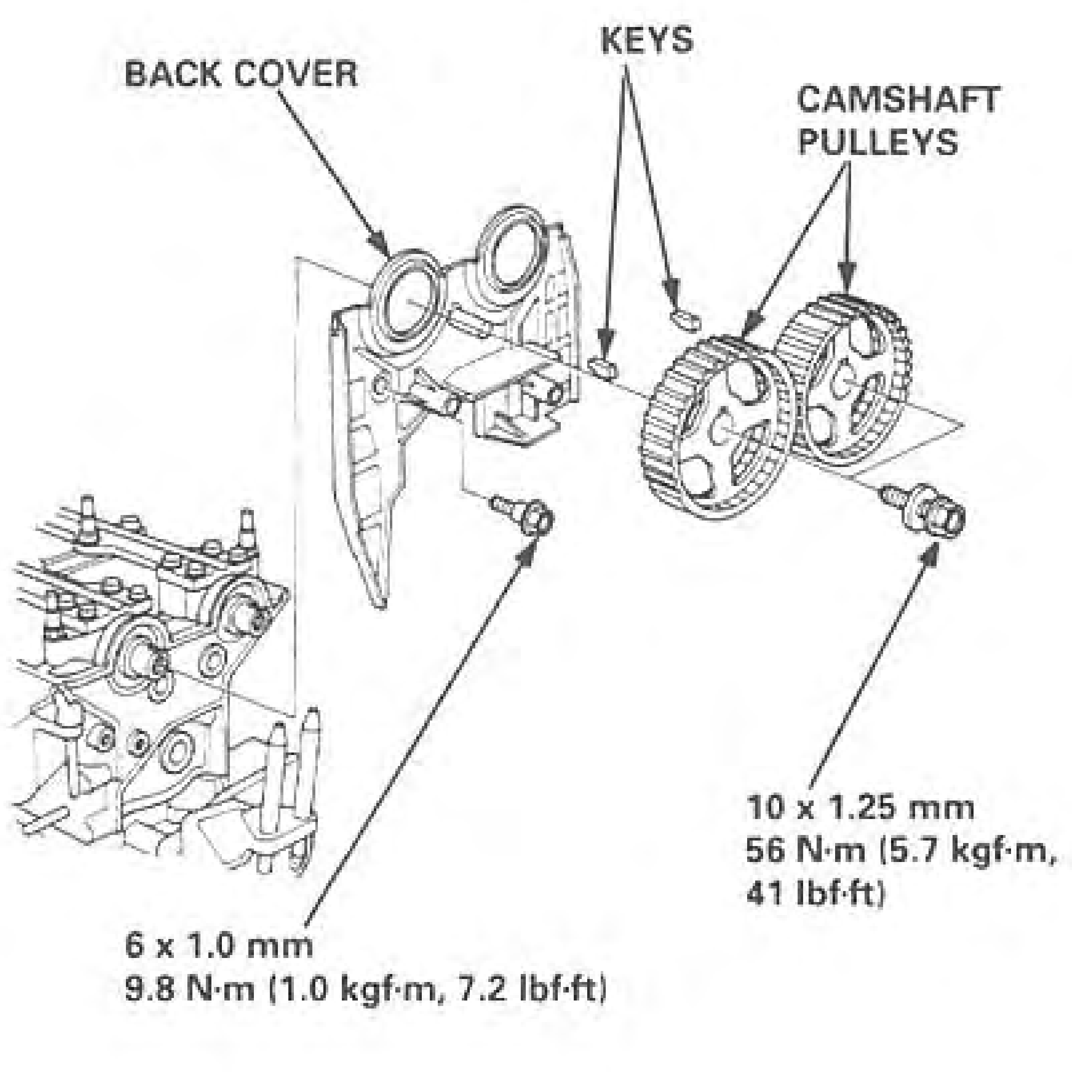


❶ – ❿: 8 x 1.25 mm 27 N·m (2.8 kgf·m, 20 lbf·ft)
Apply engine oil to the bolt threads.
⓫ – ⓮: 6 x 1.0 mm 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

9. Align the marks on the cylinder head plug to the cylinder head upper surface, then install the cylinder head plug in the cylinder head to the end.

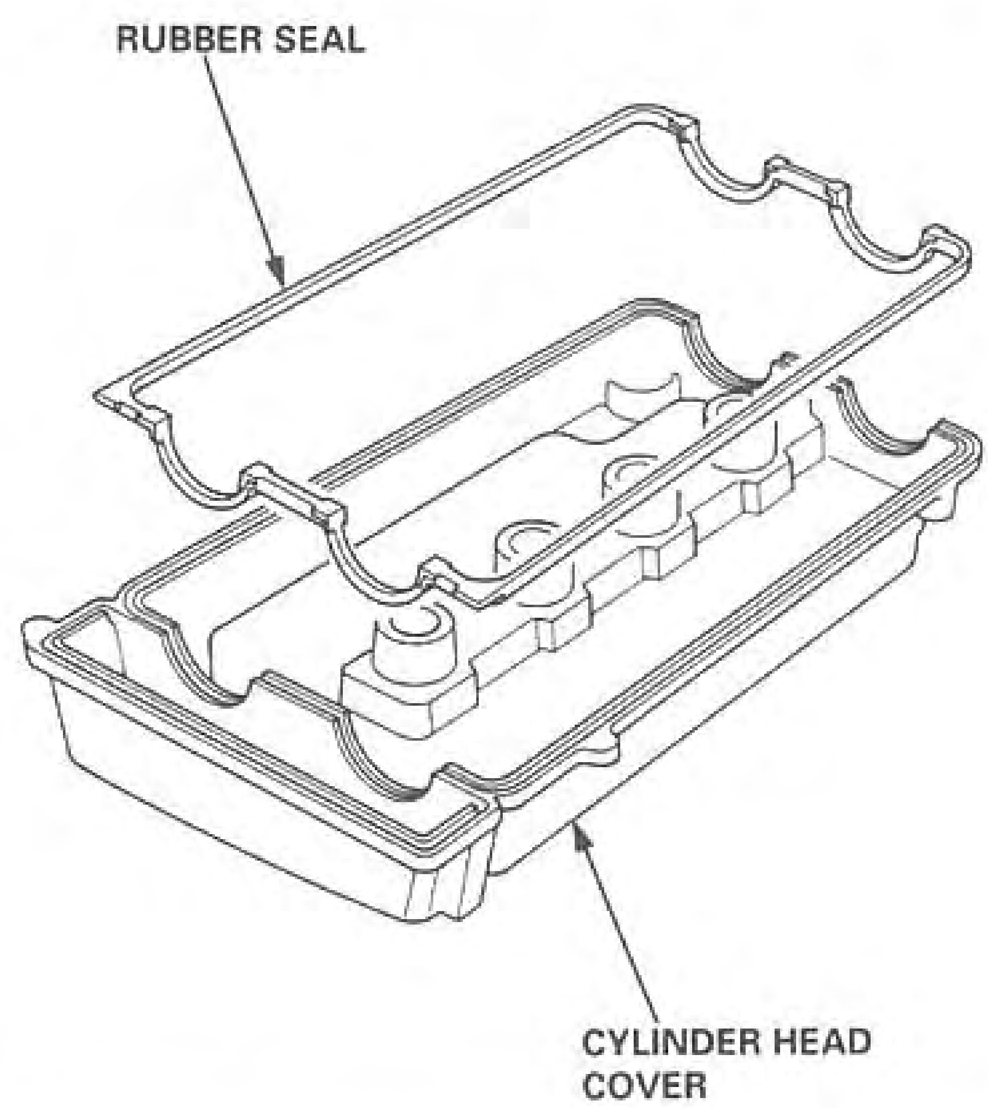


10. Install the back cover and camshaft pulleys.



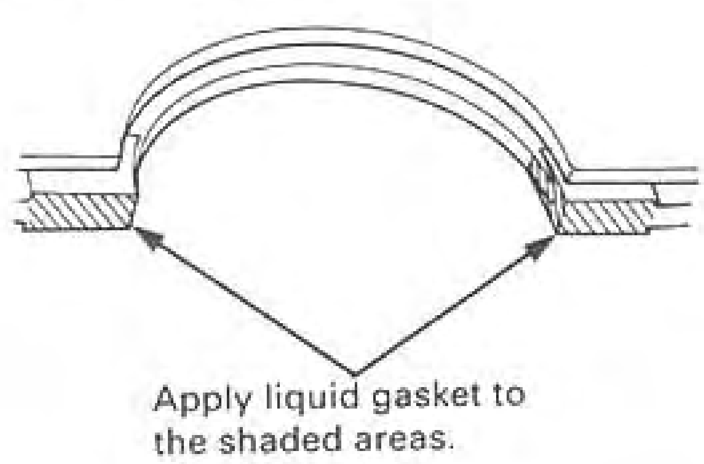
11. Install the timing belt (see page 6-50).
12. Adjust the valve clearance (see page 6-43).
13. Install the rubber seal in the groove of the cylinder head cover. Seat the seal in the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:
- Before installing the rubber seal, thoroughly clean the seal and the groove.
- When installing, make sure the seal is seated securely in the corners of the recesses with no gap.



14. Apply liquid gasket to the rubber seal at the eight corners of the recesses.

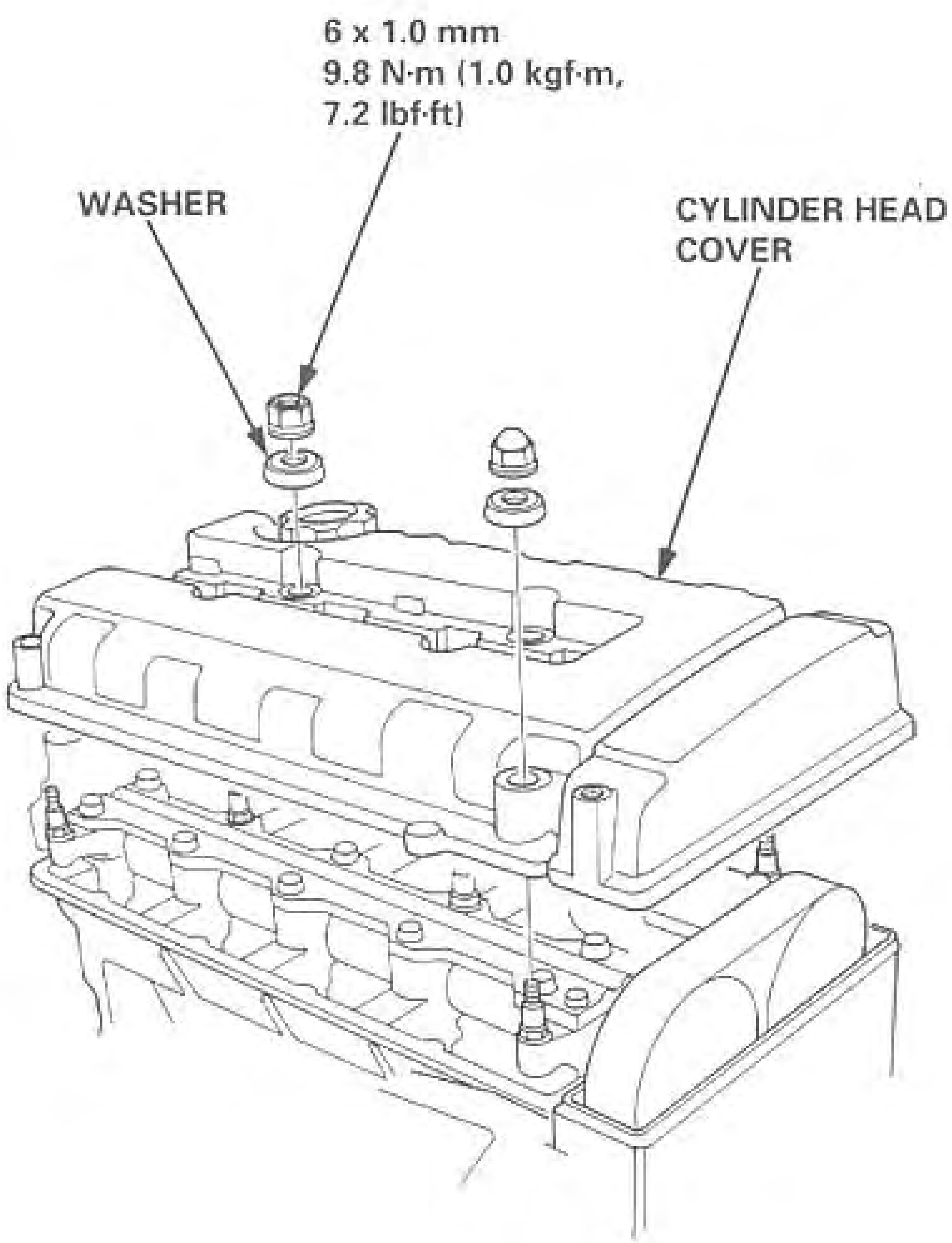
NOTE:
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.



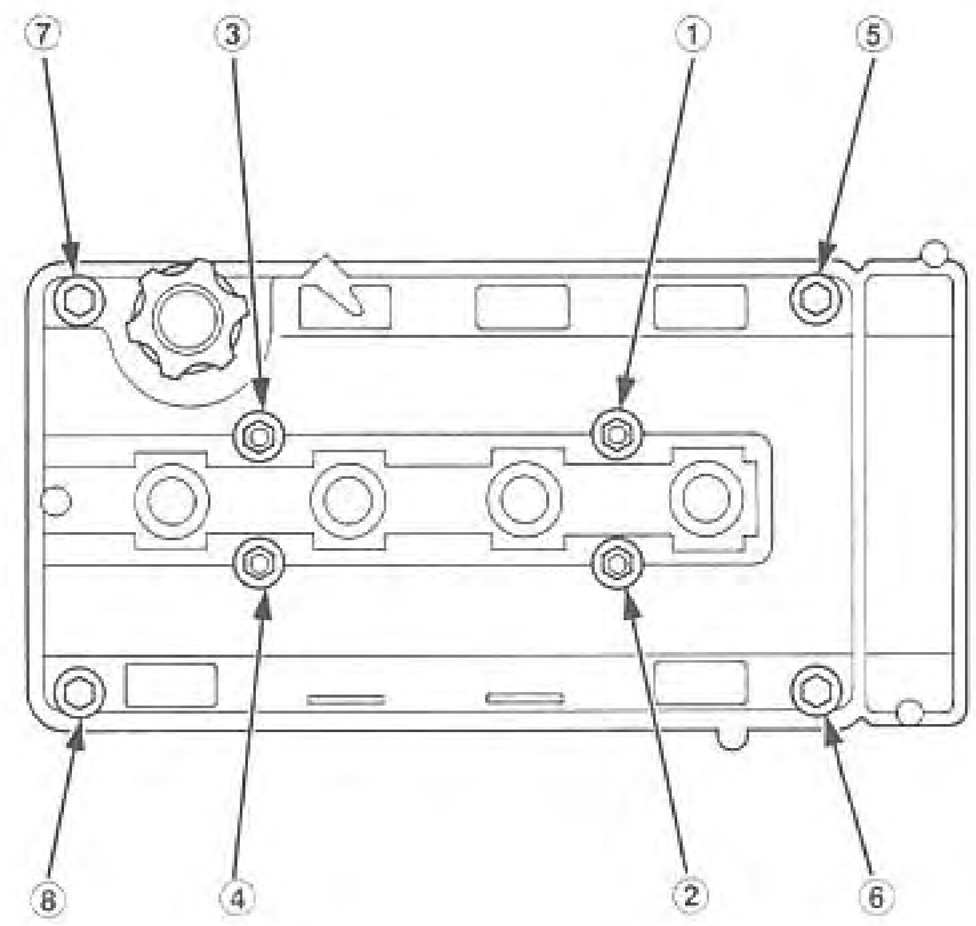
(cont'd)

15. When installing the cylinder head cover, hold the rubber seal in the groove by placing your fingers on the camshaft contacting surfaces (top of the semi-circles).
    Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the rubber seal.

    NOTE:
    - Before installing the cylinder head cover, clean the cylinder head contacting surfaces using a shop towel.
    - Do not touch the parts where liquid gasket was applied.



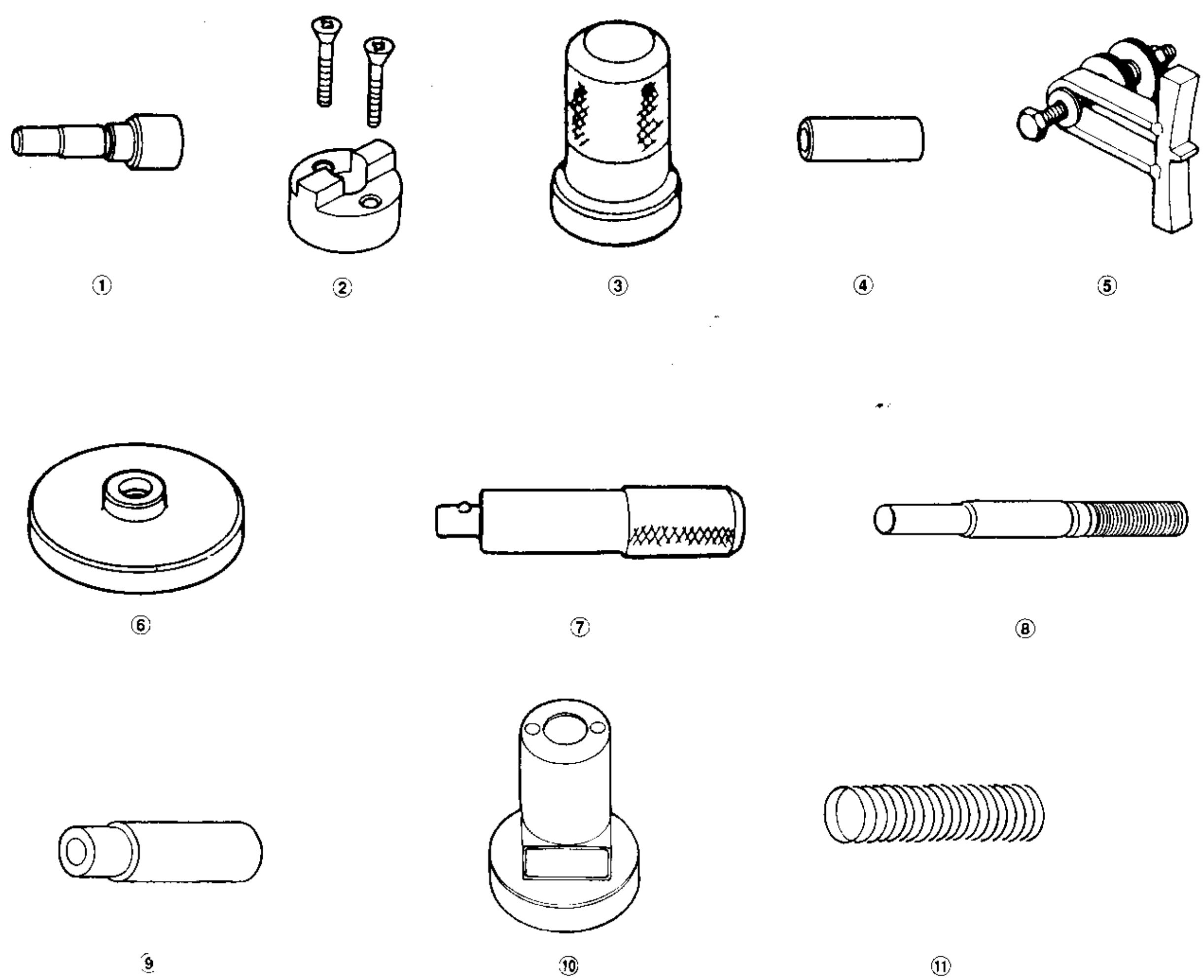
16. Tighten the nuts in 2 or 3 steps. In the final step, tighten all nuts, in sequence, to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft).



17. After installing, check that all tubes, hoses and connectors are installed correctly.

Engine Block

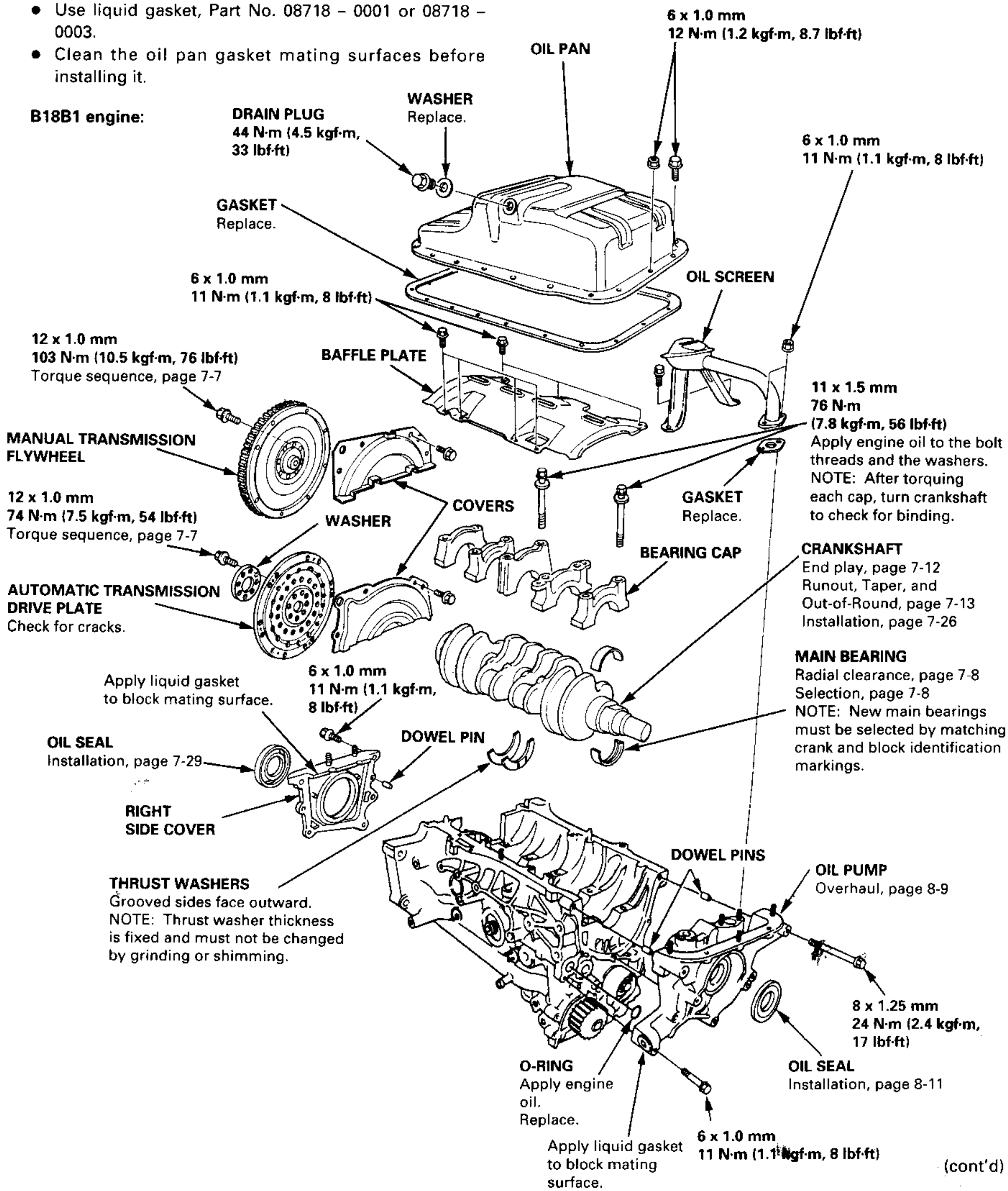
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF – PH60300	Piston Pin Base Insert	1	7-22, 23
②	07HAF – PL20102	Piston Base Head	1	7-22, 23
③	07LAD – PR4010A	Seal Driver	1	7-29
④	07LAF – PR30100	Pilot Collar	1	7-22, 23
⑤	07LAB – PV00100	Ring Gear Holder	1	7-7
⑥	07948 – SB00101	Driver Attachment	1	7-29
⑦	07749 – 0010000	Driver	1	7-29
⑧	07973 – PE00310	Piston Pin Driver Shaft	1	7-22, 23
⑨	07973 – PE00320	Piston Pin Driver Head	1	7-22, 23
⑩	07973 – 6570500	Piston Base	1	7-22, 23
⑪	07973 – 6570600	Piston Base Spring	1	7-22



NOTE:
- Apply liquid gasket to the mating surfaces of the right side cover and oil pump housing before installing them.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil pan gasket mating surfaces before installing it.

Lubricate all internal parts with engine oil during reassembly.

B18B1 engine:

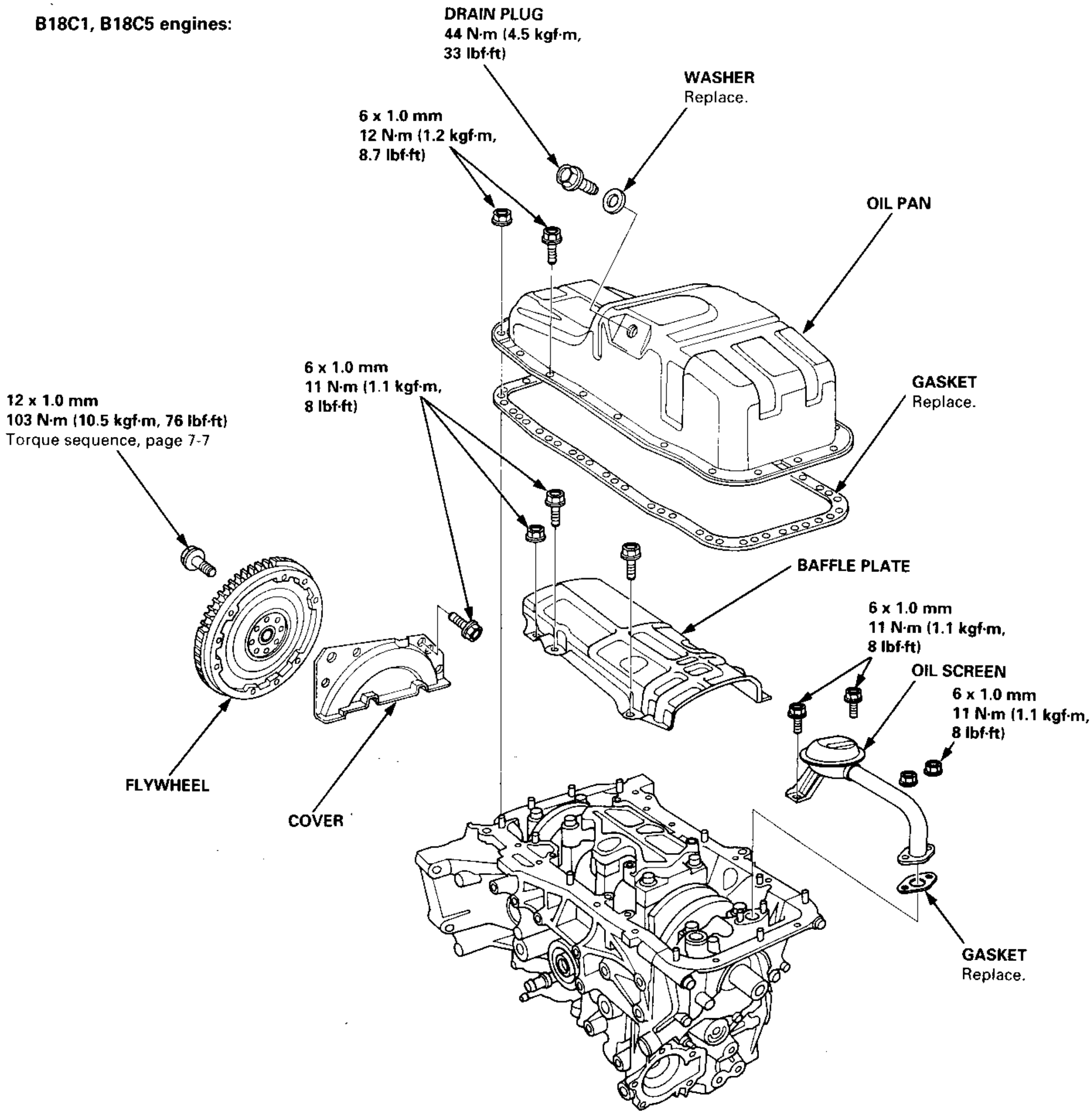


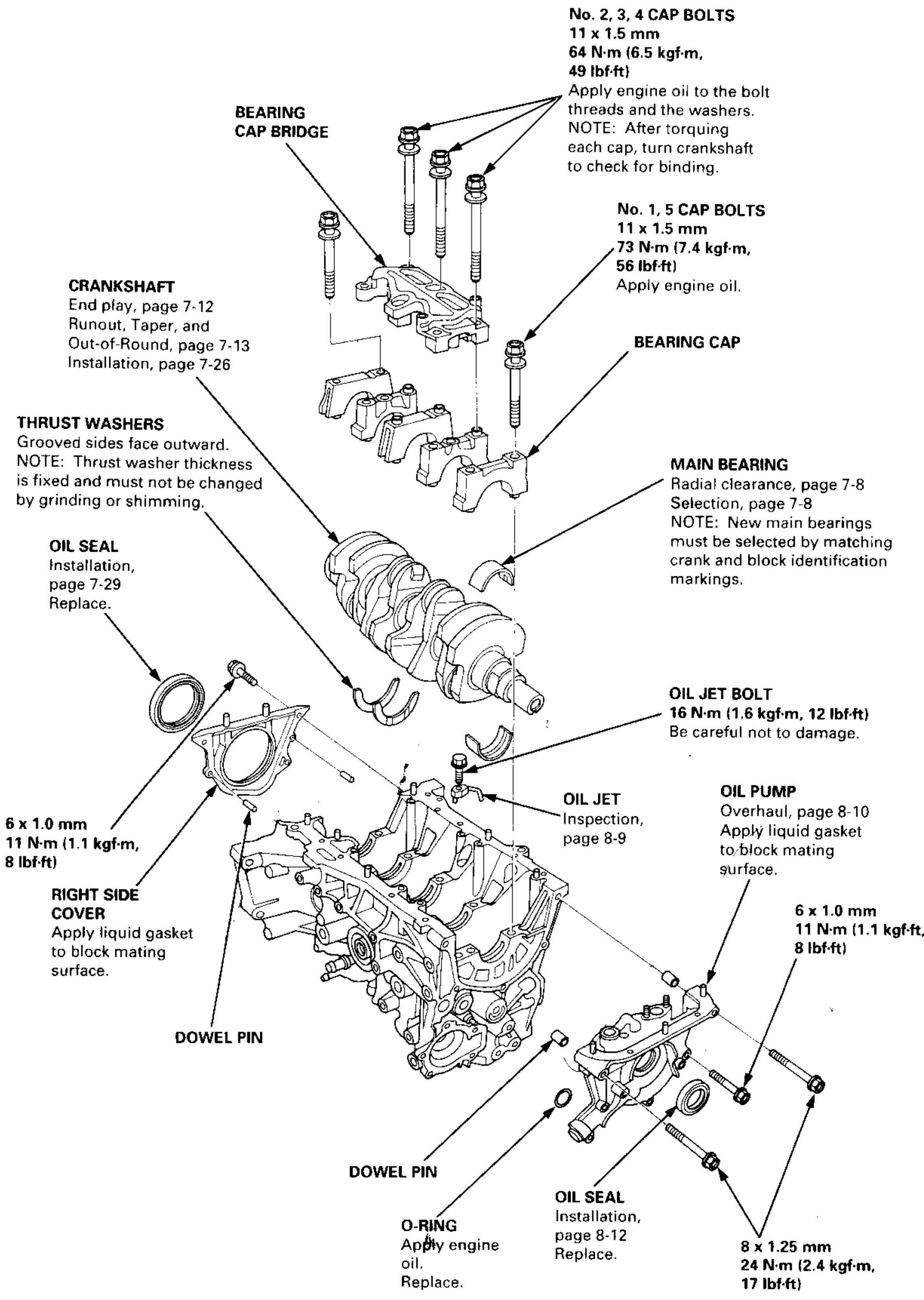
(cont'd)

NOTE:
- Apply liquid gasket to the mating surfaces of the right side cover and oil pump housing before installing them.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil pan gasket mating surfaces before installing it.

Lubricate all internal parts with engine oil during reassembly.

B18C1, B18C5 engines:





No. 2, 3, 4 CAP BOLTS
11 x 1.5 mm
64 N·m (6.5 kgf·m, 49 lbf·ft)
Apply engine oil to the bolt threads and the washers.
NOTE: After torquing each cap, turn crankshaft to check for binding.
BEARING CAP BRIDGE
No. 1, 5 CAP BOLTS
11 x 1.5 mm
73 N·m (7.4 kgf·m, 56 lbf·ft)
Apply engine oil.
CRANKSHAFT
End play, page 7-12
Runout, Taper, and Out-of-Round, page 7-13
Installation, page 7-26
BEARING CAP
THRUST WASHERS
Grooved sides face outward.
NOTE: Thrust washer thickness is fixed and must not be changed by grinding or shimming.
MAIN BEARING
Radial clearance, page 7-8
Selection, page 7-8
NOTE: New main bearings must be selected by matching crank and block identification markings.
OIL SEAL
Installation, page 7-29
Replace.
OIL JET BOLT
16 N·m (1.6 kgf·m, 12 lbf·ft)
Be careful not to damage.
OIL JET
Inspection, page 8-9
OIL PUMP
Overhaul, page 8-10
Apply liquid gasket to block mating surface.
6 x 1.0 mm
11 N·m (1.1 kgf·m, 8 lbf·ft)
RIGHT SIDE COVER
Apply liquid gasket to block mating surface.
6 x 1.0 mm
11 N·m (1.1 kgf·ft, 8 lbf·ft)
DOWEL PIN
DOWEL PIN
OIL SEAL
Installation, page 8-12
Replace.
O-RING
Apply engine oil.
Replace.
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)

(cont'd)

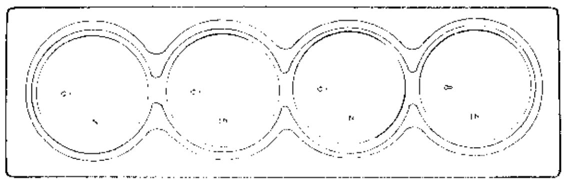
Illustrated Index

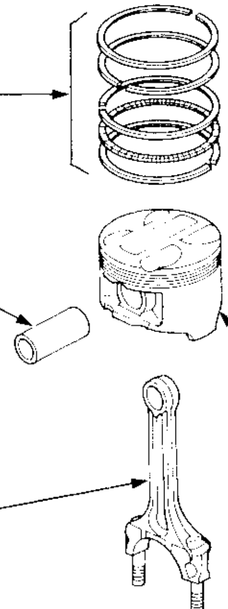
(cont'd)

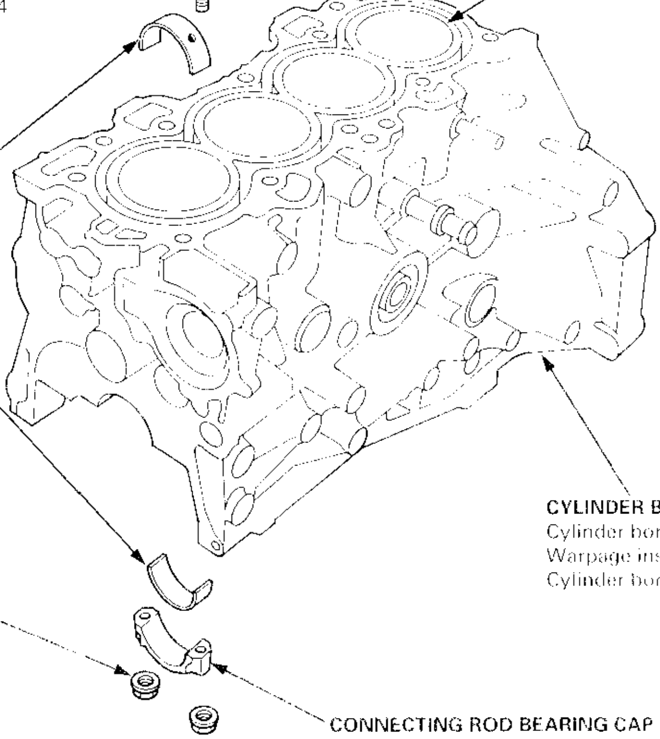
NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (see pages 7 8, 9, 10).

OIL Lubricate all internal parts with engine oil during reassembly.

PISTON INSTALLATION DIRECTION







PISTON RINGS
Replacement, page 7-20
Measurement, pages 7-20, 21
Alignment, page 7-21

PISTON PIN
Removal, page 7-22
Installation, pages 7 22, 23
Inspection, page 7-23

PISTON
Removal, pages 7 11, 12
Measurement, page 7 16

Inspect top of each cylinder bore for carbon build-up or ridge before removing piston.
Remove ridge if necessary, page 7 11

CONNECTING ROD
End play, page 7-24
Selection, page 7 25
Small end measurement, page 7 24

CONNECTING ROD BEARINGS
Clearance, page 7 9
Selection, pages 7 9, 10

CYLINDER BLOCK
Cylinder bore inspection, page 7 14
Warpage inspection, page 7-15
Cylinder bore honing, page 7 15

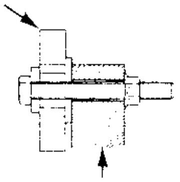
CONNECTING ROD NUT
B18B1 engine
8 x 0.75 mm
31 N·m (3.2 kgf·m, 23 lbf·ft)
B18C1 engine
9 x 0.75 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
B18C5 engine
Tightening, page 7 19
After torquing each bearing cap, rotate crankshaft to check for binding.

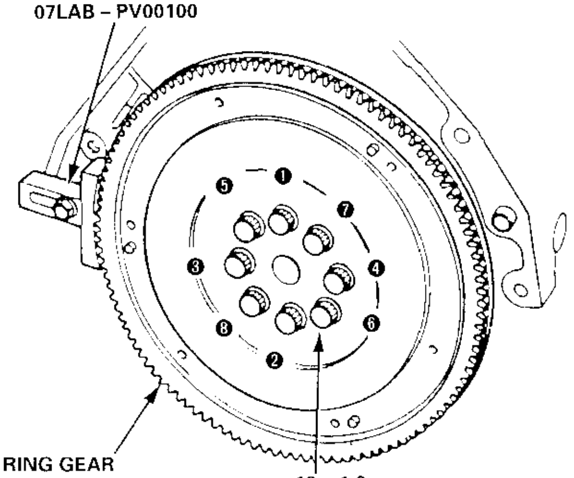
CONNECTING ROD BEARING CAP
Installation, page 7-26
NOTE: Install caps so the bearing recess is on the same side as the recess in the rod.

Replacement

Manual Transmission:

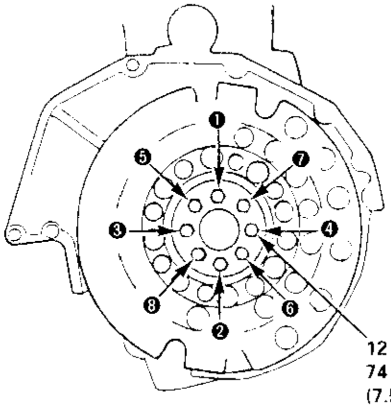
Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sequence shown.





Automatic Transmission:

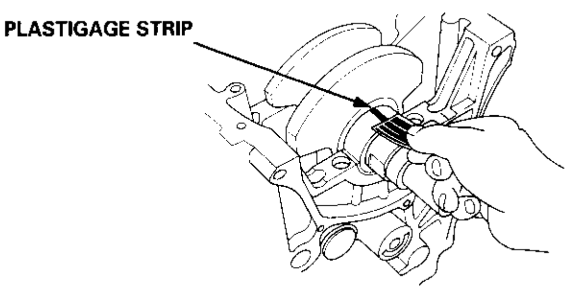
Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



Main Bearings

Clearance

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal.
   NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crankshaft and flywheel will flatten the plastigage further than just the torque on the cap bolt, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time.
4. Reinstall the bearing caps and cap bridge (B18C1, B18C5 engines only) then torque the bolts.
   B18B1 engine: 77 N·m (7.8 kgf·m, 56 lbf·ft)
   B18C1, B18C5 engines:
   No. 1, 5 cap bolts 73 N·m (7.4 kgf·m, 56 lbf·ft)
   No. 2, 3, 4 cap bolts 64 N·m (6.5 kgf·m, 49 lbf·ft)
   NOTE: Do not rotate the crankshaft during inspection.
5. Remove the cap bridge (B18C1, B18C5 engines only), caps and bearings again, and measure the widest part of the plastigage.
   Main Bearing-to-Journal Oil Clearance:
   Standard (New):
   No. 1, 2, 4, 5: 0.024 – 0.042 mm
   (0.0009 – 0.0017 in)
   Service Limit: 0.050 mm (0.0020 in)
   No. 3: 0.030 – 0.048 mm
   (0.0012 – 0.0019 in)
   Service Limit: 0.060 mm (0.0024 in)



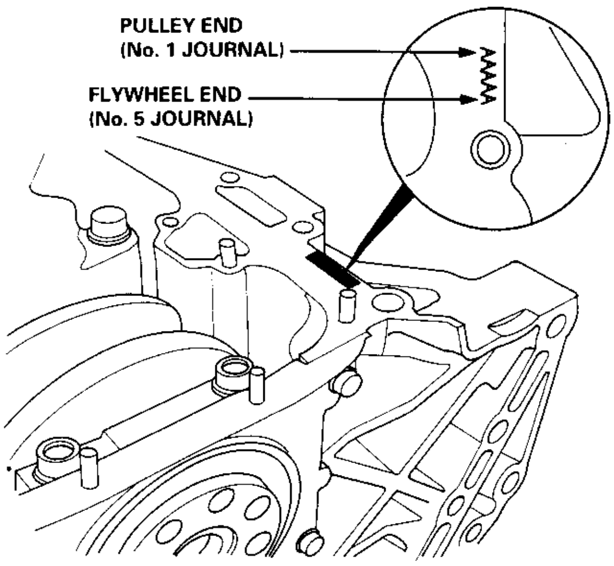
6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code (select the color as shown in the right column), and recheck the clearance.
   CAUTION: Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

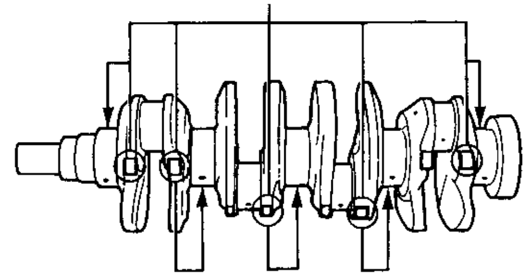
Selection

CAUTION: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Crankshaft Bore Code Location

Letters have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.
Use them, and the numbers or bars stamped on the crank (codes for main journal size), to choose the correct bearings.





Main Journal Code Locations (Numbers or Bars)

Bearing Identification
Color code is on the edge of the bearing.

→ Larger crank bore

→ Smaller bearing (thicker)

	A	B	C	D
1 or I	Red	Pink	Yellow	Green
2 or II	Pink	Yellow	Green	Brown
3 or III	Yellow	Green	Brown	Black
4 or IIII	Green	Brown	Black	Blue

↓ Smaller main journal ↓ Smaller bearing (thicker)

Connecting Rod Bearings

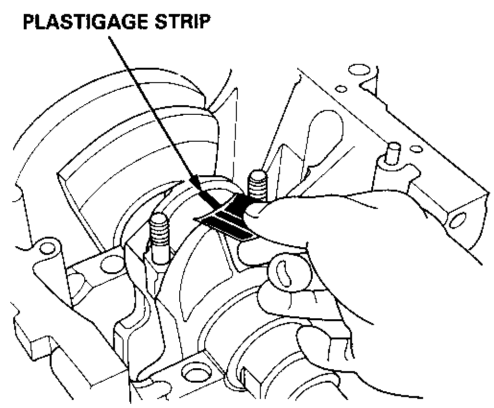
Clearance

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
3. Place the plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts (B18C5 engine: see page 7-19).

B18B1 engine: 31 N·m (3.2 kgf·m, 23 lbf·ft)
B18C1 engine: 44 N·m (4.5 kgf·m, 33 lbf·ft)

NOTE: Do not rotate the crankshaft during inspection.

Connecting Rod Bearing-to-Journal Oil Clearance:
B18B1 engine:
Standard (New): 0.020 – 0.038 mm (0.0008 – 0.0015 in)
Service Limit: 0.050 mm (0.0020 in)
B18C1 engine:
Standard (New): 0.032 – 0.050 mm (0.0013 – 0.0020 in)
Service Limit: 0.060 mm (0.0024 in)
B18C5 engine:
Standard (New): 0.038 – 0.050 mm (0.0015 – 0.0020 in)
Service Limit: 0.060 mm (0.0024 in)



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code (select the color as shown in the right column), and recheck the clearance.

CAUTION: Do not file, shim, or scrape the bearing or the caps to adjust clearance.

7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again.

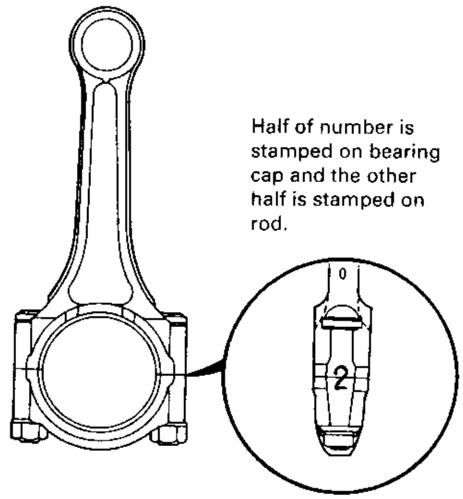
NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Selection

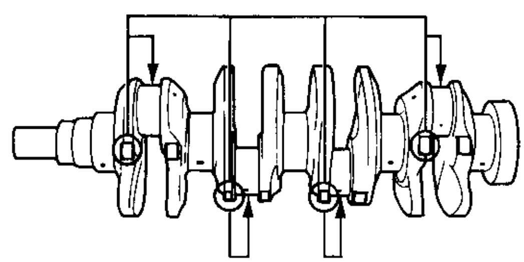
CAUTION: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Connecting Rod Code Location

A number has been stamped on the side of each connecting rod as a code for the size of the big end. Use it, and the letters stamped on the crank (codes for rod journal size), to choose the correct bearings.



Connecting Rod Journal Code Locations (Letters or Bars)



Bearing Identification
Color code is on the edge of the bearing.

→ Larger big end bore
→ Smaller bearing (thicker)
↓ Smaller rod journal
↓ Smaller bearing (thicker)

	1	2	3	4
A or I	Red	Pink	Yellow	Green
B or II	Pink	Yellow	Green	Brown
C or III	Yellow	Green	Brown	Black
D or IIII	Green	Brown	Black	Blue

(cont'd)

Connecting Rod Bearings

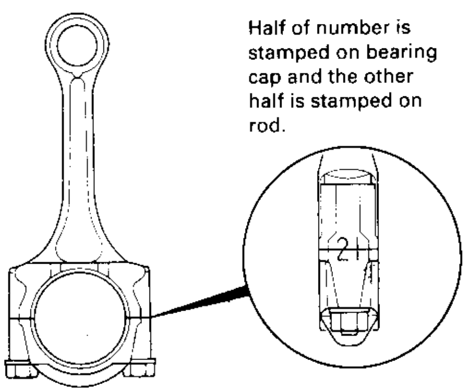
Selection (cont'd)

B18C5 engine:

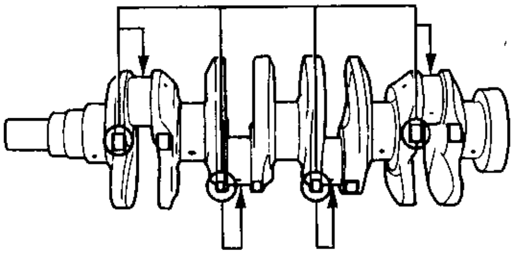
CAUTION: **If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.**

Connecting Rod Code Location

A number has been stamped on the side of each connecting rod as a code for the size of the big end. Use it, and the letters stamped on the crank (codes for rod journal size), to choose the correct bearings.



Connecting Rod Journal Code Locations (Letters or Bars)



Bearing Identification
Color code is on the edge of the bearing.

→ Larger big end bore

→ Smaller bearing (thicker)

↓ Smaller rod journal ↓ Smaller bearing (thicker)

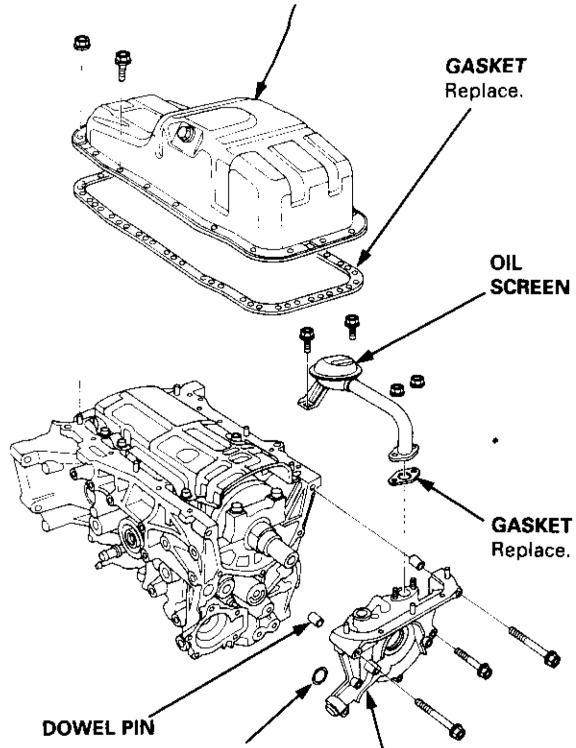
	21	22	23	24	25	26
T	Pink Pink	Pink Yellow	Yellow Yellow	Yellow Green	Green Green	Green Brown
V	Pink Yellow	Yellow Yellow	Yellow Green	Green Green	Green Brown	Brown Brown
W	Yellow Yellow	Yellow Green	Green Green	Green Brown	Brown Brown	Brown Black
X	Yellow Green	Green Green	Green Brown	Brown Brown	Brown Black	Black Black
Y	Green Green	Green Brown	Brown Brown	Brown Black	Black Black	Black Blue
Z	Green Brown	Brown Brown	Brown Black	Black Black	Black Blue	Blue Blue

Crankshaft

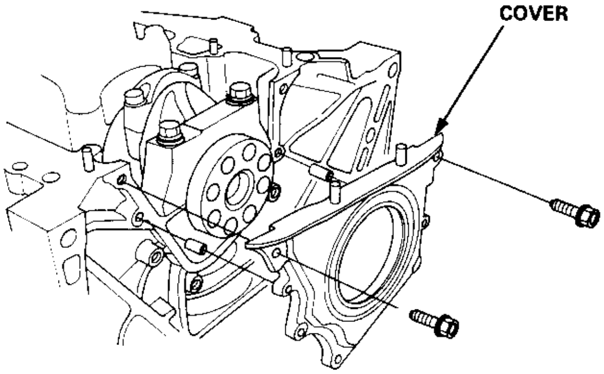
Removal

NOTE: End play for the connecting rods and crankshaft should be inspected before removing the crankshaft.

1. Remove the oil pan, oil screen and the oil pump.

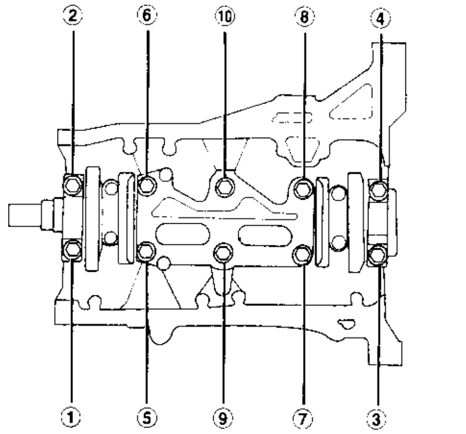


2. Remove the baffle plate.
3. Turn the crankshaft so No. 2 and 3 crankpins are at the bottom.
4. Remove the right side cover.

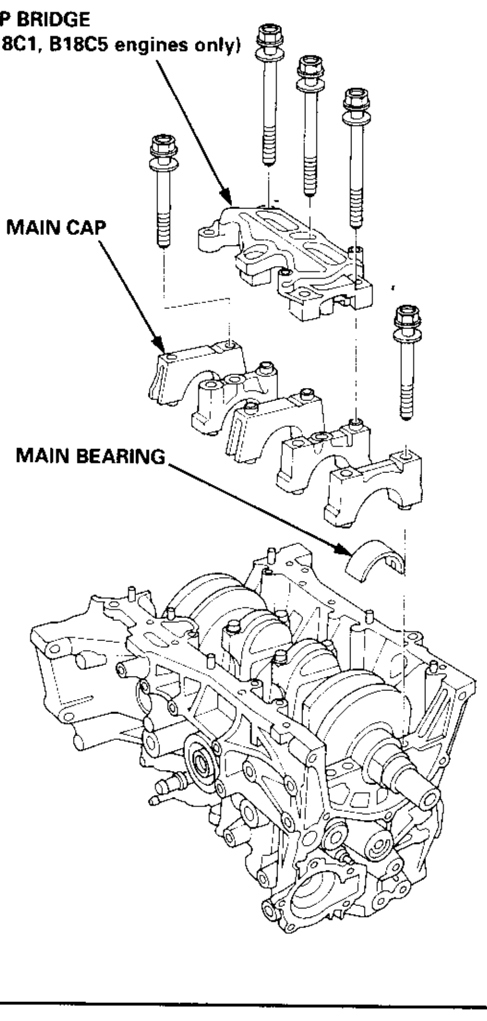


5. Remove the bearing cap bolts.

CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

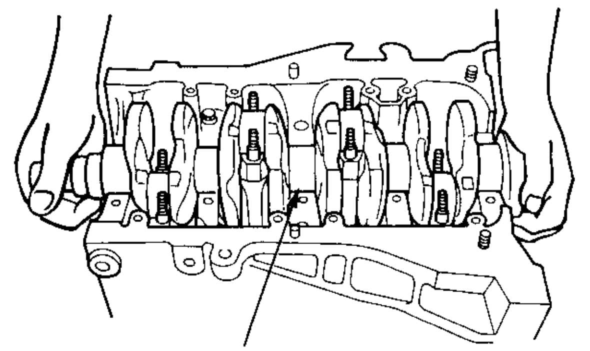


6. Remove the cap bridge (B18C1, B18C5 engines only) and main caps/bearings. Keep all caps/bearings in order.



7. Remove the rod caps/bearings. Keep all caps/bearings in order.

8. Lift the crankshaft out of the engine, being careful not to damage journals.

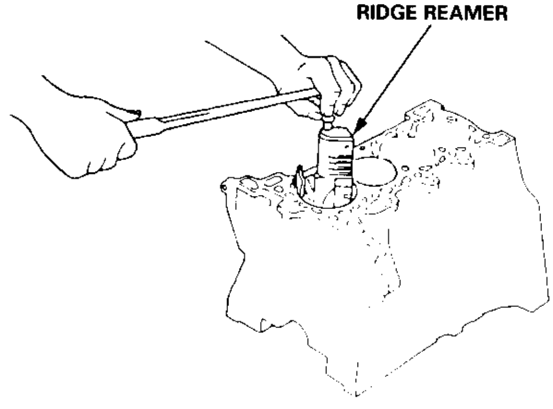


9. Remove the upper bearing halves from connecting rods and set them aside with their respective caps.

10. Reinstall main caps and bearings on the engine in proper order.

11. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer.
Follow the reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.



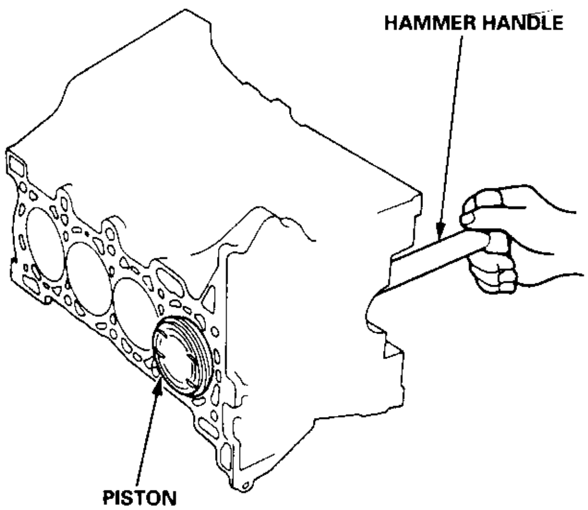
(cont'd)

Crankshaft

Removal (cont'd)

12. Use the wooden handle of a hammer to drive the pistons out.

    CAUTION:
    - **Take care not to damage the contact surface of the metal gasket.**
    - **When removing the piston/connecting rod, take care not to hit the oil jet (B18C1, B18C5 engines).**
    - **If the oil jet nozzle is damaged or bent, replace the oil jet assembly (B18C1, B18C5 engines, page 8-9).**



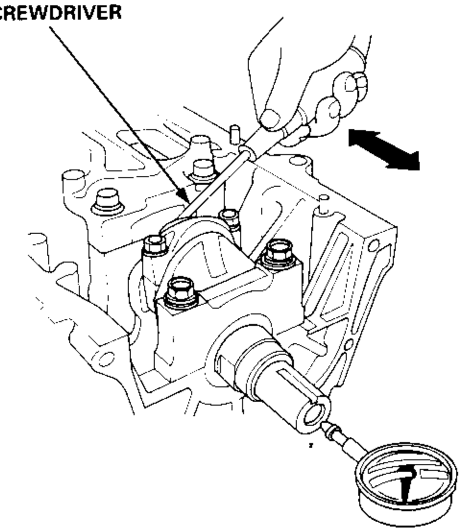
13. Reinstall the rod bearings and caps after removing each piston/connecting rod assembly.
14. Mark each piston/connecting rod assembly with its cylinder number to avoid mixup on reassembly.

    NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

End Play

NOTE: End play should be inspected before removing crankshaft.

Push the crank firmly away from the dial indicator, and zero the dial against the end of the crank. Then pull the crank firmly back toward the indicator; dial reading should not exceed service limit.



Crankshaft End Play:
Standard (New): 0.10 – 0.35 mm (0.004 – 0.014 in)
Service Limit: 0.45 mm (0.018 in)

- If end play is excessive, inspect the thrust washers and thrust surface on the crankshaft. Replace parts as necessary.

NOTE:
- Thrust washer thickness is fixed and must not be changed either by grinding or shimming.
- Thrust washers are installed with grooved sides facing outward.

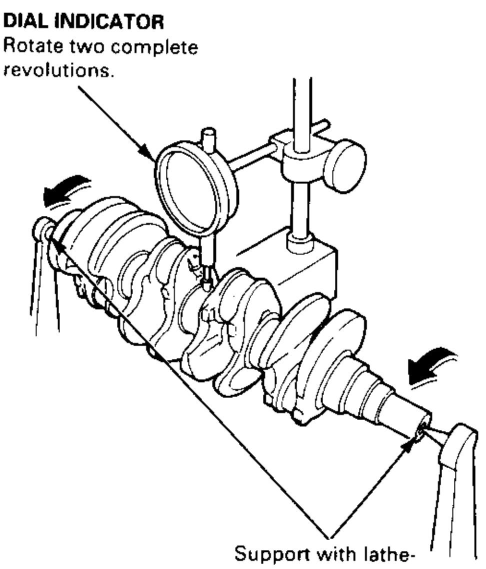
Inspection

NOTE:
- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and threads.

Alignment

- Measure runout on all main journals to make sure the crank is not bent.
- The difference between measurements on each journal must not be more than the service limit.

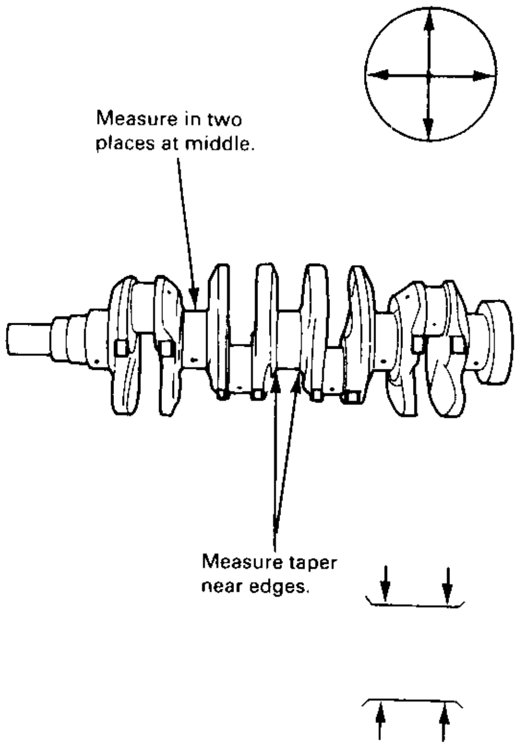
Crankshaft Total Indicated Runout:
Standard (New): 0.03 mm (0.001 in) max.
Service Limit: 0.05 mm (0.002 in)



Out-of-Round and Taper

- Measure out-of-round at the middle of each rod and main journal in two places.
- The difference between measurements on each journal must not be more than the service limit.

Journal Out-of-Round:
Standard (New): 0.005 mm (0.0002 in) max.
Service Limit: 0.010 mm (0.0004 in)



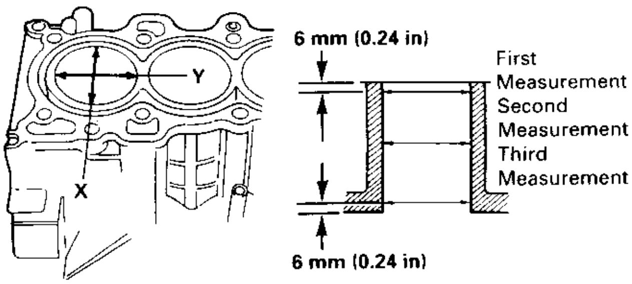
- Measure taper at the edges of each rod and main journal.
- The difference between measurements on each journal must not be more than the service limit.

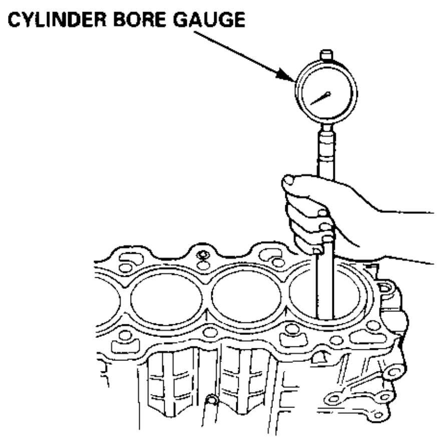
Journal Taper:
Standard (New): 0.005 mm (0.0002 in) max.
Service Limit: 0.010 mm (0.0004 in)

Cylinder Block

Inspection

1. Measure wear and taper in direction X and Y at three levels in each cylinder as shown.



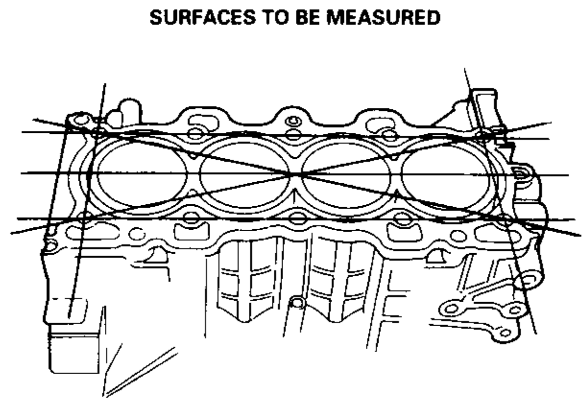


Cylinder Bore Size:
Standard (New): 81.00 – 81.02 mm (3.189 – 3.190 in)
Service Limit: 81.07 (3.192 in)
Oversize:
0.25: 81.25 – 81.27 mm (3.199 – 3.200 in)
Bore Taper:
Service Limit: (Difference between first and third measurement) 0.05 mm (0.002 in)

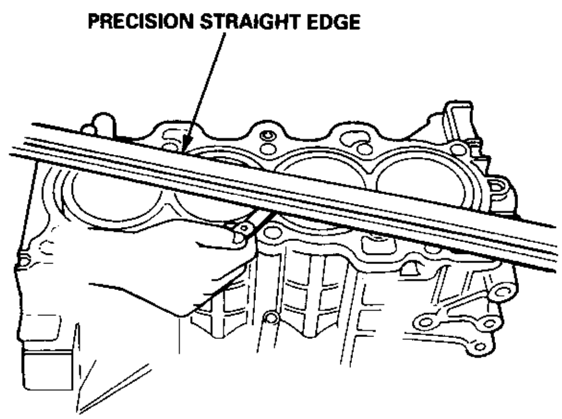
- If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- If the block is to be rebored, refer to Piston Clearance Inspection (see page 7-16) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.
Reboring Limit: 0.25 mm (0.01 in)

2. Check the top of the block for warpage.
Measure along the edges and across the center as shown.



Engine Block Warpage:
B18B1 engine:
Standard (New): 0.07 mm (0.003 in) max.
Service Limit: 0.10 mm (0.004 in)
B18C1, B18C5 engines:
Standard (New): 0.05 mm (0.002 in) max.
Service Limit: 0.08 mm (0.003 in)

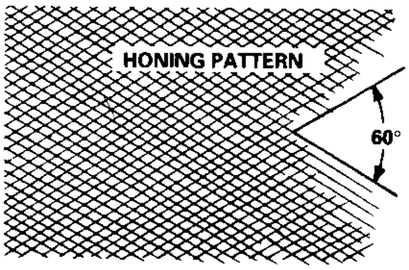


Bore Honing

1. Measure cylinder bores as shown on page 7-14.
   If the block is to be reused, hone the cylinders and remeasure the bores.

2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.

   NOTE:
   - Use only a rigid hone with 400 grit or finer stone such as Sunnen, Ammco, or equivalent.
   - Do not use stones that are worn or broken.

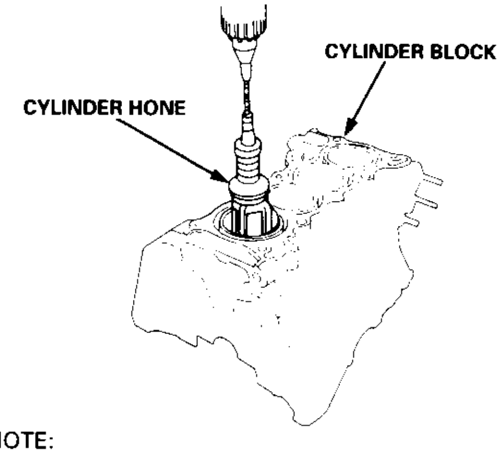


3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.

   NOTE: Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in cylinder bores after honing to the service limit, rebore the engine block.

   NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



NOTE:
- After honing, clean the cylinder thoroughly with soapy water.
- Only scored or scratched cylinder bores must be honed.

Pistons

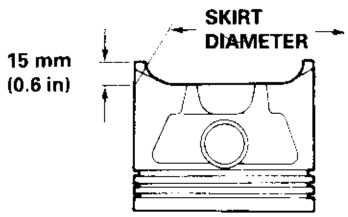
Inspection

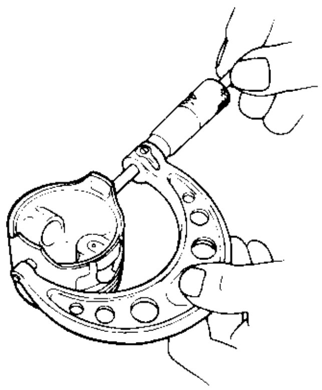
1. Check the piston for distortion or cracks.

   NOTE: If the cylinder is bored, an oversized piston must be used.

2. Measure the piston diameter at a point 15 mm (0.6 in) from the bottom of the skirt.

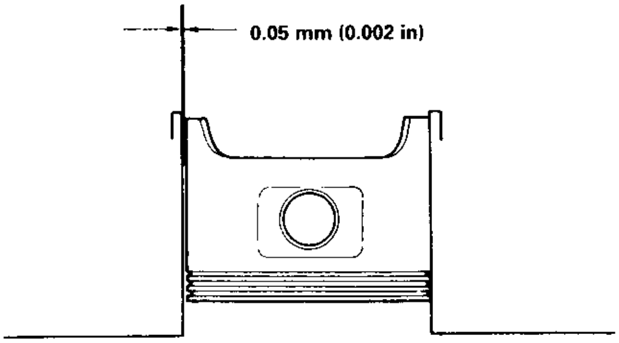
   Piston Diameter:
   Standard (New): 80.98 – 80.99 mm
   (3.188 – 3.189 in)
   Service Limit: 80.97 mm (3.188 in)





3. Calculate the difference between cylinder bore diameter on (see page 7-14) and piston diameter.

   Piston-to-Cylinder Clearance:
   Standard (New): 0.010 – 0.040 mm
   (0.0004 – 0.0016 in)
   Service Limit: 0.05 mm (0.002 in)



If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

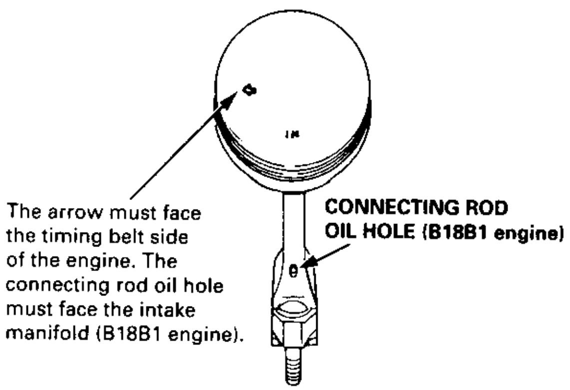
Oversize Piston Diameter:
0.25: 81.23 – 81.24 mm (3.1980 – 3.1984 in)

Installation

B18B1, B18C1 engines:

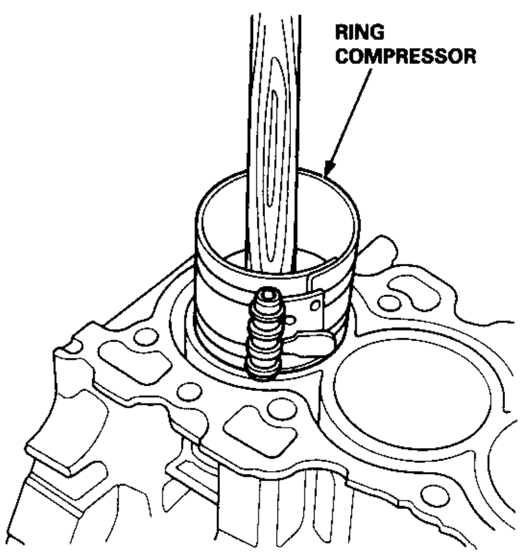
If the crankshaft is already installed

1. Set the crankshaft to BDC for each cylinder.
2. Remove the connecting rod caps, and slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
3. Install the ring compressor, and check that the bearing is securely in place.
4. Position the arrow facing the timing belt side of the engine.



5. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.

   NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.



6. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing piston in to place.
7. Check the connecting rod bearing clearance with plastigage (see page 7-9).
8. Apply engine oil to the bolt threads, then install the rod caps with bearings.
9. Install the nuts, and torque it.

   B18B1 engine: 31 N·m (3.2 kgf·m, 23 lbf·ft)
   B18C1 engine: 44 N·m (4.5 kgf·m, 33 lbf·ft)

(cont'd)

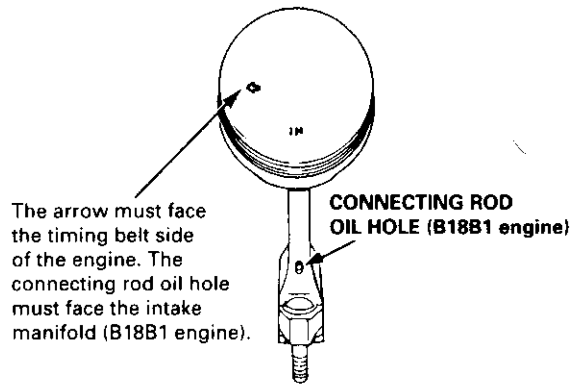
Pistons

Installation (cont'd)

If the crankshaft is not installed

1. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.

2. Position the arrow and the mark facing the timing belt side of the engine.



3. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.

   NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.

4. Position all pistons at top dead center.

B18C5 engine:

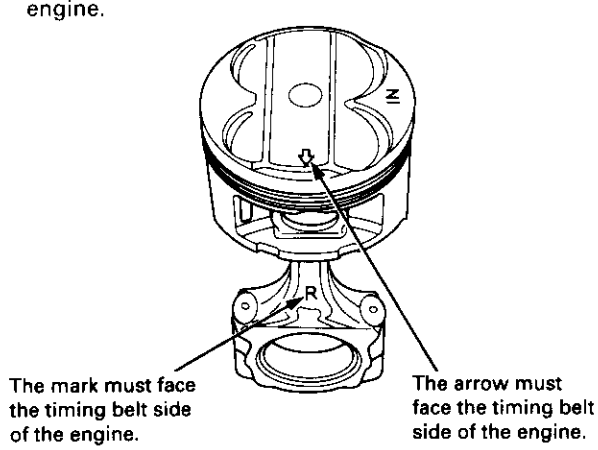
If the crankshaft is already installed

1. Set the crankshaft to BDC for each cylinder.

2. Remove the connecting rod caps, and slip short sections of rubber hose over the threaded ends of the connecting rod bolts.

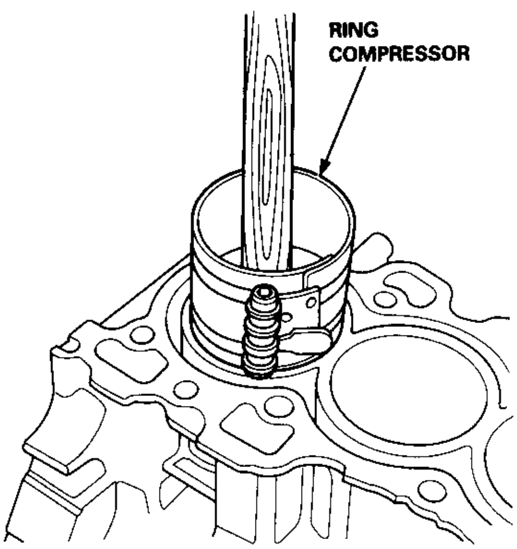
3. Install the ring compressor, and check that the bearing is securely in place.

4. Position the arrow facing the timing belt side of the engine.



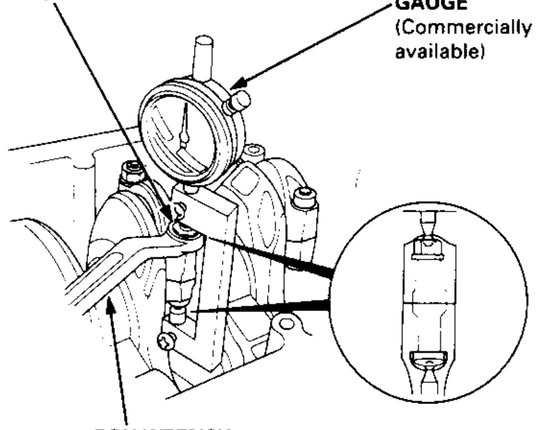
5. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.

   NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.

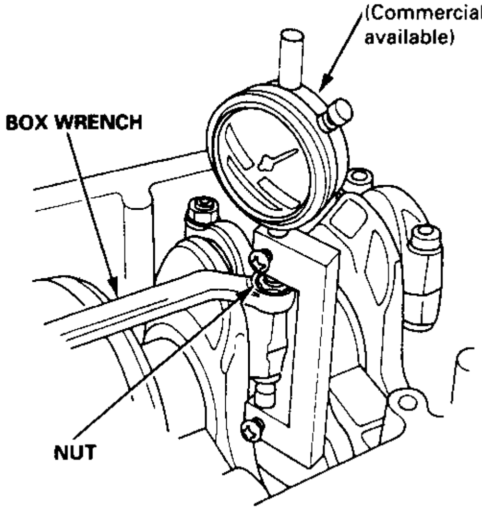


6. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing piston in to place.

7. Check the connecting rod bearing clearance with plastigage (see page 7-9).
8. Apply engine oil to the bolt threads, then install the rod caps with bearings.
9. Install the nut, and finger tight, then set the box wrench and connecting rod gauge as shown below.

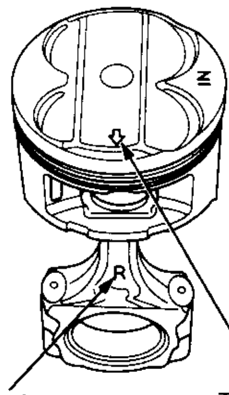


10. Zero the connecting rod gauge.
11. Tighten the nut until the connecting rod gauge reads 0.13 – 0.15 mm (0.005 – 0.006 in).



If the crankshaft is not installed

1. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.
2. Position the arrow and the mark facing the timing belt side of the engine.



3. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.

   NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.

4. Position all pistons at top dead center.

Piston Rings

Replacement

1. Using a ring expander, remove old piston rings.
2. Clean all ring grooves thoroughly.

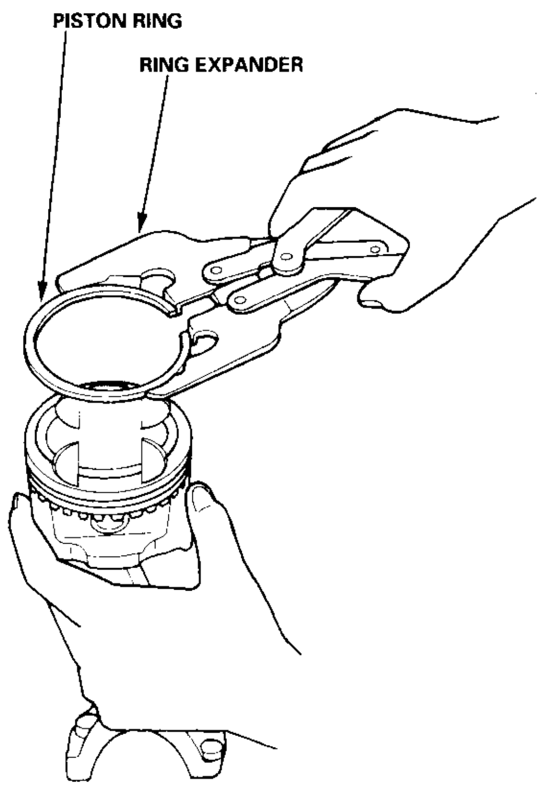
   NOTE:
   - Use a squared-off broken ring or ring groove cleaner with blade to fit piston grooves.
   - Top ring groove is 1.0 mm (0.039 in) wide, second groove is 1.2 mm (0.047 in) wide, and oil ring groove is 2.8 mm (0.110 in) wide.
   - File down blade if necessary.

   CAUTION: Do not use a wire brush to clean the ring lands, or cut ring lands deeper with cleaning tool.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

3. Install new rings in the proper sequence and position (see page 7-21).

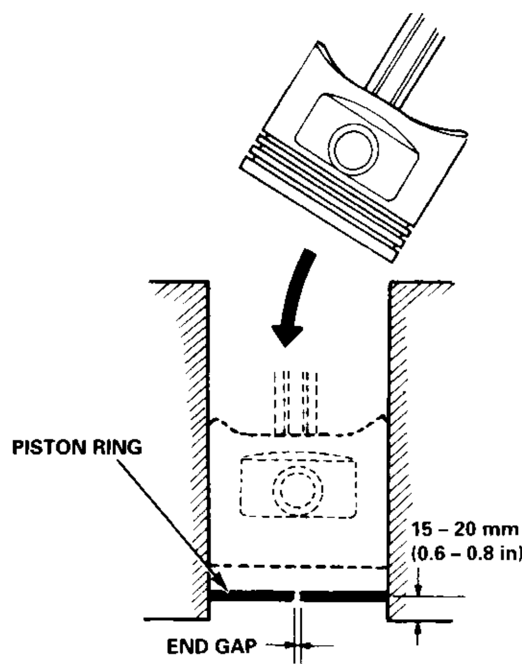
   NOTE: Do not use old piston rings.



End Gap

1. Using a piston, push a new ring into the cylinder bore 15 – 20 mm (0.6 – 0.8 in) from the bottom.
2. Measure the piston ring end-gap with a feeler gauge:
   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, recheck the cylinder bore diameter against the wear limits on page 7-13.
     If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:
Top Ring
Standard (New): **0.20 – 0.35 mm (0.008 – 0.014 in)[*1]**
0.20 – 0.30 mm (0.008 – 0.012 in)[*2]
Service Limit: **0.60 mm (0.024 in)**
Second Ring
Standard (New): **0.40 – 0.55 mm (0.016 – 0.022 in)**
Service Limit: **0.70 mm (0.028 in)**
Oil Ring
Standard (New): **0.20 – 0.50 mm (0.008 – 0.020 in)[*1]**
0.20 – 0.45 mm (0.008 – 0.018 in)[*2]
Service Limit: **0.70 mm (0.028 in)**



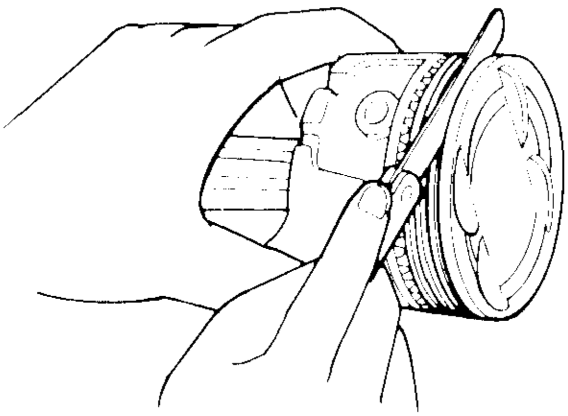
*1: RIKEN manufactured piston ring
*2: TEIKOKU PISTON RING manufactured piston ring (B18B1 engine only)

Ring-to-Groove Clearance

After installing a new set of rings, measure the ring-to-groove clearances.

Top Ring Clearance:
Standard (New): 0.045 – 0.070 mm (0.0018 – 0.0028 in)
Service Limit: 0.13 mm (0.005 in)

Second Ring Clearance:
Standard (New): 0.040 – 0.065 mm (0.0016 – 0.0026 in)*1
0.045 – 0.070 mm (0.0018 – 0.0028 in)*2
Service Limit: 0.13 mm (0.005 in)



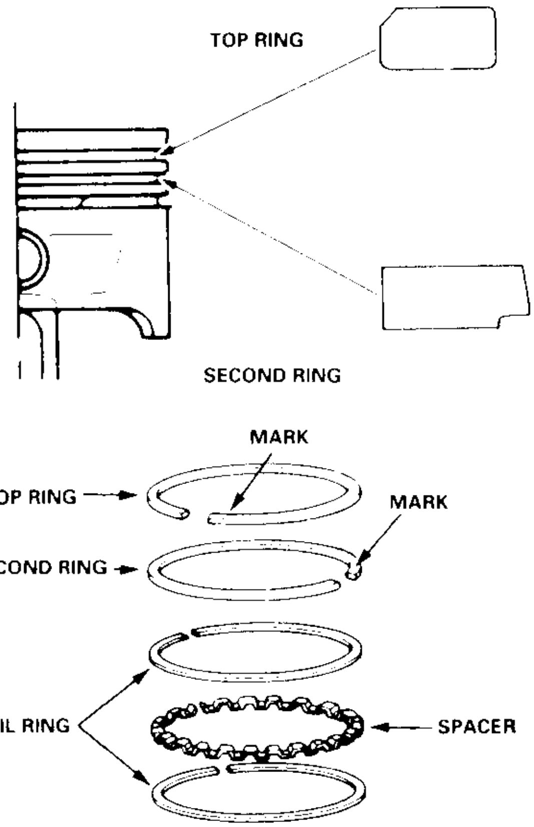
*1: RIKEN manufactured piston ring
*2: TEIKOKU PISTON RING manufactured piston ring (B18B1 engine only)

Alignment

1. Install the rings as shown.

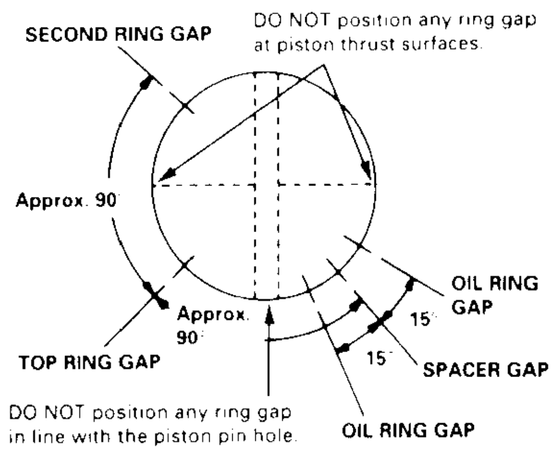
   Identify top and second rings by the chamfer on the edge. Make sure they are in their proper grooves on the piston.

   NOTE: The manufacturing marks must be facing upward.



2. Rotate the rings in their grooves to make sure they do not bind.

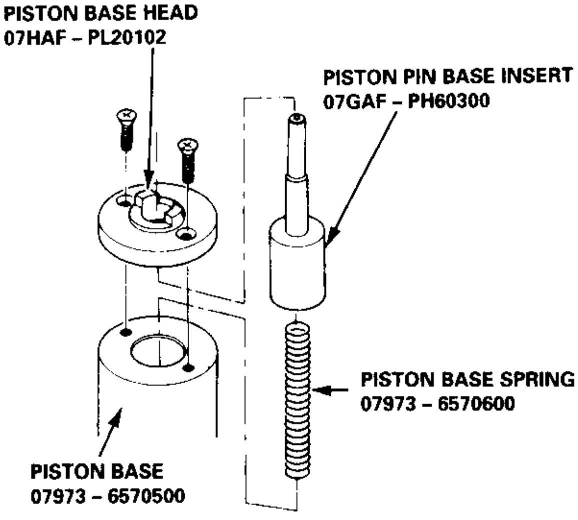
3. Position the ring end gaps as shown:



Piston Pins

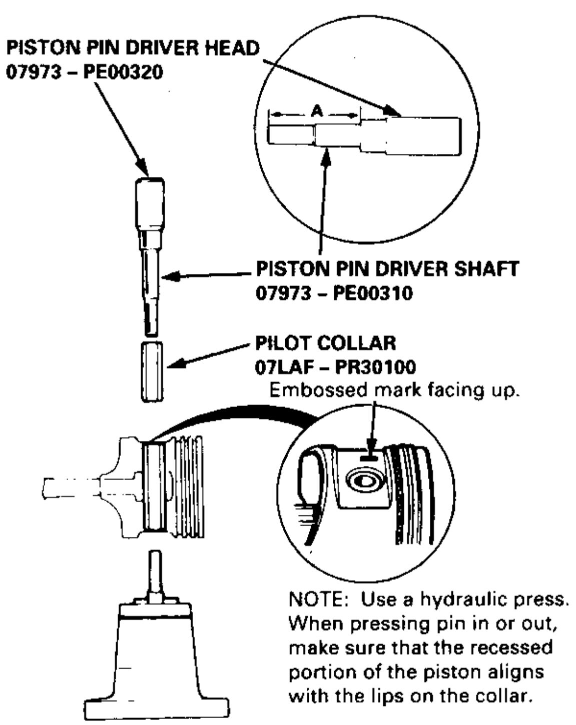
Removal

1. Assemble the Piston Pin Tools as shown.



2. Adjust the length A of the piston pin driver.

   A: B18B1 engine: 49.70 mm (1.957 in)
   B18C1 engine: 51.70 mm (2.035 in)

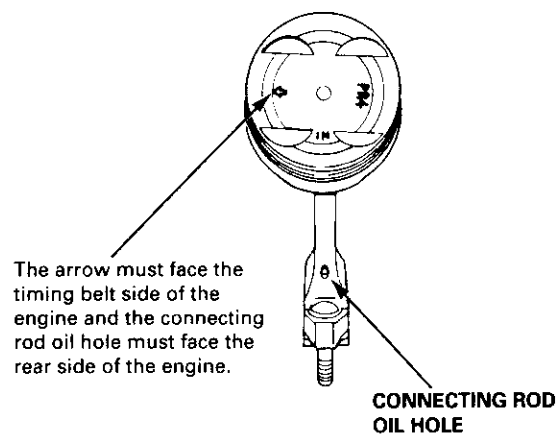


3. Place the piston on the piston base and press the pin out with a hydraulic press.

Installation (B18B1 engine)

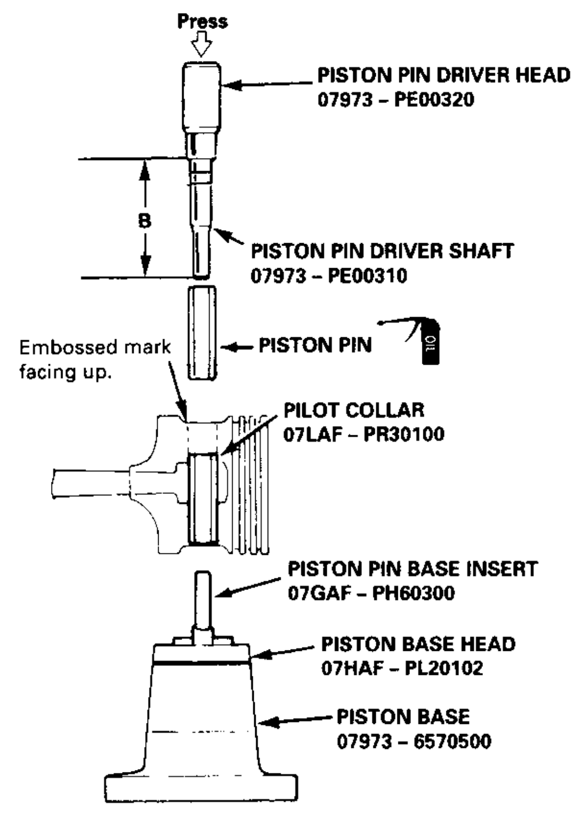
1. Use a hydraulic press for installation.

   - When pressing the pin in or out, be sure to position the recessed flat on the piston against the lugs on the base attachment.



2. Adjust the length B of the piston pin driver and shaft.

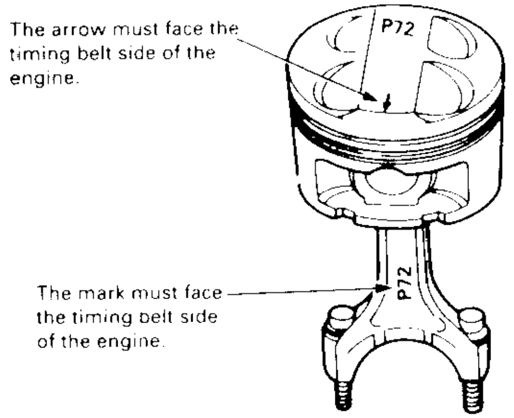
   B: 49.70 mm (1.957 in)



NOTE: Use a hydraulic press. When pressing pin in or out, make sure that the recessed portion of the piston aligns with the lugs on the piston base head.

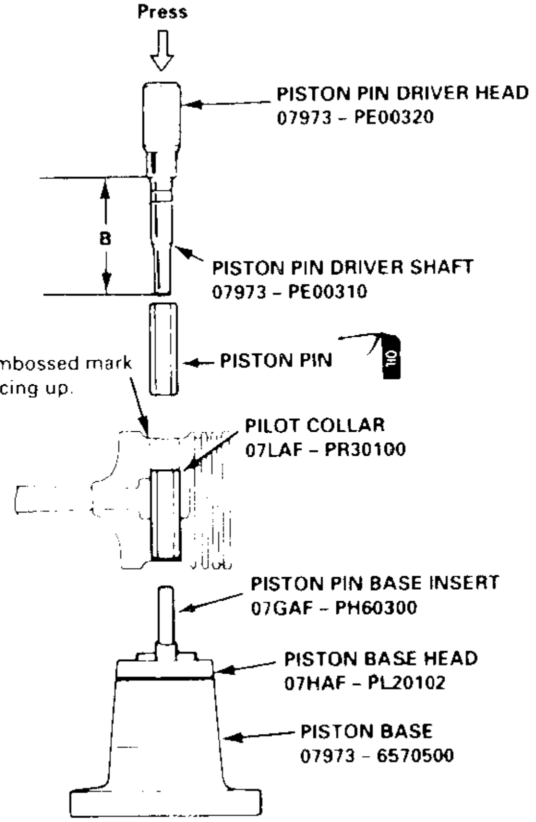
Installation (B18C1 engine)

1. Use a hydraulic press for installation.
   - When pressing pin in or out, be sure you position the recessed flat on the piston against the lugs on the base attachment.



2. Adjust the length B of piston pin driver and shaft.

B: 51.70 mm (2.035 in)



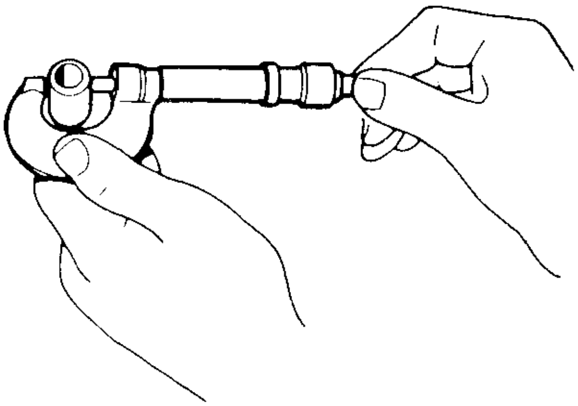
NOTE: Use a hydraulic press. When pressing pin in or out, make sure that the recessed portion of the piston aligns with the lugs on the piston base head.

Inspection

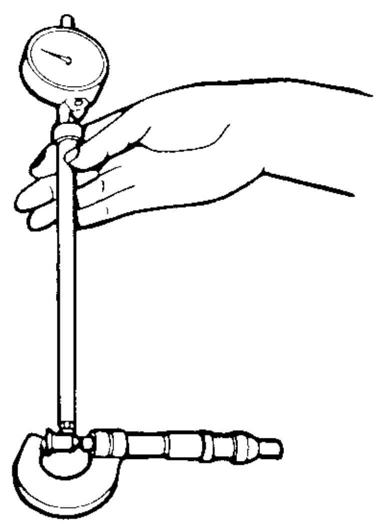
1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 20.994 – 21.000 mm
(0.8265 – 0.8268 in)
Oversize: 20.997 – 21.003 mm
(0.8267 – 0.8269 in)

NOTE: All replacement piston pins are oversize.



2. Zero the dial indicator to the piston pin diameter.



Piston Pins

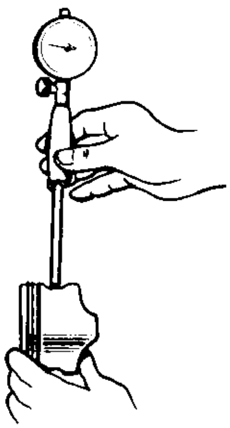
Inspection (cont'd)

3. Measure the piston pin-to-piston clearance.

   NOTE: Check the piston for distortion or cracks.

   If the piston pin clearance is greater than 0.022 mm (0.0009 in), remeasure using an oversize piston pin.

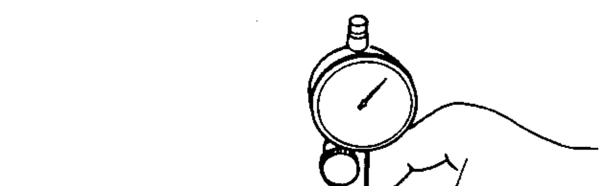
   Piston Pin-to-Piston Clearance:
   Standard (New): 0.010 – 0.022 mm
   (0.0004 – 0.0009 in)



4. Check the difference between piston pin diameter and connecting rod small end diameter.

   Piston Pin-to-Connecting Rod Interference:
   Standard (New):

B18B1 engine:	**0.013 – 0.032 mm (0.0005 – 0.0013 in)**
B18C1, B18C5 engines:	**0.017 – 0.036 mm (0.0007 – 0.0014 in)**

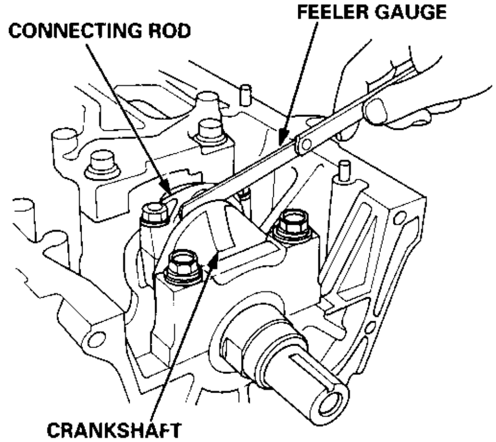


Connecting Rods

End Play

NOTE: End play should be inspected before removing the crankshaft.

Connecting Rod End Play:
Standard (New): 0.15 – 0.30 mm
(0.006 – 0.012 in)
Service Limit: 0.40 mm (0.016 in)



- If out-of-tolerance, install a new connecting rod.
- If still out-of-tolerance, replace the crankshaft (see pages 7-10 and 7-26)

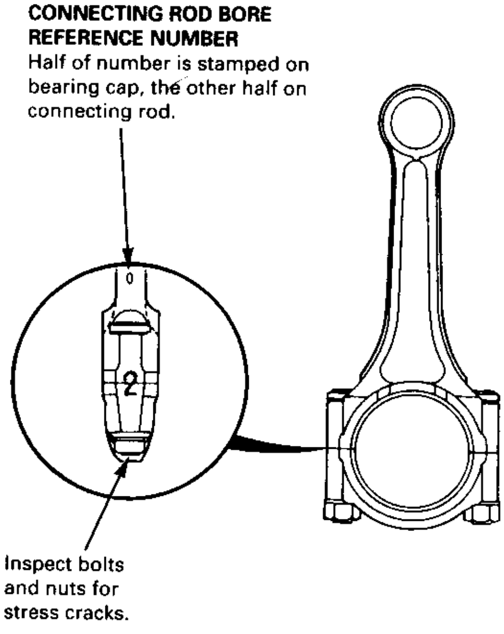
Selection

B18B1, B18C1 engines:

Each rod falls into one of four tolerance ranges (from 0 to + 0.024 mm (0 to + 0.0009 in), in 0.006 mm (0.0002 in) increments) depending on the size of its big end bore. It's then stamped with a number (1, 2, 3, or 4) indicating the range.
You may find any combination of 1, 2, 3, or 4 in any engine.

Normal Bore Size: 48.0 mm (1.89 in)

NOTE:
- Reference numbers are for big end bore size and do NOT indicate the position of the rod in the engine.
- Inspect connecting rod for cracks and heat damage.

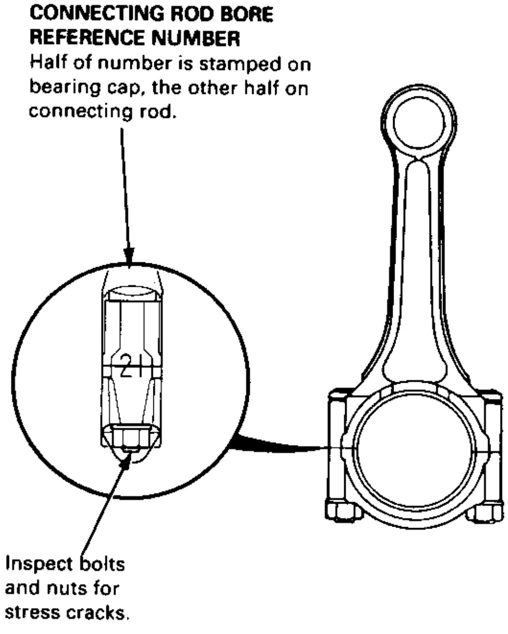


B18C5 engine:

Each rod falls into one of four tolerance ranges (from +0.006 to + 0.024 mm (+0.0002 to + 0.0009 in), in 0.003 mm (0.0001 in) increments) depending on the size of its big end bore. It's then stamped with a number (21, 22, 23, 24, 25 or 26) indicating the range.
You may find any combination of 21, 22, 23, 24, 25 or 26 in any engine.

Normal Bore Size: 48.0 mm (1.89 in)

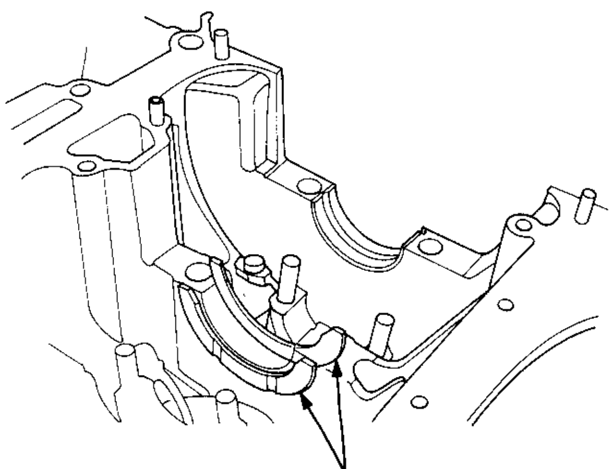
NOTE:
- Reference numbers are for big end bore size and do NOT indicate the position of the rod in the engine.
- Inspect connecting rod for cracks and heat damage.



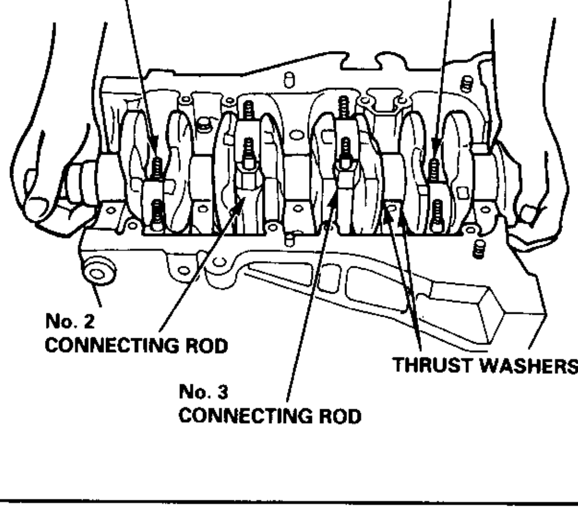
Installation

Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Install the thrust washers in the No. 4 journal of the cylinder block.



2. Insert bearing halves in the engine block and connecting rods.
3. Hold the crankshaft so rod journals for cylinders No. 2 and No. 3 are straight up.
4. Lower the crankshaft into the block, putting the rod journals into connecting rods No. 2 and No. 3. Install the rod caps and nuts finger-tight.



5. Rotate the crankshaft clockwise, put journals into connecting rods No. 1 and No. 4, and install the rod caps and nuts finger-tight.

   NOTE: Install caps so the bearing recess is on the same side as the recess in the rod.

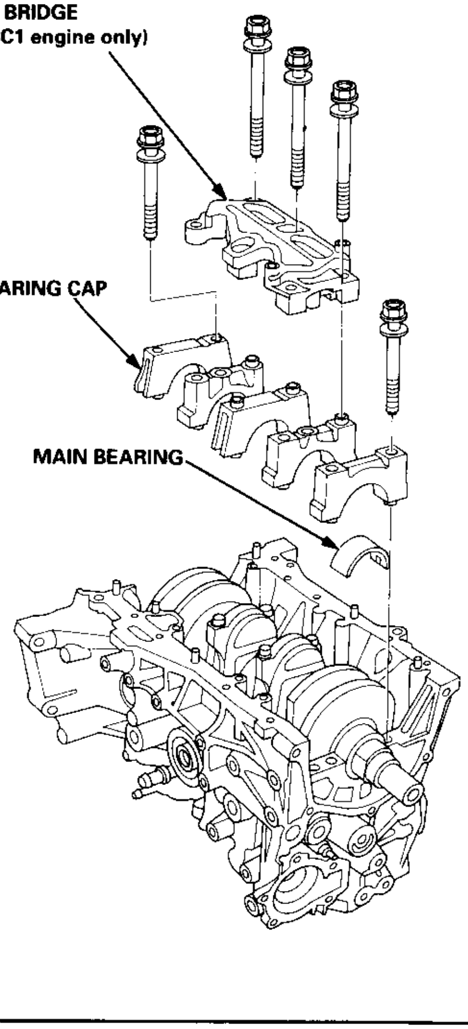
6. Check rod bearing clearance with plastigage (see page 7-9), then tighten the capnuts in 2 steps.

   1st step: 20 N·m (2.0 kgf·m, 14 lbf·ft)
   2nd step:
   B18B1 engine: 31 N·m (3.2 kgf·m, 23 lbf·ft)
   B18C1, B18C5 engines: 44 N·m (4.5 kgf·m, 33 lbf·ft)

   NOTE: Reference numbers on connecting rod are for big-end bore tolerance and do NOT indicate the position of piston in the engine.

7. Install the main bearings/caps and cap bridge (B18C1, B18C5 engines only).

   NOTE: Coat the bolt threads with oil.

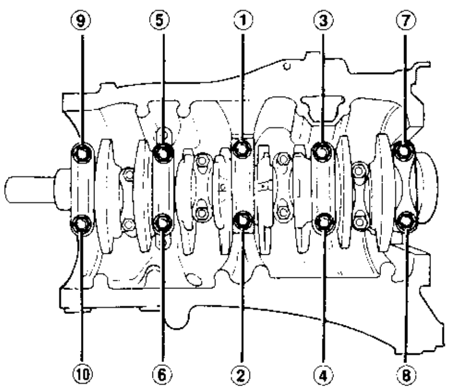


8. Check clearance with plastigage (see page 7-8), then tighten bearing cap bolts in 2 steps.

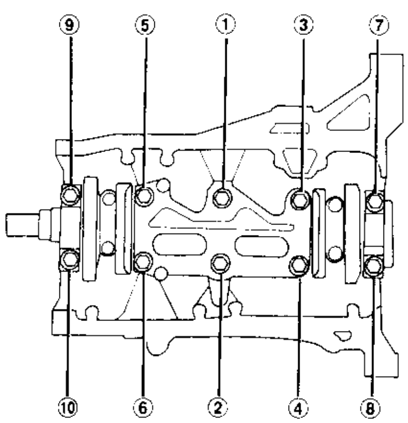
1st step: 29 N·m (3.0 kgf·m, 22 lbf·ft)
2nd step:
B18B1 engine: 76 N·m (7.8 kgf·m, 56 lbf·ft)
B18C1, B18C5 engines:
No. 1, 5 cap bolts: 73 N·m (7.4 kgf·m, 56 lbf·ft)
No. 2, 3, 4 cap bolts: 64 N·m (6.5 kgf·m, 49 lbf·ft)

BEARING CAP BOLTS TORQUE SEQUENCE

B18B1 engine:



B18C1, B18C5 engines:

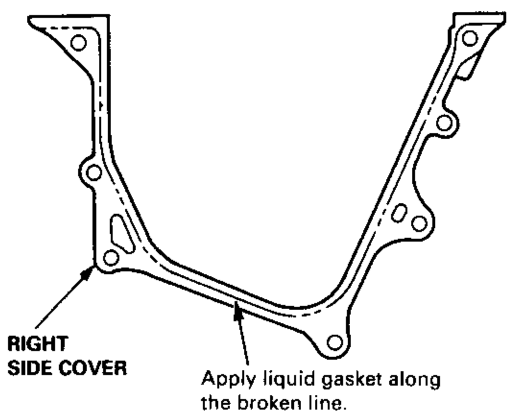


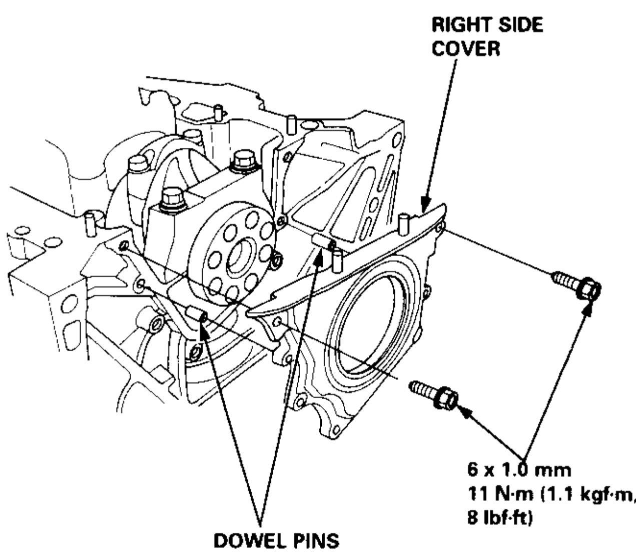
CAUTION: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for approximately 15 minutes.

9. Apply non-hardening liquid gasket to the block mating surface of the right side cover, and install it on the cylinder block.

NOTE:
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket as an even bead, centered between the edges of the mating surface.
- To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
- Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.

RIGHT SIDE COVER:





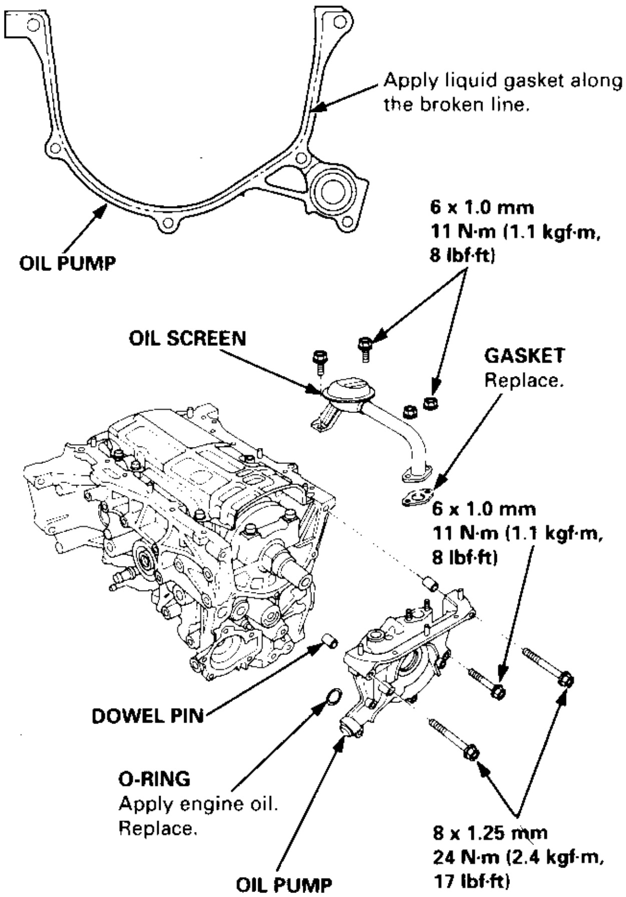
(cont'd)

Installation (cont'd)

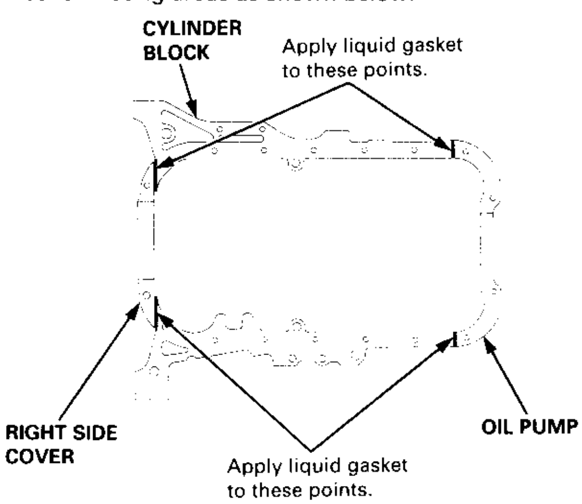
10. Apply non-hardening liquid gasket to the block mating surface of the oil pump, and install it on the cylinder block.

11. Install the oil screen.

OIL PUMP:

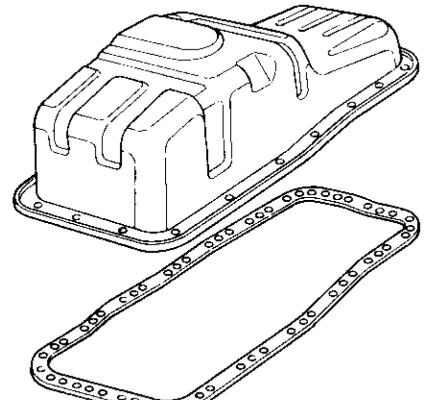


12. Apply liquid gasket on oil pump and right side cover mating areas as shown below.

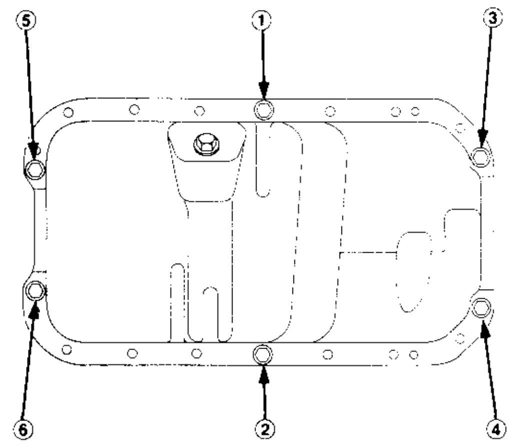


13. Install the oil pan gasket and oil pan.

NOTE: Use a new oil pan gasket.



14. Tighten bolts and nuts finger tight at six points as shown below.



15. Tighten all bolts and nuts stating from bolt 1 clockwise in three steps.

NOTE: Excessive tightening can cause distortion of oil pan gasket and oil leakage.

Torque: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)

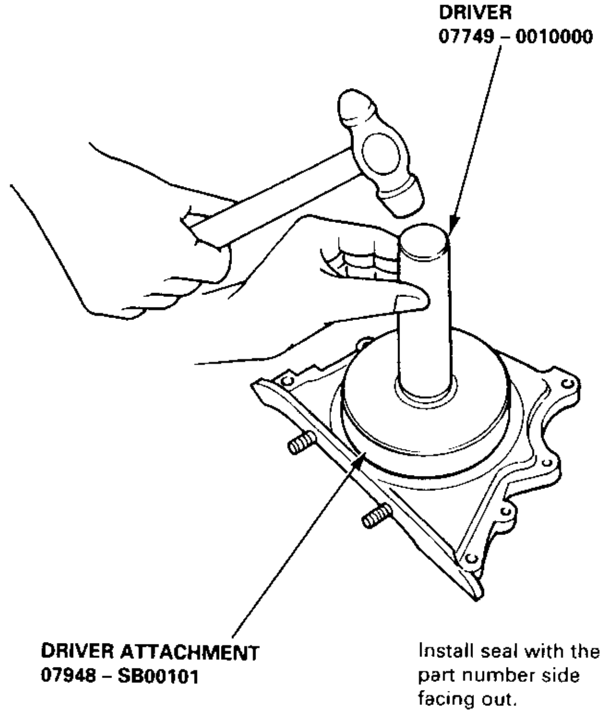
Oil Seal

Installation

The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of the seal.

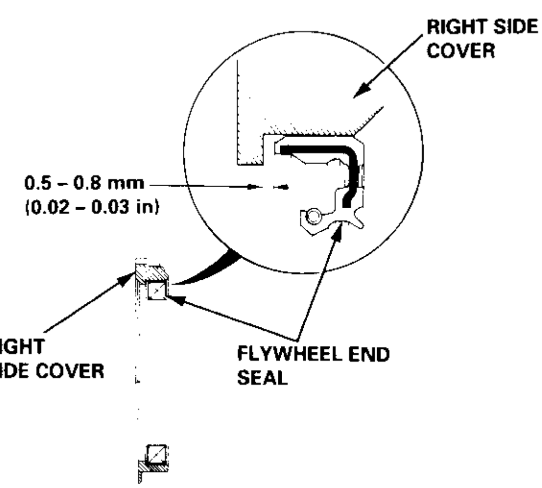
1. Drive in flywheel end seal against right side cover.

   NOTE: Drive the end seal in squarely.



2. Confirm that clearance is equal all the way around with a feeler gauge.

   Clearance: 0.5 – 0.8 mm (0.02 – 0.03 in)

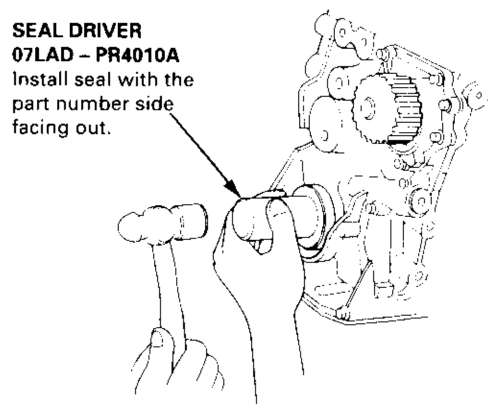


NOTE: Refer to right column and 8-11 for installation of the oil pump side oil seal.

Installation (engine removal not required)

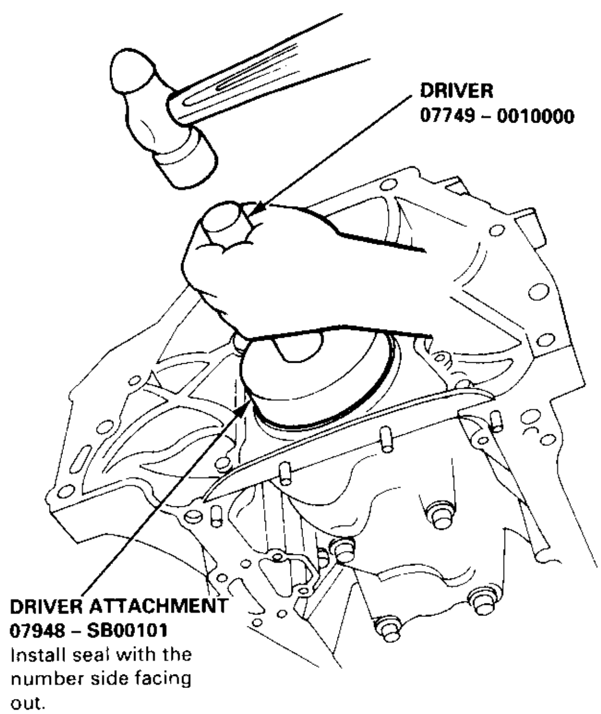
The seal surface on the block should be dry. Apply a light coat of grease to the crankshaft and to the lip of seal.

1. Using the special tool, drive in the timing pulley-end seal until the driver bottoms against the oil pump.
   When the seal is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.



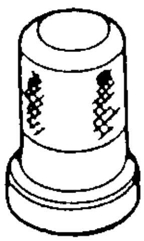
2. Using the special tool, drive in the flywheel-end seal until the driver bottoms against block.

   NOTE: Align the hole in the driver attachment with the pin on the crankshaft.

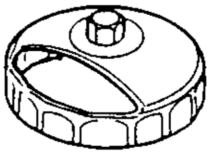


Engine Lubrication

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAD–PR4010A	Seal Driver	1	8-12
②	07912–6110001	Oil Filter Wrench	1	8-8



①

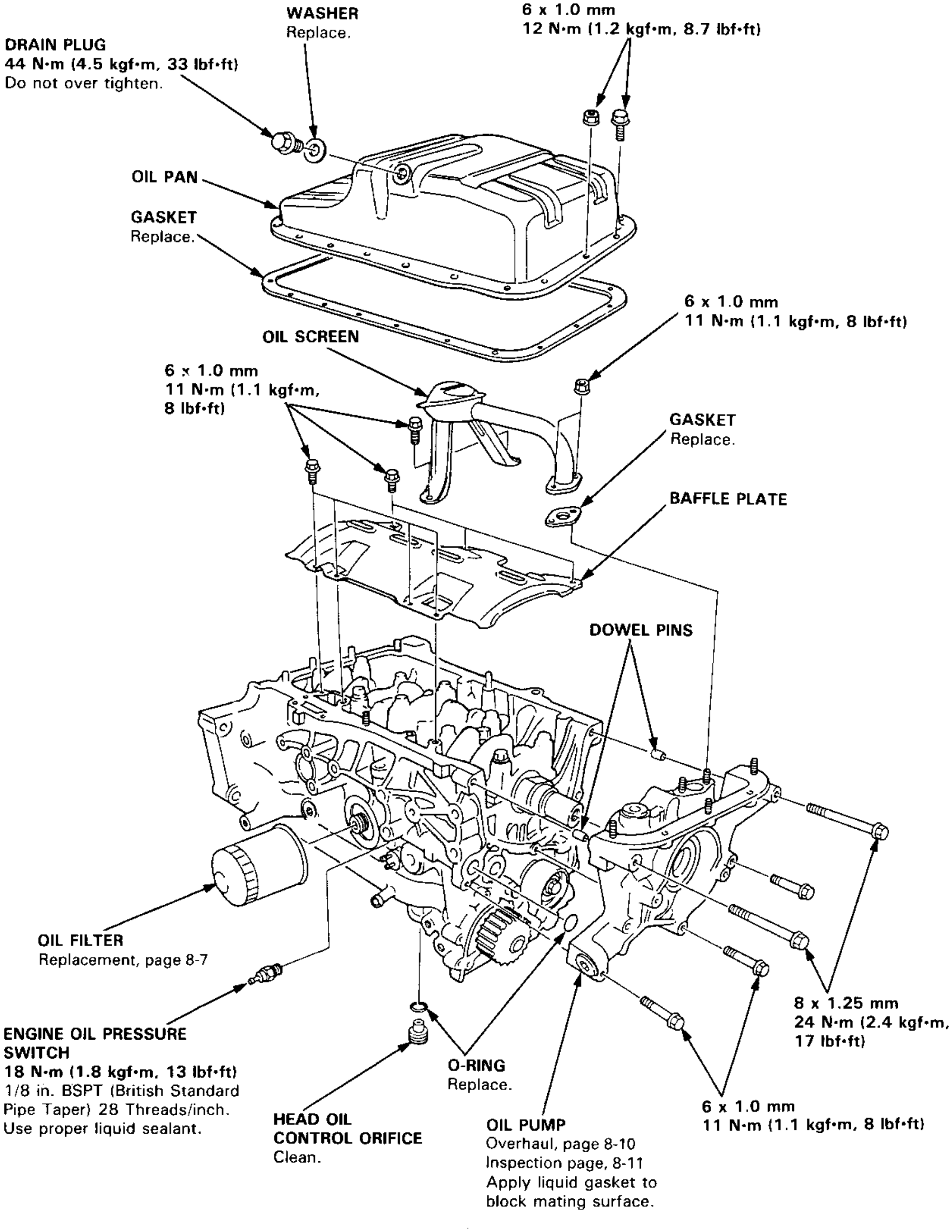


②

CAUTION: Do not overtighten the drain plug.

B18B1 engine:

NOTE:
- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Clean the oil pan gasket mating surfaces before installing it.

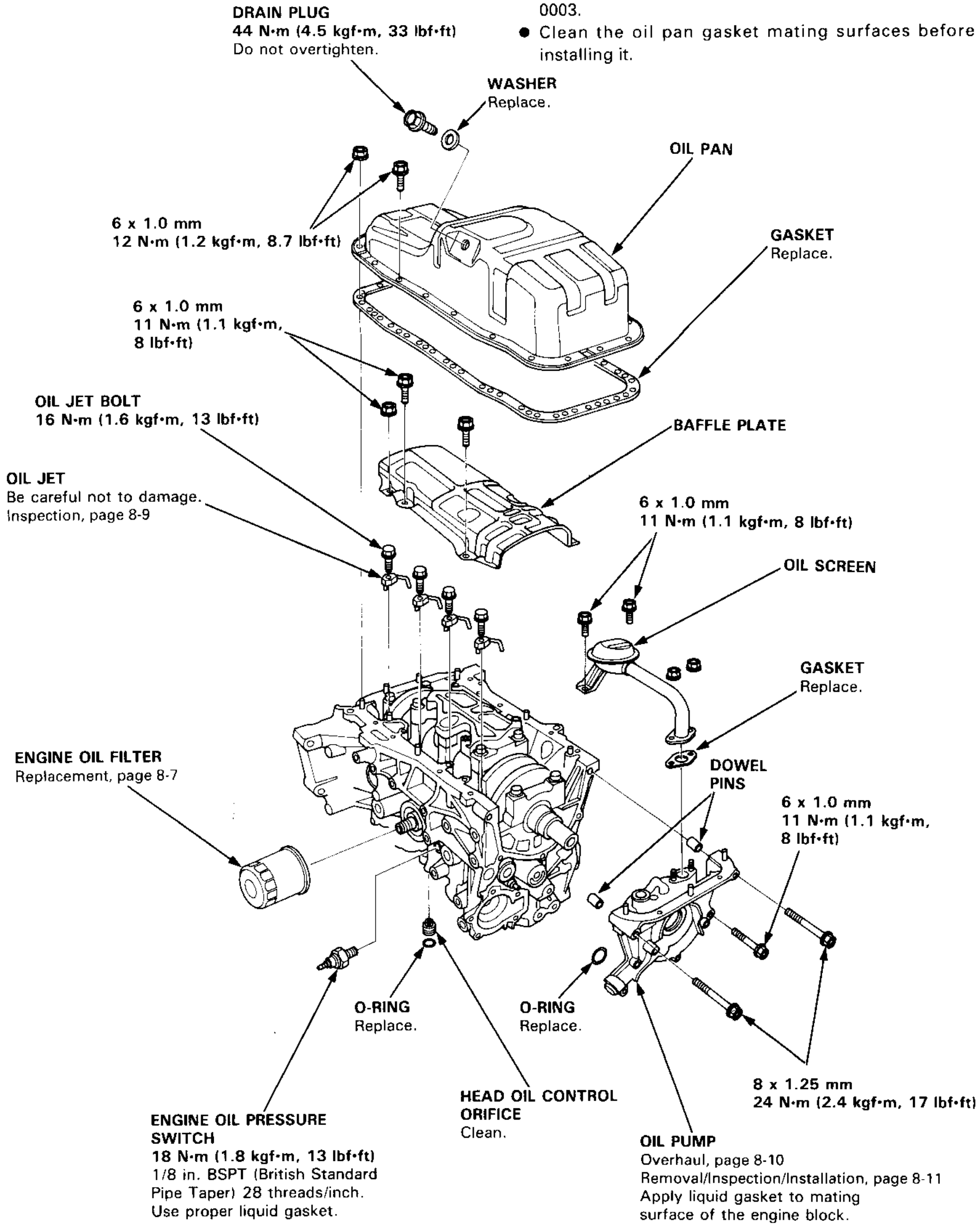


(cont'd)

CAUTION: Do not overtighten the drain plug.

NOTE:
- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Clean the oil pan gasket mating surfaces before installing it.

B18C1 engine:

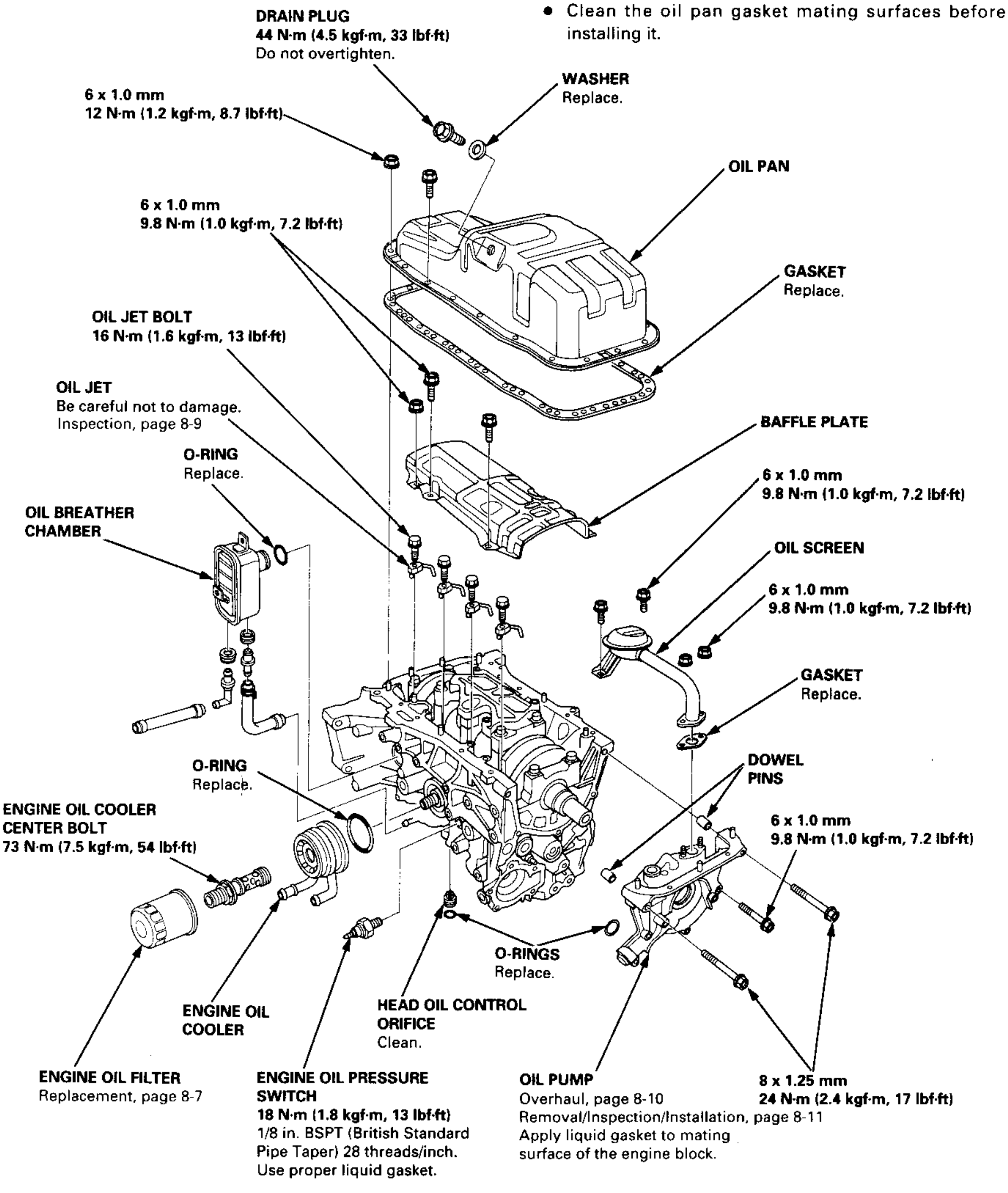


CAUTION: Do not overtighten the drain plug.

B18C5 engine:

NOTE:

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil pan gasket mating surfaces before installing it.

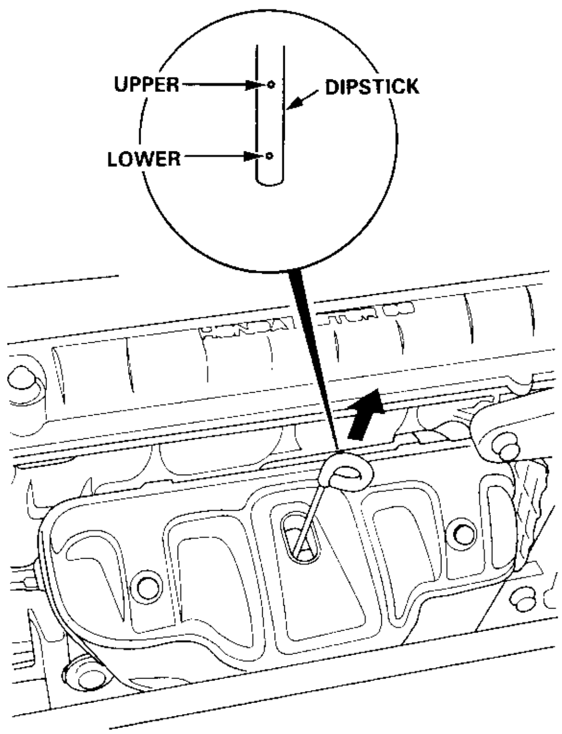


Engine Oil

Inspection

1. Park the vehicle on level ground, and turn off the engine. Allow the oil a few minutes to drain back into the oil pan so the dipstick will show the actual level.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

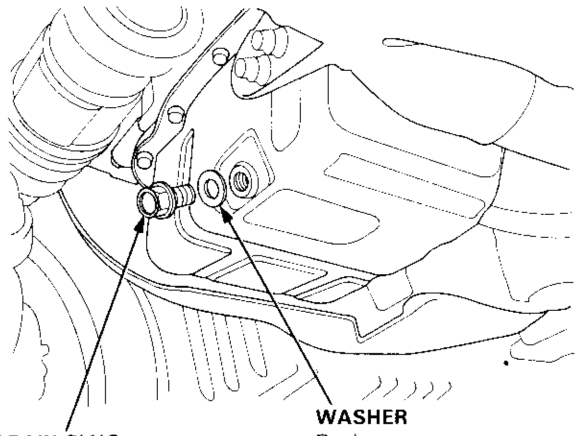
   CAUTION: Insert the dipstick carefully to avoid bending it.



Replacement

CAUTION: Remove the drain plug carefully while the engine is hot; the hot oil may cause scalding.

1. Warm up the engine.
2. Drain the engine oil.



3. Reinstall the drain plug with a new washer, and refill with the recommended oil.

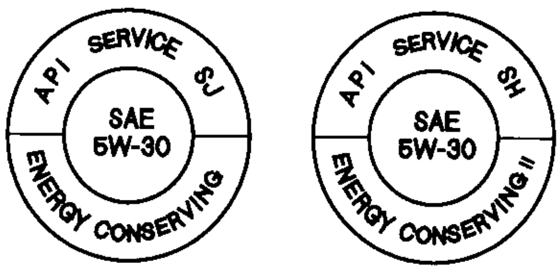
   CAUTION: Do not overtighten the drain plug.

Requirement	API Service Grade: Use "Energy Conserving" SJ or "Energy Conserving II" SH grade oil SAE 5W-30 preferred. You can also use an oil from a container that bears the API CERTIFICATION MARK.
Capacity	B18B1 engine: 3.5 ℓ (3.7 US qt, 3.1 Imp qt) at oil change. 3.8 ℓ (4.0 US qt, 3.3 Imp qt) at change, including filter. 4.6 ℓ (4.9 US qt, 4.0 Imp qt) after engine overhaul. B18C1, B18C5 engines: 3.7 ℓ (3.9 US qt, 3.3 Imp qt) at oil change. 4.0 ℓ (4.2 US qt, 3.5 Imp qt) at change, including filter. 4.8 ℓ (5.1 US qt, 4.2 Imp qt) after engine overhaul.
Change	Every 7,500 miles (12,000 km) or 12 months (Normal conditions). Every 3,750 miles (6,000 km) or 6 months (Severe conditions).

NOTE: Under normal conditions, the oil filter should be replaced at every other oil change. Under severe conditions, the oil filter should be replaced at each oil change.

Oil Filter

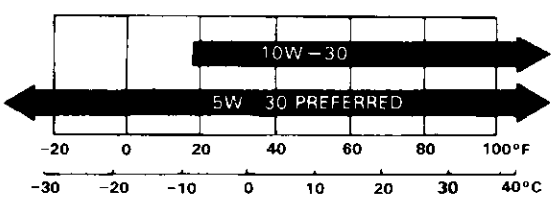
API CERTIFICATION MARK



API SERVICE LABEL

The numbers in the middle of the API Service label tell you the oil's SAE viscosity or weight. Select the oil for your vehicle according to this chart:

Ambient Temperature



An oil with a viscosity of 5 W-30 is preferred for improved fuel economy and year-round protection in the vehicle.
You may use a 10 W-30 oil if the climate in your area is limited to the temperature range shown on the chart.

4. Run the engine for more than three minutes, then check for oil leakage and oil level.

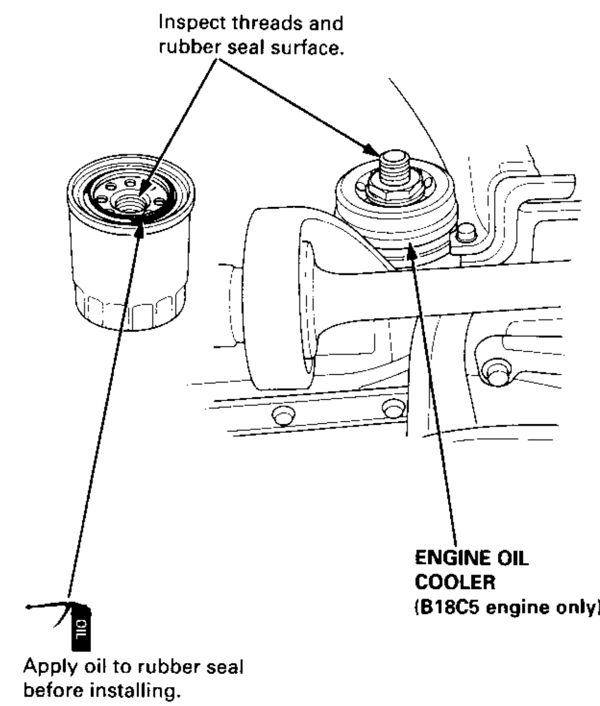
Replacement

CAUTION: After the engine has been run, the exhaust pipes will be hot; be careful when working around the exhaust manifold.

1. Remove the oil filter with the special oil filter wrench.

2. Inspect the threads and rubber seal on the new filter. Wipe off seat on engine oil cooler, then apply a light coat of oil to the filter rubber seal.

   NOTE: Use only filters with a built-in bypass system.



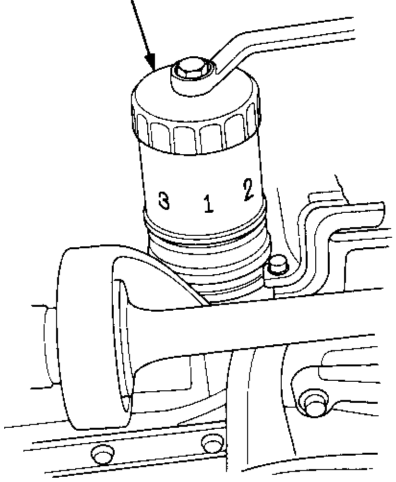
(cont'd)

Oil Filter

Replacement (cont'd)

3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

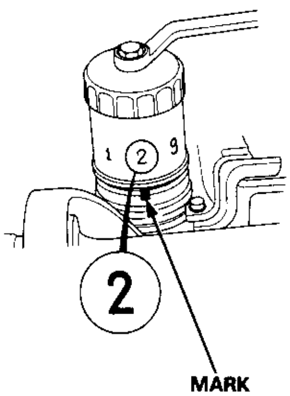
Tighten: 7/8 turn clockwise.
Tightening torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)

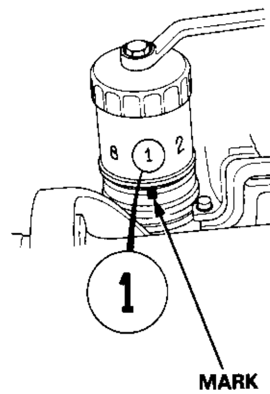


Eight numbers (1 to 8) are printed on the surface of the filter.
The following explains the procedure for tightening filters using these numbers.

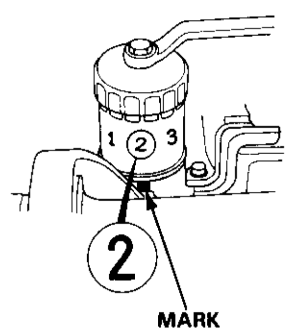
1) Make a mark on the engine oil cooler (B18C5 engine) or cylinder block (B18B1, B18C1 engines) under the number that shows at the bottom of the filter when the rubber seal is seated.
2) Tighten the filter by turning it clockwise seven numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.

B18C5 engine:

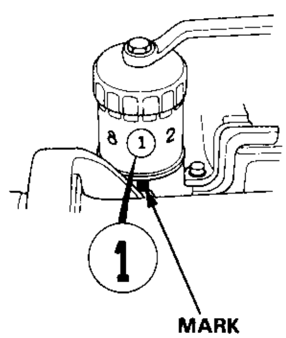




B18B1, B18C1 engines:



Number when rubber seal is seated.



Number after tightening.

Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

5. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage and oil level.
   CAUTION: Installation using other than the above procedure could result in serious engine damage due to oil leakage.

Oil Pressure

Testing

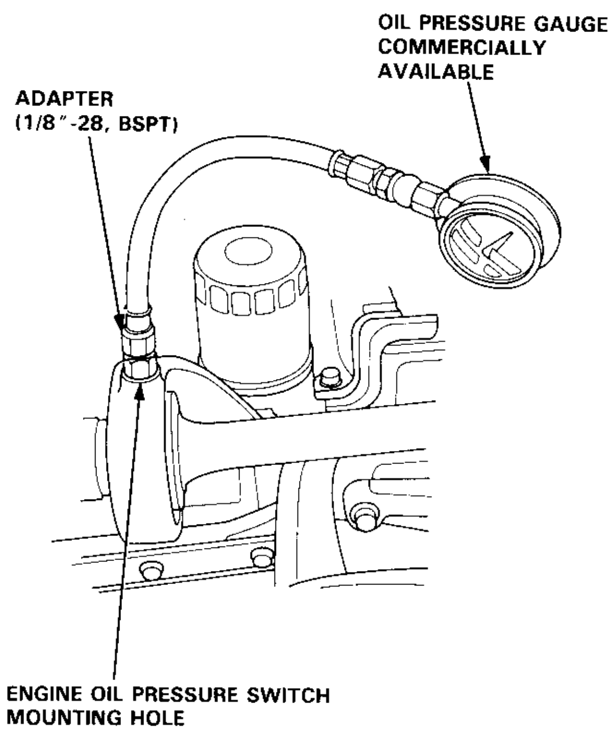
If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the oil pressure switch and install an oil pressure gauge.
3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

   Engine Oil Pressure:

   At Idle: **70 kPa (0.7 kgf/cm², 10 psi) minimum**
   At 3,000 rpm: **340 kPa (3.5 kgf/cm², 50 psi) minimum**

   - If oil pressure is within specifications, replace the engine oil pressure switch and recheck.
   - If oil pressure is NOT within specifications, inspect the oil pump (see page 8-11).



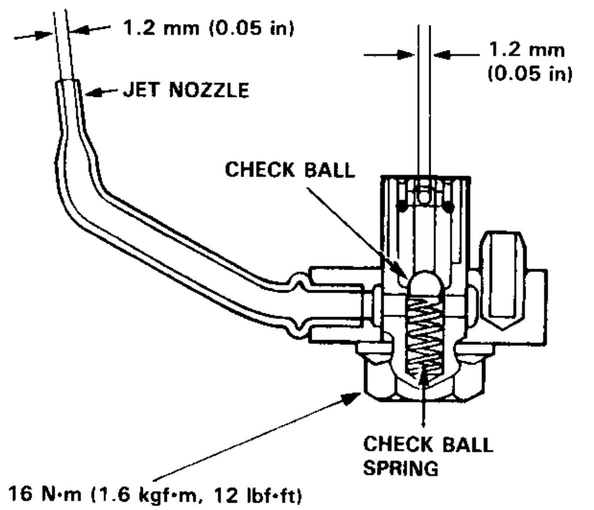
Oil Jet

Inspection (B18C1, B18C5 engines only)

1. Remove the oil jet (see pages 8-4 or 8-5) and inspect it as follows.

   - Make sure that a 1.1 mm (0.04 in) diameter drill will go through the nozzle hole (1.2 mm (0.05 in) diameter).
   - Insert the other end of the same 1.1 mm (0.04 in) drill into the oil intake (1.2 mm (0.05 in) diameter).
     Make sure the check ball moves smoothly and has a stroke of approximately 4.0 mm (0.16 in).
   - Check the oil jet operation with an air nozzle. It should take at least 200 kPa (2.0 kgf/cm², 28 psi) to unseat the check ball.

   NOTE: Replace the oil jet assembly if the nozzle is damaged or bent.



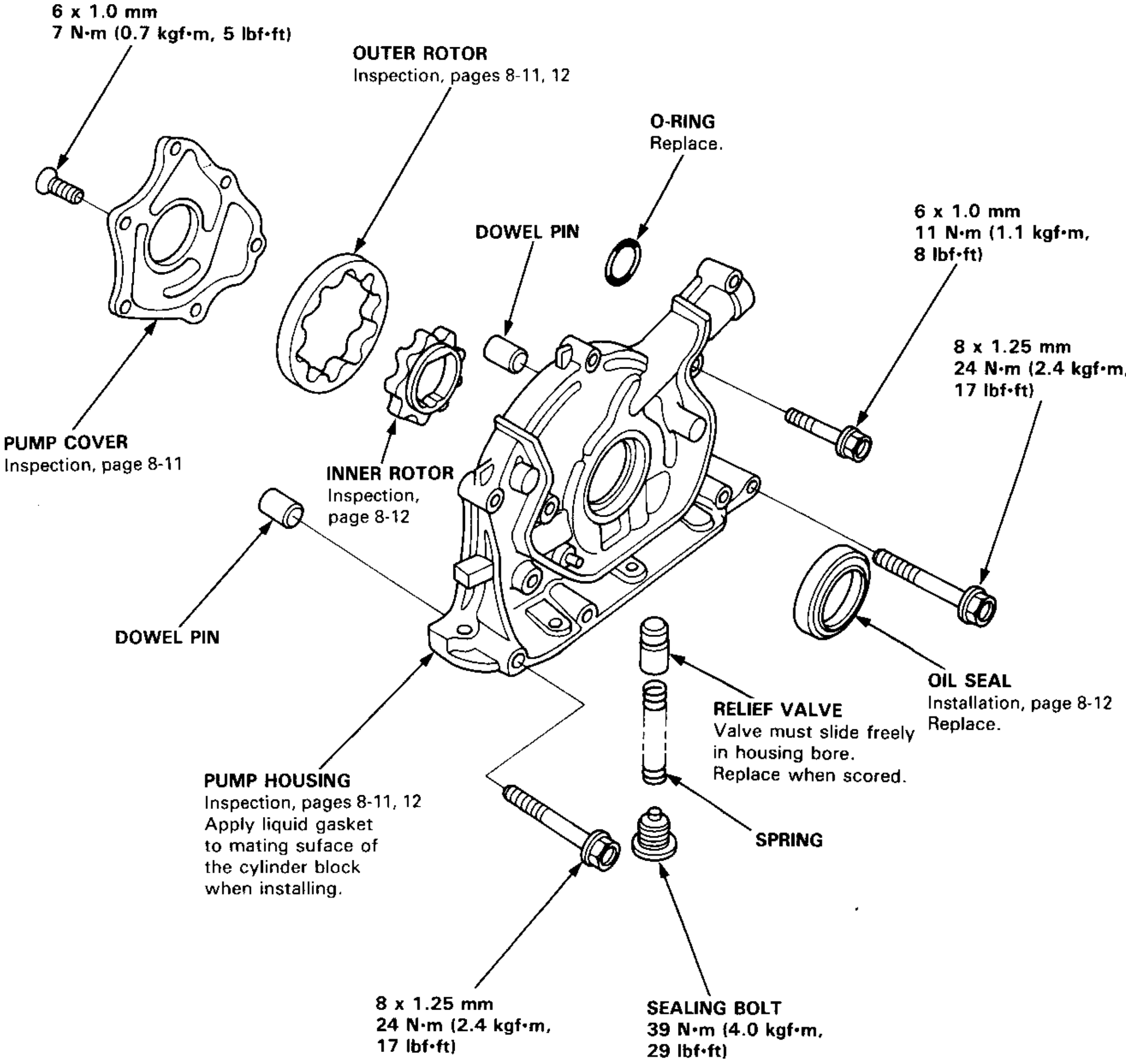
2. Mounting torque is critical. Be very precise when installing.

   Torque: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Oil Pump

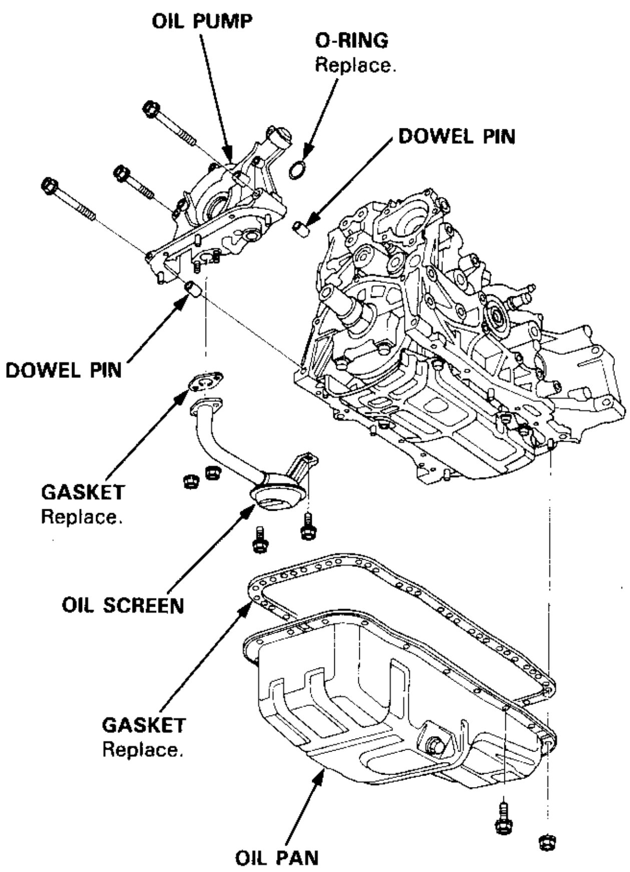
Overhaul

NOTE:
- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- After reassembly, check that the rotors move without binding.



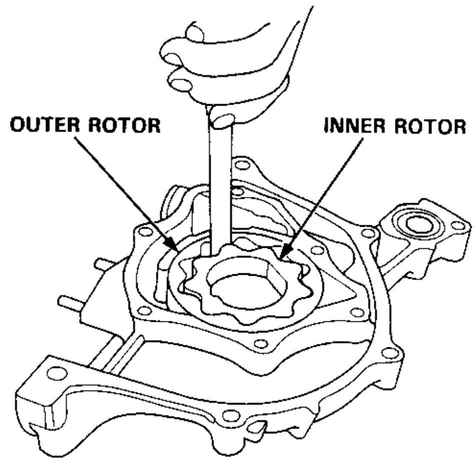
Removal/Inspection/Installation

1. Drain the engine oil.
2. Turn the crankshaft and align the white groove on the crankshaft pulley with the pointer on the lower cover.
3. Remove the cylinder head cover and middle cover.
4. Remove the power steering pump belt, air conditioner belt and the alternator belt.
5. Remove the crankshaft pulley and remove the lower cover.
6. Remove the timing belt.
7. Remove the drive pulley.
8. Remove the oil pan and oil screen.
9. Remove the oil pump.



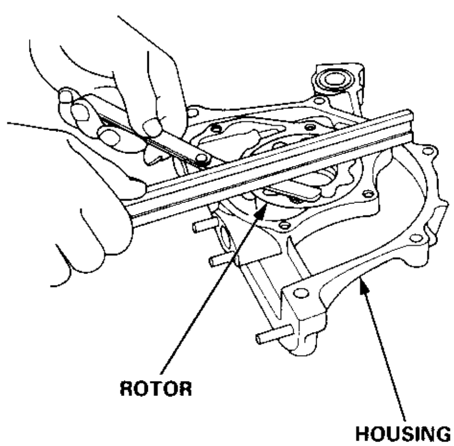
10. Remove the screws from the pump housing, then separate the housing and cover.
11. Check the inner-to outer rotor radial clearance on the pump rotor.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.04–0.16 mm (0.002–0.006 in)
Service Limit: 0.20 mm (0.008 in)



12. Check the housing-to-rotor axial clearance on the pump rotor.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02–0.07 mm (0.001–0.003 in)
Service Limit: 0.15 mm (0.006 in)

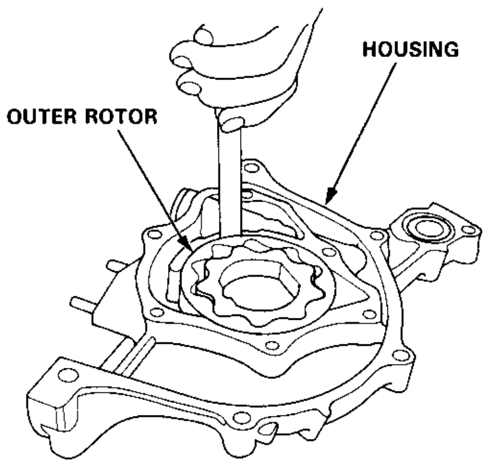


(cont'd)

Removal/Inspection/Installation (cont'd)

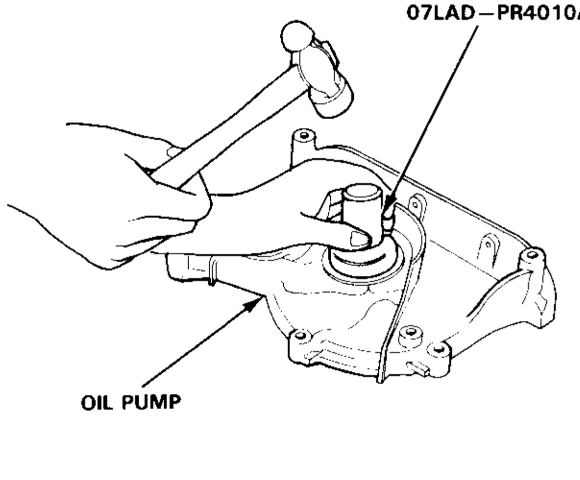
13. Check the housing-to-outer rotor radial clearance.

Housing-to-Outer Rotor Radial Clearance:
Standard (New): 0.10–0.19 mm (0.004–0.007 in)
Service Limit: 0.20 mm (0.008 in)



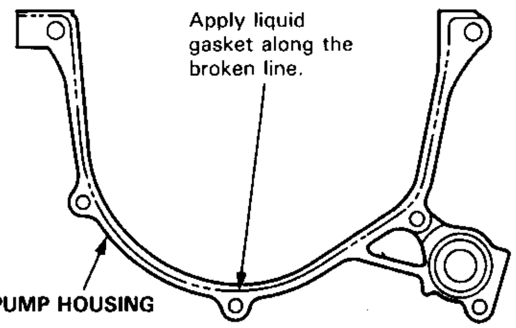
14. Inspect both rotors and pump housing for scoring or other damage. Replace parts if necessary.
15. Remove the old oil seal from the oil pump.
16. Gently tap in the new oil seal until the special tool bottoms on the pump.

NOTE: The oil seal alone can be replaced without removing the oil pump.



17. Reassemble the oil pump, applying thread lock to the pump housing screws.
18. Check that the oil pump turns freely.
19. Apply a light coat of oil to the seal lip.
20. Install the two dowel pins and new O-ring on the oil pump.
21. Apply liquid gasket to the cylinder block mating surface of the oil pump.

NOTE:
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.



- Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.

22. Install the oil pump on the cylinder block.
    - Apply grease to the lip of the oil pump seal. Then, install the oil pump onto the crankshaft. When the pump is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.
23. Install the oil screen.
24. Install the oil pan (see page 7-28).

Intake Manifold/Exhaust System

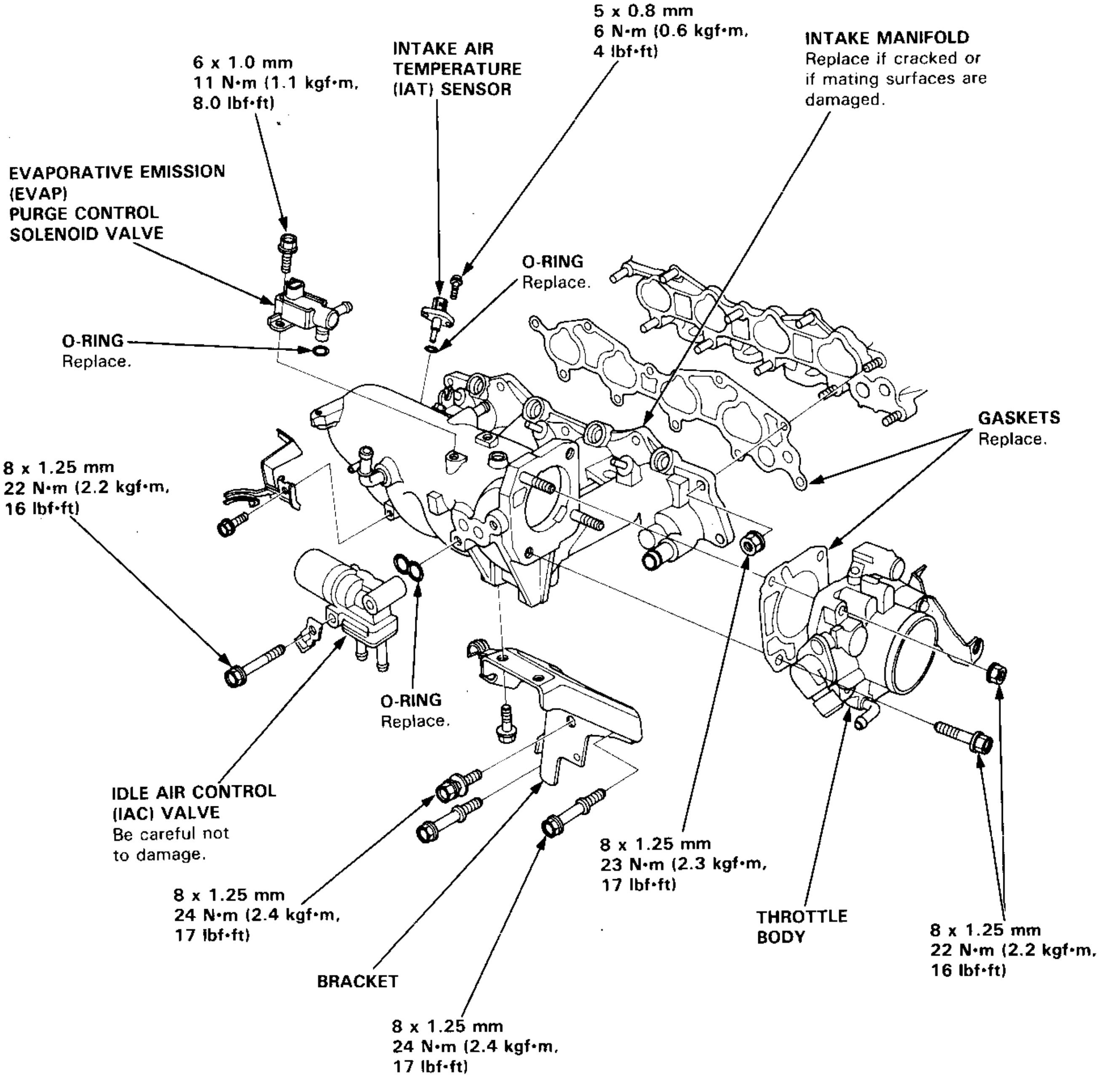
Intake Manifold

Replacement

NOTE: Use new O-rings and gaskets when reassembling.

CAUTION: Check for folds or scratches on the surface of the gasket. Replace with a new gasket if damaged.

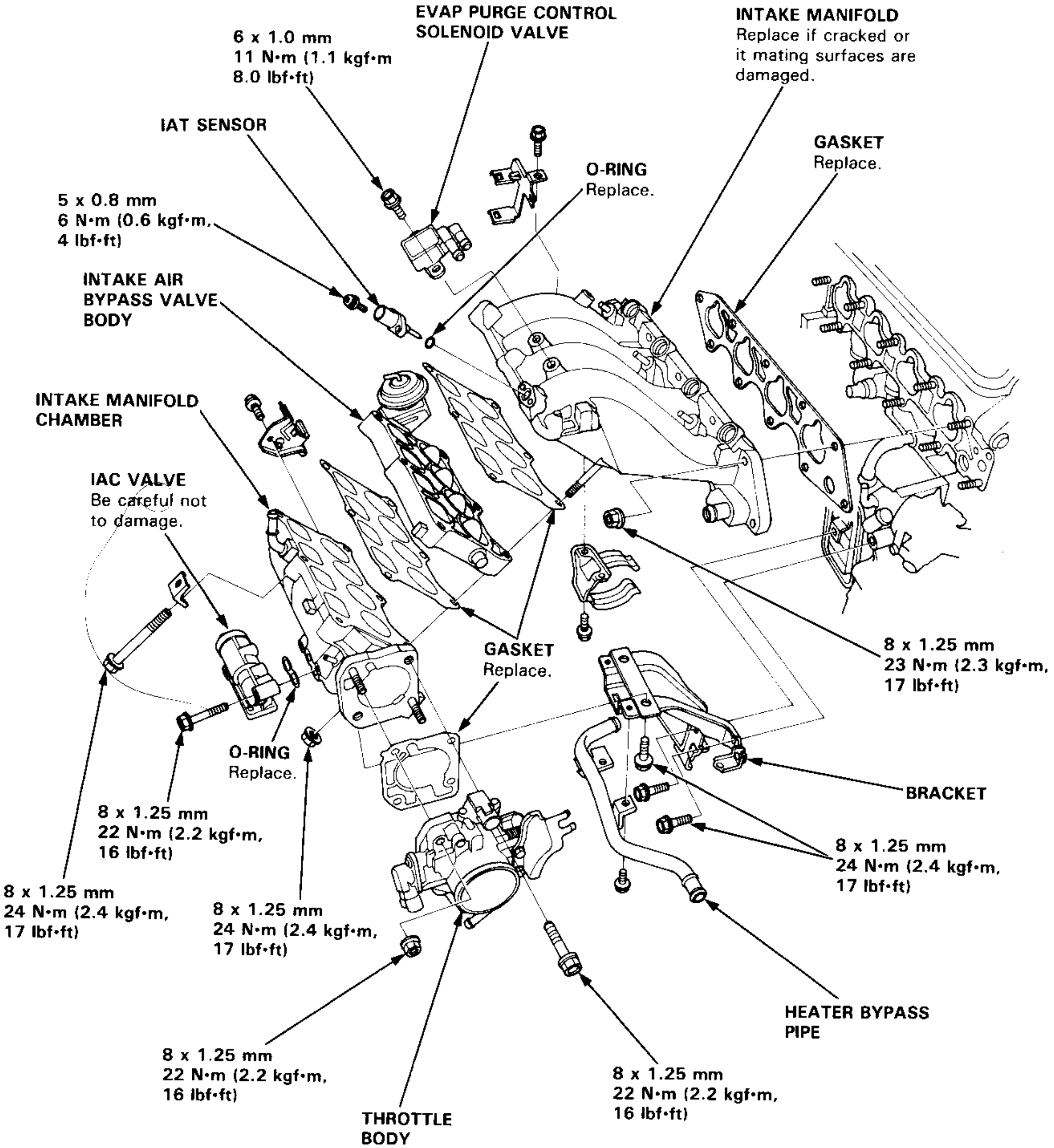
B18B1 engine:



NOTE: Use new O-rings and gaskets when reassembling.

CAUTION: Check for folds or scratches on the surface of the gasket. Replace with a new gasket if damaged.

B18C1 engine:



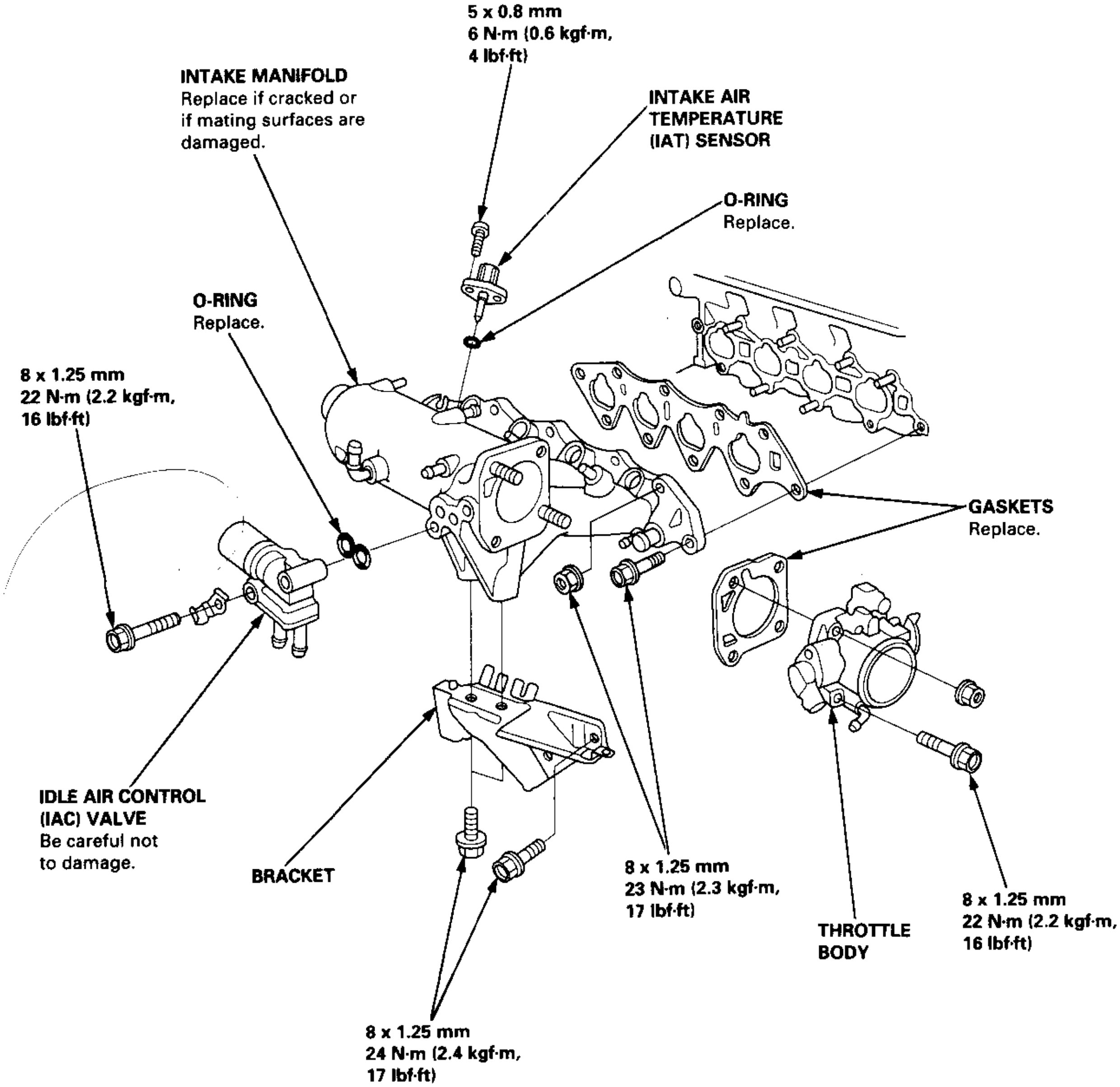
(cont'd)

Replacement (cont'd)

NOTE: Use new O-rings and gaskets when reassembling.

CAUTION: Check for folds or scratches on the surface of the gasket. Replace with a new gasket if damaged.

B18C5 engine:

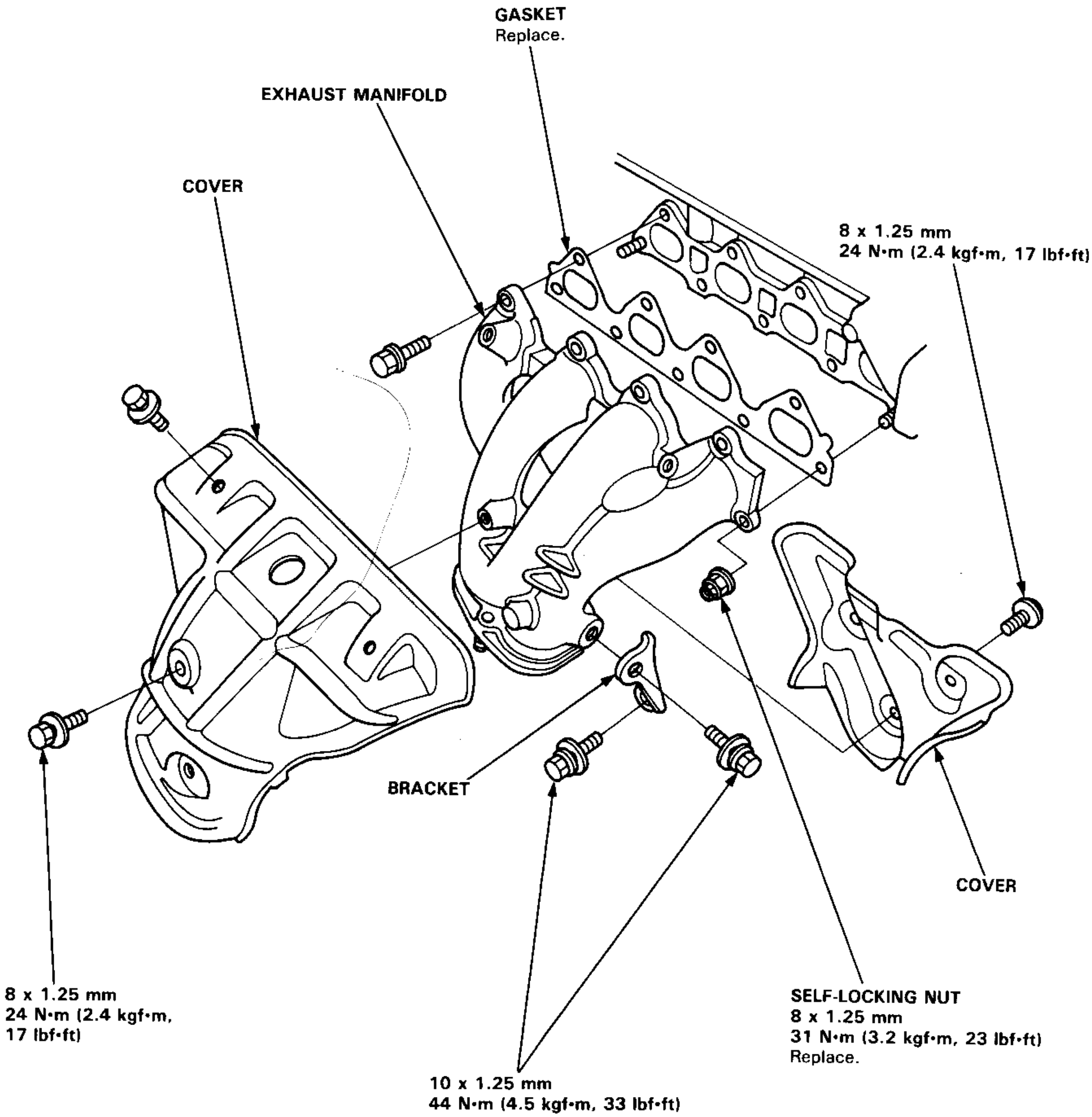


Exhaust Manifold

Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

B18B1, B18C1 engine:



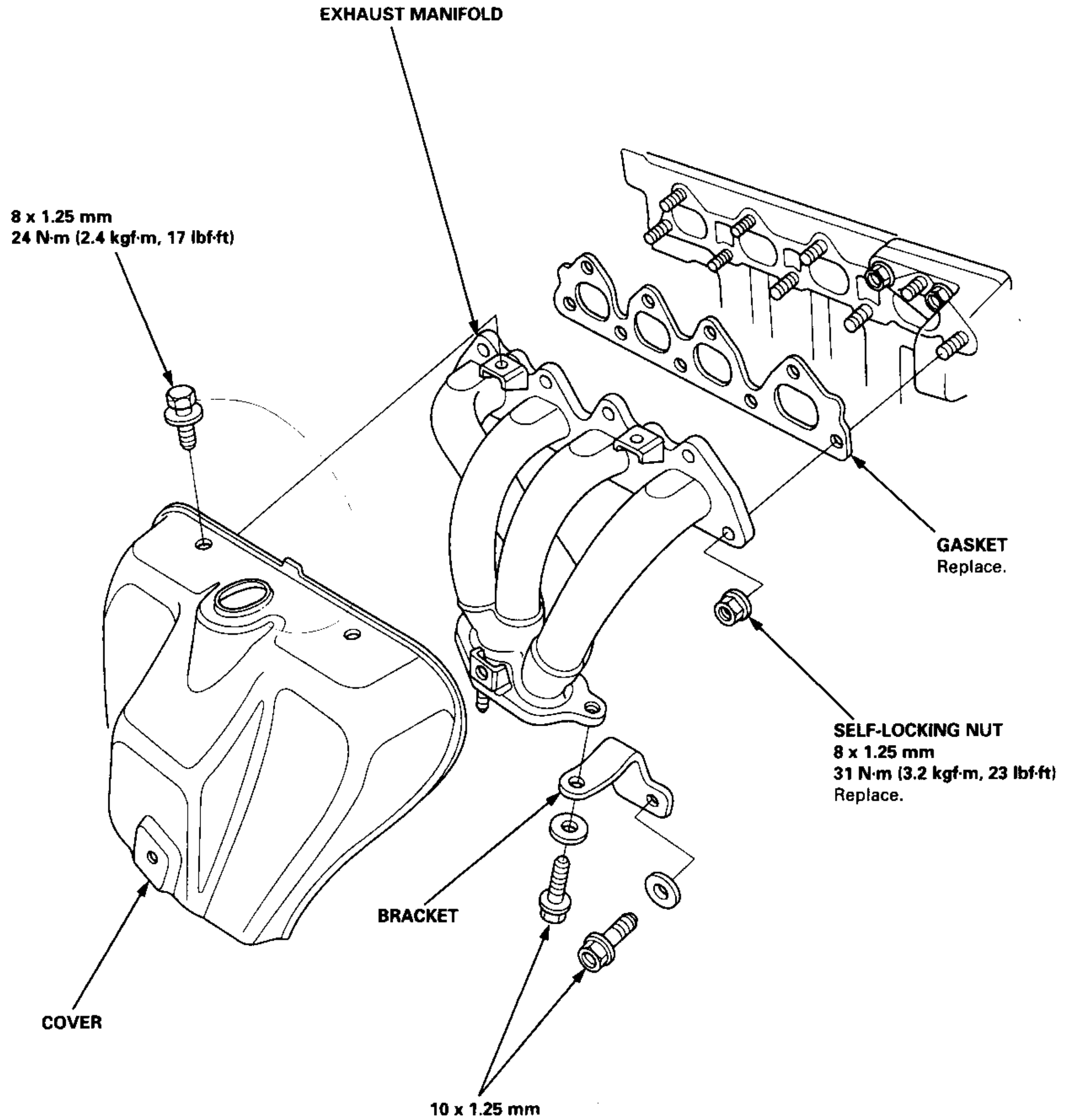
(cont'd)

Exhaust Manifold

Replacement (cont'd)

NOTE: Use new gaskets and self-locking nuts when reassembling.

B18C5 engine:

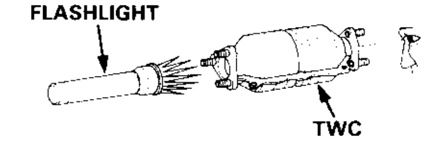


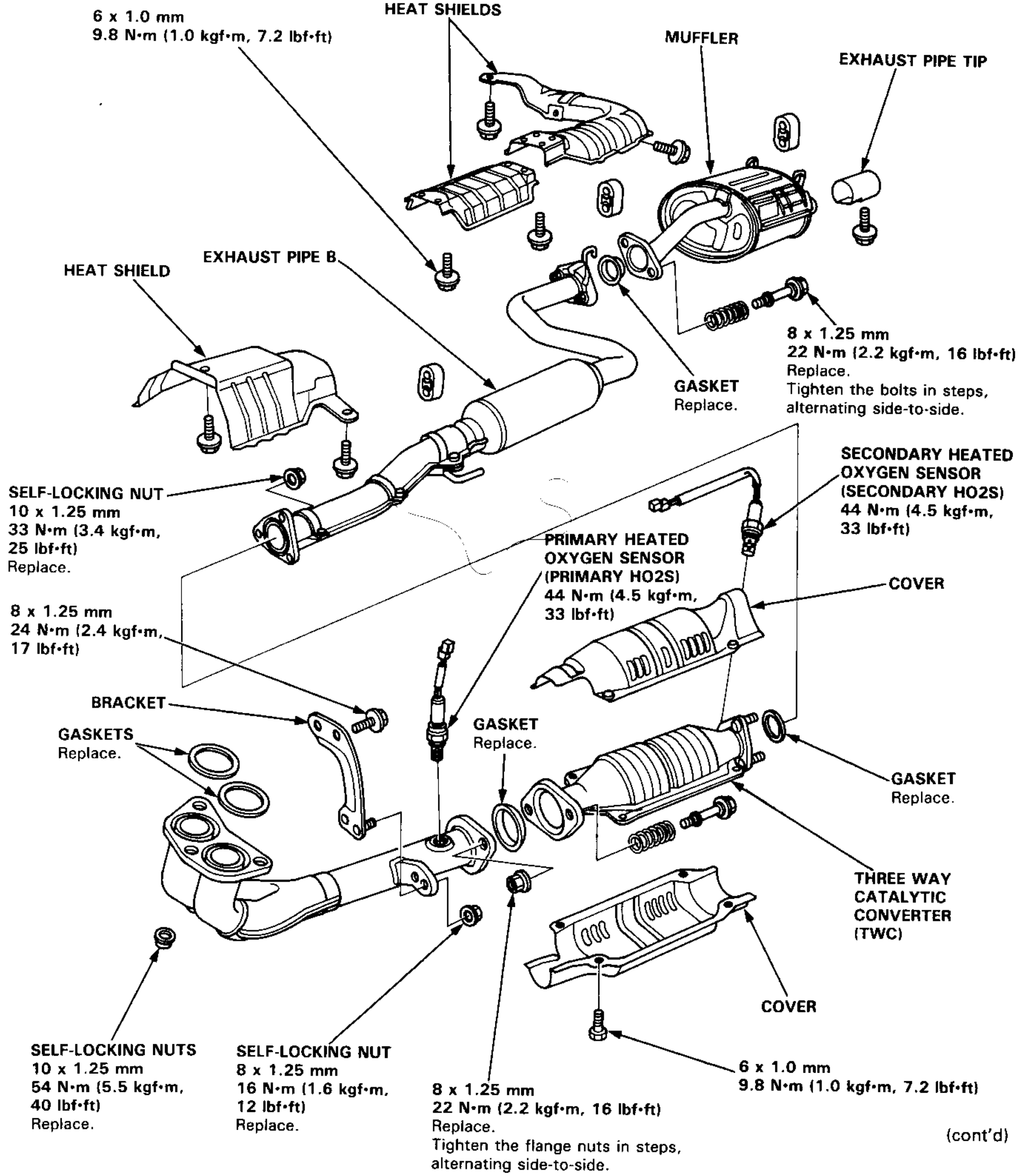
Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

B18B1 engine:

TWC Inspection:
Make a visual check for plugging, melting or cracking of the catalyst





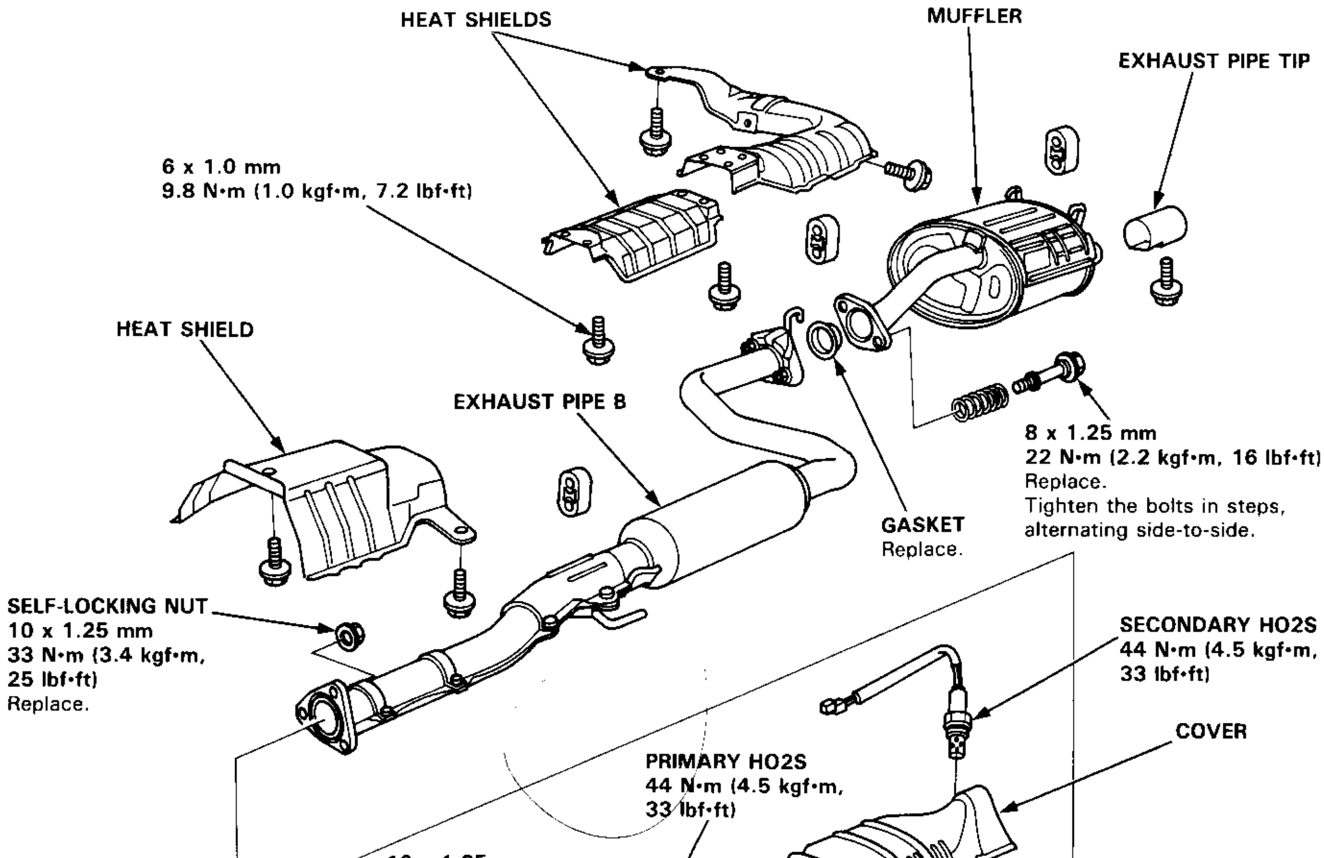
(cont'd)

Exhaust Pipe and Muffler

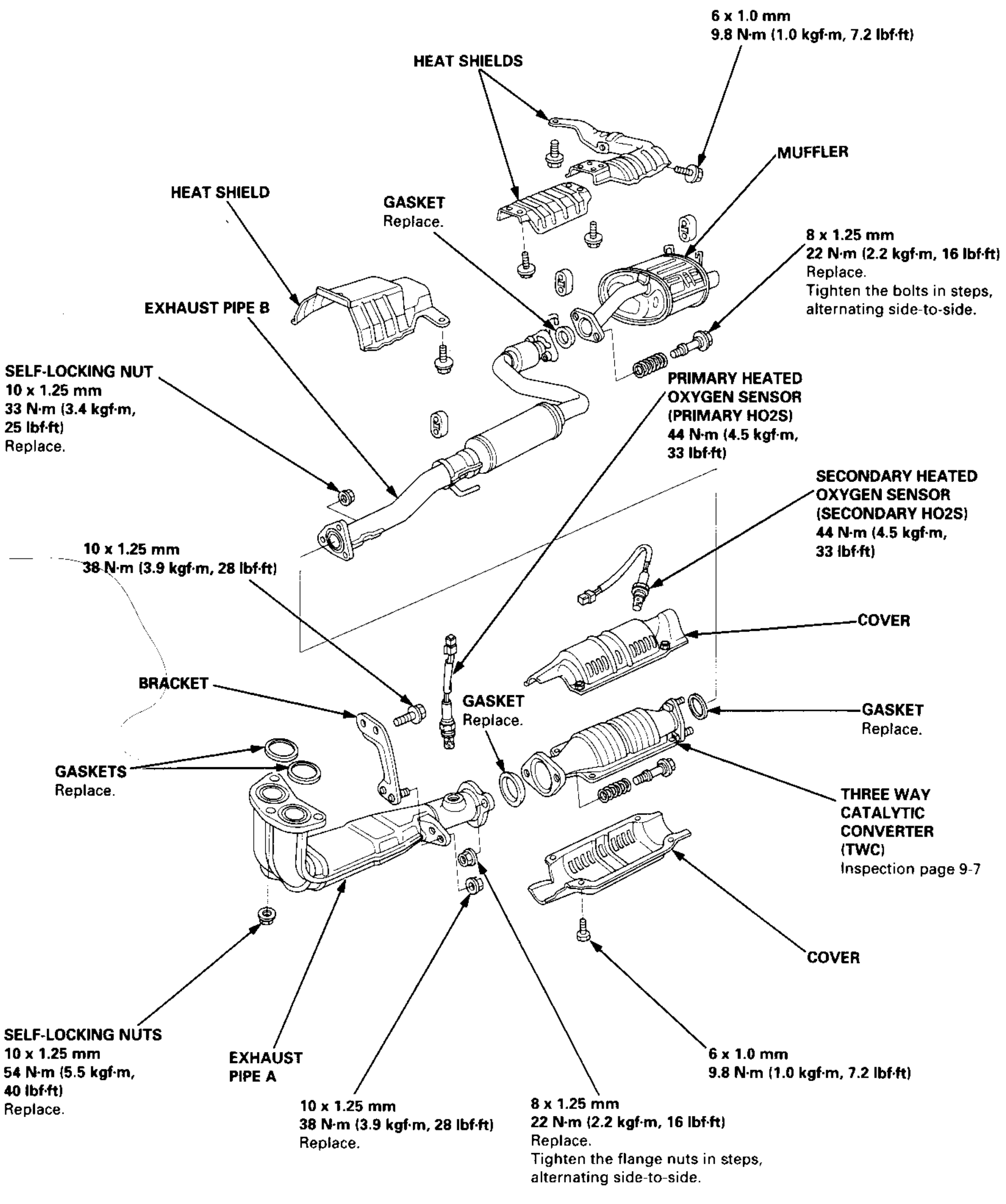
Replacement (cont'd)

NOTE: Use new gaskets and self-locking nuts when reassembling.

B18C1 engine:



B18C5 engine:



Cooling

⚠ WARNING System is under high pressure when the engine is hot. To avoid danger of releasing scalding engine coolant, remove the cap only when engine is cool.

Total Cooling System Capacity (Including heater and reservoir)

B18B1 engine:

M/T: 6.4 ℓ (6.8 US qt, 5.6 Imp qt)
A/T: 6.7 ℓ (7.1 US qt, 5.9 Imp qt)

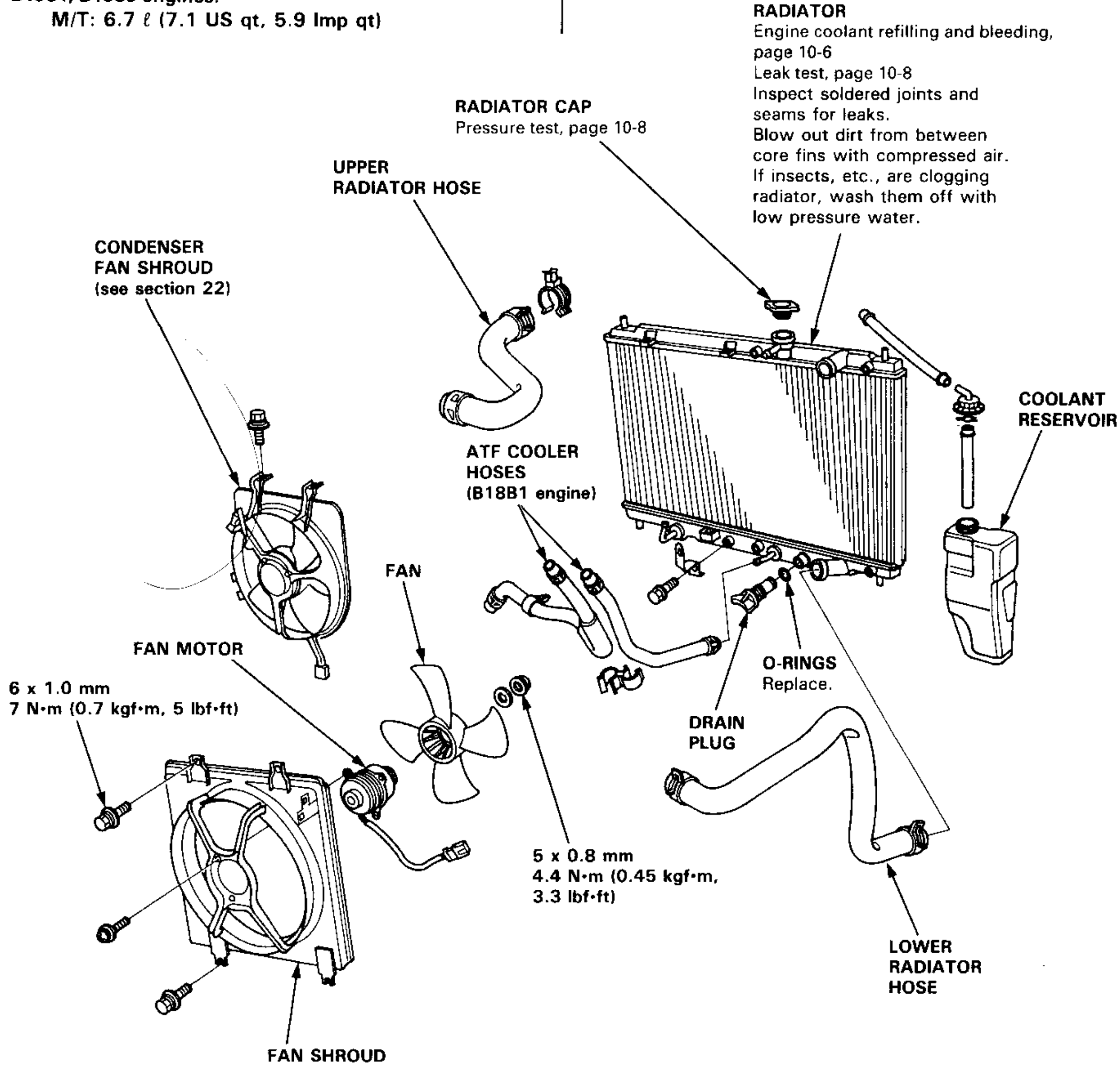
B18C1, B18C5 engines:

M/T: 6.7 ℓ (7.1 US qt, 5.9 Imp qt)

CAUTION: If any engine coolant spills on painted portions of the body, rinse it off immediately.

NOTE:

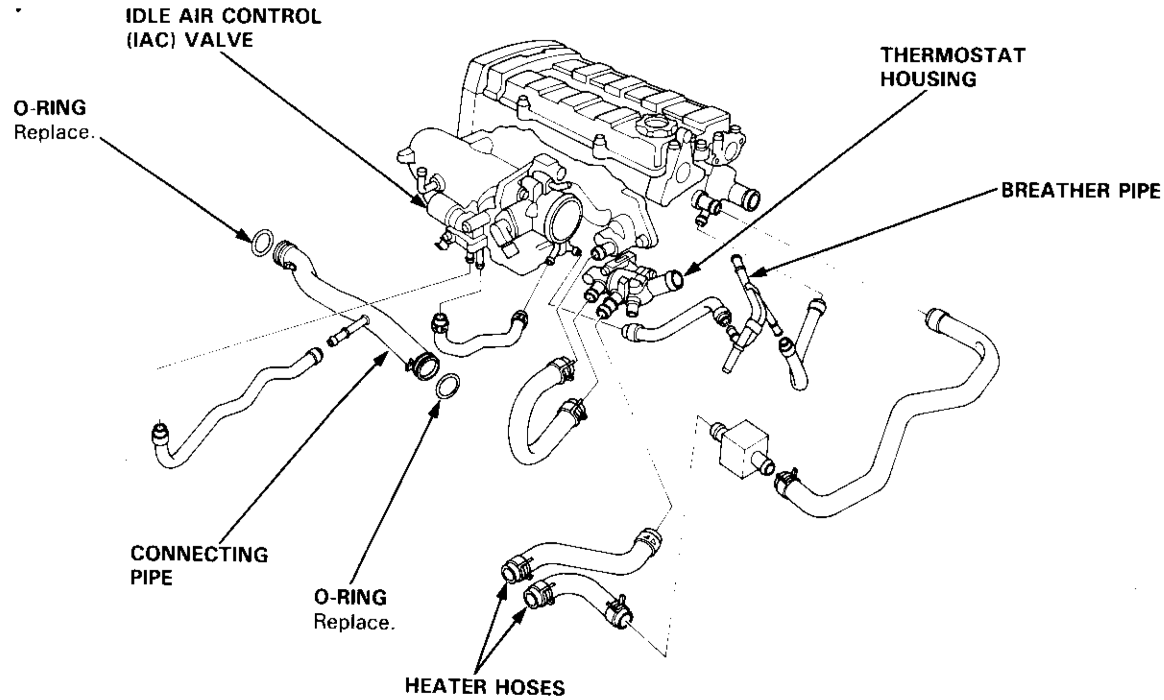
- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings when reassembling.



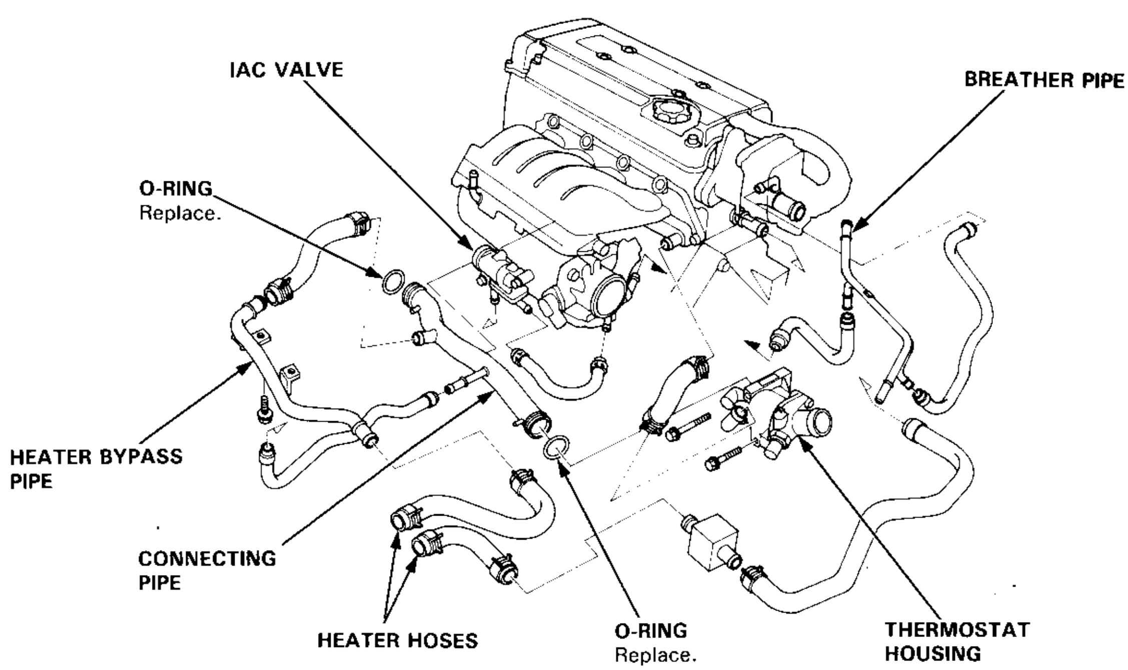
M/T: Manual transmission
A/T: Automatic transmission
ATF: Automatic transmission fluid

ENGINE COMPARTMENT HOSE CONNECTIONS:

B18B1 engine:



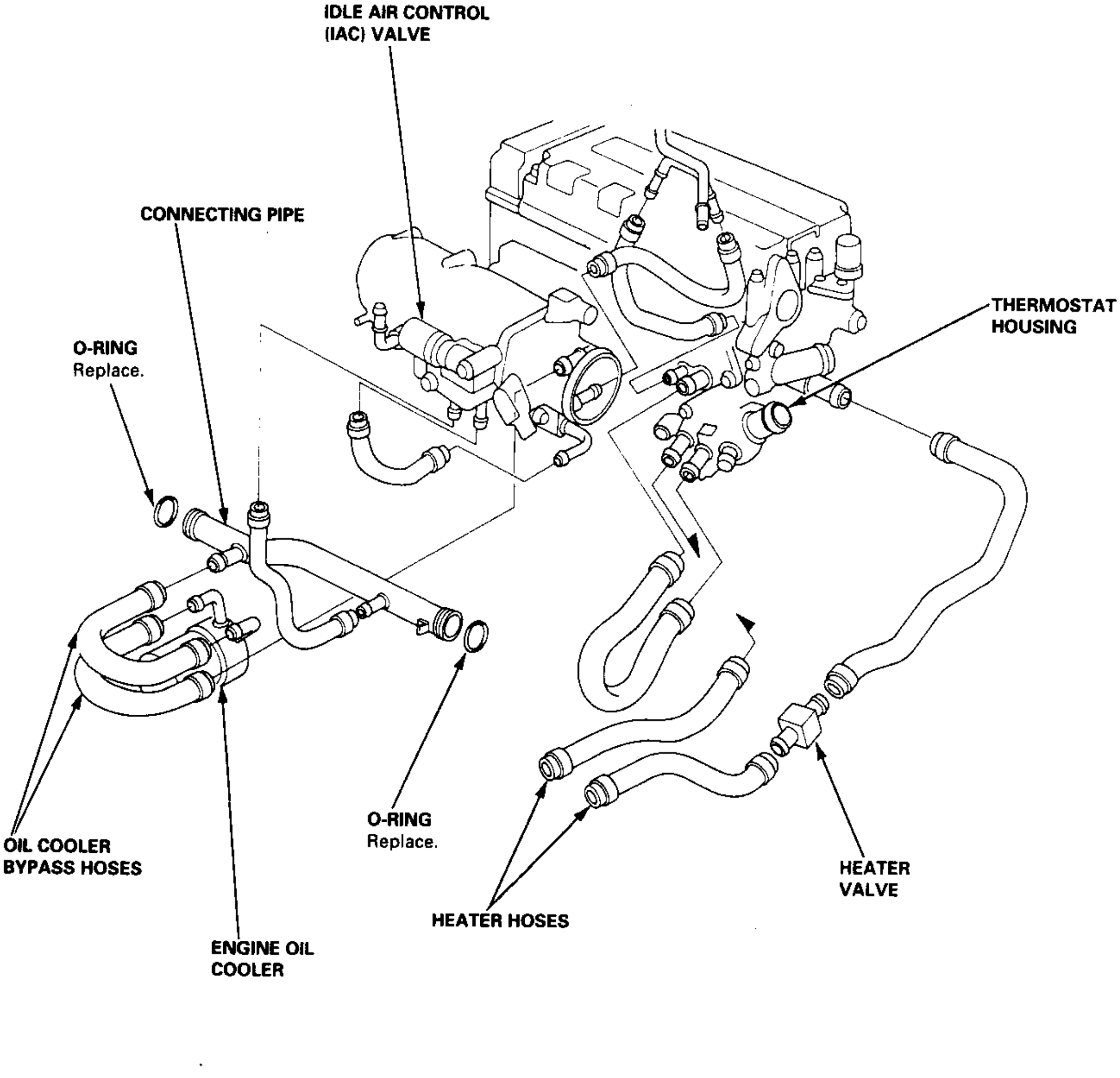
B18C1 engine:



(cont'd)

ENGINE COMPART MENT HOSE CONNECTIONS (cont'd):

B18C5 engine:

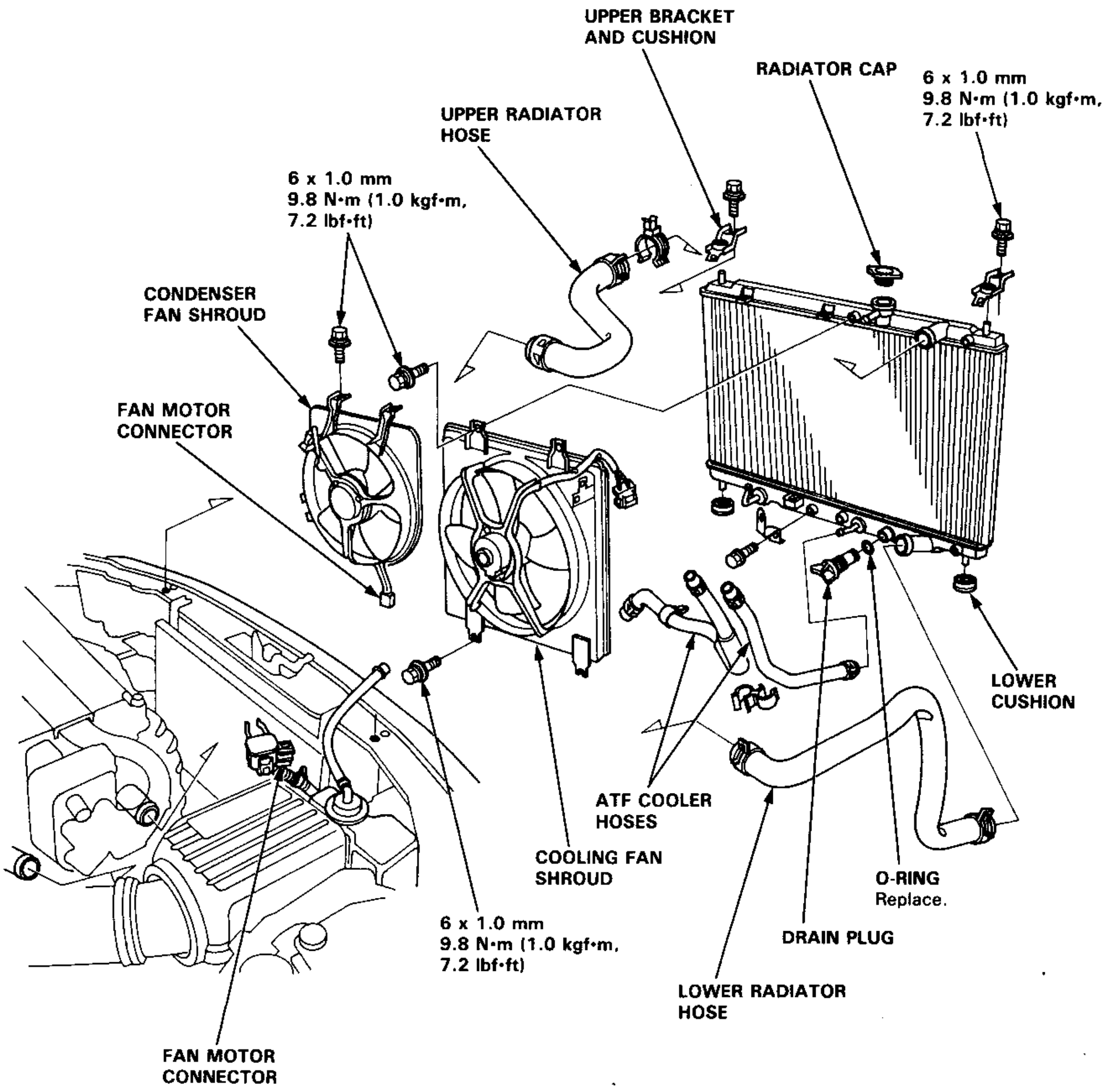


Replacement

1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connectors.
4. Remove the radiator upper brackets, then pull up the radiator.
5. Remove the fan shroud assemblies and other parts from radiator.

Install the radiator in the reverse order of removal:

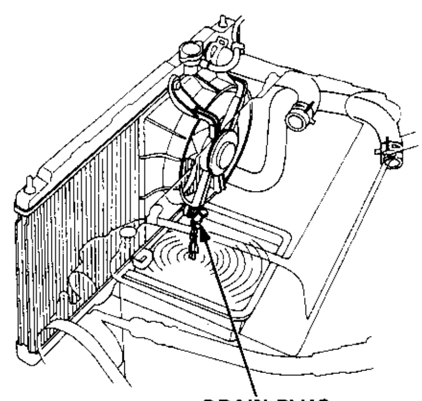
NOTE:
- Set the upper and lower cushions securely.
- Fill the radiator and bleed the air.



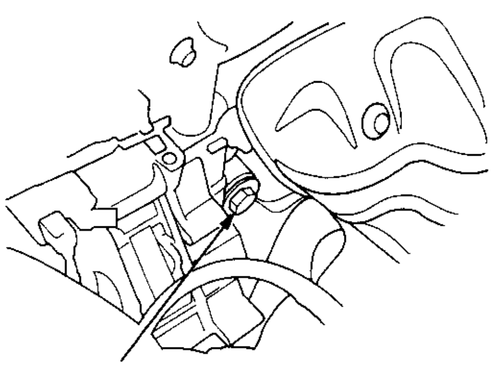
Engine Coolant Refilling and Bleeding

CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

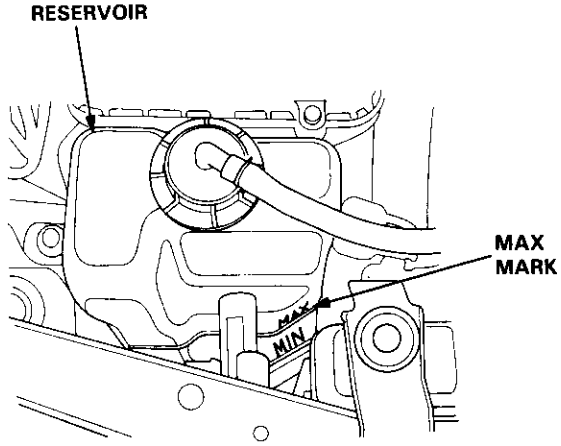
1. Slide the heater temperature control lever to maximum heat.
   Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug, and drain the coolant.



4. Remove the drain bolt from the cylinder block.



5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to MAX mark with antifreeze.



8. Mix the recommended antifreeze with an equal amount of water in a clean container.
   NOTE:
   - Use only genuine Honda antifreeze/coolant.
   - For best corrosion protection, the coolant concentration must be maintained year-round at 50% minimum. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
   - Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

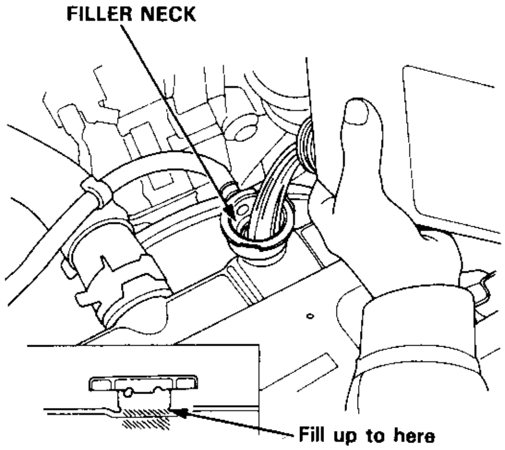
   CAUTION:
   - **Do not mix different brands of anti-freeze/coolants.**
   - **Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the coolant.**

   Engine Coolant Refill Capacity [including reservoir (0.6 ℓ (0.6 US qt, 0.5 Imp qt))]:

   B18B1 engine:
   M/T: 4.4 ℓ (4.6 US qt, 3.9 Imp qt)
   B18B1, B18C1 engines:
   A/T: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)

   B18C1, B18C5 engines:
   M/T: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)

9. Pour coolant into the radiator up to the base of the filler neck.

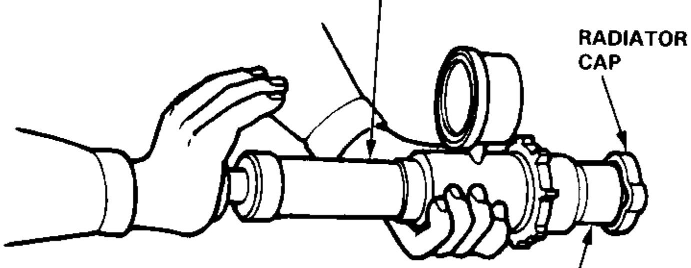


10. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).
11. Turn off the engine. Check the level in the radiator, add coolant if needed.
12. Put the radiator cap on tightly, then run the engine again and check for leaks.

Radiator

Cap Testing

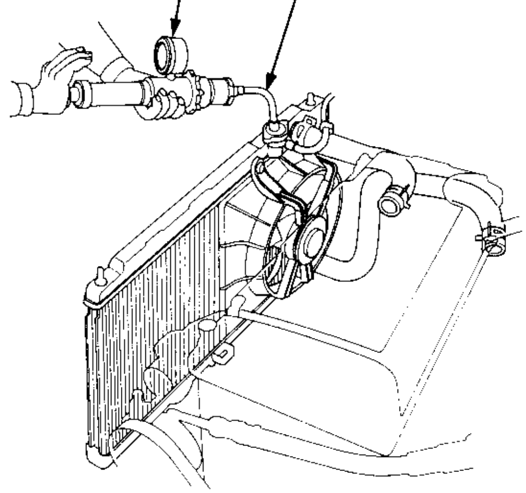
1. Remove the radiator cap, wet its seal with engine coolant, then install it on the pressure tester.
2. Apply a pressure of:
   93 – 123 kPa
   (0.95 – 1.25 kgf/cm², 13.5 – 17.8 psi)
3. Check for a drop in pressure.



Pressure Testing

1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filler neck.
2. Attach the pressure tester to the radiator and apply a pressure of:
   93 – 123 kPa
   (0.95 – 1.25 kgf/cm², 13.5 – 17.8 psi)
3. Inspect for engine coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the radiator cap.

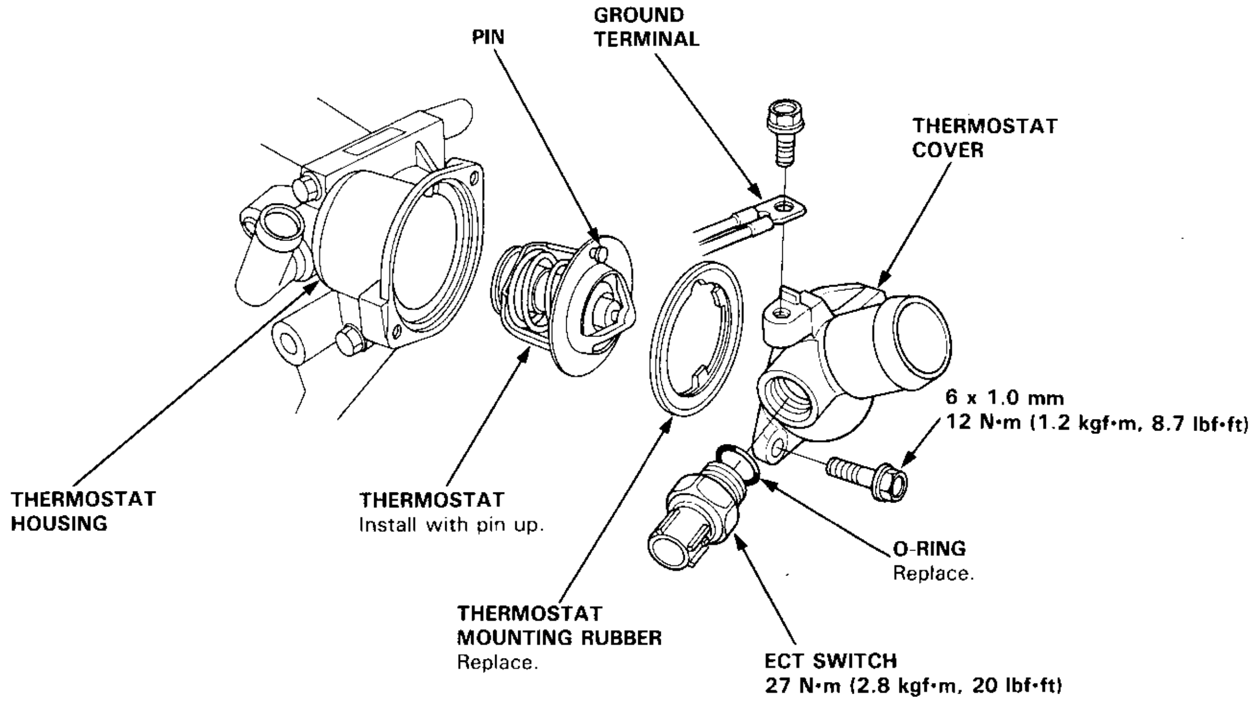
   NOTE:
   - Check for engine oil in the engine coolant and/or coolant in the engine oil.
   - Check for ATF in the engine coolant and/or coolant in the ATF (A/T).



Thermostat

Replacement

NOTE: Use new gaskets and O-rings when reassembling.



Testing

Replace thermostat if it is open at room temperature.

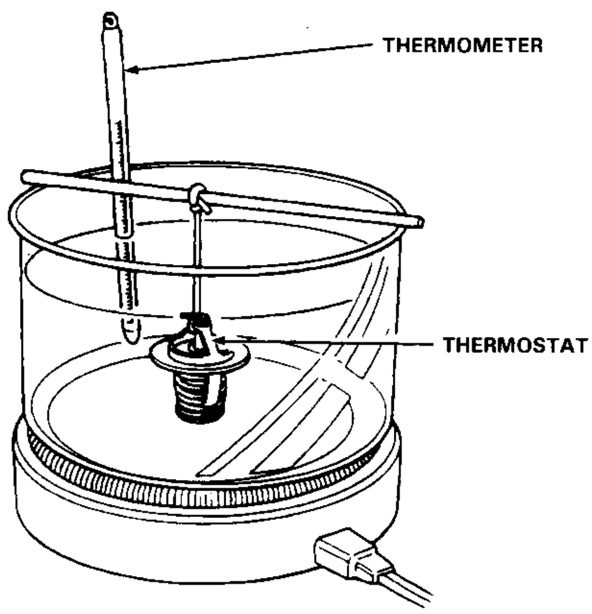
To test a closed thermostat:

1. Suspend the thermostat in a container of water as shown.
2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens and at full lift.

   CAUTION: Do not let the thermometer touch the bottom of the hot container.

3. Measure the lift height of the thermostat when it's fully open.

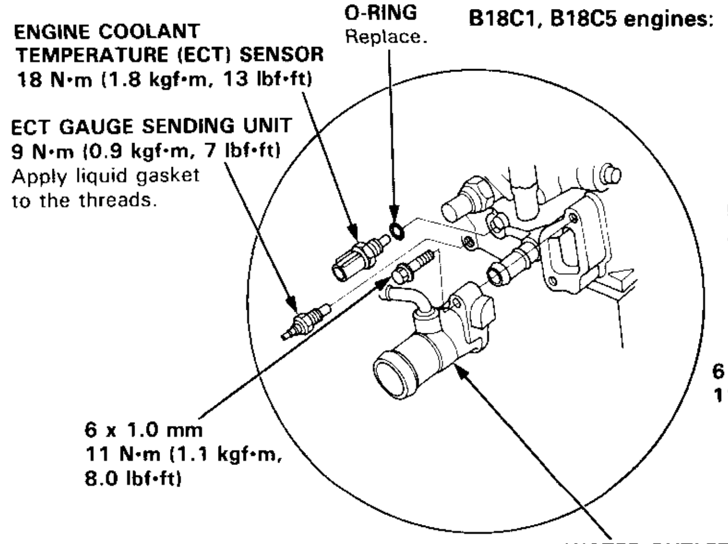
   STANDARD THERMOSTAT
   Lift height: above 8.0 mm (0.31 in)
   Starts opening: 169–176°F (76–80°C)
   Fully open: 194°F (90°C)

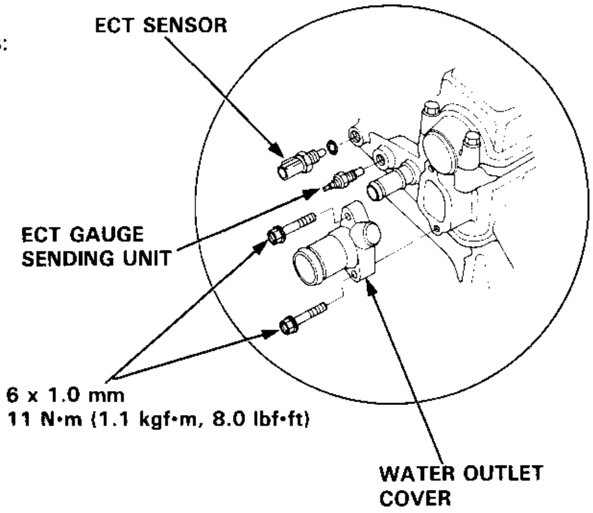


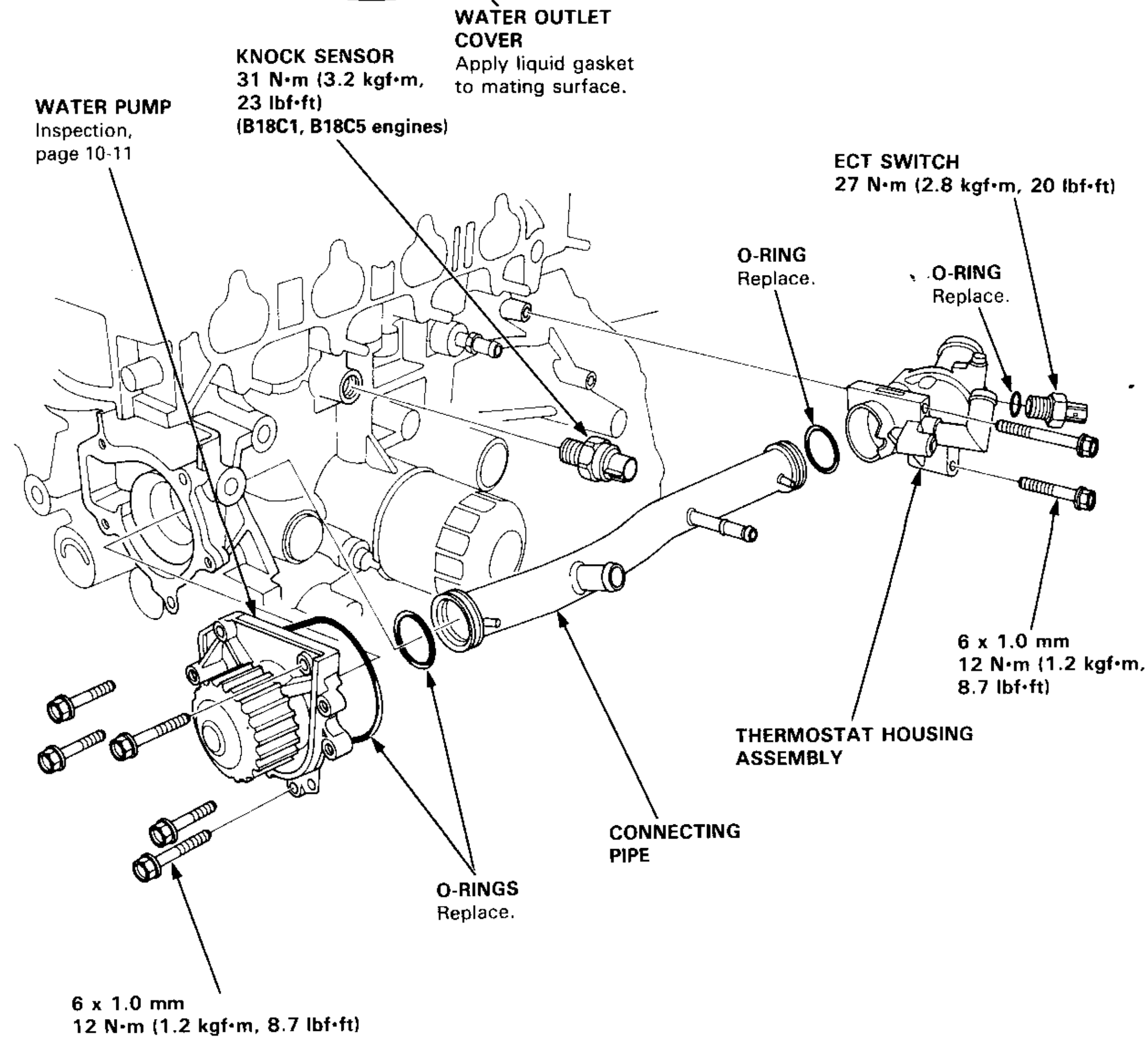
Water Pump

Illustrated Index

NOTE:
- Use new O-rings and new special bolts when reassembling.
- Use liquid gasket, Part No. 08718–0001.



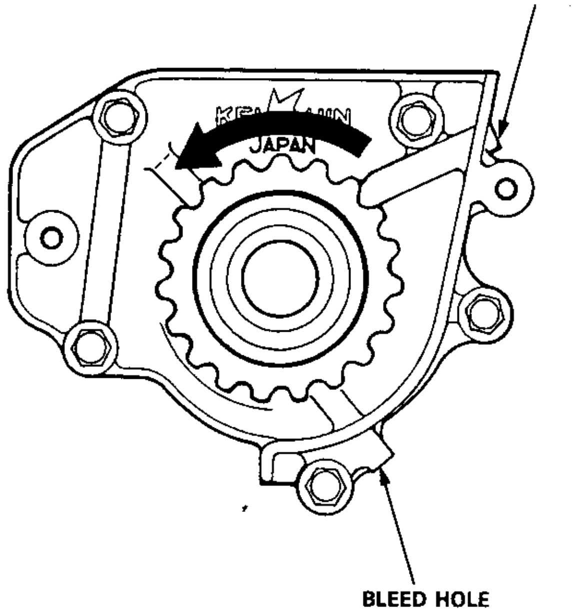




Inspection

1. Remove the timing belt (B18B1 engine: see page 6-10, B18C1, B18C5 engines: see page 6-48).
2. Turn the water pump pulley counterclockwise. Check that it turn freely.
3. Check for signs of seal leakage.

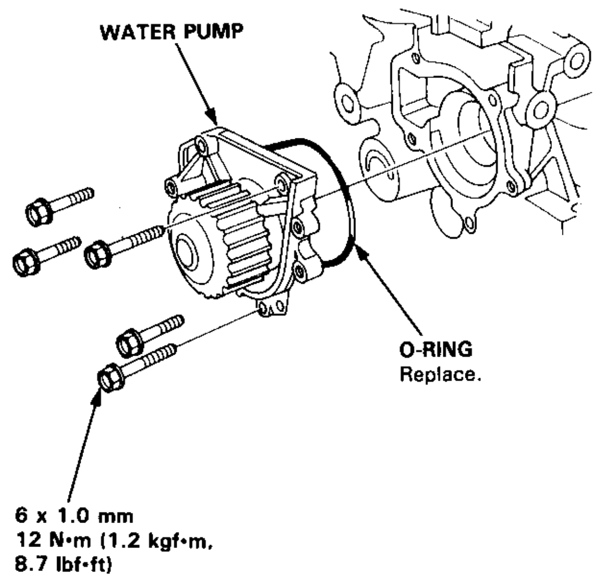
   NOTE: A small amount of "weeping" from the bleed hole is normal.



Replacement

1. Remove the timing belt (B18B1 engine: see page 6-10, B18C1, B18C5 engines: see page 6-48).
2. Remove the camshaft pulleys and the back cover (B18B1 engine: see page 6-20, B18C1, B18C5 engines: see page 6-60).
3. Remove the water pump by removing five bolts.

   NOTE: Inspect, repair and clean the O-ring groove and mating surface with the cylinder block.



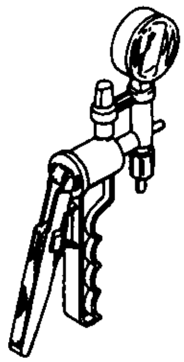
4. Install the water pump in the reverse order of removal.

   NOTE:
   - Keep the O-ring in position when installing.
   - Clean the spilled engine coolant.

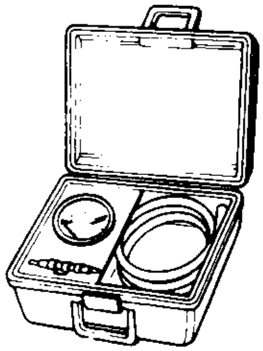
Fuel and Emissions

Special Tools

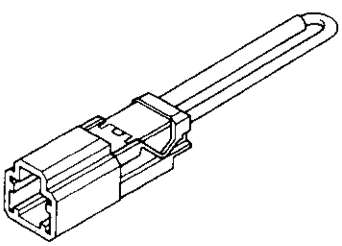
Ref. No.	Tool Number	Description	Qty	Page Reference
①	A973X – 041 – XXXXX	Vacuum Pump/Gauge, 0 – 30 in.Hg	1	11-135, 146, 147, 149, 151
②	07JAZ – 001000B	Vacuum/Pressure Gauge, 0 – 4 in.Hg	1	11-151
③	07PAZ – 0010100	SCS Service Connector	1	11-32, 51, 70, 80, 86, 139
④	07SAZ – 001000A	Backprobe Set	2	11-34
⑤	07406 – 0040001	Fuel Pressure Gauge	1	11-119, 121



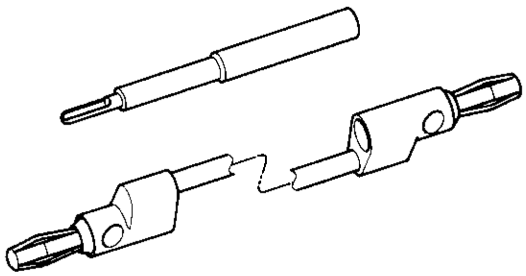
①



②



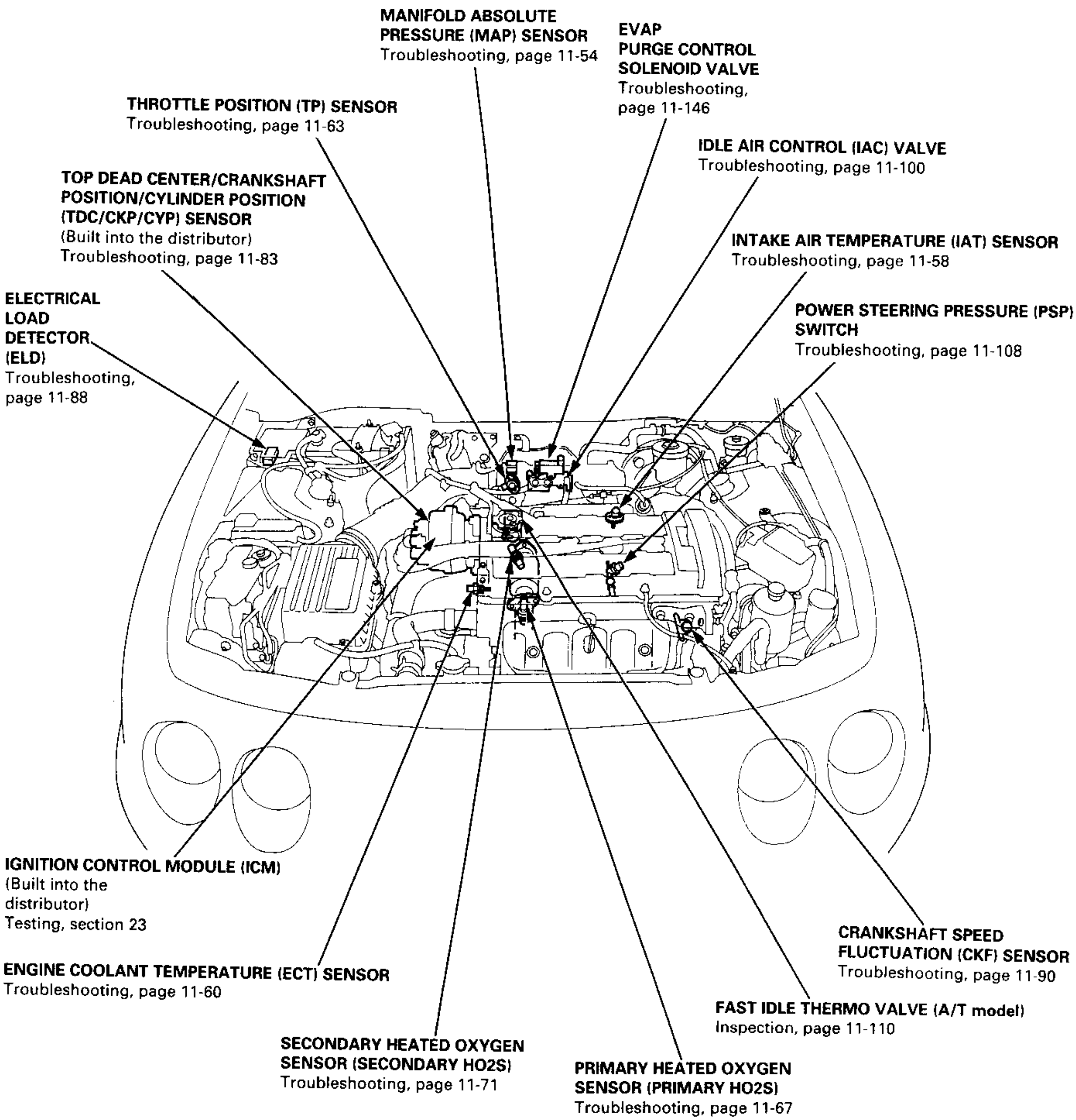
③



④

⑤

B18B1 engine:

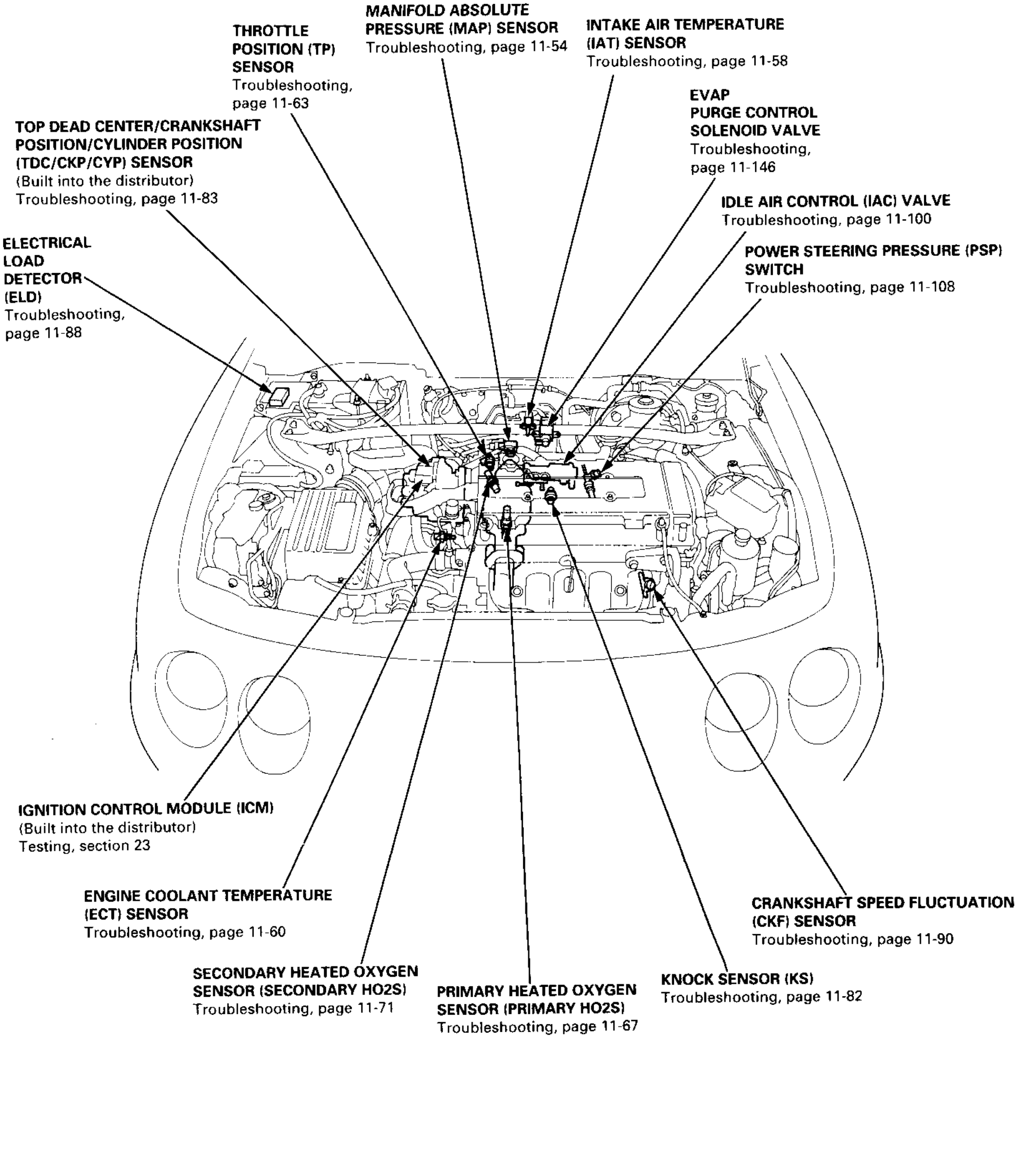


(cont'd)

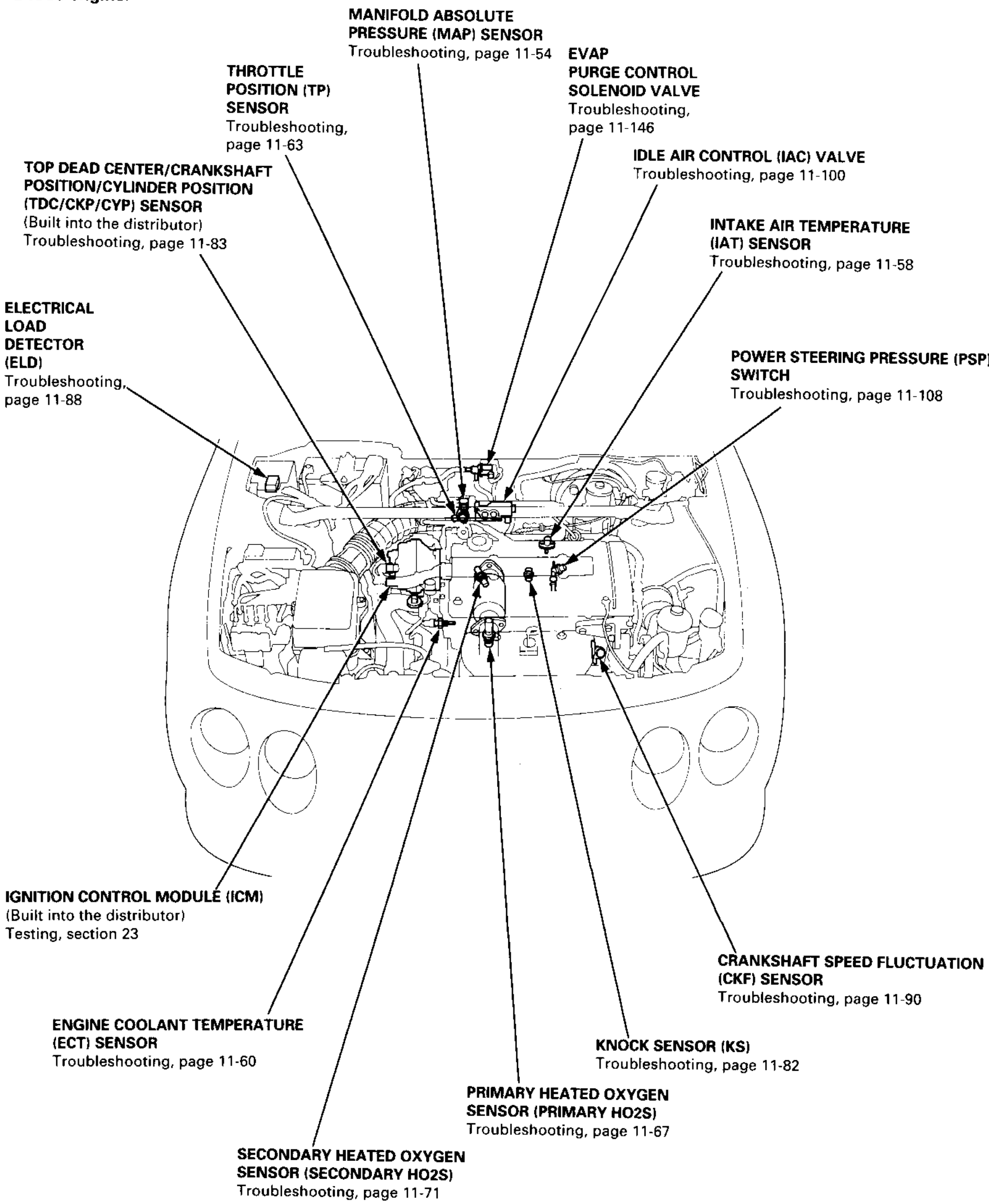
Component Locations

Index (cont'd)

B18C1 engine:



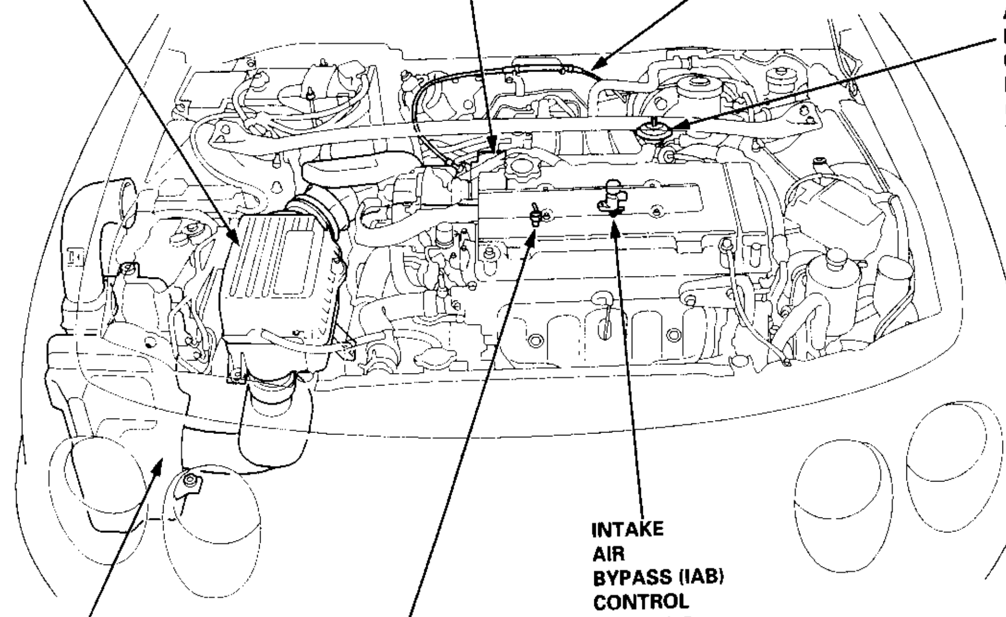
B18C5 engine:

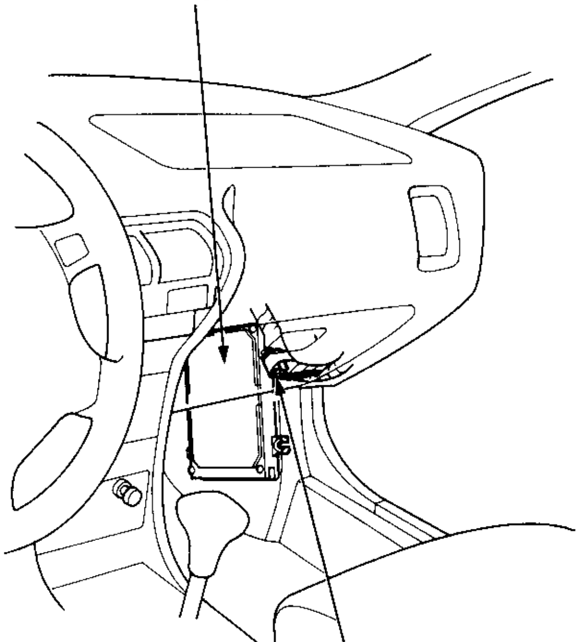


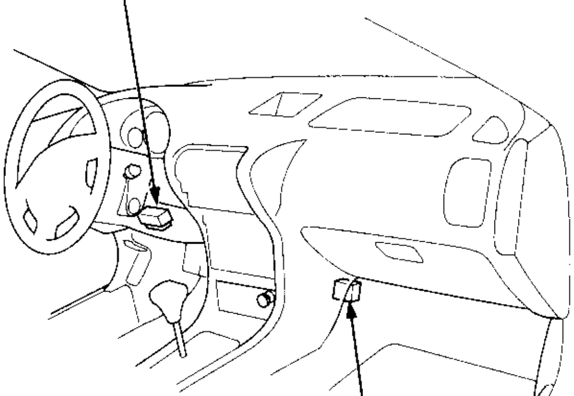
(cont'd)

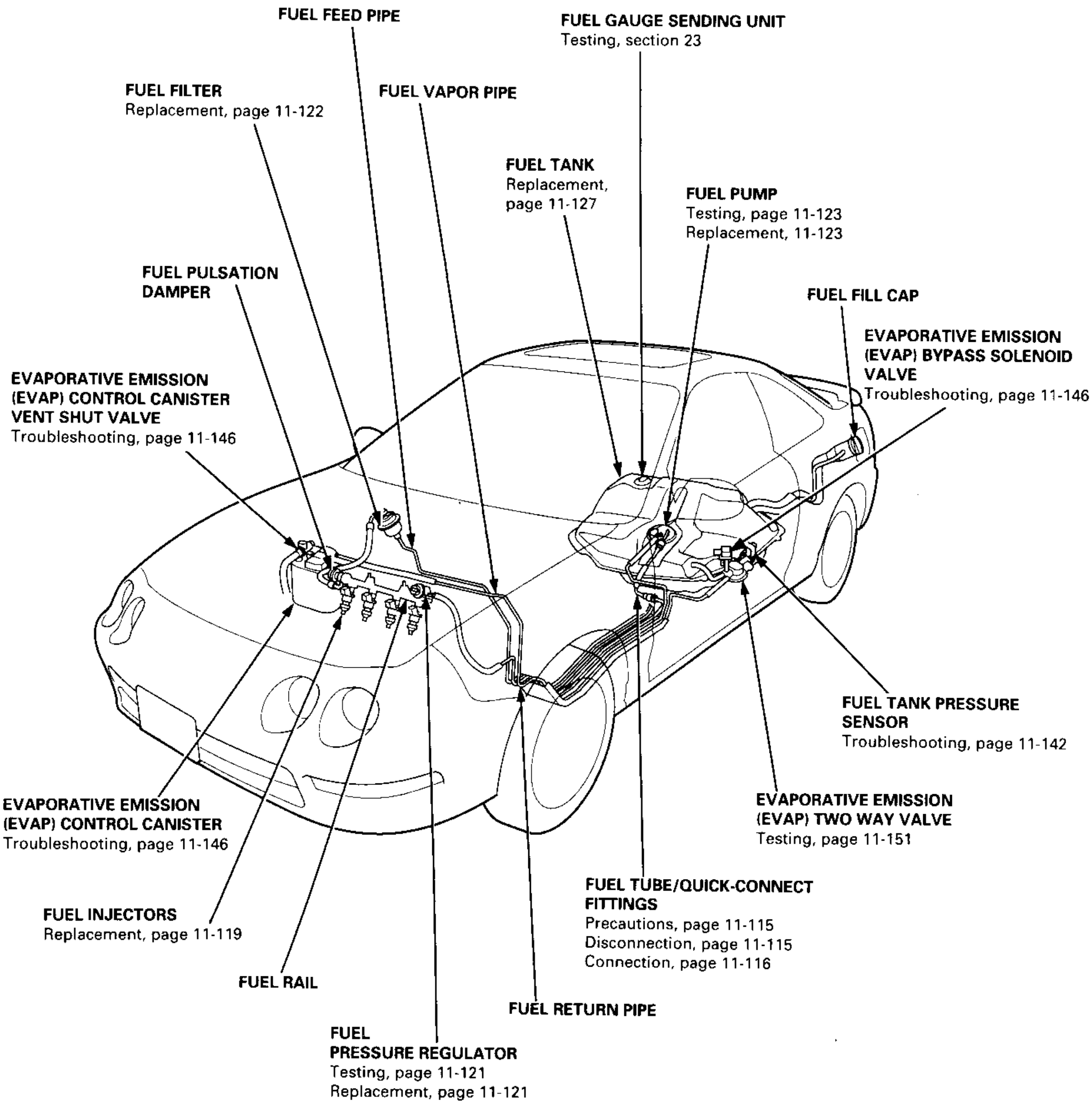
Component Locations

Index (cont'd)







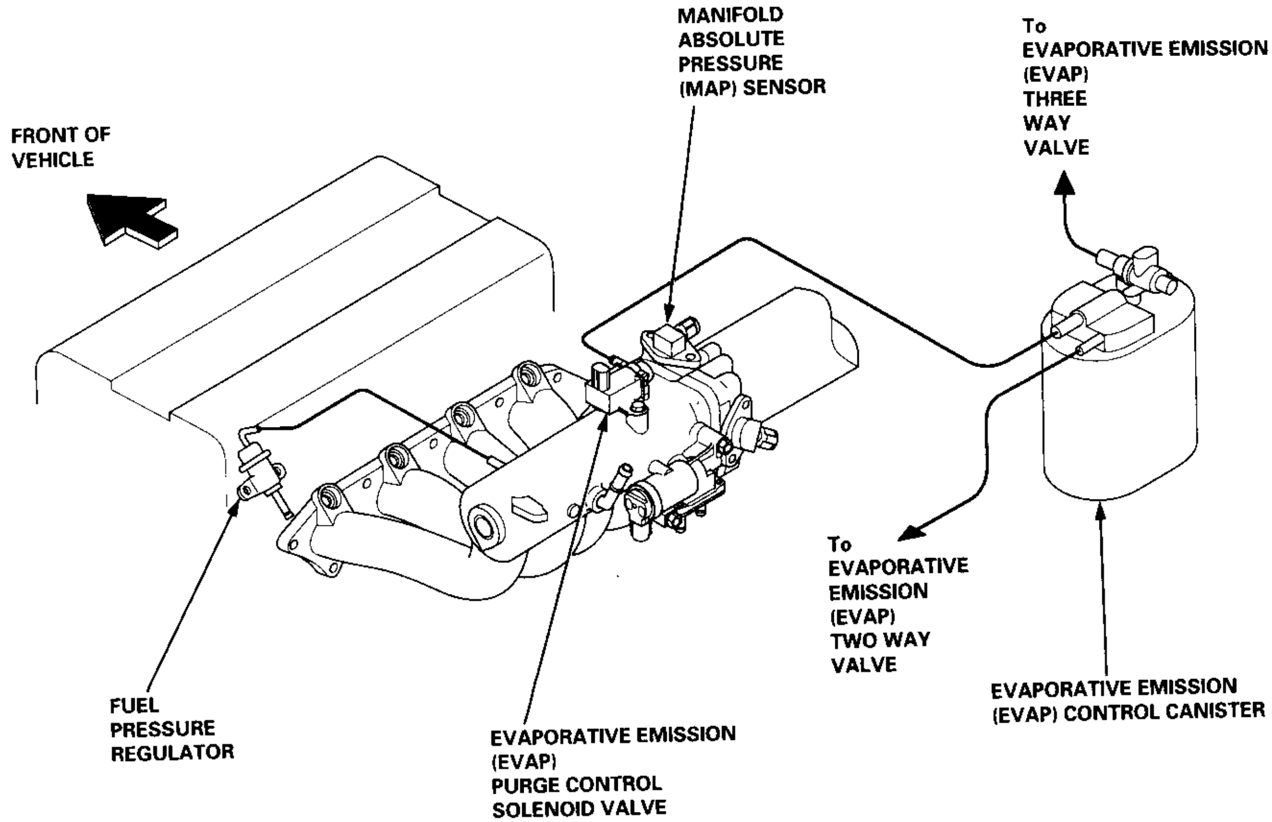


FUEL FEED PIPE
FUEL GAUGE SENDING UNIT
Testing, section 23
FUEL FILTER
Replacement, page 11-122
FUEL VAPOR PIPE
FUEL TANK
Replacement, page 11-127
FUEL PUMP
Testing, page 11-123
Replacement, 11-123
FUEL PULSATION DAMPER
FUEL FILL CAP
EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
Troubleshooting, page 11-146
EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
Troubleshooting, page 11-146
FUEL TANK PRESSURE SENSOR
Troubleshooting, page 11-142
EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
Troubleshooting, page 11-146
EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
Testing, page 11-151
FUEL TUBE/QUICK-CONNECT FITTINGS
Precautions, page 11-115
Disconnection, page 11-115
Connection, page 11-116
FUEL INJECTORS
Replacement, page 11-119
FUEL RAIL
FUEL RETURN PIPE
FUEL PRESSURE REGULATOR
Testing, page 11-121
Replacement, page 11-121

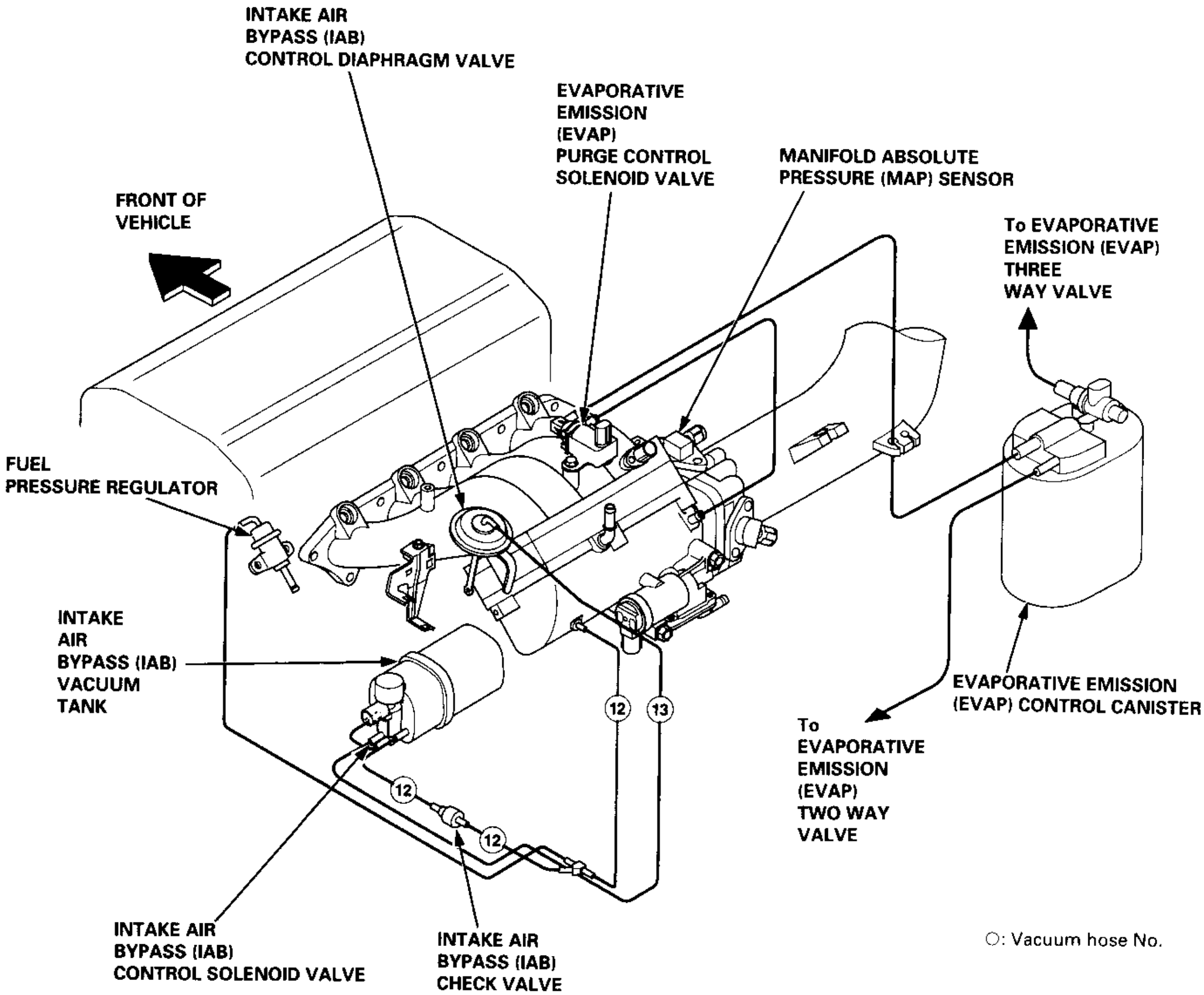
System Description

Vacuum Connections

B18B1 engine:



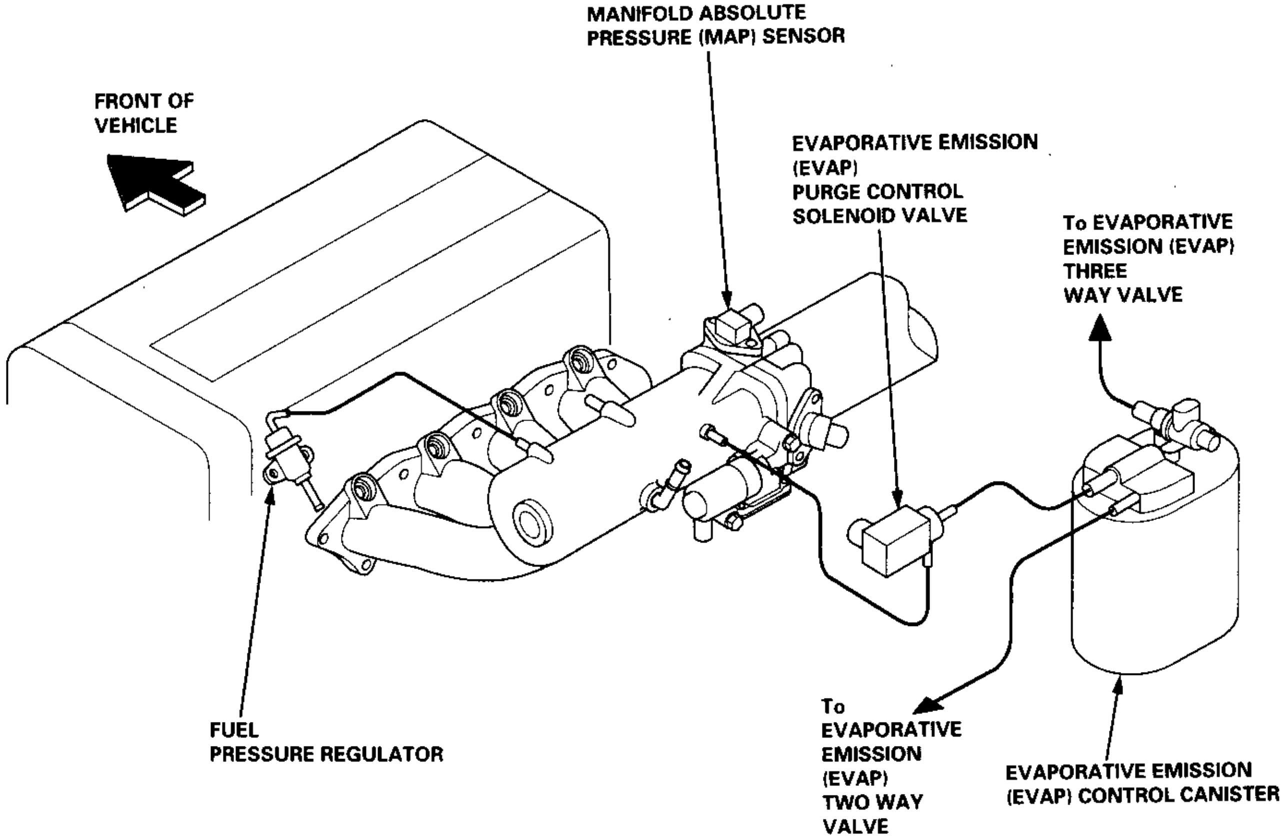
B18C1 engine:



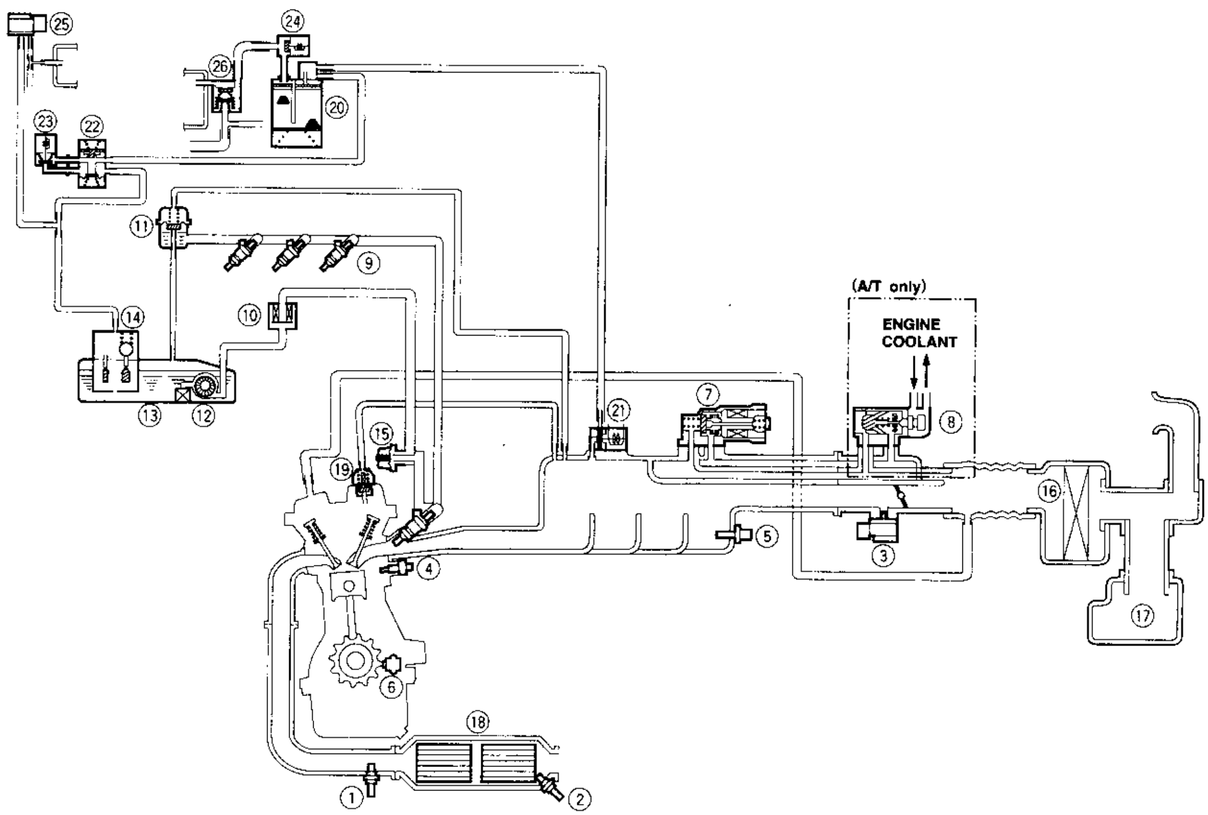
(cont'd)

Vacuum Connections (cont'd)

B18C5 engine:



B18B1 engine:

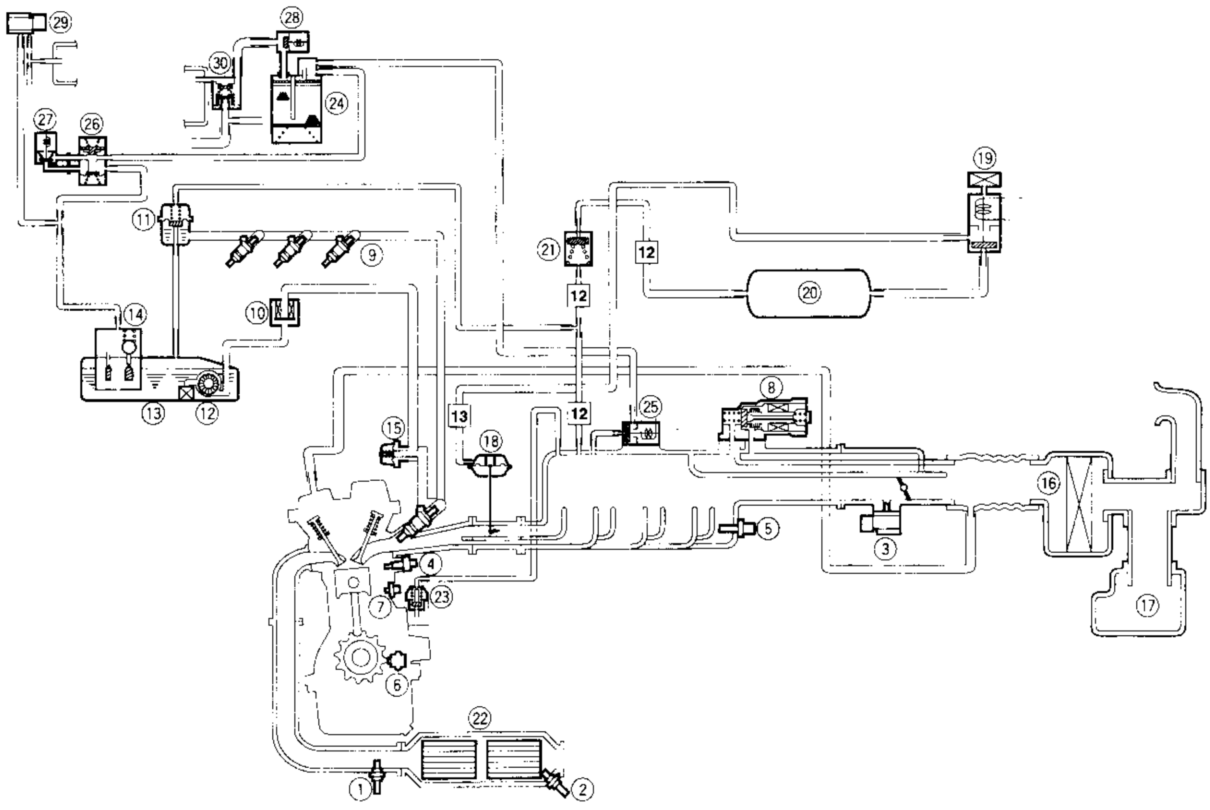


1. PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
2. SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
3. MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
4. ENGINE COOLANT TEMPERATURE (ECT) SENSOR
5. INTAKE AIR TEMPERATURE (IAT) SENSOR
6. CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
7. IDLE AIR CONTROL (IAC) VALVE
8. FAST IDLE THERMO VALVE
9. FUEL INJECTOR
10. FUEL FILTER
11. FUEL PRESSURE REGULATOR
12. FUEL PUMP (FP)
13. FUEL TANK
14. FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE
15. FUEL PULSATION DAMPER
16. AIR CLEANER
17. RESONATOR
18. THREE WAY CATALYTIC CONVERTER (TWC)
19. POSITIVE CRANKCASE VENTILATION (PCV) VALVE
20. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
21. EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
22. EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
23. EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
24. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
25. FUEL TANK PRESSURE SENSOR
26. EVAPORATIVE EMISSION (EVAP) THREE WAY VALVE

(cont'd)

Vacuum Connections (cont'd)

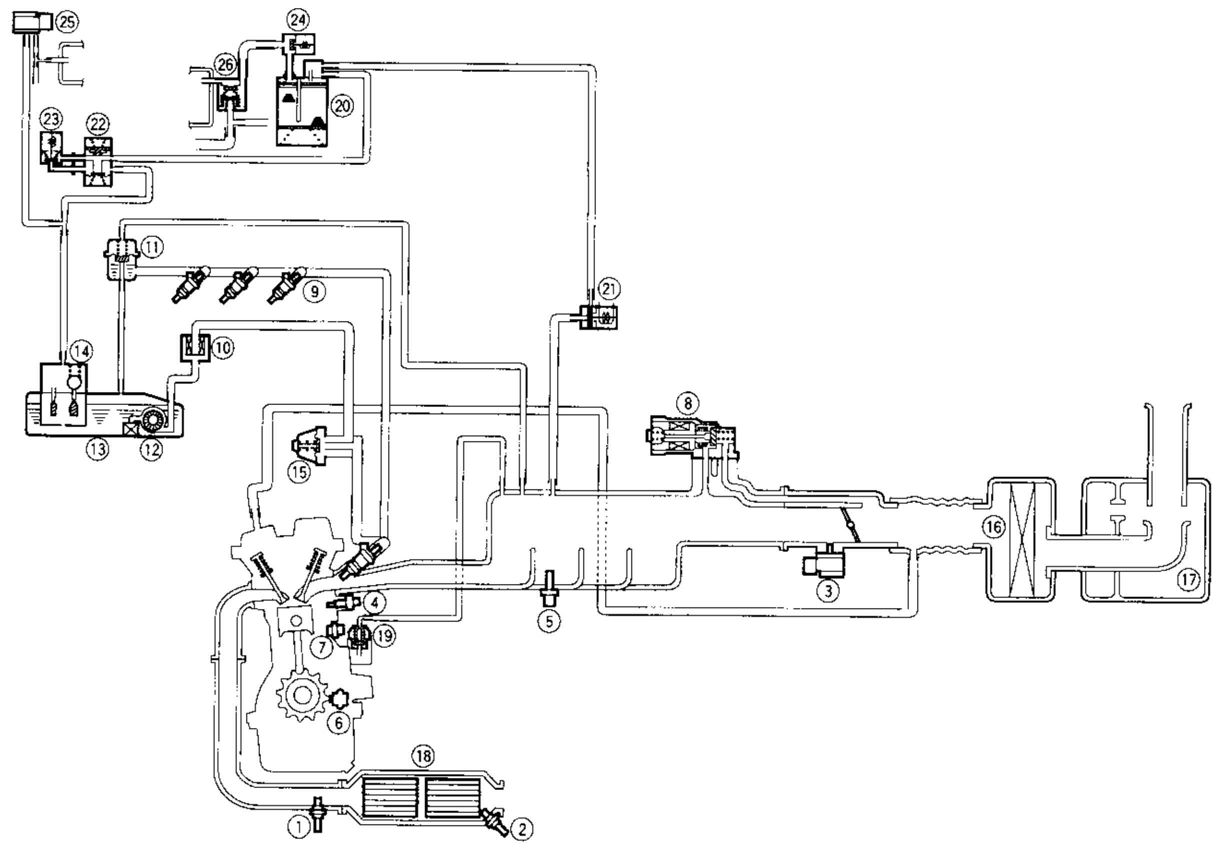
B18C1 engine:



□: Vacuum hose No.

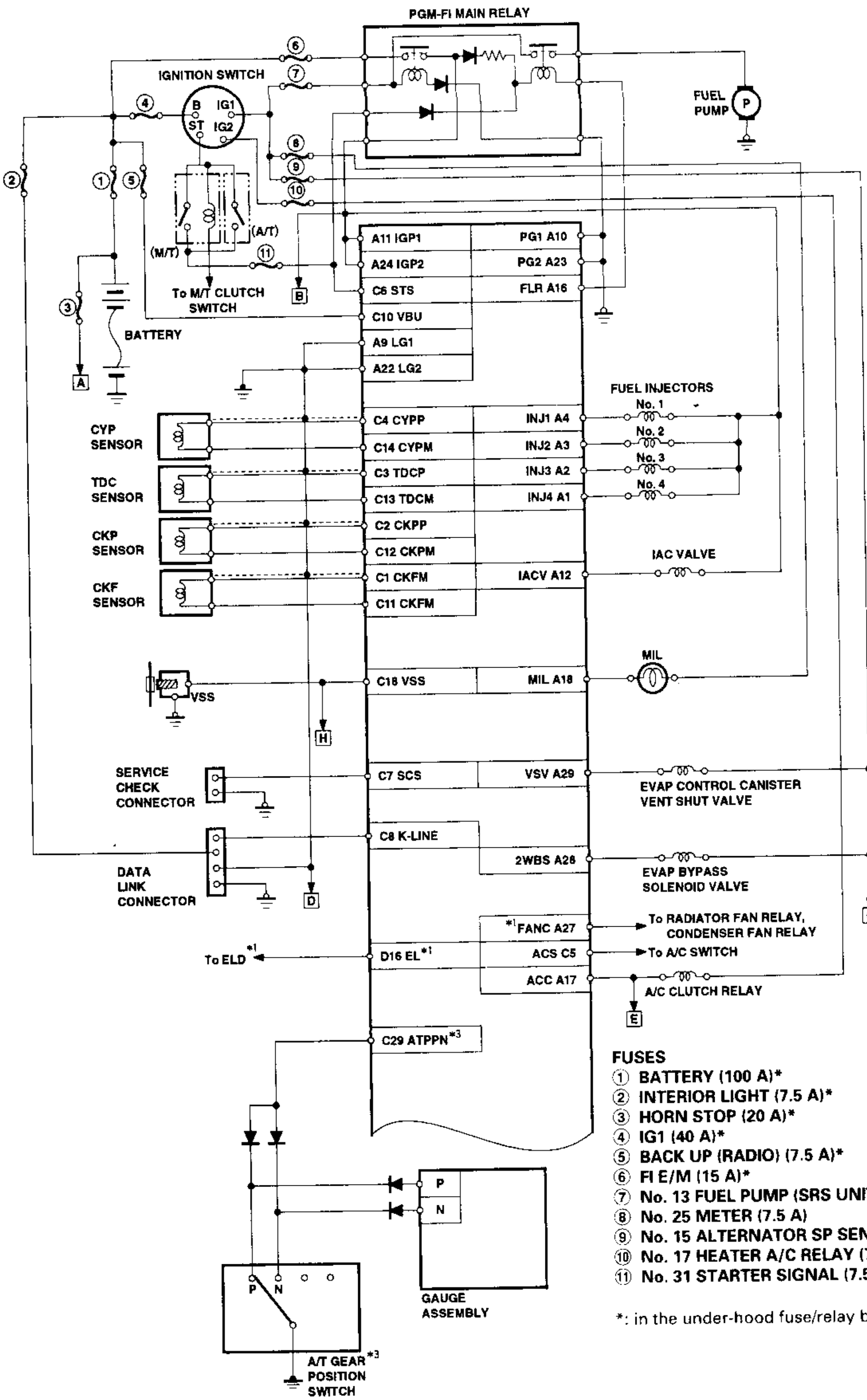
1. PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
2. SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
3. MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
4. ENGINE COOLANT TEMPERATURE (ECT) SENSOR
5. INTAKE AIR TEMPERATURE (IAT) SENSOR
6. CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
7. KNOCK SENSOR (KS)
8. IDLE AIR CONTROL (IAC) VALVE
9. FUEL INJECTOR
10. FUEL FILTER
11. FUEL PRESSURE REGULATOR
12. FUEL PUMP (FP)
13. FUEL TANK
14. FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE
15. FUEL PULSATION DAMPER
16. AIR CLEANER
17. RESONATOR
18. INTAKE AIR BYPASS (IAB) CONTROL DIAPHRAGM VALVE
19. INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE
20. INTAKE AIR BYPASS (IAB) VACUUM TANK
21. INTAKE AIR BYPASS (IAB) CHECK VALVE
22. THREE WAY CATALYTIC CONVERTER (TWC)
23. POSITIVE CRANKCASE VENTILATION (PCV) VALVE
24. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
25. EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
26. EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
27. EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
28. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
29. FUEL TANK PRESSURE SENSOR
30. EVAPORATIVE EMISSION (EVAP) THREE WAY VALVE

B18C5 engine:



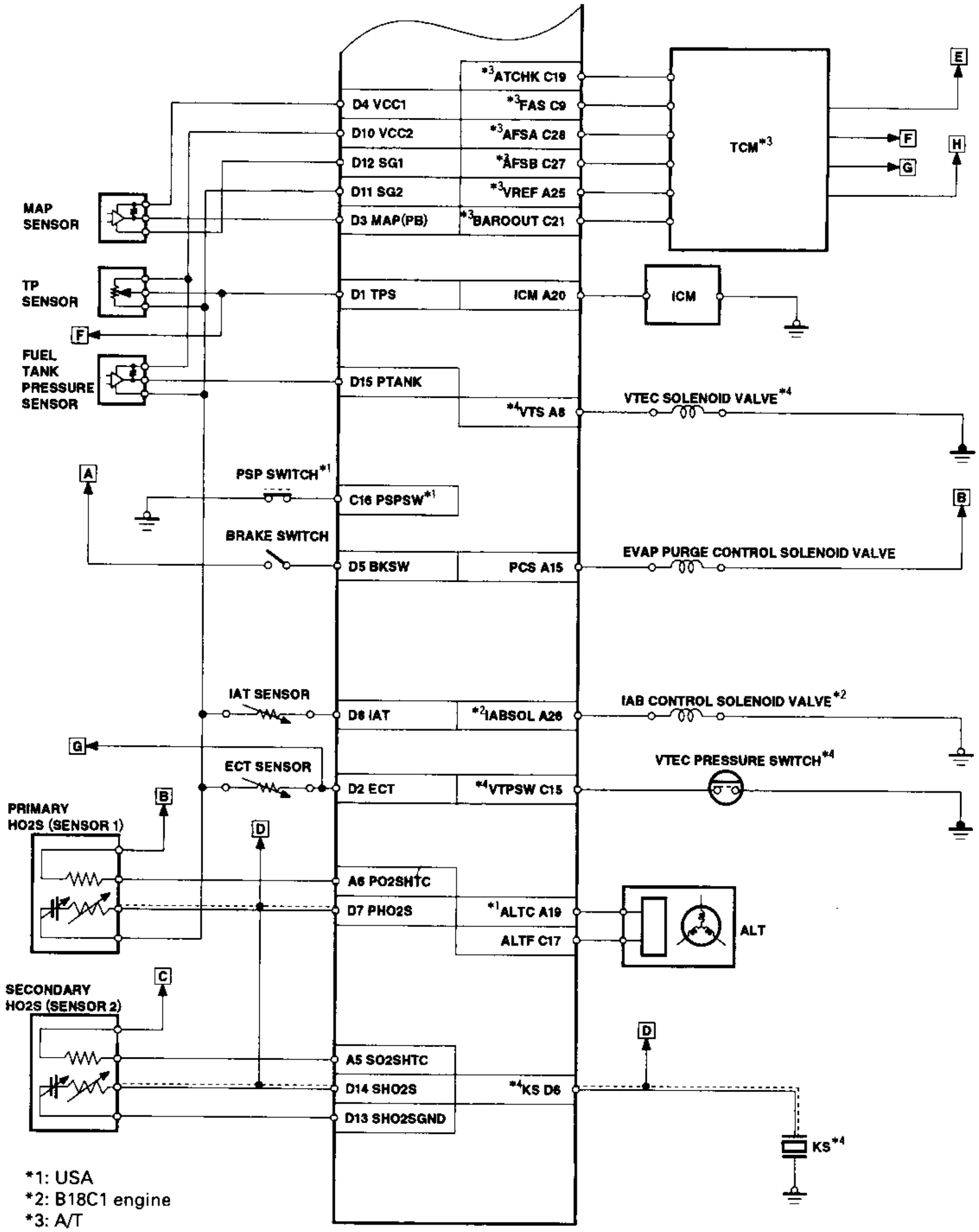
① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑥ CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
⑦ KNOCK SENSOR (KS)
⑧ IDLE AIR CONTROL (IAC) VALVE
⑨ FUEL INJECTOR
⑩ FUEL FILTER
⑪ FUEL PRESSURE REGULATOR
⑫ FUEL PUMP (FP)
⑬ FUEL TANK
⑭ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE
⑮ FUEL PULSATION DAMPER
⑯ AIR CLEANER
⑰ RESONATOR
⑱ THREE WAY CATALYTIC CONVERTER (TWC)
⑲ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
⑳ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
㉑ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
㉒ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉓ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
㉔ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
㉕ FUEL TANK PRESSURE SENSOR
㉖ EVAPORATIVE EMISSION (EVAP) THREE WAY VALVE

Electrical Connections

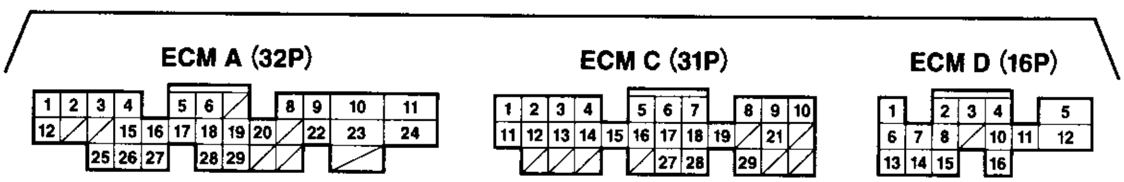


FUSES
1. BATTERY (100 A)*
2. INTERIOR LIGHT (7.5 A)*
3. HORN STOP (20 A)*
4. IG1 (40 A)*
5. BACK UP (RADIO) (7.5 A)*
6. FI E/M (15 A)*
7. No. 13 FUEL PUMP (SRS UNIT) (15 A)
8. No. 25 METER (7.5 A)
9. No. 15 ALTERNATOR SP SENSOR (7.5 A)
10. No. 17 HEATER A/C RELAY (7.5 A)
11. No. 31 STARTER SIGNAL (7.5 A)

*: in the under-hood fuse/relay box

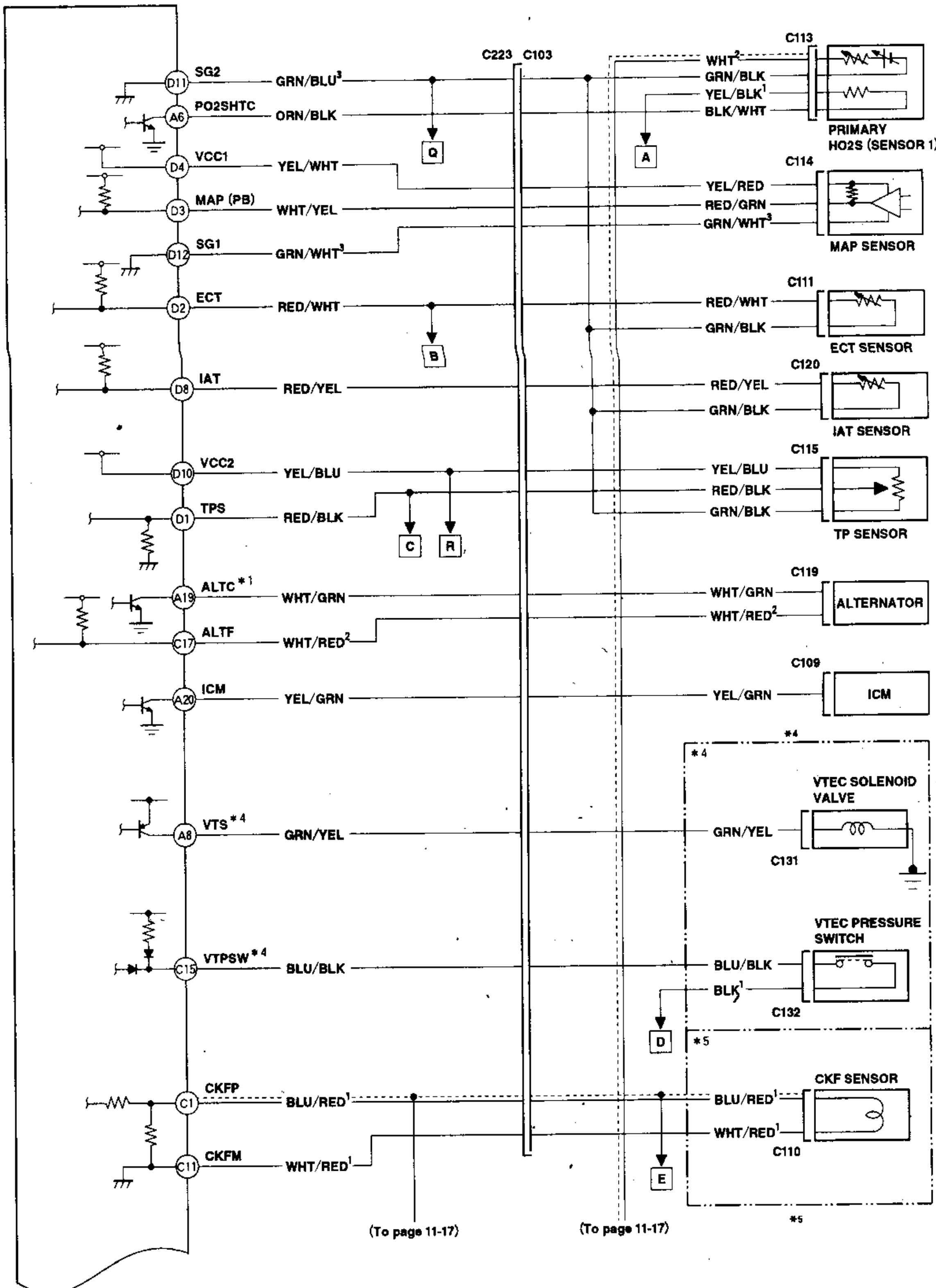


*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

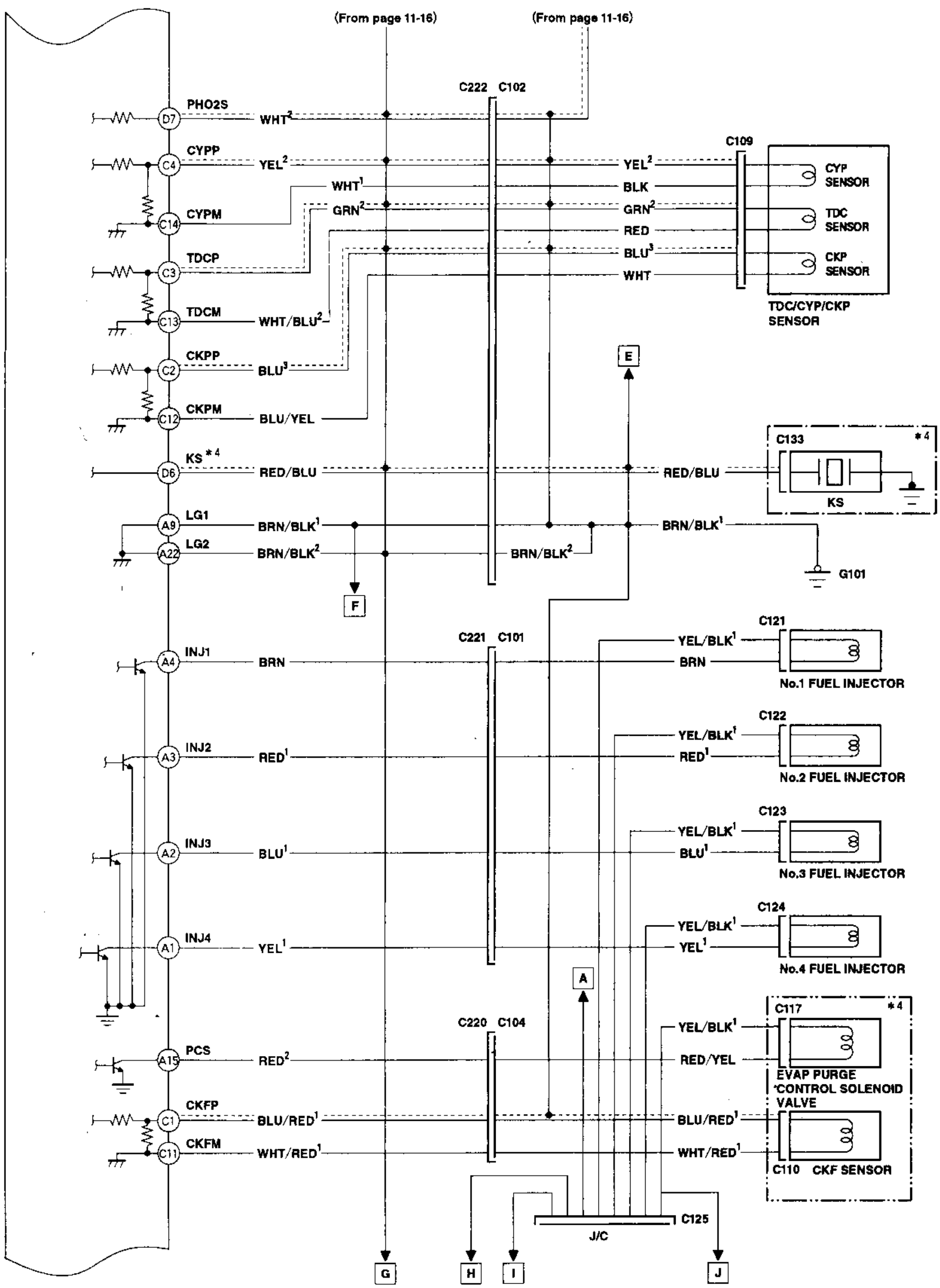


(cont'd)

Electrical Connections (cont'd)

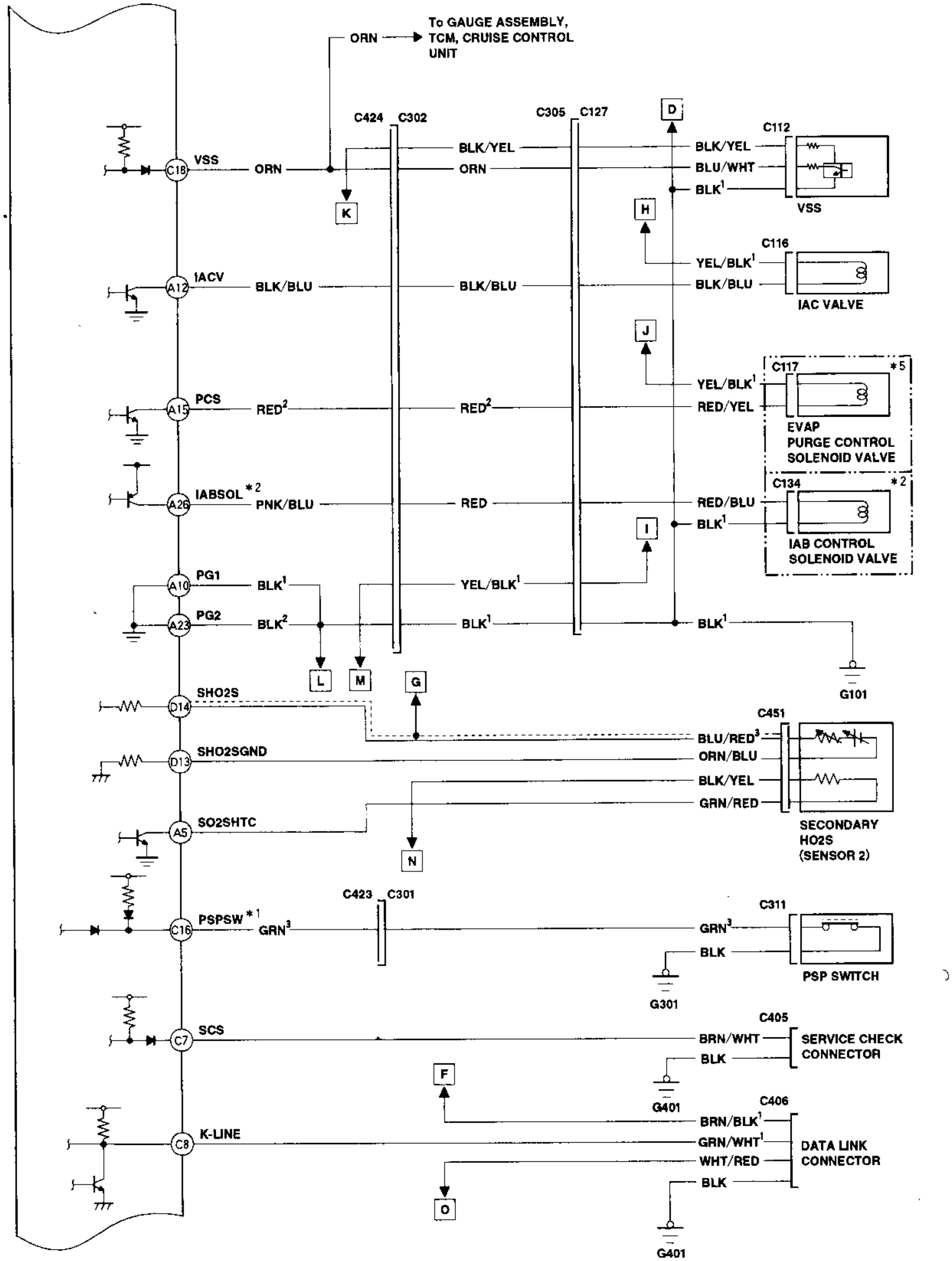


*1: USA
*4: B18C1, B18C5 engines
*5: B18B1 engine

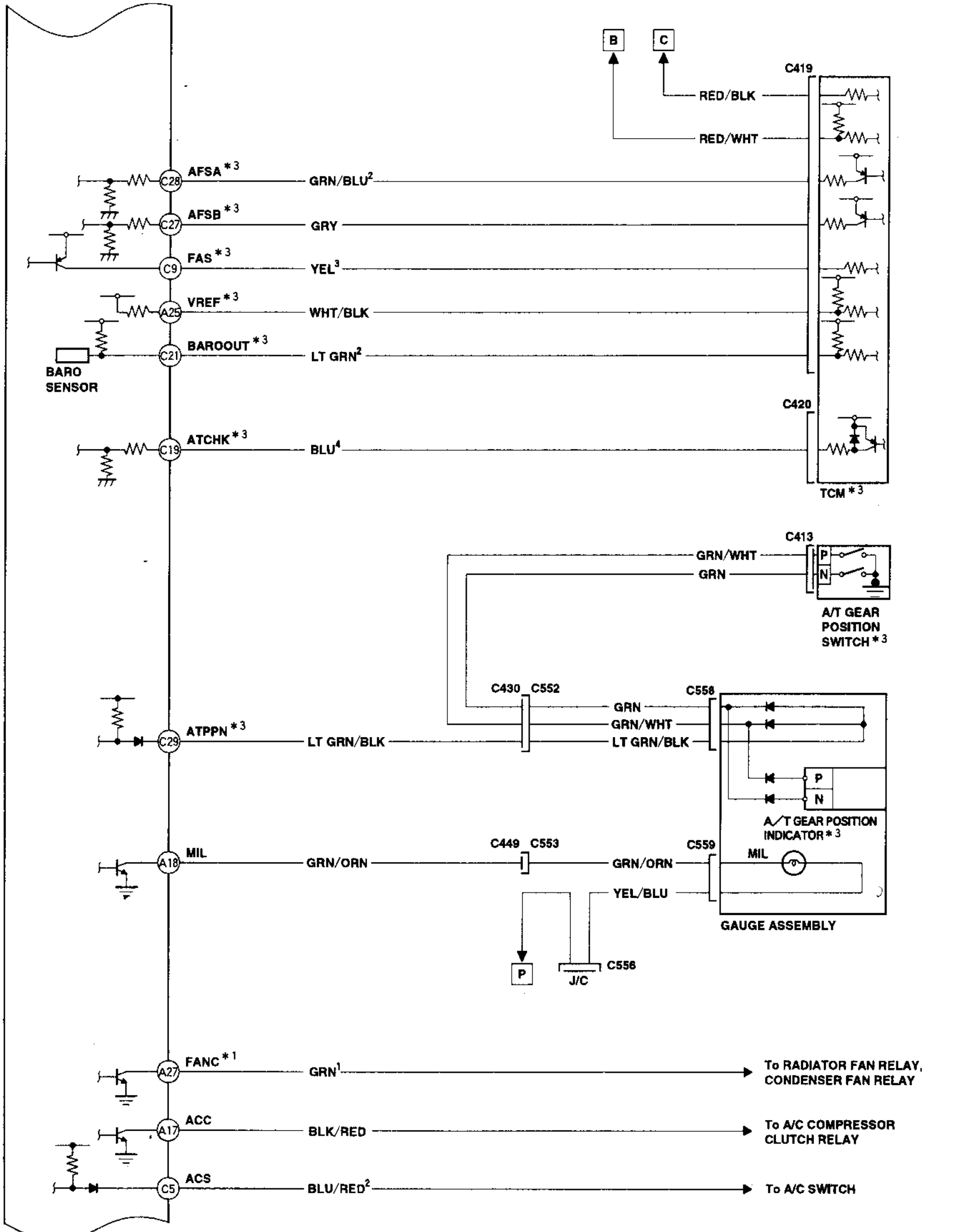


*4: B18C1, B18C5 engines

(cont'd)



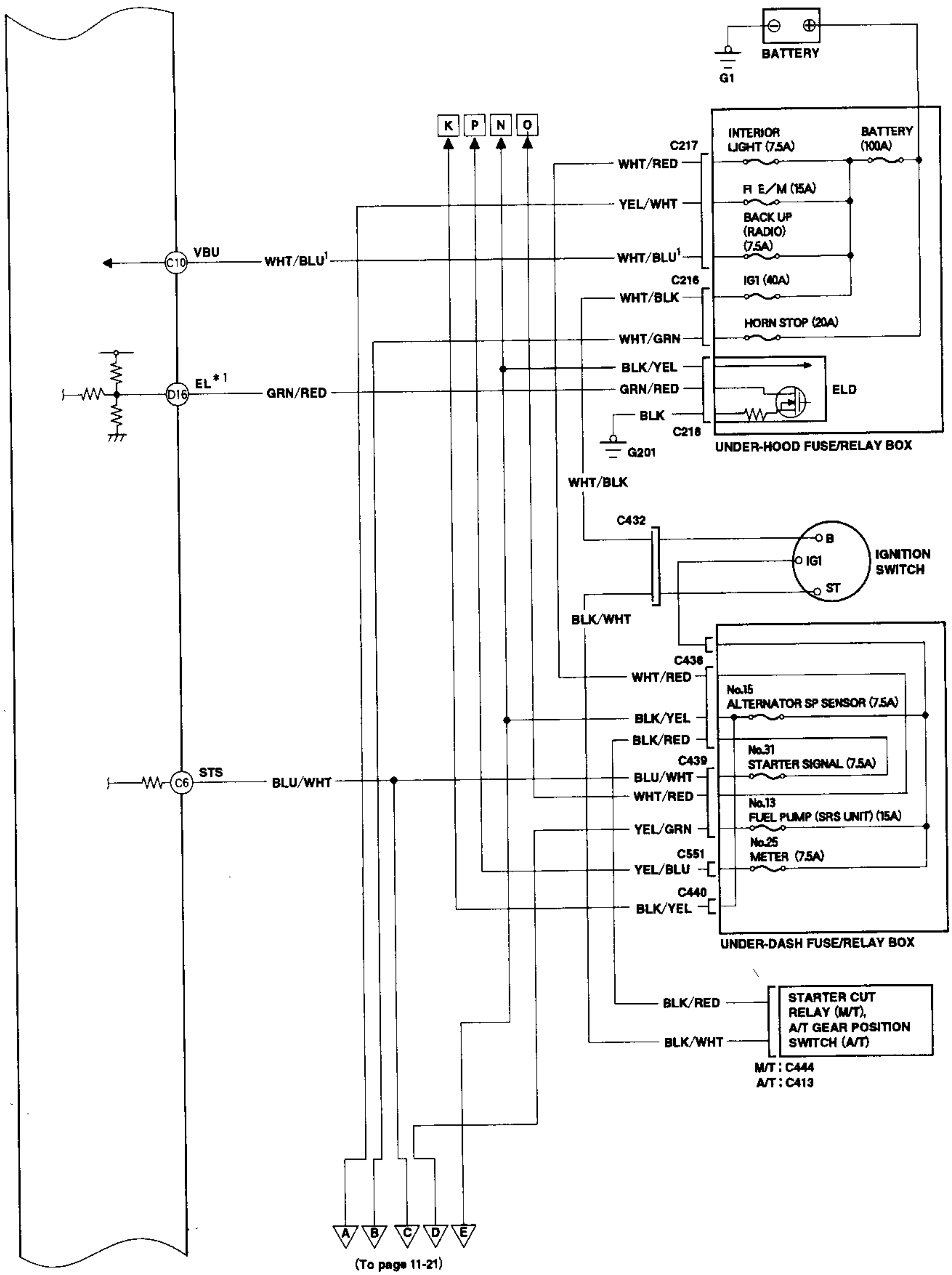
*1: A/T
*2: B18C1 engine
*5: B18B1 engine



(cont'd)

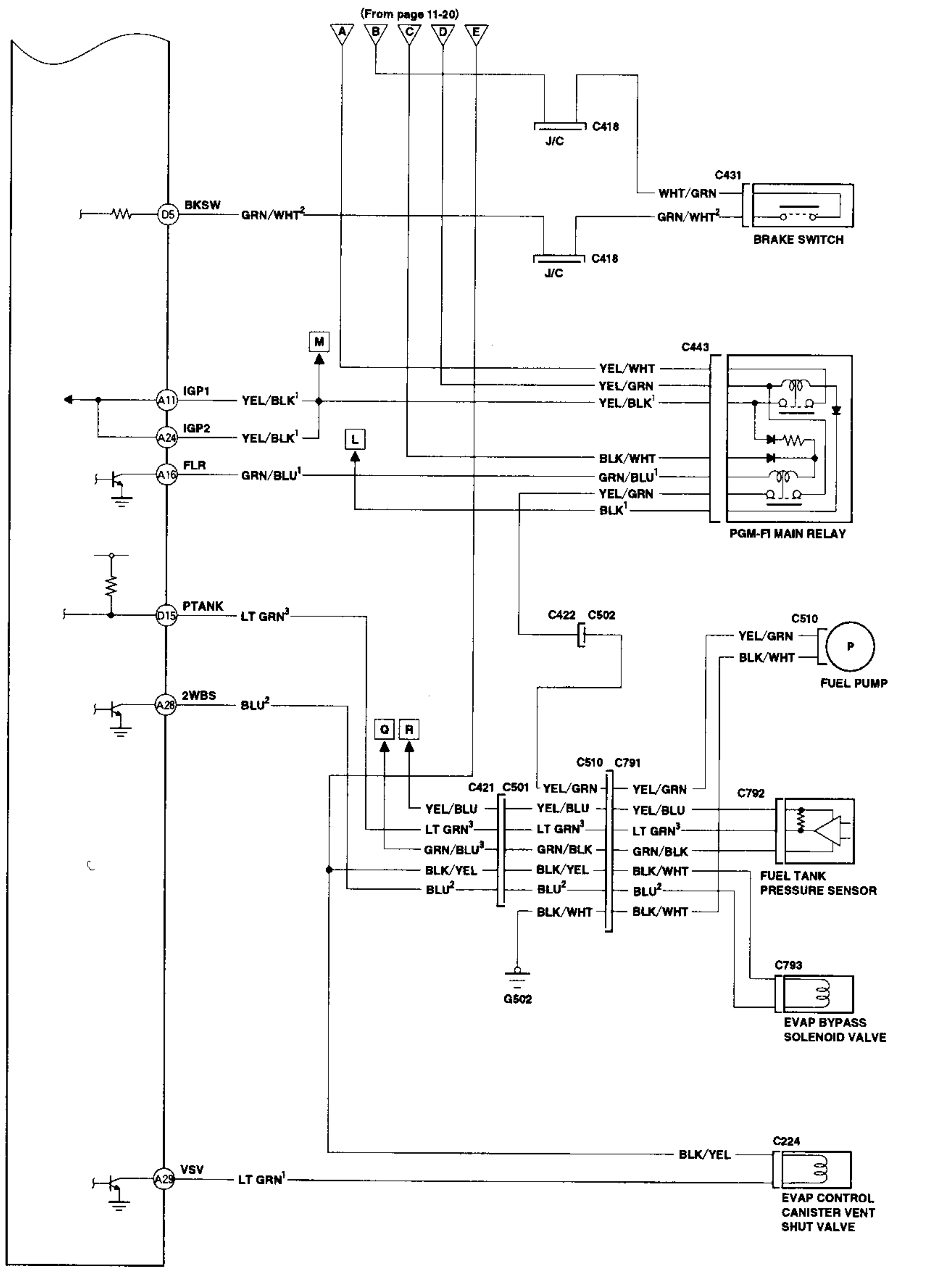
*1: USA
*3: A/T

Electrical Connections (cont'd)



(To page 11-21)

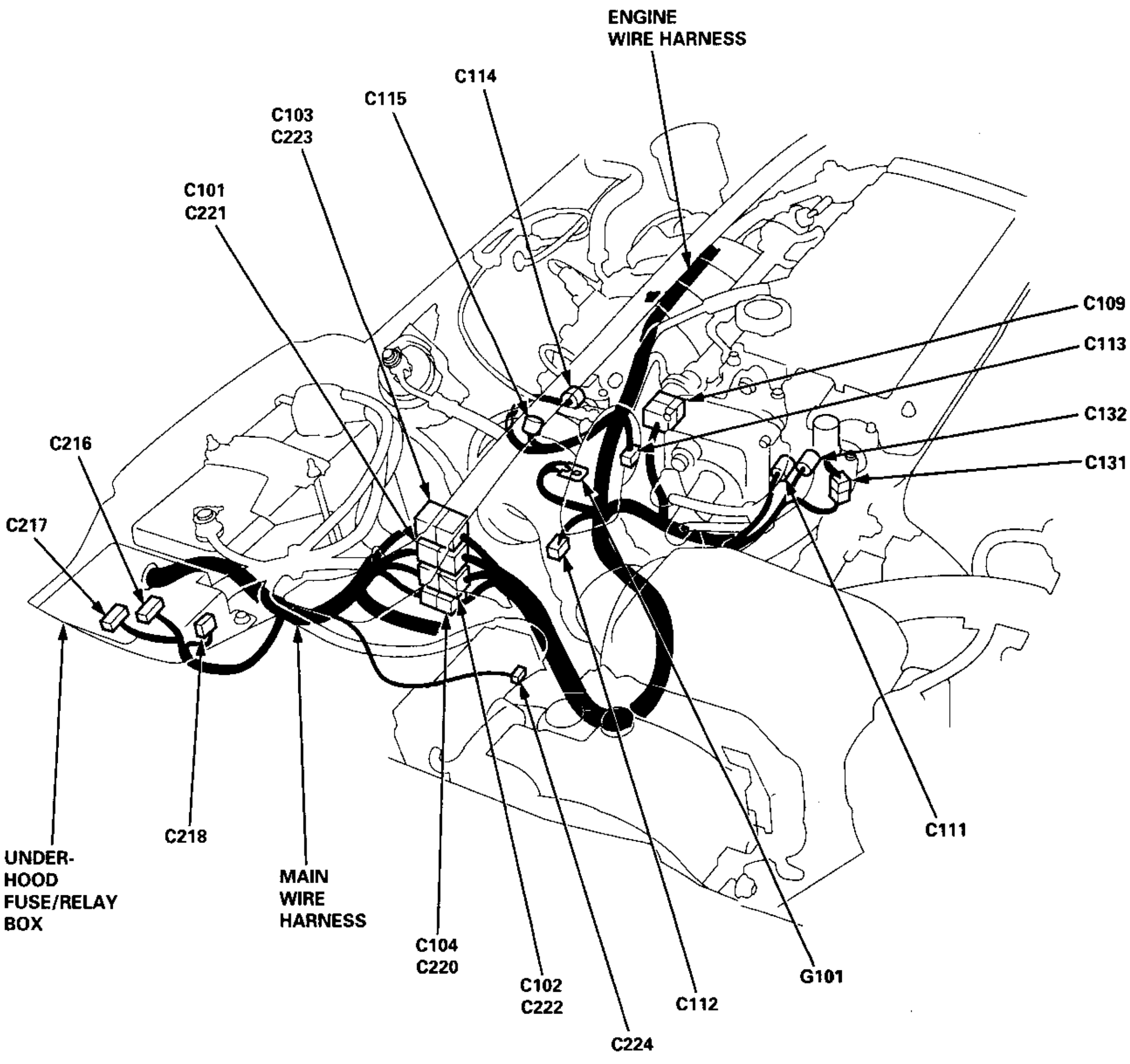
*1: USA



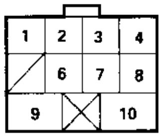
(From page 11-20)
A
B
C
D
E
C418
J/C
C431
WHT/GRN
GRN/WHT2
BRAKE SWITCH
BKSW
D5
GRN/WHT2
C418
J/C
M
C443
YEL/WHT
YEL/GRN
YEL/BLK1
IGP1
A11
YEL/BLK1
IGP2
A24
YEL/BLK1
L
BLK/WHT
FLR
A16
GRN/BLU1
GRN/BLU1
YEL/GRN
BLK1
PGM-FI MAIN RELAY
PTANK
D15
LT GRN3
C422 C502
C510
YEL/GRN
BLK/WHT
P
FUEL PUMP
2WBS
A28
BLU2
Q
R
C510 C791
C421 C501
YEL/GRN
YEL/GRN
C792
YEL/BLU
YEL/BLU
YEL/BLU
LT GRN3
LT GRN3
LT GRN3
GRN/BLU3
GRN/BLK
GRN/BLK
BLK/YEL
BLK/YEL
BLK/WHT
FUEL TANK PRESSURE SENSOR
BLU2
BLU2
BLU2
BLK/WHT
BLK/WHT
G502
C793
EVAP BYPASS SOLENOID VALVE
C224
BLK/YEL
VSV
A29
LT GRN1
EVAP CONTROL CANISTER VENT SHUT VALVE

System Description

System Connectors [Engine Compartment]

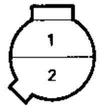


C109



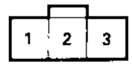
1	YEL/GRN	6	WHT
2	BLU[3]	7	RED
3	GRN[2]	8	BLK
4	YEL[2]	9	BLU
5	——	10	BLK/YEL

C111



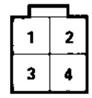
1	RED/WHT
2	GRN/BLK

C112



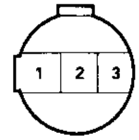
1	BLK[1]
2	BLK/YEL
3	BLU/WHT

C113



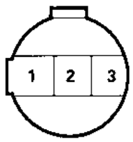
1	WHT[2]
2	GRN/BLK
3	YEL/BLK[1]
4	BLK/WHT

C114



1	YEL/RED
2	GRN/WHT[3]
3	RED/GRN

C115

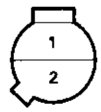


1	GRN/BLK
2	RED/BLK
3	YEL/BLU

C131

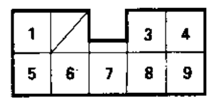
1	GRN/YEL

C132



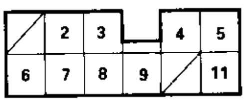
1	BLU/BLK
2	BLK[1]

C216



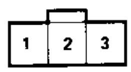
1	GRN	6	BLK/YEL
2	——	7	WHT/GRN
3	WHT/GRN	8	WHT/GRN
4	WHT/BLK	9	WHT
5	BLK/RED		

C217



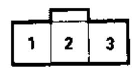
1	——	7	YEL/WHT
2	WHT/BLU	8	WHT/BLU[1]
3	WHT/GRN	9	WHT
4	BLK	10	——
5	WHT/RED	11	BLU/WHT
6	WHT/RED		

C218



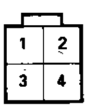
1	BLK/YEL
2	BLK
3	GRN/RED

C220
(B18C1, B18C5 engine)



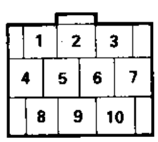
1	RED[2]
2	BLU/RED[1]
3	WHT/RED[1]

C221



1	RED[1]
2	BRN
3	YEL[1]
4	BLU[1]

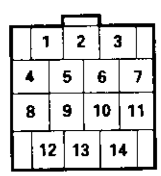
C222



1	BRN/BLK[2]	6	ORN[2]
2	WHT[2]	7	WHT/BLU[7]
3	BRN/BLK[1]	8	BLU[3]
4	YEL[2]	9	BLU/YEL
5	WHT[1]	10	RED/BLU[1]

*: B18C1, B18C5 engines

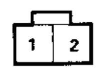
C223



1	WHT/GRN	8	RED/BLK
2	ORN/BLK	9	GRN/BLU[1]
3	GRN/YEL BLU/RED[1]*	10	YEL/BLU
4	GRN/WHT[3]	11	YEL/GRN
5	WHT/YEL	12	RED/YEL
6	YEL/WHT	13	RED/WHT
7	BLU/BLK WHT/RED[1]*	14	WHT/RED[2]

*: B18B1 engine

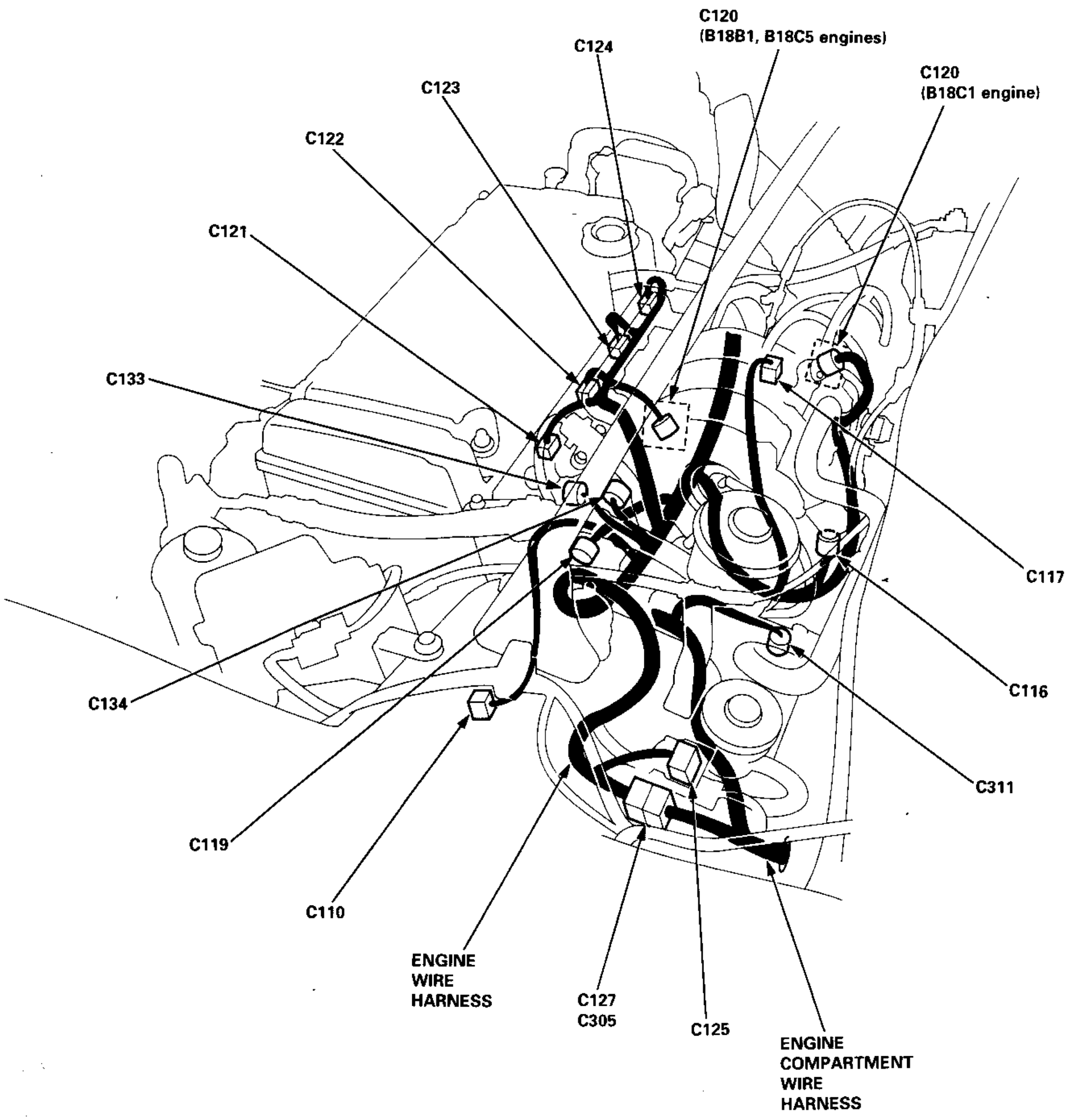
C224



1	LT GRN[1]
2	BLK/YEL

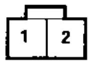
NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side

(cont'd)



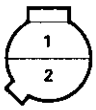
C120
(B18B1, B18C5 engines)
C124
C120
(B18C1 engine)
C123
C122
C121
C133
C117
C134
C116
C311
C119
C110
ENGINE
WIRE
HARNESS
C127
C305
C125
ENGINE
COMPARTMENT
WIRE
HARNESS

C110



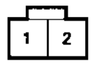
①	BLU/RED[1]
②	WHT/RED[1]

C116



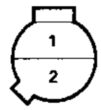
①	BLK/BLU
②	YEL/BLK[1]

C117
(B18C1, B18B1 engine)



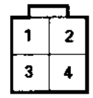
1	YEL/BLK[1]
②	RED/YEL

C117
(B18C5 engine)



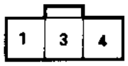
1	RED/YEL
②	YEL/BLK[1]

C119
(USA)



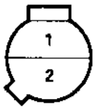
1	BLK/YEL
②	WHT/GRN
3	WHT/BLU
④	WHT/RED[2]

C119
(CANADA)



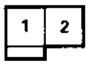
1	WHT/RED[2]
2	BLK/YEL
3	WHT/BLU

C120



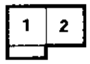
1	GRN/BLK
2	RED/YEL

C121



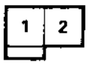
①	BRN
②	YEL/BLK[1]

C122



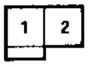
①	RED[1]
②	YEL/BLK[1]

C123



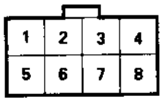
①	BLU[1]
②	YEL/BLK[1]

C124



①	YEL[1]
②	YEL/BLK[1]

C125



①	YEL/BLK[1]	⑤	YEL/BLK[1]
②	YEL/BLK[1]	⑥	YEL/BLK[1]
③	YEL/BLK[1]	⑦	YEL/BLK[1]
④	YEL/BLK[1]	⑧	YEL/BLK[1]

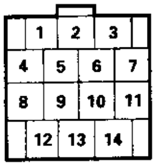
C133

①	RED/BLU
2	——

C134
(B18C1 engine)

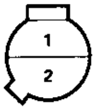
①	RED/BLU
②	BLK

C305



1	BLK/YEL	8	YEL/RED
2	WHT/BLU	9	GRN
③	RED[2] RED*	⑩	BLK[1]
		11	YEL/GRN
④	BLK/BLU	⑫	YEL/BLK[1]
⑤	BLK/YEL	13	GRN/BLK
⑥	ORN	14	YEL
7	BLU	*: B18C1 engine	

C311

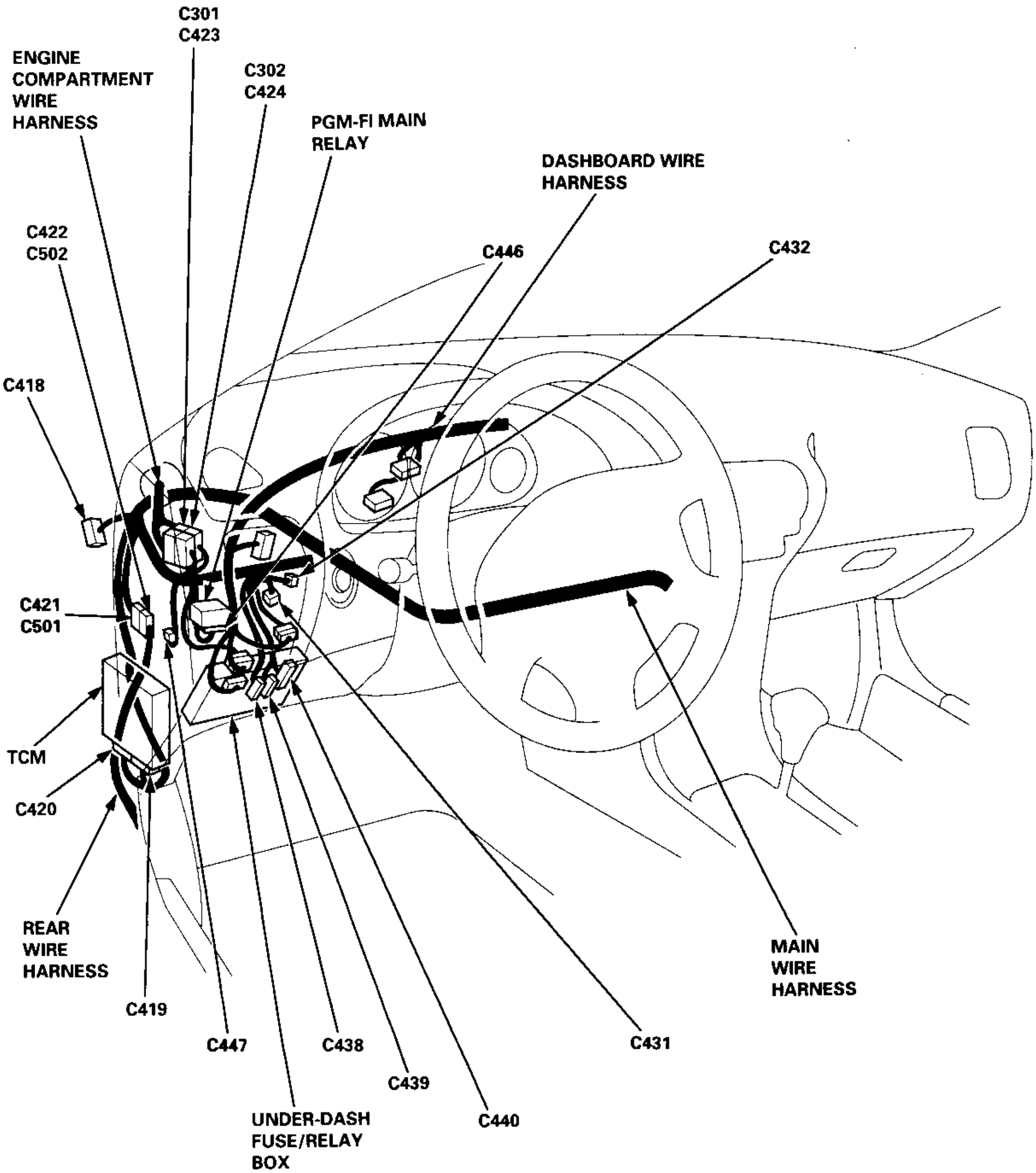


①	GRN[3]
②	BLK

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
○: Related to Fuel and Emissions System.
• — Connector of male terminals: View from terminal side
— Connector of female terminals: View from wire side

System Description

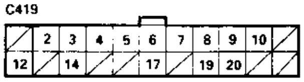
System Connectors [Dash and Floor]



C418

1	BLU	11	LT GRN/RED
2	BLU	12	LT GRN/RED
3	BLU	13	LT GRN/RED
4	GRN/WHT	14	WHT/GRN
5	GRN/WHT	15	WHT/GRN
6	GRN/WHT	16	WHT/GRN
7	—	17	—
8	—	18	—
9	—	19	—
10	—	20	—

C419

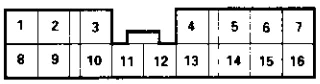


1	—	12	GRN/WHT
2	LT GRN[2]	13	—
3	RED/WHT	14	BRN/WHT
4	RED/BLK	15	—
5	ORN	16	—
6	GRY	17	WHT
7	GRN/BLU[4]	18	—
8	GRN	19	YEL[1]
9	BLU	20	WHT/BLK
10	RED	21	—
11	—	22	—

C420

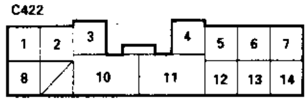
1	—	14	—
2	GRN/WHT	15	GRN/BLK
3	BLU/YEL	16	YEL
4	—	17	GRN/BLK
5	BLU	18	—
6	LT GRN/WHT	19	—
7	GRN/YEL	20	BLU[4]
8	GRN/BLU	21	—
9	PNK/GRN	22	WHT/RED
10	LT GRN/BLK	23	WHT/BLU
11	GRN/RED	24	BLK/RED
12	BLK/YEL	25	YEL/BLK
13	BRN/BLK	26	BRN/BLK

C421



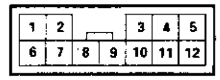
1	GRN/WHT	9	BLK/YEL
2	GRN	10	BLU/WHT
3	YEL/WHT	11	BLU/BLK
4	YEL/RED	12	BLU/YEL
5	WHT/RED	13	BLU/GRN
6	YEL/BLU	14	BLU/BLK
7	GRN/BLU[2]	15	BLU[2]
8	YEL/BLU	16	LT GRN[2]

C422



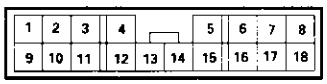
1	LT BLU	8	BLK/WHT
2	RED/BLU	9	—
3	GRN/BLK	10	GRN/WHT
4	YEL/GRN	11	BLK/WHT
5	GRN	12	LT GRN/RED
6	LT GRN/BLK	13	GRN/BLU
7	LT GRN	14	BLK/RED

C423 (Without ABS)



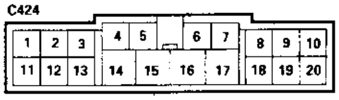
1	RED/BLK	7	BLU/YEL
2	GRN[3]	8	BLU/WHT
3	GRN/BLU	9	BLU
4	RED/BLK	10	GRN/BLK
5	RED/YEL	11	BLK/GRN
6	RED/GRN	12	BLU/BLK

C423 (With ABS)



1	RED/BLK	10	BRN/BLK
2	WHT/RED	11	BRN/RED
3	GRN/BLU	12	GRN/BLU
4	RED/BLK	13	BRN
5	RED/YEL	14	BLU/YEL
6	RED/GRN	15	BLU/WHT
7	GRN[3]	16	BLU
8	BLU/BLK	17	GRN/BLK
9	BRN/WHT	18	BLK/GRN

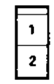
C424



1	YEL	11	GRN/BLK
2	BLK/BLU	12	BLK/YEL
3	BLK/YEL	13	YEL/BLK[1]
4	WHT/BLU	14	BLU
5	RED[2] PNK/BLU*	15	RED/GRN**
		16	BLK/YEL
6	RED/BLU**	17	BLK/RED
7	BLU	18	GRN/RED
8	ORN	19	GRN
9	YEL/RED	20	BLK[1]
10	YEL/GRN		

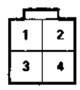
*: B18C1 engine
**: Canada

C431 (Without cruise control)



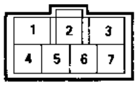
1	WHT/GRN
2	GRN/WHT[2]

C431 (With cruise control)



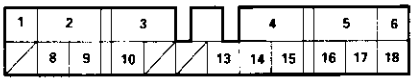
1	LT GRN
2	WHT/GRN
3	GRN/WHT[2]
4	GRY

C432



1	BLK/WHT
2	LT BLU
3	WHT/BLK
4	BLK
5	WHT/YEL
6	WHT/BLU
7	WHT/GRN

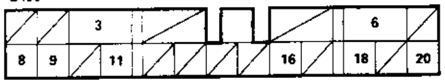
C438



1	BLK/YEL	10	YEL
2	WHT/RED	11	—
3	WHT*	12	—
4	BLK/RED	13	WHT/GRN
5	WHT	14	BLK/YEL
6	WHT/RED	15	GRN/RED*
7	—	16	YEL/BLU
8	BLK/YEL	17	RED/BLK
9	YEL/BLK*	18	RED/GRN*

* Canada

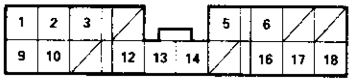
C439



1	—	11	BLU/WHT
2	—	12	—
3	BLK	13	—
4	—	14	—
5	—	15	—
6	WHT/BLU	16	WHT/YEL*
7	—	17	—
8	YEL/GRN	18	WHT/GRN
9	BLK/YEL	19	—
10	—	20	WHT/RED

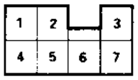
*: Canada

C440



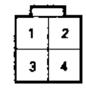
1	RED/YEL	10	GRN/YEL
2	BLK/BLU	11	—
3	RED/GRN	12	BLK/YEL
4		13	BLK/YEL
5	RED/BLU	14	GRN/RED
6	WHT/BLU	15	—
7	—	16	GRN/BLU
8	—	17	RED/BLK
9	RED/WHT	18	RED/BLK

C446



1	GRN/BLU[1]
2	BLU/WHT
3	BLK[1]
4	YEL/GRN
5	YEL/GRN
6	YEL/BLK[1]
7	YEL/WHT

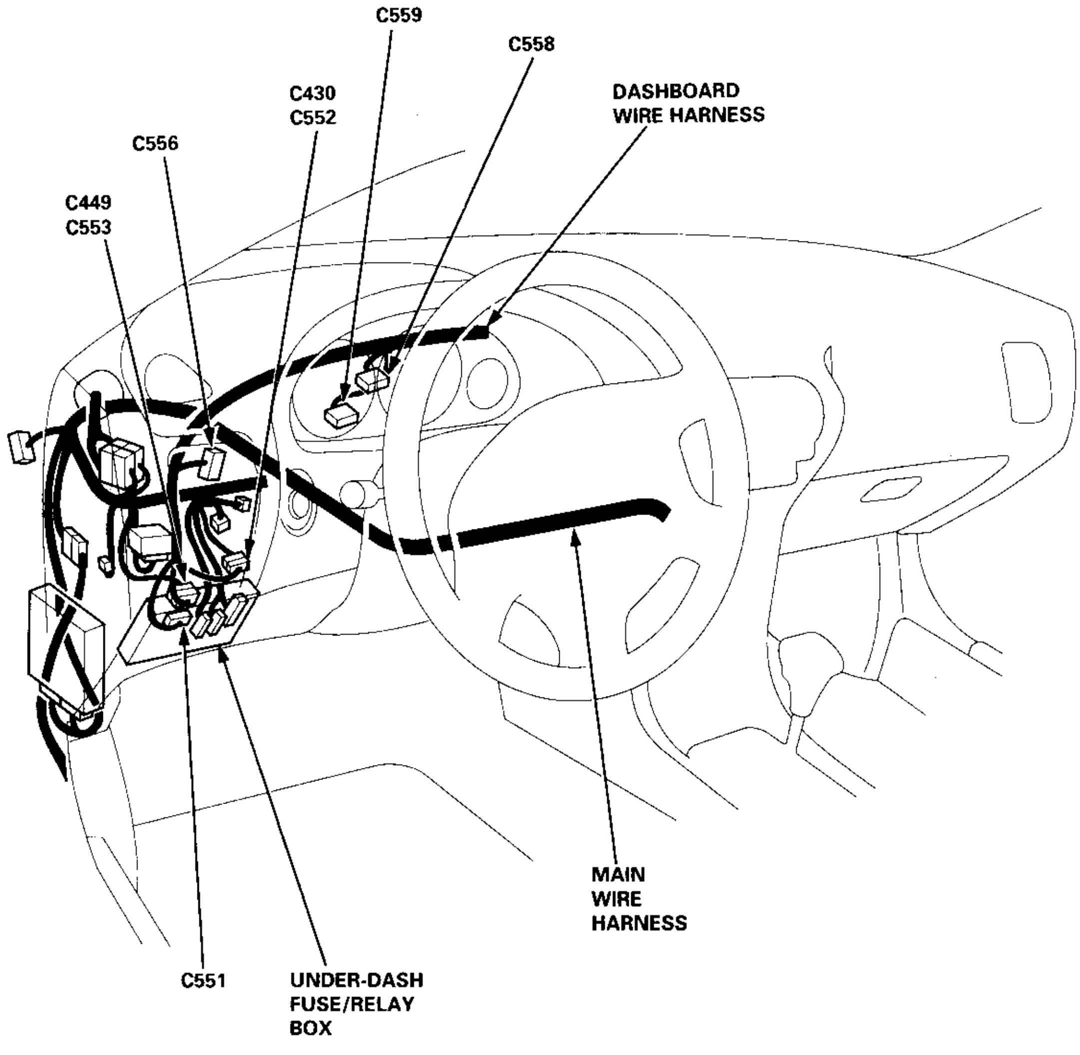
C447 (M/T)



1	BLK/WHT
2	BLK/WHT
3	BLK/RED
4	BLU/BLK

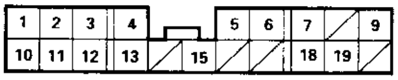
NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side

(cont'd)



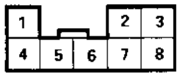
C559
C558
C430
C552
DASHBOARD
WIRE HARNESS
C556
C449
C553
MAIN
WIRE
HARNESS
C551
UNDER-DASH
FUSE/RELAY
BOX

C551



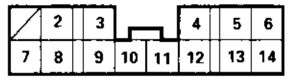
1	RED/GRN	11	YEL/BLK
2	BLK/BLU	12	BLK/WHT
3	WHT/BLU	13	YEL/GRN
4	BLK	14	—
5	GRN/WHT	15	RED/BLK
6	GRN/BLU	16	—
7	GRN/ORN	17	—
8	—	18	BLK/YEL
9	GRN/YEL	19	YEL/RED
10	YEL/BLU	20	—

C552



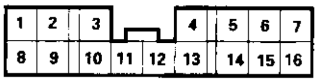
1	LT GRN/WHT	5	GRN/WHT
2	GRN	6	GRN/BLK
3	LT GRN/BLK	7	GRN/BLU
4	GRN/RED	8	GRN/YEL

C553 (Without ABS)



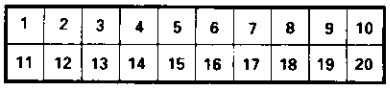
1	—	8	RED/GRN
2	BLU	9	BRN/BLK
3	ORN	10	WHT/GRN
4	YEL/RED	11	BLU/YEL
5	YEL/GRN	12	RED
6	YEL	13	GRN/ORN
7	WHT/BLU	14	BLU

C553 (With ABS)



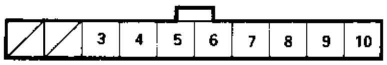
1	RED/BLU	9	RED/GRN
2	LT GRN	10	BRN/BLK
3	BLU	11	WHT/GRN
4	ORN	12	BLU/YEL
5	YEL/RED	13	RED
6	YEL/GRN	14	GRN/ORN
7	YEL	15	BLU
8	WHT/BLU	16	BLU/RED

C556



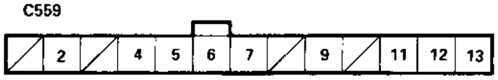
1	RED	11	YEL/BLU
2	RED	12	YEL/BLU
3	RED	13	YEL/BLU
4	RED	14	YEL/BLU
5	RED/BLK	15	BLK
6	RED/BLK	16	BLK
7	RED/BLK	17	BLK
8	RED/BLK	18	BLK
9	RED/BLK	19	BLK
10	RED/BLK	20	BLK

C558



1	—	6	GRN
2	—	7	GRN/BLU
3	LT GRN/BLK	8	GRN/YEL
4	GRN/WHT	9	LT GRN/WHT
5	GRN/RED	10	GRN/BLK

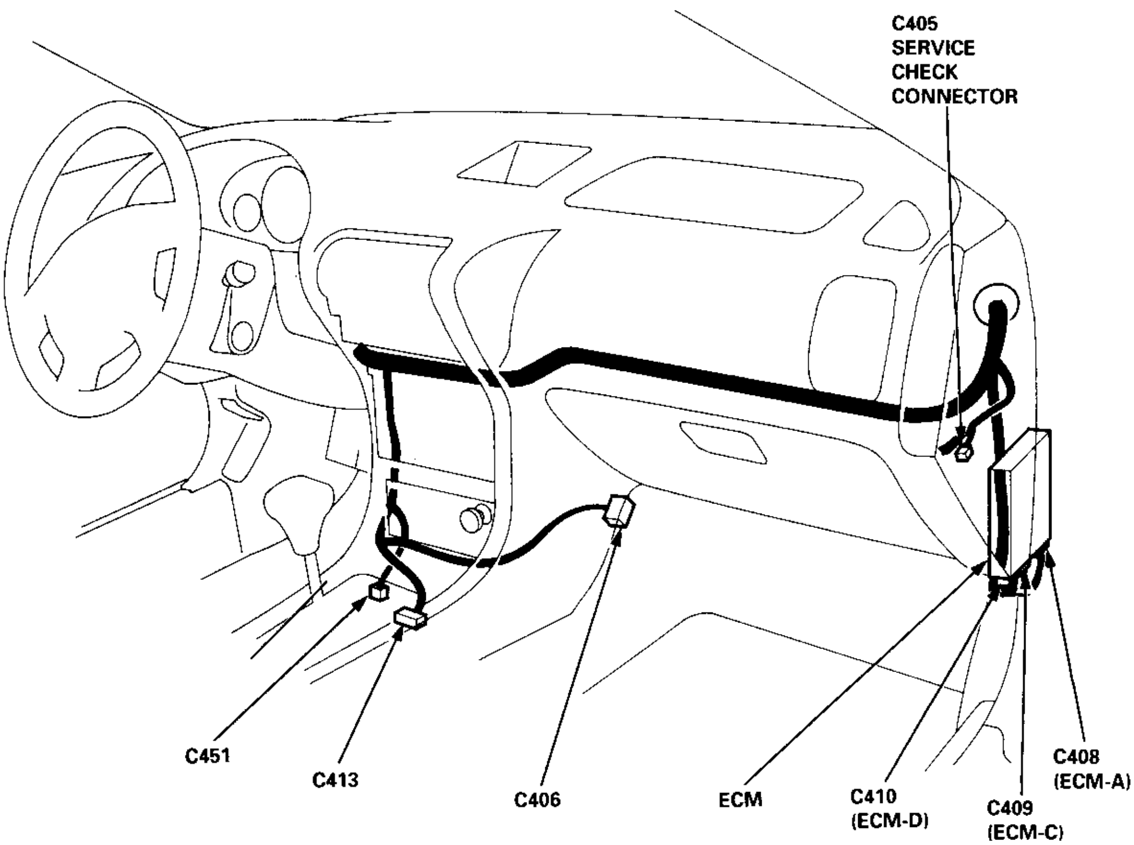
C559



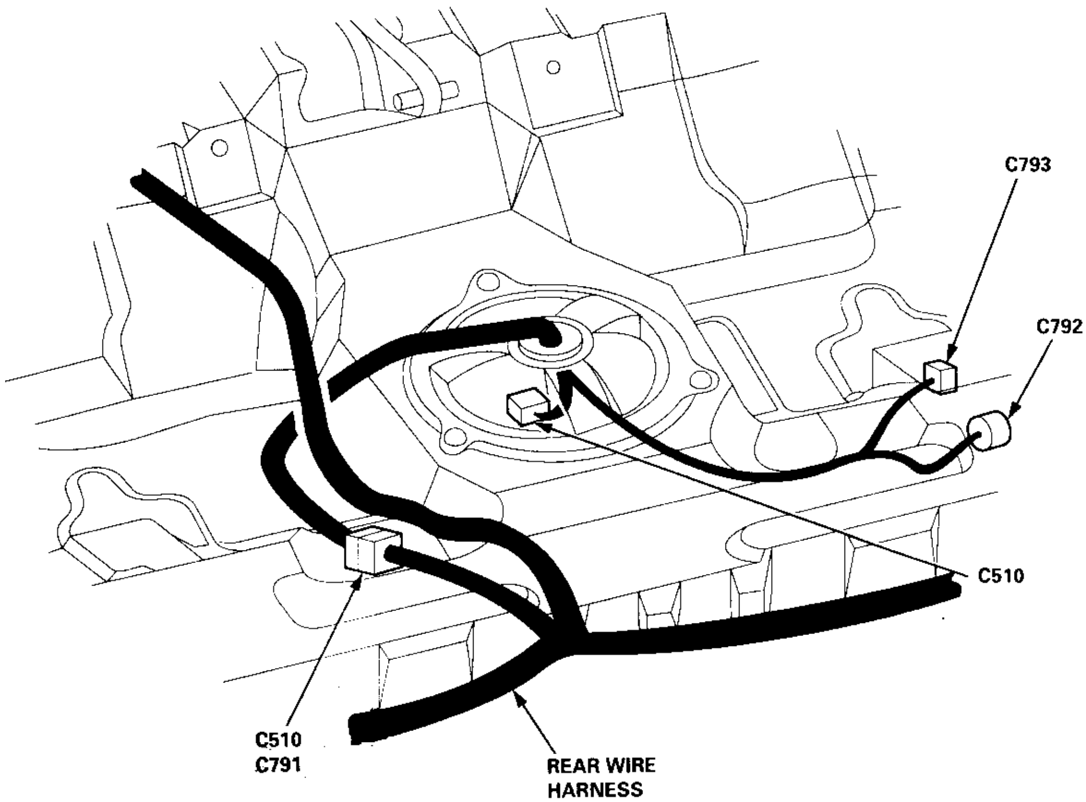
1	—	8	—
2	PNK	9	WHT/BLU
3	—	10	—
4	YEL/BLU	11	YEL/RED
5	RED/BLU	12	GRN/ORN
6	BLK	13	BLU
7	YEL/GRN		

NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side

(cont'd)

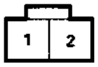


C405
SERVICE
CHECK
CONNECTOR
C451
C413
C406
ECM
C410
(ECM-D)
C409
(ECM-C)
C408
(ECM-A)



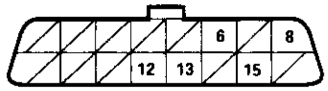
C793
C792
C510
C510
C791
REAR WIRE
HARNESS

C405



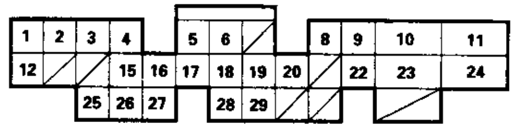
1	BRN/WHT
②	BLK

C406



1	—	9	—
2	—	10	—
3	—	11	—
4	—	⑫	BLK
5	—	⑬	BRN/BLK^1
6	LT BLU	14	—
7	—	⑮	GRN/WHT^1
8	WHT/RED	16	—

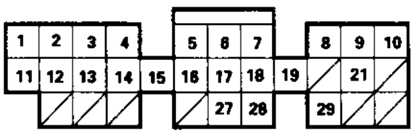
C408 (ECM-A)



1	YEL^1	12	BLK/BLU	23	BLK^2
2	BLU^1	13	—	24	YEL/BLK^2
3	RED^1	14	—	25	WHT/BLK*3
4	BRN	15	RED^2	26	PNK/BLU*2
5	GRN/RED	16	GRN/BLU^1	27	GRN^1*1
6	ORN/BLK	17	BRK/RED	28	BLU^2
7	—	18	GRN/ORN	29	LT GRN
8	GRN/YEL*4	19	WHT/GRN*3	30	—
9	BRN/BLK^1	20	YEL/GRN	31	—
10	BLK^1	21	—	32	—
11	YEL/BLK^1	22	BRN/BLK^2		

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

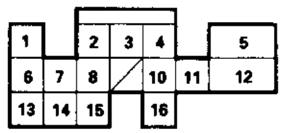
C409 (ECM-C)



①	BLU/RED^1	⑫	BLU/YEL	22	—
②	BLU^3	⑬	WHT/BLU^2	23	—
③	GRN^2	⑭	WHT^1	24	—
④	YEL^7	⑮	BLU/BLK*3	25	—
⑤	BLU/RED^2	⑯	GRN^3*1	26	—
⑥	BLU/WHT	⑰	WHT/RED^2	27	GRY*2
⑦	BRN/WHT	⑱	ORN	28	GRN/BLU^2*2
⑧	GRN/WHT^1	⑲	BLU^4*2	29	LT GRN/BLK*2
⑨	YEL^3*2	⑳	—	30	—
⑩	WHT/BLU^1	㉑	LT GRN^2*2	31	—
⑪	WHT/RED^1				

*1: USA
*2: A/T
*3: B18C1, B18C5 engines

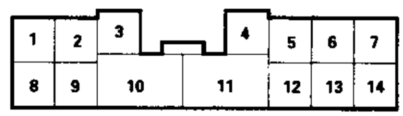
C410 (ECM-D)



①	RED/BLK	9	—
②	RED/WHT	⑩	YEL/BLU
③	WHT/YEL	⑪	GRN/BLU^3
④	YEL/WHT	⑫	GRN/WHT^3
⑤	GRN/WHT^7	⑬	ORN/BLU
⑥	RED/BLU*2	⑭	BLU/RED^3
⑦	WHT^2	⑮	LT GRN^3
⑧	RED/YEL	⑯	GRN/RED*1

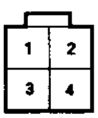
*1: USA
*2: B18C1, B18C5 engines

C413 (A/T)



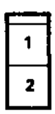
1	BLK	8	—
2	LT GRN/WHT	9	PNK
3	YEL	⑩	BLK/WHT
4	GRN/BLK	⑪	BLK/RED
5	GRN/YEL	⑫	GRN/WHT
6	GRN/BLU	13	GRN/RED
7	PNK/GRN	⑭	GRN

C451



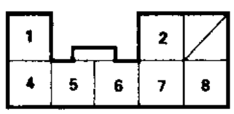
①	BLU/RED^3
②	ORN/BLU
③	BLK/YEL
④	GRN/RED

C510



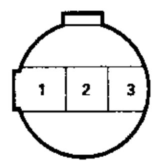
①	BLK/WHT
②	YEL/GRN

C791



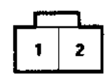
①	LT GRN^3
②	BLU^2
3	—
④	BLK/WHT
⑤	GRN/BLK
⑥	YEL/BLU
⑦	YEL/GRN
⑧	BLK/WHT

C792



1	YEL/BLU
2	GRN/BLK
3	LT GRN^3

C793



1	BLK/WHT
2	BLU^2

NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK^1 and YEL/BLK^2 are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side

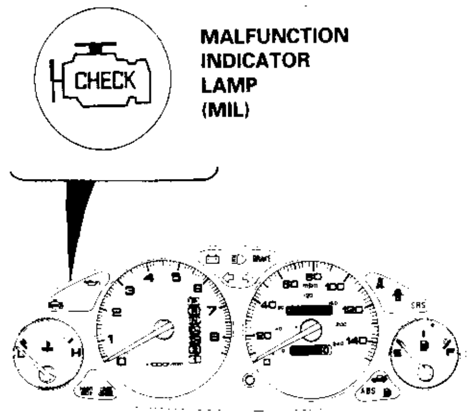
Troubleshooting

Troubleshooting Procedures

I. How To Begin Troubleshooting
When the Malfunction Indicator Lamp (MIL) has been reported on, or there is a driveability problem, use the appropriate procedure below to diagnose and repair the problem.

A. When the MIL has come on:

1. Connect the Honda PGM Tester or an OBD II scan tool to the 16P Data Link Connector (DLC) located behind the front console right side.
2. Turn the ignition switch ON (II).
3. Check the DTC and note it. Also check and note the freeze frame data. Refer to the Diagnostic Trouble Code Chart and begin troubleshooting.

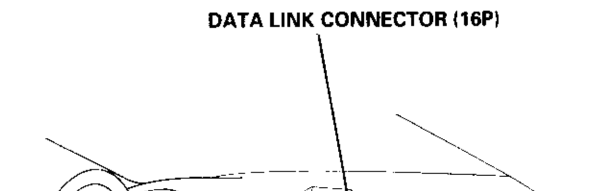


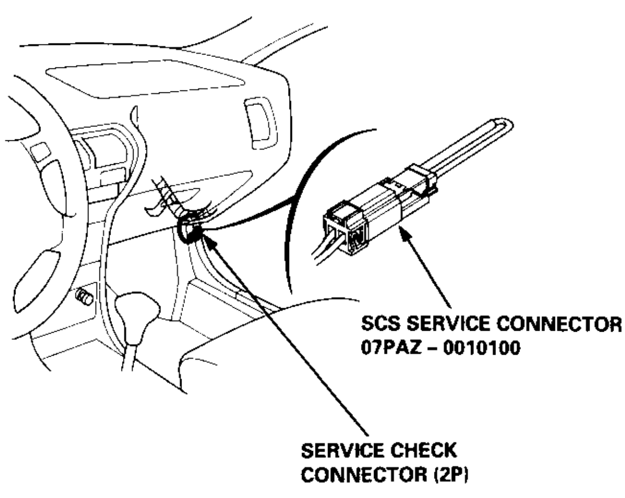
NOTE:

- See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- The scan tool or tester can read the Diagnostic Trouble Codes (DTC), freeze frame data, current data, and other Engine Control Module (ECM) data.
- Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected. It can be useful information when troubleshooting.

B. When the MIL has not come on, but there is a driveability problem, refer to the Symptom Chart on page 11-36.

C. DTCs will be indicated by the blinking of the Malfunction INdicator Lamp (MIL) with the SCS service connector connected.
Connect the SCS service connector to Service Check Connector as shown. (The 2P Service Check Connector is located under the dash on the passenger's side of the car.) Turn the ignition switch on (II).





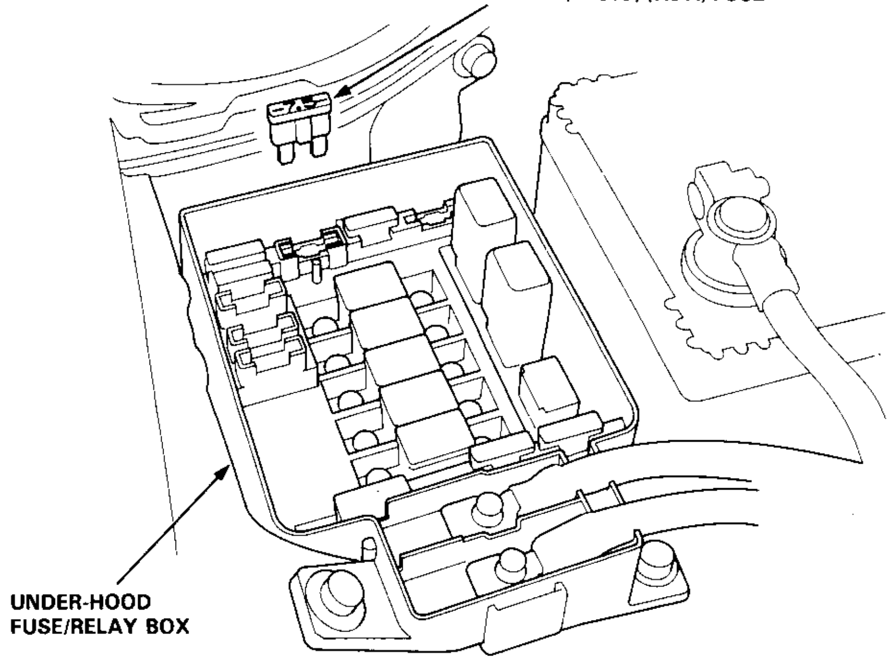
II. Engine Control Module (ECM) Reset Procedure

Either of the following actions will reset the ECM.

- Use the OBD II scan tool or Honda PGM Tester to clear the ECM's memory.

  NOTE: See the OBD II scan tool or Honda PGM Tester use's manuals for specific operating instructions.

- Turn the ignition switch OFF. Remove the BACK UP (RADIO) (7.5 A) fuse from the under-hood fuse/relay box for 10 seconds.



III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the SCS Service Connector if it is connected.

   NOTE: If the SCS service connectors is connected and there are no DTCs stored in the ECM, the MIL will stay on when the ignition switch is turned ON (II).

2. Do the ECM Reset Procedure.

3. Turn the ignition switch OFF.

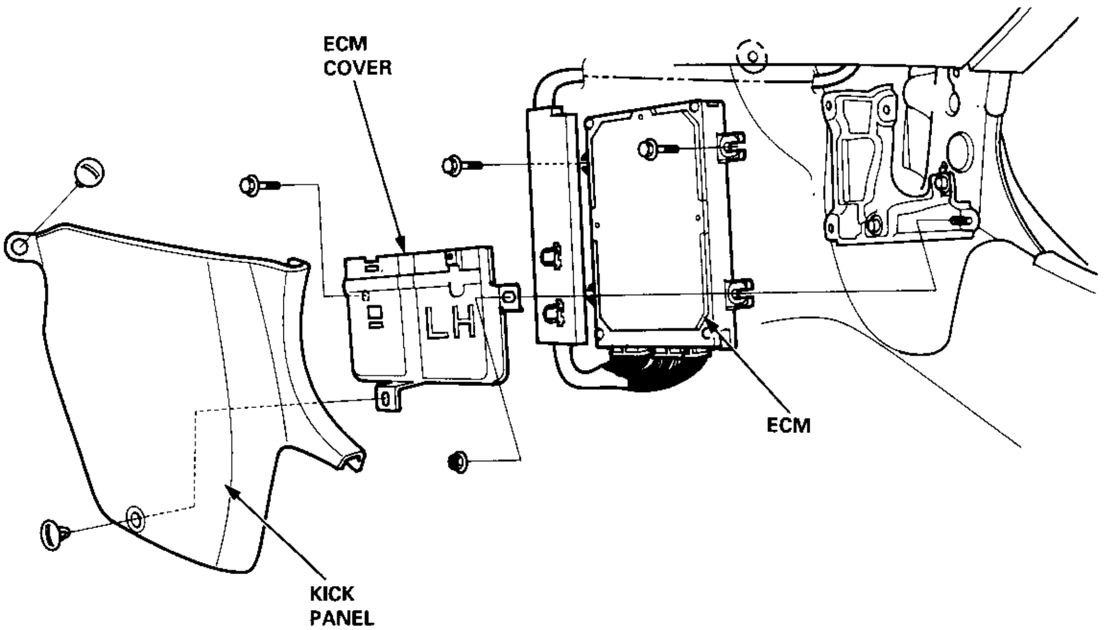
4. Disconnect the OBD II scan tool or Honda PGM Tester from the Data Link Connector (16P).

(cont'd)

Troubleshooting

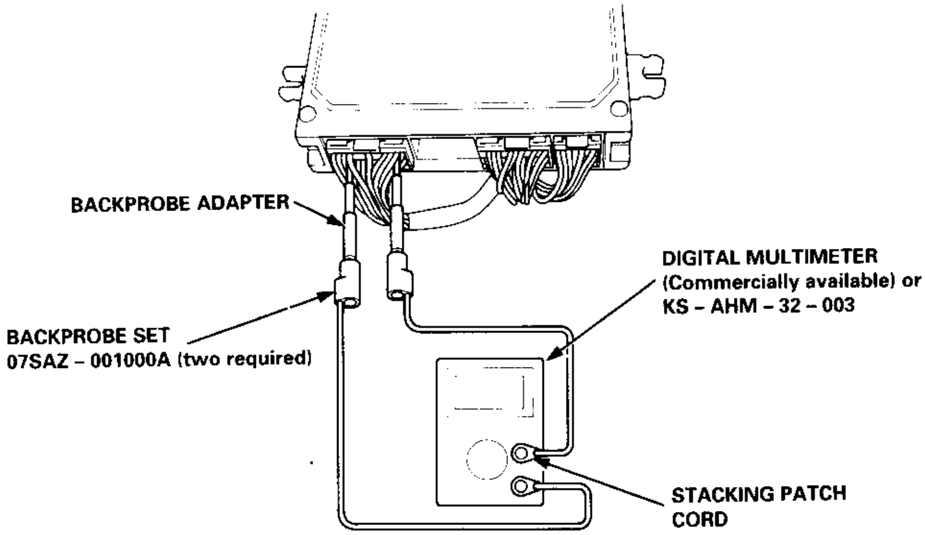
Troubleshooting Procedures (cont'd)

If the inspection for a particular code requires voltage or resistance checks at the ECM connectors, remove the right door sill molding and kick panel. Pull the carpet back to expose the ECM. Unbolt the ECM cover. Turn the ignition switch off, and connect the backprobe sets and a digital multimeter as described below. Check the system according to the procedure described for the appropriate code(s) listed on the following pages.



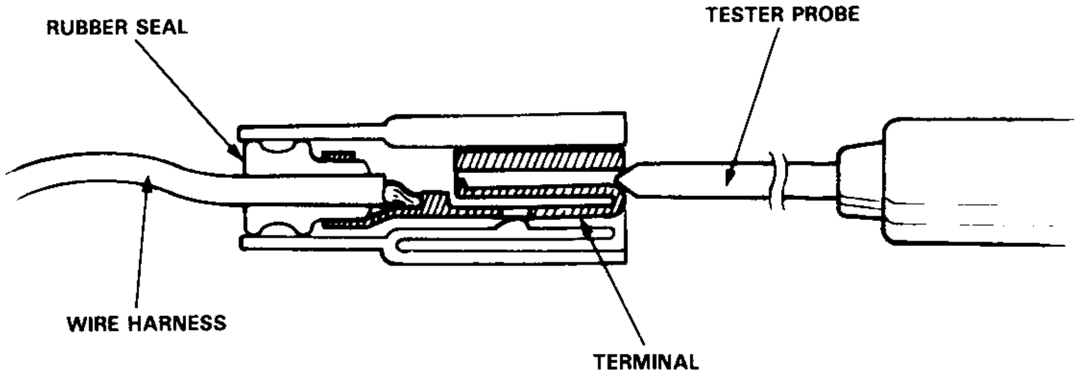
How to Use the Backprobe Sets

Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with terminal end of the wire.



CAUTION:

- **Puncturing the insulation on a wire can cause poor or intermittent electrical connections.**
- **Bring the tester probe into contact with the terminal from the terminal side of wire harness connectors in the engine compartment. For female connectors, just touch lightly with the tester probe and do not insert the probe.**



(cont'd)

Troubleshooting Procedures (cont'd)

Symptom Chart

Listed below are symptoms and probable causes for problems that DO NOT cause the malfunction Indicator Lamp (MIL) to come on. If the MIL was reported on, go to page 11-32.

Troubleshooting each probable cause in the order listed (from left to right) until the symptom is eliminated.

The probable cause and troubleshooting page reference can be found below.

SYMPTOM	PROBABLE CAUSE
Engine will not start	4, 2, 3, 5, 21, 15, 1
Hard starting	2, 4, 12, 14, 20, 21
Cold fast idle too low	7, 8, 9, 6
Cold fast idle too high	7, 8, 9, 11, 10
Idle speed fluctuates	7, 8, 9, 11, 10
Misfire or rough running	Troubleshoot for misfire on pages 11-78, 79
Low power	2, 10, 11, 13, 18, 17, 19, 12
Engine stalls	2, 4, 7, 12, 21, 9, 5, 16

Other Probable Causes for an engine that will not start:

Engine will not start

— Compression
— Engine locked up
— Timing belt
— Starting system
— Overheating
— Battery

Probable Cause List (For the DTC chart, see page 11-42)

Probable Cause	Page	System
1	11-50	Engine Control Module (ECM)
2	11-118	Fuel pressure
3	11-124	PGM-FI main relay
4	Section 23	Ignition system
5	11-83	Crankshaft Position/Top Dead Center/Cylinder Position sensor circuit
6	11-58	Intake Air Temperature (IAT) sensor circuit
7	11-100	Idle Air Control (IAC) Valve
8	11-110	Fast idle thermo valve
9	11-111	Idle speed adjustment
10	11-132	Throttle body
11	11-130	Throttle cable
12	11-54	Manifold Absolute Pressure (MAP) sensor
13	11-63	Throttle Position (TP) sensor
14	11-86	Barometric pressure (BARO) sensor
15	11-106	A/T gear position signal (see section 23)
16	11-104	Brake switch signal
17	11-129	Air Cleaner
18	11-134	Intake Air Bypass (IAB) control system and intake air pipe
19	11-138	Three Way Catalytic Converter (TWC)
20	11-141	Evaporative emission (EVAP) control
21	———	Contaminated fuel

ECM Data

By connecting the OBD II scan tool or the Honda PGM Tester to the 16P data link connector (DLC), various data can be retrieved from the ECM. The items listed in the table below conform to the SAE recommended practice.
The Honda PGM Tester also reads data beyond that recommended by SAE.
Understanding this data will help to find the causes of intermittent failures or engine problems.

NOTE:

- The "operating values" given below are approximate values and may be different depending on the environment and the individual car.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up, transmission in Park or neutral and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM detects a problem, it will store it as a code consisting of one letter and four numbers. Depending on the problem, an SAE-defined code (P0xxx) or a Honda-defined code (P1xxx) will be output to the tester.	If no problem is detected, there is no output.	YES
Engine Speed	The ECM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication at idle speed: B18B1, B18C1 engines: 750 ± 50 rpm B18C5 engine: 800 ± 50 rpm	YES
Vehicle Speed	The ECM converts pulse signals from the Vehicle Speed Sensor (VSS) into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure created in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure. At idle speed: 24 – 37 kPa (180 – 280 mmHg, 7.1 – 11.0 inHg)	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT With engine warmed up: approx. 176 – 200°F (80 – 93°C)	YES
Heated Oxygen Sensor (HO2S) (sensor 1) (sensor 2)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM. Based on these signals, the ECM controls the air/fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiomeric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the ratio is richer than the stoichiomeric ratio), the voltage signal is higher.	0.0 – 1.25 V At idle speed: about 0.1 – 0.9 V (sensor 1)	NO (sensor 1)

(cont'd)

Troubleshooting

Troubleshooting Procedures (cont'd)

Data	Description	Operating Value	Freeze Data
HO2S Feedback Loop Status	Loop status is indicated as "open" or "closed". Closed: Based on the HO2S output, the ECM determines the air/fuel ratio and controls the amount of injected fuel. Open: Ignoring HO2S output, the ECM refers to signals from the TP, MAP, and ECT sensors to control the amount of injected fuel.	At idle speed: closed	YES
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO2S feedback is in the closed loop status. When the signal from the HO2S is weak, short term fuel trim gets higher, and the ECM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO2S output. Consequently, the short term fuel trim is lowered, and the ECM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiomeric ratio when in closed loop status.	–30% – + 47%	YES
Long Term Fuel Trim	Long term fuel trim in computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	–14% – + 20%	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle: Approx. 10% At full throttle: Approx. 90%	YES
Ignition Timing	The ignition advance angle is set by the ECM. The ECM matches ignition timing to the driving conditions.	At idle speed: 16 ± 2° BTDC with the SCS service connector connected.	NO
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 15 – 35% At 2,500 rpm with no load: 12 – 30%	YES

Engine Control Module Terminal Arrangement

ECM CONNECTOR A (32P)

1 INJ4	2 INJ3	3 INJ2	4 INJ1		5 SO2S HTC	6 PO2S HTC	/		8 VTS	9 LG1	10 PG1	11 IGP1
12 IACV	/	/	15 PCS	16 FLR	17 ACC	18 MIL	19 ALTC	20 ICM	/	22 LG2	23 PG2	24 IGP2
		25 VREF	26 IAB SOL	27 FANC		28 2WBS	29 VSV	/	/		/	

Wire side of female terminals

ECM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12 V.

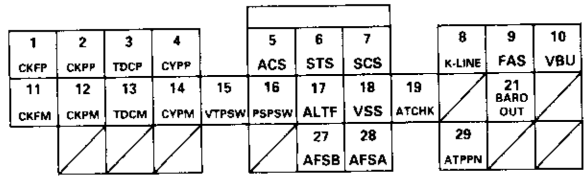
Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	With engine running: pulses
2	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector.	
3	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	
4	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	
5	GRN/RED	S O2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
6	ORN/BLK	P O2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
8*4	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: 0 V With engine at high rpm: battery voltage
9	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the ECM control circuit.	Less than 1.0 V at all times
10	BLK	PG1 (POWER GROUND)	Ground for the ECM power circuit.	Less than 1.0 V at all times
11	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
12	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IACV.	With engine running: about 6 V – 10 V (depending on engine speed)
15	RED	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant above 154°F (68°C): duty controlled
16	GRN/BLU	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	BLK/RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
19*1	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal.	With fully warmed up engine running: battery voltage During driving with small electrical load: 0 V
20	YEL/GRN	ICM (IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): battery voltage With engine running: about 10 V (depending on engine speed)
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the ECM control circuit.	Less than 1.0 V at all times
23	BLK	PG2 (POWER GROUND)	Ground for the ECM power circuit.	Less than 1.0 V at all times
24	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
25*3	WHT/BLK	VREF (REFERENCE VOLTAGE)	Provides reference voltage to other control units.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
26*2	PNK/BLU	IAB SOL (INTAKE AIR BYPASS CONTROL SOLENOID VALVE)	Drives IAB control solenoid valve.	With engine running, engine speed below 5,750 rpm: battery voltage With engine running, engine speed above 5,750 rpm: 0 V
27*1	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay.	With radiator fan running: 0 V With radiator fan stopped: battery voltage
28	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve.	With ignition switch ON (II): battery voltage
29	LT GRN	VSV (EVAP CONTROL CANISTER VENT SHUT VAVLE)	Drives EVAP control canister vent shut valve.	With ignition switch ON (II): battery voltage

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

(cont'd)

Engine Control Module Terminal Arrangement (cont'd)

ECM CONNECTOR C (31P)



Wire side of female terminals

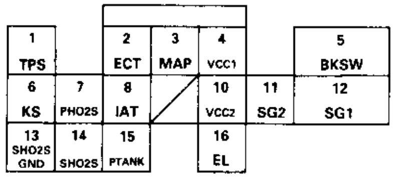
ECM CONNECTOR (31P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLU/RED	CKF P (CKF SENSOR P SIDE)	Detects CKF sensor.	With engine running: pulses
2	BLU	CKP P (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
3	GRN	TDC P (TDC SENSOR P SIDE)	Detects TDC sensor.	With engine running: pulses
4	YEL	CYP P (CYP SENSOR P SIDE)	Detects CYP sensor.	With engine running: pulses
5	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: battery voltage
6	BLU/WHT	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON: battery voltage With starter switch OFF: 0 V
7	BRN/WHT	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication).	With the connector connected: 0 V With the connector disconnected: about 5 V
8	GRN/WHT	K-LINE	Sends and receives OBD II scan tool and PGM tester signal.	With ignition switch ON (II): about 5 V
9	YEL	FAS (FEEDBACK AT SIGNAL)	Sends feedback signal for the TCM.	At idle: about 5 V During shifting: momentary change to 0 V
10	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM control circuit. Power source for the DTC memory.	Battery voltage at all times
11	WHT/RED	CKF M (CKF SENSOR M SIDE)	Ground for CKF sensor.	
12	BLU/YEL	CKP M (CKP SENSOR M SIDE)	Ground for CKP sensor.	
13	WHT/BLU	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor.	
14	WHT	CYPM (CYP SENSOR M SIDE)	Ground for CYP sensor.	
15*4	BLU/BLK	VTP SW (VTEC PRESSURE SWITCH)	Detects VTEC pressure switch signal.	With engine at low rpm: 0 V With engine at high rpm: battery voltage
16*1	GRN	PSPSW (P/S OIL PRESSURE SWITCH)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage
17	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V – battery voltage (depending on electrical load)
18	ORN	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheels rotating: cycles 0 V – 5 V
19*3	BLU	AT CHK (A/T FI DATA LINE)	Detects TCM data signal.	With ignition switch ON (II): pulses
21*3	LT GRN	BARO OUT (BAROMETRIC SENSOR OUTPUT SIGNAL)	Sends barometric sensor output signal.	With ignition switch ON (II): about 3 V (depending on barometric pressure)
27*3	GRY	AFSB (A/T FI SIGNAL B)	Detects retard signal from the TCM.	At idle: about 5 V During shifting: momentary change to 0 V
28*3	GRN/BLU	AFSA (A/T FI SIGNAL A)	Detects retard signal from the TCM.	At idle: about 5 V During shifting: momentary change to 0 V
29*3	LT GRN/BLK	ATPPN (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In N or P position: 0 V In any other position: battery voltage

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

ECM CONNECTOR D (16P)



Wire side of female terminals

ECM CONNECTOR D (16P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.5 V With throttle fully closed: about 0.5 V
2	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
3	WHT/YEL	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
4	YEL/WHT	VCC1 (SENSOR VOLTAGE)	Power source for MAP sensor.	With ignition switch ON (II): about 5 V
5	GRN/WHT	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage
6*4	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine running: pulses
7	WHT	PHO2S (PRIMARY HEATED OXYGEN GENSOR)	Detects primary oxygen sensor signal.	With throttle fully opened, fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
8	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
10	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
11	GRN/BLU	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times.
12	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times.
13	ORN/BLU	SHO2S GND (SECONDARY HEATED OXYGEN SENSOR GROUND)	Ground for secondary heated oxygen sensor.	Less than 1.0 V at all times.
14	BLU/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR)	Detects secondary oxygen sensor signal.	With throttle fully opened, fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
15	LT GRN	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor.	With fuel fill cap opened: about 2.5 V
16	GRN/RED	EL (ELD)	Detects ELD signal.	With parking lights turned on at idle: about 2.5 – 3.5 V With low beam headlights turned on at idle: about 1.5 – 2.5 V

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

Diagnostic Trouble Code (DTC) Chart

DTC (MIL indication*)	Detection Item	Probable Cause	Page
P0107 (3)	Manifold Absolute Pressure Circuit Low Input	• Open or short in MAP sensor circuit • MAP sensor • ECM	11-54
P0108 (3)	Manifold Absolute Pressure Circuit High Input	• Open in MAP sensor circuit • MAP sensor • ECM	11-56
P0112 (10)	Intake Air Temperature Circuit Low Input	• Short in IAT sensor circuit • IAT sensor • ECM	11-58
P0113 (10)	Intake Air Temperature Circuit High Input	• Open in IAT sensor circuit • IAT sensor • ECM	11-59
P0116 (86)	Engine Coolant Temperature Circuit Range/Performance Problem	• ECT sensor • Cooling system	11-60
P0117 (6)	Engine Coolant Temperature Circuit Low Input	• Short in ECT sensor circuit • ECT sensor • ECM	11-61
P0118 (6)	Engine Coolant Temperature Circuit High Input	• Open in ECT sensor circuit • ECT sensor • ECM	11-62
P0122 (7)	Throttle Position Circuit Low Input	• Open or short in TP sensor circuit • TP sensor • ECM	11-63
P0123 (7)	Throttle Position Circuit High Input	• Open in TP sensor circuit • TP sensor • ECM	11-65
P0131 (1)	Primary Heated Oxygen Sensor Circuit Low Voltage (Sensor 1)	• Short in Primary HO2S (Sensor 1) circuit • Primary HO2S (Sensor 1) • Fuel supply system • ECM	11-67
P0132 (1)	Primary Heated Oxygen Sensor Circuit High Voltage (Sensor 1)	• Open in Primary HO2S (Sensor 1) circuit • Primary HO2S (Sensor 1) • ECM	11-69
P0133 (61)	Primary Heated Oxygen Sensor Slow Response (Sensor 1)	• Primary HO2S (Sensor 1) • Exhaust system	11-70

*: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected.

DTC (MIL indication)	Detection Item	Probable Cause	Page
P0135 (41)	Primary Heated Oxygen Sensor Heater Circuit Malfunction (Sensor 1)	• Open or short in Primary HO2S (Sensor 1) heater circuit • ECM	11-74
P0137 (63)	Secondary Heated Oxygen Sensor Circuit Low Voltage (Sensor 2)	• Short in Secondary HO2S (Sensor 2) circuit • Secondary HO2S (Sensor 2) • ECM	11-71
P0138 (63)	Secondary Heated Oxygen Sensor Circuit High Voltage (Sensor 2)	• Open in Secondary HO2S (Sensor 2) circuit • Secondary HO2S (Sensor 2) • ECM	11-72
P0139 (63)	Secondary Heated Oxygen Sensor Slow Response (Sensor 2)	• Secondary HO2S (Sensor 2)	11-73
P0141 (65)	Secondary Heated Oxygen Sensor Heater Circuit Malfunction (Sensor 2)	• Open or short in Secondary HO2S (Sensor 2) heater circuit • ECM	11-74
P0171 (45)	System Too Lean	• Fuel supply system • Primary HO2S (Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance • Exhaust leakage	11-76
P0172 (45)	System Too Rich	• Fuel supply system • Primary HO2S (Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance	11-76
P0300 (71, 72, 73, 74)	Random Misfire	• Ignition system • Fuel supply system • MAP sensor • IAC valve • Contaminated fuel • Lack of fuel	11-78
P0301 (71) P0302 (72) P0303 (73) P0304 (74)	— Cylinder 1 — Cylinder 2 — Cylinder 3 — Cylinder 4 Misfire Detected	• Fuel injector • Fuel injector circuit • Ignition system • Low compression • Valve clearance	11-79
P0325 (23)	Knock Sensor Circuit Malfunction	• Open or short in Knock Sensor circuit • Knock Sensor • ECM	11-82
P0335 (4)	Crankshaft Position Sensor Circuit Malfunction	• Crankshaft Position Sensor • Crankshaft Position Sensor circuit • ECM	11-83
P0336 (4)	Crankshaft Position Sensor Range/Performance	• Crankshaft Position Sensor • Timing belt skipped teeth	11-83
P0420 (67)	Catalyst System Efficiency Below Threshold	• Three Way Catalytic converter • Secondary HO2S	11-139

(cont'd)

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P0452 (91)	Fuel Tank Pressure Sensor Circuit Low Input	• Short in Fuel Tank Pressure Sensor circuit • Fuel Tank Pressure Sensor • ECM	11-142
P0453 (91)	Fuel Tank Pressure Sensor Circuit High Input	• Open in Fuel Tank Pressure Sensor circuit • Fuel Tank Pressure Sensor • ECM	11-144
P0500 (17)	Vehicle Speed Sensor Circuit Malfunction	• Vehicle Speed Sensor • Vehicle Speed Sensor circuit • ECM	11-85
P0505 (14)	Idle Control System Malfunction	• IAC valve • Fast idle thermo valve • Throttle Body	11-98
P0700 P0715 P0720 P0725 P0730 (70) P0740 P0753 P0758	Automatic Transaxle	——	section 14
P1106 (13)	Barometric Pressure Circuit Range/Performance Problem	• ECM (Baro sensor)	11-86
P1107 (13)	Barometric Pressure Circuit Low Input	• ECM (Baro sensor) • TCM • ECM to TCM harness	11-87
P1108 (13)	Barometric Pressure Circuit High Input	• ECM (Baro sensor)	11-87
P1121 (7)	Throttle Position Lower Than Expected	• TP sensor	11-66
P1122 (7)	Throttle Position Higher Than Expected	• TP sensor	11-66
P1128 (5)	Manifold Absolute Pressure Lower Than Expected	• MAP sensor	11-57
P1129 (5)	Manifold Absolute Pressure Higher Than Expected	• MAP sensor	11-57
P1259 (22)	VTEC System Malfunction	• VTEC Solenoid Valve • Open or short in VTEC Solenoid Valve circuit • VTEC Pressure Switch • Open or short in VTEC Pressure Switch circuit • ECM	section 6
P1297 (20)	Electrical Load Detector Circuit Low Input	• Electrical Load Detector • Electrical Load Detector circuit • ECM	11-88
P1298 (20)	Electrical Load Detector Circuit High Input	• Electrical Load Detector • Electrical Load Detector circuit • ECM	11-89

DTC (MIL indication)	Detection Item	Probable Cause	Page
P1336 (54)	Crankshaft Speed Fluctuation Sensor Intermittent Interruption	• CKF sensor	11-90
P1337 (54)	Crankshaft Speed Fluctuation Sensor No Signal	• CKF sensor • CKF sensor circuit • ECM	11-90
P1359 (8)	Crankshaft Position/Top Dead Center/Cylinder Position Sensor Connector Disconnection	• CKP/TDC/CYP sensor circuit	11-92
P1361 (8)	Top Dead Center Sensor Intermittent Interruption	• TDC sensor	11-83
P1362 (8)	Top Dead Center Sensor No Signal	• TDC sensor • TDC sensor circuit • ECM	11-83
P1381 (9)	Cylinder Position Sensor Intermittent Interruption	• CYP sensor	11-83
P1382 (9)	Cylinder Position Sensor No Signal	• CYP sensor • CYP sensor circuit • ECM	11-83
P1456*6 (90)	Evaporative Emission Control System Leak Detected (Fuel Tank Area)	• Fuel fill cap • Vacuum connection • Fuel tank • Fuel tank pressure sensor • EVAP bypass solenoid valve • EVAP two way valve • EVAP control canister vent shut valve • EVAP control canister • EVAP purge control solenoid valve	11-146
P1457*6 (90)	Evaporative Emission Control System Leak Detected (EVAP Control Canister Area)	• Vacuum connection • EVAP control canister • Fuel tank pressure sensor • EVAP bypass solenoid valve • EVAP two way valve • EVAP control canister vent shut valve • Fuel Tank • EVAP purge control solenoid valve	11-146
P1508 (14)	Idle Air Control Valve Circuit Failure	• IAC valve • IAC valve circuit • ECM	11-100
P1607 (–)	Engine Control Module Internal Circuit Failure	• ECM	11-92

(cont'd)

Troubleshooting

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P1660 (70)	A/T FI Data Line Failure	• A/T FI Data Line • TCM • ECM	11-93
P1681 (30)	A/T FI Signal A Low Input	• AFSA Line • TCM • ECM	11-95
P1682 (30)	A/T FI Signal A High Input	• AFSA Line • TCM • ECM	11-95
P1686 (31)	A/T FI Signal B Low Input	• AFSB Line • TCM • ECM	11-95
P1687 (31)	A/T FI Signal B High Input	• AFSB Line • TCM • ECM	11-95
P0700 P1705 P1706 P1753 P1758 (70) P1786 P1790 P1791 P1792 P1794	Automatic Transaxle	——	Section 14

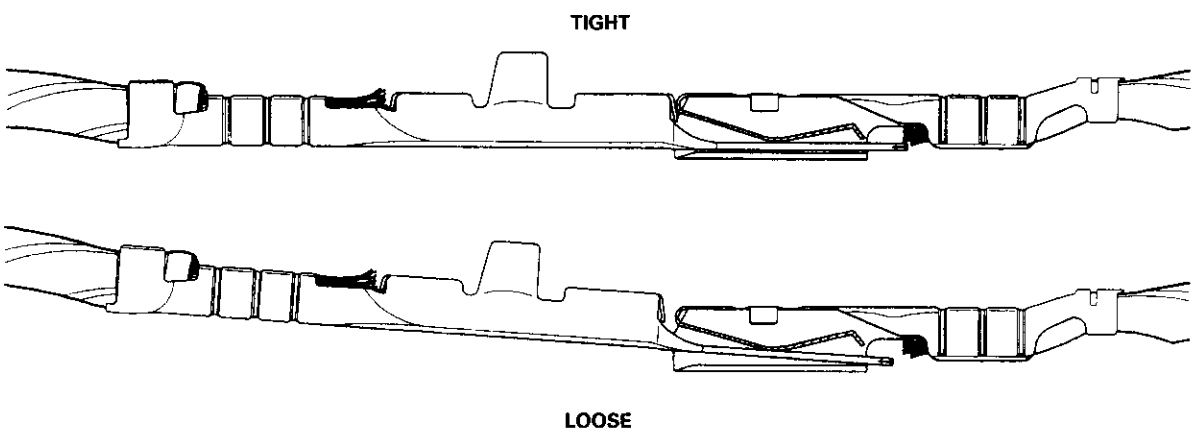
How to Read Flowcharts

A flowchart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware: if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

START (bold type)	Describes the conditions or situation to start a troubleshooting flowchart.
ACTION	Asks you to do something; perform a test, set up a condition etc.
< DECISION >	Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.
STOP (bold type)	The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

NOTE:

- The term "Intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- Most of the troubleshooting flowcharts have you reset the Engine Control Module (ECM) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you can't duplicate the code, do not continue through the flowchart. To do so will only result in confusion and, possibly, a needlessly replaced ECM.
- "Open" and "Short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won't work at all. In complex electronics (like ECM's), this can sometimes mean something works, but not the way it's supposed to.



PGM-FI System

System Description

INPUTS	ENGINE CONTROL MODULE (ECM)	OUTPUTS
TDC/CKP/CYP Sensor CKF Sensor MAP Sensor ECT Sensor IAT Sensor TP Sensor HO2S VSS BARO Sensor ELD*1 Starter Signal ALT FR Signal Air Conditioning Signal A/T Gear Position Signal*3 Battery Voltage (IGN.1) Brake Switch Signal PSP Switch Signal*2 Knock Sensor*4 VTEC Pressure Switch*4 Fuel Tank Prssure Sensor	Fuel Injector Timing and Duration Electronic Idle Control Other Control Functions Ignition Timing Control ECM Back-up Functions	Fuel-Injectors PGM-FI Main Relay (Fuel Pump) MIL IAC Valve A/C Compressor Clutch Relay Radiator Fan Relay*1 Condenser Fan Relay ALT*1 ICM EVAP Purge Control Solenoid Valve HO2S Heater VTEC Solenoid Valve*4 IAB Control Solenoid Valve*2 EVAP Bypass Solenoid Valve EVAP Control Canister Vent Shut Valve

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

PGM-FI System
The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration
The ECM contains memories for the basic discharge durations at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control
Idle Air Control Valve (IAC Valve)
When the engine is cold, the A/C compressor is on, the transmission is in gear (A/T only) the brake pedal is depressed, the P/S load is high, or the alternator is charging, the ECM controls current to the IAC Valve to maintain correct idle speed.

Ignition Timing Control
- The ECM contains memories for basic ignition timing at various engine speeds and manifold pressures. Ignition timing is also adjusted for engine coolant temperature.
- A Knock Control System is adopted which sets the ideal ignition timing for the octane number of gasoline used*4.

Other Control Functions
1. Starting Control
   When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
   - When the ignition switch is initially turned on, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurize the fuel system.
   - When the engine is running, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
   - When the engine is not running and the ignition is on, the ECM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

3. Fuel Cut-off Control
   - During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over following rpm:
     - B18B1 engine: 970 rpm (Canada model: 1,050 rpm)
     - B18C1 engine: 970 rpm (Canada model: 1,050 rpm)
     - B18C5 engine: 1,300 rpm (Canada model: 1,400 rpm)
   - Fuel cut-off action also takes place when engine speed exceeds 7,000 rpm (B18B1 engine), 8,100 rpm (B18C1 engine) or 8,600 rpm (B18C5 engine), regardless of the position of the throttle valve, to protect the engine from over-revving.

4. A/C Compressor Clutch Relay
   When the ECM receives a demand for cooling from the air conditioning system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

5. Evaporative Emission (EVAP) Purge Control Solenoid Valve
   When the engine coolant temperature is above 154°F (68°C) and the air conditioner on, the ECM controls the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.

6. Intake Air Bypass (IAB) Control Solenoid Valve*4
   When the engine rpm is below 5,750 rpm, the IAB control solenoid valve is activated by a signal from the ECM, intake air flows through the long intake path, then high torque is delivered. At speeds higher than 5,750 rpm, the solenoid valve is deactivated by the ECM, and intake air flows through the short intake path in order to reduce the resistance in airflow.

ECM Fail-safe/Back-up Functions

1. Fail-safe Function
   When an abnormality occurs in a signal from a sensor, the ECM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

2. Back-up Function
   When an abnormality occurs in the ECM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

3. Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]
   When an abnormality occurs in a signal from a sensor, the ECM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned on, the ECM supplies ground for the MIL for two seconds to check the MIL bulb condition.

4. Two Driving Cycle Detection Method
   To prevent false indications, the Two Driving Cycle Detection Method is used for the HO2S, fuel metering-related, idle control system, ECT sensor, TWC and EVAP control system and other self-diagnostic functions. When an abnormality occurs, the ECM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the ECM informs the driver by lighting the MIL.
   However, to ease troubleshooting, this function is cancelled when you short the service check connector. The MIL will then blink immediately when an abnormality occurs.

Engine Control Module (ECM)

The Malfunction Indicator Lamp (MIL) never comes on (even for two seconds) after ignition is turned ON (II).

NOTE: If this symptom is intermittent, check for a loose fuse No. 25 METER (7.5A) in the under-dash fuse/relay box, a poor connection at ECM terminal A18, or an intermittent open in the GRN/ORN wire between the ECM (A18) and the gauge assembly.

Turn the ignition switch ON (II).

Is the low oil pressure light on?

NO — **Repair short or open in the wire between No. 25 METER (7.5 A) fuse and gauge assembly.**
— **Replace No. 25 METER (7.5 A) fuse.**

YES

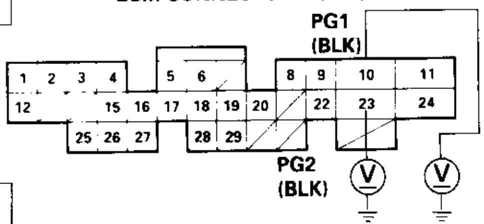
Try to start the engine.

Does the engine start?

NO

Check for an open in the wires (PG lines):

1. Turn the ignition switch ON (II).
2. Measure voltage between body ground and ECM connector terminals A10 and A23 individually.



Wire side of female terminals

Is there less than 1.0 V?

NO — **Repair open in the wire(s) between ECM and G101 (located at thermostat housing) that had more than 1.0 V.**

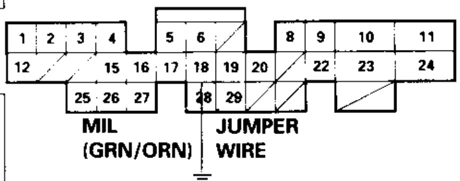
YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

YES

Check for an open in the wire or bulb:

1. Turn the ignition switch OFF.
2. Connect the ECM connector terminal A18 to body ground with a jumper wire.
3. Turn the ignition switch ON (II).



Is the MIL on?

NO — **Repair open in the wires between ECM (A18) and gauge assembly.**
— **Replace the MIL bulb.**

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

The Malfunction Indicator Lamp (MIL) stays on or comes on after two seconds.

NOTE:
- When there is no code stored, the MIL will stay on if the service check connector is shorted.
- If this symptom is intermittent, check for:
  - A loose FI E/M (15 A) in the under-hood fuse/relay box
  - A loose No. 13 FUEL PUMP (SRS UNIT) (15 A) in the under-dash fuse/relay box
  - An intermittent short in the wire between the ECM (C7) and the service check connector
  - An intermittent open in the wire between the service check connector and G401
  - An intermittent short in the wire between the ECM (A18) and the gauge assembly
  - An intermittent short in the wire between the ECM (D14) and the MAP sensor
  - An intermittent short in the wire between the ECM (D10), the TP sensor and Fuel tank pressure sensor
  - PGM-FI Main relay
- See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.

Check the Diagnostic Trouble Code (DTC):
1. Connect a scan tool or Honda PGM Tester.
2. Turn the ignition switch ON (II).
3. Read the DTC with the scan tool or Honda PGM Tester.

Are any DTC(s) indicated?

YES → **Go to troubleshooting procedures. (see page 11-32)**

NO ↓

Check the DTC by MIL indication:
1. Turn the ignition switch OFF.
2. Connect the SCS service connector to the service check connector.
3. Turn the ignition switch ON (II).

Does the MIL indicate any DTC?

YES →
- **Repair open or short in wire between the ECM (C8) and Data Link Connector.**
- **Go to troubleshooting procedures. (see page 11-32)**

NO ↓

Try to start the engine.

Does the engine start?

NO → B (To page 11-52)

YES ↓

Check for a short in the wires (SCS line):
1. Turn the ignition switch OFF and turn the ignition switch ON (II).
2. Disconnect the SCS service connector.
3. Measure voltage between the ECM connector terminal C7 and body ground.

Is there approx. 5 V?

NO → **Repair short to body ground in the wire between ECM (C7) and service check connector.**

YES ↓

A (To page 11-52)

(cont'd)

Engine Control Module (ECM) (cont'd)

(From page 11-51)

A

Check for a short in the wire (MIL line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector A (32P).
3. Turn the ignition switch ON (II).

Is the MIL ON?

YES → **Repair short to body ground in the wire between the ECM (A18) and MIL.**

NO → **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

(From page 11-51)

B

Inspect FI E/M (15 A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

NO →
- **Repair short in the wire between FI E/M (15 A) fuse and PGM-FI main relay.**
- **Replace FI E/M (15 A) fuse.**

YES → Inspect No. 13 FUEL PUMP (SRS UNIT) (15A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

NO →
- **Repair short in the wire between No. 13 FUEL PUMP (SRS UNIT) (15 A) fuse and PGM-FI main relay.**
- **Replace No. 13 FUEL PUMP (SRS UNIT) (15 A) fuse.**

YES →

Check for a short in a sensor:
1. Turn the ignition switch ON (II).
2. Disconnect the 3P connector from each sensor one at time:
   - MAP sensor
   - TP sensor
   - Fuel tank pressure sensor

Does the MIL go OFF?

YES → **Replace the sensor that caused the light to go out.**

NO

(To page 11-53)

(From page 11-52)

Check for a short in the wires (VCC1, VCC2 lines):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between body ground and ECM connector terminals D4 and D10 individually.

Is there continuity?

YES →
- **Repair short to body ground in the wire between ECM (D4) and MAP sensor.**
- **Repair short to body ground in the wire between ECM (D10), TP sensor and Fuel tank pressure sensor.**

NO ↓

Check for an open in the wires (IGP1, IGP2 lines):
1. Turn the ignition switch ON (II).
2. Measure voltage between body ground and ECM connector terminals A11 and A24 individually.

Is there battery voltage?

NO →
- **Repair open in the wire(s) between ECM (A11, A24) and PGM-FI main relay.**
- **Check for poor connections or loose wires at the PGM-FI main relay.**
- **Test the PGM-FI main relay (see page 11-124).**

YES ↓

Check for an open in the wires (LG1, LG2 lines):
1. Reconnect all sensor connectors.
2. Reconnect the ECM connector D (16P).
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and ECM connector terminals A9 and A22 individually.

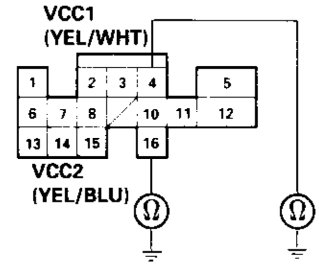
Is there less than 1.0 V?

NO → **Repair open in the wire(s) between ECM (A9, A22) and G101 that had more than 1.0 V.**

YES ↓

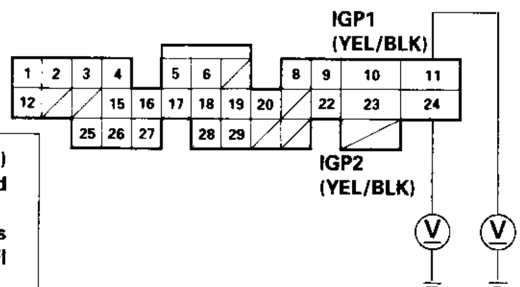
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

ECM CONNECTOR D (16P)

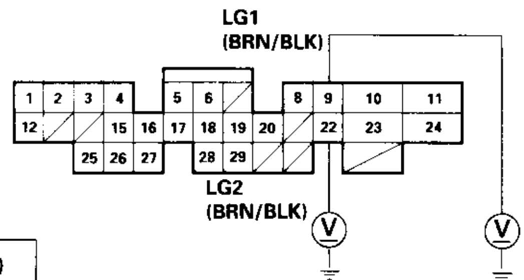


Wire side of female terminals

ECM CONNECTOR A (32P)



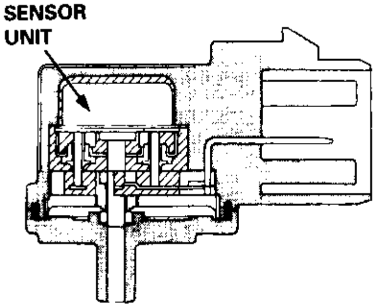
Wire side of female terminals

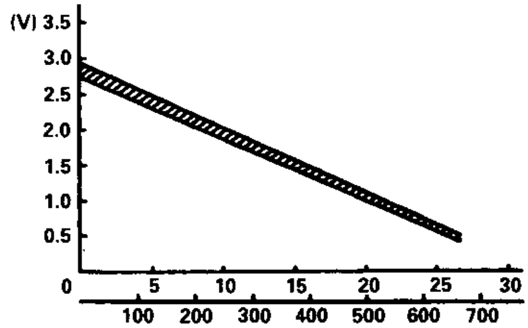


Manifold Absolute Pressure (MAP) Sensor

P0107 The scan tool indicates Diagnostic Trouble Code (DTC) P0107: A low voltage (high vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

The MAP sensor converts manifold absolute pressure into electrical signals and inputs the ECM.





— **The MIL has been reported on.**
— **DTC P0107 is stored.**

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

Is approx. 0 kPa (0 mmHg, 0 in.Hg) or 2.8 V indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C114 (MAP sensor) and ECM.**

YES ↓

Check for an open or short in the MAP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. Check the MAP with the scan tool.

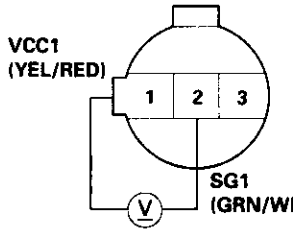
Is approx. 0 kPa (0 mmHg, 0 in.Hg) or 2.8 V indicated?

NO → **Replace the MAP sensor.**

YES ↓

Check for an open in wire (VCC1 line):
Measure voltage between the MAP sensor 3P connector terminals No. 1 and No. 2.

MAP SENSOR 3P CONNECTOR (C114)



Wire side of female terminals

Is there approx. 5 V?

NO → **Repair open in the wire between ECM (D4) and MAP sensor.**

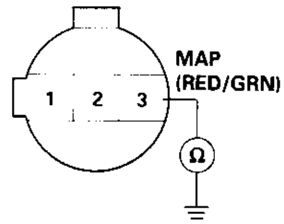
YES ↓

(To page 11-55)

(From page 11-54)

Check for a short in the wire (MAP line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between the MAP sensor 3P connector terminal No. 3 and body ground.

MAP SENSOR 3P CONNECTOR (C114)



Wire side of female terminals

Is there continuity?

YES — **Repair short in the wire between ECM (D3) and MAP sensor.**

NO — **Substitute a known-good ECM and recheck. If normal MAP is indicated, replace the original ECM.**

(cont'd)

Manifold Absolute Pressure (MAP) Sensor (cont'd)

P0108 The scan tool indicates Diagnostic Trouble Code (DTC) P0108: A high voltage (low vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

— The MIL has been reported on.
— DTC P0108 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

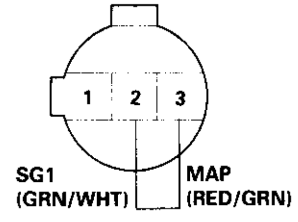
Is 101 kPa (760 mmHg, 30.0 in.Hg), 1.0 V or higher indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C114 (MAP sensor) and ECM.**

YES ↓

Check for an open in the MAP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor 3P connector.
3. Install a jumper wire between the MAP sensor 3P connector terminals No. 3 and No. 2.
4. Turn the ignition switch ON (II).
5. Check the MAP with the scan tool.

MAP SENSOR 3P CONNECTOR (C114)



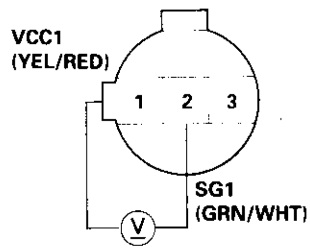
Wire side of female terminals

Is 101 kPa (760 mmHg, 30.0 in.Hg), 1.0 V or higher indicated?

NO → **Replace the MAP sensor.**

YES ↓

Check for an open in wire (SG1 line):
1. Remove the jumper wire.
2. Measure voltage between the MAP sensor 3P connector terminals No. 1 and No. 2.



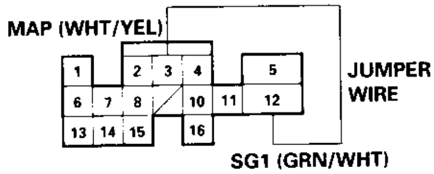
Is there approx. 5 V?

NO → **Repair open in the wire between ECM (D12) and MAP sensor.**

YES ↓

Check for an open in the wire (MAP line):
1. Turn the ignition switch OFF.
2. Install a jumper wire on the ECM connector terminals between D3 and D12.
3. Turn the ignition switch ON (II).
4. Check the MAP with the scan tool.

ECM CONNECTOR D (16P)



Wire side of female terminals

Is 101 kPa (760 mmHg, 30.0 in.Hg), 1.0 V or higher indicated?

NO → **Repair open in the wires between ECM (D3) and MAP sensor.**

YES ↓

Substitute a known-good ECM and recheck. If normal MAP is indicated, replace the original ECM.

P1128 The scan tool indicates Diagnostic Trouble Code (DTC) P1128: Manifold Absolute Pressure (MAP) lower than expected.

- **The MIL has been reported on.**
- **DTC P1128 is stored.**

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

Is 54.1 kPa (406 mmHg, 16.0 in.Hg) or higher indicated?

YES — **Intermittent failure, system is OK at this time.**

NO — **Replace the MAP sensor.**

P1129 The scan tool indicates Diagnostic Trouble Code (DTC) P1129: Manifold Absolute Pressure (MAP) higher than expected.

- **The MIL has been reported on.**
- **DTC P1129 is stored.**

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

Is 43.3 kPa (325 mmHg, 12.8 in.Hg) or less indicated?

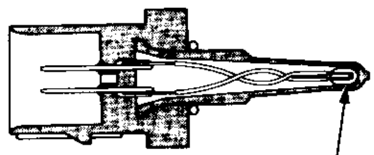
YES — **Intermittent failure, system is OK at this time.**

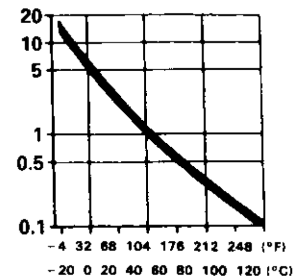
NO — **Replace the MAP sensor.**

Intake Air Temperature (IAT) Sensor

P0112 The scan tool indicates Diagnostic Trouble Code (DTC) P0112: A low voltage (high temperature) problem in the Intake Air Temperature (IAT) sensor circuit.

The IAT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below.





— The MIL has been reported on.
— DTC P0112 is stored.
— Or from Probable Cause List.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

Is 302°F (150°C) or higher (or H-Limit in Honda mode of the PGM Tester) or 0 V indicated?

NO → Is the correct ambient temperature indicated*?

- NO → **Replace the IAT sensor.**
- YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C120 (IAT sensor) and ECM.**

*: If the engine is warm, it will be higher than ambient temperature.

YES ↓

Check for a short in the IAT sensor:
1. Disconnect the IAT sensor connector.
2. Check the IAT with the scan tool.

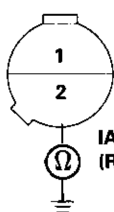
Is 302°F (150°C) or higher (or H-Limit in Honda mode of the PGM Tester) or 0 V indicated?

NO → **Replace the IAT sensor.**

YES ↓

Check for a short in the wire (IAT line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between IAT sensor connector terminal No. 2 and body ground.

IAT SENSOR CONNECTOR (C120)



Wire side of female terminals

Is there continuity?

YES → **Repair short in the wire between ECM (D8) and IAT sensor.**

NO ↓

Substitute a known-good ECM and recheck. If normal IAT is indicated, replace the original ECM.

P0113 The scan tool indicates Diagnostic Trouble Code (DTC) P0113: A high voltage (low temperature) problem in the Intake Air Temperature (IAT) sensor circuit.

— The MIL has been reported on.
— DTC P0113 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

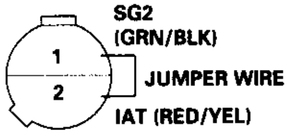
Is -4°F (-20°C) or less (or L-Limit in Hond mode of PGM Tester) or 5 V indicated?

NO — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C120 (IAT sensor) and ECM.**

YES

Check for an open in the IAT sensor:
1. Disconnect the IAT sensor connector.
2. Install a jumper wire between the two terminals on the IAT sensor connector.
3. Check the intake air temperature with the scan tool.

IAT SENSOR CONNECTOR (C120)



Wire side of female terminals

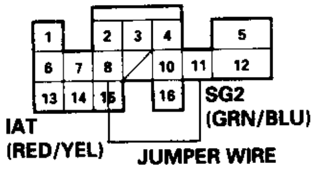
Is -4°F (-20°C) or less (or L-Limit in Hond mode of PGM Tester) or 5 V indicated?

NO — **Replace the IAT sensor.**

YES

Check for an open in the wires (IAT, SG2 lines):
1. Turn the ignition switch OFF.
2. Install a jumper wire between ECM connector terminals D8 and D11.
3. Turn the ignition switch ON (II).
4. Check the IAT with the scan tool.

ECM CONNECTOR D (16P)



Wire side of female terminals

Is -4°F (-20°C) or less (or L-Limit in Hond mode of PGM Tester) or 5 V indicated?

NO — **Repair open in the wires between ECM (D8, D11) and the IAT sensor.**

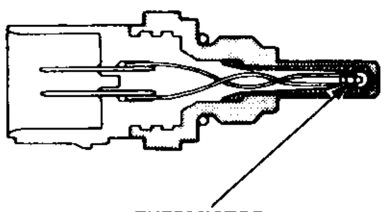
YES

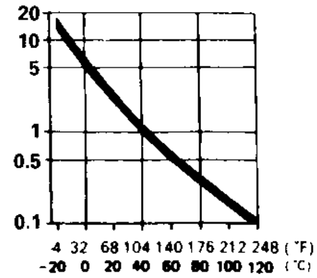
Substitute a known-good ECM and recheck. If normal IAT is indicated, replace the original ECM.

Engine Coolant Temperature (ECT) Sensor

P0116 The scan tool indicates Diagnostic Trouble Code (DTC) P0116: A range/performance problem in the Engine Coolant Temperature (ECT) Sensor circuit.

The ECT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.





NOTE: If DTC P0117 and/or P0118 are stored at the same time as DTC P0116, troubleshoot those DTCs first, then troubleshoot DTC P0116.

Possible Cause

- ECT sensor deterioration
- Malfunction in the thermostat and the cooling system

Troubleshooting Flowchart

- **The MIL has been reported on.**
- **DTC P0116 is stored.**

Problem verification:

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. With the scan tool, check the ECT.

Is 176 – 200°F (80 – 93°C) or 0.4 – 0.7 V indicated?

YES — **Intermittent failure, system is OK at this time. Check the thermostat and the cooling system.**

NO — **Check the thermostat and the cooling system. If they are OK, replace the ECT sensor.**

P0117 The scan tool indicates Diagnostic Trouble Code (DTC) P0117: A low voltage (high temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit.

— The MIL has been reported on.
— DTC P0117 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C111 (ECT sensor) and ECM.**

YES ↓

Check for a short in the ECT sensor:
1. Disconnect the ECT sensor connector.
2. Check the ECT with the scan tool.

Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

NO → **Replace the ECT sensor.**

YES ↓

Check for a short in the wires (ECT line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between ECT sensor connector terminal No. 1 and body ground.

Is there continuity?

NO → **Substitute a known-good ECM and recheck. If normal ECT is indicated, replace the original ECM.**

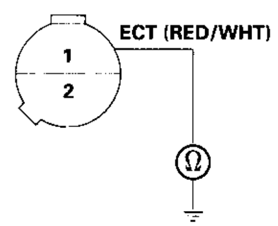
YES → **Check for short in the TCM (ECT line):**
1. Disconnect the 22P connector from the TCM.
2. Check for continuity between ECT sensor connector terminal No. 2 and body ground.

Is there continuity?

YES → **Repair short in the wire between ECM (D2), TCM and ECT sensor.**

NO → **Replace the TCM.**

ECT SENSOR CONNECTOR (C111)



Wire side of female terminals

(cont'd)

PGM-FI System

Engine Coolant Temperature (ECT) Sensor (cont'd)

P0118 The scan tool indicates Diagnostic Trouble Code (DTC) P0118: A high voltage (low temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit.

— The MIL has been reported on.
— DTC P0118 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C111 (ECT sensor) and ECM.**

YES ↓

Check for an open in the ECT sensor:
1. Disconnect the ECT sensor connector.
2. Install a jumper wire between the two terminals on the harness side of the ECT sensor connector.
3. Check the ECT with the scan tool.

Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

NO → **Replace the ECT sensor.**

YES ↓

Check for an open in the wires (ECT, SG2 lines):
1. Turn the ignition switch OFF.
2. Install a jumper wire between ECM connector terminals D2 and D11.
3. Turn the ignition switch ON (II).
4. Check the ECT with the scan tool.

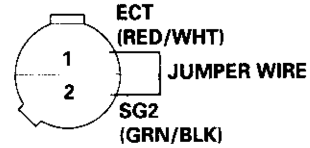
Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

NO → **Repair open in the wires between ECM (D2, D11) and ECT sensor.**

YES ↓

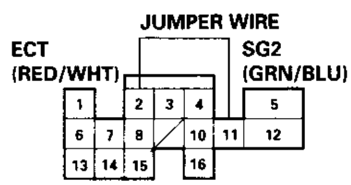
Substitute a known-good ECM and recheck. If normal ECT is indicated, replace the original ECM.

ECT SENSOR CONNECTOR (C111)



Wire side of female terminals

ECM CONNECTOR D (16P)

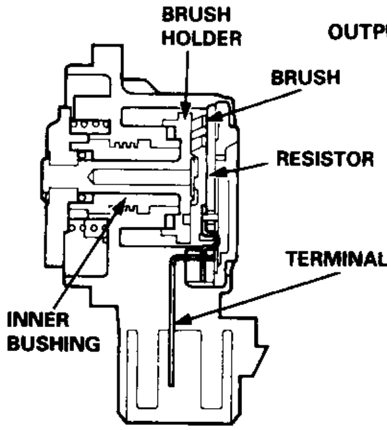


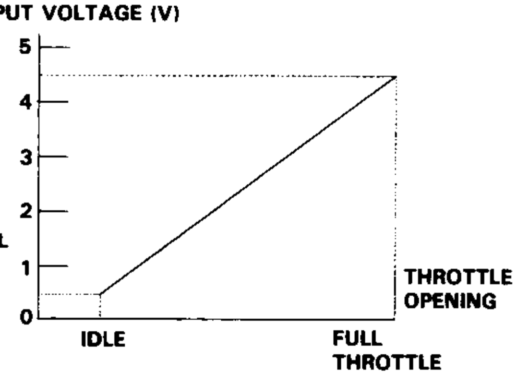
Wire side of female terminals

Throttle Position (TP) Sensor

P0122 The scan tool indicates Diagnostic Trouble Code (DTC) P0122: A low voltage problem in the Throttle Position (TP) sensor circuit.

The TP Sensor is a potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the throttle position sensor varies the voltage signal to the ECM.





- **The MIL has been reported on.**
- **DTC P0122 is stored.**

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

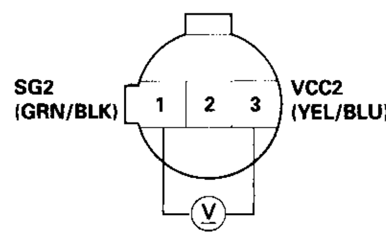
Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C115 (TP sensor) and ECM.**

NO ↓

Check for an open in the wire (VCC2 line):
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between TP sensor connector terminals No. 1 and No. 3.

TP SENSOR CONNECTOR (C115)

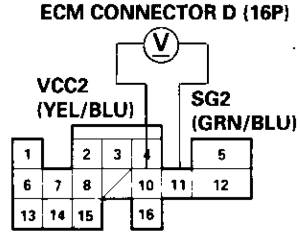


Wire side of female terminals

Is there approx. 5 V?

NO → **Check for an open in wire (VCC2 line):**
Measure voltage between ECM connector terminals D10 and D11.

ECM CONNECTOR D (16P)



Wire side of female terminals

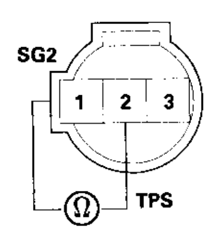
Is there approx. 5 V?

YES → **Repair open in the wire between ECM (D10) and TP sensor.**

NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

YES ↓

Check for an open or short in TP sensor:
1. Turn the ignition switch OFF.
2. Measure resistance between TP sensor terminals No. 1 and No. 2 with the throttle fully closed.



Terminal side of male terminals

(To page 11-64)

(cont'd)

Throttle Position (TP) Sensor (cont'd)

(From page 11-63)

Is there approx. 0.5 – 0.9 kΩ?

NO → **Replace the throttle body.**

YES ↓

Check for an open or short in the TP sensor:
Measure resistance between TP sensor terminals No. 2 and No. 3 with the throttle fully closed.

Is there approx. 4.5 kΩ?

NO → **Replace the throttle body.**

YES ↓

Check for an open in the ECM:

1. Reconnect the TP sensor connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between ECM connector terminals D1 and D11.

Is there approx. 0.5 V when the throttle is fully closed and approx. 4.5 V when the throttle is fully opened?

YES → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

NO ↓

(A/T only)

Check for short in the TCM:

1. Turn the ignition switch OFF.
2. Disconnect the 22P connector from the TCM.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals D1 and D11.

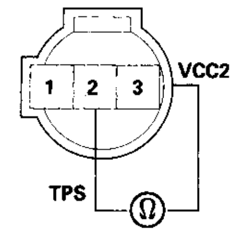
Is there approx. 0.5 V when the throttle is fully closed and approx. 4.5 V when the throttle is fully opened?

YES → **Replace the TCM.**

NO ↓

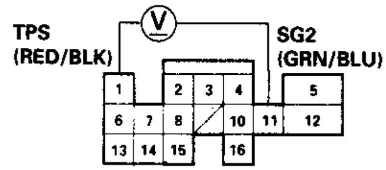
Repair short in the wire between ECM (D1), TCM and TP sensor.

TP SENSOR



Terminal side of male terminals

ECM CONNECTOR D (16P)



Wire side of female terminals

P0123 The scan tool indicates Diagnostic Trouble Code (DTC) P0123: A high voltage problem in the Throttle Position (TP) sensor circuit.

— The MIL has been reported on.
— DTC P0123 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C115 (TP sensor) and ECM.**

NO

Check for an open in the TP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between TP sensor connector terminals No. 3 and No. 1.

Is there approx. 5 V?

YES — **Replace the throttle body.**

NO

Check for an open in the wire (SG2 line):
Measure voltage between ECM connector terminals D10 and D11.

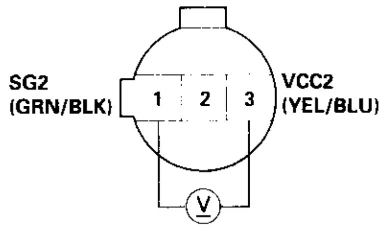
Is there approx. 5 V?

YES — **Repair open in the wire between ECM (D11) and TP sensor.**

NO

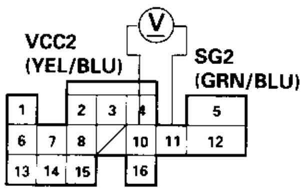
Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

TP SENSOR CONNECTOR (C115)



Wire side of female terminals

ECM CONNECTOR D (16P)



Wire side of female terminals

(cont'd)

Throttle Position (TP) Sensor (cont'd)

P1121 The scan tool indicates Diagnostic Trouble Code (DTC) P1121: Throttle Position (TP) lower than expected.

- **The MIL has been reported on.**
- **DTC P1121 is stored.**

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

Is TP*% or higher indicated when the throttle is fully opened?

YES — **Intermittent failure, system is OK at this time.**

NO — **Replace the throttle body.**

*: 12.9 (M/T),
12.2 (A/T)

P1122 The scan tool indicates Diagnostic Trouble Code (DTC) P1122: Throttle Position (TP) higher than expected.

- **The MIL has been reported on.**
- **DTC P1122 is stored.**

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

Is TP*% or less indicated when the throttle is fully closed?

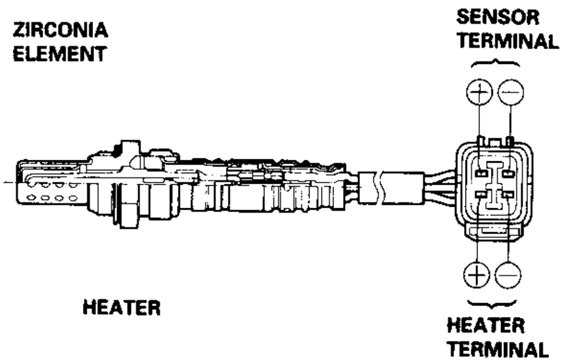
YES — **Intermittent failure, system is OK at this time.**

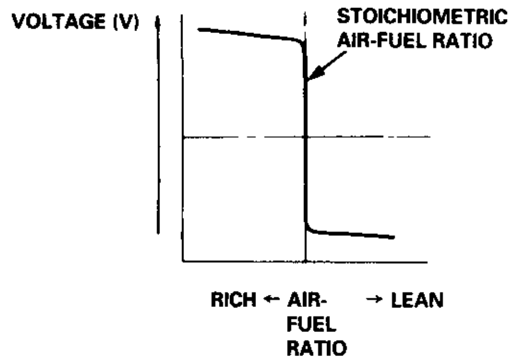
NO — **Replace the throttle body.**

*: 17.2 (B18C1, B18C5 engines),
17.6 (B18B1 engine M/T),
16.5 (B18B1 engine A/T)

Primary Heated Oxygen Sensor (HO2S) (Sensor 1)

The Heated Oxygen Sensor (HO2S) detects the oxygen content in the exhaust gas and signals the ECM. In operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilize the sensor's output, the sensor has an internal heater and the sensor element is coated with a catalyst. The HO2S is installed in TWC housing (B18C1, B18C5 engines) or exhaust pipe B (B18B1 engine).





P0131 The scan tool indicates Diagnostic Trouble Code (DTC) P0131: A low voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

— The MIL has been reported on.
— DTC P0131 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive with the A/T in [2] position, M/T in 4th gear.
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.

Does the voltage stay at 0.1 V or less?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C113 (Primary HO2S (Sensor 1)) and ECM.**

YES ↓

Check the fuel pressure (see page 11-118).

Is it normal?

NO → **Repair fuel supply system.**

YES ↓

(To page 11-68)

(cont'd)

Primary Heated Oxygen Sensor (HO2S) (Sensor 1) (cont'd)

(From page 11-67)

Check for a short in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) connector.
3. Start the engine and let it idle.
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

Does it stay at 0.1 V or less?

NO → **Replace the HO2S.**

YES ↓

Check for a short in the wires:
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between HO2S connector terminal No. 1 and body ground.

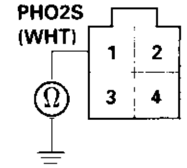
Is there continuity?

YES → **Repair short in the wire between ECM (D7) and Primary HO2S (Sensor 1).**

NO ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

PRIMARY HO2S (Sensor 1) CONNECTOR (C113)



Wire side of female terminals

P0132 The scan tool indicates Diagnostic Trouble Code (DTC) P0132: A high voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

— **The MIL has been reported on.**
— **DTC P0132 is stored.**

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive with the A/T in [2] position, M/T in 4th gear.
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool during deceleration using completely closed throttle.

Does the voltage stay at 1.0 V or more?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C113 (Primary HO2S (Sensor 1)) and ECM.**

YES ↓

Check for an open in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) connector.
3. Install a jumper wire on the harness side of the Primary HO2S (Sensor 1) connector between terminals No. 1 and No. 2.
4. Turn the ignition switch ON (II).
5. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

Is there 1.0 V or more?

NO → **Replace the Primary HO2S (Sensor 1).**

YES ↓

Check for an open in the wires (PHO2S line):
1. Turn the ignition switch OFF.
2. Connect ECM connector terminals D7 and D11 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

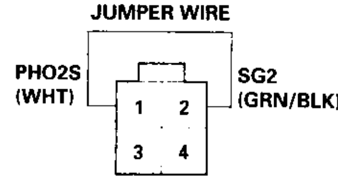
Is there 1.0 V or more?

NO → **Repair open in the wire between ECM (D7) and Primary HO2S (Sensor 1).**

YES ↓

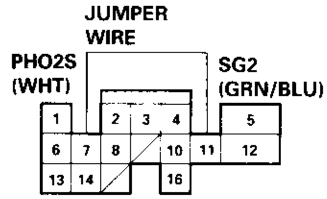
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

PRIMARY HO2S (Sensor 1) CONNECTOR (C113)



Wire side of female terminals

ECM CONNECTOR D (16P)



Wire side of female terminals

(cont'd)

Primary Heated Oxygen Sensor (HO2S) (Sensor 1) (cont'd)

P0133 The scan tool indicates Diagnostic Trouble Code (DTC) P0133: A slow response problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

Description
By controlling the air/fuel ratio with a Primary HO2S (Sensor 1) and a Secondary HO2S (Sensor 2), the deterioration of the Primary HO2S (Sensor 1) can be evaluated by its feedback period. When the feedback period of the HO2S exceeds a certain value during stable driving conditions, the sensor will be judged as deteriorated.
When deterioration has been detected during two consecutive trips, the MIL comes on and DTC P0133 will be stored.

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then troubleshoot DTC P0133.

Possible Cause
- Primary HO2S (sensor 1) Deterioration
- Primary HO2S Heater (sensor 1) Deterioration
- Exhaust system leakage

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0133 is stored.

↓

Problem Verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Connect the SCS service connector.
4. Test-drive under following conditions.
   — 55 mph (89 km/h) steady speed
   — A/T in [D4] position, M/T in 5th gear
   — Until readiness code comes on

↓

Is DTC P0133 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C113 (Primary HO2S (Sensor 1)) and ECM.**

YES → **Replace the Primary HO2S (Sensor 1).**

Secondary Heated Oxygen Sensor (HO2S) (Sensor 2)

P0137 The scan tool indicates Diagnostic Trouble Code (DTC) P0137: A low voltage problem in the Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) circuit.

— The MIL has been reported on.
— DTC P0137 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

Does the voltage stay at 0.3 V or less?

NO — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C451 (Secondary HO2S (Sensor 2)) and ECM.**

YES

Check for a short in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) connector.
3. Start the engine.
4. Check the Secondary HO2S (Sensor 2) output with the scan tool.

Does the voltage stay at 0.3 V or less?

NO — **Replace the Secondary HO2S (Sensor 2).**

YES

Check for a short in the wire (SHO2S line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between No. 1 terminal on the Secondary HO2S (Sensor 2) connector and body ground.

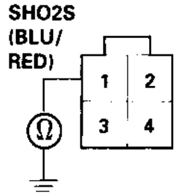
Is there continuity?

YES — **Repair short in the wire between ECM (D14) and Secondary HO2S (Sensor 2).**

NO

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

SECONDARY HO2S (Sensor 2) CONNECTOR C451



Wire side of female terminals

(cont'd)

Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) (cont'd)

P0138 The scan tool indicates Diagnostic Trouble Code (DTC) P0138: A high voltage problem in the Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) circuit.

— The MIL has been reported on.
— DTC P0138 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

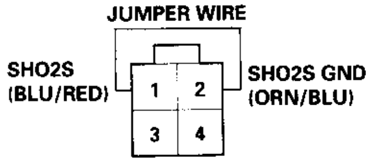
Does the voltage stay at 0.6 V or more?

NO — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C451 (Secondary HO2S (Sensor 2)) and ECM.**

YES

Check for an open in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) connector.
3. Connect the Secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.
4. Turn the ignition switch ON (II).
5. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

SECONDARY HO2S (Sensor 2) CONNECTOR C451



Wire side of female terminals

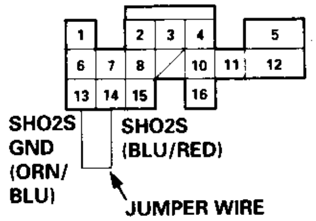
Is there 0.6 V or more?

NO — **Replace the HO2S.**

YES

Check for an open in the wire (SO2S line):
1. Turn the ignition switch OFF.
2. Connect ECM connector terminals D13 and D14 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

ECM CONNECTOR D (16P)



Wire side of female terminals

Is there 0.6 V or more?

NO — **Repair open in the wire between ECM (D14 or D13) and Secondary HO2S (Sensor 2).**

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

P0139 The scan tool indicates Diagnostic Trouble Code (DTC) P0139: A slow response problem in the Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) circuit.

— The MIL has been reported on.
— DTC P0139 is stored.

Problem verification:

1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Secondary HO2S (Sensor 2) output at 3,000 rpm with the scan tool.

Does the voltage stay within 0.3 – 0.6 V for two minutes?

NO

Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C451 Secondary HO2S (Sensor 2) and ECM.

YES

Replace the Secondary HO2S (Sensor 2).

PGM-FI System

Heated Oxygen Sensor (HO2S) Heater

P0135 The scan tool indicates Diagnostic Trouble Code (DTC) P0135: A problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) Heater circuit.

P0141 The scan tool indicates Diagnostic Trouble Code (DTC) P0141: A problem in the Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) Heater circuit.

— The MIL has been reported on.
— DTC P0135 and/or P0141 are stored.

↓

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.

↓

Is DTC P0135 or P0141 indicated?

- NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wire at C113 (Primary HO2S (Sensor 1)), C451 (Secondary HO2S (Sensor 2))* and ECM.**
- YES ↓

Check for an open or short in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) Secondary HO2S (Sensor 2)* connector.
3. At the HO2S side measure resistance between the 4P connector No. 3 and No. 4 terminals on the HO2S side.

↓

Is there 10 – 40 Ω?

- NO → **Replace the (Primary or Secondary*) HO2S.**
- YES ↓

Check for continuity between body ground and the HO2S 4P connector terminals No. 3 and No. 4 individually.

↓

Is there continuity?

- YES → **Replace the (Primary or Secondary*) HO2S.**
- NO ↓

Check for an open or short in the wires (IGP, IG1*, O2SHTC lines):
1. Turn the ignition switch ON (II).
2. Measure voltage between No. 3 terminal and No. 4 terminal on the harness side of the 4P connector.

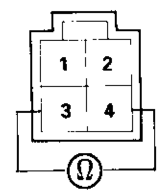
↓

Is there battery voltage?

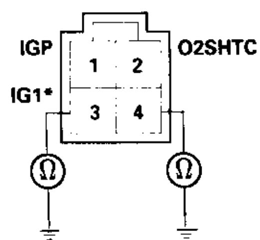
- NO → A (To page 11-75)
- YES → B (To page 11-75)

*: P0141

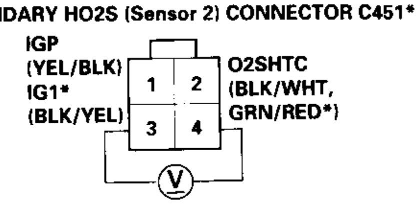
PRIMARY HO2S (Sensor 1) CONNECTOR C113, SECONDARY HO2S (Sensor 2) CONNECTOR C451*



Terminal side of male terminals



PRIMARY HO2S (Sensor 1) CONNECTOR C113, SECONDARY HO2S (Sensor 2) CONNECTOR C451*



Wire side of female terminals

(From page 11-74)

A

Check for an open in the wire (IGP, IG1* line):
Measure voltage between No. 3 terminal and body ground.

Is there battery voltage?

NO —

— Repair open in the wire between PGM-FI main relay and Primary HO2S (Sensor 1).
***— Repair open in the wire between No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse in the under-dash fuse/relay box and Secondary HO2S (Sensor 2).**

YES

Check for an open in the wires:
1. Turn the ignition switch OFF.
2. Reconnect the HO2S connector.
3. Disconnect the ECM connector A (32P).
4. Turn the ignition switch ON (II).
5. Measure voltage between the ECM connector terminals A6 or A5* and A10.

Is there 0.1 V or less?

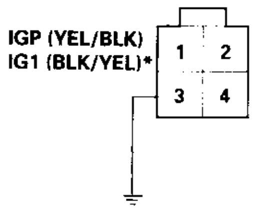
YES —

Repair open in the wire between ECM (A6 or A5*) and HO2S.

NO

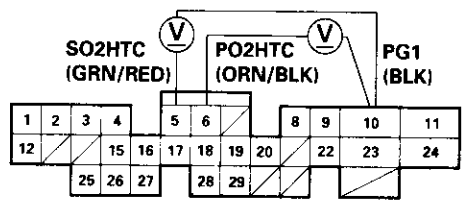
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

PRIMARY HO2S (Sensor 1) CONNECTOR C113
SECONDARY HO2S (Sensor 2) CONNECTOR C451*



Wire side of female terminals

ECM CONNECTOR A (32P)



Wire side of female terminals

(From page 11-74)

B

Check for a short in the wire (O2SHTC line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector A (32P).
3. Check for continuity between the ECM connector A6 or A5* terminal and body ground.

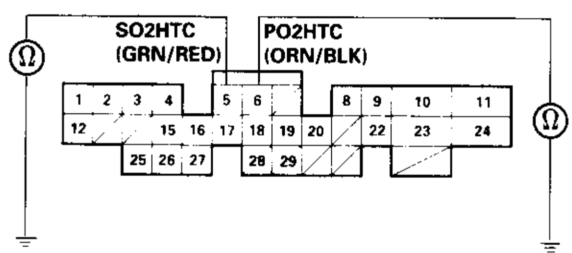
Is there continuity?

YES —

Repair short in the wire between ECM (A6 or A5*) and HO2S.

NO

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.



*: P0141

Fuel Supply System

P0171 The scan tool indicates Diagnostic Trouble Code (DTC) P0171: The fuel system is too lean

P0172 The scan tool indicates Diagnostic Trouble Code (DTC) P0172: The fuel system is too rich

Description
By monitoring the Long Term Fuel Trim, long term malfunctions in the fuel system will be detected.
If a malfunction has been detected during two consecutive trips, the MIL will come on and DTC P0171 and/or P0172 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172 troubleshoot those DTCs first, then troubleshoot DTC P0171 and/or P0172.

P0107, P0108, P1128, P1129: MAP Sensor
P0135: Primary HO2S Heater (Sensor 1)
P0137, P0138: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S Heater (Sensor 2)
P1259: VTEC System

Possible Cause

DTC P0171
System too lean

- Fuel Pump insufficient flow/pressure
- Fuel Feed Line clogged, leaking
- Fuel Pressure Regulator stuck open
- Fuel Filter clogged
- Fuel Injector clogged, air inclusion
- Gasoline doesn't meet Owner's Manual spec.
- Primary HO2S (Sensor 1) deteriorated
- Valve Clearance
- Exhaust leak

DTC P0172
System too rich

- Fuel Pressure Regulator clogged, stuck closed
- Fuel Return Pipe clogged
- Fuel Injector leaking
- Gasoline doesn't meet Owner's Manual spec.
- Primary HO2S (Sensor 1) deteriorated
- Valve Clearance

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0171 and/or P0172 are stored.

Check the fuel pressure.

Is the fuel pressure OK?

NO → Is the fuel pressure too high or too low?

HIGH → **Check the fuel pressure regulator, and fuel return pipe.**

LOW → **Check the fuel pump, fuel feed pipe, fuel filter, and fuel pressure regulator.**

YES

Check the Primary HO2S:

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
2. Check the Primary HO2S (Sensor 1) output with the scan tool.

Does it stay at less than 0.3 V or more than 0.6 V?

YES → **Replace the Primary HO2S (Sensor 1).**

NO

Check for a sticking or leaking EVAP purge control solenoid valve:
With a vacuum pump, apply vacuum to the EVAP purge control solenoid valve.

Does it hold vacuum?

NO → **Replace the EVAP purge control solenoid valve.**

YES

Check the valve clearances and adjust it necessary. If the valve clearances are OK, replace the fuel injectors.

Random Misfire

P0300 and **P0301 through P0304** The scan tool indicates Diagnostic Trouble Code (DTC) P0300 and some of P0301 – P0304: Random misfire.

Description
Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft speed fluctuation sensor which is attached to the crankshaft.
If misfiring strong enough to damage the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0300 and some of DTCs P0301 through P0304 will be stored. Then, after misfire has ceased, the MIL will come on.
If misfiring that increases emissions is detected during two consecutive driving cycles, the MIL will come on, and DTC P0300 and some of DTCs P0301 through P0304 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.
P0171, P0172: Fuel metering
P0505: Idle Control System
P1361, P1362: TDC sensor
P1381, P1382: CYP sensor
P1508: IAC valve

Possible Cause
- Fuel pump insufficient fuel pressure, amount of flow
- Fuel line clogging, blockage, leakage
- Fuel filter clogging
- Fuel pressure regulator stuck open
- Distributor malfunction
- Ignition coil wire open, leakage
- Ignition control module malfunction
- Valves carbon deposit
- Compression low
- IAC valve malfunction
- Fast idle thermo valve malfunction
- Fuel does not meet Owner's Manual spec., lack of fuel
- VTEC system malfunction

Troubleshooting
By test-driving, determine the conditions during which misfire occurs. Depending on these conditions, test in the order described in the table below.

Possible cause / Page / Condition	Fuel pressure	Distributor and Ignition wires	ICM	IAC Valve	Valve Clearance	VTEC System
	11-118	section 23	section 23	11-100	section 6	section 6
Only low rpm and load	③			①	④	②
Only accelerating	①	②	③			
Only high rpm and load	①	③	③		④	②
Not specification	①	②	②		④	③

NOTE: If misfire doesn't recur, some possible causes are fuel that doesn't meet owner's manual spec, lack of fuel, carbon deposits on spark plug, etc.

Misfire Detected in One Cylinder

P0301 The scan tool indicates Diagnostic Trouble Code (DTC) P0301: Cylinder 1 misfire detected.

P0302 The scan tool indicates Diagnostic Trouble Code (DTC) P0302: Cylinder 2 misfire detected.

P0303 The scan tool indicates Diagnostic Trouble Code (DTC) P0303: Cylinder 3 misfire detected.

P0304 The scan tool indicates Diagnostic Trouble Code (DTC) P0304: Cylinder 4 misfire detected.

Description
Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft speed fluctuation sensor which is attached to the crankshaft.
If misfiring strong enough to damage the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0301, P0302, P0303 or P0304 will be stored. Then, after the misfire has ceased, the MIL will come on.
If misfiring that increases emissions is detected during two consecutive driving cycles, the MIL will come on, and DTC P0301, P0302, P0303 or P0304 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.

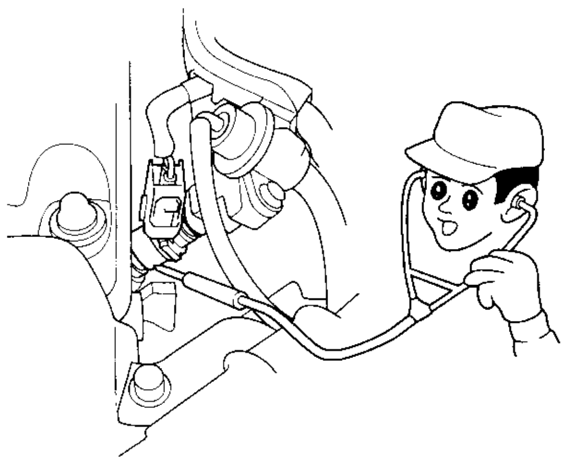
P0107, P108, P1128, P1129: MAP sensor
P0171, P0172: Fuel metering
P0505: Idle control system
P1259: VTEC System
P1361, P1362: TDC sensor
P1381, P1382: CYP sensor
P1519: IAC valve

Possible Cause
- Fuel injector clogging, fuel leakage, air leakage
- Fuel injector circuit open or shorted
- Spark plug carbon deposits, fouling, malfunction
- Ignition wires open, leaking
- Distributor malfunction
- Compression low
- Valve clearance out of spec.

(cont'd)

Misfire Detected in One Cylinder (cont'd)

Troubleshooting Flowchart



- **The MIL has been reported on.**
- **DTC P0301, P0302, P0303 or P0304 is indicated.**

Check the fuel injector function:
Start the engine, and listen for a clicking sound at the fuel injector in the problem cylinder.

Does it click?

NO → Check for an open or short in the harness between ECM and the fuel injector.

Are the wires OK?

NO → **Repair open or short in the wire.**

YES →

- **Replace the fuel injector.**
- **Substitute a known-good ECM and recheck. If symptom/ indication goes away, replace the original ECM.**

YES (Does it click?) →

Problem verification:
1. After checking the freeze data, do the ECM Reset Procedure.
2. Exchange the spark plug from the problem cylinder with one of another cylinder.
3. Connect the SCS service connector.
4. Test-drive the car several times in the range of the freeze data.

NOTE:
- If there is no freeze data of misfiring, just clear the DTC.
- If there is no freeze data of misfiring, test drives under various conditions are necessary.

(To page 11-81)

(From page 11-80)

Is DTC P0301, P0302, P0303 or P0304 indicated?

NO → **Intermittent misfire due to spark plug fouling, etc. (firing is OK at this time).**

YES ↓

Does the misfire occur in the other cylinder whose spark plug was exchanged?

YES → **Replace the faulty spark plug.**

NO ↓

Check for fuel injector malfunction:
1. Exchange the fuel injector from the problem cylinder with one from another cylinder.
2. Let the engine idle for two minutes.
3. Test-drive the car several times in the range of the freeze data.

NOTE: If there is no freeze data of misfiring, test drives under various conditions are necessary.

Is DTC P0301, P0302, P0303 or P0304 indicated?

NO → **Intermittent misfire due to bad contact in the fuel injector connector (firing is OK at this time).**

YES ↓

Does the misfire occur in the other cylinder whose fuel injector was exchanged?

YES → **Replace the faulty fuel injector.**

NO ↓

Check the following items
- **Cylinder leak-down**
- **Compression**
- **Crankshaft Position (CKP) sensor**

Knock Sensor (KS) (B18C1, B18C5 engines)

P0325 The scan tool indicates Diagnostic Trouble Code (DTC) P0325: A problem in the circuit of the Knock Sensor (KS).

— The MIL has been reported on.
— DTC P0325 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold the engine at 3,000 – 4,000 rpm for 10 seconds.

Is DTC P0325 indicated?

NO — **Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between C133 knock sensor (KS) and ECM.**

YES

Check for a short in the wire (KS line):
1. Turn the ignition switch OFF.
2. Disconnect the knock sensor connector.
3. Check for continuity between ECM connector terminals D6 and body ground.

Is there continuity?

YES — **Repair short in the wire between ECM (D6) and knock sensor.**

NO

Check for an open in the wire (KS line):
Check for continuity between ECM connector terminal D6 and knock sensor connector terminal No. 1.

Is there continuity?

NO — **Repair open in the wire between ECM (D6) and knock sensor.**

YES

Substitute a known-good knock sensor and recheck.

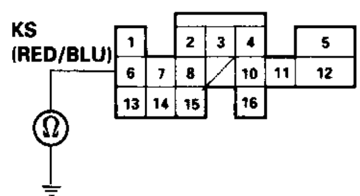
Is DTC P0325 is indicated?

NO — **Replace the original knock sensor.**

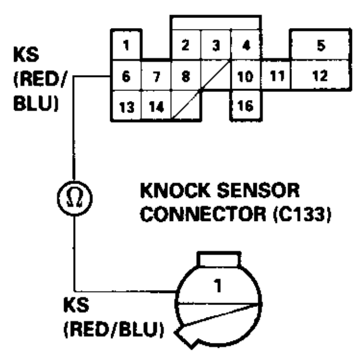
YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

ECM CONNECTOR D (16P)



Wire side of female terminals



Wire side of female terminals

Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) Sensor

P0335 The scan tool indicates Diagnostic Trouble Code (DTC) P0335: A malfunction in the Crankshaft Position (CKP) sensor circuit.

P0336 The scan tool indicates Diagnostic Trouble Code (DTC) P0336: A range/performance problem in the Crankshaft Position (CKP) sensor circuit.

P1361 The scan tool indicates Diagnostic Trouble Code (DTC) P1361: Intermittent interruption in the Top Dead Center (TDC) sensor circuit.

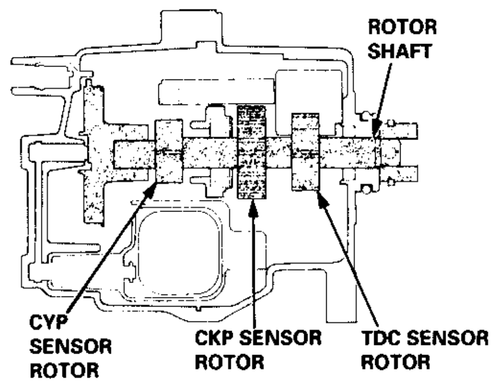
P1362 The scan tool indicates Diagnostic Trouble Code (DTC) P1362: No signal in the Top Dead Center (TDC) sensor circuit.

P1381 The scan tool indicates Diagnostic Trouble Code (DTC) P1381: Intermittent interruption in the Cylinder Position (CYP) sensor circuit.

P1382 The scan tool indicates Diagnostic Trouble Code (DTC) P1382: No signal in the Cylinder Position (CYP) sensor circuit.

Description
The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The TDC Sensor determines ignition timing at start-up (cranking) and when crank angle is abnormal. The CYP Sensor detects the position of No. 1 cylinder for sequential fuel injection to each cylinder.

NOTE: If DTC P1359 is stored at the same time as DTC P0335, P0336, P1361, P1362, P1381 and/or P1382, troubleshoot DTC P1359 first, then troubleshoot those DTCs.



— The MIL has been reported on.
— DTC P0335, P0336, P1361, P1362, P1381 and/or P1382 are stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.

Is DTC P0335, P0336, P1361, P1362, P1381 and/or P1382 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C109 (CKP/TDC/CYP Sensor) and ECM.**

YES ↓

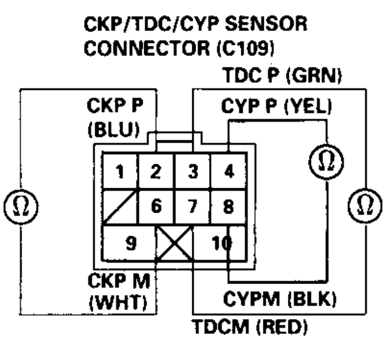
Check for an open in the TDC/CYP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the CKP/TDC/CYP connector.
3. Measure resistance between the terminals of the indicated sensor (see table).

Is there 0.5 – 1.0 kΩ?

NO → **Replace the distributor housing sensor (see section 23).**

YES ↓

(To page 11-84)



Terminal side of male terminals

SENSOR	DTC	SENSOR TERMINAL	ECM TERMINAL	WIRE COLOR
CKP	P0335	2	C2	BLU
	P0336	6	C12	BLU/YEL (WHT)
TDC	P1361	3	C3	GRN
	P1362	7	C13	WHT/BLU (RED)
CYP	P1381	4	C4	YEL
	P1382	8	C14	WHT (BLK)

( ): ENGINE WIRE HARNESS SIDE

(cont'd)

Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) Sensor (cont'd)

(From page 11-83)

Check for a short in the CKP/TDC/CYP sensor:
Check for continuity to body ground on both terminals of the indicated sensor individually.

Is there continuity?

YES → **Replace the distributor housing, sensor (see section 23).**

NO ↓

Check for an open in the wires (CKP/TDC/CYP lines):

1. Reconnect the CKP/TDC/CYP sensor connector.
2. Disconnect the ECM connector C (31P).
3. Measure resistance between the terminals of the indicated sensor on the ECM connector (see table).

Is there 0.5 – 1.0 kΩ?

NO → **Repair open in the indicated sensor wires (see table).**

YES ↓

Check for a short in the wires (CKP/TDC/CYP lines):
Check for continuity between body ground and ECM connector terminals C2, C3 and/or C4 individually.

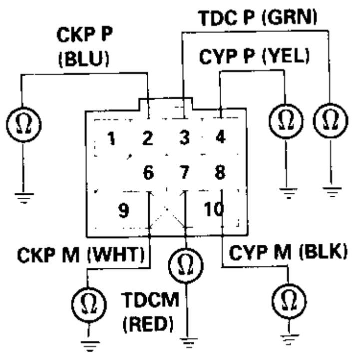
Is there continuity?

YES → **Repair short in the indicated sensor wires (see table).**

NO ↓

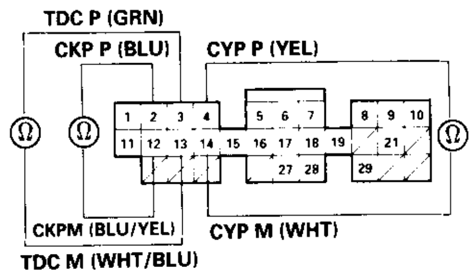
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

CKP/TDC/CYP SENSOR CONNECTOR (C109)

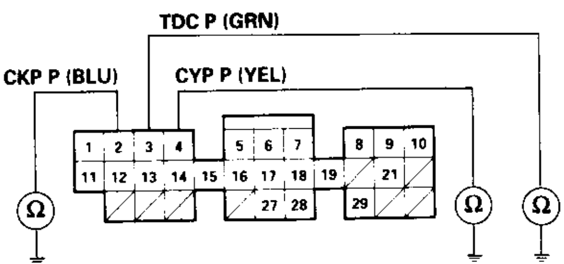


Terminal side of male terminals

ECM CONNECTOR C (31P)



Wire side of female terminals



Vehicle Speed Sensor (VSS)

P0500 The scan tool indicates Diagnostic Trouble Code (DTC) P0500: A low voltage problem in the Vehicle Speed Sensor (VSS) circuit.

- **The MIL has been reported on.**
- **DTC P0500 is stored.**

Problem verification:
1. Test-drive the car.
2. Check the vehicle speed with the scan tool.

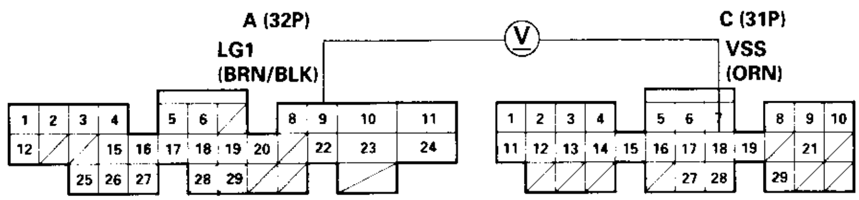
Is the correct speed indicated?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C112 (VSS) and ECM.**

NO ↓

Check for an open in the ECM:
1. Turn the ignition switch OFF.
2. Block the rear wheels and set the parking brake.
3. Jack up the front of the car and support it with safety stands.
4. Turn the ignition switch ON (II).
5. Block the right front wheel and slowly rotate the left front wheel.
6. Measure voltage between ECM connector terminals C18 and A9.

ECM CONNECTORS



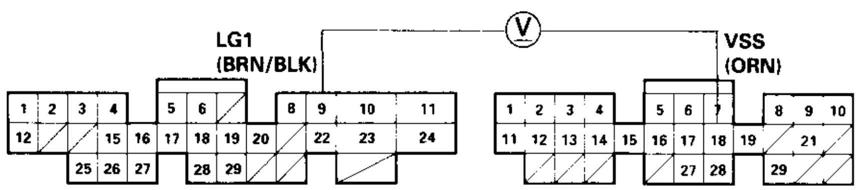
Wire side of female terminals

Does the voltage pulse 0 V and 5 V or battery voltage?

YES → **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

NO ↓

Check for a short in the ECM:
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector C (31P).
3. Turn the ignition switch ON (II).
4. Block the right front wheel and slowly rotate the left front wheel.
5. Measure voltage between ECM connector terminals C18 and A9.



Does the voltage pulse 0 V and 5 V or battery voltage?

YES → **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

NO ↓

- **Repair short in the wire between ECM (C18) and VSS, TCM, or cruise control unit.**
- **Repair open in the wire between ECM (C18) and VSS.**
- **If wire is OK, replace the VSS.**

Barometric Pressure (BARO) Sensor

P1106 The scan tool indicates Diagnostic Trouble Code (DTC) P1106: A range/performance problem in the Barometric Pressure (BARO) Sensor circuit.

— The MIL has been reported on.
— DTC P1106 is stored.

Problem verification:
1. Do the ECM reset procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Connect the SCS service connector.
4. Test-drive with the A/T in [2] position (M/T in 4th gear).
5. Accelerate for five seconds using wide open throttle.

Is DTC P1106 indicated?

NO — **Intermittent failure, system is OK at this time.**

YES — **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

P1107 The scan tool indicates Diagnostic Trouble Code (DTC) P1107: A low voltage problem in the Baro sensor circuit.

P1108 The scan tool indicates Diagnostic Trouble Code (DTC) P1108: A high voltage problem in the Baro sensor circuit.

— The MIL has been reported on.
— DTC P1107 or P1108 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Turn the ignition switch ON (II).

Is DTC P1108 indicated?

YES — **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

NO

Is DTC P1107 indicated?

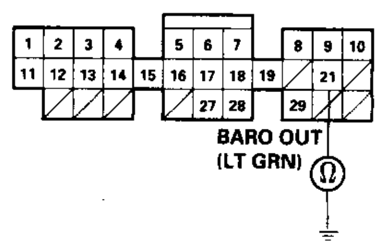
NO — **Intermittent failure, system is OK at this time.**

YES

(A/T only)

Check for a short in the wire (BARO OUT line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector C (31P).
3. Disconnect the 22P connector from the TCM.
4. Check for continuity between body ground and ECM connector terminal C21.

ECM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES — **Repair short in the wire between ECM (C21) and TCM.**

NO

Substitute a known-good TCM and recheck.

Is DTC P1107 indicated?

NO — **Replace the original TCM.**

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

Electrical Load Detector (ELD) (USA)

P1297 The scan tool indicates Diagnostic Trouble Code (DTC) P1297: A low voltage problem in the Electrical Load Detector (ELD) circuit.

— DTC P1297 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.
3. Turn on headlights.

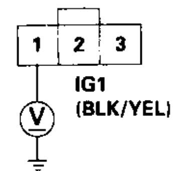
Is DTC P1297 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C218 (ELD) and ECM.**

YES ↓

Check for an open in the wire (IG1 line):
1. Turn the ignition and headlights OFF.
2. Disconnect the ELD 3P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and the ELD 3P connector terminal No. 1.

ELD 3P CONNECTOR (C218)



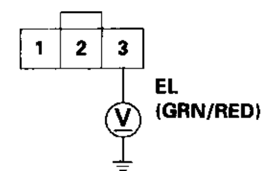
Wire side of female terminals

Is there battery voltage?

NO → **Repair open in the wire between No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse in the under-dash fuse/relay box and ELD.**

YES ↓

Check for short in the wire (EL line):
Measure voltage between body ground and the ELD 3P connector terminal No. 3.



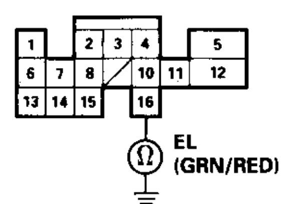
Is there approx. 5 V?

YES → **Replace the ELD.**

NO ↓

Check for a short in the wire (EL line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between body ground and ECM connector terminal D16.

ECM CONNECTOR D (16P)



Wire side of female terminals

Is there continuity?

YES → **Repair short in the wire between ECM (D16) and ELD.**

NO ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

P1298 The scan tool indicates Diagnostic Trouble Code (DTC) P1298: A high voltage problem in the Electrical Load Detector (ELD) circuit.

— **DTC P1298 is stored.**

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.
3. Turn on headlights.

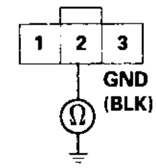
Is DTC P1298 indicated?

NO — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C218 (ELD) and ECM.**

YES

Check for an open in the wire (GND line):
1. Turn the ignition switch and headlights OFF.
2. Disconnect the ELD 3P connector.
3. Check for continuity between body ground and the ELD 3P connector terminal No. 2.

ELD 3P CONNECTOR (C218)



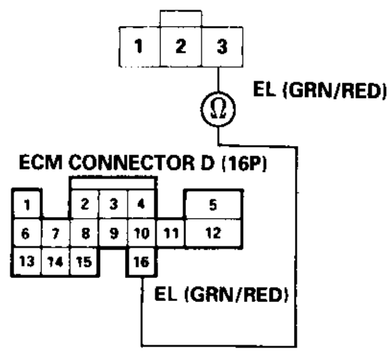
Wire side of female terminals

Is there continuity?

NO — **Repair open in the wire between ELD connector and G402.**

YES

Check for an open in the wire (EL line):
1. Disconnect the ECM connector D (16P).
2. Check for continuity between the ELD 3P connector terminal No. 3 and ECM connector terminal D16.



Wire side of female terminals

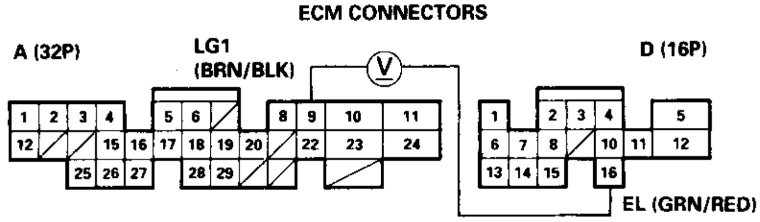
Is there continuity?

NO — **Repair open in the wire between ECM (D16) and the ELD.**

YES

Check for a malfunction in the ELD:
1. Reconnect the ELD 3P connector and ECM connector D (16P).
2. Start the engine and allow it to idle.
3. While measuring voltage between ECM connector terminals D16 and A9, turn the headlights on (low).

ECM CONNECTORS



Wire side of female terminals

Does the voltage drop?

NO — **Replace the ELD.**

YES

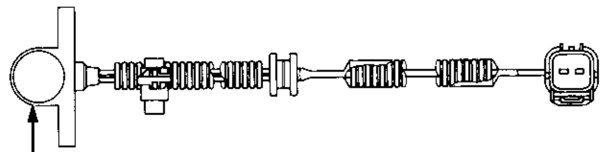
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

Crankshaft Speed Fluctuation (CKF) Sensor

P1336 The scan tool indicates Diagnostic Trouble Code (DTC) P1336: Intermittent interruption in the Crankshaft Speed Fluctuation (CKF) sensor circuit.

P1337 The scan tool indicates Diagnostic Trouble Code (DTC) P1337: No signal in the Crankshaft Speed Fluctuation (CKF) sensor circuit.

Description
The diagnostic system has a pulser rotor on the crankshaft and a pulse pick-up sensor on the engine block. The ECM monitors the crankshaft speed fluctuation based on the CKF sensor signal, and judges that an engine misfire occurred if the fluctuation goes beyond a predetermined limit.



- **The MIL has been reported on.**
- **DTC P1336 and/or P1337 are stored.**

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.

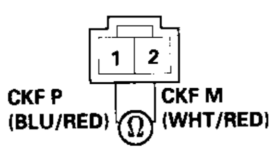
Is DTC P1336 and/or P1337 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C110 (CKF sensor) and ECM.**

YES ↓

Check for an open in the CKF sensor:
1. Turn the ignition switch OFF.
2. Disconnect the CKF sensor connector.
3. Measure the resistance between the CKF sensor 2P connector terminals No. 1 and No. 2.

CKF SENSOR CONNECTOR (C 110)



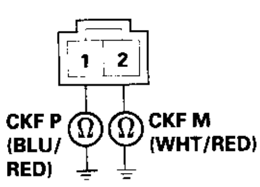
Terminal side of male terminals

Is there 1.6 – 3.2 kΩ?

NO → **Replace the CKF sensor (see section 6).**

YES ↓

Check for a short in the CKF sensor:
Check for continuity between body ground and the CKF sensor 2P connector terminals No. 1 and No. 2 individually.



Is there continuity?

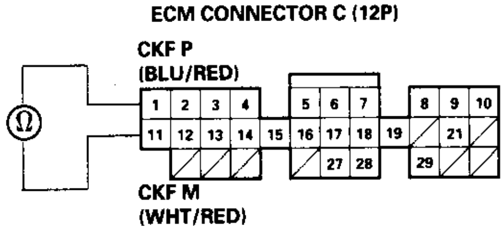
YES → **Replace the CKF sensor (see section 6).**

NO ↓

(To page 11-91)

(From page 11-90)

Check for an open in the wires (CKF lines):
1. Reconnect the CKF sensor connector.
2. Disconnect the ECM connector C (31P).
3. Measure resistance between ECM connector terminals C1 and C11.



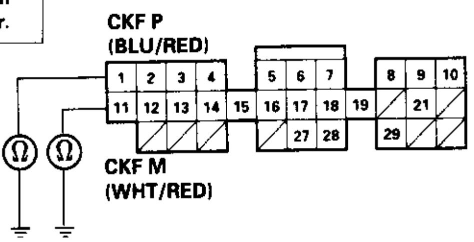
Wire side of female terminals

Is there 1.6 – 3.2 kΩ?

NO → **Repair open in the wire between ECM (C1, C11) and the CKF sensor.**

YES ↓

Check for a short in the wires (CKF lines):
Check for continuity between body ground and ECM connector terminal C1 and C11 individually.



Is there continuity?

YES → **Repair short in the wire between ECM (C1, C11) and the CKF sensor.**

NO ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

(cont'd)

Crankshaft Speed Fluctuation (CKF) Sensor (cont'd)

P1359 The scan tool indicates Diagnostic Trouble Code (DTC) P1359: A problem in the Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) sensor circuit.

— The MIL has been reported on.
— DTC P1359 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Turn the ignition switch to the START (III) position for 10 seconds
   NOTE:
   - M/T: Clutch pedal must be depressed.
   - A/T: Transmission in [N] or [P] position.

Is DTC P1359 indicated?

NO → **Intermittent failure, system is OK. Check for poor connections or loose wires at C109 (CKP/TDC/CYP sensor) and ECM.**

YES ↓

Check for poor connections or loose wires between the CKP/TDC/CYP sensor and the ECM.

Are the connections OK?

NO → **Repair as necessary.**

YES ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

ECM Internal Circuit

P1607 The scan tool indicates Diagnostic Trouble Code (DTC) P1607: An ECM Internal Circuit Failure A.

— The MIL has been reported on.
— DTC P1607 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.
3. Allow it to idle for 5 seconds.

Is DTC P1607 indicated?

NO → **Intermittent failure, system is OK at this time.**

YES ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

A/T FI Data Line

P1660 The scan tool indicates Diagnostic Trouble Code (DTC) P1660: A problem in the A/T FI data line.

— The MIL has been reported on.
— DTC P1660 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Turn the ignition switch OFF.
3. Start the engine. Allow the engine at idle for one minute.

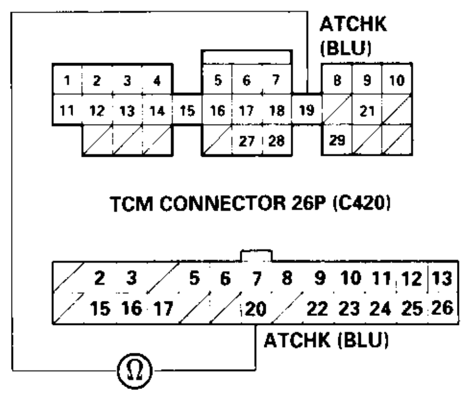
Is DTC P1660 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C420 (TCM) and ECM.**

YES ↓

Check for an open in the wire (ATCHK line):
1. Turn the ignition switch OFF.
2. Check for continuity between ECM connector terminal C19 and TCM 26P connector terminal No. 20.

ECM CONNECTOR C (31P)



Wire side of female terminals

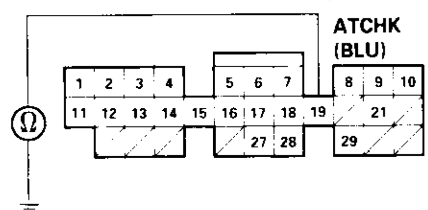
Is there continuity?

NO → **Repair open in the wire between ECM (C19) and TCM.**

YES ↓

Check for a short in the wire (ATCHK line):
1. Disconnect the ECM connector C (31P).
2. Disconnect the 26P connector from the TCM.
3. Check for continuity between body ground and ECM connector terminal C19.

ECM CONNECTOR C (31P)



Is there continuity?

YES → **Repair short in the wire between ECM (C19) and TCM.**

NO ↓

(To page 11-94)

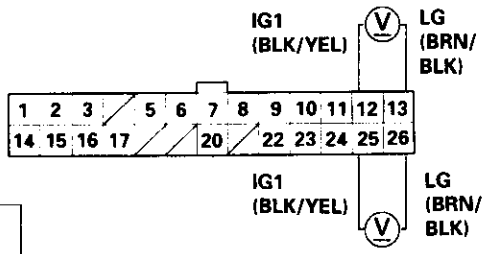
(cont'd)

A/T FI Data Line (cont'd)

(From page 11-93)

Check for an open or short in the wires (IG1, LG lines):
Measure voltage between TCM 26P connector terminals No. 12 and 13 and terminals No. 25 and 26.

TCM CONNECTOR 26P (C420)



Wire side of female terminals

Is there battery voltage?

NO →

- **Repair open or short in the wire between TCM and No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse in the under-dash fuse/relay box.**
- **Repair open in the wire between TCM and G101.**

YES ↓

Check for an open or short in the TCM:
Substitute a known-good TCM and recheck.

Is DTC P1660 indicated?

NO → **Replace the original TCM.**

YES ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

A/T FI Signal A/B

P1681 The scan tool indicates Diagnostic Trouble Code (DTC) P1681: A low voltage problem in the A/T FI signal A circuit.

P1682 The scan tool indicates Diagnostic Trouble Code (DTC) P1682: A high voltage problem in the A/T FI signal A circuit.

P1686 The scan tool indicates Diagnostic Trouble Code (DTC) P1686: A low voltage problem in the A/T FI signal B circuit.

P1687 The scan tool indicates Diagnostic Trouble Code (DTC) P1687: A high voltage problem in the A/T FI signal B circuit.

— DTC P1681, P1682, P1686 and/or P1687 are stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Drive the car for several miles so that the transmission upshifts and downshifts several times.

Is DTC P1681, P1682, P1686 and/or P1687 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C419 (TCM) and ECM.**

YES ↓

Check for a short in the wires (AFSA, AFSB line):
1. Turn the ignition switch OFF.
2. Disconnect the 22P connector from the TCM.
3. Disconnect the ECM connector C (31P).
4. Check for continuity between body ground and ECM connector terminal C28 (C27)*.

Is there continuity?

YES → **Repair short in the wires between ECM (C28 or C27*) and TCM.**

NO ↓

Check for an open in the wires (AFSA, AFSB lines):
Check for continuity between ECM connector terminal C28 (C27)* and TCM 22P connector terminal No. 7 (No. 6)*.

Is there continuity?

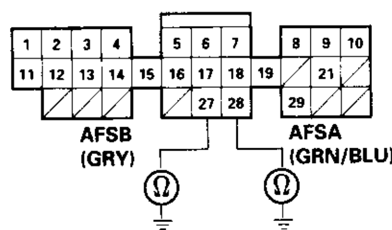
NO → **Repair open in the wires between ECM (C28 or C27*) and TCM.**

YES ↓

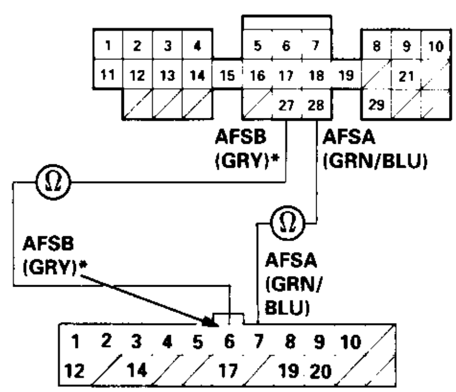
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

*:DTC P1686 or P1687 (A/T FI signal B)

ECM CONNECTOR C (31P)



Wire side of female terminals



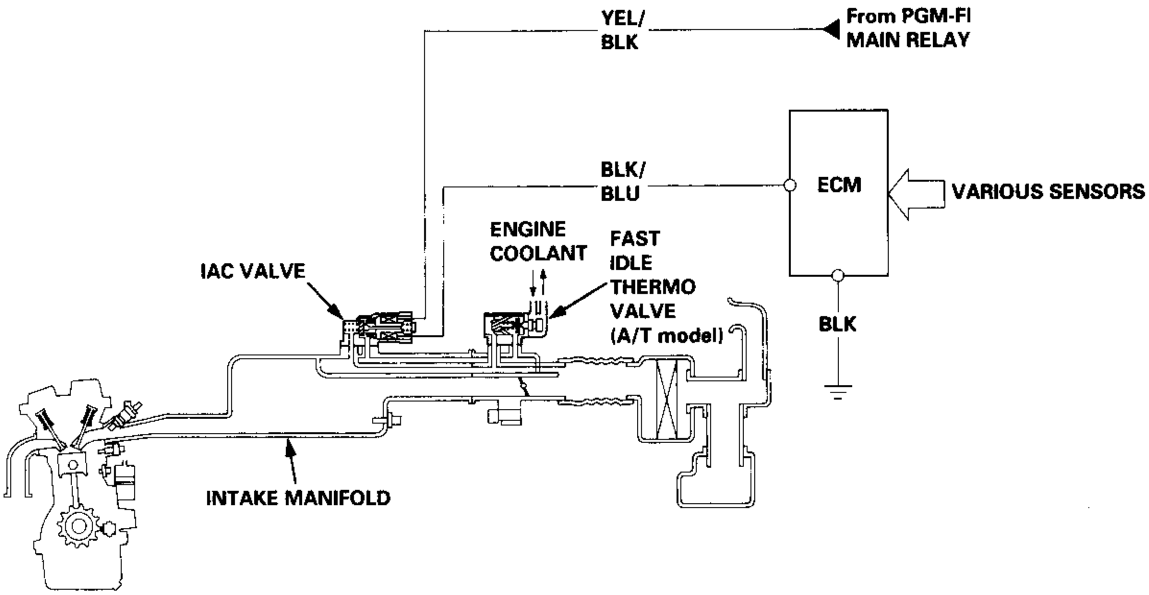
TCM CONNECTOR (22P) (C419)
Wire side of female terminals

Idle Control System

System Description

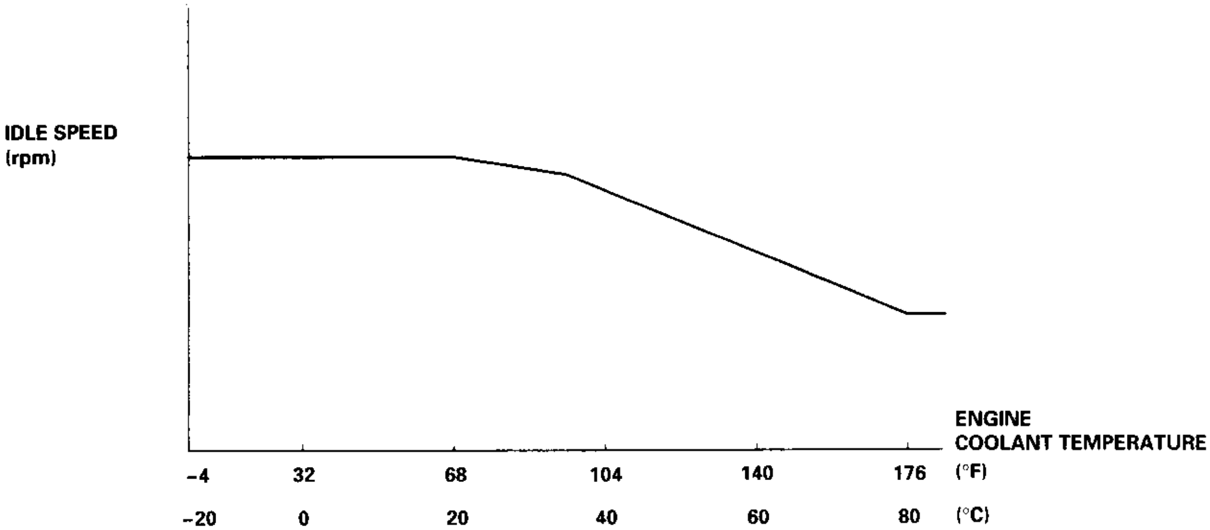
The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve.
The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

B18B1 engine (B18C1, B18C5 engines are similar):



1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about 150 – 300 rpm.

2. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.



1. When the idle speed is out of specification and the scan tool does not indicate Diagnostic Trouble Code (DTC) P0505 or P1508, check the following items:
   - Adjust the idle speed (see page 11-111)
   - ALT FR signal (see page 11-101)
   - Air conditioning signal (see page 11-102)
   - Brake switch signal (see page 11-104)
   - Starter switch signal (see page 11-105)
   - A/T gear position signal (see page 11-106) (A/T)
   - PSP switch signal (see page 11-108) (USA)
   - Fast idle thermo valve (see page 11-110)
   - Hoses and connections
   - IAC valve and its mounting O-rings

2. If the above items are normal, substitute a known-good IAC valve and readjust the idle speed (see page 11-111).

   If the idle speed still cannot be adjusted to specification (and the scan tool does not indicate DTC P0505 or P1508) after IAC valve replacement, substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.

Idle Control System

P0505 The scan tool indicates Diagnostic Trouble Code (DTC) P0505: Idle control system malfunction.

NOTE: If DTC P1508 is stored at the same time as DTC P0505, troubleshoot DTC P1508 first, then troubleshoot DTC P0505.

Possible Cause

- IAC valve mechanical malfunction
- Fast idle thermo valve malfunction (A/T)
- Throttle body clogged port, improper adjustment
- Intake manifold, gasket leakage
- Intake air hose loose, leakage
- Vacuum hoses leakage
- ECT sensor incorrect output
- Throttle Position sensor incorrect output

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0505 is stored.

Problem verification:

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. With the scan tool, check the following items.
   — Throttle position should be approx. 10% with the throttle fully closed.
   — Engine coolant temperature should be 176 – 212°F (80 – 100°C).
   If they are not within the spec., repair the faulty sensor circuit.
3. Check the engine speed at idle with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

Is it 750 ± 50 rpm (B18B1, B18C1 engines), 800 ± 50 rpm (B18C5 engine)?

YES — **Intermittent failure, system is OK at this time.**

NO

Is it 550 rpm (B18B1, B18C1 engines), 600 rpm (B18C5 engine) or less?

YES — A (To page 11-99)

NO — B (To page 11-99)

(From page 11-98)

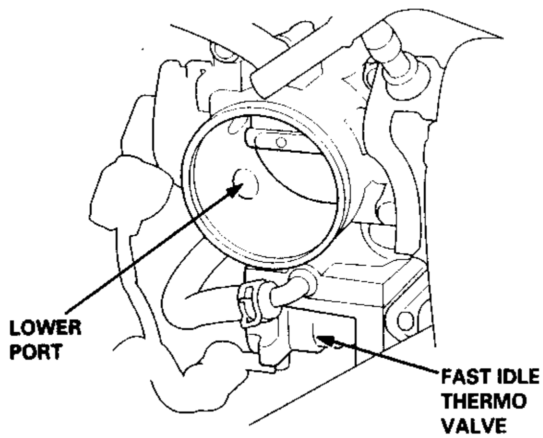
A

Check the IAC valve:
Disconnect the 2P connector from the IAC valve.

Does the engine speed drop or the engine stall?

NO → **Replace the IAC valve.**

YES → **Adjust the (base) idle speed (see page 11-111).**
If it's impossible, clean the ports in the throttle body.



(From page 11-98)

B

(A/T model)

Check the fast idle thermo valve:
1. Turn the ignition switch OFF.
2. Remove the intake air duct from the throttle body.
3. Start the engine and let it idle.
4. Put your finger on the lower port in the throttle body.

Does the engine speed drop?

YES → **Check engine coolant level and for air in the cooling system. If OK, replace the fast idle thermo valve.**

NO ↓

Put your finger on the upper port in the throttle body.

Does the engine speed drop?

NO → **Check for vacuum leaks, make sure the throttle valve is completely closed, and repair as necessary.**

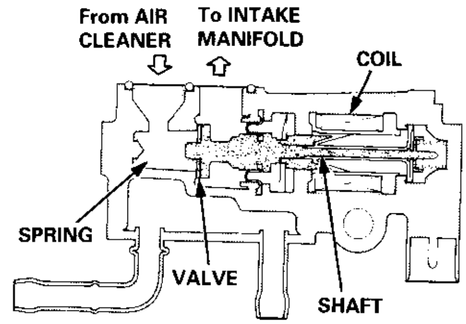
YES → **Adjust the idle speed (see page 11-111). If it's impossible, replace the IAC valve.**

Idle Control System

Idle Air Control (IAC) Valve

P1508 The scan tool indicates Diagnostic Trouble Code (DTC) P1508: A problem in the Idle Air Control (IAC) valve circuit.

The IAC Valve changes the amount of air bypassing the throttle body in response to a current signal from the ECM in order to maintain the proper idle speed.



— **The MIL has been reported on.**
— **DTC P1508 is stored.**

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine.

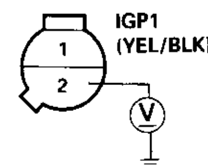
Is DTC P1508 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C116 (IAC valve) and ECM.**

YES ↓

Check for an open in the wire (IGP1 line):
1. Turn the ignition switch OFF.
2. Disconnect the IAC valve connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and the IACV connector terminal No. 2.

IAC VALVE CONNECTOR (C116)



WIRE SIDE OF FEMALE TERMINALS

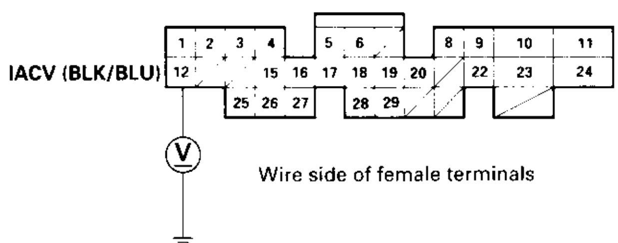
Is there battery voltage?

NO → **Repair open in the wire between IAC valve and PGM-FI main relay.**

YES ↓

Check for an open or short in the wire (IACV line):
1. Turn the ignition switch OFF and reconnect the IAC valve connector.
2. Disconnect the ECM connector A (32P).
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and ECM connector terminal A12.

ECM CONNECTOR A (32P)



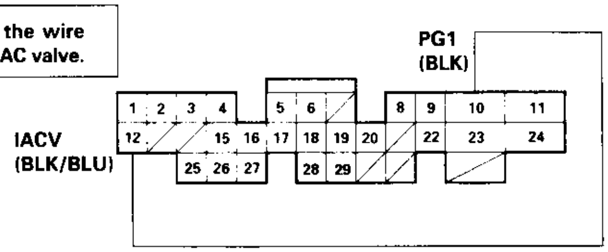
Wire side of female terminals

Is there battery voltage?

NO → **Repair open or short in the wire between ECM (A12) and IAC valve.**

YES ↓

Check the IAC valve function:
Momentarily connect ECM connector terminals A12 and A10 with a jumper wire several times.



JUMPER WIRE

Does the IAC valve click?

NO → **Replace the IAC valve.**

YES ↓

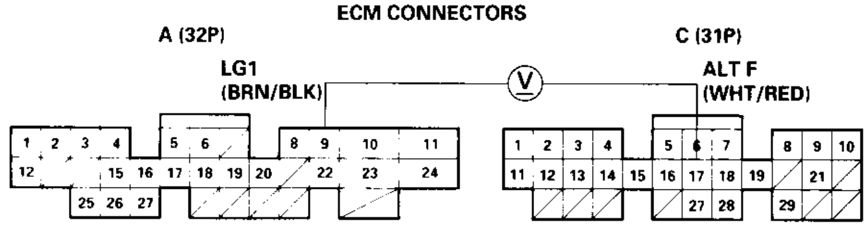
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

Alternator (ALT) FR Signal

This signals the ECM when the Alternator (ALT) is charging.

Inspection of ALT FR Signal.

Check for a short in the wire (ALT F line):
1. Disconnect the ALT GRN 4P (3P)* connector from the ALT.
2. Turn the ignition switch ON (II).
3. Measure voltage between ECM connector terminals C17 and A9.

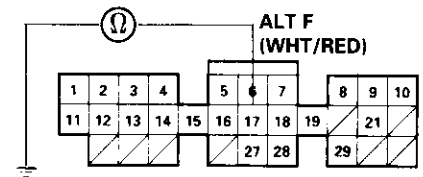


Wire side of female terminals

Is there approx. 5 V?

NO →

Check for a short in the wire (ALT F line):
1. Turn the ignition switch OFF.
2. Disconnect the negative battery cable from the battery.
3. Disconnect the ECM connector C (31P).
4. Check for continuity between body ground and ECM connector terminal C17.



Is there continuity?

YES → **Repair short in the wire between the ECM (C17) and the ALT.**

NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

YES ↓

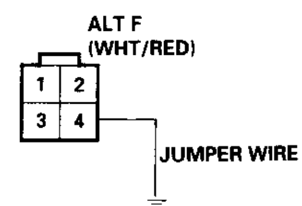
Check the operation of the ALT:
1. Turn the ignition switch OFF.
2. Reconnect the ALT GRN 4P (3P)* connector to the ALT.
3. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Measure voltage between ECM connector terminals C17 and A9.

Does the voltage decrease when headlights and rear defogger are turned on?

YES → **ALT FR signal is OK.**

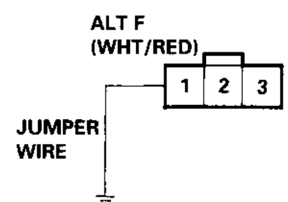
NO ↓

ALT GRN 4P CONNECTOR (C119)



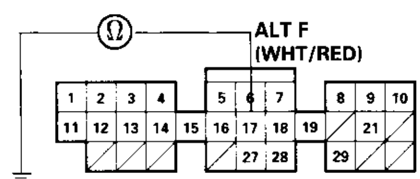
Wire side of female terminals

ALT GRN 3P CONNECTOR (C119)*



Wire side of female terminals

Check for an open in the wire (ALT F line):
1. Turn the ignition switch OFF.
2. Disconnect the negative battery cable from the battery.
3. Disconnect the ECM connector C (31P).
4. Disconnect the ALT GRN 4P (3P)* connector from the ALT.
5. Connect the ALT GRN 4P (3P)* connector terminal No. 4 (No. 1)* to body ground with a jumper wire.
6. Check for continuity between body ground and ECM connector terminal C17.



Is there continuity?

NO → **Repair open wire between the ECM (C17) and the ALT.**

YES ↓

See the ALT inspection (see section 23).

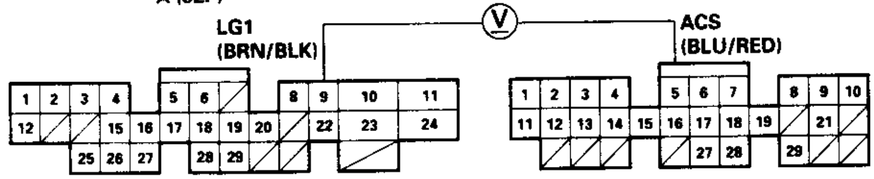
*: Canada

Idle Control System

Air Conditioning Signal

This signals the ECM when there is a demand for cooling from the air conditioning system.

Inspection of Air Conditioning Signal.



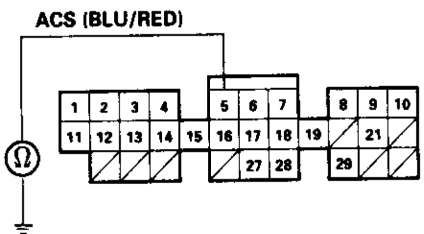
Wire side of female terminals

Check for a short in the wire (ACS line):
1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch connector and A/C diode connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals C5 and A9.

Is there approx. 5 V?

NO →

Check for a short in the wire (ACS line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector C (31P).
3. Check for continuity between body ground and ECM connector terminal C5.



Is there continuity?

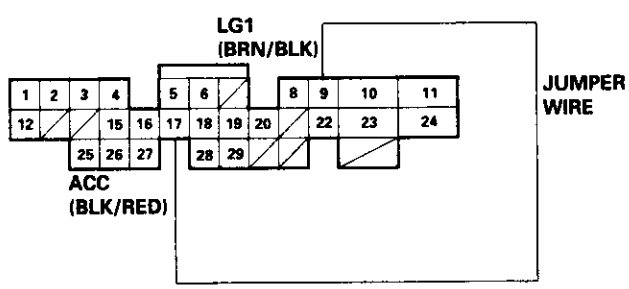
YES → **Repair short in the wire between the ECM (C5) and the A/C pressure switch or A/C diode.**

NO →

- **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**
- **See the air conditioner inspection (see section 22).**

YES (approx. 5 V) →

Check for an open in the wire (ACC line):
1. Turn the ignition switch OFF.
2. Reconnect the A/C pressure switch connector and A/C diode connector.
3. Turn the ignition switch ON (II).
4. Momentarily connect ECM connector terminals A17 and A9 with a jumper wire several times.

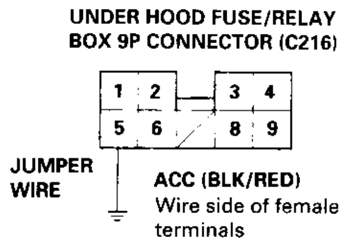


(To page 11-103)

(From page 11-102)

Is there a clicking noise from the A/C compressor clutch?

NO → **Check for an open in the wire (ACC line):**
Momentarily connect the A/C clutch relay 4P connector terminal No. 4 to body ground with a jumper wire several times.

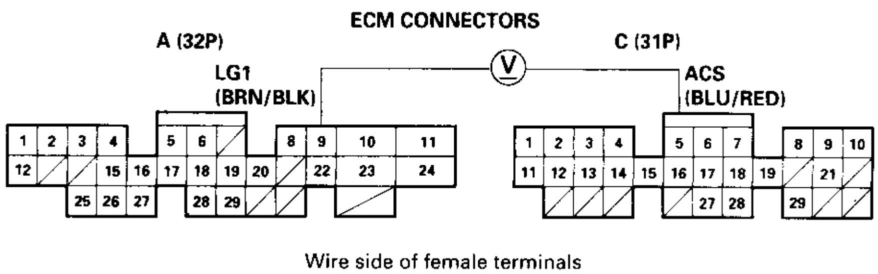


Is there a clicking noise from the A/C compressor clutch?

NO → **See air conditioner inspection (see section 22).**

YES → **Repair open in the wire between the ECM (A17) and the A/C clutch relay.**

YES → **Check for the operation of the A/C:**
1. Start the engine.
2. Turn the blower switch ON.
3. Turn the A/C switch ON.



Does the A/C operate?

YES → **Air conditioning signal is OK.**

NO → **Check for an open in the wire (ACS line):**
Measure voltage between ECM connector terminals C5 and A9.

Is voltage less than 1.0 V?

NO → **Repair open in the wire between the ECM (C5) and the A/C pressure switch or A/C diode.**

YES →
- **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**
- **See the air conditioner inspection (see section 22).**

Brake Switch Signal

This signals the ECM when the brake pedal is depressed.

Inspection of Brake Switch Signal.

Are the brake lights on without depressing the brake pedal?

YES → **Inspect the brake switch (see section 19).**

NO ↓

Depress the brake pedal.

Do the brake lights come on?

NO → Inspect the HORN STOP (20 A) fuse in the under-hood fuse/ relay box.

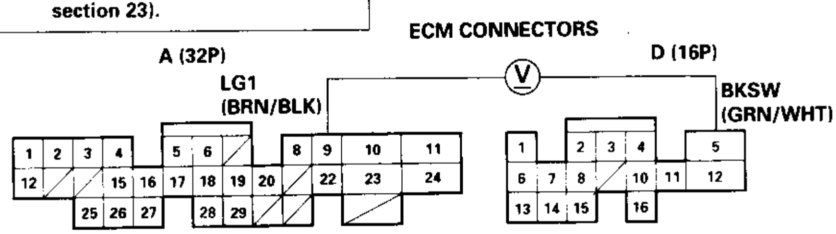
Is the fuse OK?

NO →
- **Repair short in the wire between the brake switch and the HORN STOP (20 A) fuse.**
- **Replace the HORN STOP (20 A) fuse.**

YES ↓
- **Repair open in the wire between the brake switch and the HORN STOP (20 A) fuse.**
- **Inspect the brake switch (see section 23).**

YES ↓

Check for an open in the wire (BKSW line):
1. Depress the brake pedal.
2. Measure voltage between ECM connector terminals D5 and A9 with the brake pedal depressed.



Wire side of female terminals

Is there battery voltage?

NO → **Repair open in the wire between the ECM (D5) and the brake switch.**

YES ↓

Brake switch signal is OK.

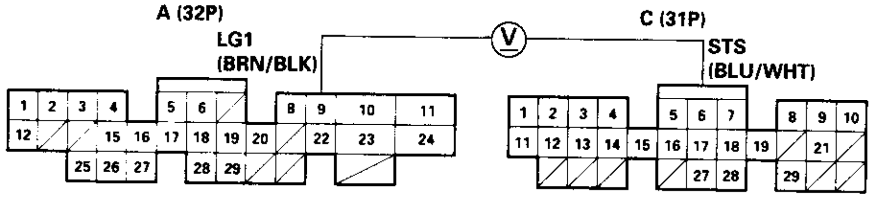
Starter Switch Signal

This signals the ECM when the engine is cranking.

Inspection of Starter Switch Signal.

NOTE:
- M/T: Clutch pedal must be depressed.
- A/T: Transmission in N or P position.

ECM CONNECTORS



Wire side of female terminals

Check for an open or short in the wire (STS line):
Measure voltage between ECM connector terminals C6 and A9 with the ignition switch in the start position (III).

Is there battery voltage?

- YES → **Starter switch signal is OK.**
- NO → Inspect the No. 31 STARTER SIGNAL (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

- NO →
  - **Repair short in the wire between the ECM (C6) and the No. 31 STARTER SIGNAL (7.5 A) fuse or the PGM-FI main relay.**
  - **Replace the No. 31 STARTER SIGNAL (7.5 A) fuse.**
- YES → **Repair open in the wire between the ECM (C6) and the No. 31 STARTER SIGNAL (7.5 A) fuse.**

Idle Control System

Automatic Transaxle (A/T) Gear Position Signal

This signals the ECM when the transmission is in Park or neutral.

Inspection of A/T Gear Position Signal.

Check the operation of the A/T gear position switch:
1. Turn the ignition switch ON (II).
2. Observe the A/T shift position indicator and select each position separately.

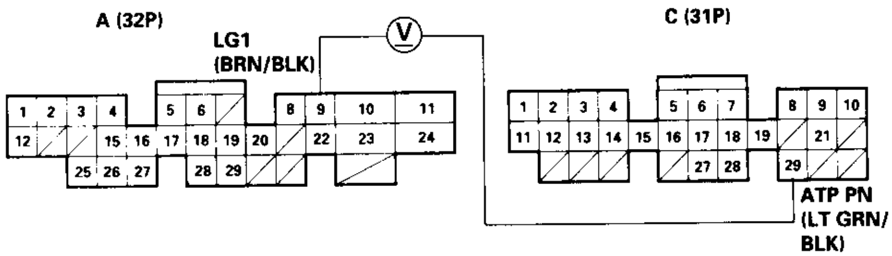
Does the indicator light properly?

NO → **See the A/T gear position indicator inspection (see section 14).**

YES ↓

Check for a short in the wire (ATP PN line):
1. Turn the ignition switch OFF.
2. Disconnect the 10P connector from the gauge assembly.
3. Disconnect the 26P connector from the TCM.
4. Turn the ignition switch ON (II).
5. Measure voltage between ECM connector terminals C29 and A9.

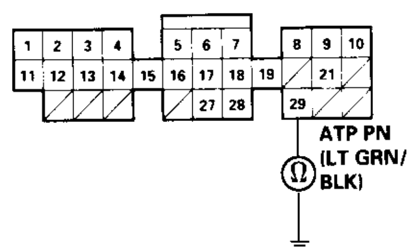
ECM CONNECTORS



Wire side of female terminals

Is there approx. 5 V?

NO → **Check for a short in the wire (ATP PN line):**
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector C (31P).
3. Check for continuity between body ground and ECM connector terminal C29.



Is there continuity?

YES → **Repair short in the wire between the ECM (C29) and the gauge assembly.**

NO ↓

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

YES (approx. 5 V) ↓

A

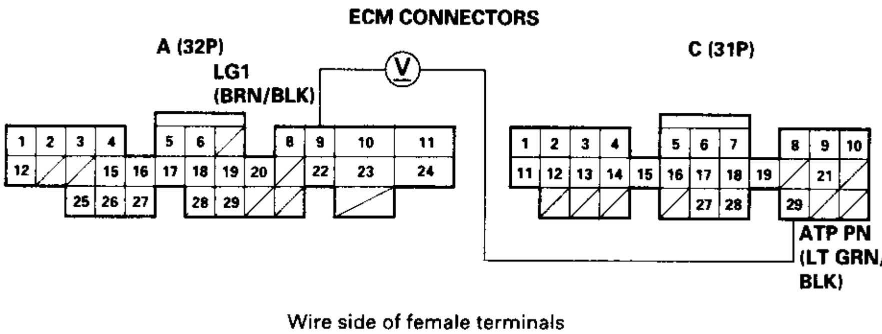
(To page 11-107)

(From page 11-106)

A

Check for an open in the wire (ATP PN line):

1. Turn the ignition switch OFF.
2. Reconnect the 10P connector to the gauge assembly.
3. Reconnect the 26P connector to the TCM.
4. Start the engine.
5. Measure voltage between ECM connector terminals C29 and A9 with the transmission in N position.



Is there less than 1.0 V?

NO →

- **Repair open in the wire between the ECM (C29) and the gauge assembly.**
- **Repair open in GRN wire between the gauge assembly and the A/T gear position switch.**

YES ↓

Check for an open in the wire (ATP PN line):
Measure voltage between ECM connector terminals C29 and A9 with the transmission in P position.

Is there less than 1.0 V?

NO →

Repair open in GRN/WHT wire between the gauge assembly and the A/T gear position switch.

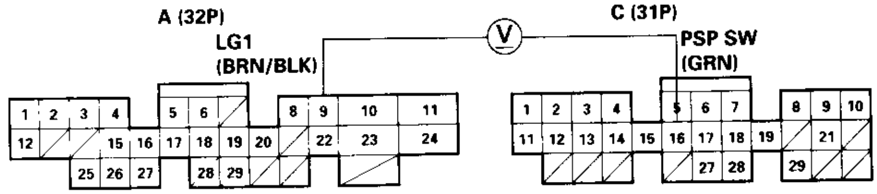
YES ↓

A/T gear position signal is OK.

Power Steering Pressure (PSP) Switch Signal (USA)

This signals the ECM when the power steering load is high.

ECM CONNECTORS



Wire side of female terminals

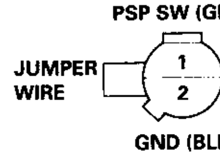
Inspection of PSP switch signal.

Check for an open in the wire (PSP SW line):
1. Turn the ignition switch ON (II).
2. Measure voltage between ECM connector terminals C16 and A9.

Is there less than 1.0 V?

NO → **Check for an open in the wire (PSP SW line):**
1. Turn the ignition switch OFF.
2. Disconnect the PSP switch 2P connector.
3. Turn the ignition switch ON (II).
4. At the wire side, connect the PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire.
5. Measure voltage between ECM connector terminals C16 and A9.

PSP SWITCH 2P CONNECTOR (C311)



Wire side of female terminals

Is there less than 1.0 V?

NO →
- **Repair open in the wire between the ECM (C16) and the PSP switch.**
- **Repair open in BLK wire between the PSP switch and G301.**

YES → **Replace the PSP switch.**

YES ↓

Check the operation of the PSP switch:
1. Start the engine
2. Turn steering wheel to full lock.
3. Measure voltage between ECM connector terminals C16 and A9.

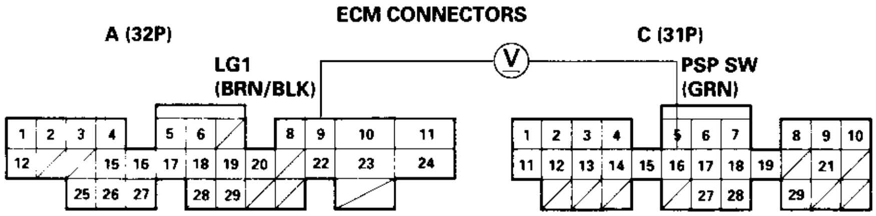
Is there battery voltage?

NO → (To page 11-109)

YES → **PSP switch signal is OK.**

(From page 11-108)

Check for a short in the PSP switch:
1. Turn the ignition switch OFF.
2. Disconnect the 2P connector from the PSP switch.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals C16 and A9.



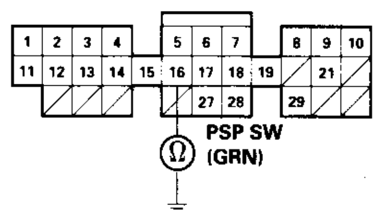
Wire side of female terminals

Is there battery voltage?

YES → **Replace the PSP switch.**

NO →

Check for a short in the wire (PSP SW line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector C (31P).
3. Check for continuity between body ground and ECM connector terminal C16.



Is there continuity?

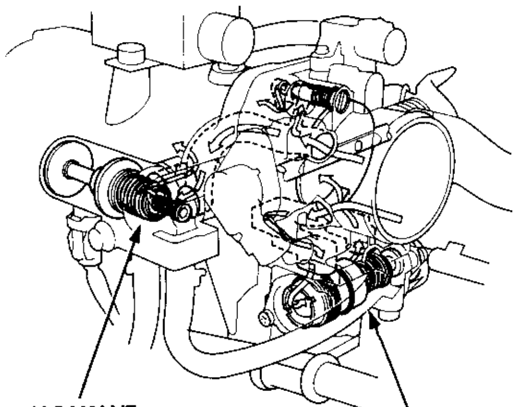
YES → **Repair short in the wire between the ECM (C16) and the PSP switch.**

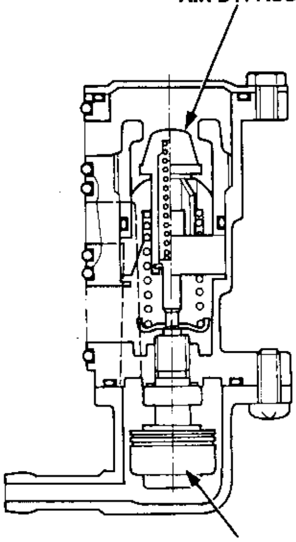
NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

Fast Idle Thermo Valve (A/T model only)

Description

To prevent erratic running when the engine is warming up, it is necessary to raise the idle speed. The fast idle thermo valve is controlled by a thermowax plunger. When the engine is cold, the engine coolant surrounding the thermowax contracts the plunger, allowing additional air to be bypassed into the intake manifold so that the engine idles faster. When the engine reaches operating temperature, the valve closes, reducing the amount of air bypassing into the manifold.

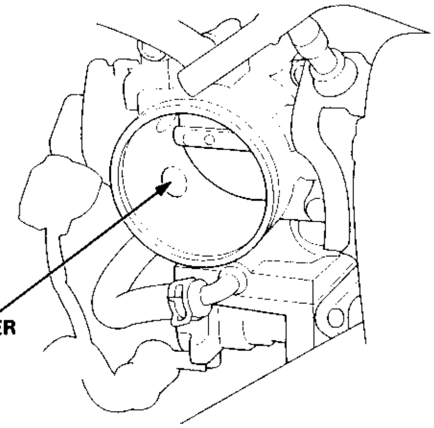




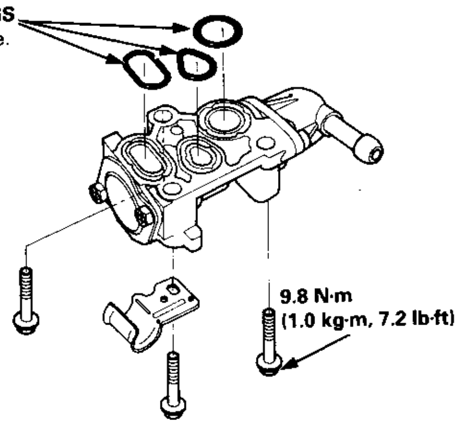
Inspection

NOTE: The fast idle thermo valve is factory adjusted; it should not be disassembled.

1. Remove the intake air duct from the throttle body.
2. Start the engine.
3. Put your finger over the lower port in throttle body and make sure that there is air flow with the engine cold (engine coolant temperature below 86°F, 30°C).



If there is no air flow, replace the fast idle thermo valve and retest.



4. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Check that valve is completely closed. If not, air suction can be felt at the lower port in the throttle body.

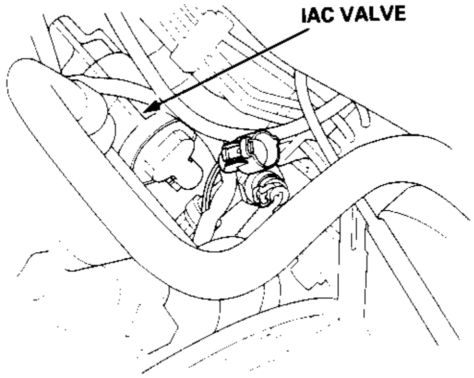
   If any suction is felt, the valve is leaking. Check engine coolant level and for air in the engine coolant system (see section 10). If OK, replace the fast idle thermo valve and recheck.

Idle Speed Setting

Inspection/Adjustment

NOTE:
- When setting the idle speed, check the following items:
  — The MIL has not been reported on.
  — Ignition timing
  — Spark plugs
  — Air cleaner
  — PCV system
- (Canada) Pull the parking brake lever up. Start the engine, then check that the headlights are off.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Disconnect the 2P connectors from the Idle Air Control (IAC) valve and the EVAP purge control solenoid valve.



4. If the engine stalls, restart the engine with the accelerator pedal slightly depressed. Stabilize the rpm at 1,000, then slowly release the pedal until the engine idles.
5. Check idling in no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

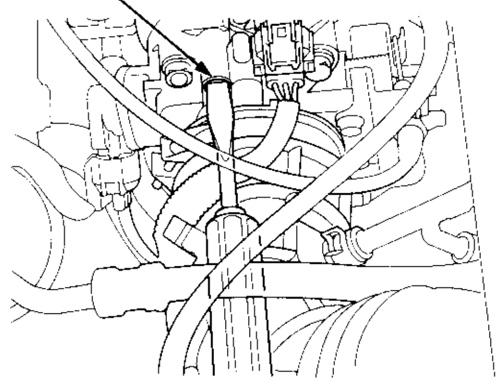
Idle speed should be;

B18B1 engine:

M/T	480 ± 50 rpm
A/T	480 ± 50 rpm (in Park or neutral)

B18C1 engine: 480 ± 50 rpm
B18C5 engine: 550 ± 50 rpm

If necessary, adjust the idle speed, by turning the idle adjusting screw.
After adjusting the idle speed, recheck the ignition timing (see section 23). If it is out of spec, go back to step 4.



6. Turn the ignition switch OFF.
7. Reconnect the 2P connectors to the IAC valve and the EVAP purge control solenoid valve, then do the ECM reset procedures.
8. Restart and idle the engine with no-load conditions for one minute, then check the idle speed.

NOTE: (Canada) Pull the parking brake lever up.
Start the engine, then check that the headlights are off.

Idle speed should be;

B18B1 engine:

M/T	750 ± 50 rpm
A/T	750 ± 50 rpm (in Park or neutral)

B18C1 engine: 750 ± 50 rpm
B18C5 engine: 800 ± 50 rpm

NOTE: B18B1, B18C1 engines – If the idle speed increases to *[1]rpm, this means the EVAP system is purging the canister. To stop the purging termporarily, raise the engine speed above 1,000 rpm with the accelerator pedal, then slowly release the pedal.

*1: B18B1 engine
M/T: 820 ± 50 rpm
A/T: 840 ± 50 rpm
B18C1 engine
850 ± 50 rpm

(cont'd)

Idle Control System

Idle Speed Setting (cont'd)

9. Idle the engine for one minute with headlights (Low) ON and check the idle speed.

   Idle speed should be;

   B18B1 engine:

M/T	750 ± 50 rpm
A/T	750 ± 50 rpm (in Park or neutral)

   B18C1 engine: 750 ± 50 rpm
   B18C5 engine: 800 ± 50 rpm

10. Turn the headlights off. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

    Idle speed should be;

    B18B1 engine:

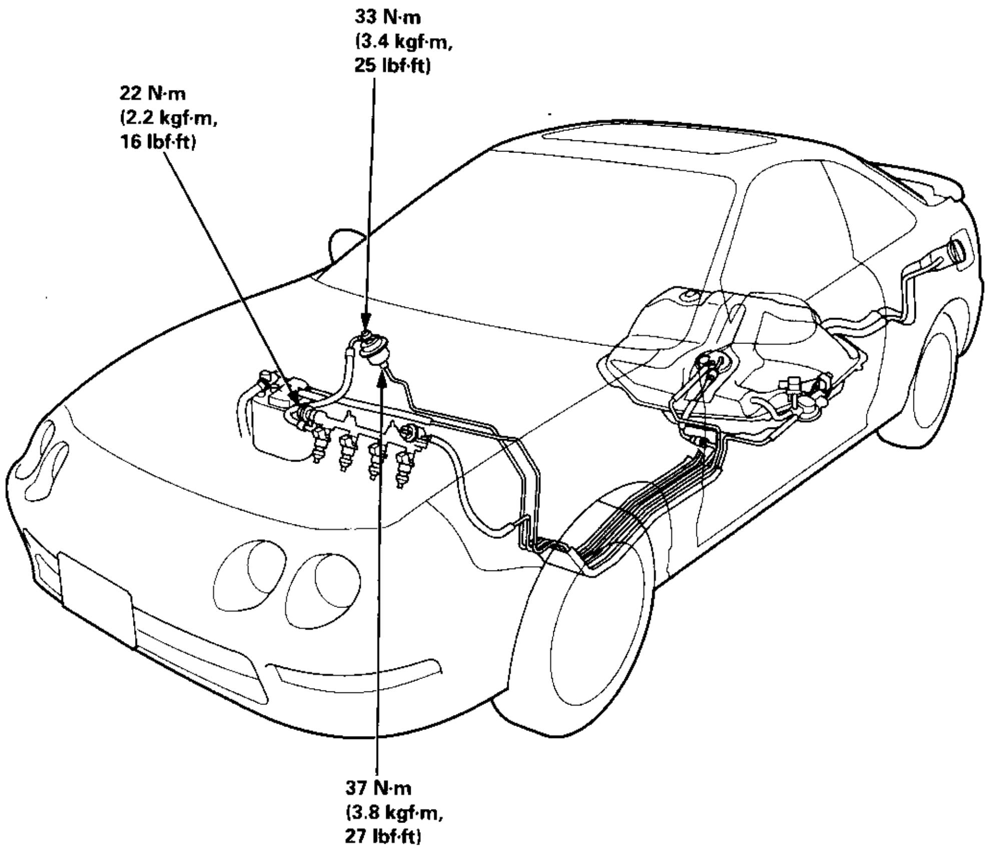
M/T	820 ± 50 rpm
A/T	840 ± 50 rpm (in Park or neutral)

    B18C1 engine: 850 ± 50 rpm
    B18C5 engine: 1,050 ± 50 rpm

    NOTE: If the idle speed is not within specification, see Symptom Chart on page 11-36.

Fuel Lines

Check fuel system lines, hoses, fuel filter, and other components for damage, leaks and deterioration, and replace if necessary.

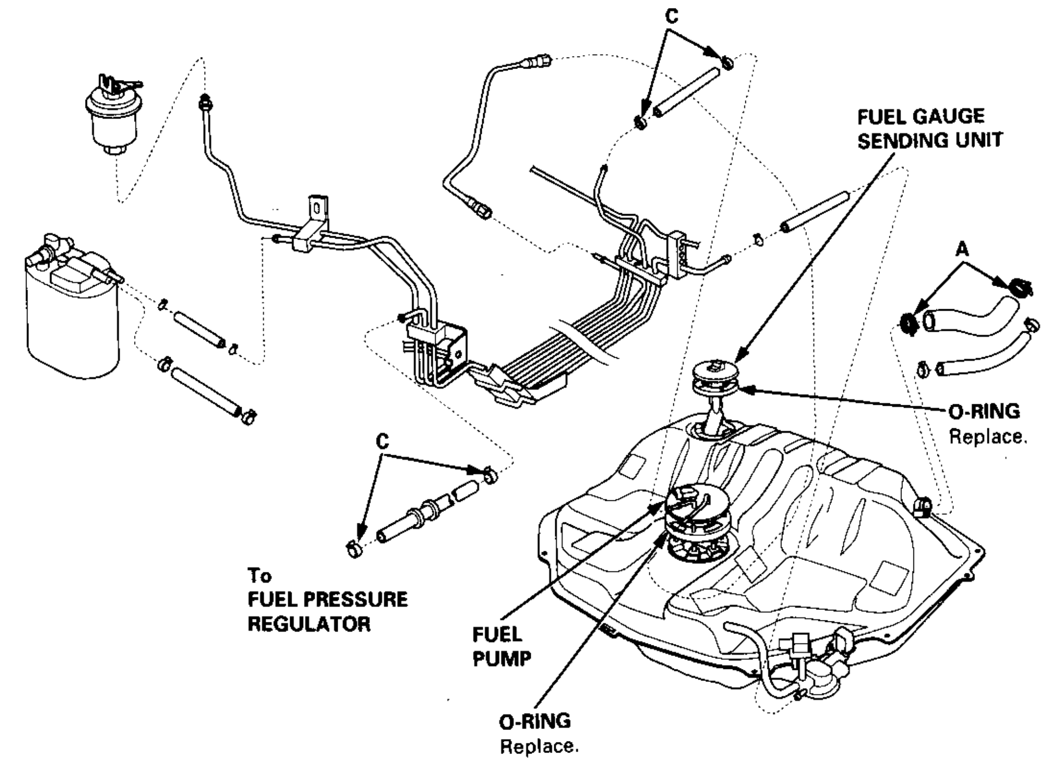


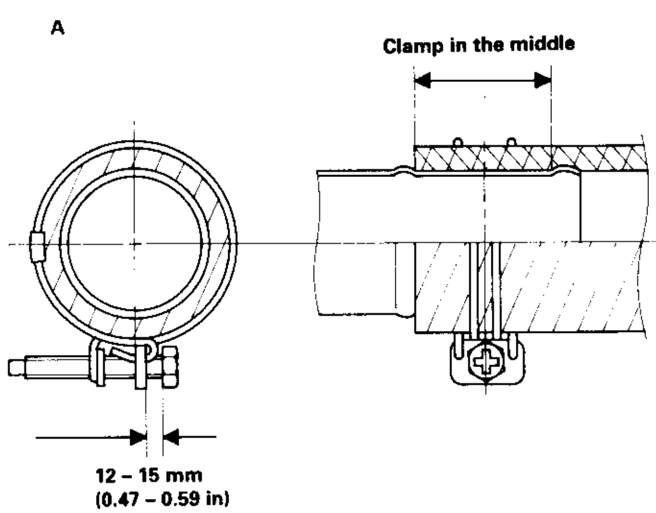
(cont'd)

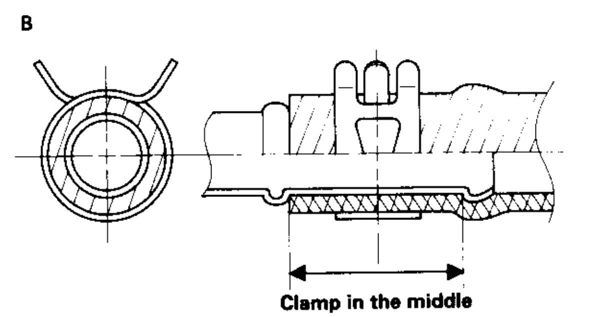
Fuel Supply System

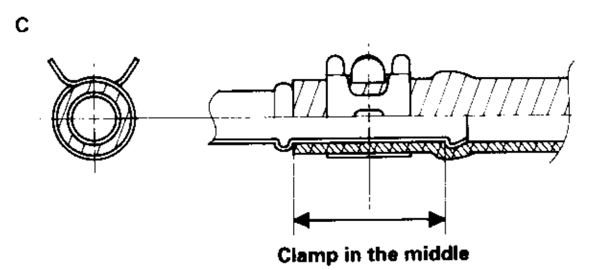
Fuel Lines (cont'd)

Check all hose clamps and retighten if necessary.









Fuel Tube/Quick-Connect Fittings

Precautions

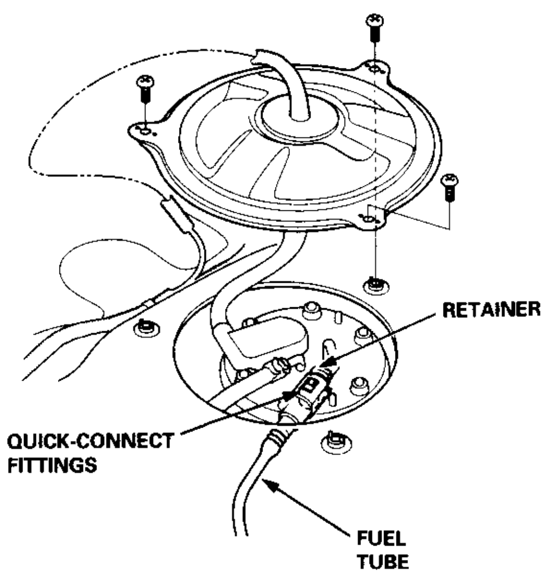
⚠WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump with the fuel feed pipe. For removing or installing the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings. Pay attention to following:

- The fuel tube/quick-connect fittings assembly is not heat-resistant; be careful not to damage it during welding or other heat-generating procedures.
- The fuel tube/quick-connect fittings assembly is not acid-proof; do not touch it with a shop towel which was used for wiping battery electrolyte. Replace the fuel tube/quick-connect fittings assembly if it came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tube/quick-connect fittings assembly, be careful not to bend or twist it excessively. Replace it if damaged.

A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when

— Replacing the fuel pump.
— Replacing the fuel feed pipe.
— It has been removed from the pipe.
— It is damaged.

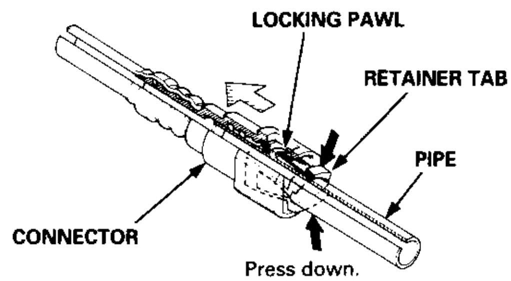


Disconnection

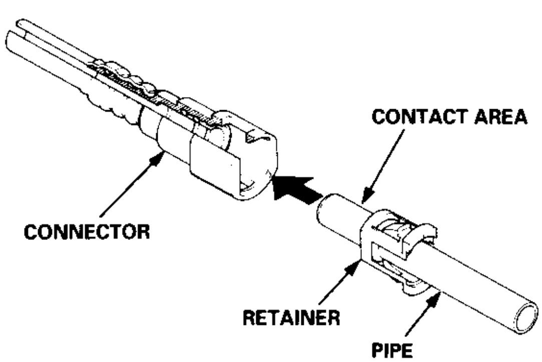
⚠WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

1. Relieve fuel pressure (see page 11-118).
2. Check the fuel quick-connect fittings for dirt, and clean if necessary.
3. Hold the connector with one hand and press down the retainer tabs with the other hand, then pull the connector off.

   NOTE:
   - Be careful not to damage the pipe or other parts. Do not use tools.
   - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
   - Do not remove the retainer from the pipe; once removed, the retainer must be replaced with a new one.



4. Check the contact area of the pipe for dirt and damage.
   — If the surface is dirty, clean it.
   — If the surface is rusty or damaged, replace the fuel pump or fuel feed pipe.

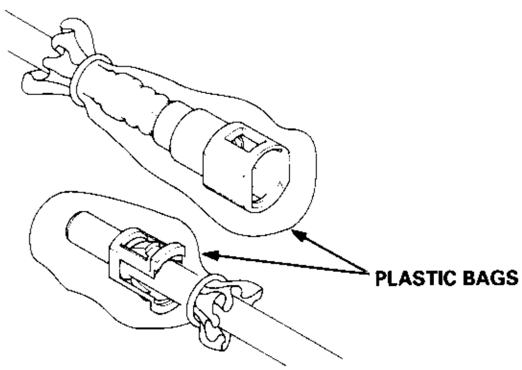


(cont'd)

Fuel Supply System

Fuel Tube/Quick-Connect Fittings (cont'd)

5. To prevent damage and keep out foreign matter, cover the disconnected connector and pipe end with plastic bags.

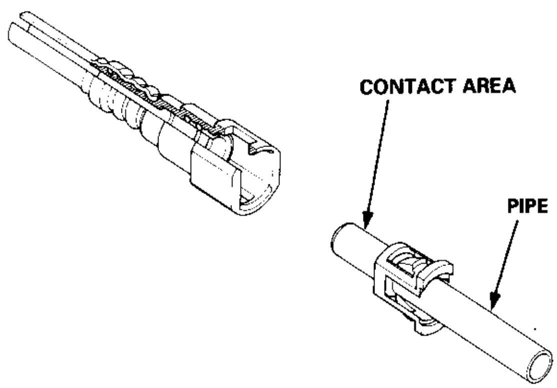


NOTE:
- The retainer cannot be reused once it has been removed from the pipe.
  Replace the retainer when
  - replacing the fuel pump.
  - replacing the fuel feed pipe.
  - it has been removed from the pipe.
  - it is damaged.

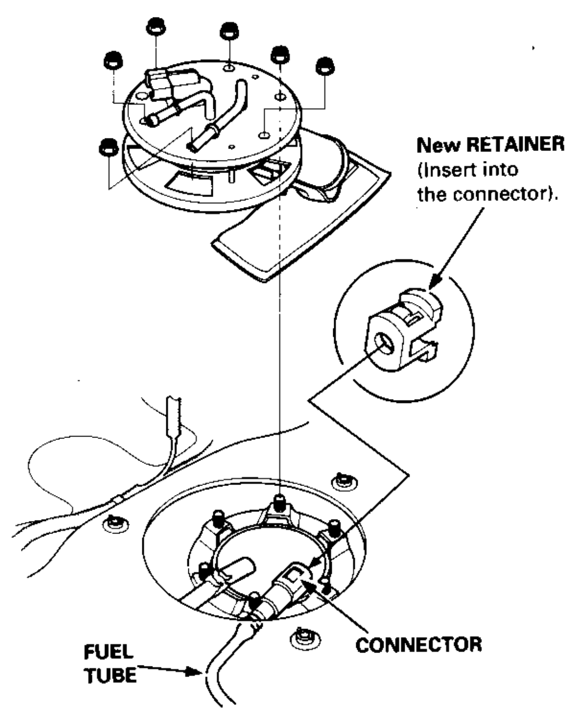
Connection

⚠ WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

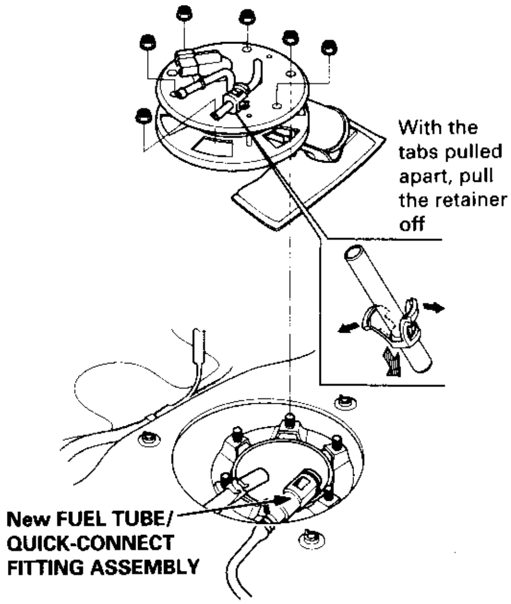
1. Check the pipe contact area for dirt and damage, and clean if necessary.



2. Insert a new retainer into the connector if the retainer is damaged, or after
   - replacing the fuel pump.
   - replacing the fuel feed pipe.
   - removing the retainer from the pipe.



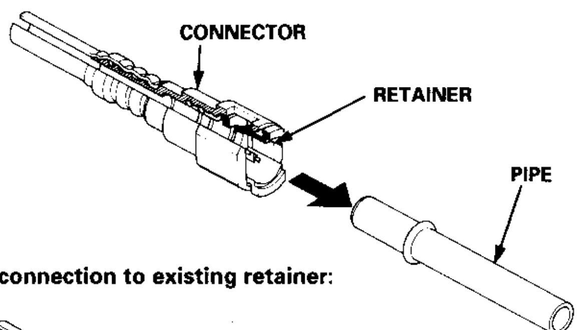
Before connecting a new fuel tube/quick-connect fitting assembly, remove the old retainer from the mating pipe.



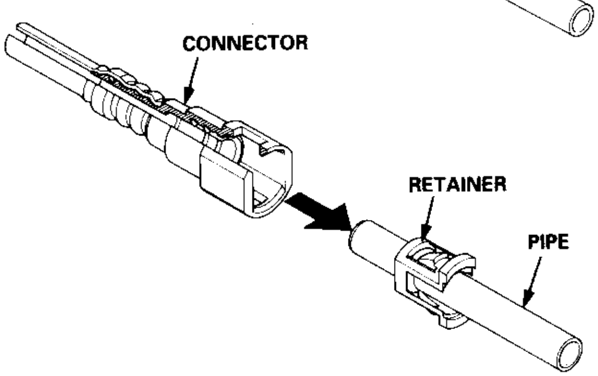
3. Align the quick-connect fittings with the pipe, and align the retainer locking pawls with the connector grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

   NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

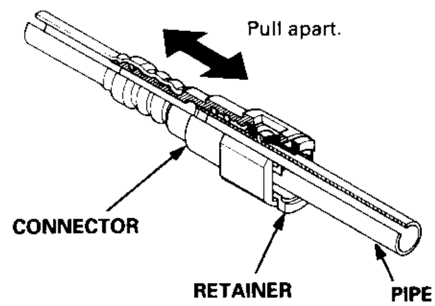
Connection with new retainer:



Reconnection to existing retainer:



4. Make sure the connection is secure and the pawls are firmly locked into place; check visually and by pulling the connector.



5. Reconnect the battery negative cable, and turn the ignition switch ON (II) the fuel pump will run for about two seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.

Fuel Supply System

System Description

The fuel supply system consists of a fuel tank, in-tank high pressure fuel pump, PGM-FI main relay, fuel-filter, fuel pressure regulator, fuel injectors, fuel pulsation damper, and fuel delivery and return lines. This system delivers pressure-regulated fuel to the fuel injectors and cuts the fuel delivery when the engine is not running.

Fuel Pressure

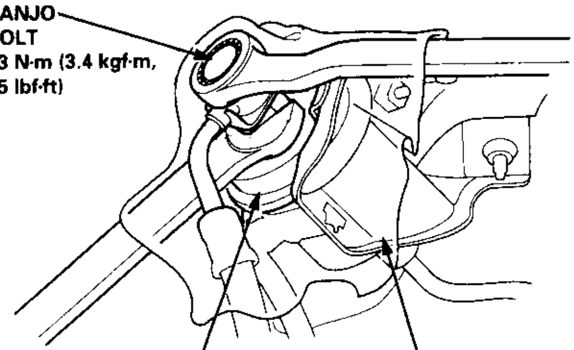
Relieving

Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 12 mm banjo bolt on top of the fuel filter.

⚠ WARNING

- **Do not smoke while working on the fuel system. Keep open flames or sparks away from your work area.**
- **Be sure to relieve fuel pressure while the ignition switch is off.**

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable from the battery negative terminal.
3. Remove the fuel fill cap.
4. Use a box end wrench on the 12 mm banjo bolt at the fuel filter while holding the fuel filter with another wrench.
5. Place a rag or shop towel over the 12 mm banjo bolt.
6. Slowly loosen the 12 mm banjo bolt one complete turn.



NOTE: Replace the washers whenever the 12 mm banjo bolt is loosened or removed.

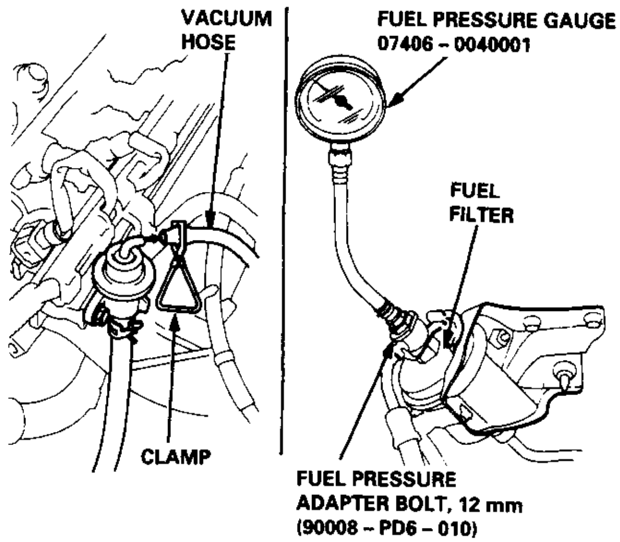
Inspection

1. Relieve fuel pressure.
2. Remove the 12 mm banjo bolt from the fuel filter while holding the fuel filter with another wrench. Attach the fuel pressure adapter bolt, 12 mm and the special tool.
3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the fuel pressure regulator disconnected from the fuel pressure regulator and pinched. If the engine will not start, turn the ignition switch ON (II), wait for two seconds, turn it off, then back on again and read the fuel pressure.

   Pressure should be:
   B18B1 engine:
   270 – 320 kPa (2.8 – 3.3 kgf/cm², 40 – 47 psi)
   B18C1, B18C5 engines:
   320 – 370 kPa (3.3 – 3.8 kgf/cm², 47 – 54 psi)

4. Reconnect vacuum hose to the fuel pressure regulator.

Pressure should be:
B18B1 engine:
250 – 290 kPa (2.5 – 3.0 kgf/cm², 36 – 43 psi)
B18C1, B18C5 engines:
260 – 310 kPa (2.7 – 3.2 kgf/cm², 38 – 46 psi)



If the fuel pressure is not as specified, first check the fuel pump (see page 11-123). If the fuel pump is OK, check the following:

- If the fuel pressure is higher than specified, inspect for:
  — Pinched or clogged fuel return hose or line.
  — Faulty fuel pressure regulator (see page 11-121).
- If the fuel pressure is lower than specified, inspect for:
  — Clogged fuel filter.
  — Faulty fuel pressure regulator (see page 11-121).
  — Fuel line leakage.

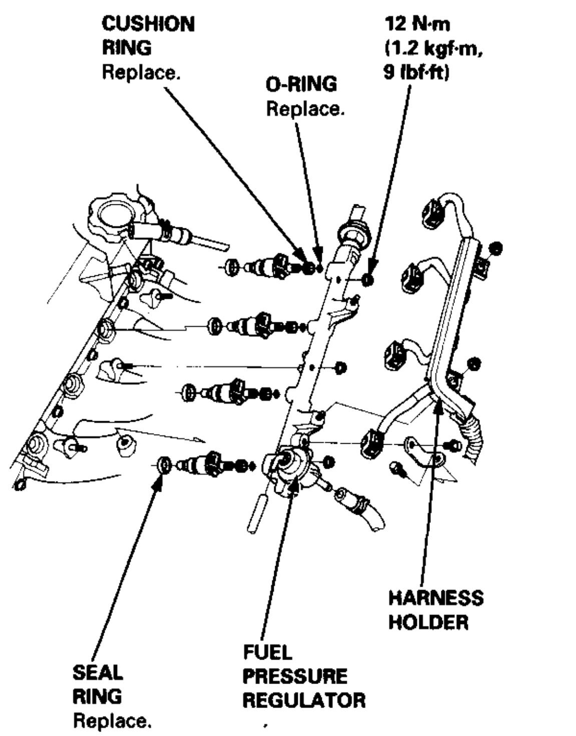
Fuel Injectors

Replacement

WARNING Do not smoke during the work. Keep open flames away from your work area.

1. Relieve fuel pressure (see page 11-118).
2. Disconnect the connectors from the fuel injectors.
3. Disconnect the vacuum hose and fuel return hose from the fuel pressure regulator.

   NOTE: Place a rag or shop towel over the hoses before disconnecting them.
4. Loosen the retainer nuts on the fuel rail and harness holder.
5. Disconnect the fuel rail.
6. Remove the fuel injectors from the intake manifold.

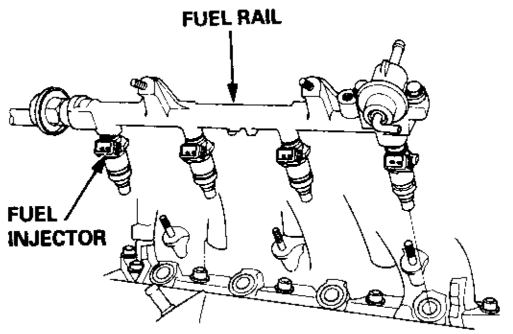


(cont'd)

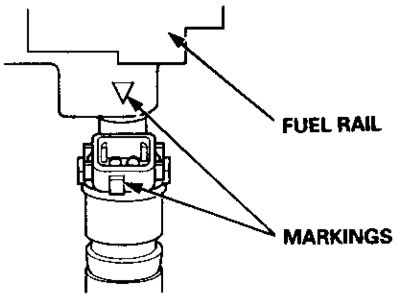
Fuel Supply System

Fuel Injector (cont'd)

7. Slide new cushion rings onto the fuel injectors.
8. Coat new O-rings with clean engine oil, and put them on the fuel injectors.
9. Insert the injectors into the fuel rail first.
10. Coat new seal rings with clean engine oil, and press them into the intake manifold.
11. To prevent damage to the O-rings, install the fuel injectors in the fuel rail first, then install them in the intake manifold.



12. Align the center line on the connector with the mark on the fuel rail.



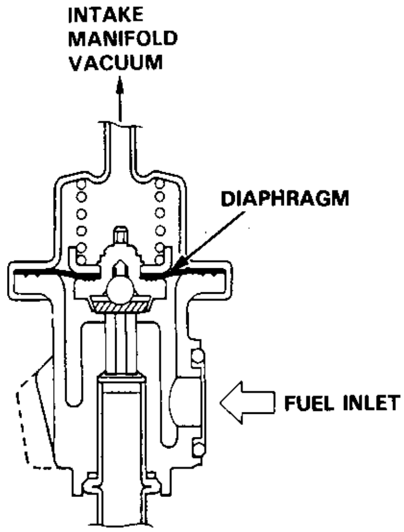
13. Install and tighten the retainer nuts.
14. Connect the vacuum hose and fuel return hose to the fuel pressure regulator.
15. Install the connectors on the fuel injectors.
16. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

Fuel Pressure Regulator

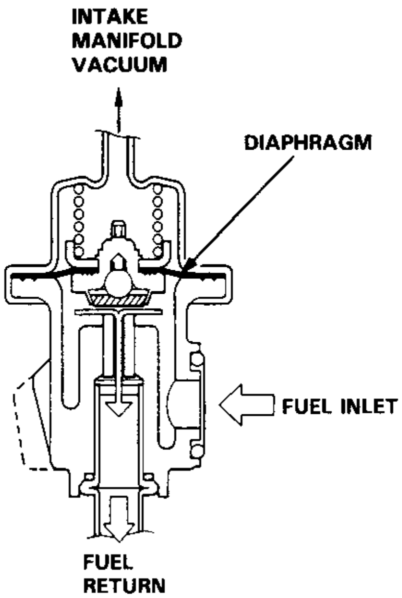
Description

The fuel pressure regulator maintains a constant fuel pressure to the fuel injectors. When the difference between the fuel pressure and manifold pressure exceeds 3.0 kgf/cm^2 (294 kPa, 43 psi) [B18C1, B18C5 engines: 3.5 kgf/cm^2 (343 kPa, 50 psi)], the diaphragm is pushed upward, and the excess fuel is fed back into the fuel tank through the return line.

CLOSED:



OPEN:

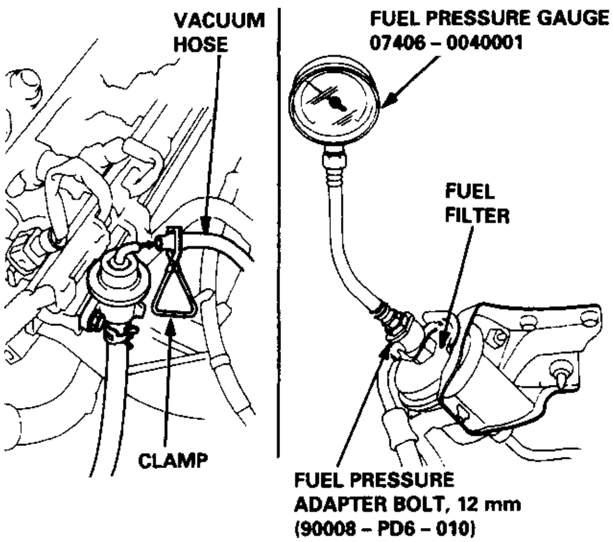


Testing

⚠WARNING Do not smoke during the test. Keep open flames away from your work area.

1. Attach a fuel pressure gauge to the service port of the fuel filter (see page 11-118).

   Pressure should be:
   B18B1 engine:
   270 – 320 kPa (2.8 – 3.3 kgf/cm², 40 – 47 psi)
   B18C1, B18C5 engines:
   320 – 370 kPa (3.3 – 3.8 kgf/cm², 47 – 54 psi)
   (with the fuel pressure regulator vacuum hose disconnected and pinched)



2. Reconnect the vacuum hose to the fuel pressure regulator.

3. Check that the fuel pressure rises when the vacuum hose from the fuel pressure regulator is disconnected again.

   If the fuel pressure did not rise, replace the fuel pressure regulator.

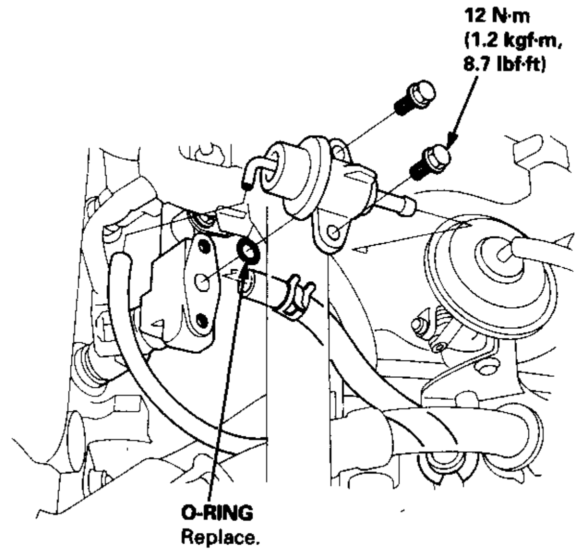
Replacement

⚠WARNING Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see page 11-118).

2. Disconnect the vacuum hose and fuel return hose.

3. Remove the two 6 mm retainer bolts.



NOTE:
- Replace the O-ring.
- When assembling the fuel pressure regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

Fuel Supply System

Fuel Filter

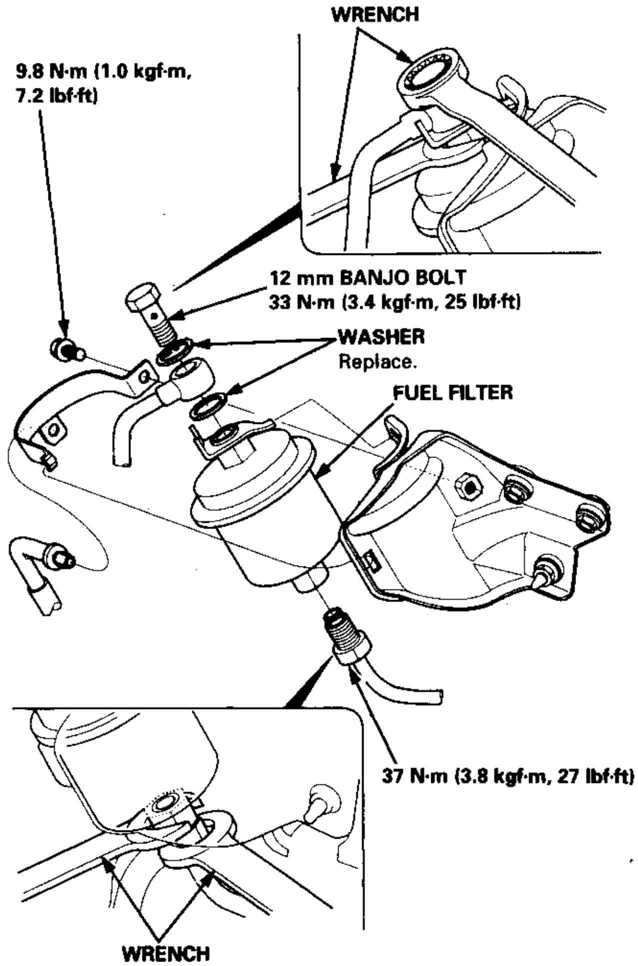
Replacement

⚠ WARNING

- **Do not smoke while working on fuel system. Keep open flame away from your work area.**
- **While replacing the fuel filter, be careful to keep a safe distance between battery terminals and any tools.**

The fuel filter should be replaced whenever the fuel pressure drops below the specified value [270 – 320 kPa, 2.8 – 3.3 kgf/cm², 40 – 47 psi (B18C1, B18C5 engines: 320 – 370 kPa (3.3 – 3.8 kgf/cm², 47 – 54 psi) with the fuel pressure regulator vacuum hose disconnected and pinched] after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Place a shop towel under and around the fuel filter.
2. Relieve fuel pressure (see page 11-118).
3. Support the fuel filter with a wrench, as shown, then remove the 12 mm banjo bolt and the fuel feed pipe from the fuel filter.
4. Remove the fuel filter clamp and fuel filter.
5. Install the new fuel filter in the reverse order of removal, and note these items:
   - When assembling, use new washers as shown.
   - Clean the flared joint of high pressure hoses thoroughly before reconnecting them.



Fuel Pump

Testing

⚠ WARNING Do not smoke during the test. Keep open flame away from your work area.

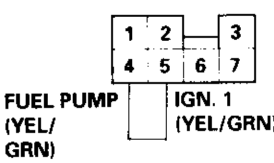
If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON, you will hear some noise if you hold your ear to the fuel fill port with the fuel fill cap removed. The fuel pump should run for two seconds, when ignition switch is first turned on. If the fuel pump does not make noise, check as follows:

1. Remove the rear seat (see section 20).
2. Remove the access panel.
3. Disconnect the 2P connector from the fuel pump.

   CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

4. Connect the PGM-FI main relay 7P connector terminals No. 4 and No. 5 with a jumper wire.

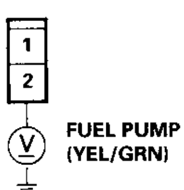
PGM-FI MAIN RELAY CONNECTOR (C443)



Wire side of female terminals

5. Check that battery voltage is available between the fuel unit sub-harness connector terminal No. 2 and body ground when the ignition switch is turned ON (II).

FUEL PUMP CONNECTOR (C510)



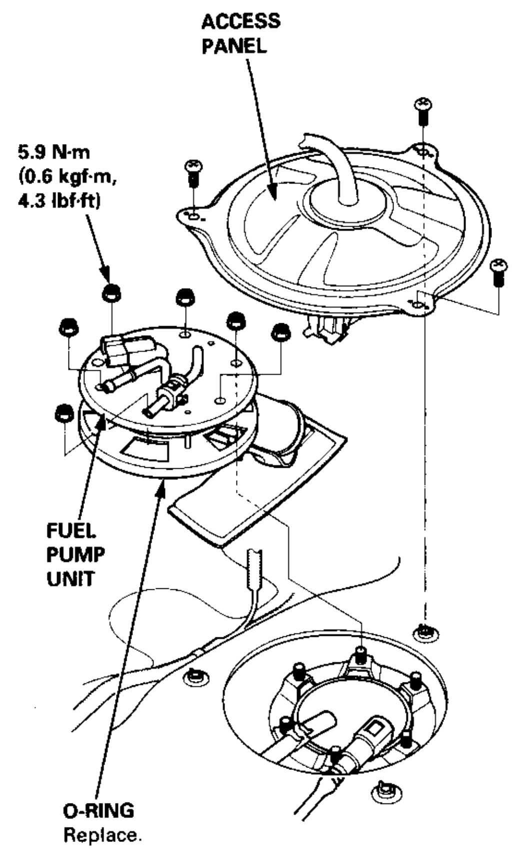
Wire side of female terminals

- If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump.
- If there is no voltage, check the wire harness (see page 11-125).

Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flames away from your work area.

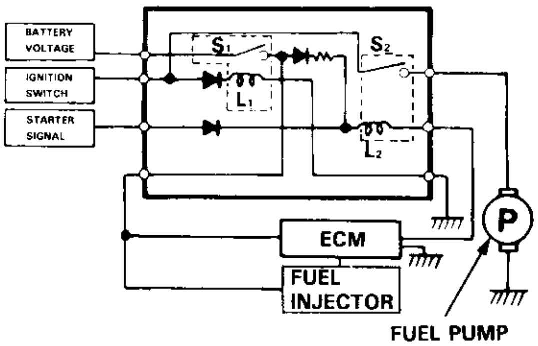
1. Remove the rear seat (see section 20) (Hatchback: Remove the spare tire lid and the protective cover).
2. Remove the access panel.
3. Disconnect the 2P connector from the fuel pump.
4. Remove the fuel pump mounting nuts.
5. Remove the fuel pump from the fuel tank.
6. Install parts in the reverse order of removal.



PGM-FI Main Relay

Description

The PGM-FI main relay actually contains two individual relays. This relay is located at the left side of the cowl. One relay is energized whenever the ignition is on which supplies the battery voltage to the ECM, power to the fuel injectors, and power for the second relay. The second relay is energized for two seconds when the ignition is switched on, and when the engine is running, to supply power to the fuel pump.

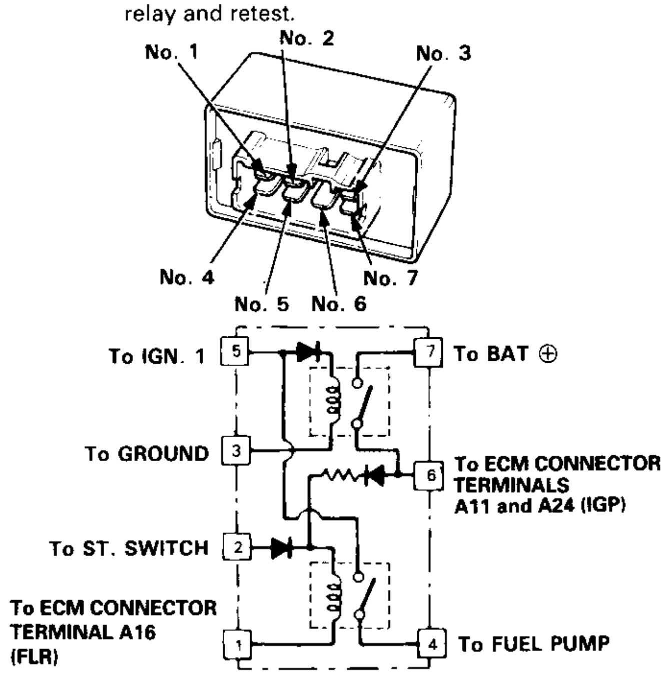


Relay Testing

NOTE: If the engine starts and continues to run, the PGM-FI main relay is OK.

1. Remove the PGM-FI main relay.
2. Attach the battery positive terminal to the No. 2 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check for continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.

   - If there is continuity, go on to step 3.
   - If there is no continuity, replace the PGM-FI main relay and retest.



3. Attach the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 3 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 7 terminal and No. 6 terminal of the PGM-FI main relay.

   - If there is continuity, go on to step 4.
   - If there is no continuity, replace the PGM-FI main relay and retest.

4. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 5 terminal and No. 4 terminal of the PGM-Fi main relay.

   - If there is continuity, the PGM-FI main relay is OK.
   - If the fuel pump still does not work, go to Harness Testing on the next page.
   - If there is no continuity, replace the PGM-FI main relay and retest.

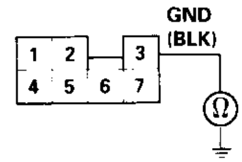
Troubleshooting

- Engine will not start.
- Inspection of PGM-FI main relay and relay harness.

Check for an open in the wire (GND line):

1. Turn the ignition switch OFF.
2. Disconnect the PGM-FI main relay 7P connector.
3. Check for continuity between the PGM-FI main relay 7P connector terminal No. 3 and body ground.

PGM-FI MAIN RELAY 7P CONNECTOR (C443)



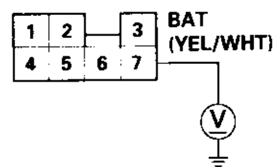
Wire side of female terminals

Is there continuity?

NO → **Repair open in the wire between the PGM-FI main relay and G101.**

YES

Check for an open or short in the wire (BAT line):
Measure voltage between the PGM-FI main relay 7P connector terminal No. 7 and body ground.



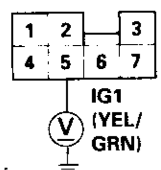
Is there battery voltage?

NO →
- **Repair open or short in the wire between the PGM-FI main relay and the FI E/M (15 A) fuse.**
- **Replace the FI E/M (15 A) fuse in the under-hood fuse/relay box.**

YES

Check for an open or short in the wire (IG1 line):

1. Turn the ignition switch ON (II).
2. Measure the voltage between the PGM-FI main relay 7P connector terminal No. 5 and body ground.



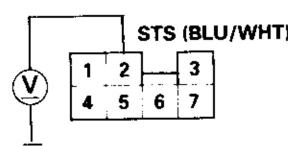
Is there battery voltage?

NO →
- **Repair open or short in the wire between the PGM-FI main relay and the No. 13 FUEL PUMP (SRS UNIT) (15 A) fuse.**
- **Replace the No. 13 FUEL PUMP (SRS UNIT) (15 A) fuse in the under-dash fuse/relay box.**

YES

Check for an open or short in the wire (STS line):

1. Turn the ignition switch to the START (III) position.
   NOTE:
   - M/T: Clutch pedal must be depressed.
   - A/T: Transmission in [N] or [P] position.
2. Measure the voltage between the PGM-FI main relay 7P connector terminal No. 2 and body ground.



(To page 11-126)

(cont'd)

PGM-FI Main Relay (cont'd)

(From page 11-125)

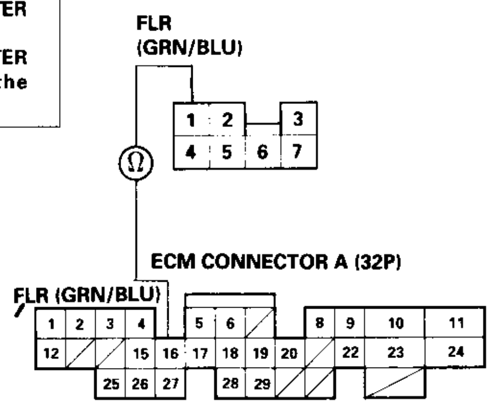
Is there battery voltage?

NO →
- Repair open or short in the wire between the PGM-FI main relay and the No. 31 STARTER SIGNAL (7.5 A) fuse.
- Replace the No. 31 STARTER SIGNAL (7.5 A) fuse in the under-dash fuse/relay box.

YES ↓

Check for an open in the wire (FLR line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector A (32P).
3. Check for continuity between the PGM-FI main relay 7P connector terminal No. 1 and ECM connector terminal A16.

PGM-FI MAIN RELAY 7P CONNECTOR (C443)



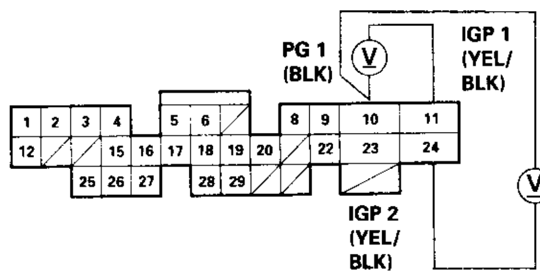
Wire side of female terminals

Is there continuity?

NO → **Repair open in the wire between the ECM (A16) and the PGM-FI main relay.**

YES ↓

Check for an open in the wires (IGP1, IGP2 lines):
1. Reconnect the ECM connector A (32P).
2. Reconnect the PGM-FI main relay 7P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals A10 and A11, and between A10 and A24.

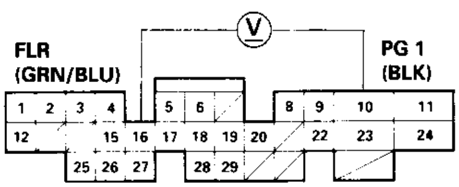


Is there battery voltage?

NO →
- Repair open in the wire between the ECM (A11, A24) and the PGM-FI main relay.
- Replace the PGM-FI main relay.

YES ↓

Check for an open in the ECM:
1. Turn the ignition switch OFF.
2. Measure voltage between ECM connector terminals A16 and A10 when the ignition switch is first turned ON (II) for two seconds.



Is there 1.0 V or less?

NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

YES ↓

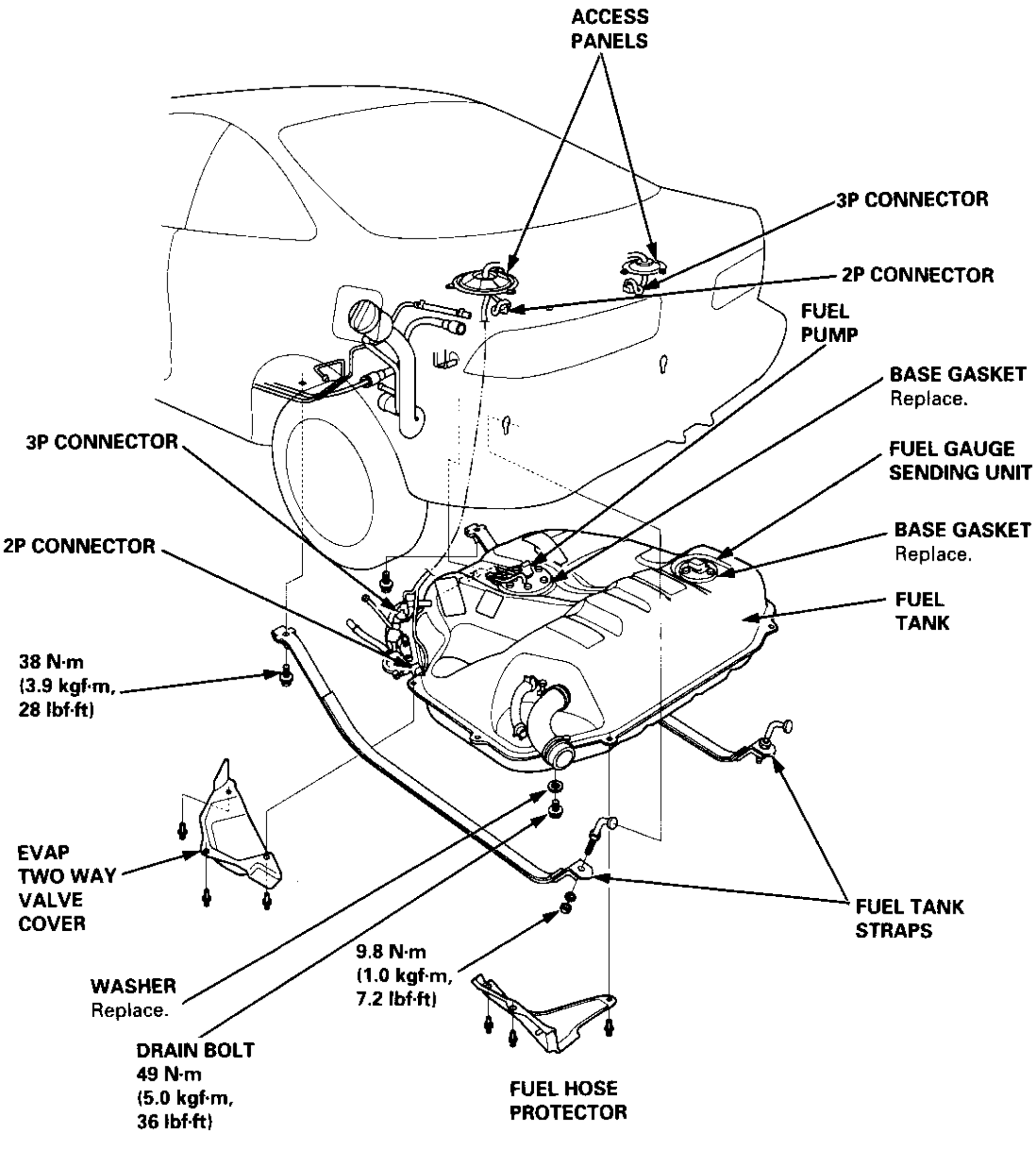
Check the PGM-FI main relay (see page 11-124).

Fuel Tank

Replacement

⚠WARNING Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Relieve the fuel pressure (see page 11-118).
2. Jack up the vehicle, and support it with jackstands.
3. Remove the drain bolt, and drain the fuel into an approved container.
4. Remove the rear seat (Hatchback: Remove the spare tire lid and the protective cover), and access panels, and disconnect the 2P and 3P connectors.
5. Remove the EVAP two way valve cover and fuel hose protector, and disconnect the connectors.
6. Disconnect the hoses (see page 11-105). Slide back the clamps, then twist hoses as you pull, to avoid damaging them.
7. Place a jack, or other support, under the tank.
8. Remove the strap nuts, and let the straps fall free.
9. Remove the fuel tank.
   If it sticks on the undercoat applied to its mount, carefully pry it off the mount.
10. Install the drain bolt with a new washer, then coat the drain bolt with Noxrust 124B. Allow the Noxrust to dry for 20 minutes.
11. Install the remaining parts in the reverse order of removal.

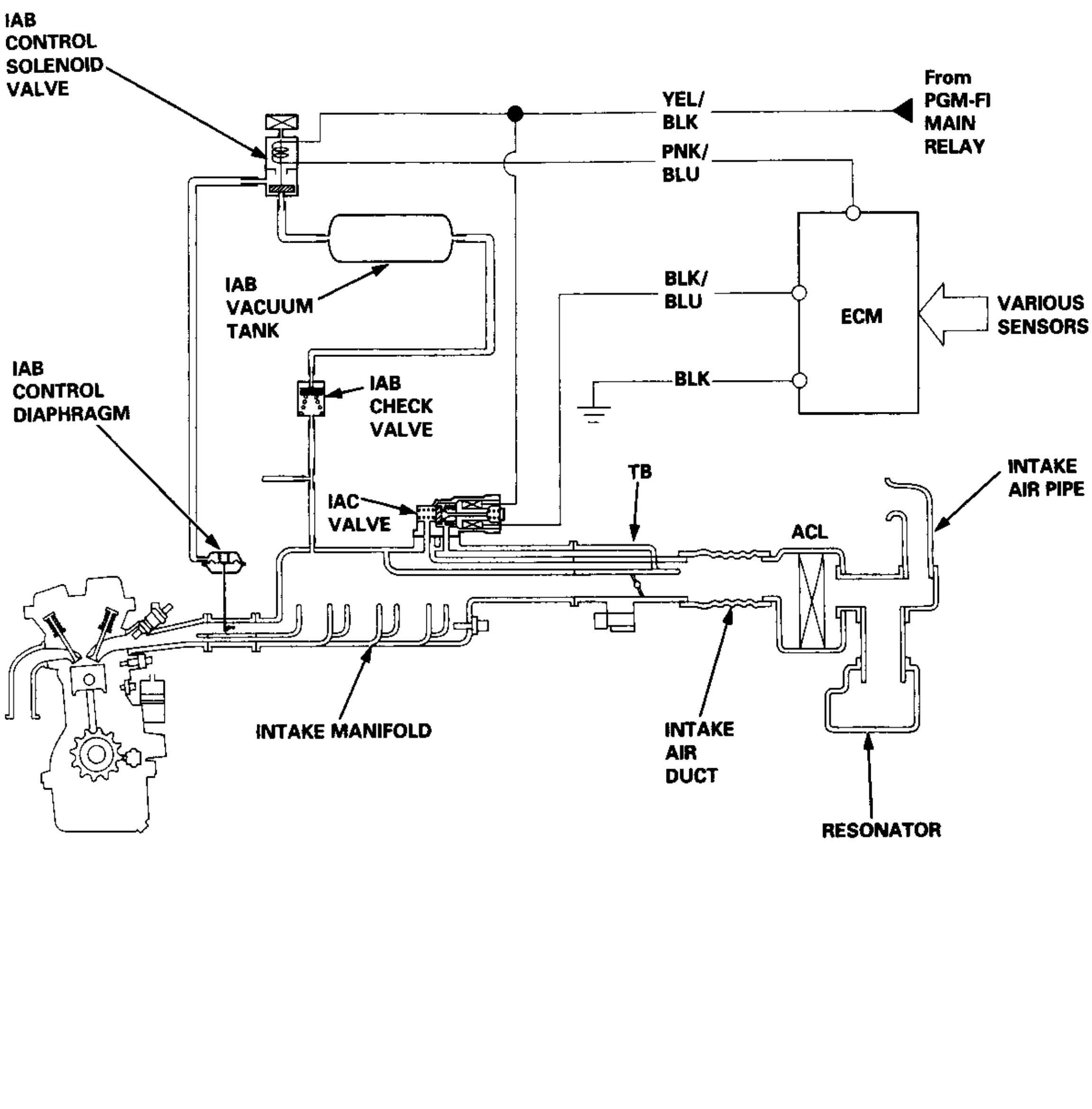


Intake Air System

System Description

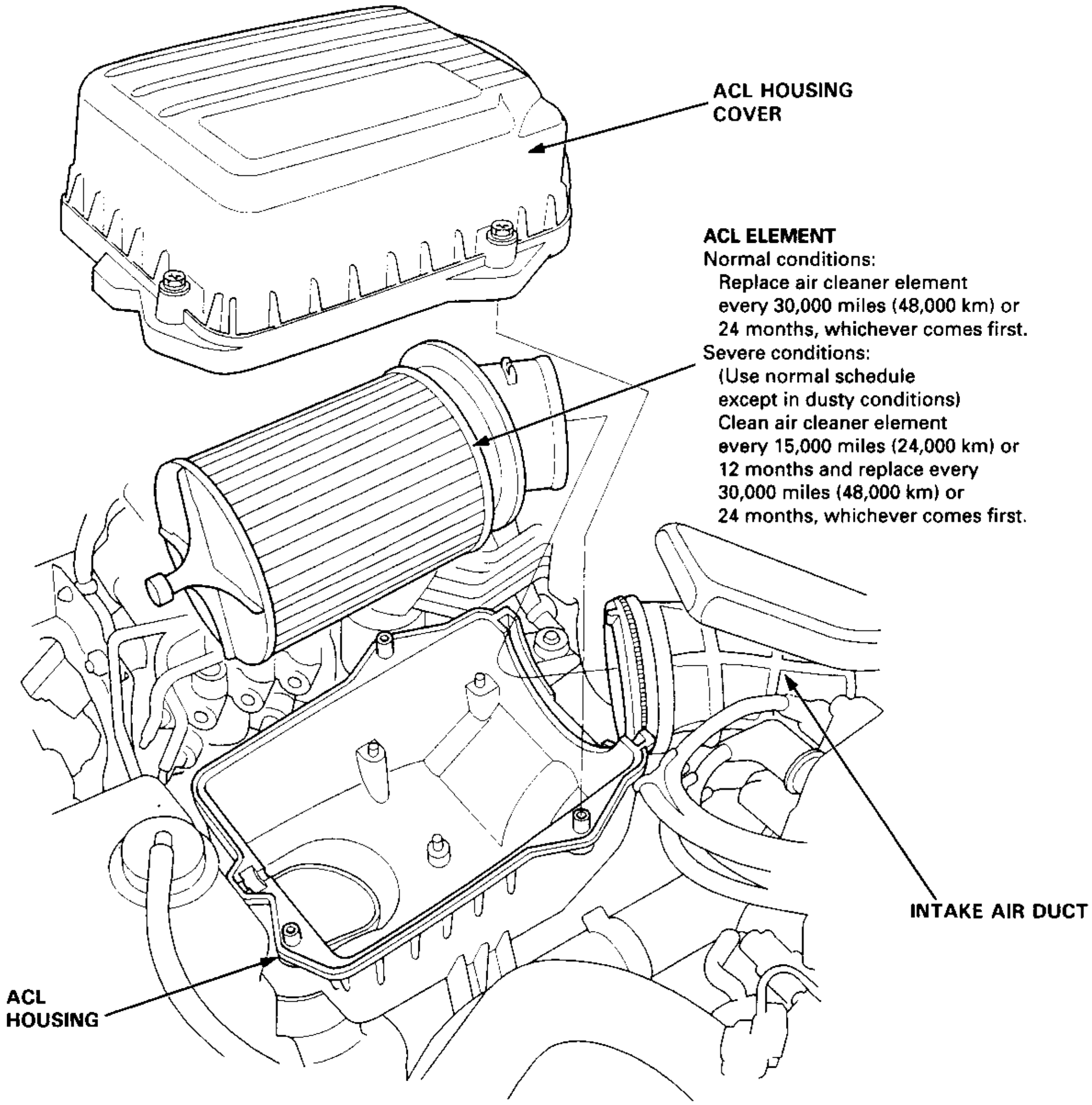
The system supplies air for all engine needs. It consists of the intake air pipe, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) Valve, fast idle thermo valve (A/T model only), and intake manifold.
A resonator in the intake air pipe provides additional silencing as air is drawn into the system.

B18C1 engine (B18B1, B18C5 engines does not have the IAB system):



Air Cleaner (ACL)

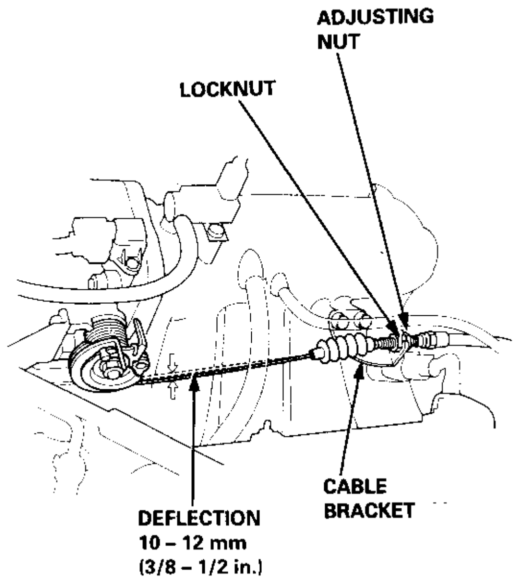
ACL Element Replacement



Throttle Cable [B18B1, B18C5 engines]

Inspection/Adjustment

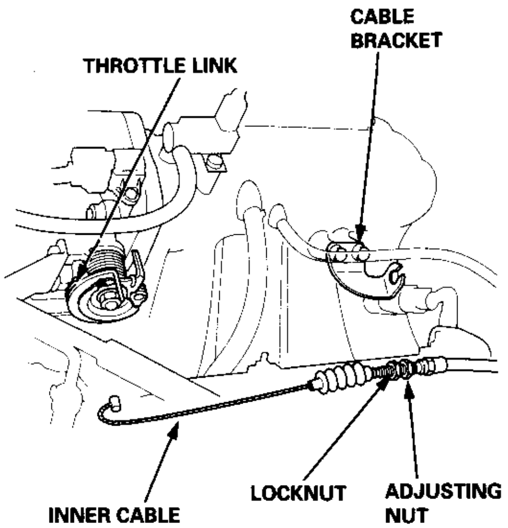
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10 – 12 mm (3/8 – 1/2 in.)



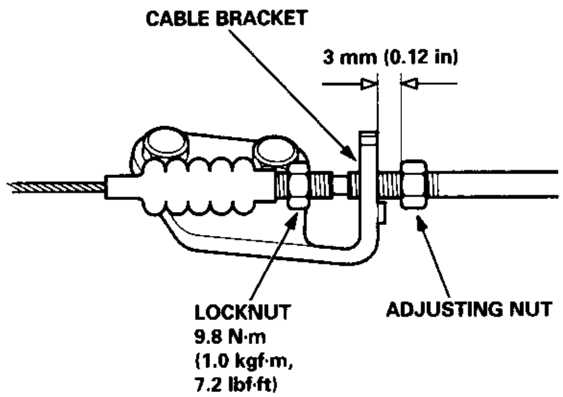
4. If deflection is not within specs, loosen the locknut, turn the adjusting nut until the deflection is as specified, then retighten the locknut.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Installation

1. Open the throttle valve fully, then install the throttle cable in the throttle linkage and install the cable housing in the cable bracket.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.



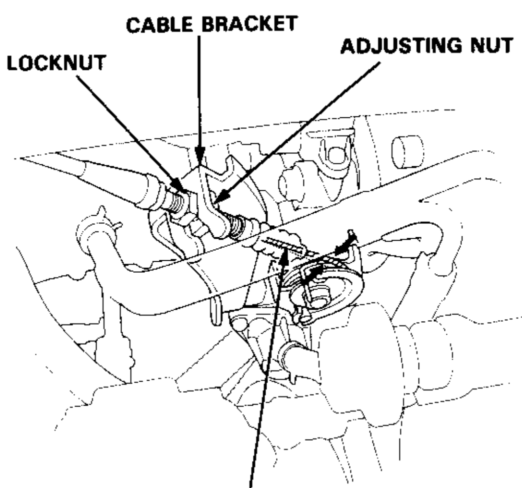
3. Hold the cable sheath, removing all slack from the cable.
4. Turn the adjusting nut until it is 3 mm (1/8 in.) away from the cable bracket.
5. Tighten the locknut. The cable deflection should now be 10 – 12 mm (3/8 – 1/2 in.). If not, see Inspection/ Adjustment.



Throttle Cable [B18C1 engine]

Inspection/Adjustment

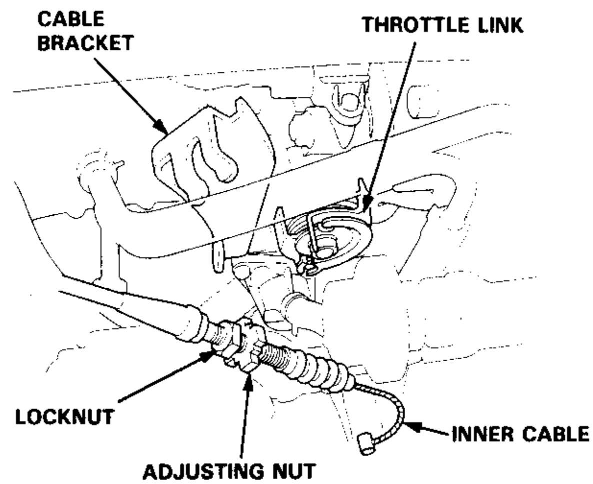
1. Start the engine. Hold the engine at 3,000 rpm with no load in neutral until the radiator fan comes on, then let it idle.
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10 – 12 mm (3/8 – 1/2 in.)



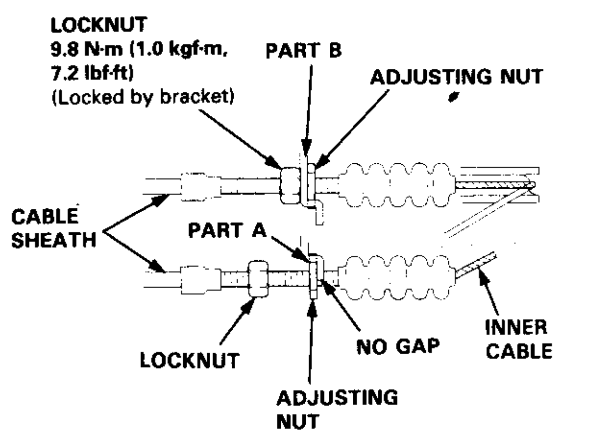
4. If deflection is not within specs, loosen the locknut, turn the adjusting nut until the deflection is as specified, then retighten the locknut.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Installation

1. Open the throttle valve fully, then install the throttle cable in the throttle linkage and install the cable housing in the cable bracket.
2. Start the engine. Hold the engine at 3,000 rpm with no load in neutral until the radiator fan comes on, then let it idle.



3. With part A of the cable bracket, support the cable sheath so that there is no inner wire free play. Turn the adjusting nut until it touches part A, leaving a gap between the locknut and adjusting nut.
4. Move the cable sheath to part B of the cable bracket that so the bracket slides into the gap between the locknut and adjusting nut. Tighten the locknut.

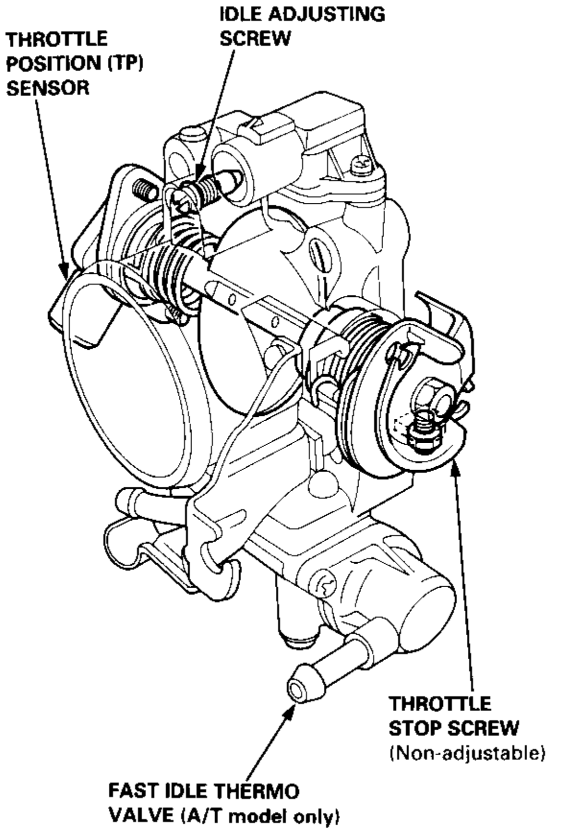


5. The cable deflection should now be 10 – 12 mm (3/8 – 1/2 in.). If not, see Inspection/Adjustment.

Throttle Body

Description

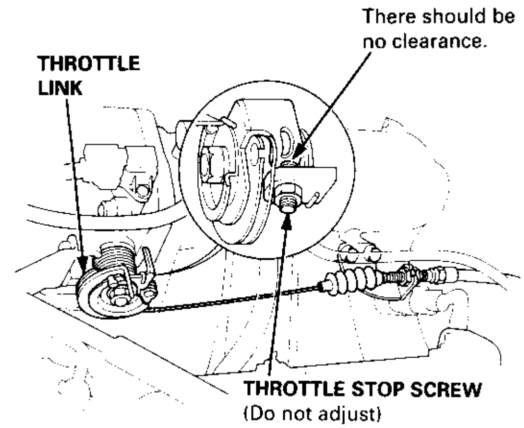
The throttle body is of the single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The idle adjusting screw which increases/decreases bypass air is located on the top of the throttle body.



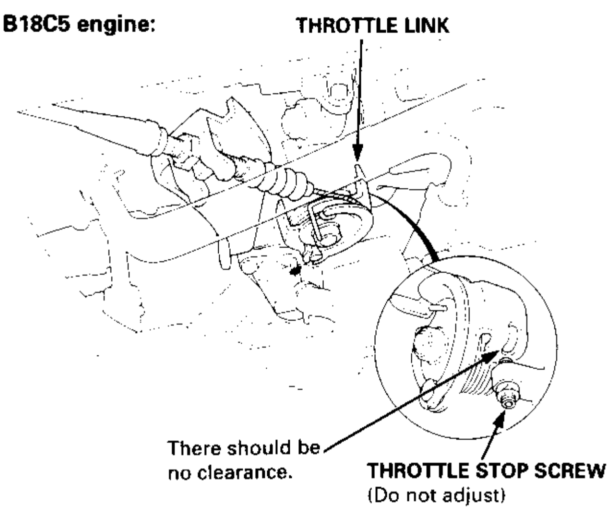
Inspection

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Stop the engine, and check that the throttle cable operates smoothly without binding or sticking.
   - If the throttle body port is clogged, clean it with carburetor cleaner.
   - If there are any abnormalities in the above steps, check for:
     — Excessive wear or play in the throttle valve shaft.
     — Sticky or binding throttle lever at full close position.
     — Clearance between throttle stop screw and throttle lever at full close position.

B18B1, B18C1 engines:

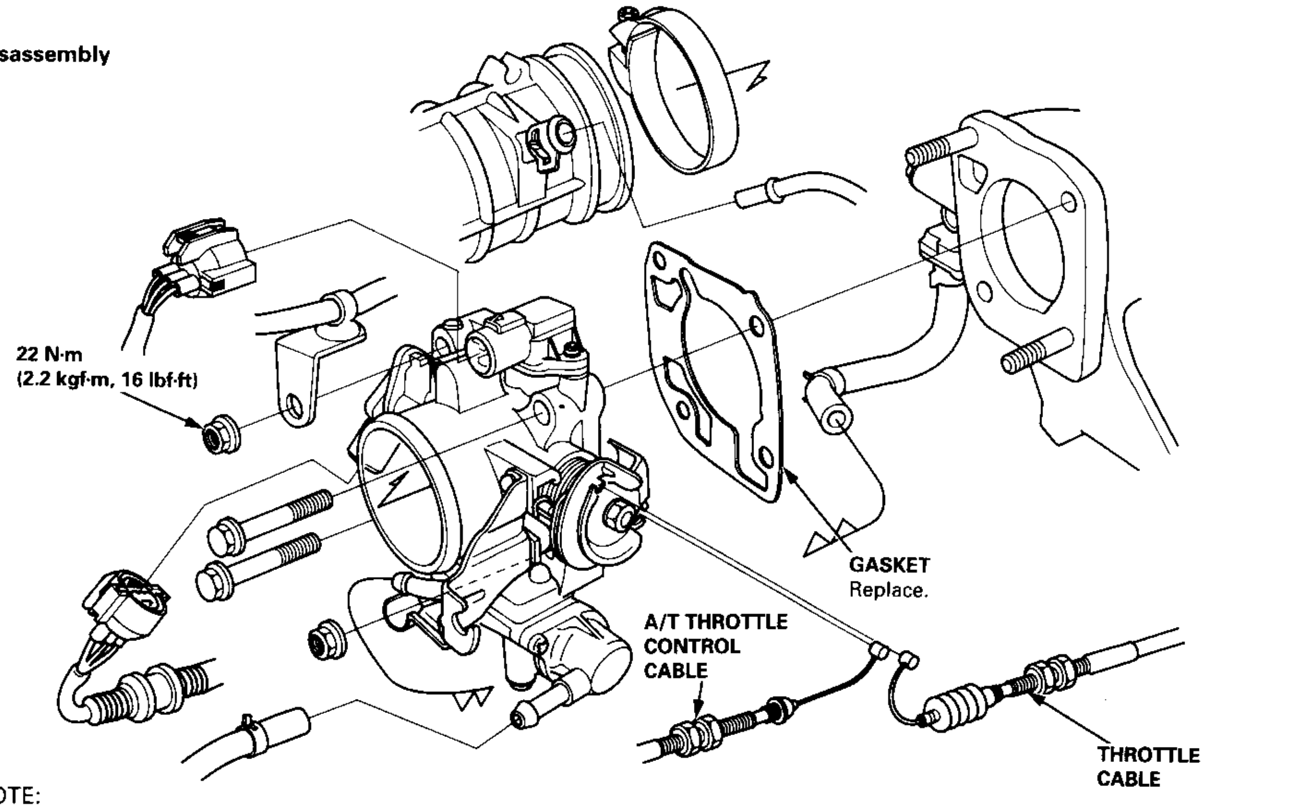


B18C5 engine:



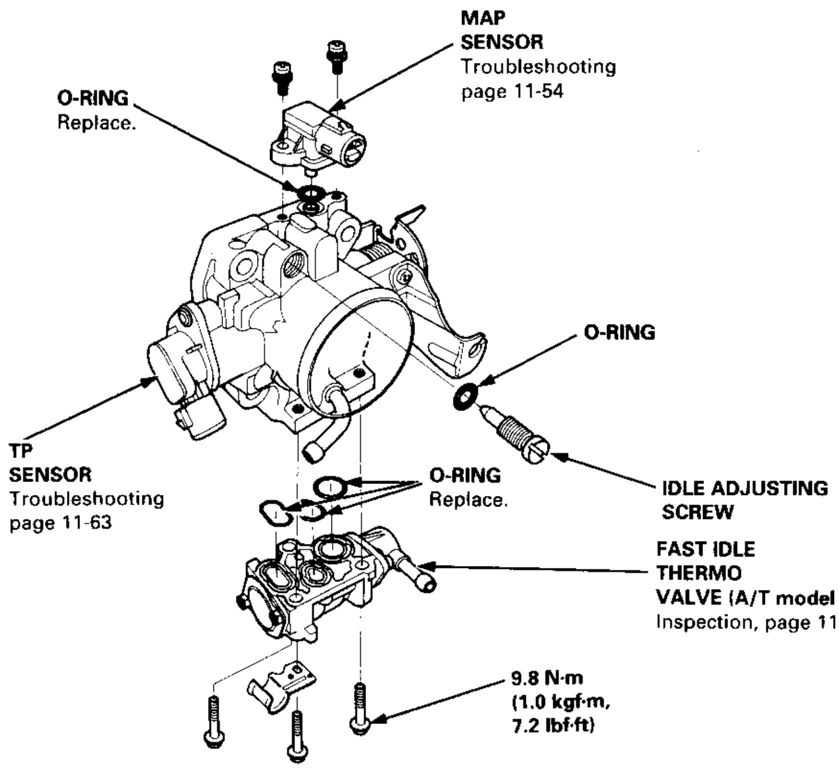
Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

Disassembly



NOTE:

- The throttle stop screw is non-adjustable.
- After reassembly, adjust the throttle cable (page 11-130, 131), and A/T throttle control cable (section 14) for cars with A/T.
- The TP sensor is not removable.

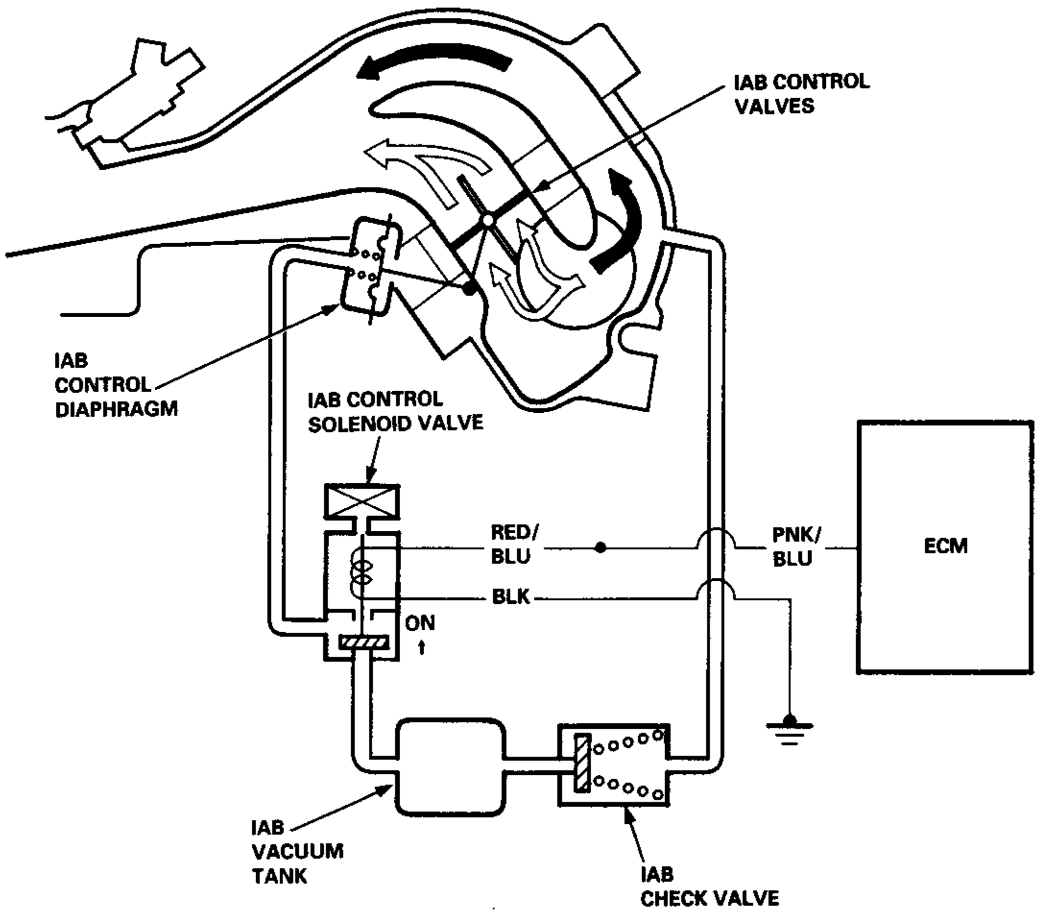


Intake Air System

Intake Air Bypass (IAB) Control System [B18C1 engine]

Description

Two air intake paths are provided in the intake manifold to allow the selection of the intake path most favorable for a given engine speed.
Satisfactory power performance is achieved by closing and opening the intake air bypass (IAB) control valves. High torque at low RPM is acheived when the valves are closed, whereas high power at high RPM is achieved by when the valves are opened.

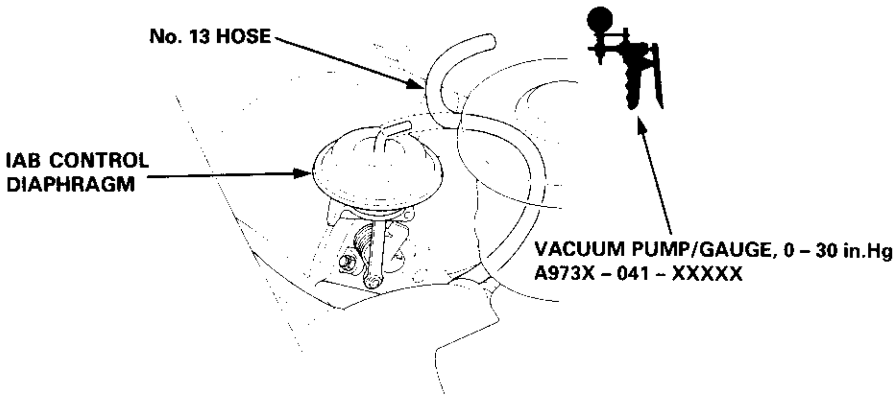


INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE OFF

↑

ENGINE RPM IS ABOVE 5,750 rpm

Troubleshooting



Inspection of IAB Control System.

Check for vacuum at idle:
1. Start the engine and allow it to idle.
2. Remove the vacuum hose from the IAB control diaphragm and connect vacuum gauge to the hose.

Is there vacuum?

- YES → A (To page 11-136)
- NO →

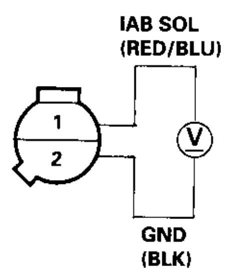
Check for vacuum at IAB vacuum tank:
Remove No. 13 vacuum hose from the IAB vacuum tank, then check for vacuum at the IAB vacuum tank.

Is there vacuum?

- NO → **Repair the blockage or vacuum leak between the IAB vacuum tank and the intake manifold.**
- YES →

Check for an open in the wire (IAB SOL line):
1. Turn the ignition switch OFF.
2. Disconnect the IAB control solenoid valve 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between the IAB control solenoid valve 2P connector terminals No. 1 and No. 2.

IAB CONTROL SOLENOID VALVE 2P CONNECTOR (C134)

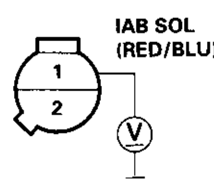


Wire side of female terminals

Is there battery voltage?

- YES → **Replace the IAB control solenoid valve.**
- NO →

Check for an open or short in the wire (IAB SOL line):
Measure voltage between body ground and the IAB control solenoid valve 2P connector terminal No. 1.



B

(To page 11-136)

(cont'd)

Intake Air Bypass (IAB) Control System [B18C1 engine] (cont'd)

(From page 11-135)

A

Check for vacuum at 6,000 rpm:
1. Raise engine speed to above 6,000 rpm.
2. Check for vacuum at the vacuum hose.

Is there vacuum?

YES — Disconnect the IAB control solenoid valve 2P connector.

Is there vacuum?

YES — **Replace the IAB control solenoid valve.**

NO — **Substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.**

NO — **IAB control system is OK.**

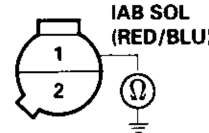
(From page 11-135)

B

Is there battery voltage?

NO —

IAB CONTROL SOLENOID VALVE 2P CONNECTOR (C134)



Wire side of female terminals

Check for a short in the wire (IAB SOL line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector A (32P).
3. Check for continuity between body ground and the IAB control solenoid valve 2P connector terminal No. 1.

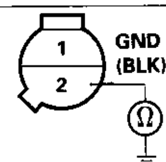
Is there continuity?

YES — **Repair short in the wire between ECM (A26) and the IAB control solenoid valve connector.**

NO — **Repair open in the wire between ECM (A26) and the IAB control solenoid valve 2P connector.**

YES —

Check for an open in the wire (GND line):
1. Turn the ignition switch OFF.
2. Check for continuity between body ground and the IAB control solenoid valve 2P connector terminal No.2.



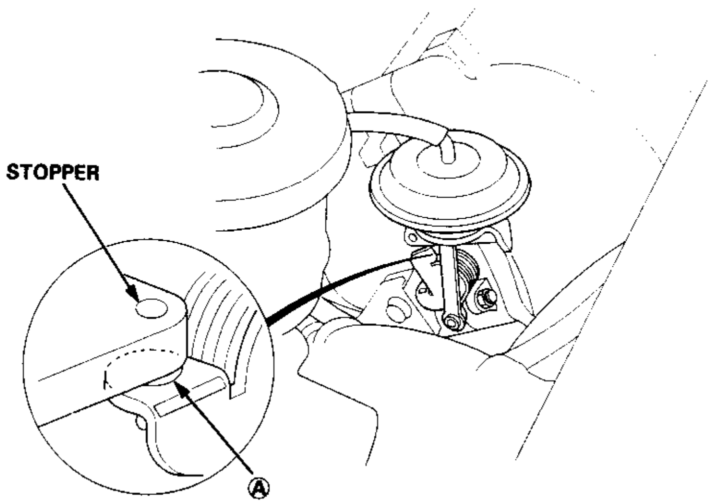
Is there continuity?

NO — **Repair open in the wire between the IAB control solenoid valve 2P connector and G101.**

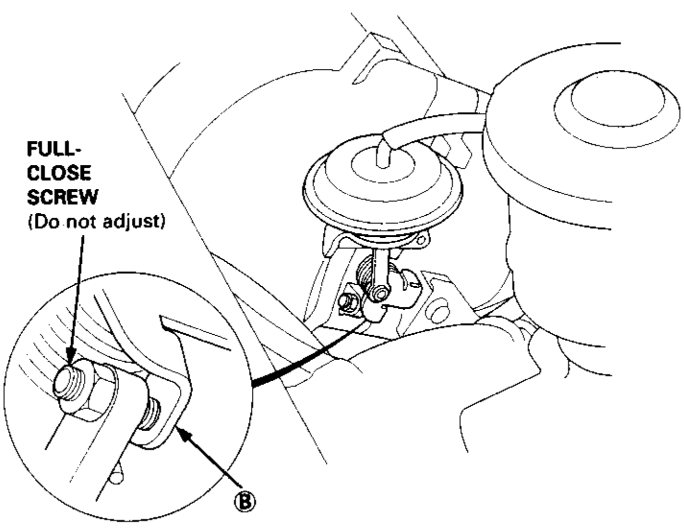
YES — **Substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.**

Testing

1. Check the IAB control valve shaft for binding or sticking.
2. Check the IAB control valve for smooth movement.
3. With the engine at idle, check that Ⓐ of the IAB control valve is in close contact with the stop when vacuum hose is disconnected.



4. With the engine at idle, check that Ⓑ of the IAB control valve is in close contact with the full-close screw when the vacuum hose is connected.



If any fault is found, clean the linkage and shafts with carburetor cleaner. If the problem still exists after cleaning, disassemble the intake manifold and check the IAB valve body assembly.

Emission Control System

System Description

The emission control system includes a Three Way Catalytic Converter (TWC), Positive Crankcase Ventilation (PCV) system and Evaporative Emission (EVAP) Control system. The emission control system is designed to meet federal and state emission standards.

Tailpipe Emission

Inspection

WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Check and adjust the idle speed, if necessary (see page 11-111).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

   NOTE: (Canada) Pull the parking brake lever up. Start the engine, then check that the headlights are off.

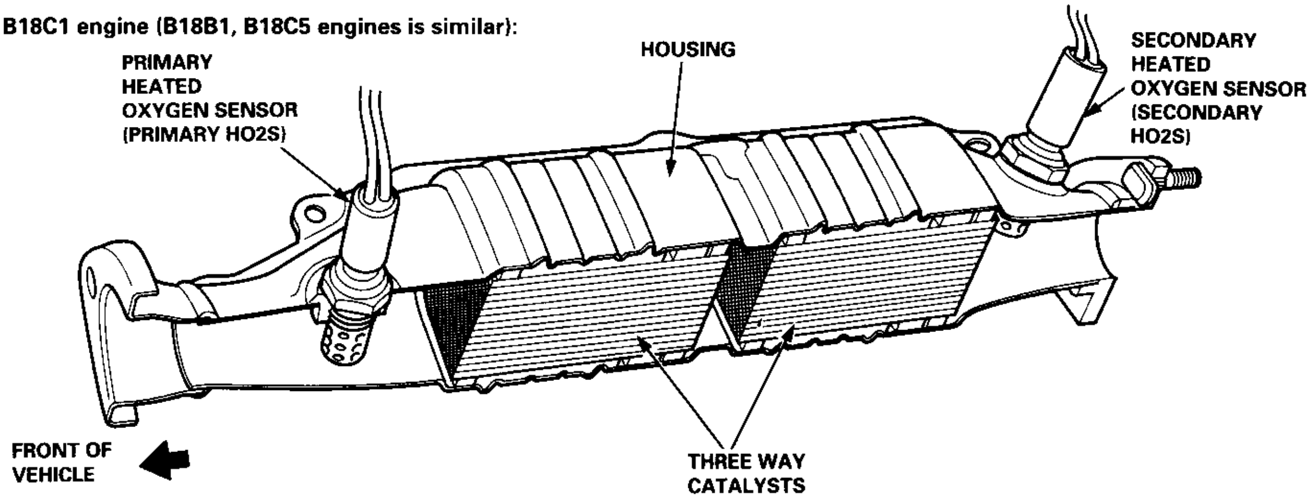
   CO meter should indicate 0.1% maximum.

Three Way Catalytic Converter (TWC)

Description

The Three Way Catalytic Converter (TWC) is used to convert hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas, to carbon dioxide (CO_2), dinitrogen (N_2) and water vapor.

B18C1 engine (B18B1, B18C5 engines is similar):



Three Way Catalytic Converter (TWC)

P0420 The scan tool indicates Diagnostic Trouble Code (DTC) P0420: Catalyst system efficiency below threshold.

Description

This system evaluates the catalyst's capacity by means of the HO2S (Primary and Secondary) output during stable driving conditions. If deterioration has been detected during three consecutive driving cycles, the MIL comes on and DTC P0420 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then troubleshoot DTC P0420.

P0136, P0139: Secondary HO2S
P0141: Secondary HO2S Heater

Possible Cause

- TWC Deterioration
- Exhaust system leakage

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0420 is stored.

Problem verification:

1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Connect the SCS service connector.
4. Test-drive 40 – 55 mph (64 – 88 km/h) for approx. two minutes. Then decelerate for at least 3 seconds with the throttle completely closed. Then reduce the vehicle speed to 35 mph (56 km/h), and try to hold it until the readiness code comes on.

Is DTC P0420 indicated?

NO → **Intermittent failure, system is OK at this time.**

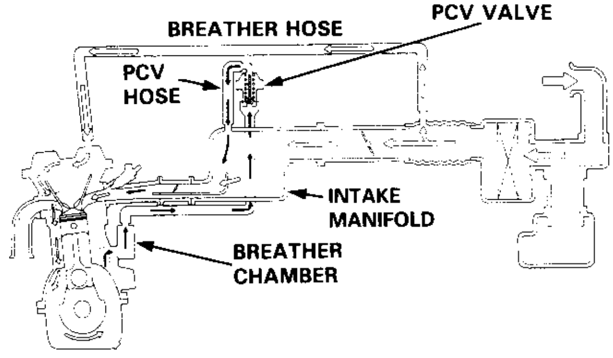
YES → **Check the TWC (see section 9).** If necessary, replace the TWC.

Emission Control System

Positive Crankcase Ventilation (PCV) System

Description

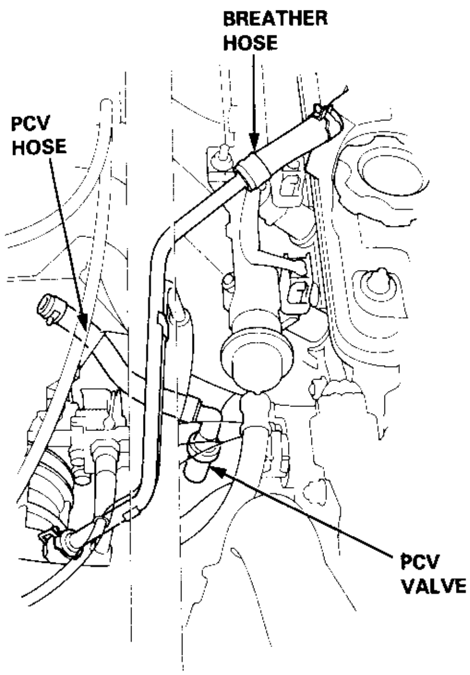
The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.



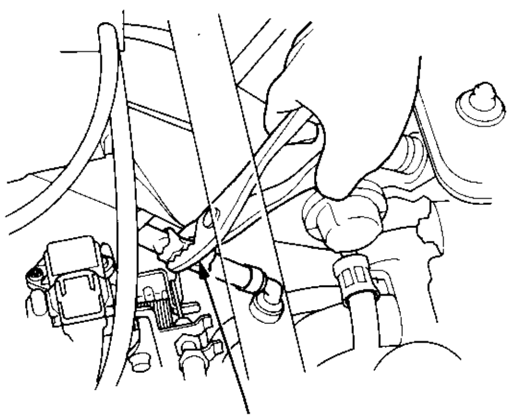
←: BLOW-BY VAPOR
⇦: FRESH AIR

Inspection

1. Check the PCV hoses and connections for leaks and clogging.



2. At idle, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold in lightly pinched with your fingers or pliers.



If there is no clicking sound, check the PCV valve grommet for cracks and damage. If the grommet is OK, replace the PCV valve and recheck.

Evaporative Emission (EVAP) Controls

Description

The evaporative emission controls are designed to minimize the amount of fuel vapor escaping to the atmosphere. The system consists of the following components:

A. **Evaporative Emission (EVAP) Control Canister**
An EVAP control canister is used for the temporary storage of fuel vapor until the fuel vapor can be purged from the EVAP control canister into the engine and burned.

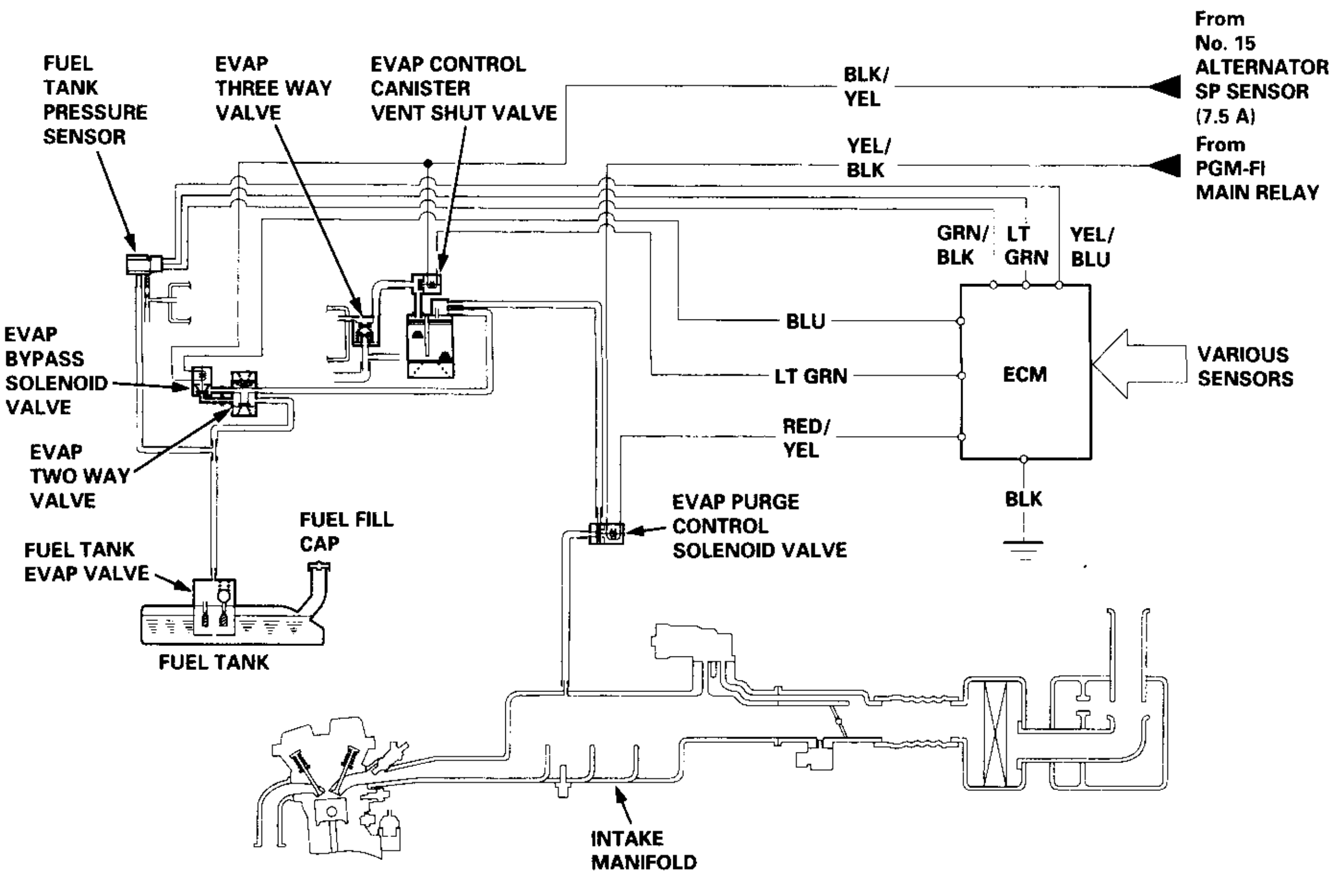
B. **Vapor Purge Control System**
EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the intake manifold. The purging vacuum is controlled by the EVAP purge control solenoid valve.

EVAP PURGE CONTROL SOLENOID VALVE DUTY CONTROLLED AFTER STARTING ENGINE

↑

ENGINE COOLANT TEMPERATURE ABOVE 154°F (68°C)

C. **Fuel Tank Vapor Control System**
When fuel vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP control canister.



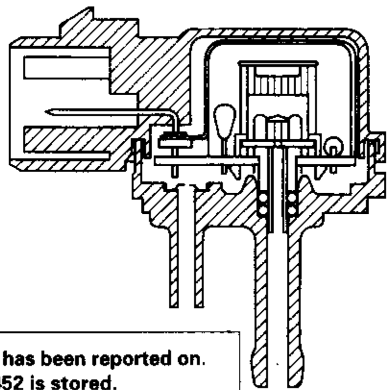
(cont'd)

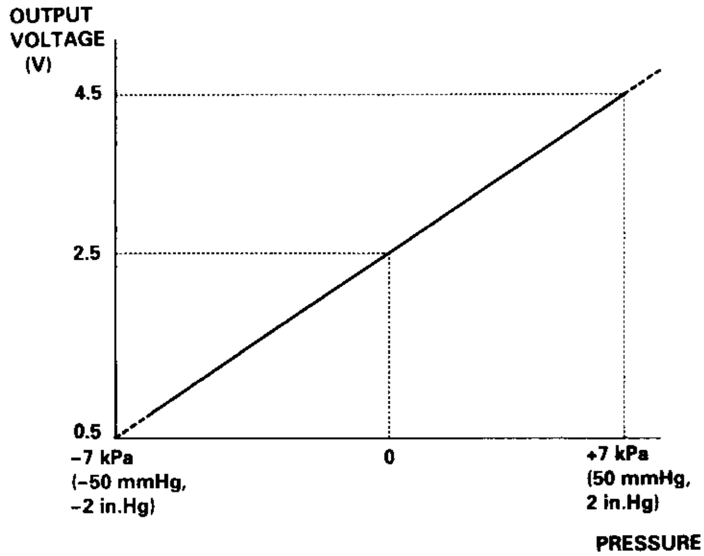
Evaporative Emission (EVAP) Controls (cont'd)

Fuel Tank Pressure Sensor

P0452 The scan tool indicates Diagnostic Trouble Code (DTC) P0452: A low voltage problem in the Fuel Tank Pressure sensor.

The fuel tank pressure sensor converts fuel tank absolute pressure into electrical signals and inputs the ECM.





— The MIL has been reported on.
— DTC P0452 is stored.

Check the vacuum lines:
Check the vacuum lines of the fuel tank pressure sensor for misrouting, leakage, breakage and clogging.

Are the vacuum lines OK?

NO → **Repair or replace vacuum lines as necessary.**

YES ↓

Problem verification:
1. Do the ECM Reset Procedure.
2. Remove the fuel fill cap.
3. Turn the ignition switch ON (II).
4. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and ECM connector terminal D15.

Is there approx. 2.5 V?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C421 (located above under-dash fuse/relay box), C510 (located under access panel), C792 (fuel tank pressure sensor) and ECM.**

NO ↓

Check for an open in wire (VCC2 line):
1. Turn the ignition switch OFF.
2. Reinstall the fuel fill cap.
3. Disconnect the fuel tank pressure sensor 3P connector.
4. Turn the ignition switch ON (II).
5. Measure voltage between the fuel tank pressure sensor 3P connector terminals No. 1 and No. 2.

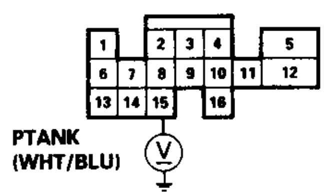
Is there approx. 5 V?

NO → **Repair open in the wire between the fuel tank pressure sensor and the ECM (D10).**

YES ↓

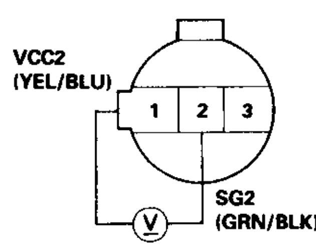
(To page 11-143)

ECM CONNECTOR D (16P)



Wire side of female terminals

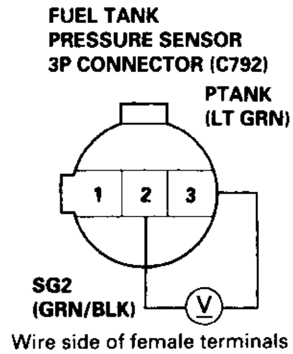
FUEL TANK PRESSURE SENSOR 3P CONNECTOR (C792)



Wire side of female terminals

(From page 11-142)

Check for a short in the wire (PTANK line):
Measure voltage between the fuel tank pressure sensor 3P connector terminals No. 2 and No. 3.

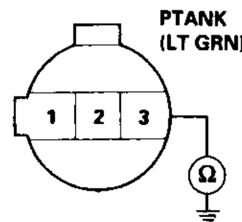


Is there approx. 5 V?

YES → **Replace the fuel tank pressure sensor.**

NO ↓

Check for a short in the wire (PTANK line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM connector D (16P).
3. Check for continuity between the fuel tank pressure sensor 3P connector terminal No. 3 and body ground.



Is there continuity?

YES → **Repair short in the wire between the fuel tank pressure sensor and ECM (D15).**

NO ↓

Substitute a known-good ECM and recheck. If normal fuel tank pressure sensor is indicated, replace the original ECM.

(cont'd)

Emission Control System

Evaporative Emission (EVAP) Controls (cont'd)

Fuel Tank Pressure Sensor

P0453 The scan tool indicates Diagnostic Trouble Code (DTC) P0453: A high voltage problem in the Fuel Tank Pressure sensor.

— The MIL has been reported on.
— DTC P0453 is stored.

Check the vacuum lines:
Check the vacuum lines of the fuel tank pressure sensor for misrouting, leakage, breakage and clogging.

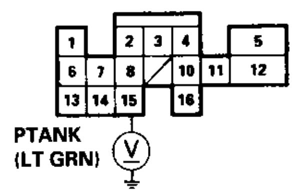
Are the vacuum lines OK?

NO → **Repair or replace vacuum lines as necessary.**

YES ↓

Problem verification:
1. Do the ECM Reset Procedure.
2. Remove the fuel fill cap.
3. Turn the ignition switch ON (II).
4. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and ECM connector terminal D15.

ECM CONNECTOR D (16P)



Wire side of female terminals

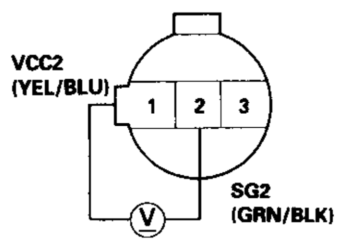
Is there approx. 2.5 V?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C421 (located above under-dash fuse/relay box), C510 (located under access panel), C792 (fuel tank pressure sensor) and ECM.**

NO ↓

Check for an open in the wire (SG2 line):
1. Turn the ignition switch OFF.
2. Reinstall the fuel fill cap.
3. Disconnect the fuel tank pressure sensor 3P connector.
4. Turn the ignition switch ON (II).
5. Measure voltage between the fuel tank pressure sensor 3P connector terminals No. 1 and No. 2.

FUEL TANK PRESSURE SENSOR 3P CONNECTOR (C792)



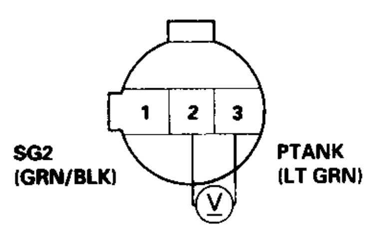
Wire side of female terminals

Is there approx. 5 V?

NO → **Repair open in the wire between the fuel tank pressure sensor and ECM (D11).**

YES ↓

Check for a short in the wire (PTANK line):
Measure voltage between the fuel tank pressure sensor 3P connector terminals No. 2 and No. 3.



(To page 11-145)

(From page 11-144)

Is there approx. 5 V?

YES → **Replace the fuel tank pressure sensor.**

NO ↓

Check for an open in the wire (PTANK line):
Measure voltage between ECM connector terminals D15 and D11.

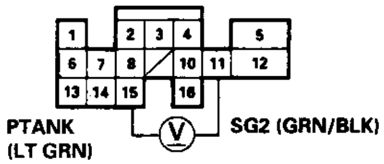
Is there approx. 5 V?

YES → **Repair open in the wire between the fuel tank pressure sensor and the ECM (D15).**

NO ↓

Substitute a known-good ECM and recheck. If normal fuel tank pressure sensor is indicated, replace the original ECM.

ECM CONNECTOR D (16P)



Wire side of female terminals

(cont'd)

Emission Control System

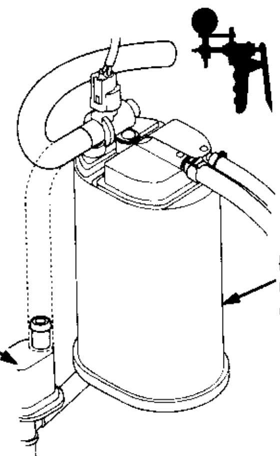
Evaporative Emission (EVAP) Controls (cont'd)

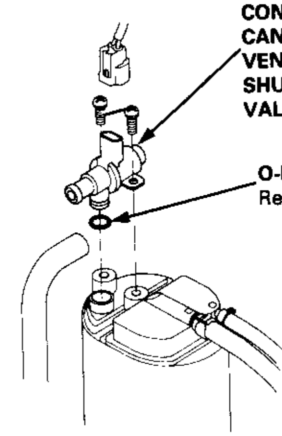
P1456 The scan tool indicates Diagnostic Trouble Code (DTC) P1456: Evaporative Emission (EVAP) control system leak detected (fuel tank system).

P1457 The scan tool indicates Diagnostic Trouble Code (DTC) P1457: Evaporative Emission (EVAP) control system leak detected (EVAP control canister system).

Possible Cause

- Fuel fill cap
- Vacuum Connections
- Fuel Tank
- EVAP Control Canister Vent Shut Valve
- EVAP Control Canister Vent Shut Valve Circuit
- EVAP Purge Control Solenoid Valve
- EVAP Purge Control Solenoid Valve Circuit
- EVAP Bypass Solenoid Valve
- EVAP Bypass Solenoid Valve Circuit
- Fuel Tank Pressure Sensor
- Fuel Tank Pressure Sensor Circuit
- EVAP Control Canister
- Throttle Body





Troubleshooting Flowchart

- **The MIL has been reported on.**
- **DTC P1456 or P1457 is stored.**

Check the EVAP control canister vent shut valve:

1. Disconnect the vacuum hose from the EVAP three way valve and connect a vacuum pump to the hose.
2. Remove the EVAP control canister vent shut valve from the canister.
3. Turn the ignition switch ON (II).
4. Apply vacuum to the hose.

Does the valve hold vacuum?

YES →

Check for a short in the wire (VSV line):
Disconnect the 2P connector from the EVAP control canister vent shut valve.

Does the valve hold vacuum?

NO → **Repair short in the wire between the EVAP control canister vent shut valve and the ECM (A29).**

YES → **Replace the EVAP control canister vent shut valve.**

NO (from first "Does the valve hold vacuum?") →

Check the EVAP control canister vent shut valve:

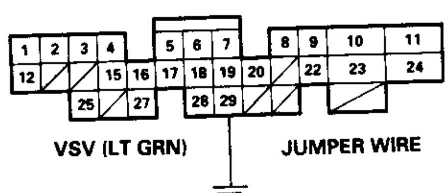
1. Turn the ignition switch OFF.
2. Connect ECM connector terminal A29 to body ground with a jumper wire.
3. Turn the ignition switch ON (II).
4. Apply vacuum to the hose.

Does the valve hold vacuum?

YES → A (To page 11-147)

NO → B (To page 11-147)

ECM CONNECTOR A (32P)



Wire side of female terminals

(From page 11-146)

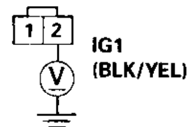
A

(From page 11-146)

B

Check for an open in the wire (IG1 line):
1. Turn the ignition switch OFF.
2. Disconnect the 2P connector from the EVAP control canister vent shut valve.
3. Turn the ignition switch ON (II).
4. Measure voltage between the EVAP control canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CONTROL CANISTER VENT SHUT VALVE 2P CONNECTOR (C224)



Wire side of female terminals

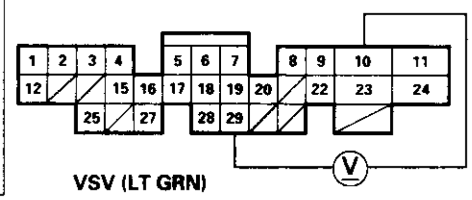
Is there battery voltage?

NO → **Repair open in the wire between the EVAP control canister vent shut valve and the No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse.**

YES

Check for an open in the wire (VSV line):
1. Turn the ignition switch OFF.
2. Reconnect the 2P connector to the EVAP control canister vent shut valve.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals A29 and A10.

ECM CONNECTOR A (32P)



Wire side of female terminals

Is there battery voltage?

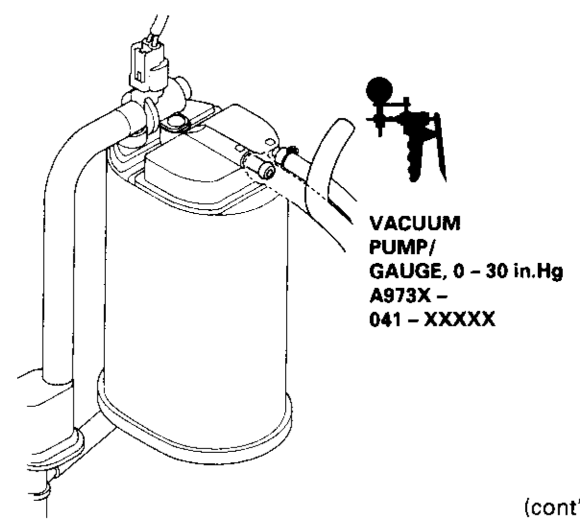
NO → **Repair open in the wire between the EVAP control canister vent shut valve and the ECM (A29).**

YES

Replace the EVAP control canister vent shut valve.

Check the vacuum when cold:
1. Disconnect the vacuum hose shown from the EVAP control canister and connect a vacuum gauge to the hose.
2. Start the engine and allow it to idle.
   NOTE: Engine coolant temperature must be below 154°F (68°C) or A/C switch OFF.
3. Quickly raise the engine speed to 3,000 rpm.

(To page 11-148)



(cont'd)

Emission Control System

Evaporative Emission (EVAP) Controls (cont'd)

(From page 11-147)

Is there vacuum?

YES →

Check the EVAP purge control solenoid valve:
1. Disconnect the 2P connector from the EVAP purge control solenoid valve.
2. Quickly raise the engine speed to 3,000 rpm.

Is there vacuum?

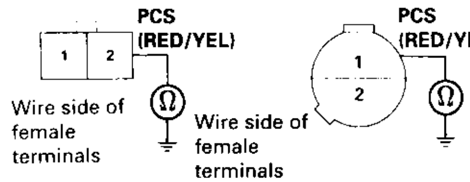
YES → **Inspect vacuum hose routing. If OK, replace the EVAP purge control solenoid valve.**

NO ↓

Check for a short in the wire (PCS line):
1. Turn the ignition switch OFF.
2. Disconnect ECM connector A (32P).
3. Check for continuity between the EVAP purge control solenoid valve 2P connector terminal No. 2 (B18C5 engine: No. 1) and body ground.

EVAP PURGE CONTROL SOLENOID VALVE 2P CONNECTOR (C114)

B18C1, C18B1 engines: **B18C5 engine:**



Is there continuity?

YES → **Repair short in the wire between the EVAP purge control solenoid valve and the ECM (A15).**

NO ↓

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

(From "Is there vacuum?" above) NO ↓

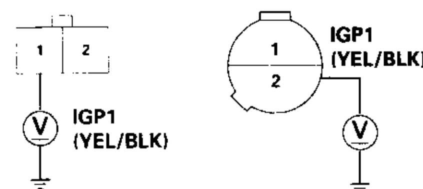
Check the vacuum when hot:
1. Turn the ignition switch OFF.
2. Block the rear wheels and set the parking brake.
3. Jack up the front of the vehicle and support it with safety stands.
4. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Check for vacuum at the vacuum hose with transmission in gear (A/T in [2] position, M/T in 1 st gear) after starting the engine.
6. Quickly raise the engine speed to 3,000 rpm.

Is there vacuum?

YES ↓ (To A)

NO →

Check for an open in the wire (IG1 line):
1. Turn the ignition switch OFF.
2. Disconnect the 2P connector from the EVAP purge control solenoid valve.
3. Turn the ignition switch ON (II).
4. At the harness side, measure voltage between the EVAP purge control solenoid valve 2P connector terminal No. 1 (B18C5 engine: No. 2) and body ground.



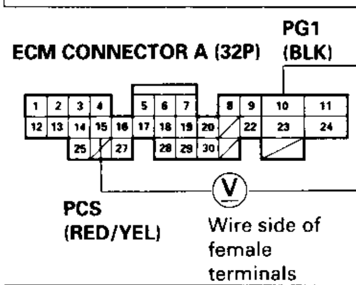
Is there battery voltage?

NO → **Repair open in the wire between EVAP purge control solenoid valve and PGM-FI main relay fuse.**

YES ↓

Check for an open in the wire (PCS line):
1. Turn the ignition switch OFF.
2. Reconnect the 2P connector to the EVAP purge control solenoid valve.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals A15 and A10.

ECM CONNECTOR A (32P)



Is there battery voltage?

NO → **Repair open in the wire between the EVAP purge control solenoid valve and the ECM (A15).**

YES ↓

A (To page 11-149)

B (To page 11-149)

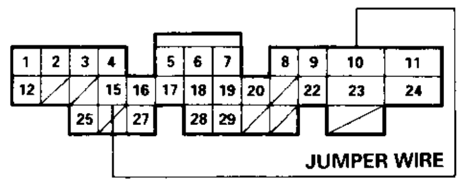
(From page 11-148)

A

(From page 11-148)

B

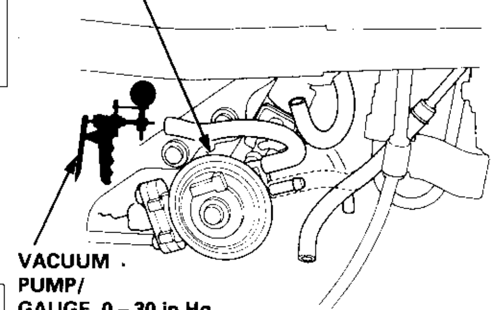
Check the EVAP purge control solenoid valve:
1. Turn the ignition switch OFF.
2. Connect the ECM connector terminals A15 and A10 with a jumper wire.
3. Start the engine and check for vacuum at the vacuum hose.



Is there vacuum?

NO → **Inspect vacuum hose routing. If OK, replace EVAP purge control solenoid valve.**

YES → **Substitute a known-good ECM and retest. If symptom/indication goes away, replace the original ECM.**



(From A)

Check the EVAP two way valve: See EVAP two way valve test (see page 11-151).

Is it OK?

NO → **Replace the EVAP two way valve.**

YES ↓

Check the EVAP bypass solenoid valve:
1. Disconnect the vacuum hose from the EVAP two way valve and connect a vacuum pump to the hose.
2. Turn the ignition switch ON (II).
3. Apply vacuum to the hose.

Does valve hold vacuum?

NO → **Check for a short in the wire (2WBS line):** Disconnect the 2P connector from the EVAP bypass solenoid valve.

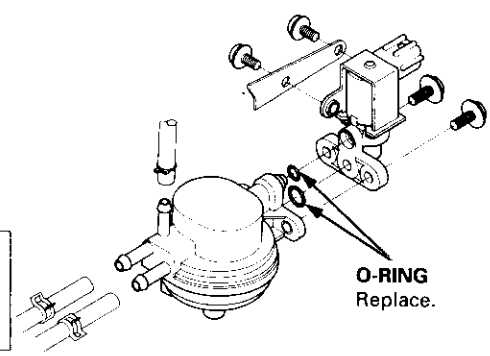
Does valve hold vacuum?

YES → **Repair short in the wire between EVAP bypass solenoid valve and the ECM (A28).**

NO → **Replace the EVAP bypass solenoid valve.**

YES ↓

(To page 11-150)



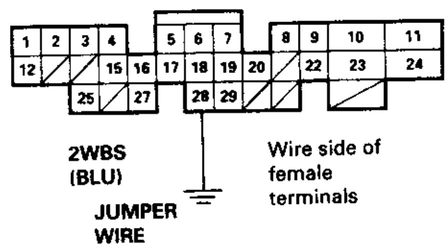
(cont'd)

Evaporative Emission Controls (cont'd)

(From page 11-149)

Check the EVAP bypass solenoid valve:
1. Turn the ignition switch OFF.
2. Connect ECM connector terminal A28 and body ground with a jumper wire.
3. Turn the ignition switch ON (II).

ECM CONNECTOR A (32P)

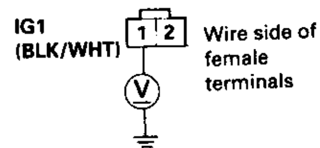


Does valve hold vacuum?

YES →

Check for an open in the wire (IG1 line):
1. Turn the ignition switch OFF.
2. Disconnect the 2P connector from the EVAP bypass solenoid valve.
3. Turn the ignition switch ON (II).
4. Measure voltage between the EVAP bypass solenoid valve 2P connector terminal No. 1 and body ground.

EVAP BYPASS SOLENOID VALVE 2P CONNECTOR (C793)



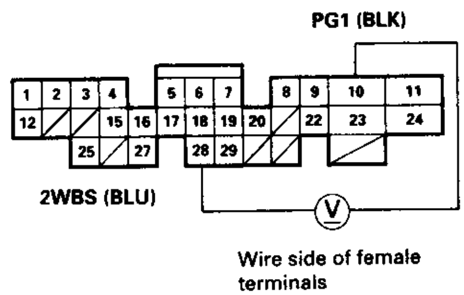
Is there battery voltage?

NO → **Repair open in the wire between EVAP purge control solenoid valve and the No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse.**

YES ↓

Check for an open in the wire (2WBS line):
1. Turn the ignition switch OFF.
2. Reconnect the 2P connector to the EVAP bypass solenoid valve.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM connector terminals A28 and A10.

ECM CONNECTOR A (32P)



Is there battery voltage?

NO → **Repair open in the wire between the EVAP bypass solenoid valve and the ECM (A28).**

YES ↓

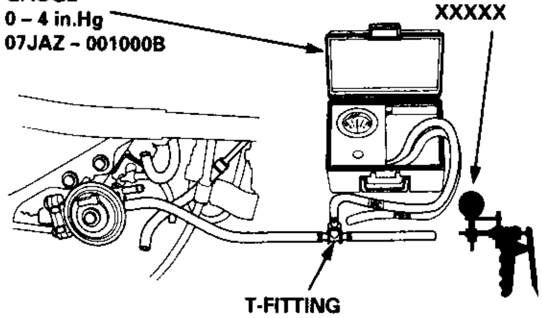
Replace the EVAP bypass solenoid valve.

NO (Does valve hold vacuum?) ↓

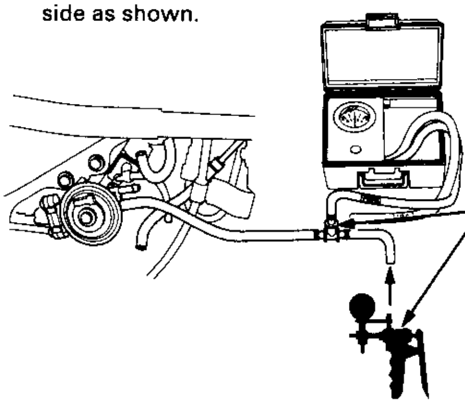
Check the following parts for leakage to atmosphere, and repair or replace if necessary:
- fuel fill cap
- fuel tank
- fuel vapor pipe
- EVAP two way valve
- EVAP bypass solenoid valve
- fuel tank pressure sensor
- EVAP control canister
- EVAP control canister vent shut valve
- EVAP purge control solenoid valve
- vacuum hoses and connections

Evaporative Emission (EVAP) Two Way Valve Testing

1. Remove the fuel fill cap.
2. Remove the vapor line from the EVAP two way valve, and connect it to a T-fitting from a vacuum gauge and a vacuum pump as shown.



3. Apply vacuum slowly and continuously while watching the gauge. The vacuum should stabilize momentarily at 0.8 – 2.1 kPa (6 – 16 mmHg, 0.2 – 0.6 in.Hg). If the vacuum stabilizes (valve opens) below 0.8 kPa (6 mmHg, 0.2 in.Hg) or above 2.1 kPa (16 mmHg, 0.6 in.Hg), install a new valve and retest.
4. Move the vacuum pump hose from the vacuum fitting to the pressure fitting, and move the vacuum gauge hose from the vacuum side to the pressure side as shown.



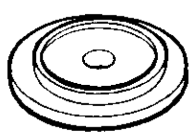
5. Slowly pressurize the vapor line while watching the gauge. The pressure should be stabilize momentarily above 1.0 kPa (8 mmHg, 0.3 in.Hg).
   - If the pressure momentarily stabilizes (valve opens) above 1.0 kPa (8 mmHg, 0.3 in.Hg), the valve is OK.
   - If the pressure stabilizes below 1.0 kPa (8 mmHg, 0.3 in.Hg), install a new valve and retest.

Transaxle

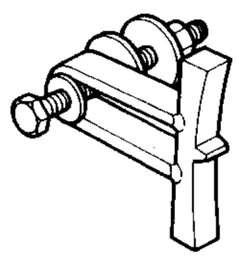
Clutch

Special Tools

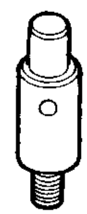
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAF−PM7011A	Clutch Alignment Disc	1	12-7
②	07LAB-PV00100 or 07924-PD20003	Ring Gear Holder	1	12-7, 8, 9, 10
③	07NAF-PR30100	Clutch Alignment Shaft	1	12-7, 8, 10
④	07746-0010100	Attachment, 32 x 35 mm	1	12-10
⑤	07749-0010000	Driver	1	12-10
⑥	07936-3710100	Handle	1	12-7, 8, 10



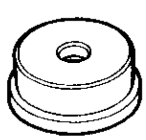
①



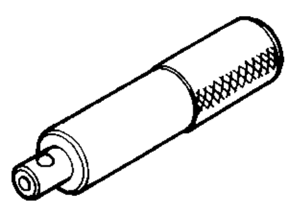
②



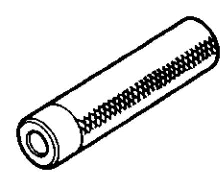
③



④

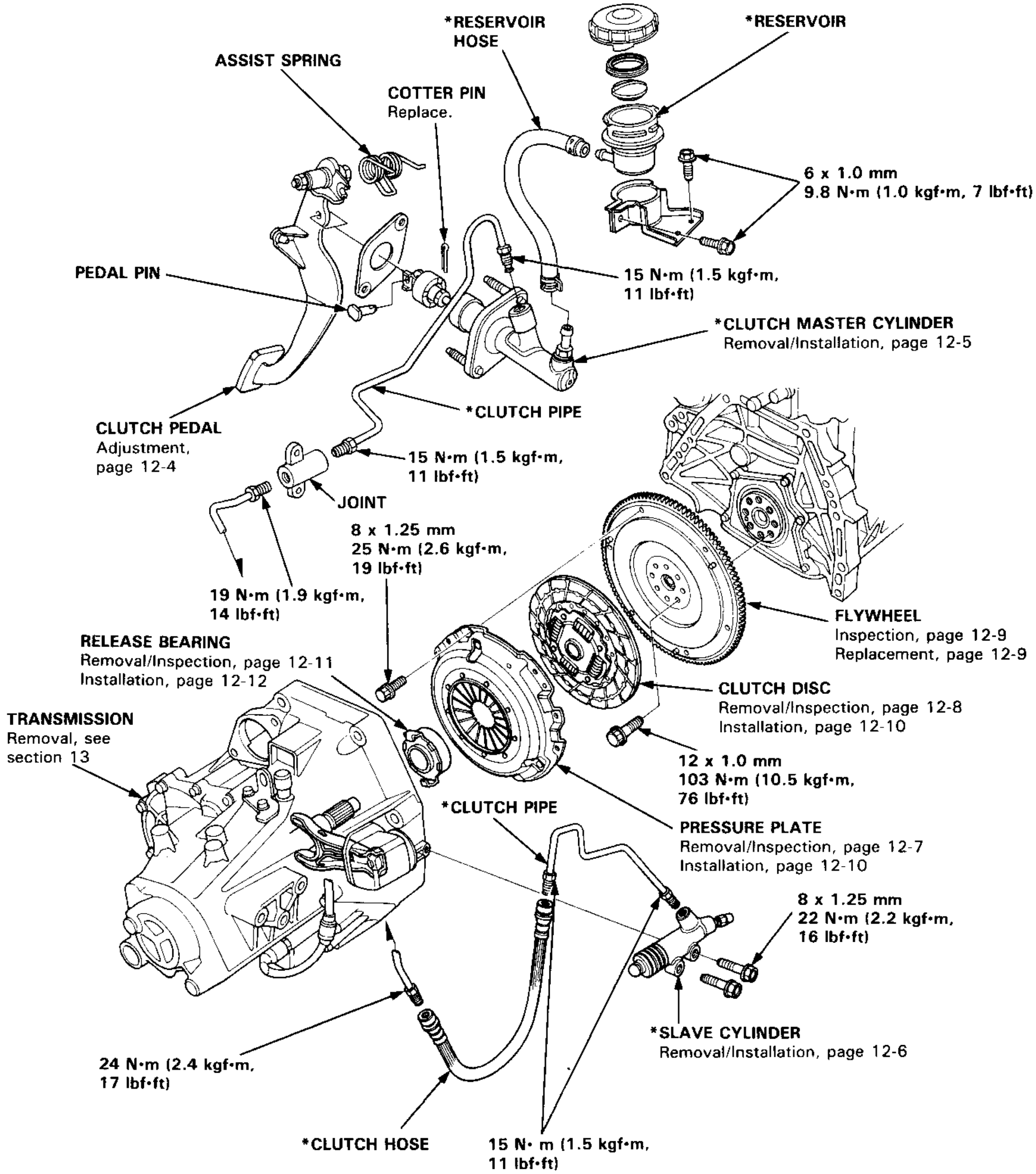


⑤



⑥

NOTE:
- Whenever the transmission is removed, clean and grease the release bearing sliding surface.
- If the parts marked with an asterisk (*) are removed, the clutch hydraulic system must be bled (see page 12-6).
- Inspect the hoses for damage, leaks, interference, and twisting.



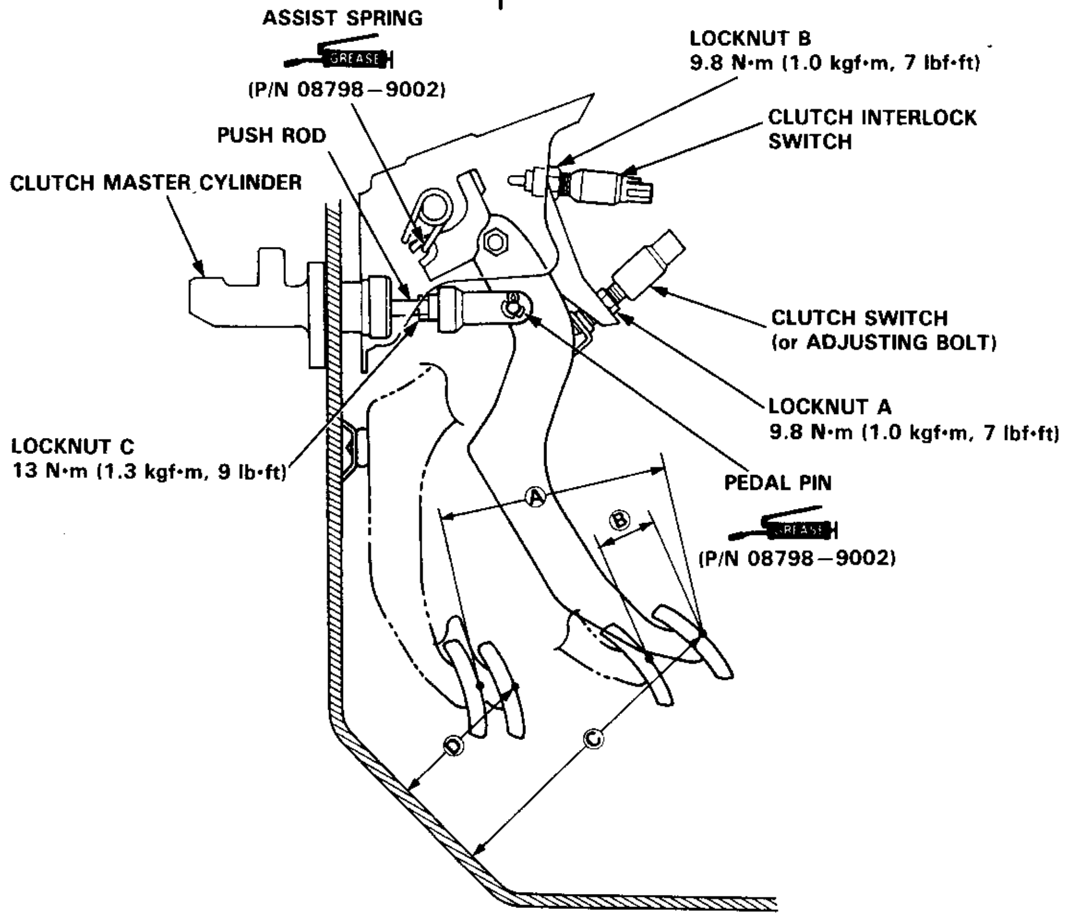
Clutch Pedal

Adjustment

NOTE:
- To check the clutch interlock switch and clutch switch, see section 23.
- The clutch is self-adjusting to compensate for wear.

CAUTION: If there is no clearance between the master cylinder piston and push rod, the release bearing is held against the diaphragm spring, which can result in clutch slippage or other clutch problems.

1. Loosen locknut A, and back off the clutch switch (or adjusting bolt) until it no longer touches the clutch pedal.
2. Loosen locknut C, and turn the push rod in or out to get the specified stroke (Ⓐ) and height (Ⓒ) at the clutch pedal.
3. Tighten locknut C.
4. Turn the clutch switch (or adjusting bolt) until it contacts the clutch pedal.
5. Turn the clutch switch (or adjusting bolt) in 3/4 to 1 full turn further.
6. Tighten locknut A.
7. Loosen locknut B on the clutch interlock switch.
8. Measure the clearance between the floor board and clutch pedal with the clutch pedal fully depressed.
9. Release the clutch pedal 15–20 mm (0.59–0.79 in) from the fully depressed position and hold it there. Adjust the position of the clutch interlock switch so that the engine will start with the clutch pedal in this position.
10. Turn clutch interlock switch 3/4 to 1 full turn further.
11. Tighten locknut B.



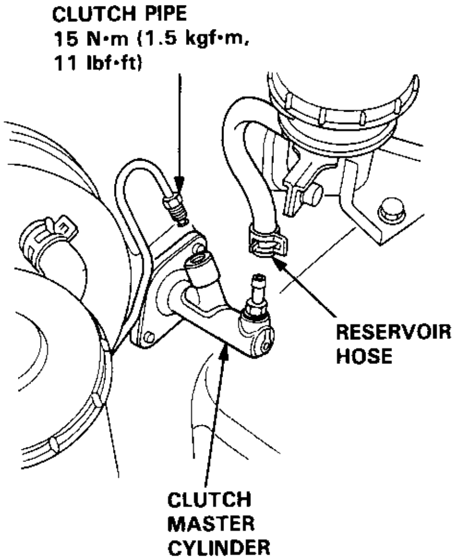
Ⓐ (STROKE at PEDAL): 130–140 mm (5.12–5.51 in)
Ⓑ (TOTAL CLUTCH PEDAL FREE PLAY): 12–21 mm (0.47–0.83 in) including the pedal play 1–10 mm (0.04–0.39 in)
Ⓒ (CLUTCH PEDAL HEIGHT): 164 mm (6.46 in) to the floor
Ⓓ (CLUTCH PEDAL DISENGAGEMENT HEIGHT): 83 mm (3.27 in) minimum to the floor

Clutch Master Cylinder

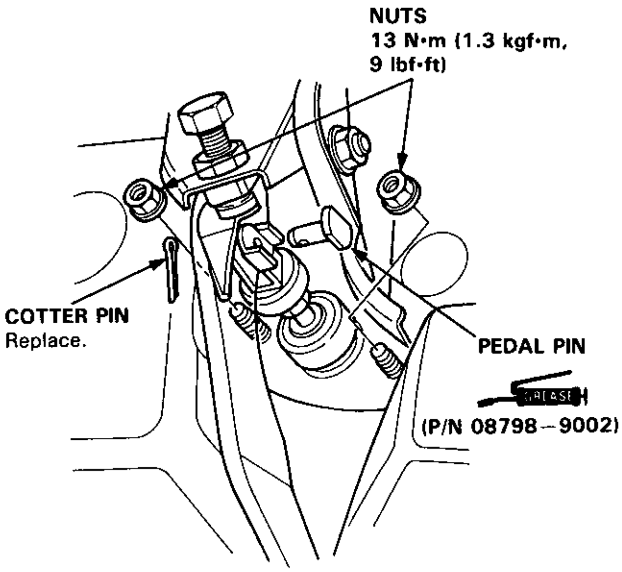
Removal/Installation

CAUTION:
- **Do not spill brake fluid on the vehicle; it may damege the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Plug the end of the clutch pipe and reservoir hose with a shop towel to prevent brake fluid from coming out.**

1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Disconnect the clutch pipe and reservoir hose from the clutch master cylinder.

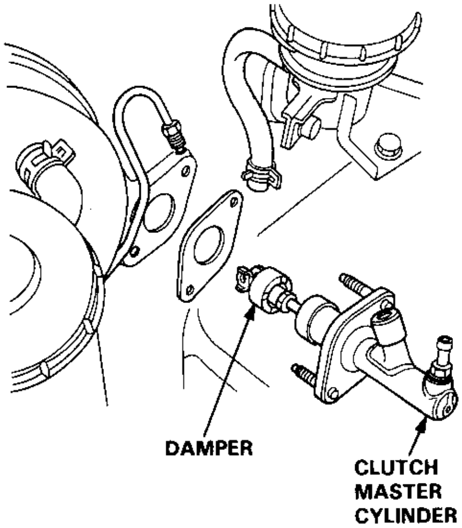


3. Pry out the cotter pin, and pull the pedal pin out of the yoke. Remove the nuts.



4. Remove the clutch master cylinder.

   NOTE: Do not spill brake fluid on the clutch master cylinder damper.



5. Install the clutch master cylinder in the reverse order of removal.

   NOTE: Bleed the clutch hydraulic system (see page 12-6).

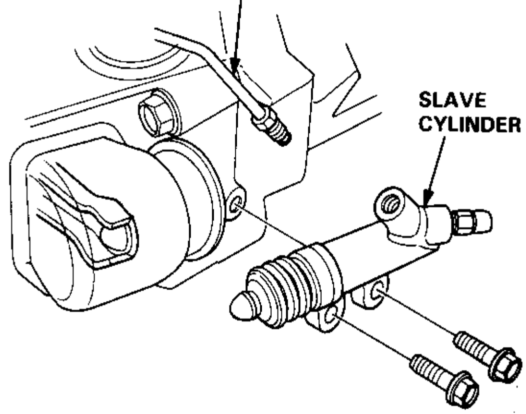
Slave Cylinder

Removal/Installation

CAUTION:
- **Do not spill brake fluid on the vehicle; it may damege the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Plug the end of the clutch pipe with a shop towel to prevent brake fluid from coming out.**

GREASE: Super High Temp Urea Grease (P/N 08798–9002).
GREASE: Brake Assembly Lube or equivalent rubber grease.

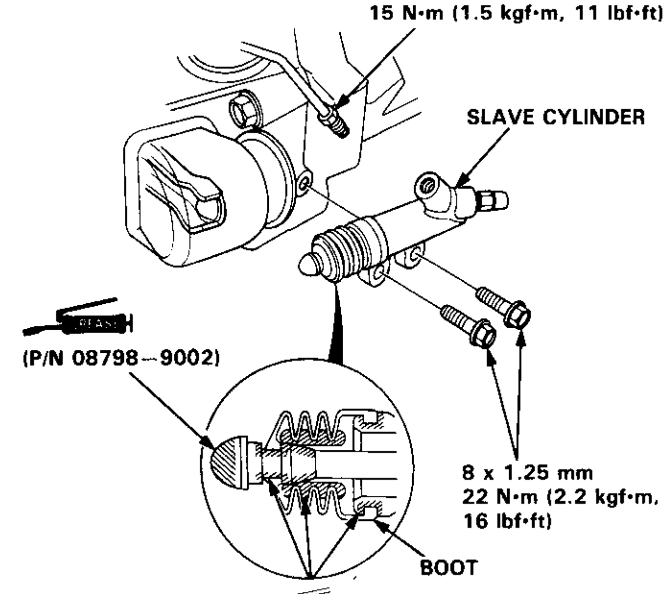
1. Disconnect the clutch pipe from the slave cylinder.



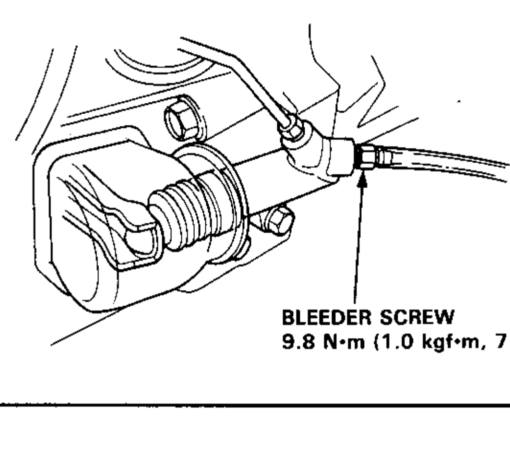
2. Remove the slave cylinder from the clutch housing.

3. Install the slave cylinder in the reverse order of removal.

   NOTE: Make sure the boot is installed on the slave cylinder.



4. Bleed the clutch hydraulic system.
   - Attach a hose to the bleeder screw, and suspend the hose in a container of brake fluid.
   - Make sure there is an adequate supply of fluid at the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
   - Refill the clutch master cylinder with fluid when done.
   - Use only DOT 3 or 4 brake fluid.
     We recommend Genuine Honda Super Duty DOT 3.
   - Confirm clutch operation, and check for leaking fluid.

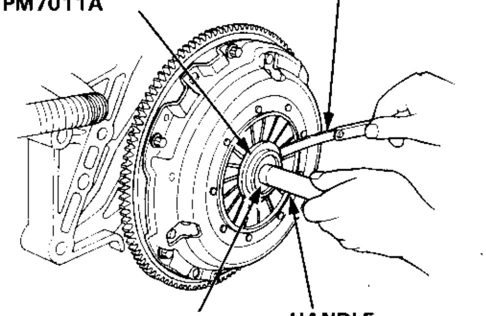


Pressure Plate

Removal/Inspection

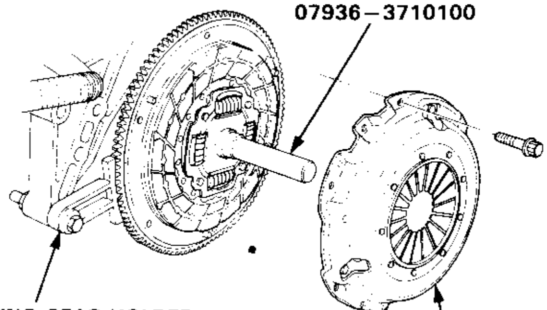
1. Check the diaphragm spring fingers for height using the special tools and a feeler gauge.

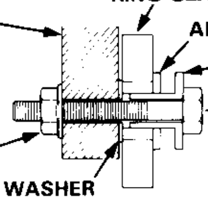
   Standard (New): 0.6 mm (0.02 in) max.
   Service Limit: 0.8 mm (0.03 in)



   If the height is more than the service limit, replace the pressure plate.

2. Install the special tools.

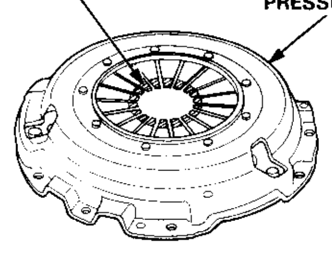




3. To prevent warping, unscrew the pressure plate mounting bolts in a crisscross pattern in several steps, then remove the pressure plate.

4. Inspect the pressure plate surface for wear, cracks, and burning.

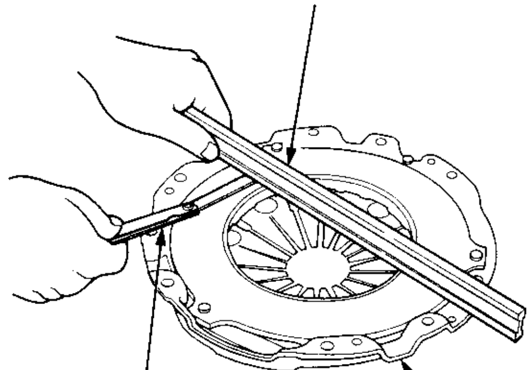
5. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.



6. Inspect for warpage using a straight edge and feeler gauge.

   NOTE: Measure across the pressure plate at three points.

   Standard (New): 0.03 mm (0.001 in) max.
   Service Limit: 0.15 mm (0.006 in)

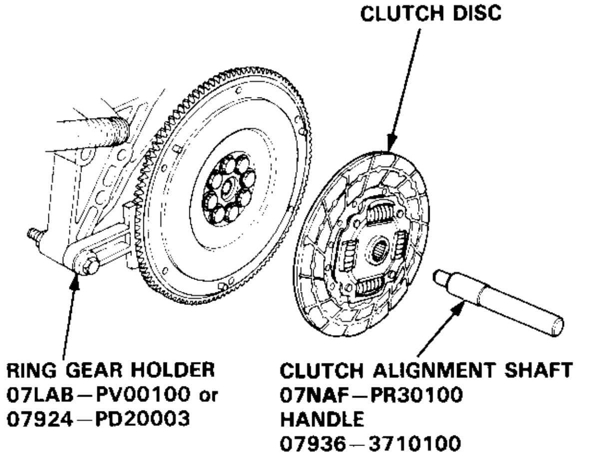


   If the warpage is more than the service limit, replace the pressure plate.

Clutch Disc

Removal/Inspection

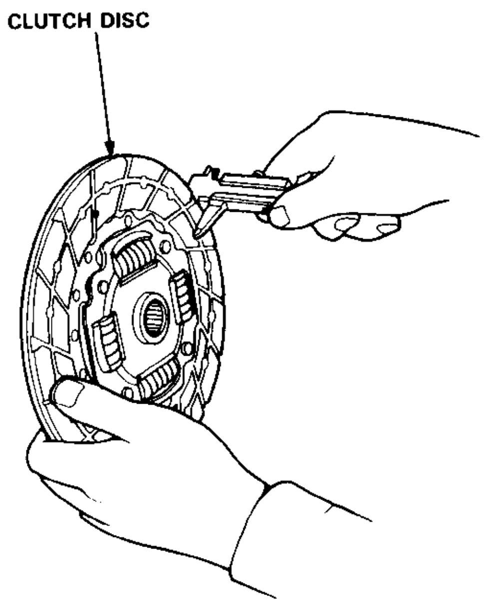
1. Remove the clutch disc and special tools.



2. Inspect the lining of the clutch disc for signs of slipping or oil. If it is burned black or oil soaked, replace it.

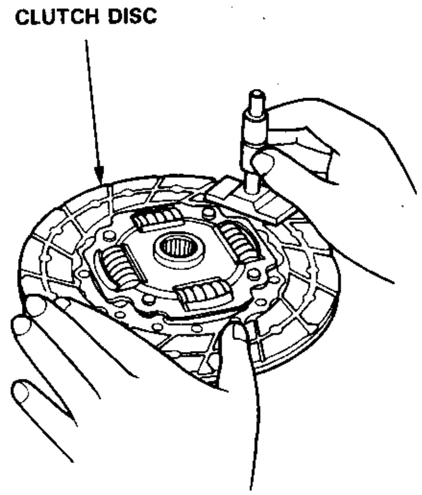
3. Measure the clutch disc thickness. If the thickness is less than the service limit, replace the clutch disc.

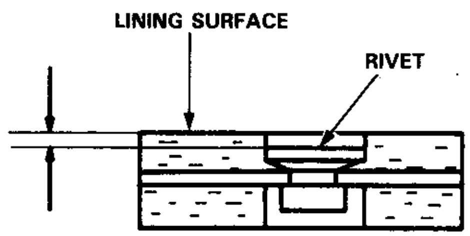
Standard (New): 8.3 – 9.0 mm (0.33 – 0.35 in)
Service Limit: 6.0 mm (0.24 in)



4. Measure the depth from the lining surface to the rivets, on both sides.

Standard (New): 1.2 – 1.7 mm (0.05 – 0.07 in) min.
Service Limit: 0.2 mm (0.01 in)





If the rivet depth is less than the service limit, replace the clutch disc.

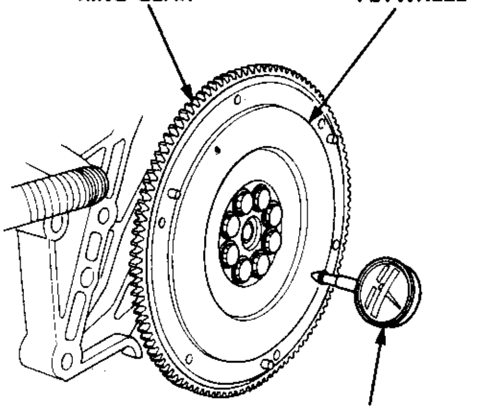
Flywheel, Flywheel Bearing

Inspection

1. Inspect the ring gear teeth for wear and damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks, and burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push against the flywheel each time you turn it to take up the crank-shaft thrust washer clearance.

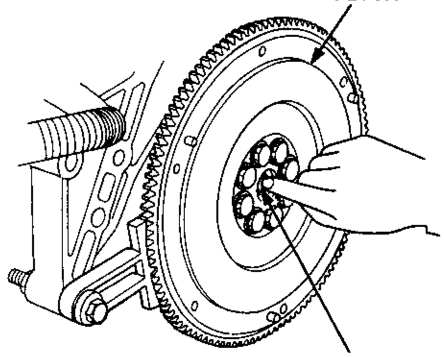
   NOTE: The runout can be measured with engine installed.

   Standard (New): 0.05 mm (0.002 in) max.
   Service Limit: 0.15 mm (0.006 in)



   If the runout is more than the service limit, replace the flywheel.

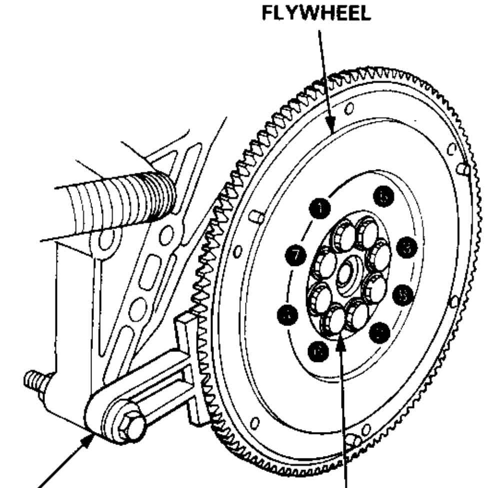
4. Turn the inner race of the flywheel bearing with your finger. The bearing should turn smoothly and quietly. Check that the bearing outer race fits tightly in the flywheel.



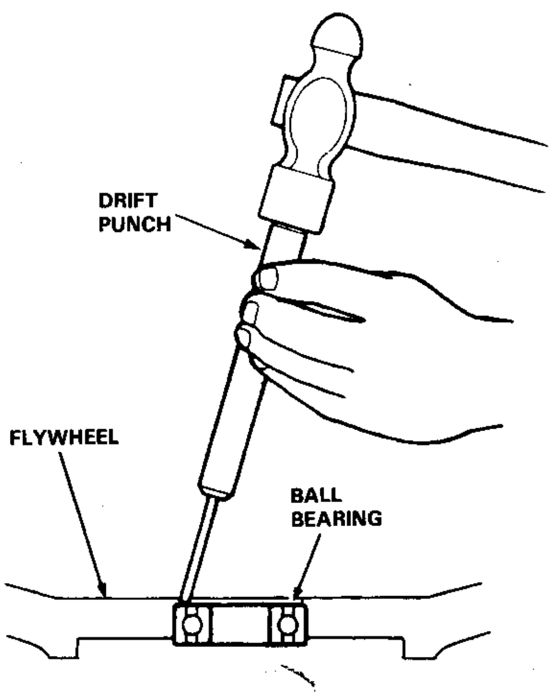
   If the race does not turn smoothly, quietly, or fit tight in the flywheel, replace the flywheel bearing.

Replacement

1. Install the special tool.



2. Remove the flywheel mounting bolts in a crisscross pattern in several steps as shown, then remove the flywheel.
3. Remove the flywheel bearing from the flywheel.

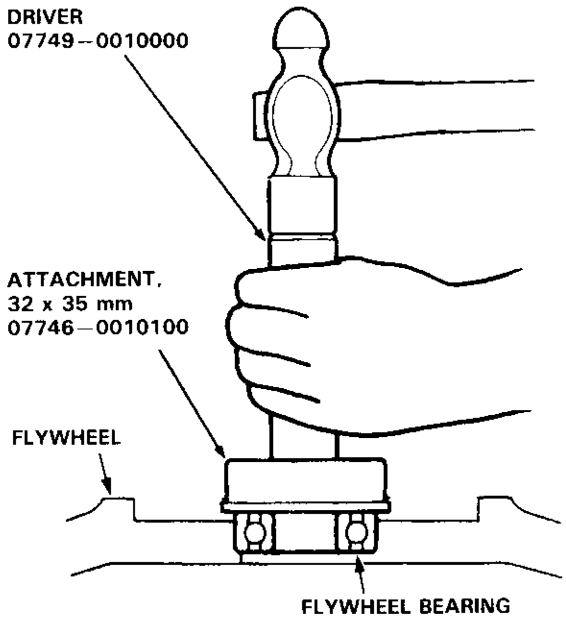


(cont'd)

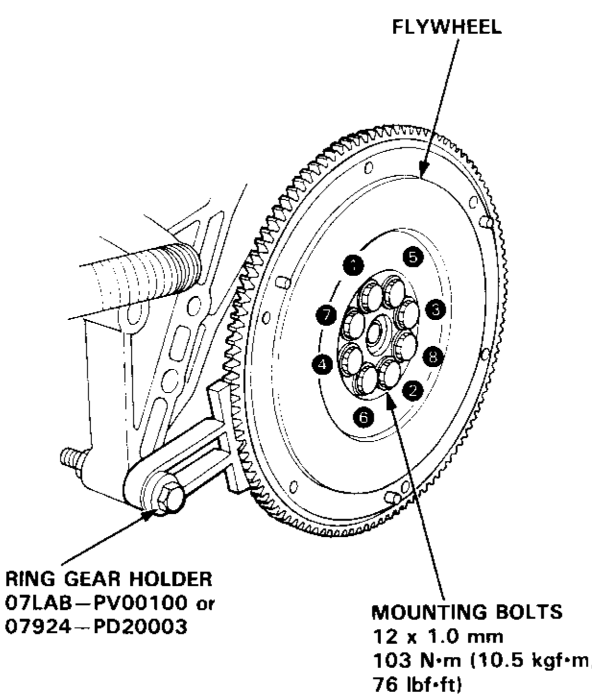
Flywheel, Flywheel Bearing

Replacement (cont'd)

4. Drive the new flywheel bearing into the flywheel using the special tools as shown.



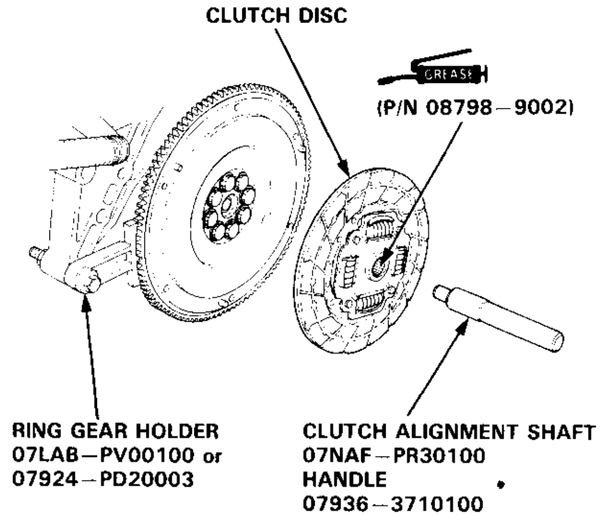
5. Align the hole in the flywheel with the crankshaft dowel pin and install the flywheel. Install the mounting bolts finger-tight.
6. Install the special tool as shown, then torque the flywheel mounting bolts in a crisscross pattern in several steps as shown.



Clutch Disc, Pressure Plate

Installation

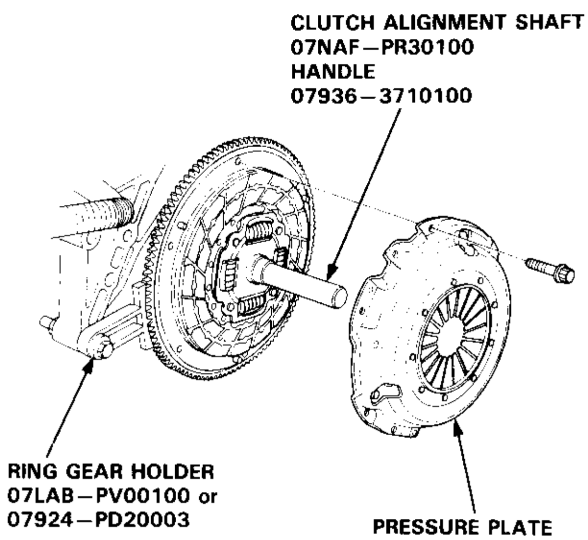
1. Install the ring gear holder.



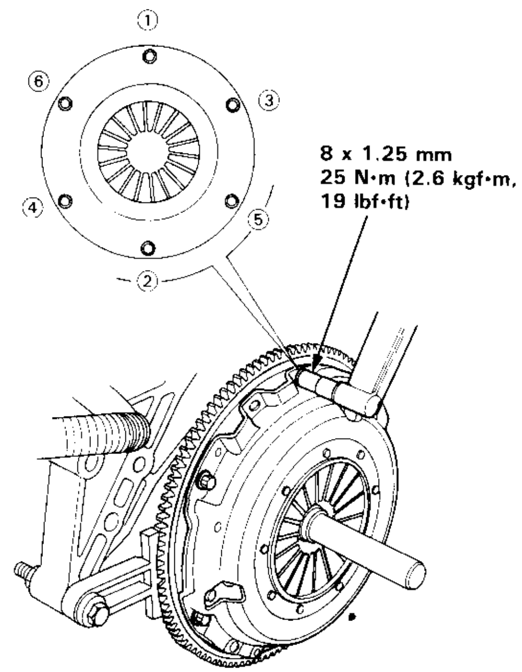
2. Apply grease to the spline of the clutch disc, then install the clutch disc using the special tools as shown.

   NOTE: Use only Super High Temp Urea Grease (P/N 08798–9002).

3. Install the pressure plate.



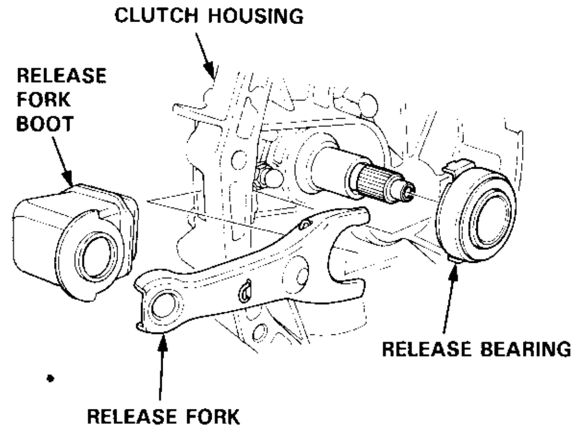
4. Torque the mounting bolts in a crisscross pattern as shown. Tighten the bolts in several steps to prevent warping the diaphragm spring.



5. Remove the special tools.
6. Recheck the diaphragm spring fingers for height (see page 12-7).

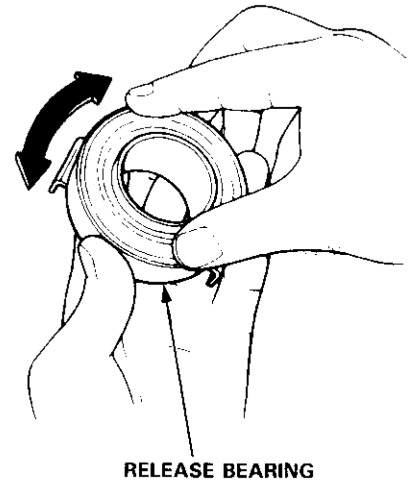
Removal/Inspection

1. Remove the release fork boot from the clutch housing.



2. Remove the release fork from the clutch housing by squeezing the release fork set spring with pliers. Remove the release bearing.
3. Check the release bearing for play by spinning it by hand. If there is excessive play, replace the release bearing with a new one.

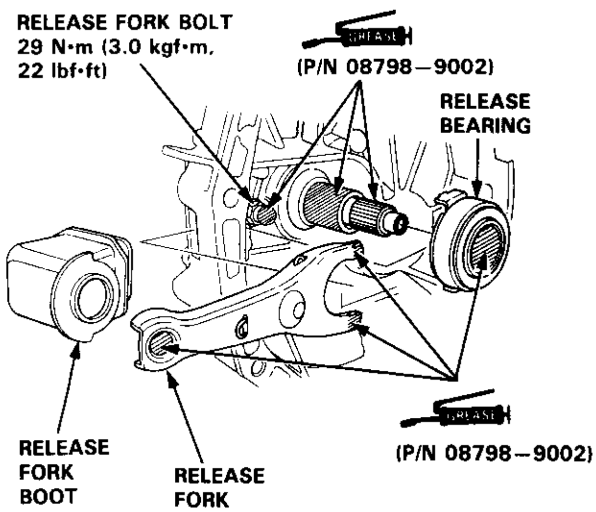
CAUTION: The release bearing is packed with grease. Do not wash it in solvent.



Release Bearing

Installation

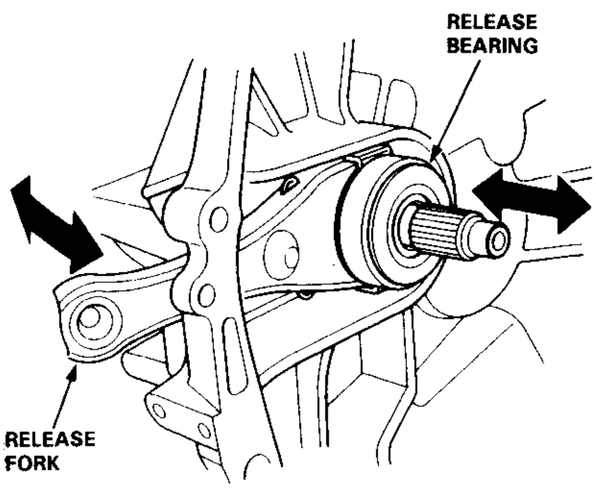
1. With the release fork slid between the release bearing pawls, install the release bearing on the mainshaft while inserting the release fork through the hole in the clutch housing.



2. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt.

   NOTE: Use only Super High Temp Urea Grease (P/N 08798–9002).

3. Move the release fork right and left to make sure that the fork fits properly against the release bearing, and that the release bearing slides smoothly.



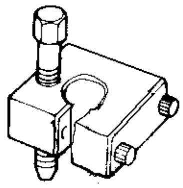
4. Install the release fork boot.

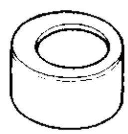
Manual Transmission

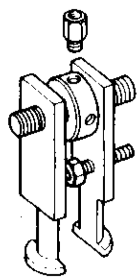
Special Tools

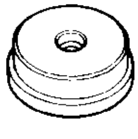
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAJ – PG20110	Mainshaft Holder	1	13 – 40
②	07GAJ – PG20130	Mainshaft Base	1	13 – 40
*③	07736 – A01000A	Adjustable Bearing Puller, 25 – 40 mm	1	13 – 36, 37
④	07746 – 0010300	Attachment, 42 x 47 mm	1	13 – 36
⑤	07746 – 0010400	Attachment, 52 x 55 mm	1	13 – 36, 37
⑥	07746 – 0030100	Driver, 40 mm I.D.	1	13 – 27, 33
⑦	07746 – 0030300	Attachment, 30 mm I.D.	1	13 – 27, 33
⑧	07746 – 0030400	Attachment, 35 mm I.D.	1	13 – 27, 33
⑨	07746 – 0041100	Pilot, 28 mm	1	13 – 36
⑩	07749 – 0010000	Driver	1	13 – 36, 37

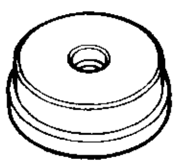
*③ Must be used with commercially – available 3/8" – 16 Slide Hammer.

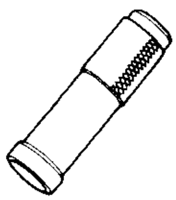

①


②


③

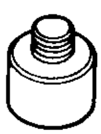

④

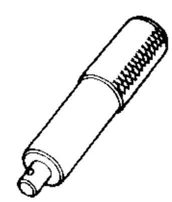

⑤


⑥


⑦


⑧

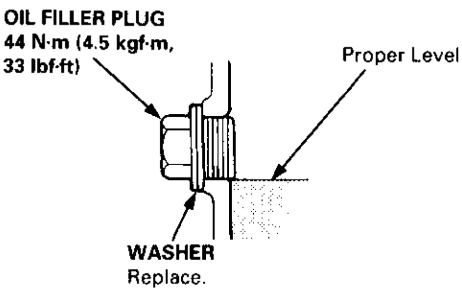

⑨


⑩

Transmission Oil

NOTE: Check the transmission oil with the engine OFF and the vehicle on level ground.

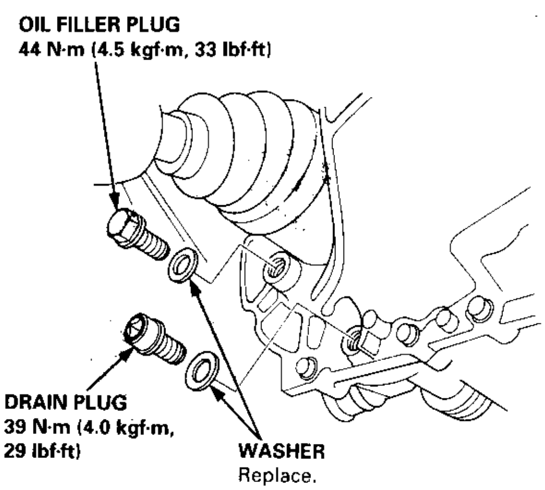
1. Remove the oil filler plug, then check the level and condition of the oil.



2. The oil level must be up to the filler hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug.
3. If the transmission oil is dirty, remove the drain plug and drain the oil.
4. Reinstall the drain plug with a new washer, and refill the transmission oil to the proper level.
   NOTE: The drain plug washer should be replaced at every oil change.

   Oil Capacity
   2.2 ℓ (2.3 US.qt, 1.9 Imp.qt) at oil change.
   2.3 ℓ (2.4 US.qt, 2.0 Imp.qt) at overhaul.

   Always use genuine Honda manual transmission fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.

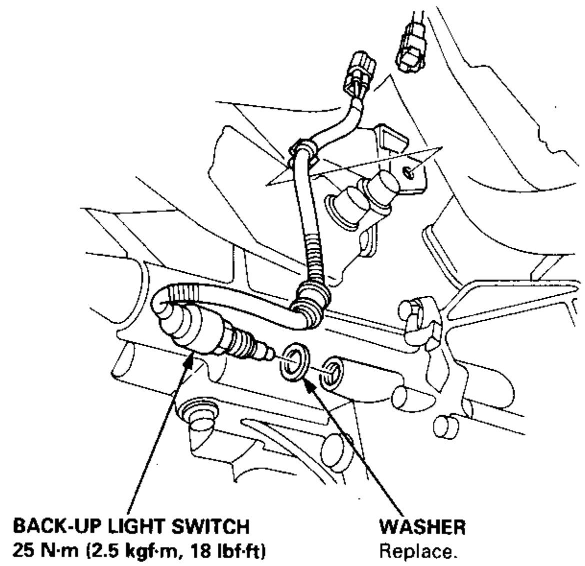


5. Reinstall the oil filler plug with a new washer.

Replacement

NOTE: To check the back-up light switch, see section 23.

1. Disconnect the connector, then remove the back-up light switch connector from the connector clamp.



2. Remove the back-up light switch.
3. Install the new washer and the back-up light switch.
4. Check the transmission oil level.

Transmission Assembly

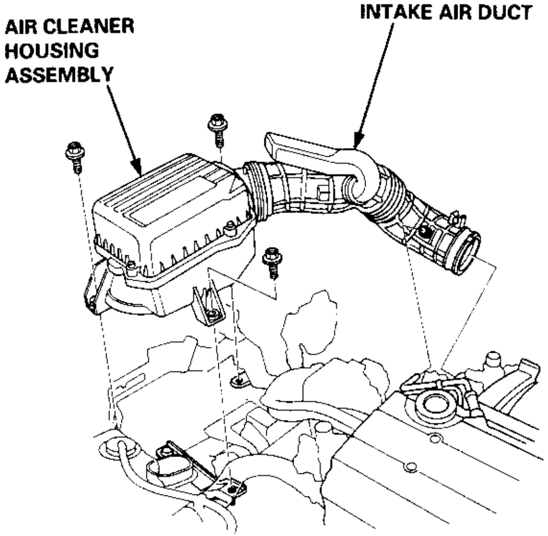
Removal

⚠ WARNING

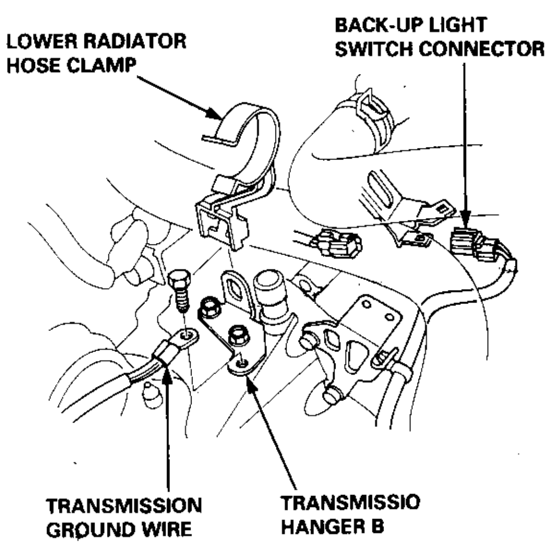
- **Make sure jacks and safety stands are placed properly (see section 1).**
- **Apply parking brake and block rear wheels so vehicle will not roll off stands and fall on you while working under it.**

CAUTION: Use fender covers to avoid damaging painted surfaces.

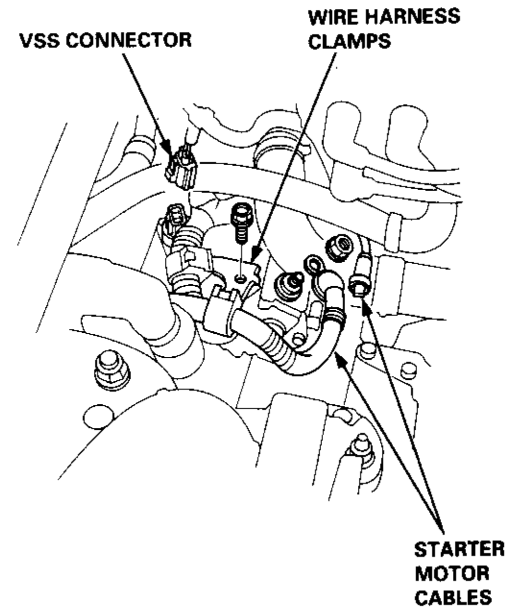
1. Disconnect the negative (–) cable from the battery, then the positive (+) cable.
2. Remove the intake air duct and the air cleaner housing assembly.



3. Disconnect the back-up light switch connector and the transmission ground wire.

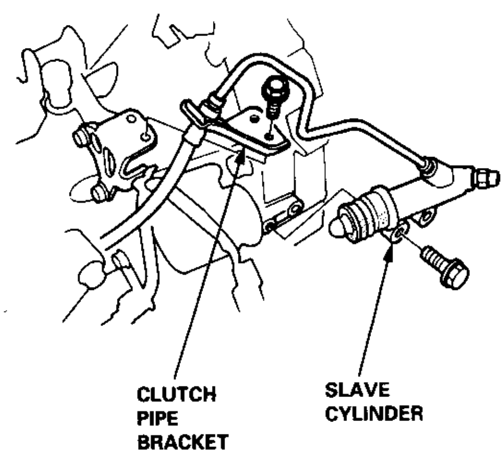


4. Remove the lower radiator hose clamp from the transmission hanger B.
5. Remove the wire harness clamps.

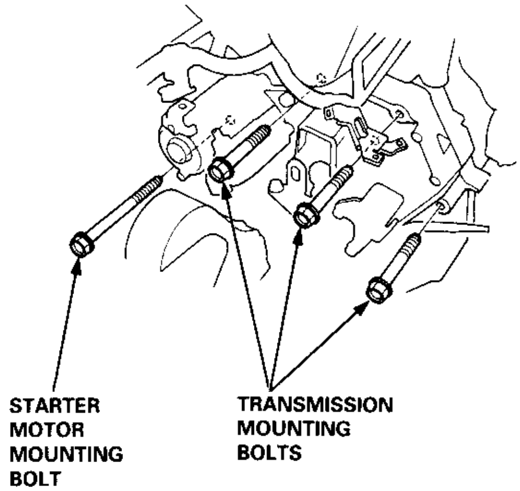


6. Disconnect the starter motor cables and the vehicle speed sensor (VSS) connector.
7. Remove the clutch pipe bracket and the slave cylinder.

NOTE: Do not operate the clutch pedal once the slave cylinder has been removed.

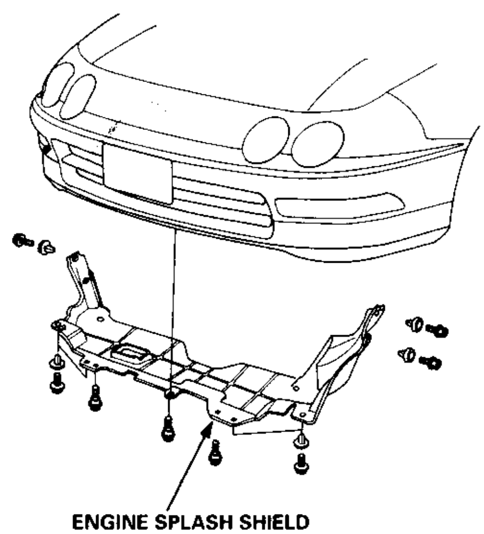


8. Remove the three upper transmission mounting bolts and the lower starter motor mounting bolt.

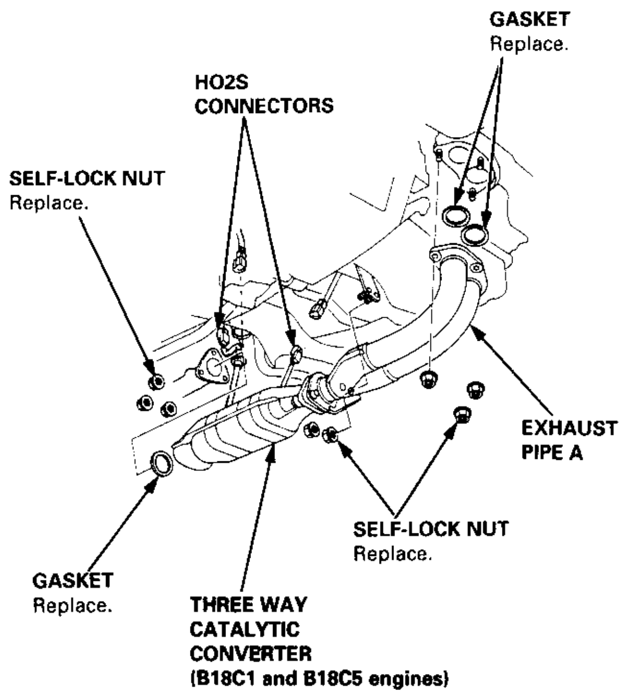


9. Drain the transmission oil, then reinstall the drain plug with a new washer (see page 13-3).

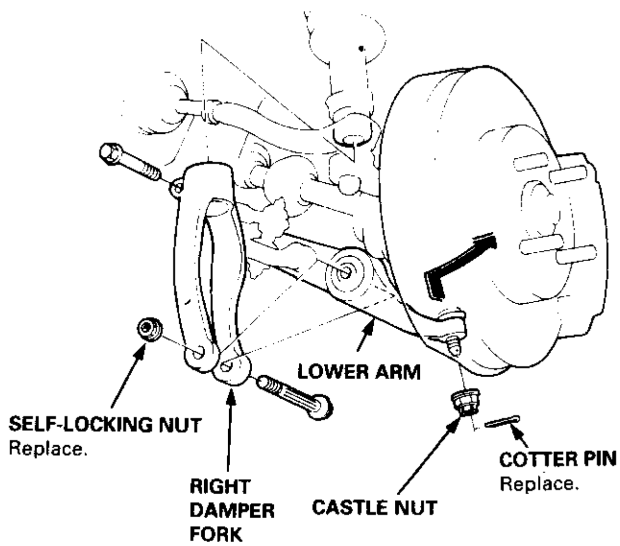
10. Remove the engine splash shield.



11. Disconnect the heated oxygen sensor (HO2S) connectors, then remove the exhaust pipe A, and the three way catalytic converter (B18C1 and B18C5 engines).



12. Remove the cotter pins and loosen the castle nuts, then separate the ball joints from the lower arm (see section 18).



13. Remove the right damper FORK

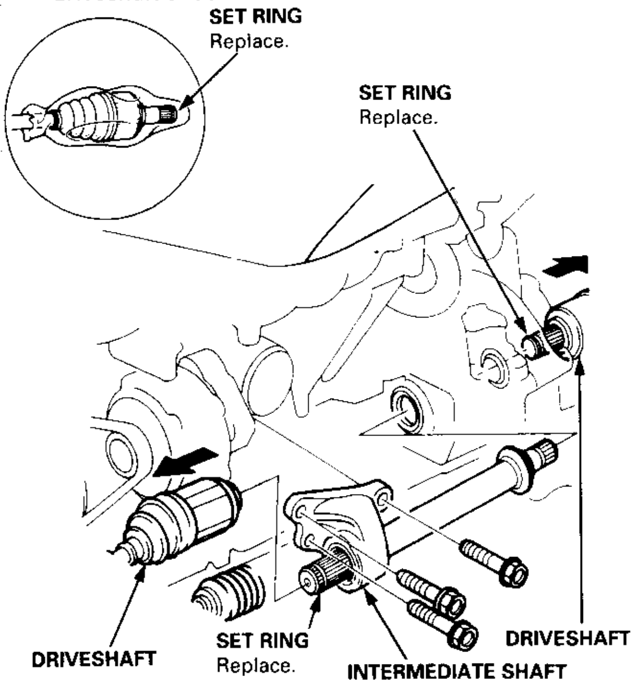
(cont'd)

Transmission Assembly

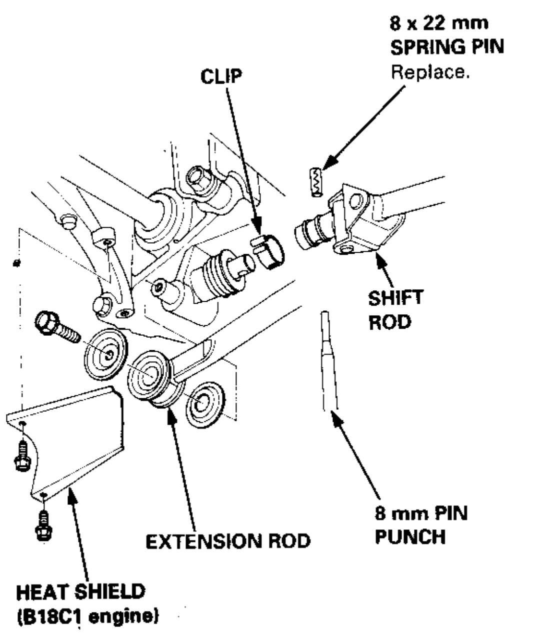
Removal (cont'd)

14. Remove the driveshafts and the intermediate shaft (see section 16).

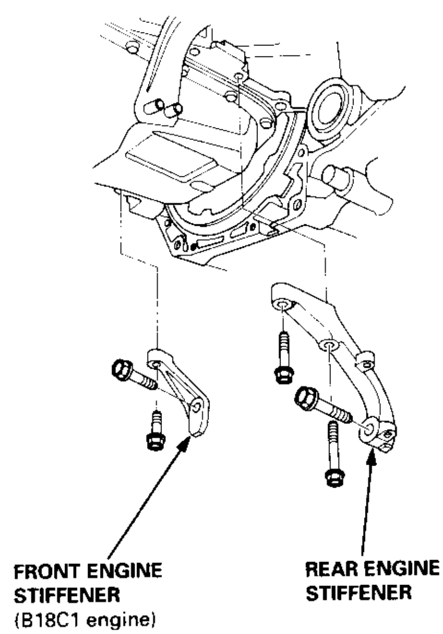
    NOTE: Coat all precision finished surfaces with clean engine oil or grease. Tie plastic bags over the driveshaft ends.



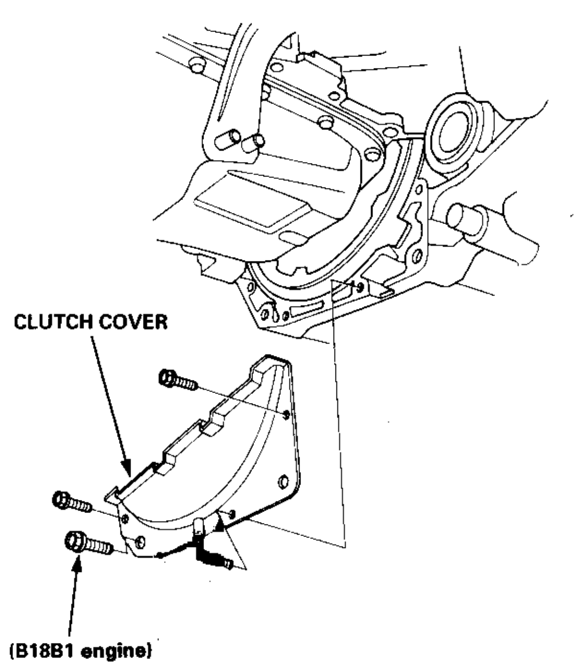
15. Remove the heat shield (B18C1 engine).
16. Remove the bolt, then disconnect the extension rod.
17. Remove the clip and the spring pin, then disconnect the shift rod.



18. Remove the front (B18C1 engine) and the rear engine stiffeners.



19. Remove the clutch cover (B18C1 and B18B1 engines).

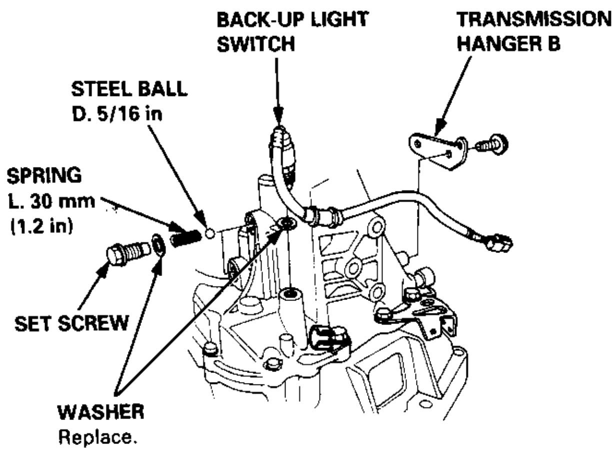


Transmission Housing

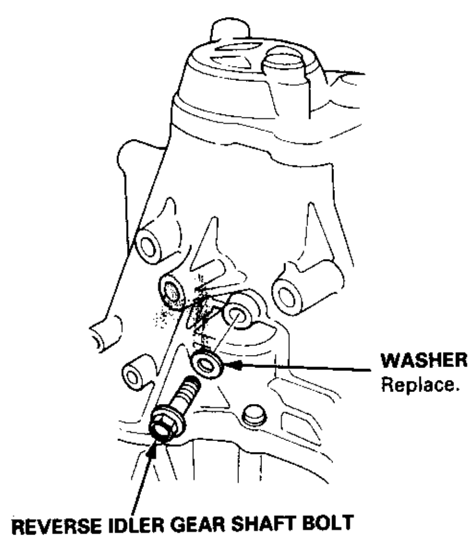
Removal

NOTE:
- If the transmission housing or clutch housing are replaced, the bearing preload must be adjusted (B18C1 and B18C5 engines).
- Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from the hitting the workbench.

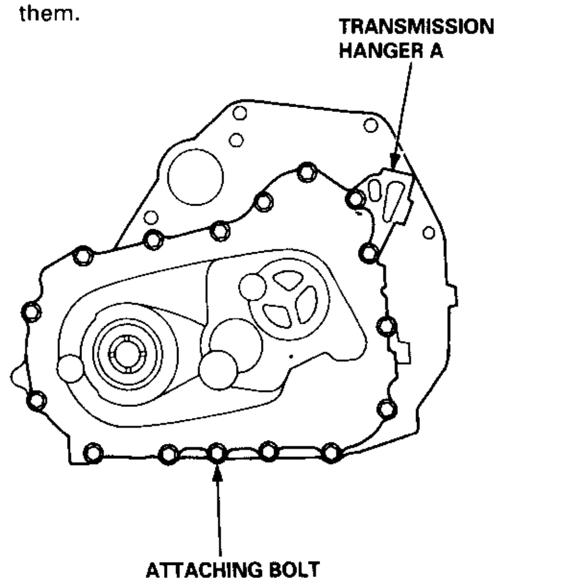
1. Remove the back-up light switch.
2. Remove the transmission hanger B.
3. Remove the set screws, the springs, and the steel balls.



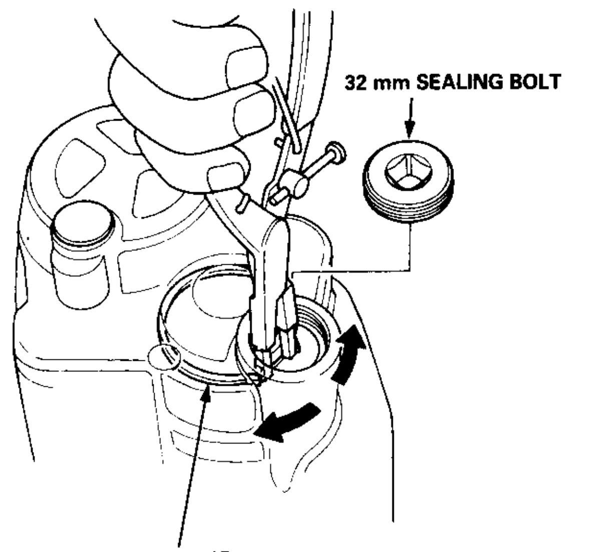
Remove the reverse idler gear shaft bolt.



5. Loosen the transmission housing attaching bolts in a crisscross pattern in several steps, then remove them.

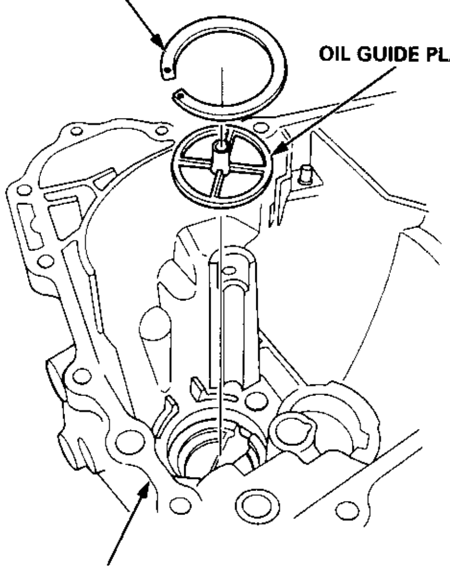


6. Remove the 32 mm sealing bolt.
7. Expand the snap ring on the countershaft ball bearing and remove it from the groove using a pair of snap ring pliers.

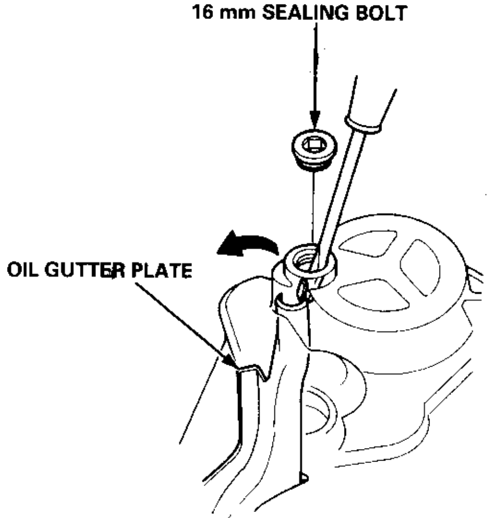


8. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.

9. Remove the 72 mm thrust shim and the oil guide plate from the transmission housing.



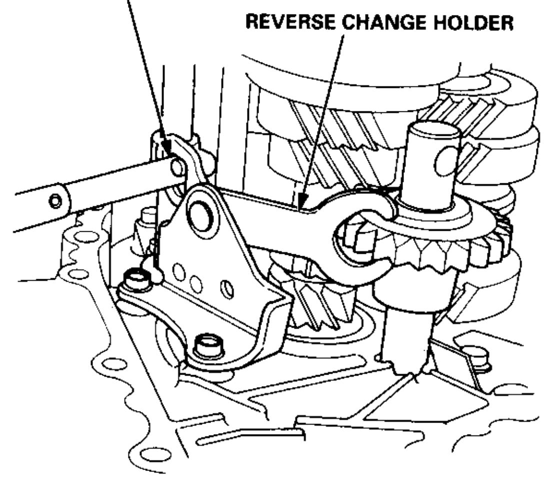
10. Remove the 16 mm sealing bolt and the oil gutter plate.



Clearance Inspection

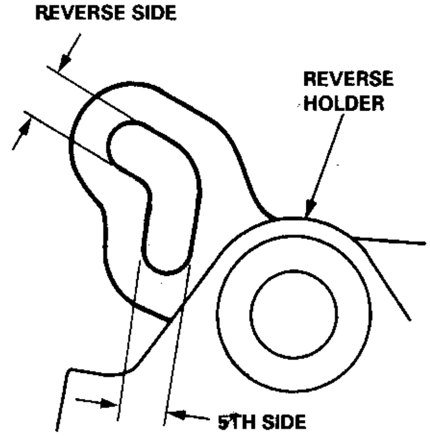
1. Measure the clearance between the reverse change holder and the 5th/reverse shift piece pin.

Standard:
Reverse Side: 0.05 – 0.45 mm (0.002 – 0.018 in)
5th Side: 0.4 – 0.9 mm (0.02 – 0.04 in)



2. If the clearance are not within the standard, measure the width of the grooves in the reverse change holder.

Standard:
Reverse Side: 7.05 – 7.25 mm (0.278 – 0.285 in)
5th Side: 7.4 – 7.7 mm (0.29 – 0.30 in)



- If the width of the grooves are not within the standard, replace the reverse change holder with a new one.
- If the width of the grooves are within the Standard, replace the 5th/reverse SHIFT piece with new one.

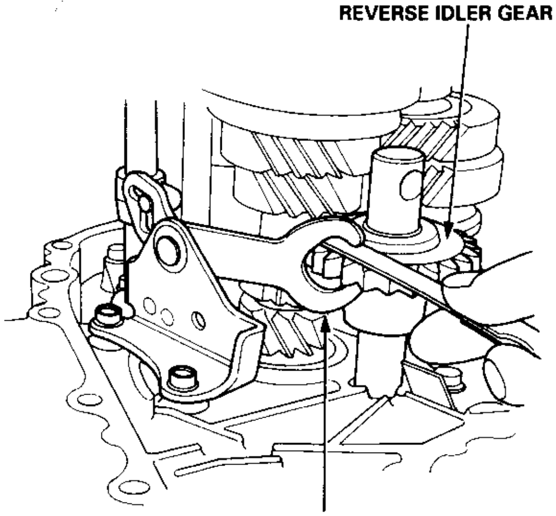
(cont'

Reverse Change Holder, Reverse Idler Gear

Clearance Inspection (cont'd)

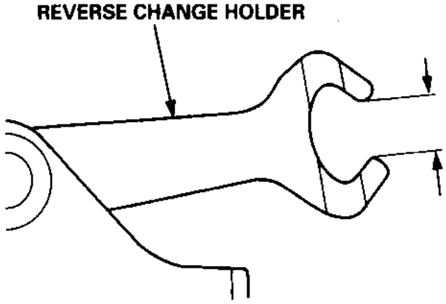
3. Measure the clearance between the reverse idler gear and the reverse change holder.

   Standard: 0.5 – 1.1 mm (0.02 – 0.04 in)
   Service Limit: 1.8 mm (0.07 in)



4. If the clearance is more than the service limit, measure the width of the reverse change holder.

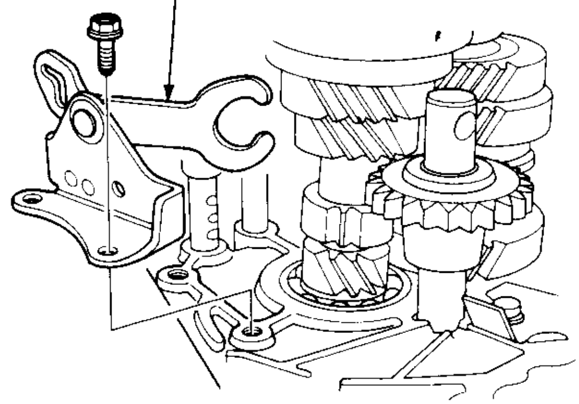
   Standard: 13.0 – 13.3 mm (0.512 – 0.524 in)



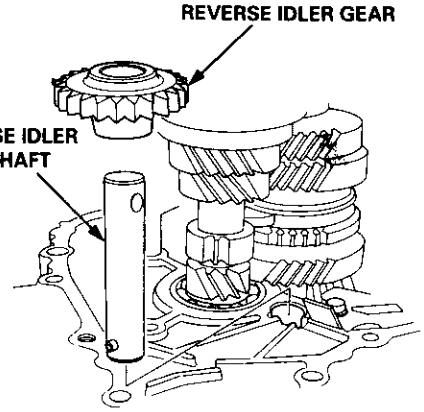
- If the width is not within the standard, replace the reverse change holder with a new one.
- If the width is within the standard, replace the reverse idler gear with a new one.

Removal

1. Remove the reverse change holder.



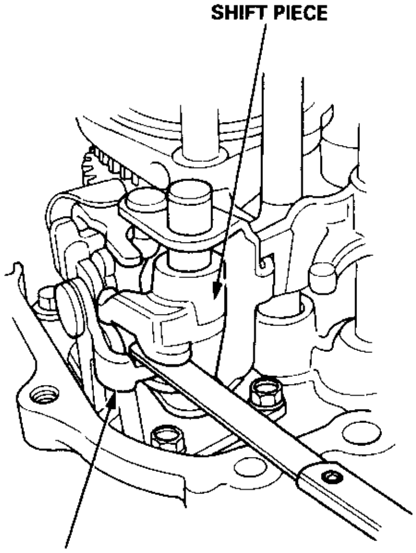
2. Remove the reverse idler gear and the reverse idler gear shaft.



Clearance Inspection

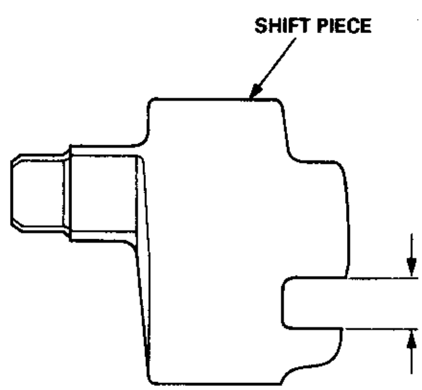
1. Measure the clearance between the shift piece and the shift arm holder.

   Standard: 0.1 – 0.3 mm (0.004 – 0.012 in)
   Service Limit: 0.6 mm (0.02 in)



2. If the clearance is more than the service limit, measure the width of the groove in the shift piece.

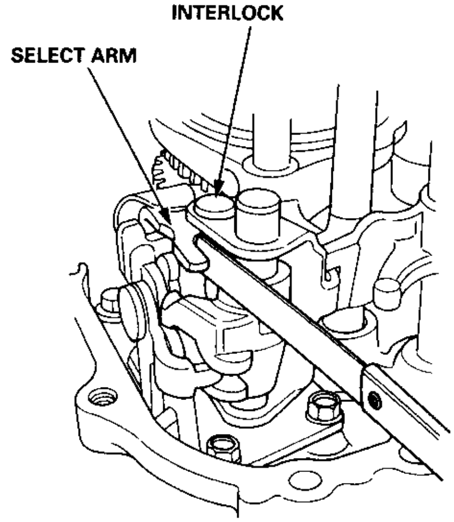
   Standard: 8.1 – 8.2 mm (0.319 – 0.323 in)



- If the width of the groove is not within the standard, replace the shift piece with a new one.
- If the width of the groove is within the standard, replace the shift arm holder with a new one.

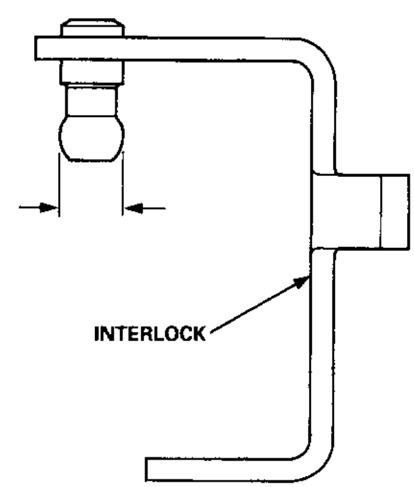
3. Measure the clearance between the select arm and the interlock.

   Standard: 0.05 – 0.25 mm (0.002 – 0.010 in)
   Service Limit: 0.5 mm (0.02 in)



4. If the clearance is more than the service limit, measure the width of the interlock.

   Standard: 9.9 – 10.0 mm (0.390 – 0.394 in)



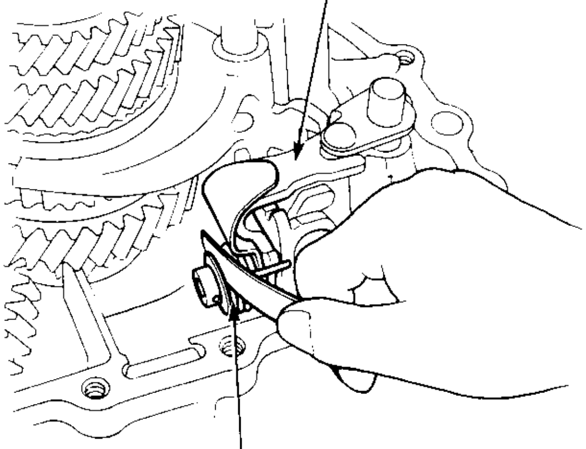
- If the width is not within the standard, replace the interlock with a new one.
- If the width is within the standard replace the select arm with a new one.

(cont'd)

Clearance Inspection (cont'd)

5. Measure the clearance between the select arm and the 10 mm shim.

Standard: 0.01 – 0.2 mm (0.0004 – 0.008 in)



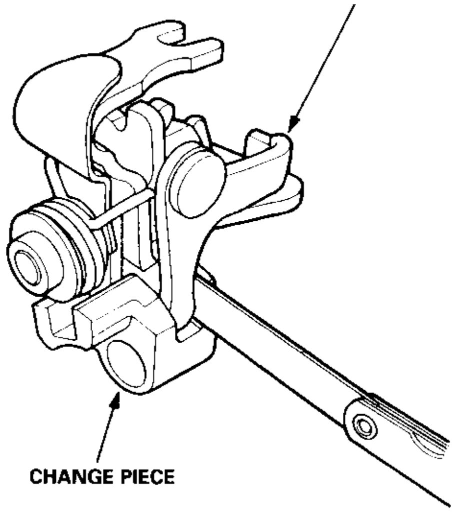
6. If the clearance is not within the standard, select and install the appropriate 10 mm shim for the correct clearance from the chart below.

10 mm Shim

	Part Number	Thickness
A	24435 – 689 – 000	0.8 mm (0.031 in)
B	24436 – 689 – 000	1.0 mm (0.039 in)
C	24437 – 689 – 000	1.2 mm (0.047 in)
D	24438 – 689 – 000	1.4 mm (0.055 in)
E	24439 – 689 – 000	1.6 mm (0.063 in)

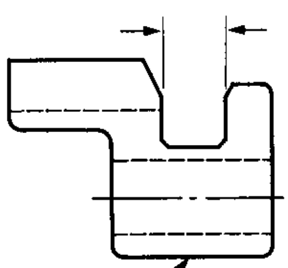
7. Measure the clearance between the shift arm holder and the change piece.

Standard: 0.05 – 0.35 mm (0.002 – 0.014 in)
Service Limit: 0.8 mm (0.03 in)



8. If the clearance is more than the service limit, measure the groove of the change piece.

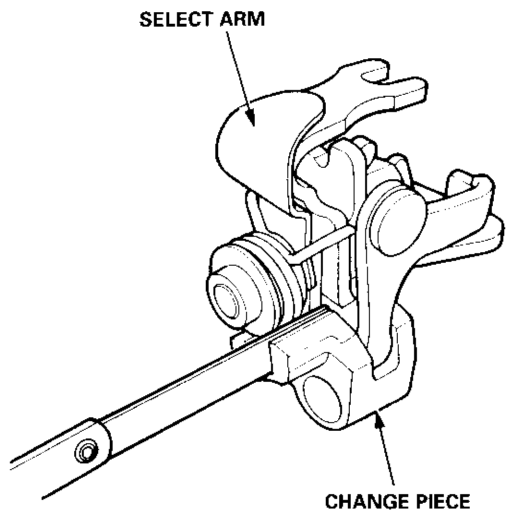
Standard: 12.05 – 12.15 mm (0.4744 – 0.4783 in)



- If the groove is not within the standard, replace the change piece with a new one.
- If the groove is within the standard, replace the shift arm holder with a new one.

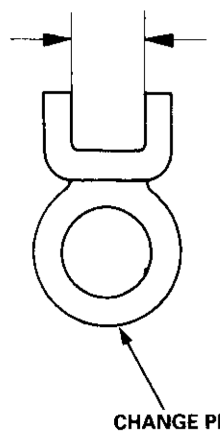
9. Measure the clearance between the select arm and the change piece.

Standard: 0.05 – 0.35 mm (0.002 – 0.014 in)
Service Limit: 0.5 mm (0.02 in)



10. If the clearance is more than the service limit, measure the width of the change piece.

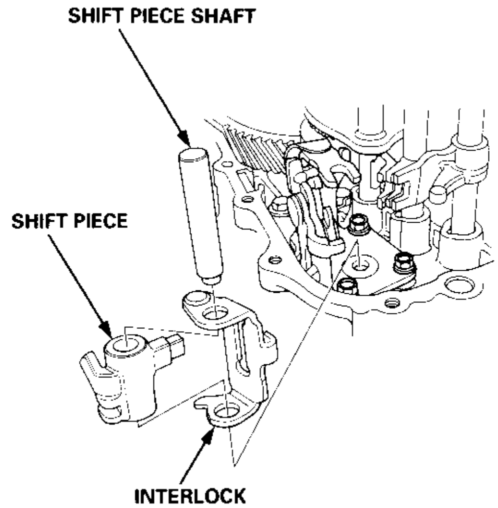
Standard: 12.05 – 12.15 mm (0.4744 – 0.4783 in)



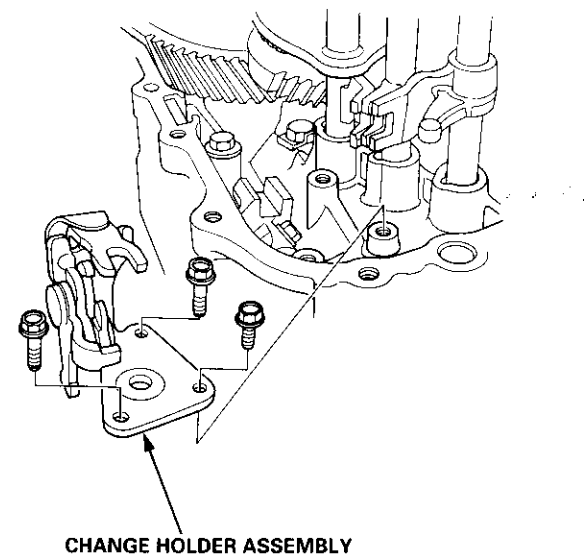
- If the width is not within the standard, replace the change piece with a new one.
- If the width is within the standard, replace the select arm with a new one.

Removal

1. Remove the shift piece shaft, then remove the shift piece and the interlock.



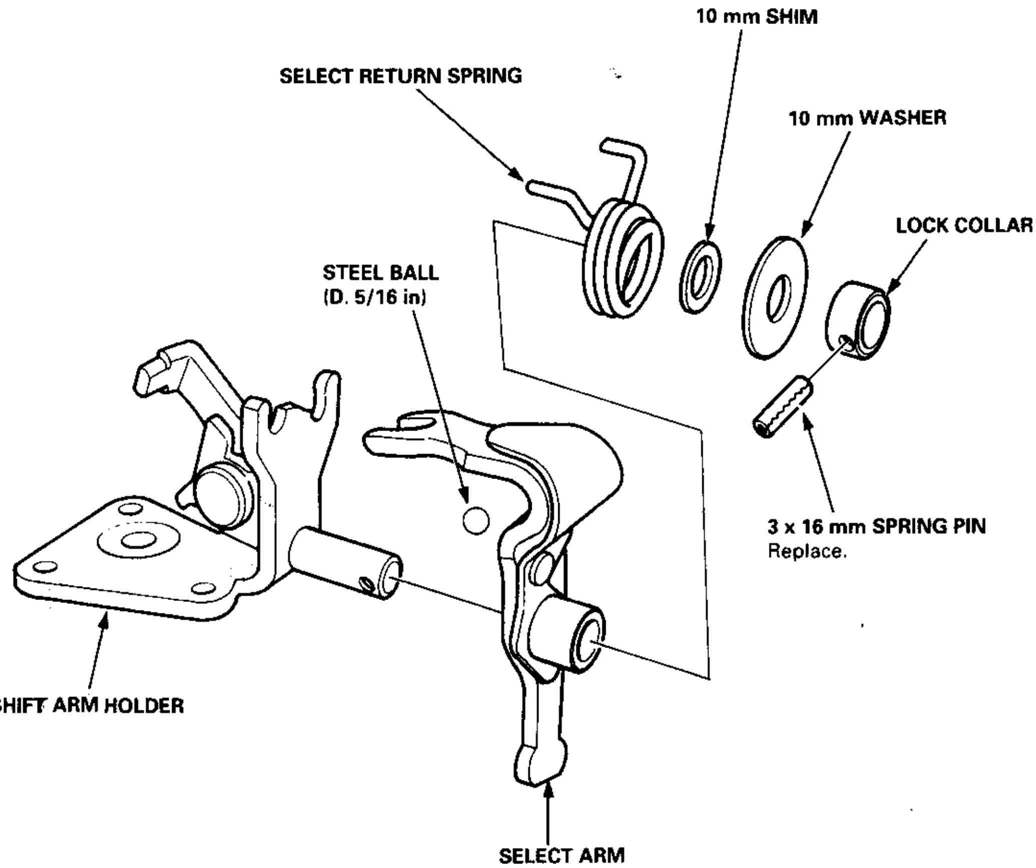
2. Remove the change holder assembly.

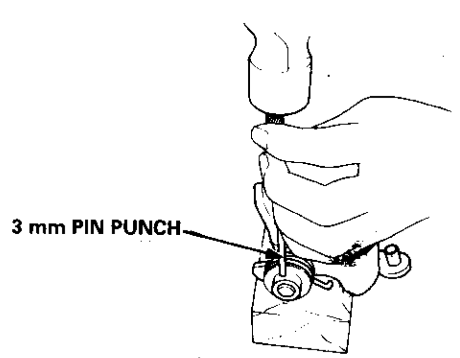


Change Holder Assembly

Disassembly/Reassembly

Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces.





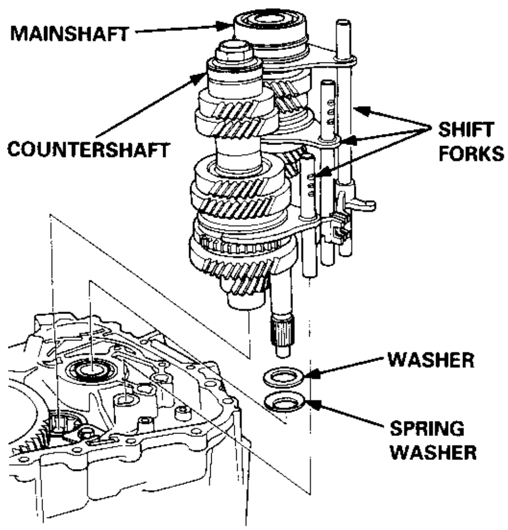
Mainshaft, Countershaft, Shift Fork

Removal

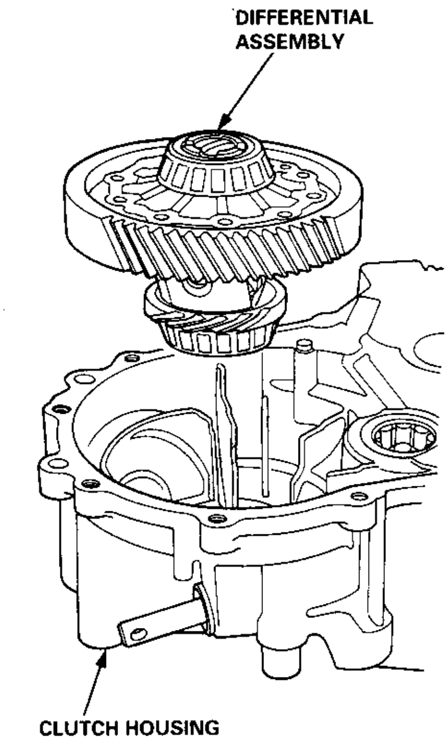
1. Remove the mainshaft and the countershaft assemblies with the shift forks from the clutch housing.

   NOTE: Tape the mainshaft spline before removing the mainshaft and the countershaft assemblies.

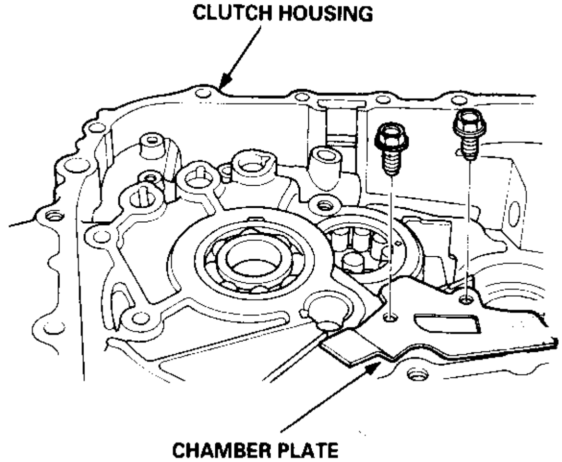
2. Remove the spring washer and the washer.



3. Remove the differential assembly from the clutch housing.



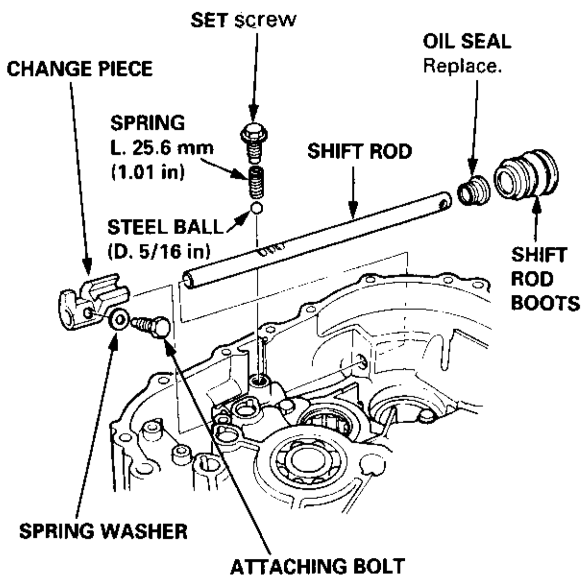
4. Remove the chamber plate.



Shift Rod

Removal

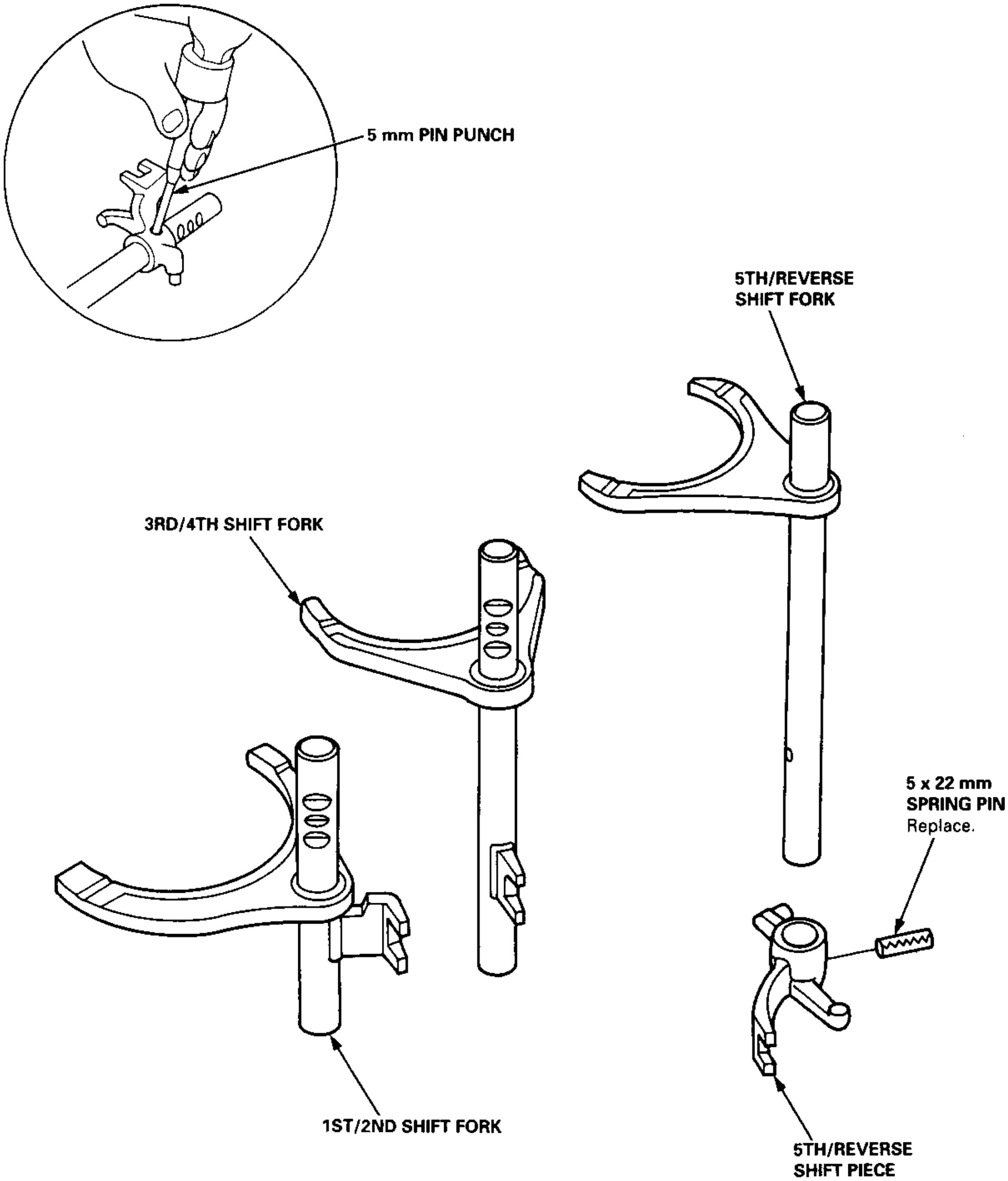
1. Remove the shift rod boots.
2. Remove the change piece attaching bolt and the spring washer.
3. Remove the set screw, then remove the spring and the steel ball.
4. Remove the shift rod, then remove the change piece.
5. Remove the oil seal.



Shift Fork Assembly

Index

Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact parts



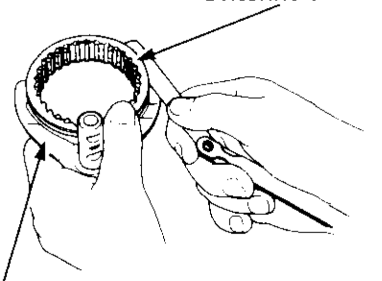
Shift Fork Assembly

Clearance Inspection

NOTE: The synchro sleeve and the synchro hub should be replaced as a set.

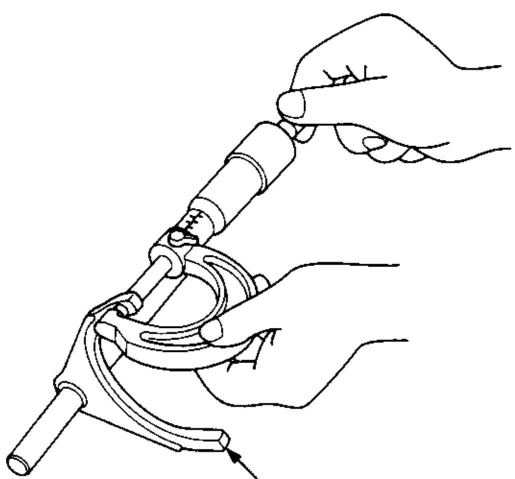
1. Measure the clearance between each shift fork and its matching synchro sleeve.

   Standard: 0.35 – 0.65 mm (0.014 – 0.026 in)
   Service Limit: 1.0 mm (0.04 in)



2. If the clearance is more than the service limit, measure the thickness of the shift fork fingers.

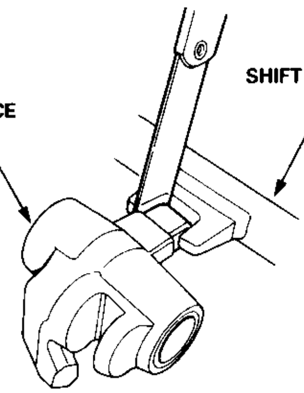
   Standard: 7.4 – 7.6 mm (0.291 – 0.299 in)



- If the thickness of the shift fork fingers is not within the standard, replace the shift fork with a new one.
- If the thickness of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

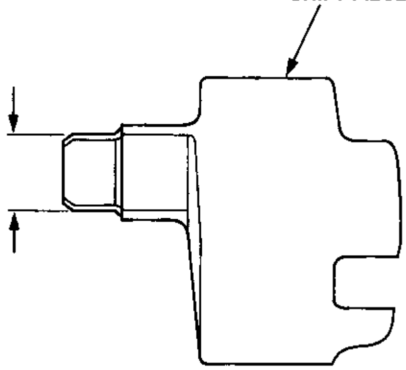
3. Measure the clearance between the shift piece and the shift fork shafts.

   Standard: 0.2 – 0.5 mm (0.008 – 0.02 in)
   Service Limit: 0.8 mm (0.03 in)



4. If the clearance is more than the service limit, measure the width of the shift piece.

   Standard: 11.9 – 12.0 mm (0.469 – 0.472 in)



- If the width of the shift piece is not within the standard, replace the shift piece with a new one.
- If the width of the shift piece is within the standard, replace the shift fork with a new one.

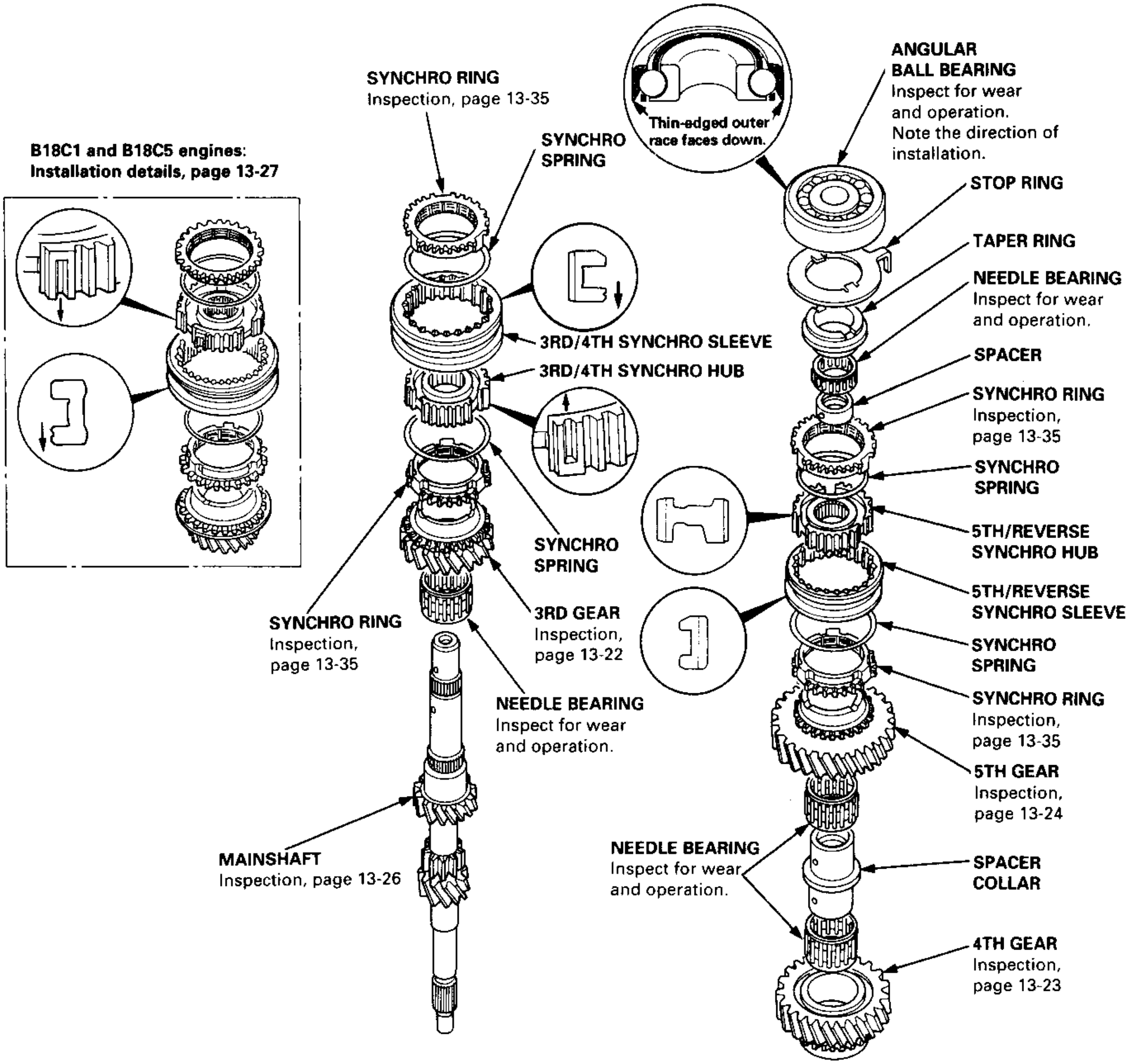
Mainshaft Assembly

Index

NOTE:

- The 3rd/4th and the 5th synchro hubs are installed with a press.
- Install the angular ball bearing with the thin-edged outer race facing the stop ring.

Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd/4th and the 5th synchro hubs, however, should be installed with a press before lubricating them.



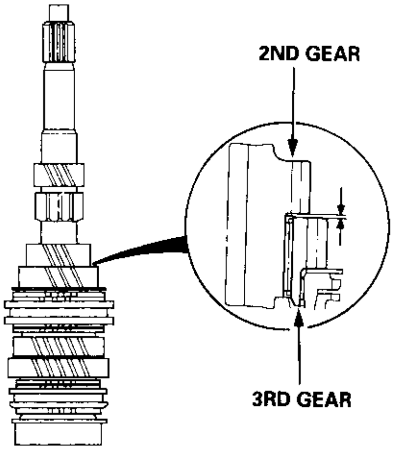
Mainshaft Assembly

Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and the synchro hub as a set.

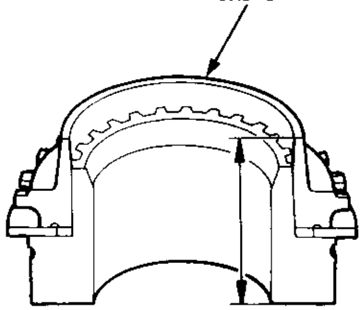
1. Measure the clearance between 2nd and 3rd gears.

   Standard: **0.06 – 0.21 mm (0.002 – 0.008 in)**
   Service Limit: 0.3 mm (0.01 in)



2. If the clearance is more than the service limit, measure the thickness of 3rd gear.

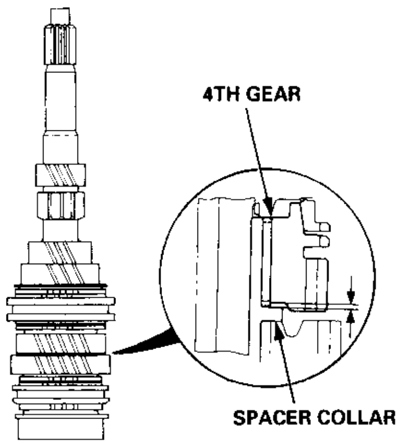
Engine Type	B18C1, B18C5	B18B1
Standard	34.92 – 34.97 mm (1.375 – 1.377 in)	34.42 – 34.47 mm (1.355 – 1.357 in)
Service Limit	34.8 mm (1.370 in)	34.3 mm (1.350 in)



- If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
- If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

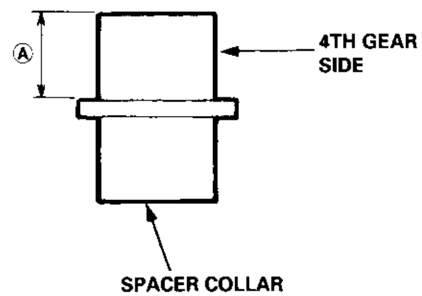
3. Measure the clearance between 4th gear and the spacer collar.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.3 mm (0.01 in)



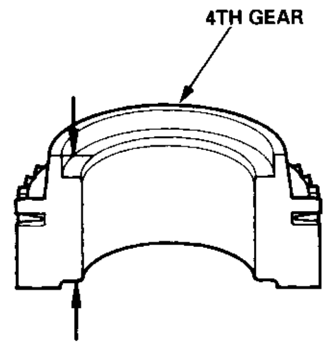
4. If the clearance is more than the service limit, measure distance Ⓐ on the spacer collar.

Standard: 26.03 – 26.08 mm (1.025 – 1.027 in)



5. If distance Ⓐ is not within the standard, replace the spacer collar with a new one. If distance Ⓐ is within the standard, measure the thickness of 4th gear.

Engine Type	B18C1, B18C5	B18B1
Standard	31.42 – 31.47 mm (1.237 – 1.239 in)	30.92 – 30.97 mm (1.217 – 1.219 in)
Service Limit	31.3 mm (1.232 in)	30.8 mm (1.213 in)



- If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
- If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

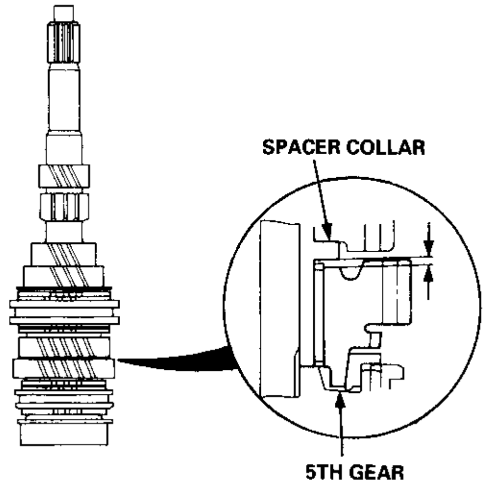
(cont'd)

Mainshaft Assembly

Clearance Inspection (cont'd)

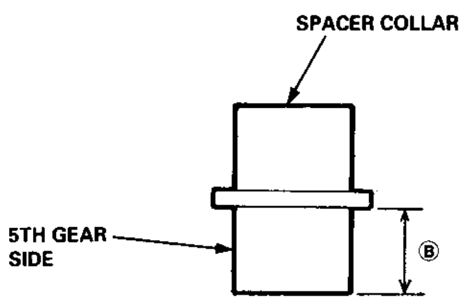
6. Measure the clearance between 5th gear and the spacer collar.

   Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
   Service limit: 0.3 mm (0.012 in)



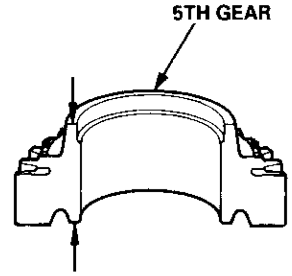
7. If the clearance is more than the service limit, measure distance Ⓑ on the spacer collar.

   Standard: 26.03 – 26.08 mm (1.025 – 1.027 in)



8. If distance Ⓑ is not within the standard, replace the spacer collar with a new one.
   If distance Ⓑ is within the standard, measure the thickness of 5th gear.

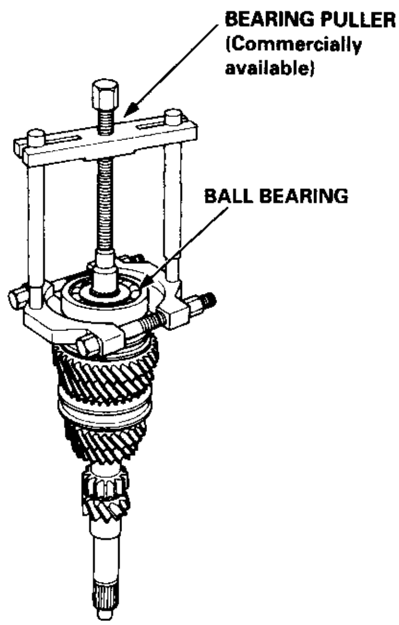
   Standard: 31.42 – 31.47 mm (1.237 – 1.239 in)
   Service Limit: 31.3 mm (1.232 in)



- If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
- If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

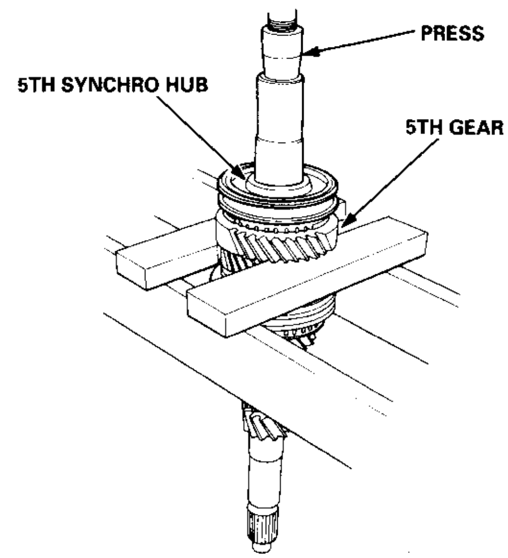
Disassembly

1. Remove the ball bearing using a bearing puller as shown.

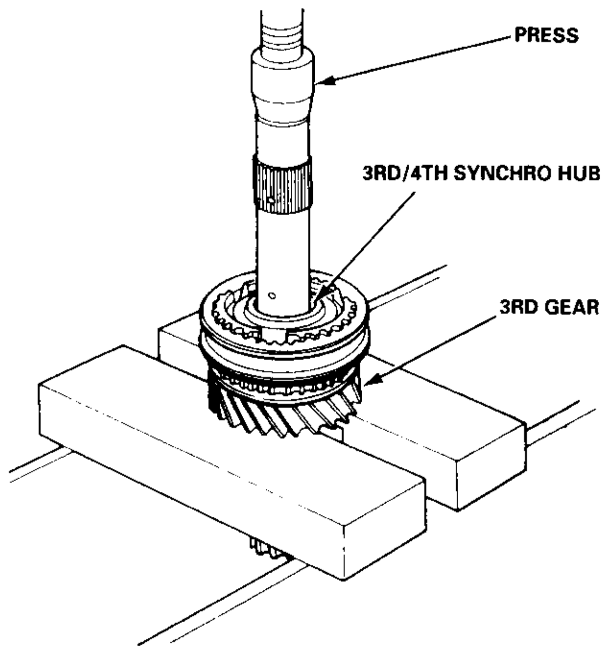


CAUTION: Remove the synchro hubs using a press and the steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

2. Support 5th gear on steel blocks, and press the mainshaft out of the 5th synchro hub, as shown.



3. Support 3rd gear on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub, as shown.



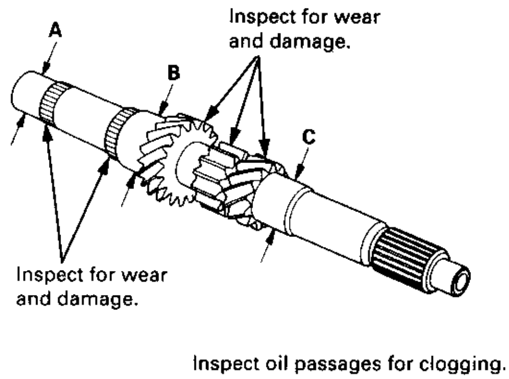
Mainshaft Assembly

Inspection

1. Inspect the gear surfaces and the bearing surfaces for wear and damage, then measure the mainshaft at points A, B, and C.

   Standard:
   A: 27.987 – 28.000 mm (1.1018 – 1.1024 in)
   B: 37.984 – 38.000 mm (1.4954 – 1.4960 in)
   C: 27.977 – 27.990 mm (1.1015 – 1.1020 in)

   Service Limit:
   A: 27.940 mm (1.1000 in)
   B: 37.930 mm (1.4933 in)
   C: 27.930 mm (1.0996 in)

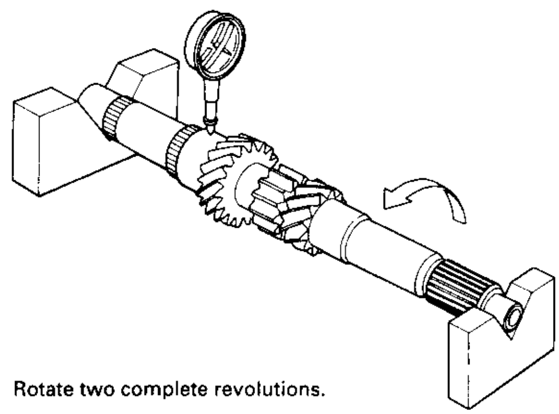


   - If any parts of the mainshaft are less than the service limit, replace mainshaft with a new one.

2. Inspect for runout.

   Standard: 0.02 mm (0.0008 in) max.
   Service Limit: 0.05 mm (0.002 in)

   NOTE: Support the mainshaft at both ends as shown.



   - If the runout is more than the service limit, replace the mainshaft with a new one.

Reassembly

CAUTION:

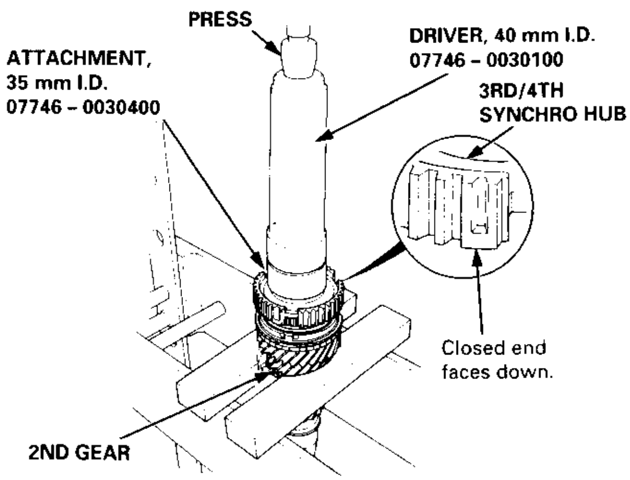
- **Press the 3rd/4th and the 5th synchro hubs on the mainshaft without lubrication.**
- **When installing the 3rd/4th and the 5th synchro hubs, support the mainshaft on the steel blocks, and install synchro hubs using a press.**
- **Install the 3rd/4th and the 5th synchro hubs with a maximum pressure of 19.6 kN (2,000 kgf, 14,466 lbf).**

NOTE: Refer to page 13-21 for reassembly sequence.

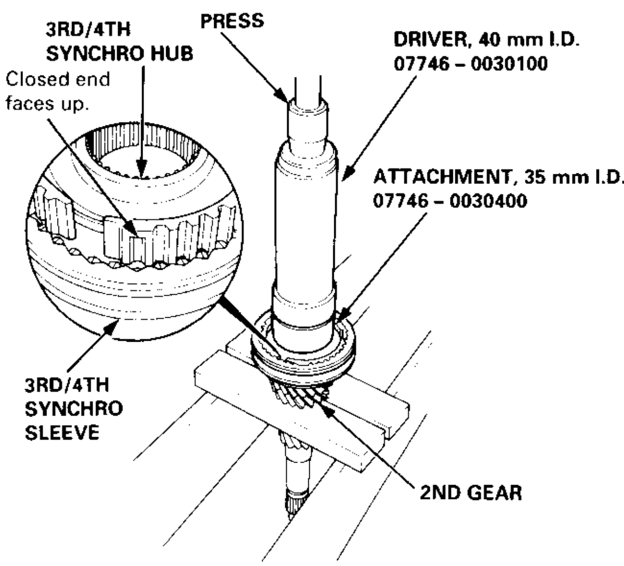
1. Support 2nd gear on steel blocks, then install the 3rd/4th synchro hub using the special tools and a press, as shown.

   NOTE: After installing, check the operation of the 3rd/4th synchro sleeve and hub.

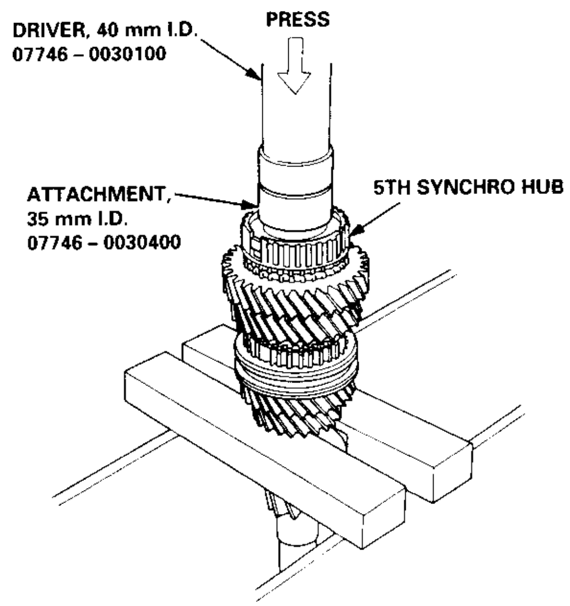
B18B1 engine:



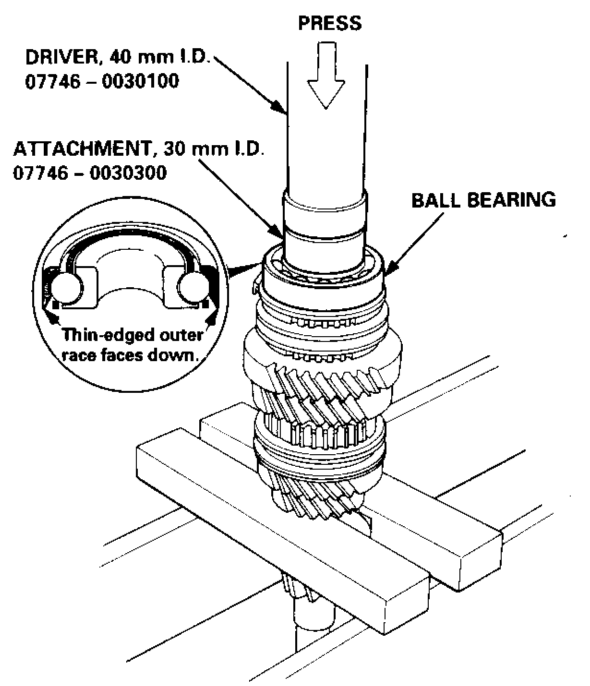
B18C1 and B18C5 engines: Assemble the 3rd/4th synchro hub and sleeve together before installing them on the mainshaft.



2. Install the 5th synchro hub using the special tools and a press as shown.



3. Install the angular ball bearing using the special tools and a press as shown.

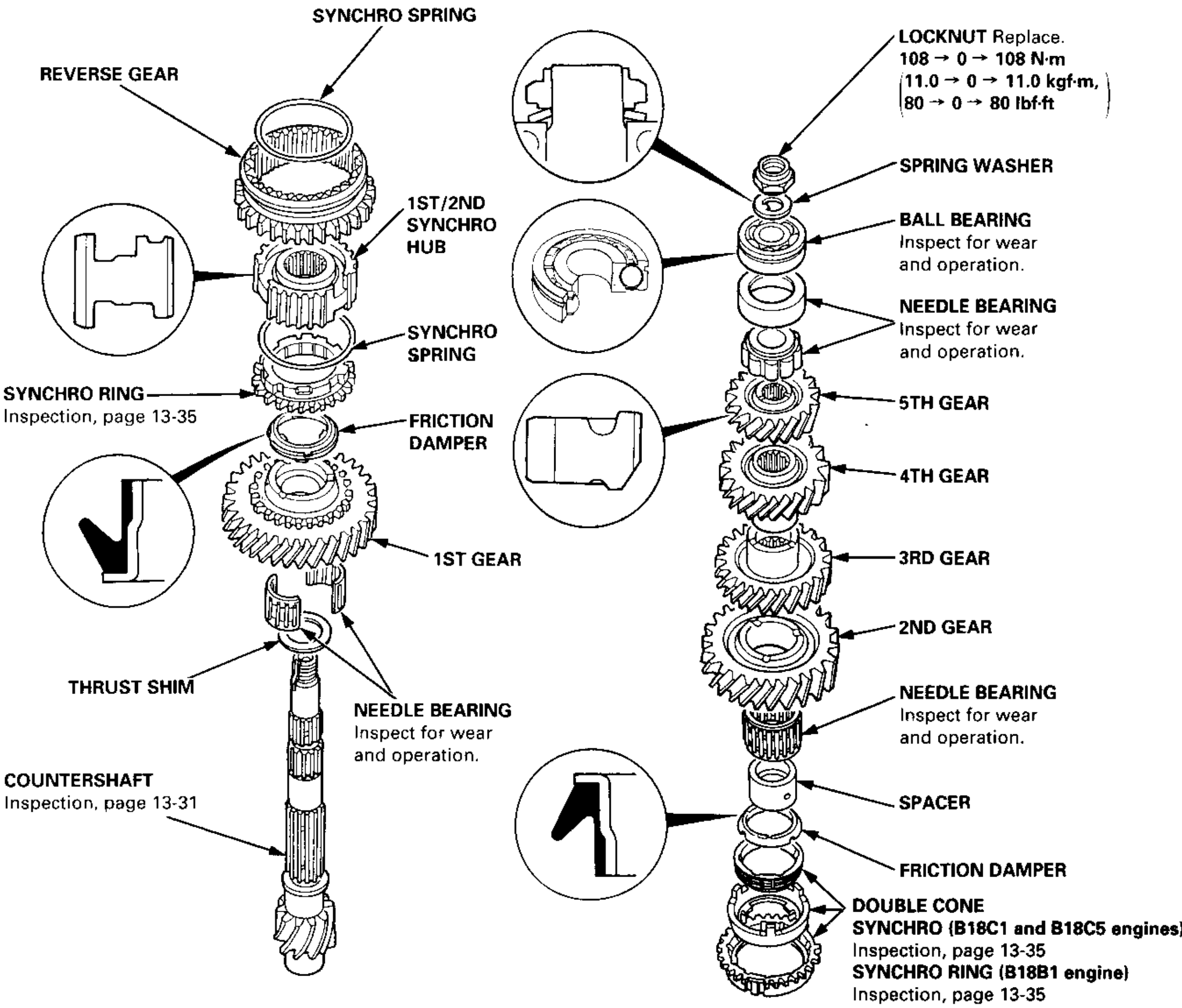


Countershaft Assembly

Index

NOTE: The 4th and 5th gears are installed with a press.

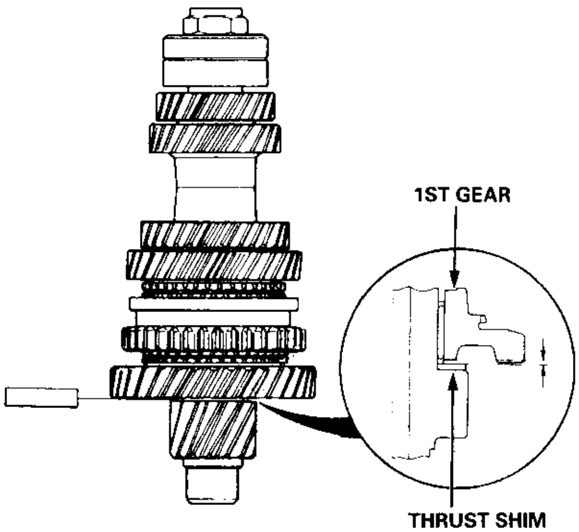
Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 4th and 5th gears, however, should be installed with a press before lubricating them.



Clearance Inspection

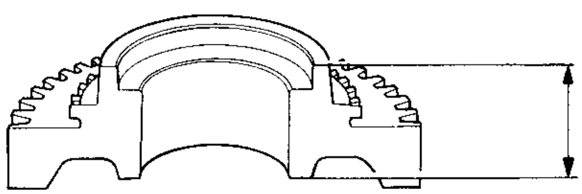
1. Measure the clearance between the thrust shim and 1st gear.

   Standard: 0.045 – 0.205 mm (0.0018 – 0.0081 in)
   Service Limit: 0.265 mm (0.0104 in)



2. If the clearance exceeds the service limit, measure the thicknesses of 1st gear and the thrust shim.

   1ST GEAR
   Standard: 31.45 – 31.50 mm (1.238 – 1.240 in)

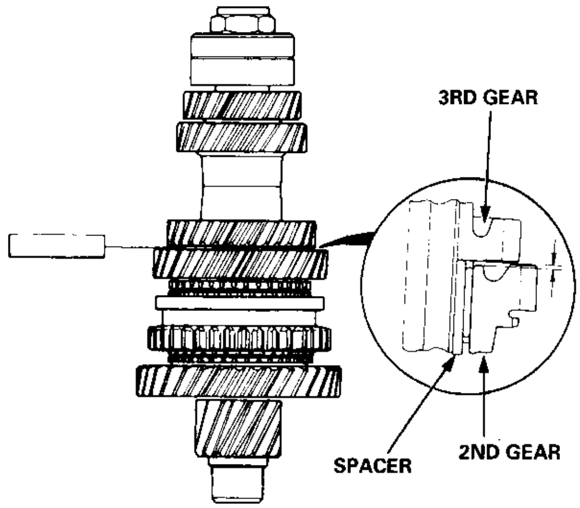


   THRUST SHIM
   Standard: 1.945 – 1.955 mm (0.0766 – 0.0770 in)

- If the thicknesses of 1st gear and the thrust shim are less than the standard, replace them with new ones.
- If the thicknesses of 1st gear and the thrust shim are within the standard, replace the 1st/2nd synchro hub with a new one.

3. Measure the clearance between 2nd and 3rd gears.

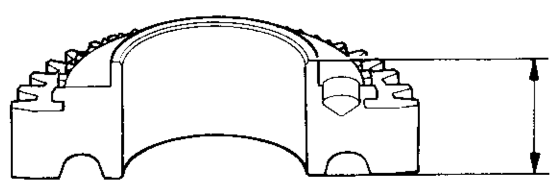
   Standard: 0.07 – 0.14 mm (0.003 – 0.006 in)
   Service Limit: 0.20 mm (0.008 in)



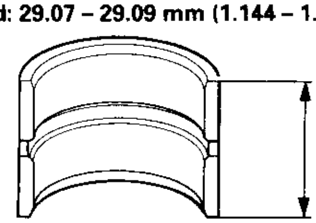
4. If the clearance exceeds the service limit, measure the thicknesses of 2nd gear and the spacer collar.

2ND GEAR

Engine Type	B18C1, B18C5	B18B1
Standard	28.92 – 28.97 mm (1.139 – 1.141 in)	34.62 – 34.67 mm (1.363 – 1.365 in)
Service Limit	28.8 mm (1.13 in)	34.5 mm (1.36 in)



SPACER COLLAR
Standard: 29.07 – 29.09 mm (1.144 – 1.145 in)



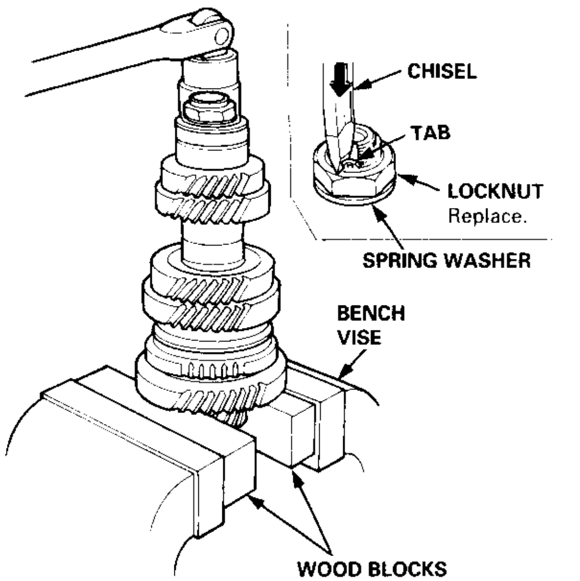
- If the thicknesses of 2nd gear and the spacer collar are less than the standard, replace them with new ones.
- If the thicknesses of 2nd gear and the spacer collar are within the standard, replace the 1st/2nd synchro hub with a new one.

Countershaft Assembly

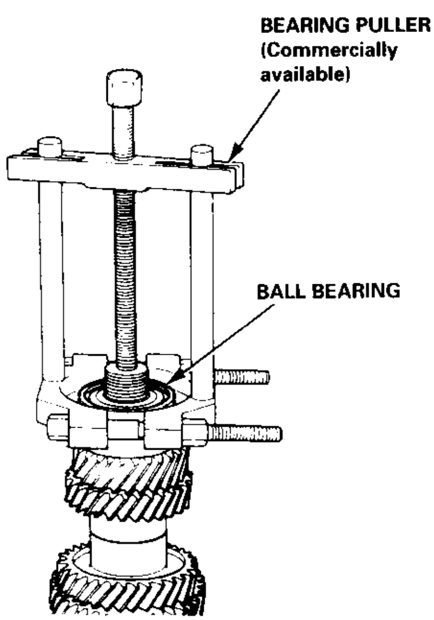
Disassembly

1. Securely clamp the countershaft assembly in a bench vise with wood blocks.

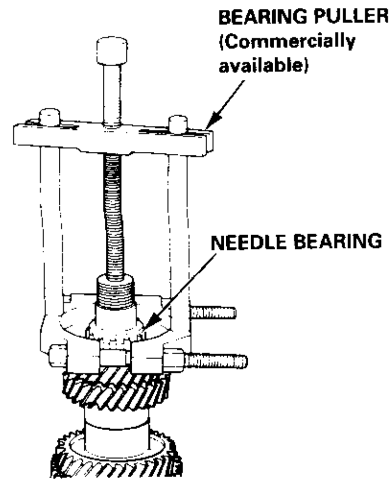
2. Raise the locknut tab from the groove in the countershaft, then remove the locknut and the spring washer.



3. Remove the ball bearing using a bearing puller as shown.

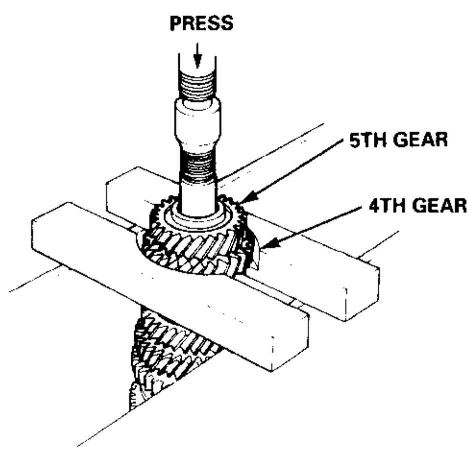


4. Remove the bearing outer race, then remove the needle bearing using a bearing puller as shown.



CAUTION: Remove the gears using a press and the steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

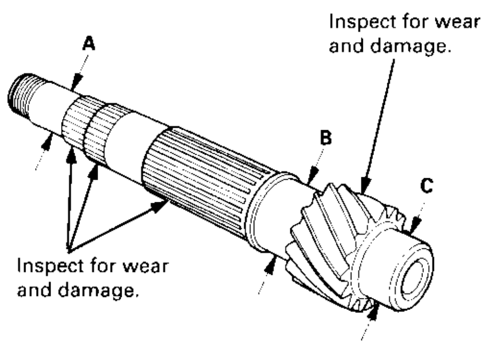
5. Support 4th gear on steel blocks, and press the countershaft out of 5th and 4th gears, as shown.



Inspection

1. Inspect the gear surfaces and the bearing surfaces for wear and damage, then measure the countershaft at points A, B, and C.

   Standard:
   A: 24.980 – 24.993 mm (0.9835 – 0.9840 in)
   B: 36.984 – 37.000 mm (1.4561 – 1.4567 in)
   C: 33.000 – 33.015 mm (1.2992 – 1.2998 in)
   Service Limit:
   A: 24.930 mm (0.9815 in)
   B: 36.930 mm (1.4539 in)
   C: 32.950 mm (1.2972 in)



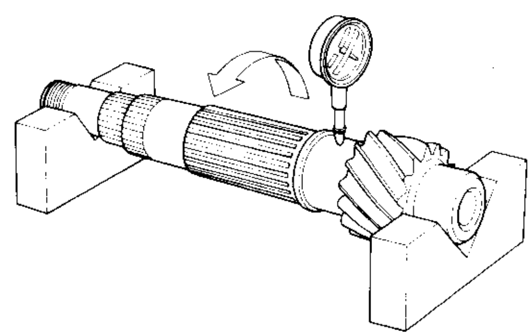
Inspect oil passage for clogging.

- If any parts of the countershaft are less than the service limit, replace countershaft with a new one.

2. Inspect for runout.

   Standard: 0.02 mm (0.0008 in) max.
   Service Limit: 0.05 mm (0.002 in)

   NOTE: Support the countershaft at both ends as shown.



- If the runout is more than the service limit, replace the countershaft with a new one.

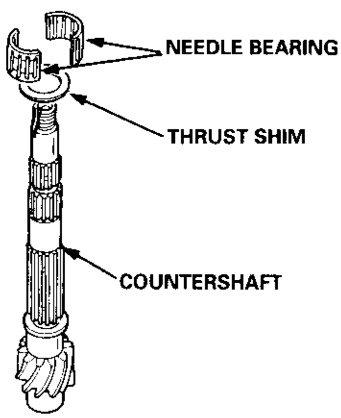
Countershaft Assembly

Reassembly

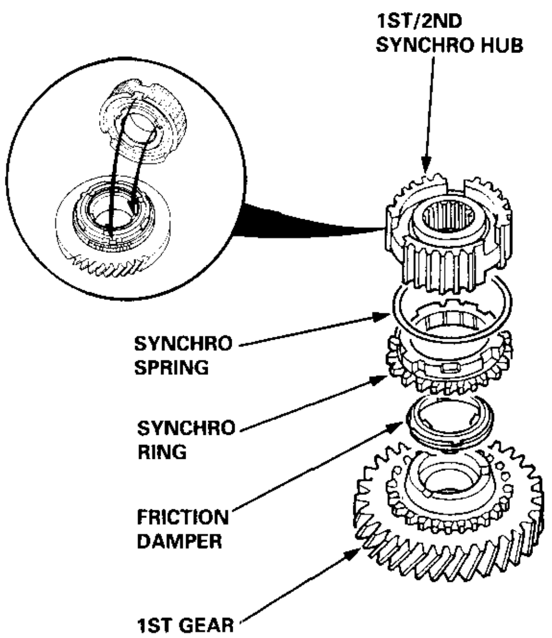
CAUTION:
- **Press 4th and 5th gears on the countershaft without lubrication.**
- **When installing 4th and 5th gears, support the shaft on steel blocks, and install the gears using a press.**
- **Install 4th and 5th gear with a maximum pressure of 25.5 kN (2,600 kgf, 18,806 lbf).**

NOTE: Refer to page 13-28 for reassembly sequence.

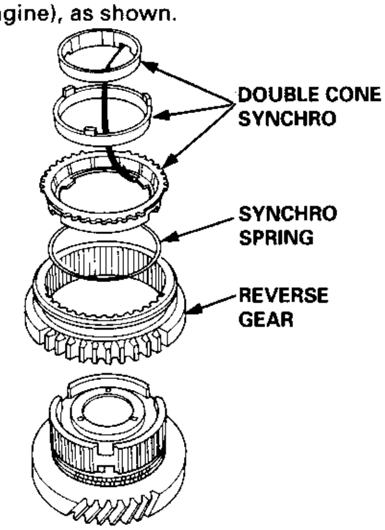
1. Install the thrust shim and the needle bearings on the countershaft.



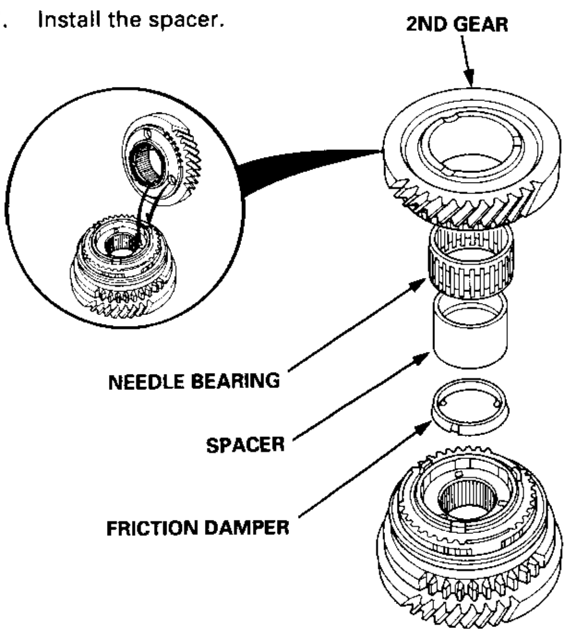
2. Install the friction damper, the synchro ring, and the synchro spring on 1st gear.
3. Install the 1st/2nd synchro hub by aligning the fingers on the friction damper and the grooves in the 1st/2nd synchro hub, as shown.



4. Install the reverse gear.
5. Install the synchro spring, and the double cone synchro (B18C1 and B18C5 engines), or synchro ring (B18B1 engine), as shown.

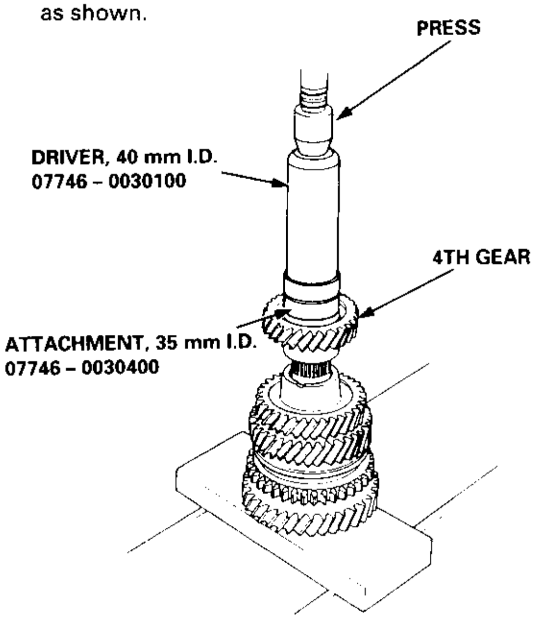


6. Assemble the friction damper, the needle bearing, and 2nd gear, then install them by aligning the fingers on the friction damper and the grooves in the 1st/2nd synchro hub with the fingers of the double cone synchro and the grooves on 2nd gear, as shown.
7. Install the spacer.

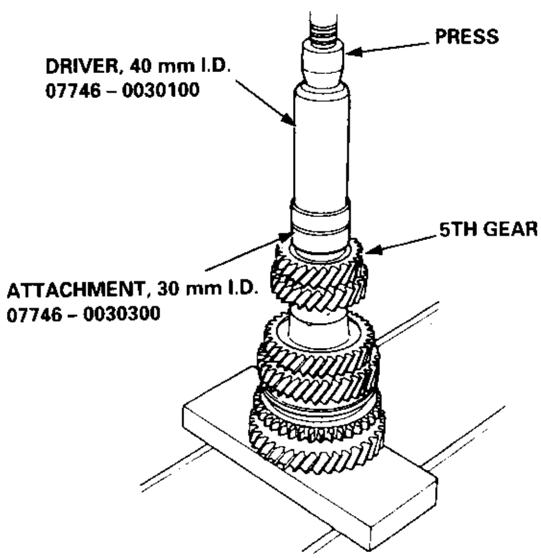


8. Install the parts assembled in steps 2 – 6 on the countershaft.

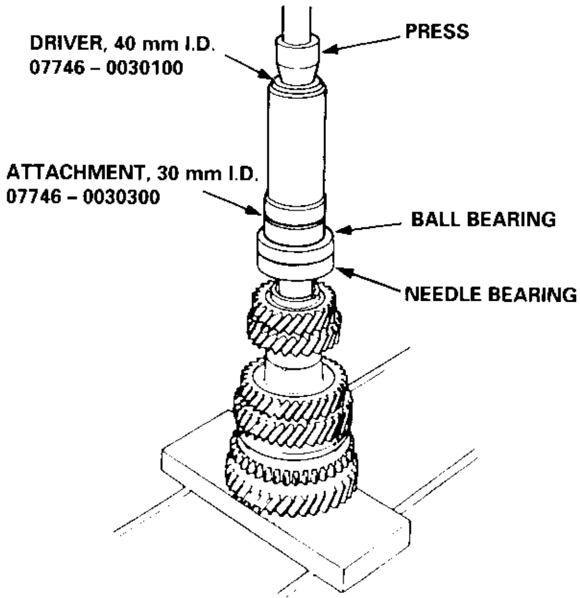
9. Support the countershaft on a steel block, and install 4th gear using the special tools and a press, as shown.



10. Support the countershaft on a steel block, and install 5th gear using the special tools and a press, as shown.



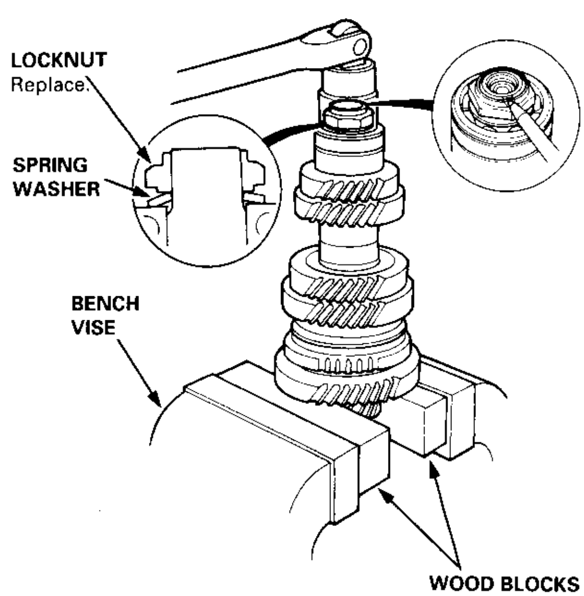
11. Install the needle bearing, then install the ball bearing using the special tools and a press as shown.



12. Securely clamp the countershaft assembly in a bench vise with wood blocks.

13. Install the spring washer, tighten the locknut, then stake the locknut tab into the groove.

LOCKNUT
108 → 0 → 108 N·m (11.0 → 0 → 11.0 kgf·m, 80 → 0 → 80 lbf·ft)



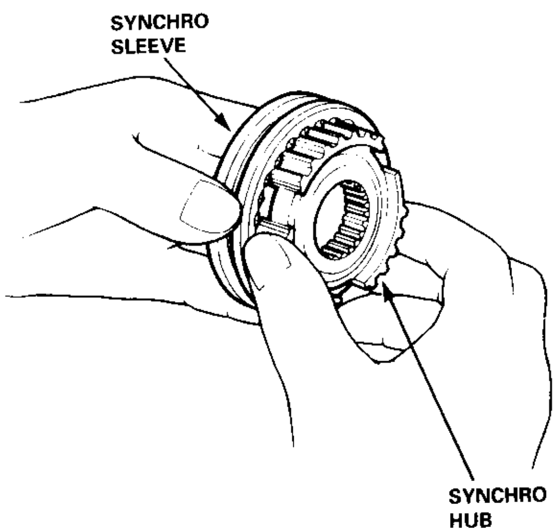
Synchro Sleeve, Synchro Hub

Inspection

1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicates wear.

2. Install each synchro hub in its mating synchro sleeve and check for freedom of movement.

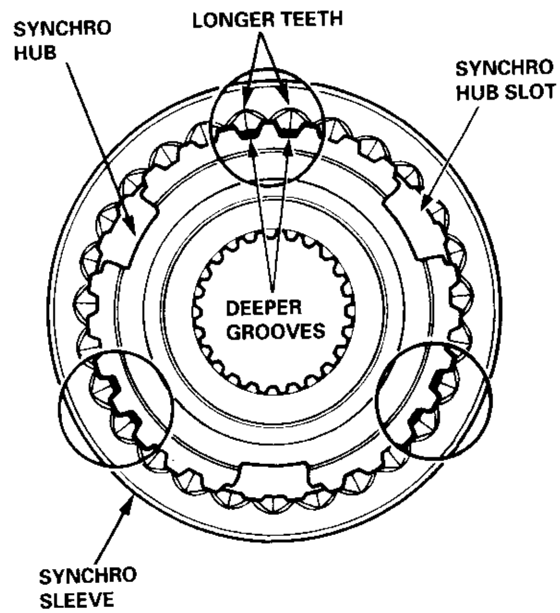
   NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



Installation

When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.

CAUTION: Do not install the synchro sleeve with its longer teeth in the synchro hub slots, because it will damage the spring ring.



Synchro Ring, Gear

Inspection

1. Inspect the synchro ring and gear.

   A: Inspect the inside of the synchro ring for wear.

   B: Inspect the teeth on the synchro ring for wear (rounded off).

   C: Inspect the synchro sleeve teeth and matching teeth on the gear for wear (rounded off).

   D: Inspect the gear hub thrust surface for wear.

   E: Inspect the cone surface for wear and roughness.

   F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.

2. Coat the cone surface of the gear with oil, and place the synchro ring on the matching gear. Rotate the ring, making sure that it does not slip.

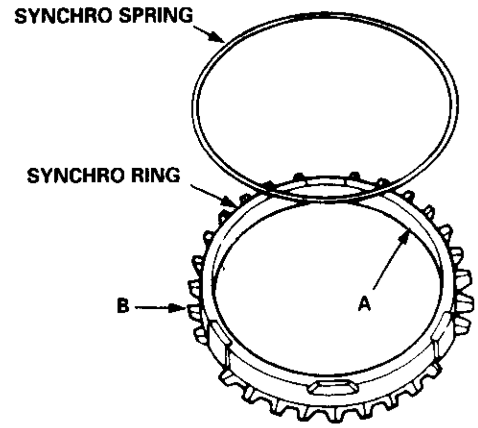
   Measure the clearance between the synchro ring and gear all the way around.

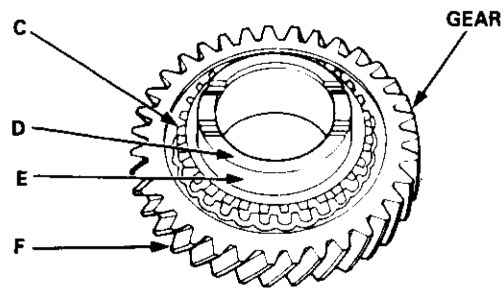
   NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

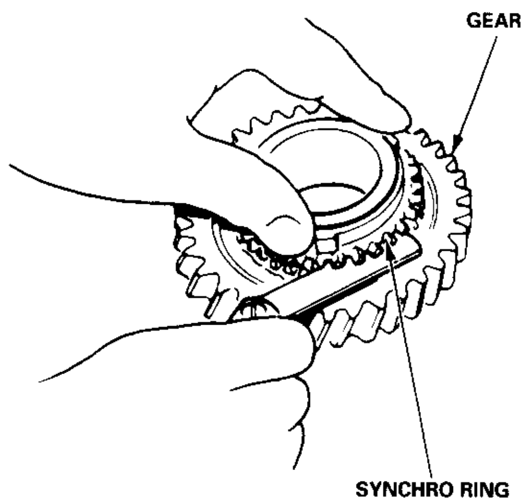
   Synchro Ring-to-Gear Clearance
   Standard: 0.85 – 1.10 mm (0.033 – 0.043 in)
   Service Limit: 0.4 mm (0.02 in)

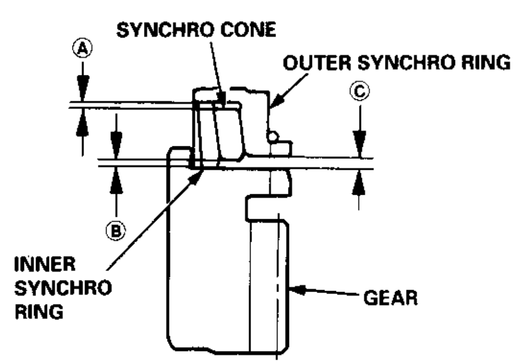
   Double Cone Synchro-to-Gear Clearance
   Standard:
   Ⓐ: (Outer Synchro Ring to Synchro Cone) 0.5 – 1.0 mm (0.02 – 0.04 in)
   Ⓑ: (Synchro Cone to Gear) 0.5 – 1.0 mm (0.02 – 0.04 in)
   Ⓒ: (Outer Synchro Ring to Gear) 0.95 – 1.68 mm (0.037 – 0.066 in)
   Service Limit:
   Ⓐ: 0.3 mm (0.01 in)
   Ⓑ: 0.3 mm (0.01 in)
   Ⓒ: 0.6 mm (0.02 in)

   If the clearance is less than the service limit, replace the synchro ring and synchro cone.







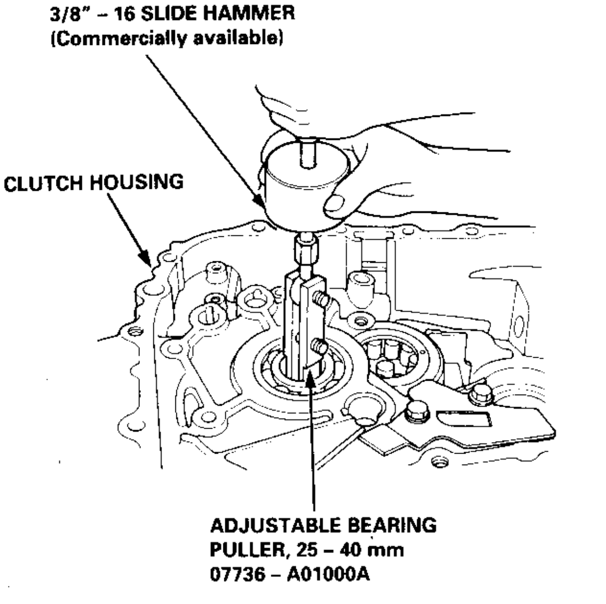


Clutch Housing Bearing

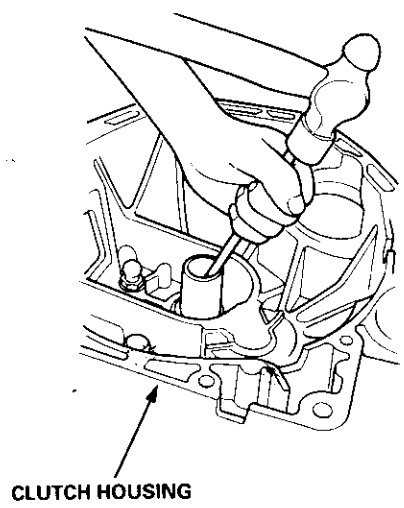
Replacement

Mainshaft:

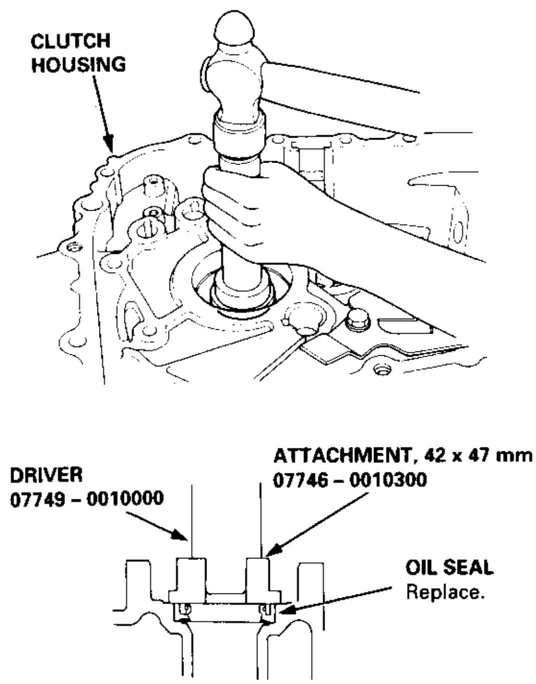
1. Remove the ball bearing using the special tools as shown.



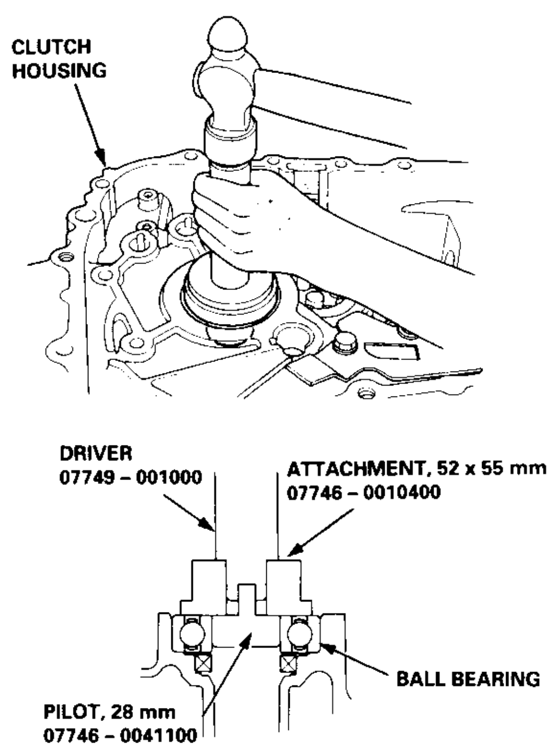
2. Remove the oil seal from the clutch housing.



3. Drive the new oil seal into the clutch housing using the special tools as shown.

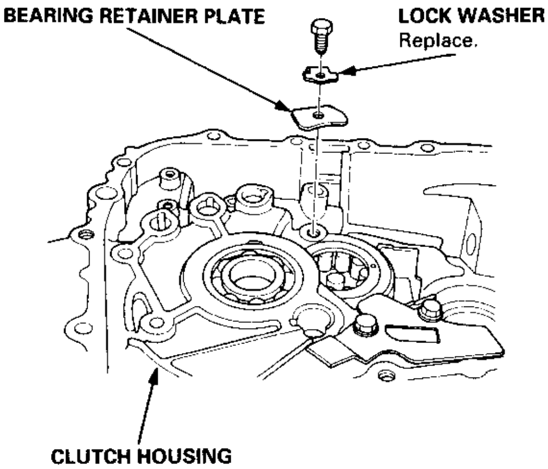


4. Drive the ball bearing into the clutch housing using the special tools as shown.

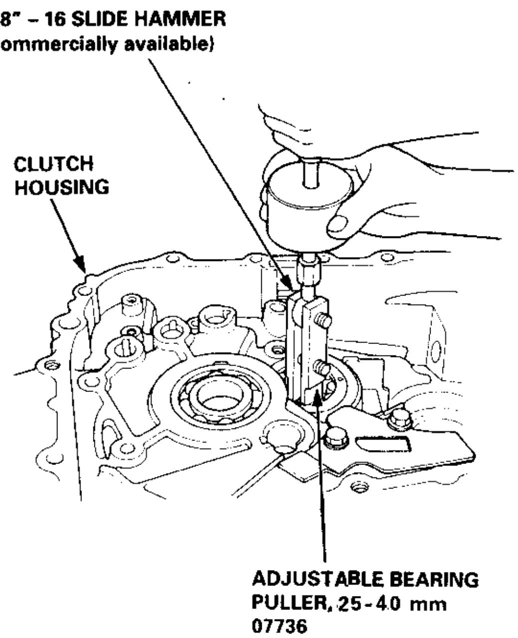


Countershaft:

1. Bend the tab on the lock washer down, then remove the bolt and bearing retainer plate.

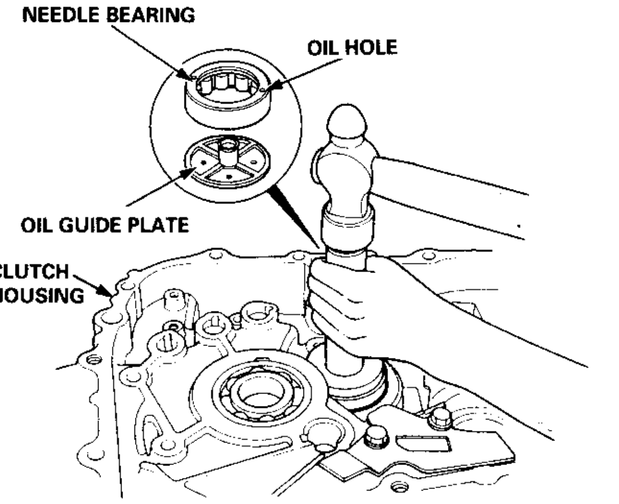


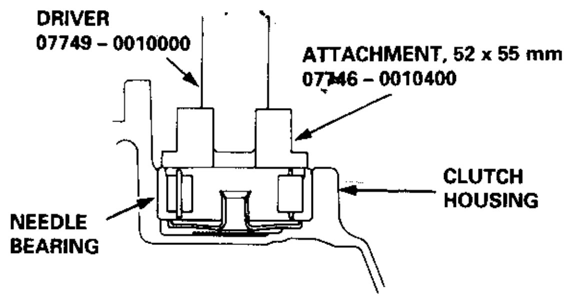
2. Remove the needle bearing using the special tools as shown, then remove the oil guide plate.



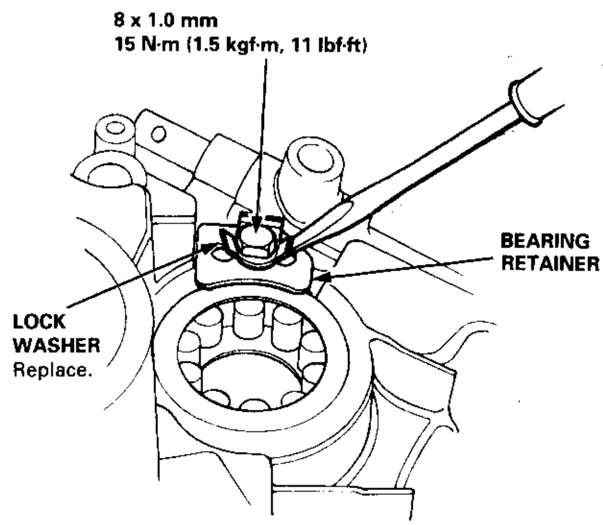
3. Position the oil guide plate and new needle bearing in the bore of the clutch housing, then drive in the needle bearing using the special tools as shown.

   NOTE: Position the needle bearing with the oil hole facing up.





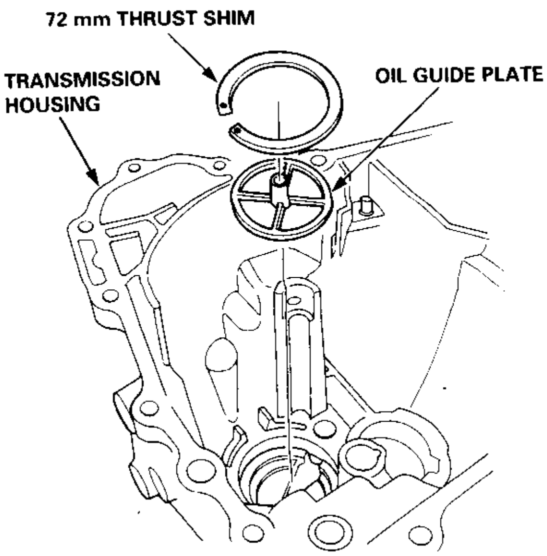
4. Install the bearing retainer plate and new lock washer, then bend the tab against the bolt head.



Mainshaft Thrust Clearance

Adjustment

1. Remove the 72 mm thrust shim and oil guide plate from the transmission housing.

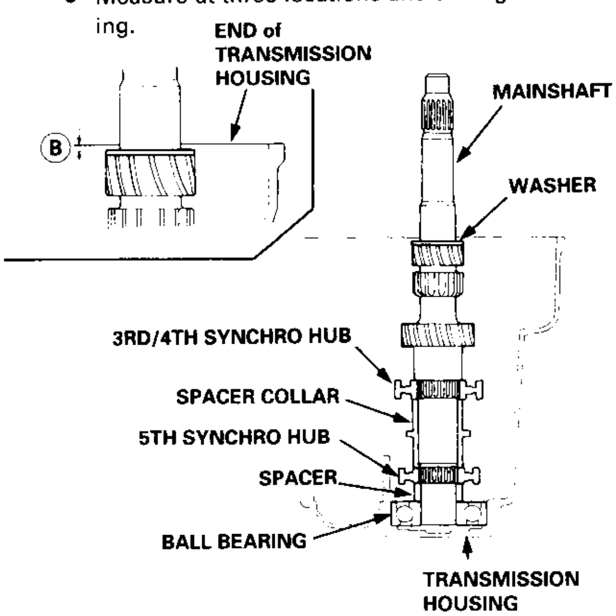


2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, spacer, and ball bearing on the mainshaft, then install the above assembly in the transmission housing.

3. Install the washer on the mainshaft.

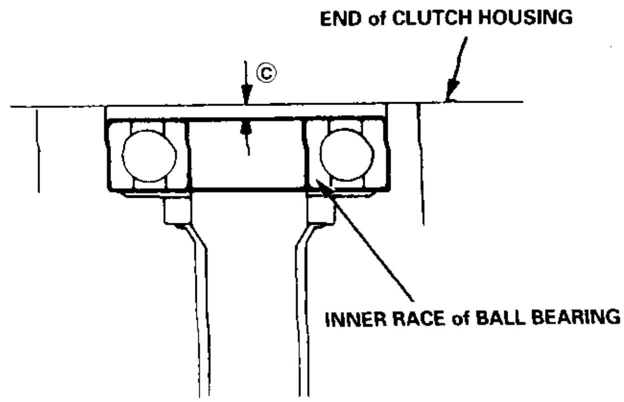
4. Measure distance Ⓑ between the end of the transmission housing and washer.

   NOTE:
   - Use a straight edge and vernier caliper.
   - Measure at three locations and average the reading.



5. Measure distance Ⓒ between the end of the clutch housing and bearing inner race.

   NOTE:
   - Use a straight edge and depth gauge.
   - Measure at three locations and average the readings.



6. Select the proper 72 mm thrust shim from the chart by using the formula below.

   NOTE: Use only one 72 mm thrust shim.

   Shim Selection Formula:

   From the measurements you made in steps 4 and 5:
   -1. Add distance Ⓒ (step 5) to distance Ⓑ (step 4).
   -2. From this number, subtract 0.93 (which is the midpoint of the flex range of the clutch housing bearing spring washer).
   -3. Take this number and compare it to the available shim sizes in the chart.

   (For example)

   B: 2.39
   \+ C: 0.22
   = 2.61

   2.61
   − 0.93
   = 1.68

   - Try the 1.68 mm (0.0661 in) shim.

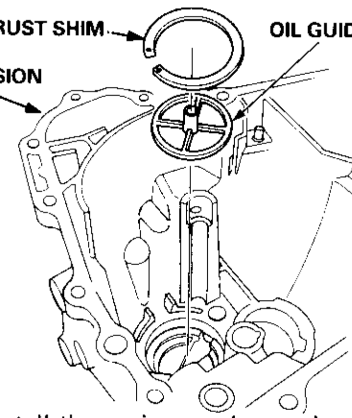
72 mm Thrust Shim

	Part Number	Thickness
A	23931 - P21 - 000	0.60 mm (0.0236 in)
B	23932 - P21 - 000	0.63 mm (0.0248 in)
C	23933 - P21 - 000	0.66 mm (0.0260 in)
D	23934 - P21 - 000	0.69 mm (0.0272 in)
E	23935 - P21 - 000	0.72 mm (0.0283 in)
F	23936 - P21 - 000	0.75 mm (0.0295 in)
G	23937 - P21 - 000	0.78 mm (0.0307 in)
H	23938 - P21 - 000	0.81 mm (0.0319 in)
I	23939 - P21 - 000	0.84 mm (0.0331 in)
J	23940 - P21 - 000	0.87 mm (0.0343 in)
K	23941 - P21 - 000	0.90 mm (0.0354 in)
L	23942 - P21 - 000	0.93 mm (0.0366 in)
M	23943 - P21 - 000	0.96 mm (0.0378 in)
N	23944 - P21 - 000	0.99 mm (0.0390 in)
O	23945 - P21 - 000	1.02 mm (0.0402 in)
P	23946 - P21 - 000	1.05 mm (0.0413 in)
Q	23947 - P21 - 000	1.08 mm (0.0425 in)
R	23948 - P21 - 000	1.11 mm (0.0437 in)
S	23949 - P21 - 000	1.14 mm (0.0449 in)
T	23950 - P21 - 000	1.17 mm (0.0461 in)
U	23951 - P21 - 000	1.20 mm (0.0472 in)
V	23952 - P21 - 000	1.23 mm (0.0484 in)
W	23953 - P21 - 000	1.26 mm (0.0496 in)
X	23954 - P21 - 000	1.29 mm (0.0508 in)
Y	23955 - P21 - 000	1.32 mm (0.0520 in)
Z	23956 - P21 - 000	1.35 mm (0.0531 in)
AA	23957 - P21 - 000	1.38 mm (0.0543 in)
AB	23958 - P21 - 000	1.41 mm (0.0555 in)
AC	23959 - P21 - 000	1.44 mm (0.0567 in)
AD	23960 - P21 - 000	1.47 mm (0.0579 in)
AE	23961 - P21 - 000	1.50 mm (0.0591 in)
AF	23962 - P21 - 000	1.53 mm (0.0602 in)
AG	23963 - P21 - 000	1.56 mm (0.0614 in)
AH	23964 - P21 - 000	1.59 mm (0.0626 in)
AI	23965 - P21 - 000	1.62 mm (0.0638 in)
AJ	23966 - P21 - 000	1.65 mm (0.0650 in)
AK	23967 - P21 - 000	1.68 mm (0.0661 in)
AL	23968 - P21 - 000	1.71 mm (0.0673 in)
AM	23969 - P21 - 000	1.74 mm (0.0685 in)
AN	23970 - P21 - 000	1.77 mm (0.0697 in)
AO	23971 - P21 - 000	1.80 mm (0.0709 in)

7. Check the thrust clearance in the manner described below.

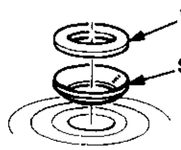
   NOTE: Check the measurement at normal room temperature.

   a. Install the thrust shim selected and oil guide plate in the transmission housing.



   b. Install the spring washer and washer on the ball bearing.

NOTE:
- Clean the spring washer, washer and thrust shim throughly before installation.
- Install the spring washer, washer and thrust shim properly.



   c. Install the mainshaft in the clutch housing.

   d. Place the transmission housing over the mainshaft and onto the clutch housing.

   e. Tighten the clutch and transmission housings with several 8 mm bolts.

      NOTE: It is not necessary to use sealing agent between the housings.

      8 x 1.25 mm
      27 N·m (2.8 kgf·m, 20 lbf·ft)

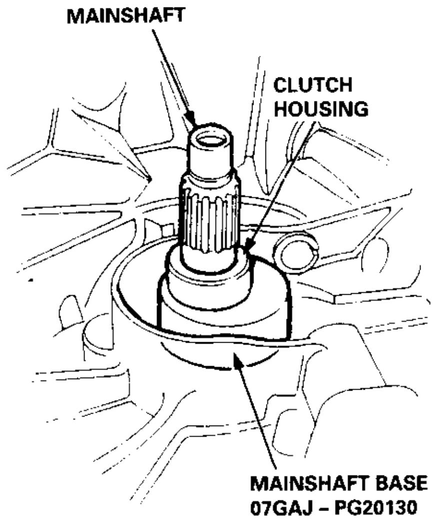
   f. Tap the mainshaft with a plastic hammer.

(cont'd)

Mainshaft Thrust Clearance

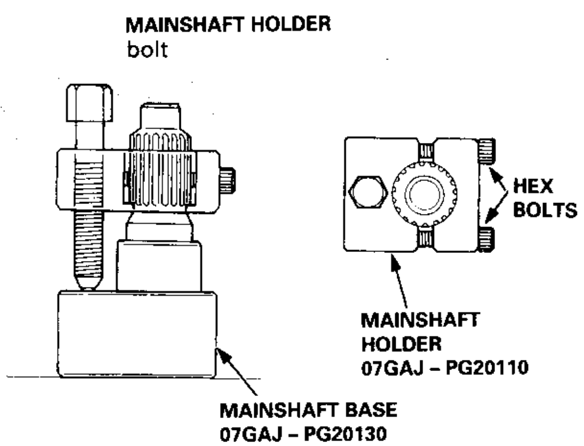
Adjustment (cont'd)

g. Slide the mainshaft base over the mainshaft.



h. Attach the mainshaft holder to the mainshaft as follows:

NOTE:
- Back-out the mainshaft holder bolt and loosen the two hex bolts.
- Fit the holder over the mainshaft so its lip is towards the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



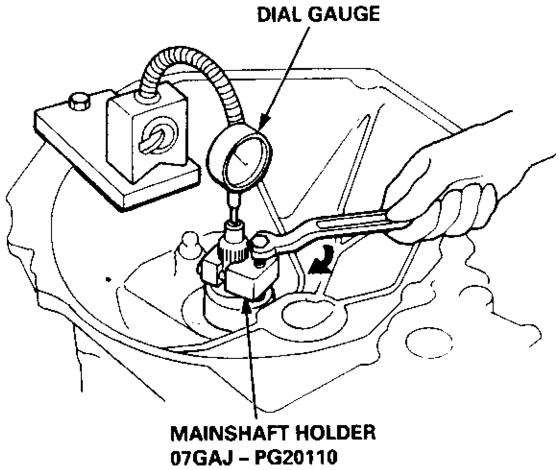
i. Seat the mainshaft fully by tapping its end with a plastic hammer.

j. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.

k. Zero a dial gauge on the end of the mainshaft.

l. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

CAUTION: Turning the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.

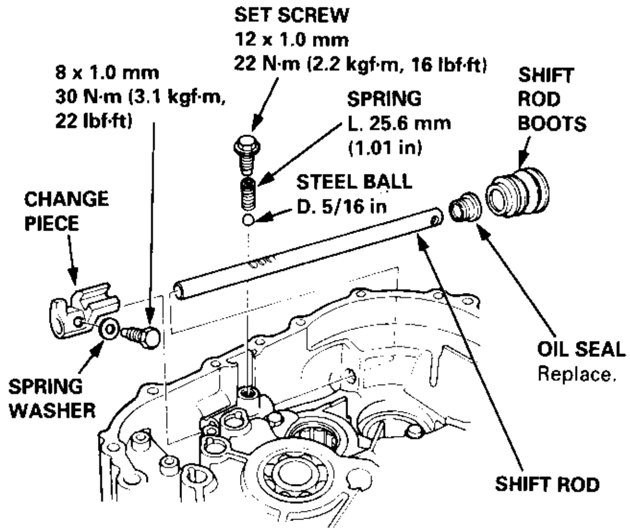


m. If the reading is within the standard, the clearance is correct.
If the reading is not within the standard, recheck the shim thickness.

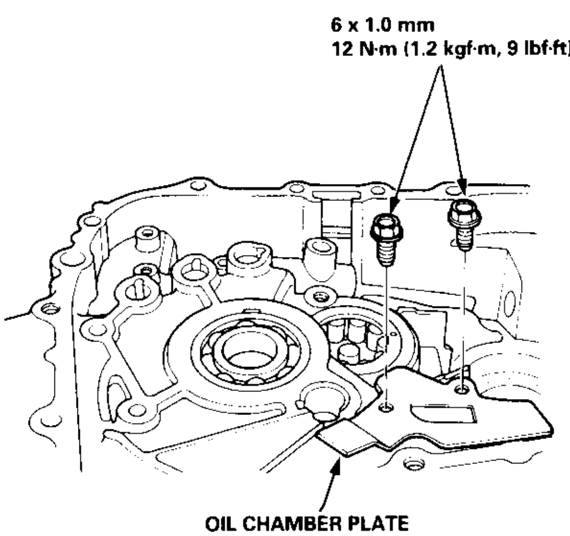
Standard: 0.11 – 0.18 mm (0.004 – 0.007 in)

Reassembly

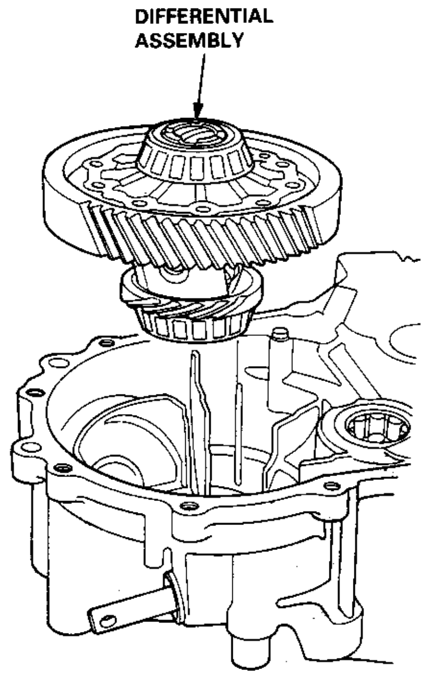
1. Install the new oil seal.
2. Set the change piece.
3. Install the shift rod.
4. Install the steel ball, the spring, and the set screw.
5. Install the change piece attaching bolt.
6. Install the shift rod boots.



7. Install the oil chamber plate.

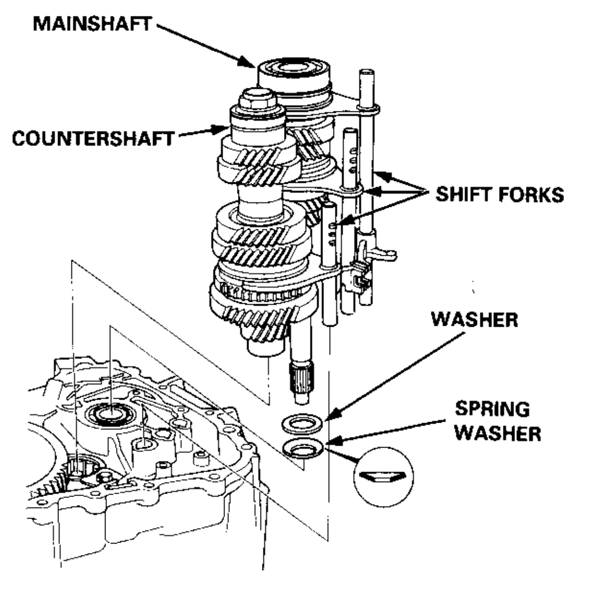


8. Install the differential assembly.



9. Position the spring washer and the washer onto the mainshaft bearing.
10. Install the mainshaft, the countershaft, and the shift fork assemblies.

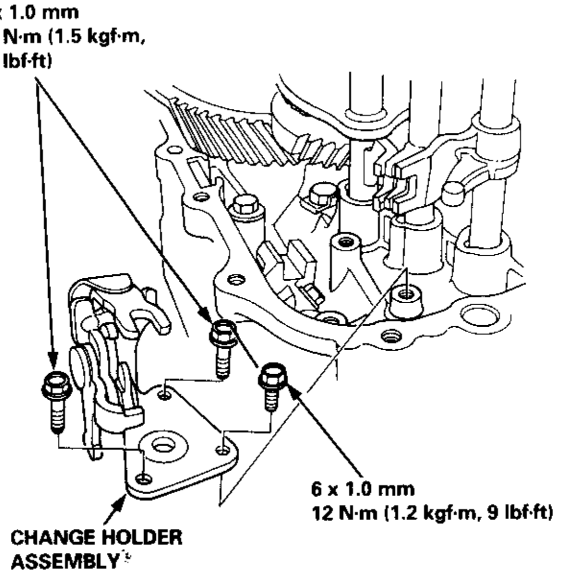
NOTE: Align the finger of the interlock with the groove in the shift fork shaft.



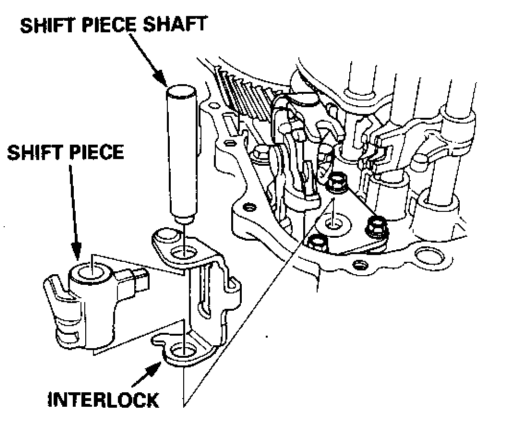
(cont'd)

Reassembly (cont'd)

11. Install the change holder assembly.

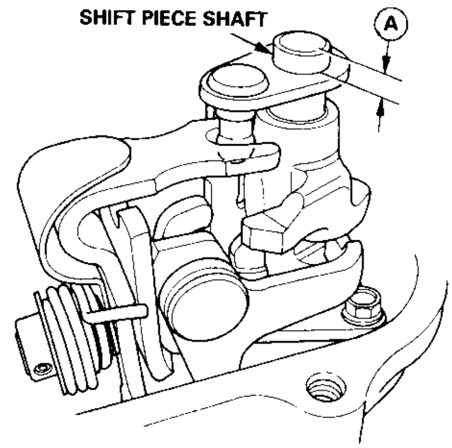


12. Install the shift piece and the interlock, then install the shift piece shaft.

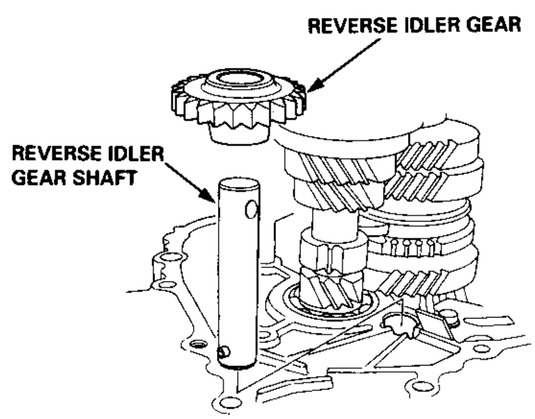


13. Measure the distance Ⓐ after mounting the shift piece shaft. If it's incorrect, check the installation.

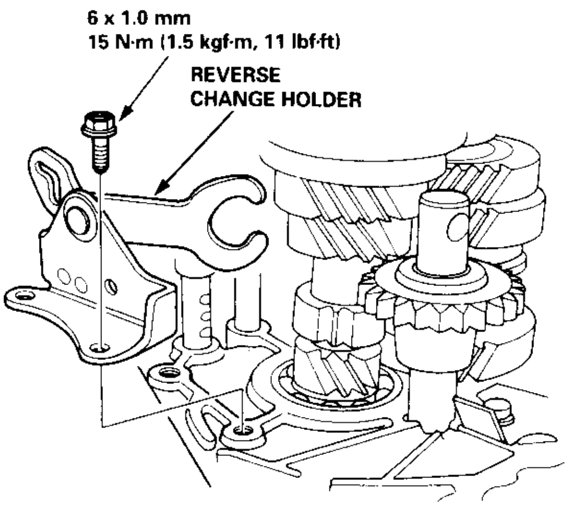
Distance Ⓐ: 11.9 – 12.3 mm (0.47 – 0.48 in)



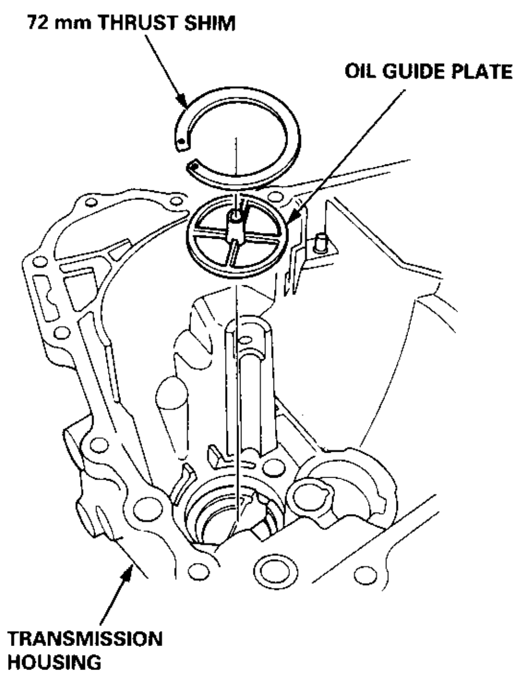
14. Install the reverse idler gear, and the reverse idler gear shaft.



15. Install the reverse change holder.



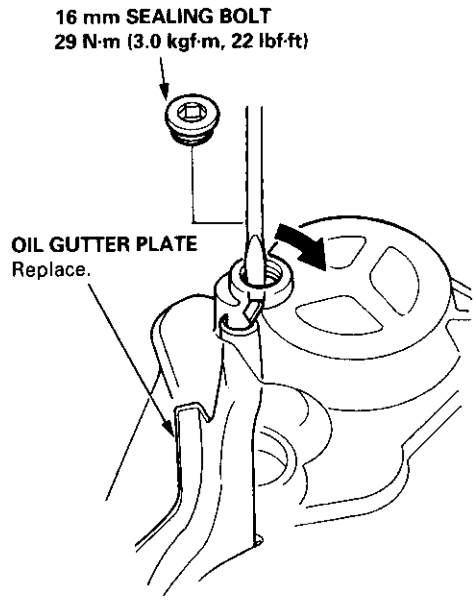
16. Install the oil guide plate and the 72 mm thrust shim into the transmission housing.



17. Install the oil gutter plate.

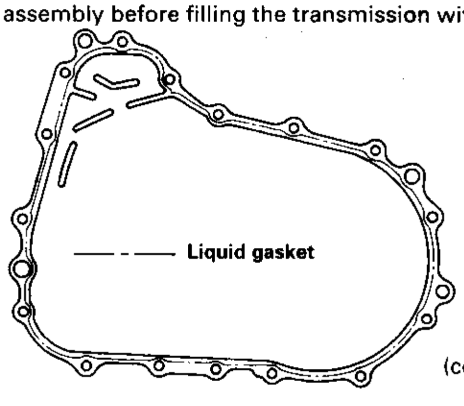
18. Bend the hook of the oil gutter plate, then install the 16 mm sealing bolt.

NOTE: Apply liquid gasket (P/N 08718 – 0001) to the threads.



19. Apply liquid gasket to the surface of the transmission housing as shown.

NOTE:
- Use liquid gasket (P/N 08718 – 0001).
- Remove the dirt and oil from the sealing surface.
- Seal the entire circumference of the bolt holes to prevent oil leakage.
- If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings, and allow it to cure at least 30 minutes after assembly before filling the transmission with oil.

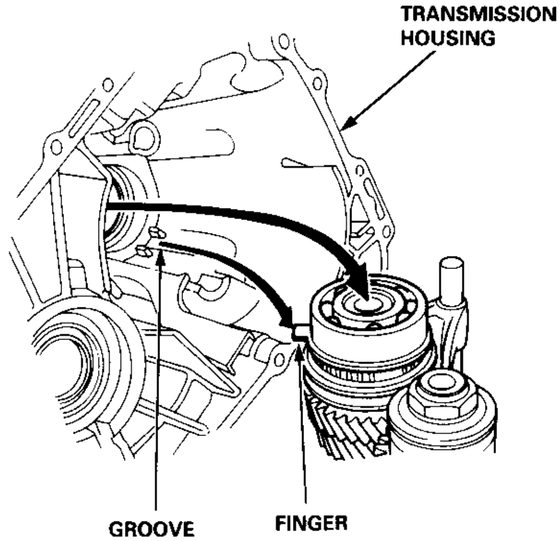


(cont'd)

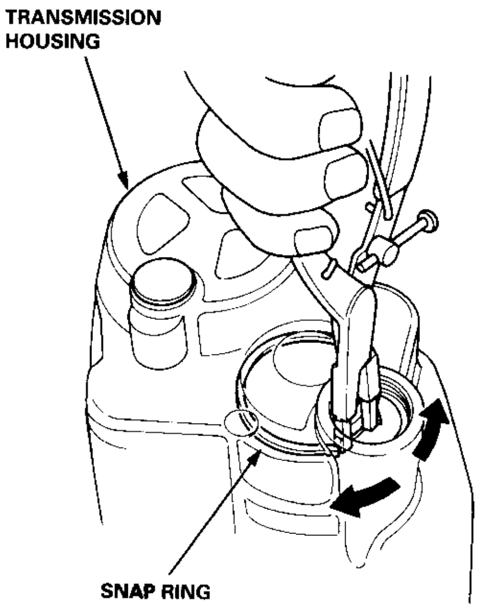
Reassembly (cont'd)

20. Install the dowel pins.

21. Install the transmission housing by aligning the groove in the housing with finger on the stop ring.

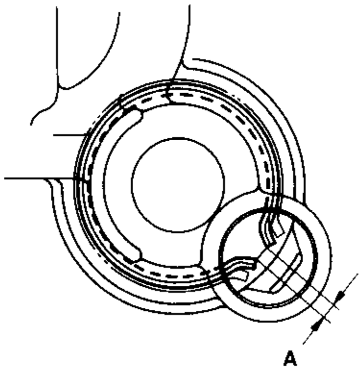


22. Lower the transmission housing with the snap ring pliers, and set the snap ring in the groove of the countershaft bearing.

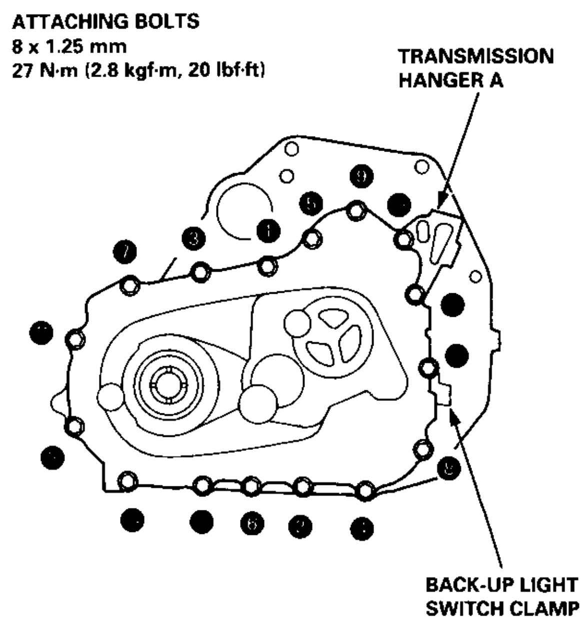


23. Check that the snap ring is securely seated in the groove of the countershaft bearing.

Dimension Ⓐ as installed: 4.6 – 8.3 mm (0.181 – 0.327 in)

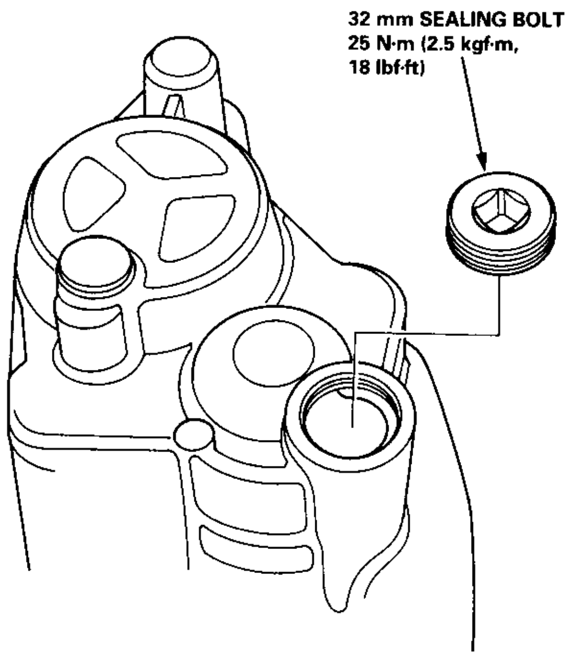


24. Install the transmission hanger A and back-up light switch clamp, then tighten the transmission housing attaching bolts in the numbered sequence shown below.

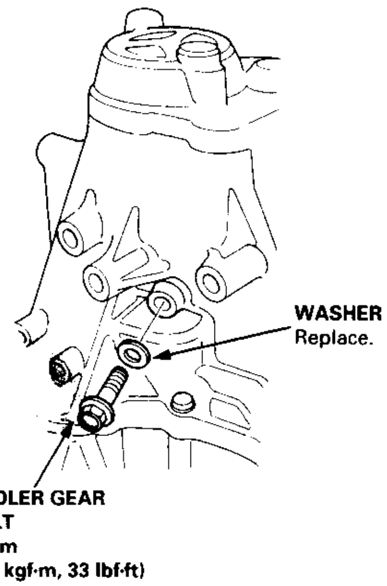


25. Install the 32 mm sealing bolt.

    NOTE: Apply liquid gasket (P/N 08718 – 0001) to the threads.

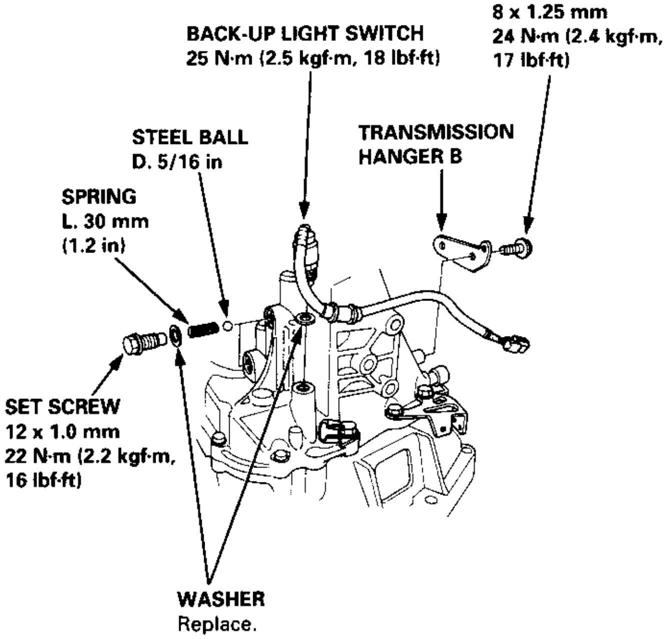


26. Tighten the reverse idler gear shaft bolt.



27. Install the steel balls, the springs, and the set screws.

28. Install the back-up light switch and the transmission hanger B.

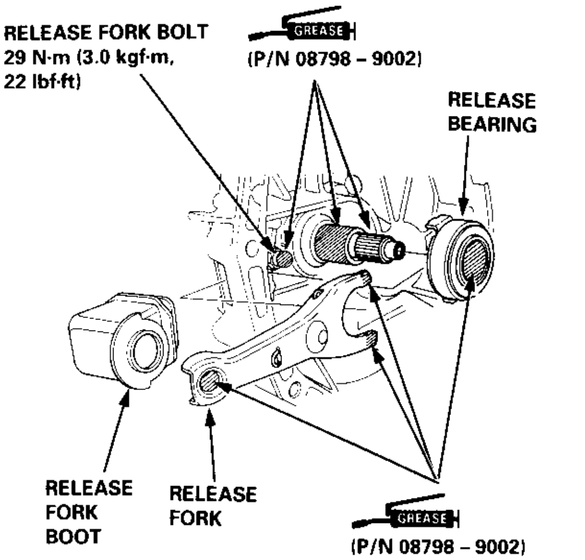


Transmission Assembly

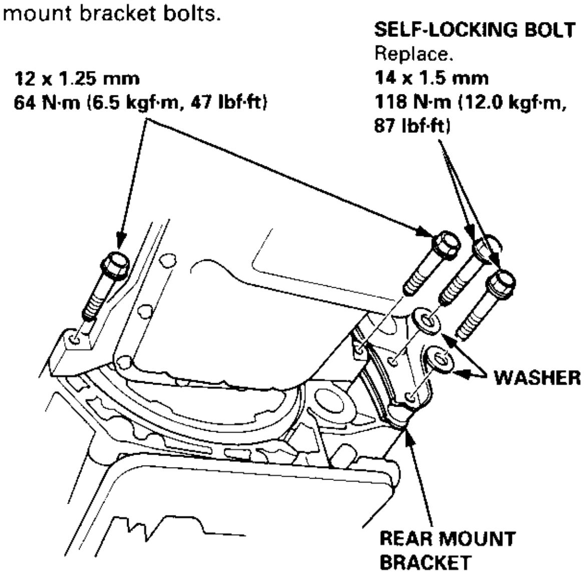
Installation

1. Install the dowel pins on the clutch housing.
2. Apply grease to the parts as shown, then install the release fork and release bearing.

   NOTE: Use only Super High Temp Urea Grease (P/N 08798 – 9002).
3. Install the release fork boot.



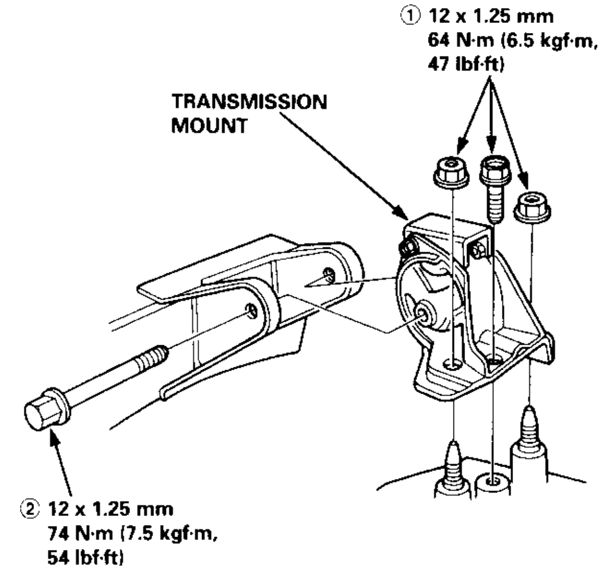
4. Place the transmission on the transmission jack, and raise it to the engine level.
5. Install the transmission mounting bolts and the rear mount bracket bolts.



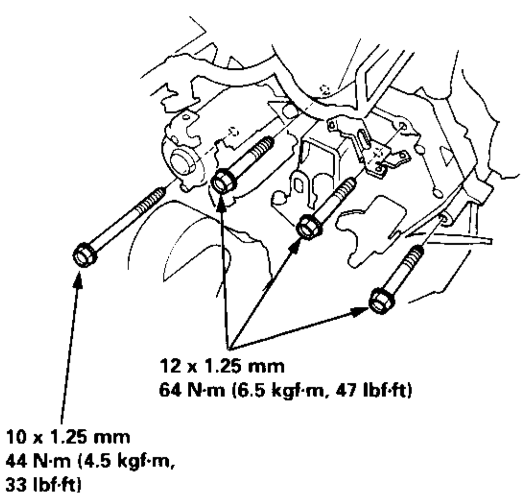
6. Raise the transmission, then install the transmission mount.

   NOTE: Torque the mounting bolt and nuts in the sequence shown.

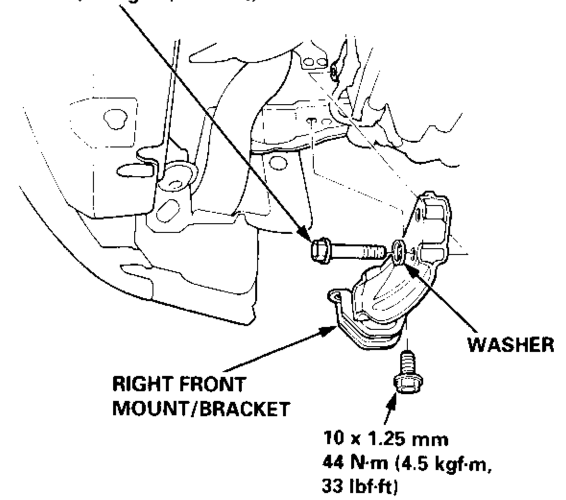
   CAUTION: Check that the bushings are not twisted or offset.



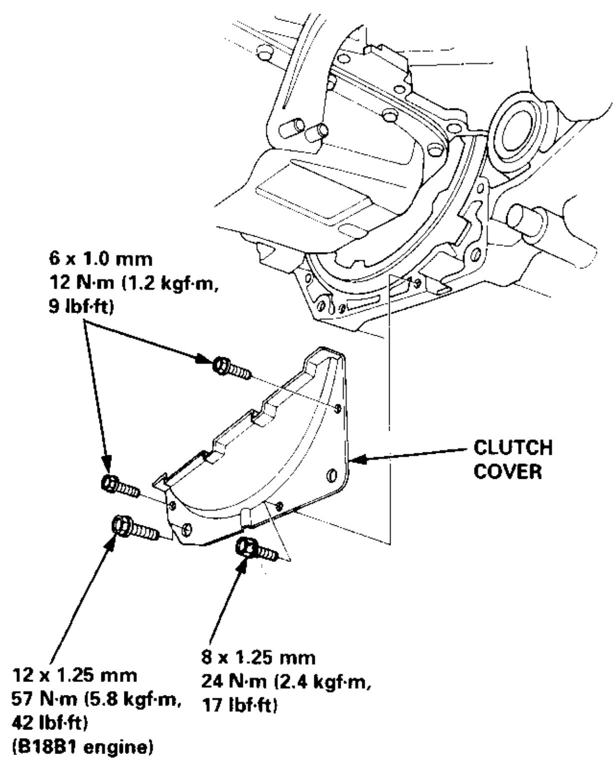
7. Install the three upper transmission mounting bolts and the lower starter motor mounting bolt.



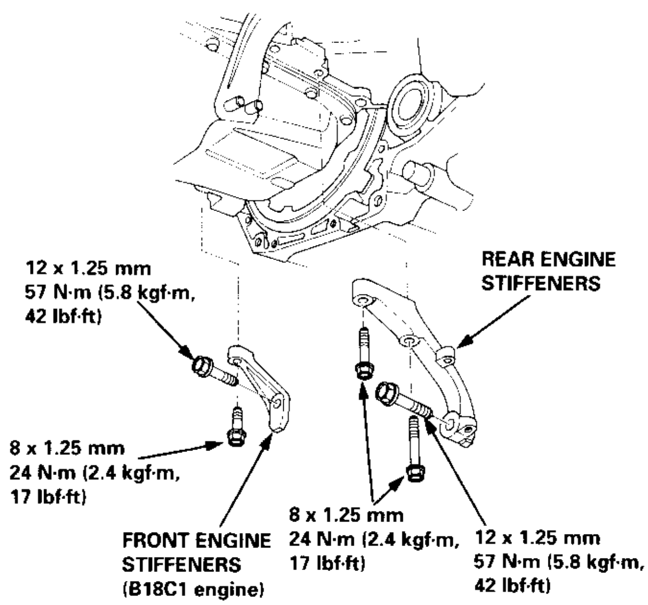
8. Install the right front mount/bracket.



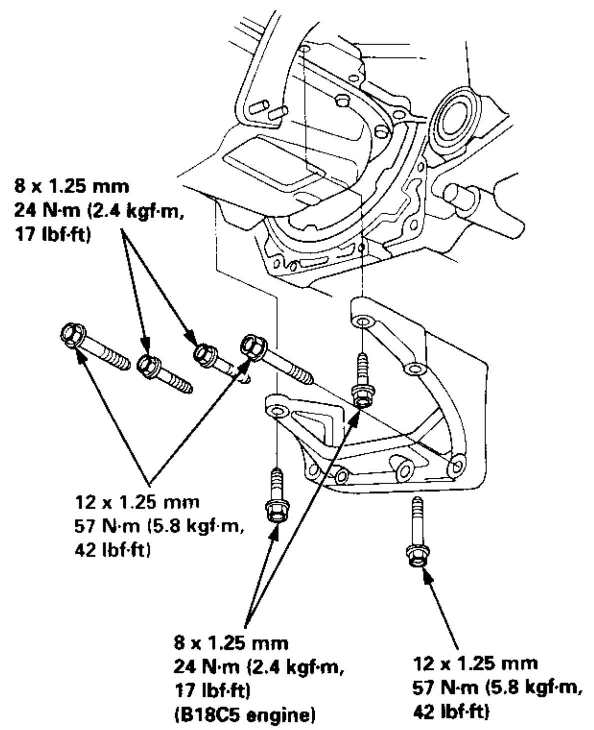
9. Install the clutch cover (B18C1 and B18B1 engines).



10. Install the front (B18C1 engine) and rear engine stiffeners.



11. Install the stiffener (B18C5 engine).



(cont'd)

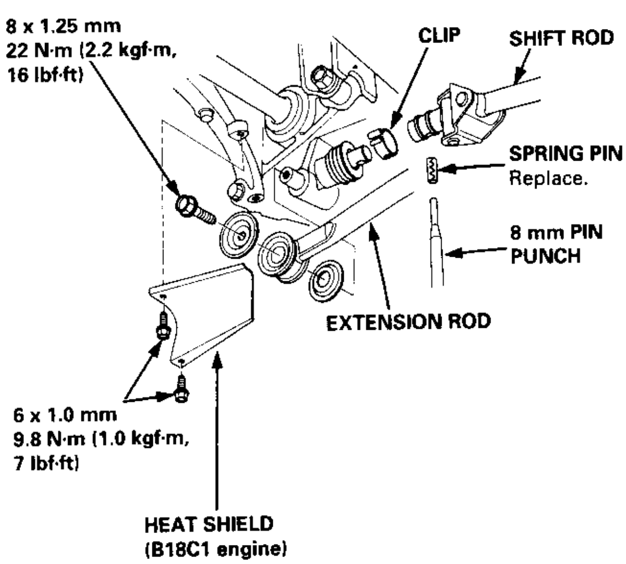
Installation (cont'd)

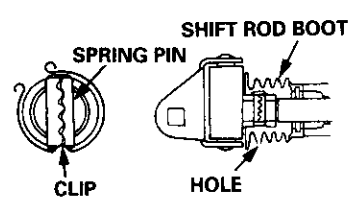
12. Install the shift rod, the spring pin, and the clip.

    NOTE:
    - Install the clip and the spring pin on the change joint as shown.
    - Turn the shift rod boot so the hole is facing down as shown.
    - Make sure the shift rod boot is installed on the shift rod.

13. Install the extension rod.

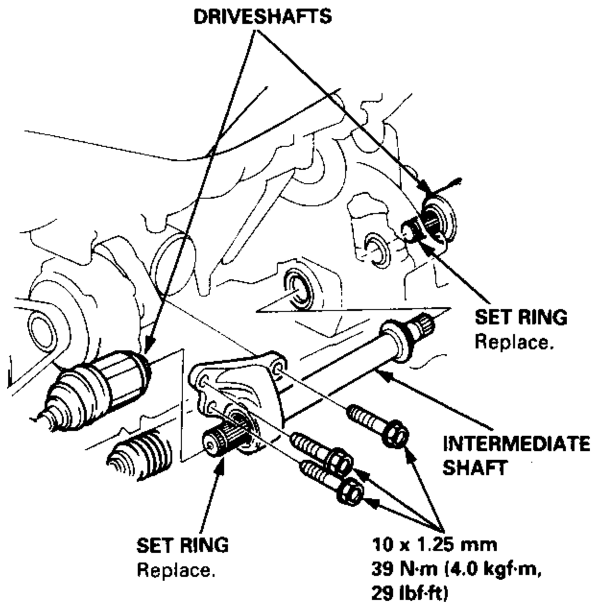
14. Install the heat shield (B18C1 engine).





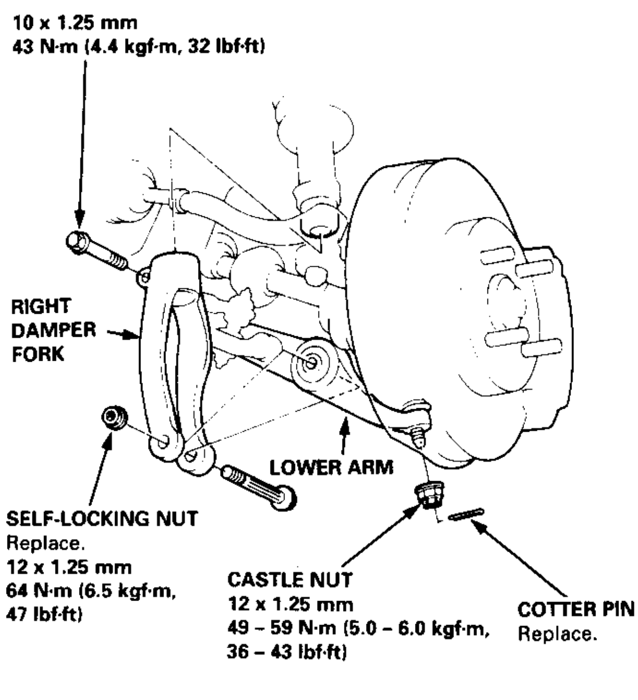
15. Install the intermediate shaft and the driveshafts (see section 16).

    NOTE: Replace the set rings with new ones.

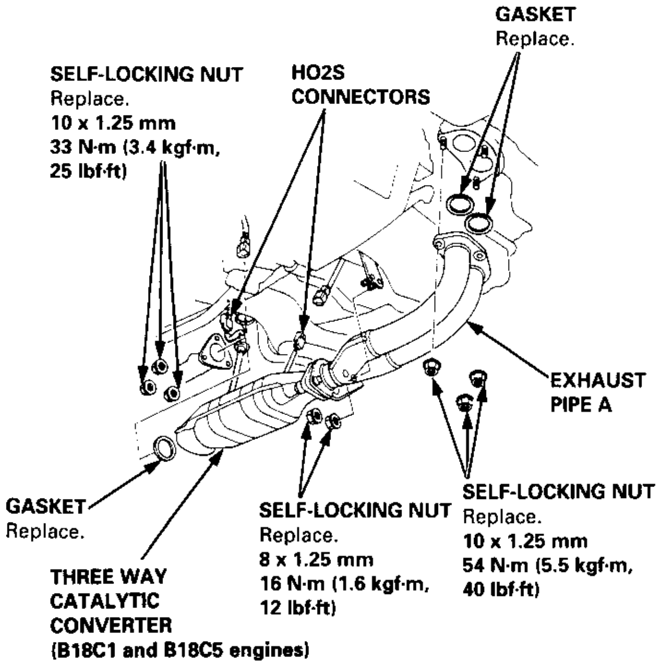


16. Install the ball joints onto the lower arm (see section 18).

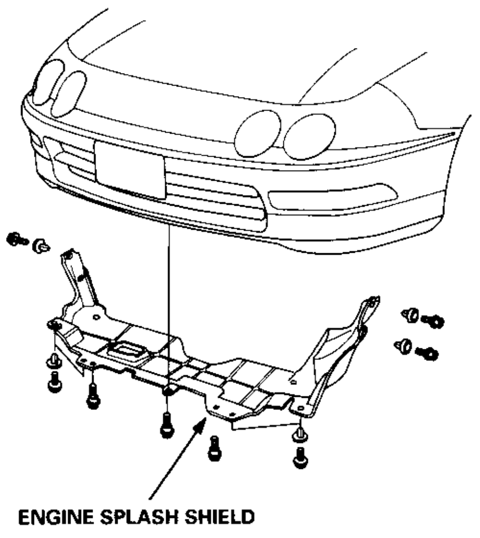
17. Install the right damper fork (see section 18).



18. Install the exhaust pipe A, and the three way catalytic converter (B18C1 and B18C5 engines), and connect the heated oxygen sensor (HO2S) connectors.

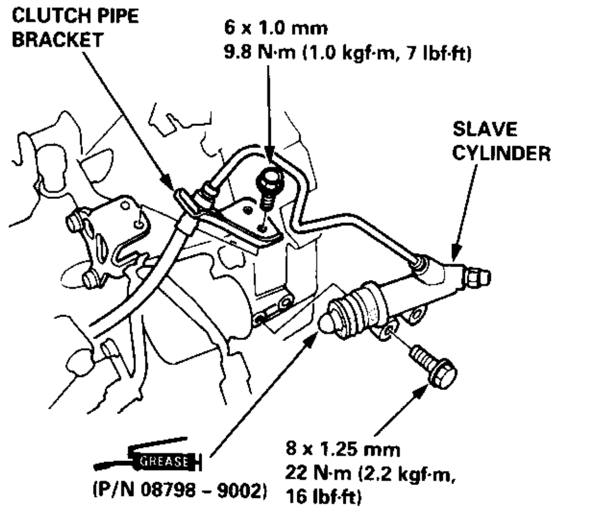


19. Install the engine splash shield.



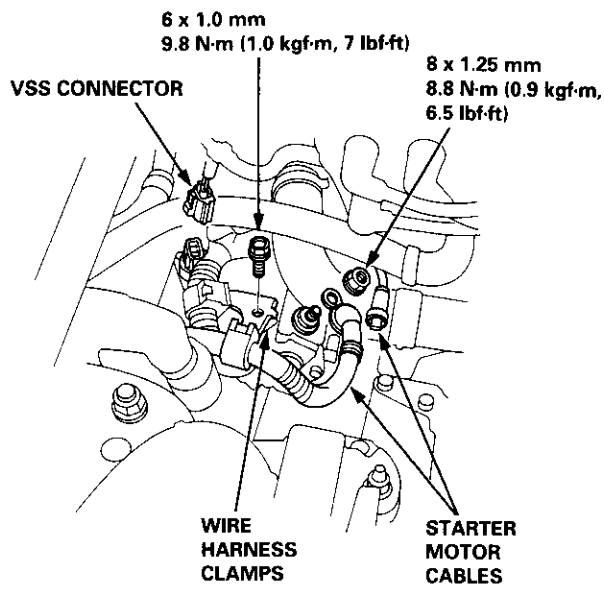
20. Install the slave cylinder, then install the clutch pipe bracket.

NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).



21. Connect the vehicle speed sensor (VSS) connector and the starter motor cables.

22. Install the wire harness clamps.



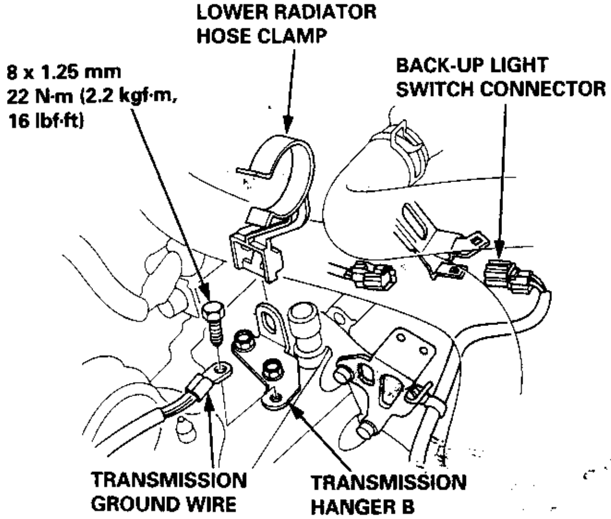
(cont'd)

Transmission Assembly

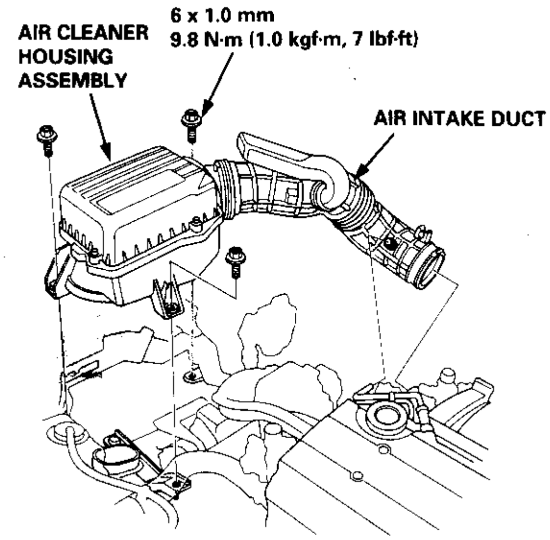
Installation (cont'd)

23. Install the lower radiator hose clamp on the transmission hanger B.

24. Connect the transmission ground wire and the back-up light switch connector.



25. Install the air cleaner housing assembly and the air intake duct.



26. Refill the transmission with oil (see page 13-3).

27. Connect the positive (+) cable first, then connect the negative (–) cable to the battery.

28. Check the clutch operation.

29. Shift the transmission, and check for smooth operation.

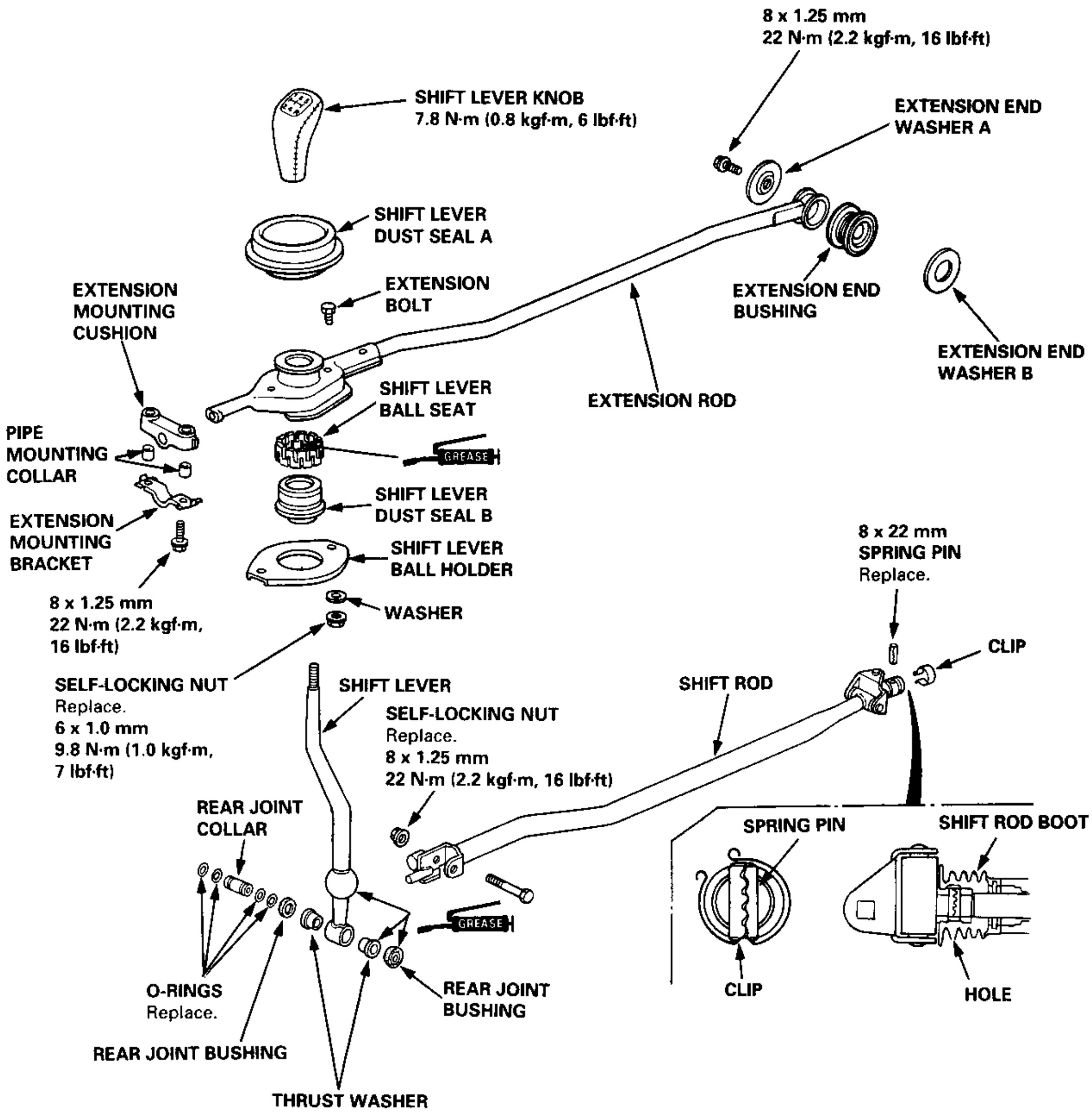
30. Check the front wheel alignment (see section 18).

Gearshift Mechanism

Overhaul

NOTE:

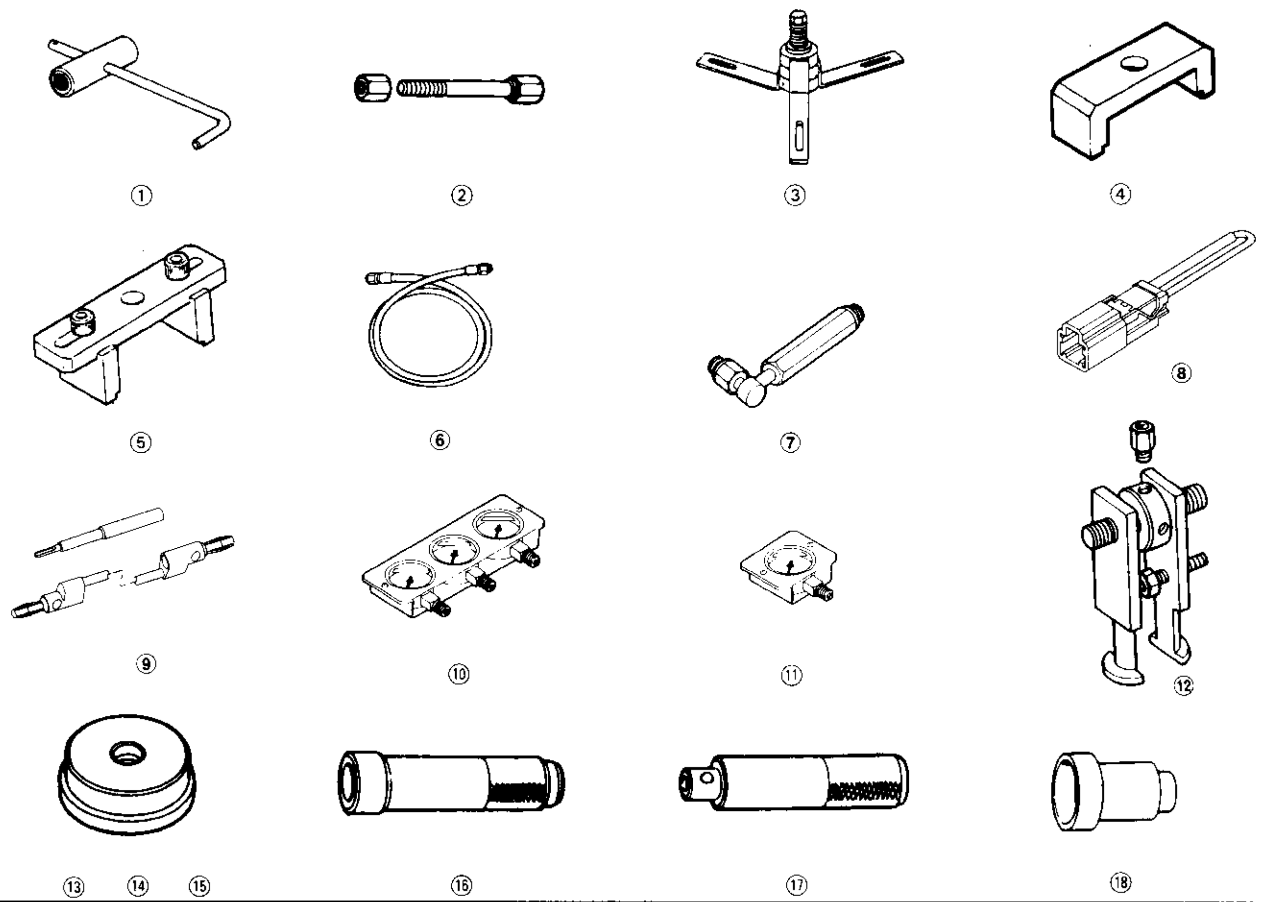
- Inspect rubber parts for wear and damage when disassembling; replace any worn or damaged parts.
- Install the spring pin and the clip on the change joint as shown.
- Turn the shift rod boot so the hole is facing down as shown.
- Make sure the shift rod boot is installed on the change rod.



Automatic Transmission

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAB – PH50101 or 07GAB – PH50100	Mainshaft Holder	1	14-115, 164
②	07GAE – PG40200 or 07GAE – PG4020A	Clutch Spring Compressor Bolt Assembly	1	14-148, 151
③	07HAC – PK4010A	Housing Puller	1	14-117
④	07HAE – PL50100	Clutch Spring Compressor	1	14-148, 151
⑤	07LAE – PX40100	Clutch Spring Compressor	1	14-148, 151
⑥	07MAJ – PY4011A	A/T Pressure Hose, 2210 mm	4	14-98
⑦	07MAJ – PY40120	A/T Pressure Hose, Adapter	4	14-98
⑧	07PAZ – 0010100	SCS Service Connector	1	14-51
⑨	07SAZ – 001000A	Backprobe Set	2	14-52
⑩	07406 – 0020400	A/T Pressure Gauge Set w/panel	1	14-98
⑪	07406 – 0070300	A/T Low Pressure Gauge w/panel	1	14-98
⑫*	07736 – A01000A	Adjustable Bearing Puller, 25 – 40 mm	1	14-154, 155
⑬	07746 – 0010100	Attachment, 32 x 35 mm	1	14-143, 144
⑭	07746 – 0010500	Attachment, 62 x 68 mm	1	14-144, 154, 155, 14-156, 157
⑮	07746 – 0010600	Attachment, 72 x 75 mm	1	14-154, 156
⑯	07746 – 0030100	Driver 40 mm I.D.	1	14-138
⑰	07749 – 0010000	Driver	1	14-138, 144, 154, 14-155, 156, 157
⑱	07947 – 6340500	Driver Attachment	1	14-154

*Must be used with commercially available 3/8" – 16 slide hammer.



Description

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 speed reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches

The torque converter consists of a pump, turbine, and stator, assembled in sigle unit. The torque converter is connected to the engine crankshaft so they turn torether as a unit as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft.

The transmission has three parallel shafts: the mainshaft, the countershaft, and the sub-shaft. The mainshaft is in-line with the engine crankshaft.

The mainshaft includes the 1st, and 2nd/4th clutches,and gear for 3rd, 2nd, 4th, reverse, and 1st. (3rd gear is integral with the mainshaft, while reverse gear is integral with the 4th gear.)

The countershaft includes the 3rd clutch and gears for 3rd, 2nd, 4th, reverse, 1st, and parking. Reverse and 4th gears can be loched to the countershaft at its center,providing 4th gear or reverse, depending on which way the selector is moved.

The sub-shaft includes the 1st-hold clutch and gears fo 1st and 4th.

The gears on the mainshaft are in constant mesh with those on the countersahft and sub-shaft.When certain combinations of gears in the transmission are engaged by clutches, power in transmitted from the mainshaft to the countershaft via the sub-shaft to provude $\boxed{D_4}$, $\boxed{D_3}$, $\boxed{2}$, $\boxed{1}$, and $\boxed{R}$.

Electronic Control

The electronic control system consists of the Transmission Control Module (TCM), sensors, and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The TCM is located below the dashboard, behind the left side kick panel on the driver's side.

Hydraulic Control

The valve bodies include the main valve body, the secondary valve body, the regulator valve body, the serbvo body, and the lock-up valve body, through the respective separator plates. They are bolted to the torque converter housing.

The main valve body contains the manual valve, the 1-2 shift valve, the 2-3 shift valve, the Clutch Pressure Control (CPC) valve, the 4th exhaust valve, the relief valve, and the ATF pump gears.

The secondary valve body contains the 4-3 kick-down valve, the 3-2 kick-down valve, the 2-3 orifice control valve, the 3-4 shift valve, the orifice control valve, the modulator valve, and the servo control valve.

The regulator valve body contains the pressure regulator valve, the lock-up control valve, the torque converter check valve, and the cooler check valve.

The servo body contains the servo valve, which is integrated with shift fork shaft, the throttle valve B, and the accumulators.

The lock-up valve body contains the lock-up shift valve and the lock-up timing B valve, and is bolted to the regulator valve body.

Fluid from the regulator passes through the manual valve to the various control valves.

Shift Control Mechanism

Input to the TCM from various sensors located throughout the car determines which shift control solenoid valve should be activated. Activating a shift control solenoid valve changes modulator pressure, causing a shift valve to move. This pressurizes a line to one of the clutches, engaging that clutch and its corresponding gear.

Lock-up Mechanism

In $\boxed{D_4}$ position, in 2nd, 3rd and 4th, and $\boxed{D_3}$ position in 3rd, pressurized fluid can be drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the TCM optimizes the timing of the lock-up mechanism.

The lock-up valves control the range of lock-up according to lock-up control solenoid valves A and B, and throttle valve B. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the TCM.

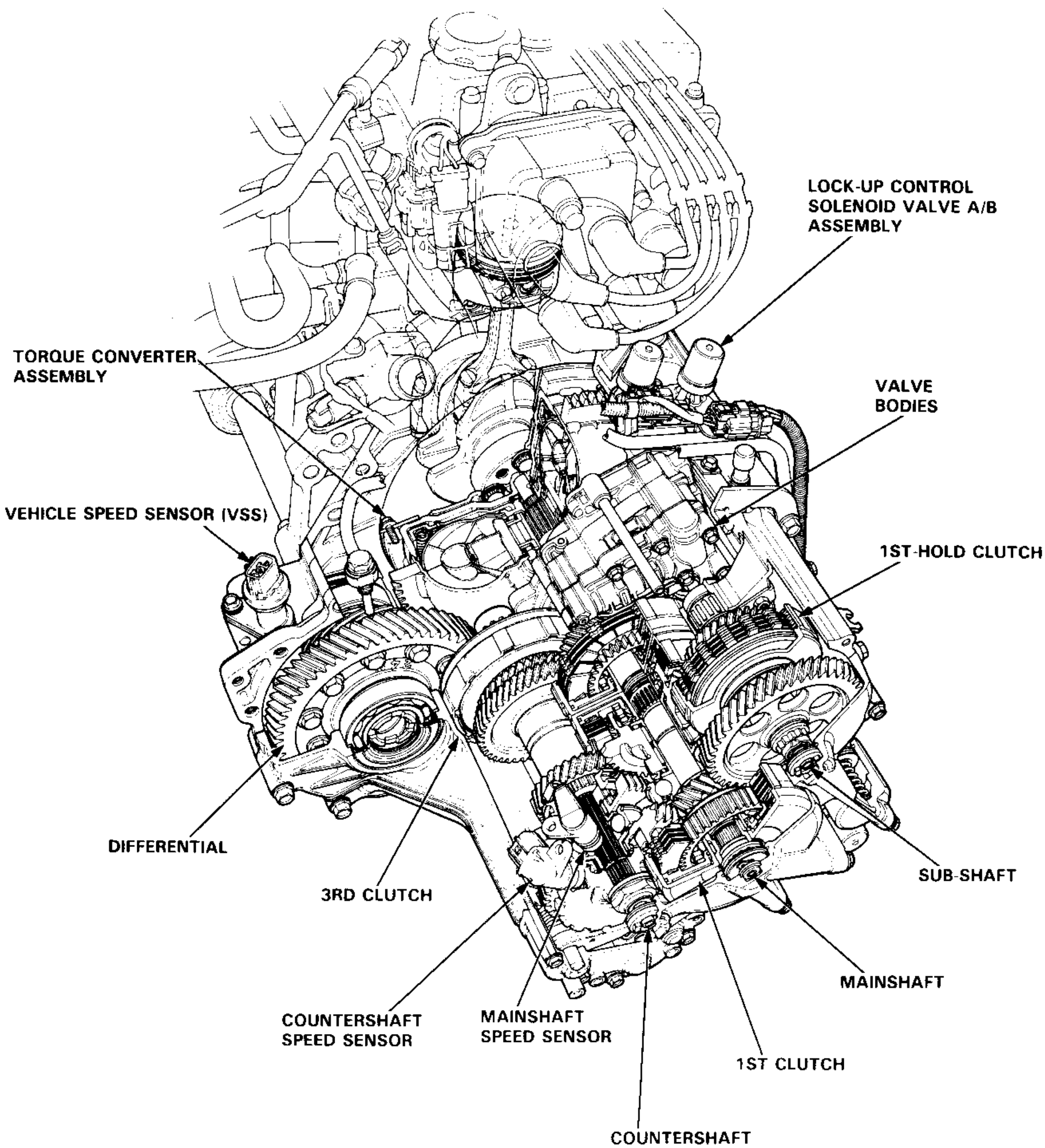
(cont'd)

Gear Selection
The shift lever has seven positions; [P] PARK, [R] REVERSE, [N] NEUTRAL, [D_4] 1st through 4th ranges, [D_3] 1st through 3rd ranges, [2] 2nd gear and [1] 1st gear.

Position	Description
[P] PARK	Front wheels locked; parking brake pawl engaged with parking gear on countershaft. All clutches released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch locked.
[N] NEUTRAL	All clutches released.
[D_4] DRIVE (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in [D_4] in 2nd, 3rd and 4th gear.
[D_3] DRIVE (1st through 3rd)	For rapid acceleration at highway speeds and general driving; starts off in 1st, shifts automatically to 2nd then 3rd, depending on vehicle speed and throttle position. Downshifts through lower gears on deceleration to stop. The lock-up mechanism comes into operation in 3rd gear.
[2] SECOND	Driving in 2nd gear; stays in 2nd gear, does not shift up and down. For engine braking or better traction starting off on loose or slippery surfece.
[1] FIRST	Driving in 1st gear; stays in 1st gear, does not shift up. For engine braking.

Starting is possible only in [P] and [N] positions through use of a slide-type, neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator
A/T gear position indicator in the instrument panel shows what gear has been selected without having look down at the console.


LOCK-UP CONTROL SOLENOID VALVE A/B ASSEMBLY
TORQUE CONVERTER ASSEMBLY
VALVE BODIES
VEHICLE SPEED SENSOR (VSS)
1ST-HOLD CLUTCH
DIFFERENTIAL
3RD CLUTCH
SUB-SHAFT
MAINSHAFT
COUNTERSHAFT SPEED SENSOR
MAINSHAFT SPEED SENSOR
1ST CLUTCH
COUNTERSHAFT

Description

Clutches

The four-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston is applied. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear.

Likewise, when hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other while disengaged. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the end of the mainshaft, just behind the right side cover. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

1st-hold Clutch
The 1st-hold clutch engages/disengages 1st-hold or [1] position, and is located at the middle of the sub-shaft. The 1st-hold clutch is supplied hydraulic pressure by its ATF feed pipe within the sub-shaft.

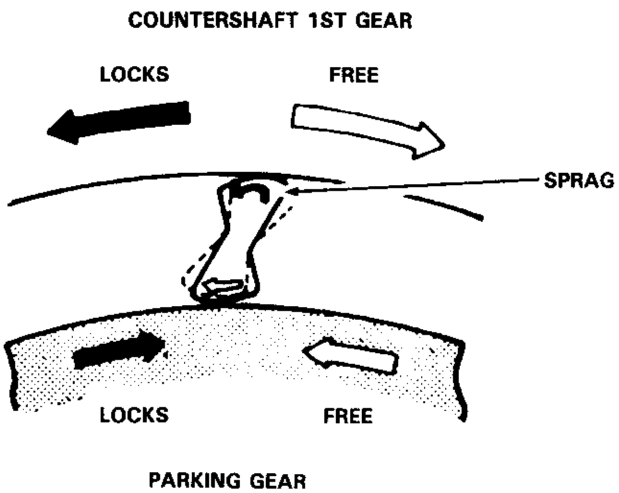
2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the mainshaft. The 2nd clutch is joined back-to-back to the 4th clutch. The 2nd clutch is supplied hydraulic pressure through the mainshaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft, opposite the right side cover. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the countershaft.

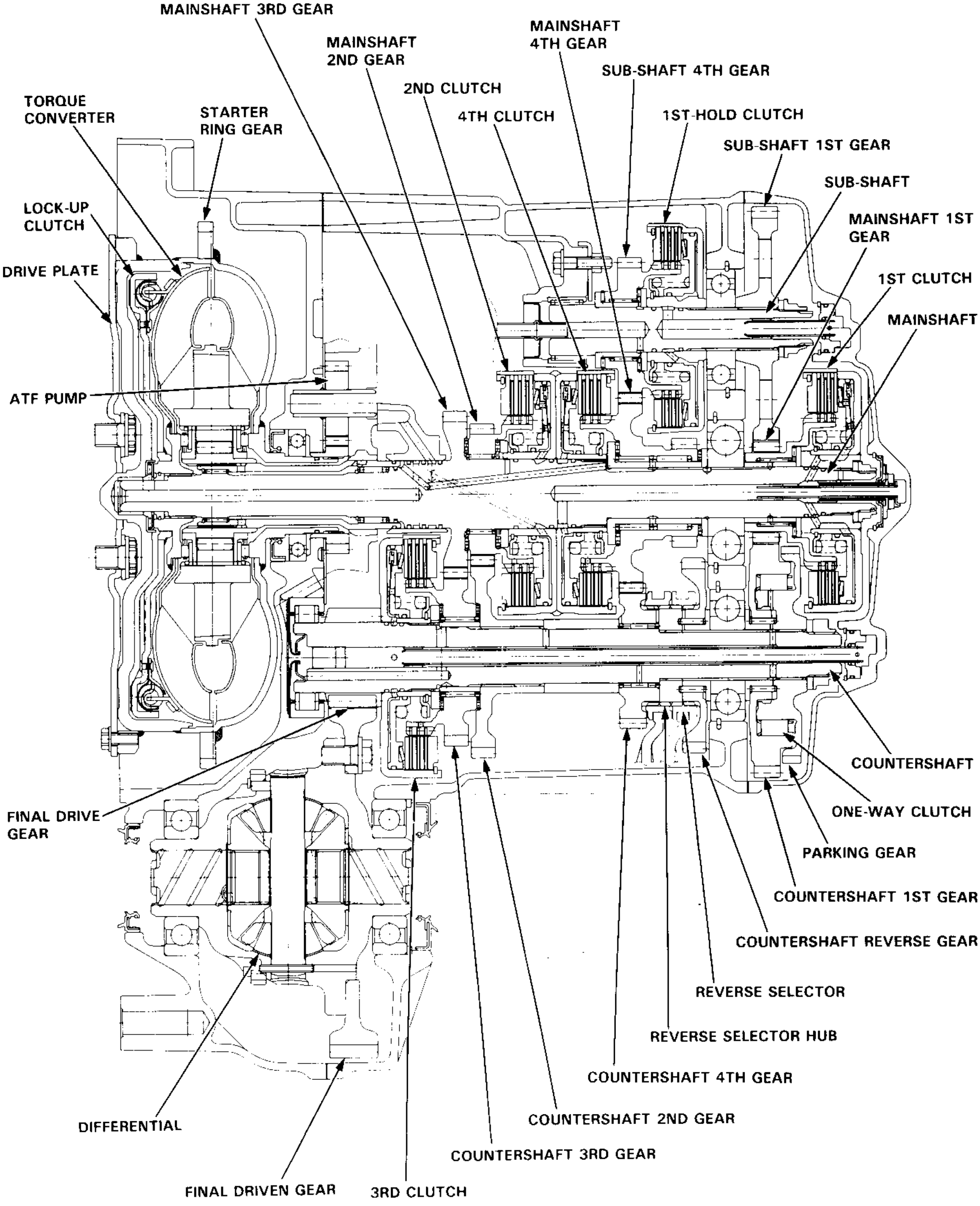
4th Clutch
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 2nd clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

One-way Clutch
The one-way clutch is positioned between the parking gear and the countershaft 1st gear, with the parking gear splined to the countershaft. The countershaft 1st gear provides the outer race, and the parking gear provides the inner race surface. The one-way clutch locks up when power is transmitted from the mainshaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the [D4], [D3] or [2] position.

However, the one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the [D4], [D3] or [2] position. This is because the increased rotational speed of the gears on the countershaft over-ride the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch free-wheels with the 1st clutch still engaged.



NOTE:
View from right side cover side.


MAINSHAFT 3RD GEAR
MAINSHAFT 2ND GEAR
MAINSHAFT 4TH GEAR
SUB-SHAFT 4TH GEAR
2ND CLUTCH
TORQUE CONVERTER
STARTER RING GEAR
4TH CLUTCH
1ST-HOLD CLUTCH
SUB-SHAFT 1ST GEAR
SUB-SHAFT
LOCK-UP CLUTCH
MAINSHAFT 1ST GEAR
DRIVE PLATE
1ST CLUTCH
MAINSHAFT
ATF PUMP
COUNTERSHAFT
FINAL DRIVE GEAR
ONE-WAY CLUTCH
PARKING GEAR
COUNTERSHAFT 1ST GEAR
COUNTERSHAFT REVERSE GEAR
REVERSE SELECTOR
REVERSE SELECTOR HUB
COUNTERSHAFT 4TH GEAR
COUNTERSHAFT 2ND GEAR
DIFFERENTIAL
COUNTERSHAFT 3RD GEAR
FINAL DRIVEN GEAR
3RD CLUTCH

Description

Power Flow

POSITION \ PART		TORQUE CONVERTER	1ST-HOLD CLUTCH	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH GEAR	4TH CLUTCH	REVERSE GEAR	PARKING GEAR
P		○	X	X	X	X	X	X	X	○
R		○	X	X	X	X	X	○	○	X
N		○	X	X	X	X	X	X	X	X
D4	1ST	○	X	○*2	X	X	X	X	X	X
	2ND	○	X	○*1	○	X	X	X	X	X
	3RD	○	X	○*1	X	○	X	X	X	X
	4TH	○	X	○*1	X	X	○	○	X	X
D3	1ST	○	X	○*2	X	X	X	X	X	X
	2ND	○	X	○*1	○	X	X	X	X	X
	3RD	○	X	○*1	X	○	X	X	X	X
2		○	X	○*1	○	X	X	X	X	X
1		○	○	○	X	X	X	X	X	X

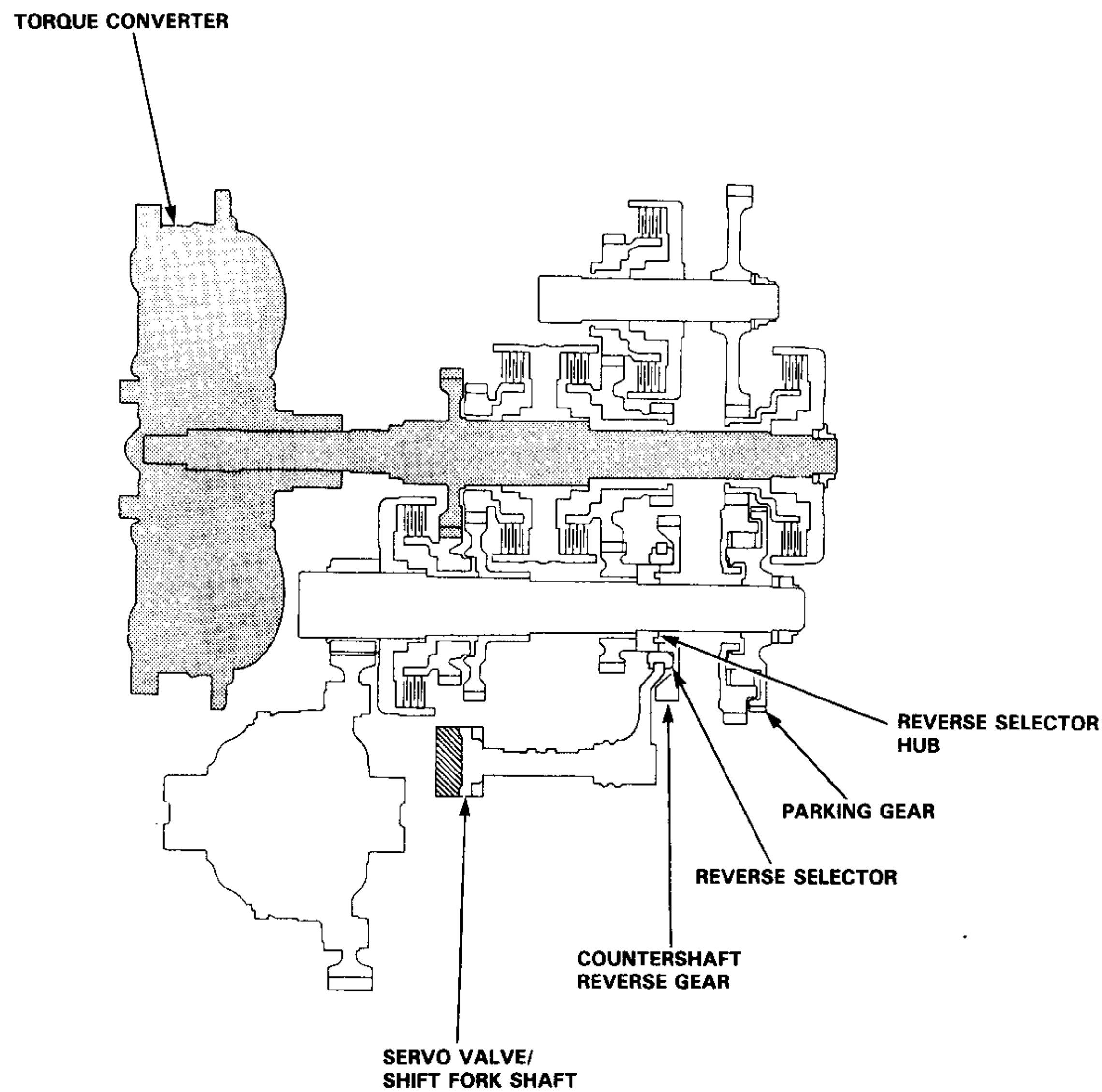
○: Operates, X: Doesn't operate.
*1: Although the 1st clutch engages, driving power is not transmitted as the one-way clutch slips.
*2: The one-way clutch engages when accelerating, and slips when decelerating.

N Position

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.

P Position

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.
The countershaft is locked by the parking brake pawl interlocking the parking gear.



(cont'd)

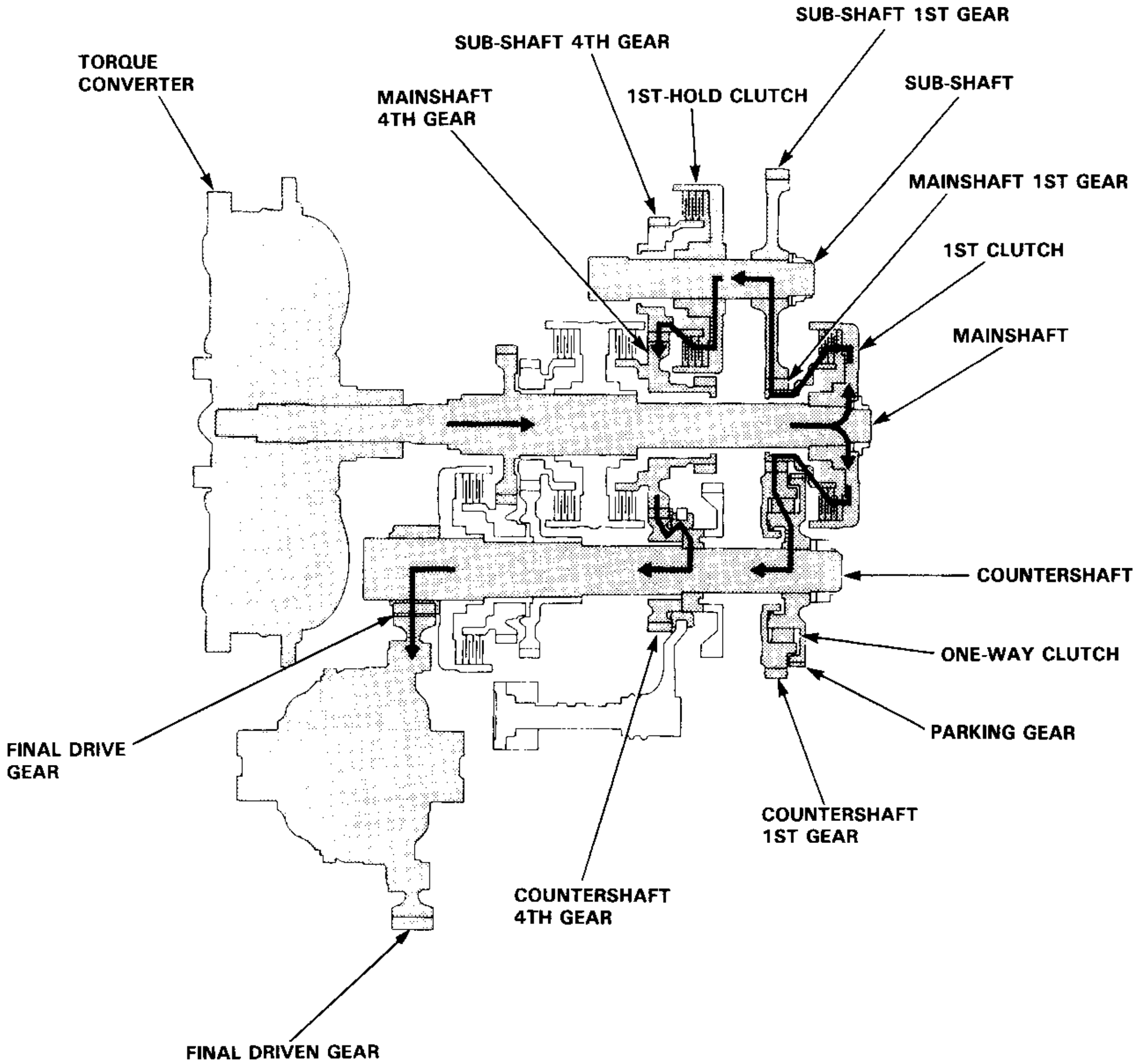
Power Flow (cont'd)

[1] Position Acceleration

In [1] position, hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch.

The power flow when accelerating is as follows:

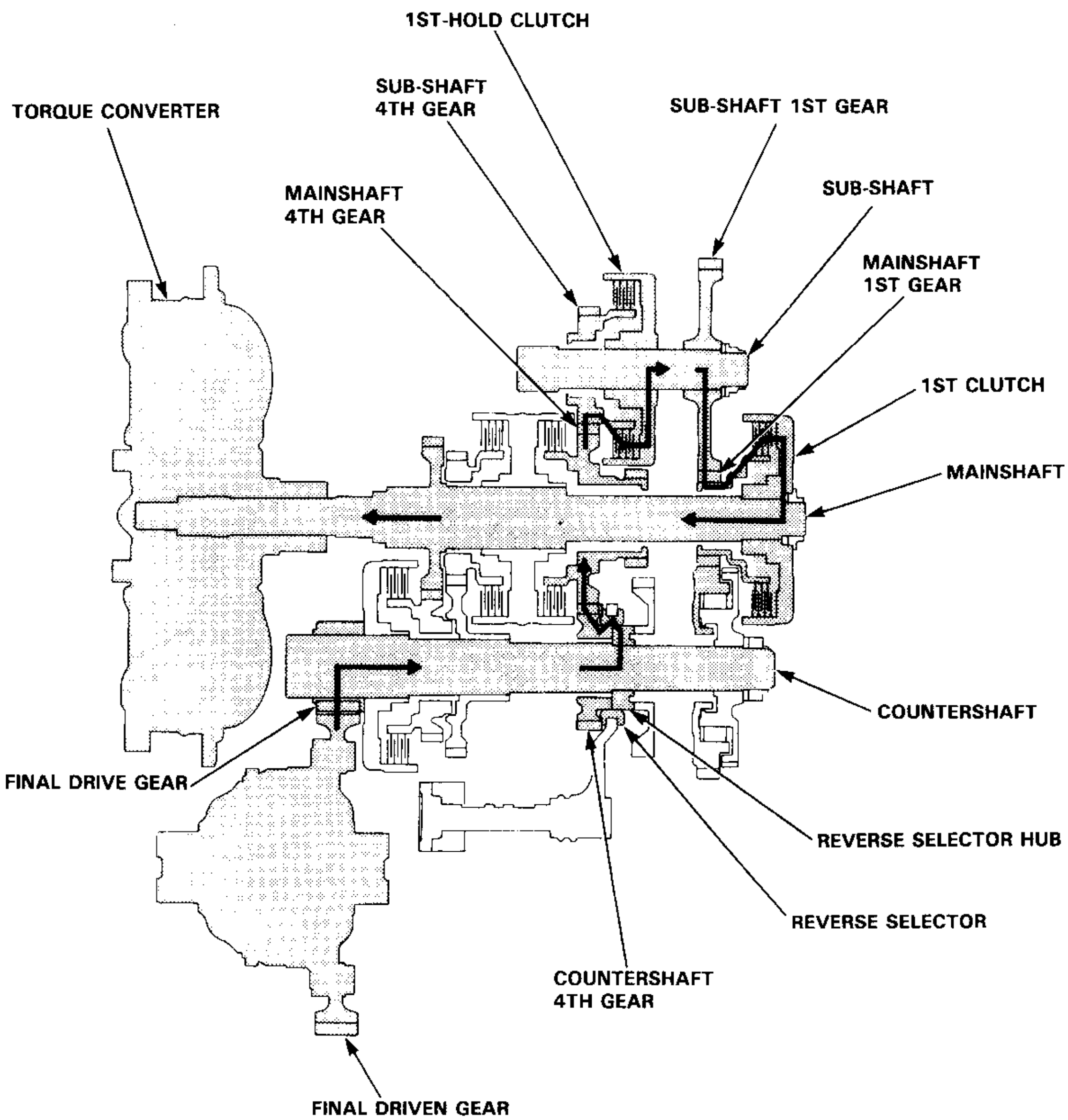
1. Hydraulic pressure is applied to the 1st clutch on the mainshaft and power is transmitted via the 1st clutch to the mainshaft 1st gear.
2. Hydraulic pressure is also applied to the 1st-hold clutch on the sub-shaft. Power transmitted to the mainshaft 1st gear is conveyed via the countershaft 1st gear to the one-way clutch, and via the sub-shaft 1st gear to the 1st-hold clutch. The one-way clutch is used to drive the countershaft, and the 1st-hold clutch drives the countershaft via the 4th gears.
3. Power is transmitted to the final drive gear, which drives the final driven gear.



[1] Position Deceleration

The power flow when decelerating is as follows;

1. Rolling resistance from the road surface goes through the front wheels to the final drive gear, then to the sub-shaft 1st gear via the 4th gear, and 1st-hold clutch which is applied during deceleration.
2. The one-way clutch disengages at this time because the application of torque is reversed.
3. The counterforce conveyed to the countershaft 4th gear turns the sub-shaft 4th gear via the mainshaft 4th gear. At this time, since hydraulic pressure is also applied to the 1st clutch, counterforce is also transmitted to the mainshaft. As a result, engine braking can be obtained with 1st gear.



(cont'd)

Description

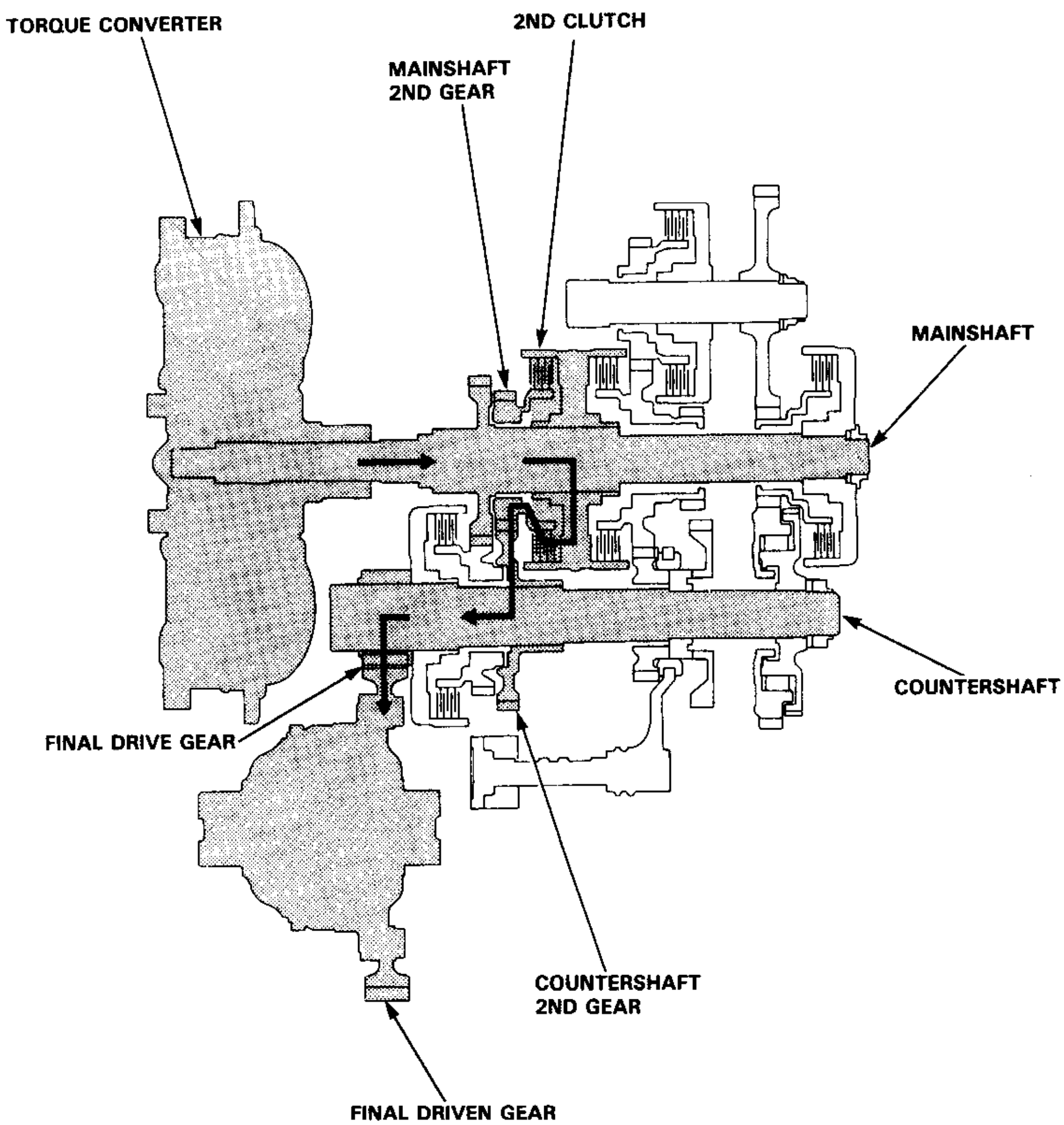
Power Flow (cont'd)

[2] Position

[2] Position is provided to drive only 2nd gear.

1. Hydraulic pressure is applied to the 2nd clutch on the mainshaft and power is transmitted via the 2nd clutch to the mainshaft 2nd gear.
2. Power transmitted to the mainshaft 2nd gear is conveyed via the countershaft 2nd gear, which drives the countershaft.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

   NOTE:
   Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of the 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

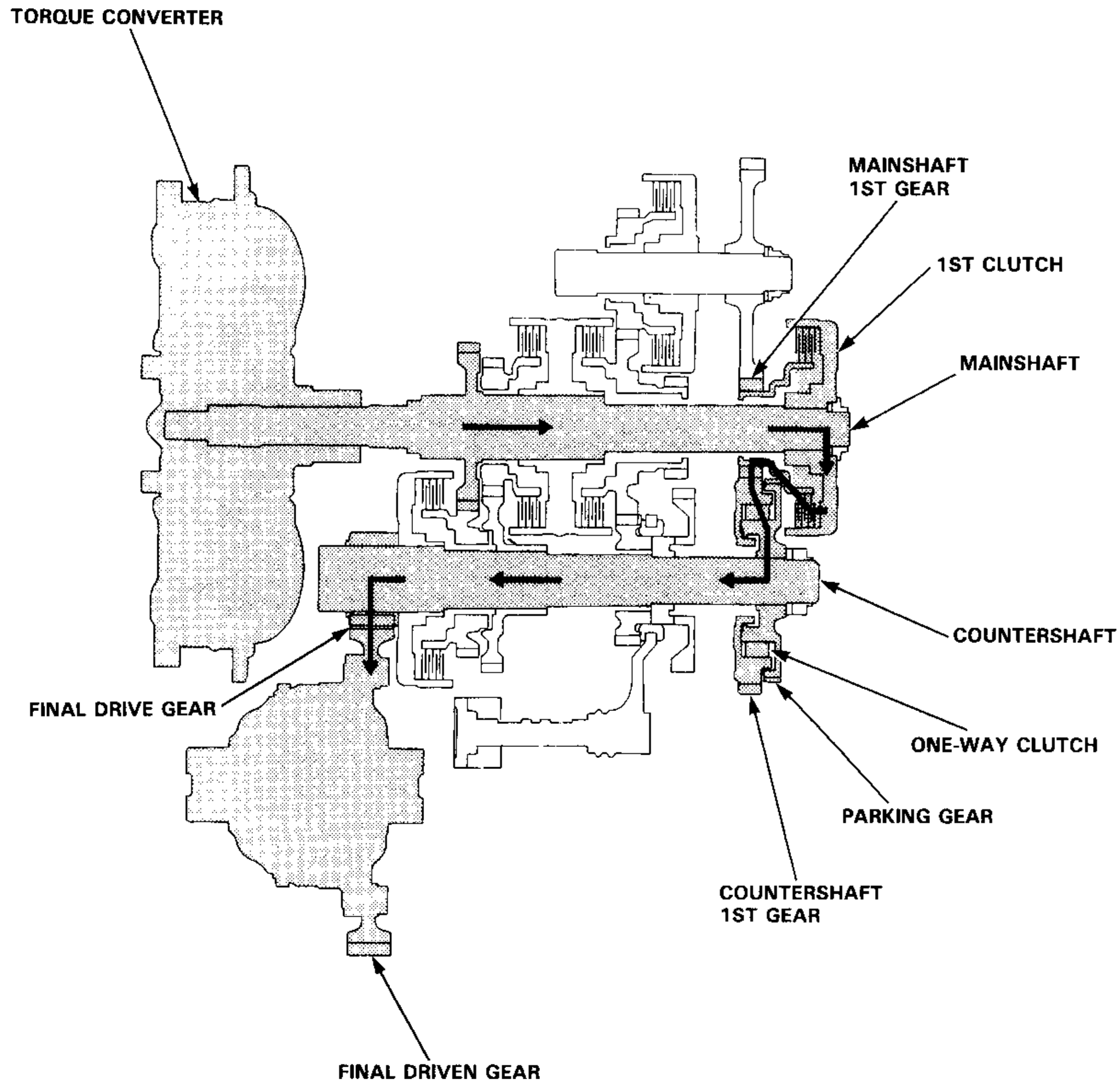


In [D4] or [D3] position, the optimum gear is automatically selected from 1st, 2nd, 3rd and 4th gears, according to conditions such as the balance between throttle opening (engine load) and vehicle speed.

[D4] or [D3] Position, 1st gear

1. Hydraulic pressure is applied to the 1st clutch, which rotates together with the mainshaft, and the mainshaft 1st gear rotates.
2. Power is transmitted to the countershaft 1st gear, which drives the countershaft via the one-way clutch.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

NOTE:
In [D4] or [D3] position, hydraulic pressure is not applied to the 1st-hold clutch.



(cont'd)

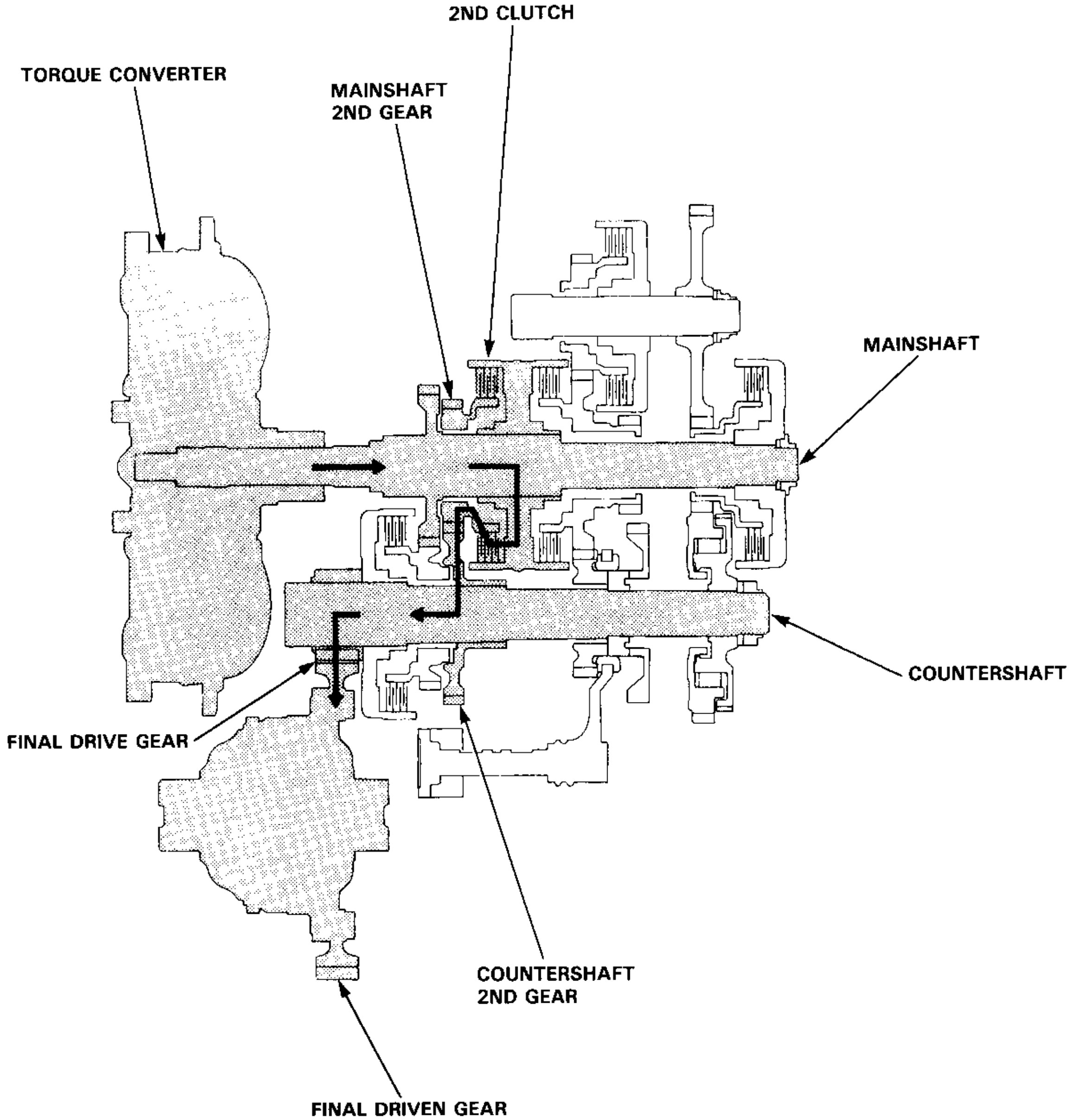
Description

Power Flow (cont'd)

D4 or D3 Position, 2nd gear

1. Hydraulic pressure is applied to the 2nd clutch, which rotates together with the mainshaft, and the mainshaft 2nd gear rotates.
2. Power is transmitted to the countershaft 2nd gear, which drives the countershaft.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

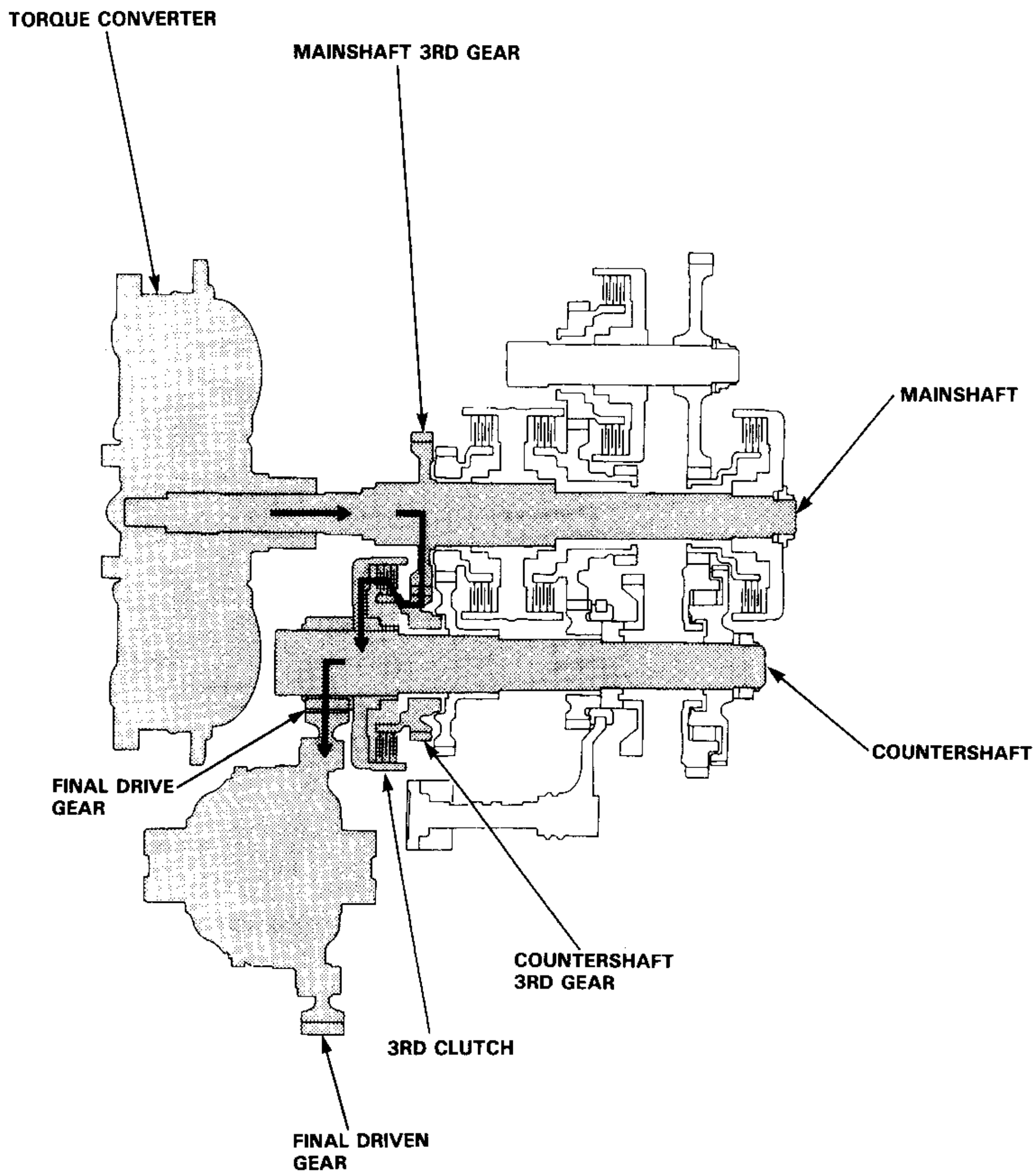
NOTE:
In D4 or D3 position, 2nd speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



[D4] or [D3] Position, 3rd gear

1. Hydraulic pressure is applied to the 3rd clutch. Power from the mainshaft 3rd gear is transmitted to the countershaft 3rd gear.
2. Power is transmitted to the final drive gear, which drives the final driven gear.

NOTE:
In [D4] or [D3] position, 3rd speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



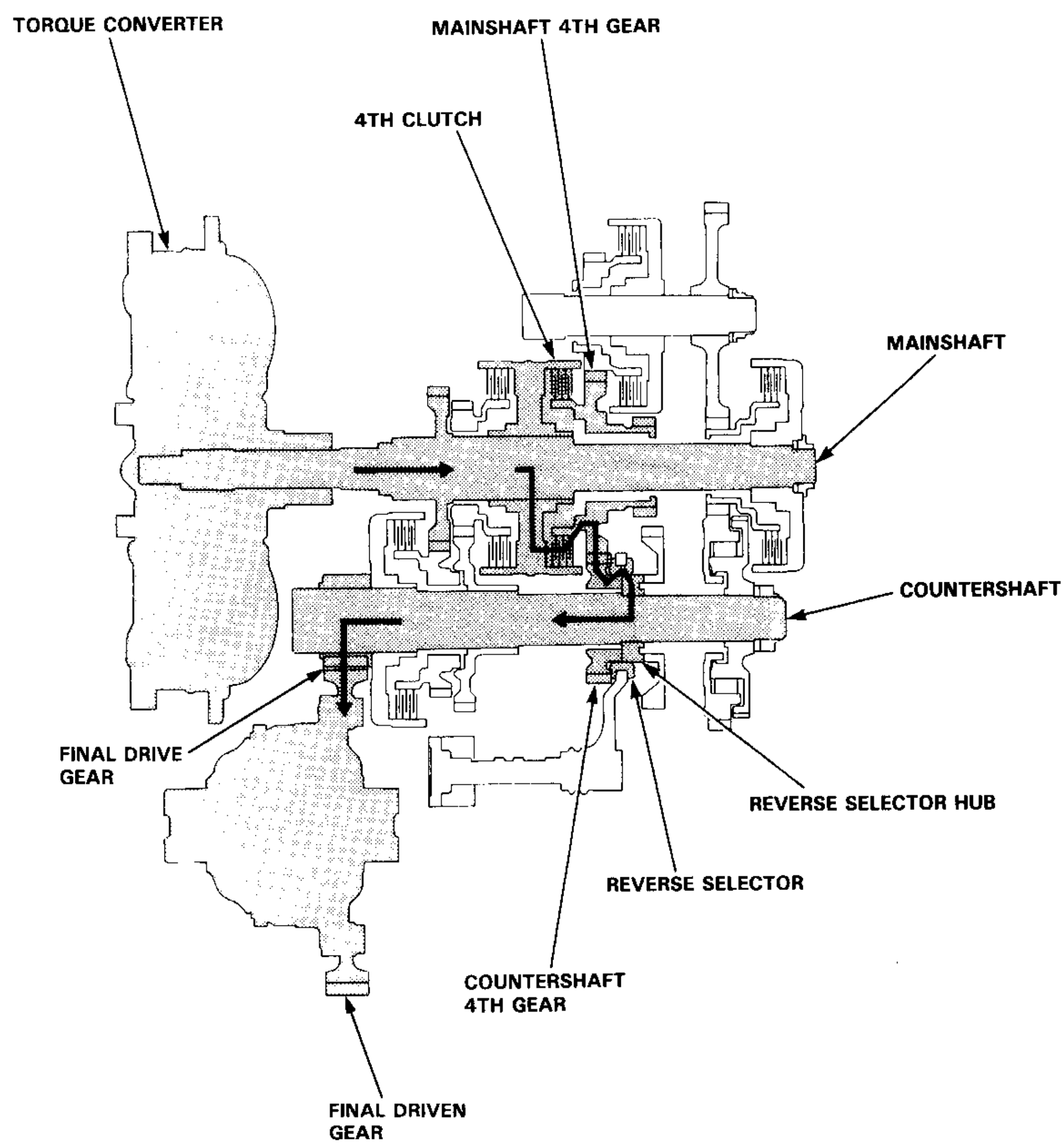
(cont'd)

Power Flow (cont'd)

D4 Position, 4th gear

1. Hydraulic pressure is applied to the 4th clutch, which rotates together with the mainshaft, and the mainshaft 4th gear rotates.
2. Power is transmitted to the countershaft 4th gear, which drives the countershaft.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

NOTE:
In D4 position, 4th speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



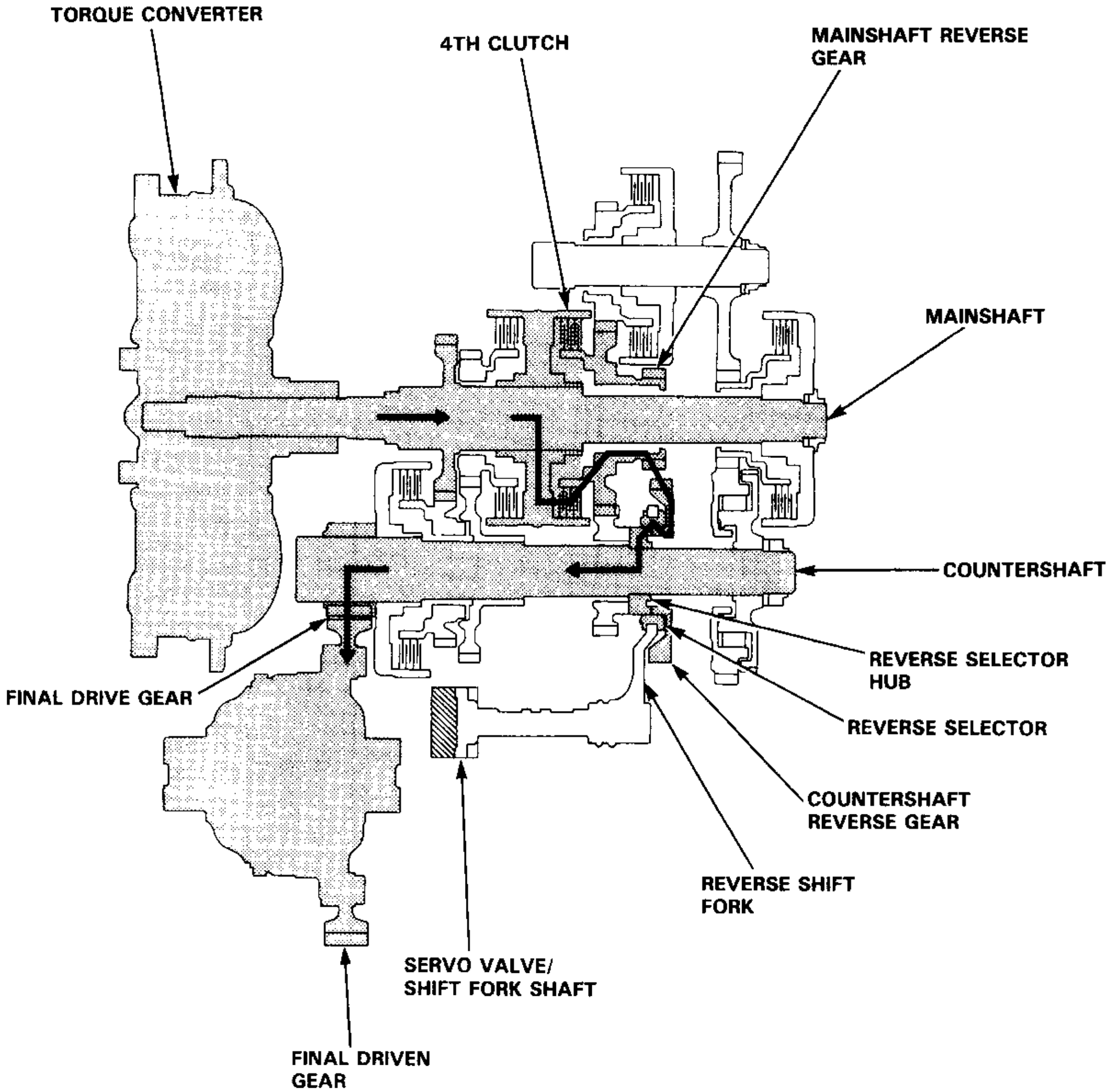
[R] Position

1. Hydraulic pressure is switched by the manual valve to the servo valve, which moves the reverse shift fork to the reverse position. The reverse shift fork engages with the reverse selector, the reverse selector hub,and the countershaft reverse gear.

2. Hydraulic pressure is also applied to the 4th clutch. Power is transmitted from the mainshaft reverse gear via the reverse idler gear to the countershaft reverse gear.

3. Rotation direction of the countershaft reverse gear is changed via the reverse idler gear.

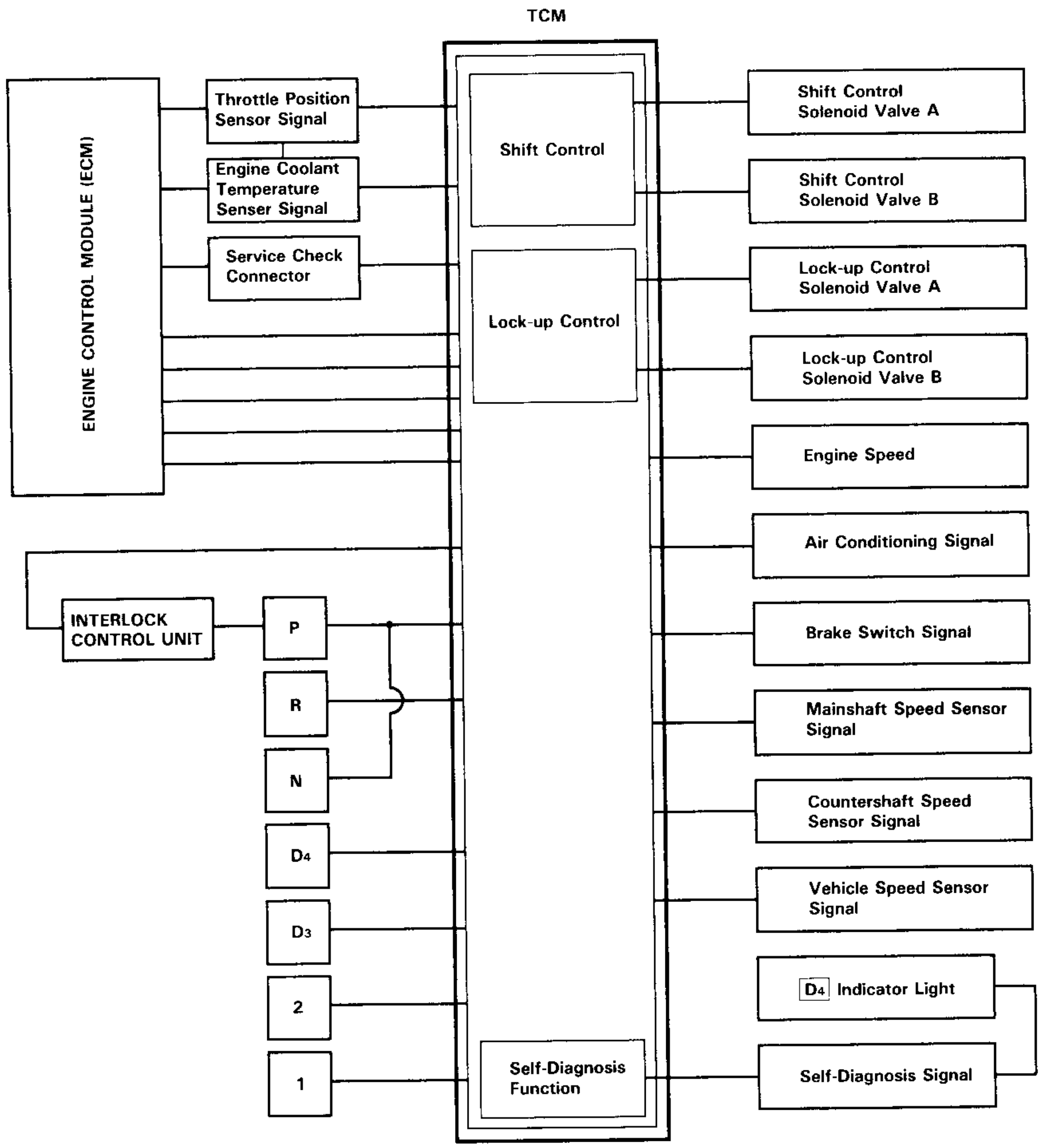
4. Power is transmitted to the final drive gear, which drives the final driven gear.



Description

Electronic Control System

The electronic control system consists of the Transmission Control Module (TCM), sensors, and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.
The TCM is located below the dashboard, behind the left side kick panel on the driver's side.



Lock-up Control

From sensor input signals, the TCM determines whether to turn the lock-up ON or OFF and activates lock-up control solenoid valve A and/or B accordingly. The combination of driving signals to lock-up control solenoid valves A and B is shown in the table below.

Lock-up control Solenoid valve / Lock-up condition	A	B
Lock-up OFF	OFF	OFF
Lock-up, slight	ON	OFF
Lock-up, half	ON	ON
Lock-up, full	ON	ON
Lock-up during deceleration	ON	Duty operation OFF↔ON

Shift Control

The TCM instantaneously determines which gear should be selected by various signals sent from sensors, and actuates the shift control solenoid valves A and B control shifting. Also, a Grade Logic Control System has been adopted to control shifting in [D4] position while the vehicle is ascending or descending a slope, or reducing speed.

Shift control solenoid valve / Position (gear)		A	B
[D3], [D4]	(1st)	OFF	ON
	(2nd)	ON	ON
	(3rd)	ON	OFF
[D4]	(4th)	OFF	OFF
[2]	(2nd)	ON	ON
[1]	(1st)	ON	OFF
[R]	(Reverse)	ON	OFF

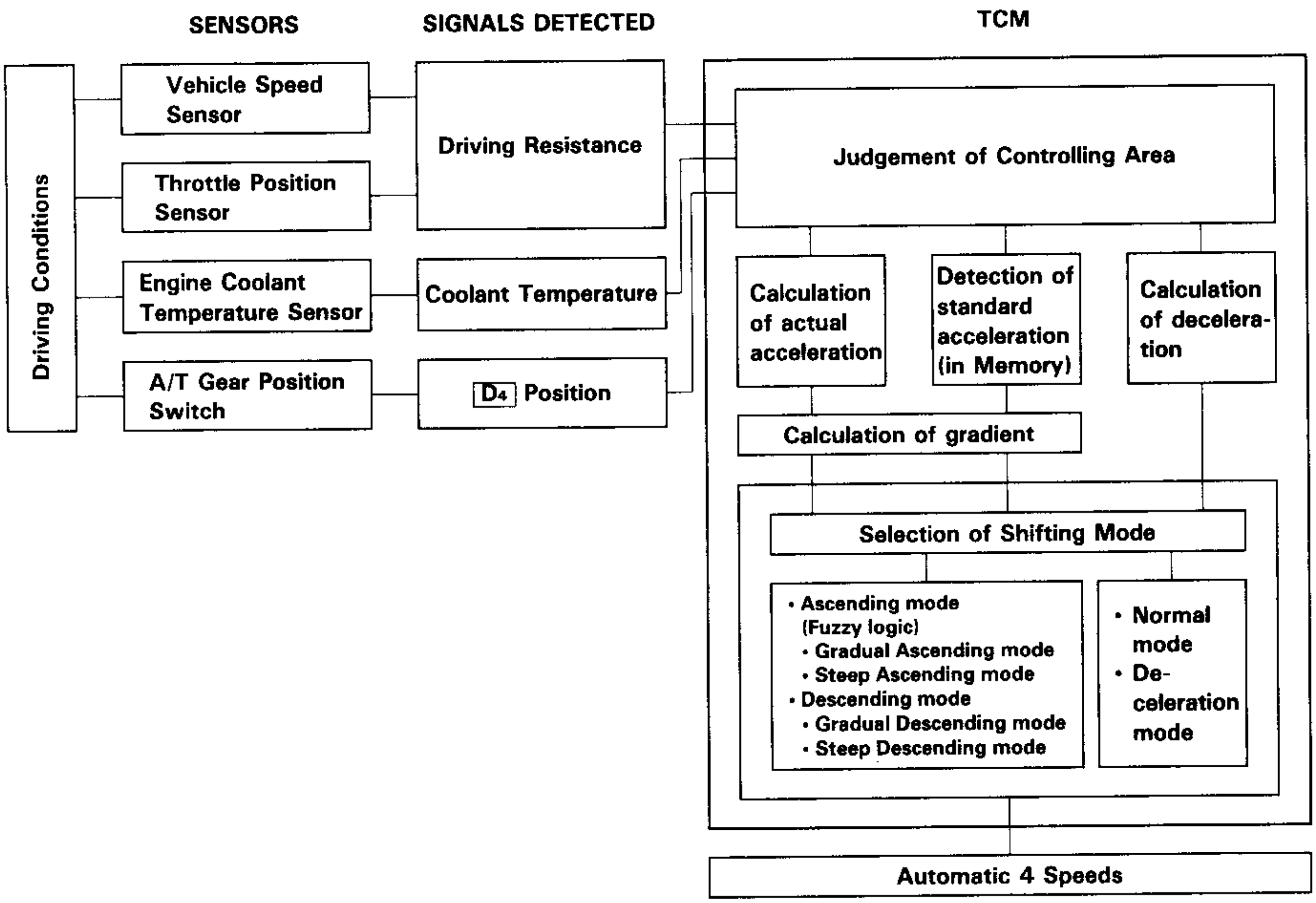
(cont'd)

Description

Electronic Control System (cont'd)

- **GRADE LOGIC CONTROL SYSTEM**

How it works:
The TCM compares actual driving conditions with driving conditions memorized in the TCM, based on the input from the vehicle speed sensor, throttle position sensor, engine coolant temperature sensor, barometric pressure sensor, brake switch signal and shift lever position signal, to control shifting while a vehicle is ascending or descending a slope, or reducing speed.



- **Ascending Control**

When the TCM determines that the vehicle is climbing a hill in D4 position, the system extends the engagement area of 3rd gear to prevent the transmission from frequently shifting between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

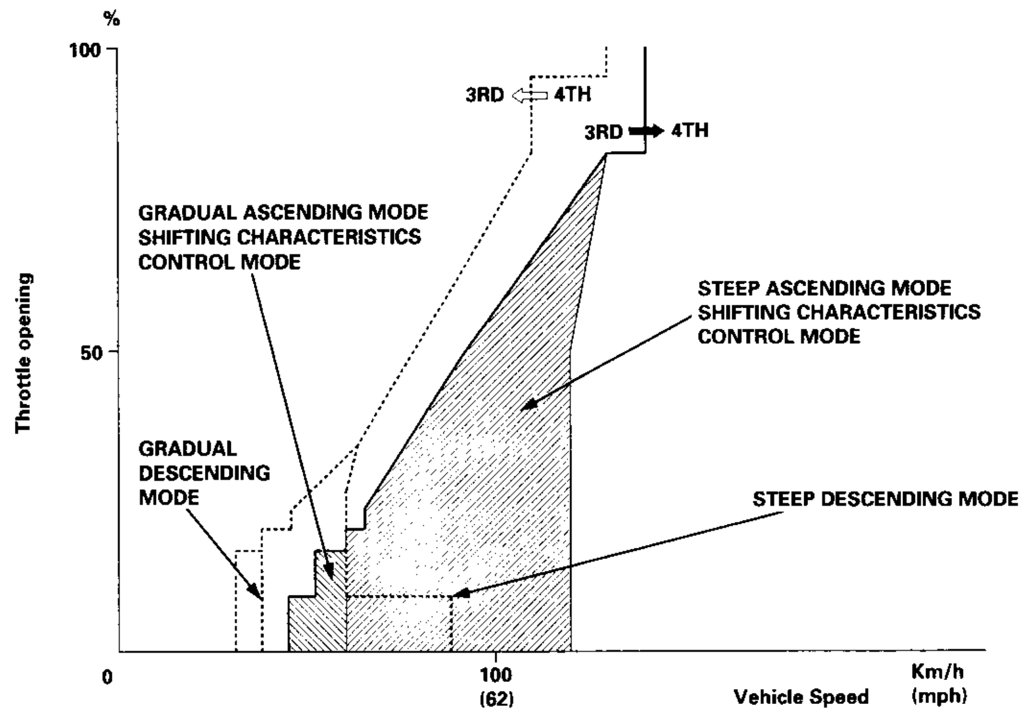
NOTE:
- Shift schedules between 3rd and 4th gear stored in the TCM enable the TCM's fuzzy logic to automatically select the most suitable gear according to the magnitude of a gradient.
- Fuzzy logic is a form of artificial intelligence that lets computers respond to changing conditions much like a human mind would.

- **Descending Control**

When the TCM determines that the vehicle is going down a hill in D4 position, the shift-up speed from 3rd to 4th gear when the throttle is closed becomes faster than the set speed for flat road driving to widen the 3rd gear driving area.
This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending.

There are two descending modes with different 3rd gear driving areas according to the magnitude of a gradient stored in the TCM.

When the vehicle is in 4th gear, and you are decelerating on a gradual hill, or when you are applying the brakes on a steep hill, the transmission will downshift to 3rd gear. When you accelerate, the transmission will then return to 4th gear.

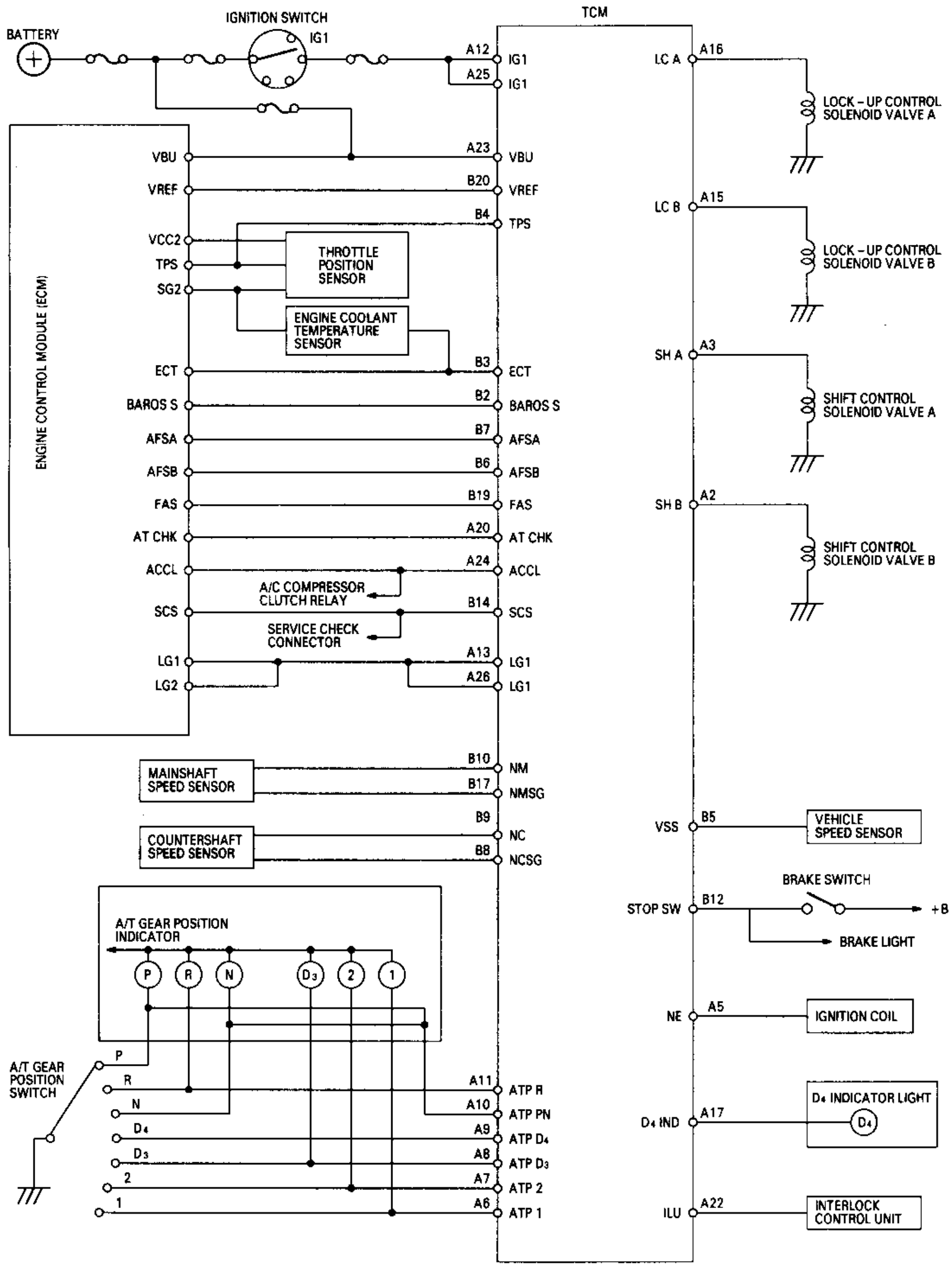


- **Deceleration Control**

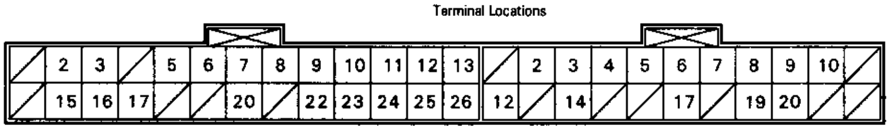
When the vehicle goes around a corner, and needs to decelerate first and then accelerate, the TCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 30 mph (48 km/h), the TCM shifts the transmission from 4th to 2nd earlier than normal to cope with upcoming acceleration. (cont'd)

Electronic Control System (cont'd)

Circuit Diagram and Terminal Locations



Terminal Locations

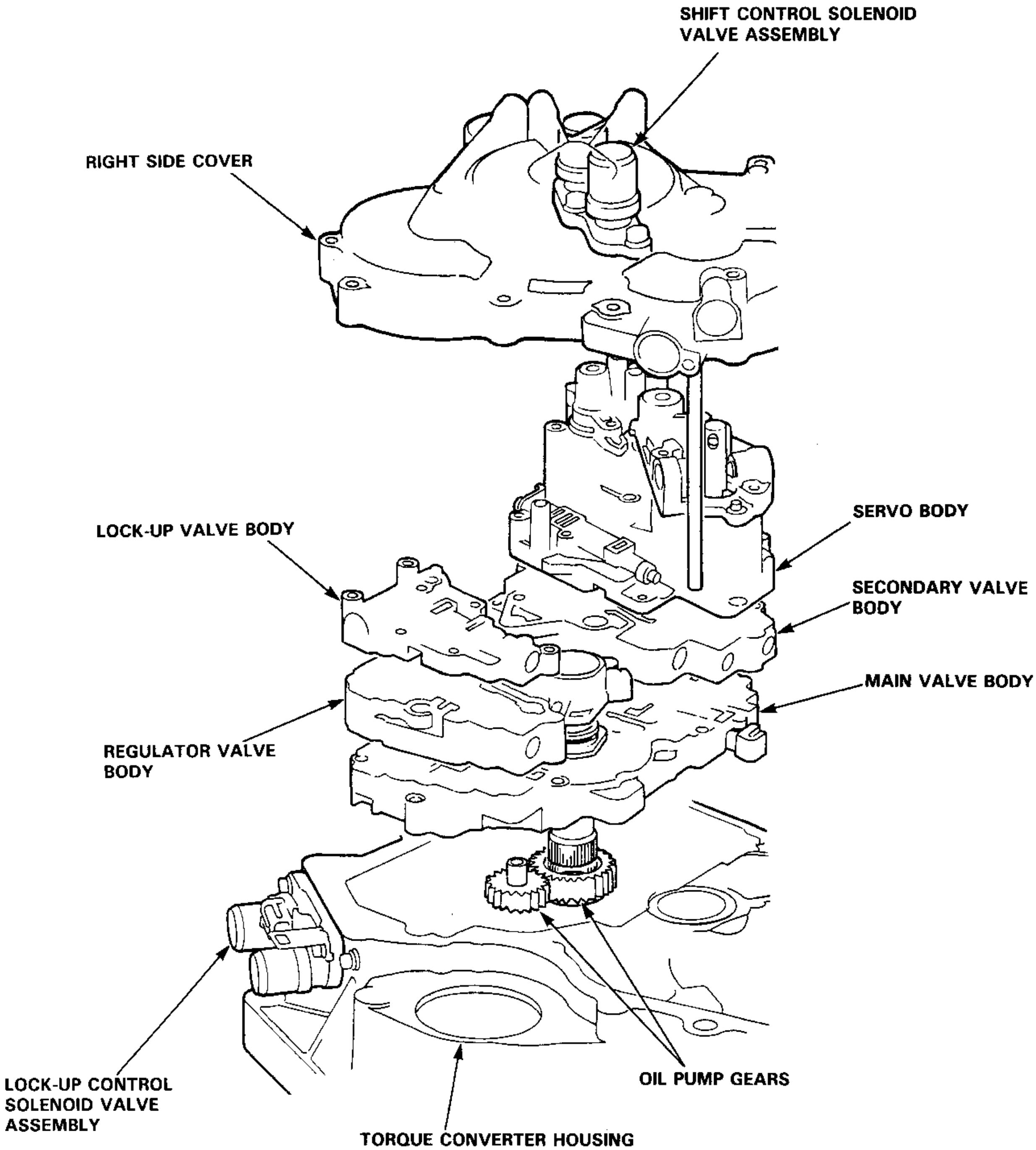


TCM – A (26P) Connector

TCM – B (22P) Connector

Hydraulic Control

The valve bodies include the main valve body, the secondary valve body, the regulator valve body, the servo body and the lock-up valve body.
The ATF pump is driven by splines behind the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches.



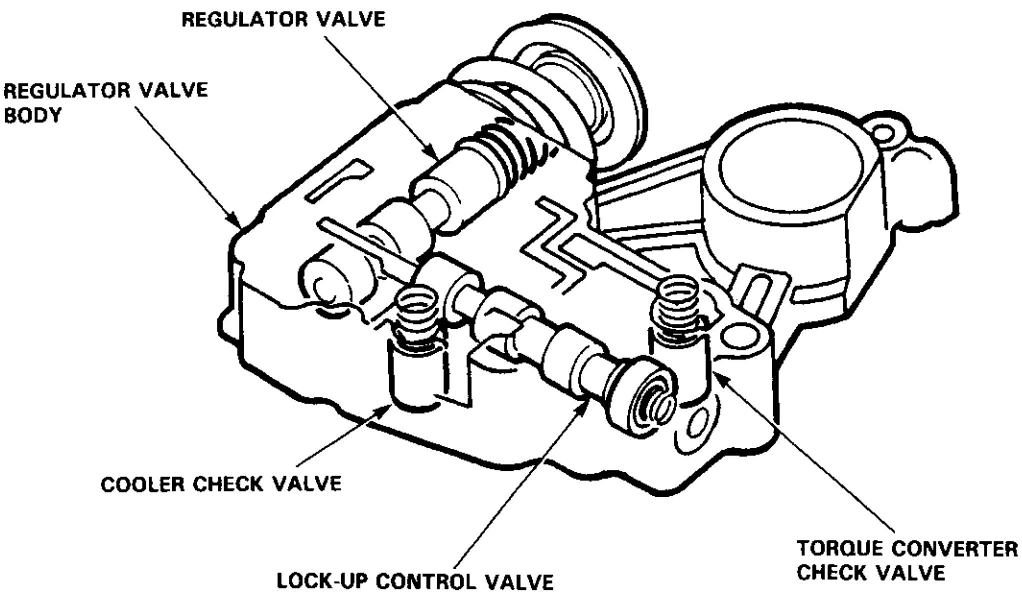
(cont'd)

Description

Hydraulic Control (cont'd)

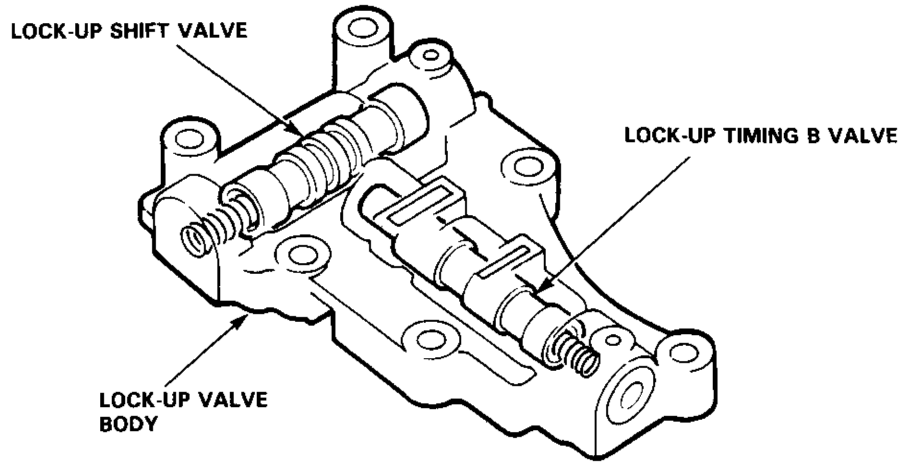
Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body consists of the regulator valve, the torque converter check valve, the cooler check valve, and the lock-up control valve.



Lock-up Valve Body

The lock-up valve body with the lock-up shift valve and lock-up timing B valve is located on the regulator valve body.

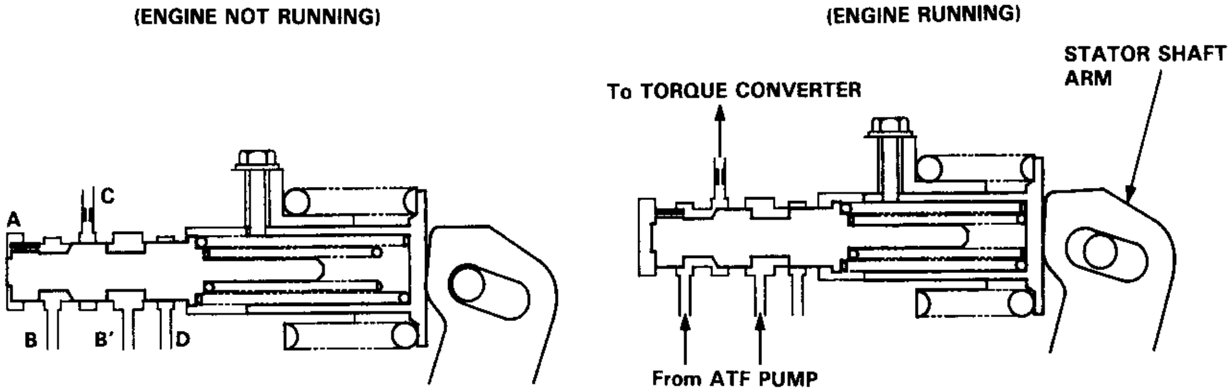


Regulator Valve

The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter.

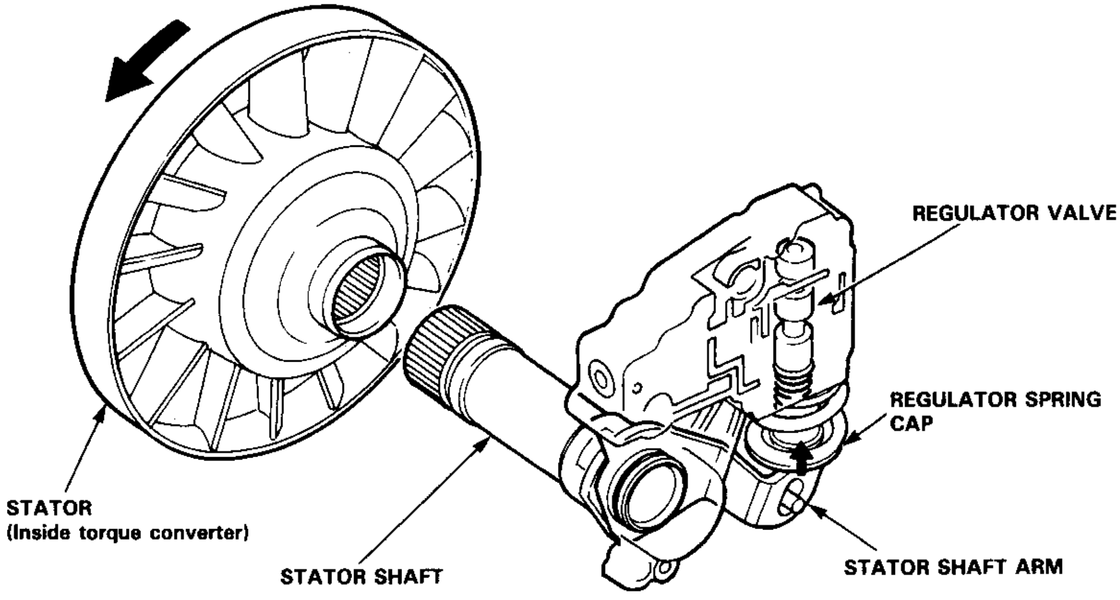
Fluid flows through B and B'. The fluid enters through B and flows through the valve orifice to A, pushing the regulator valve to the right. According to the level of hydralic pressure through B, the position of the valve changes, and the amount of the fluid through D from B' thus changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Stator Reaction Hydraulic Pressure Control

Hydraulic pressure increase, according to torque, is performed by the regulator valve using stator torque reaction. The stator shaft is splined to the stator and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft and the stator shaft arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The spring compresses and the regulator valve moves to increase the regulated control pressure or line pressure. Line pressure is maximum when the stator reaction is maximum.

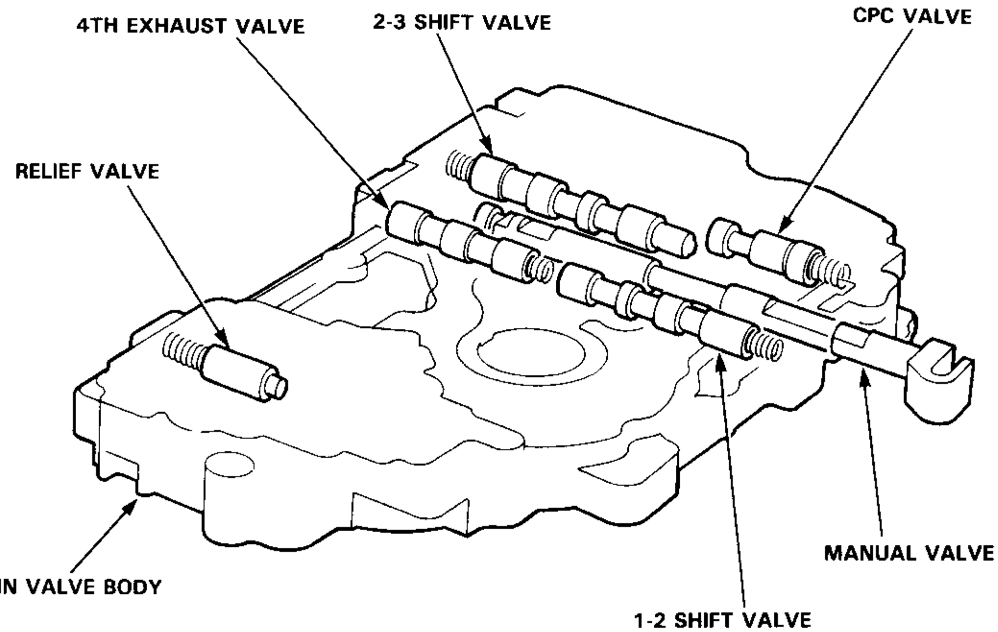


(cont'd)

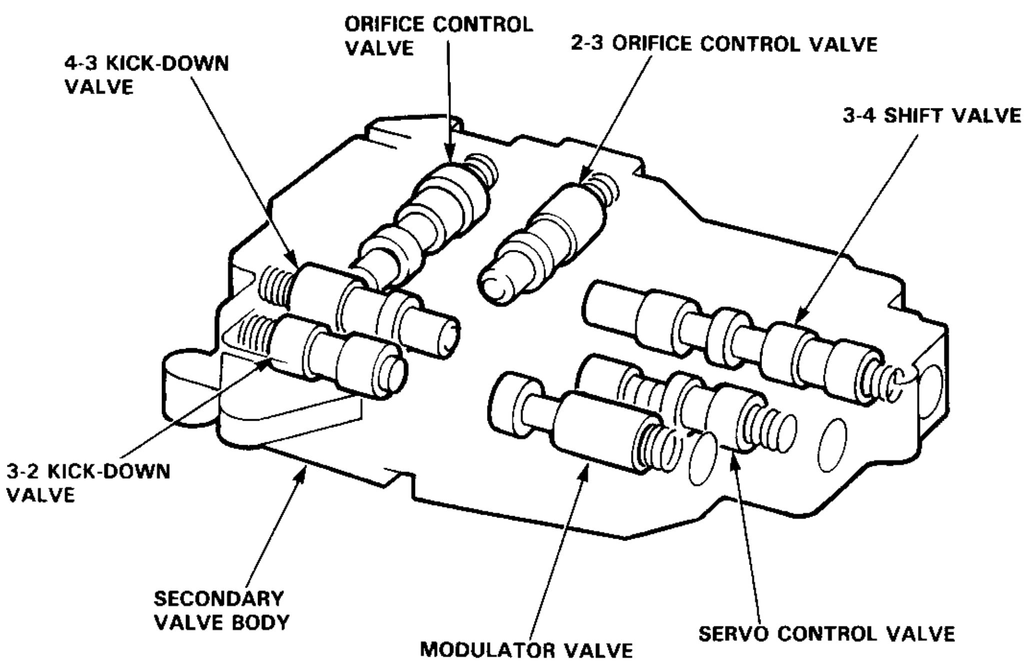
Description

Hydraulic Control (cont'd)

Main Valve Body
The main valve body houses the manual valve, the 1-2 shift valve, the 2-3 shift valve, the 4th exhaust valve, the CPC valve, and the relief valve.
The primary functions of this valve body are switching ATF passages on and off, and controlling the hydraulic pressure going to the hydraulic control system.



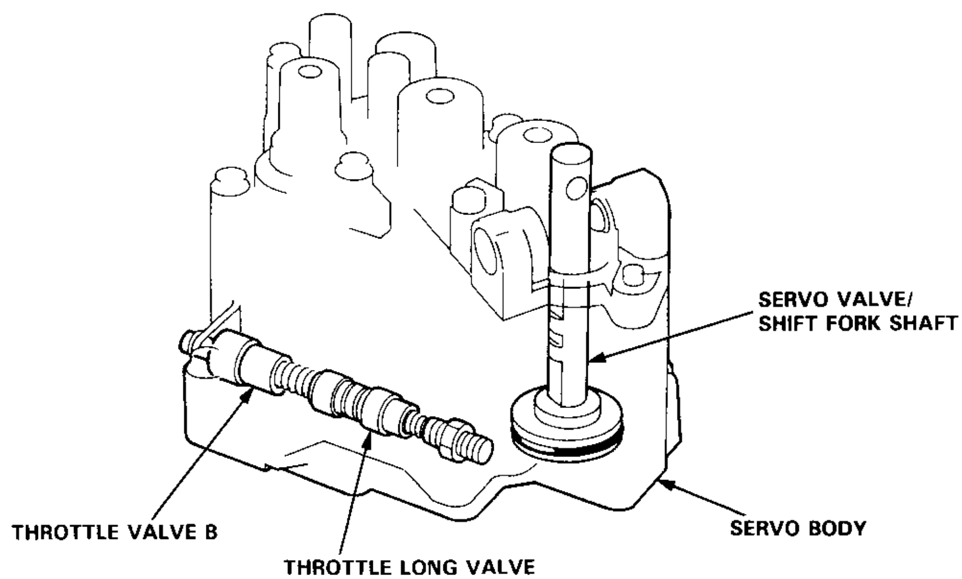
Secondary Valve Body
The secondary valve body is located on the main valve body. The secondary valve body houses the 3-2 kick-down valve, the 4-3 kick-down valve, the 2-3 orifice control valve, the orifice control valve, the 3-4 shift valve, the modulator valve, and the servo control valve.



Servo Body

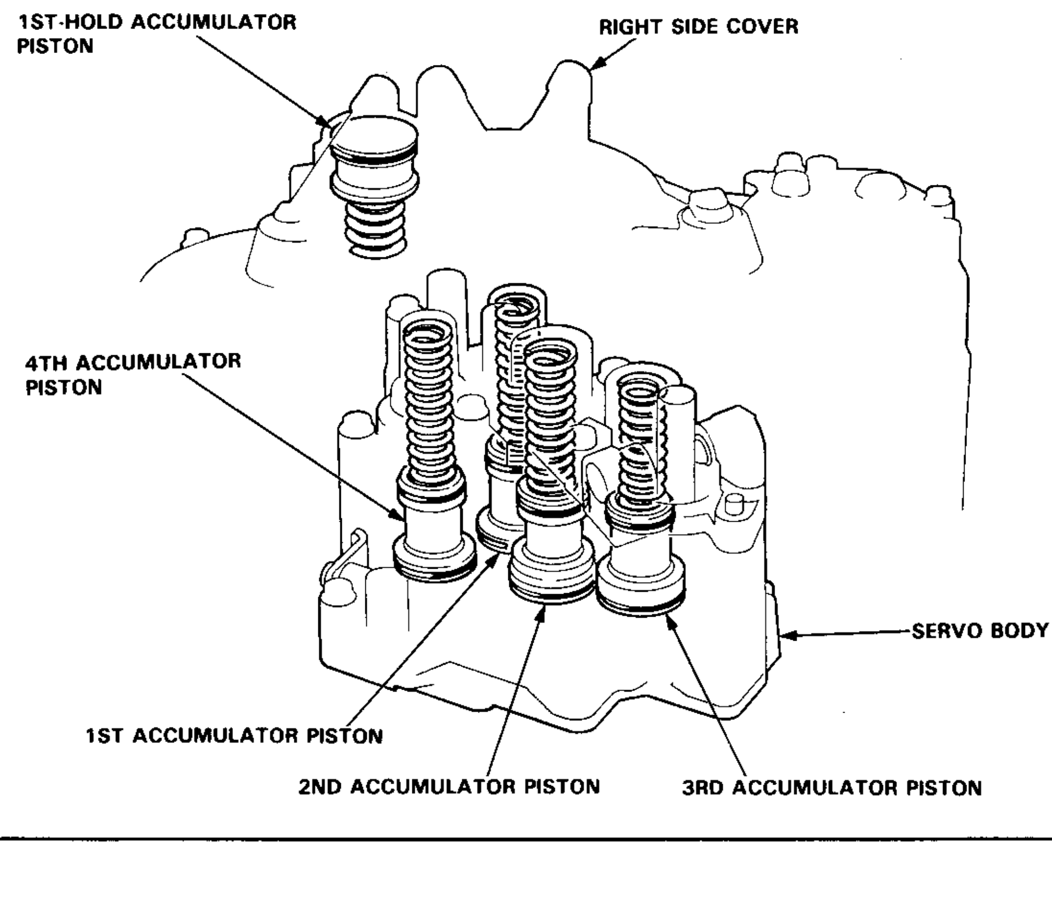
The servo body is located on the secondary valve body.

The servo body houses the servo valve (integrated with the shift fork shaft), the throttle valve B, and the accumulator pistons.



Accumulator Pistons

The accumulator pistons are assembled in the servo body and right side cover. The 1st-hold clutch accumulator piston is in the right side cover, and the 1st, 2nd, 3rd, and 4th accumulator pistons are in the servo body.



Description

Hydraulic Flow

General Chart of Hydraulic Pressure

- ATF Pump — Regulator Valve
  - Line Pressure
    - Modulator Pressure
    - Throttle B Pressure
    - Clutch Pressure
  - Torque Converter Pressure
  - Lubrication Pressure

Distribution of Hydraulic Pressure

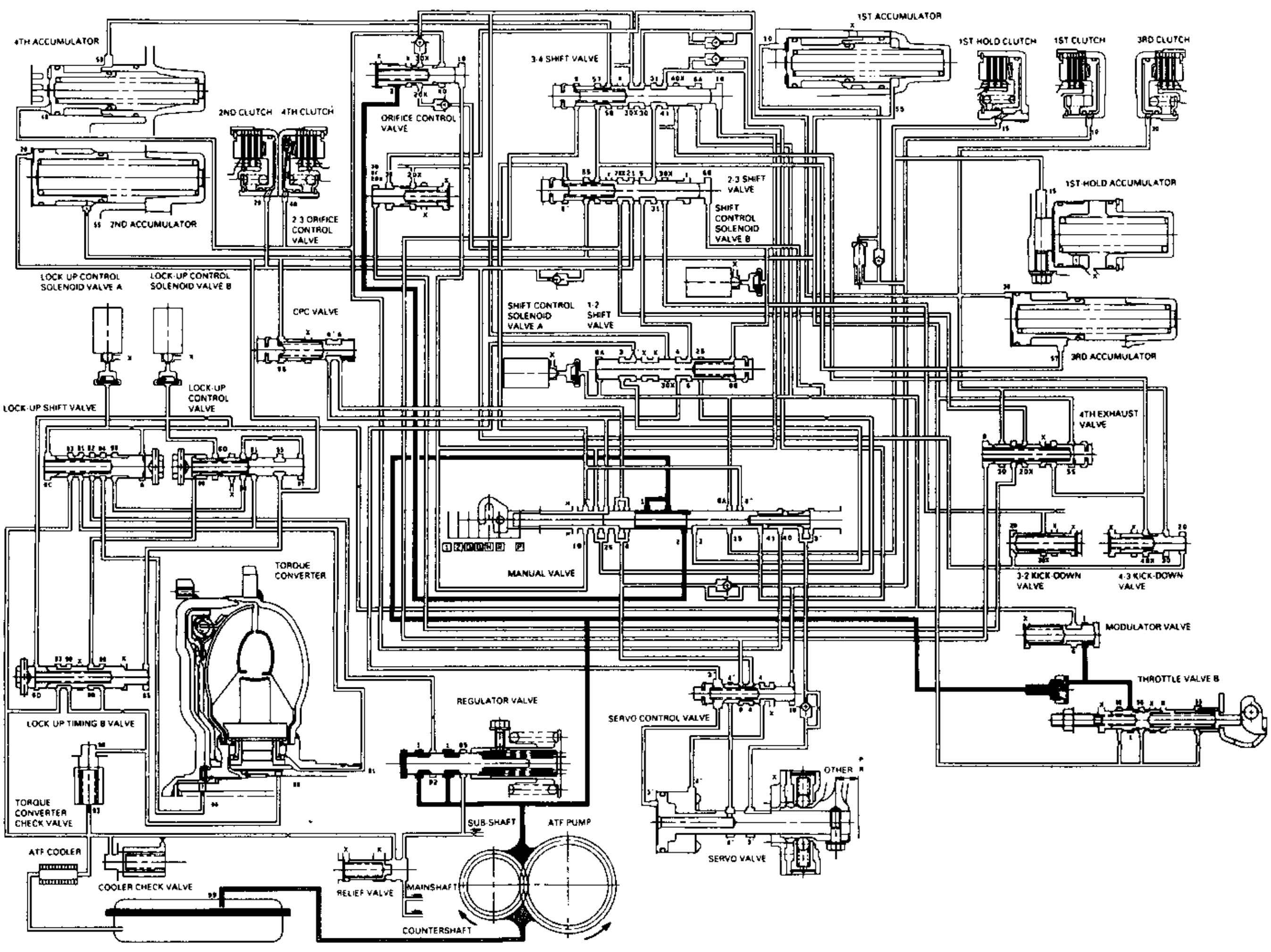
- Regulator Valve
  - Torque Converter Pressure
  - Lubrication Pressure
  - To Regulate Line Pressure
- Manual Valve — To Select Line Pressure — Clutch Pressure
- Modulator Valve — Modulator Pressure
  - Shift Control Solenoid Valves
  - Lock-up Control Solenoid Valves
- 1-2 Shift Valve
- 2-3 Shift Valve
- 3-4 Shift Valve
  - (1-2, 2-3, 3-4 Shift Valves) — Clutch Pressure
- Throttle Valve — Throttle B Pressure

NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE
1	LINE	6C	MODULATOR (LOCK-UP CONTROL SOLENOID VALVE A)	55	THROTTLE B
2	LINE	6D	MODULATOR (LOCK-UP CONTROL SOLENOID VALVE B)	56	THROTTLE B
3	LINE	9	LINE	57	THROTTLE B
3′	LINE	10	1ST CLUTCH	58	THROTTLE B
3″	LINE	15	1ST-HOLD CLUTCH	90	TORQUE CONVERTER
4	LINE	16	1ST-HOLD CLUTCH	91	TORQUE CONVERTER
4′	LINE	18	LINE	92	TORQUE CONVERTER
5	LINE	20	2ND CLUTCH	93	ATF COOLER
5′	LINE	21	2ND CLUTCH	94	TORQUE CONVERTER
5″	LINE	25	LINE	95	LUBRICATION
6	MODULATOR	30	3RD CLUTCH	96	TORQUE CONVERTER
6′	MODULATOR	31	3RD CLUTCH	97	TORQUE CONVERTER
6A	MODULATOR (SHIFT CONTROL SOLENOID VALVE A)	40	4TH CLUTCH	99	SUCTION
6B	MODULATOR (SHIFT CONTROL SOLENOID VALVE B)	41	4TH CLUTCH	X	BLEED

[N] Position

As the engine turns, the ATF pump also starts to operate. Automatic transmission fluid (ATF) is drawn from (99) and discharged into (1). Then, ATF pressure is controlled by the regulator valve and becomes line pressure (1). The torque converter inlet pressure (92) enters (94) of torque converter through the orifice and discharges into (90).
The torque converter check valve prevents the torque converter pressure from rising.
Under this condition, the hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Description

Hydraulic Flow (cont'd)

[1] Position

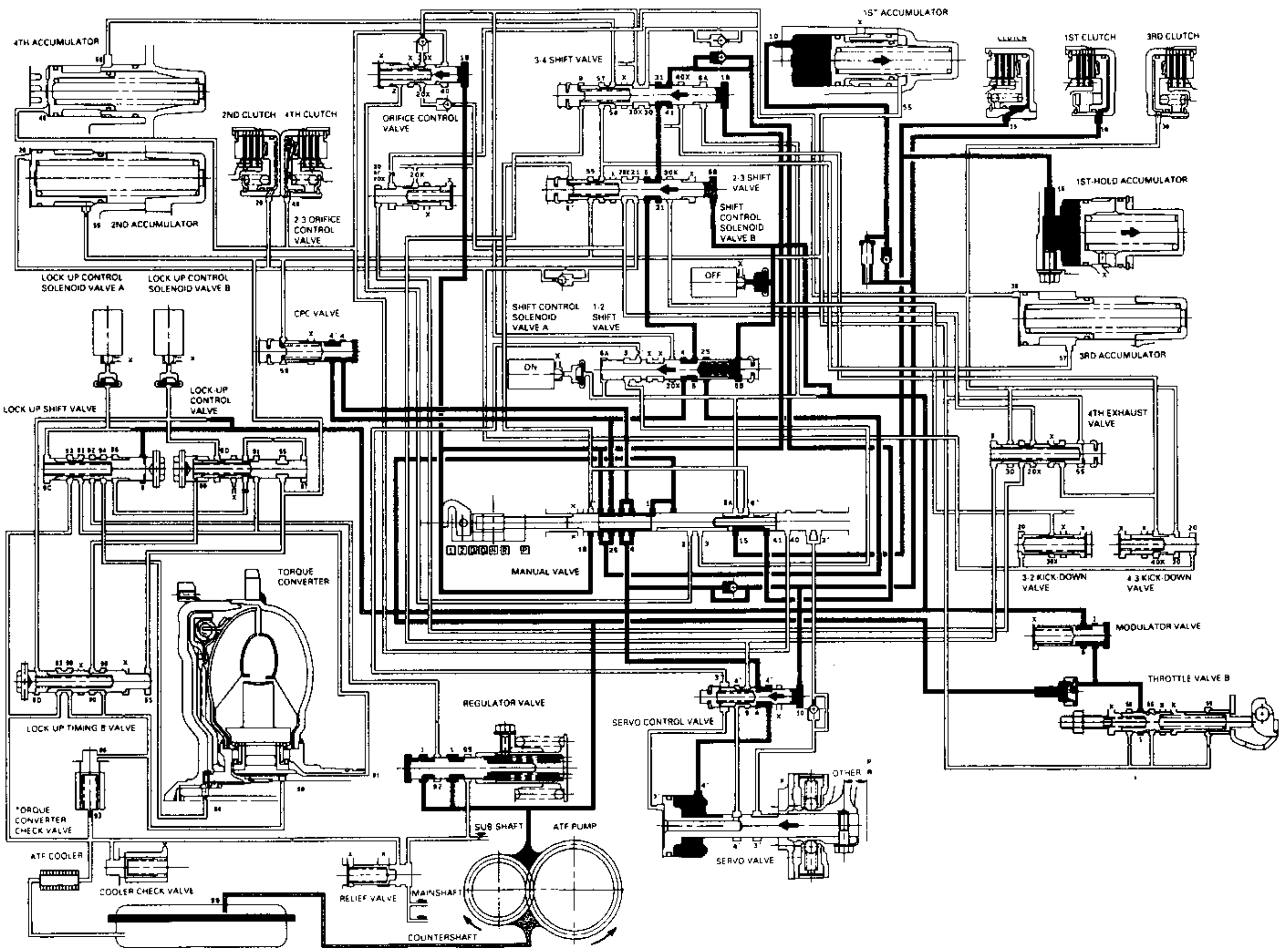
The line pressure (1) becomes line pressure (4) at the manual valve and passes to the 1st clutch and 1st accumulator. Then line pressure (4) flows through the 1st-hold clutch and 1st-hold accumulator.

Fluid flows by way of:

— Line Pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve — 3rd Clutch Pressure (31) → 3-4 Shift Valve — 4th Clutch Pressure (41) → Manual Valve — 1st-hold Clutch Pressure (15) → 1st-hold Clutch

The modulator pressure (6) is supplied to the 1-2 and 2-3 shift valves.
The line pressure (1) also flows to the throttle valve B.

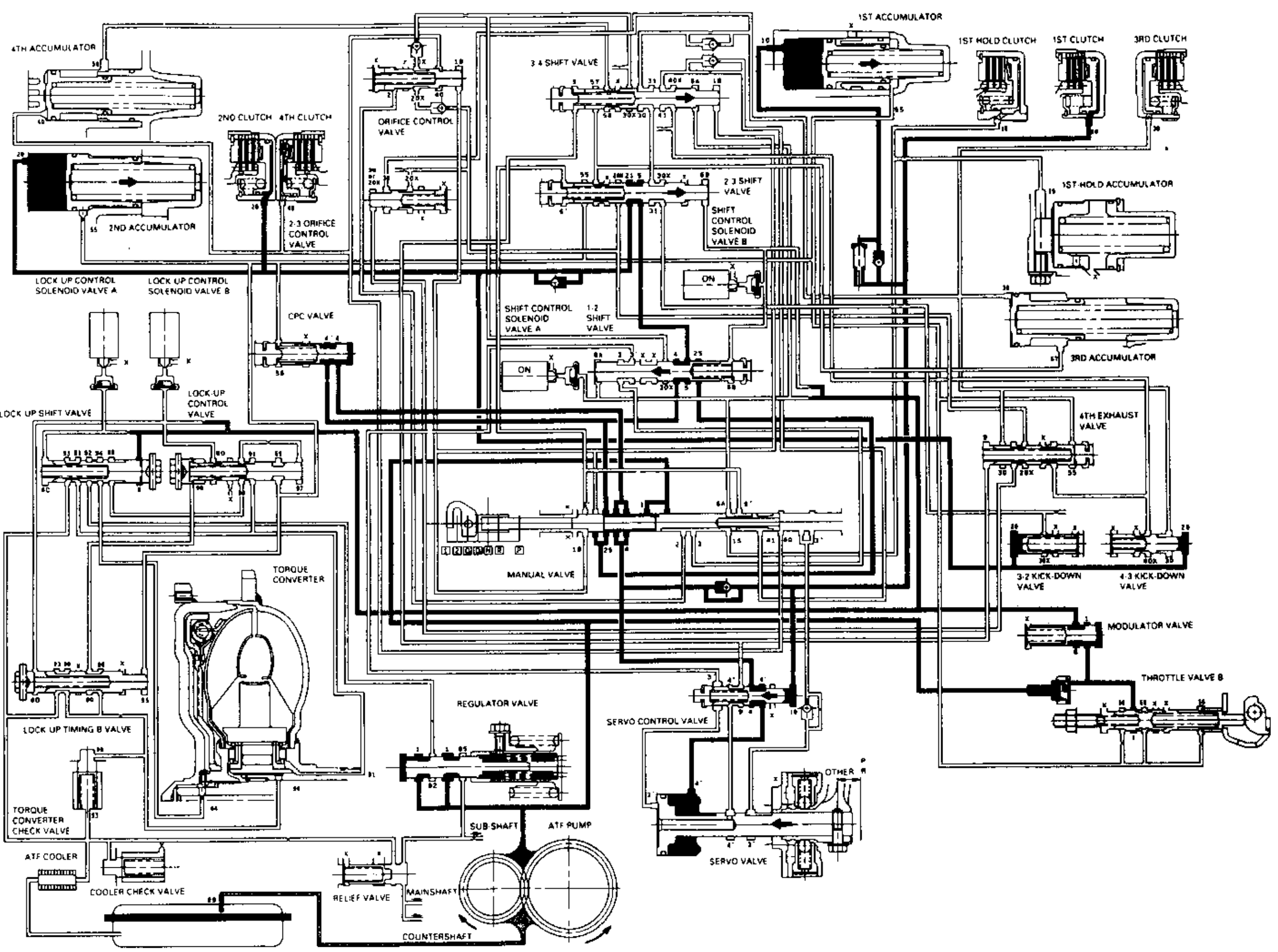
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[2] Position

The line pressure (1) becomes line pressure (4) as it passes through the manual valve. It then goes through line (20) to the 2nd clutch via the 1-2 and 2-3 shift valves. Also, line pressure (1) goes to the modulator valve through the filter and becomes the modulator pressure (6). Modulator pressure (6) is not supplied to the 1-2, 2-3 and 3-4 shift valves because the shift control solenoid valves A and B are turned ON by the TCM.

NOTE: When use, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

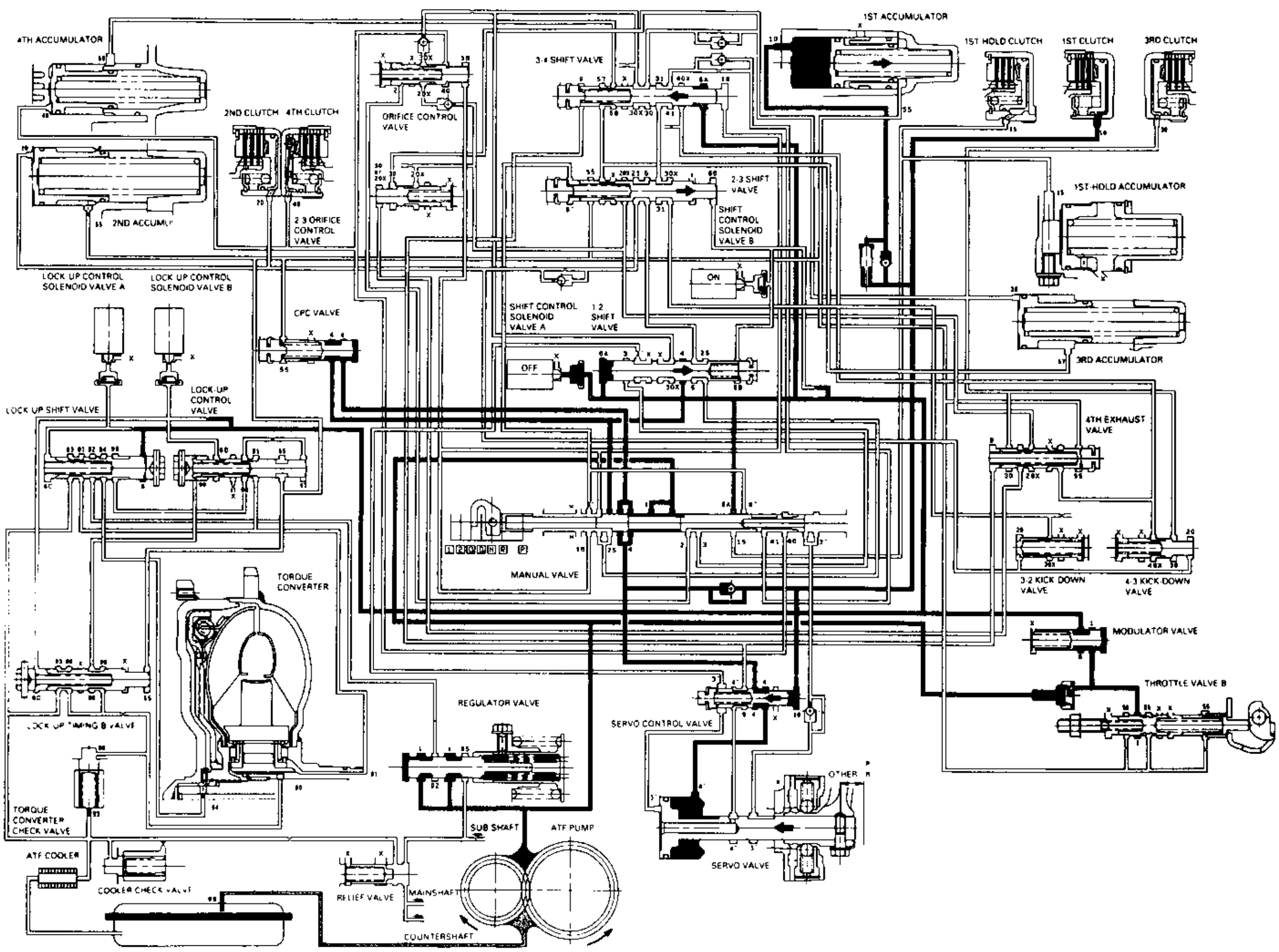
Description

Hydraulic Flow (cont'd)

[D3] or [D4] Position

1. **1st Gear**
   The flow of fluid through the torque converter circuit is the same as in [N] postion.
   The line pressure (1) becomes line pressure (4) and it becomes the 1st clutch pressure (10). The 1st clutch pressure is applied to the 1st clutch and 1st accumulator; consequently, the vehicle will move as the engine power is transmitted. The line pressure (1) becomes the modulator pressure (6) by the modulator valve and travels to 1-2 and 3-4 shift valves. The 1-2 shift valve is moved to the right side because the shift control solenoid valve A is turned OFF and B is turned ON by the TCM. This valve stops 2nd clutch pressure and power is not transmitted to the 2nd clutch.
   Line pressure (4) also flows to the servo valve and line pressure (1) also flows to throttle valve B.

   NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



2. **2nd Gear**

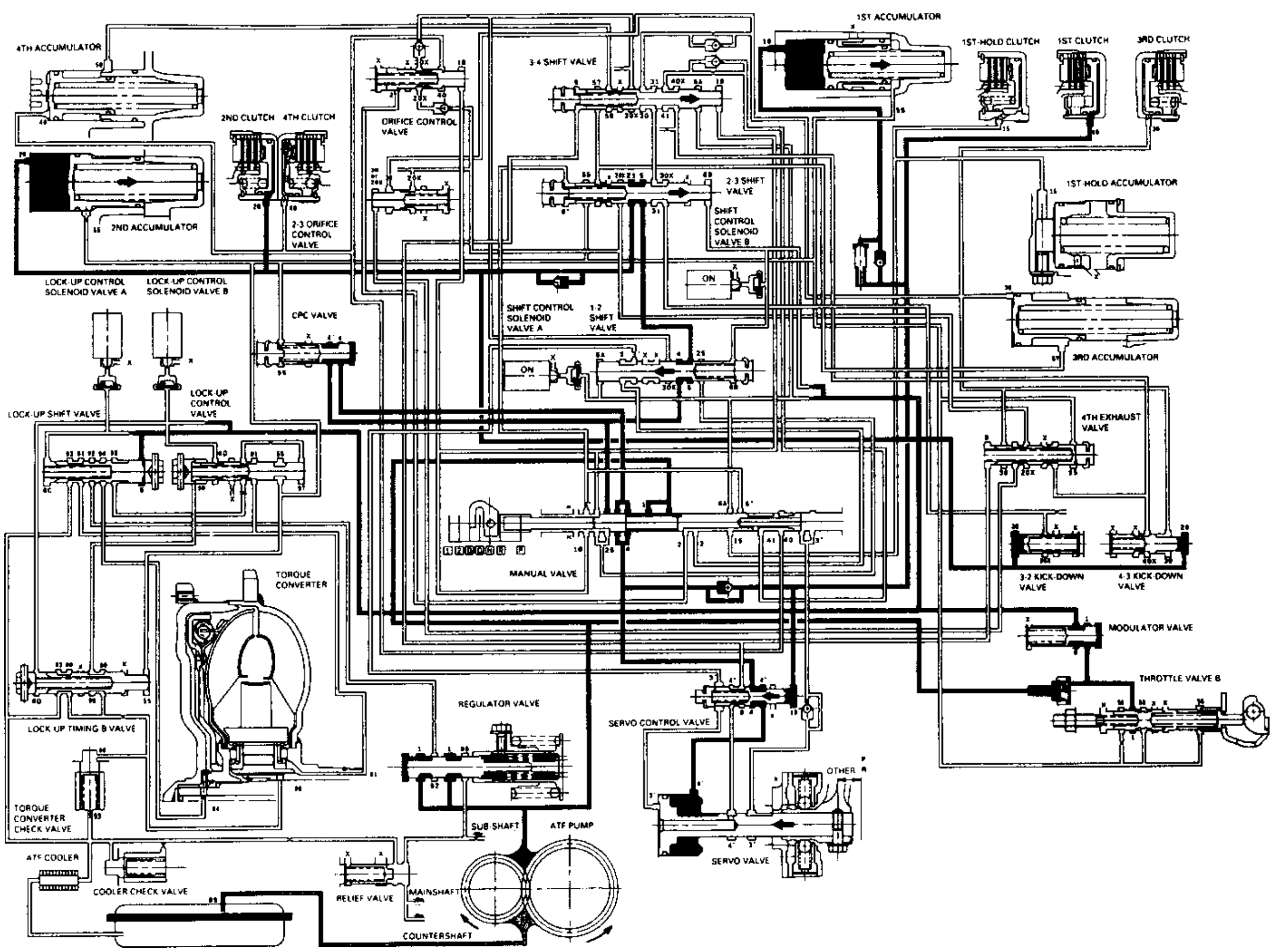
The flow of fluid up the 1-2 shift valve is the same as in 1st gear. As the speed of the vehicle reaches the prescriabed value, the shift control solenoid valve A is turned ON by means of the TCM. As a result, the 1-2 shift valve is moved to the left and uncovers the port leading to the 2nd clutch; the 2nd clutch is engaged.

Fluid flows by way of:

— Line pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve – 2nd Clutch Pressure (21) → 2nd Cluch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Hydraulic Flow (cont'd)

3. **3rd Gear**

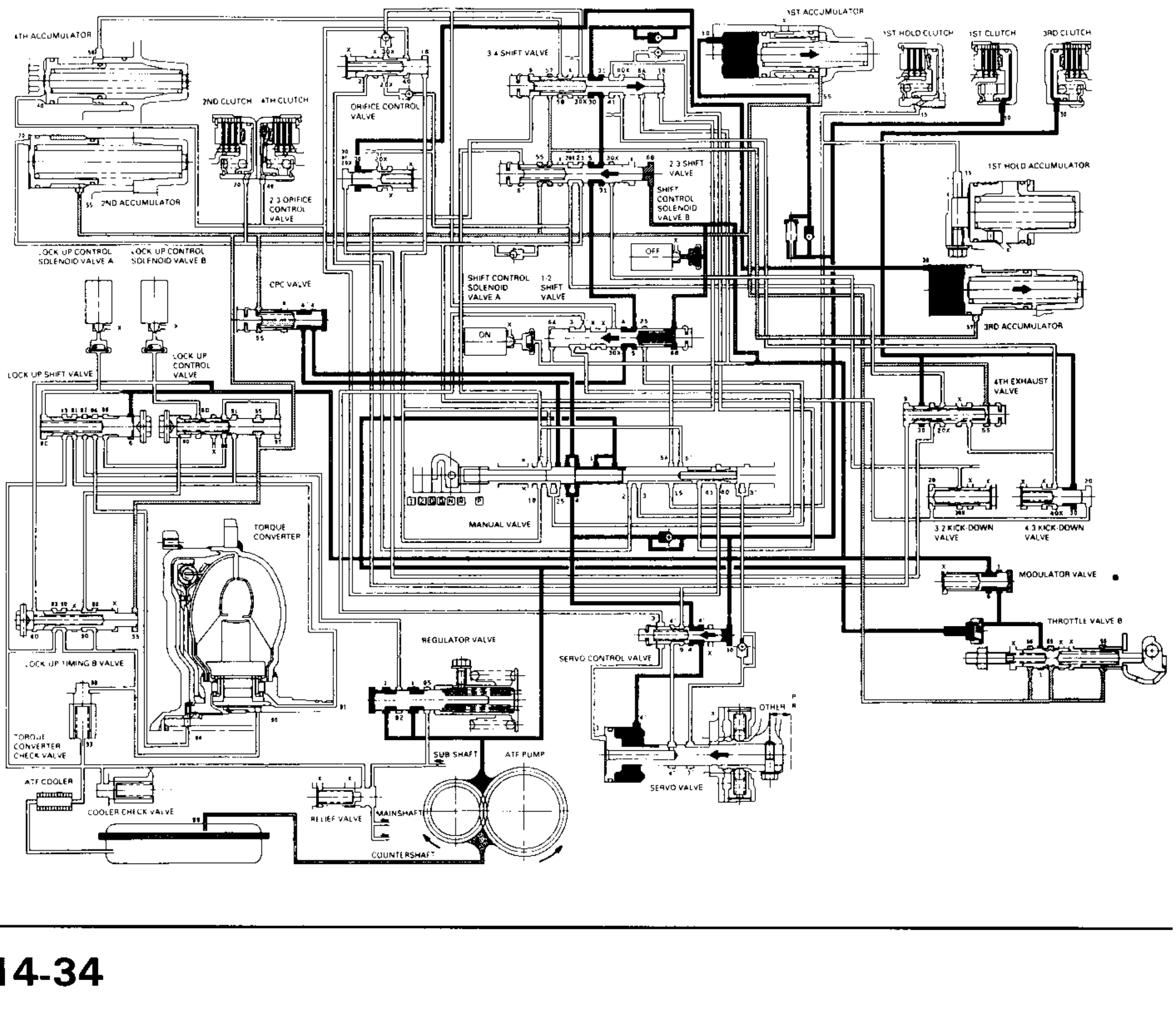
The flow of fluid up to the 1-2 and 2-3 shift valve is the same as in 2nd gear. As the speed of the vehicle reaches the prescribed value, the shift control solenoid valve B is turned OFF (shift control solenoid valve A remains ON). The 2-3 shift valve is then moved to the left, uncovering the port leading to the 3rd clutch. Since the 3-4 shift valve is moved to the right to vover the port to the 4th clutch, the 3rd clutch is turned on.

Fluid flows by way of:

— Line pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve – 3rd Clutch Pressure (31) → 3-4 Shift Valve (not controlled) – 3rd Clutch Pressure (30) → 3rd Clutch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch as in the 2nd gear.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



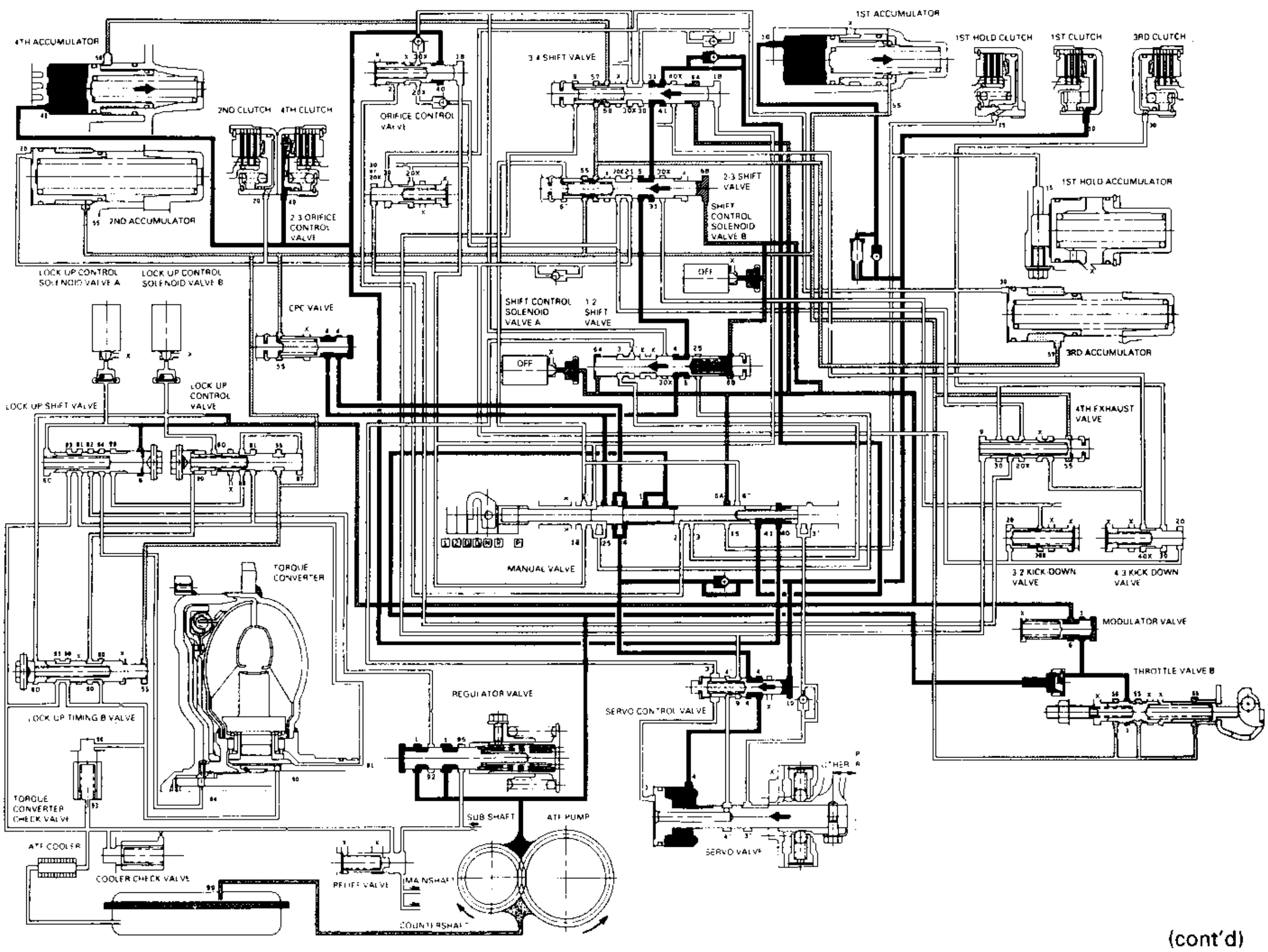
D4 Position

4. **4th Gear**
The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in 3rd gear. As the speed of the vehicle reaches the prescribed value, the shift control solenoid valve A is turned OFF (shift control solenoid valve B remains OFF). As this takes place, 3-4 shift valve is moved to the left and uncovers the port leading to the 4th clutch. Since the1-2 and 2-3 shift valves are kept on the left side, the fluid flows through the 4th clutch; the power is transmitted through the 4th clutch.

Fluid flows by way of:
— Line pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve – 3rd Clutch Pressure (31) → 3-4 Shift Valve – 4th Clutch pressure (41) → Manual Valve – 4th Clutch Pressure (40) → 4th Clutch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch as in 2nd and 3rd gears.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

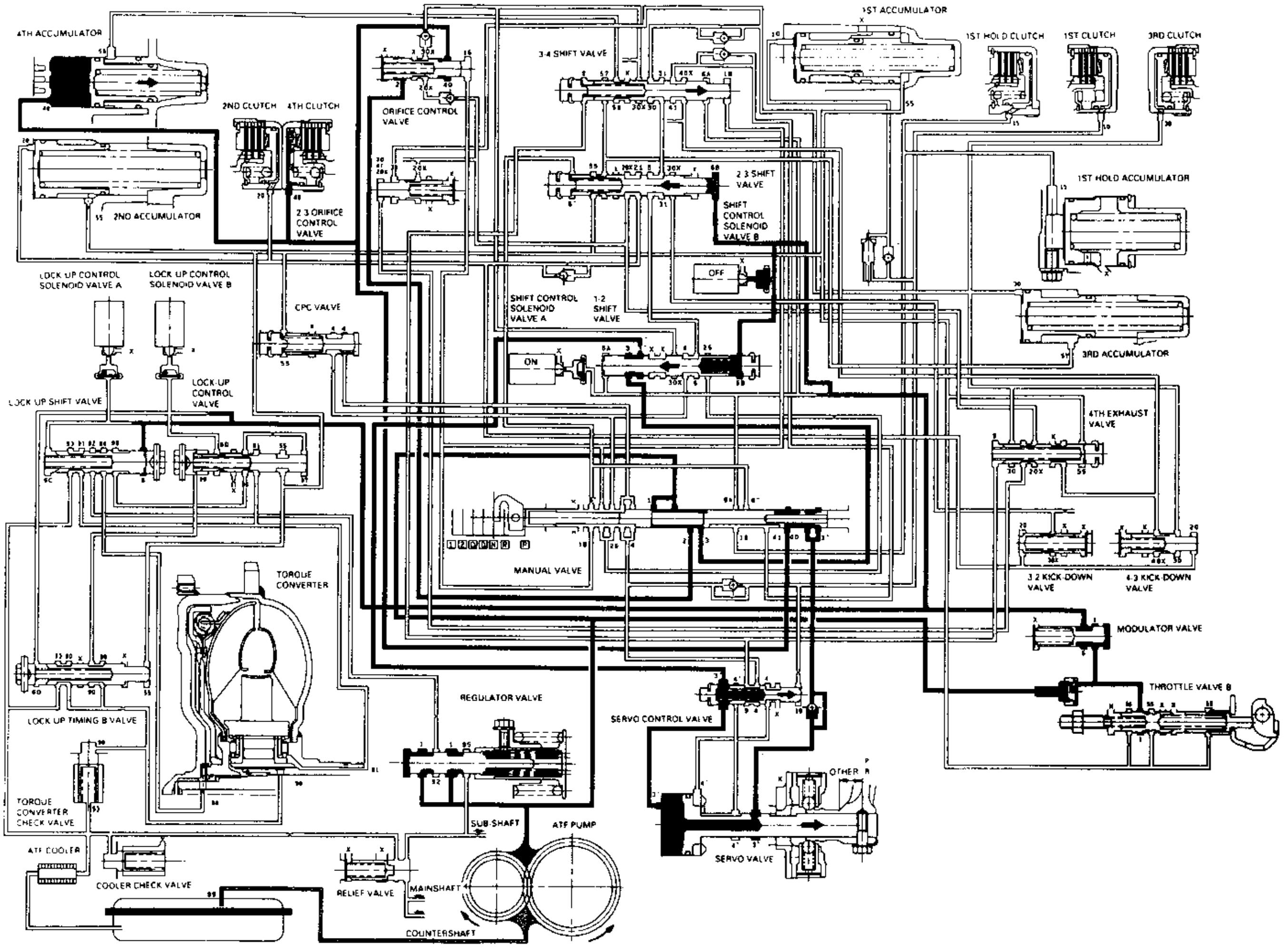


(cont'd)

[R] Position

The flow of fluid through the torque converter circuit is the same as in [N] postion. The line pressure (1) flows through the manual valve and becomes line pressure (3). It then flows through the 1-2 shift valve to the servo valve via the servo control valve, causing the shift fork shaft to be moved in the reverse direction.

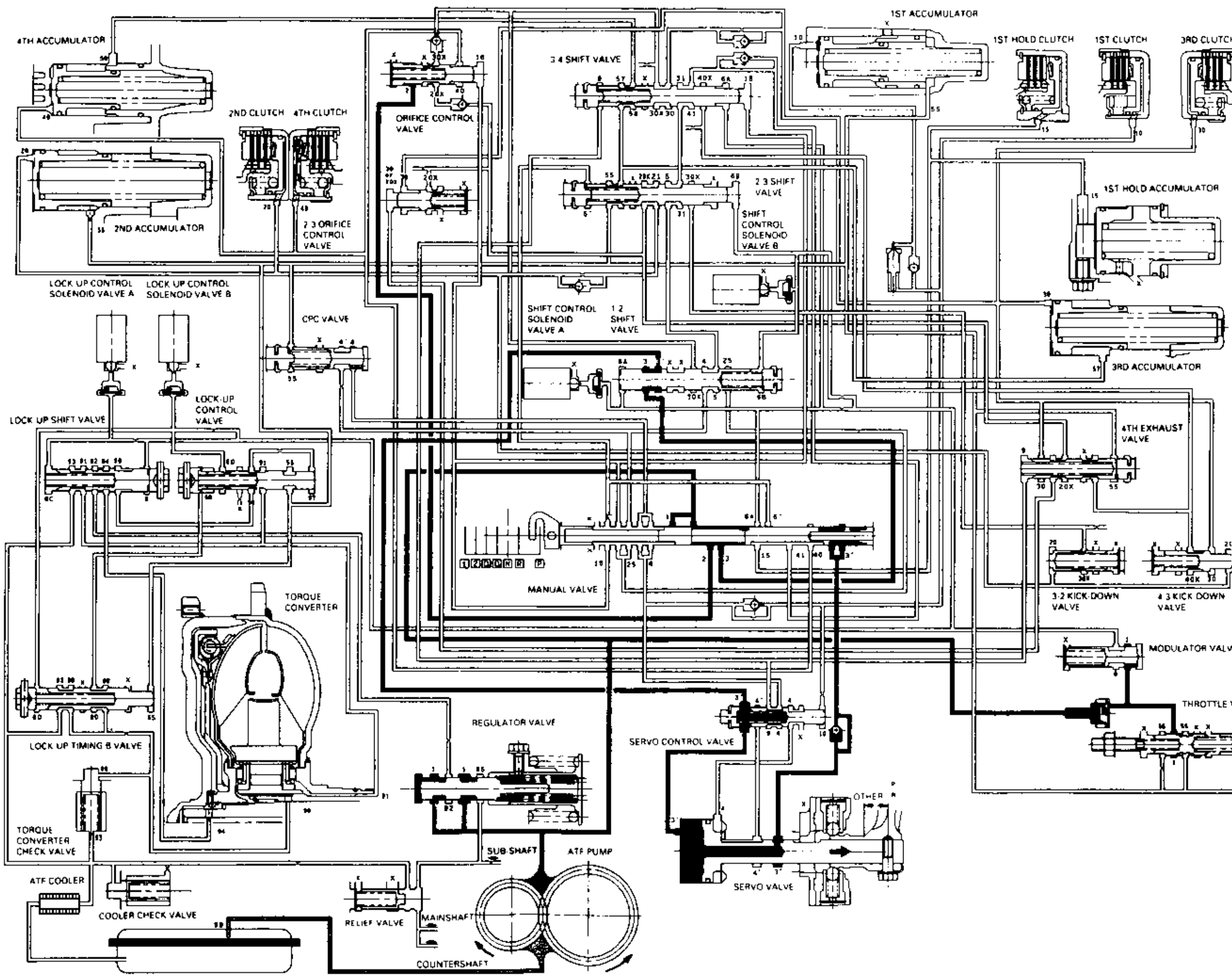
Under this condition, the shift control solenoid valve A is turned ON whereas the valve B is turned OFF as in 3rd gear in [D4] or [D3] position. As a result, the 1-2 shift valve is also moved to the left. The fluid (3') will flow through the servo valve and manual valve to the 4th clutch; power is transmitted through the 4th clutch.



[P] Position

The flow of fluid through the torque converter circuit is the same as in [N] position. The line pressure (1) becomes line pressure (3) as it passes through the manual valve. Then line pressure (3) flows through the 1-2 shift valve to the servo valve via the servo control valve, causing the shift fork shaft to be moved to the reverse position as in [R] position. However, the hydraulic pressure is not supplied to the clutches. Power is not transmitted.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Lock-up System

Lock-up Clutch

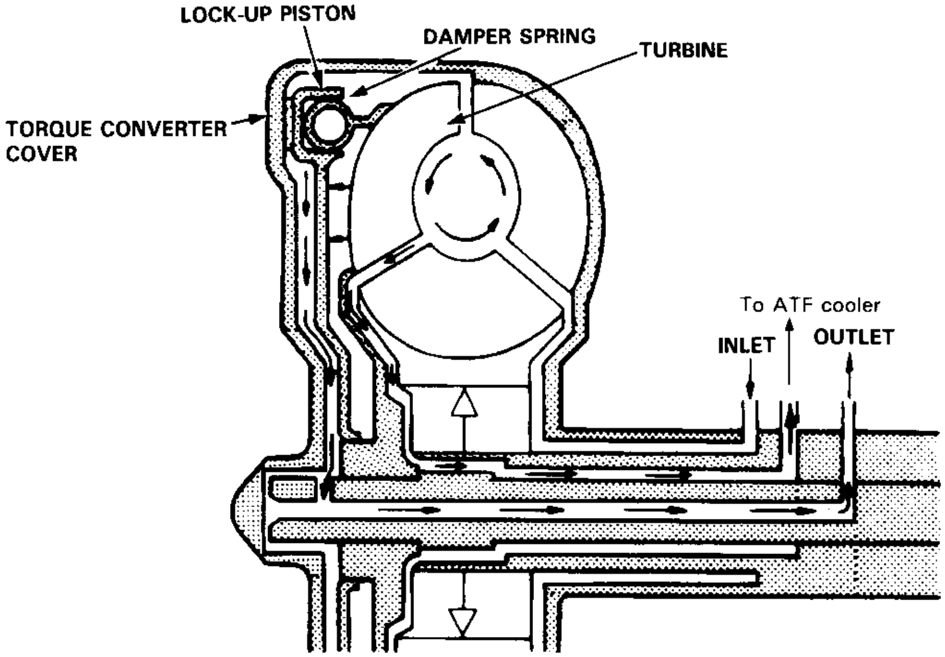
1. Operation (clutch on)

With the lock-up clutch on, the fluid in the chamber between the torque converter cover and lock-up piston is discharged, and the converter fluid exerts pressure through the piston against the converter cover. As a result, the converter turbine is locked on the converter cover firmly. The effect is to bypass the converter, thereby placing the vehicle in direct drive.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft

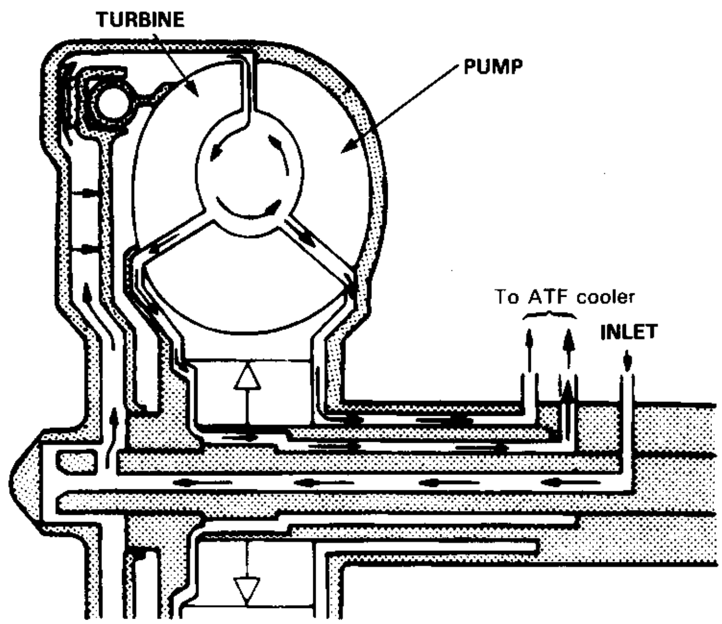


2. Operation (clutch off)

With the lock-up clutch off, the fluid flows in the reverse of "clutch on." As a result, the lock-up piston is moved away from the converter cover; that is, the torque converter lock-up is released.

Power flow

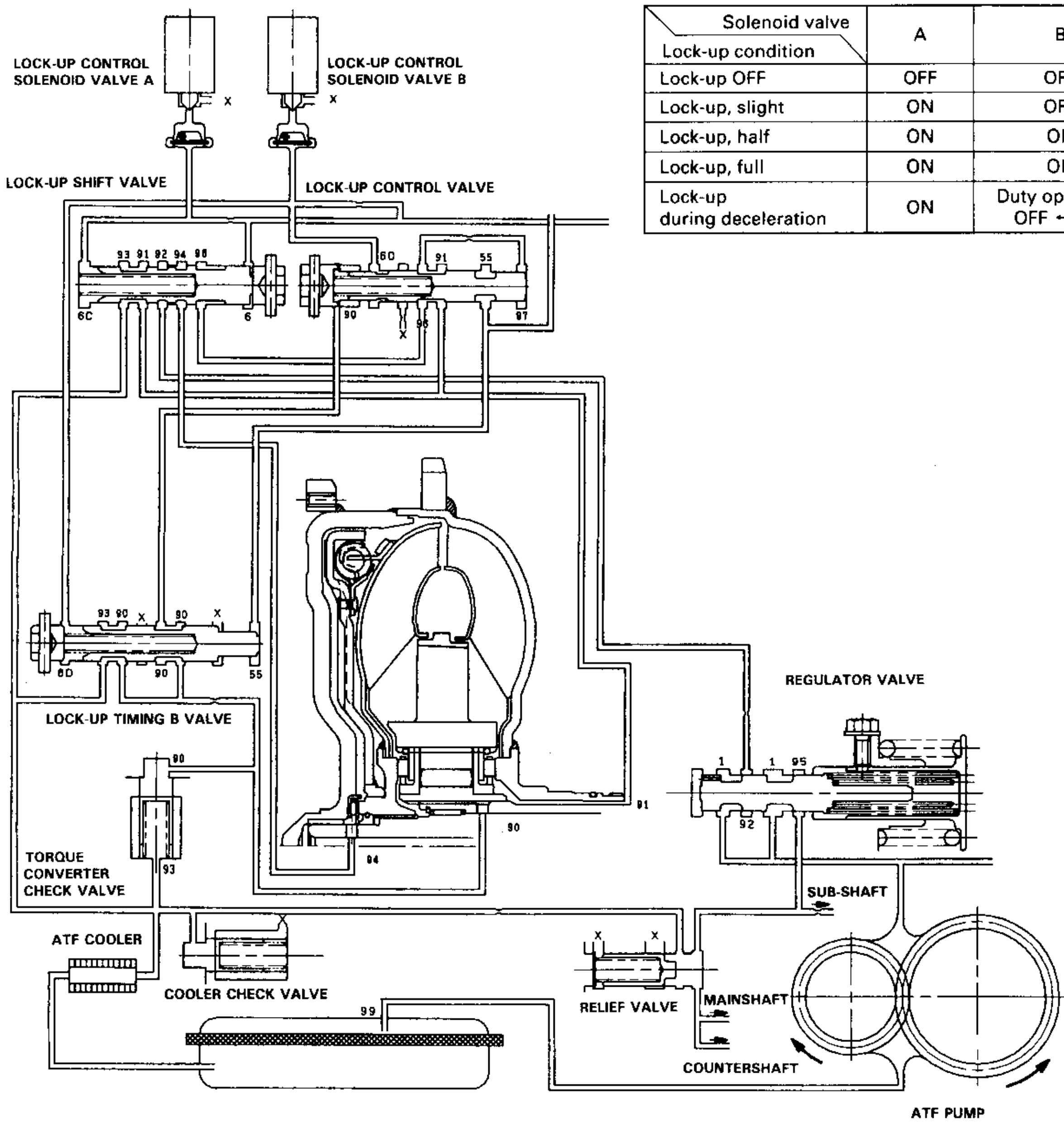
Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



In [D4] position in 2nd, 3rd and 4th, and [D3] position in 3rd, pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the TCM optimized the timing of the lock-up system. Under certain conditions, the lock-up clutch is applied during deceleration in 3rd and 4th gear.

The lock-up system controls the range of lock-up according to lock-up control solenoid valves A and B, and the throttle valve B. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the TCM.

Lock-up condition \ Solenoid valve	A	B
Lock-up OFF	OFF	OFF
Lock-up, slight	ON	OFF
Lock-up, half	ON	ON
Lock-up, full	ON	ON
Lock-up during deceleration	ON	Duty operation OFF ↔ ON



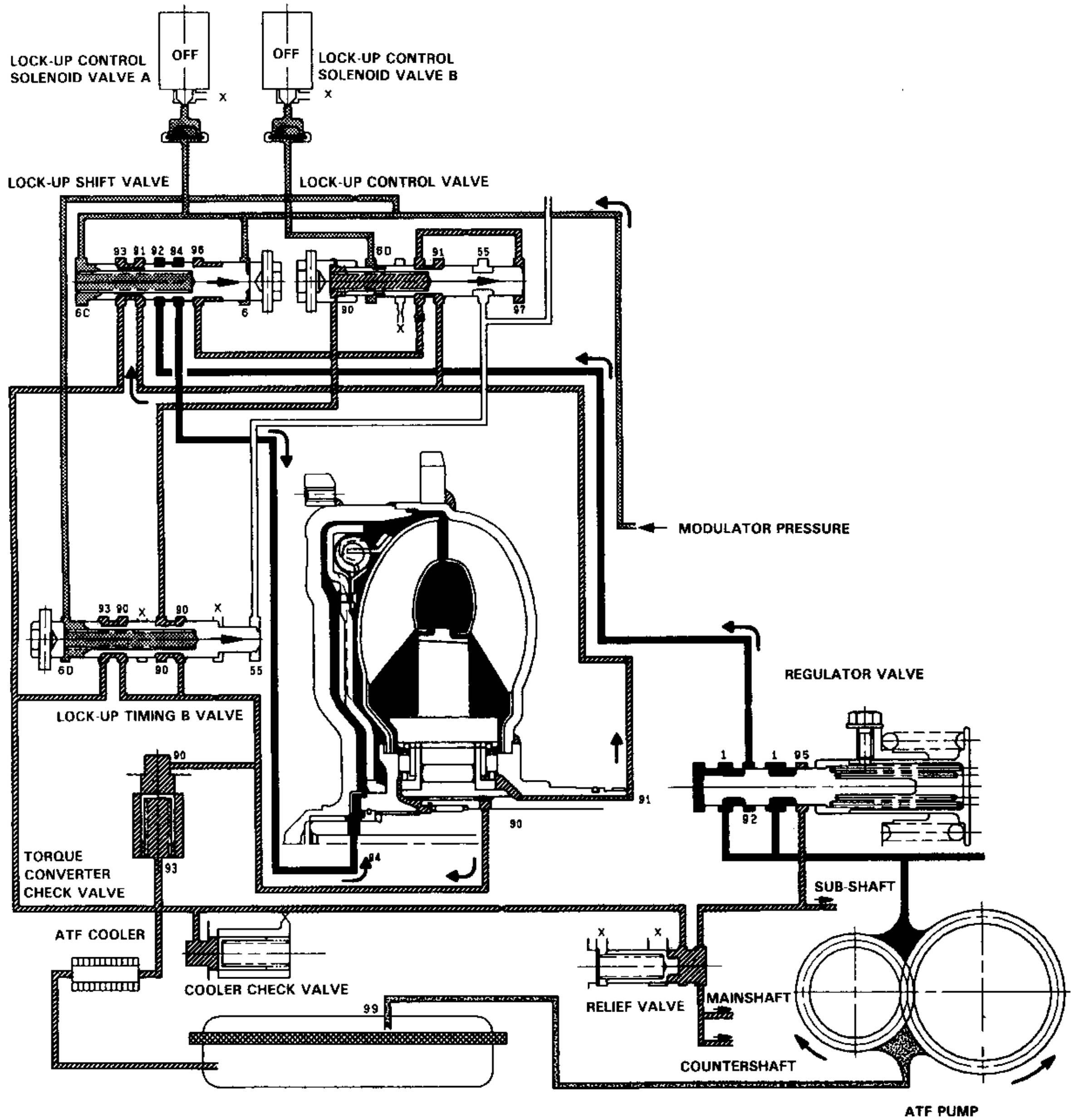
(cont'd)

Lock-up System (cont'd)

No Lock-up

The pressurized fluid regulated by the modulator works on both ends of the lock-up shift valve and on the left side of the lock-up control valve. Under this condition, the pressures working on both ends of the lock-up shift valve are equal, the shift valve is moved to the right side by the tension of the valve spring alone. The fluid from the ATF pump will flow through the left side of the lock-up clutch to the torque converter; that is, the lock-up clutch is in OFF condition.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Partial Lock-up

Lock-up Control Solenoid Valve A: ON   Lock-up Control Solenoid Valve B: OFF

The TCM switches solenoid valve A ON to release modulator pressure in the left cavity of the lock-up shift valve. Modulator pressure in the right cavity of the lock-up shift valve overcomes the spring force, and the lock-up shift valve is moved to the left side.

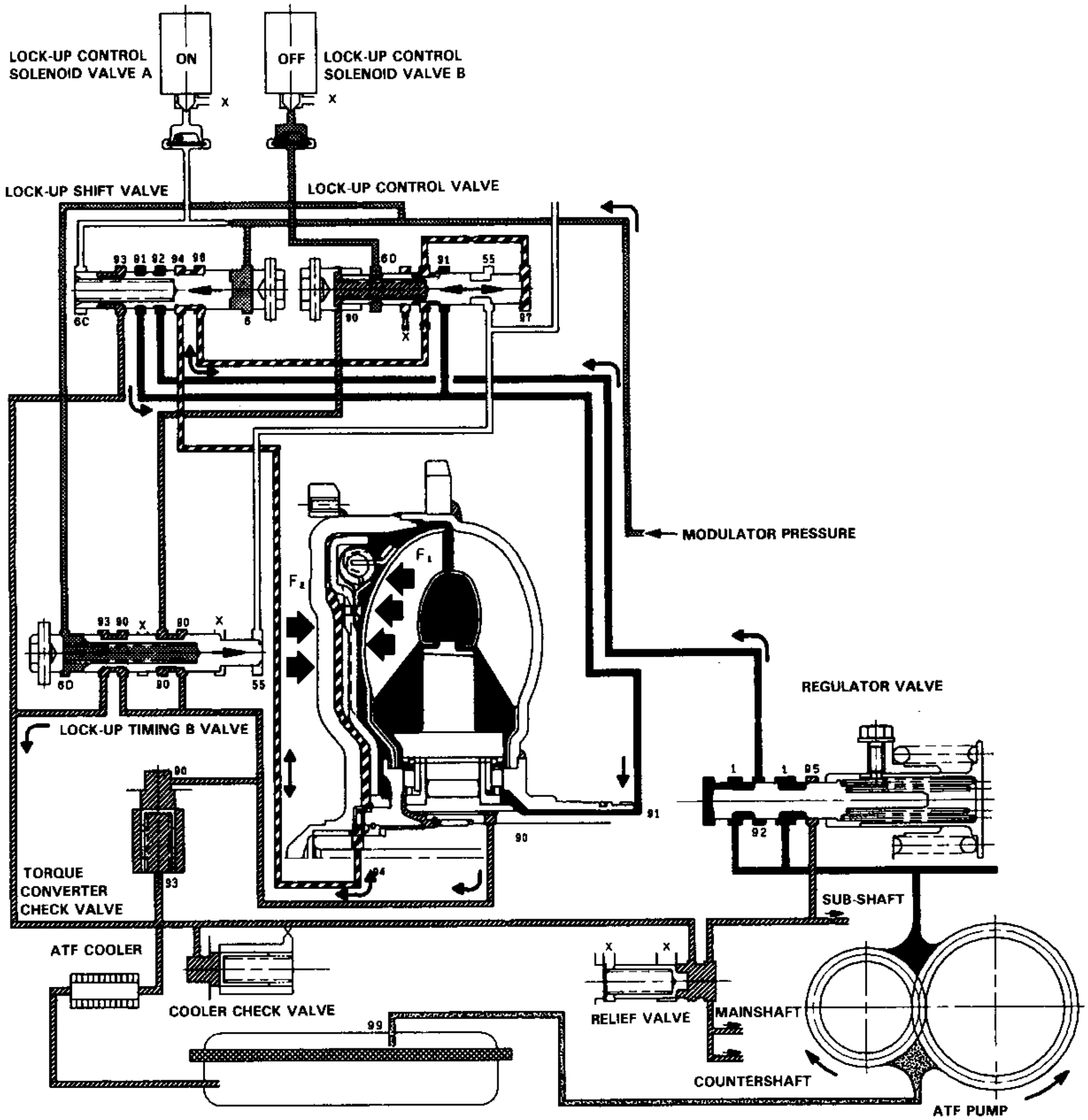
Modulator pressure is separated into the two passages:

Torque Converter Inner Pressure: enters into right side to engage lock-up clutch.

Torque Converter Back Pressure: enters into left side to disengage lock-up clutch.

Back pressure (F2) is regulated by the lock-up control valve whereas the position of the lock-up timing B valve is determined by the throttle B pressure, tension of the valve spring, and pressure regulated by the modulator. Also the position of the lock-up control valve is determined by the back pressure of the lock-up control valve and torque converter pressure regulated by the check valve. With lock-up control solenoid valve B kept OFF, modulator pressure is maintained in the left end of the lock-up control valve; in other words, the lock-up control valve is moved slightly to the left side. This slight movement of the lock-up control valve causes the back pressure to be lowered slightly, resulting in partial lock-up.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Lock-up System (cont'd)

Half Lock-up

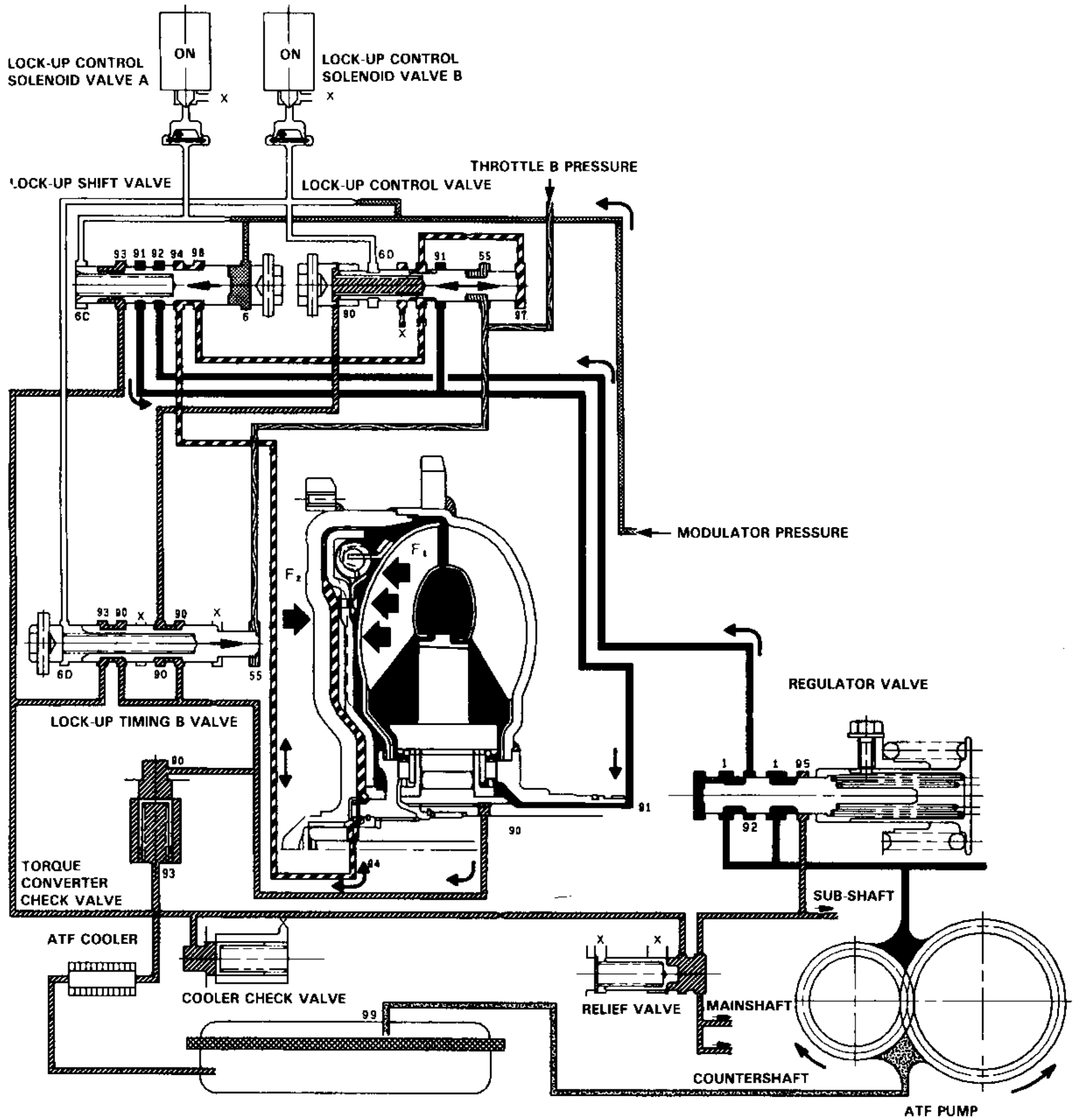
Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: ON

Modulator pressure is released by solenoid valve B, causing modulator pressure in the left cavity of the lock-up control valve to lower.

Also modulator pressure in the left cavity of lock-up timing B valve is low. However, throttle B pressure is still low so lock-up timing B valve is kept on the right side by spring force.

With lock-up control solenoid valve B turned ON, the lock-up control valve is moved somewhat to the left side, causing back pressure (F2) to lower. This allows a greater amount of fluid (F1) to work on the lock-up clutch to engage the clutch. Back pressure (F2) which still exists, prevents the clutch from engaging fully.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Full Lock-up

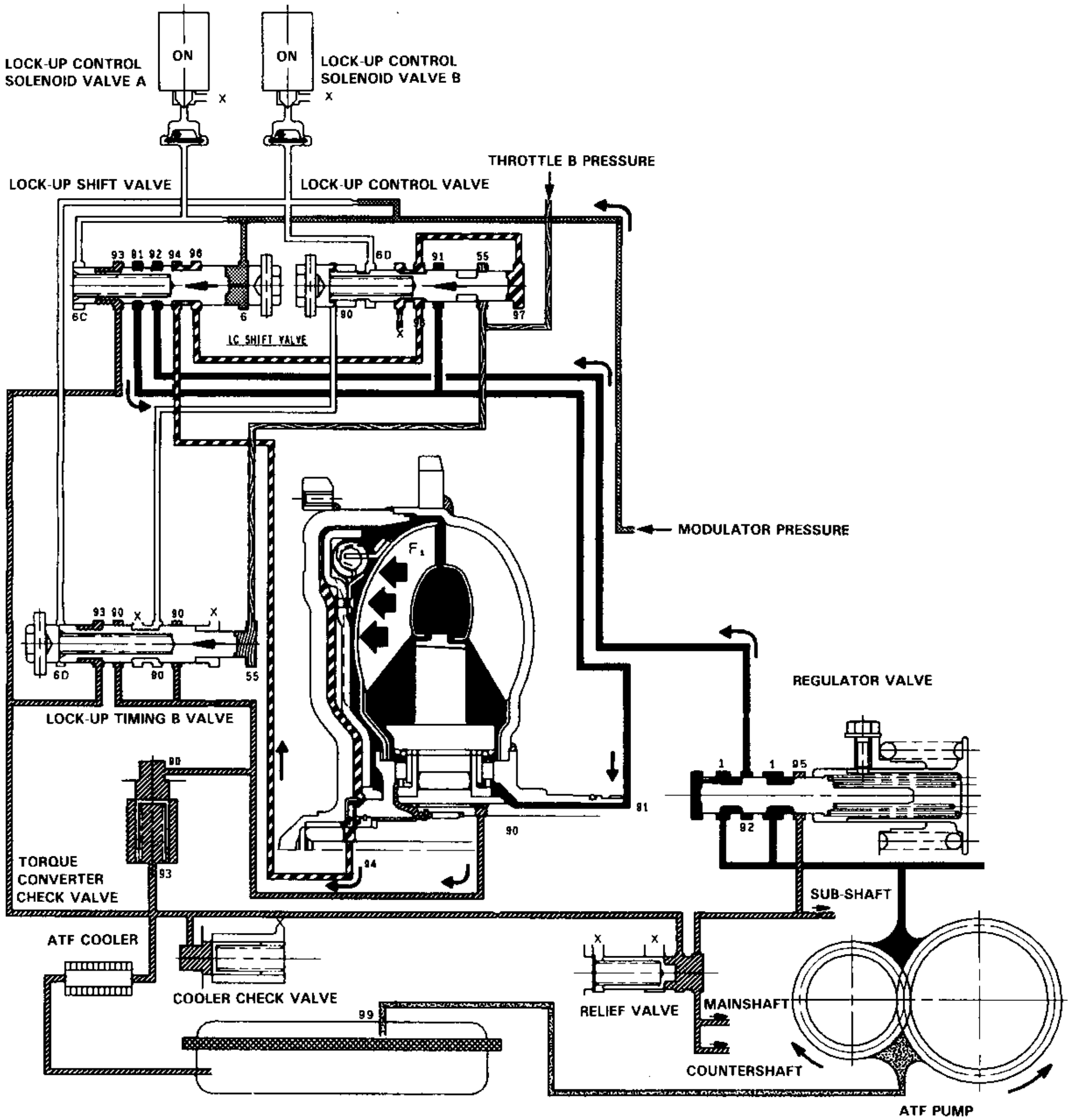
Lock-up Control Solenoid Valve A: ON   Lock-up Contorl Solenoid Valve B:ON

When the vehicle speed further increases, throttle B pressure is increased in accordance with the throttle opening.

The lock-up timing B valve overcomes spring force and moves to the left side. Also, this valve closes the port leading to the torque converter check valve.

Under this condition, throttle B pressure working on the right end of the lock-up control valve becomes greater than that on the left end (modulator pressure in the left end has already been released by the solenoid valve B); the lock-up control valve is moved to the left. As this happens, torque converter back pressure is fully released, causing the lock-up clutch to be fully engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Description

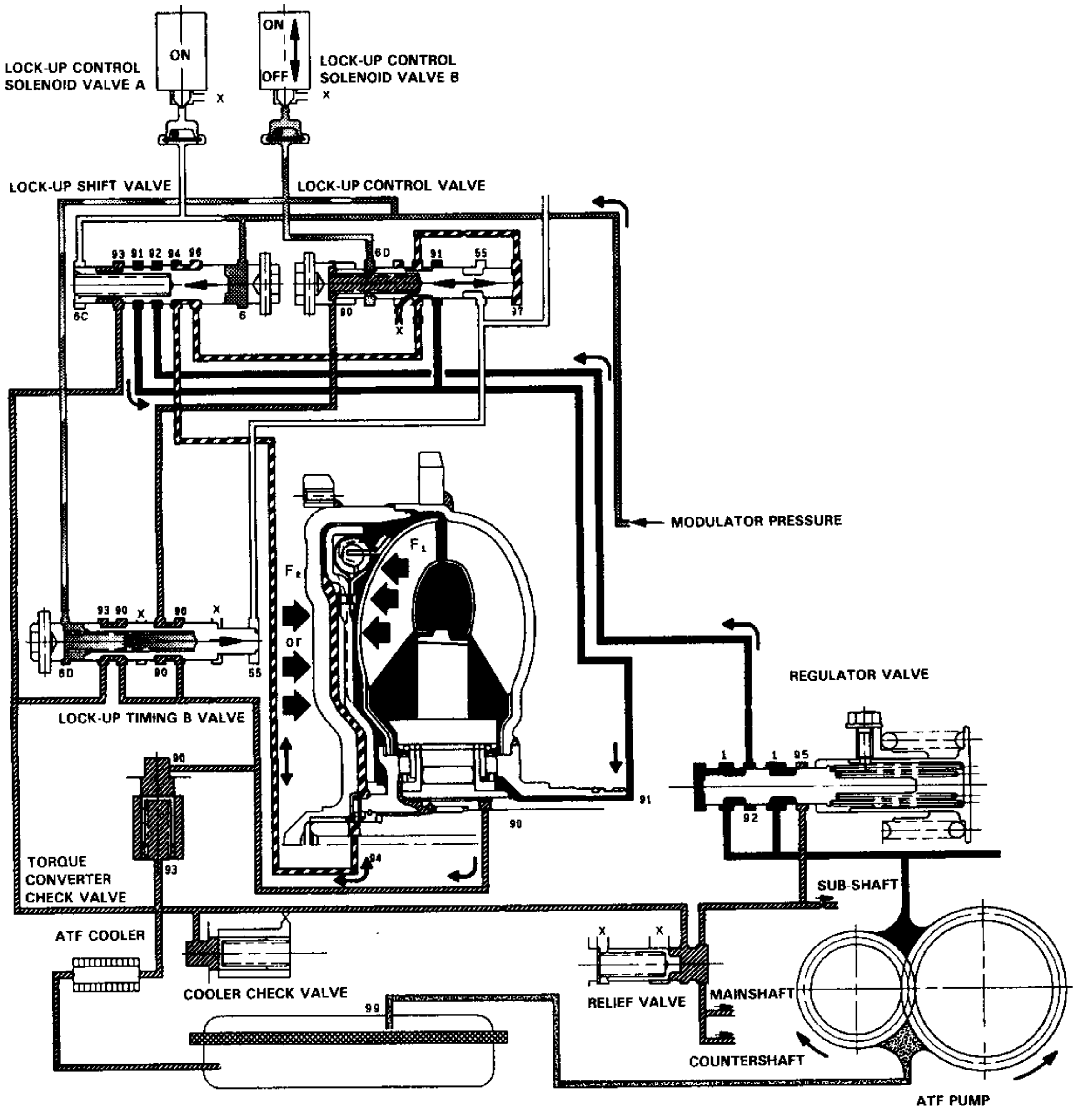
Lock-up System (cont'd)

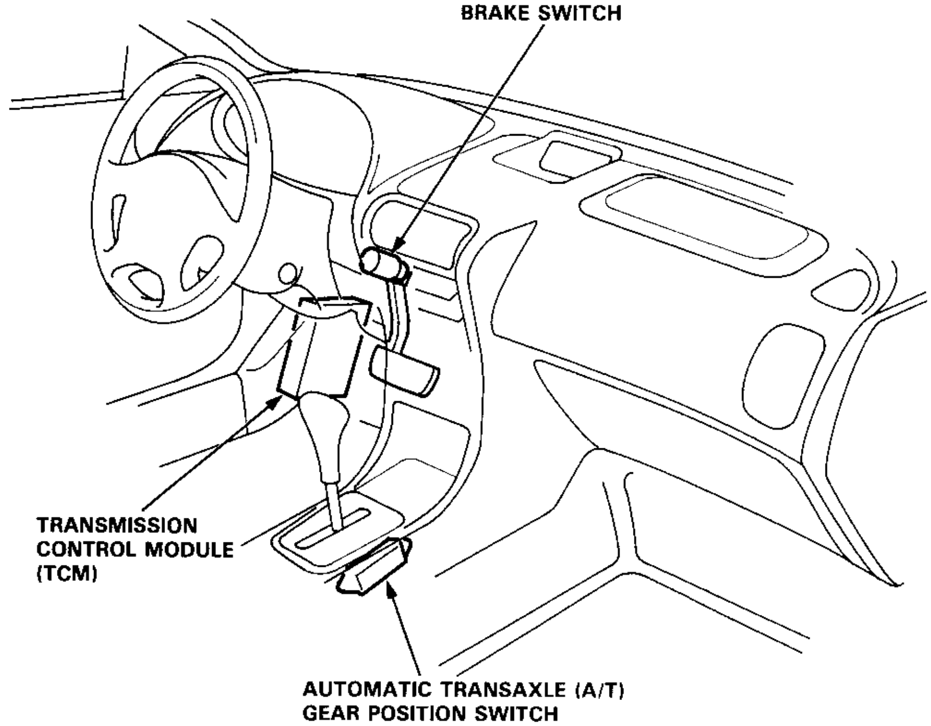
Deceleration Lock-up

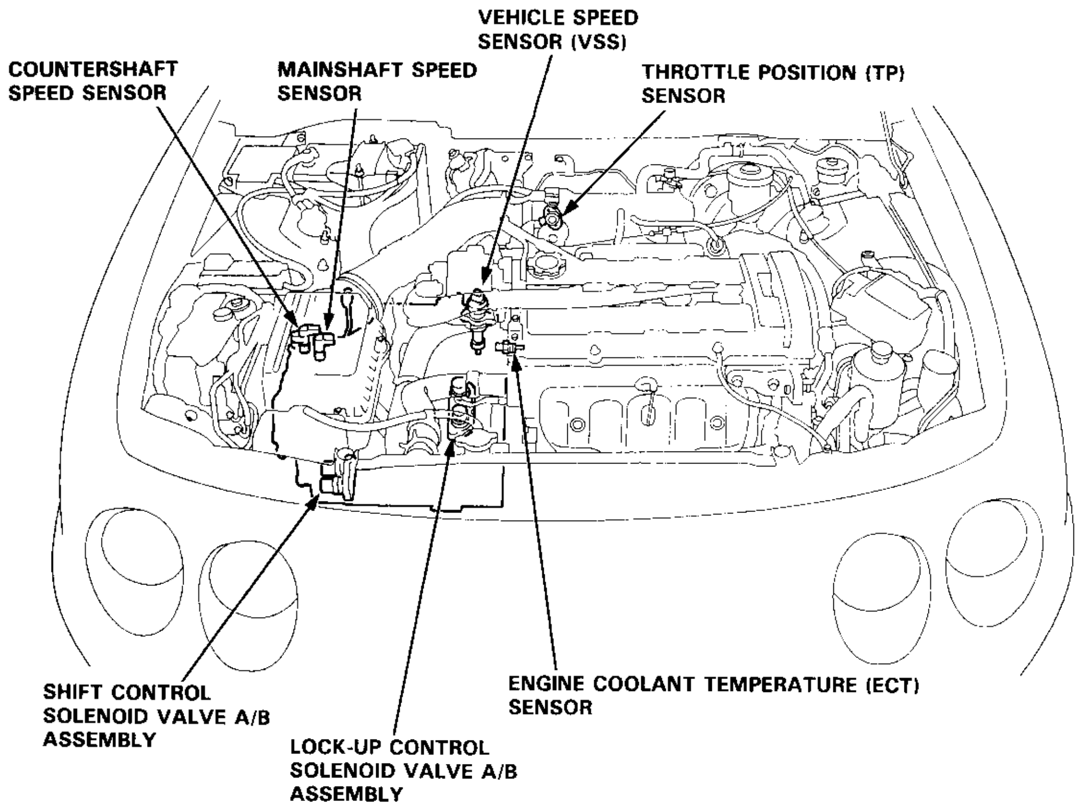
Lock-up Control Solenoid Valve A: ON   Lock-up Control Solenoid Valve B: Duty Operation (ON ↔ OFF)

The TCM switches solenoid valve B ON and OFF rapidly under certain conditions. The slight lock-up and half lock-up regions are maintained so as to lock the torque converter properly.

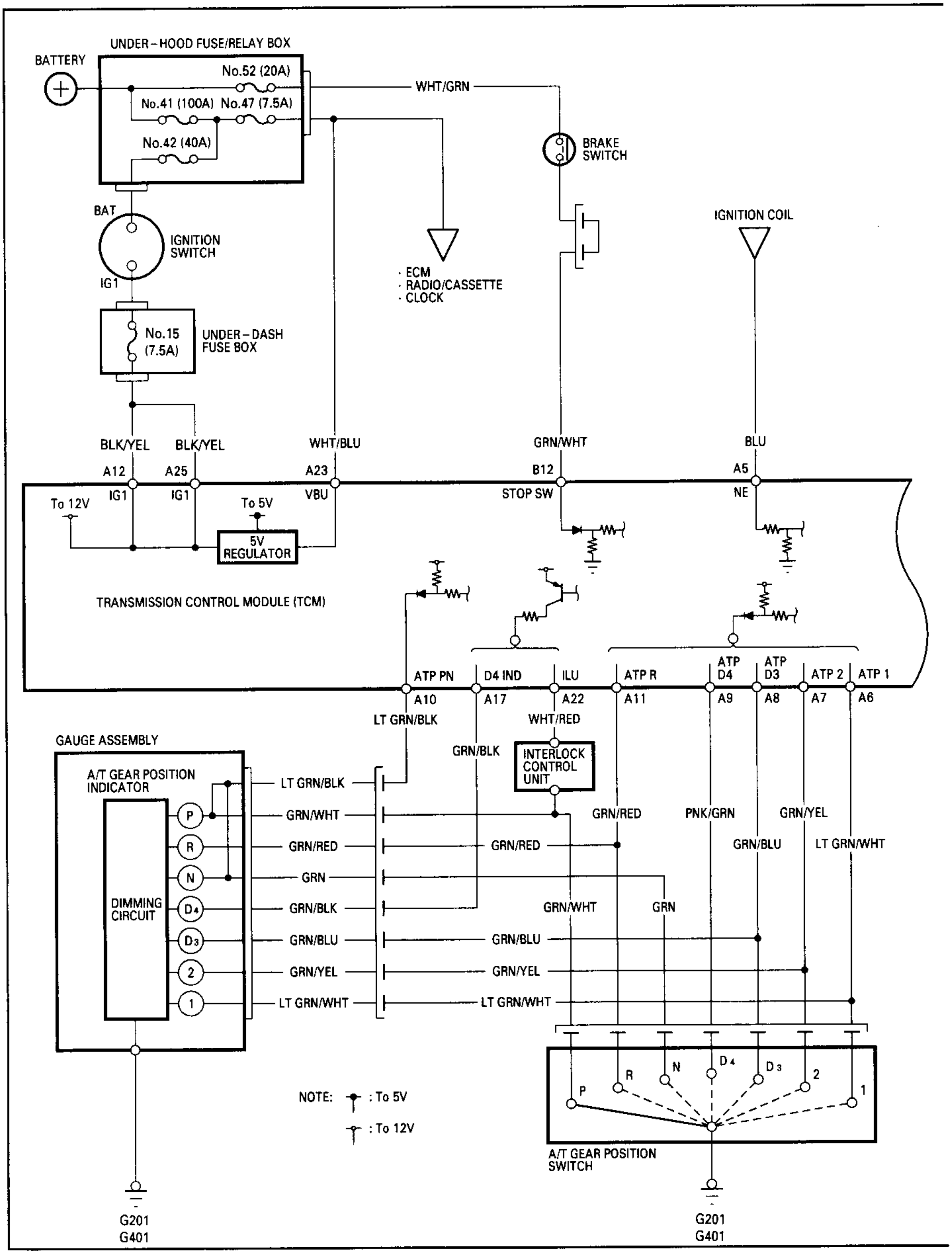
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

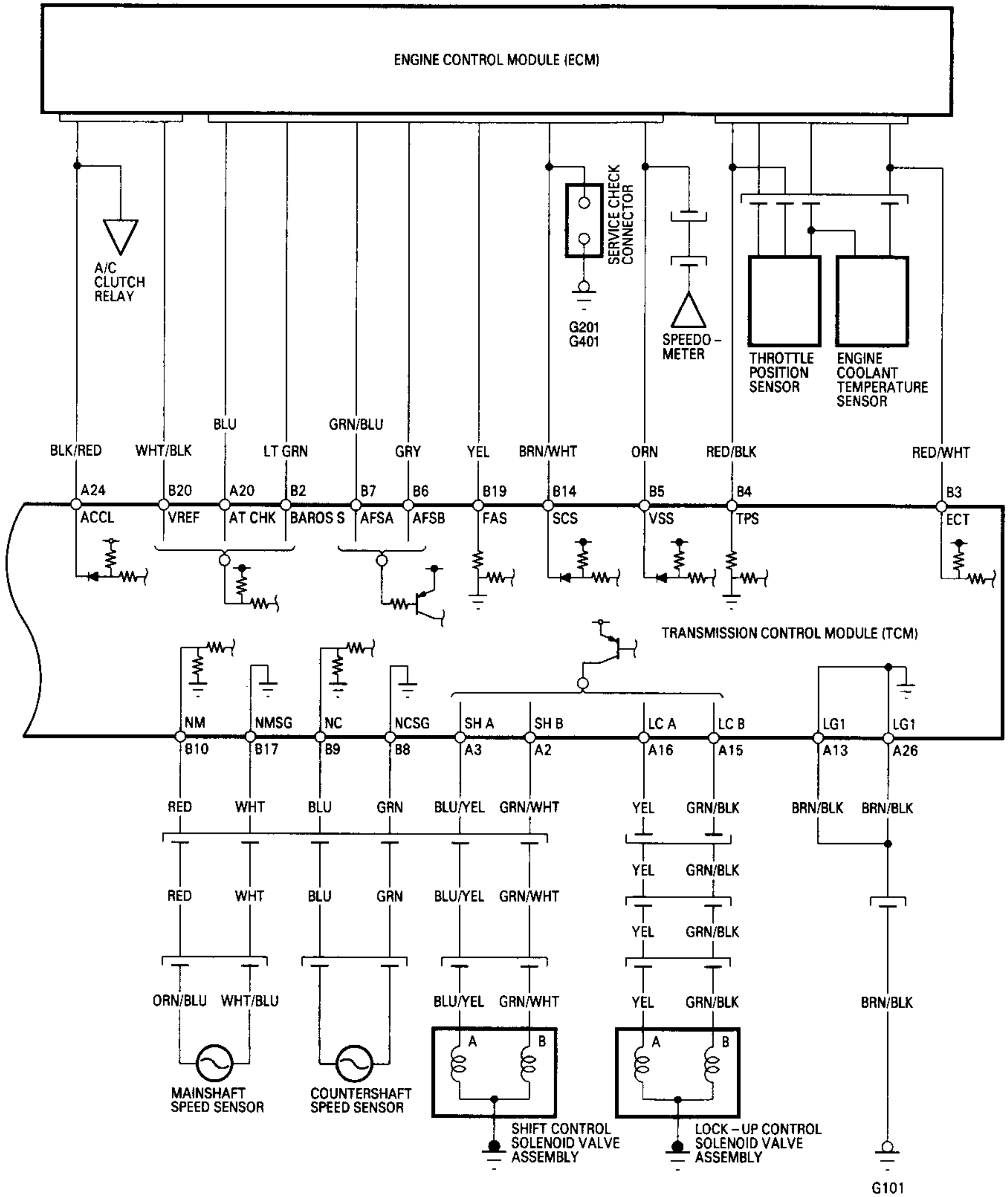



BRAKE SWITCH
TRANSMISSION CONTROL MODULE (TCM)
AUTOMATIC TRANSAXLE (A/T) GEAR POSITION SWITCH

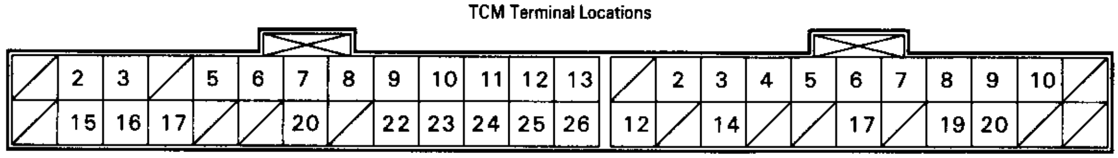

VEHICLE SPEED SENSOR (VSS)
COUNTERSHAFT SPEED SENSOR
MAINSHAFT SPEED SENSOR
THROTTLE POSITION (TP) SENSOR
SHIFT CONTROL SOLENOID VALVE A/B ASSEMBLY
ENGINE COOLANT TEMPERATURE (ECT) SENSOR
LOCK-UP CONTROL SOLENOID VALVE A/B ASSEMBLY

Circuit Diagram





TCM Terminal Locations

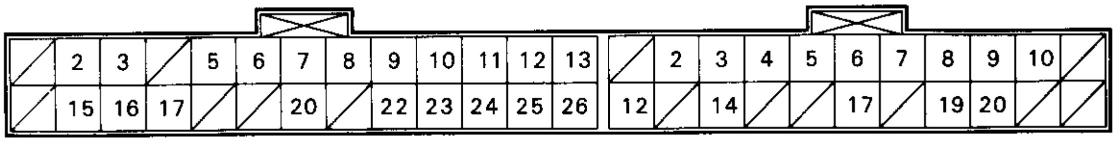


TCM – A (26P) Connector

TCM – B (22P) Connector

TCM Terminal Voltage/Measuring Conditions

TCM Terminal Locations



A (26P) Connector

B (22P) Connector

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A1	—	Not used	
A2	SHB	Shift control solenoid valve B control	In 1st and 2nd gear in [D3] and [D4] positions and [2] position: Battery voltage In [1] position, 3rd and 4th gear in [D3] and [D4] positions: 0 V
A3	SHA	Shift control solenoid valve A control	In [1], [2] positions, 2nd and 3rd gear in [D3] and [D4] positions: Battery voltage In 1st gear in [D3] and [D4] positons and 4th gear in [D4] position: 0 V
A4	—	Not used	
A5	NE	Engine speed signal input	When engine is rotating: Pulsing signal
A6	ATP1	A/T gear position switch [1] position input	In [1] position: 0 V In other than [1] position: Battery voltage
A7	ATP2	A/T gear position switch [2] position input	In [2] position: 0 V In other than [2] position: Battery voltage
A8	ATP D3	A/T gear position switch [D3] position input	In [D3] position: 0 V In other than [D3] position: Battery voltage
A9	ATP D4	A/T gear position switch [D4] position input	In [D4] position: 0 V In other than [D4] position: Battery voltage
A10	ATP PN	A/T gear position switch [P] and [N] positions input	In [P] or [N] positions: 0 V In other than [P] or [N] position: Battery voltage
A11	ATP R	A/T gear position switch [R] position input	In [R] position: 0 V In other than [R] position: Battery voltage
A12	IG1	Power supply system	With ignition switch ON (II): Battery voltage
A13	LG1	Ground	
A14	—	Not used	
A15	LCB	Lock-up control solenoid valve B control	During half and full lock-up and during deceleration: Battery voltage During no lock-up: 0 V
A16	LCA	Lock-up control solenoid valve A control	When lock-up is ON: Battery voltage With no lock-up: 0 V
A17	D4 IND	D4 Indicator light control	When ignition switch is first turned ON (II): Battery voltage for two seconds In [D4] position: Battery voltage
A18	—	Not used	
A19	—	Not used	
A20	AT CHK	Upshift/downshift comparative signal output	With ignition switch ON (II): Pulsing signal
A21	—	Not used	
A22	ILU	Interlock control	When ignition switch is ON (II), brake pedal depressed and accelerator pedal released: Battery voltage
A23	VBU	Back-up power system	Always Battery voltage

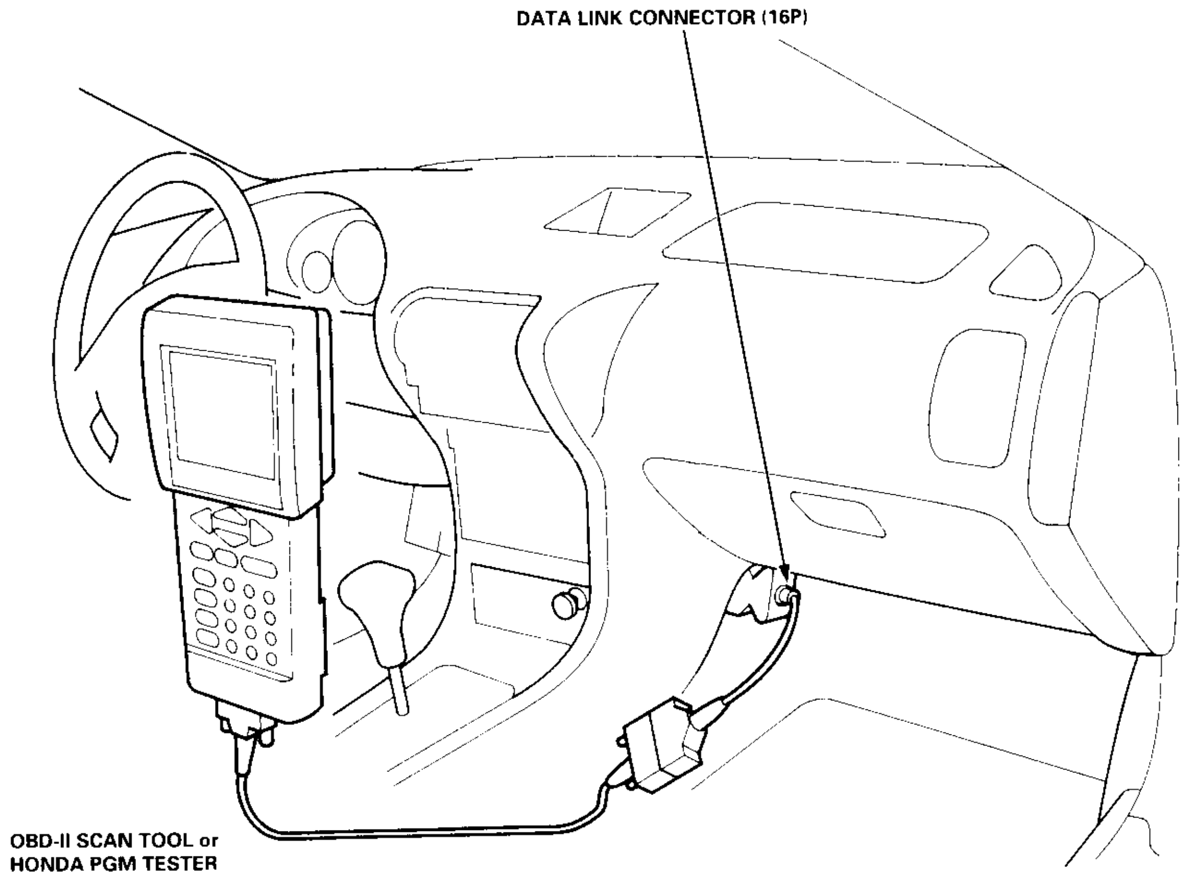
Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A24	ACCL	Air conditioning (A/C) clutch relay control	With A/C compressor ON: 0 V With A/C compressor OFF: Battery voltage
A25	IG1	Power supply system	With ignition switch ON (II): 12 V
A26	LG1	Ground	
B1	—	Not used	
B2	BAROS S	Barometric pressure sensor signal input	With ignition switch ON (II) and depending on barometric pressure: Approx. 3 V
B3	ECT	Engine coolant temperature sensor signal input	With ignition switch ON (II) and depending on engine coolant temperature: Approx. 0.1 – 4.8 V
B4	TPS	Throttle position sensor signal input	With ignition switch ON (II) and throttle fully open: 4.14 – 4.82 V With ignition switch ON (II) and throttle fully closed: 0.44 – 0.56 V
B5	VSS	Vehicle speed sensor signal input	With ignition switch ON (II) and front wheels rotating: Pulsing signal
B6	AFSB	Upshift/downshift comparative signal output	With engine idling: 0 V At upshift or downshift: 5 V for an instant
B7	AFSA	Upshift/downshift comparative signal output	With engine idling: 0 V At upshift or downshift: 5 V for an instant
B8	NCSG	Countershaft speed sensor signal ground	Always: 0 V
B9	NC	Countershaft speed sensor signal input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: 0 V
B10	NM	Mainshaft speed sensor signal input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: 0 V
B11	—	Not used	
B12	STOP SW	Brake switch signal input	With ignition switch ON (II) and brake pedal depressed: Battery voltage With ignition switch ON (II) and brake pedal released: 0 V
B13	—	Not used	
B14	SCS	Timing adjustment service check signal	With ignition switch ON (II) and service check connector open: 5 V With ignition switch ON (II) and service check connector connected with special tool: 0 V
B15	—	Not used	
B16	—	Not used	
B17	NMSG	Mainshaft speed sensor signal ground	Always: 0 V
B18	—	Not used	
B19	FAS	Shift acknowledge input	With engine idling: 5 V At upshift or downshift: 0 V for an instant
B20	VREF	+5 V reference	With ignition switch ON (II): Approx. 5 V
B21	—	Not used	
B22	—	Not used	

Checking the Diagnostic Trouble Code (DTC) with an OBD II Scan Tool or the Honda PGM Tester

When the TCM senses an abnormality in the input or output systems, the D4 indicator light in the gauge assembly will blink. When the 16P Data Link Connector (DLC) (located under the dash on the passenger side) is connected to the OBD II Scan Tool or Honda PGM Taster as shown, the scan tool or tester will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the D4 indicator light has been reported on, connect the OBD II Scan Tool confirming to SAE J1978 or Honda PGM Tester to the DLC (16P) behind the ashtray. Turn the ignition switch ON (II) and observe the DTC on the screen of the OBD II Scan Tool or Honda PGM Tester. After determining the DTC, refer to the electrical system Symptom-to-Component Chart on pages 14-54 and 14-55.

NOTE: See the OBD II Scan Tool or Honda PGM Tester user's manual for specific instructions.



Some PGM-FI problems will also make the D4 indicator light come on. After repairing the PGM-FI system, disconnect the BACK UP fuse (7.5 A) in the under-hood fuse/relay box for more than 10 seconds to reset the TCM memory, then recheck.

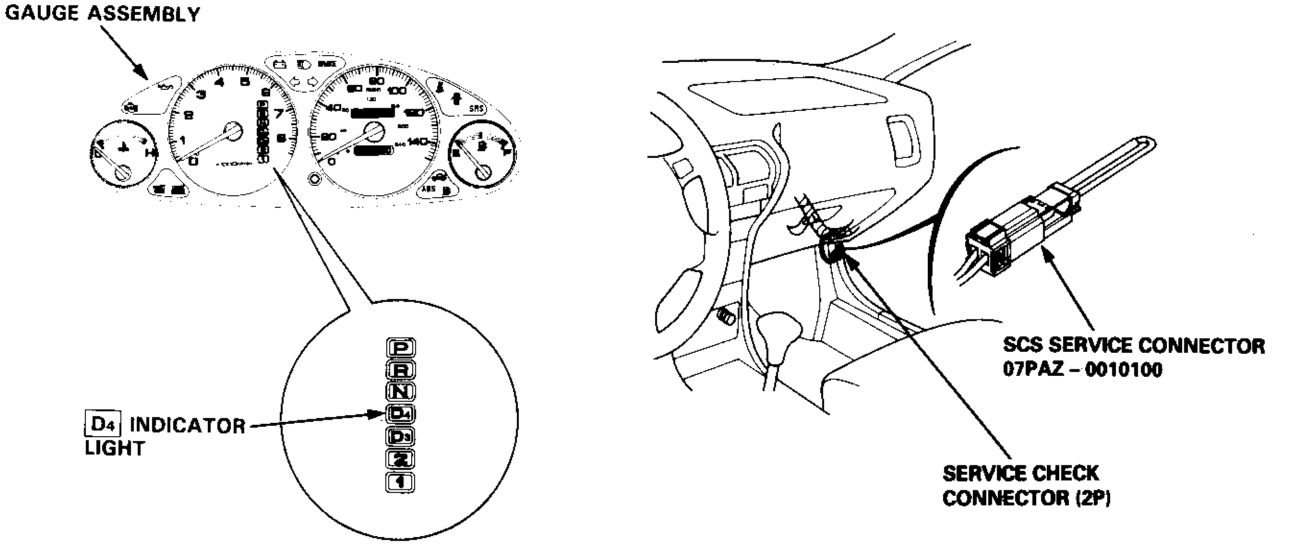
NOTE: Disconnecting the BACK UP fuse also cancels the radio anti-theft code, preset stations and the clock setting. Get the customer's code number, and make note of the radio presets before removing the fuse so you can reset them.

Checking the Diagnostic Trouble Code (DTC) with the Service Check Connector and Special Tool

When the TCM senses an abnormality in the input or output systems, the D4 indicator light in the gauge assembly will blink.

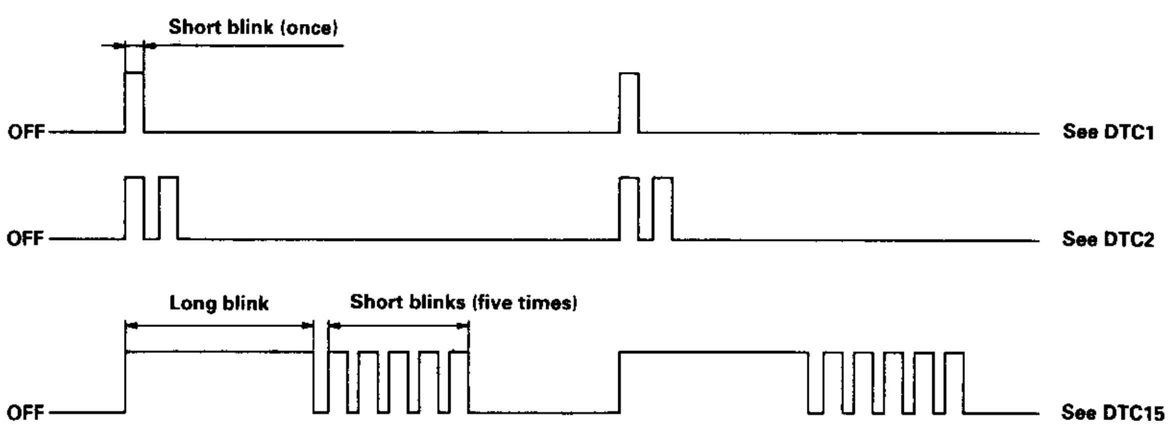
When the Service Check Connector (located under the dash on the passenger side) is connected with the special tool as shown, the D4 indicator light will indicate (blink) the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the D4 indicator light has been reported on, connect the Service Check Connector with the special tool.



Then turn ON (II) the ignition switch and observe the D4 indicator light.

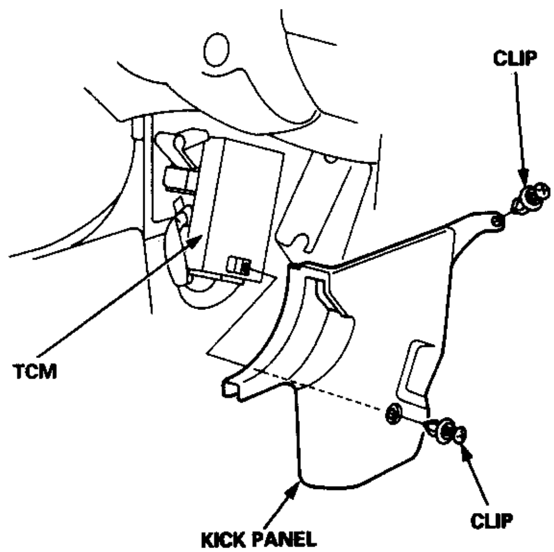
Codes 1 through 9 are indicated by individual short blinks. Codes 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the electrical system Symptom-to-Component Chart on pages 14-54 and 55.



Some PGM-FI problems will also make the D4 indicator light come on. After repairing the PGM-FI system, disconnect the BACK UP fuse No. 47 (7.5 A) in the under-hood fuse/relay box for more than 10 seconds to reset the TCM memory, then recheck.

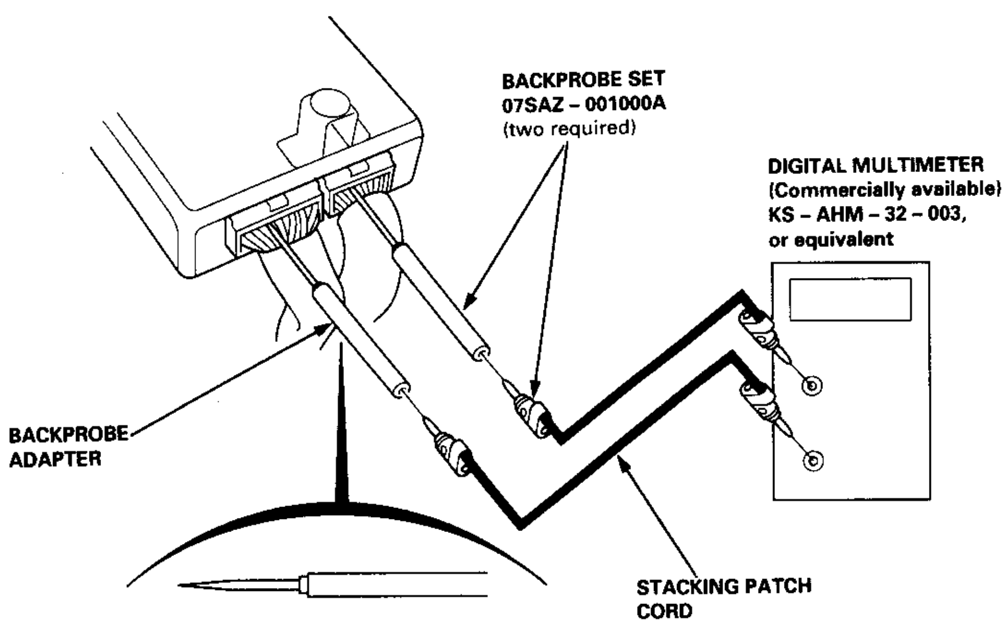
NOTE: Disconnecting the BACK UP fuse also cancels the radio anti-theft code, preset stations and the clock setting(cont'd)

1. Remove the two clips securing the kick panel, then remove the left side kick panel on the driver's side.
2. Remove the TCM, and turn it over.



3. Inspect the circuit on the TCM according to the troubleshooting flowchart with the special tool and a digital multimeter as shown.

How to use the Backprobe Set
Connect the backprobe adapters to the stacking patch cords, and connect the cord to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire until it comes in contact with the terminal end of the wire.

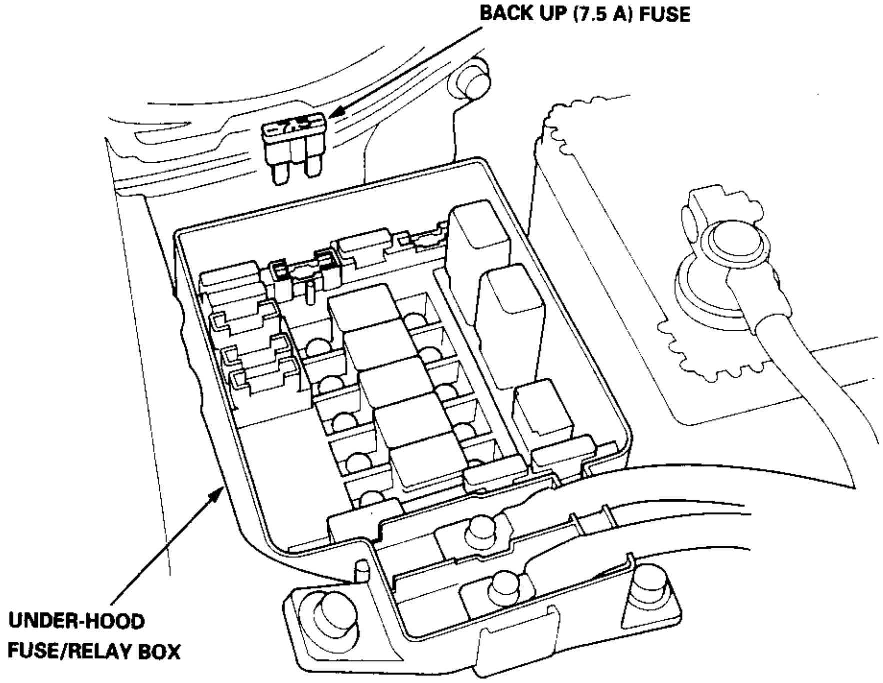


TCM Reset Procedure

1. Turn the ignition switch OFF.
2. Remove the No. 47 BACK UP fuse (7.5 A) from the under-hood fuse/relay box for 10 seconds to reset the TCM.

NOTE:

- Disconnecting the No. 47 BACK UP fuse also cancels the radio anti-theft code, preset stations and clock setting. Get the customer's code number, and make note of the radio presets before removing the fuse so you can reset them.
- The TCM memory cannot be cleared by using the OBD II Scan Tool or Honda PGM Tester; be sure to remove the BACK UP fuse to reset the TCM.



- **Final Procedure**

NOTE: This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Reset the TCM.
3. Disconnect the OBD II Scan Tool or Honda PGM Tester from the Data Link Connector, or remove the special tool from the Service Check Connector.
4. Turn the ignition switch ON (II), and set the radio presets and clock setting.

Symptom-to-Component Chart

Electrical System

Diagnostic Trouble Code (DTC)*	D4 Indicator Light	Symptom	Possible Cause	Refer to Page
P1753 (1)	Blinks	• Lock-up clutch does not engage. • Lock-up clutch does not disengage.	• Disconnected lock-up control solenoid valve A connector • Short or open in lock-up control solenoid valve A wire • Faulty lock-up control solenoid valve A	14-56
P1758 (2)	Blinks	• Lock-up clutch does not engage.	• Disconnected lock-up control solenoid valve B connector • Short or open in lock-up control solenoid valve B wire • Faulty lock-up control solenoid valve B	14-58
P1790 (3)	Blinks	• Lock-up clutch does not engage.	• Disconnected throttle position (TP) sensor connector • Short or open in TP sensor wire • Faulty TP sensor	14-60
P1791 (4)	Blinks	• Lock-up clutch does not engage.	• Disconnected vehicle speed sensor (VSS) connector • Short or open in VSS wire • Faulty VSS	14-61
P1705 (5)	Blinks	• Fails to shift other than 2nd – 4th gears. • Lock-up clutch does not engage.	• Short in A/T gear position switch wire • Faulty A/T gear position switch	14-62
P1706 (6)	OFF	• Fails to shift other than 2nd – 3rd – 4th gears. • Lock-up clutch does not engage.	• Disconnected A/T gear position switch connector • Open in A/T gear position switch wire • Faulty A/T gear position switch	14-64
P0753 (7)	Blinks	• Fails to shift (between 1st – 4th or 2nd – 3rd gear only). • Fails to shift (stuck in 4th gear).	• Disconnected shift control solenoid valve A connector • Short or open in shift control solenoid valve A wire • Faulty shift control solenoid valve A	14-66
P0758 (8)	Blinks	• Fails to shift (stuck in 1st or 4th gears).	• Disconnected shift control solenoid valve B connector • Short or open in shift control solenoid valve B wire • Faulty shift control solenoid valve B	14-68
P0720 (9)	Blinks	• Lock-up clutch does not engage.	• Disconnected countershaft speed sensor connector • Short or open in countershaft speed sensor wire • Faulty countershaft speed sensor	14-70
P1792 (10)	Blinks	• Lock-up clutch does not engage.	• Disconnected engine coolant temperature (ECT) sensor connector • Short or open in ECT sensor wire • Faulty ECT sensor	14-72
P0725 (11)	OFF	• Lock-up clutch does not engage.	• Disconnected ignition coil connector • Short or open in ignition coil wire • Faulty ignition coil	14-73

(DTC)*: The DTCs in the parentheses are the codes the D4 indicator light indicates (blinks) when the service check connector is connected to the special tool (SCS service connector).

Diagnostic Trouble Code (DTC)*	D4 Indicator Light	Symptom	Possible Cause	Refer to Page
P1794 (13)	Blinks	• No specific symptom appears.	• Short or open in LT GRN wire between B2 terminal and ECM • Faulty barometric pressure (BARO) sensor NOTE: BARO sensor is built into ECM.	14-74
P1786 (14)	Blinks	• Transmission jerks hard when shifting.	• Short or open in FAS (YEL) wire between B19 terminal and ECM • Faulty ECM	14-76
P0715 (15)	Blinks	• Lock-up clutch does not engage.	• Disconnected mainshaft speed sensor connector • Short or open in mainshaft speed sensor wire • Faulty mainshaft speed sensor	14-78
P0740 (none)	OFF	• Lock-up clutch does not engage.	• Faulty lock-up control system	14-80
P0730 (none)	OFF	• Fails to shift (between 1st – 2nd, 2nd – 3rd, 1st – 4th, 3rd – 4th, 1st – 2nd – 3rd, 1st – 2nd – 4th, 1st – 3rd – 4th, or 2nd – 3rd – 4th gears only). • Fails to shift (stuck in 1st gears).	• Faulty shift control system	14-81
P0700 (none)	——	• Other automatic transmission problem (s) Inspect the automatic transmission problem (s) according to the DTC (s) indicated with code P0700.		——

(DTC)*: The DTCs in the parentheses are the codes the D4 indicator light indicates (blinks) when the service check connector is connected with the special tool (SCS service connector).

NOTE: When the OBD II Scan Tool or Honda PGM Tester indicates the DTC(s) for the automatic transmission control system, the scan tool or tester also indicates code P0700 simultaneously. Code P0700 means detection of some automatic transmission problem on the PGM-FI control system.

If the self-diagnostic D4 indicator light does not blink, perform an inspection according to the table below.

Symptom	Inspection	Ref. page
D4 indicator light does not come on for two seconds after ignition is first turned on (II).	——	14-82
D4 indicator light is on constantly (not blinking) whenever the ignition is on (II).	——	14-84
Lock-up clutch does not have duty operation (ON ↔ OFF).	Check A/C signal with A/C on.	14-85
Lock-up clutch does not engage.		
Shift lever cannot be moved from P position with the brake pedal depressed.	Check brake switch signal.	14-86

NOTE:
- If a customer describes the symptom for code P1706 (6), P0725 (11) or P0715 (15), it will be necessary to recreate the symptom by test-driving, then recheck the DTC.
- Sometimes the D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously. If so, check the PGM-FI system according to the DTC, then reset the memory by removing the BACK UP fuse in the under-dash fuse/relay box for more than 10 seconds. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), then recheck the DTC.
- Disconnecting the BACK UP fuse also cancels the radio anti-theft code, preset stations and the clock setting. Get the customer's code number, and make note of the radio presets before removing the fuse so you can reset them.

Troubleshooting Flowchart — Lock-up Control Solenoid Valve A

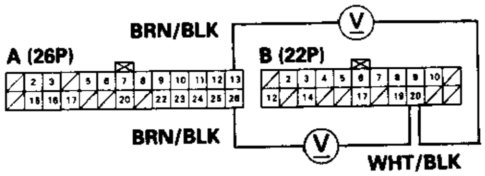
- **OBD II Scan Tool indicates Code P1753.**
- **Self-Diagnosis [D4] indicator light blinks once.**

Possible Cause

- **Disconnected lock-up control solenoid valve A connector**
- **Short or open in lock-up control solenoid valve A wire**
- **Faulty lock-up control solenoid valve A**

Measure VREF Voltage:
1. Disconnect the A (26P) and B (22P) connectors from the TCM.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

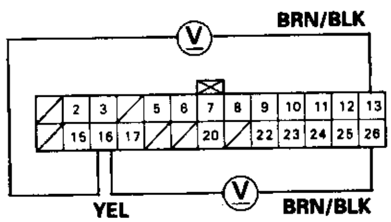
Is there approx. 5 V?

NO → **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Check for a Short to Power:
Measure the voltage between the A16 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



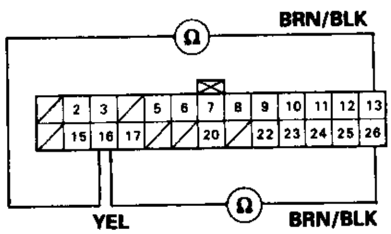
WIRE SIDE OF FEMALE TERMINALS

Is there voltage?

YES → **Repair short to power in the wire between the A16 terminal and the lock-up control solenoid valve A.**

NO ↓

Measure Lock-up Control Solenoid Valve A Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the A16 and A13 or A26 terminals.



Is the resistance 12 – 25 Ω?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.**

NO ↓

To page 14-57

From page 14-56

Check Lock-up Control Solenoid Valve A for a Short Circuit:
1. Disconnect the 2P connector from the lock-up control solenoid valve assembly.
2. Check for continuity between the A16 and A13 or A26 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the A16 terminal and the lock-up control solenoid valve A.**

NO ↓

Measure Lock-up Control Solenoid Valve A Resistance at the Solenoid Connector:
Measure the resistance between terminal No. 2 of the lock-up control solenoid connector and body ground.

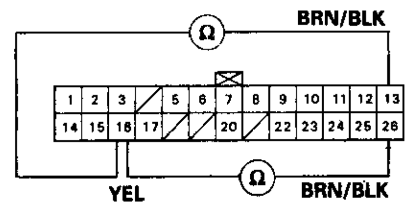
Is the resistance 12 – 25 Ω?

YES → **Check for open in the wire between the A16 terminal and the lock-up control solenoid valve A.**

NO ↓

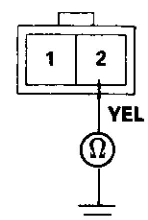
Replace the lock-up control solenoid valve assembly.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

LOCK-UP CONTROL
SOLENOID CONNECTOR



TERMINAL SIDE OF
MALE TERMINALS

Electrical Troubleshooting

Troubleshooting Flowchart — Lock-up Control Solenoid Valve B

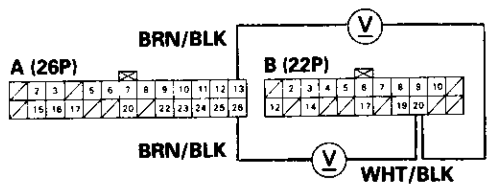
- OBD II Scan Tool indicates Code P1758.
- Self-Diagnosis D4 indicator light blinks twice.

Possible Cause

- Disconnected lock-up control solenoid valve B connector
- Short or open in lock-up control solenoid valve B wire
- Faulty lock-up control solenoid valve B

Measure VREF Voltage:
1. Disconnect the A (26P) and B (22P) connectors from the TCM.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

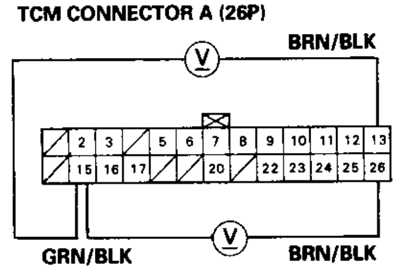
Is there approx. 5 V?

NO → **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Check for a Short to Power:
Measure the voltage between the A15 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



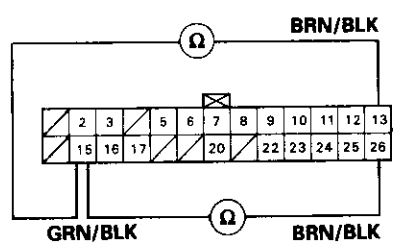
WIRE SIDE OF FEMALE TERMINALS

Is there voltage?

YES → **Repair short to power in the wire between the A15 terminal and the lock-up control solenoid valve B.**

NO ↓

Measure Lock-up Control Solenoid Valve B Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the A15 and A13 or A26 terminals.



Is the resistance 12 – 25 Ω?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.**

NO ↓

To page 14-59

From page 14-58

Check Lock-up Control Solenoid Valve B for a Short Circuit:

1. Disconnect the 2P connector from the lock-up control solenoid valve assembly.
2. Check for continuity between the A15 and A13 or A26 terminals.

Is there continuity?

YES — **Repair short to ground in the wire between the A15 terminal and the lock-up control solenoid valve B.**

NO

Measure Lock-up Control Solenoid Valve B Resistance at the Solenoid Connector:
Measure the resistance between terminal No. 1 of the lock-up control solenoid connector and body ground.

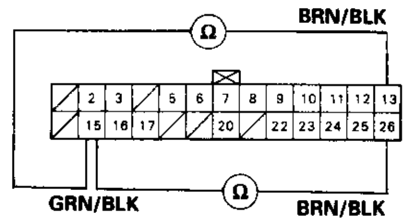
Is the resistance 12 – 25 Ω?

YES — **Check for open in the wire between the A15 terminal and the lock-up control solenoid valve B.**

NO

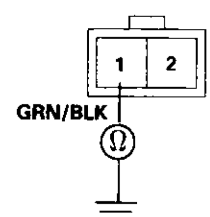
Replace the lock-up control solenoid valve assembly.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

LOCK-UP CONTROL SOLENOID CONNECTOR



TERMINAL SIDE OF MALE TERMINALS

Troubleshooting Flowchart — Throttle Position (TP) Sensor

- **OBD II Scan Tool indicates Code P1790.**
- **Self-diagnosis D4 indicator light blinks three times.**

Possible Cause
· Disconnected throttle position (TP) sensor connector **· Short of open in TP sensor wire** **· Faulty TP sensor**

Check for Another Code or MIL Blinking:
1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates another code or the Malfunction Indicator Lamp (MIL) blinks (see section 11).

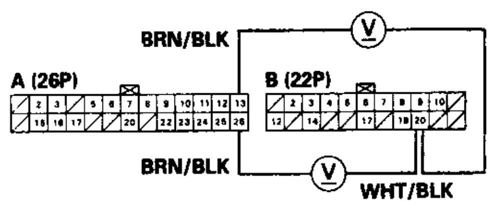
Does the OBD II scan tool indicate the another code or is the MIL blinking?

YES → **Repair the PGM-FI system (see section 11).**

NO ↓

Measure VREF Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) and B (22P) connectors from the TCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



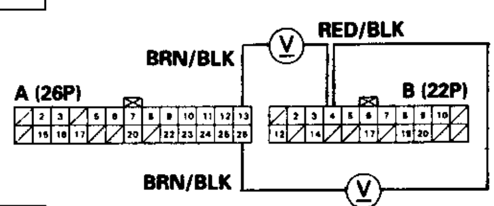
WIRE SIDE OF FEMALE TERMINALS

Is there approx. 5 V?

NO → **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Measure TPS Voltage:
Measure the voltage between the B4 and A13 or A26 terminals.



Is there 0.4 – 0.6 V?

NO → **Repair open or short in the wire between the B4 terminal and the TP sensor.**

YES ↓

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Troubleshooting Flowchart — Vehicle Speed Sensor (VSS)

- OBD II Scan Tool indicates Code P1791.
- Self-diagnosis D4 indicator light blinks four times.

Possible Cause

- Disconnected vehicle speed sensor (VSS) connector
- Short or open in VSS wire
- Faulty VSS

Check the Speedometer Operation:
Check that the speedometer operates correctly.

Does the speedometer operate?

NO → Refer to section 23 for vehicle speed sensor (VSS) test.

YES ↓

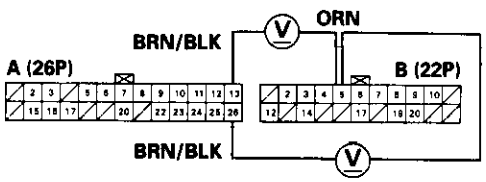
Check the VSS Voltage:

1. Raise the car.
2. Shift the transmission to N position.
3. Disconnect the A (26P) and B (22P) connectors from the TCM.
4. Turn the ignition switch ON (II).
5. Rotate the front wheel and check for the voltage between the B5 and A13 or A26 terminals. Block the other wheel so it does not turn.

WARNING

- Make sure lifts, jacks, and safety stands are placed properly (see section 1).
- Set the parking brake securely, and block the rear wheels.
- Jack up the front of the vehicle, and support it with safety stands.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

Does 0 V and approx. 5 V appear alternately?

NO → Check for short or open in the wire between the B5 terminal and the vehicle speed sensor (VSS). If wire is OK, check the VSS (see section 23).

YES ↓

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Troubleshooting Flowchart — A/T Gear Position Switch (Short)

- **OBD II Scan Tool indicates Code P1705.**
- **Self-diagnosis D4 indicator light blinks five times.**

Possible Cause
• Short in A/T gear position switch wire • Faulty A/T gear position switch

NOTE: Code P1705 (5) is set when the TCM receives two gear position inputs at the same time.

Observe the A/T gear position indicator:
1. Turn the ignition switch ON (II).
2. Observe the A/T gear position indicator, and shift each position separately.

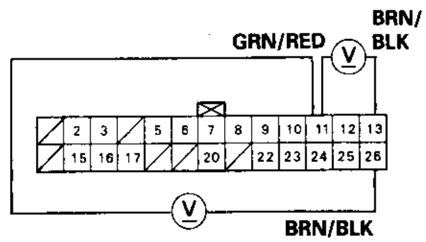
Do any indicators stay on when the shift lever is not in that position?

NO → **The system is OK at this time. Check the wire harness for damage.**

YES ↓

Measure ATP R Voltage:
1. Turn the ignition switch ON (II).
2. Shift to all positions other than R.
3. Measure the voltage between the A11 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



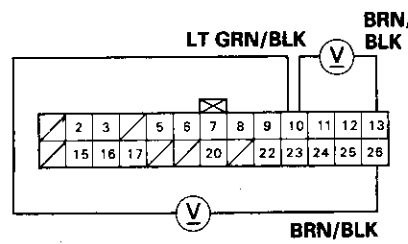
WIRE SIDE OF FEMALE TERMINALS

Is there battery voltage?

NO → **Check for short in the wire between the A11 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

YES ↓

Measure ATP PN Voltage:
1. Shift to all positions other than N or P.
2. Measure the voltage between the A10 and A13 or A26 terminals.

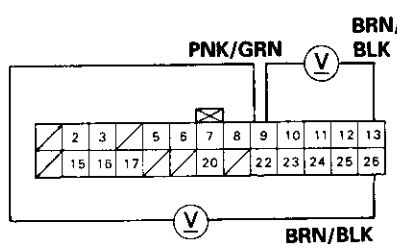


Is there battery voltage?

NO → **Check for short in the wire between the A10 terminal and the A/T gear position indicator, or a short in the wires between the A/T gear position indicator and A/T gear position switch. If wires are OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

YES ↓

Measure ATP D4 Voltage:
1. Shift to all positions other than D4.
2. Measure the voltage between the A9 and A13 or A26 terminals.



Is there battery voltage?

NO → **Check for short in the wire between the A9 terminal and the A/T gear position switch. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

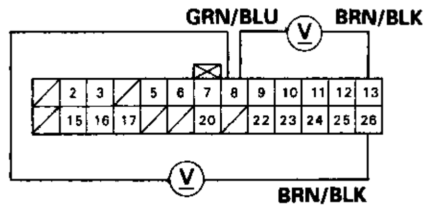
YES ↓

To page 14-63

From page 14-62

Measure ATP D3 Voltage:
1. Shift to all positions other than [D3].
2. Measure the voltage between the A8 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



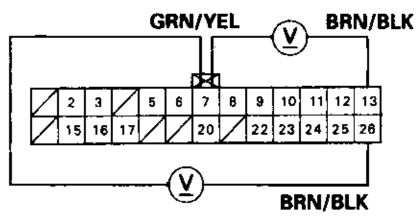
WIRE SIDE OF FEMALE TERMINALS

Is there battery voltage?

NO → **Check for short in the wire between the A8 terminal and the A/T gear position switch or the A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

YES ↓

Measure ATP2 Voltage:
1. Shift to all positions other than [2].
2. Measure the voltage between the A7 and A13 or A26 terminals.

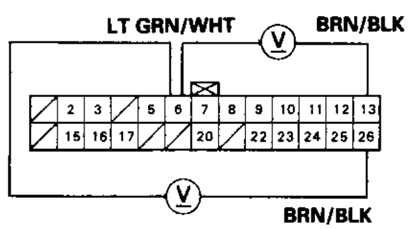


Is there battery voltage?

NO → **Check for short in the wire between the A7 terminal and the A/T gear position switch or the A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

YES ↓

Measure ATP1 Voltage:
1. Shift to all positions other than [1].
2. Measure the voltage between the A6 and A13 or A26 terminals.



Is there battery voltage?

NO → **Check for short in the wire between the A6 terminal and the A/T gear position switch or the A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

YES ↓

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Electrical Troubleshooting

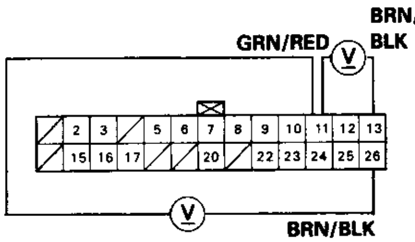
Troubleshooting Flowchart — A/T Gear Position Switch (Open)

- **OBD II Scan Tool indicates Code P1706.**
- **Self-diagnosis D4 indicator light blinks six times.**

Possible Cause
• Disconnected A/T gear position switch connector • Open in A/T gear position switch wire • Faulty A/T gear position switch

Measure ATP R Voltage:
1. Turn the ignition switch ON (II).
2. Shift to R position.
3. Measure the voltage between the A11 and A13 or A26 terminals.

TCM CONNECTOR A (26P)

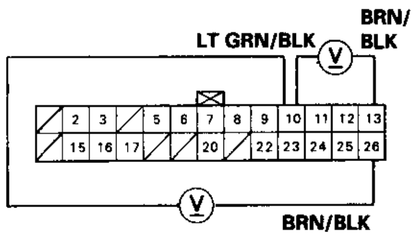


WIRE SIDE OF FEMALE TERMINALS

Is there voltage? — YES → **Repair open in the wire between the A11 terminal and the A/T gear position switch.**

NO

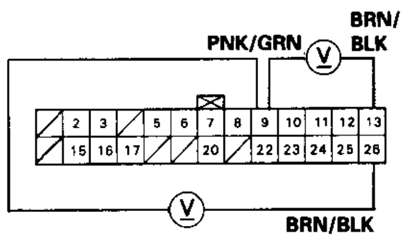
Measure ATP PN Voltage:
1. Shift to N or P position.
2. Measure the voltage between the A10 and A13 or A26 terminals.



Is there voltage? — YES → **Repair open in the wire between the A10 terminal and the A/T gear position indicator.**

NO

Measure ATP D4 Voltage:
1. Shift to D4 position.
2. Measure the voltage between the A9 and A13 or A26 terminals.



Is there voltage? — YES → **Repair open in the wire between the A9 terminal and the A/T gear position switch.**

NO

To page 14-65

From page 14-64

Measure ATP D_3 Voltage:
1. Shift to $\boxed{D_3}$ position.
2. Measure the voltage between the A8 and A13 or A26 terminals.

Is there voltage?

YES → **Repair open in the wire between the A8 terminal and the A/T gear position switch.**

NO ↓

Measure ATP 2 Voltage:
1. Shift to $\boxed{2}$ position.
2. Measure the voltage between the A7 and A13 or A26 terminals.

Is there voltage?

YES → **Repair open in the wire between the A7 terminal and the A/T gear position switch.**

NO ↓

Measure ATP 1 Voltage:
1. Shift to $\boxed{1}$ position.
2. Measure the voltage between the A6 and A13 or A26 terminals.

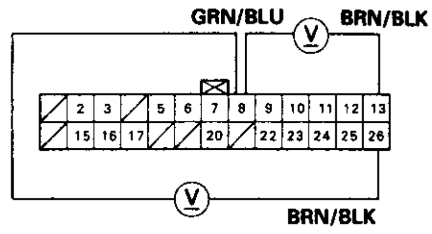
Is there voltage?

YES → **Repair open in the wire between the A6 terminal and the A/T gear position switch.**

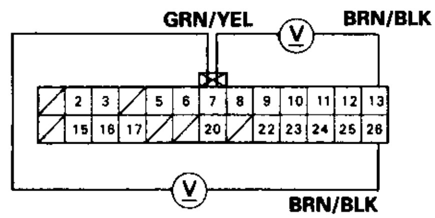
NO ↓

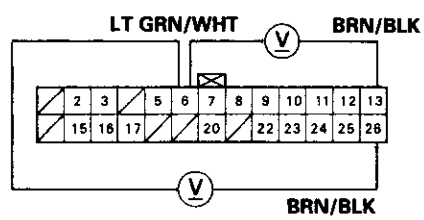
Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS





Electrical Troubleshooting

Troubleshooting Flowchart — Shift Control Solenoid Valve A

- OBD II Scan Tool Indicates Code P0753.
- Self-Diagnosis D4 indicator light blinks seven times.

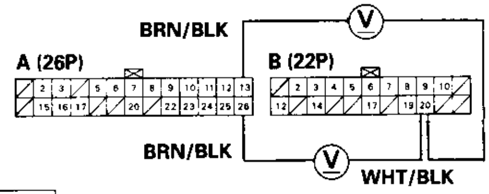
Possible Cause

- Disconnected shift control solenoid valve A connector
- Short or open in shift control solenoid valve A wire
- Faulty shift control solenoid valve A

Measure VREF Voltage:

1. Disconnect the A (26P) and B (22P) connectors from the TCM.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

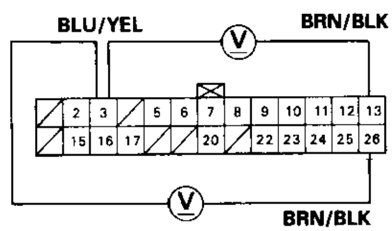
Is there approx. 5 V?

NO → **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Check for a Short to Power:
Measure the voltage between the A3 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

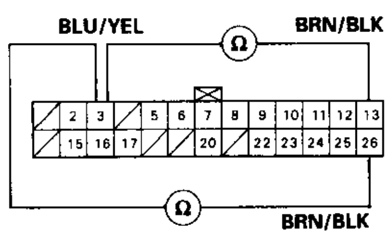
Is there voltage?

YES → **Repair short to power in the wire between the A3 terminal and the shift control solenoid valve A.**

NO ↓

Measure Shift Control Solenoid Valve A Resistance:

1. Turn the ignition switch OFF.
2. Measure the resistance between the A3 and A13 or A26 terminals.



Is the resistance 12 – 25 Ω?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.**

NO ↓

To page 14-67

From page 14-66

Check Shift Control Solenoid Valve A for a Short Circuit:

1. Disconnect the 3P connector from the shift control solenoid valve assembly.
2. Check for continuity between the A3 and A13 or A26 terminals.

Is there continuity?

YES — **Repair short to ground in the wire between the A3 terminal and the shift control solenoid valve A.**

NO

Measure Shift Control Solenoid Valve A Resistance at the Solenoid Connector:
Measure the resistance between terminal No. 1 of the shift control solenoid connector and body ground.

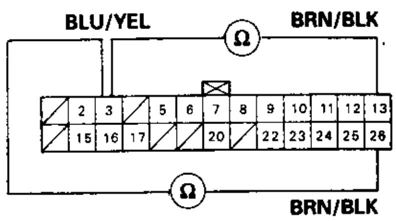
Is the resistance 12 – 25 Ω?

YES — **Check for open in the wire between the A3 terminal and the shift control solenoid valve A.**

NO

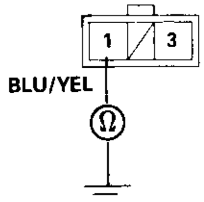
Replace the shift control solenoid valve assembly.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

SHIFT CONTROL SOLENOID CONNECTOR



TERMINAL SIDE OF MALE TERMINALS

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Control Solenoid Valve B

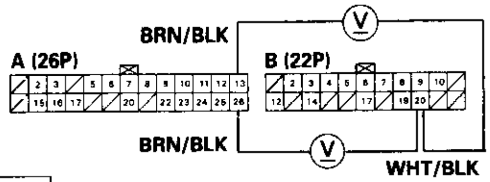
- OBD II Scan Tool Indicates Code P0758.
- Self-Diagnosis D4 indicator light blinks eight times.

Possible Cause

- Disconnected shift control solenoid valve B connector
- Short or open in shift control solenoid valve B wire
- Faulty shift control solenoid valve B

Measure VREF Voltage:
1. Disconnect the A (26P) and B (22P) connectors from the TCM.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

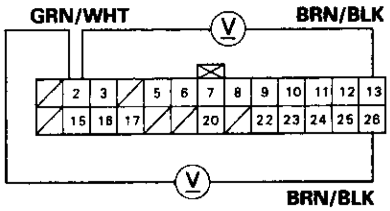
Is there approx. 5 V?

NO → **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Check for a Short to Power:
Measure the voltage between the A2 and A13 or A26 terminals.

TCM CONNECTOR A (26P)



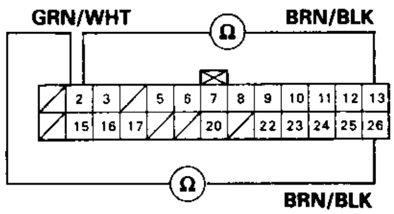
WIRE SIDE OF FEMALE TERMINALS

Is there voltage?

YES → **Repair short to power in the wire between the A2 terminal and the shift control solenoid valve B.**

NO ↓

Measure Shift Control Solenoid Valve B Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the A2 and A13 or A26 terminals.



Is the resistance 12 – 25 Ω?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.**

NO ↓

To page 14-69

From page 14-68

Check Shift Control Solenoid Valve B for a Short Circuit:

1. Disconnect the 3P connector from the shift control solenoid valve assembly.
2. Check for continuity between the A2 and A13 or A26 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the A2 terminal and the shift control solenoid valve B.**

NO ↓

Measure Shift Control Solenoid Valve B Resistance at the Solenoid Connector:
Measure the resistance between terminal No. 3 of the shift control solenoid connector and body ground.

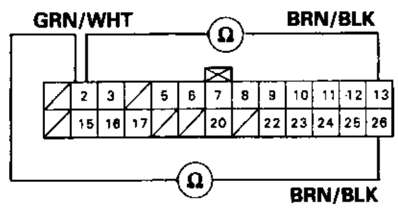
Is the resistance 12 – 25 Ω?

YES → **Check for open in the wire between the A2 terminal and the shift control solenoid valve B.**

NO ↓

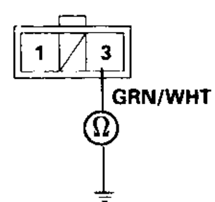
Replace the shift control solenoid valve assembly.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

SHIFT CONTROL SOLENOID CONNECTOR



TERMINAL SIDE OF MALE TERMINALS

Troubleshooting Flowchart — Countershaft Speed Sensor

- **OBD II Scan Tool Indicates Code P0720.**
- **Self-diagnosis D4 indicator light blinks nine times.**

Possible Cause
• Loose or faulty connection between the TCM and car harness • Disconnected countershaft speed sensor connector • Short or open in countershaft speed sensor wire • Faulty countershaft speed sensor

Check the countershaft speed sensor installation.

Is the countershaft speed sensor installed properly?

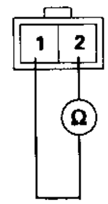
NO → **Reinstall and recheck.**

YES ↓

Measure Countershaft Speed Sensor Resistance at the Sensor Connector:

1. Disconnect the 2P connector from the countershaft speed sensor connector.
2. Measure the resistance of the countershaft speed sensor.

COUNTERSHAFT SPEED SENSOR CONNECTOR



TERMINAL SIDE OF MALE TERMINALS

Is the resistance 400 – 600 Ω?

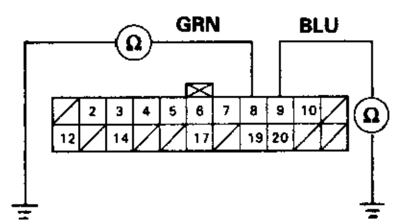
NO → **Replace the countershaft speed sensor.**

YES ↓

Check Countershaft Speed Sensor for a Short Circuit:

1. Disconnect the B(22P) connector from the TCM.
2. Check for continuity between body ground and the B8 terminal and B9 terminal individually.

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

Is there continuity?

YES → **Repair short in the wires between the B8 and B9 terminals and the countershaft speed sensor.**

NO ↓

To page 14-71

From page 14-70

Measure Countershaft Speed Sensor Resistance:
1. Connect the countershaft speed sensor 2P connector.
2. Measure the resistance between the B8 and B9 terminals.

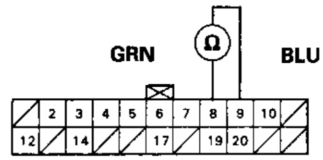
Is the resistance 400 – 600 Ω?

NO → **Repair loose terminal or open in the wires between the B8 and B9 terminals and the countershaft speed sensor.**

YES ↓

Check for loose TCM connector. If necessary, substitute a known-good TCM and recheck.

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

Troubleshooting Flowchart — Engine Coolant Temperature (ECT) Sensor

- OBD II Scan Tool Indicates Code P1792.
- Self-diagnosis D4 indicator light indicates Code 10.

Possible Cause

- **Disconnected Engine Coolant Temperature (ECT) sensor connector**
- **Short or open in ECT sensor wire**
- **Faulty ECT sensor**

Check for Another Code or MIL Blinking:

1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates another code or the Malfunction Indicator Lamp (MIL) blinks (see section 11).

Does the OBD II scan tool indicate another code or is the MIL blinking?

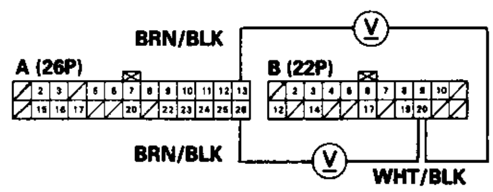
YES — **Repair PGM-FI system (see section 11).**

NO ↓

Measure VREF Voltage:

1. Turn the ignition switch OFF.
2. Disconnect the A (26P) and B (22P) connectors from the TCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B20 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

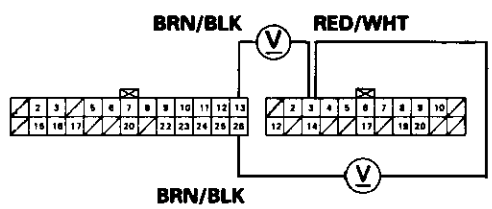
Is there approx. 5 V?

NO — **Repair open or short in the wire between the B20 terminal and the ECM.**

YES ↓

Measure ECT Voltage:

1. Turn the ignition switch OFF.
2. Connect the A (26P) and B (22P) connectors to the TCM.
3. Start the engine and warm it up to normal operating temperature (the radiator fan comes on).
4. Measure the voltage between the B3 and A13 or A26 terminals.



Is there less than 1 V?

NO — **Repair open in the wire between the B3 terminal and the ECT sensor.**

YES ↓

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

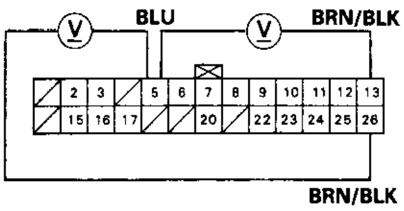
Troubleshooting Flowchart — Ignition Coil

- OBD II Scan Tool Indicates Code P0725.
- Self-diagnosis D4 indicator light indicates Code 11.

Possible Cause

- Disconnected ignition coil connector
- Short or open ignition coil wire
- Faulty ignition coil

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

Measure NE Voltage:
1. Disconnect the A(26P) connector from the TCM.
2. Start the engine.
3. Measure the voltage between the A5 and A13 or A26 terminals.

Is there battery voltage?

NO → **Repair open or short in the wire between the A5 terminal and the ignition coil.**

YES ↓

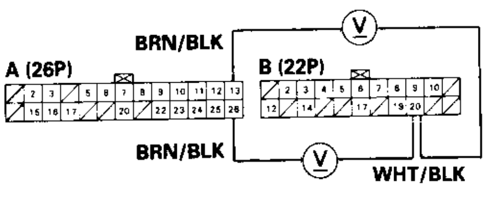
Check for loose TCM connector. If necessary, substitute a known-good TCM and recheck.

Troubleshooting Flowchart — Barometric Pressure (BARO) Sensor

- **OBD II Scan Tool Indicates Code P1794.**
- **Self-diagnosis D4 indicator light indicates Code 13.**

Possible Cause
• Short or open in LT GRN wire between the B2 terminal and the ECM • Faulty barometric pressure (BARO) sensor NOTE: The BARO sensor is built into the ECM.

Measure VREF Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) and B (22P) connectors from the TCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B20 and A13 or A26 terminals.

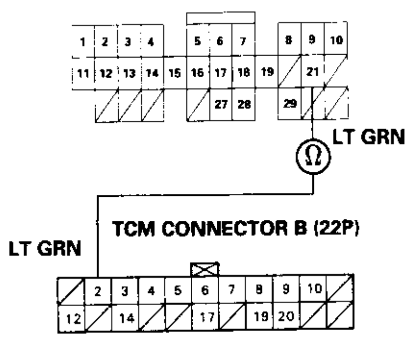


Is there approx. 5 V?

NO → **Repair short or open in the wire between the B20 terminal and the ECM.**

YES ↓

Check BAROS S Wire Continuity:
1. Turn the ignition switch OFF.
2. Disconnect the 22P connector from the ECM.
3. Check for continuity between the B2 terminal of the TCM connector and C21 terminal of the ECM connector.



Is there continuity?

NO → **Repair open in the wire between the TCM and ECM.**

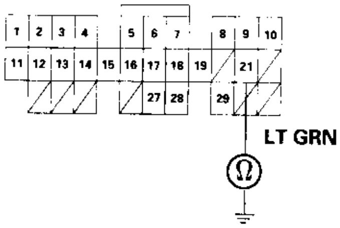
YES ↓

To page 14-75

From page 17-74

Check BAROS S Wire for a Short Circuit:
Check for continuity between the B2 terminal of the TCM or the C21 terminal of the ECM and body ground.

ECM CONNECTOR C (31P)



WIRE SIDE OF FEMALE TERMINALS

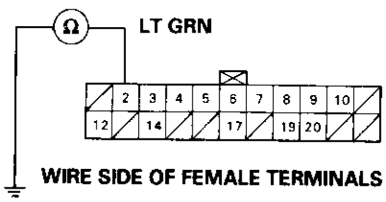
Is there continuity?

YES → **Repair short to body ground in the wire.**

NO ↓

Check for loose TCM and ECM connectors. If necessary, substitute a known-good TCM and recheck.

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

Electrical Troubleshooting

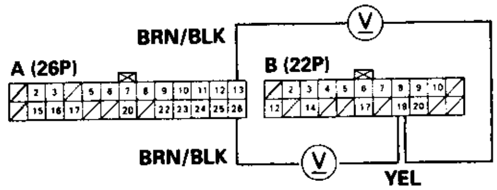
Troubleshooting Flowchart — FAS Signal

- **OBD II Scan Tool indicates Code P1786.**
- **Self-diagnosis [D4] indicator light indicates Code 14.**

Possible Cause
- **Short or open FAS wire**
- **Faulty ECM**

Measure FAS Voltage:
1. Start the engine and warm it up to normal operating temperature (the radiator fan comes on).
2. Shift to [P] position.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II) and wait for at least two seconds.
5. Measure the voltage between the B19 and A13 or A26 terminals.

TCM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

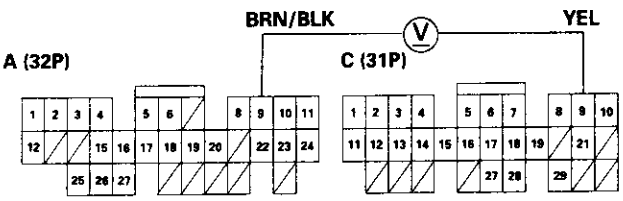
Is there approx. 5 V?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

NO ↓

Measure FAS Voltage (ECM side):
1. Turn the ignition switch OFF.
2. Disconnect the B (22P) connector from the TCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage A9 and C9 terminals of the ECM connectors.

ECM CONNECTORS



WIRE SIDE OF FEMALE TERMINALS

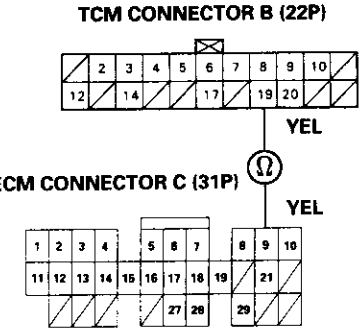
Is there approx. 5 V?

NO → To page 14-75

YES ↓

Check FAS Wire Continuity:
1. Turn the ignition switch OFF.
2. Disconnect the C (31P) connector from the ECM.
3. Check for continuity between the C9 terminal of the ECM C (31P) connector and the B19 terminal of the TCM B (22P) connector.

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

Is there continuity?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

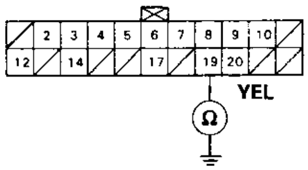
NO ↓

Repair open in the FAS wire between the TCM and the ECM.

From page 14-76

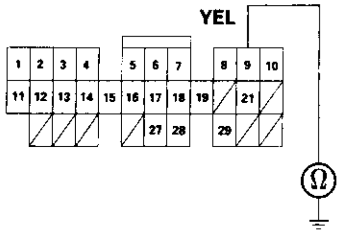
Check FAS Wire for a Short Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the C (31P) connector from the ECM.
3. Check for continuity between the C9 terminal of the ECM C (31P) connector or the B19 terminal of the TCM B (22P) connector and body ground.

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

ECM CONNECTOR C (31P)



WIRE SIDE OF FEMALE TERMINALS

Is there continuity?

YES → **Repair short in the FAS wire between the TCM and the ECM.**

NO ↓

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Electrical Troubleshooting

Troubleshooting Flowchart — Mainshaft Speed Sensor

- **OBD II Scan Tool indicates Code P0715**
- **Self-diagnosis D4 indicator light indicates Code 15.**

Possible Cause

- **Disconnected mainshaft speed sensor connector**
- **Short or open in mainshaft speed sensor wire**
- **Faulty mainshaft speed sensor**

NOTE: Code P0715 (code 15) on the TCM doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code P0715 (code 15) may also indicates a mechanical problem in the transmission.

Check the mainshaft and countershaft speed sensor installation.

Are the mainshaft and countershaft speed sensor installed properly?

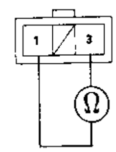
NO — **Reinstall and recheck.**

YES

Measure Mainshaft Speed Sensor Resistance at the Sensor Connector:

1. Disconnect the 3P connector from the mainshaft speed sensor connector.
2. Measure the resistance of the mainshaft speed sensor.

MAINSHAFT SPEED SENSOR CONNECTOR



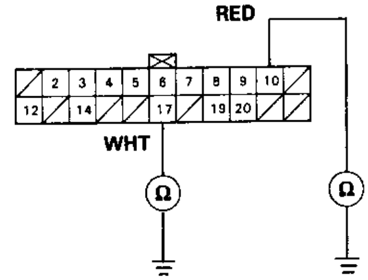
TERMINAL SIDE OF MALE TERMINALS

Is the resistance 400 – 600 Ω?

NO — **Replace the mainshaft speed sensor.**

YES

TCM CONNECTOR B (22P)



WIRE SIDE OF FEMALE TERMINALS

Check Mainshaft Speed Sensor for a Short Circuit:

1. Disconnect the B (22P) connector from the TCM.
2. Check for continuity between body ground and the B10 terminal and B17 terminal individually.

Is there continuity?

YES — **Repair short in the wires between the B10 and B17 terminals and the mainshaft speed sensor.**

NO

To page 14-79

From page 17-78

Measure Mainshaft Speed Sensor Resistance:
1. Connect the mainshaft speed sensor 3P connector.
2. Measure the resistance between the B10 and B17 terminals.

Is the resistance 400 – 600 Ω?

YES → **Run the Electrical Troubleshooting Flowchart for code P0720 (code 9). Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

NO ↓

Check NM Wire Continuity:
1. Disconnect the 3P connector from the mainshaft speed sensor connector.
2. Check for continuity between the B10 terminal and the No. 3 terminal of the mainshaft speed sensor connector.

Is there continuity?

NO → **Repair open in the wire between the B10 terminal and the mainshaft speed sensor.**

YES ↓

Check NMSG Wire Continuity:
Check for continuity between the B17 terminal and the No. 1 terminal of the mainshaft speed sensor connector.

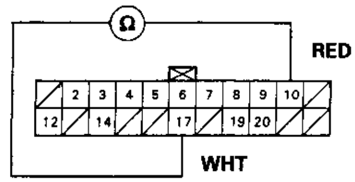
Is there continuity?

NO → **Repair open in the wire between the B17 terminal and the mainshaft speed sensor.**

YES ↓

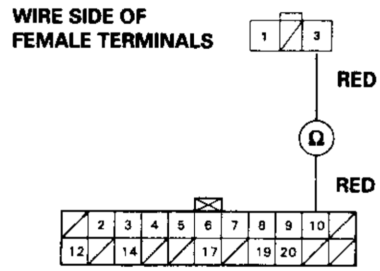
Check for loose TCM connector. If necessary, substitute a known-good TCM and recheck.

TCM CONNECTOR B (22P)

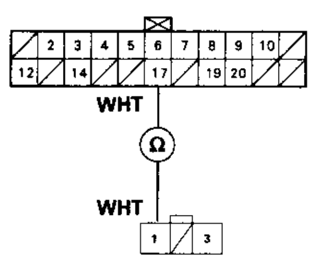


WIRE SIDE OF FEMALE TERMINALS

MAINSHAFT SPEED SENSOR CONNECTOR



WIRE SIDE OF FEMALE TERMINALS



Troubleshooting Flowchart — LC Control System

OBD II Scan Tool indicates Code P0740.

Possible Cause
Faulty lock-up control system

Check for Another Code:
Check whether the OBD II scan tool indicates another code.

Does the OBD II scan tool indicate another code?

YES → **Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0740 after troubleshooting.**

NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

NO ↓

Test Line Pressure:
Measure the line pressure (see page 14-98).

Is the line pressure within the service limit?

NO → **Repair the hydraulic system as necessary (see page 14-98).**

YES ↓

Replace the Lock-up Control Solenoid Valve Assembly and Recheck:

1. Replace the lock-up control solenoid valve A/B assembly (see page 14-87).
2. Turn the ignition switch OFF and reset the TCM memory by removing the BACK UP fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Using the OBD II scan tool, check that the engine coolant temperatures is 176°F (80°C) and above.
4. Drive the vehicle at 55 mph (88 km/h) constantly for more than one minute.
5. Recheck for code P0740.

Does the OBD II scan tool indicate code P0740?

NO → **The system is OK at this time.**

YES ↓

Replace the transmission and torque converter.

Troubleshooting Flowchart — Shift Control System

OBD II Scan Tool indicates Code P0730.

Possible Cause
Faulty shift control system

Check for Another Code:
Check whether the OBD II scan tool indicates another code.

Does the OBD II scan tool indicate another code?

YES → **Perform the Troubleshooting Flowchart for the indicated Code(s).**
Recheck for code P0730 after troubleshooting.

NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

NO ↓

Test 1st, 2nd, 3rd, and 4th Clutch Pressure:
Measure the 1st, 2nd, 3rd, and 4th clutch pressure (see page 14-99).

Is each clutch pressure within the service limit?

NO → **Repair the hydraulic system as necessary (see page 14-99).**

YES ↓

Replace the Shift Control Solenoid Valve A/B Assembly, then Recheck:

1. Turn the ignition switch OFF and reset the TCM memory by removing the BACK UP fuse in the under-hood fuse/relay box for more than 10 seconds.
2. Drive the vehicle at over 12 mph (20 km/h) in 1st, 2nd, 3rd, and 4th gear for more than 30 seconds in D4 position.
3. Recheck for code P730 (41).

Does the OBD II scan tool or the D4 indicator light indicate code P0730 (41)?

NO → **The system is OK at this time.**

YES ↓

Replace the transmission.

Troubleshooting Flowchart — D4 Indicator Light Does Not Come On

The D4 Indicator light does not come on when the ignition switch is first turned ON (II). (It should come on for about two seconds.)

Check the Service Check Connector:
Make sure the special tool (SCS Service Connector) is not connected to the service check connector.

Is the special tool (SCS Service Connector) connected to the service check connector?

YES → **Disconnect the special tool from the service check connector and recheck.**

NO ↓

Check the D4 Indicator Light:
Shift to D4 position.

Does the D4 indicator light come on?

YES → **Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**

NO ↓

Check the Ground Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) connector from the TCM.
3. Check for continuity between the A13 terminal and body ground and the A26 terminal and body ground.

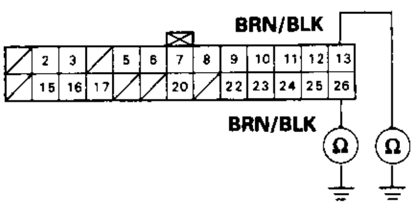
Is there continuity?

NO →
- **Repair open in the wires between the A13 or A26 terminals and G101.**
- **Repair poor ground (G101).**

YES ↓

To page 14-83

TCM CONNECTOR A (26P)

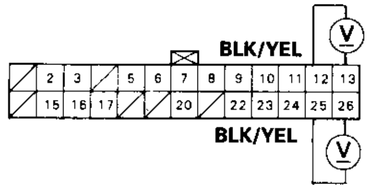


WIRE SIDE OF FEMALE TERMINALS

From page 14-82

Measure Power Supply Circuit Voltage:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the A12 and A13 terminals and between the A25 and A26 terminals.

TCM CONNECTOR A (26P)



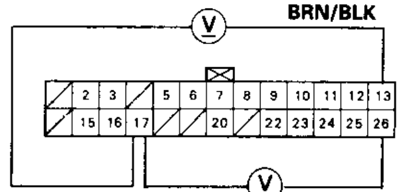
WIRE SIDE OF FEMALE TERMINALS

Is there battery voltage?

NO → **Repair open or short in the wire between the A12 and/or A25 terminals and under-dash fuse/relay box.**

YES

Measure D4 IND Voltage:
1. Turn the ignition switch OFF.
2. Connect the A (26P) connector to the TCM.
3. Connect a digital multimeter to the A17 and A13 or A26 terminals.
4. Turn the ignition switch ON (II) and make sure that the voltage is available for 2 seconds.



Is there voltage?

YES → **Check for open or short in the wire between the A17 terminal and the gauge assembly. If the wire is OK, check for a faulty D4 indicator light bulb or a faulty gauge assembly printed circuit board.**

NO

Check D4 IND for an Open Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) connector from the TCM.
3. Check for continuity between the A17 terminal and the terminal of the gauge assembly connector (see section 23).

Is there continuity?

NO → **Repair open in the wire between the A17 terminal and the gauge assembly.**

YES

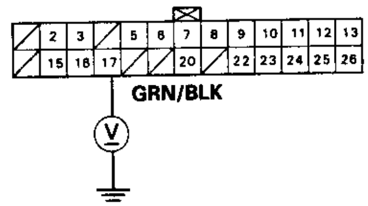
Check for loose TCM connectors. Check the A/T gear position switch. If necessary, substitute a known-good TCM and recheck.

Troubleshooting Flowchart — D4 Indicator Light On Constantly

The D4 indicator light is on constantly (not blinking) whenever the ignition switch is ON (II).

Measure D4 IND Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) connector from the TCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the A17 terminal and body ground.

TCM CONNECTOR A (26P)



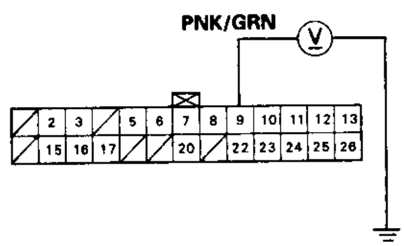
WIRE SIDE OF FEMALE TERMINALS

Is there voltage?

YES → **Repair short to power in the wire between the A17 terminal and the gauge assembly.**

NO ↓

Measure ATP D4 Voltage:
1. Turn the ignition switch OFF.
2. Connect the A (26P) connector to the TCM.
3. Turn the ignition switch ON (II).
4. Shift to any position other than D4 position.
5. Measure the voltage between the A9 terminal and body ground.



Is there voltage?

NO → **Check for a short to ground in the wire between the A9 terminal and the A/T gear position switch. If wire is OK, replace the A/T gear position indicator.**

YES ↓

Replace the TCM.

Troubleshooting Flowchart — A/C signal

Inspection of the A/C signal

Symptom
• Lock-up clutch does not have duty operation (ON↔OFF). • Lock-up clutch does not engage.

Check A/C Operation:
1. Start the engine.
2. Turn the blower switch ON.
3. Push the A/C switch ON.

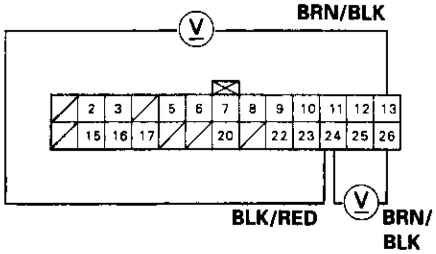
Does the A/C compressor clutch engage?

NO → **Inspect the A/C system (see section 22).**

YES ↓

Measure ACCL Voltage:
1. Stop the engine.
2. Disconnect the A (26P) connector from the TCM.
3. Start the engine.
4. Measure the voltage between the A24 and A13 or A26 terminals with the A/C compressor OFF.

TCM CONNECTOR A (26P)



WIRE SIDE OF FEMALE TERMINALS

Is there battery voltage?

NO → **Repair open in the wire between the A24 terminal and the A/C compressor clutch relay.**

YES ↓

- **A/C signal is OK.**
- **Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**
- **Inspect the A/C system (see section 22).**

Electrical Troubleshooting

Troubleshooting Flowchart — Brake Switch Signal

Inspection of the brake switch signal

Symptom
Shift lever cannot be moved from [P] position with the brake pedal depressed.

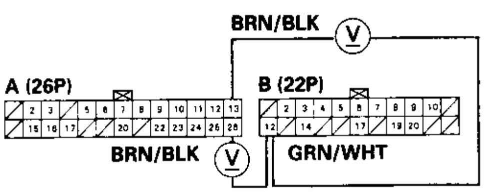
Check Brake Light Operation:
Depress the brake pedal.

Are the brake lights ON?

NO → **Repair faulty brake switch circuit (see section 23).**

YES ↓

Measure STOP SW Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (26P) and B (22P) connectors from the TCM.
3. Measure the voltage between the B12 and A13 or A26 terminals with the brake pedal depressed.



Is there battery voltage?

NO → **Repair open in the wire between the B12 terminal and brake switch.**

YES ↓

- **Brake switch signal is OK.**
- **Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.**
- **Inspect the brake switch circuit (see section 23).**

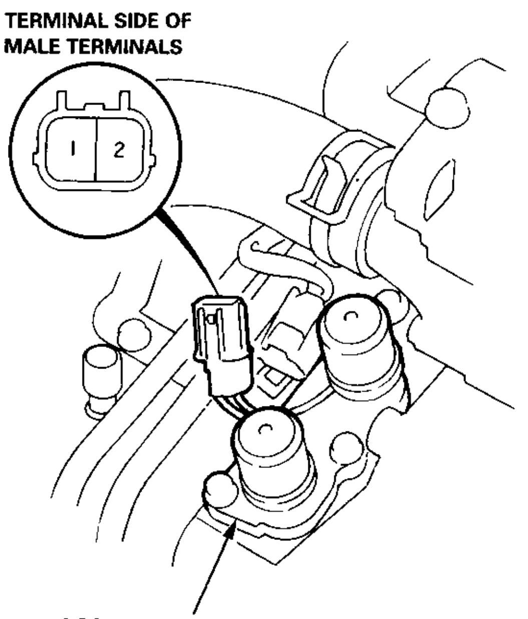
Lock-up Control Solenoid Valve A/B Assembly

Test

NOTE: Lock-up control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect 2P connector from the lock-up control solenoid valve A/B assembly.
2. Measure the resistance between the No. 2 terminal (solenoid valve A) of the lock-up control solenoid valve connector and body ground, and between the No. 1 terminal (solenoid valve B) and body ground.

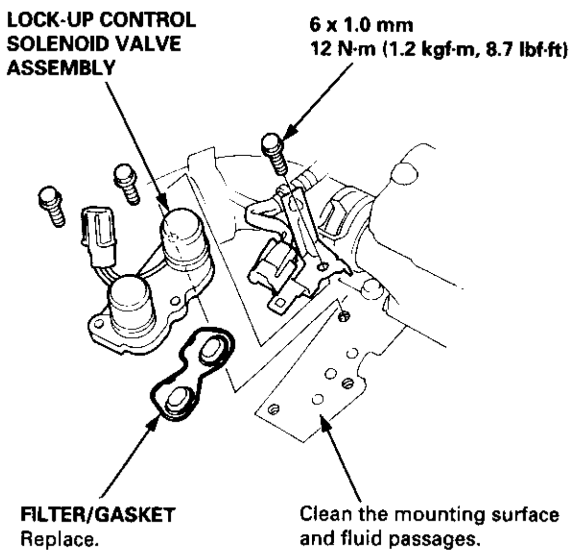
STANDARD: 12 – 25 Ω



3. Replace the lock-up control solenoid valve assembly if the resistance is out of specification.
4. If the resistance is within the standard, connect the No. 1 terminal of the lock-up control solenoid valve connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 2 terminal to the battery positive terminal. A clicking sound should be heard. Replace the lock-up control solenoid valve assembly if no clicking sound is heard.

Replacement

1. Remove the mounting bolts and lock-up control solenoid valve A/B assembly.
2. Check the lock-up control solenoid valve fluid passages for dust or dirt, and replace as an assembly, if necessary.



3. Clean the mounting surface and fluid passages of the lock-up control solenoid valve assembly, and install a new lock-up control solenoid valve A/B with a new filter/gasket.
4. Check the connector for rust, dirt or oil, and reconnect it securely.

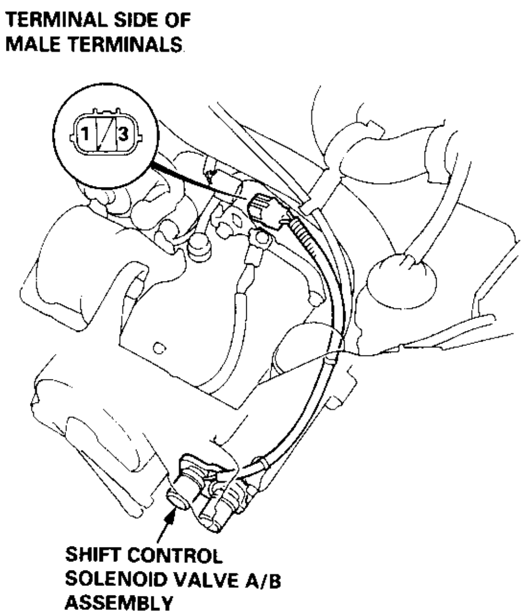
Shift Control Solenoid Valve A/B Assembly

Test

NOTE: Shift control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect 3P connector from the shift control solenoid valve A/B assembly.
2. Measure the resistance between the No. 1 terminal (solenoid valve A) of the shift control solenoid valve connector and body ground, and between the No. 3 terminal (solenoid valve B) and body ground.

   STANDARD: 12 – 25 Ω



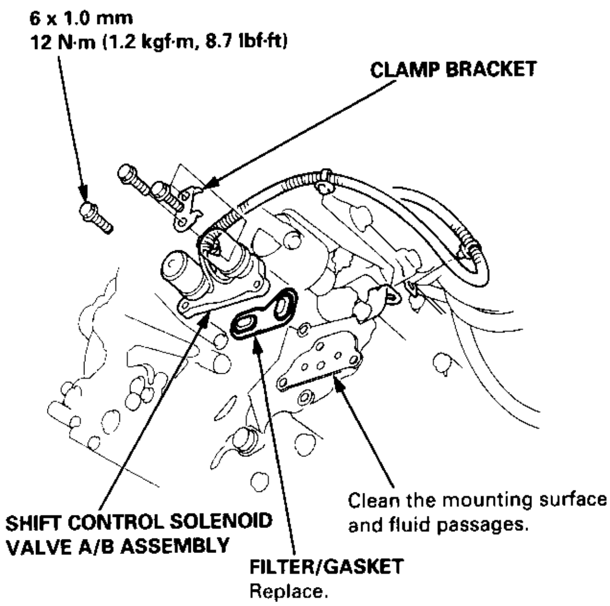
3. Replace the shift control solenoid valve assembly if the resistance is out of specification.
4. If the resistance is within the standard, connect the No. 1 terminal of the shift control solenoid valve connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 3 terminal to the battery positive terminal. A clicking sound should be heard. Replace the shift control solenoid valve assembly if no clicking sound is heard.

Replacement

1. Remove the mounting bolts and shift control solenoid valve A/B assembly.

   NOTE: Be sure to remove or replace the shift control solenoid valves A and B as an assembly.

2. Check the shift control solenoid valve fluid passages for dust or dirt, and replace as an assembly, if necessary.

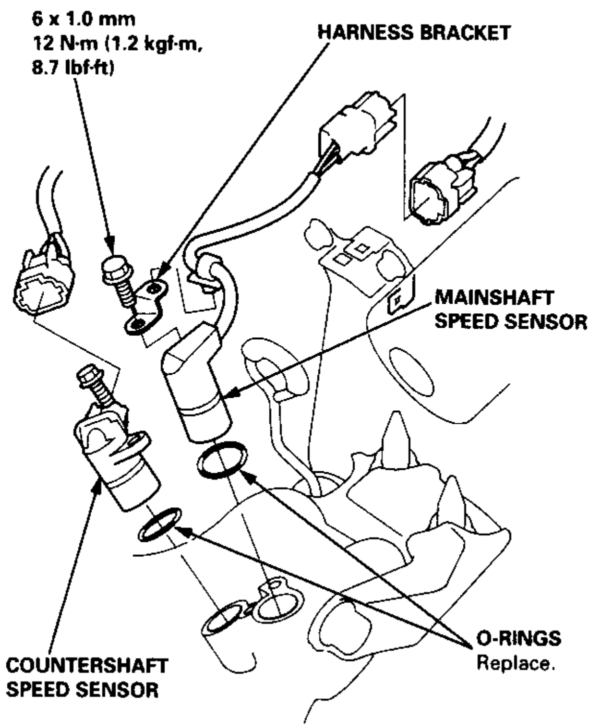


3. Clean the mounting surface and fluid passages of the shift control solenoid valve assembly, and install a new shift control solenoid valve A/B with a new filter/gasket.
4. Check the connector for rust, dirt or oil, and reconnect it securely.

Mainshaft/Countershaft Speed Sensors

Replacement

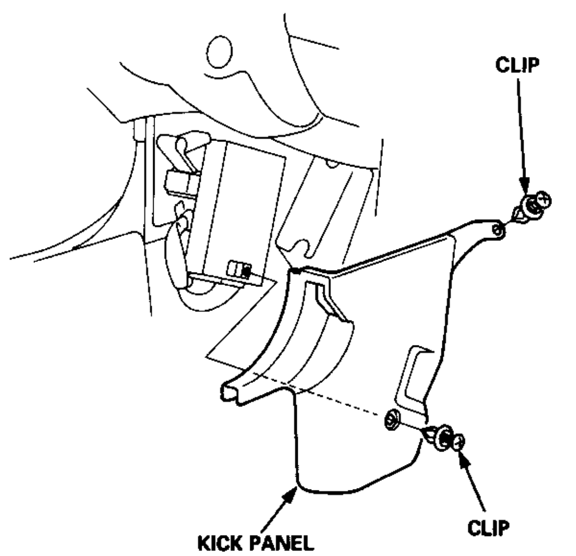
1. Disconnect the speed sensor connectors.
2. Remove the 6 mm bolts securing the mainshaft and countershaft speed sensors from the transmission housing.
3. Remove the mainshaft and countershaft speed sensors.
4. Install the mainshaft and countershaft speed sensors in the reverse order of the removal.



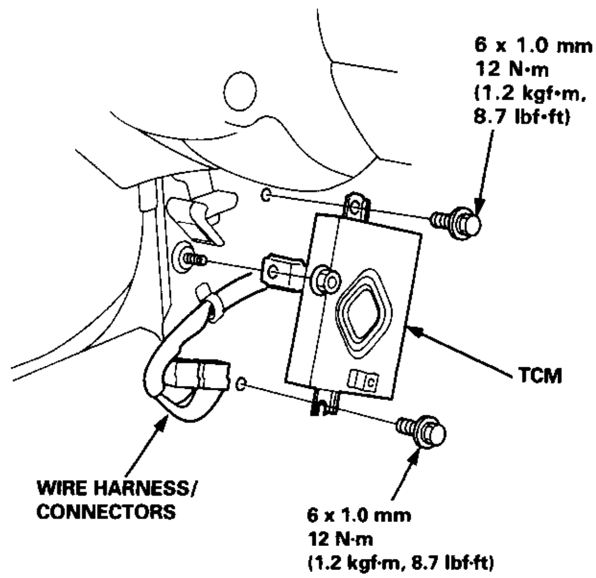
Transmission Control Module (TCM)

Replacement

1. Remove the two clips securing the kick panel, then remove the panel.



2. Disconnect the connectors and remove the TCM.



Symptom-to-Component Chart

Hydraulic System

SYMPTOM		Check these items on the PROBABLE CAUSE List	Check these items on the NOTES List
Engine runs, but car does not move in any gear.		1, 2, 3, 5, 6, 7, 37, 42	K, L, R, S
Vehicle moves in [R] and [2], but not in [D3], [D4], or [1] position.		6, 8, 9, 10, 59	C, M, O
Vehicle moves in [D3], [D4], [1], [R], but not in [2] position.		6, 11, 12, 21	C, L
Vehicle moves in [D3], [D4], [2], [1], but not in [R] position.		4, 6, 13, 32	C, L, Q
Vehicle moves in [N] position.		10, 12, 14, 31, 32, 34, 35, 36	C, D
Excessive idle vibration.		2, 33, 37, 48, 49	B, K, L
Poor acceleration; flares on starting off in [D3] position			
	Stall rpm high in [D4], [D3], [2], [1] position.	1, 2, 3, 6, 42, 45	K, L, R
	Stall rpm high in [D4], [D3], [1] position.	6, 8, 10	C, D
	Stall rpm high in [2] position.	6, 12	C, D
	Stall rpm high in [R] position.	32	N
	Stall rpm low.	15, 33, 48, 49	R
No shift		44, 51, 52	G, L
Fails to shift in [D3] position; from 1st to 3rd gear.		19	
Fails to shift in [D4] position; from 1st to 4th gear.		19, 20	
Erratic upshifting.			V
	1-2 upshift, 2-3 upshift, 3-4 upshift	64	
	1-2 upshift	51	
	2-3 upshift	52	
	3-4 upshift	51	
Harsh upshift (1-2).		12, 16, 17, 21, 63,64	C, D, E, V
Harsh upshift (2-3).		16, 17, 22, 24, 31, 63, 64	C, D, E, H, L, V
Harsh upshift (3-4).		16, 17, 23, 28, 32, 63, 64	C, D, E, I, L, V
Harsh downshift (2-1).		16, 17, 21, 27, 38, 63, 64	O
Harsh downshift (3-2).		16, 17, 22, 28, 39, 57, 63, 64	C, D, E, H
Harsh downshift (4-3).		16, 17, 23, 40, 56, 63, 64	C, D, E, I
Flares on 2-3 upshift.		16, 17, 22, 24, 25, 29, 31	E, L, V
Flares on 3-4 upshift.		16, 17, 23, 25, 28, 30, 32	E, L, V, N
Excessive shock on 2-3 upshift.		16, 17, 22, 24, 29, 38, 46, 64	E, L, N
Excessive shock on 3-4 upshift.		16, 17, 23, 28, 29, 40, 46, 64	E, L, N
Late shift from [N] position to [D4] or [D3] position.		10, 26	M
Late shift from [N] position to [R] position.		4, 18, 32, 55	Q
Noise from transmission in all shift lever positions.		2, 41	K, L, Q
Vehicle does not accelerate more than 31 mph (50 km/h).		15	
Shift lever does not operate smoothly.		6, 43	P
Fails to shift; stuck in 4th gear.		51, 52	
Transmission will not shift into parking gear in [P] position.		6, 43, 62	P
Stall rpm high; all clutch pressures are in specification.		45	D, K, O
Lock-up clutch does not disengage.		16, 17, 47, 48, 49, 50, 53, 54, 64	E, L, V
Lock-up clutch does not operate smoothly.		16, 17, 45, 47, 48, 49, 50, 53, 54, 64	L
Lock-up clutch does not engage.		16, 17, 45, 47, 48, 49, 50, 53, 54, 63, 64	E, L, V
Excessive shock when shifting into [1] position.		60	E, O
No engine braking in [1] position.		58, 60	C, D, L
Vibration in all positions.		37	
Position indicator light does not come on.		6, 43, 61	

PROBABLE CAUSE			
1	Low ATF.	40	4th check ball stuck.
2	ATF pump worn or binding.	41	Torque converter housing or transmission housing ball bearing worn/damaged.
3	Regulator valve stuck or spring worn.	42	ATF strainer clogged.
4	Servo valve stuck.	43	Joint in shift cable and transmission or body worn.
5	Mainshaft worn/damaged.	44	Modulator valve stuck.
6	Shift cable broken/out of adjustment.	45	Torque converter check valve stuck.
7	Final gears worn/damaged (2 gears).	46	Foreign material in separator plate orifice.
8	One-way (sprag) clutch worn/damaged.	47	Lock-up timing B valve stuck.
9	1st gears worn/damaged (2 gears).	48	Lock-up shift valve stuck.
10	1st clutch defective.	49	Lock-up piston defective.
11	2nd gears worn/damaged (2 gears).	50	Lock-up control valve stuck.
12	2nd clutch defective.	51	Shift control solenoid valve A defective.
13	Reverse gears worn/damaged (2 gears).	52	Shift control solenoid valve B defective.
14	Excessive ATF.	53	Lock-up control solenoid valve A defective.
15	Torque converter one-way clutch defective.	54	Lock-up control solenoid valve B defective.
16	Throttle valve B stuck.	55	Servo control valve stuck.
17	Throttle control cable out of adjustment.	56	4-3 kick-down valve stuck.
18	1-2 shift valve stuck.	57	3-2 kick-down valve stuck.
19	2-3 shift valve stuck.	58	1st-hold clutch defective.
20	3-4 shift valve stuck.	59	1st accumulator defective.
21	2nd accumulator defective.	60	1st-hold accumulator defective.
22	3rd accumulator defective.	61	A/T gear position switch defective.
23	4th accumulator defective.	62	Parking mechanism defective.
24	Orifice control valve stuck.	63	Mainshaft speed sensor defective.
25	Foreign material in main orifice.	64	Countershaft speed sensor defective.
26	Foreign material in 1st orifice.		
27	Foreign material in 2nd orifice.		
28	2-3 orifice control valve stuck.		
29	Foreign material in 3rd orifice.		
30	Foreign material in 4th orifice.		
31	3rd clutch defective.		
32	4th clutch defective.		
33	Engine output low.		
34	Needle bearing worn/damaged.		
35	Thrust washer worn/damaged.		
36	Clutch clearance incorrect.		
37	Drive plate defective or transmission misassembly.		
38	2nd check ball stuck.		
39	3rd check ball stuck.		

(cont'd)

Hydraulic System (cont'd)

The following symptoms can be caused by improper repair or assembly	Check these items on the PROBABLE CAUSE DUE TO IMPROPER REPAIR List	Items on the NOTES List
Vehicle creeps in [N] position.	R1, R2	
Vehicle does not move in [D3] or [D4] position.	R4	
Transmittion locks up in [R] position.	R3, R12	
Excessive drag in transmission.	R6	K, R
Excessive Vibration, rpm related.	R7	
Noise with wheels moving only.	R5	
Main seal pops out.	R8	S
Various shifting problems.	R9, R10	
Harsh upshifts.	R11	

PROBABLE CAUSE DUE TO IMPROPER REPAIR	
R1.	Improper clutch clearance.
R2.	Improper gear clearance.
R3.	Parking brake lever installed upside down.
R4.	One-way (sprag) clutch installed upside down.
R5.	Reverse selector hub installed upside down.
R6.	ATF pump binding.
R7.	Torque converter not fully seated in ATF pump.
R8.	Main seal improperly installed.
R9.	Springs improperly installed.
R10.	Valves improperly installed.
R11.	Ball check valves not installed.
R12.	Shift fork bolt not installed.

NOTES	
A.	See flushing procedure, page 14-172 and 173.
B.	Set idle rpm in gear to specified idle speed. If still no good, adjust motor mounts as outlined in engine section of service manual.
C.	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D.	If the clutch pack is seized or is excessively worn, inspect the other clutches for wear, and check the orifice control valves and throttle valves for free movement.
E.	If throttle valve B is stuck, inspect the clutches for wear.
G.	If the 1—2 shift valve is stuck closed, the transmission will not upshift. If stuck open, the transmission has no 1st gear.
H.	If the 2—3 orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I.	If the orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J.	If the clutch pressure control valve is stuck closed, the transmission will not shift out of 1st gear.
K.	Improper alignment or main valve body and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high-pitched squeak.
L.	If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump and differential pinion shaft. If both are OK and no cause for the contamination is found, replace the torque converter.
M.	If the 1st clutch feed pipe guide in the right side cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the right side cover as it is dented. The O-ring under the guide is probably worn.
N.	• Replace the mainshaft if the bushing for the 4th feed pipe is loose or damaged. If the 4th feed pipe is damaged or out of round, replace the right side cover. • Replace the sub-shaft if the bushing for the 1st-hold feed pipe is loose or damaged. If the 1st-hold feed pipe is damaged or out of round, replace it. • Replace the mainshaft if the bushing for the 1st feed pipe is loose or damaged. If the 1st feed pipe is damaged or out of round, replace it.
O.	A worn or damaged sprag clutch is mostly a result of shifting the transmission in D3 or D4 position while the wheels rotate in reverse, such as rocking the vehicle in snow.
P.	Inspect the frame for collision damage.
Q.	Inspect for damage and wear: 1. Reverse selector gear teeth chamfers. 2. Engagement teeth chamfers of countershaft 4th and reverse gear. 3. Shift fork for scuff marks in center. 4. Differential pinion shaft for wear under pinion gears. 5. Bottom of 3rd clutch for swirl marks. Replace items 1, 2, 3 and 4 if worn or damaged. If transmission makes clicking, grinding or whirring noise, also replace mainshaft 4th gear, reverse idler gear, and countershaft 4th gear in addition to 1, 2, 3 or 4. If differential pinion shaft is worn, overhaul differential assembly, and replace ATF strainer, and thoroughly clean transmission, flush torque converter, cooler and lines. If bottom of 3rd clutch is swirled and transmission makes gear noise, replace the countershaft and final driven gear.
R.	Be very careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use proper tools.
S.	Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
T.	Harsh downshifts when coasting to a stop with zero throttle may be caused by a bent-in throttle valve retainer/cam stopper. Throttle cable adjustment may clear this problem.
V.	Throttle cable adjustment is essential for proper operation of the transmission. Not only does it affect the shift points if misadjusted, but also the shift quality and lock-up clutch operation. A cable adjusted too long will result in throttle pressure being too low for the amount of engine torque input into the transmission and may cause clutch slippage. A cable adjusted too short will result in too high throttle pressure which may cause harsh shifts, erratic shifts and torque converter hunting.

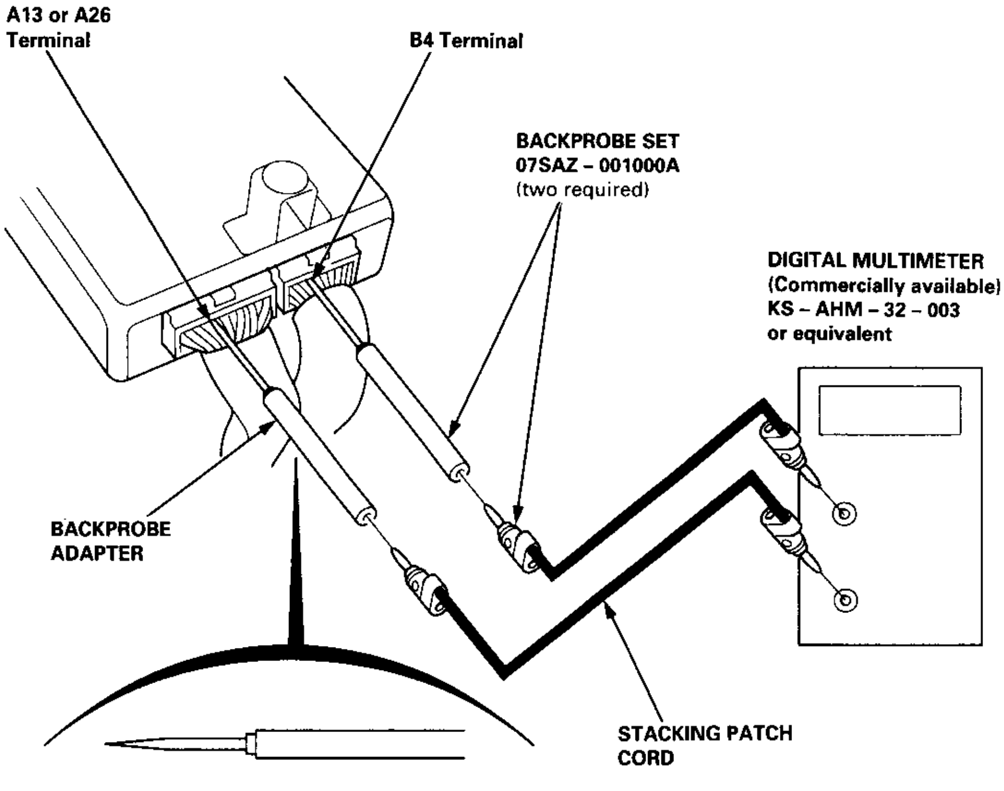
Road Test

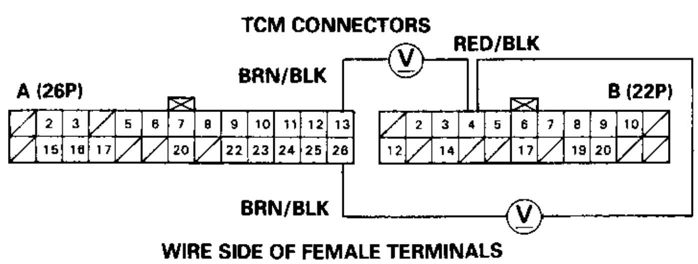
NOTE: Warm up the engine to operating temperature (the radiator fan comes on).

1. Apply parking brake and block the wheels. Start the engine, then shift to D4 position while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. The engine should not stall.
2. Repeat same test in D3 position.
3. Test drive the vehicle on a flat road in the D4 position. Check that the shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

NOTE: Throttle position sensor voltage represents the throttle opening.

–1. Remove the TCM (see page 14-52).
–2. Set the digital multimeter to check voltage between B4 (+) terminal and A13 or A26 (–) terminal for the throttle position sensor.





- **Upshift: D4 Position**

Throttle Opening	Unit of speed	1st → 2nd	2nd → 3rd	3rd → 4th
Throttle position sensor voltage: 1.0 V	mph	8.0 – 10.0	20.0 – 23.0	27.0 – 31.0
	km/h	13.5 – 16.1	32.2 – 37.0	43.5 – 49.9
Throttle position sensor voltage: 2.5 V	mph	21.0 – 25.0	38.0 – 43.0	58.0 – 64.0
	km/h	33.8 – 40.2	61.2 – 69.2	93.3 – 103.0
Fully-opened throttle	mph	31.0 – 36.0	63.0 – 71.0	97.0 – 108.0
	km/h	49.9 – 57.9	101.4 – 114.3	156.1 – 173.8

- **Upshift: D3 Position**

Throttle Opening	Unit of speed	1st → 2nd	2nd → 3rd
Throttle position sensor voltage: 1.0 V	mph	8.0 – 10.0	20.0 – 23.0
	km/h	13.5 – 16.1	32.2 – 37.0
Throttle position sensor voltage: 2.5 V	mph	21.0 – 25.0	38.0 – 43.0
	km/h	33.8 – 40.2	61.2 – 69.2
Fully-opened throttle	mph	31.0 – 36.0	63.0 – 71.0
	km/h	49.9 – 57.9	101.4 – 114.3

- **Downshift: D4 Position**

Throttle Opening	Unit of speed	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.5 V	mph	17.5 – 20.5	6.0 – 9.0 (3rd→1st)	———
	km/h	28.2 – 33.0	9.7 – 14.5 (3rd→1st)	———
Fully-opened throttle	mph	85.0 – 95.0	54.0 – 61.0	23.0 – 28.0
	km/h	137.0 – 152.9	86.9 – 98.2	37.0 – 45.1

- **Downshift: D3 Position**

Throttle Opening	Unit of speed	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.5 V	mph	6.0 – 9.0 (3rd→1st)	———
	km/h	9.7 – 14.5 (3rd→1st)	———
Fully-opened throttle	mph	54.0 – 61.0	23.0 – 28.0
	km/h	86.9 – 98.2	37.0 – 45.1

(cont'd)

(cont'd)

- **Lock-up: D4 Position**

Throttle Opening	Unit of speed	Lock-up control solenoid valve A: ON	Lock-up control solenoid valve B: ON
Throttle position sensor voltage: 1.0 V	mph	14.0 – 17.0	17.0 – 20.0
	km/h	22.5 – 27.4	27.4 – 32.2
Fully-opened throttle	mph	92.0 – 96.0	92.0 – 96.0
	km/h	148.1 – 154.5	148.1 – 154.5

- **Lock-up: D3 Position**

Throttle Opening	Unit of speed	Lock-up control solenoid valve A: ON	Lock-up control solenoid valve B: ON
Throttle position sensor voltage: 1.0 V	mph	61.0 – 68.0	60.0 – 67.0
	km/h	98.2 – 109.4	96.6 – 107.8
Fully-opened throttle	mph	85.0 – 94.0	85.0 – 94.0
	km/h	136.8 – 151.3	136.8 – 151.3

4. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from D4 position to 2 position. The vehicle should immediately begin slowing down from engine braking.

   CAUTION: Do not shift from D4 or D3 position to 2 or 1 position at speeds over 100 mph (160 km/h); you may damage the transmission.

5. Check for abnormal noise and clutch slippage in the following positions.

   1 (1st Gear) Position
   –1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
   –2. Upshifts should not occur with the shift lever in this position.
   2 (2nd Gear) Position
   –1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
   –2. Upshifts and downshifts should not occur with the shift lever in this position.
   R (Reverse) Position
   Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

6. Test in P (Parking) Position
   Park vehicle on slope (approx. 16°), apply the parking brake, and shift into P position. Release the brake; the vehicle should not move.

Stall Speed

Test

CAUTION:
- **To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.**
- **Do not shift the lever while raising the engine speed.**
- **Be sure to remove the pressure gauge before testing stall speed.**

1. Engage the parking brake, and block all four wheels.
2. Connect the tachometer, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift into [2] position.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed.
6. Allow two minutes for cooling, then repeat the test in [1], [D4] and [R] positions.

NOTE:
- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in [D4], [2], [1] and [R] positions.

Stall Speed RPM: rpm
Specification:
B18B1 engine 2,500 rpm
B18C1 engine 2,400 rpm
Service Limit:
B18B1 engine 2,350 – 2,650 rpm
B18C1 engine 2,250 – 2,550 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D4], [2], [1] and [R] position	• Low fluid level or ATF pump output • Clogged ATF strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in [1] position	• Slippage of 1st clutch, 1st-hold clutch or 1st gear one-way clutch
Stall rpm high in [2] position	• Slippage of 2nd clutch
Stall rpm high in [D4] position	• Slippage of 1st clutch, 1st gear one-way clutch
Stall rpm high in [R] position	• Slippage of 4th clutch
Stall rpm low in [D4], [2], [1] and [R] position	• Engine output low • Torque converter one-way clutch slipping

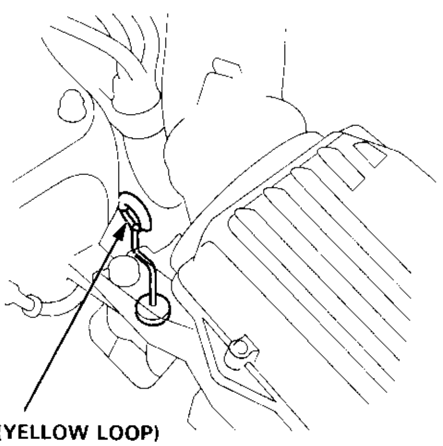
Fluid Level

Checking/Changing

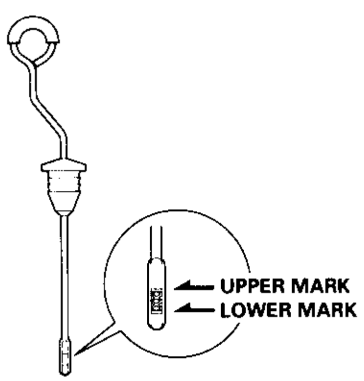
Checking

NOTE: Check the fluid level with the engine at normal operating temperature (the radiator fan comes on).

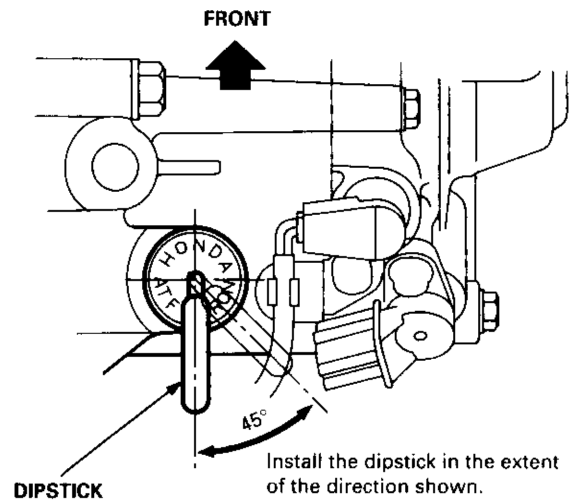
1. Park the vehicle on level ground. Turn off the engine.
2. Remove the dipstick (yellow loop) from the transmission, and wipe it with a clean cloth.
3. Insert the dipstick into the transmission.



4. Remove the dipstick and check the fluid level. It should be between the upper and lower marks.



5. If the level is below the lower mark, pour the recommended fluid* into the tube to bring it to the upper mark.
6. Insert the dipstick back into the transmission in the direction shown.

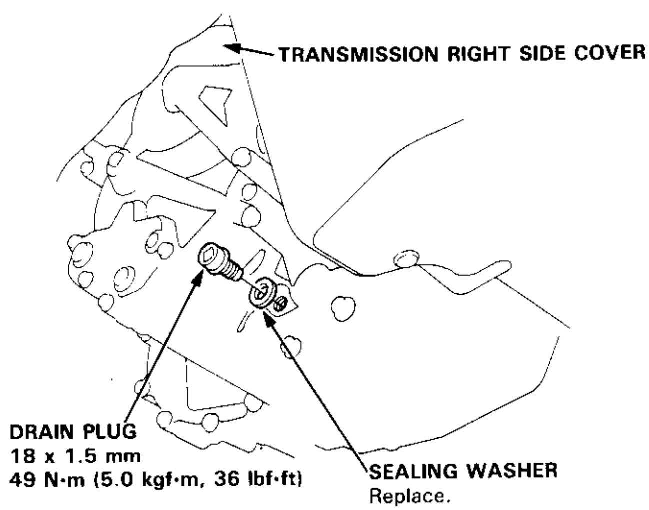


Changing

1. Bring the transmission up to operating temperature by driving the vehicle. Park the vehicle on level ground, turn the engine off, then remove drain plug and drain the automatic transmission fluid (ATF).
2. Reinstall the drain plug with a new sealing washer, then refill the transmission with the recommended fluid* to the upper mark on the dipstick.

Automatic Transmission Fluid Capacity:
2.7 ℓ (2.9 US qt, 2.4 Imp qt) at change
5.9 ℓ (6.2 US qt, 5.2 Imp qt) at overhaul
Recommended Automatic Transmission Fluid:
Genuine Honda Premium Formula Automatic Transmission Fluid (ATF)*

* Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.



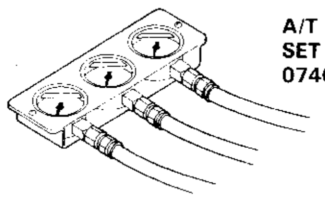
⚠ WARNING
- **While testing, be careful of the rotating front wheels.**
- **Make sure lifts, jacks, and safety stands are placed properly (see section 1).**

CAUTION: **Before testing, be sure the transmission fluid is filled to the proper level.**

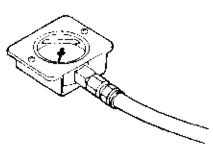
1. Raise the vehicle (see section 1).
2. Warm up the engine (the radiator fan comes on), then stop the engine and connect a tachometer.
3. Connect the special tool to each inspection hole(s).

   TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

   CAUTION: **Connect the A/T pressure gauge securely, be sure not to allow dust and other foreign particles to enter the inspection hole.**

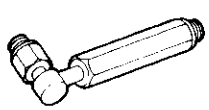


A/T PRESSURE GAUGE SET W/PANEL 07406–0020400



A/T LOW PRESSURE GAUGE W/PANEL 07406–0070300

A/T PRESSURE HOSE, 2210 mm 07MAJ–PY4011A (4 Required)



A/T PRESSURE HOSE ADAPTER 07MAJ–PY40120 (4 Required)

NOTE: Use the A/T Pressure Gauge Set (07406–0020003) or A/T Low Pressure Gauge (07406–0070000), and the A/T pressure gauge hoses and adapters shown above.

4. Start the engine, and measure the respective pressures as follows.
   - Line Pressure
   - Clutch Pressure
   - Clutch Low/High Pressure
   - Throttle B Pressure
5. Install a new sealing washer and the sealing bolt in the inspection hole and tighten to the specified torque.
   TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

   NOTE: Do not reuse old sealing washers; always replace washers.

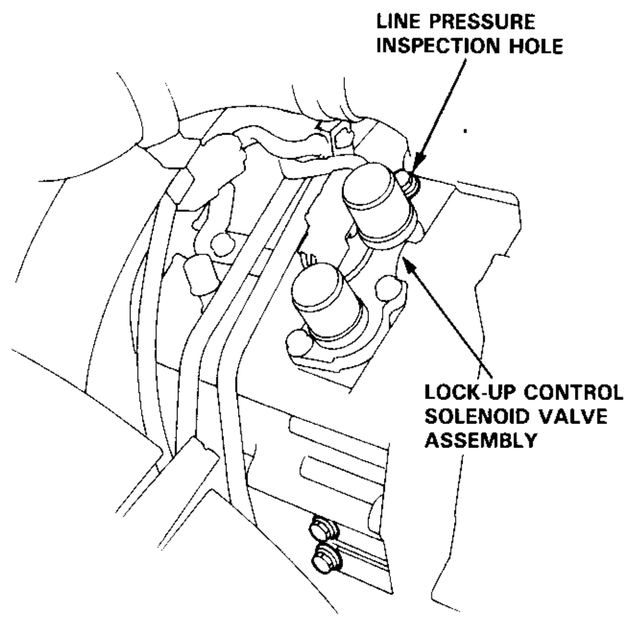
Line Pressure Measurement

–1. Set the parking brake, and block both rear wheels securely.

–2. Run the engine at 2,000 rpm.

–3. Shift to [N] or [P] position.

–4. Measure line pressure.



PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line	[N] or [P]	No (or low) line pressure	Torque converter, ATF pump, pressure regulator, torque converter check valve	830–880 kPa (8.5–9.0 kgf/cm², 120–130 psi)	780 kPa (8.0 kgf/cm², 110 psi)

NOTE: Higher pressures may be indicated if measurements are made in shift lever positions other than [N] or [P] position.

(cont'd)

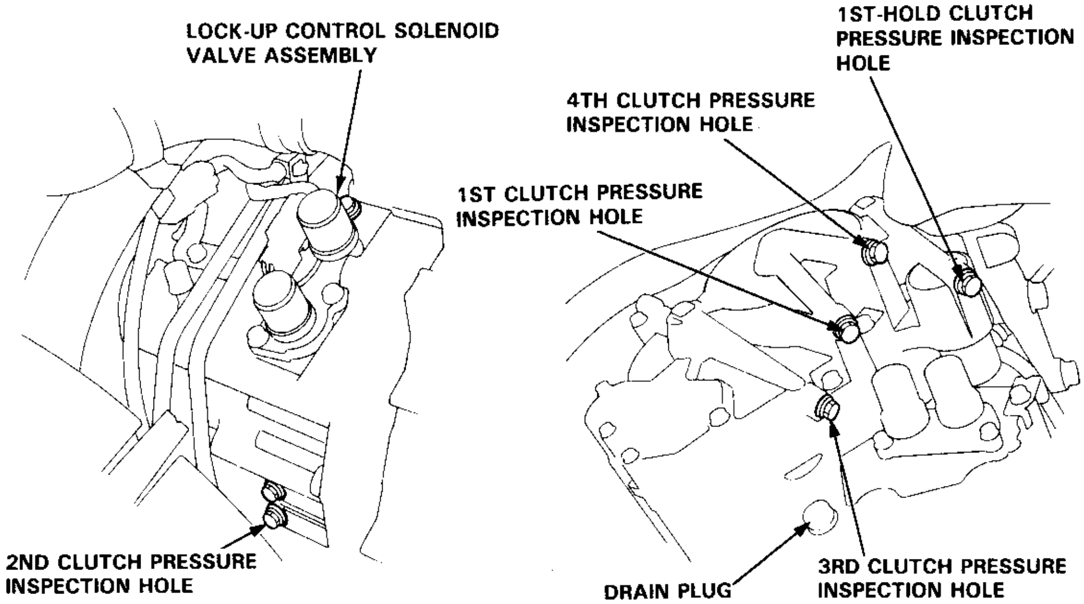
Pressure Testing

(cont'd)

Clutch Pressure Measurement

⚠ WARNING While testing, be careful of the rotating front wheels.

- 1. Set the parking brake, and block both rear wheels securely.
- 2. Raise the front of the vehicle, and support it with safety stands.
- 3. Allow the front wheels to rotate freely.
- 4. Run the engine at 2,000 rpm.
- 5. Measure each clutch pressure.



PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
1st Clutch	1 or D4	No or low 1st pressure	1st Clutch	830 – 880 kPa (8.5 – 9.0 kgf/cm^2, 120 – 130 psi)	780 kPa (8.0 kgf/cm^2, 110 psi)
1st-hold Clutch	1	No or low 1st-hold pressure	1st-hold Clutch		
2nd Clutch	2	No or low 2nd pressure	2nd Clutch		
2nd Clutch	D4	No or low 2nd pressure	2nd Clutch	420 – 480 kPa (4.3 – 4.9 kgf/cm^2, 61 – 70 psi) throttle control drum fully-closed 830 – 880 kPa (8.5 – 9.0 kgf/cm^2, 120 – 130 psi) throttle control drum more than 1/4 opened	400 kPa (4.1 kgf/cm^2, 58 psi) throttle control drum fully-closed 780 kPa (8.0 kgf/cm^2, 110 psi) throttle control drum more than 1/4 opened
3rd Clutch		No or low 3rd pressure	3rd Clutch	440 – 480 kPa (4.5 – 4.9 kgf/cm^2, 64 – 70 psi) throttle control drum fully-closed 830 – 880 kPa (8.5 – 9.0 kgf/cm^2, 120 – 130 psi) throttle control drum more than 1/4 opened	400 kPa (4.1 kgf/cm^2, 58 psi) throttle control drum fully-closed 780 kPa (8.0 kgf/cm^2, 110 psi) throttle control drum more than 1/4 opened
4th Clutch		No or low 4th pressure	4th Clutch		
	R		Servo Valve or 4th Clutch	830 – 880 kPa (8.5 – 9.0 kgf/cm^2, 120 – 130 psi)	780 kPa (8.0 kgf/cm^2, 110 psi)

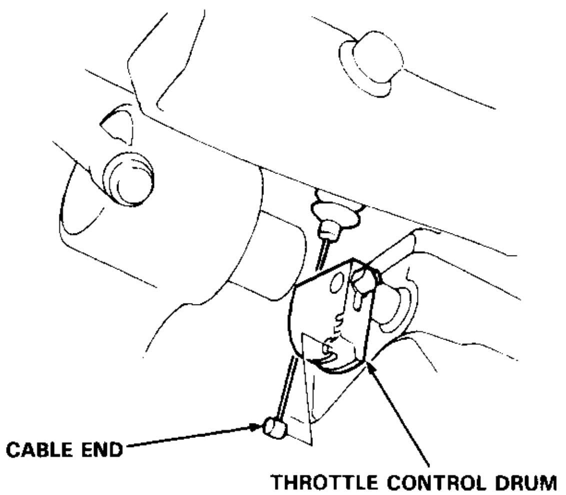
Clutch Low/High Pressure Measurement

⚠ WARNING While testing, be careful of the rotating front wheels.

— 1. Allow the front wheels to rotate freely.

— 2. Remove the cable end of the throttle control cable from the throttle control drum.

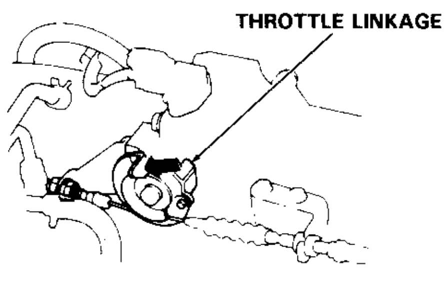
NOTE: Do not loosen the locknuts, simply unhook the cable end.



— 3. Start the engine and let it idle.

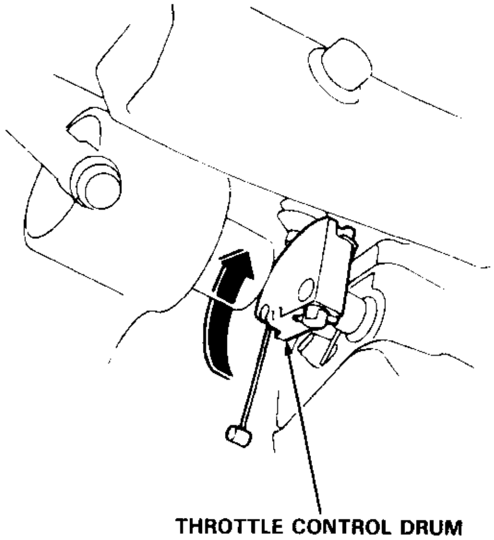
— 4. Shift to $\boxed{D_4}$ position.

— 5. Slowly move the throttle linkage to increase engine rpm until pressure is indicated on the A/T pressure gauge.
Then release the throttle linkage, allowing the engine to return to an idle, and measure the pressure reading.

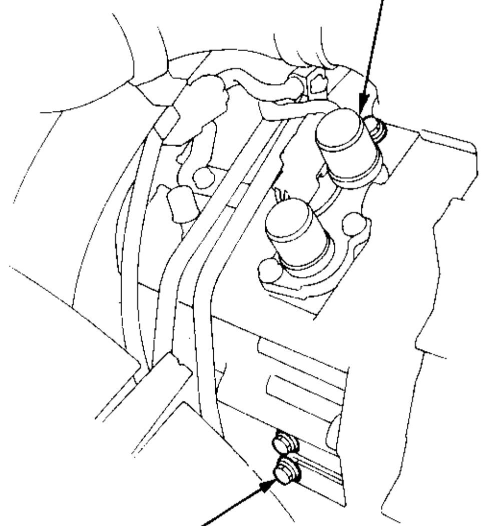


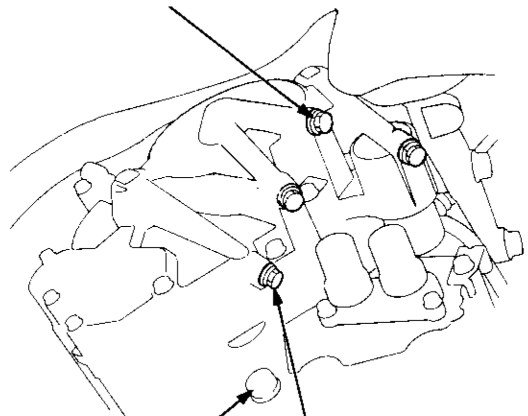
— 6. With the engine idling, lift the throttle control drum up approximately 1/2 of its possible travel and increase the engine rpm until pressure is indicated on the gauge, then measure the highest pressure reading obtained.

— 7. Repeat steps 5 and 6 for each clutch pressure being inspected.



(cont'd)





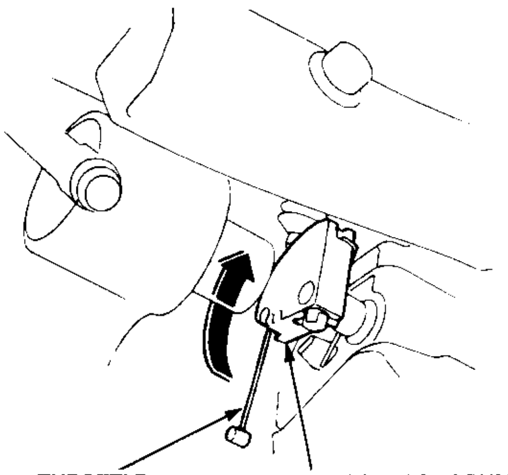
PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2nd Clutch	D4	No or low 2nd pressure	2nd Clutch	420 – 880 kPa (4.3 – 9.0 kgf/cm², 61 – 130 psi) varies with throttle opening	400 kPa (4.1 kgf/cm², 58 psi) with throttle control drum released 780 kPa (8.0 kgf/cm², 110 psi) with throttle control drum more than 1/4 opened
3rd Clutch		No or low 3rd pressure	3rd Clutch	440 – 880 kPa (4.5 – 9.0 kgf/cm², 64 – 130 psi) varies with throttle opening	
4th Clutch		No or low 4th pressure	4th Clutch		

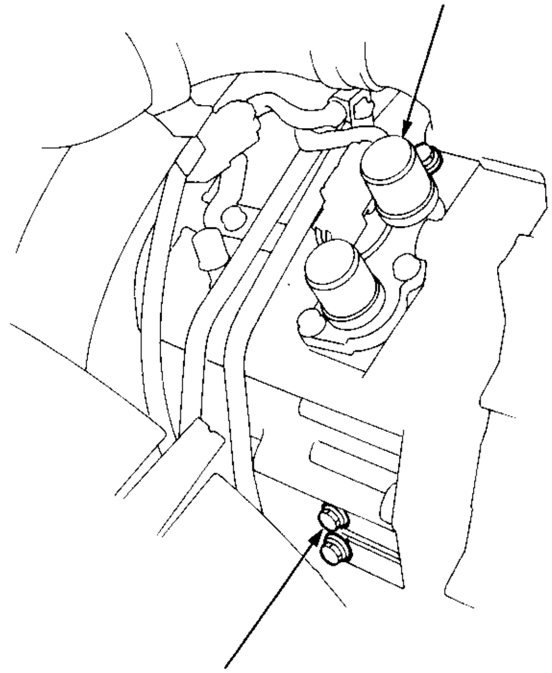
Throttle B pressure Measurement

WARNING While testing, be careful of the rotating front wheels.

- 1. Allow the front wheels to rotate freely.
- 2. Remove the cable end of the throttle control cable from the throttle control drum.

  NOTE: Do not loosen the locknuts, simply unhook the cable end.
- 3. Shift to D4 or D3 position.
- 4. Run the engine at 2,000 rpm.
- 5. Measure fully-closed throttle B pressure.
- 6. Move the throttle control drum to fully-opened throttle position.
- 7. Measure fully-opened throttle B pressure.





PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Throttle B	D4 or D3	Pressure too high	Throttle Valve B	0–15 kPa (0–0.15 kgf/cm², 0–2.1 psi) throttle control drum fully closed	—
		No or low Throttle B pressure		830–880 kPa (8.5–9.0 kgf/cm², 120–130 psi) throttle control drum fully open	780 kPa (8.0 kgf/cm², 110 psi) throttle control drum fully open

Removal

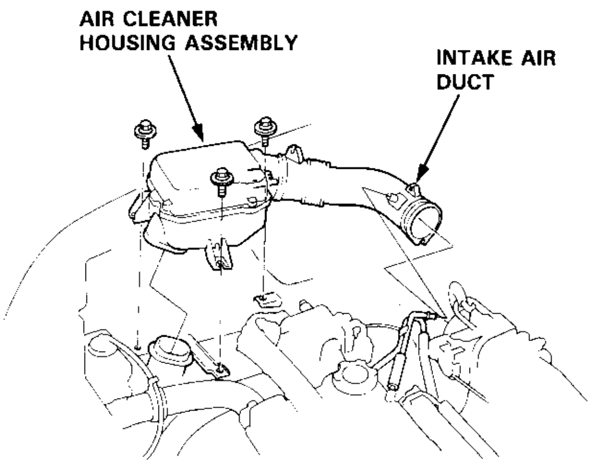
⚠ WARNING

- **Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).**
- **Apply parking brake and block rear wheels, so vehicle will not roll off stands and fall on you while working under it.**

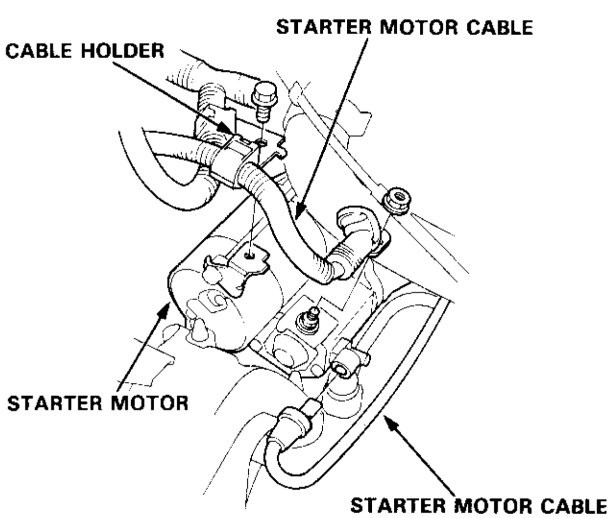
CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the battery negative (−) and positive (+) cables from the battery.

2. Remove the intake air duct and air cleaner housing assembly.

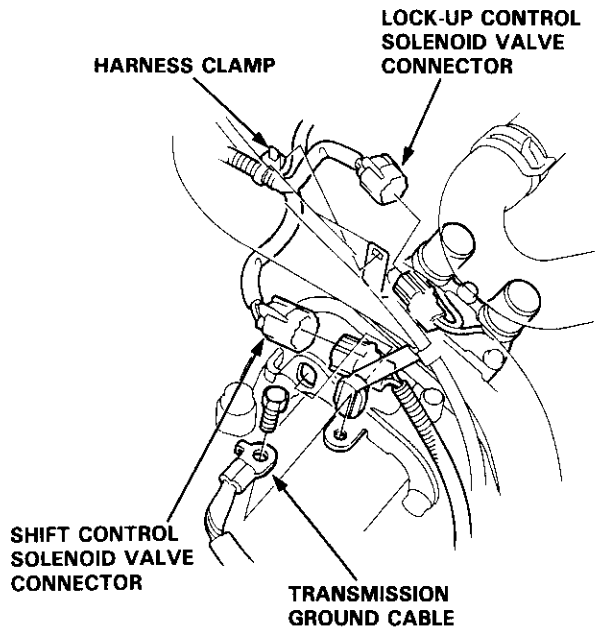


3. Remove the starter motor cables and cable holder from the starter motor.

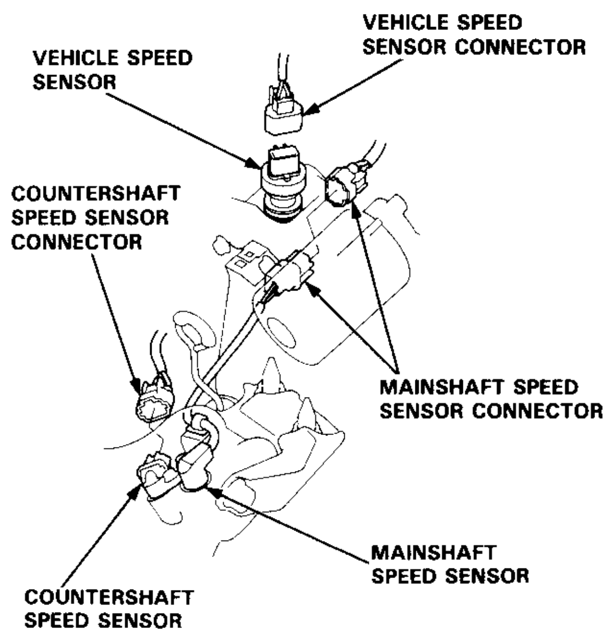


4. Remove the transmission ground cable from the transmission hanger.

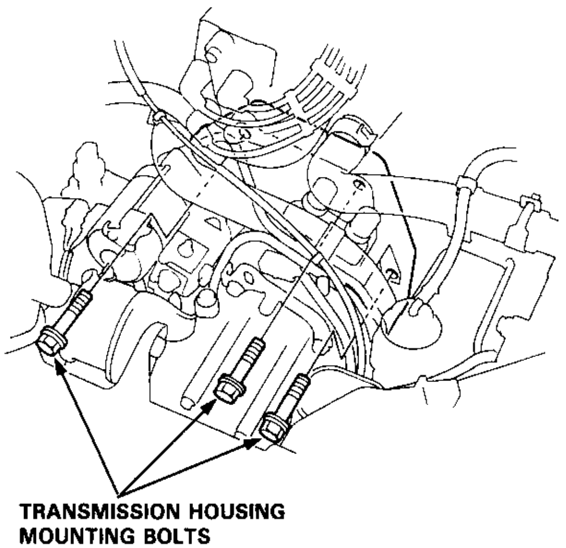
5. Disconnect the lock-up control solenoid valve connector and the shift control solenoid valve connector, then remove the harness clamp on the lock-up control solenoid harness from the harness stay.



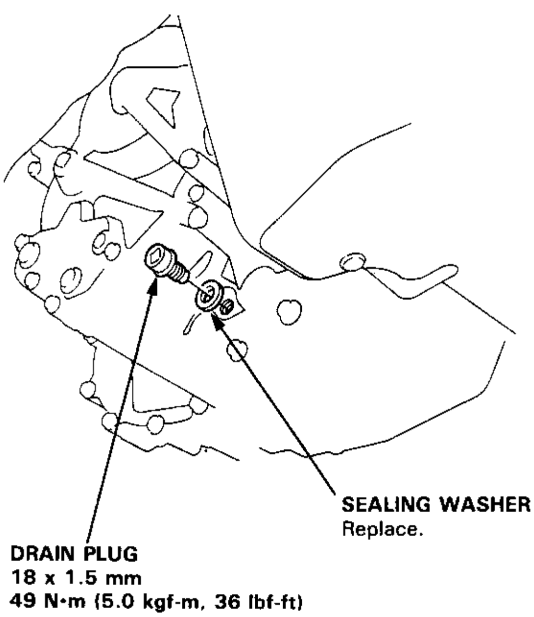
6. Disconnect the vehicle speed sensor (VSS), mainshaft speed sensor and countershaft speed sensor connectors.



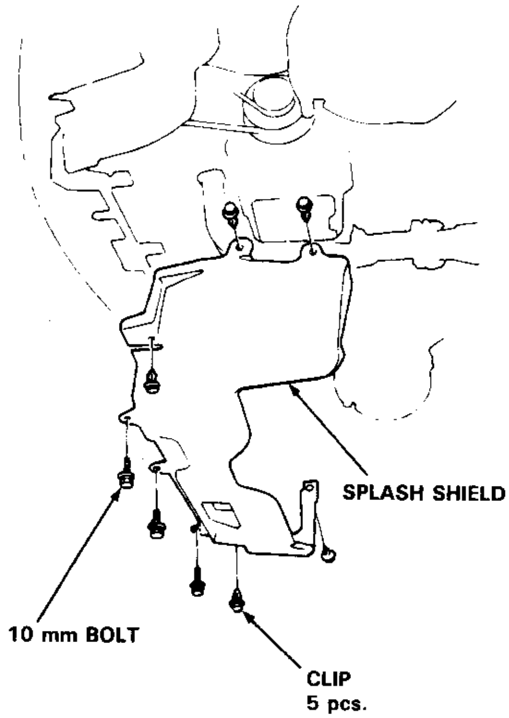
7. Remove the transmission housing mounting bolts.



8. Remove the drain plug, and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer.

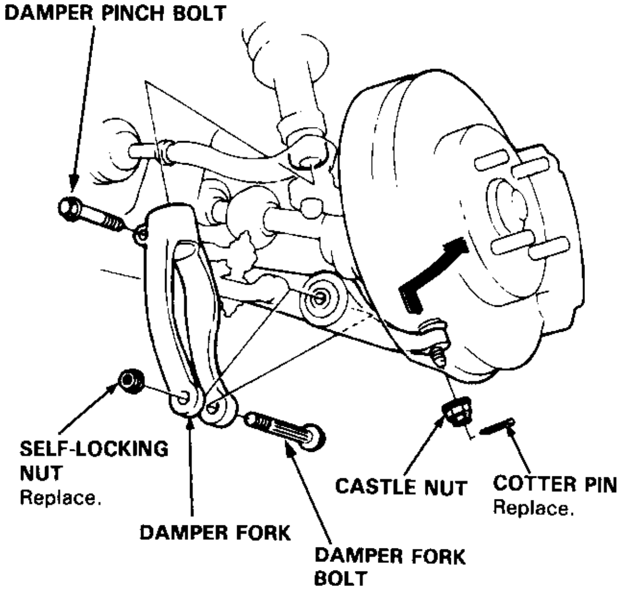


9. Remove the splash shield.



10. Remove the cotter pins and castle nuts, then separate the ball joints from the lower arm (see section 18).

11. Remove the right damper fork bolt and damper pinch bolt, then separate right damper fork and damper.

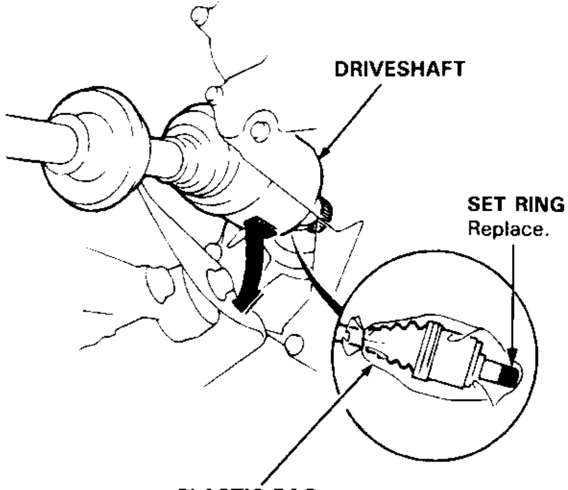


(cont'd)

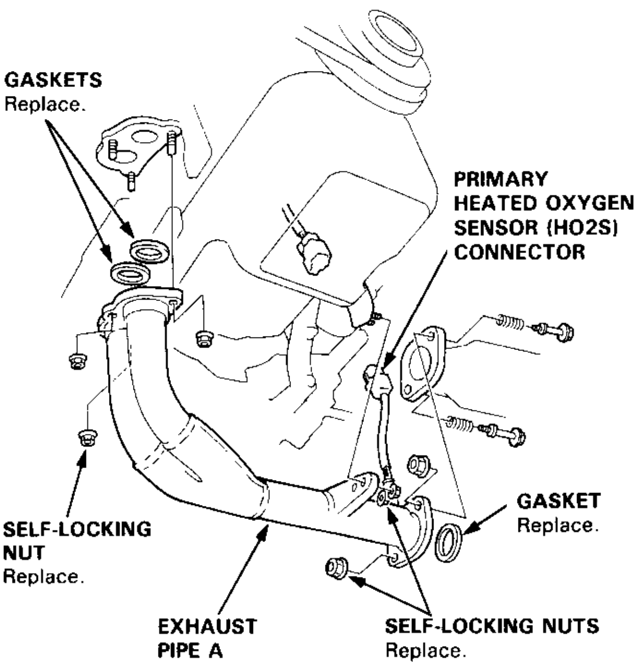
Removal (cont'd)

12. Pry the right driveshaft out of the differential, and pry the left driveshaft out of the intermediate shaft.
13. Pull on the inboard joint, and remove the right and left driveshafts (see section 16).
14. Tie plastic bags over the driveshaft ends.

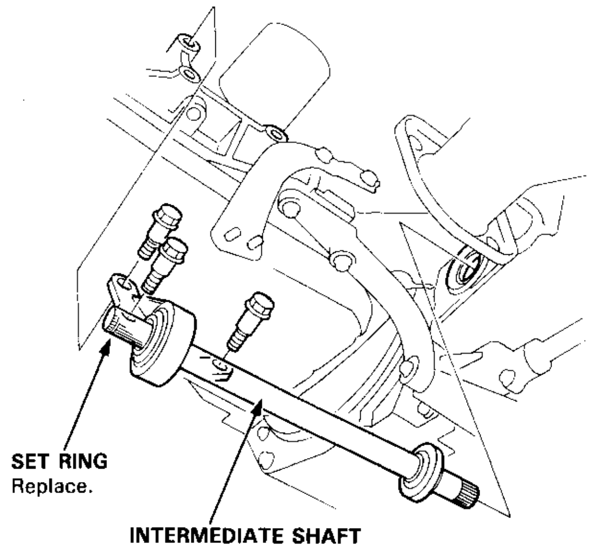
NOTE: Coat all precision finished surfaces with clean engine oil.



15. Disconnect the primary heated oxygen sensor (HO2S) connector.
16. Remove the exhaust pipe A.

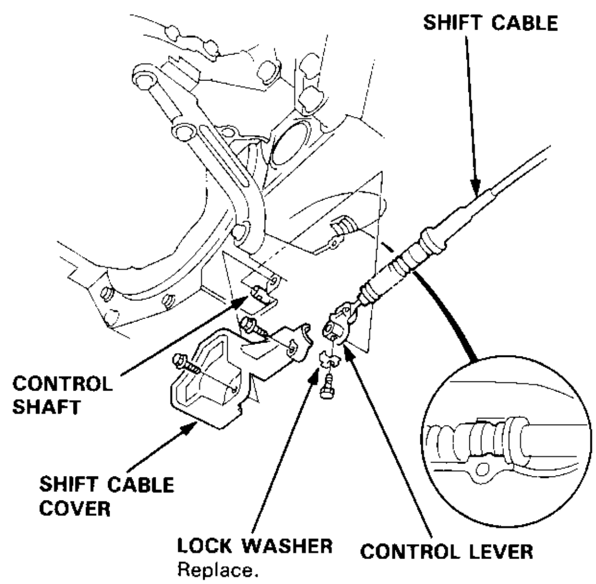


17. Remove the intermediate shaft.



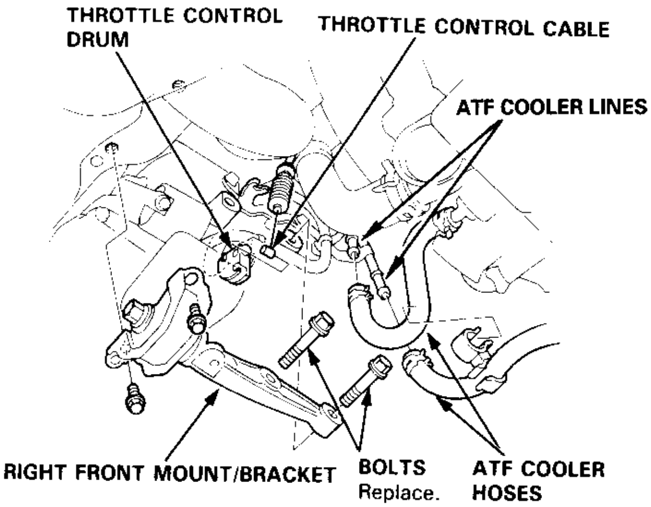
18. Remove the shift cable cover, then remove the shift cable by removing the control lever.

CAUTION: Take care not to bend the shift cable while removing it.



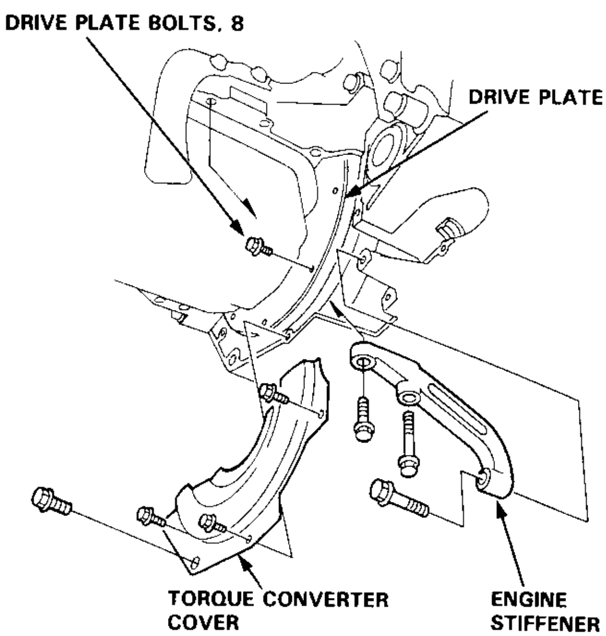
19. Remove the right front mount/bracket, then remove the end of the throttle control cable from the throttle control drum.

20. Remove the ATF cooler hoses at the ATF cooler lines. Turn the ends of the cooler hoses up to prevent ATF from flowing out, then plug the ATF cooler lines.
NOTE: Check for any sign of leakage at the hose joints.

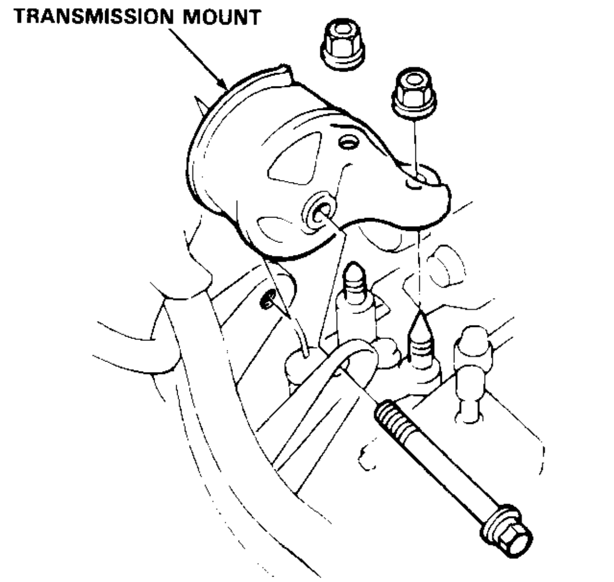


21. Remove the engine stiffener and torque converter cover.

22. Remove the eight drive plate bolts one at a time while rotating the crankshaft pulley.

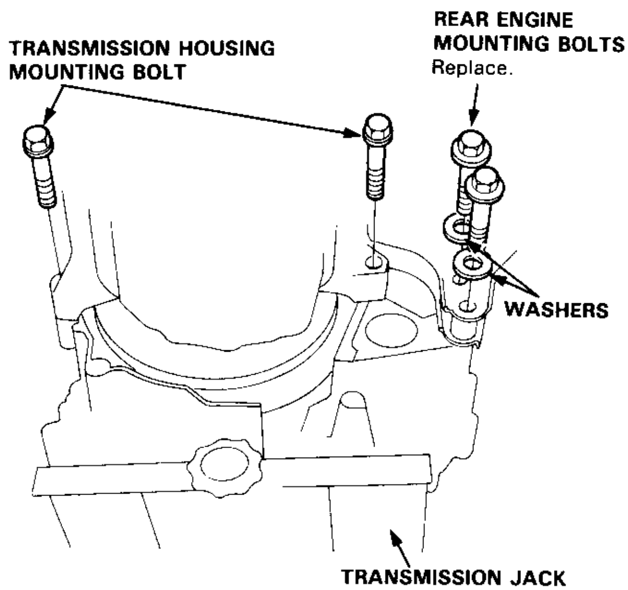


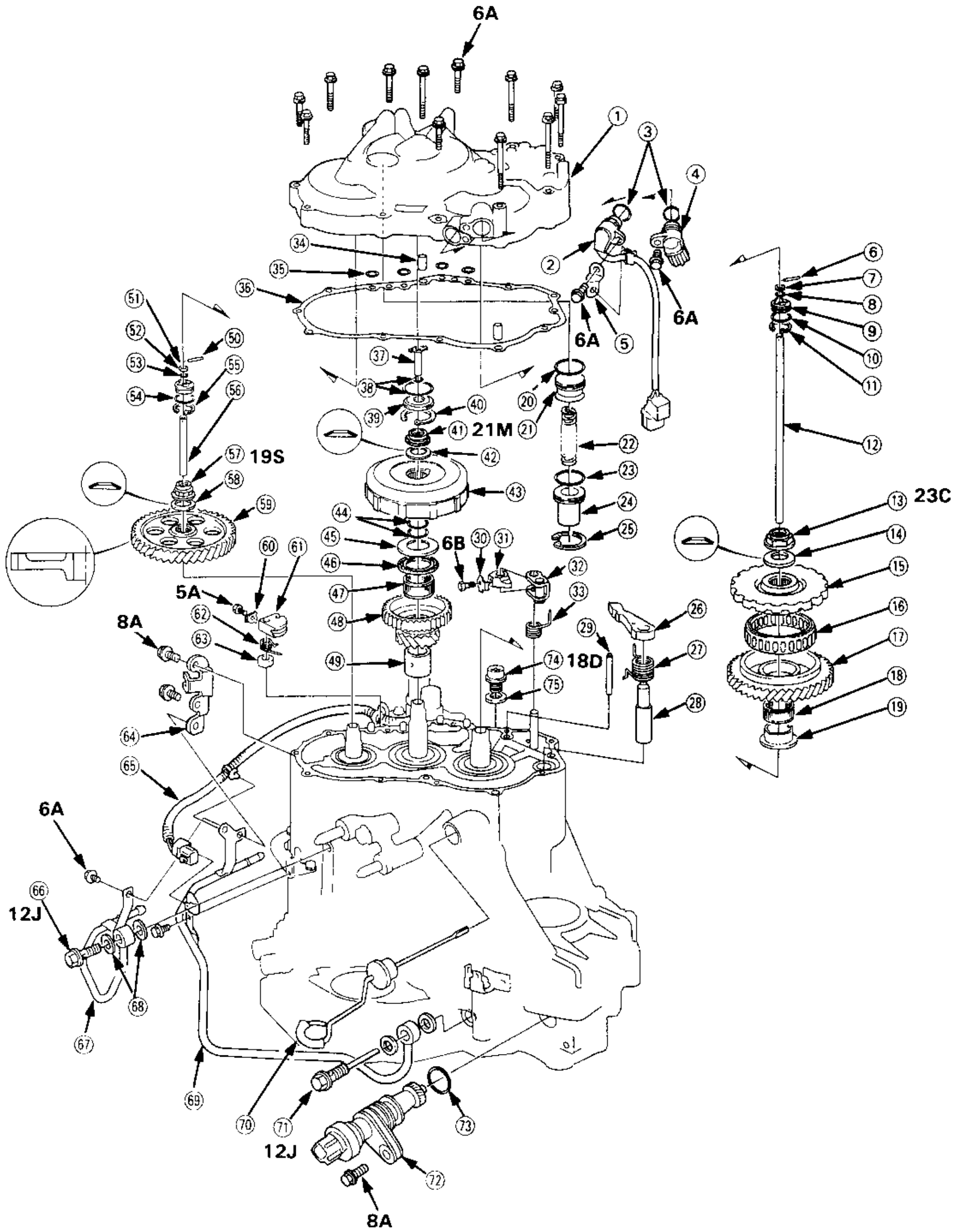
23. Place a jack under the transmission, raise the transmission just enough to take weight off of the mounts, then remove the transmission mount.



24. Remove the transmission housing mounting bolts and rear engine mounting bolts.

25. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower it on the transmission jack.



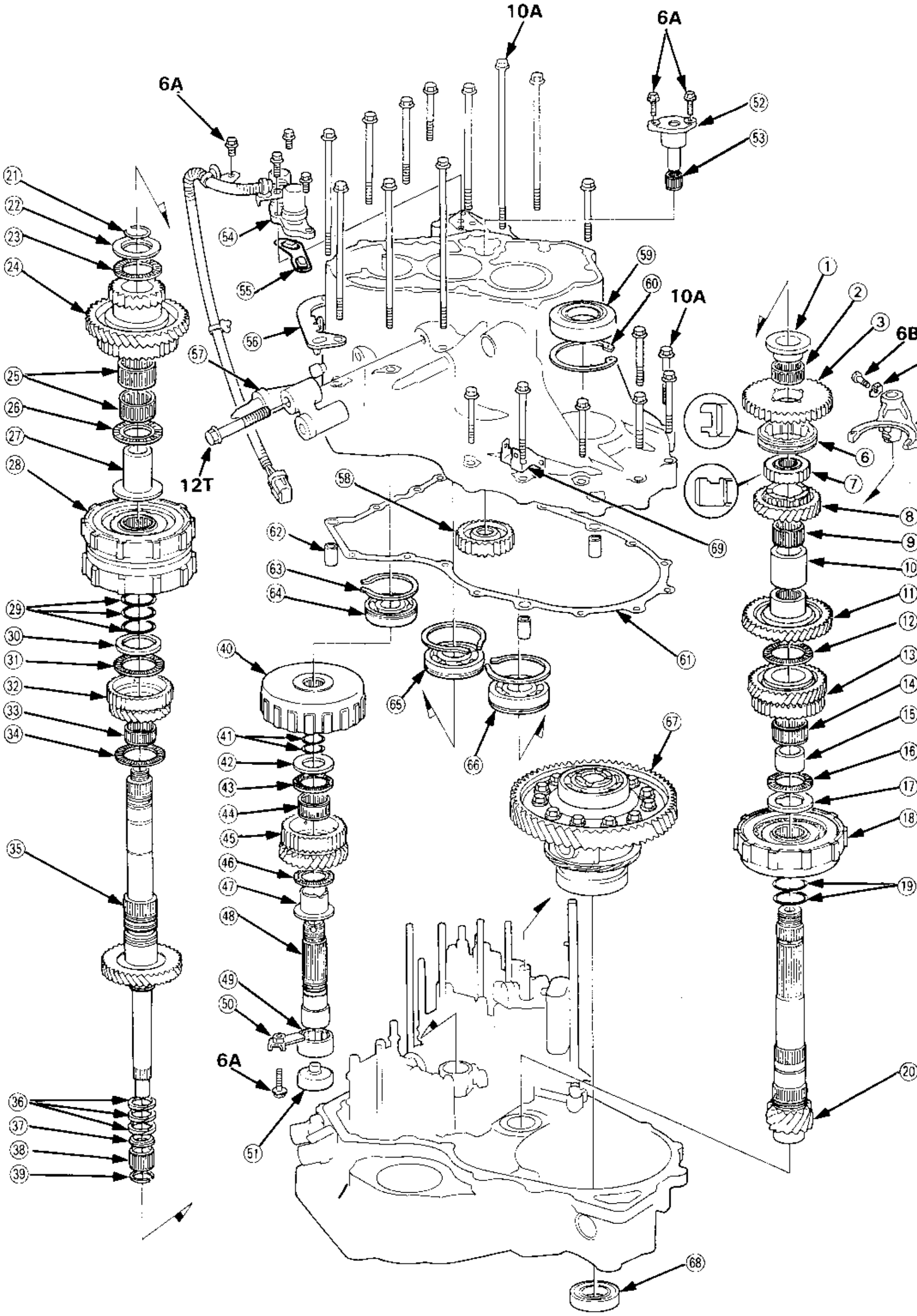


6A
1
2
3
4
5
6
7
8
9
10
11
12
13 23C
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41 21M
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57 19S
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74 18D
75
5A
6B
8A
12J

① RIGHT SIDE COVER
② MAINSHAFT SPEED SENSOR
③ O-RINGS Replace.
④ COUNTERSHAFT SPEED SENSOR
⑤ HARNESS BRACKET
⑥ ROLLER
⑦ COLLAR
⑧ O-RING Replace.
⑨ FEED PIPE FLANGE
⑩ O-RING Replace.
⑪ SNAP RING
⑫ 3RD CLUTCH FEED PIPE
⑬ COUNTERSHAFT LOCKNUT (FLANGE NUT) Replace.
⑭ COUNTERSHAFT CONICAL SPRING WASHER Replace.
⑮ PARKING GEAR
⑯ ONE-WAY CLUTCH
⑰ COUNTERSHAFT 1ST GEAR
⑱ NEEDLE BEARING
⑲ COUNTERSHAFT 1ST GEAR COLLAR
⑳ O-RING Replace.
㉑ 1ST-HOLD ACCUMULATOR PISTON
㉒ 1ST-HOLD ACCUMULATOR SPRING
㉓ O-RING Replace.
㉔ 1ST-HOLD ACCUMULATOR COVER
㉕ SNAP RING
㉖ PARKING BRAKE PAWL
㉗ PARKING BRAKE PAWL SPRING
㉘ PARKING BRAKE PAWL SHAFT
㉙ PARKING BRAKE PAWL STOPPER
㉚ LOCK WASHER Replace.
㉛ PARKING BRAKE STOP Selective part
㉜ PARKING BRAKE LEVER
㉝ PARKING BRAKE LEVER SPRING
㉞ DOWEL PIN
㉟ O-RINGS Replace.
㊱ RIGHT SIDE COVER GASKET Replace.
㊲ 1ST CLUTCH FEED PIPE
㊳ O-RINGS Replace.
㊴ FEED PIPE GUIDE
㊵ SNAP RING
㊶ MAINSHAFT LOCKNUT (FLANGE NUT) Replace.
㊷ MAINSHAFT CONICAL SPRING WASHER Replace.
㊸ 1ST CLUTCH ASSEMBLY
㊹ O-RINGS Replace.
㊺ THRUST WASHER
㊻ THRUST NEEDLE BEARING
㊼ NEEDLE BEARING
㊽ MAINSHAFT 1ST GEAR
㊾ MAINSHAFT 1ST GEAR COLLAR
㊿ ROLLER
(51) COLLAR
(52) O-RING Replace.
(53) FEED PIPE FLANGE
(54) O-RING Replace.
(55) SNAP RING
(56) 1ST-HOLD CLUTCH FEED PIPE
(57) SUB-SHAFT LOCKNUT (FLANGE NUT) Replace.
(58) SUB-SHAFT CONICAL SPRING WASHER Replace.
(59) SUB-SHAFT 1ST GEAR
(60) LOCK WASHER Replace.
(61) THROTTLE CONTROL DRUM
(62) THROTTLE CONTROL DRUM SPRING
(63) OIL SEAL Replace.
(64) THROTTLE CONTROL CABLE BRACKET
(65) SHIFT CONTROL SOLENOID HARNESS
(66) JOINT BOLT
(67) ATF COOLER LINE
(68) SEALING WASHERS Replace.
(69) ATF COOLER LINE
(70) ATF DIPSTICK
(71) JOINT BOLT
(72) VEHICLE SPEED SENSOR
(73) O-RING Replace.
(74) DRAIN PLUG
(75) SEALING WASHER Replace.

TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
5A	8 N•m (0.8 kgf•m, 6 lbf•ft)	5 x 0.8 mm	
6A	12 N•m (1.2 kgf•m, 8.7 lbf•ft)	6 x 1.0 mm	
6B	14 N•m (1.4 kgf•m, 10 lbf•ft)	6 x 1.0 mm	
8A	22 N•m (2.2 kgf•m, 16 lbf•ft)	8 x 1.25 mm	
12J	28 N•m (2.9 kgf•m, 21 lbf•ft)	12 x 1.25 mm	Joint bolt
18D	49 N•m (5.0 kgf•m, 36 lbf•ft)	18 x 1.5 mm	Drain plug
19S	93 N•m (9.5 kgf•m, 69 lbf•ft)	19 x 1.25 mm	Sub-shaft locknut
21M	78 N•m (8.0 kgf•m, 58 lbf•ft)	21 x 1.25 mm	Mainshaft locknut: Left-hand threads
23C	103→0→103 N•m (10.5→0→10.5 kgf•m, 75.9→0→75.9 lbf•ft)	23 x 1.25 mm	Countershaft locknut: Left-hand threads



10A
6A
6A
12T
10A
6B
6A

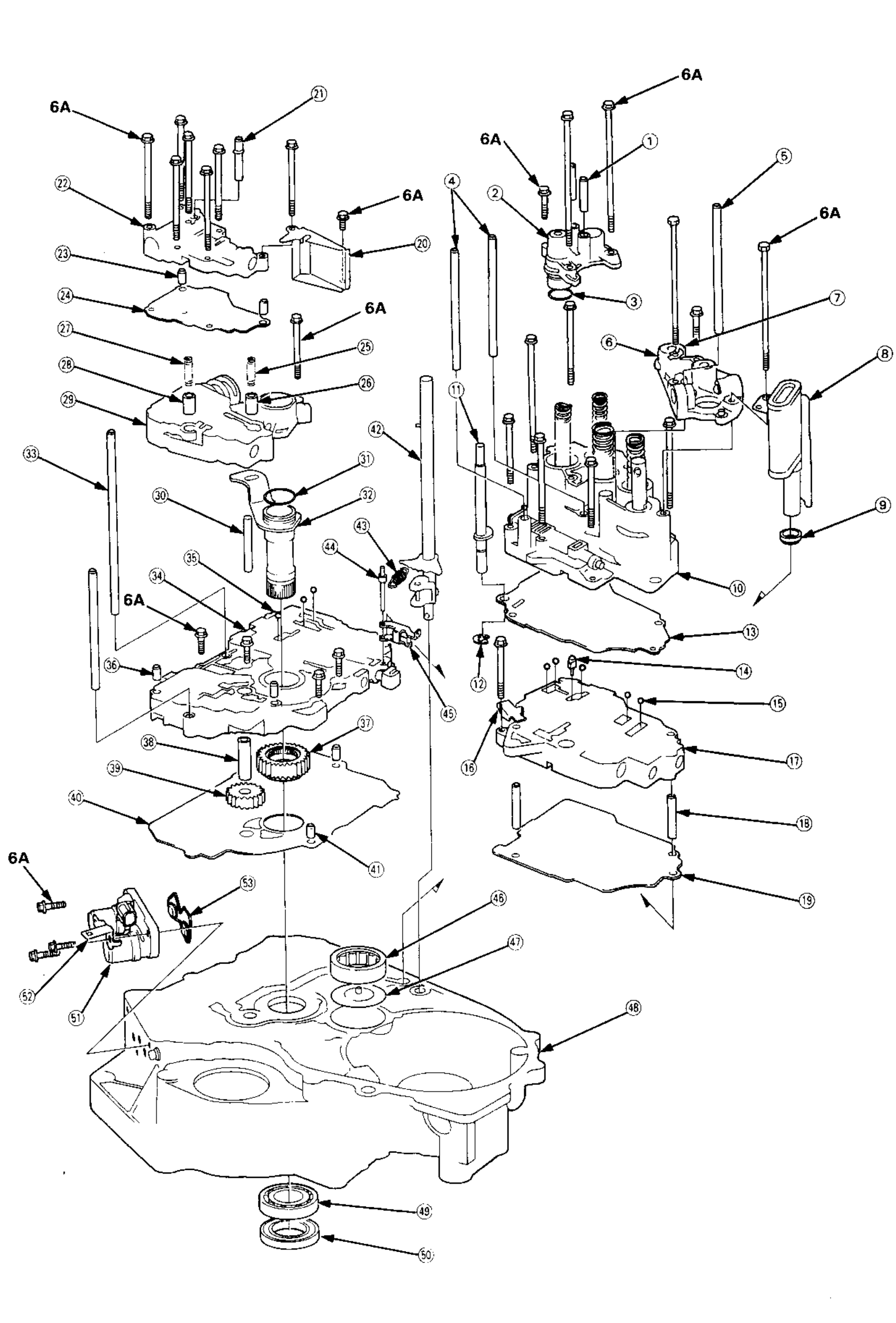
1. COUNTERSHAFT REVERSE GEAR COLLAR
2. NEEDLE BEARING
3. COUNTERSHAFT REVERSE GEAR
4. LOCK WASHER Replace.
5. REVERSE SHIFT FORK
6. REVERSE SELECTOR
7. REVERSE SELECTOR HUB
8. COUNTERSHAFT 4TH GEAR
9. NEEDLE BEARING
10. DISTANCE COLLAR, 28 mm Selective part
11. COUNTERSHAFT 2ND GEAR
12. THRUST NEEDLE BEARING
13. COUNTERSHAFT 3RD GEAR
14. NEEDLE BEARING
15. COUNTERSHAFT 3RD GEAR COLLAR
16. THRUST NEEDLE BEARING
17. SPLINED WASHER
18. 3RD CLUTCH ASSEMBLY
19. O-RINGS Replace.
20. COUNTERSHAFT
21. SNAP RING
22. THRUST WASHER
23. THRUST NEEDLE BEARING
24. MAINSHAFT 4TH GEAR
25. NEEDLE BEARINGS
26. THRUST NEEDLE BEARING
27. MAINSHAFT 4TH GEAR COLLAR
28. 2ND/4TH CLUTCH ASSEMBLY
29. O-RINGS Replace.
30. THRUST WASHER, 36.5 x 55 mm Selective part
31. THRUST NEEDLE BEARING
32. MAINSHAFT 2ND GEAR
33. NEEDLE BEARING
34. THRUST NEEDLE BEARING
35. MAINSHAFT
36. SEALING RINGS, 35 mm
37. SEALING RING, 29 mm
38. NEEDLE BEARING
39. SET RING
40. 1ST-HOLD CLUTCH ASSEMBLY
41. O-RINGS Replace.
42. THRUST WASHER
43. THRUST NEEDLE BEARING
44. NEEDLE BEARING
45. SUB-SHAFT 4TH GEAR
46. THRUST NEEDLE BEARING
47. SUB-SHAFT 4TH GEAR COLLAR
48. SUB-SHAFT
49. SUB-SHAFT NEEDLE BEARING
50. NEEDLE BEARING STOP
51. ATF GUIDE CAP Replace.
52. REVERSE IDLER GEAR SHAFT/HOLDER
53. NEEDLE BEARING
54. SHIFT CONTROL SOLENOID VALVE A/B
55. SHIFT CONTROL SOLENOID VALVE FILTER/GASKET Replace.
56. TRANSMISSION HANGER
57. TRANSMISSION MOUNT BRACKET
58. REVERSE IDLER GEAR
59. OIL SEAL Replace.
60. THRUST SHIM, 80 mm Selective part
61. TRANSMISSION HOUSING GASKET Replace.
62. DOWEL PIN
63. SNAP RING
64. SUB-SHAFT TRANSMISSION HOUSING BEARING
65. MAINSHAFT TRANSMISSION HOUSING BEARING
66. COUNTERSHAFT TRANSMISSION HOUSING BEARING
67. DIFFERENTIAL ASSEMBLY
68. OIL SEAL Replace.
69. CONNECTOR BRACKET

TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
6B	14 N·m (1.4 kgf·m, 10 lbf·ft)	6 x 1.0 mm	
10A	44 N·m (4.5 kgf·m, 33 lbf·ft)	10 x 1.25 mm	
12T	49 N·m (5.0 kgf·m, 36 lbf·ft)	12 x 1.25 mm	

Illustrated Index

Torque Converter Housing/Valve Body



1. ATF FEED PIPE
2. ACCUMULATOR COVER
3. O-RING Replace.
4. ATF FEED PIPES
5. ATF FEED PIPE
6. SERVO DETENT BASE
7. LOCK WASHER Replace.
8. ATF STRAINER
9. SUCTION PIPE COLLAR
10. SERVO BODY
11. THROTTLE CONTROL SHAFT
12. E RING
13. SERVO SEPARATOR PLATE
14. 1ST ACCUMULATOR CHOKE
15. CHECK BALL
16. STOP SHAFT STAY
17. SECONDARY VALVE BODY
18. DOWEL PIN
19. SECONDARY SEPARATOR PLATE
20. LUBRICATOR PLATE
21. ATF FEED PIPE
22. LOCK-UP VALVE BODY
23. DOWEL PIN
24. LOCK-UP SEPARATOR PLATE
25. TORQUE CONVERTER CHECK VALVE SPRING
26. TORQUE CONVERTER CHECK VALVE
27. COOLER CHECK VALVE SPRING
28. COOLER CHECK VALVE
29. REGULATOR VALVE BODY
30. STOP SHAFT
31. O-RING Replace.
32. STATOR SHAFT
33. ATF FEED PIPE
34. MAIN VALVE BODY
35. CHECK BALL
36. DOWEL PIN
37. ATF PUMP DRIVE GEAR
38. ATF PUMP DRIVEN GEAR SHAFT
39. ATF PUMP DRIVEN GEAR
40. MAIN SEPARATOR PLATE
41. DOWEL PIN
42. CONTROL SHAFT
43. DETENT ARM SPRING
44. DETENT ARM SHAFT
45. DETENT ARM
46. COUNTERSHAFT TORQUE CONVERTER HOUSING NEEDLE BEARING
47. ATF GUIDE PLATE
48. TORQUE CONVERTER HOUSING
49. MAINSHAFT TORQUE CONVERTER HOUSING BEARING
50. OIL SEAL Replace.
51. LOCK-UP CONTROL SOLENOID VALVE A/B ASSEMBLY
52. CONNECTOR BRACKET
53. LOCK-UP CONTROL SOLENOID VALVE FILTER/GASKET Replace.

TORQUE SPECIFICATIONS

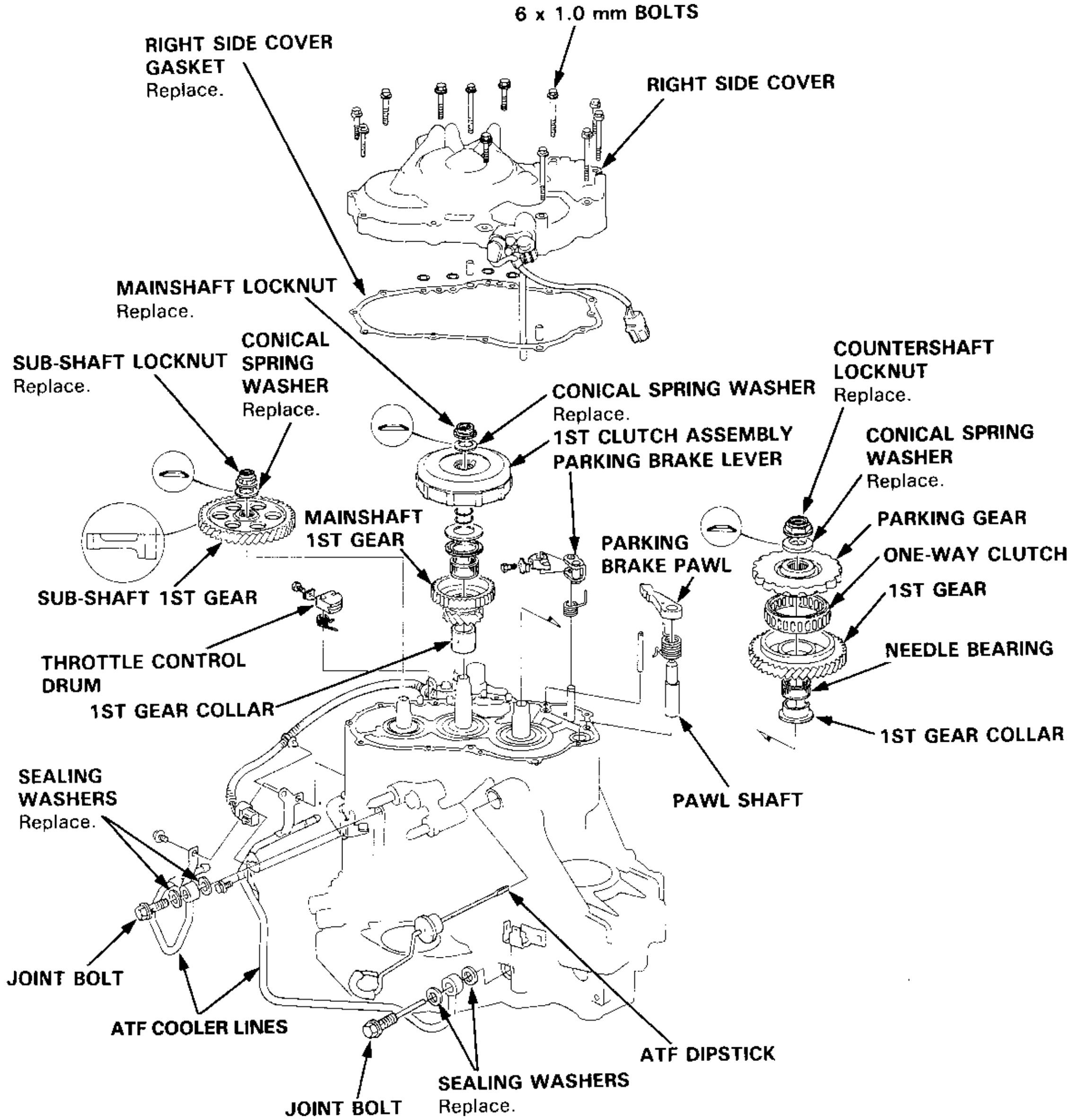
Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	

Right Side Cover

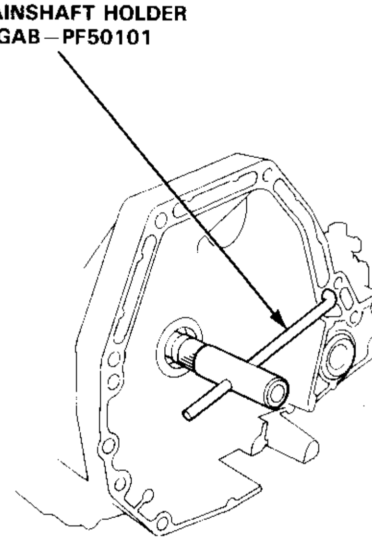
Removal

NOTE:

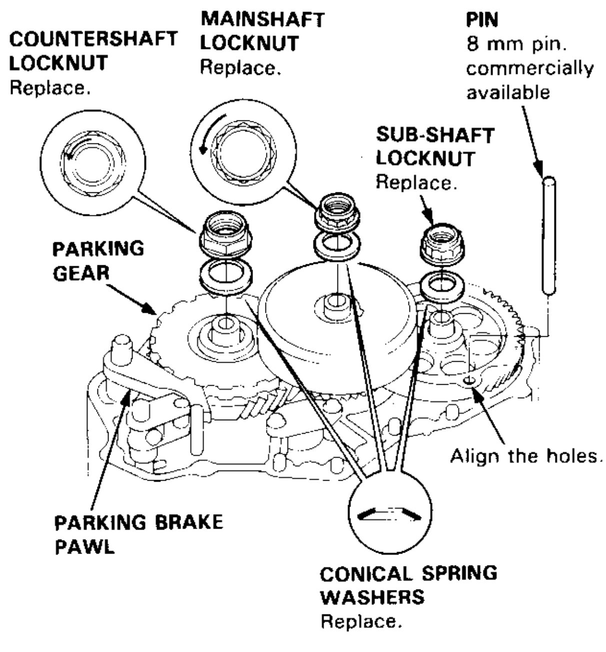
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the transmission right side cover, replace the following:
  - Right side cover gasket
  - Lock washers
  - O-rings
  - Each shaft locknut
  - Conical spring washers
  - Sealing washers



1. Remove the 13 bolts securing the right side cover, then remove the right side cover.
2. Slip the special tool onto the mainshaft as shown.



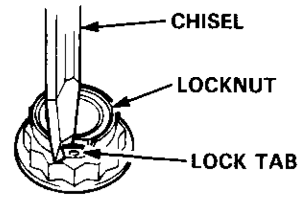
3. Engage the parking brake pawl with the parking gear.
4. Align the hole of the sub-shaft 1st gear with the hole of the the transmission housing, then insert a pin to lock the sub-shaft while removing the sub-shaft locknut.



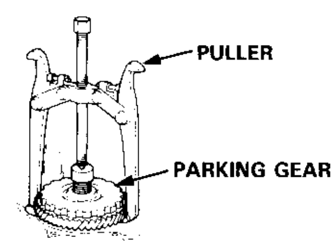
5. Cut the lock tabs of the each shaft locknut using a chisel as shown. Then remove the locknut from each shaft.

NOTE:
- Mainshaft and countershaft locknuts have left-hand threads.
- Clean the old countershaft locknut, it is used to press the parking gear on the countershaft.
- Always wear safety glasses.

CAUTION: Keep all of the chiseled particles out of the transmission.



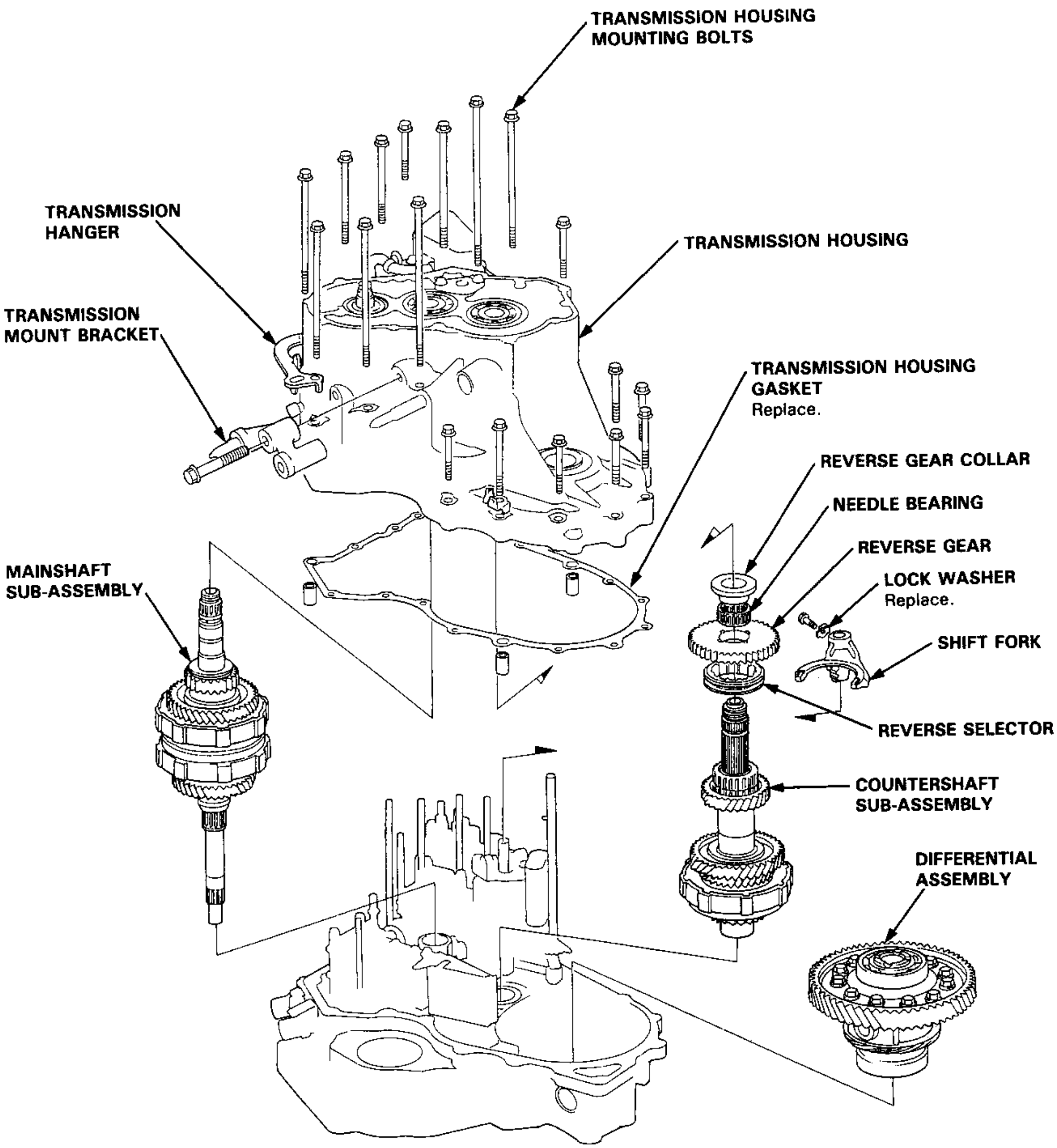
6. Remove the lock pin that was installed to hold the sub-shaft.
7. Remove the special tool from the mainshaft after removing the locknut.
8. Remove the 1st clutch and mainshaft 1st gear assembly from the mainshaft.
9. Remove the sub-shaft 1st gear.
10. Remove the parking brake pawl.
11. Using a universal two jaw puller, remove the parking gear, one-way clutch and countershaft 1st gear assembly.



12. Remove the parking brake lever from the control shaft.
13. Remove the throttle control drum from the throttle control shaft.
14. Remove the ATF cooler lines.
15. Remove the ATF dipstick.

Transmission Housing

Removal



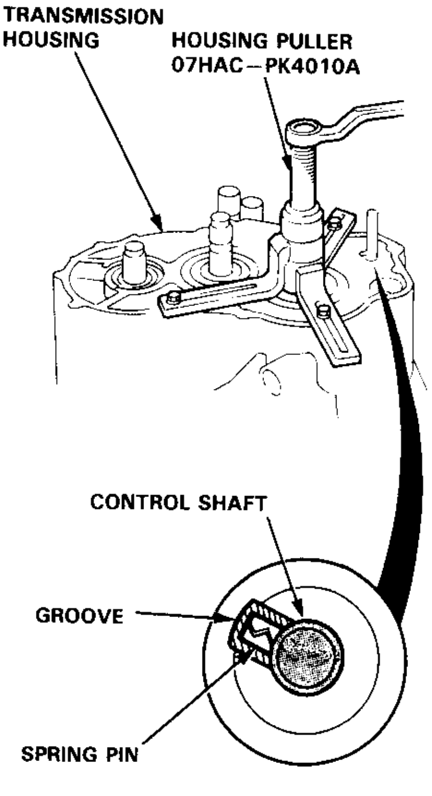
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the transmission housing, replace the following:
  - Transmission housing gasket
  - Lock washer

1. Remove the transmission mount bracket.

2. Remove the transmission housing mounting bolts and hanger.

3. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.

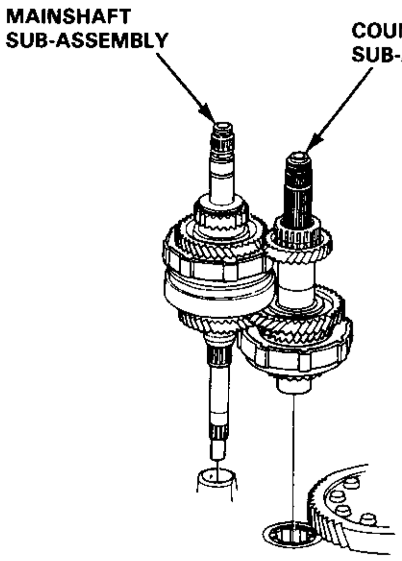
4. Install the special tool on the transmission housing, then remove the housing as shown.



5. Remove the countershaft reverse gear with the collar and needle bearing.

6. Remove the lock bolt securing the shift fork, then remove the fork with the reverse selector from the countershaft.

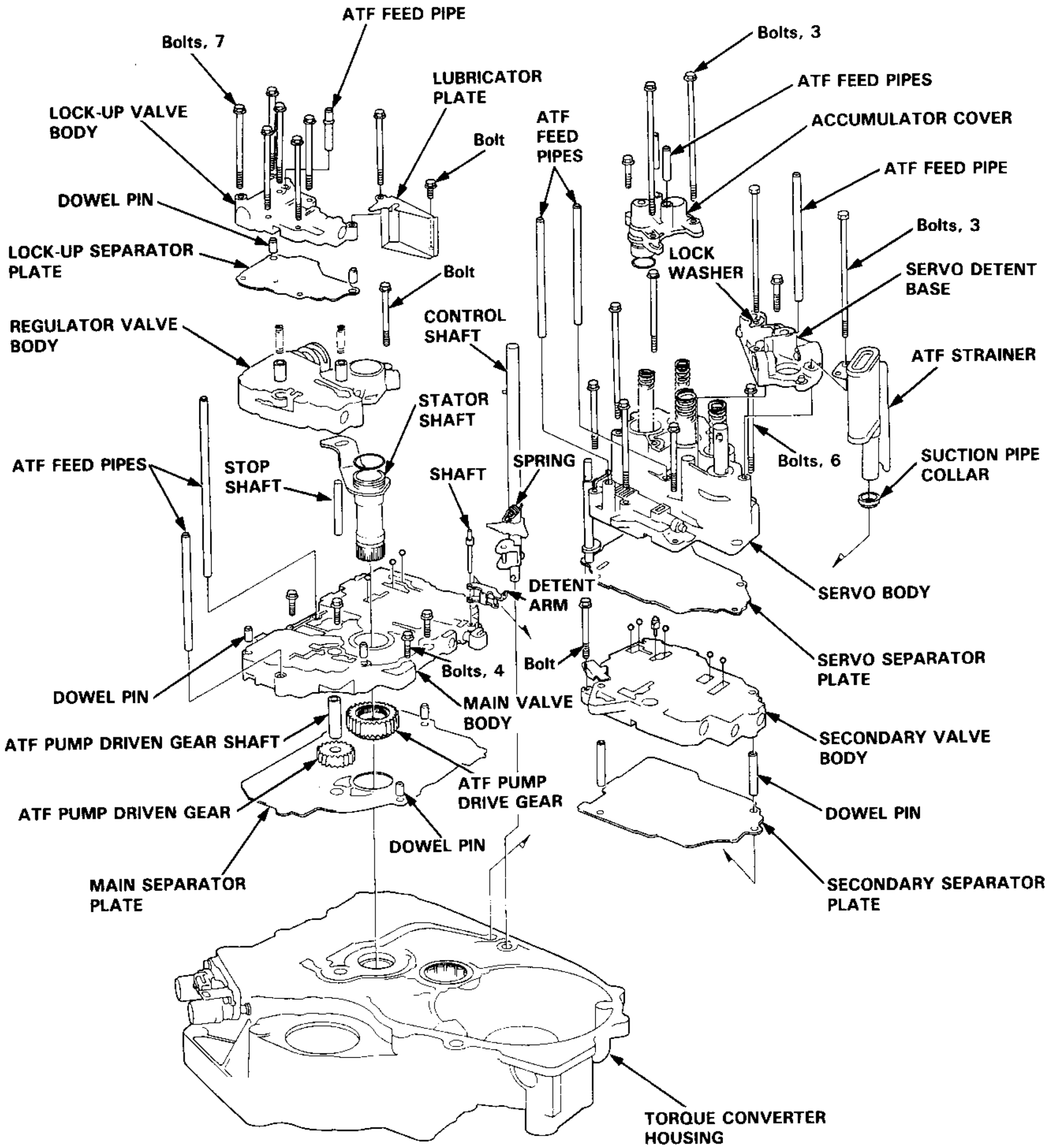
7. Remove the countershaft and mainshaft sub-assembly together.



8. Remove the differential assembly.

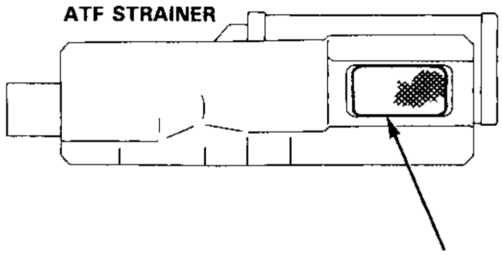
Torque Converter Housing/Valve Body

Removal



NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the valve body replace the following:
  - O-rings
  - Lock washers

1. Remove the ATF feed pipes from the servo body, servo detent base, accumulator cover, lock-up valve body and main valve body.
2. Remove the three bolts securing the ATF strainer and servo detent base, then remove the strainer and detent base.
3. Remove the three bolts securing the accumulator cover, then remove the accumulator cover.
4. Remove the six bolts securing the servo body, then remove the servo body and separator plate.
5. Remove the one bolt securing the secondary valve body, then remove the secondary valve body and separator plate.
6. Remove the eight bolts securing the lubricator plate and lock-up valve body, then remove the lubricator plate, lock-up valve body, and separator plate.
7. Remove the one bolt securing the regulator valve body, then remove the regulator valve body.
8. Remove the stator shaft and stop shaft.
9. Remove the detent spring from the detent arm, then remove the control shaft from the torque converter housing.
10. Remove the detent arm and detent arm shaft from the main valve body.
11. Remove the four bolts securing the main valve body, then remove the main valve body.
12. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
13. Remove the main separator plate with two dowel pins.
14. Clean the inlet opening of the ATF strainer thoroughly with compressed air, then check that it is in good condition, and the inlet opening is not clogged.



15. Replace the ATF strainer if it is clogged or damaged.

    NOTE: The ATF strainer can be reused if it is not clogged.

Valve Caps

Description

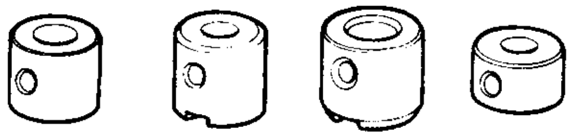
- Caps with one projected tip and one flat end are installed with the flat end toward the inside of the valve body.
- Caps with a projected tip on each end are installed with the smaller tip toward the inside of the valve body. The small tip is a spring guide.

Toward outside of valve body.

Toward inside of valve body.

- Caps with hollow ends are installed with the hollow end away from the inside of the valve body.
- Caps with notched ends are installed with the notch toward the inside of the valve body.
- Caps with flat ends and a hole through the center are installed with the smaller hole toward the inside of the valve body.

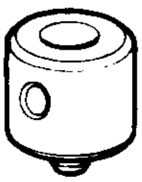
Toward outside of valve body.



Toward inside of valve body.

- Caps with one projected tip and hollow end are installed with the tip toward the inside of the valve body. The tip is a spring guide.

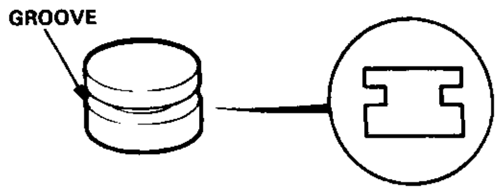
Toward outside of valve body.



Toward inside of valve body.

- Caps with flat ends and a groove around the cap are installed with the grooved side toward the outside of the valve body.

Toward outside of valve body.



Sectional view.

Toward inside of valve body.

Valve Body

Repair

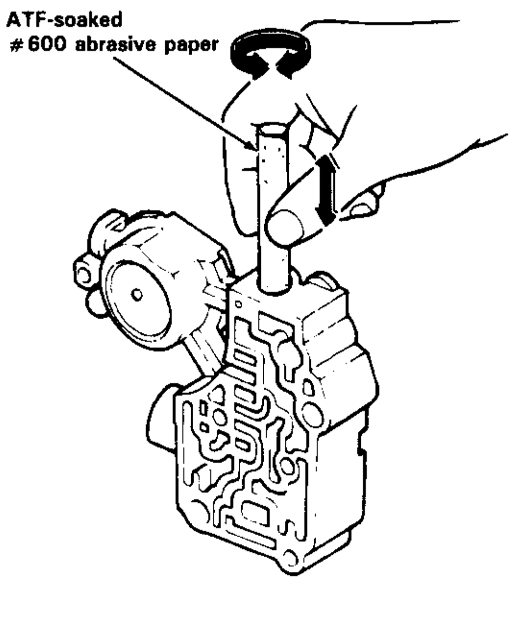
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. You may use this procedure to free the valves in the valve bodies.

1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

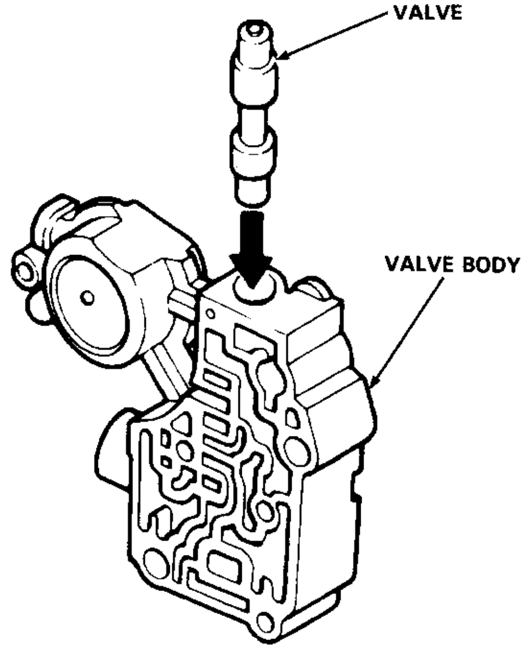
   CAUTION: It may be necessary to use a small screwdriver to pry the the valve free. Be careful not to scratch the bore with the screwdriver.

3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked paper, and insert it in the valve bore of the sticking valve.
   Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   CAUTION: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the #600 paper and thoroughly wash the entire valve body in solvent, then dry with compressed air.
6. Coat the valve with ATF then drop it into its bore.
   It should drop to the bottom of the bore under its own weight. If not, repeat step 4 then retest.
   If the valve still sticks, replace the valve body.



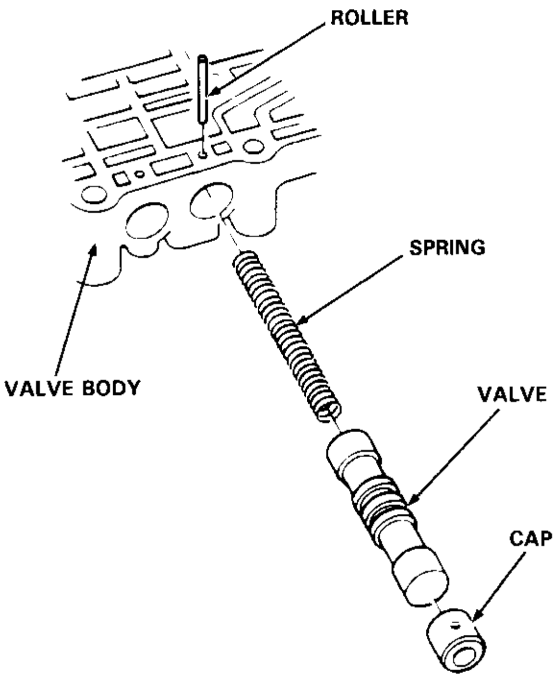
7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

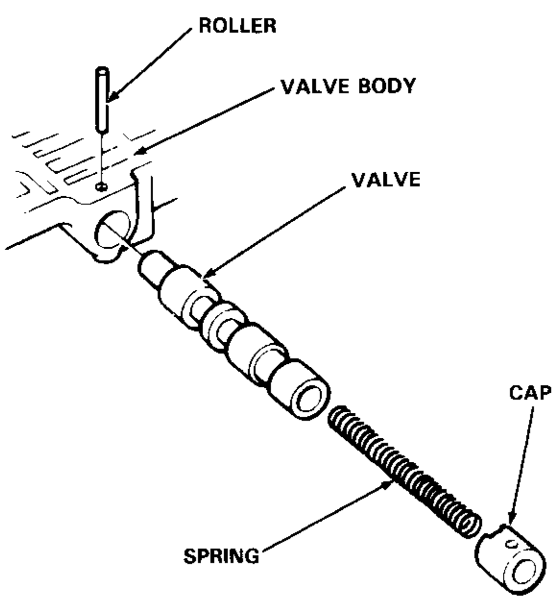
Valve

Assembly

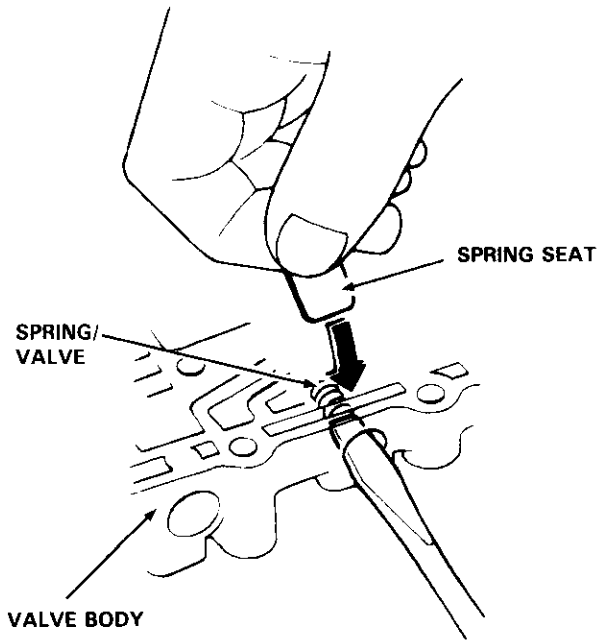
NOTE:
Coat all parts with ATF before assembly.

- Install the valve, valve spring and cap in the valve body and secure with the roller.

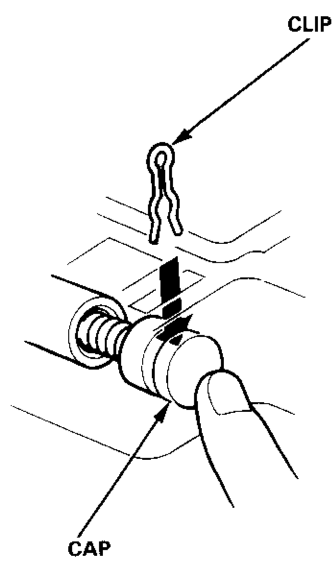




- Set the spring in the valve and install them in the valve body.
  Push the spring in with a screwdriver, then install the spring seat.



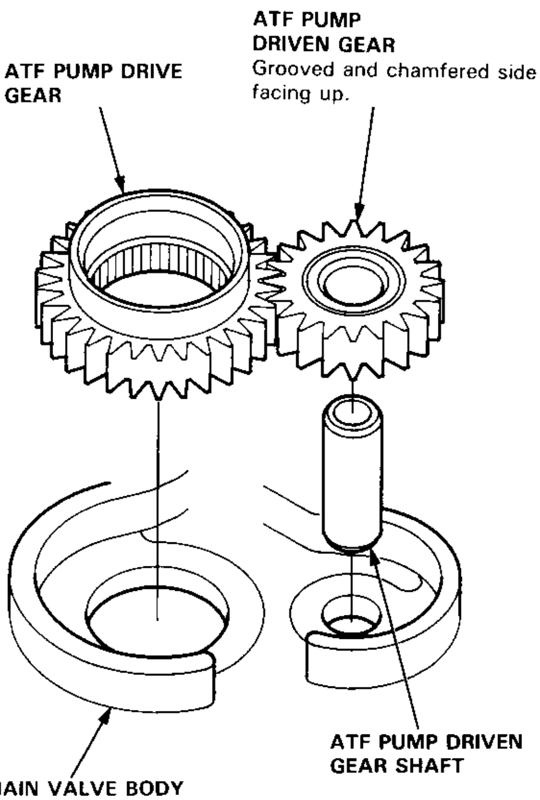
- Install the valve, spring and cap in the valve body. Push the cap, then install the clip.



Inspection

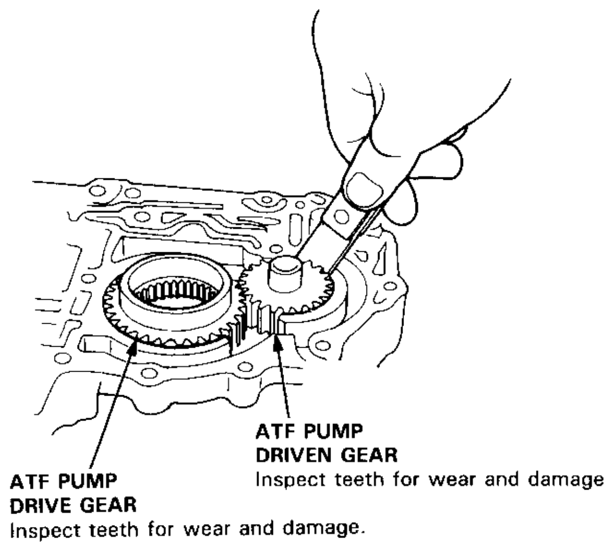
1. Install the ATF pump gears and ATF pump driven gear shaft in the main valve body.

NOTE:
- Lubricate all parts with ATF during inspecting.
- Install the ATF pump driven gear with its grooved and chamfered side facing up as shown.



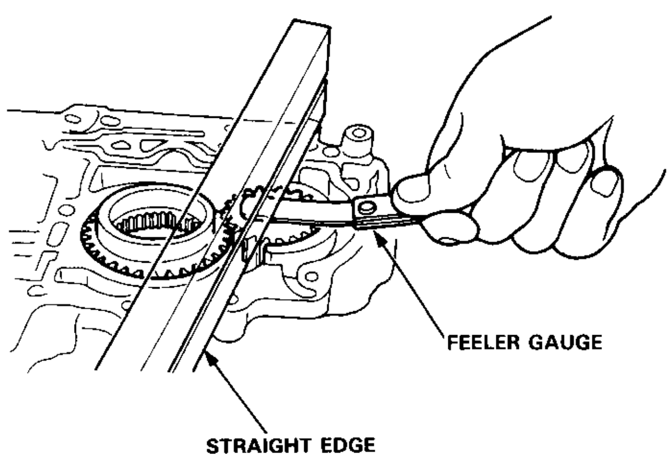
2. Measure the side clearance of the ATF pump drive and driven gears.

ATF Pump Gears Side (Radial) Clearance:
Standard (New): Drive gear
0.210–0.265 mm (0.0083–0.0104 in)
Driven gear
0.070–0.125 mm (0.0028–0.0049 in)



3. Remove the ATF pump driven gear shaft, and measure the thrust clearance of the ATF pump driven gear-to-main valve body.

ATF pump Drive/Driven Gear thrust (Axial) Clearance:
Standard (New):
0.03–0.05 mm (0.001–0.002 in)
Service Limit:
0.07 mm (0.003 in)

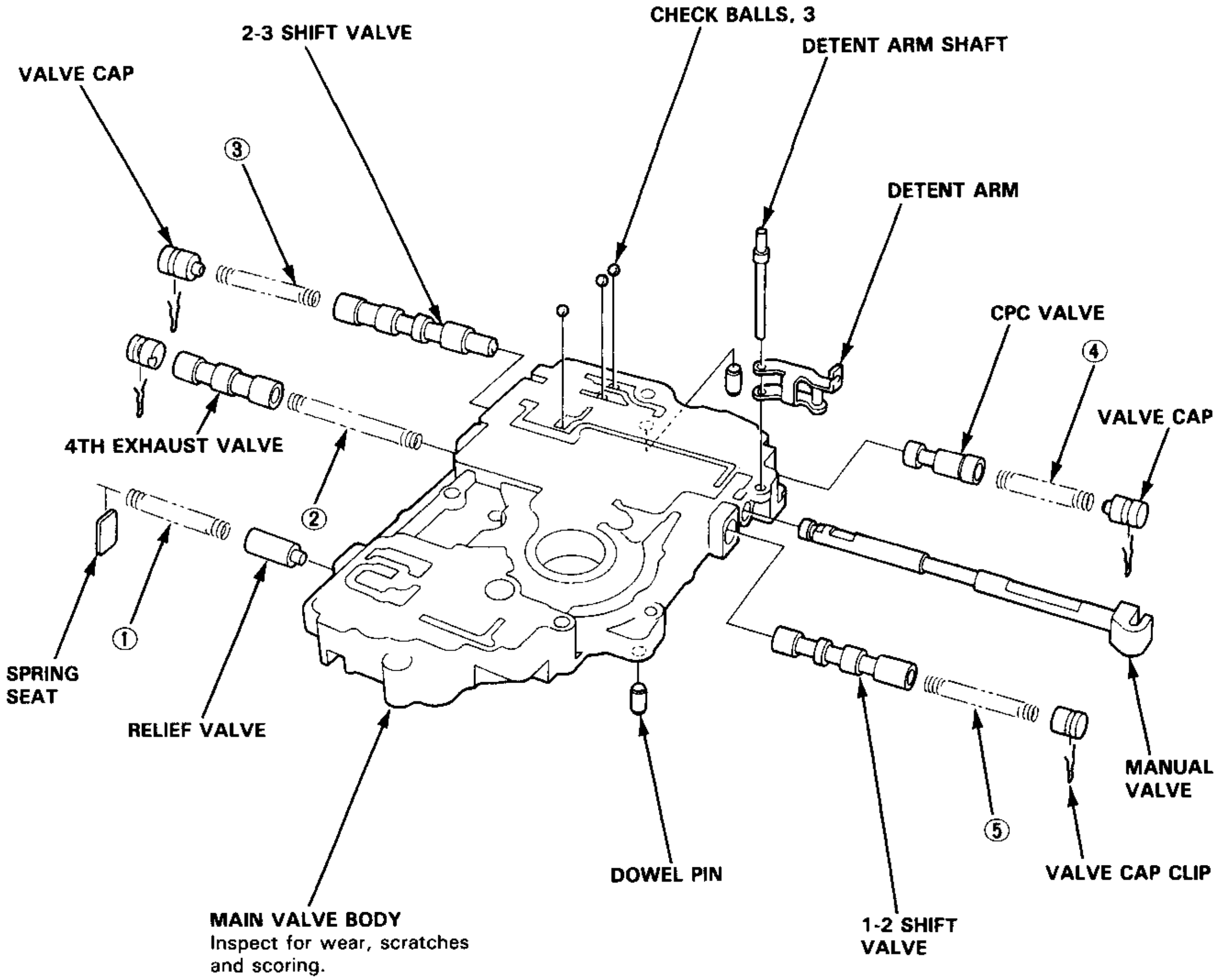


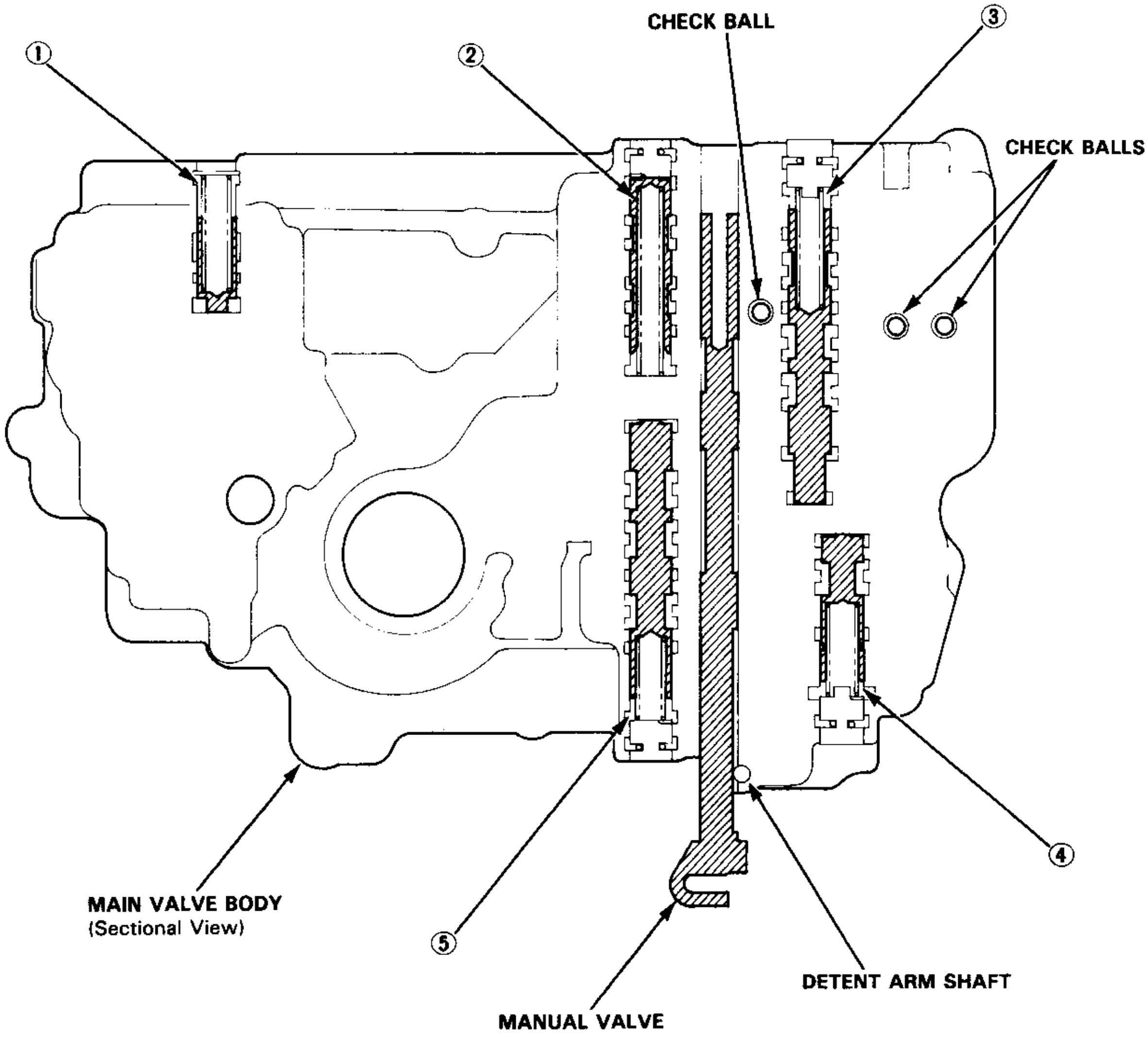
Main Valve Body

Disassembly/Inspection/Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-121.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.





SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Relief valve spring	1.1 (0.043)	8.6 (0.339)	37.1 (1.461)	13.4
②	4th exhaust valve spring	1.0 (0.039)	7.1 (0.280)	60.3 (2.374)	18.5
③	2-3 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
④	CPC valve spring	1.3 (0.051)	9.4 (0.370)	35.3 (1.390)	12.4
⑤	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5

Regulator Valve Body

Disassembly/Inspection/Reassembly

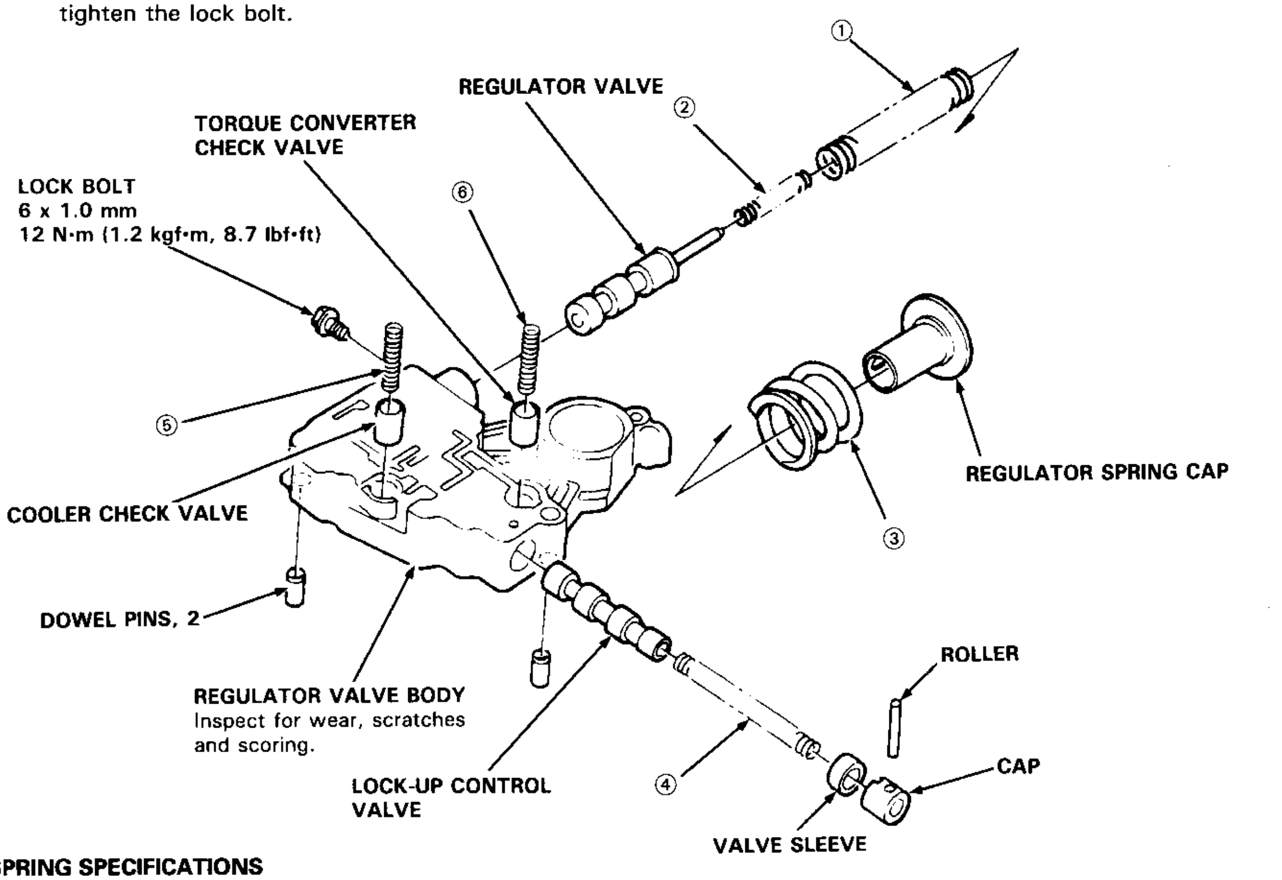
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-121.

1. Hold the regulator spring cap in place while removing the lock bolt. Once the bolt is removed, release the spring cap slowly.

   CAUTION: The regulator spring cap can pop out when the lock bolt is removed.

2. Reassembly is in the reverse order of the disassembly procedure.

   NOTE:
   - Coat all parts with ATF.
   - Align the hole in the regulator spring cap with the hole in the valve body, press the spring cap into the body and tighten the lock bolt.



SPRING SPECIFICATIONS

Unit of length: mm (in)

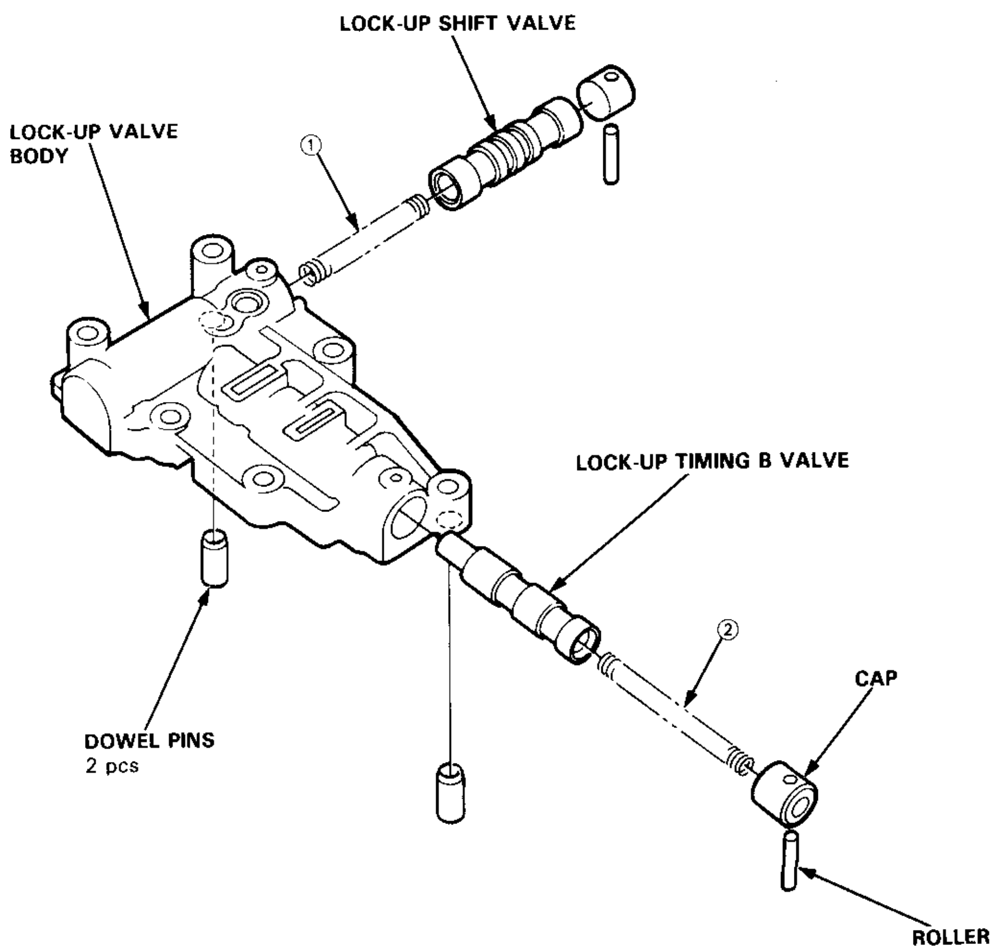
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	87.8 (3.457)	16.5
②	Regulator valve spring B	1.8 (0.071)	*6.0 (0.236)	44.0 (1.732)	7.5
③	Stator reaction spring	4.5 (0.177)	26.4 (1.039)	30.3 (1.193)	1.92
④	Lock-up control valve spring	0.8 (0.031)	6.6 (0.260)	41.6 (1.638)	27.6
⑤	Cooler check valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
⑥	Torque converter check valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2

*: Inside Diameter

Lock-up Valve Body

Disassembly/Inspection/Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-121.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
②	Lock-up timing B valve spring	0.8 (0.031)	6.6 (0.260)	60.8 (2.394)	22.1

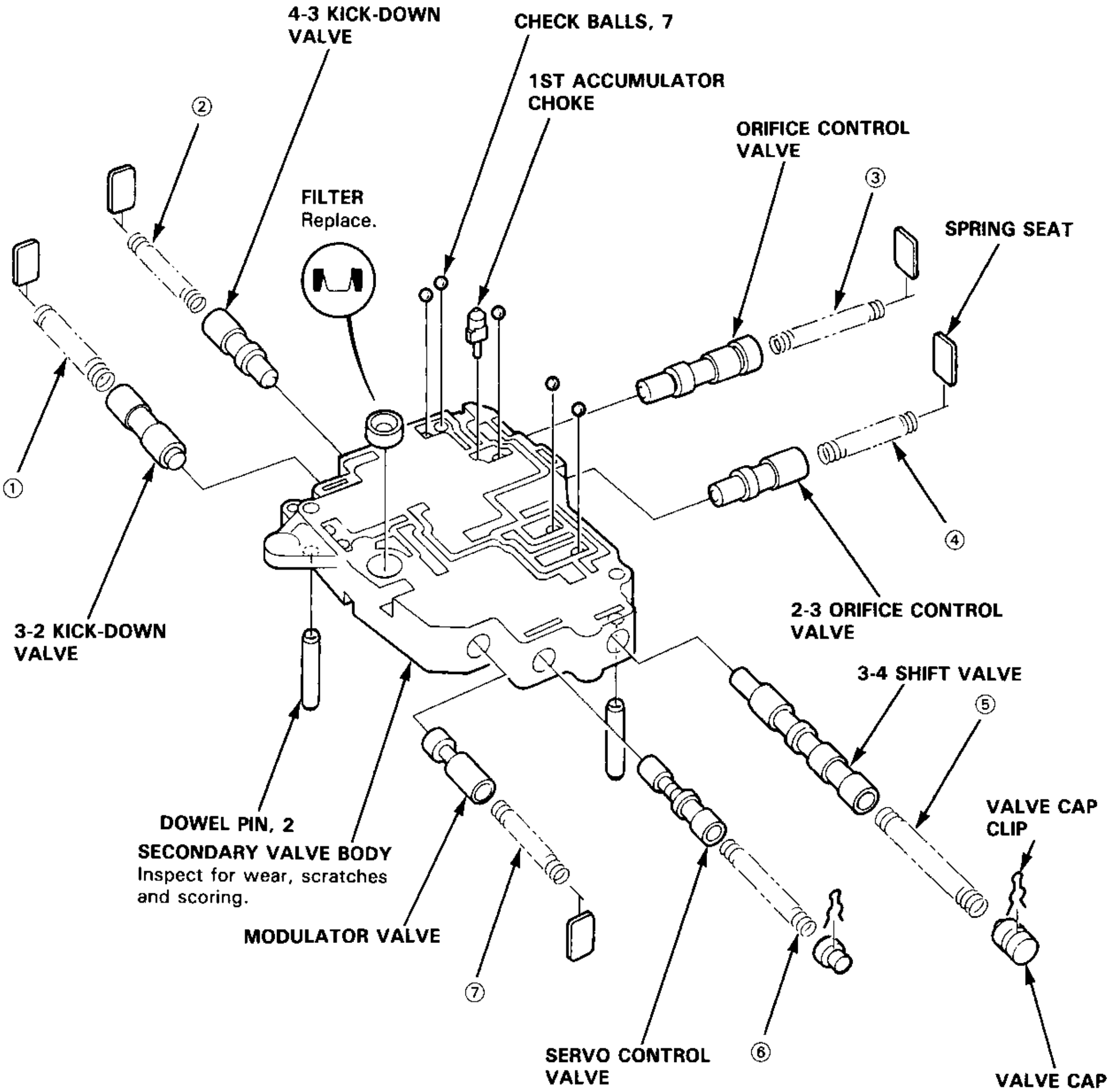
Secondary Valve Body

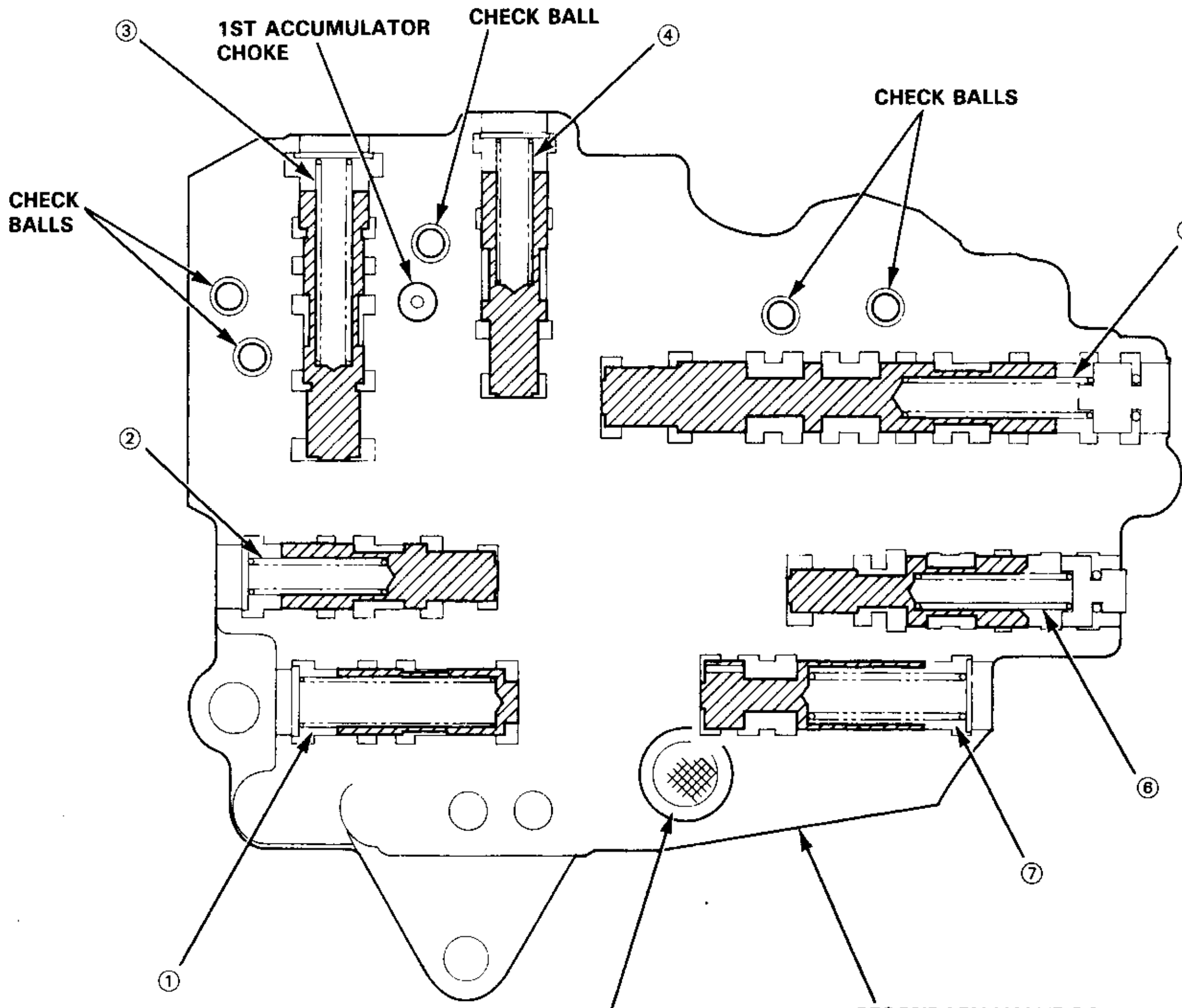
Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-121.
- Coat all parts with ATF before reassembly.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.





SPRING SPECIFICATIONS

Unit of length: mm (in)

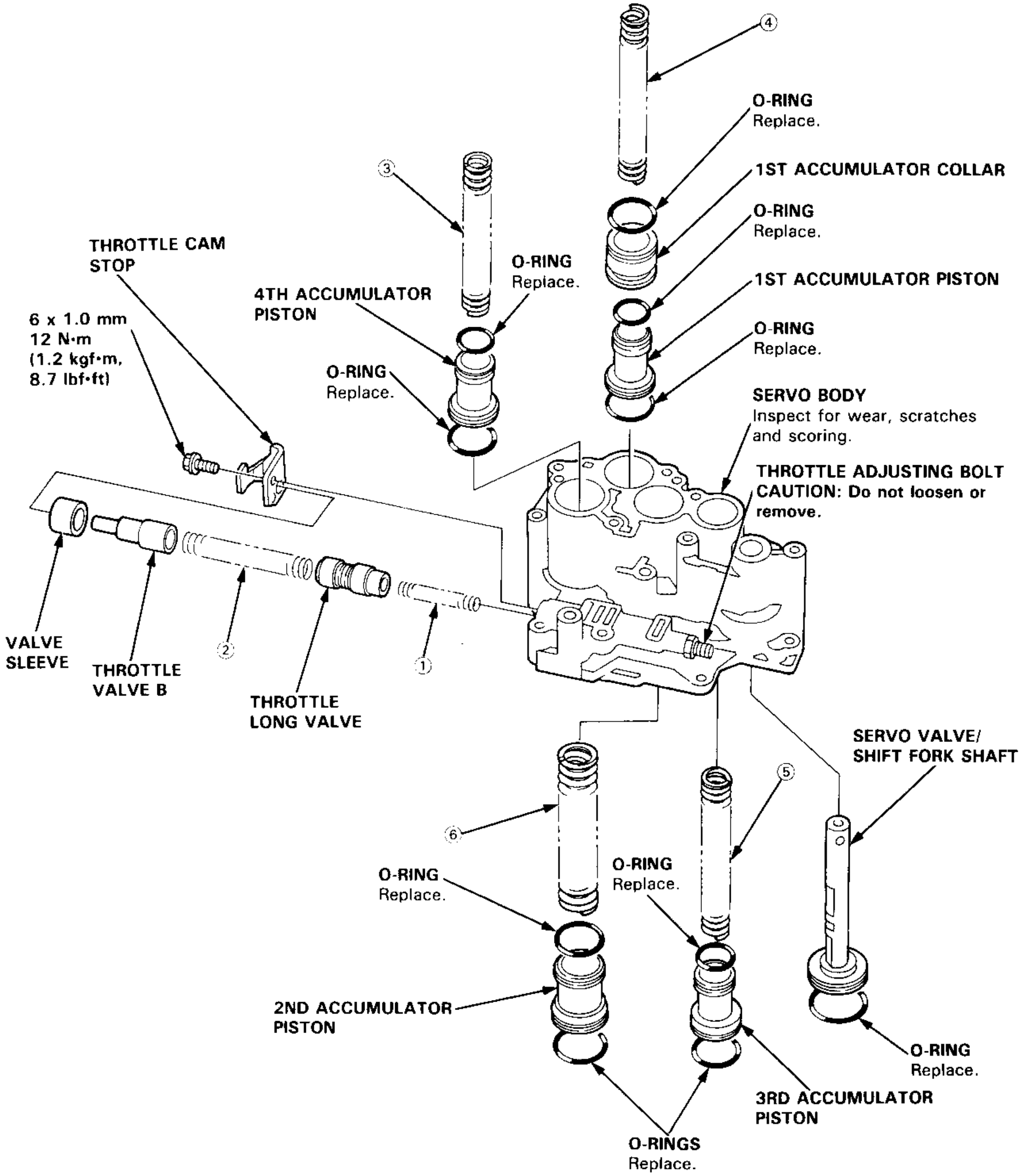
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3-2 kick-down valve spring	1.3 (0.051)	8.6 (0.339)	45.6 (1.795)	17.0
②	4-3 kick-down valve spring	1.0 (0.039)	6.6 (0.260)	28.5 (1.122)	14.7
③	Orifice control valve spring	0.8 (0.031)	6.6 (0.260)	48.2 (1.898)	33.0
④	2-3 orifice control valve spring	0.9 (0.035)	6.6 (0.260)	33.0 (1.299)	14.9
⑤	3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	52.0 (2.047)	26.8
⑥	Servo control valve spring	0.9 (0.035)	6.4 (0.252)	34.1 (1.343)	17.5
⑦	Modulator valve spring	1.3 (0.051)	9.4 (0.370)	39.3 (1.547)	12.4

Servo Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Coat all parts with ATF before reassembly.
- Replace the O-rings.



SPRING SPECIFICATIONS

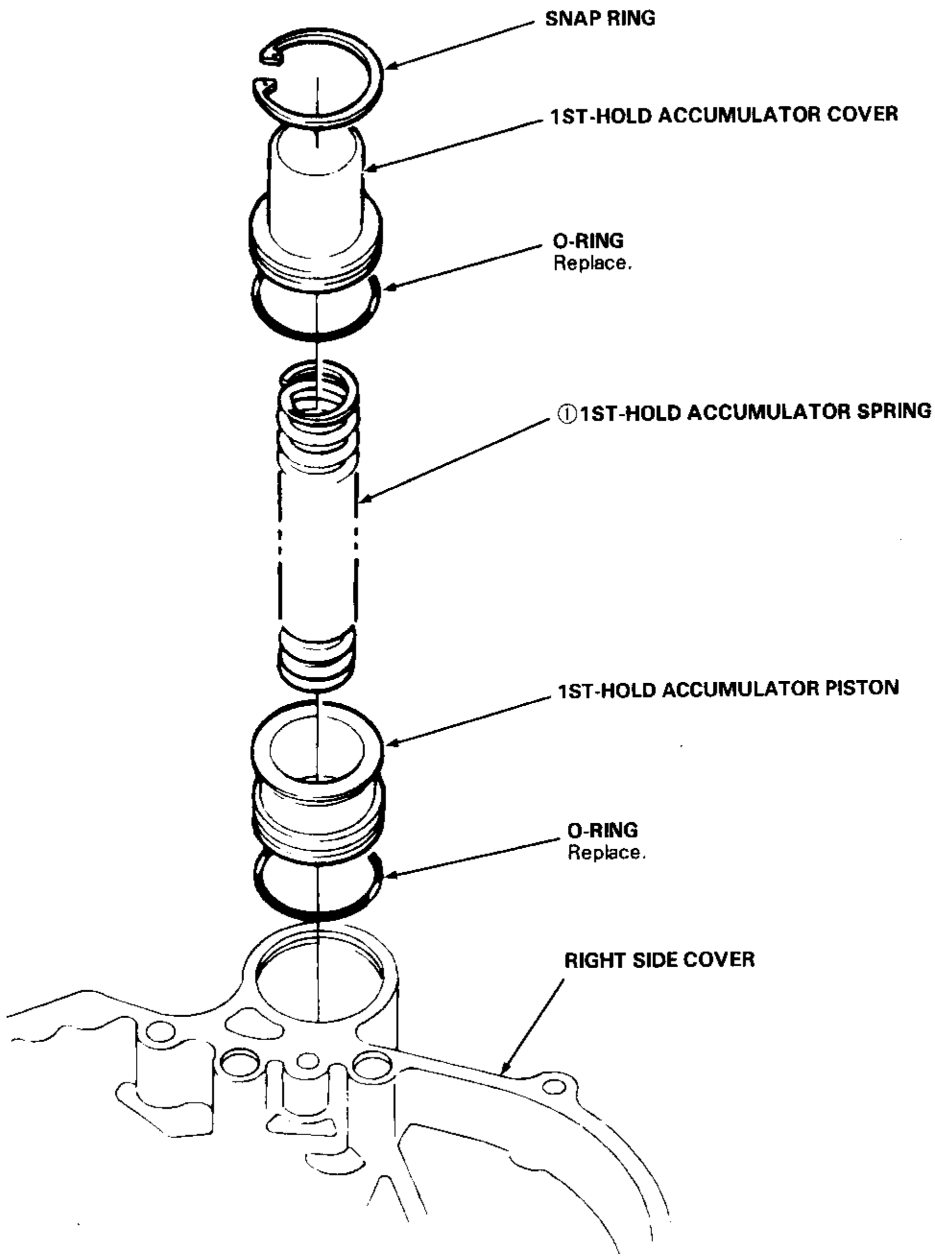
Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Throttle valve B adjusting spring	0.7 (0.028)	6.2 (0.244)	34.0 (1.339)	15.2
②	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5
		1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2
		1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4
③	4th accumulator spring	2.6 (0.102)	16.3 (0.642)	103.3 (4.067)	21.2
④	1st accumulator spring	2.5 (0.098)	16.3 (0.642)	105.4 (4.150)	16 + 8.6
⑤	3rd accumulator spring	2.8 (0.110)	17.5 (0.689)	105.2 (4.142)	19.1
⑥	2nd accumulator spring	3.6 (0.142)	22.0 (0.866)	108.9 (4.287)	15.2

1st-hold Accumulator/Right Side Cover

Disassembly/Inspection/Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

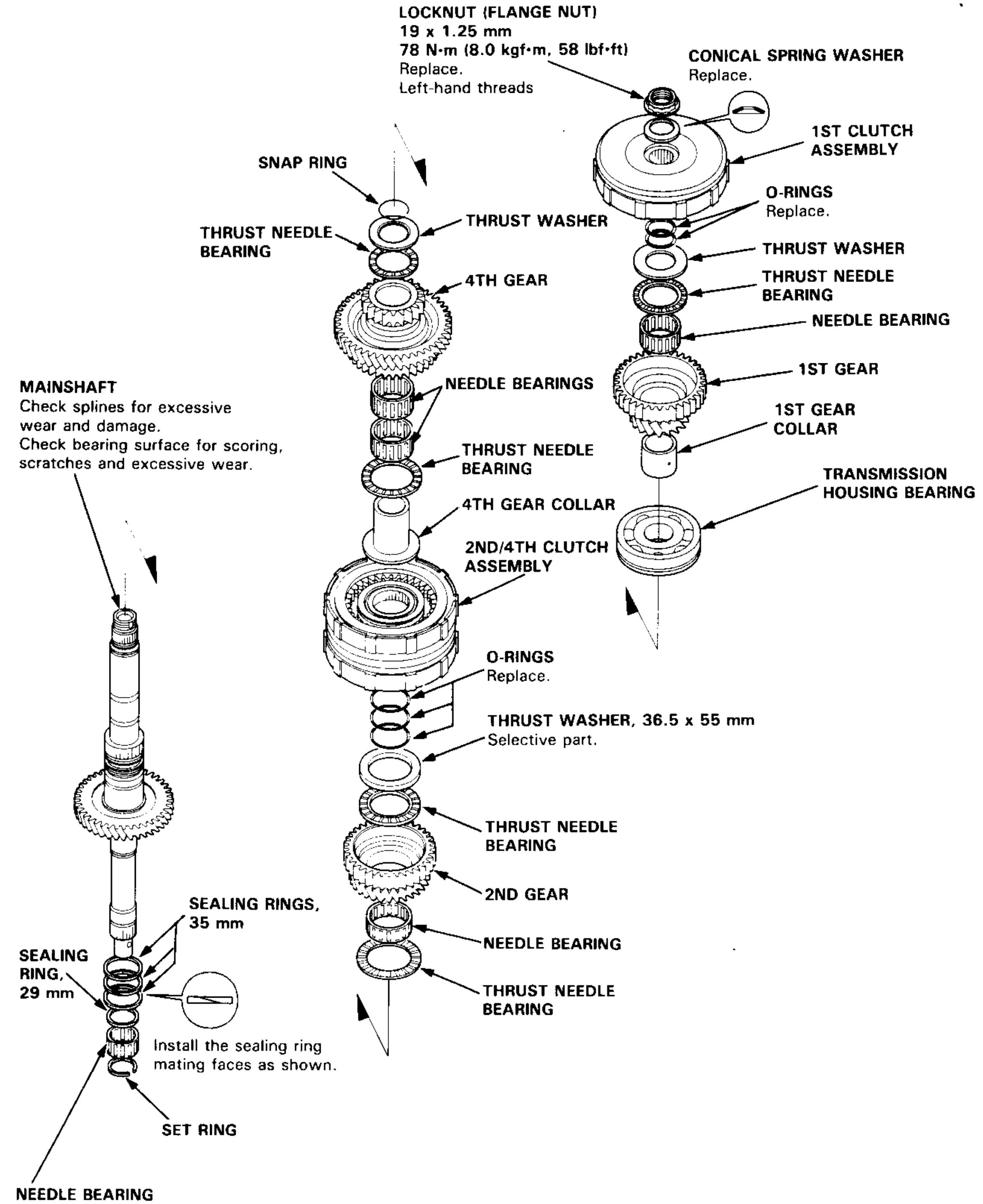
Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st-hold accumulator spring	4.0 (0.157)	21.5 (0.846)	71.7 (2.823)	8.3

Mainshaft

Disassembly/Inspection/Reassembly

NOTE:
- Lubricate all parts with ATF during reassembly.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.
- Locknut has left-hand threads.



Mainshaft

Inspection

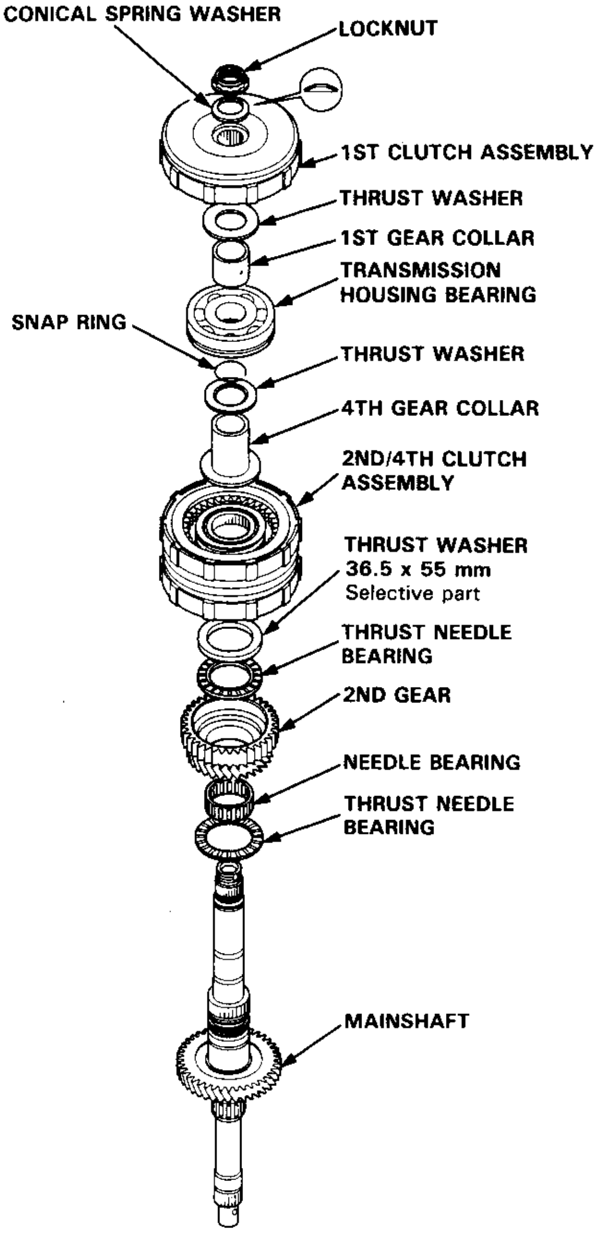
Clearance Measurement

NOTE: Lubricate all parts with ATF during assembly.

1. Remove the mainshaft bearing from the transmission housing (see page 14-156).

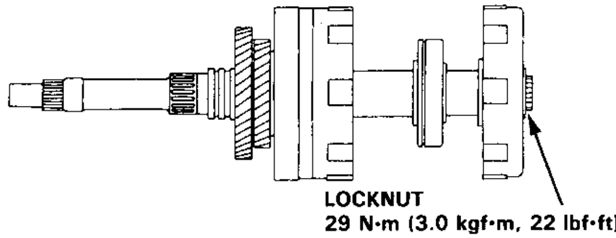
2. Assemble the parts below on the mainshaft.

   NOTE: Do not assemble the O-rings during inspection.



3. Torque the mainshaft locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

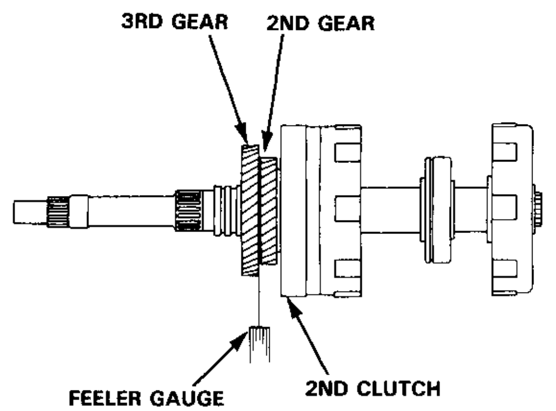
   NOTE: Mainshaft locknut has left-hand threads.

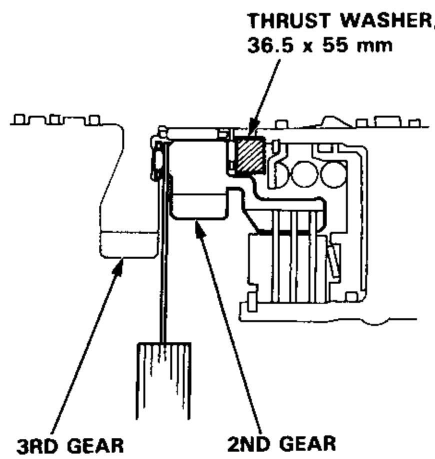


4. Hold 2nd gear against the 2nd clutch, then measure the clearance between 2nd gear and 3rd gear with a feeler gauge.

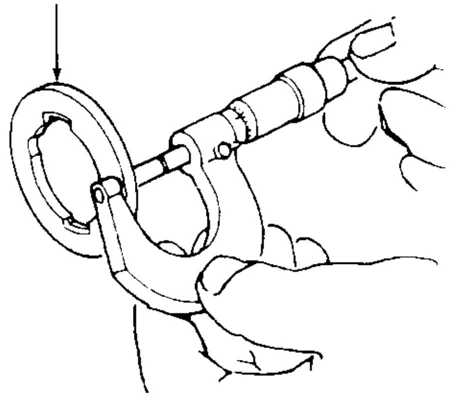
   NOTE: Take measurements in at least three places, and use the average as the actual clearance.

   STANDARD: 0.05–0.13 mm (0.002–0.005 in)





5. If the clearance is out of tolerance, remove the thrust washer and measure the thickness.



6. Select and install a new washer, then recheck.

THRUST WASHER 36.5 x 55 mm

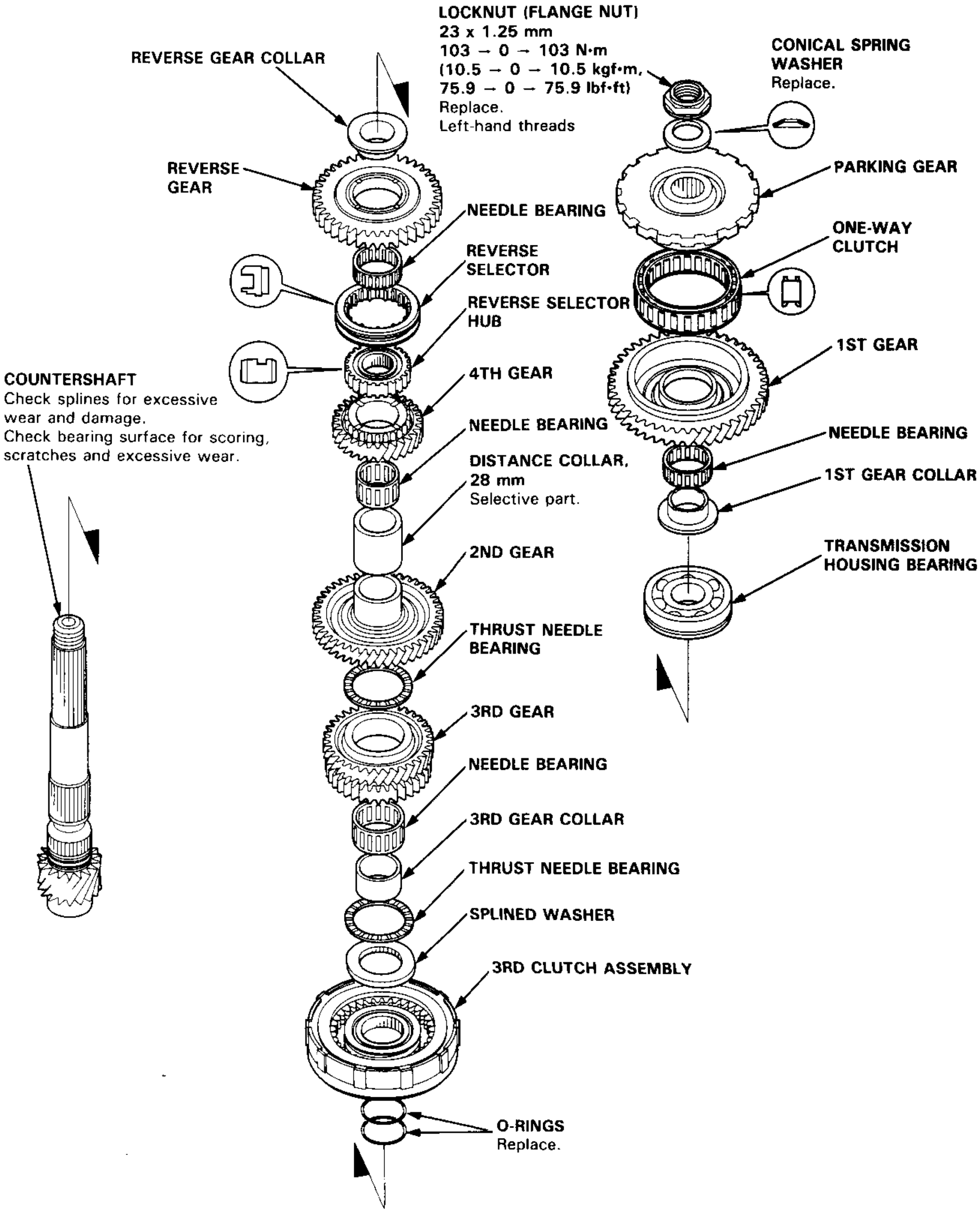
No.	Part Number	Thickness
1	90441–PG4–010	4.00 mm (0.157 in)
2	90442–PG4–010	4.05 mm (0.159 in)
3	90443–PG4–010	4.10 mm (0.161 in)
4	90444–PG4–010	4.15 mm (0.163 in)
5	90445–PG4–010	4.20 mm (0.165 in)
6	90446–PG4–010	4.25 mm (0.167 in)
7	90447–PG4–010	4.30 mm (0.169 in)
8	90448–PG4–010	4.35 mm (0.171 in)
9	90449–PG4–010	4.40 mm (0.173 in)
10	90450–PG4–000	4.45 mm (0.175 in)

7. After replacing the thrust washer, make sure the clearance is within tolerance.

Countershaft

Disassembly/Inspection/Reassembly

NOTE:
- Lubricate all parts with ATF before reassembly.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.
- Locknut has left-hand threads.

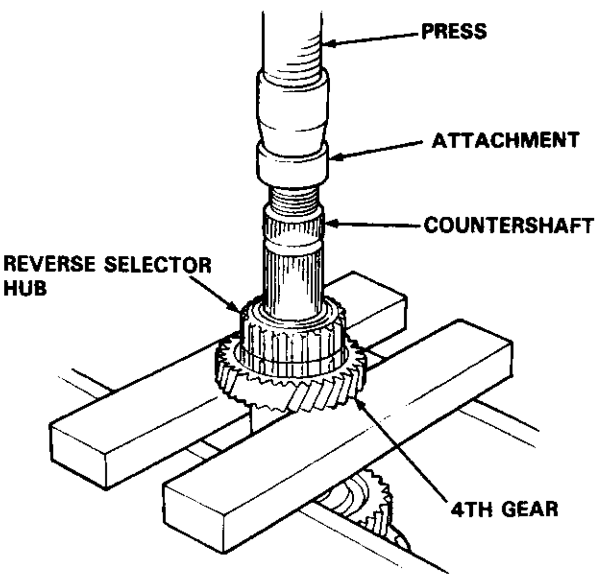


Disassembly/Reassembly

1. Using a hydraulic press, press out the countershaft while supporting 4th gear.

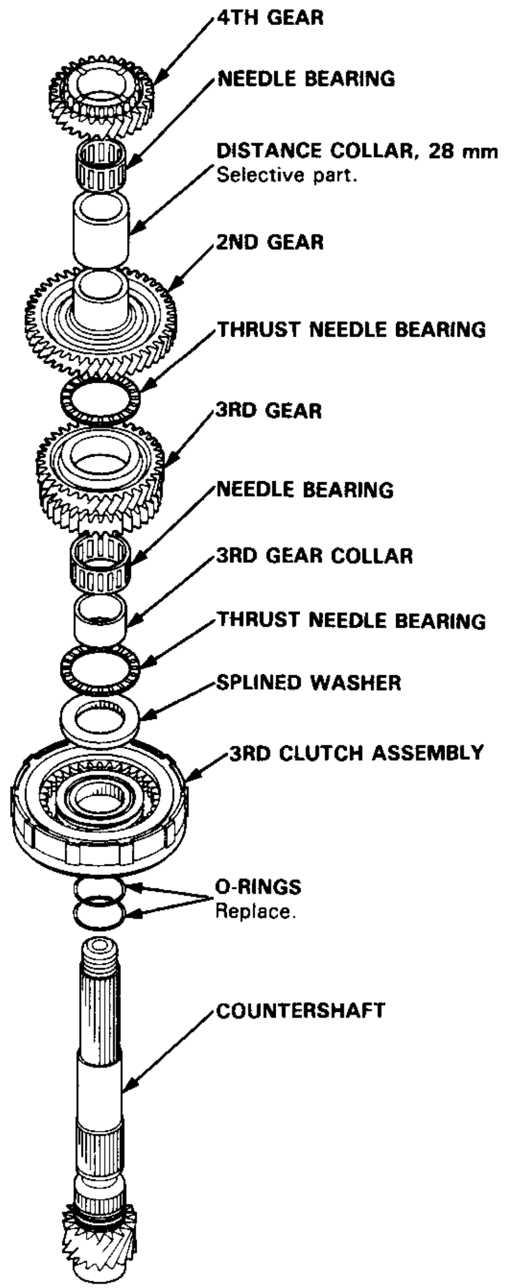
   NOTE: Place an attachment between the press and the countershaft to prevent damage to the shaft.

   CAUTION: Do not allow the countershaft to fall and hit the ground.



2. Assemble the parts on the countershaft as shown below.

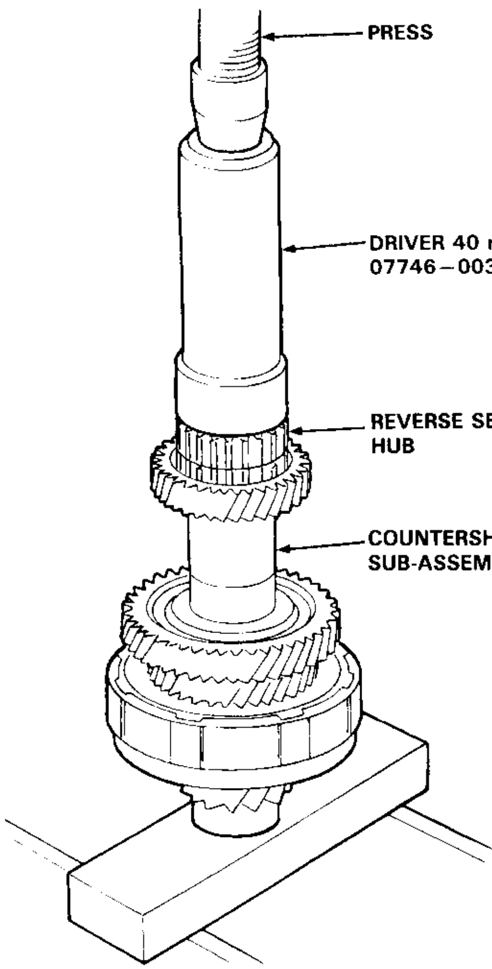
   NOTE:
   - Lubricate all parts with ATF during assembly.
   - Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.



(cont'd)

Disassembly/Reassembly (cont'd)

3. Install the reverse selector hub on the countershaft sub-assembly, and then press the reverse selector hub using the special tool and a press as shown.



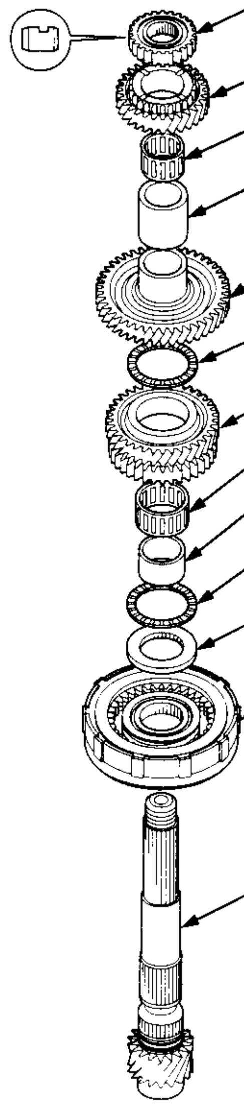
Inspection

Clearance Measurement

NOTE: Lubricate all parts with ATF during assembly.

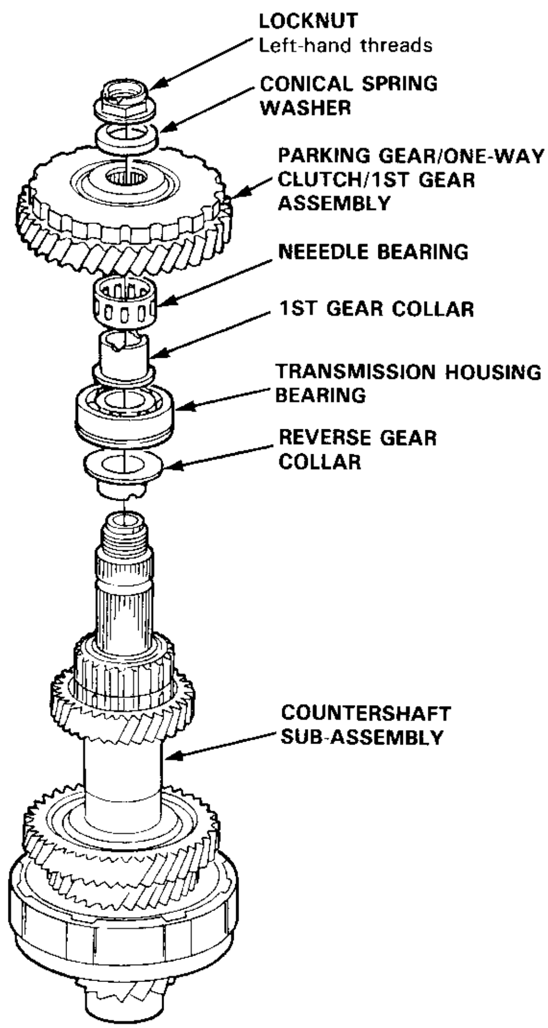
1. Remove the countershaft bearing from the transmission housing (see page 14-156).
2. Install the parts below on the countershaft using the special tool and a press as described on this page.

   NOTE: Do not assemble the O-rings during inspection.



3. Install the parts below on the countershaft sub-assembly, then torque the locknut to 29 N•m (3.0 kgf•m, 22 lbf•ft).

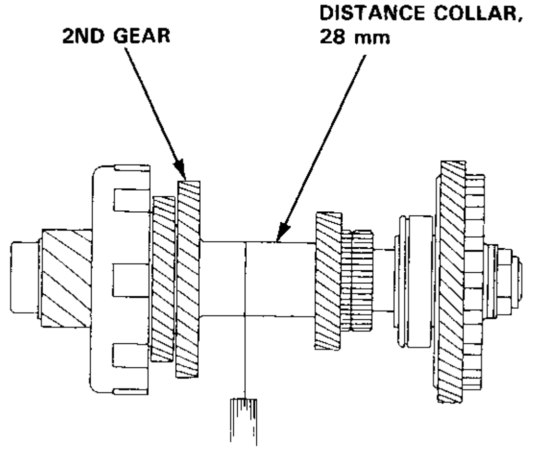
NOTE: Countershaft locknut has left-hand threads.

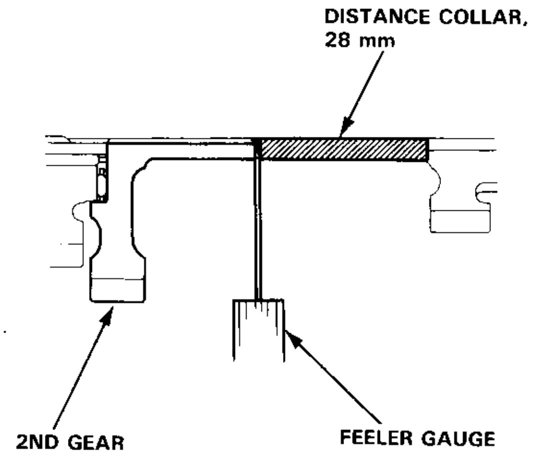


4. Measure the clearance between the 2nd gear and the 28 mm distance collar with a feeler gauge.

NOTE: Take measurements in at least three places, and use the average as the actual clearance.

STANDARD: 0.10–0.18 mm (0.004–0.007 in)





(cont'd)

Countershaft

Inspection (cont'd)

5. If the clearance is out of tolerance, remove the 28 mm distance collar and measure the width.
6. Select and install a new distance collar, then recheck.

DISTANCE COLLAR, 28 mm

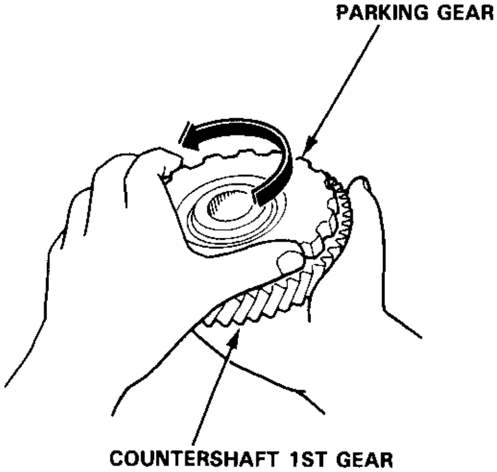
No.	Part Number	Width
1	90503–PC9–000	39.00 mm (1.535 in)
2	90504–PC9–000	39.10 mm (1.539 in)
3	90505–PC9–000	39.20 mm (1.543 in)
4	90507–PC9–000	39.30 mm (1.547 in)
5	90508–PC9–000	39.05 mm (1.537 in)
6	90509–PC9–000	39.15 mm (1.541 in)
7	90510–PC9–000	39.25 mm (1.545 in)
8	90511–PC9–000	38.90 mm (1.531 in)
9	90512–PC9–000	38.95 mm (1.533 in)

7. After replacing the distance collar, make sure the clearance is within tolerance.

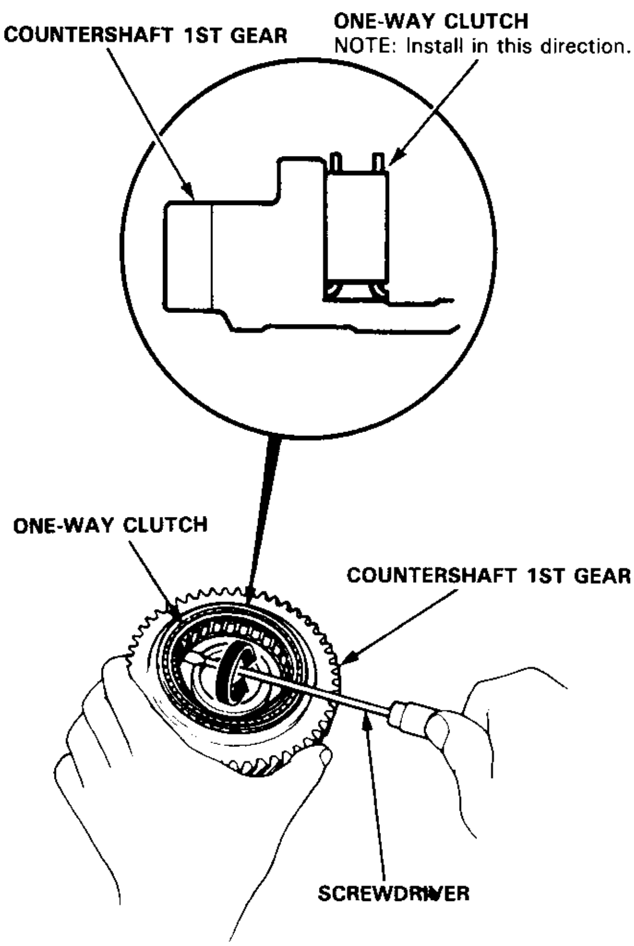
One-way Clutch

Disassembly/Inspection/Reassembly

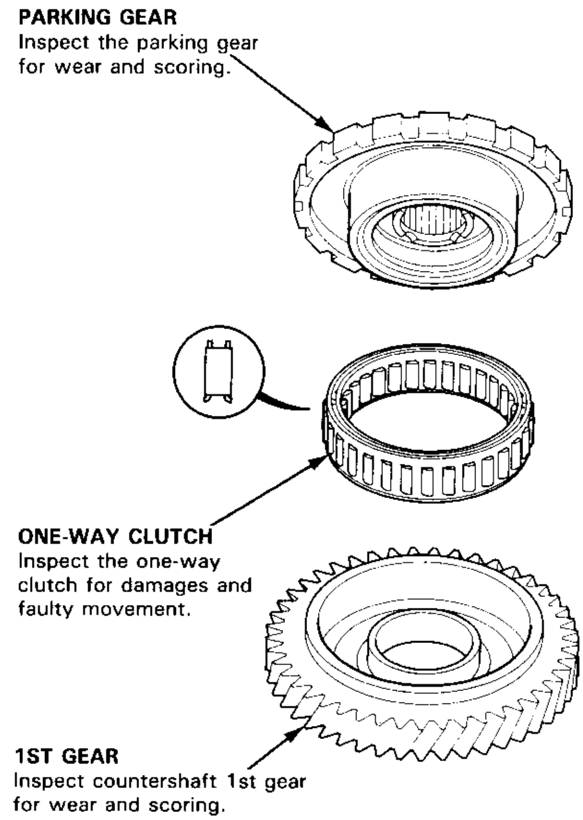
1. Separate countershaft 1st gear from the parking gear by turning the parking gear in the direction shown.



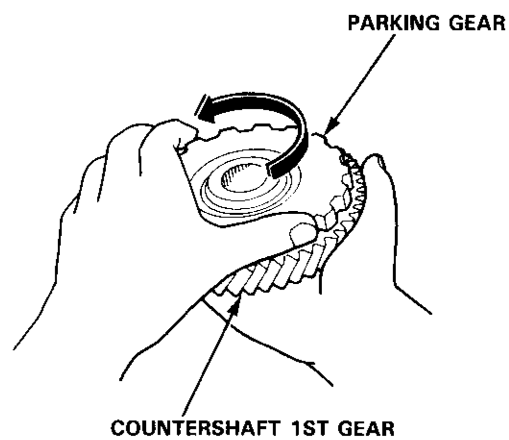
2. Remove the one-way clutch by prying it up with the end of a screwdriver.



Inspect the parts as follows:



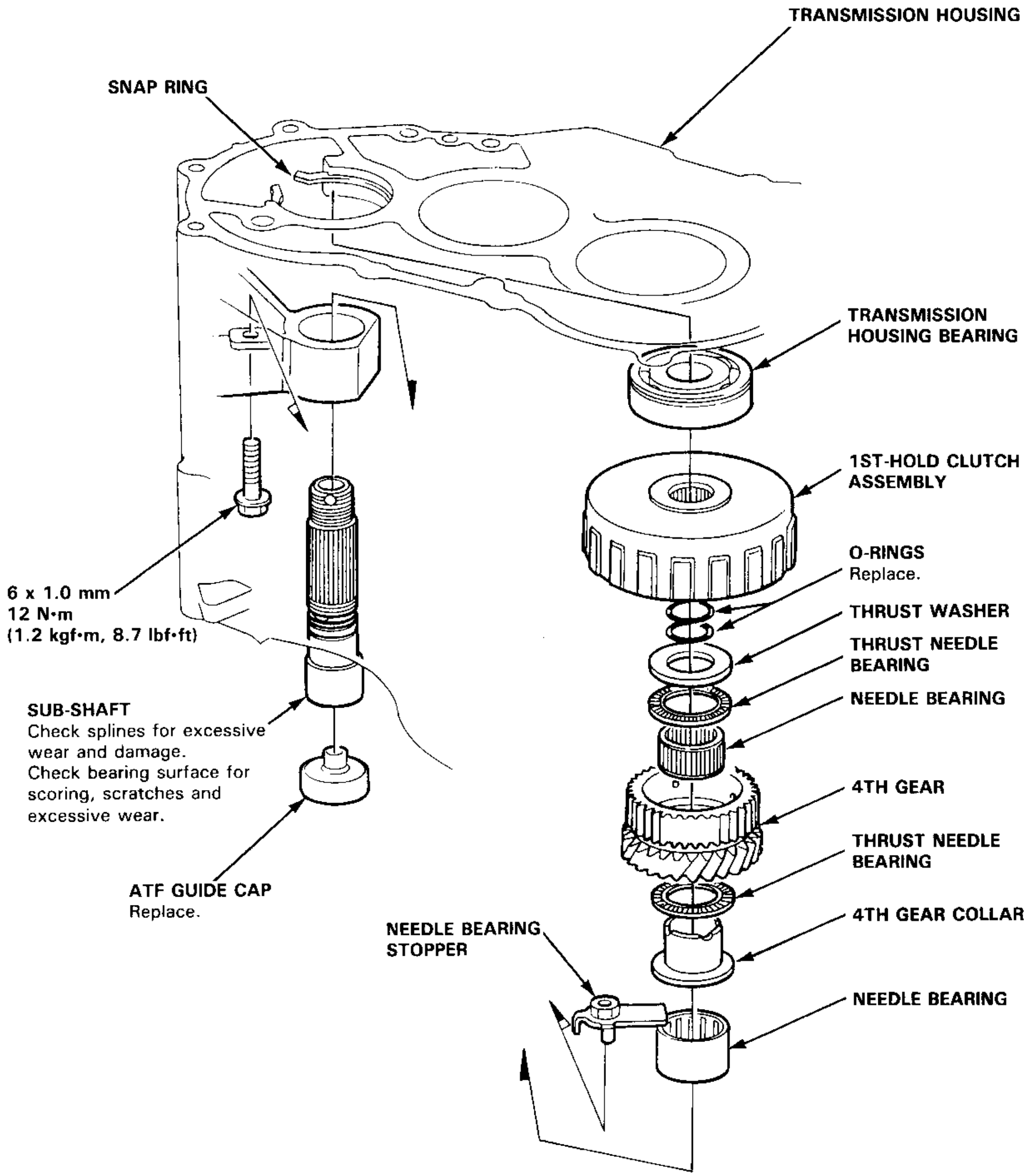
3. After the parts are assembled, hold countershaft 1st gear and turn the parking gear in the direction shown to be sure it turns freely. Also make sure the parking gear does not turn in the opposite direction.



Sub-shaft

Disassembly/Inspection/Reassembly

NOTE:
- Lubricate all parts with ATF during reassembly.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.

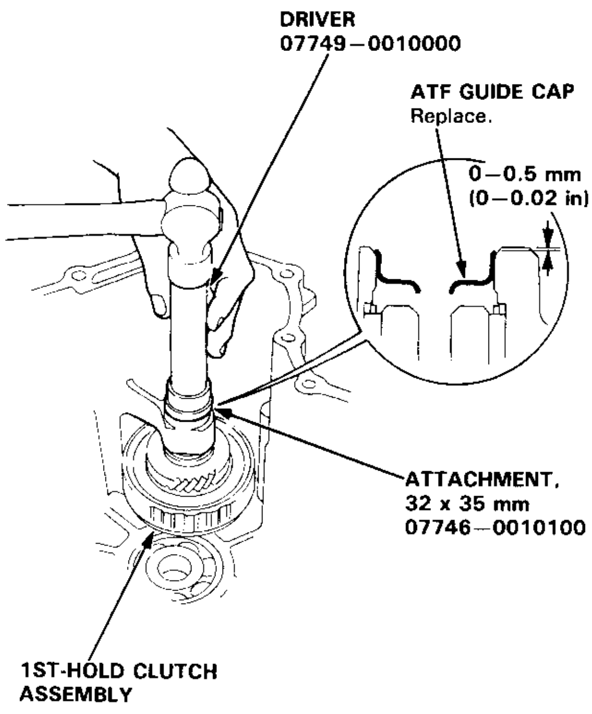


Disassembly/Reassembly

1. Remove the ATF guide cap by pushing the sub-shaft inside the transmission housing.
2. Remove the 1st-hold clutch assembly by pulling the sub-shaft, then remove the sub-shaft.
3. Install new O-rings on the sub-shaft.

   NOTE: Wrap the shaft splines with tape to prevent damaging the O-rings.
4. Place the sub-shaft in the transmission housing and install the 1st-hold clutch assembly.
5. Install new ATF guide cap using the special tools as shown.

   NOTE: Install the ATF guide cap in the direction shown.

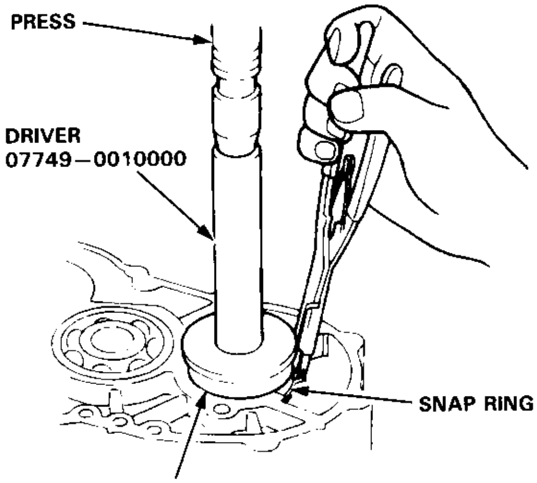


Sub-shaft Bearings

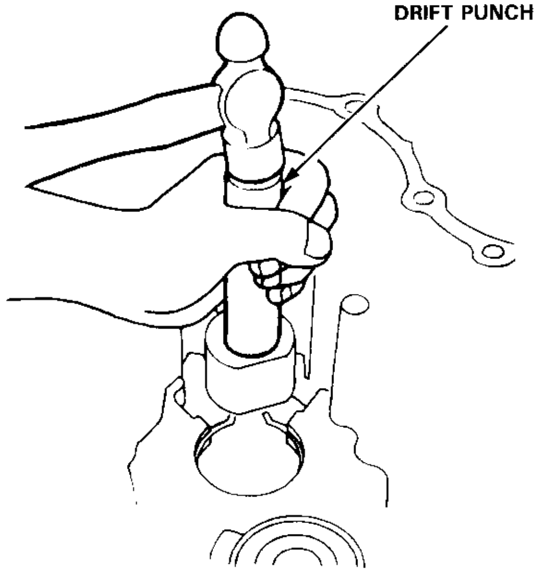
Replacement

NOTE: Lubricate all parts with ATF before reassembly.

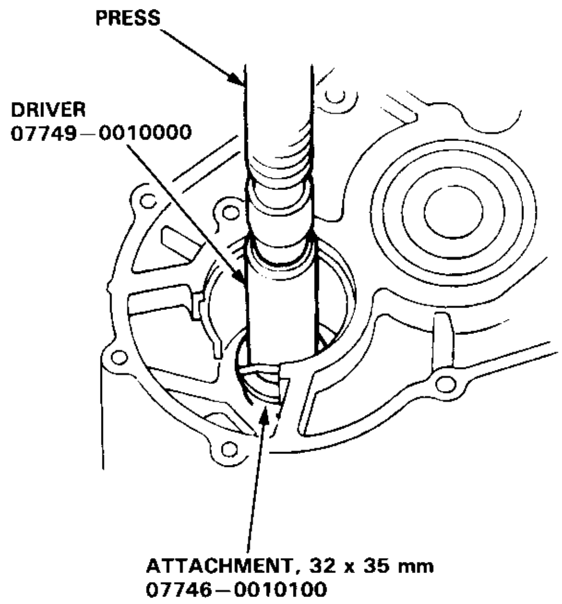
1. To remove the sub-shaft ball bearing from the transmission housing, expand the snap ring with snap ring pliers, then push the bearing out using the special tools and a press as shown.



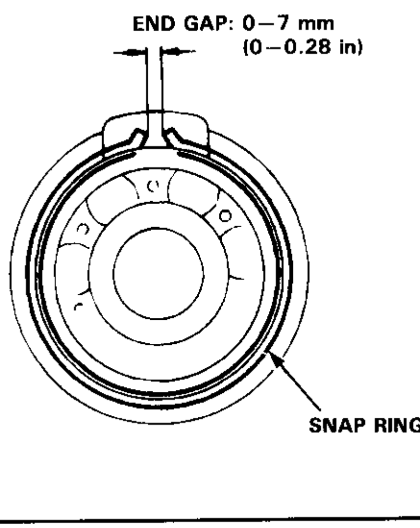
2. Remove the needle bearing stopper.
3. Remove the needle bearing from the transmission housing using a drift punch.



4. Install the new needle bearing in the transmission housing using the special tools and a press as shown.

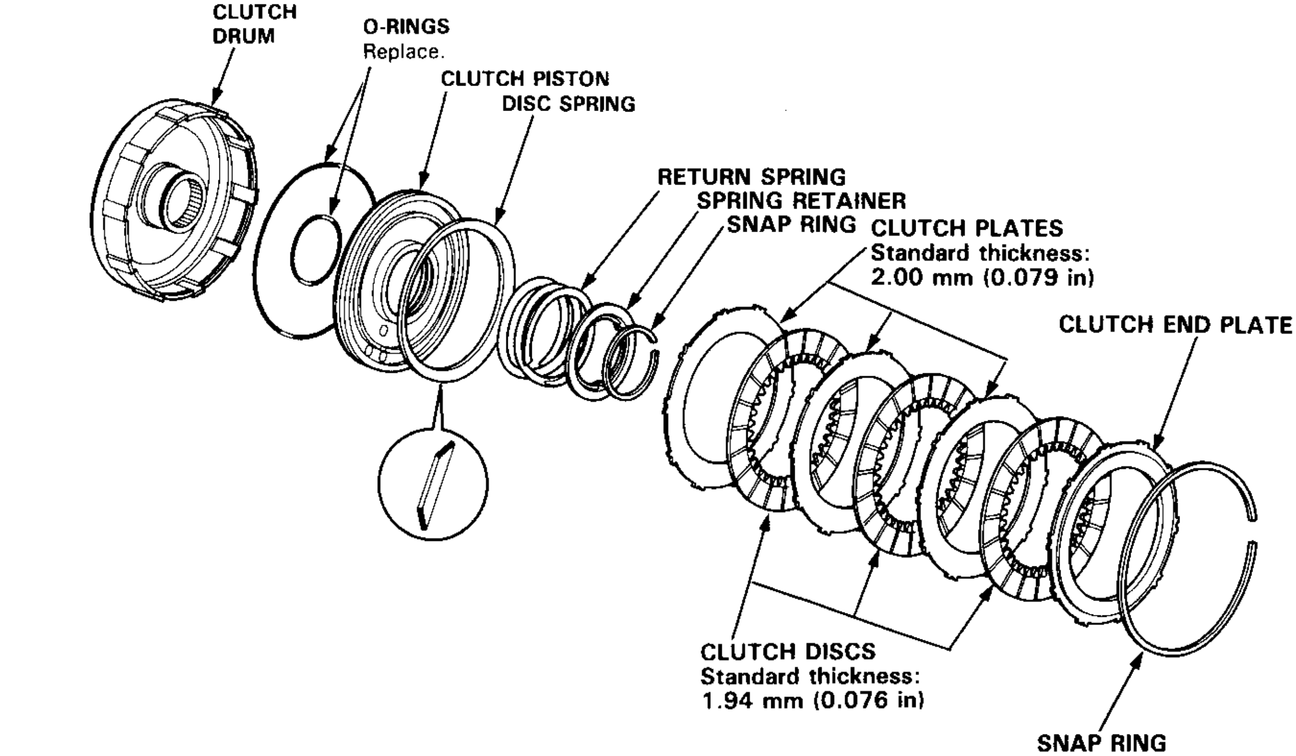


5. Expand the snap ring with snap ring pliers, then insert the ball bearing part-way into the housing using the special tools and a press as described in step 1. Install the bearing with the groove facing outside the housing.
6. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.
7. After installing the ball bearing, verify the following:
   - The snap ring is seated in the bearing and housing grooves.
   - The snap ring operates properly.
   - The ring end gap is correct.

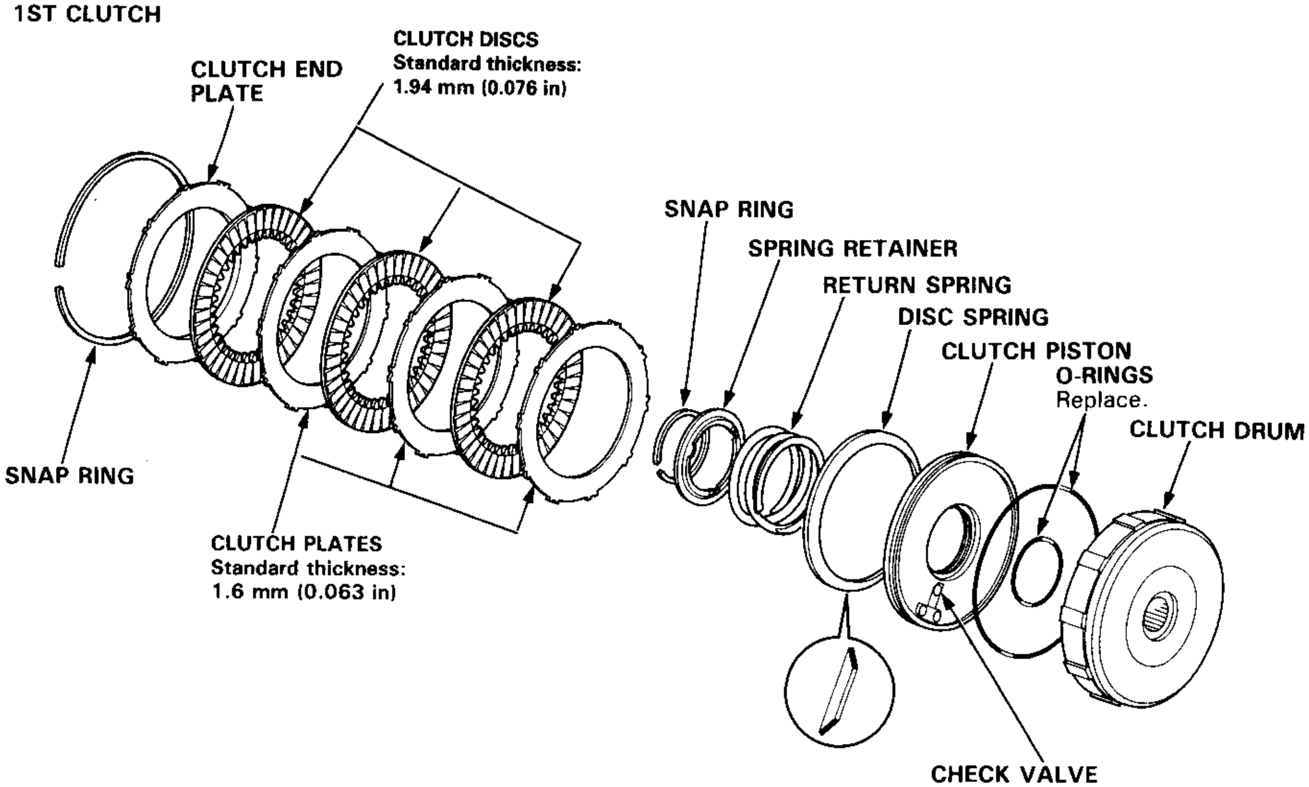


Illustrated Index

3RD CLUTCH

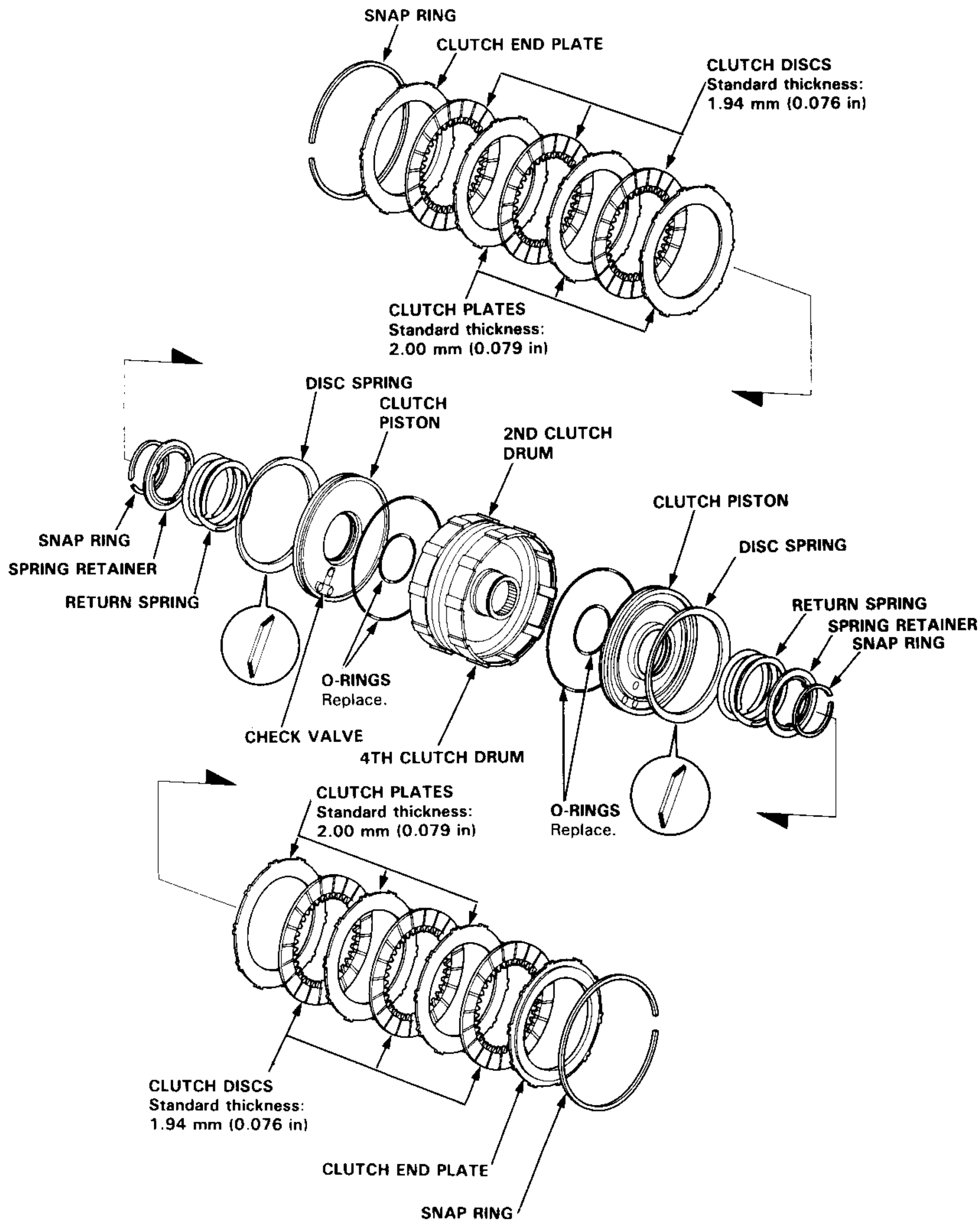


1ST CLUTCH

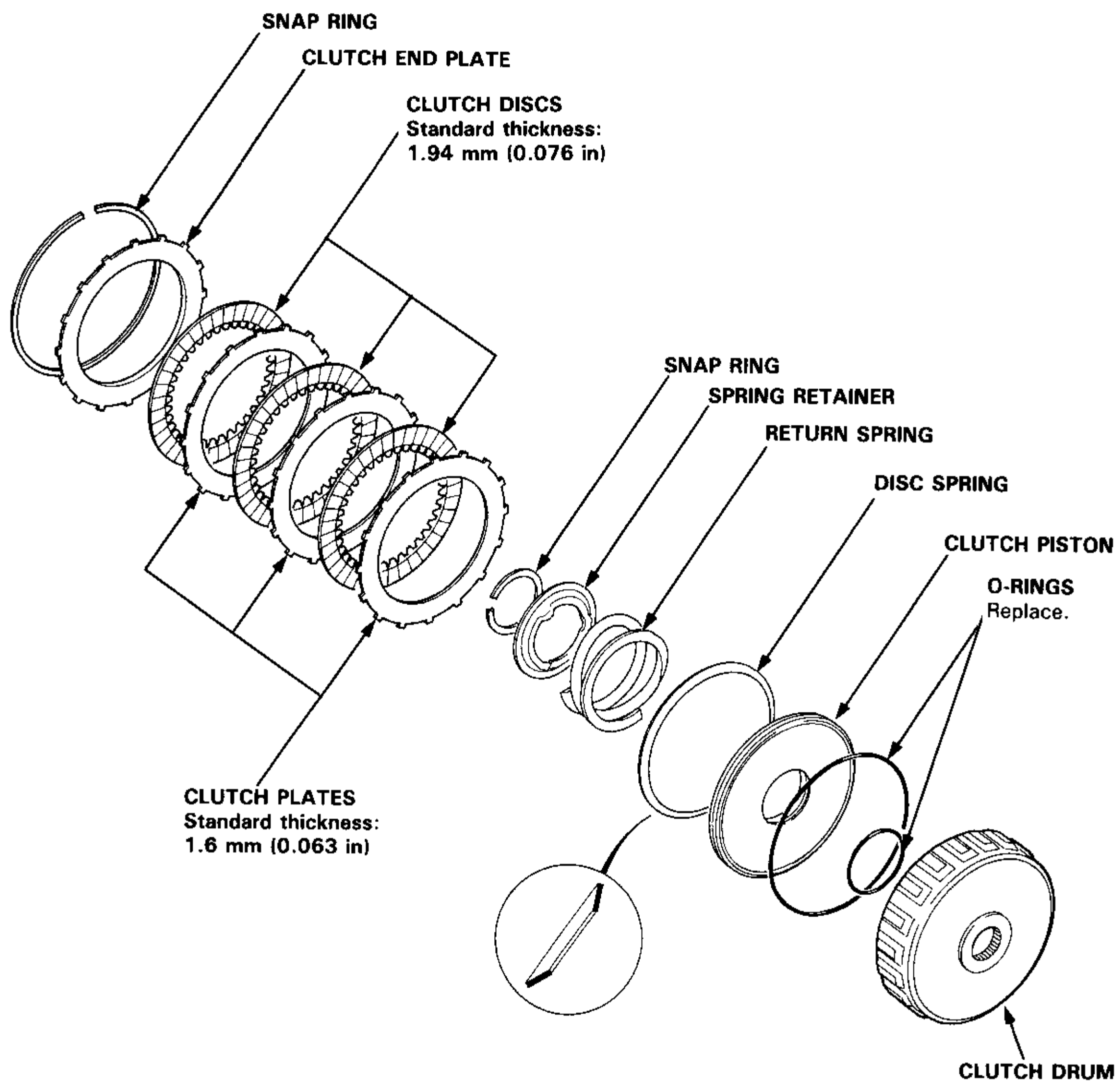


(cont'd)

2ND/4TH CLUTCH

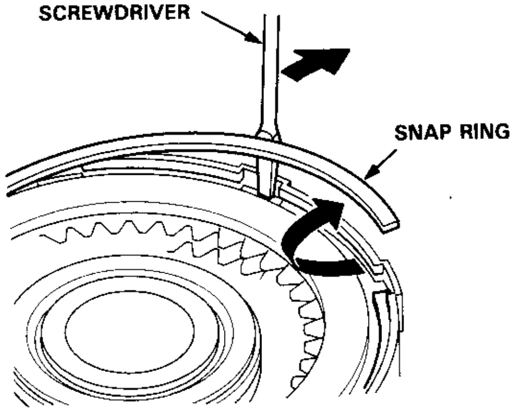


1ST-HOLD CLUTCH

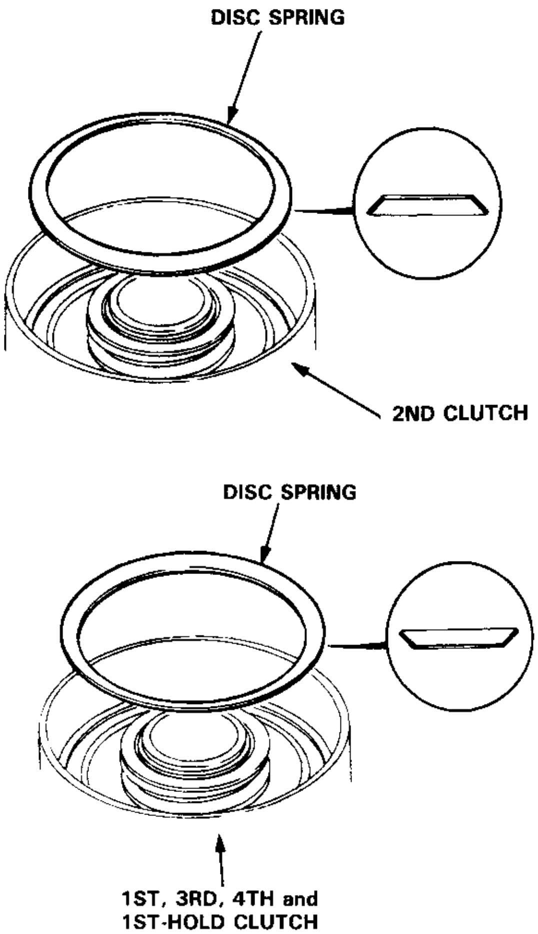


Disassembly

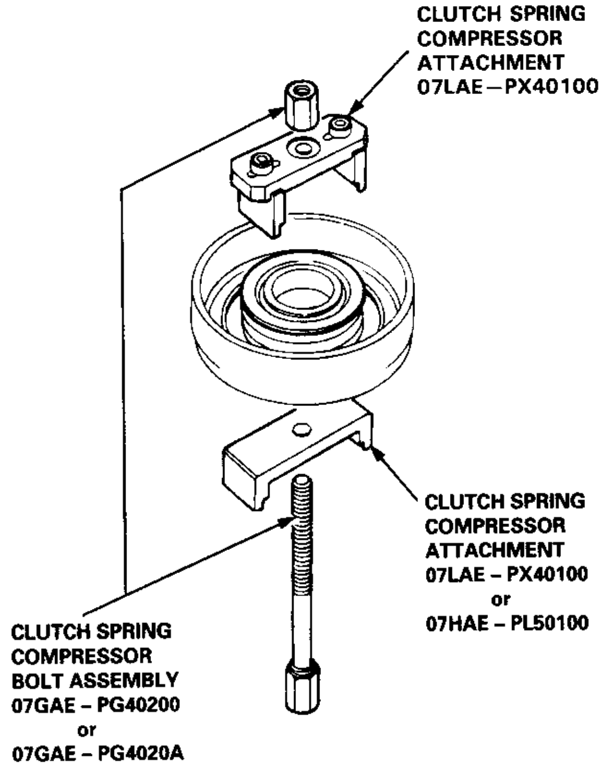
1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.

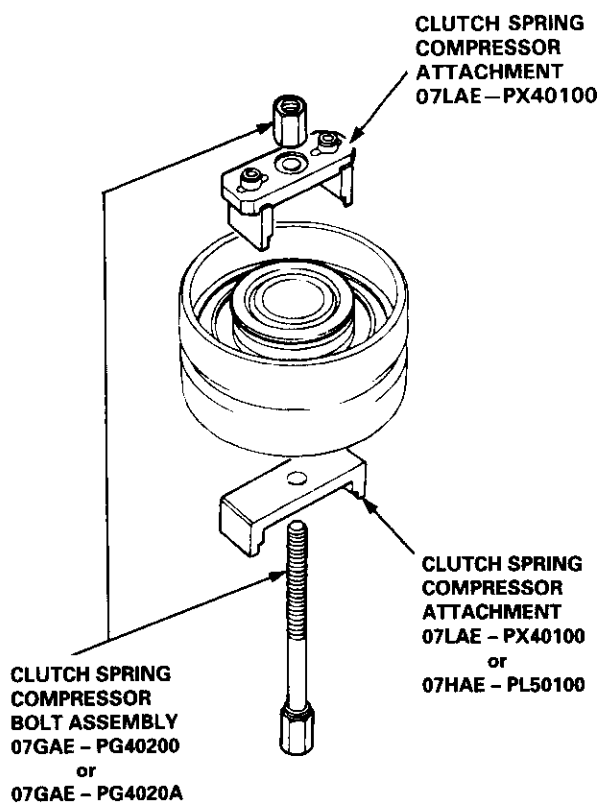


2. Remove the disc spring.

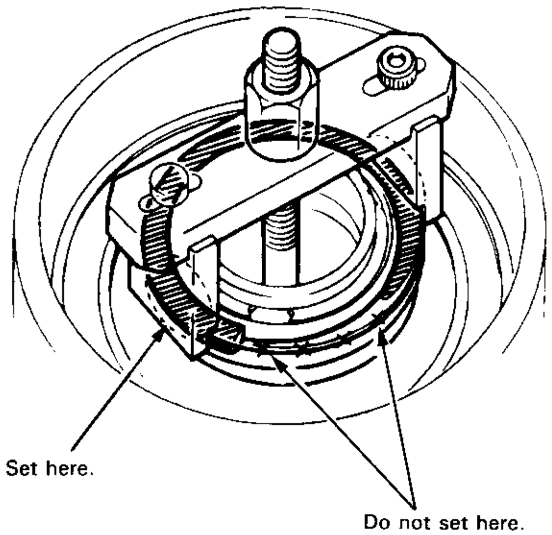


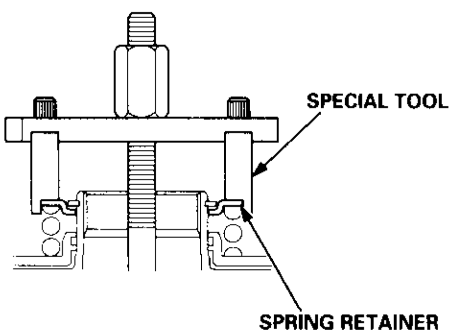
3. Install the special tools as shown.



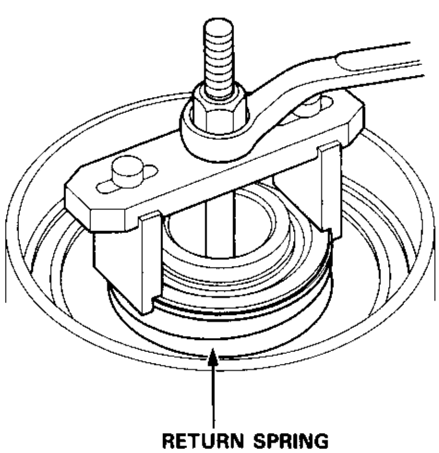


CAUTION: **If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged. Be sure the special tool is adjusted to have full contact with the spring retainer.**

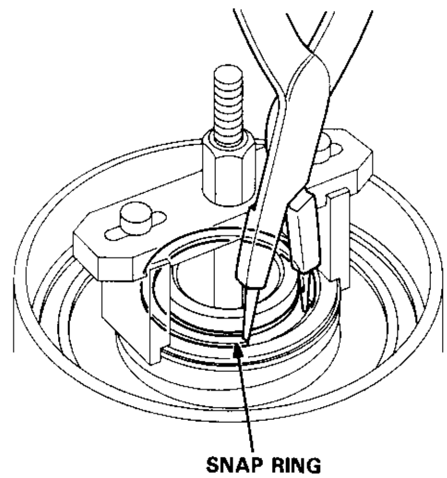




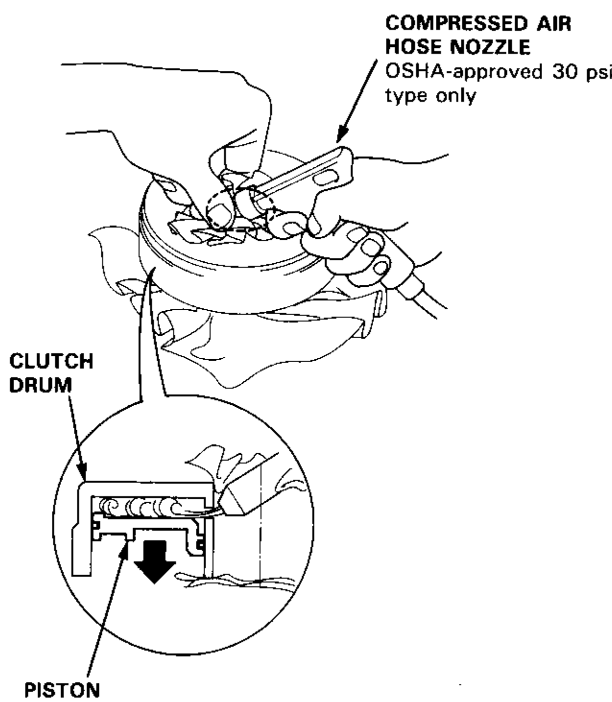
4. Compress the return spring.



5. Remove the snap ring. Then remove the special tools, spring retainer and return spring.



6. Wrap a shop towel around the clutch drum, and apply air pressure to the fluid passage to remove the piston. Place a finger tip on the other end while applying air pressure.



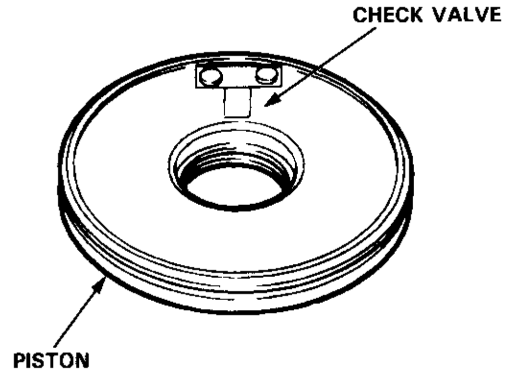
Clutch

Reassembly

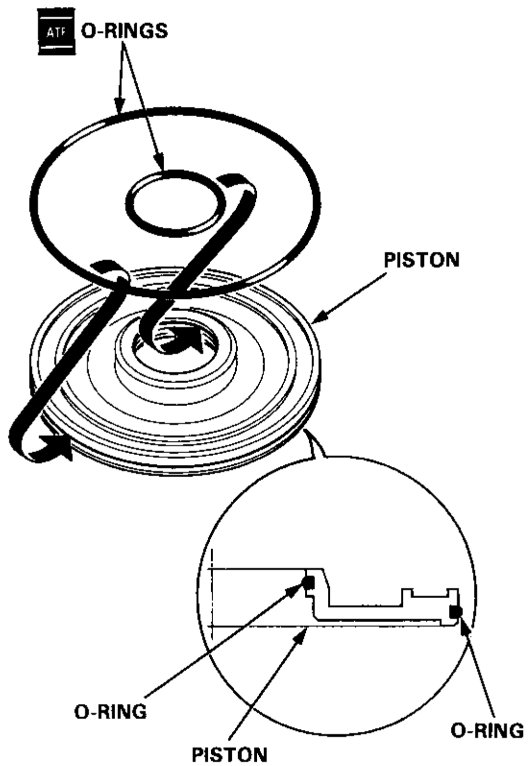
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
- Blow out all passages.
- Lubricate all parts with ATF before reassembly.

1. Inspect the check valve; if it's loose, replace the piston.

   NOTE: Except 1st-hold clutch.



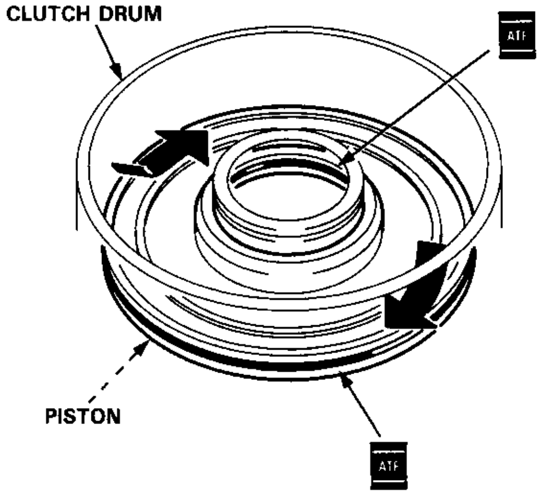
2. Install new O-rings on the clutch piston.



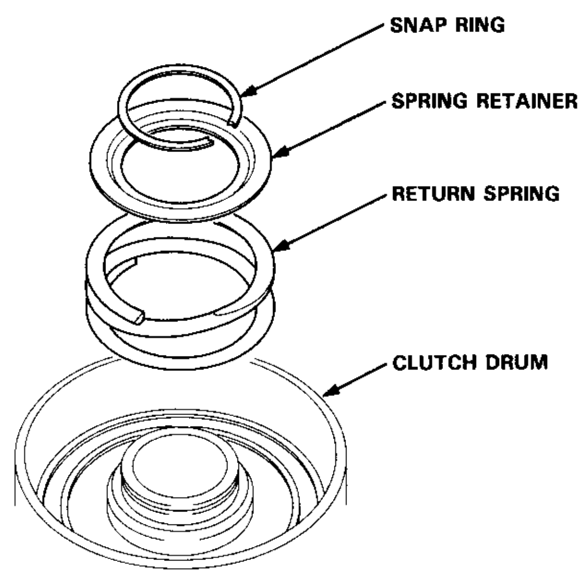
3. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

   NOTE: Lubricate the piston O-ring with ATF before installing.

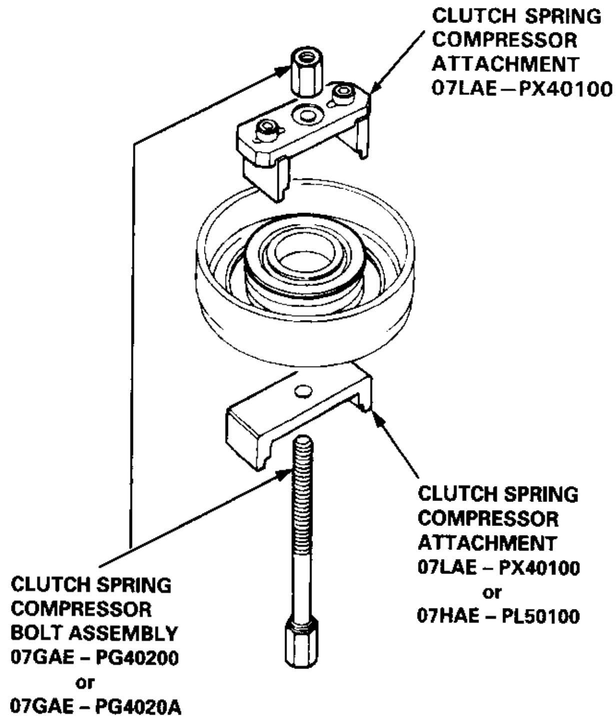
   CAUTION: Do not pinch the O-ring by installing the piston with too much force.

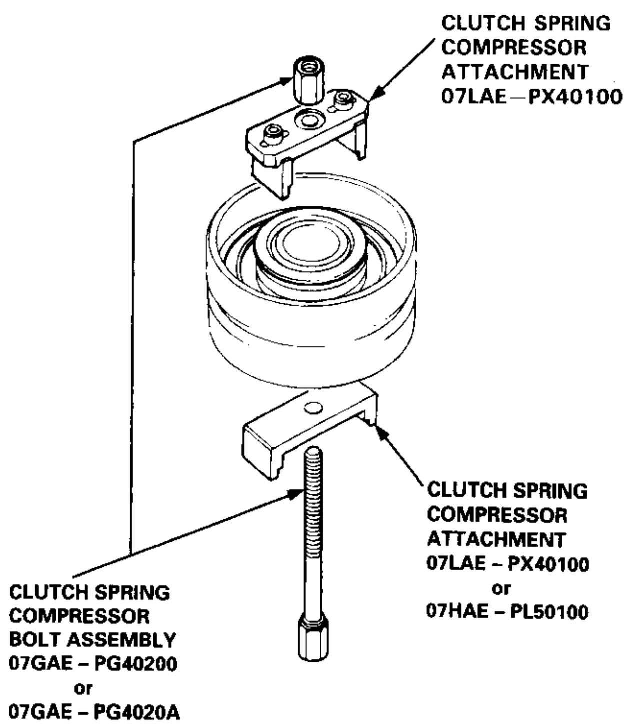


4. Install the return spring and spring retainer, and position the snap ring on the retainer.

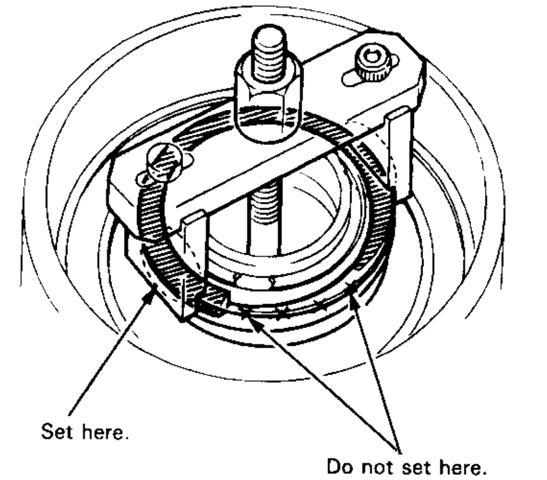


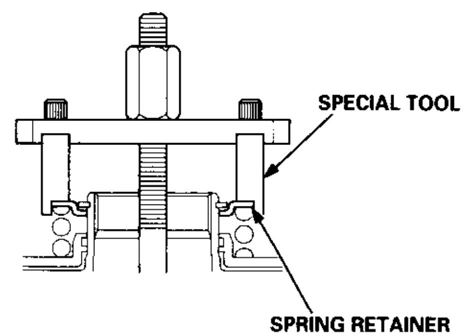
5. Install the special tools as shown.



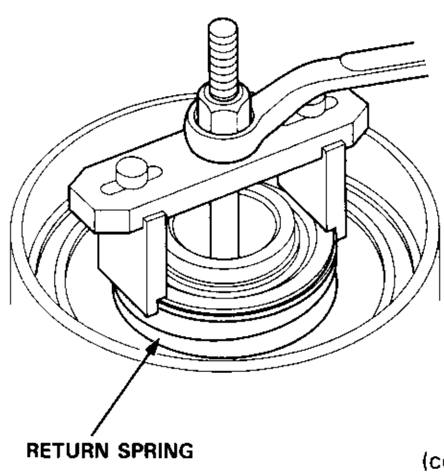


CAUTION: If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged. Be sure the special tool is adjusted to have full contact with the spring retainer.





6. Compress the return spring.

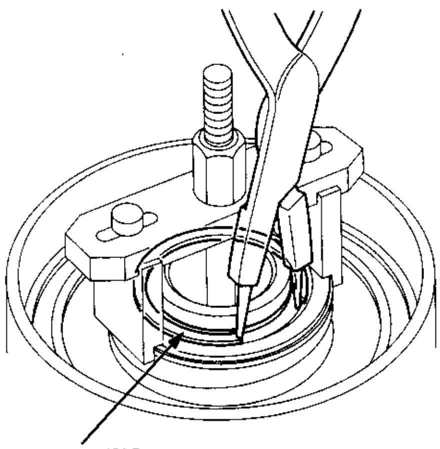


(cont'd)

Clutch

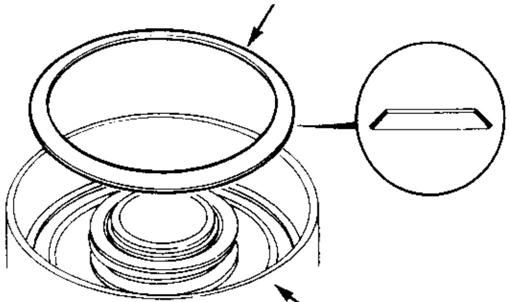
Reassembly (cont'd)

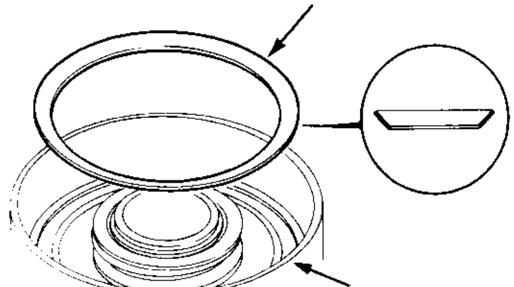
7. Install the snap ring.



8. Remove the special tools.
9. Install the disc spring.

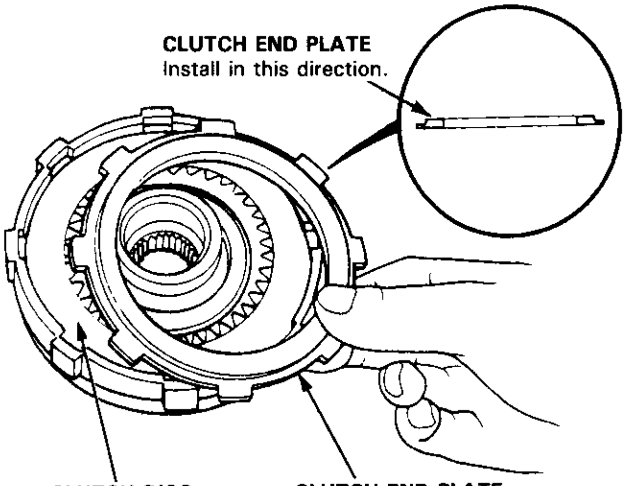
   NOTE: Install the disc spring in the direction shown.



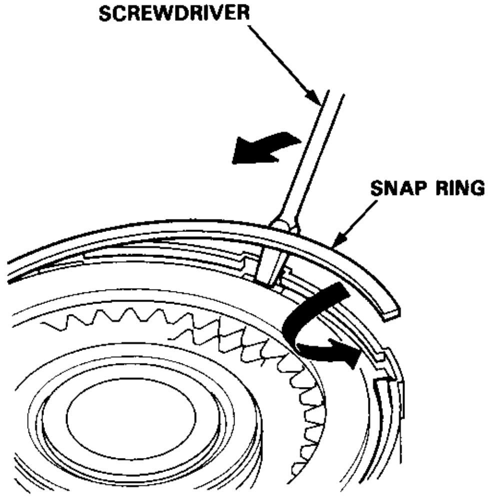


10. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.
11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

    NOTE: Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt or other foreign matter.



12. Install the snap ring.

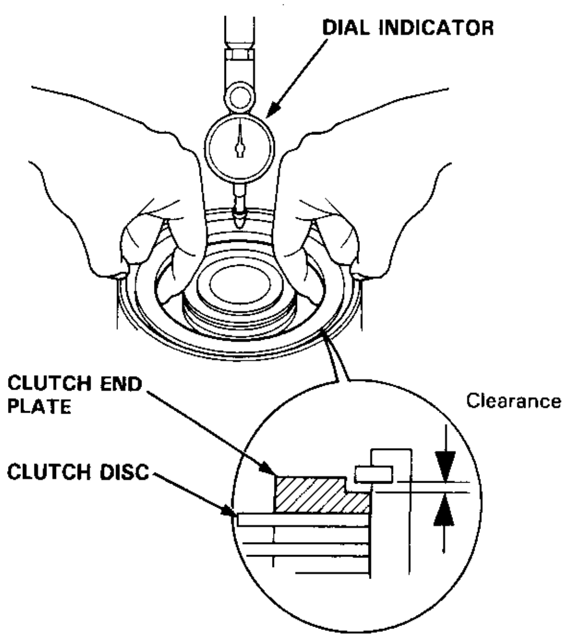


13. Measure the clearance between the clutch end plate and top disc with a dial indicator. Zero the dial indicator with the clutch end plate lowered and lift it up to the snap ring. The distance that the clutch end plate moves is the clearance between the clutch end plate and top disc.

NOTE: Measure at three locations.

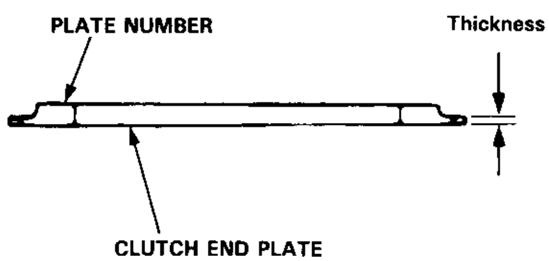
Clutch End Plate-to-Top Disc Clearance:

Clutch	Service Limit
1st	0.65–0.85 mm (0.026–0.033 in)
2nd	0.65–0.85 mm (0.026–0.033 in)
3rd	0.40–0.60 mm (0.016–0.024 in)
4th	0.40–0.60 mm (0.016–0.024 in)
1st-hold	0.50–0.80 mm (0.020–0.031 in)



14. If the clearance is not within the service limits, select a new clutch end plate from the following table.

NOTE: If the thickest clutch end plate is installed, but the clearance is still over the standard, replace the clutch discs and clutch plates.



1ST, 2ND, 3RD and 4TH CLUTCH END PLATE

Plate No.	Part Number	Thickness
1	22551–P56–N00	2.1 mm (0.083 in)
2	22552–P56–N00	2.2 mm (0.087 in)
3	22553–P56–N00	2.3 mm (0.091 in)
4	22554–P56–N00	2.4 mm (0.094 in)
5	22555–P56–N00	2.5 mm (0.098 in)
6	22556–P56–N00	2.6 mm (0.102 in)
7	22557–P56–N00	2.7 mm (0.106 in)
8	22558–P56–N00	2.8 mm (0.110 in)
9	22559–P56–N00	2.9 mm (0.114 in)
10	22560–P56–N00	3.0 mm (0.118 in)

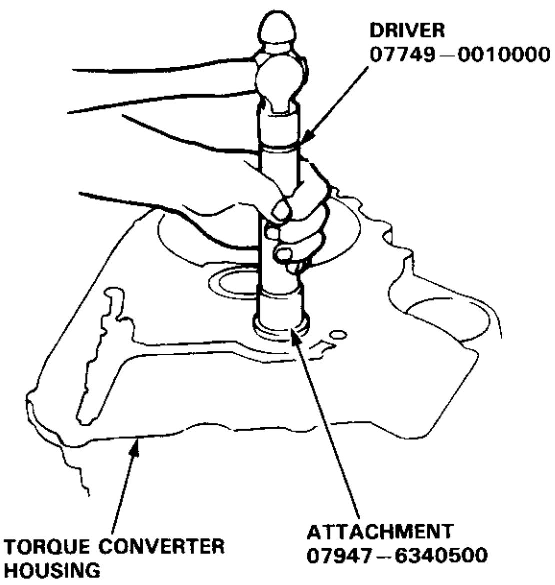
1ST-HOLD CLUTCH END PLATE

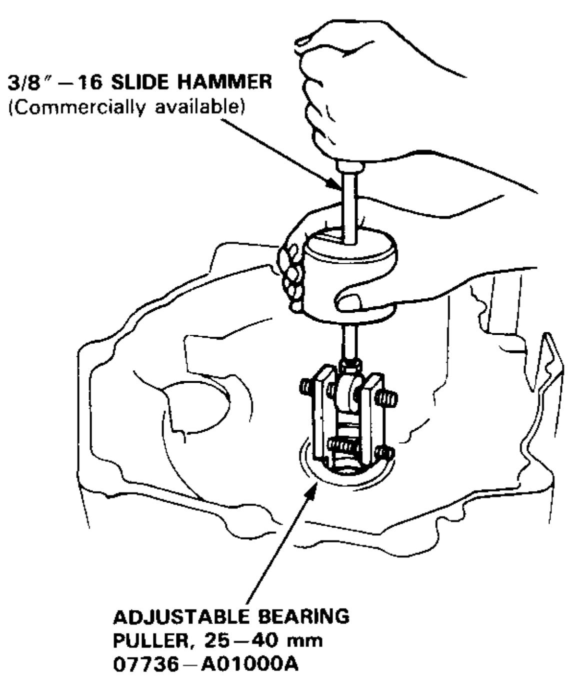
Plate No.	Part Number	Thickness
1	22551–PS5–003	2.10 mm (0.083 in)
2	22552–PS5–003	2.20 mm (0.087 in)
3	22553–PS5–003	2.30 mm (0.091 in)
4	22554–PS5–003	2.40 mm (0.094 in)
5 (No mark)	22555–PS5–003	2.50 mm (0.098 in)
6	22556–PS5–003	2.60 mm (0.102 in)
7	22557–PS5–003	2.70 mm (0.106 in)

Torque Converter Housing Bearings

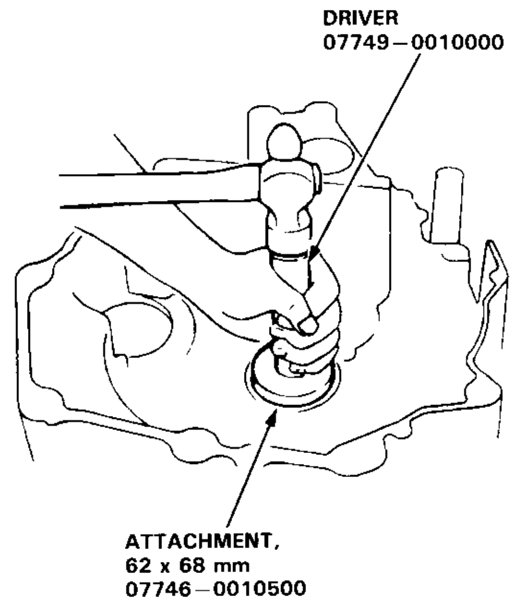
Mainshaft Bearing/Oil Seal Replacement

1. Remove the mainshaft bearing and oil seal using the special tools as shown.

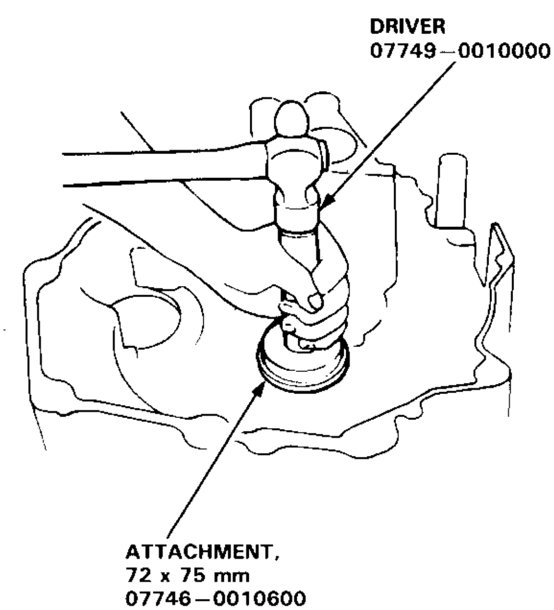




2. Drive in the new mainshaft bearing until it bottoms in the housing using the special tools as shown.

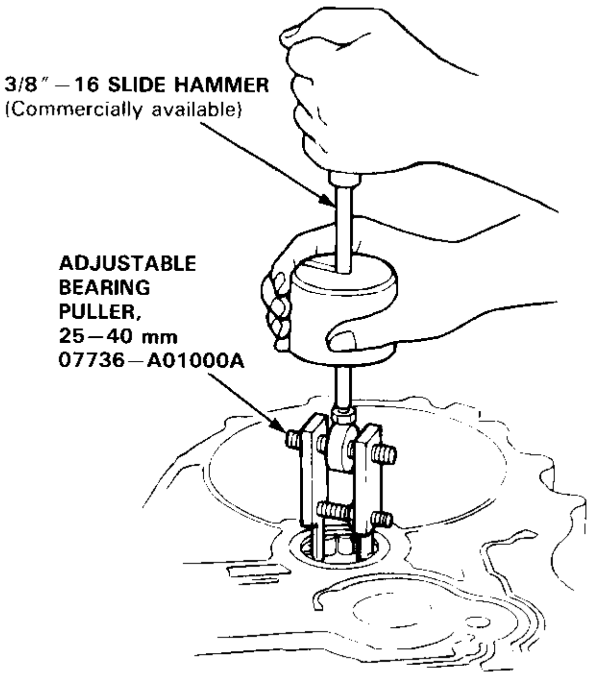


3. Install the new oil seal flush with the housing using the special tools as shown.

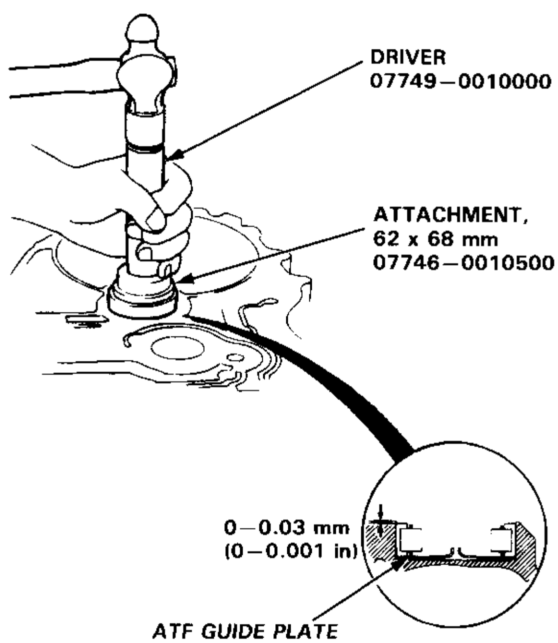


Countershaft Bearing Replacement

1. Remove the countershaft bearing using the special tools as shown.



2. Install the ATF guide plate.
3. Drive the new bearing into the housing using the special tools as shown.

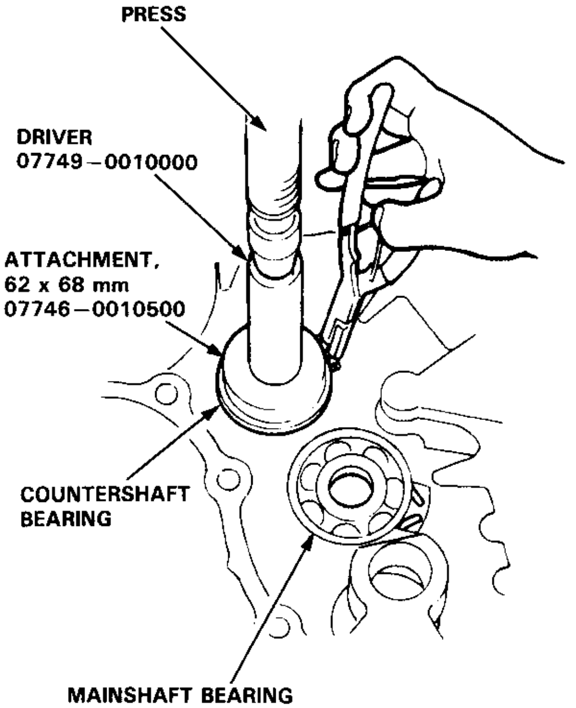


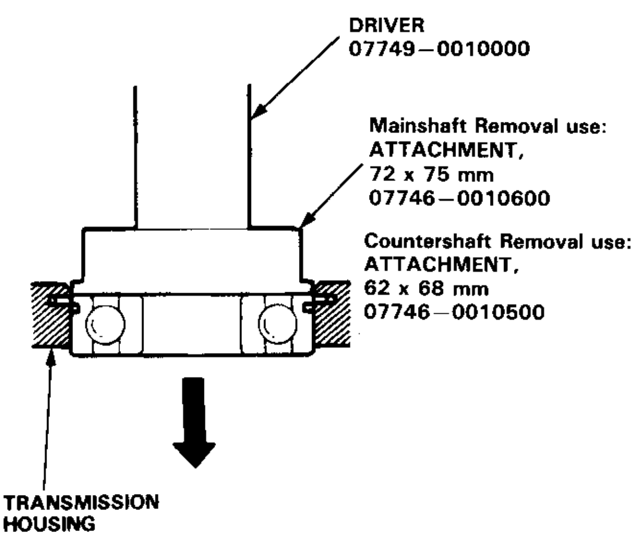
Transmission Housing Bearings

Mainshaft/Countershaft Bearing Replacement

1. To remove the mainshaft and countershaft bearings from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out using the special tools and a press as shown.

   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.

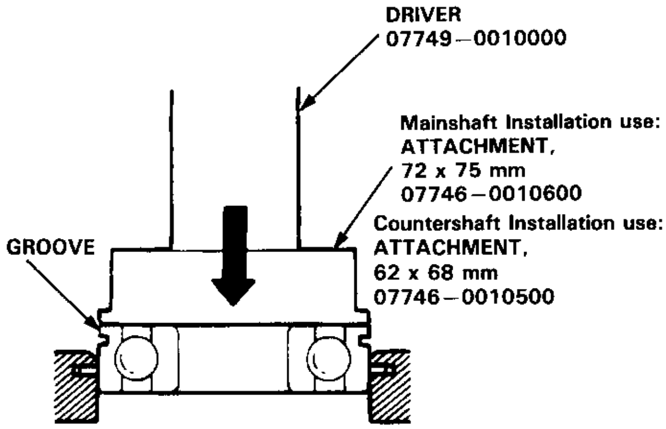




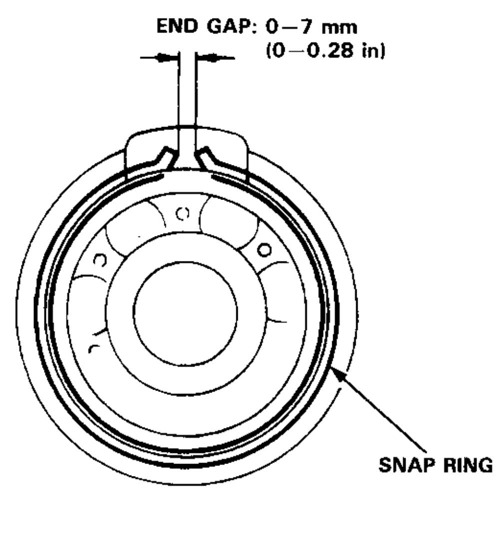
2. Expand each snap ring with snap ring pliers, insert the new bearing part-way into the housing using the special tools and a press as shown. Install the bearing with the groove facing outside the housing.

   NOTE: Coat all parts with ATF.

3. Release the pliers, then push the bearing down into the housing until the ring snaps in place around it.



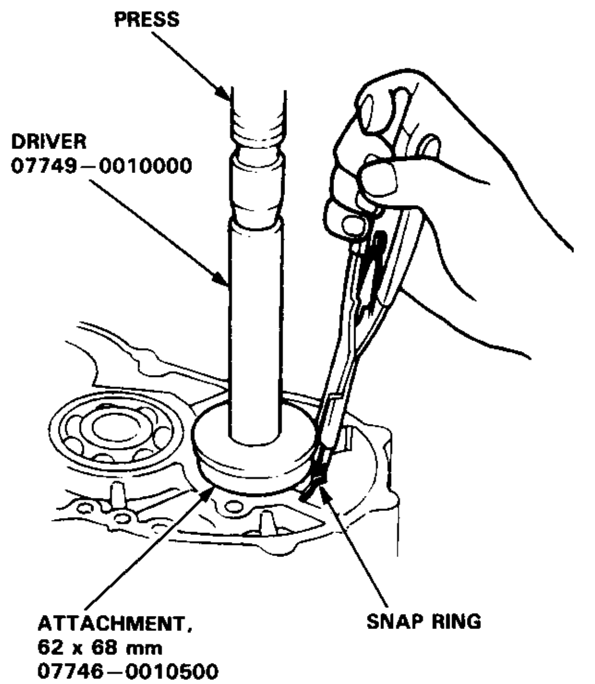
4. After installing the bearing verify the following:
   - The snap ring is seated in the bearing and housing grooves.
   - The ring end gap is correct.

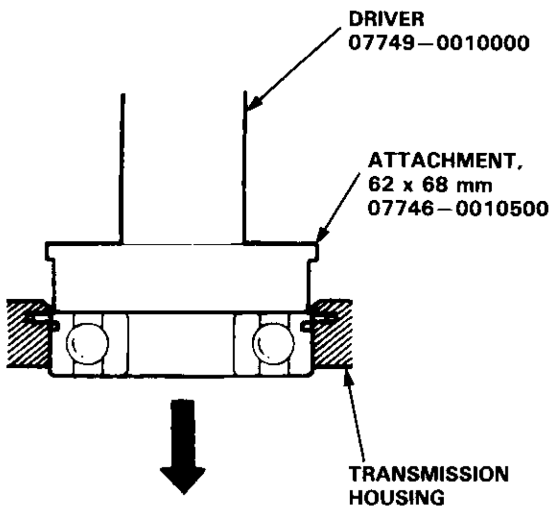


Sub-shaft Bearing Replacement

1. To remove the sub-shaft bearing from the transmission housing, expand the snap ring with snap ring pliers, then push the bearing out using the special tools and a press as shown.

   NOTE: Do not remove the snap ring unless it's necessary to clean the groove in the housing.

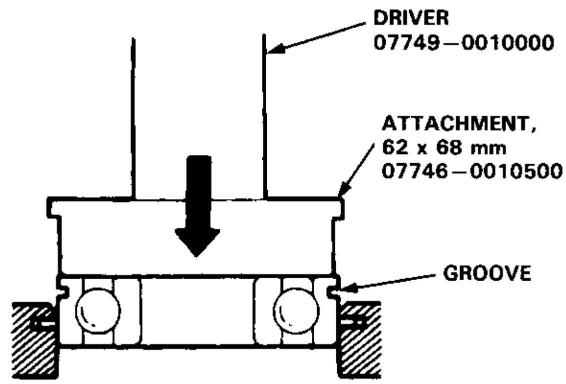




2. Expand the snap ring with snap ring pliers, insert the new bearing part-way into the housing using the special tools and a press as shown. Install the bearing with the groove facing outside the housing.

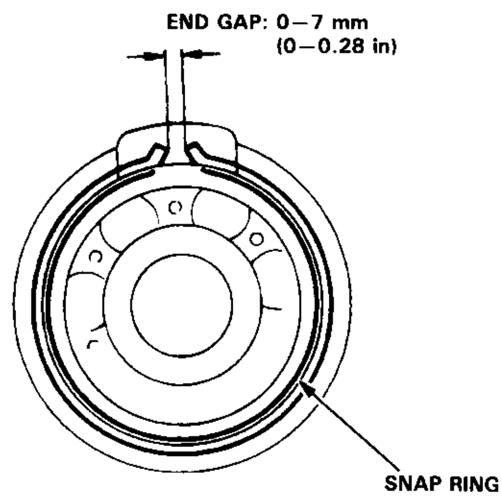
   NOTE: Coat all parts with ATF.

3. Release the pliers, then push the bearing down into the housing until the ring snaps in place around it, using the special tools as shown.



4. After installing the bearing verify the following:

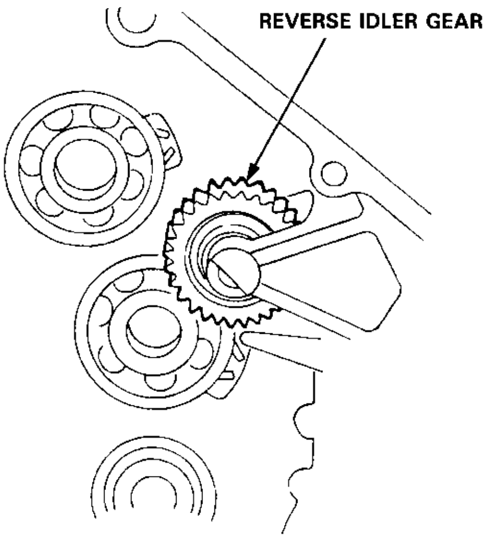
   - The snap ring is seated in the bearing and housing grooves.
   - The snap ring operates properly.
   - The ring end gap is correct.



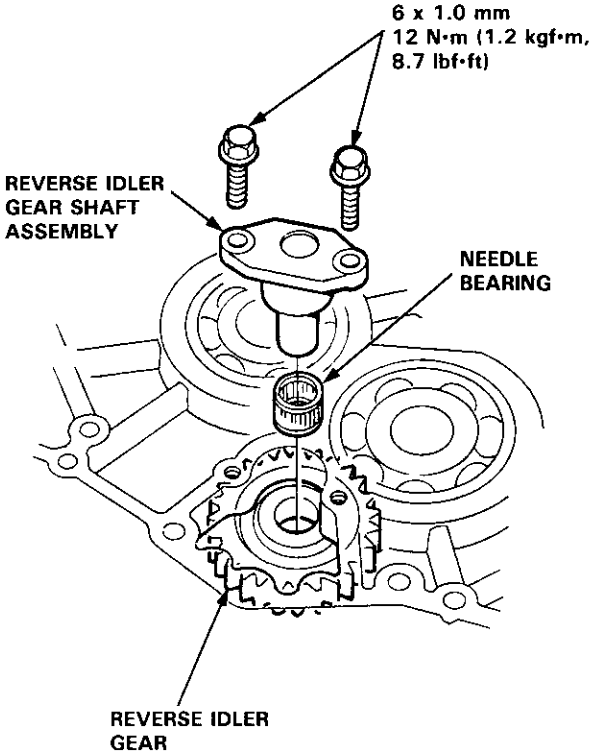
Reverse Idler Gear

Installation

1. Install the reverse idler gear.



2. Install the reverse idler gear shaft holder and needle bearing into the transmission housing, then tighten the bolts.

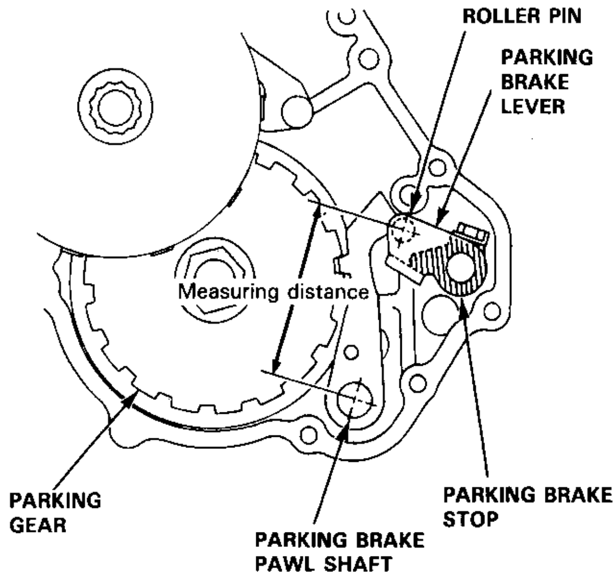


Parking Brake Stop

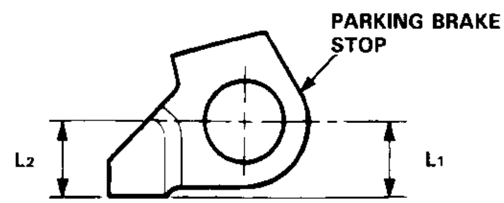
Inspection/Adjustment

1. Set the parking brake lever in the [P] position.
2. Measure the distance between the parking brake pawl shaft and the parking brake lever roller pin as shown.

STANDARD: 72.9–73.9 mm (2.87–2.91 in)



3. If the measurement is out of tolerance, select and install the appropriate parking brake stop from the table below.



PARKING BRAKE STOP

Mark	Part Number	L_1	L_2
1	24537–PA9–003	11.00 mm (0.433 in)	11.00 mm (0.433 in)
2	24538–PA9–003	10.80 mm (0.425 in)	10.65 mm (0.419 in)
3	24539–PA9–003	10.60 mm (0.417 in)	10.30 mm (0.406 in)

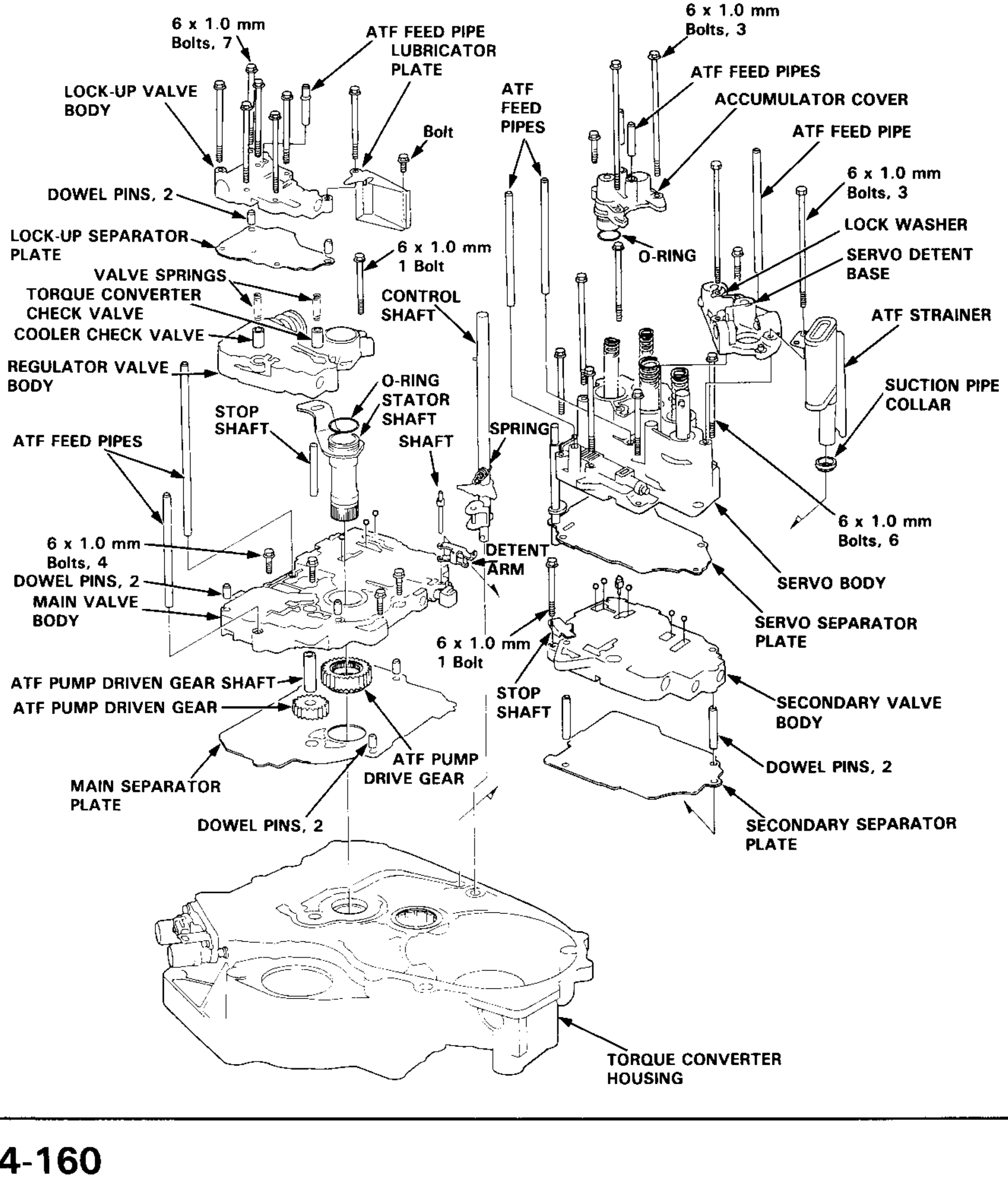
4. After replacing the parking brake stop, make sure the distance is within tolerance.

Reassembly

NOTE:

- Coat all parts with ATF.
- Replace the parts below:
  - O-rings
  - Lock washers
  - Gaskets
  - Locknuts
  - Conical spring washers
  - Sealing washers

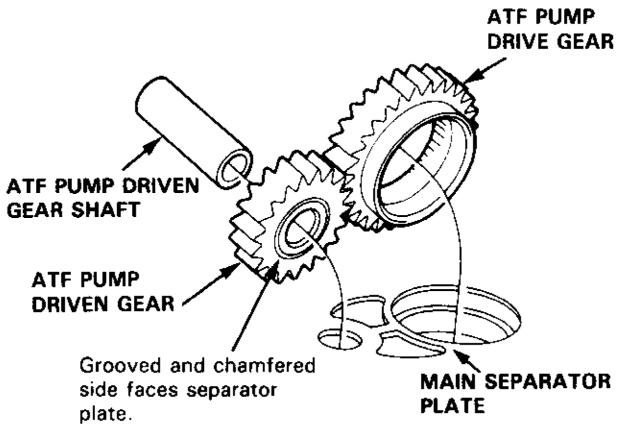
TORQUE: 6 x 1.0 mm Bolt 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



1. Install the suction pipe collar in the torque converter housing.

2. Install the main separator plate with two dowel pins on the torque converter housing. Then install the ATF pump drive gear, driven gear and driven gear shaft.

   NOTE: Install the ATF pump driven gear with its grooved and chamfered side facing down.

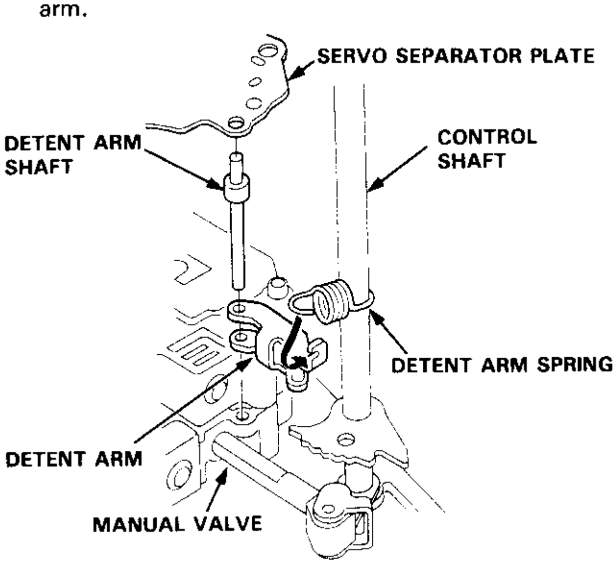


3. Loosely install the main valve body with four bolts. Make sure the ATF pump drive gear rotates smoothly in the normal operating direction and the ATF pump driven gear shaft moves smoothly in the axial and normal operating directions.

4. Install the secondary valve body, separator plate and two dowel pins on the main valve body.

5. Install the control shaft in the housing, with the control shaft and manual valve together.

6. Install the detent arm and arm shaft in the main valve body, then hook the detent arm spring to the detent arm.



7. Install the servo body and separator plate (six bolts).

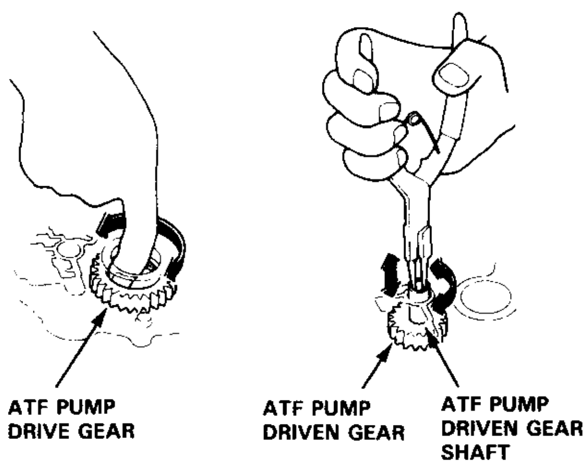
8. Install the accumulator cover (three bolts).

9. Install the servo detent base and ATF strainer and new lock washers (three bolts).

10. Tighten the four bolts to 12 N•m (1.2 kgf•m, 8.7 lbf•ft) on the main valve body.
    Make sure the ATF pump drive gear and ATF pump driven gear shaft move smoothly.

11. If the ATF pump drive gear and ATF pump driven gear shaft do not move freely, loosen the four bolts on the main valve body and disassemble the valve bodies. Realign the ATF pump driven gear shaft and reassemble the valve bodies, then retighten the bolts to the specified torque.

    CAUTION: Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.



12. Install the stator shaft and stop shaft.

13. Install the stop shaft stay on the secondary valve body (one bolt).

14. Install the regulator valve body with the bolt.

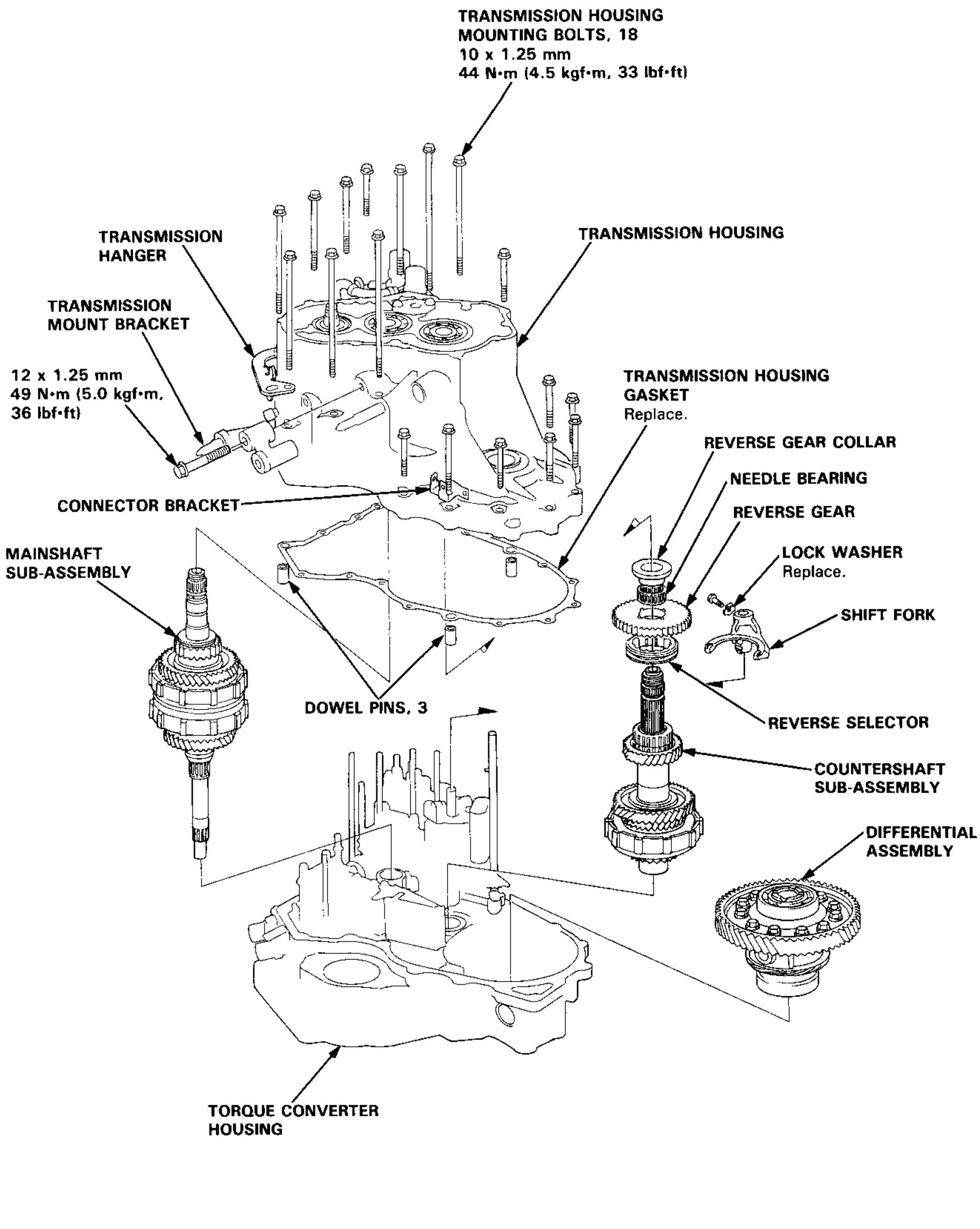
15. Install the torque converter check valve, cooler check valve and valve springs in the regulator valve body.

16. Install the lock-up valve body, separator plate, two dowel pins and lubricator plate (eight bolts).

17. Install the ATF feed pipes.

(cont'd)

Reassembly (cont'd)

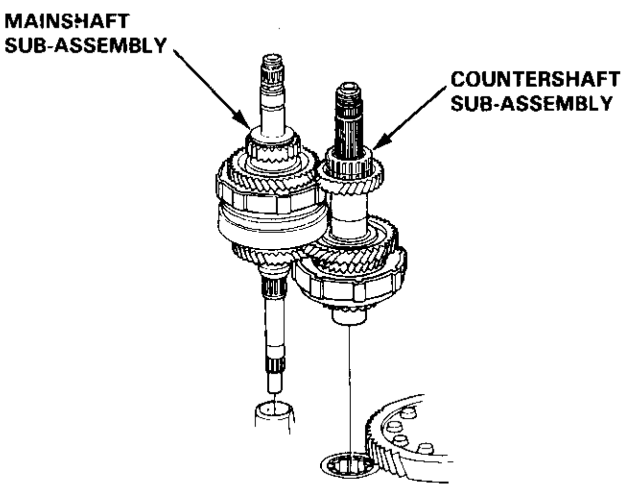


18. Install the sub-shaft assembly in the transmission housing (see page 14-142).

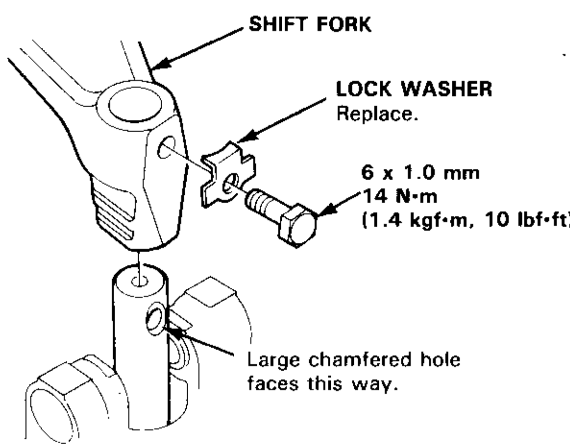
19. Install the reverse idler gear and gear shaft holder (see page 14-158).

20. Install the differential assembly in the torque converter housing.

21. Assemble the mainshaft and countershaft sub-assembly, then install them together in the torque converter housing.



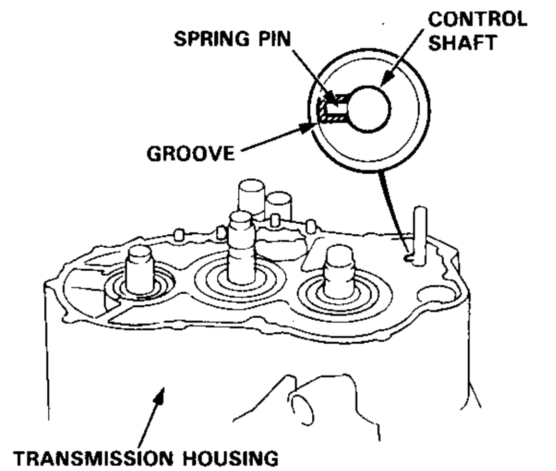
22. Turn the shift fork so the large chamfered hole is facing the fork bolt hole, then install the shift fork with the reverse selector and torque the lock bolt. Bend the lock tab against the bolt head.



23. Install the reverse gear with the collar and needle bearing on the countershaft.

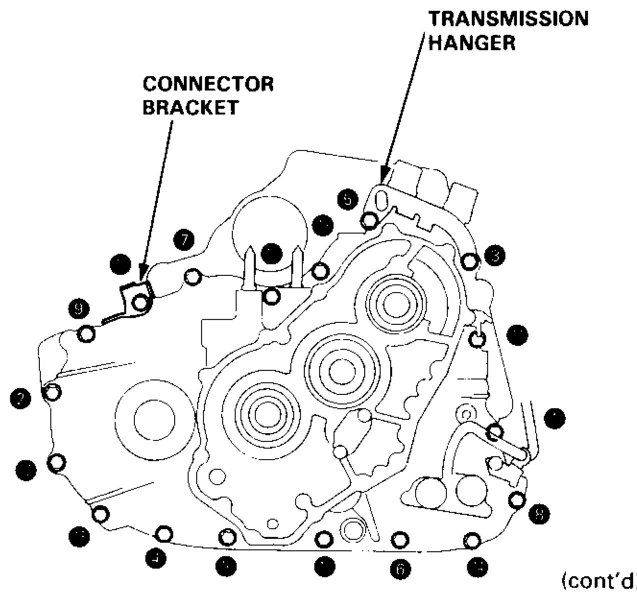
24. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.

25. Place the transmission housing on the torque converter housing with a new gasket and the three dowel pins.



26. Install the transmission housing mounting bolts along with the transmission hanger and the connector bracket, then torque the bolts in two or more steps in the sequence shown.

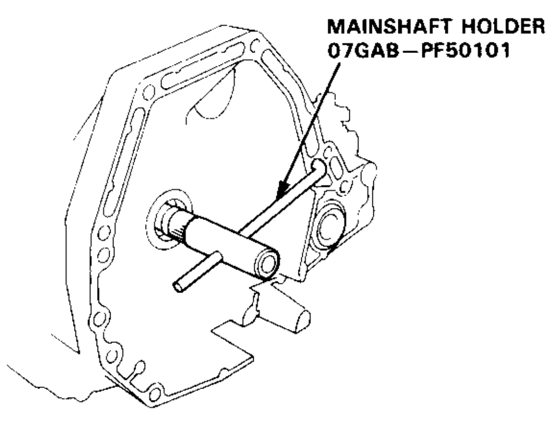
TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



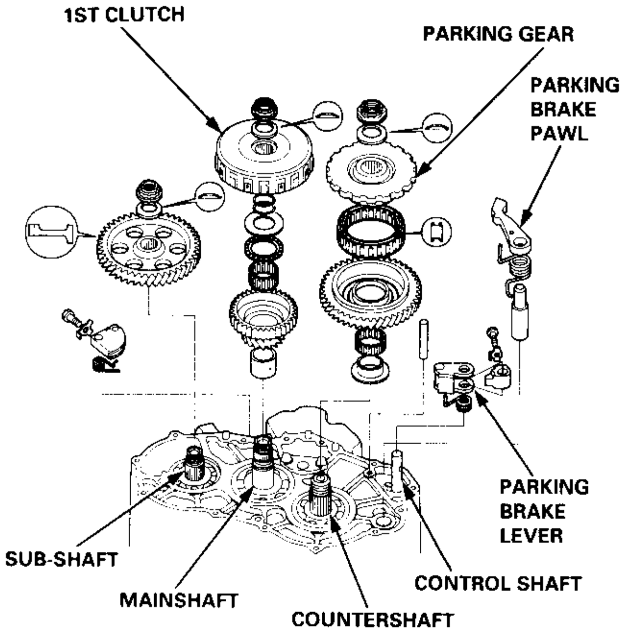
(cont'd)

Reassembly (cont'd)

27. Install the special tool onto the mainshaft as shown.



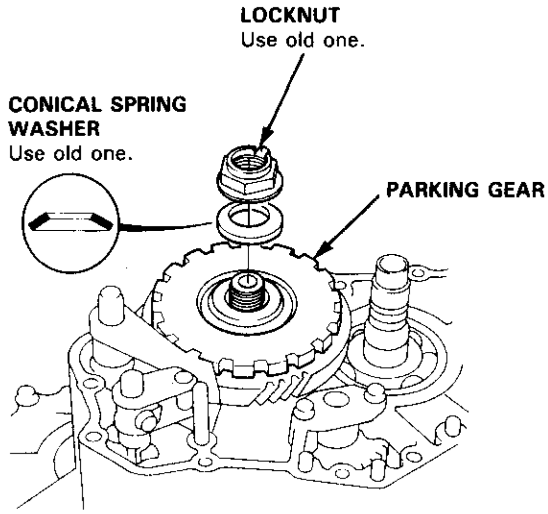
28. Install the parking brake lever on the control shaft.
29. Assemble the one-way clutch and the parking gear with the countershaft 1st gear (see page 14-141).
30. Install the countershaft 1st gear collar, needle bearing and the countershaft 1st gear/parking gear assembly on the countershaft.
31. Install the parking brake pawl shaft, spring, pawl and pawl stop on the transmission housing, then engage the parking brake pawl with the parking gear.



32. Install the old conical spring washer and locknut on the countershaft. Tighten the old locknut to seat the parking gear to the specified torque, then remove them.

NOTE:
- Do not use an impact wrench, always use a torque wrench to tighten the locknut.
- Countershaft locknut has left-hand threads.

TORQUE: 103 N·m (10.5 kgf·m, 75.9 lbf·ft)



33. Install the sub-shaft 1st gear on the sub-shaft.
34. Install the mainshaft 1st gear collar on the mainshaft.
35. Wrap the mainshaft splines with tape to prevent damage the O-rings, then install new O-rings on the mainshaft.
36. Assemble the thrust washer, thrust needle bearing, needle bearing and mainshaft 1st gear on the 1st clutch assembly, then install them on the mainshaft.

37. Align the hole of the sub-shaft 1st gear with the hole of the transmission housing, then insert a pin to hold the sub-shaft while tightening the sub-shaft locknut.

38. Install a new conical spring washers and new locknuts on each shaft.

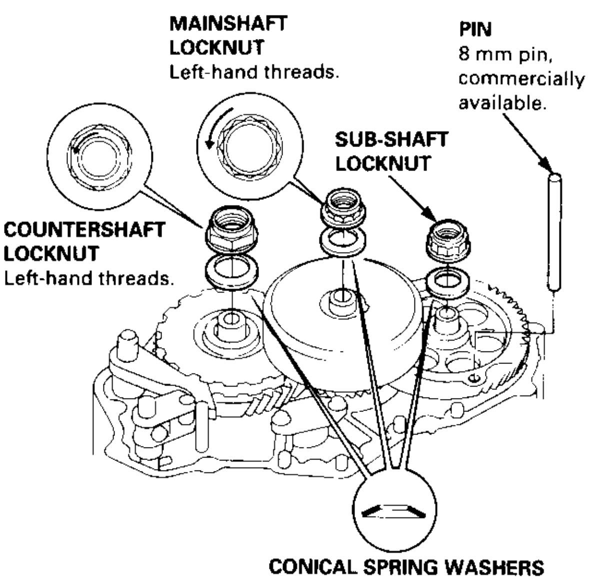
CAUTION: Install the conical spring washers in the direction shown.

39. Tighten the locknuts to the specified torque.

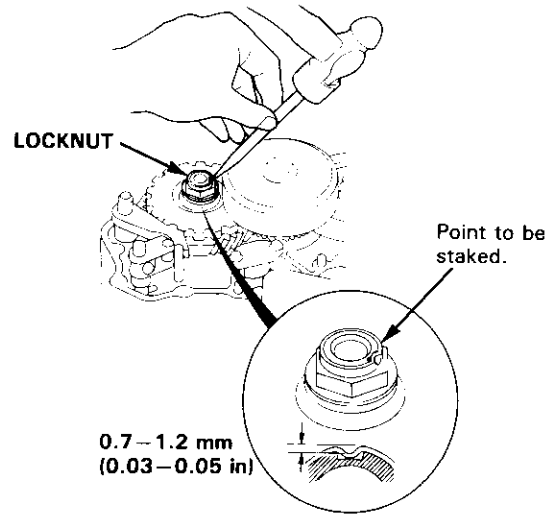
NOTE:
- Do not use an impact wrench, always use a torque wrench to tighten the locknut.
- Mainshaft and countershaft locknuts have left-hand threads.

TORQUE:

MAINSHAFT	**78 N·m (8.0 kgf·m, 58 lbf·ft)**
COUNTERSHAFT	**103 N·m (10.5 kgf·m, 75.9 lbf·ft)**
SUB-SHAFT	**93 N·m (9.5 kgf·m, 69 lbf·ft)**



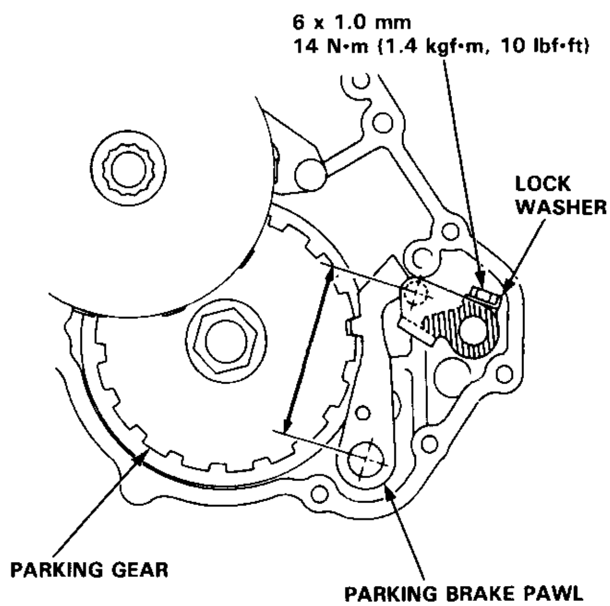
40. Stake each locknut using a 3.5 mm punch as shown.



41. Set the parking brake lever in the [P] position, then verify that the parking brake pawl engages the parking gear.

42. If the pawl does not engage fully, check the parking brake pawl stop clearance as described on page 14-158.

43. Tighten the lock bolt and bend the lock tab.

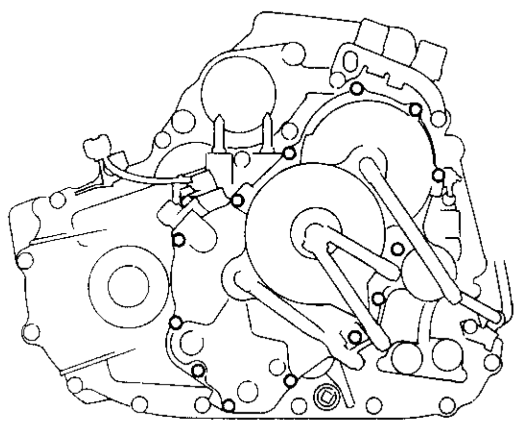


(cont'd)

Reassembly (cont'd)

44. Install the right side cover.

    TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



45. Install the throttle control drum with the drum spring on the throttle control shaft.

    TORQUE: 7.8 N·m (0.8 kgf·m, 5.8 lbf·ft)

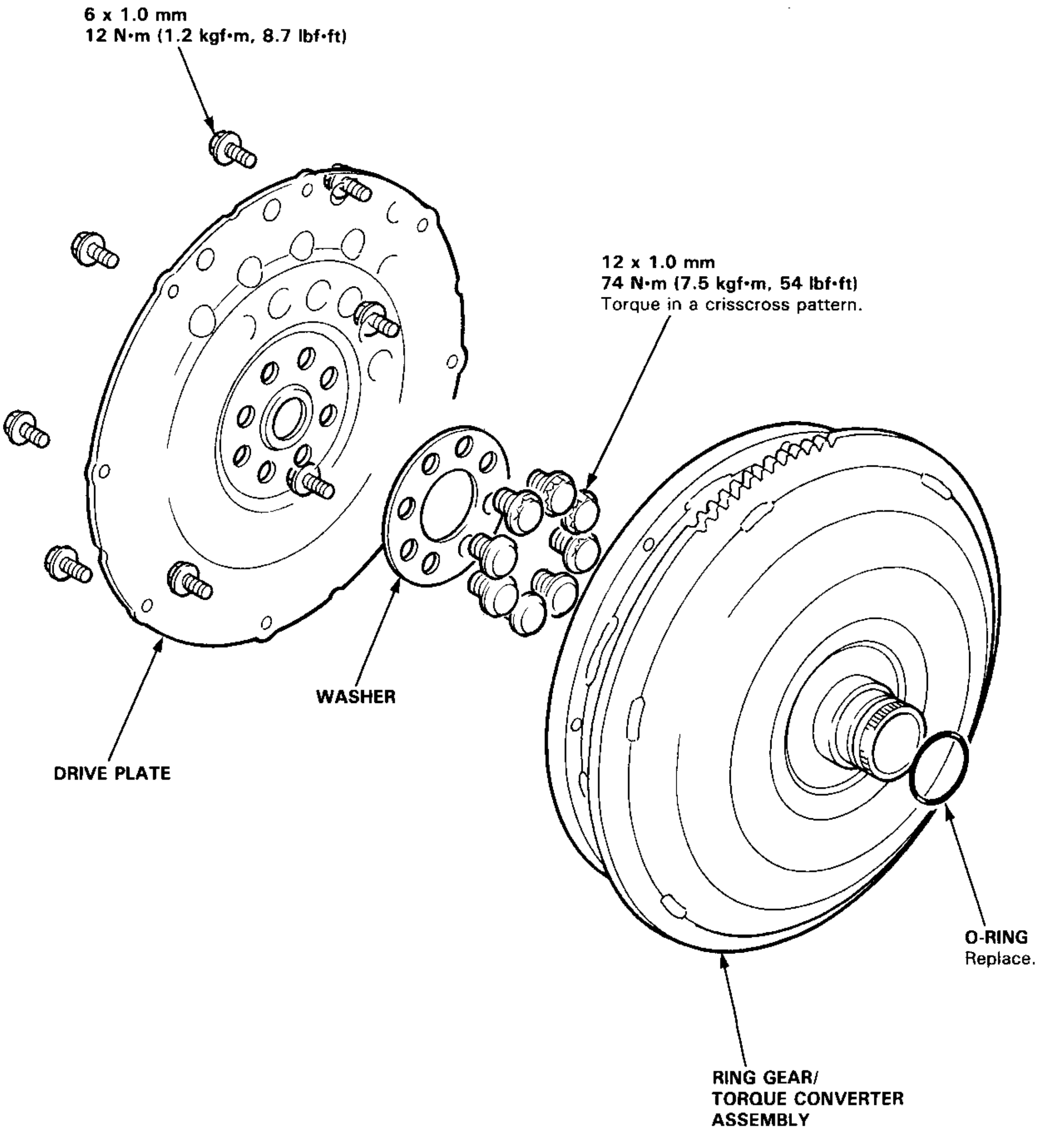
46. Install the transmission mount bracket.

    TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)

47. Install the ATF cooler lines with the joint bolts and new sealing washers.

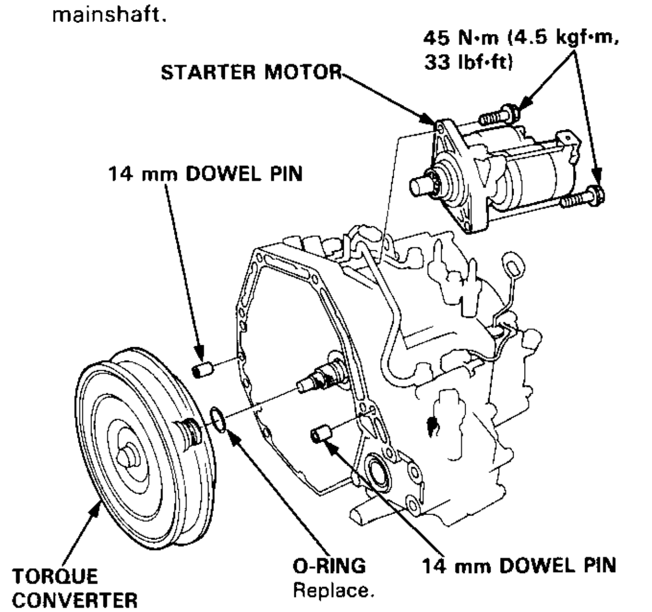
    TORQUE: 28 N·m (2.9 kgf·m, 21 lbf·ft)

48. Install the ATF dipstick.

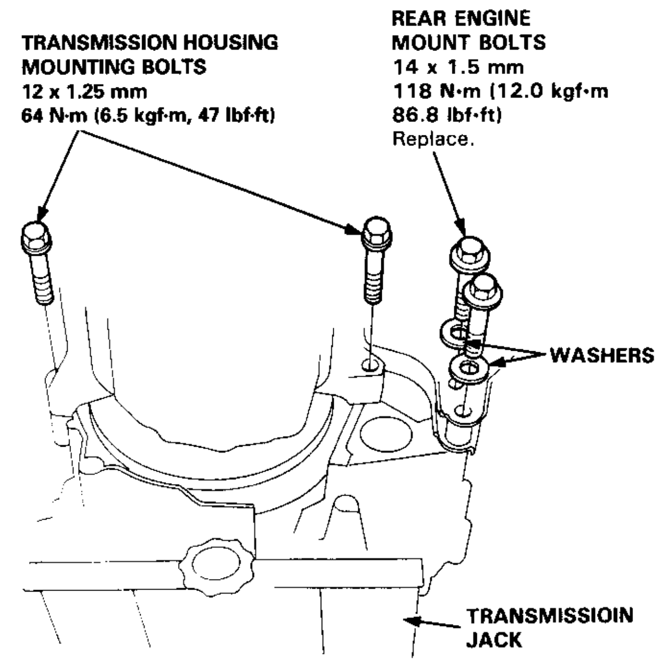

6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
12 x 1.0 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)
Torque in a crisscross pattern.
WASHER
DRIVE PLATE
O-RING
Replace.
RING GEAR/
TORQUE CONVERTER
ASSEMBLY

Installation

1. Flush the ATF cooler as described on pages 14-172 thru 173.
2. Install the starter motor on the transmission housing, then install the two 14 mm dowel pins in the torque converter housing. Install the torque converter assembly securely with a new O-ring on the mainshaft.

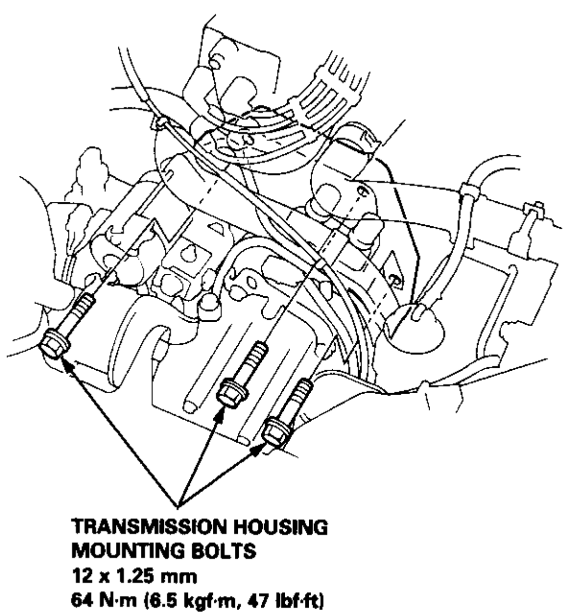


3. Place the transmission on a transmission jack, and raise it to the engine level.
4. Attach the transmission to the engine, then install the transmission housing mounting bolts and two rear engine mounting bolts with new washers.



5. Install the transmission mount.

6. Install the transmission housing mounting bolts.

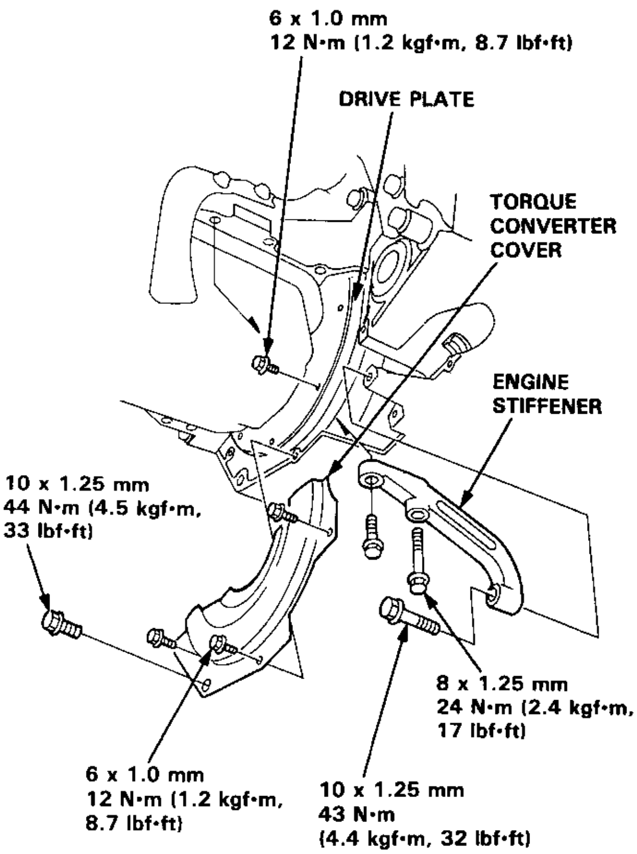


7. Remove the transmission jack.

8. Attach the torque converter to the drive plate with eight bolts and torque as follows:
Rotate the crankshaft as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern.
After tightening the last bolts, check that the crankshaft rotates freely.

TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)

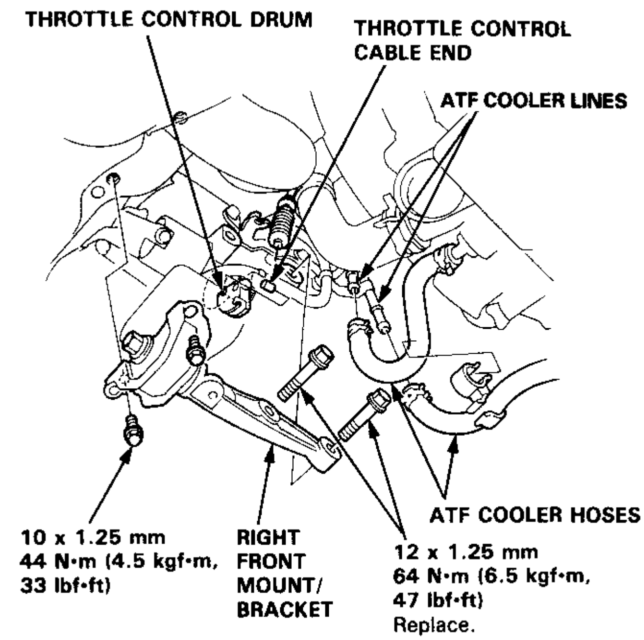
9. Install the torque converter cover and engine stiffener.



10. Tighten the crankshaft pulley bolt to specified torque (see section 6).

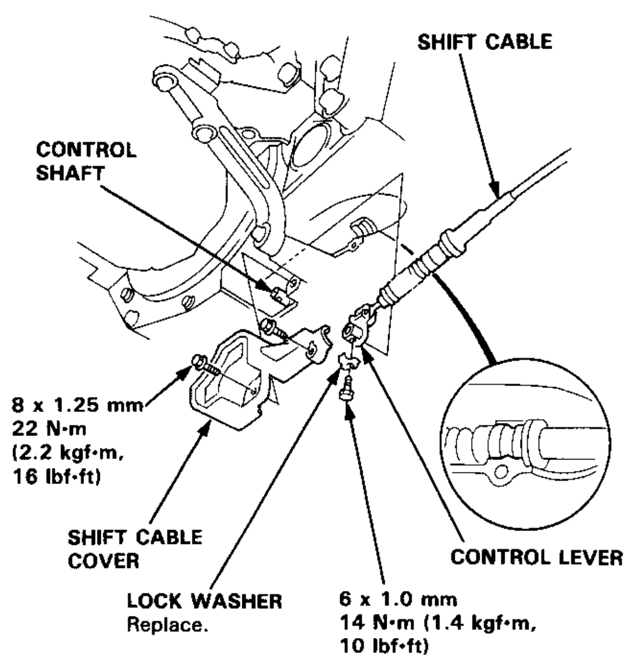
11. Connect the ATF cooler hoses to the ATF cooler lines (see page 14-174).

12. Connect the throttle control cable to the throttle control drum, and install the right front mount/bracket.



13. Install the control lever with a new lock washer to the control shaft, then install the shift cable cover.

CAUTION: Take care not to bend the shift cable.

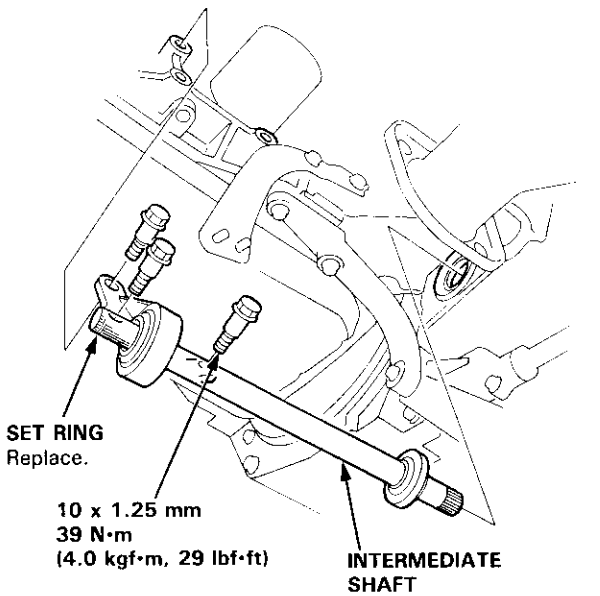


(cont'd)

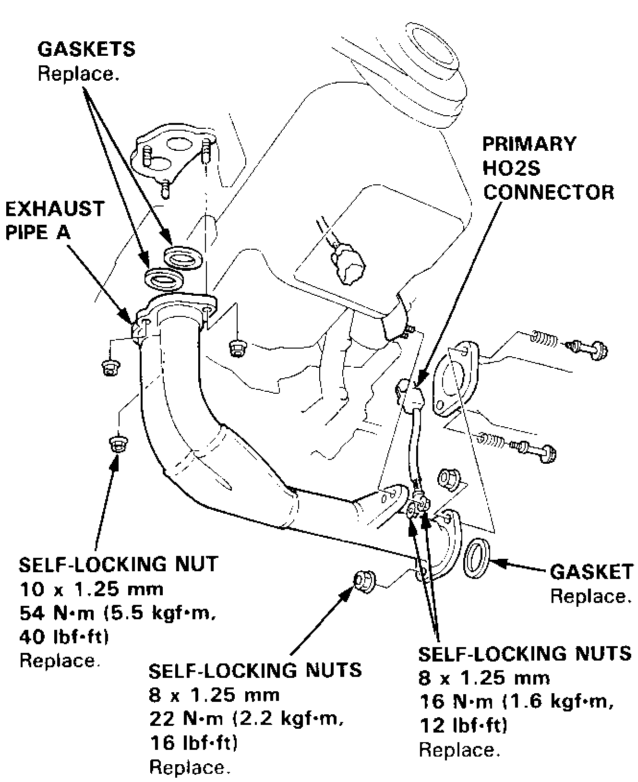
Installation (cont'd)

14. Install new set rings on the end of the intermediate shaft and the driveshaft.

15. Install the intermediate shaft.



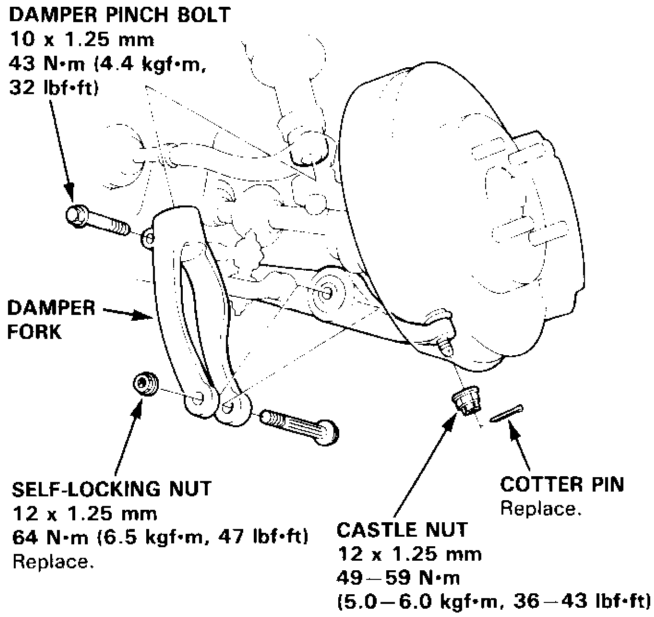
16. Install exhaust pipe A, and connect the primary heated oxygen sensor (HO2S) connector.



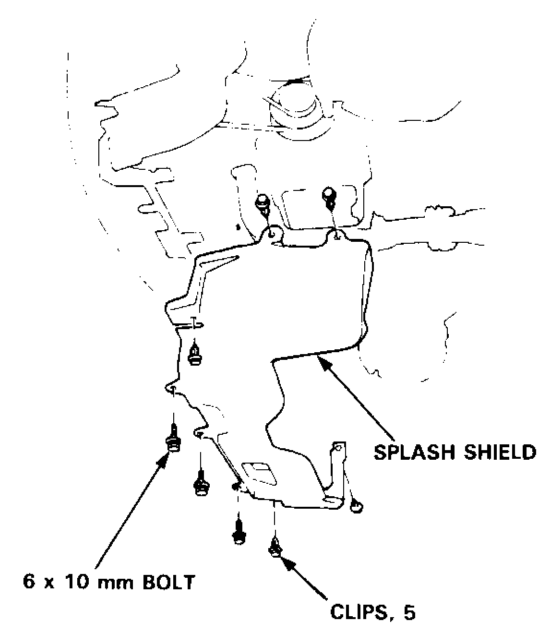
17. Install the right and left driversshafts (see section 16).

    NOTE: Turn the right and left steering knuckle fully outward, and slide the right driveshaft into the differential until you feel its spring clip engage the side gear. Slide the left driveshaft into the intermediate shaft until you feel the spring clip of the intermediate shaft engage the driveshaft.

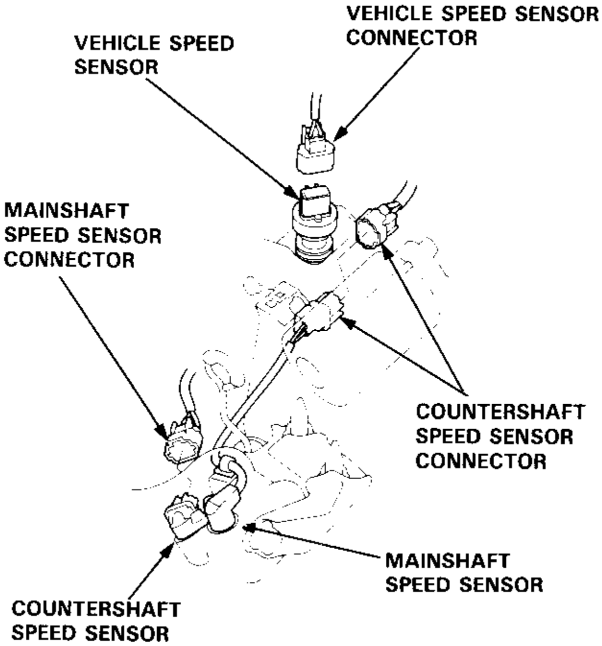
18. Install right damper fork, then install the right and left ball joints to each lower arm with the castle nuts and new cotter pins.



19. Install the splash shield.

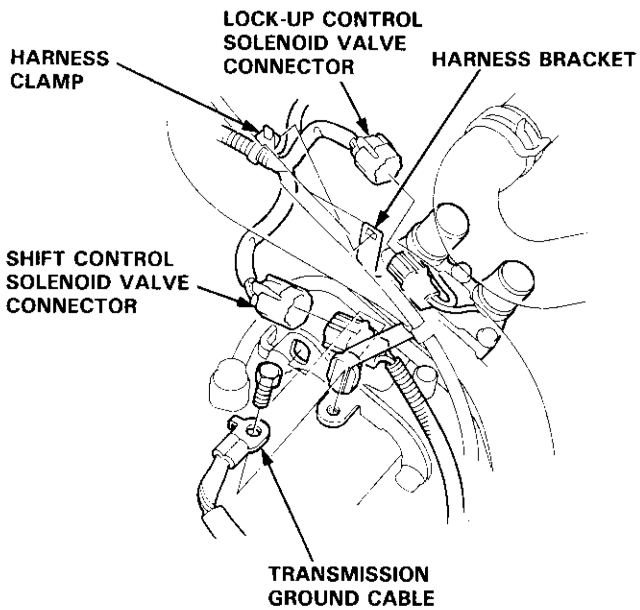


20. Connect the vehicle speed sensor (VSS), mainshaft speed sensor, and countershaft speed sensor connectors.



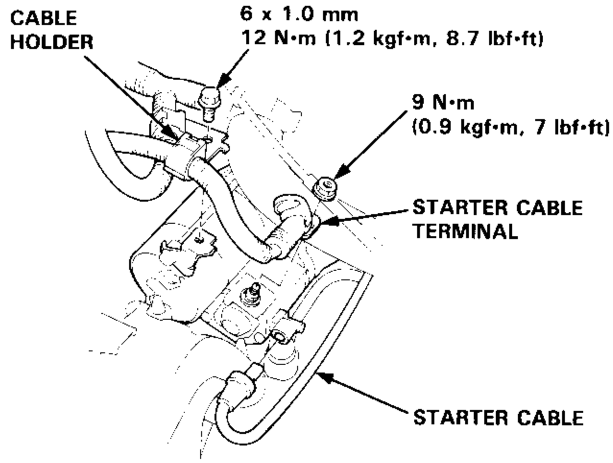
21. Connect the lock-up control solenoid valve connector and shift control solenoid valve connector, then clamp the lock-up control solenoid harness with the harness bracket.

22. Connect the transmission ground cable.

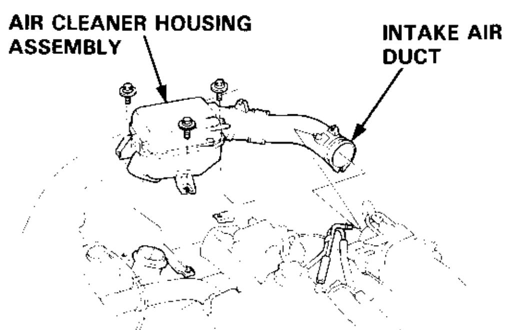


23. Connect the starter cable to the starter motor, and install the cable holder.

NOTE: When installing the starter motor cable, make sure that the crimped side of the ring terminal is facing out (see section 23).



24. Install the air cleaner housing assembly and intake air duct.



25. Refill the transmission with ATF (see page 14-98).

26. Connect the battery positive (+) and negative (−) cables to the battery.

27. Start the engine. Set the parking brake, and shift the transmission through all gears three times.

28. Check shift cable adjustment as described on page 14-176.

29. Check the front wheel alignment (see section 18).

30. Let the engine reach operating temperature (the cooling fan comes on) with the transmission in [N] or [P] position, then turn it off and check the fluid level.

31. Road test as described on page 14-94 and 96.

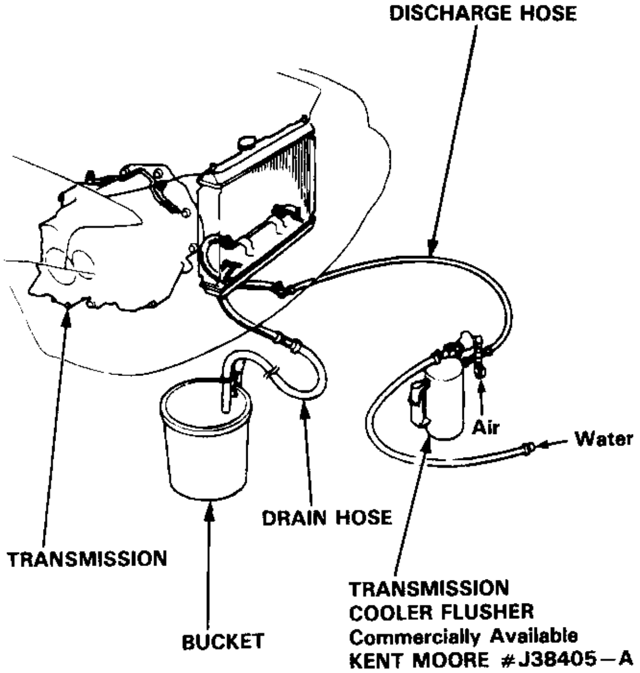
Cooler Flushing

⚠ WARNING To prevent injury to face and eyes, always wear safety glasses or a face shield when using the transmission flusher.

NOTE: This procedure should be performed before reinstalling the transmission.

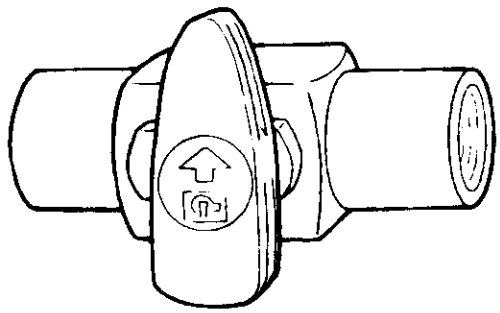
1. Check tool and hoses for wear and cracks before using. If wear or cracks are found, replace the hoses before using.
2. Using the measuring cup, fill the tank with 21 ounces (approximately 2/3 full) of biodegradable flushing fluid (J35944-20). Do not substitute with any other fluid. Follow the handling procedure on the fluid container.
3. Secure the flusher filler cap, and pressurize the tank with compressed air to between 550–829 kPa (5.6–8.45 kgf/cm², 80–120 psi).

   NOTE: The air line should be equipped with a water trap to ensure a dry air system.
4. Hang the tool under the vehicle.
5. Attach the discharge hose of the tank to the return line of the transmission cooler using a clamp.
6. Connect the drain hose to the inlet line of the transmission cooler using a clamp. Securely clamp the opposite end of the drain hose to a bucket or floor drain.



7. With the water and air valves off, attach the water and air supplies to the flusher. (Hot water if available.)

OFF



8. Turn on the flusher water valve so water will flow through the ATF cooler for 10 seconds. If water does not flow through the ATF cooler, it is completely plugged, cannot be flushed, and must be replaced.
9. Depress the trigger to mix the flushing fluid into the water flow. Use the wire clip to hold the trigger down.
10. While flushing with the water and flushing fluid for two minutes, turn the air valve on for five seconds every 15–20 seconds to create a surging action.
    AIR PRESSURE:
    MAX 829 kPa (8.45 kgf/cm², 120 psi)
11. Turn the water valve off. Release the trigger, then reverse the hoses to the cooler so you can flush in the opposite direction. Repeat steps 8 through 10.
12. Release the trigger and allow water only to rinse the cooler with water for one minute.
13. Turn the water valve off and turn off the water supply.
14. Turn the air valve on to dry the system out with air for two full minutes or until no moisture is visible leaving the drain hose.

    CAUTION: Residual moisture in the ATF cooler or pipes can damage the transmission.
15. Remove the flusher from the cooler line. Attach the drain hose to a fluid container.
16. Install the transmission and leave the drain hose attached to the cooler line.

17. Make sure the transmission is in $\boxed{P}$ position. Fill the transmission with ATF, and run the engine for 30 seconds or until approximately one quart is discharged.

18. Remove the drain hose, and reconnect the cooler return hose to the transmission.

19. Refill the transmission with ATF to the proper level.

TOOL MAINTENANCE

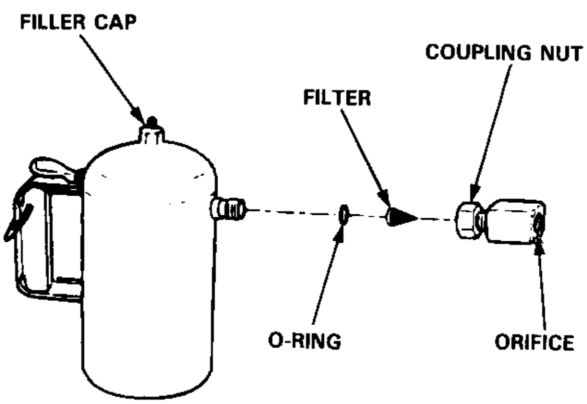
1. Empty and rinse after each use. Fill the can with water and pressurize the can. Flush the discharge line to ensure that the unit is clean.

2. If discharge liquid does not foam, the orifice may be blocked.

3. To clean, disconnect the plumbing from the tank at the large coupling nut.

4. Remove the in-line filter from the discharge side and clean if necessary.

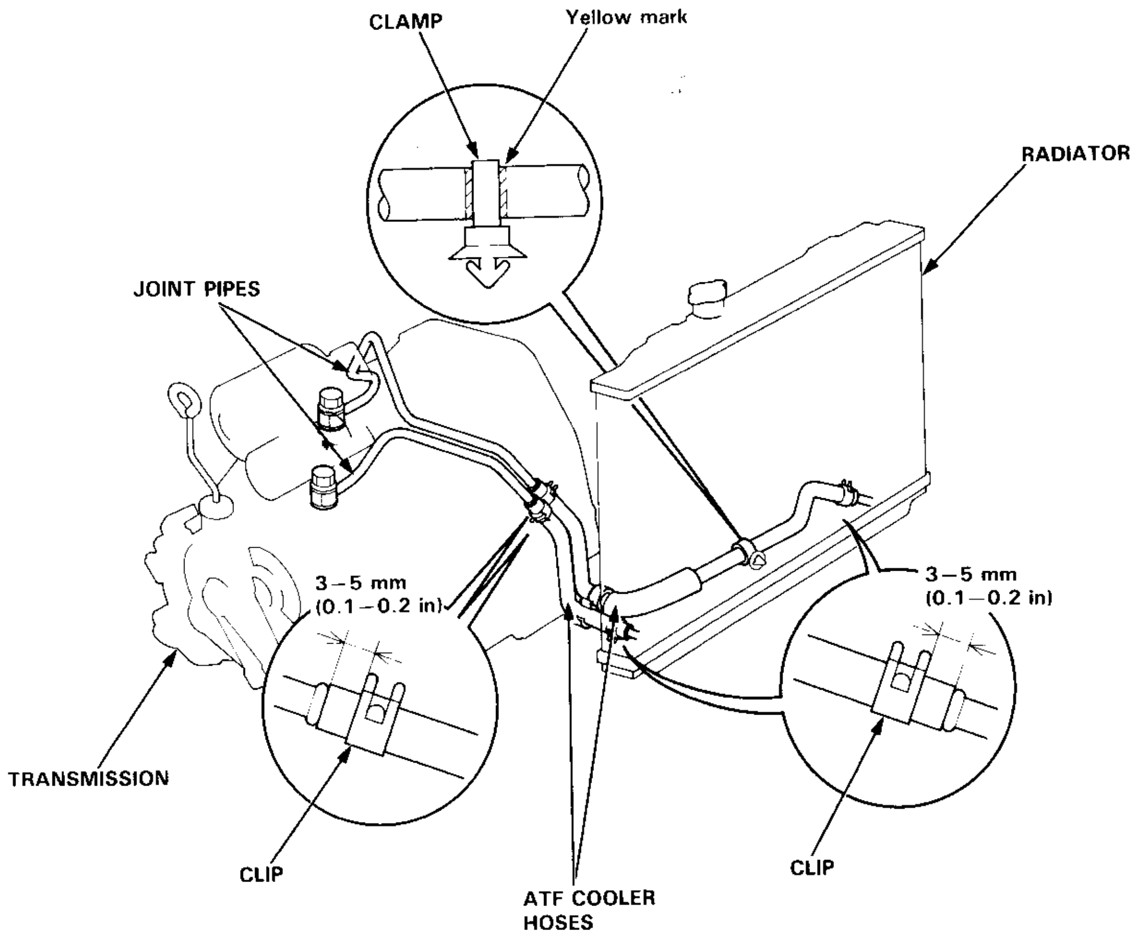
5. The fluid orifice is located behind the filter. Clean it with the pick stored in the bottom of the tank handle or blow it clean with air. Securely reassemble all parts.



ATF Cooler Hoses

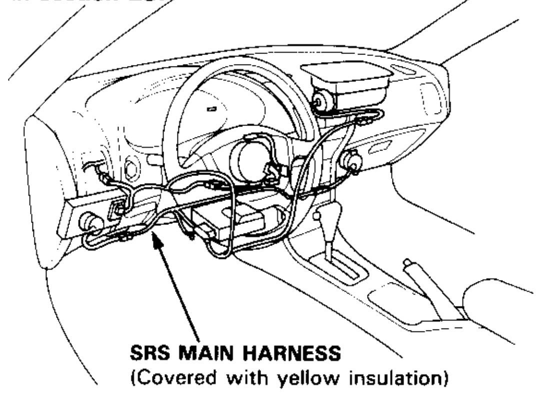
Connection

1. Connect the ATF cooler hoses to the joint lines and ATF cooler, and secure them with the clips as shown.
2. Clamp the ATF cooler hose at the yellow mark as shown.



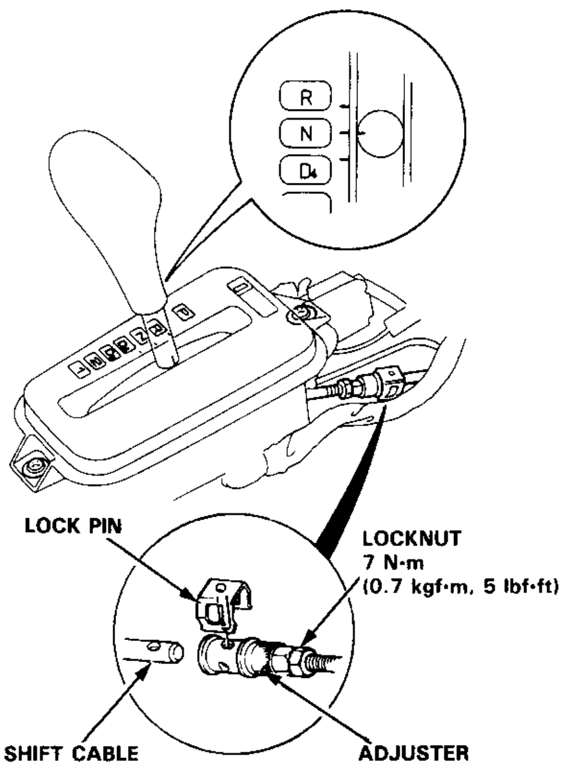
Removal/Installation

CAUTION:
- All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- For additional precautions, refer to the SRS sub-section in section 23.

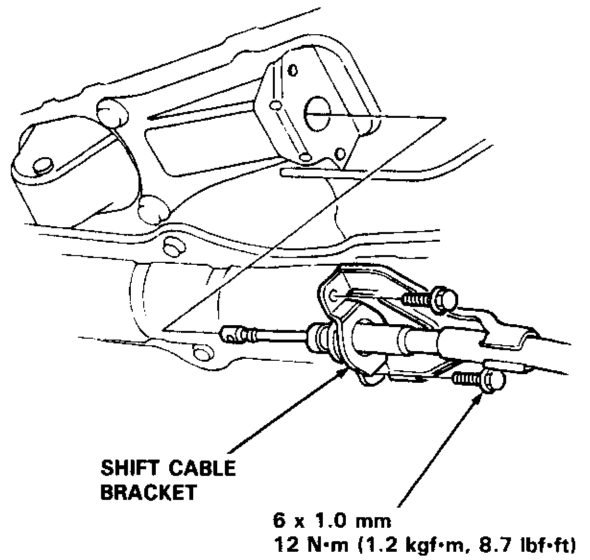


WARNING Make sure lifts are placed properly (see section 1).

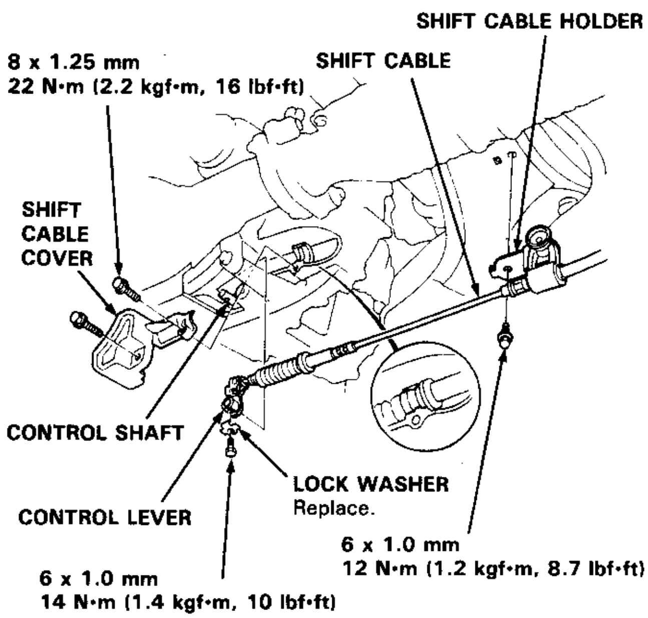
1. Remove the center console (see section 20).
2. Shift to [N] position, then remove the lock pin from the cable adjuster.



3. Remove the shift cable bracket.



4. Remove the shift cable holder.
5. Remove the shift cable cover.
6. Remove the control lever from the control shaft, then remove the shift cable. Take care not to bend the cable when removing/installing it.

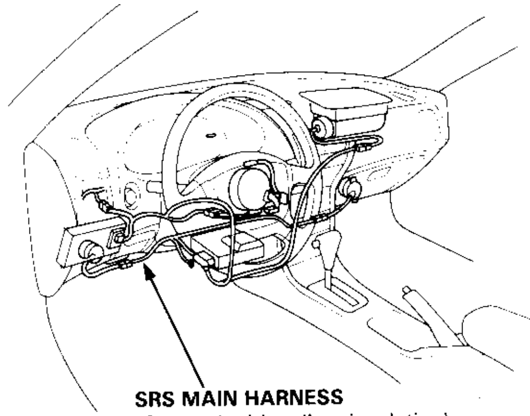


7. Install the shift cable in the reverse order of removal.
8. Check the cable adjustment on reassembly (see page 14-176).

Shift Cable

Adjustment

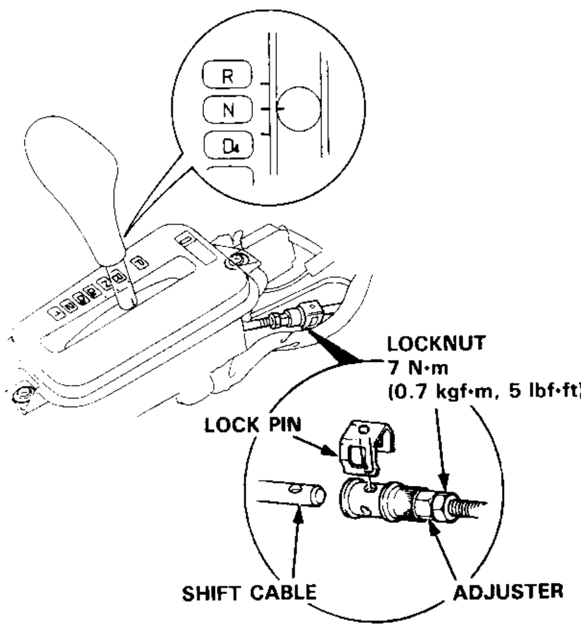
CAUTION:
- All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- For additional precautions, refer to the SRS sub-section



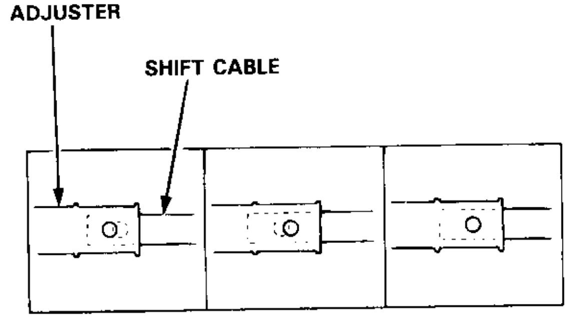
⚠ WARNING **Make sure lifts are placed properly (see section 1).**

1. Remove the center console (see section 20).

2. Shift to [N] position, then remove the lock pin from the cable adjuster.



3. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable.



NOTE: There are two holes in the adjuster. They are positioned 90° apart to allow cable adjustment in 1/4 turn increments.

4. If the hole is not perfectly aligned, loosen the locknut on the adjuster, and adjust as required.

5. Tighten the locknut to 7 N·m (0.7 kgf·m, 5 lbf·ft).

6. Install the lock pin on the adjuster. If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.

7. Make sure the lock pin is seated securely in the adjuster.

8. Move the shift lever to each gear, and verify that the automatic transaxle gear position indicator follows the automatic transaxle gear position switch.

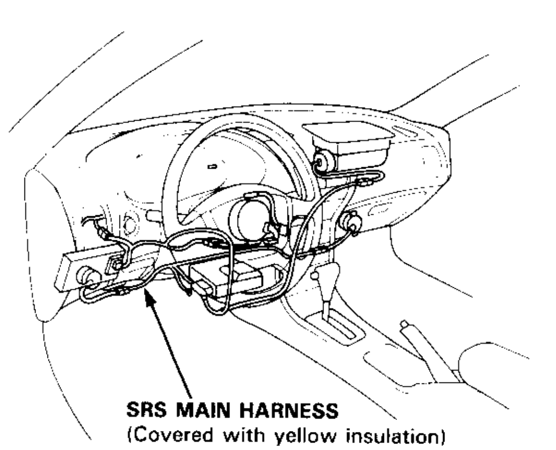
9. Start the engine, and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting on page 14-90 thru 93.

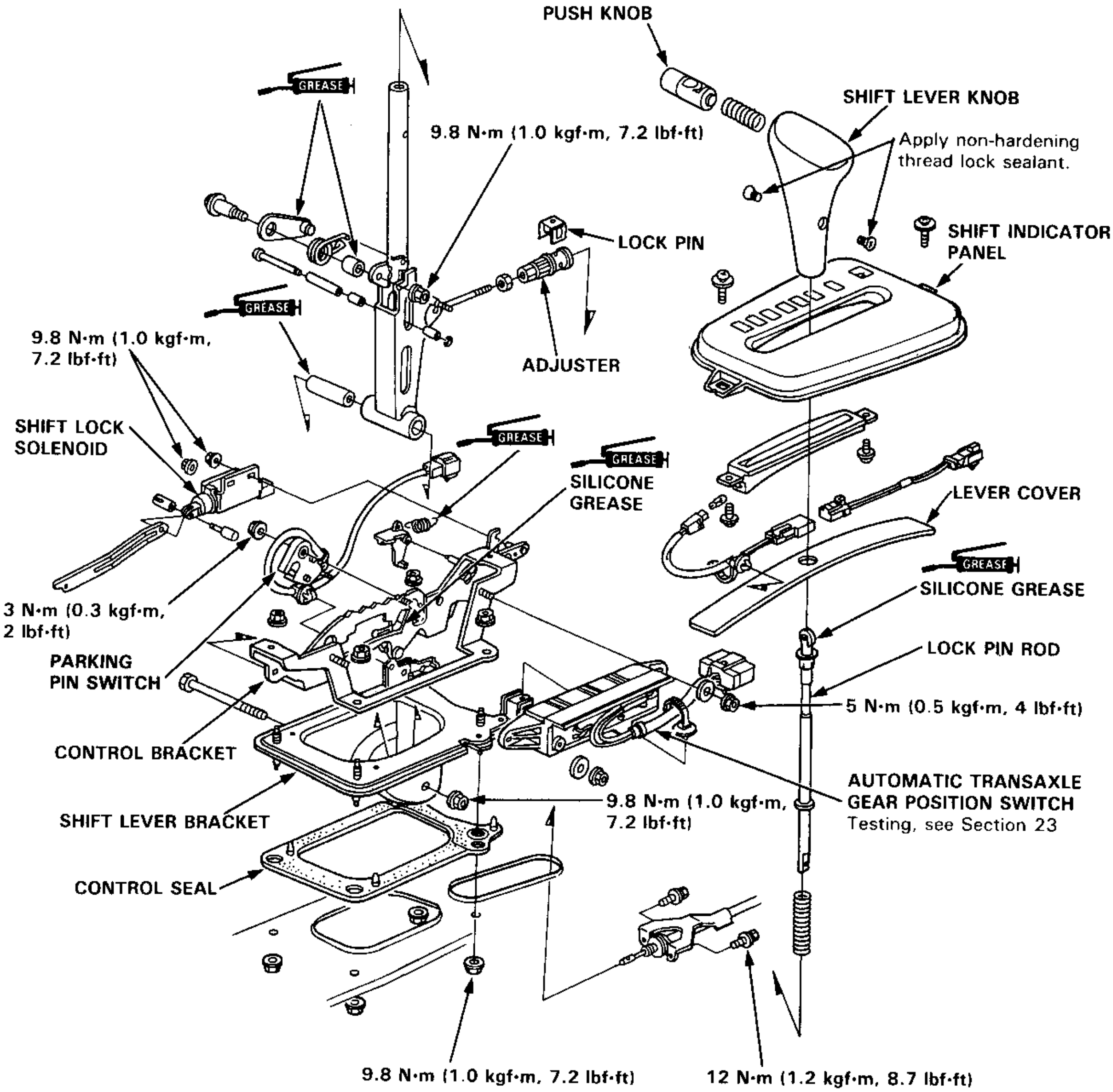
10. Insert the ignition key into the key cylinder on the shift indicator panel, verify that the shift lock lever is released.

Disassembly/Reassembly

CAUTION:

- All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- For additional precautions, refer to the SRS sub-section in section 23.

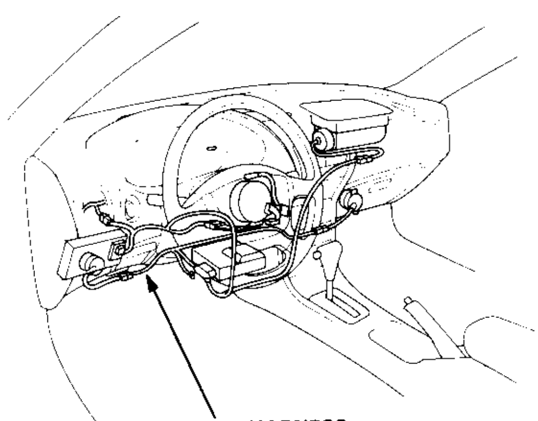




Shift Indicator Panel

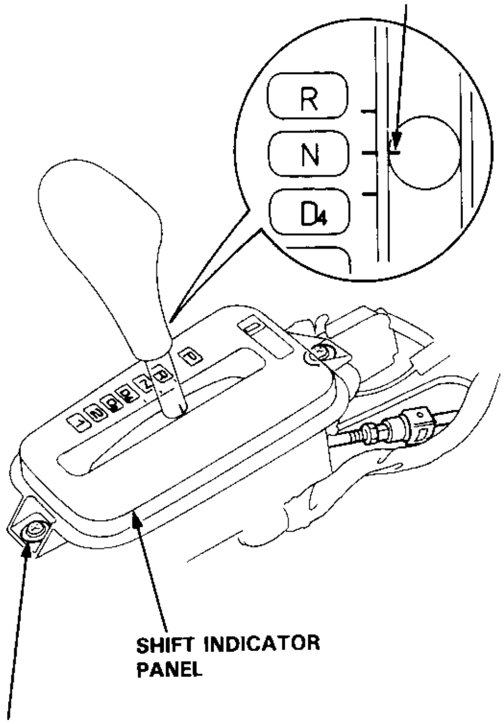
Adjustment

CAUTION:
- All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- For additional precautions, refer to the SRS sub-section in section 23.



1. Check that the index mark on the indicator aligns with the $\boxed{N}$ mark on the shift indicator panel when the transmission is in NEUTRAL.
2. If not aligned, remove the center console (see section 20).
3. Loosen the shift indicator panel mounting screws and adjust by moving the panel.

   NOTE: Whenever the shift indicator panel is removed, realign it as described above.



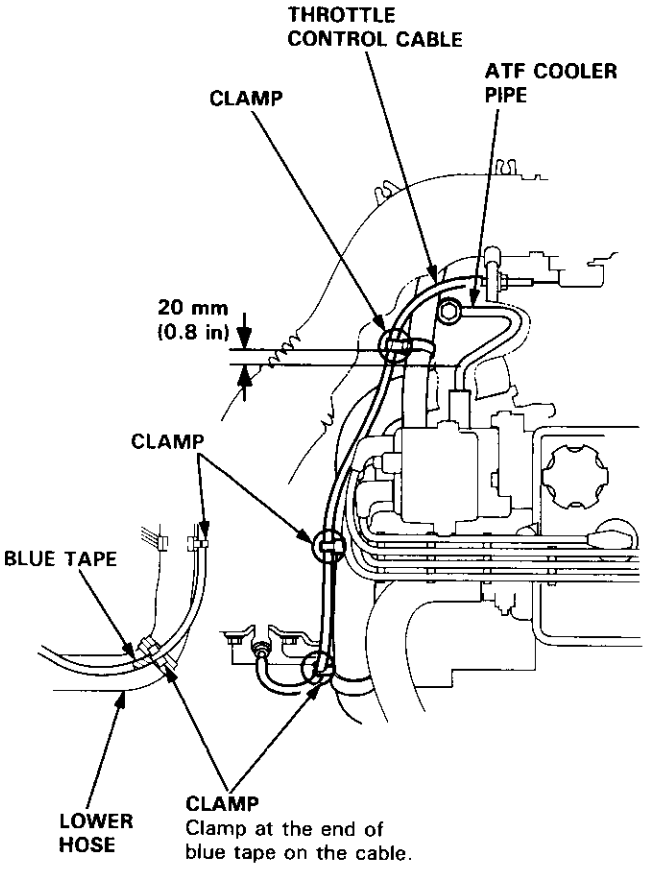
Throttle Control Cable

Inspection

NOTE: Before inspecting the throttle control cable, make sure:

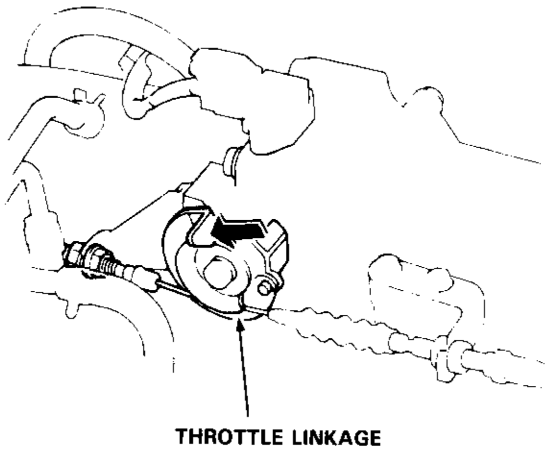
- Throttle cable free play is correct (see section 11).
- Idle speed is correct (see section 11).
- To warm up the engine to normal operating temperature (the cooling fan comes on).

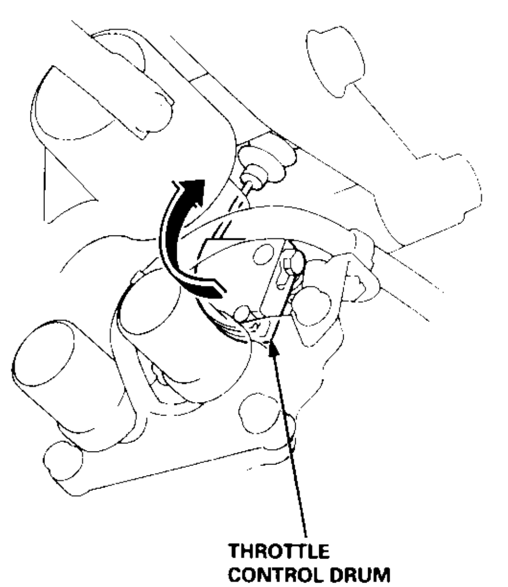
1. Verify that the throttle control cable is clamped correctly in three positions.



2. Verify that the throttle control drum is synchronized with the throttle linkage while depressing and releasing the accelerator pedal.

3. If the throttle control drum is not synchronized with the throttle linkage, adjust the throttle control cable.



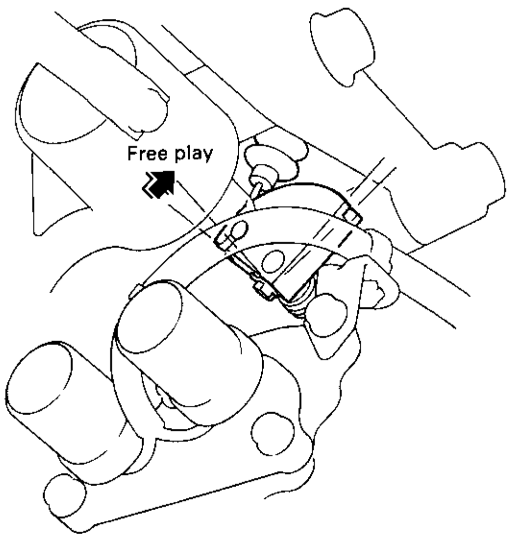


(cont'd)

Throttle Control Cable

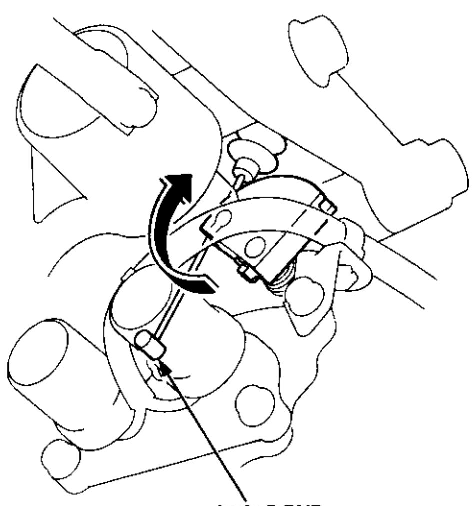
Inspection (cont'd)

4. Check that there is play in the throttle control drum while depressing the accelerator pedal to the full throttle position.



5. Remove the cable end of the throttle control cable from the throttle control drum.

6. Check that the throttle control drum moves smoothly.

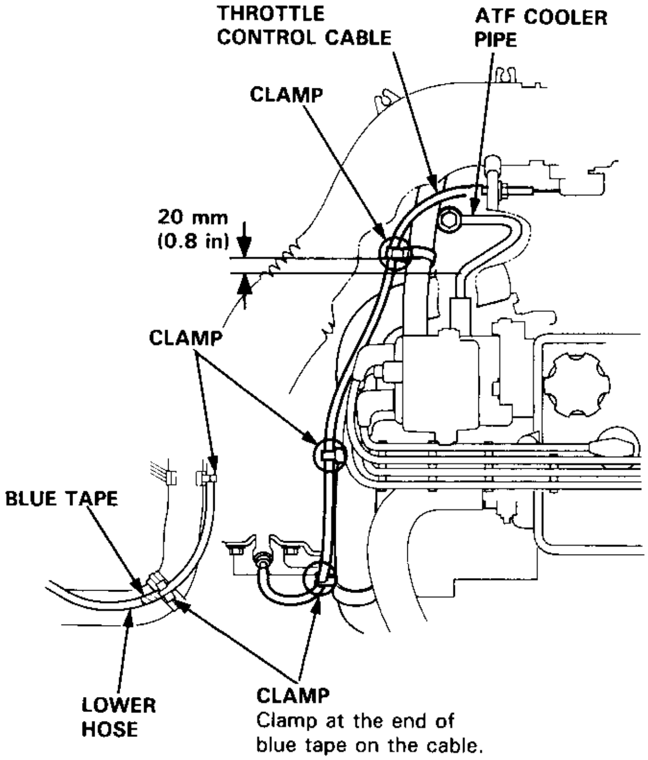


Adjustment

NOTE: Before adjusting the throttle control cable, make sure:

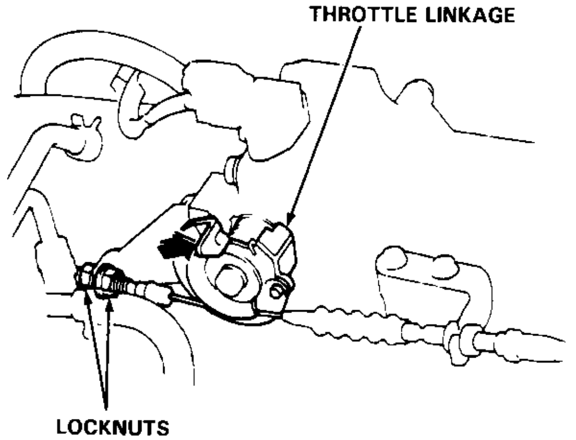
- Throttle cable free play is correct (see section 11).
- Idle speed is correct (see section 11).
- To warm up the engine to normal operating temperature (the cooling fan comes on).

1. Verify that the throttle control cable is clamped correctly in three positions.

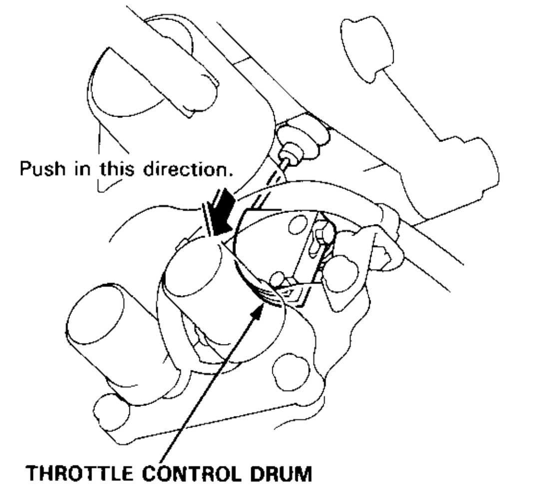


2. Verify that the throttle linkage is in the fully-closed position.

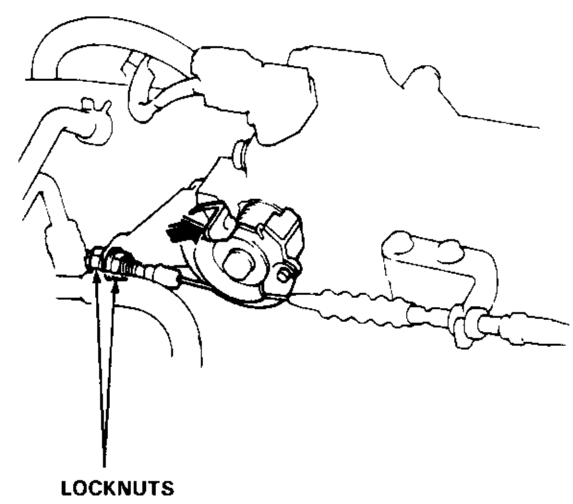
3. Loosen the locknut of the throttle control cable at the throttle linkage.



4. Remove the free play of the throttle control cable with the locknut, while pushing the throttle control drum to the full-closed potision as shown.



5. Tighten the locknuts.



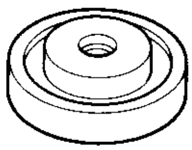
6. After tightening the locknuts, inspect the synchronization and throttle control drum movement.

Differential

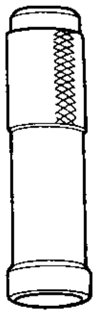
Differential (B18B1 engine)

Special Tools

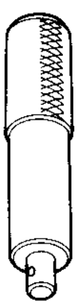
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAD-PH80101	Seal Driver Attachment	1	15-8
②	07746-0030100	Driver, 40 mm I.D.	1	15-5, 6
③	07749-0010000	Driver	1	15-8
④	07947-SD90200	Seal Driver Attachment	1	15-8



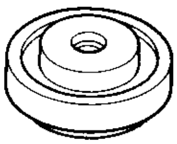
①



②



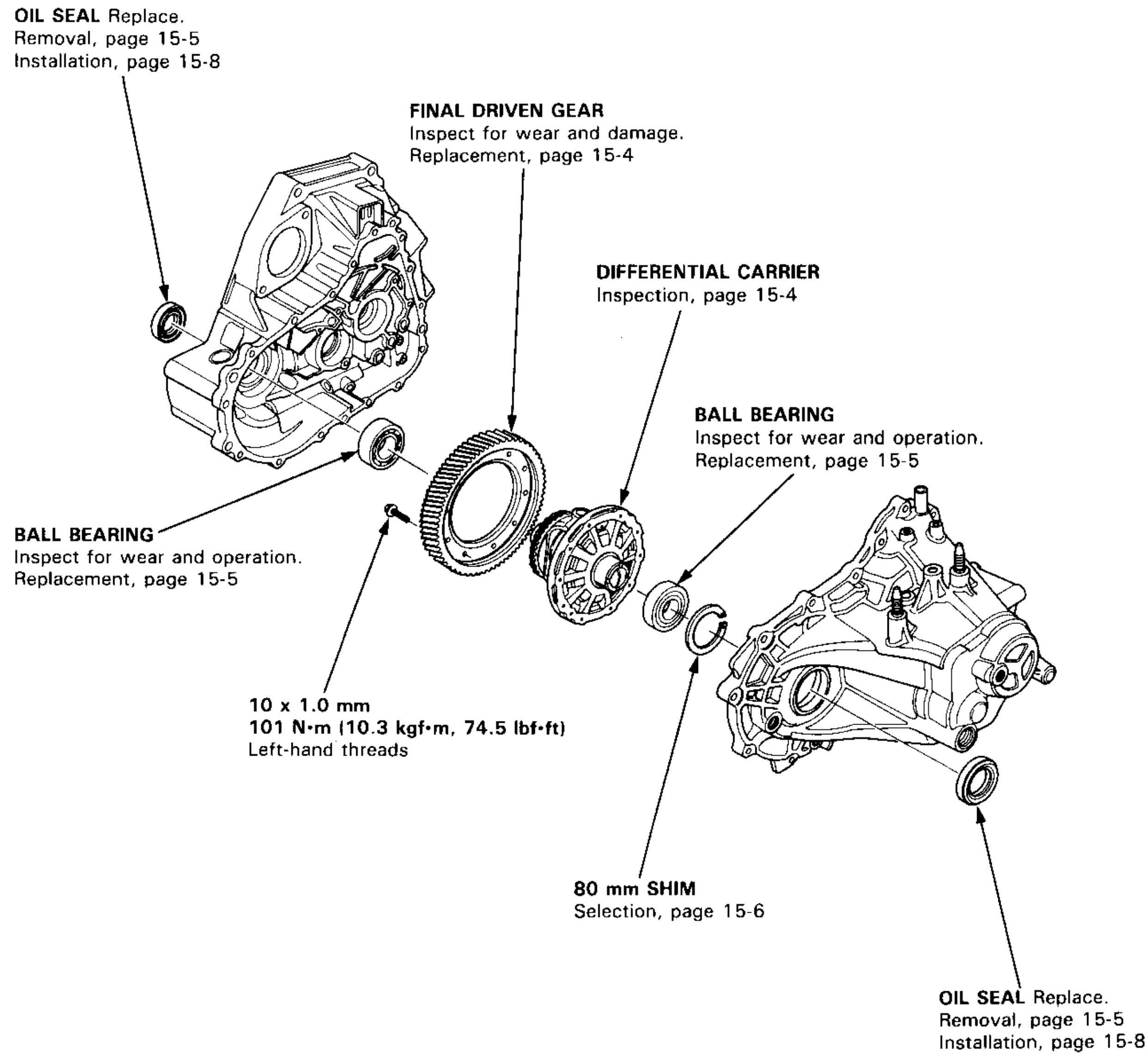
③



④

Differential (B18B1 engine)

Illustrated Index

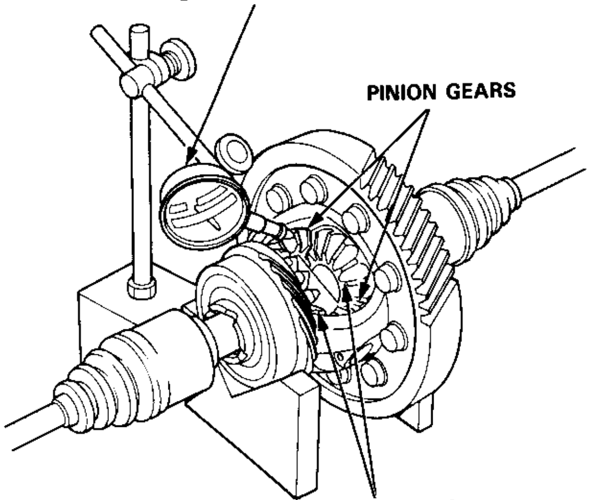


Differential (B18B1 engine)

Backlash Inspection

1. Place differential assembly on V-blocks and install both axles.
2. Measure the backlash of both pinion gears.

   Standard (New): 0.05-0.15 mm (0.002–0.006 in)

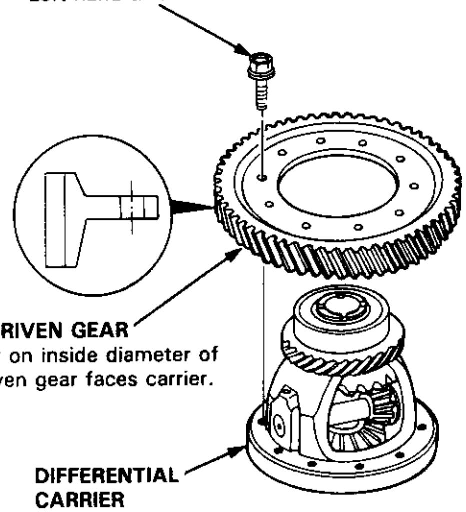


3. If the backlash is not within the standard, replace the differential carrier.

Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear from the differential carrier.

   NOTE: The final driven gear bolts have left-hand threads.

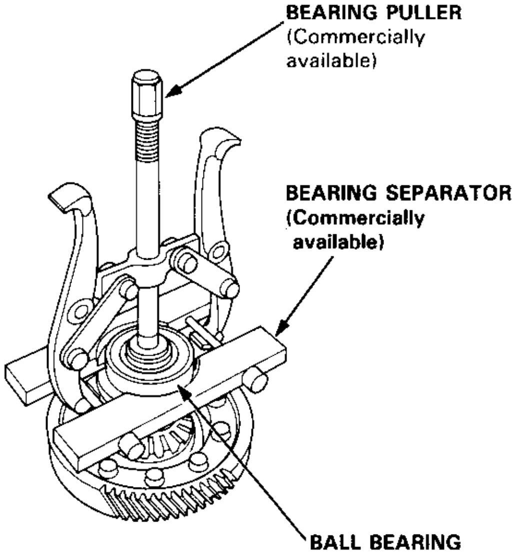


2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

Bearing Replacement

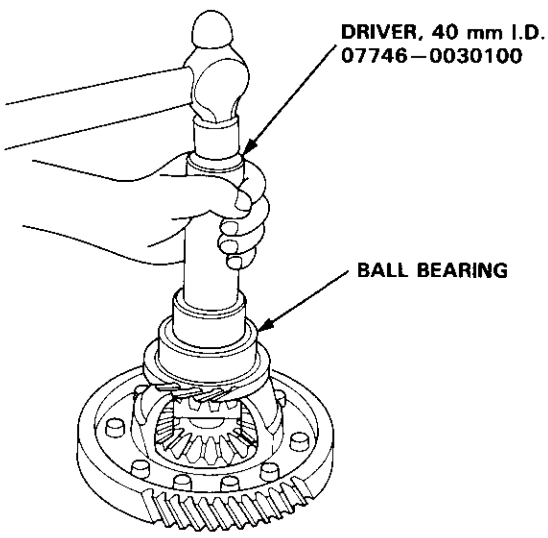
NOTE: Check the ball bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove the ball bearings using a standard bearing puller and bearing separator as shown.



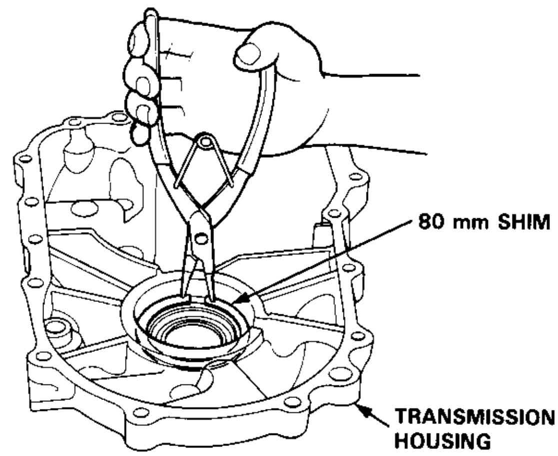
2. Install new ball bearings using the special tool as shown.

   NOTE: Drive the bearings squarely until they bottom against the carrier.

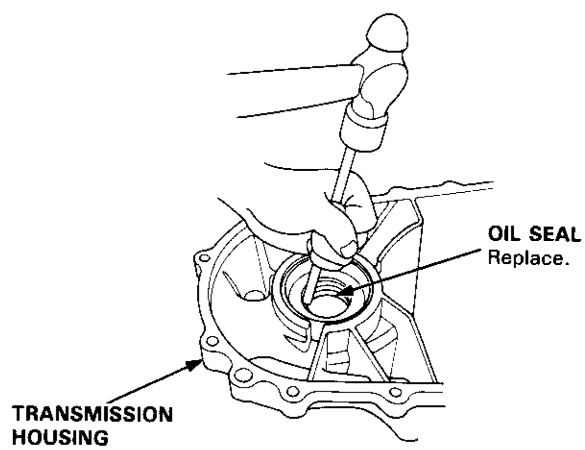


Oil Seal Removal

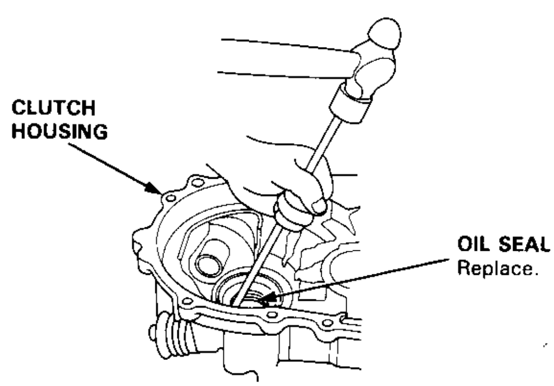
1. Remove the differential assembly.
2. Remove the 80 mm shim from the transmission housing.



3. Remove the oil seal from the transmission housing.



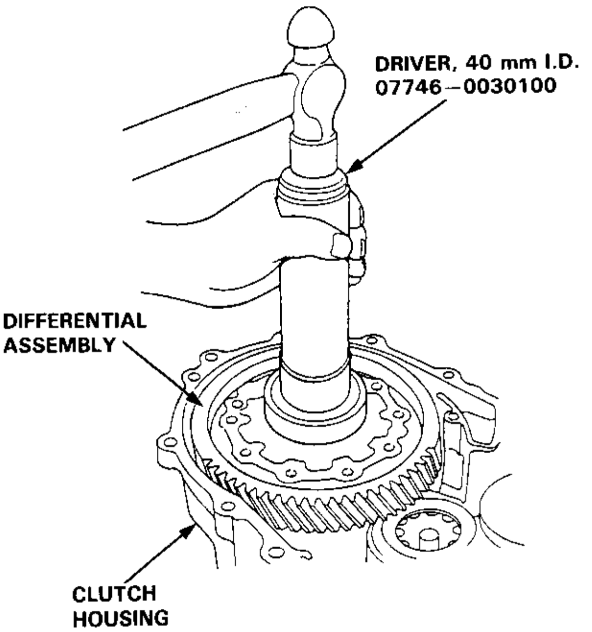
4. Remove the oil seal from the clutch housing.



Differential (B18B1 engine)

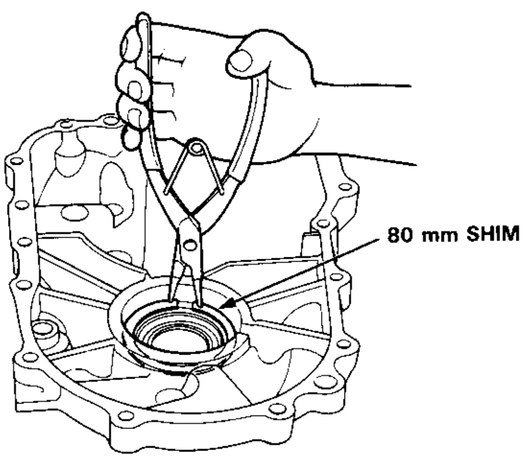
Side Clearance Adjustment

1. Install the differential assembly, making sure it bottoms in the clutch housing, using the special tool as shown.



2. Install the 80 mm shim.

   NOTE: Install the 80 mm shim that was removed.



3. Install the transmission housing (see section 13).

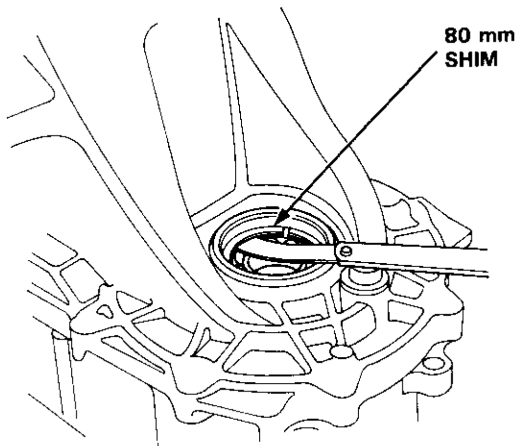
   NOTE: Do not apply liquid gasket to the mating surface of the clutch housing.

4. Tighten the transmission housing attaching bolts (see section 13).

   8 x 1.25 mm
   27 N·m (2.8 kgf·m, 20 lbf·ft)

5. Use the special tool to bottom the differential assembly in the clutch housing.

6. Measure clearance between the 80 mm shim and bearing outer race in the transmission housing.



7. If the clearance is not within the standard, select a new 80 mm shim from the following table.

Standard: 0–0.10 mm (0.004 in)

80 mm Shim

	Part Number	Thickness
A	41441–PL3–B00	1.0 mm (0.0394 in)
B	41442–PL3–B00	1.1 mm (0.0433 in)
C	41443–PL3–B00	1.2 mm (0.0472 in)
D	41444–PL3–B00	1.3 mm (0.0512 in)
E	41445–PL3–B00	1.4 mm (0.0551 in)
F	41446–PL3–B00	1.5 mm (0.0591 in)
G	41447–PL3–B00	1.6 mm (0.0630 in)
H	41448–PL3–B00	1.7 mm (0.0669 in)
J	41449–PL3–B00	1.8 mm (0.0709 in)
K	41450–PL3–B00	1.05 mm (0.0413 in)
L	41451–PL3–B00	1.15 mm (0.0453 in)
M	41452–PL3–B00	1.25 mm (0.0492 in)
N	41453–PL3–B00	1.35 mm (0.0532 in)
P	41454–PL3–B00	1.45 mm (0.0571 in)
Q	41455–PL3–B00	1.55 mm (0.0610 in)
R	41456–PL3–B00	1.65 mm (0.0650 in)
S	41457–PL3–B00	1.75 mm (0.0689 in)
T	41441–P21–000	1.85 mm (0.0728 in)
U	41442–P21–000	1.90 mm (0.0748 in)
V	41443–P21–000	1.95 mm (0.0768 in)

NOTE: If the clearance measured in step 6 is within the standard, it is not necessary to go to step 9.

8. Remove the bolts and transmission housing.

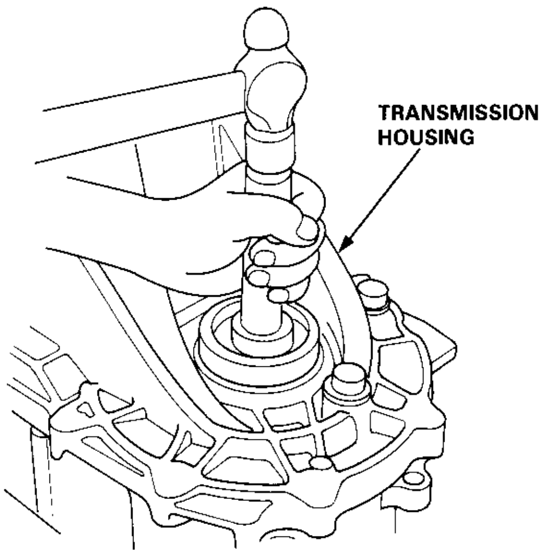
9. Replace the 80 mm shim selected in step 7, then recheck the clearance.

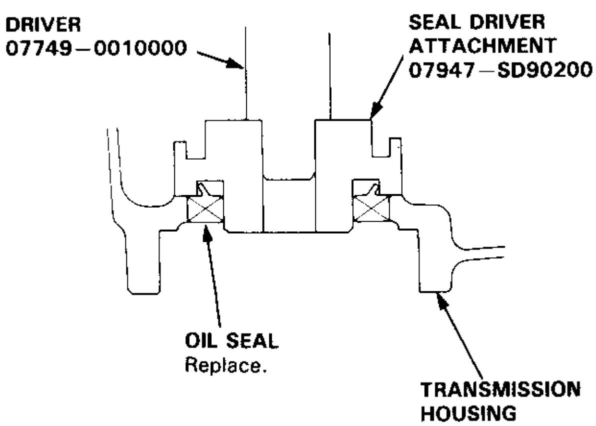
10. Reassemble the transmission and install the transmission housing (see section 13).

Differential (B18B1 engine)

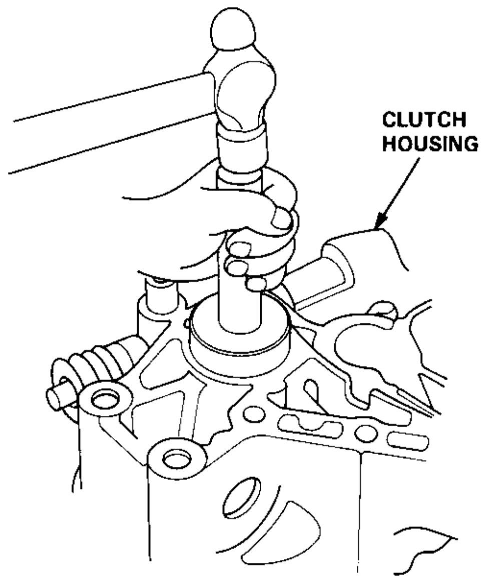
Oil Seal Installation

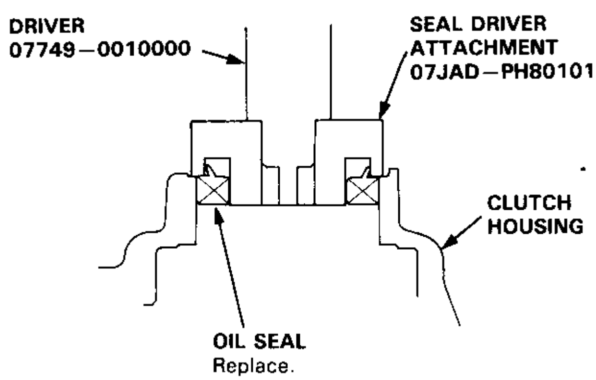
1. Install the oil seal into the transmission housing using the special tools as shown.





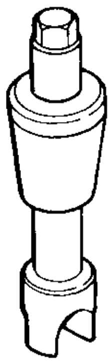
2. Install the oil seal into the clutch housing using the special tools as shown.

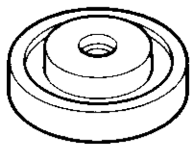


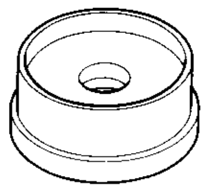


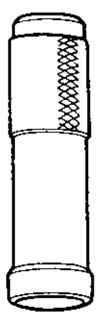
Differential (B18C1 engine)

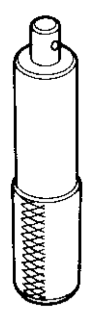
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAJ-PK40201	Preload Inspection Tool	1	15-15
②	07JAD-PH80101	Seal Driver Attachment	1	15-14, 17
③	07NAD-PX40100	Driver Attachment	1	15-14
④	07746-0030100	Driver, 40 mm I.D.	1	15-13, 14
⑤	07749-0010000	Driver	1	15-14, 17
⑥	07947-SD90200	Seal Driver Attachment	1	15-17

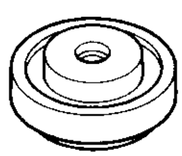

①


②


③

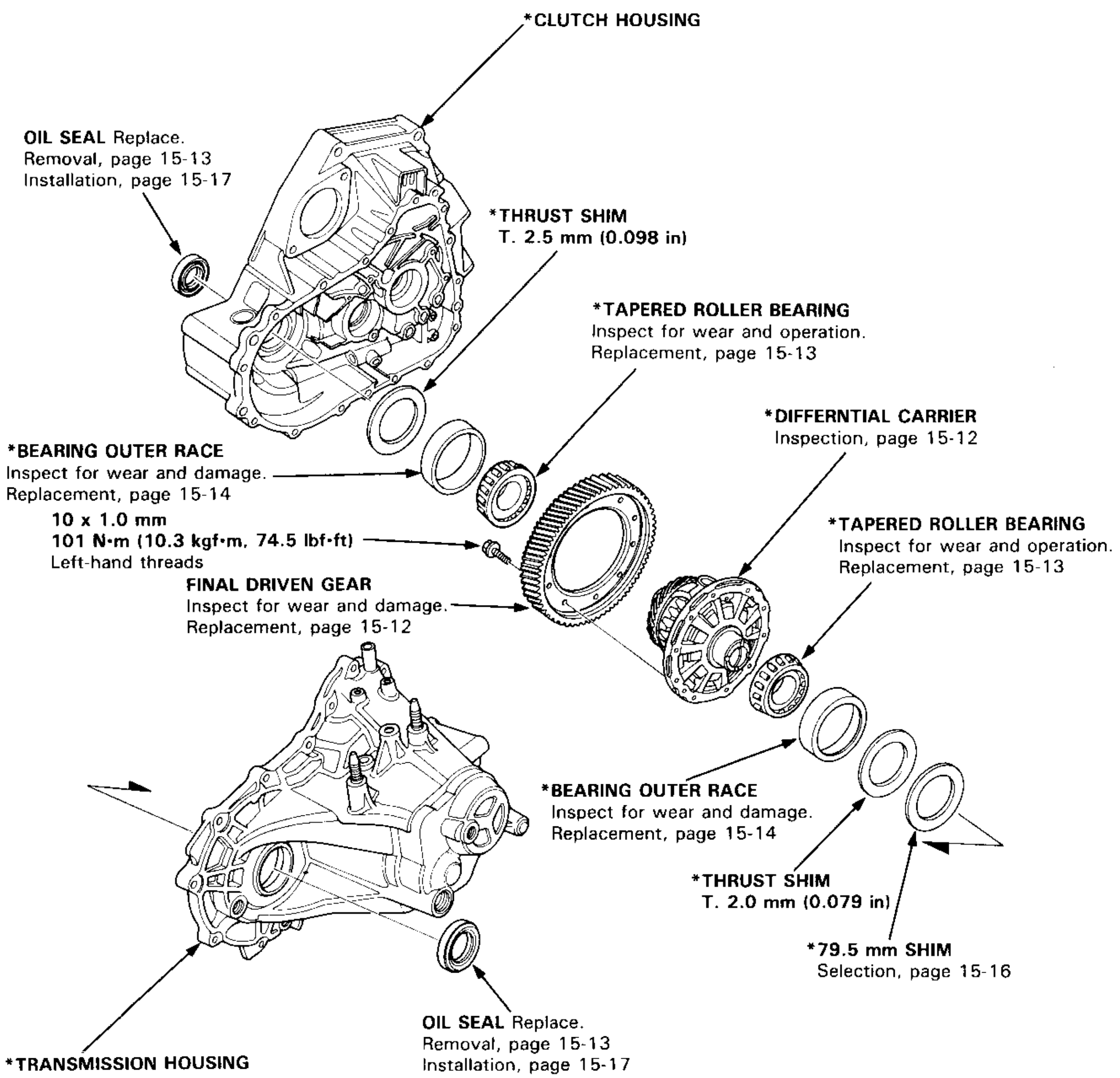

④


⑤


⑥

Illustrated Index

NOTE: If parts marked with an asterisk (*) were replaced, the tapered roller bearing preload must be adjusted (see page 15-15).

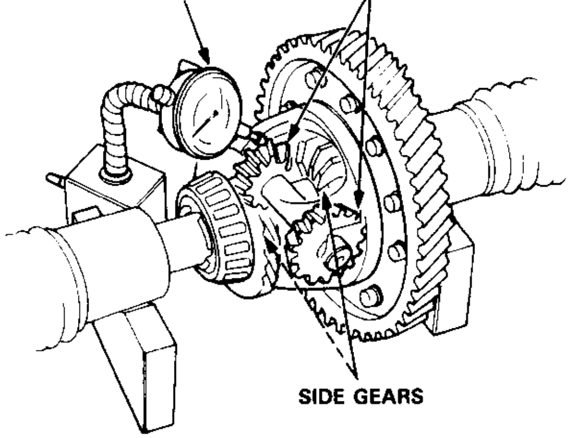


Differential (B18C1 engine)

Backlash Inspection

1. Place differential assembly on V-blocks and install both axles.
2. Measure the backlash of both pinion gears.

   Standard (New): 0.05—0.15 mm (0.002—0.006 in)

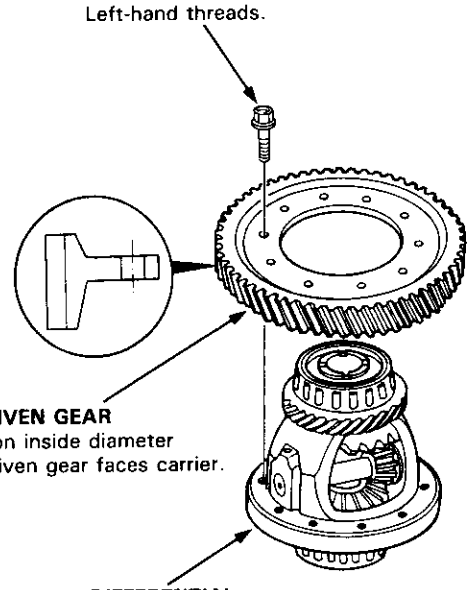


3. If the backlash is not within the standard, replace the differential carrier.

Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear from the differential carrier.

   NOTE: The final driven gear bolts have left-hand threads.

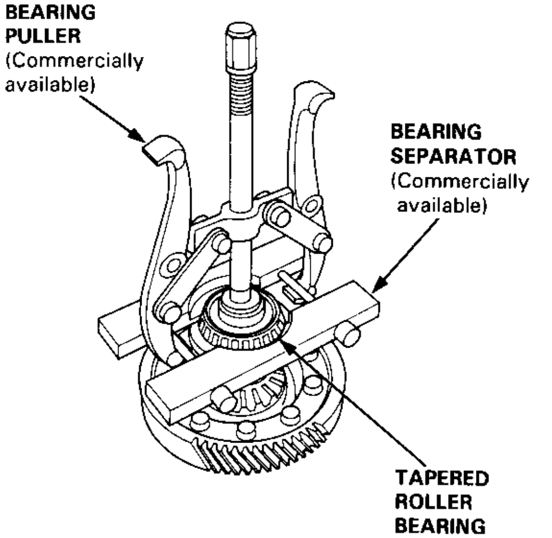


2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

Tapered Roller Bearing Replacement

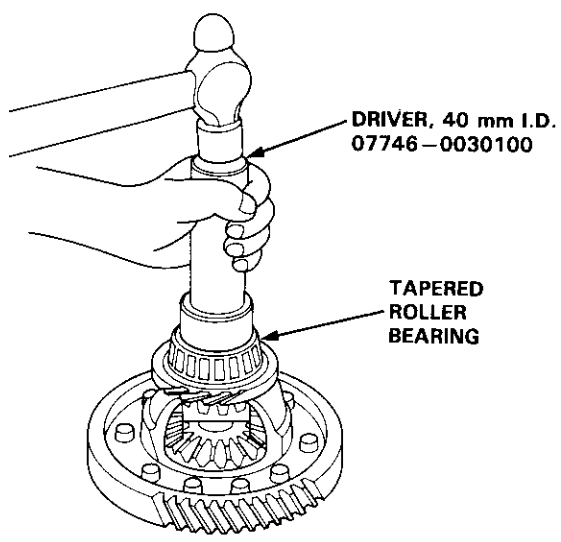
NOTE:
- The tapered roller bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
- Check the tapered roller bearings for wear and rough rotation. If tapered roller bearings are OK, removal is not necessary.

1. Remove the tapered roller bearings using a bearing puller and bearing separator as shown.



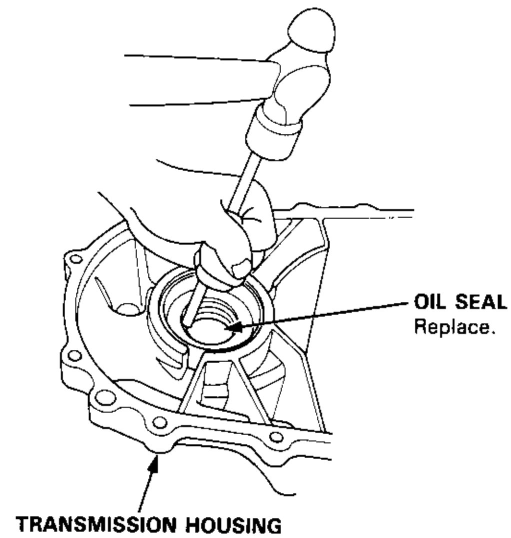
2. Install new tapered roller bearings using the special tool as shown.

   NOTE: Drive the tapered roller bearings on until they bottom against the differential carrier.

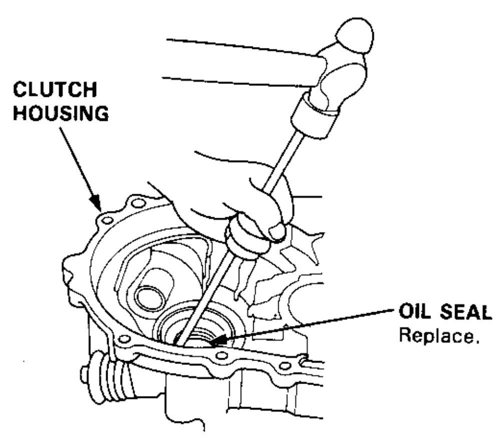


Oil Seal Removal

1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



3. Remove the oil seal from the clutch housing.



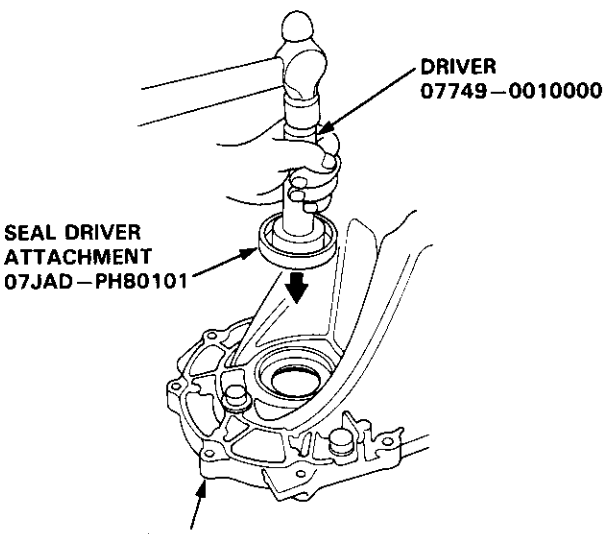
Differential (B18C1 engine)

Bearing Outer Race Replacement

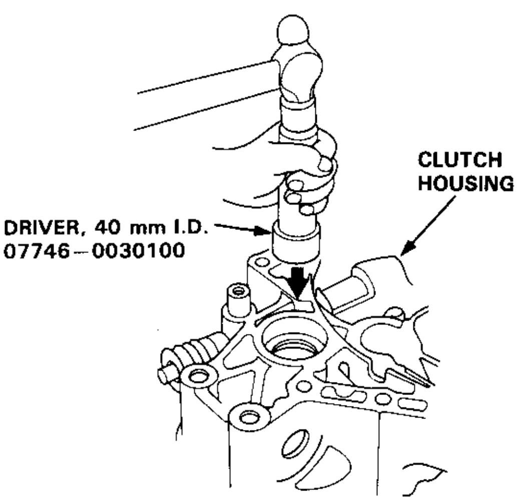
CAUTION: Do not reuse the thrust shim and the 79.5 mm shim if the outer race was driven out.

NOTE:
- The bearing outer race and tapered roller bearing should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.

1. Remove the oil seals from the transmission housing and clutch housing (see page 15-13).
2. Remove the bearing outer race, the thrust shim, and the 79.5 mm shim from the transmission housing.

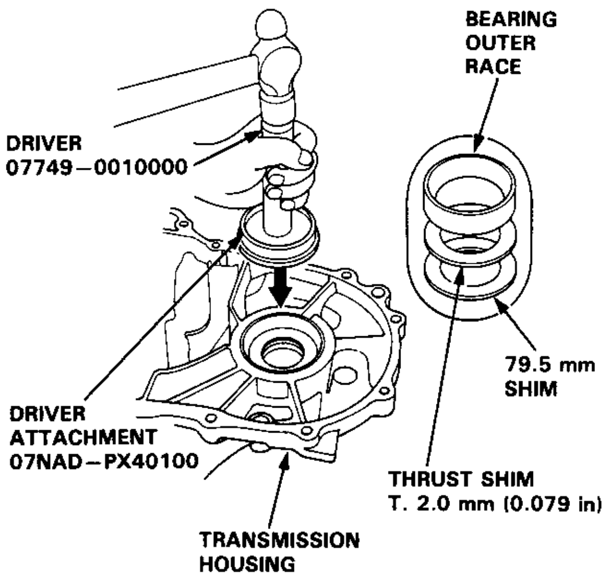


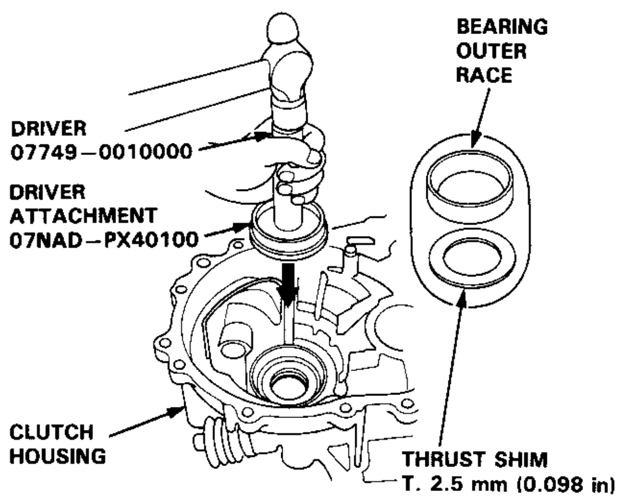
3. Remove the bearing outer race and thrust shim from the clutch housing.



4. Install the new thrust shim and 79.5 mm shim, then drive the bearing outer races in the both housings using the special tools as shown.

NOTE:
- Install the bearing outer race squarely.
- Check that there is no clearance between the bearing outer race, thrust shim, and transmission housing.





5. Install the oil seal (see page 15-17).

Tapered Roller Bearing Preload Adjustment

NOTE: If any of the items listed below were replaced, the tapered roller bearing preload must be adjusted.

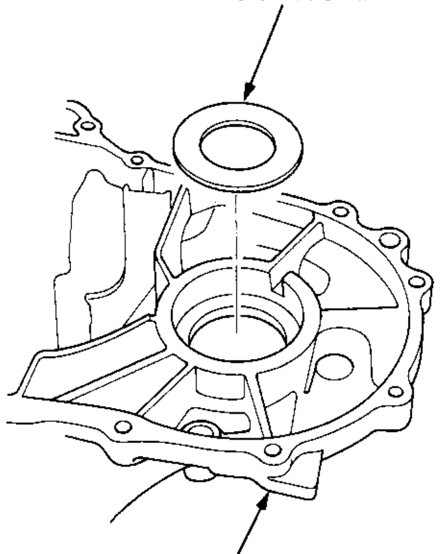
- Transmission housing
- Clutch housing
- Differential carrier
- Tapered roller bearing and bearing outer race
- Thrust shim

1. Remove the bearing outer race, the thrust shim, and the 79.5 mm shim from the transmission housing (see page 15-14).

   CAUTION: Do not reuse the thrust shim if the bearing outer race was driven out.

2. First try the same size 79.5 mm shim that was removed.

   CAUTION: Do not use more than two shims.



3. Install the thrust shim and 79.5 mm shim, then drive the bearing outer race in the transmission housing (see page 15-14).

   NOTE:
   - Install the bearing outer race squarely.
   - Check that there is no clearance between the bearing outer race, thrust shim and transmission housing.

4. With the mainshaft and countershaft removed, install the differential assembly, and torque the clutch housing and transmission housing.

   8 x 1.25 mm
   27 N·m (2.8 kgf·m, 20 lbf·ft)

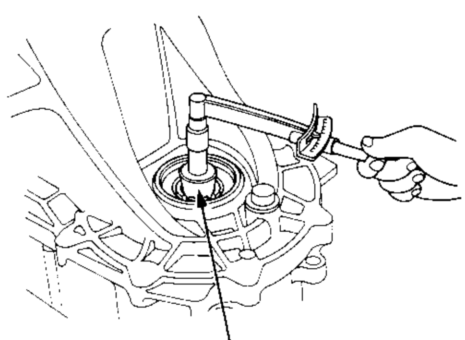
   NOTE: It is not necessary to use sealing agent between the housings.

5. Rotate the differential assembly in both directions to seat the tapered roller bearings.

6. Measure the tapered roller bearing preload of the differential assembly with the special tool and a torque wrench.

   NOTE: Measure the tapered roller bearing preload in both directions.

   STANDARD: 2.11–3.04 N·m
   (21.5–31.0 kgf·cm,
   18.7–26.9 lbf·in)



(cont'd)

Tapered Roller Bearing Preload Adjustment (cont'd)

7. If the tapered roller bearing preload is not within the standard, select the 79.5 mm shim from the following table which will give the tapered roller bearing preload closest to the standard mean value of 2.50 N•m (25.5 kgf•cm, 22 lbf•in).

   NOTE: Changing the 79.5 mm shim to the next size will increase or decrease tapered roller bearing preload about 0.3–0.4 N•m (3–4 kgf•cm, 2.6–3.5 lbf•in).

   79.5 mm SHIM

	Part Number	Thickness
AA	41460 – P5D – 000	0.66 mm (0.0260 in)
AB	41461 – P5D – 000	1.17 mm (0.0461 in)
AC	41462 – P5D – 000	1.20 mm (0.0472 in)
AD	41463 – P5D – 000	1.23 mm (0.0484 in)
AE	41464 – P5D – 000	1.26 mm (0.0496 in)
AF	41465 – P5D – 000	1.29 mm (0.0508 in)
AG	41466 – P5D – 000	1.32 mm (0.0520 in)
AH	41467 – P5D – 000	1.35 mm (0.0531 in)
AI	41468 – P5D – 000	1.38 mm (0.0543 in)
AJ	41469 – P5D – 000	1.41 mm (0.0555 in)
AK	41470 – P5D – 000	1.44 mm (0.0567 in)
AL	41471 – P5D – 000	1.47 mm (0.0579 in)
AM	41472 – P5D – 000	1.50 mm (0.0591 in)
AN	41473 – P5D – 000	1.53 mm (0.0602 in)
AO	41474 – P5D – 000	1.56 mm (0.0614 in)
AP	41475 – P5D – 000	1.59 mm (0.0626 in)
AQ	41476 – P5D – 000	1.62 mm (0.0638 in)
AR	41477 – P5D – 000	1.65 mm (0.0650 in)
AS	41478 – P5D – 000	1.68 mm (0.0661 in)
AT	41479 – P5D – 000	1.71 mm (0.0673 in)
AU	41480 – P5D – 000	1.74 mm (0.0685 in)
AV	41481 – P5D – 000	1.77 mm (0.0697 in)
AW	41482 – P5D – 000	1.80 mm (0.0709 in)
AX	41483 – P5D – 000	1.83 mm (0.0720 in)

8. Recheck the tapered roller bearing preload.

9. How to select the correct 79.5 mm shim:
   – 1) Compare the tapered roller bearing preload you get with the 79.5 mm shim that was removed with the specified mean preload of 2.50 N•m (25.5 kgf•cm, 22 lbf•in).
   – 2) If your measured tapered roller bearing preload is less than specified, subtract your's from the specified.
   If your's is more than specified, subtract the specified from your measurement.

   For example with a 1.38 mm (0.0543 in) shim:

   Ⓐ specified 2.50 N•m (25.5 kgf•cm, 22 lbf•in)
   – you measure 0.54 N•m (5.5 kgf•cm, 5 lbf•in)

   2.0 N•m (20 kgf•cm, 18 lbf•in) less

   Ⓑ you measure 3.29 N•m (33.5 kgf•cm, 29 lbf•in)
   – specified 2.50 N•m (25.5 kgf•cm, 22 lbf•in)

   0.8 N•m (8 kgf•cm, 7 lbf•in) more

   – 3) Each shim size up or down from standard makes about 0.3–0.4 N•m (3–4 kgf•cm, 2.6–3.5 lbf•in) difference in tapered roller bearing preload.

   - In example Ⓐ, your measured tapered roller bearing preload was 2.0 N•m (20 kgf•cm, 18 lbf•in) less than standard so you need a 79.5 mm shim five sizes thicker than standard (try the 1.53 mm (0.0602 in) shim and recheck).
   - In example Ⓑ, your's was 0.8 N•m (8 kgf•cm, 7 lbf•in) more than standard, so you need a thrust shim two sizes thinner (try the 1.32 mm (0.0520 in) shim and recheck).

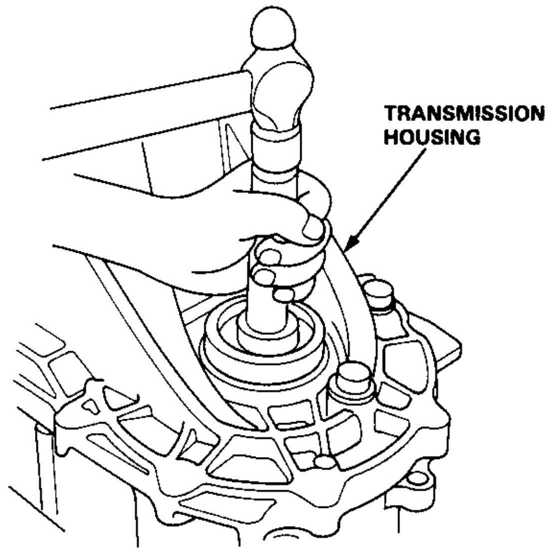
10. After adjusting the tapered roller bearing preload, assemble the transmission, and install the transmission housing (see section 13).

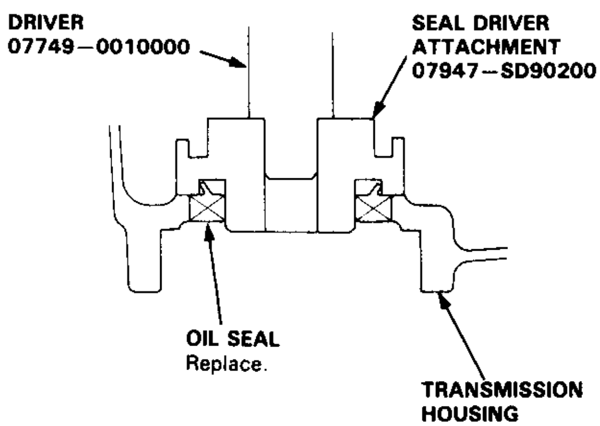
    8 x 1.25 mm
    27 N•m (2.8 kgf•m, 20 lbf•ft)

11. Rotate the differential assembly in both directions to seat the tapered roller bearings.

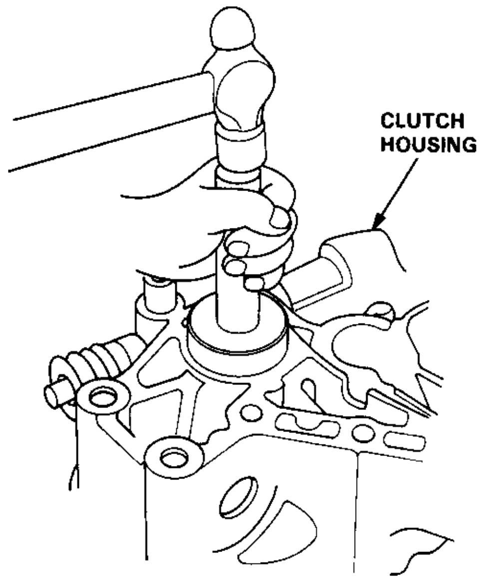
Oil Seal Installation

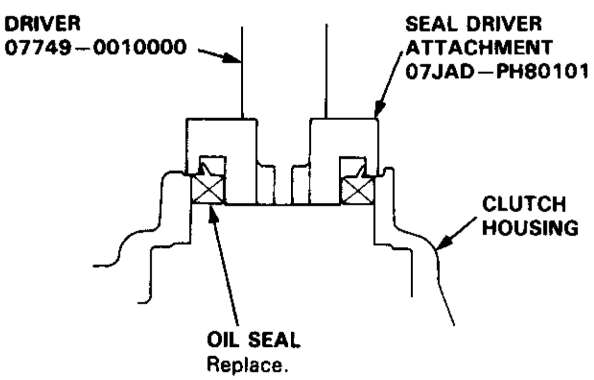
1. Install the oil seal into the transmission housing using the special tools as shown.





2. Install the new oil seal into the clutch housing using the special tools as shown.

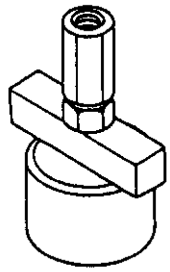




Differential (B18C5 engine)

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07TAJ – ST70100	Preload Inspection Tool	1	15-25



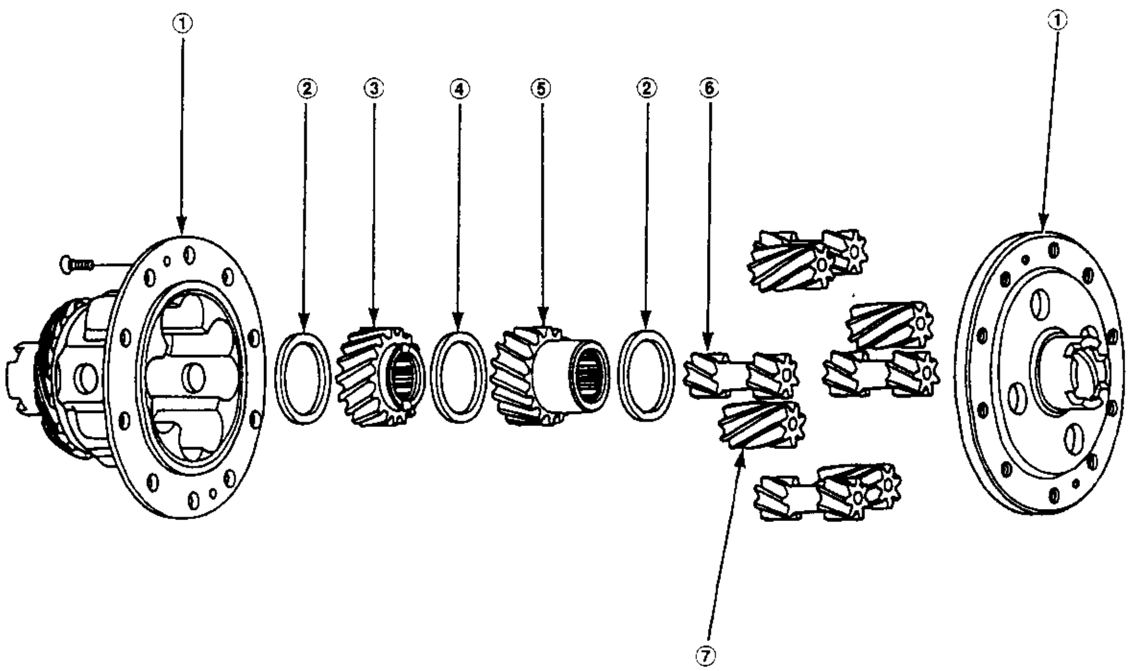
①

Limited Slip Differential (B18C5 engine)

Description

1. Function
   Operation of the limited slip differential is dependent upon the eight pinion gears that are in mesh with the two side gears. They transfer the driving power to the driving axles as well as permit the outside wheel to turn more times than the inside wheel when the vehicle goes around a turn. All gears are helically cut so that this differential action is limited by the friction created between each gear and differential carrier when either wheel slips.

2. Construction
   The unit consists of the two side gears, four short pinion gears, four long pinion gears, two thrust washers, a center washer, and a carrier that houses the gears and washers. One short and one long pinion gear are in mesh with each other and are allowed to walk around the side gears.



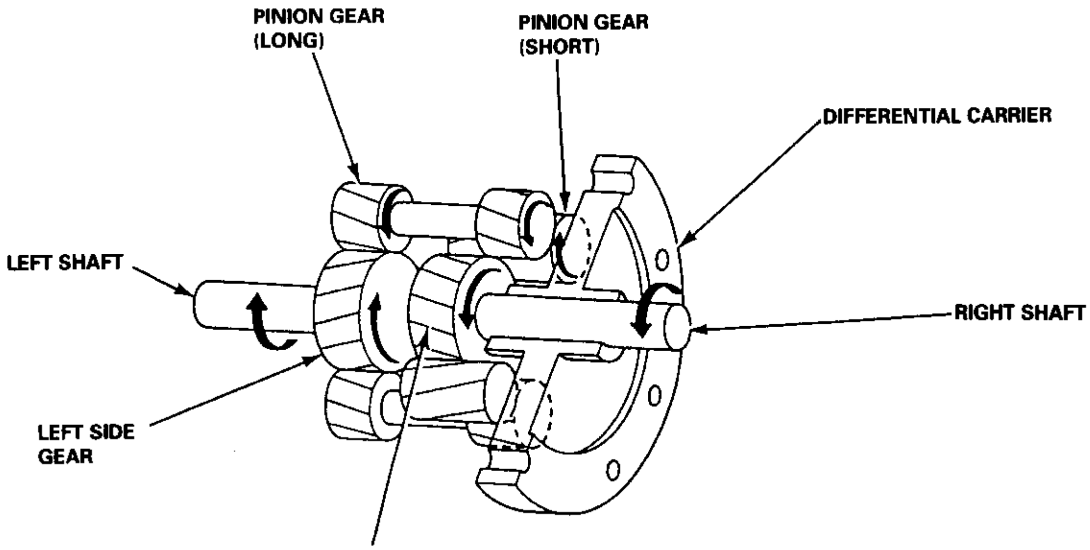
① Differential carrier
② Thrust washer
③ Left side gear
④ Center washer
⑤ Right side gear
⑥ Pinion gear (long)
⑦ Pinion gear (short)

3. Operation
   - Straight-load driving
     The differential carrier and gears rotate together as a unit when both wheels rotates at the same speed. Turning effort from the final driven gears are directly transmitted to both wheels.

(cont'd)

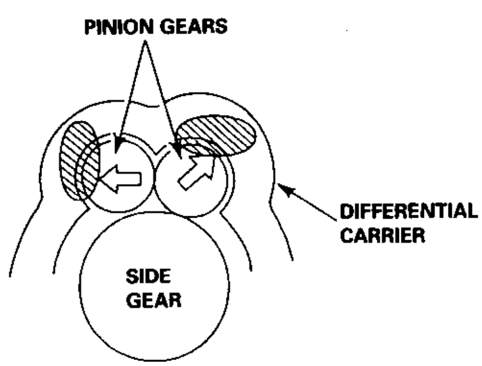
Description (cont'd)

- When rounding a curve
  When the vehicle rounds a curve, the differential allows the outer wheel to rotate a little faster than the inner wheel. When this takes place, the short and long pinion gears rotate, and walk around the side gears in the directions shown. If, for example, the right shaft is rotated in a counterclockwise direction with the differential carrier held stationary, the force is transmitted through the right side gear, short pinion gears and long pinion gears to the left side gear, causing the left shaft to rotate in a clockwise direction. This allows the outer wheel to turn more times than the inner wheel when the vehicle goes around a turn.

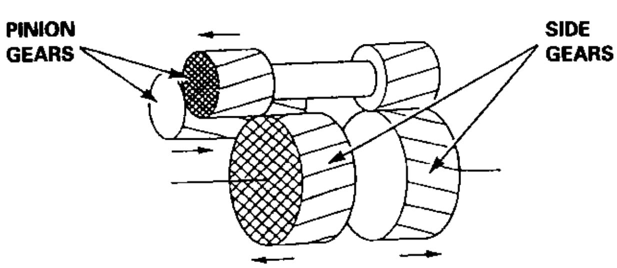


- When limiting differential action
  The limited slip differential acts to limit the differential action when either wheel slips on ice or snow or on turn. This is done by using the friction created between each gear and differential carrier:
  (1) The pinions are forced against the differential carrier by the force as they are rotated and repelled outward.
  (2) The ends of the pinion gears are held firmly against the differential carrier due to the side thrust from the helically cut gears.

(1)



(2)



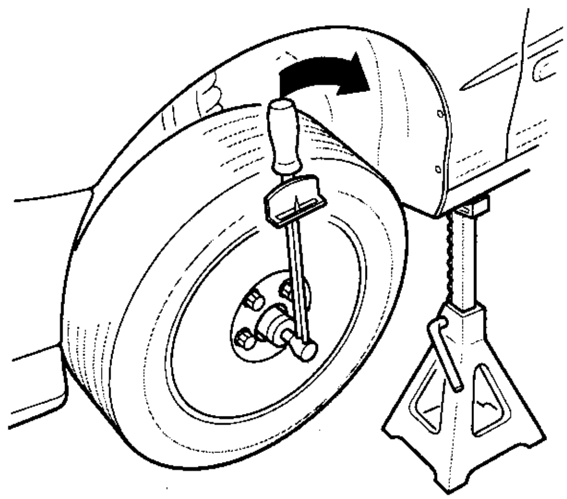
With the pinion gears locked, the torque applied to the slipping wheel is reduced and the torque delivered to the other wheel is increased.

Operational Check

1. Set the parking brake and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
3. With the engine off, shift the transmission into 1st gear.
4. Rotate either front wheel by hand and check that the other wheel rotates in the opposite direction.
5. If the opposite front wheel does not rotate, or if you cannot spin the front wheels at all, the limited slip differential is faulty and should be replaced.

Rotating Torque Check

1. Setting parking brake and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in proper locations (see section 1).
3. With the engine off, shift the transmission into Neutral.
4. Measure the rotating torque with a beam-type torque wrench in the direction shown. Rotate the torque wrench more than two complete turns and take the maximum reading.



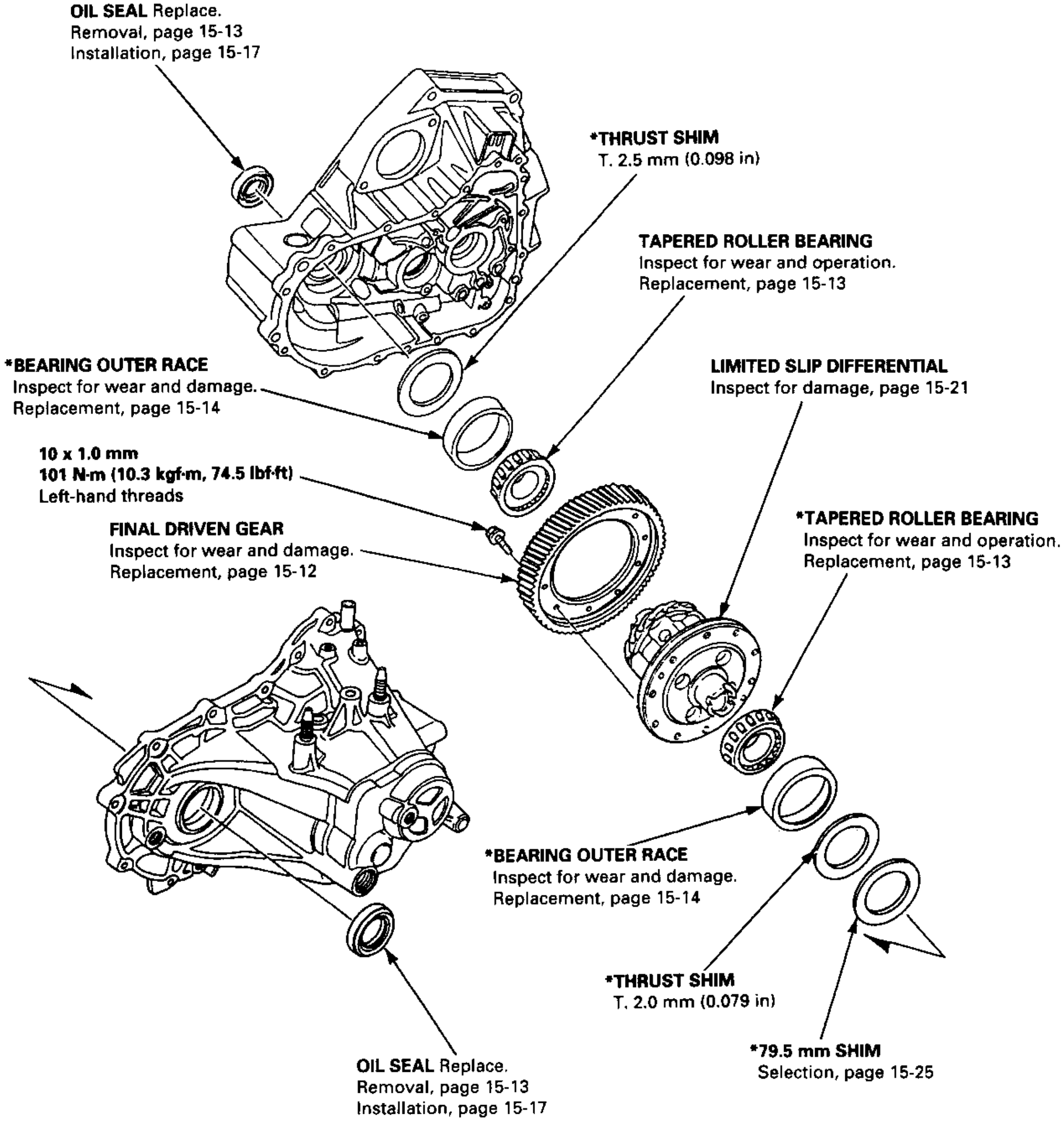
5. Shift the transmission into 1st gear and measure the rotating torque again.
6. Calculate the rotating torque:
   Service Limit:
   $$\frac{\text{Measurement from step 5}}{\text{Measurement from step 4}} \geqq 2.5$$
   For example:
   $$\frac{7.8\ \text{N·m (0.8 kgf·m)}}{2.9\ \text{N·m (0.3 kgf·m)}} = 2.67 > 2.5$$
7. Repeat step 3 through 6 for the other wheel.
8. Replace the limited slip differential assembly if the rotating torque is lower than the service limit.

Limited Slip Differential (B18C5 engine)

Illustrated Index

NOTE:

- If parts mark with an asterisk(*) were replaced, the tapered roller bearing preload must be adjusted (see page 15-25).
- The limited slip differential assembly is non-rebuildable, replace it if it is damaged.



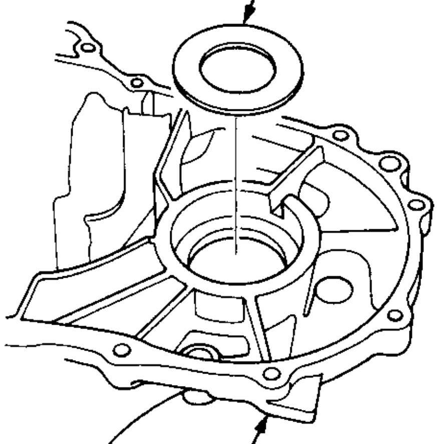
Tapered Roller Bearing Preload Adjustment

If any of the items listed below were replaced, the tapered roller bearing preload must be adjusted.

- Transmission housing
- Clutch housing
- Limited slip differential assembly
- Tapered roller bearing and bearing outer race
- Thrust shim
- 79.5 mm shim

1. Remove the bearing outer race, the thrust shim, and the 79.5 mm shim from the transmission housing. Replace the thrust shim and the 79.5 mm shim if they were damaged when the bearing outer race was driven out.

2. First try the same size 79.5 mm shim that was removed.



3. Install the thrust shim and only one 79.5 mm shim in the transmission housing, then drive in the bearing outer race.

   Note these items during rassembly:
   - Install the bearing outer race squarely.
   - Check that there is no clearance between the bearing outer race, shims and transmission housing.

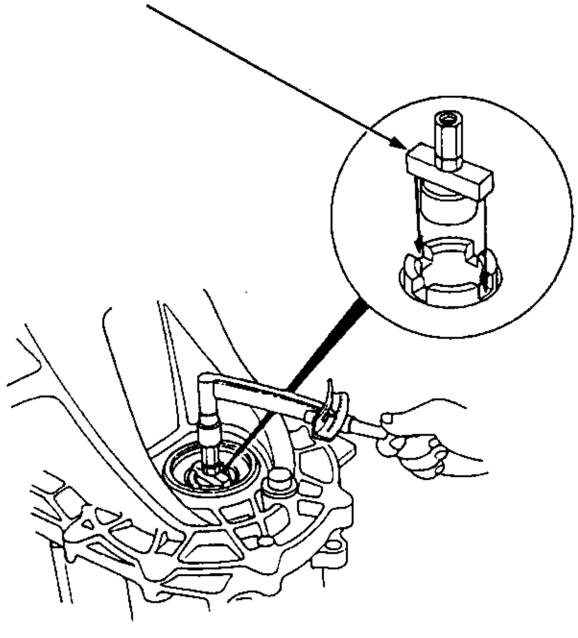
4. With the mainshaft and countershaft removed, install the differential assembly. Assemble the clutch housing and transmission housing without a sealing agent, and torque the case bolts.

   8 x 1.25 mm
   27 N·m (2.8 kgf·m, 20 lbf·ft)

5. Rotate the differential assembly in both directions to seat the tapered roller bearings.

6. Measure the tapered roller bearing preload of the differential assembly in both directions with the special tool and a torque wrench.

   STANDARD: 2.11 – 3.04 N·m
   (21.5 – 31.0 kgf·cm,
   18.7 – 26.9 lbf·in)



(cont'd)

Tapered Roller Bearing Preload Adjustment (cont'd)

7. If the tapered roller bearing preload is not within the standard, select the 79.5 mm shim from the following table which will give the tapered roller bearing preload closest to the standard value of 2.50 N·m (25.5 kgf·cm, 22 lbf·in). Changing the 79.5 mm shim to the next size will increase or decrease tapered roller bearing preload about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 lbf·in).

79.5 mm SHIM

	Part Number	Thickness
AA	41460 – P5D – 000	0.66 mm (0.0260 in)
AB	41461 – P5D – 000	1.17 mm (0.0461 in)
AC	41462 – P5D – 000	1.20 mm (0.0472 in)
AD	41463 – P5D – 000	1.23 mm (0.0484 in)
AE	41464 – P5D – 000	1.26 mm (0.0496 in)
AF	41465 – P5D – 000	1.29 mm (0.0508 in)
AG	41466 – P5D – 000	1.32 mm (0.0520 in)
AH	41467 – P5D – 000	1.35 mm (0.0531 in)
AI	41468 – P5D – 000	1.38 mm (0.0543 in)
AJ	41469 – P5D – 000	1.41 mm (0.0555 in)
AK	41470 – P5D – 000	1.44 mm (0.0567 in)
AL	41471 – P5D – 000	1.47 mm (0.0579 in)
AM	41472 – P5D – 000	1.50 mm (0.0591 in)
AN	41473 – P5D – 000	1.53 mm (0.0602 in)
AO	41474 – P5D – 000	1.56 mm (0.0614 in)
AP	41475 – P5D – 000	1.59 mm (0.0626 in)
AQ	41476 – P5D – 000	1.62 mm (0.0638 in)
AR	41477 – P5D – 000	1.65 mm (0.0650 in)
AS	41478 – P5D – 000	1.68 mm (0.0661 in)
AT	41479 – P5D – 000	1.71 mm (0.0673 in)
AU	41480 – P5D – 000	1.74 mm (0.0685 in)
AV	41481 – P5D – 000	1.77 mm (0.0697 in)
AW	41482 – P5D – 000	1.80 mm (0.0709 in)
AX	41483 – P5D – 000	1.83 mm (0.0720 in)

8. How to select the correct 79.5 mm shim:
   - -1) Compare the tapered roller bearing preload you get with the 79.5 mm shim that was removed with the specified preload of 2.50 N·m (25.5 kgf·cm, 22 lbf·in).
   - -2) If your measured tapered roller bearing preload is less than specified, subtract your's from the specified.
     If your's is more than specified, subtract the specified from your measurement.

     For example with a 1.38 mm (0.0543 in) shim:

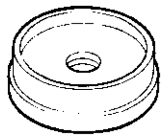
     Ⓐ specified 2.50 N·m (25.5 kgf·cm, 22 lbf·in)
     – you measure 0.54 N·m (5.5 kgf·cm, 5 lbf·in)
     2.0 N·m (20 kgf·cm, 18 lbf·in) less

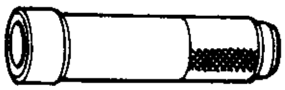
     Ⓑ you measure 3.29 N·m (33.5 kgf·cm, 29 lbf·in)
     – specified 2.50 N·m (25.5 kgf·cm, 22 lbf·in)
     0.8 N·m (8 kgf·cm, 7 lbf·in) more
   - -3) Each shim size up or down from standard makes about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 lbf·in) difference in tapered roller bearing preload.
     - In example Ⓐ, your measured tapered roller bearing preload was 2.0 N·m (20 kgf·cm, 18 lbf·in) less than standard so you need a 79.5 mm shim five sizes thicker than standard (try the 1.53 mm (0.0602 in) shim and recheck).
     - In example Ⓑ, your's was 0.8 N·m (8 kgf·cm, 7 lbf·in) more than standard, so you need a thrust shim two sizes thinner (try the 1.32 mm (0.0520 in) shim and recheck).
9. Recheck the tapered roller bearing preload.
10. After adjusting the tapered roller bearing preload, assemble the transmission, and install the transmission housing.
11. Rotate the differential assembly in both directions to seat the tapered roller bearings.

Differential (Automatic Transmission)

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAD–PH80200	Pilot, 26 x 30 mm	1	15-34
②	07NAD–P200100	Driver, 52 x 55 mm	1	15-34
③	07746–0030100	Driver, 40 mm I.D.	1	15-30, 32, 33
④	07749–0010000	Driver	1	15-34
⑤	07947–SD90200	Driver Attachment	1	15-34


①


②

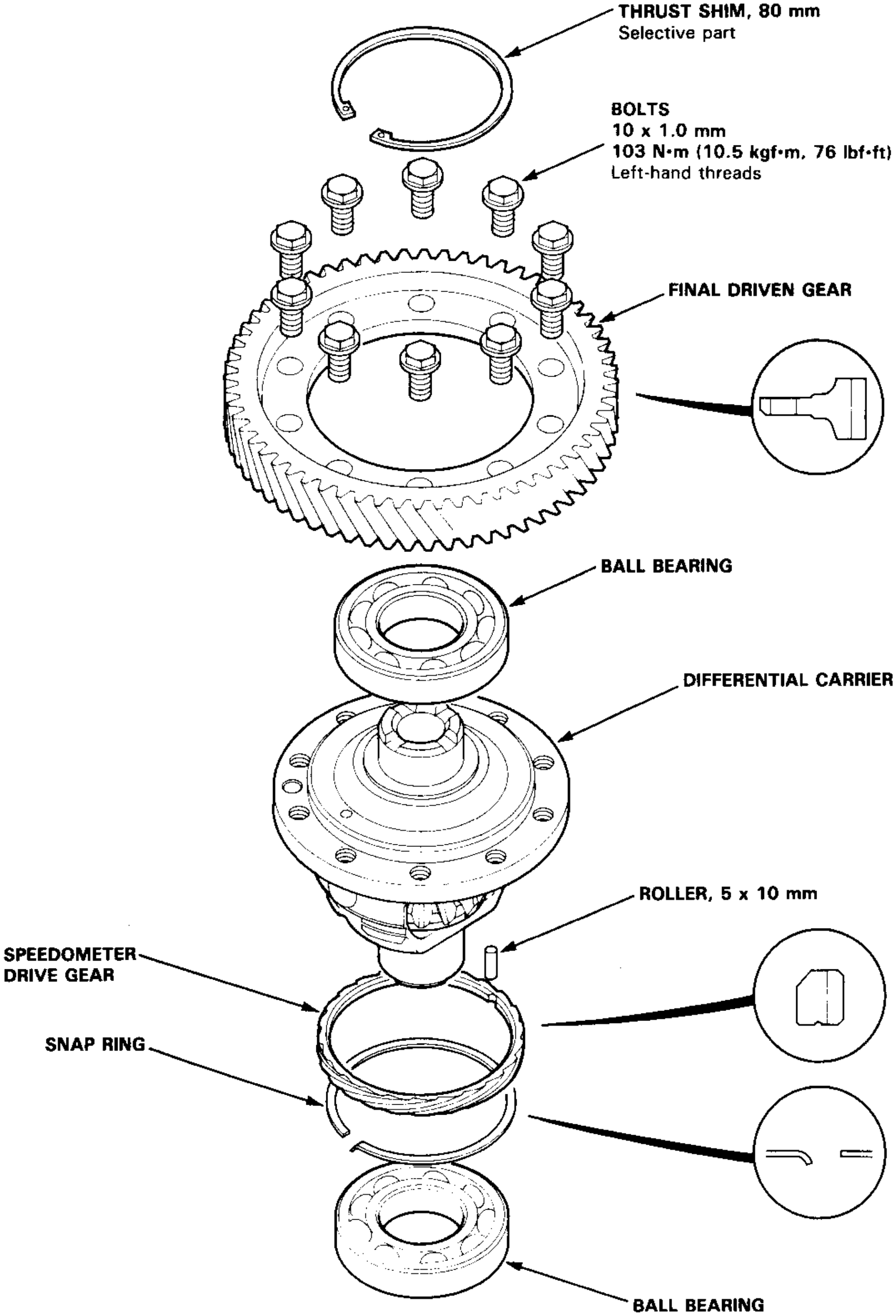

③


④


⑤

Differential (Automatic Transmission)

Illustrated Index

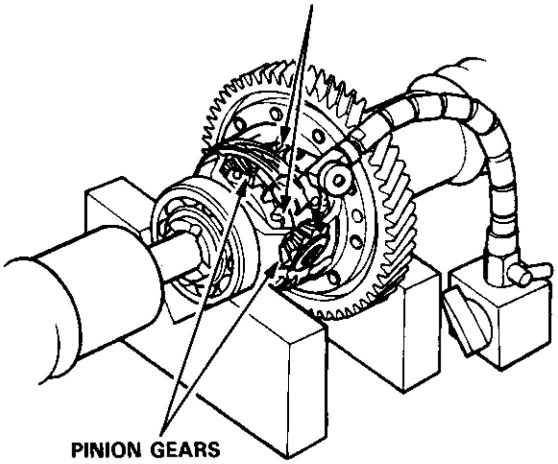


Differential (Automatic Transmission)

Backlash Inspection

1. Place the differential assembly on V-blocks and install both axles.
2. Check backlash of both pinion gears.

Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)

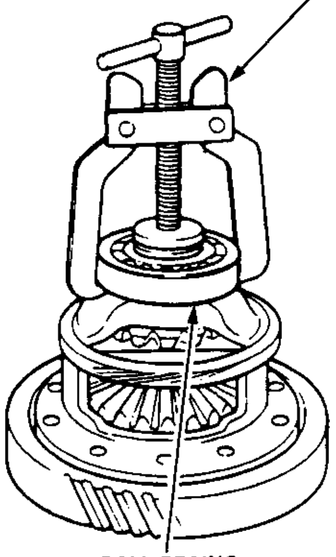


3. If the backlash is not within the standard, replace the differential carrier.

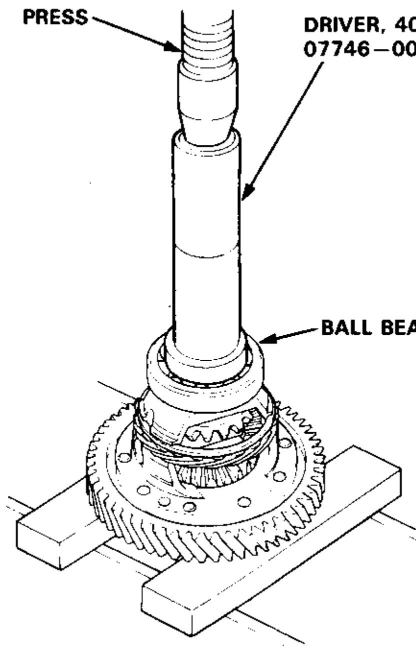
Bearing Replacement

NOTE: Check the bearings for wear and rough rotation. If the bearings are OK, removal is not necessary.

1. Remove the ball bearings using a bearing puller.



2. Install the new ball bearings using the special tool with a press as shown.

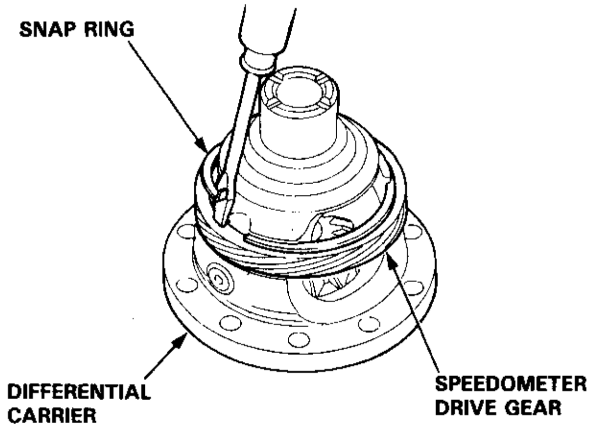


Differential Carrier Replacement

1. Remove the final driven gear from the differential carrier.

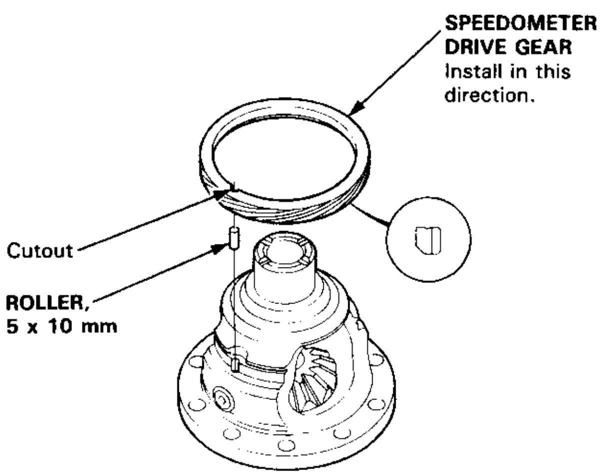
   NOTE: The final driven gear bolts have left-hand threads.

2. Pry the snap ring off differential carrier, then remove the speedometer drive gear and 5 x 10 mm roller.

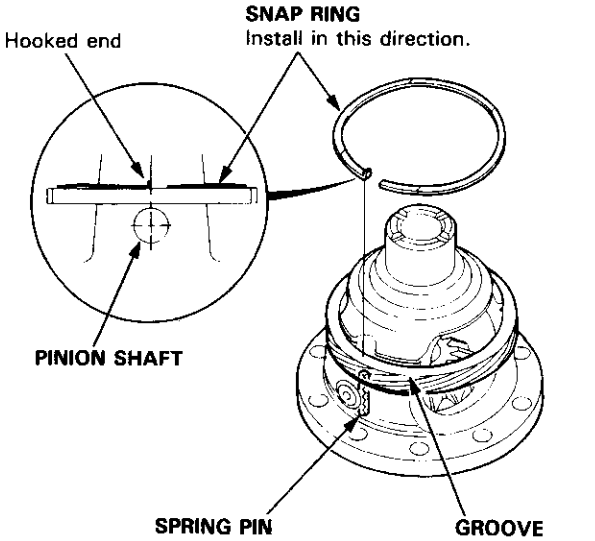


3. Install the 5 x 10 mm roller in the differential carrier.

4. Install the speedometer drive gear with its chamfered side facing the carrier. Align the cutout on the bore of the speedometer drive gear with the 5 x 10 mm roller.



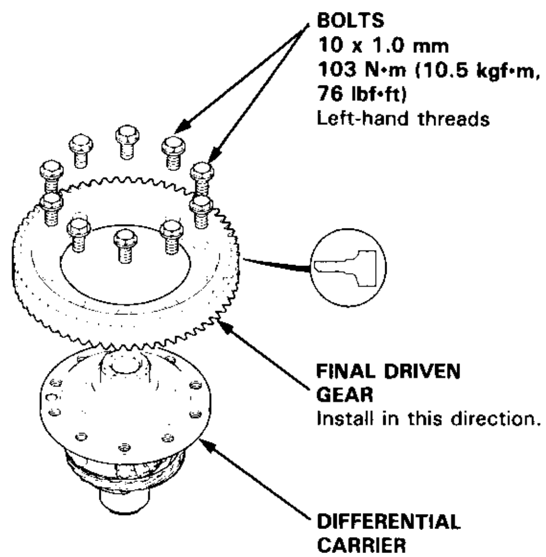
5. Align the hooked end of the snap ring with the pinion shaft as shown, then install the snap ring in the differential carrier groove.



6. Install the final driven gear, then tighten the bolts to the specified torque.

   TORQUE: 103 N·m (10.5 kgf·m, 76 lbf·ft)

   NOTE: The final driven gear bolts have left-hand threads.

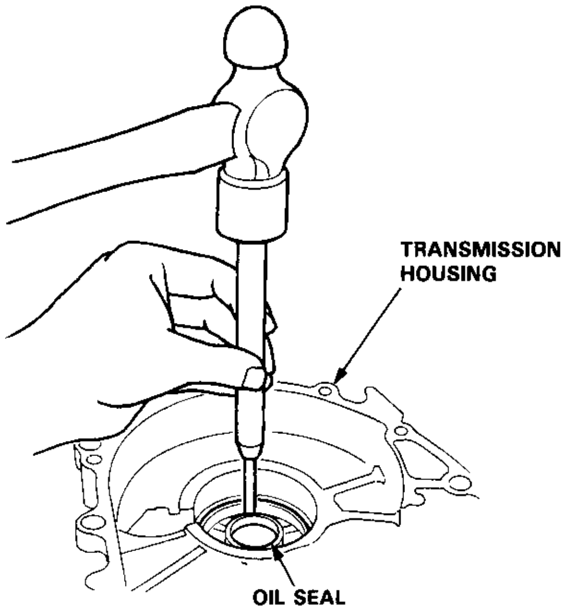


7. Install the ball bearings (see page 15-30).

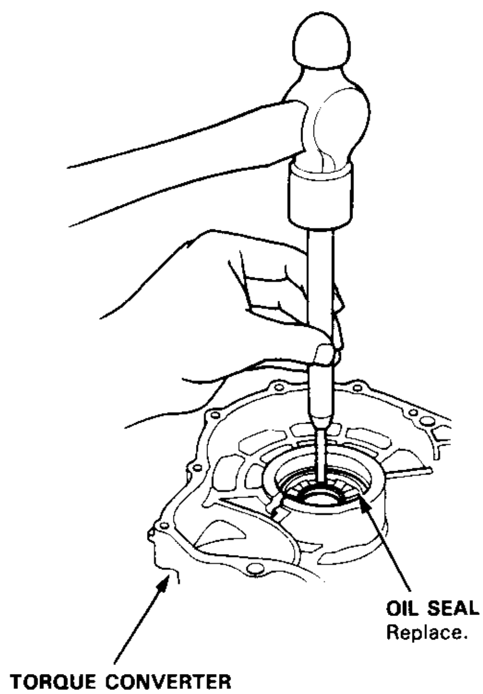
Differential (Automatic Transmission)

Oil Seal Removal

1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



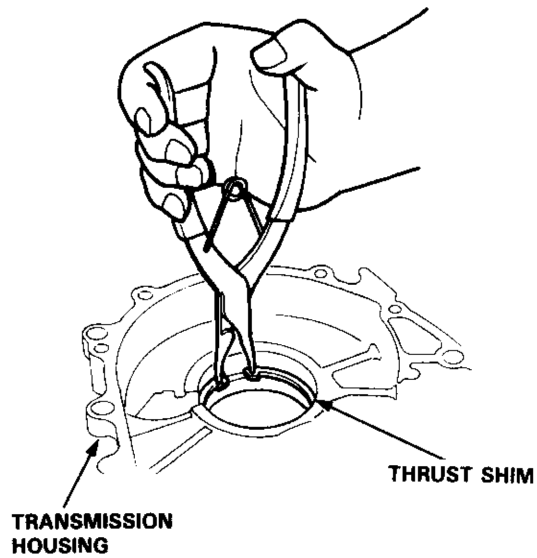
3. Remove the oil seal from the torque converter housing.



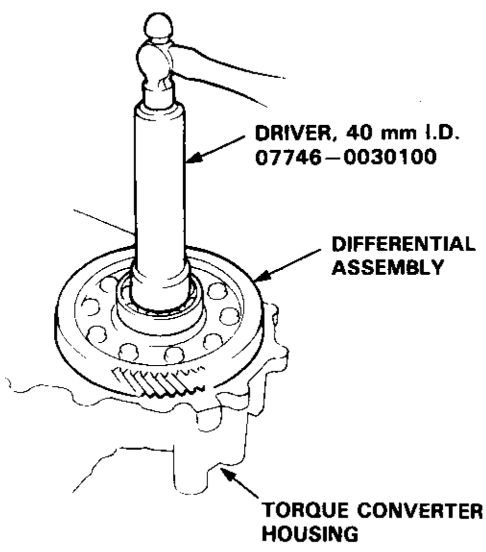
Oil Seal Installation/Side Clearance -

1. Install a 2.50 mm (0.098 in) thrust shim in the transmission housing.

   NOTE: Do not install the oil seal yet.

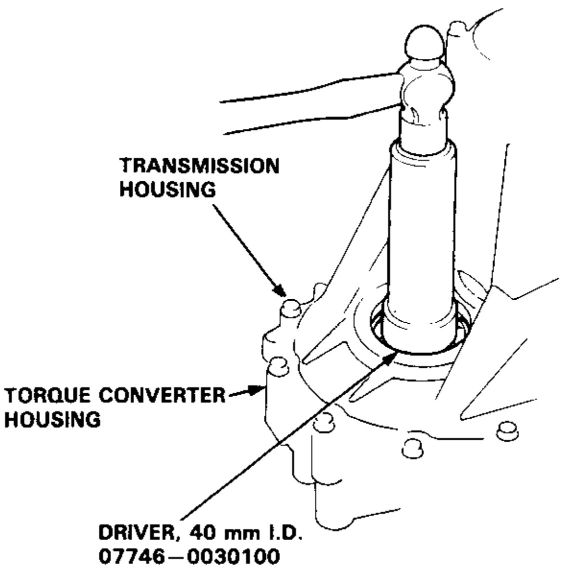


2. Install the differential assembly into the torque converter housing using the special tool as shown.



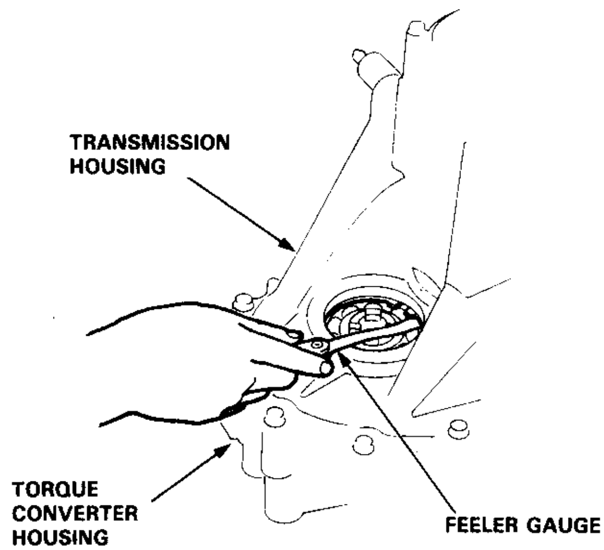
3. Assemble the transmission (see section 14). Install the transmission housing and tighten the bolts (see section 14).

4. Tap on the transmission housing side of the differential assembly with the special tool to seat the differential assembly in the torque converter housing.



5. Measure the clearance between the thrust shim and outer race of the ball bearing in the transmission housing.

STANDARD: 0–0.15 mm (0–0.006 in)



6. If out of limits, select a new thrust shim from the following table:

THRUST SHIM, 80 mm

Part Number	Thickness
90414–689–000	2.50 mm (0.09843 in)
90415–689–000	2.60 mm (0.10236 in)
90416–689–000	2.70 mm (0.10630 in)
90417–689–000	2.80 mm (0.11024 in)
90418–689–000	2.90 mm (0.11416 in)
90419–PH8–000	3.00 mm (0.11811 in)

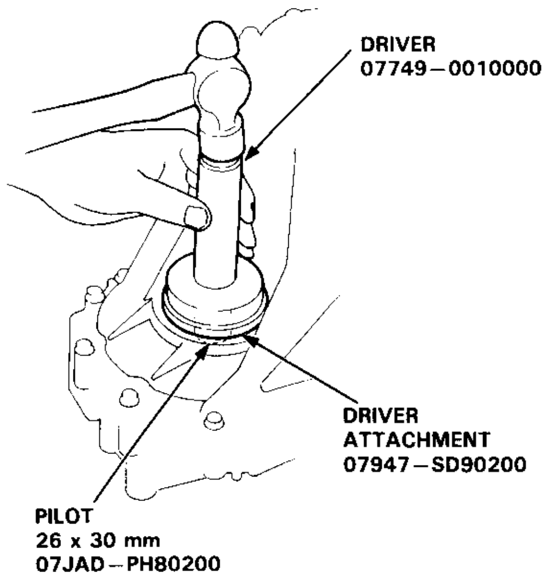
NOTE: If the thrust shim-to-ball bearing outer race clearance measured in step 5 is within the standard, it is not necessary to perform steps 7 and 8.

7. Remove the transmission housing.
8. Replace the 2.50 mm (0.098 in) thrust shim with the one of the correct thickness selected in step 6.
9. Install the transmission housing (see section 14).

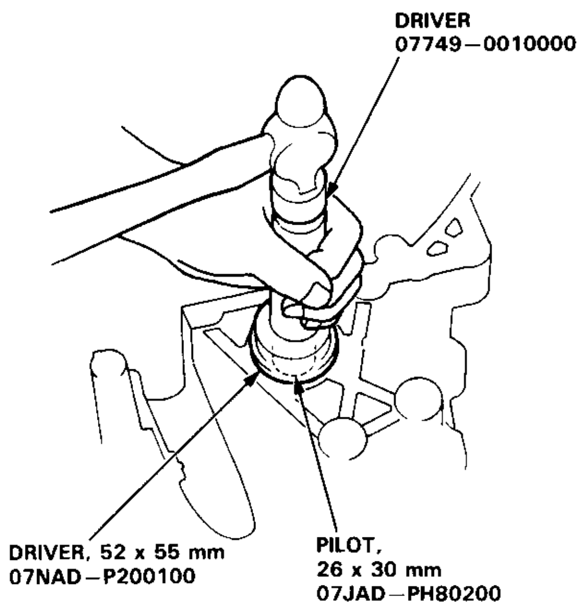
(cont'd)

Oil Seal Installation/Side Clearance (cont'd)

9. Install the oil seal flush with the transmission housing using the special tools as shown.



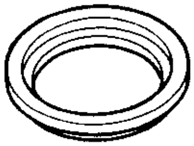
10. Install the oil seal flush with the torque converter housing using the special tools as shown.



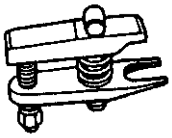
Driveshafts

Special Tools

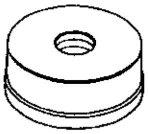
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAF – SH20400	Support Base Attachment	1	16-16
②	07LAD – PW50601	Attachment, 40 x 50 mm I.D.	1	16-18
③	07MAC – SL00200	Ball Joint Remover, 28 mm	1	16-4
④	07746 – 0010300	Attachment, 42 x 47 mm	1	16-16
⑤	07746 – 0010400	Attachment, 52 x 55 mm	1	16-17, 18
⑥	07746 – 0030400	Attachment, 35 mm I.D.	1	16-17
⑦	07749 – 0010000	Driver	1	16-16, 17, 18
⑧	07965 – SD90100	Support Base	1	16-16


①


②

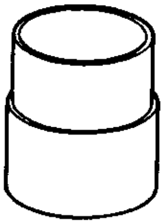

③


④


⑤


⑥


⑦

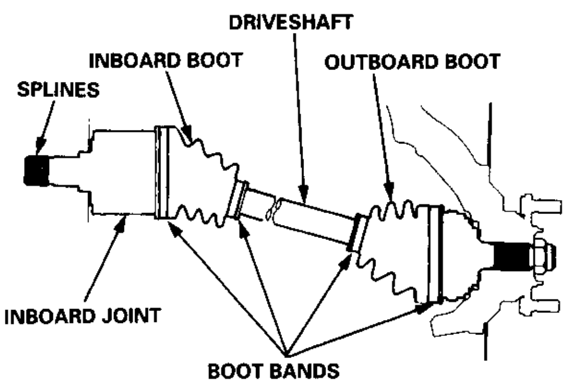

⑧

Inspection

Driveshaft Boot
Check the boots on the driveshaft for cracks, damage, leaking grease or loose boot bands.
If any damage is found, replace the boot and boot bands.

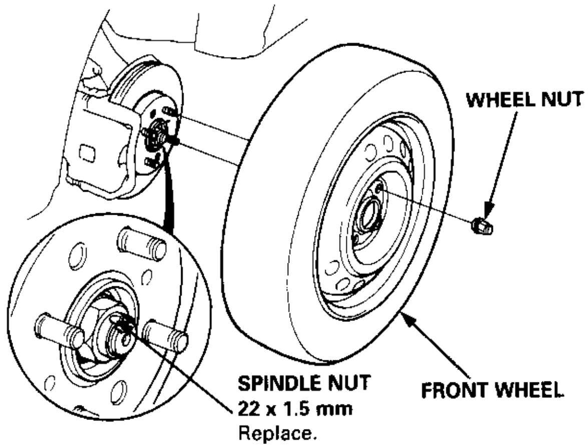
Loose Splines
Turn the driveshaft by hand and make sure the splines and joint are not excessively loose.
If damage is found, replace the joints if necessary.

Twisted or Cracked
Make sure the driveshaft is not twisted or cracked.
Replace it if necessary.



Removal

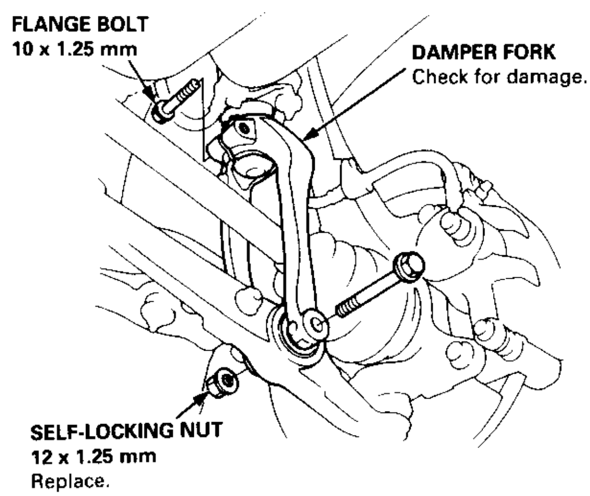
1. Loosen the wheel nuts slightly.
2. Raise the front of car and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and front wheels.



4. Drain the transmission oil or fluid (see section 13 or 14).

   NOTE: It is not necessary to drain the transmission oil or fluid when the left driveshaft is removed.

5. Raise the locking tab on the spindle nut, then remove the nut.
6. Remove the self-locking nut and flange bolts.



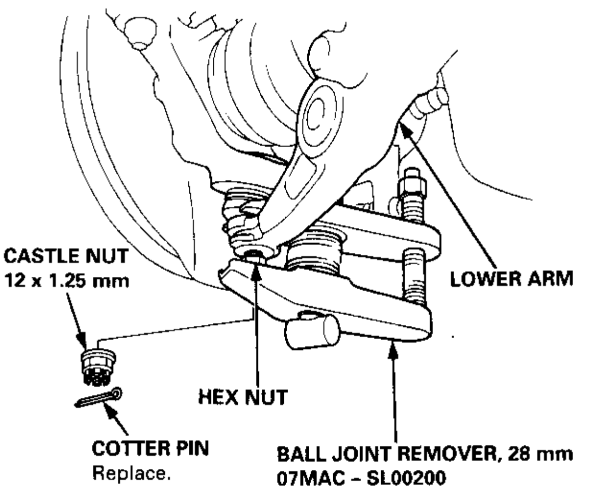
7. Remove the damper fork.

(cont'd)

Driveshafts

Removal (cont'd)

8. Remove the cotter pin from the lower arm ball joint castle nut, then remove the nut.



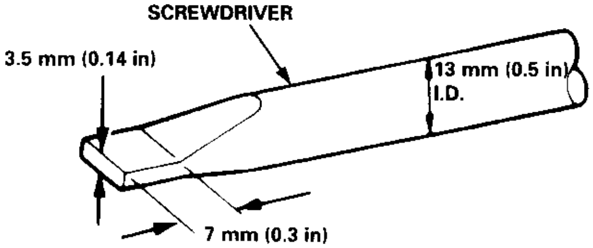
9. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.

10. Use the special tool as shown on page 18-11, to separate the ball joint and lower arm.

    CAUTION: Be careful not to damage the ball joint boot.

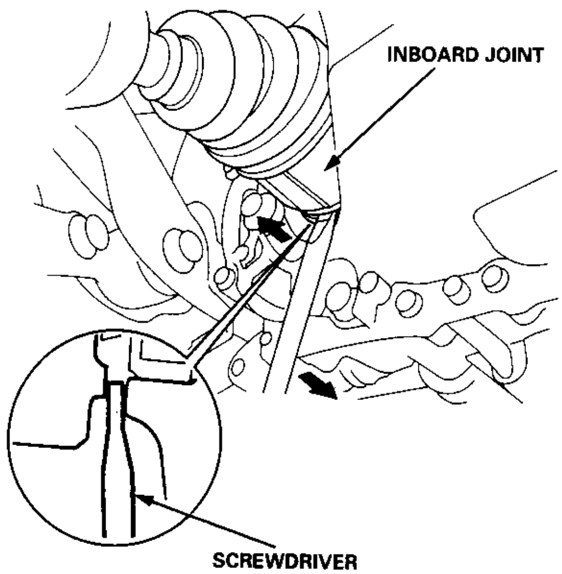
    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

11. Pry the driveshaft assembly with a screwdriver, as shown, to force the set ring at the driveshaft end past the groove. Be careful not to damage the oil seals when prying with the screwdriver.

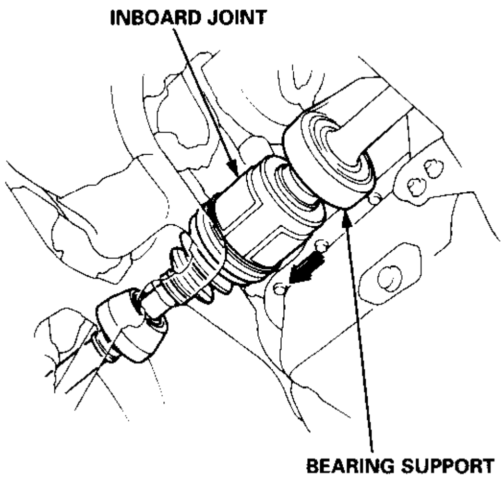


12. Pull the inboard joint, and remove the right driveshaft from the differential case as an assembly.

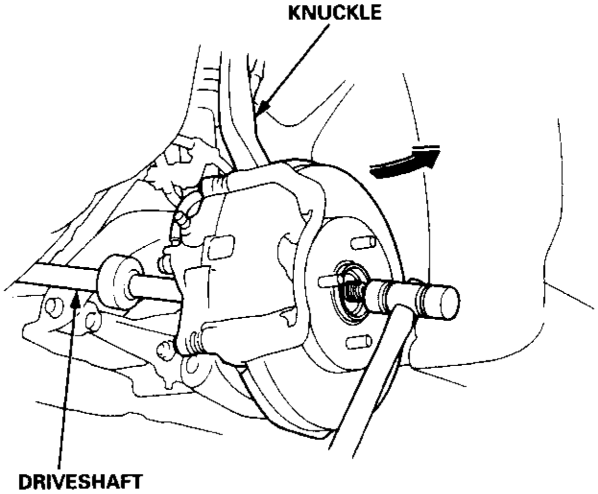
    CAUTION:
    - **Do not pull on the driveshaft, as the inboard joint may come apart.**
    - **Use care when prying out the assembly, and pull it straight to avoid damaging the differential oil seal or the intermediate shaft outer seal.**



— Left Driveshaft:
Remove the left driveshaft from the bearing support by tapping the inboard joint of the driveshaft with a plastic hammer.



13. Pull the knuckle outward, then remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



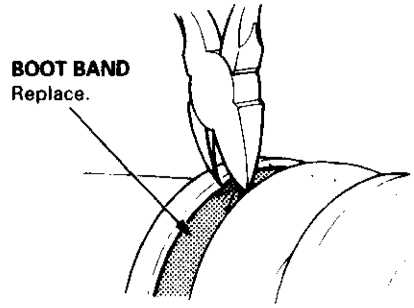
Disassembly

1. Careful clamp the driveshaft in a vise with soft jaws, then remove the set ring from the inboard joint.

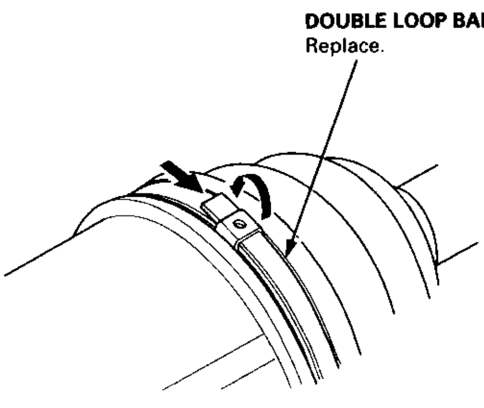
2. Remove the boot bands on the inboard joint and outboard joint.

   CAUTION: Take care not to damage the boot.

   — If the boot band is a welded type or a low profile type boot band, carefully cut it off with a pair of diagonal cutters.



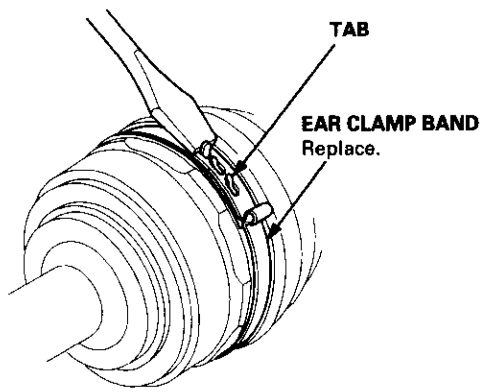
   — If the boot band is a double loop band type, raise the band bend as shown.



(cont'd)

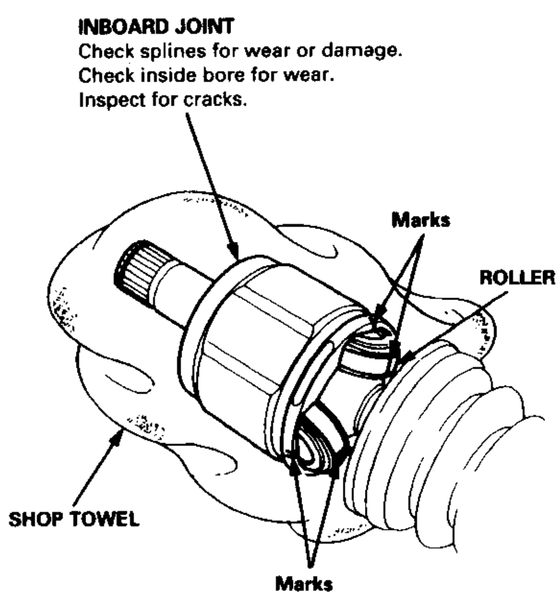
Removal (cont'd)

— If the boot band is an ear clamp type (for outboard joint on the Canada model, raise the three tabs with a screwdriver.

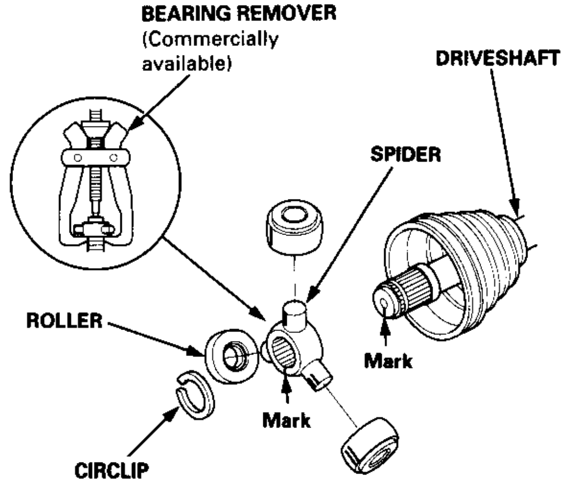


3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel.

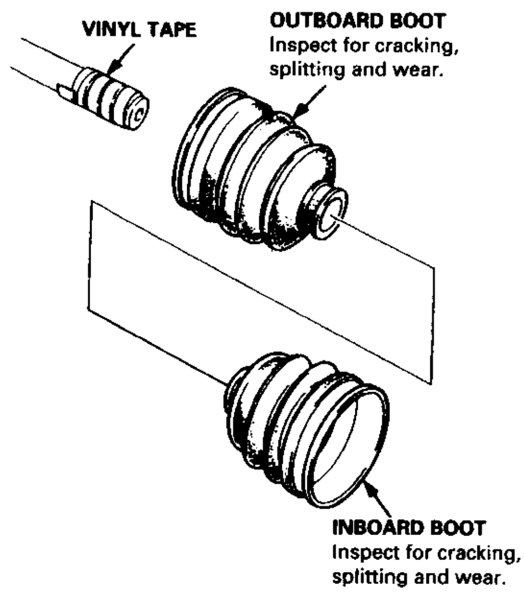
   NOTE: Be careful not to drop the rollers when separating them from the inboard joint.



4. Mark the rollers and spider to identify the locations of rollers on the spider, then remove the rollers.



5. Remove the circlip.
6. Mark the spider and driveshaft to identify the position of the spider on the shaft.
7. Remove the spider using a bearing remover.
8. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boots.



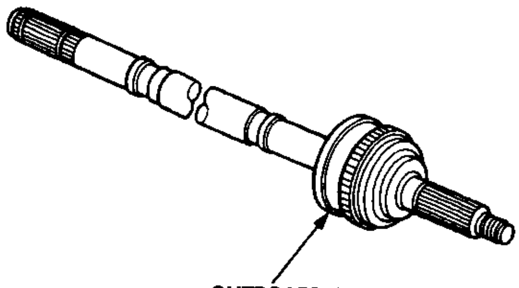
9. Remove the inboard boot.

   CAUTION: Take care not to damage the boot.

10. Remove the dynamic damper and outboard boot, then remove the vinyl tape.

    CAUTION: Take care not to damage the dynamic damper and boot.

11. Inspect the outboard joint for faulty movement and wear. If any roughness or excess play is felt, replace the outboard joint.



Driveshafts

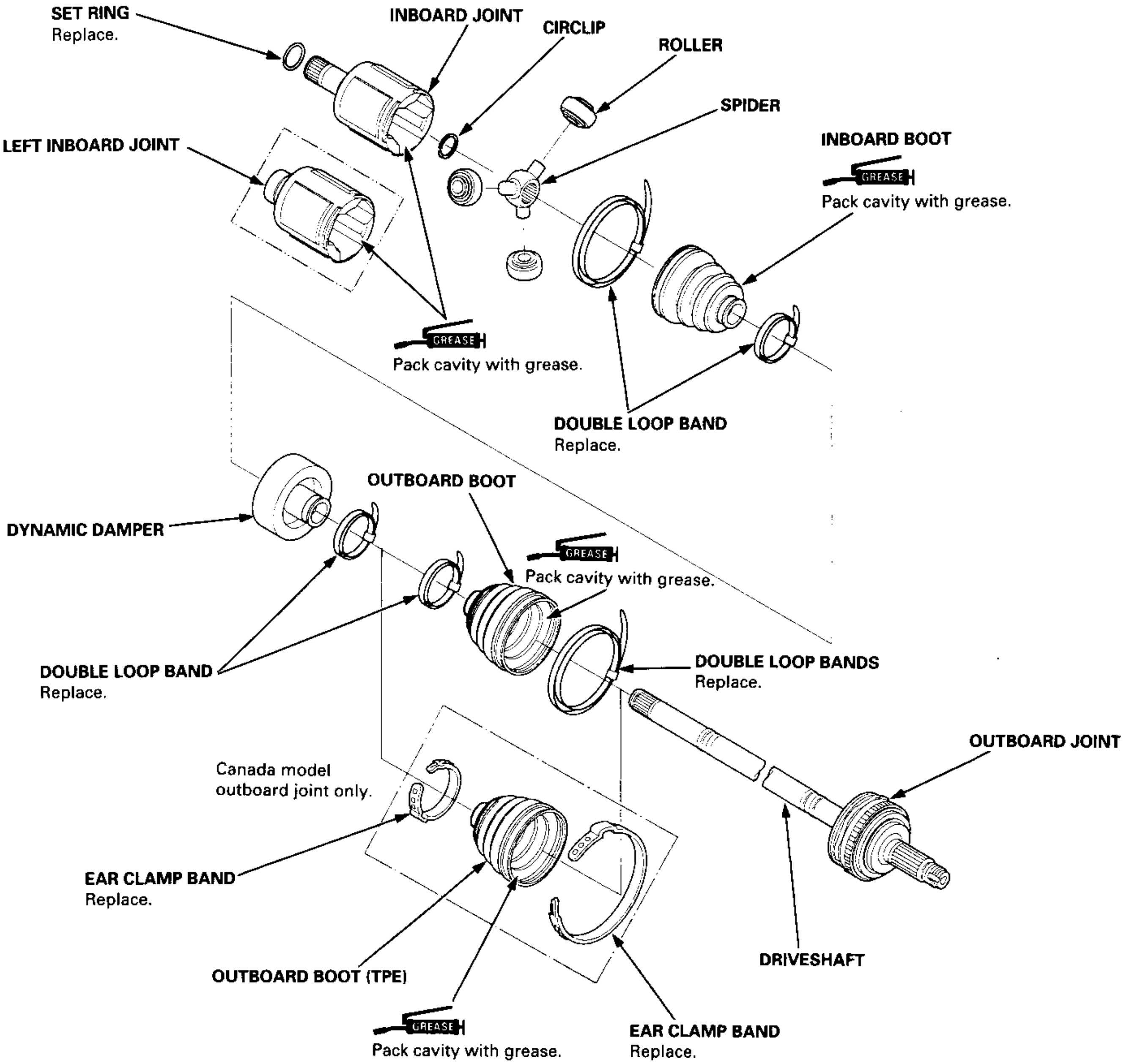
Reassembly

NOTE:

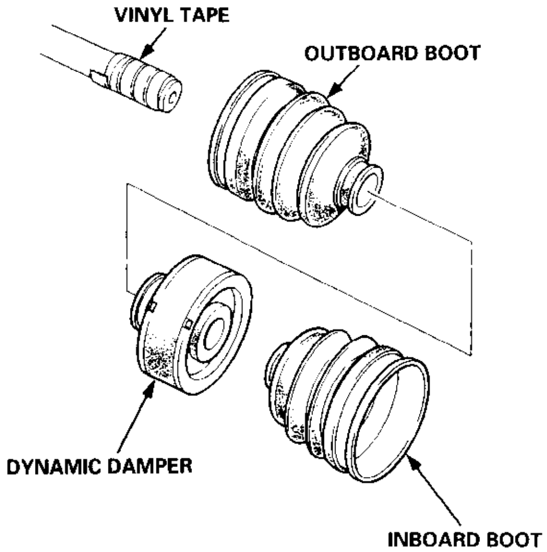
- Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- GREASE : Thoroughly pack the inboard joint and both joint boots with the joints boots with the joint grease included in the new driveshaft set.

Grease quantity:
Inboard Joint
All models: 120 – 130 g (4.2 – 4.6 oz)
Outboard Joint
USA model: 90 – 100 g (3.2 – 3.5 oz)
Canada model: 105 – 115 g (3.7 – 4.1 oz)

- The Canada model uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the ear clamp type boot band in the outboard joint boot set.



1. Wrap the splines with vinyl tape to prevent damage to the boots and dynamic damper.

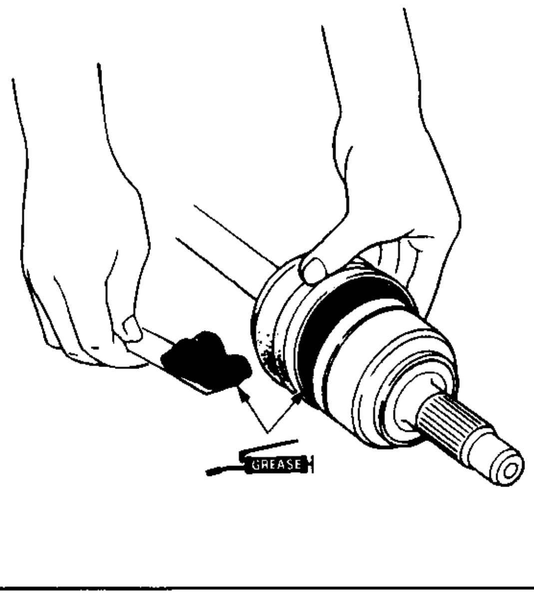


2. Install the outboard boot, dynamic damper and inboard boot to the driveshaft, then remove the vinyl tape.

CAUTION: Take care not to damage the boots and dynamic damper.

3. Pack the outboard joint with the joint grease included in the new driveshaft set.

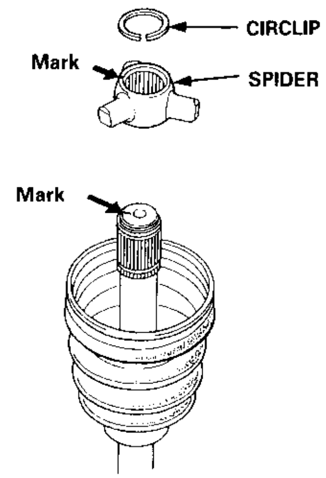
Grease quantity:
USA model: 90 – 100 g (3.2 – 3.5 oz)
Canada model: 105 – 115 g (3.7 – 41 oz)



4. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.

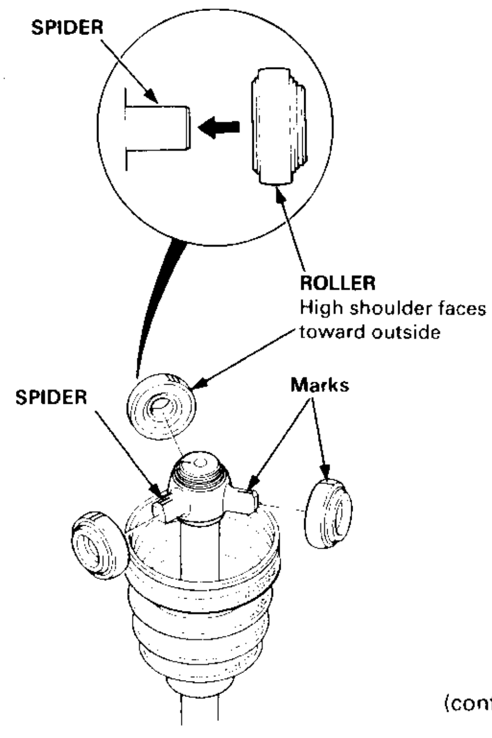
5. Fit the circlip into the driveshaft groove.

NOTE: Always rotate the circlip in its groove to be sure it is fully seated.



6. Fit the rollers to the spider with their high shoulders facing outward.

Note these items during reassembly:
- Reinstall the rollers in their original positions on the spider by aligning the marks.
- Hold the driveshaft pointed up to prevent the rollers from falling off.



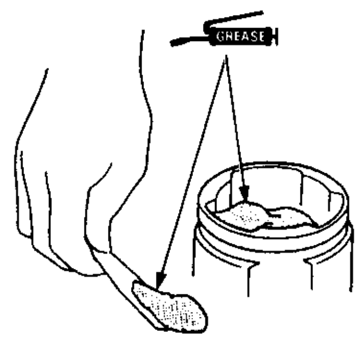
(cont'd)

Driveshafts

Reassembly (cont'd)

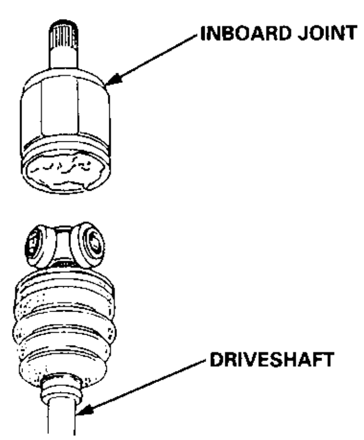
7. Pack the inboard joint with the joint grease included in the new driveshaft set.

   Grease quantity: 120 – 130 g (4.2 – 4.6 oz)

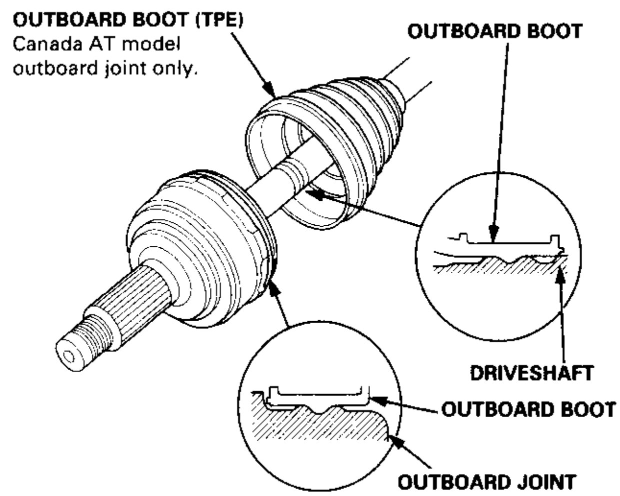


8. Fit the inboard joint onto the driveshaft.

   NOTE:
   - Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint and the rollers.
   - Hold the driveshaft so the inboard joint points up to prevent it from falling off.

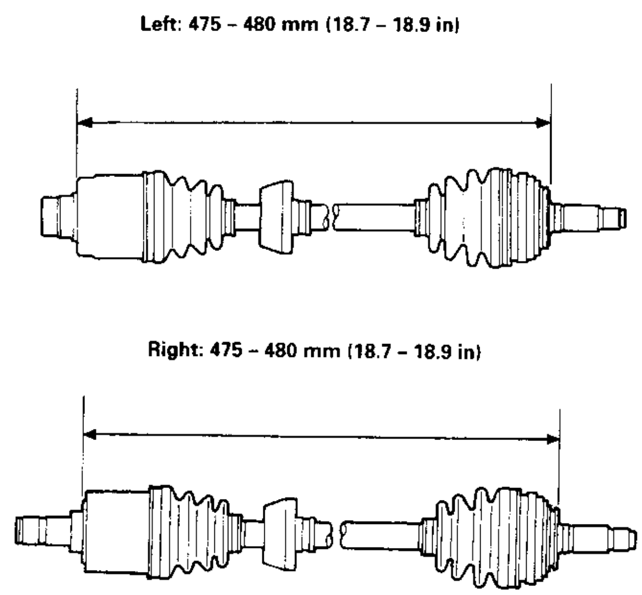


9. Fit the joint boot ends onto the driveshaft and joints.
   When installing the outboard joint boot on a Canada model, be sure the end of the boot is seated in the grooves of the driveshaft and outboard joint.



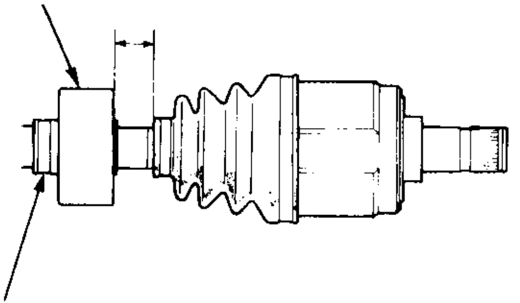
10. Adjust the length of the driveshafts to the specifications below, then adjust the boots to halfway between full compression and full extension.

    NOTE: The ends of boots seat in the groove of the driveshaft and joint.



11. Position the dynamic damper as shown below.

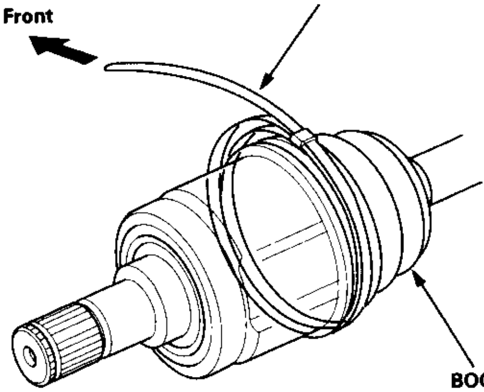
B18B1 engine:
Left/Right: 26 ± 2 mm (1.0 ± 0.1 in)
B18C1 engine:
Left/Right: 29 ± 2 mm (1.1 ± 0.1 in)



12. Install the boot bands following procedure.

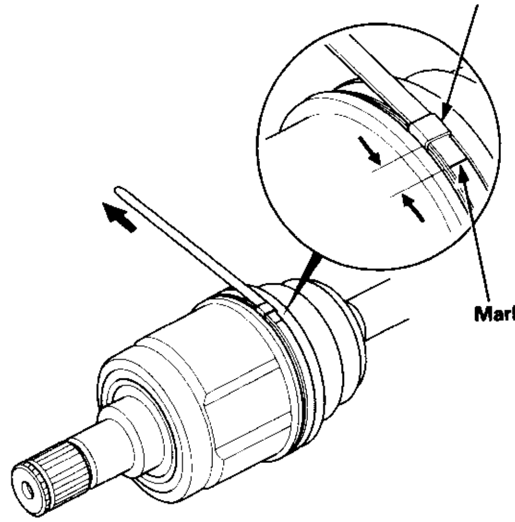
Double Loop Boot Band Installation:
USA models: all bands
Canada model: inboard joint and dynamic damper bands

-1. Set the double loop band onto the boot with the band end toward the front of the vehicle.



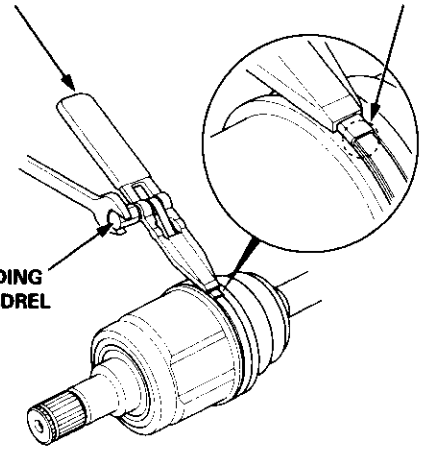
-2. Pull up the slack in band by hand.

-3. Make a mark on the band 10 – 14 mm (0.4 – 0.6 in) from the clip.



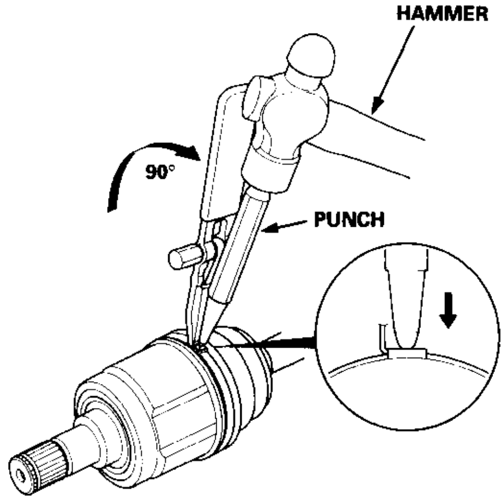
-4. Thread the free end of the band through the nose section of the commercially available boot band tool (KD-3191 or equivalent), and into the slot on the winding mandrel.

-5. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot on the band meets the edge of the clip.

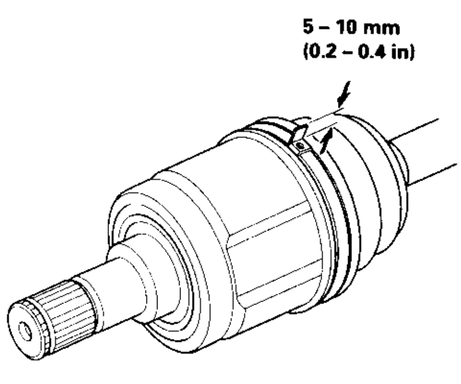


(cont'd)

-6. Raise up the boot band tool to bend the free end of the band 90 degrees to the clip. Center punch the clip, then fold over the remaining tail onto the clip.



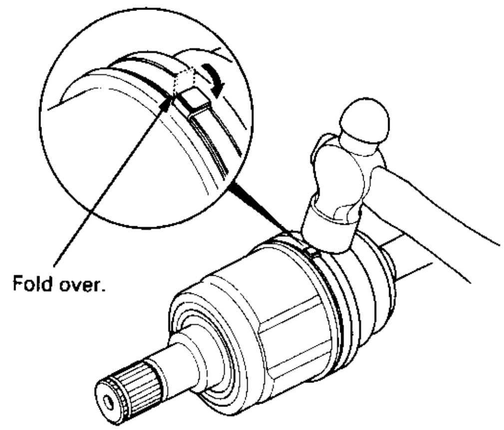
-7. Unwind the boot banding tool, and cut off the excess free end of the band to leave a 5 – 10 mm (0.2 – 0.4 in) tail protruding from the clip.



-8. Bend the band end by tapping it down with a hammer.

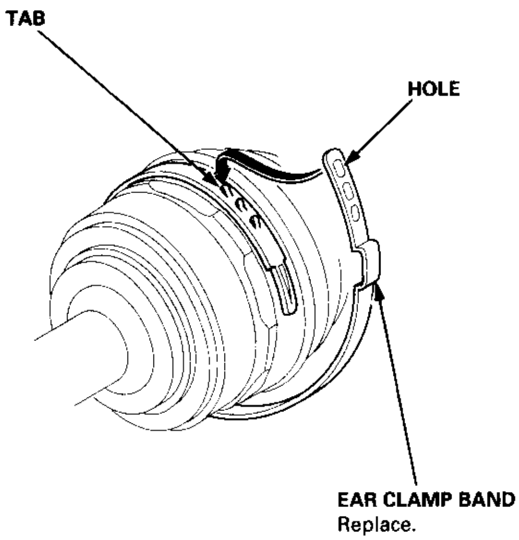
NOTE:

- Make sure the band does not move.
- Remove any grease remaining in the surrounding surfaces.

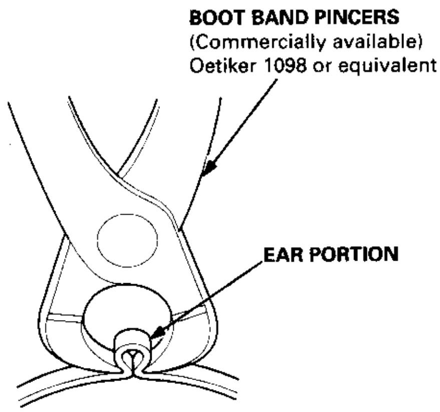


Ear Clamp Type Boot Band Installation:
Canada model outboard joint bands

-1. Install the ear clamp boot band by aligning the tabs with holes in the band.

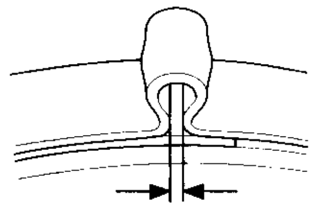


-2. Close the ear portion of the band with a commercially available boot band pincers.



-3. Measure the clearance between the closed ear portion of the band.

Standard: 0 – 3 mm (0 – 0.12 in)

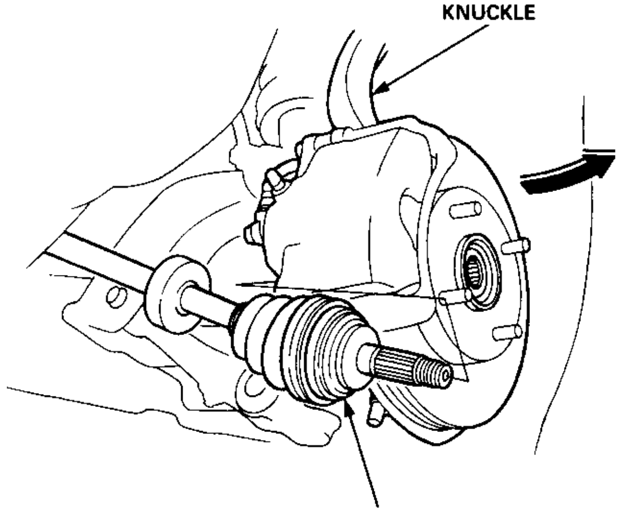


If the band's, clearance is not within the standard, close the ear portion of the band further.

NOTE:
- Make sure the band does not move.
- Remove any grease remaining in the surrounding surfaces.

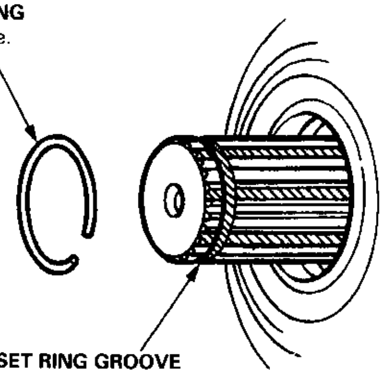
Installation

1. Install the outboard joint into the knuckle.



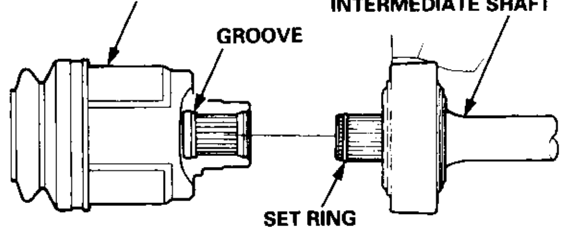
2. Apply 0.5 – 1.0 g (0.02 – 0.04 oz) of specified grease to the whole splined surface of the left driveshaft.

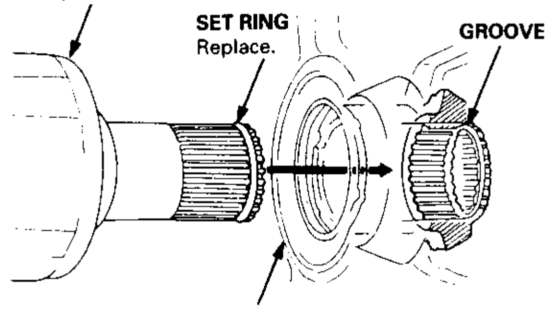
   NOTE: After applying grease, remove the grease from the splined grooves at intervals of 2 – 3 splines and from the set ring groove so air can bleed from the inboard joint.



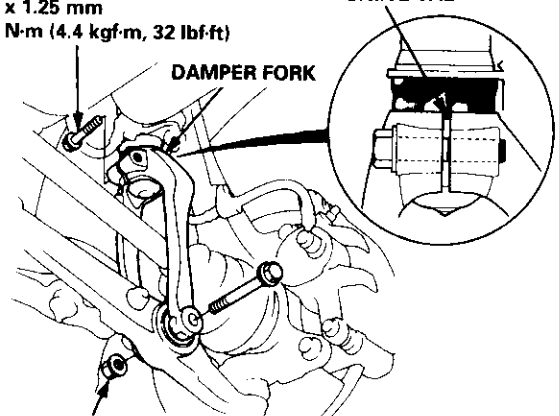
3. Install a new set ring onto the driveshaft or intermediate shaft groove.

4. Insert the inboard end of the driveshaft into the differential or intermediate shaft until the set ring locks in the groove.





5. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.



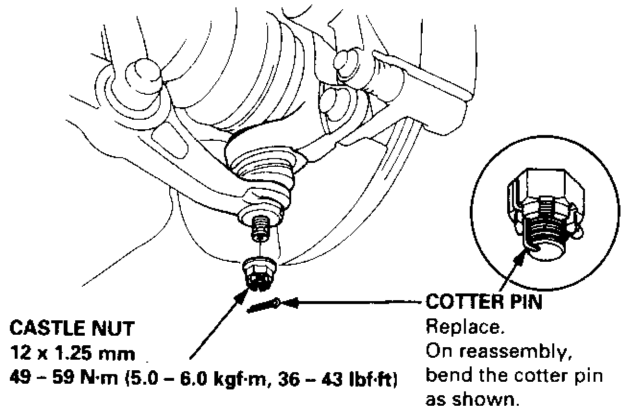
6. Loosely install the flange bolts and the new self-locking nut.

   NOTE: The bolts and nut should be tightened with the vehicle's weight on the damper.

7. Install the knuckle on the lower arm.

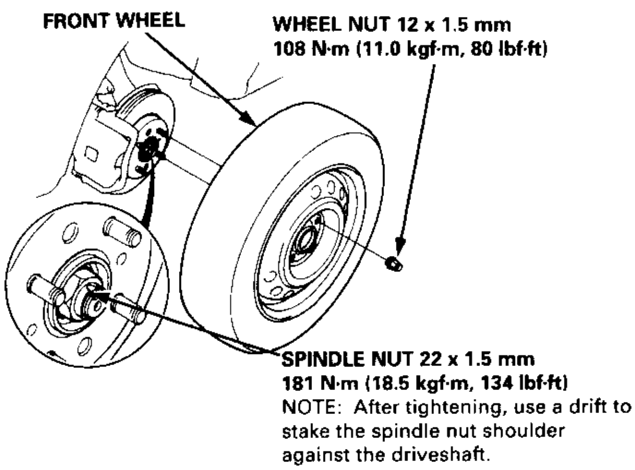
   NOTE: Wipe off the grease before tightening the nut at the ball joint.

   CAUTION:
   - **Be careful not to damage the ball joint boot.**
   - **Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.**



8. Install a new spindle nut, then tighten the nut.
9. Install the front wheel with the wheel nuts.

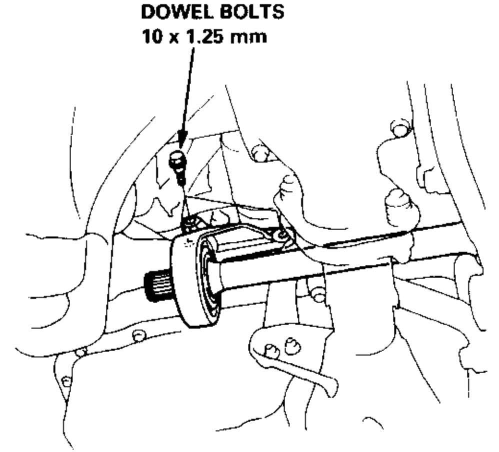
   NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.



10. Tighten the flange bolts and the new self-locking nut with the vehicle's weight on the damper.
11. Refill the transmission with recommended oil or fluid (see section 13 or 14).
12. Check the front wheel alignment and adjust if necessary (see page 18-4).

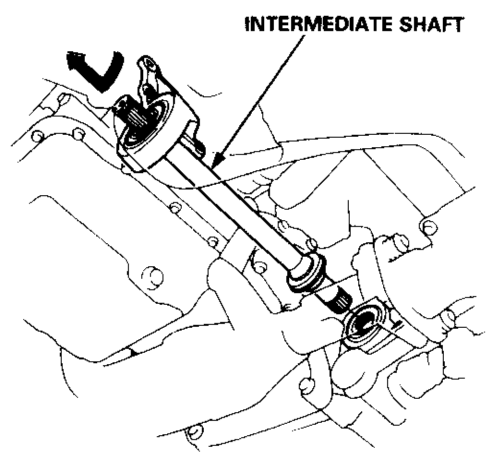
Removal

1. Drain the transmission oil or fluid (see section 13 or 14).
2. Remove the left driveshaft (see page 16-3).
3. Remove the three dowel bolts.



4. Remove the intermediate shaft from the differential.

   CAUTION: Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal.

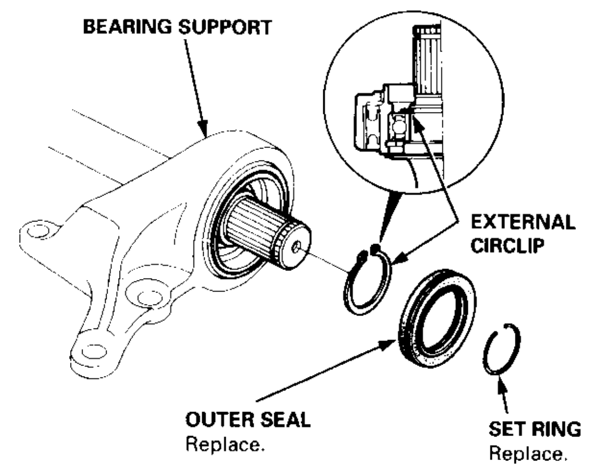


Intermediate Shaft

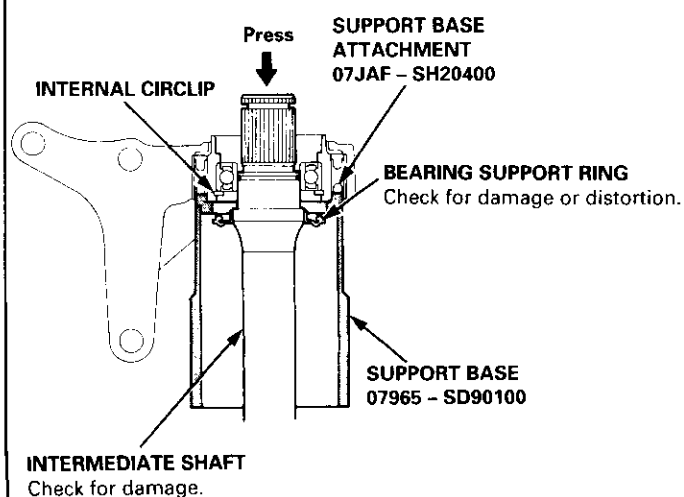
Disassembly

NOTE: Be careful not to damage the metal rings on the intermediate shaft during disassembly.

1. Remove the set ring.

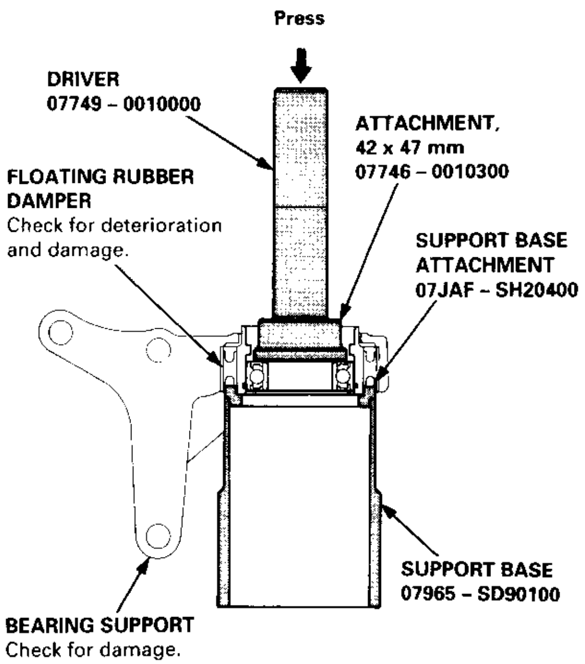


2. Remove the intermediate shaft outer seal from the bearing support.
3. Remove the external circlip.
4. Press the intermediate shaft out of the shaft bearing using the special tools and a press.



5. Remove the internal circlip.

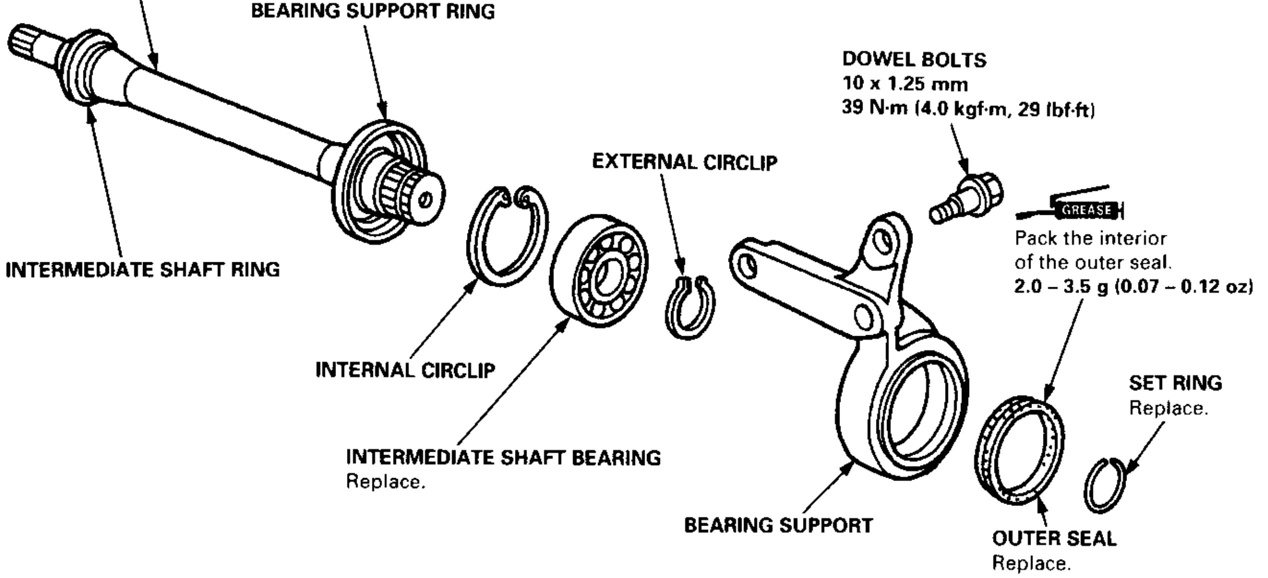
6. Press the intermediate shaft bearing out of the bearing support using the special tools and a press.



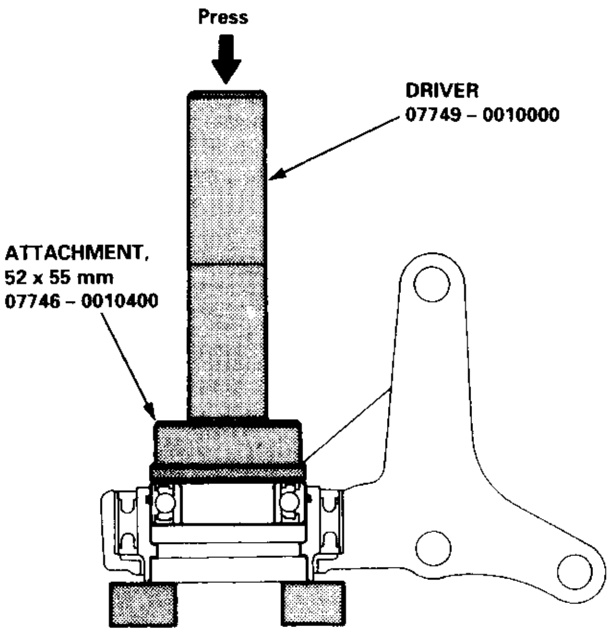
Reassembly

Note these items during reassembly:

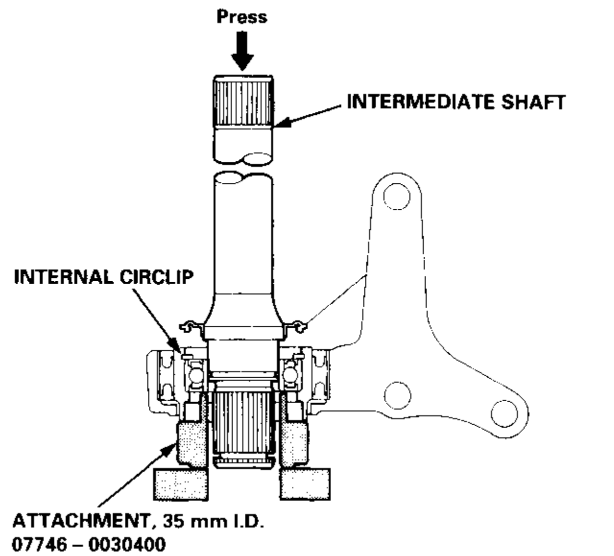
- Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- Be careful not to damage the metal rings on the intermediate shaft during reassembly.



1. Press the intermediate shaft bearing into the bearing support using the special tools and a press.



2. Seat the internal circlip in the groove of the bearing support.
3. Press the intermediate shaft into the shaft bearing using the special tools and a press.



(cont'd)

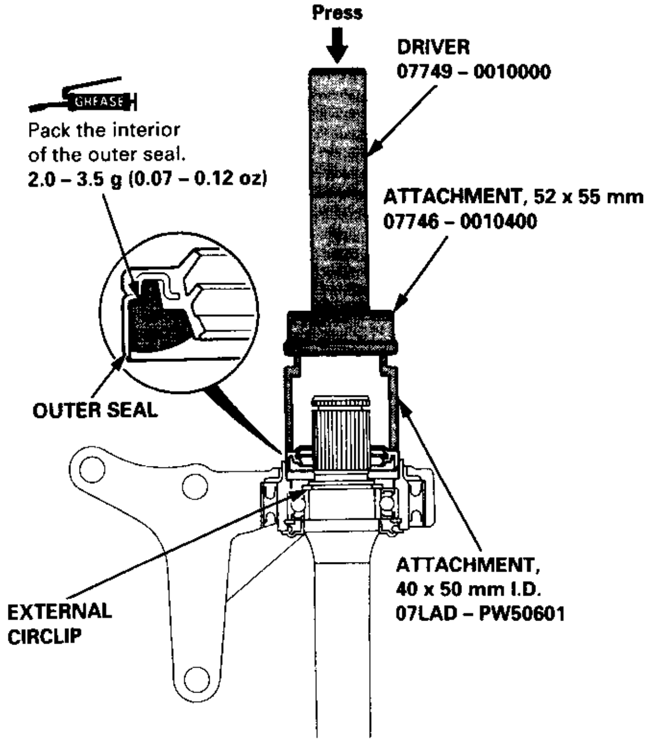
Intermediate Shaft

Reassembly (cont'd)

4. Seat the external circlip in the groove of the intermediate shaft.

5. Install the outer seal into the bearing support using the special tools.

   NOTE: Install the seal flush with the bearing support.

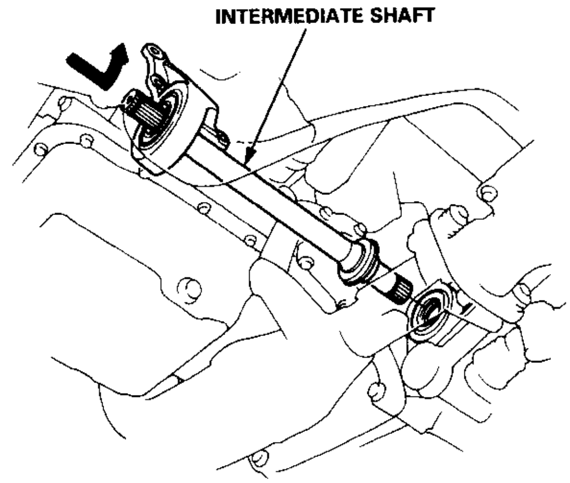


6. Install the new set ring in the intermediate shaft groove.

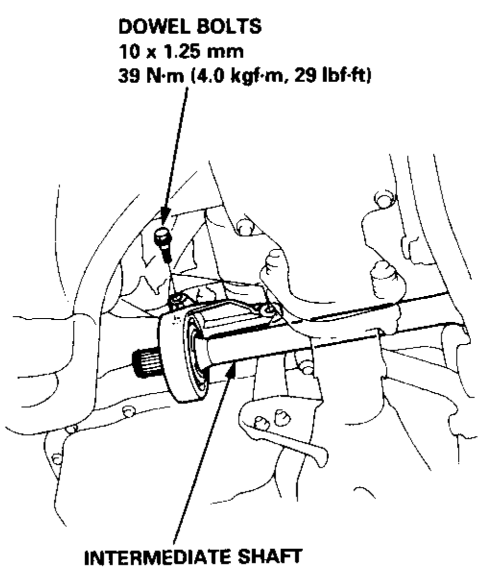
Installation

1. Insert the intermediate shaft assembly into the differential.

   CAUTION: Hold the intermediate shaft horizontal to prevent damage to the differential oil seal.



2. Install the three dowel bolts, then tighten them.



Steering

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Integra SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box.
Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

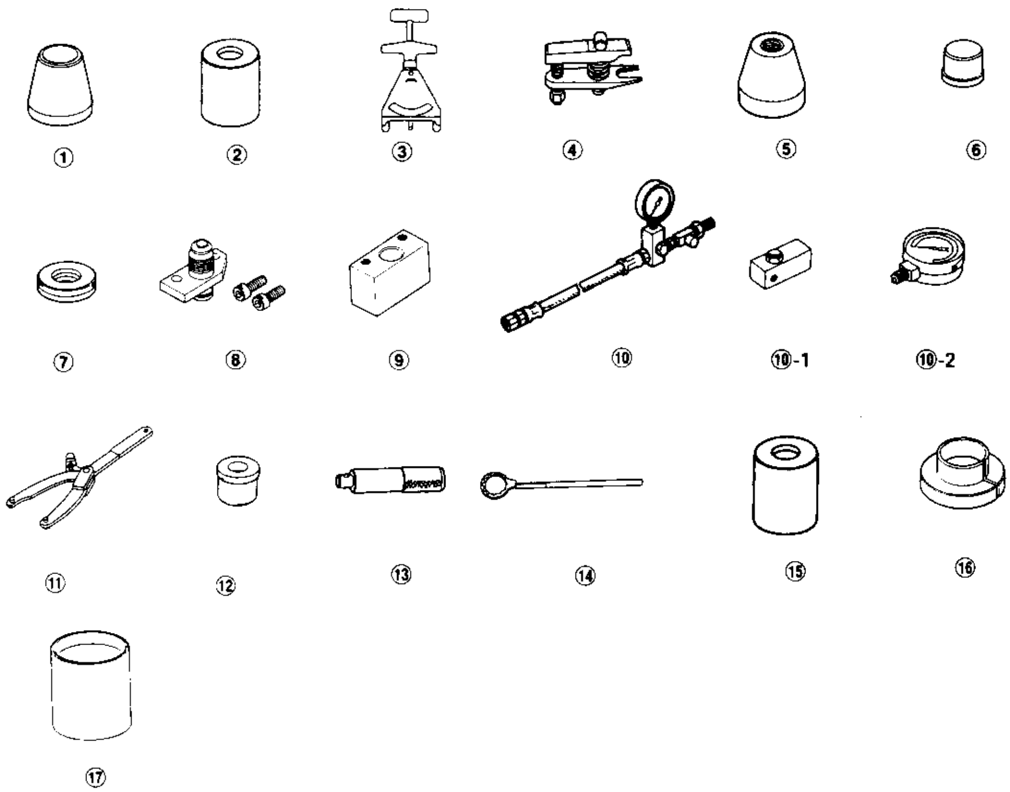
WARNING

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Special Tools

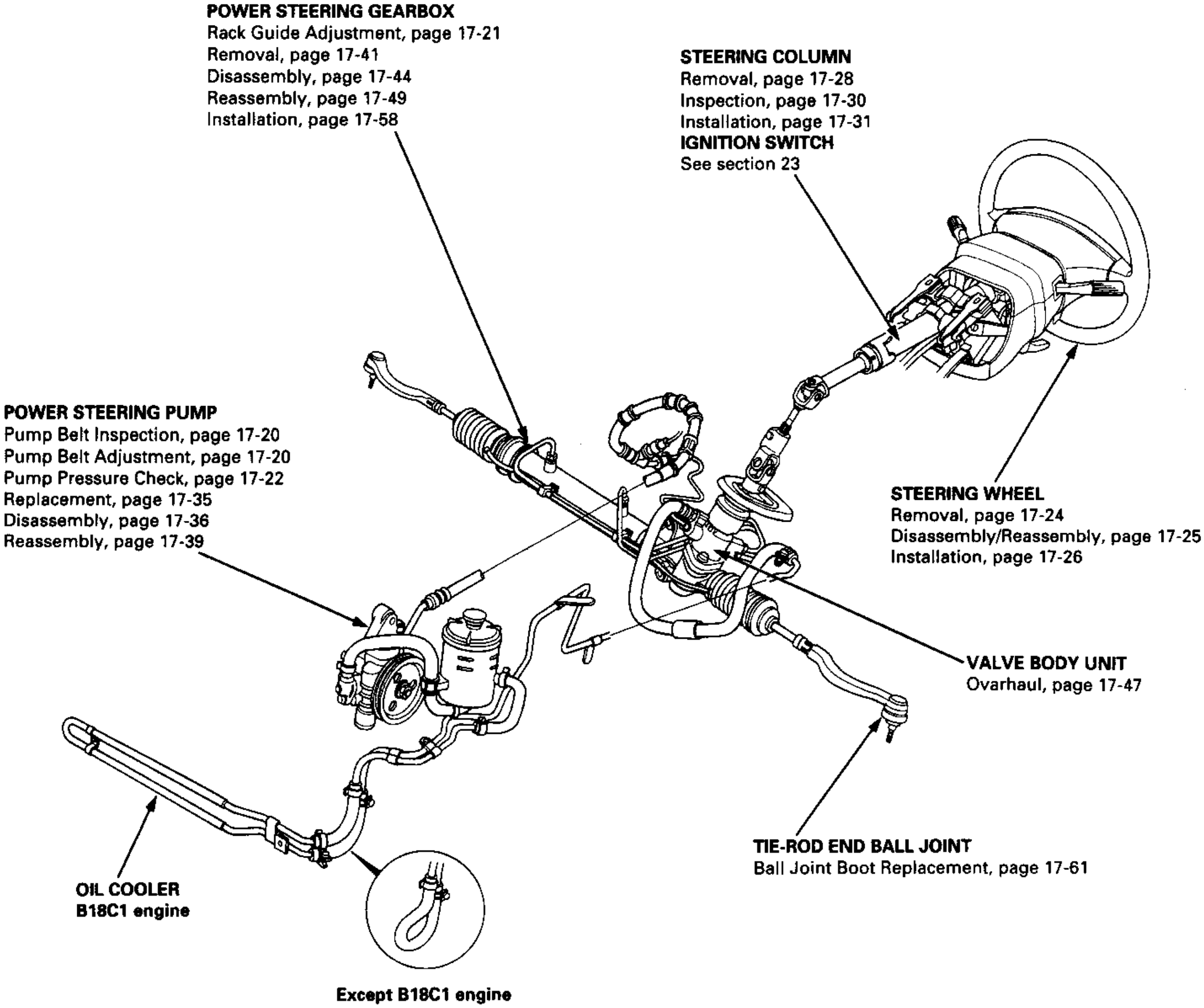
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAG - SD40100	Piston Seal Ring Guide	1	17-53
②	07GAG - SD40200	Piston Seal Ring Sizing Tool	1	17-53
③	07JGG - 001010A	Belt Tension Gauge	1	17-20
④	07MAC - SL00200	Ball Joint Remover, 28 mm	1	17-42
⑤	07MAG - SL00100	Ball Joint Boot Clip Guide	1	17-51
⑥	07NAD - SR3020A	Attachment, 23 x 25 mm	1	17-46, 48
⑦	07NAG - SR3090A	Valve Seal Ring Sizing Tool	1	17-50
⑧	07NAK - SR3011A	P/S Joint Adapter (Pump)	1	17-22
⑨	07NAK - SR3012A	P/S Joint Adapter (Hose)	1	17-22
⑩	07406 - 0010001	P/S Pressure Gauge	1	17-22
⑩-1	07406 - 0010300	Pressure Control Valve	1	17-22
⑩-2	07406 - 0010400	Pressure Gauge	1	17-22
⑪	07725 - 0030000	Universal Holder	1	17-37, 41
⑫	07746 - 0010100	Attachment, 32 x 35 mm	1	17-51, 52
⑬	07749 - 0010000	Driver	1	17-51, 52
⑭	07916 - SA50001	Locknut Wrench, 40 mm	1	17-21
⑮	07965 - SA50500	Front Hub Dis/Assembly Tool	1	17-61
⑯	07974 - 6890800 or 07974 - 689080A	Cylinder End Seal Slider	1	17-53, 54
⑰	07974 - SA50200	Sleeve Seal Ring Sizing Tool	1	17-51



Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.
Note the following special precautions when the steering gearbox removal/installation.

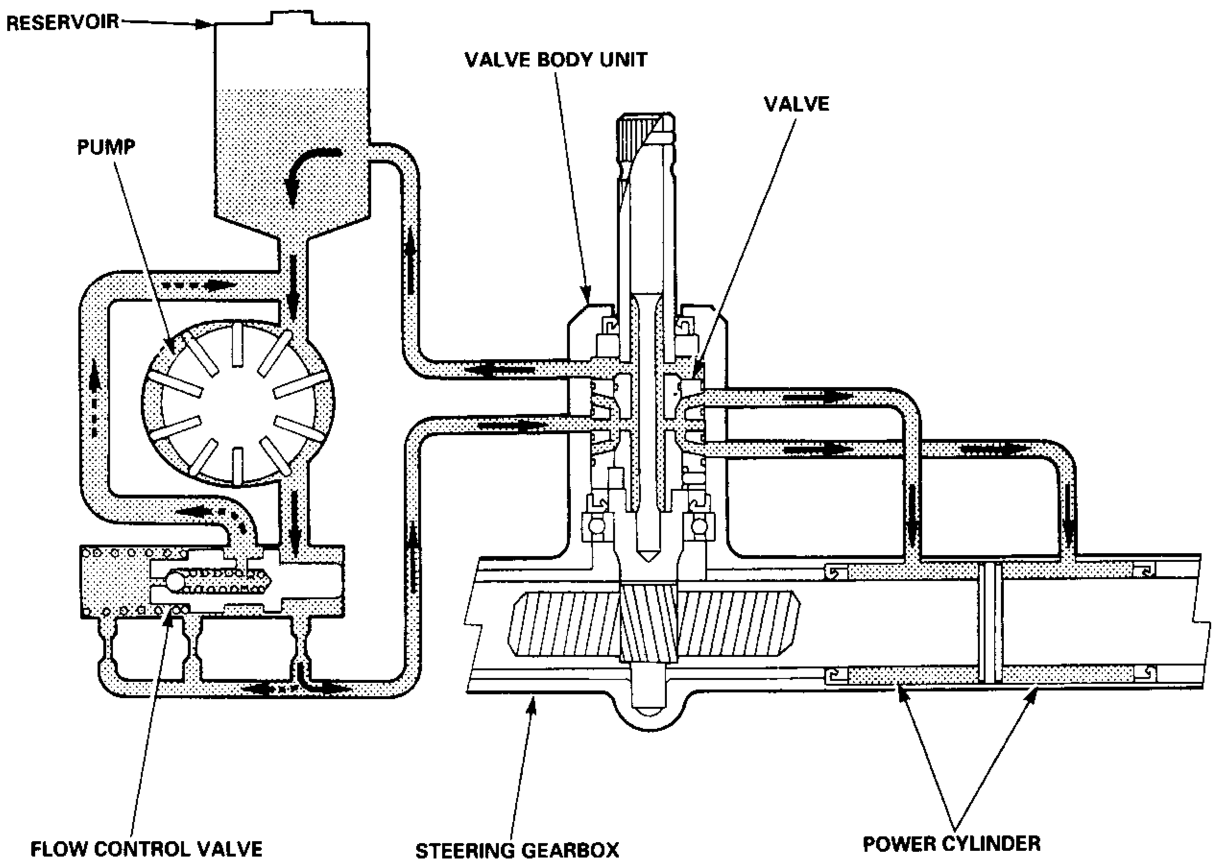
- Before removing the steering gearbox, remove the driver's airbag assembly and steering wheel.
- After installing the steering gearbox, check the wheel alignment and adjust if necessary.



System Description

Fluid Flow Diagram

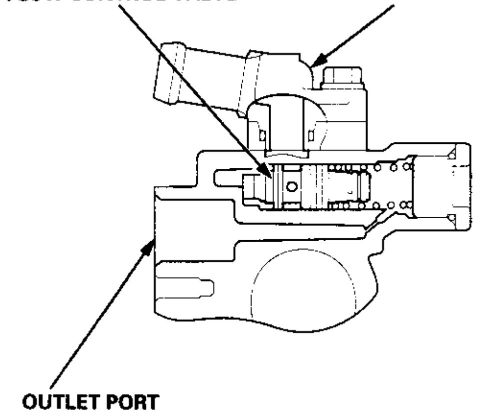
The system is a compact rotary-valve-type power steering, connected to the steering gearbox. The fluid pressure is provided by a vane-type pump which is driven by the engine crank pulley. The amount of fluid and pressure is regulated by the flow control valve built into the pump. The fluid pressure from the pump is delivered to the valve body unit around the pinion of the steering gearbox. The valve inside the valve body unit controls the hydraulic pressure and changes the direction of the flow. The fluid then flows to the power cylinder, where rack thrust is generated. Fluid returning from the power cylinder flows back to the reservoir, where the fluid is "filtered" and supplied to the pump again.

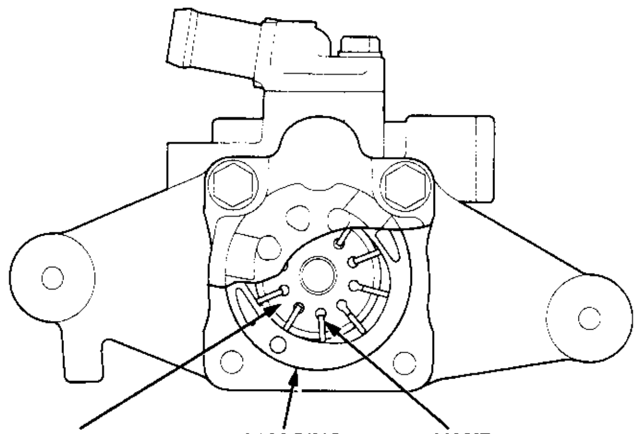


Steering Pump

Construction

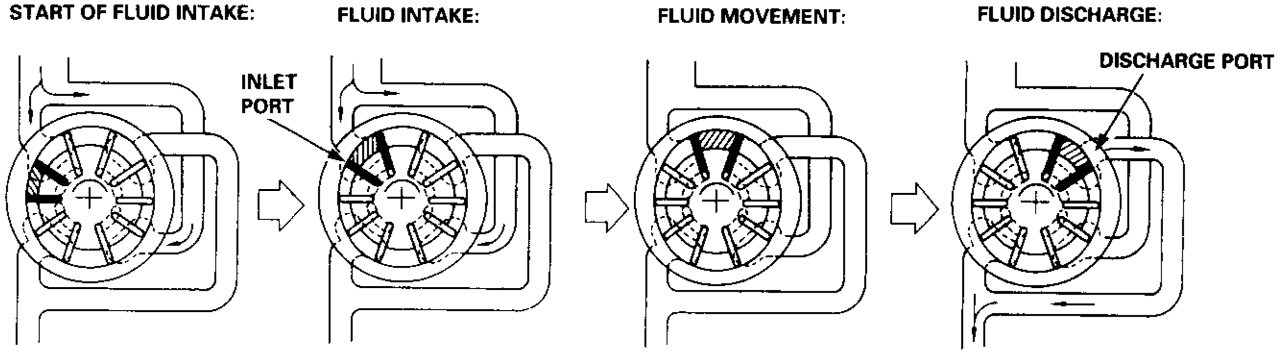
The pump is a vane-type incorporating a flow control valve (with an integrated relief valve) and is driven by a POLY-V-belt from the crank pulley. The pump features 10 vanes. Each vane performs two intake/discharge operations for every rotation of the rotor. This means that the hydraulic fluid pressure pulse becomes extremely small during discharge.





Operation

The belt-driven pulley rotates the rotor through the drive shaft. As the rotor rotates, the hydraulic pressure is applied to the vane chamber of the rotor and the vanes will rotate while being pushed onto the inner circumference of the cam ring. The inner circumference of the cam ring has an extended portion with respect to the center of the shaft, so the rollers move downward in the axial direction as the carrier rotates. As a result of this roller movement, the internal volume of the vane chamber will change, resulting in fluid intake and discharge.



The vanes are pushed onto the inner circumference of the cam ring.

The volume of the vane chamber increases so that fluid is sucked in.

The sucked-in fluid moves toward the discharge port.

As the vanes return to the their original position on the inner side, the volume of the vane chamber decreases so the fluid is discharged from the discharge port.

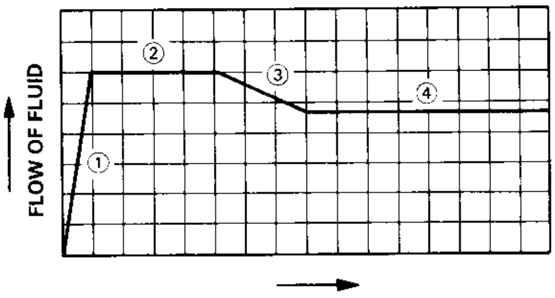
(cont'd)

Steering Pump (cont'd)

Flow Control

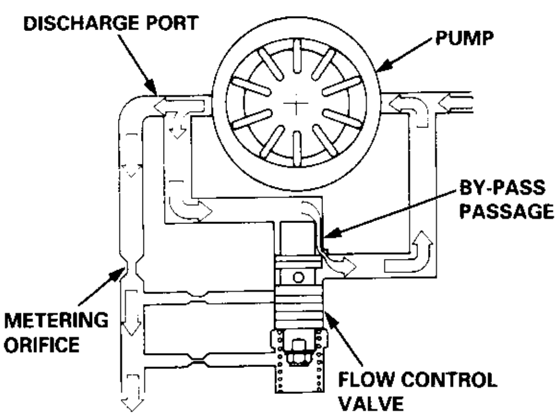
The flow control valve in the pump performs the following steps ① through ④ to control the flow of fluid, i.e. to increase the discharge volume when engine speed is low and to decrease it when the engine speed increases. The assistance thrust of the steering gearbox changes in compliance with the change in the discharge volume.

FLOW CURVE



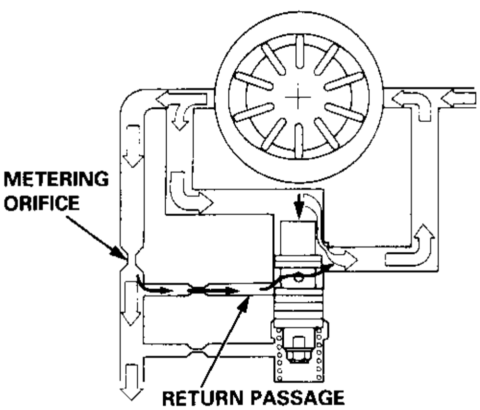
① When the engine starts, fluid discharged from the discharge port starts to run through the metering orifice in the pump. The discharge volume increases as the engine speed increases.

② As the flow has already been regulated by the metering orifice when the engine speed is at or near the idle speed, a constant and regulated amount of fluid is discharged until the engine speed reaches the middle speed range. As the engine speed increases, the pressure difference between the ends of the metering orifice increases. A pressure difference is created between the top and bottom ends of the flow control valve, too, pushing the flow control valve to open the by-pass passage. This allows the excess fluid to return to the inlet port preventing pressure at the discharge port from rising excessively.



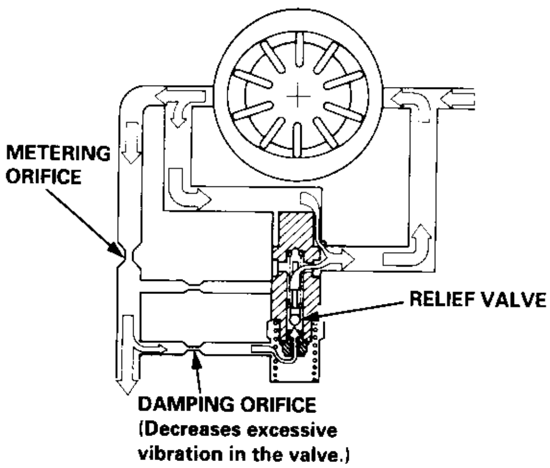
③ As the engine speed continues to increase, the flow control valve is pushed back further. When the engine speed reaches a given speed, the return passage outside the metering orifice is connected to the inlet port, and the opening to the inlet port widens in proportion to the increase in engine speed. This makes part of the fluid regulated by the metering orifice return to the inlet port of the pump; there by discharged fluid from the pump is decreased slowly by this amount.

④ The orifice in the return passage regulates and maintains the flow of fluid discharged from the pump at a given level until the engine speed reaches the high speed range.



Pressure Relief

Pressure outside of the metering orifice is directed to the bottom of the flow control valve. When the pressure builds up, the relief valve in the flow control valve opens to relieve the pressure. As the flow control valve is pushed back by the pressure difference this time, the flow of fluid in the bypass passage increases, controlling the pressure outside the metering orifice. The above operations are repeated to provide constant discharge pressure from the pump.

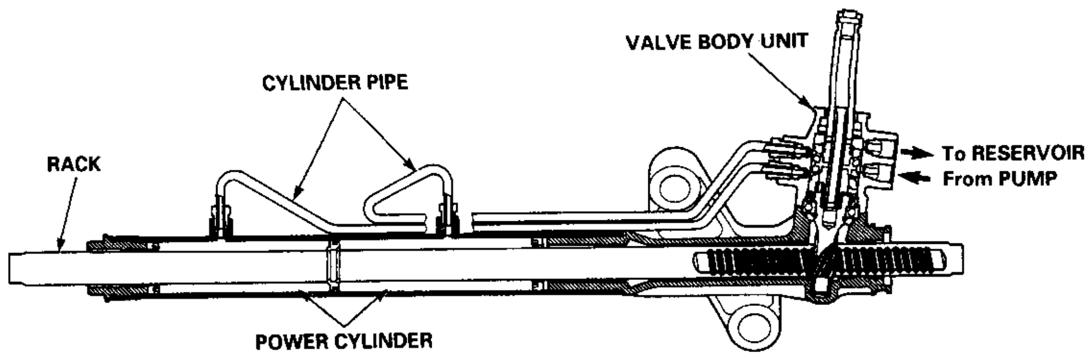


(cont'd)

System Description

Steering Gearbox

The rack-and-pinion type steering gearbox has a valve body unit incorporated with the pinion to control the steering fluid pressure. Steering fluid from the pump is regulated by a rotary valve in the valve body unit and is sent through the cylinder pipe to the power cylinder, where hydraulic pressure is applied. The steering fluid in the other side of the power cylinder returns through the cylinder pipe and valve body unit to the reservoir.



Valve Body Unit

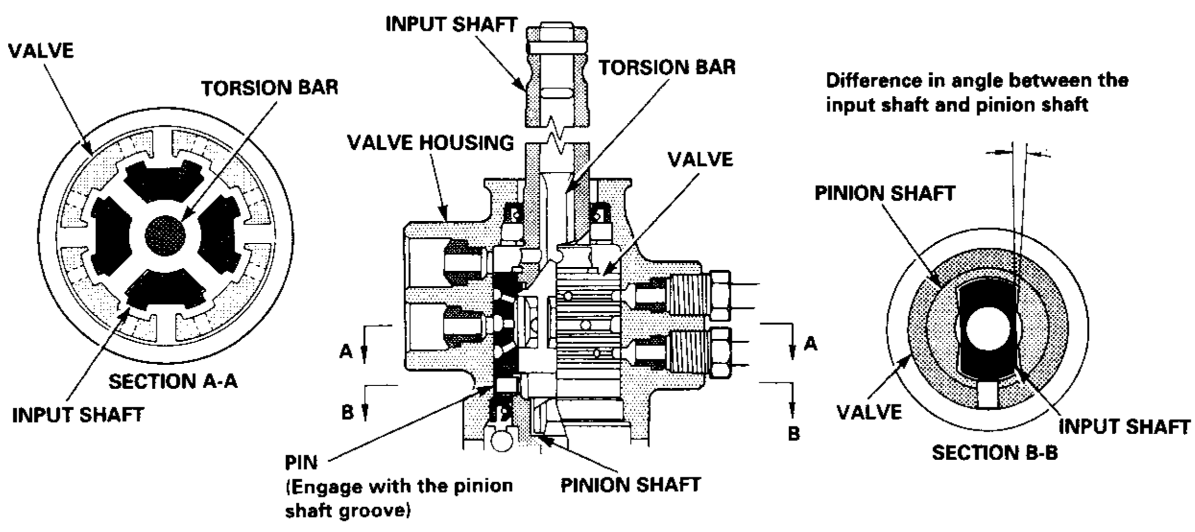
Inside the valve body unit is the valve, which is coaxial with the pinion shaft, and controls the steering fluid pressure. The valve housing is connected with the fluid pipe from the pump, return pipe to the reservoir, and the two cylinder pipes from the respective power cylinder.

The pinion shaft is double – structured with the input shaft connected to the pinion gear, both of which are interconnected with the torsion bar.

The pin inserted in the valve and the pinion shaft groove engage; this allows the pinion shaft to rotate together with the valve.

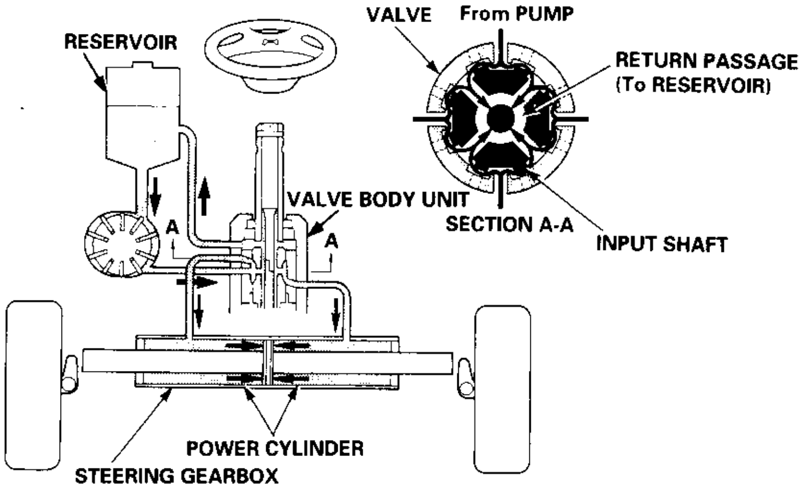
Because of this construction, the difference in angle in the circumferential direction between the input shaft and the valve becomes larger according to the torsional strength of the pinion or steering resistance. However, maximum torsion between the shafts is regulated by the engaged splines of the shafts at the pin engagement section to hold the torsion bar within the set value.

This allows the steering system to function as an ordinary rack-and-pinion type steering if the steering fluid is not pressurized because of a faulty pump.

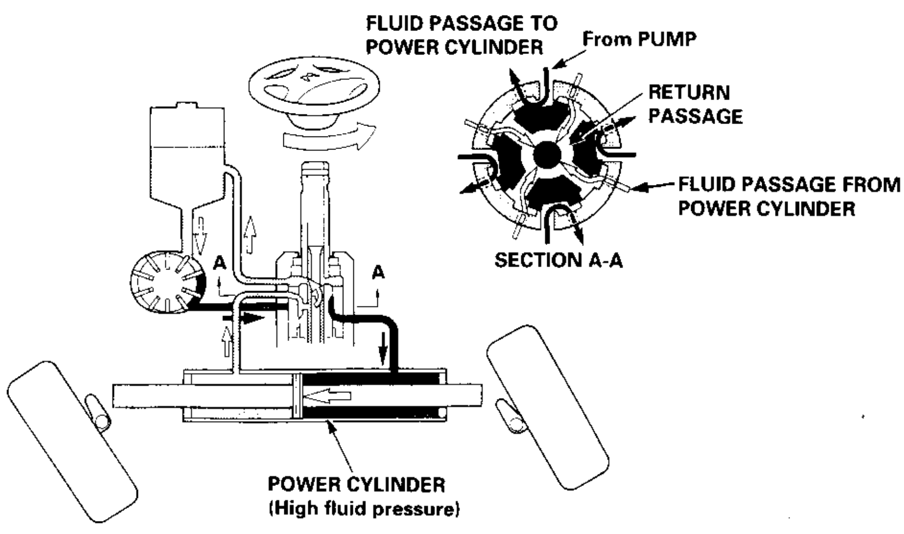


Pressure Control

Low assist at higher speeds:
When steering resistance is low, such as when driving at high speeds, or when driving straight ahead, the input shaft is near or in the neutral position, so there is little or no flow to any of the power cylinder orifices. Most of the feed pressure from the pump is bypassed to the reservoir. Because of this, the pressure stays the same in both sides of the power cylinder, resulting in low or no assist.



High assist at lower speeds:
When steering resistance is high, such as when driving at low speed, or when turning the wheel with the car stopped, the difference in angle created between the input shaft and the valve opens the fluid passage on one side, and closes the fluid passage on the other side, at each pair of orifices. The fluid pressure increases in the side of the power cylinder fed by the larger fluid passage. This increased pressure pushes on the rack piston, allowing the steering wheel to be turned with light effort. On the other side of the power cylinder, the return passage opens allowing the steering fluid to return through the input shaft to the reservoir. The fluid passages to the power cylinder automatically change in size, increasing as the steering resistance increases. In other words, the passages become larger and power assist increases when the steering effort would normally be high, (for example, when parking or making low speed turns), and the passages become smaller and power assist decreases when the steering effort would normally be low, (for example, when driving at high speeds or straight ahead).



Troubleshooting

General Troubleshooting

Check the following before you begin:

- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?

Hard Steering (Check the power assist, see page 17-18. If the force is over 34 N (3.5 kgf, 7.7 lbf), proceed with this troubleshooting.)

Check pump fluid pressure (see page 17-22).
Measure steady-state fluid pressure while idling with the both valve fully open.
It should be 1,500 kPa (15 kgf/cm², 213 psi) or below.

Abnormal fluid pressure (fluid pressure is too high) → Check the feed and return circuit lines and hose between the gearbox and pump for clogging and deformation.

Normal line and hose → Faulty valve body unit

Normal → Measure pump relief pressure while idling with the both valve fully closed.
It should be 6,400 – 7,400 kPa (65 – 75 kgf/cm², 924 – 1,067 psi)

Too low relief pressure → Check the flow control valve (see page 17-37).
- Check the valve for smooth movement in the housing.
- Check the relief valve for leaks.

Normal → Faulty pump assembly

Abnormal → Faulty flow control valve

Normal relief pressure → Go to page 17-11

From page 17-10

Check force required to turn the wheel (see page 17-18).
Start the engine and measure the force required to turn the wheel to the right and left. Difference of the force required to turn the wheel to the right and to the left should be 5 N (0.5 kgf, 1 lbf) or below.

- Abnormal → Check cylinder lines A and B for deformation (see page 17-23).
  - Deformed → Faulty cylinder lines
  - Not deformed → Check for bent rack shaft. / Check rack guide adjustment (too tight).
    - Not bent / Adjustment OK → Faulty valve body unit
- Normal ↓

Check pump fluid pressure (see page 17-22).
Turn the steering wheel fully to the right and left while idling with the pressure control valve fully open, and measure the fluid pressure. It should be 6,400 – 7,400 kPa (65 – 75 kgf/cm², 924 – 1,067 psi).

- Abnormal → Faulty gearbox
- Normal ↓

Check the gearbox.
Remove the gearbox and measure the pinion torque.
The torque should be;
- 0.7 – 1.2 N·m (7 – 12 kgf·cm, 6 – 10 lbf·in) with the steering rack in the straight driving position.

- Normal → Check the parts other than the gearbox-related parts for proper rotation.
  - Improper rotation of the steering column-related part(s)
  - Faulty steering joint
  - Faulty rack end/tie-rod end ball joints
  - Interference in the steering system
- Abnormal ↓

Adjust the rack guide (see page 17-21), and recheck the pinion torque.

- Normal → Improperly adjusted rack guide
- Abnormal ↓

Faulty gearbox

(cont'd)

General Troubleshooting (cont'd)

Assist (excessively light steering) at high speed.

- Check the rack guide proper adjustment (see page 17-21).
  - If the problem is not corrected by adjusting the rack guide, adjust the front wheel alignment (see section 18).

Shock or vibration when wheel is turned to full lock.

- Check the rack guide for proper adjustment (see page 17-21).
  - Rack guide was backed off excessively.
    - Adjust the rack guide.
      - If the problem is not corrected by adjusting the rack guide, replace the gearbox.
  - Rack guide is adjusted properly.
    - Check the belt for slippage and adjust as necessary (see page 17-20).

Steering wheel will not return smoothly.

- Check cylinder lines A and B for deformation.
  - A or B cylinder line is deformed; replace it.
  - A and B cylinder lines are normal, check wheel alignment (see section 18).
    - Wheel alignment is abnormal, adjust as needed.
    - Wheel alignment is normal. Remove the gearbox from the frame and measure the pinion torque on the gearbox.
      - It should be 0.7 – 1.2 N·m (7 – 12 kgf·cm, 6 – 10 lbf·in) or below with the steering rack in the straight ahead driving position.
        - If the measurements are out of specifications, adjust the rack guide.
          - If the problem is not corrected by adjusting the rack guide, replace the gearbox.

Symptom	Probable Cause	Remedy
Uneven or rough steering.	Improperly adjusted rack guide.	Adjust rack guide (see page 17-21).
		If the problem is not corrected by adjusting the rack guide, replace the gearbox.
	Belt slipping on pulley.	Adjust belt tension. Replace the belt, if necessary (see page 17-20).
	Idle speed low or erratic.	If the engine stalls when the wheel is turned while the vehicle is stopped or moving at low speed, adjust idle speed (see section 11).
	Air in reservoir, or check power steering fluid level.	Check power steering fluid level. If the level is excessively low, check for leaks in the system. Add fluid to the specified level.
		If fluid level is OK, check O-rings and seals on both ends of the pump suction hose, and the P/S pump housing mating surfaces and the pump shaft oil seal for suction leaks. Replace parts as necessary.
Steering wheel kicks back during wide turns.	Pump belt slipping on pulley (pump stops momentarily).	Adjust belt tension (see page 17-20) or replace belt.
	Install the power steering pressure gauge. Close the pressure control valve fully and measure the pump pressure (see page 17-22).	Check if pump pressure is normal and the gauge needle travel is 500 kPa (5 kgf/cm², 71 psi) or less. Check the flow control valve if the needle travel exceeds 500 kPa (5 kgf/cm², 71 psi). If the flow control valve is normal, replace the pump as an assembly.

Troubleshooting

Noise and Vibration

NOTE: Pump noise in first 2 – 3 minutes after starting in cold weather is normal.

Symptom	Cause / Check	Remedy
Humming	Humming due to pulsation of fluid is normal, particularly when the wheel is turned with the vehicle stopped.	
	Outlet hose (High-pressure hose) touching the frame.	Reposition the outlet hose.
Squeaking	Pinion shaft grommet not lubricated.	Grease it.
	Right cylinder end seal squeak.	Grease it.
Rattle or chattering	Loose steering shaft connector, tie-rod, or ball joint.	Check and tighten, or replace parts as necessary.
	Column shaft wobbling.	Replace the column assembly.
	Check the rack guide for proper adjustment (see page 17-21).	Adjust, if necessary.
	Rattling sound and feeling when turning the steering wheel right and left with the engine OFF is normal.	
Hissing	Pump noise, though not loud, from the valve body unit can be heard when turning the steering wheel to full lock in either direction. This is normal. Do not hold the steering wheel at full lock for more that five seconds when inspecting.	

Symptom	Noise	Probable cause	Check / Action
Pump noise	Grating noise from pump	Cavitation caused by air bubbles in the fluid.	Check the fluid level. If low, fill the reservoir to the proper level, and check for leaks. Tighten or replace as necessary.
			Check for a crushed inlet hose or a loose hose clamp allowing air into the suction side of the system. Tighten or replace as necessary.
			Check the pump shaft oil seal.
			Check the reservoir for cracks.
	Pump noise	NOTE: Pump noise up to 2 – 3 minutes after starting in cold weather is normal. Compare pump noise at operating temperature to another similar vehicle.	If pump noise is abnormally loud, remove and inspect the pump for wear and damage (see page 17-36).
	Squeaking	Belt slipping.	Tighten or replace the belt.
	Rattle or chattering	Loose pump pulley.	Tighten or replace the pulley. If shaft is loose, replace the pump.

Troubleshooting

Fluid Leaks

- Check the gearbox assembly for oil leaks carefully. Oil can leak out of various points, depending on location of the faulty oil seals/seal rings. Check the following before removing the gearbox from the frame.

Steering Gearbox	Leaking from the oil seal on the top of the valve housing.	Replace the valve oil seal from the valve housing.
	Leaking from cylinder end into left tie-rod boot.	Replace the valve oil seal from the pinion shaft.
		Replace the cylinder end seal on the gear housing side.
	Leaking from cylinder end into right tie-rod boot.	Replace the cylinder end seal on the cylinder end side.
	Leaking from the shaft upper end section or pin engagement section of the pinion shaft	Replace the valve body unit.
Lines	Leaking from cylinder line A or B connection (at flare nut).	Tighten connector. If its still leaking, replace the line, cylinder or valve housing.
	Leaking caused by a damaged cylinder line A or B.	Replace cylinder line A or B.
	Leaking from outlet line and return line joint fitting on the valve body unit (at flare nut).	Tighten the connector. If its still leaking, replace the hose, joint fitting or valve housing.

Location	Symptom	Remedy
Pump	Front seal leaking.	Replace front seal.
	Pump housing leaks at either end.	Replace housing O-rings. If the housing still leaks, replace the pump.
Reservoir	Leaking from around cap.	Reservoir overfilled. Pull off the hose and drain the reservoir to the proper level.
		Air leak in suction side of the system (reservoir, suction hose, front pump seal).
Pump outlet line (high-pressure)	Leaking at the threaded fitting.	Tighten the fitting. If its still leaking, replace the O-ring or outlet hose.
	Leaking at the swaged joint.	Replace the outlet hose.
Pump suction line (low-pressure)	Leaking because of damage, deterioration, or improper assembly.	Replace or repair as necessary.

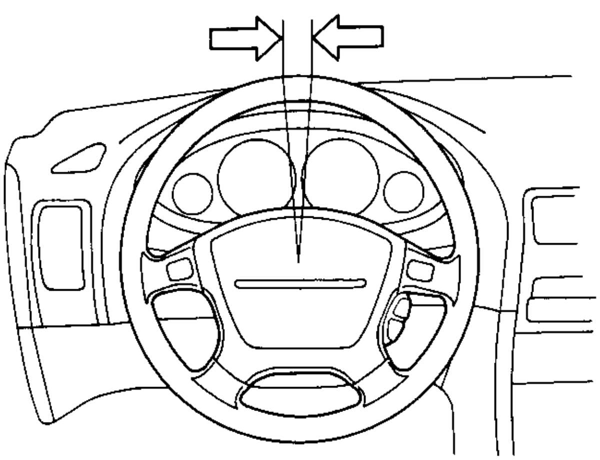
Inspection and Adjustment

Steering Operation

Place the front wheels in the straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.

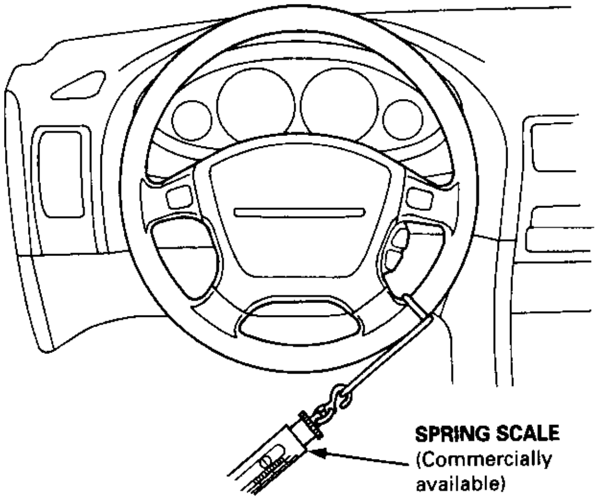
ROTATIONAL PLAY: 0 – 10 mm (0 – 0.39 in)

If the play exceeds the service limit, perform rack guide adjustment (see page 17-21).
If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox as described on the next page.



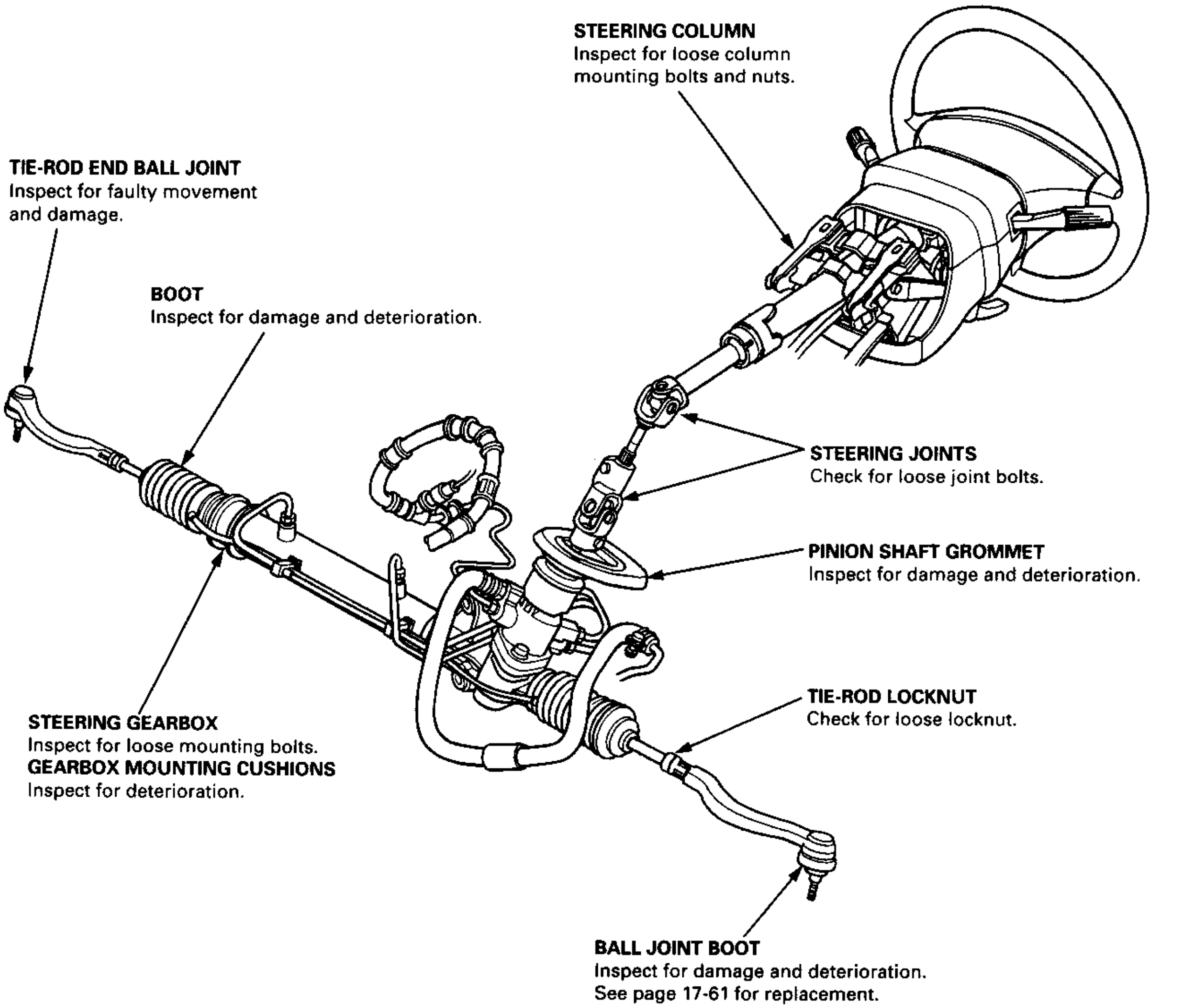
Power Assist Check with Vehicle Parked

1. Check the power steering fluid level (see page 17-21) and pump belt tension (see page 17-20).
2. Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



4. The scale should read no more than 34 N (3.5 kgf, 7.7 lbf). If it reads more, check the gearbox and pump.

Steering Linkage and Gearbox



Inspection and Adjustment

Pump Belt

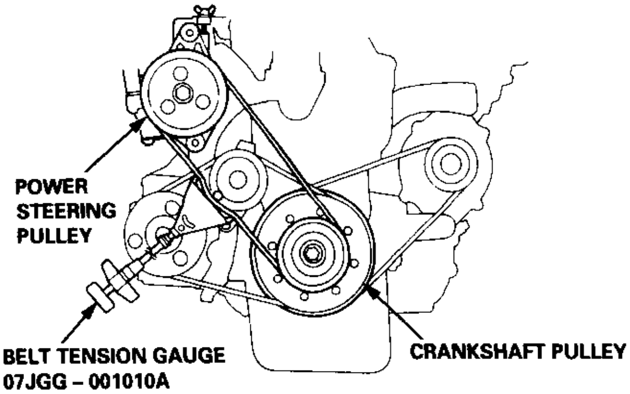
NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Inspection

Attach the special tool to the belt and measure the tension of the belt.

Tension:
Used Belt: 390 – 540 N (40 – 55 kgf, 88 – 120 lbf)
New Belt: 740 – 880 N (75 – 90 kgf, 170 – 200 lbf)

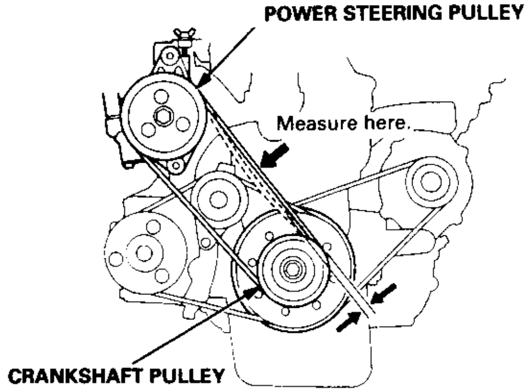
NOTE:
- If there are cracks or any damage evident on the belt, replace it with a new one.
- Follow the manufacturer's instructions for the tension gauge.



Inspect the pump belt for cracks or any damage.
Replace the belt with a new one if necessary.

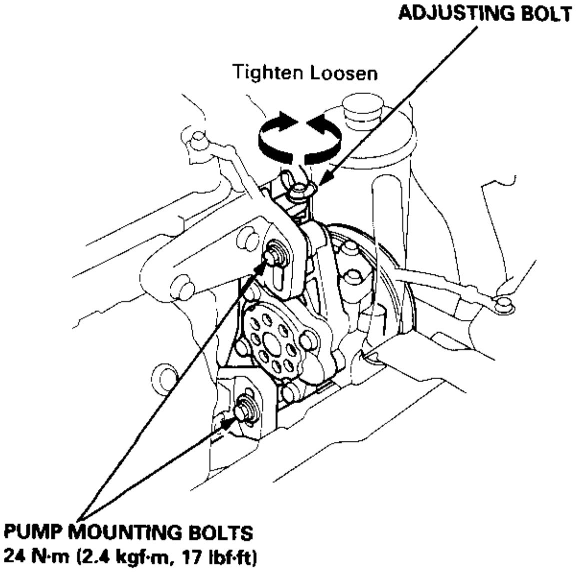
Measurement without Belt Tension Gauge:
Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump and the crankshaft pulleys.

Deflection:
Used Belt: 11.5 – 13.5 mm (0.45 – 0.53 in)
New Belt: 8.0 – 10.0 mm (0.31 – 0.39 in)



Adjustment

1. Loosen the power steering pump mounting bolts.
2. Turn the adjusting bolt to get the proper belt tension, then retighten the bolts.
3. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.



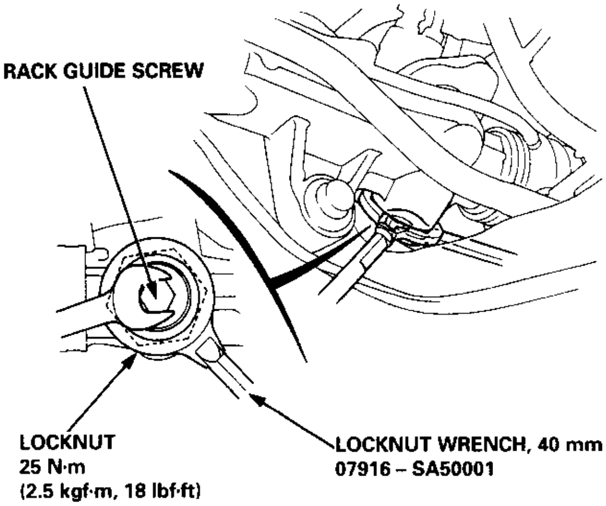
Rack Guide Adjustment

NOTE: Perform rack guide adjustment with the wheels in the straight ahead position.

1. Loosen the rack guide screw locknut with the special tool, then loosen the rack guide screw.
2. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.
3. Retighten the rack guide screw to 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft), then back it off to specified angle.

   Specified Return Angle: 20° Max

4. Tighten the locknut while holding the rack guide screw.



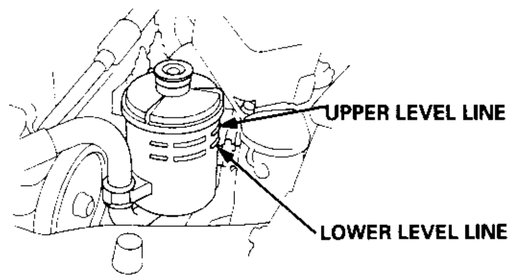
5. Check for tight or loose steering through the complete turning travel.
6. Perform following inspections:
   - Steering operation (see page 17-18).
   - Power assist with car parked.

Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

CAUTION: Use only Genuine Honda Power Steering Fluid-V. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

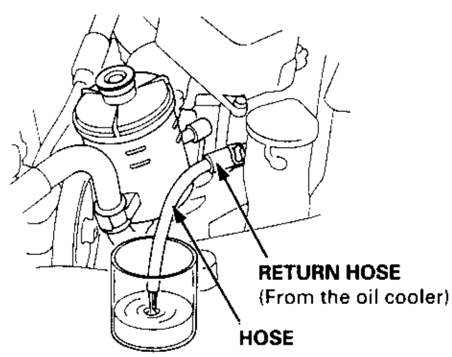
SYSTEM CAPACITY:
B18C1 engine:
1.06 liter (1.12 US. qt, 0.93 Imp.qt)
Except B18C1 engine:
1.0 liter (1.06 US. qt, 0.88 imp.qt)
at disassembly
RESERVOIR CAPACITY:
0.4 liter (0.42 US. qt, 0.35 Imp.qt)



1. Raise the reservoir and disconnect the return hose that goes to the oil cooler.
2. Connect a hose of suitable diameter to the disconnected return hose and put the hose end in a suitable container.

   CAUTION: Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.



4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line.
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add some if necessary.

   CAUTION: Do not fill the reservoir beyond the upper level line.

Inspection and Adjustment

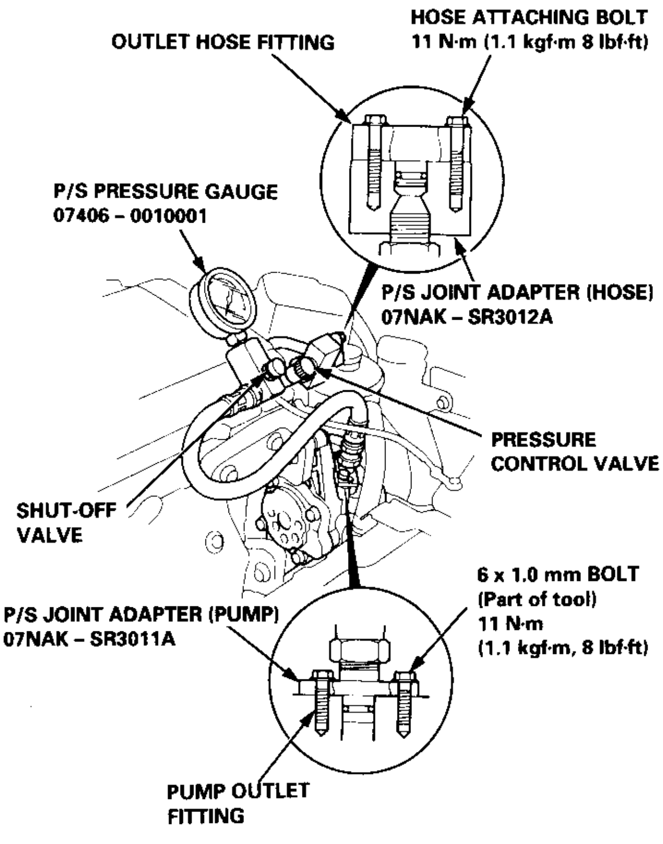
Pump Pressure Check

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

NOTE: First check the power steering fluid level and pump belt tension.

CAUTION: Disconnect the pump outlet hose (high-pressure line) with care so as not to spill the power steering fluid on the frame and other parts.

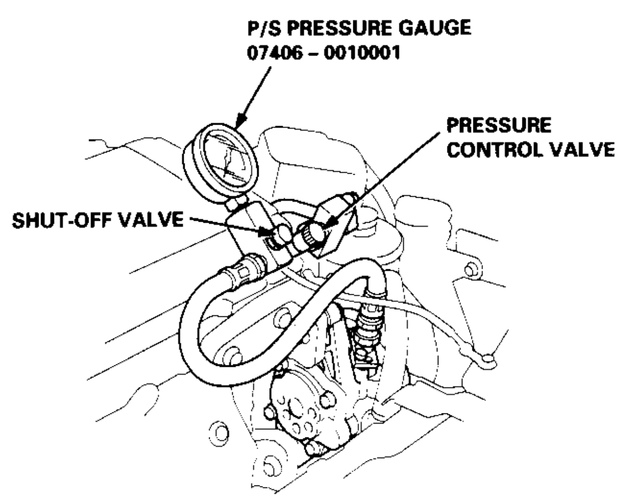
1. Disconnect the pump outlet hose (high-pressure) from the pump outlet fitting, then install the P/S joint adapter (pump) on the pump outlet.



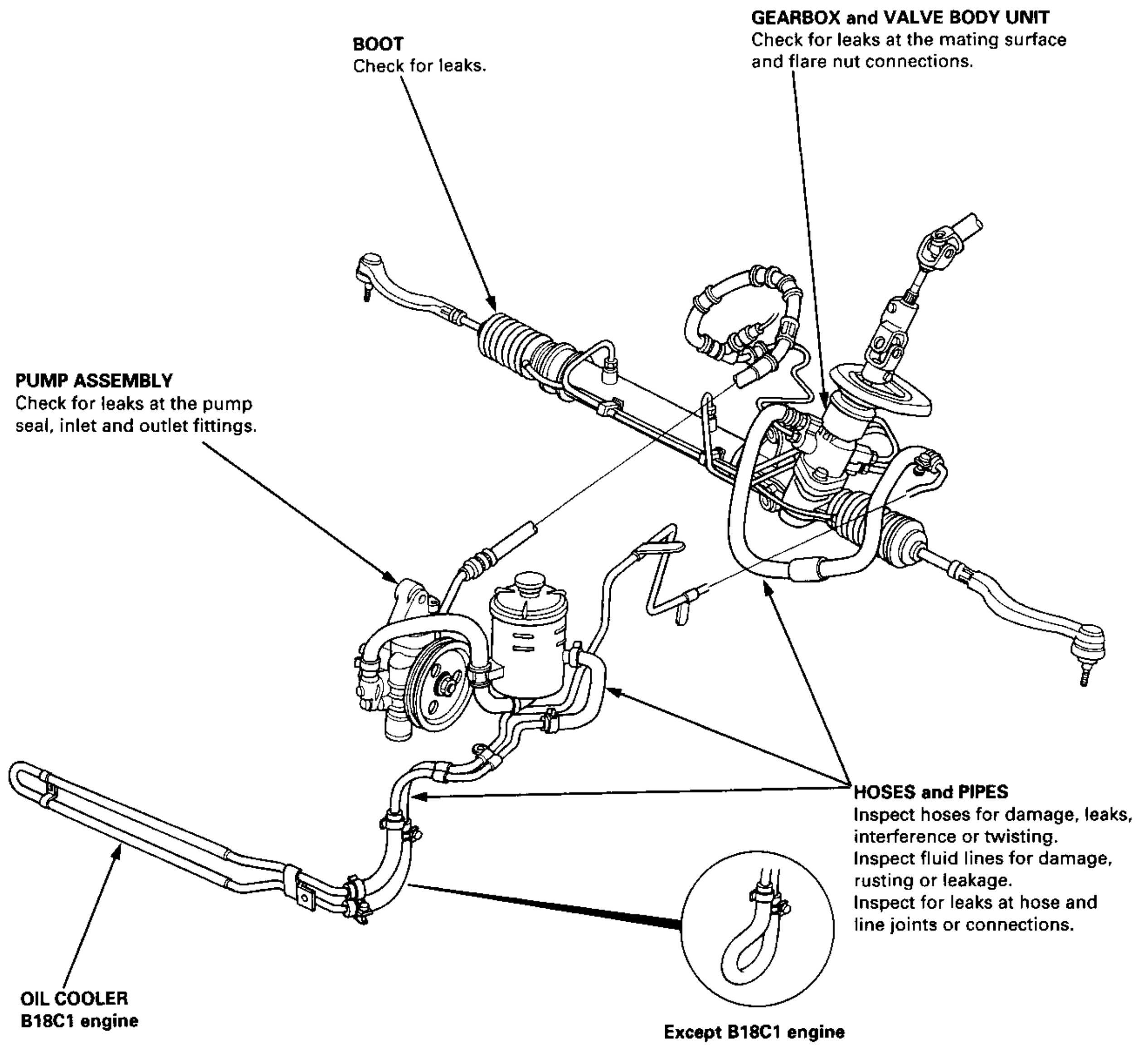
2. Connect the P/S joint adapter (hose) to the power steering pressure gauge, then connect the pump outlet hose (high-pressure) to the adapter.
3. Install the power steering pressure gauge to the P/S joint adapter (pump).
4. Open the shut-off valve fully.
5. Open the pressure control valve fully.
6. Start the engine and let it idle.
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
8. Measure steady-state fluid pressure while idling. If the pump is in good condition, the gauge should read less than 1500 kPa (15 kgf/cm², 213 psi).
   If it reads high, check the outlet hose or valve body unit (see General Troubleshooting 17-10).
9. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.
10. Immediately open the pressure control valve fully.

    CAUTION: Do not keep the pressure control valve closed more then 5 seconds or the pump could be damaged by over-heating.

    If the pump is in good condition, the gauge should read at least 6,400 – 7,400 kPa (65 – 75 kgf/cm², 924 – 1,067 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.



Fluid Leakage Inspection



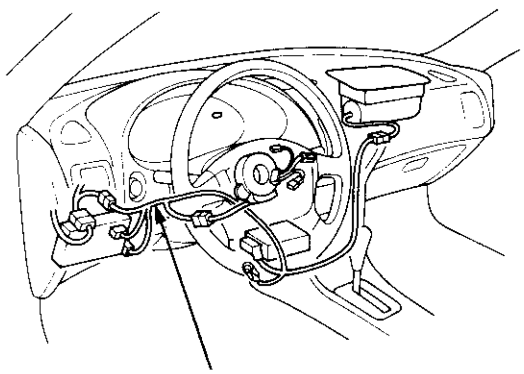
Steering Wheel

Removal

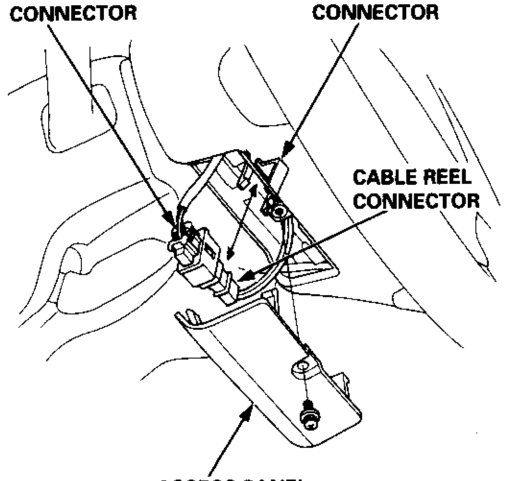
Airbag Removal

CAUTION:

- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**

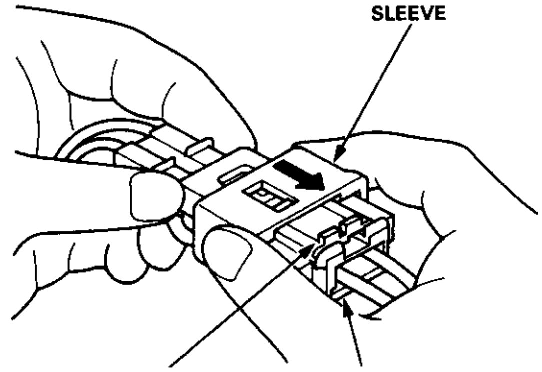


1. Disconnect the battery negative cable, then disconnect positive cable.
2. Remove the access panel from the steering wheel lower cover.

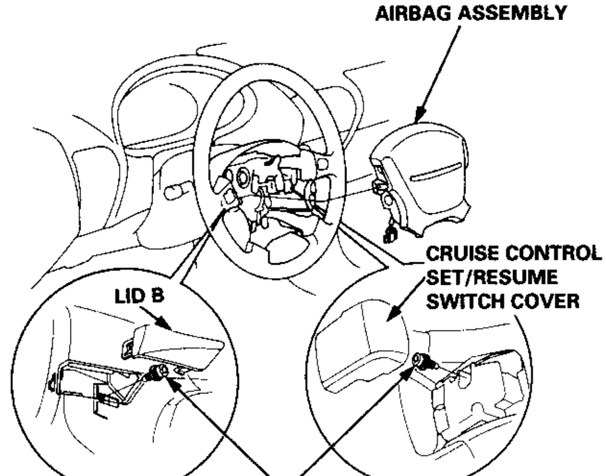


3. Disconnect the connector between the airbag and cable reel.

NOTE: Some SRS system connectors have a spring loaded lock.
To release the lock, pull the spring-loaded sleeve toward the stop. Then pull the connector halves apart.
Be sure to pullon the sleeve and not on the connector half itself.

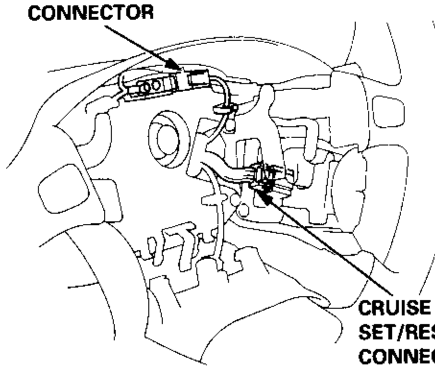


5. Remove the lid B and cruise control set/resume switch cover.
6. Remove the TORX bolts then, remove the airbag assembly.



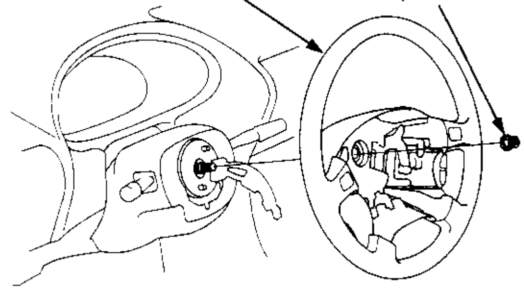
Removal

7. Disconnect the connectors from the horn and cruise control set/resume switches.



8. Remove the steering wheel nut.

9. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.

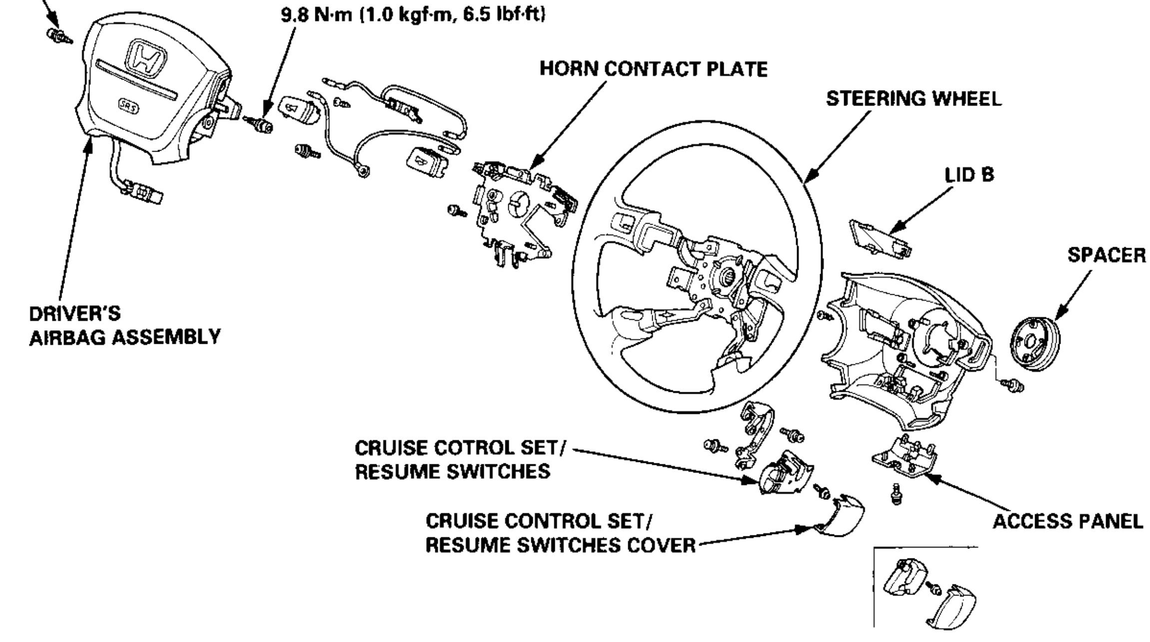


Disassembly/Reassembly

WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

NOTE: If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).

CAUTION:
- **Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Do not disassemble or tamper with the airbag assembly.**



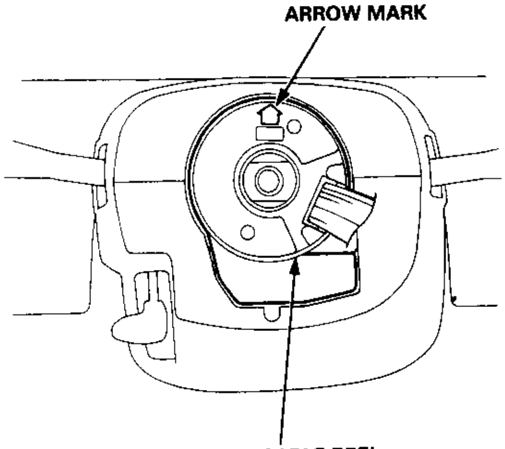
Installation

Airbag installation

CAUTION:
- **Before installing the steering wheel, align the front wheels straight ahead.**
- **Be sure to install the harness wires so that they are not pinched or interfering with other car parts.**
- **Do not replace the original steering wheel with any other design, since it will make it impossible to properly install the airbag. (Only use genuine HONDA replacement parts)**
- **After reassembly, confirm that the wheels are still straight ahead and that steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjustment of the tie-rods, not by removing and repositioning the steering wheel.**

⚠WARNING Confirm that the airbag assembly is securely attached to the steering wheel; otherwise, severe personal injury could result during airbag deployment.

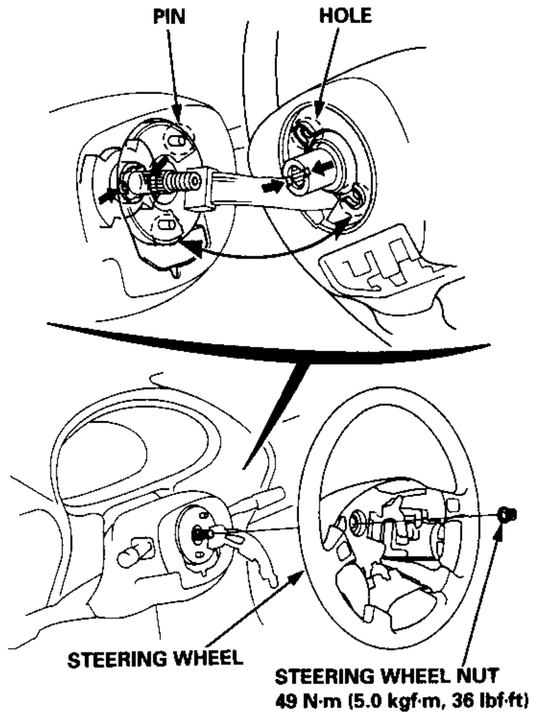
1. Before installing the steering wheel, center the cable reel. Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (approximately two turns) until. The arrow make on the cable reel label points straight up.



2. Install the steering wheel.

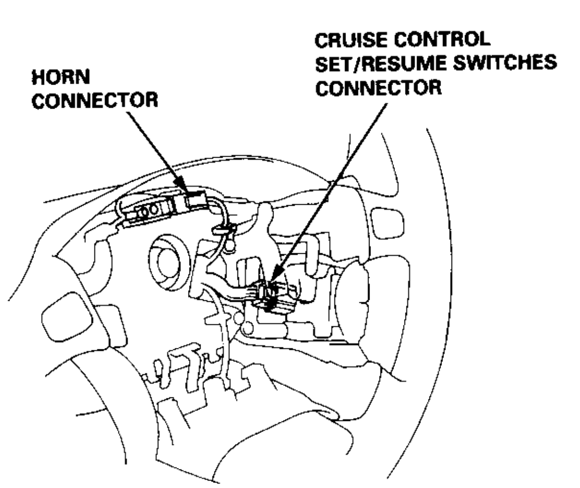
   NOTE: Be sure the steering wheel shaft engages the cable reel and canceling sleeve.

   CAUTION: Do not tap on the steering wheel or steering column shaft when installing the steering wheel.

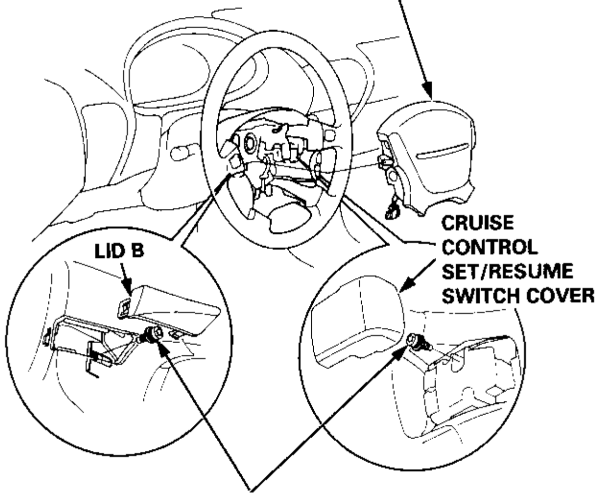


3. Attach the cruise control set/resume switches connector to the steering wheel clip.

4. Connect the horn connector.

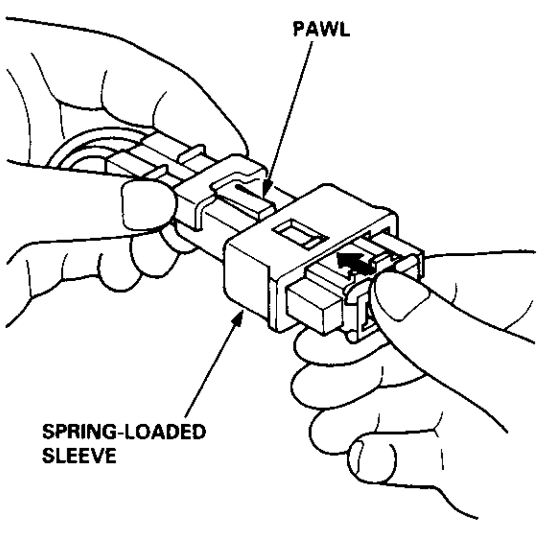


5. Install the airbag assembly with new Torx bolts, and install the covers.

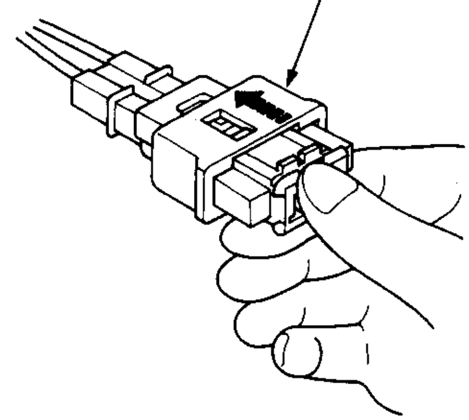


6. Hold the pawl side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve is pushed back by the pawl.

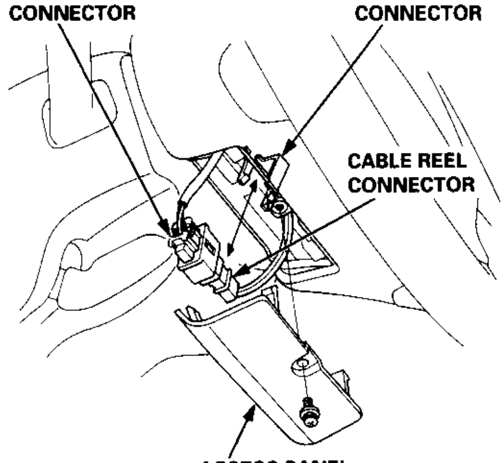
NOTE: Do not touch the sleeve.



7. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.



8. Attach the connector in the holder, then install the access panel on the steering wheel lower cover.



9. Connect the positive cable first, then the negative cable to the battery.

10. After installing the airbag assembly, confirm proper system operation:

- Turn the ignition switch ON (II); the instrument panel SRS indicator light should come on for about six seconds and then go off.
- Confirm operation of horn buttons.
- Confirm operation of cruise control set/resume switches.

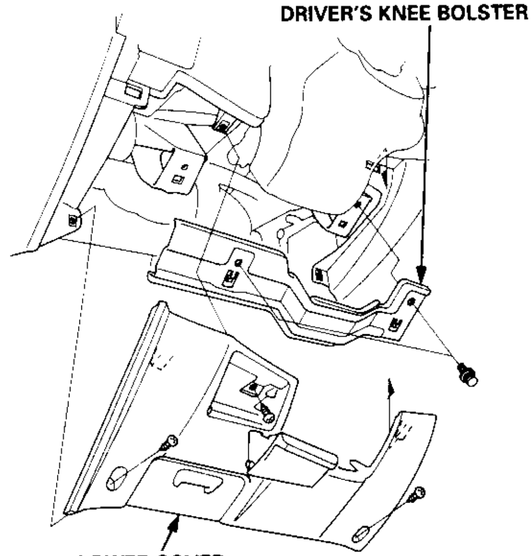
Steering Column

Removal

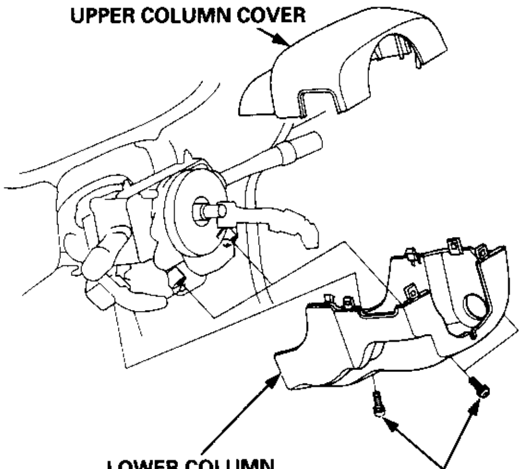
CAUTION:

- All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- For additional precautions, refer to the SRS sub-section in section 23.

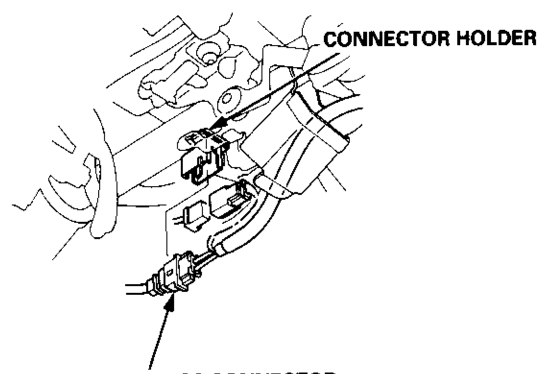
1. Remove the airbag assembly and steering wheel (see page 17-25).
2. Remove the lower cover.
3. Remove the driver's knee bolster.



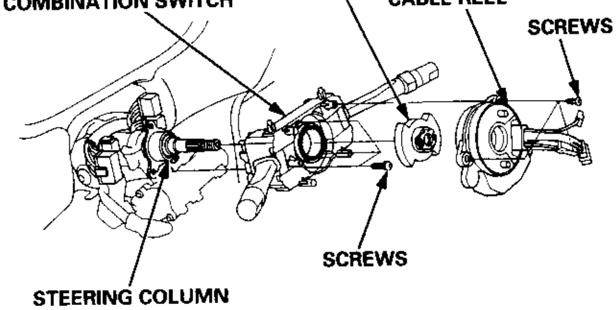
4. Remove the column covers by removing the screws.



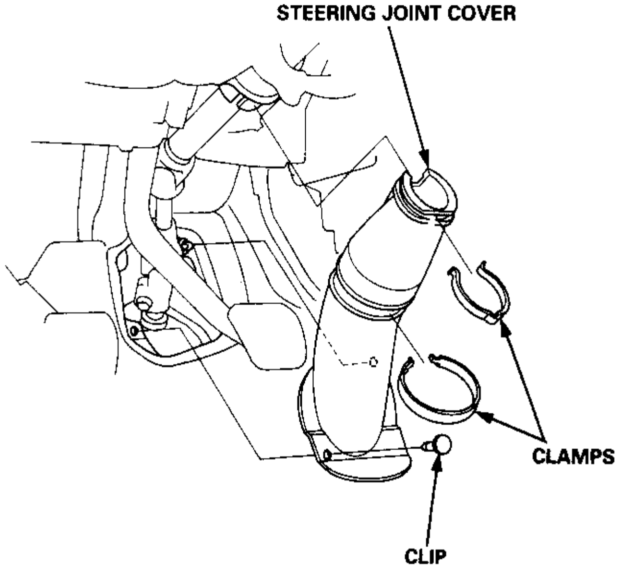
5. Remove the SRS wire harness connector from the connector holder.
6. Disconnect the cable reel connector and SRS main wire harness connector (see page 17-24).



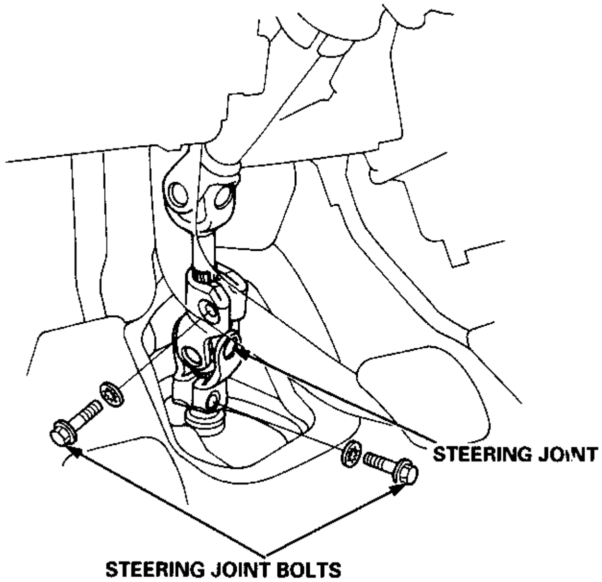
7. Disconnect the cruse control switch connector from the cable reel, and remove the cable reel from the combination switch.
8. Remove the turn signal canceling sleeve.
9. Remove the combination switch from the steering column by disconnecting the connectors.



10. Remove the steering joint cover.

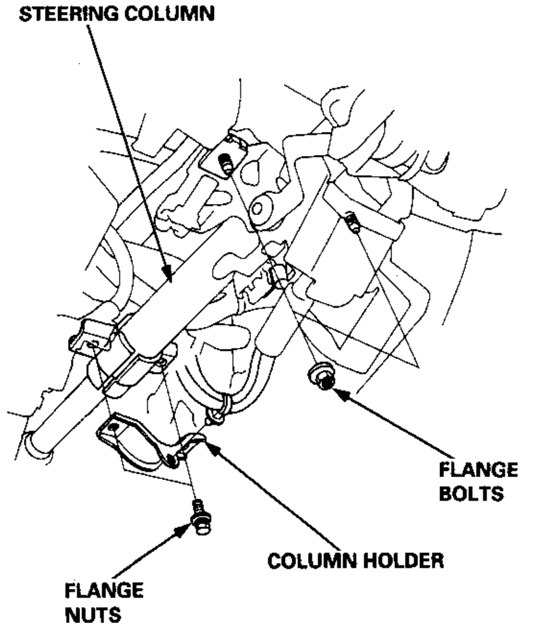


11. Remove the steering joint bolts, and move the joint toward the column.



12. Disconnect the ignition switch connectors from the under-dash fuse/relay box.

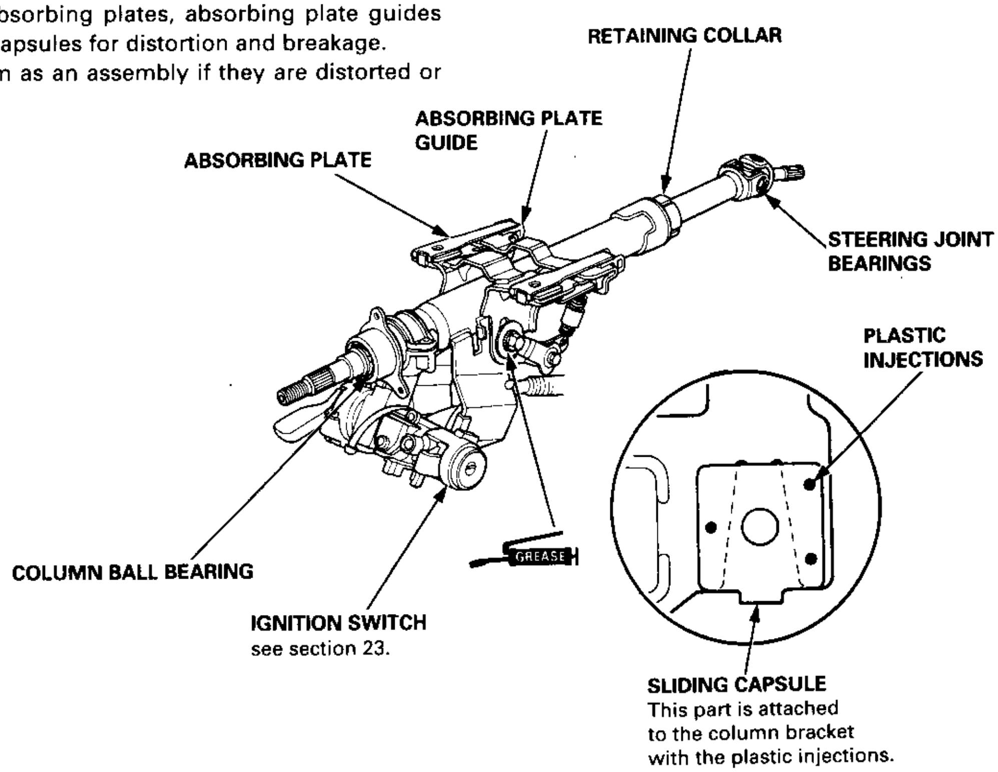
13. Remove the steering column by removing the attaching nuts and bolts.



Steering Column

Inspection

- Check the steering column ball bearing and the steering joint bearings for play and proper movement. If there is noise or if there is excessive play, replace the joint or column assembly.
- Check the retaining collar for damage. If it is damaged, replace the retaining collar.
- Check the absorbing plates, absorbing plate guides and sliding capsules for distortion and breakage. Replace them as an assembly if they are distorted or broken.



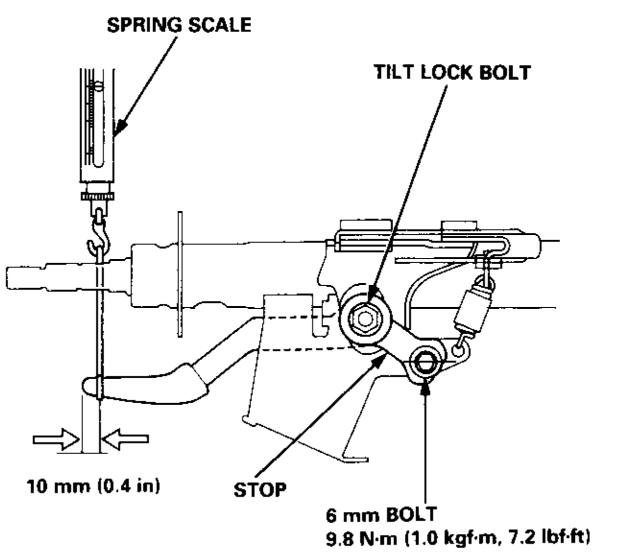
1. Move the tilt lever from the loose position to lock position 3 to 5 times; then measure the tilt lever preload 10 mm (0.4 in) from the end of the tilt lever.

   Preload: 70 – 90 N (7 – 9 kgf, 15 – 20 lbf)

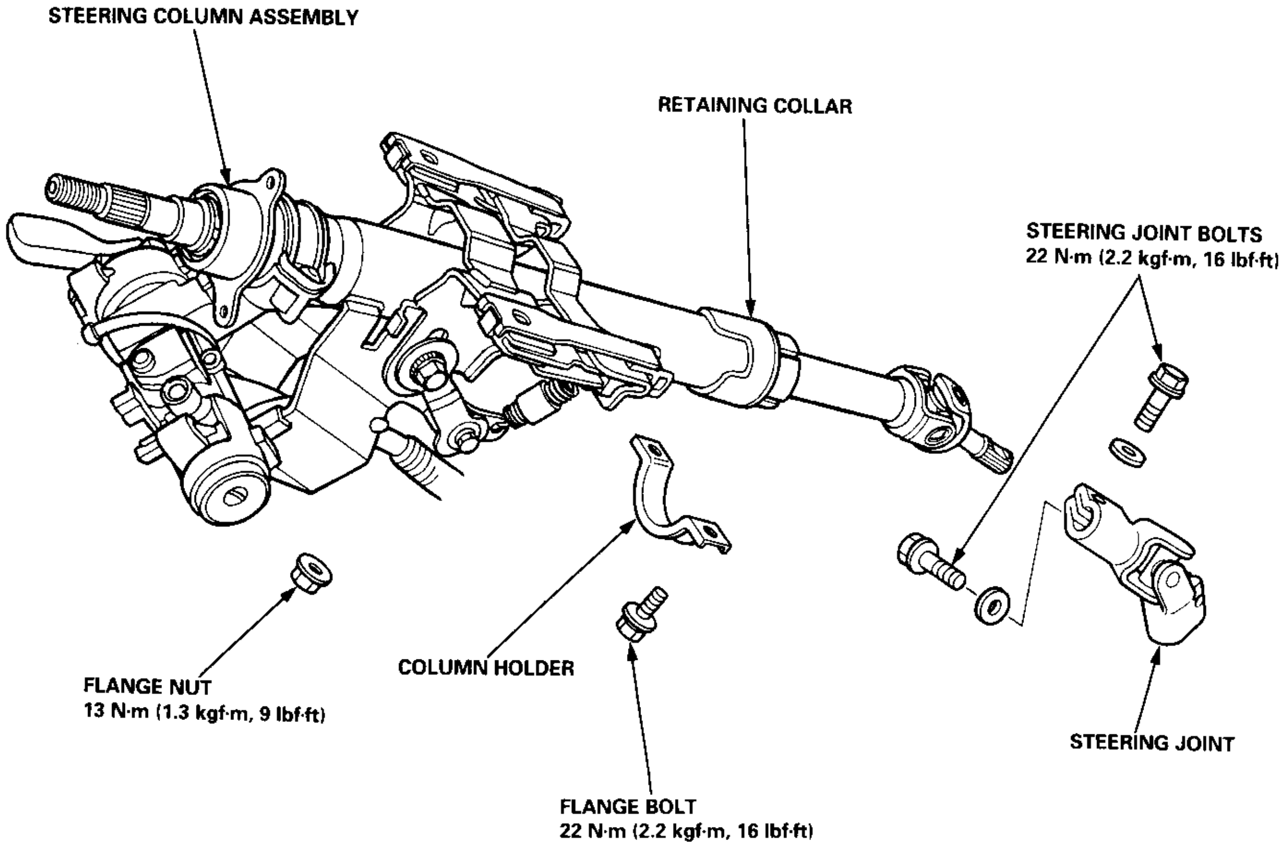
2. If the measurement is out of the specification, adjust the preload using the following procedures.

   a. Loosen the tilt lever, and set the steering column in the neutral position.
   b. Remove the 6 mm lock bolt and remove the stop.
   c. Adjust the preload by turning the tilt lock bolt left or right.
   d. Pull up the tilt lever to the uppermost position and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures (a) through (c) to adjust.

CAUTION: Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.



Installation

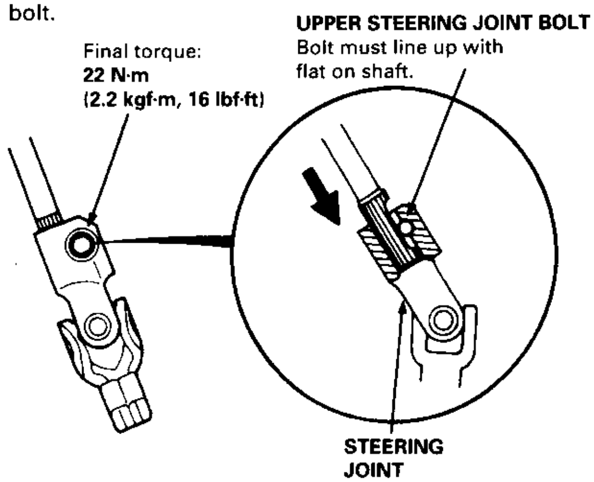


(cont'd)

Installation (cont'd)

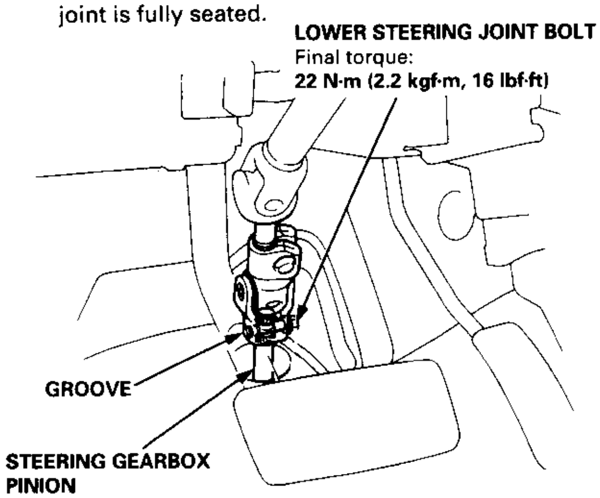
CAUTION:
- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**

1. Slip the upper end of the steering joint onto the column shaft (line up the bolt hole with the flat on the shaft), and loosely install the upper steering joint bolt.

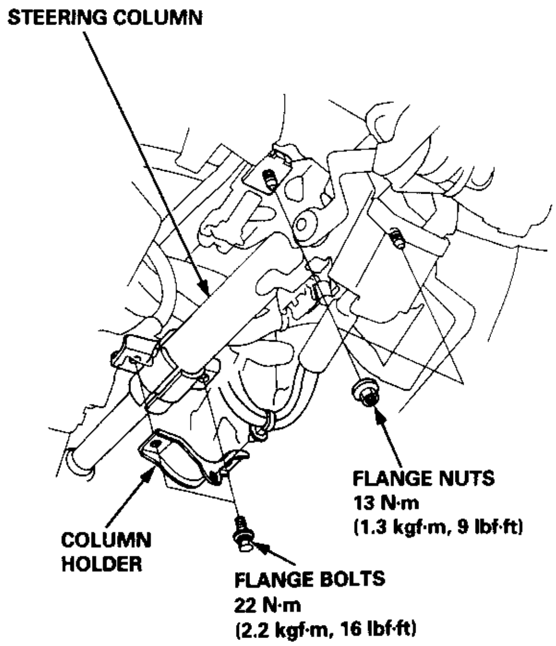


2. Slip the lower end of the steering joint onto the pinion shaft. Line up the bolt hole with the groove around the shaft) and loosely install the lower bolt.

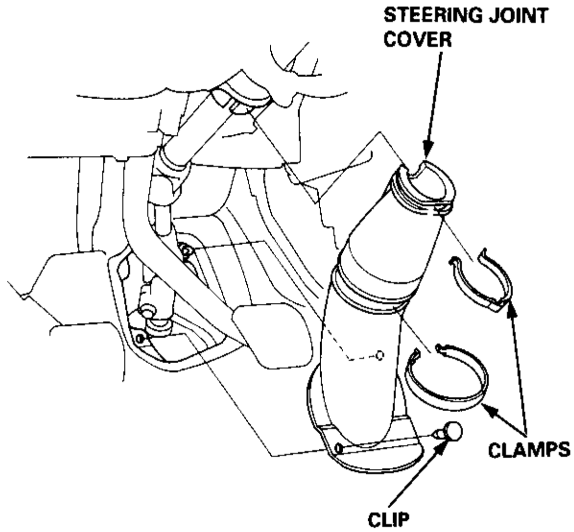
NOTE:
- Be sure that the lower steering joint bolt, is securely in the groove in the steering gearbox pinion.
- Before tightening the steering joint bolts, pull on the steering joint to make sure that the steering joint is fully seated.



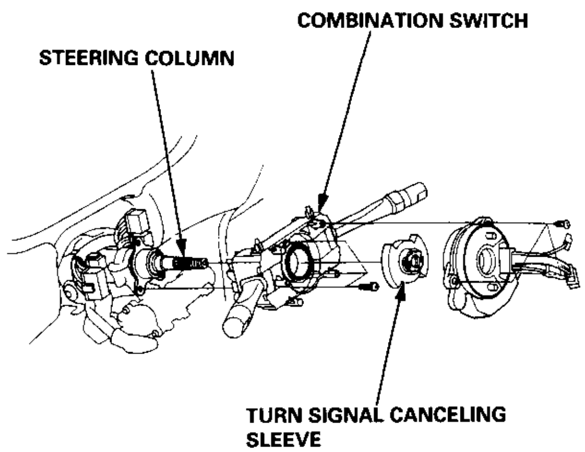
3. Install the steering column with the flange nuts, then install the column holder and flange bolts.
4. Tighten the upper and lower steering joint bolts loosely installed in steps 1 and 2.



5. Install the steering joint cover with the clamps and clip.

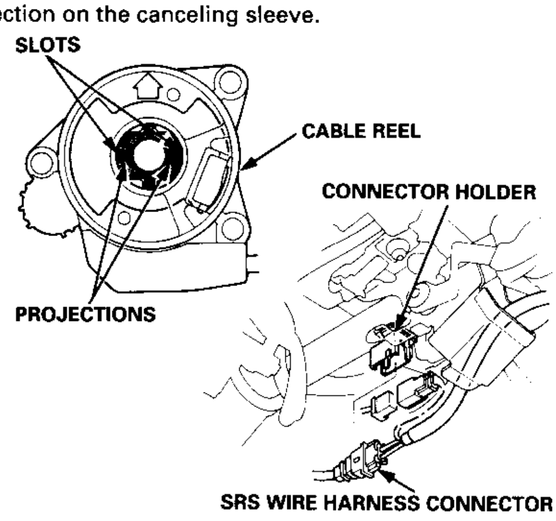


6. Connect the ignition switch wire connectors to the under-dash fuse/relay box.
7. Install the combination switch and connect the connectors. Be sure the wires are not caught or pinched by any parts when installing the combination switch.
8. Carefully install the wire harness with the harness bands and clamps.
9. Install the spring and turn signal canceling sleeve onto the combination switch.

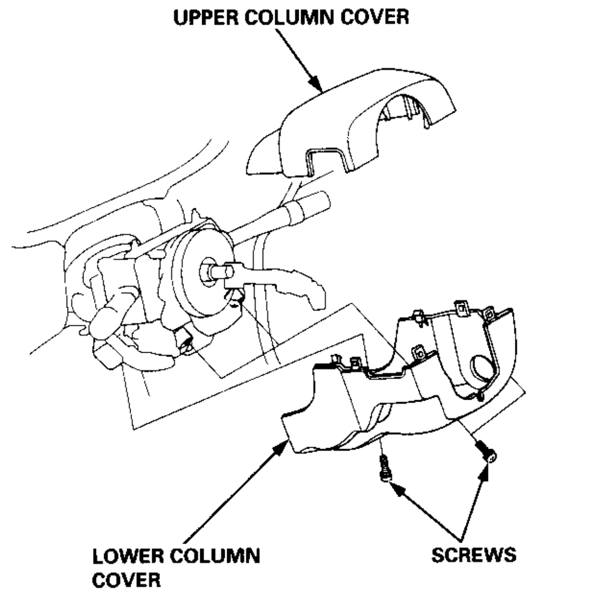


10. Install the cable reel, and connect the cruise control switch connector.
11. Connect the cable reel connector and SRS main wire harness connector (see page 17-27).

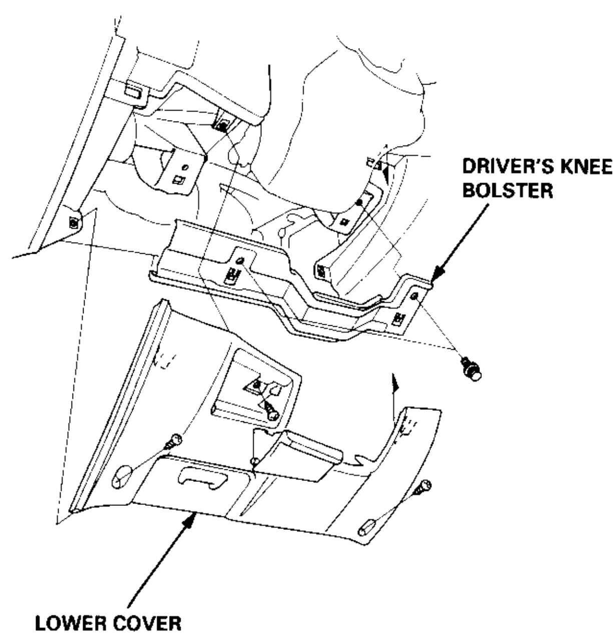
    NOTE: Align the slot in the cable reel with the projection on the canceling sleeve.



12. Install the column covers.



13. Install the driver's knee bolster.
14. Install the lower cover.
15. Install the steering wheel (see page 17-26).



Power Steering Hoses, Lines

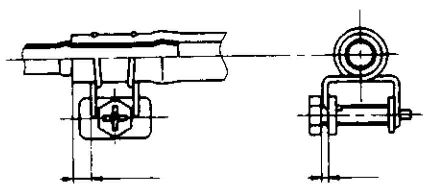
Replacement

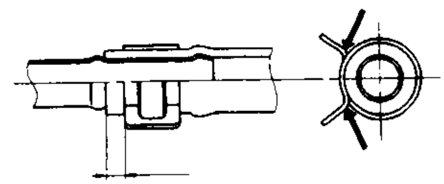
NOTE:
- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.

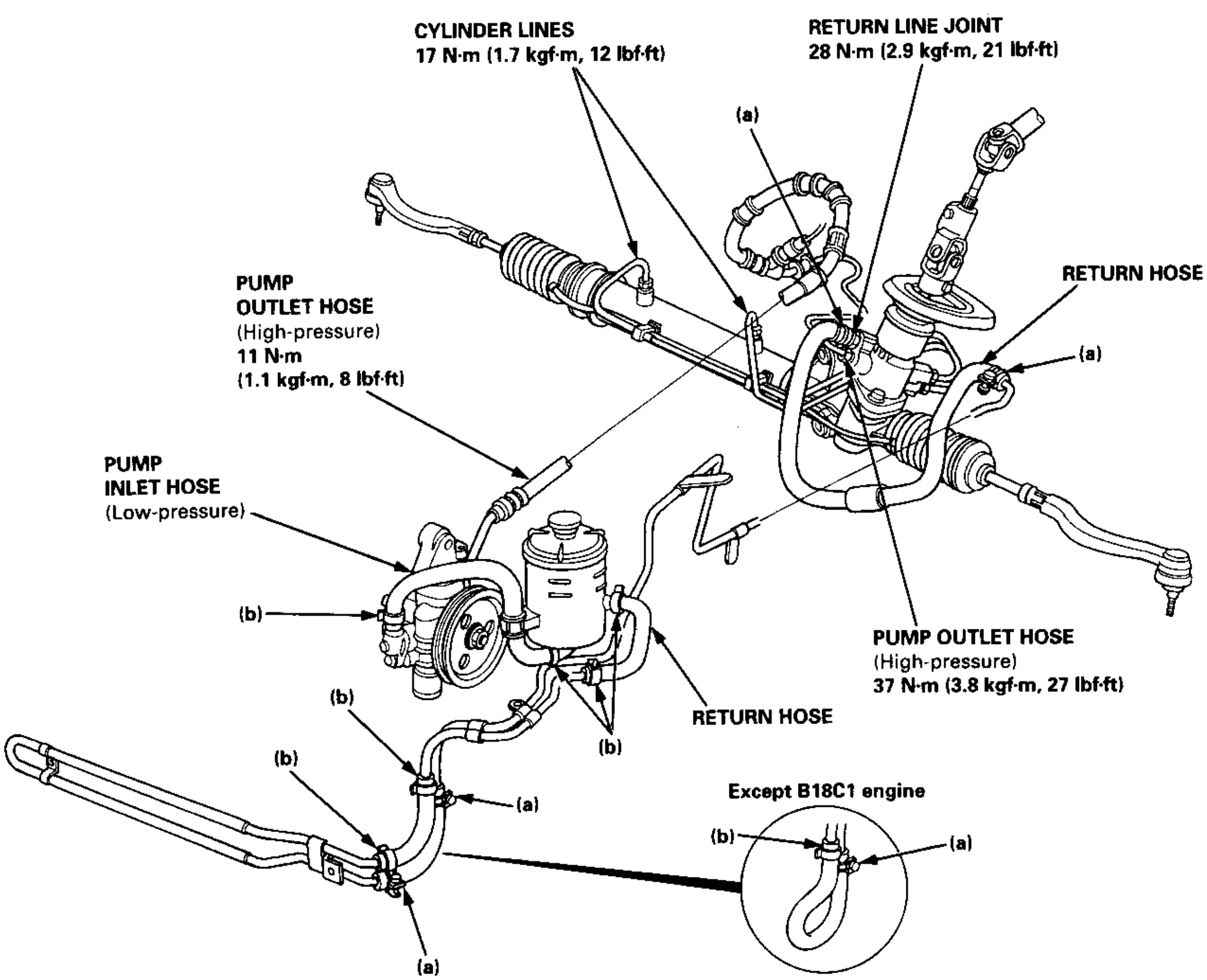
CAUTION: Check all clamps for deterioration or deformation; replace the clamps with new ones if necessary.

ADJUSTABLE HOSE CLAMP: (a)
- Position the adjustable hose clamps at the points indicated by (a) in the drawing below.
- Slide the hose over the line until it contacts the stop.

HOSE CLAMP: (b)
- Position the hose clamps at the points indicated by (b) in the drawing below.
- Slide the hose over the line until it contacts the stop.



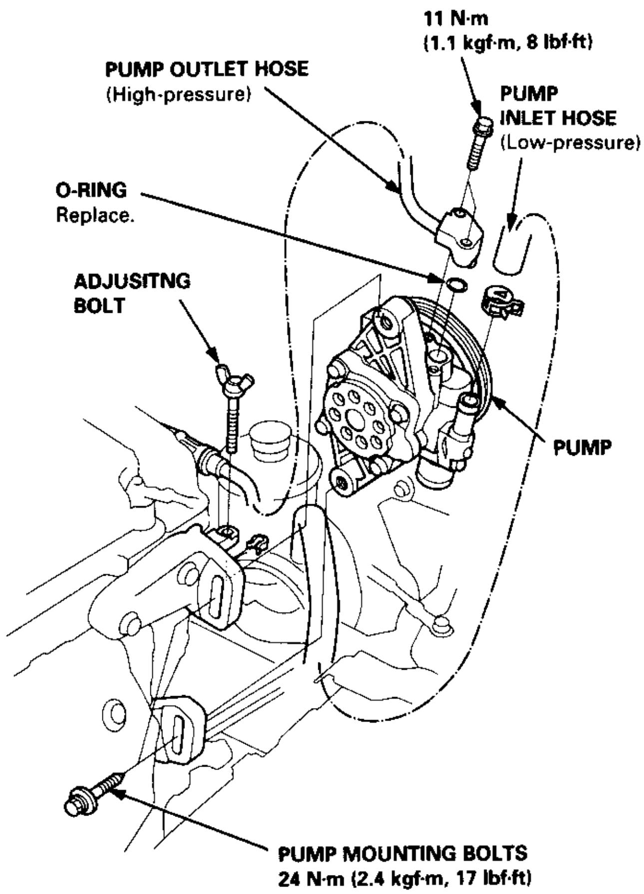




Replacement

NOTE: Before disconnecting the hoses from the pump, place a suitable container under the vehicle.

1. Remove the belt by loosening the pump adjusting bolt, mounting bolts and nuts.
2. Cover the A/C compressor with several shop towels to protect it from spilled power steering fluid.



3. Disconnect the pump inlet hose and the pump outlet hose (High-pressure) from the pump, and plug them.

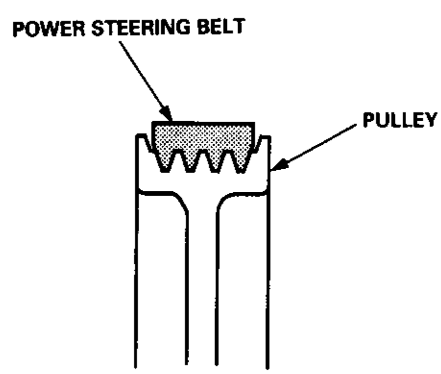
   NOTE: Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.

4. Remove the pump mounting bolts, then remove the pump.

   NOTE:
   - Do not turn the steering wheel with the pump removed.
   - Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.

5. Connect the pump inlet hose and the pump outlet hose (High-pressure). Tighten the pump fittings securely.
6. Loosely install the pump in the pump bracket with the mounting bolts, nuts and adjusting bolt.
7. Install the pump belt.

   CAUTION:
   - **Make sure that the power steering belt is properly positioned on the pulleys.**
   - **Do not get power steering fluid or grease on the power steering belt or pulley faces. Clean off any fluid or grease before installation.**



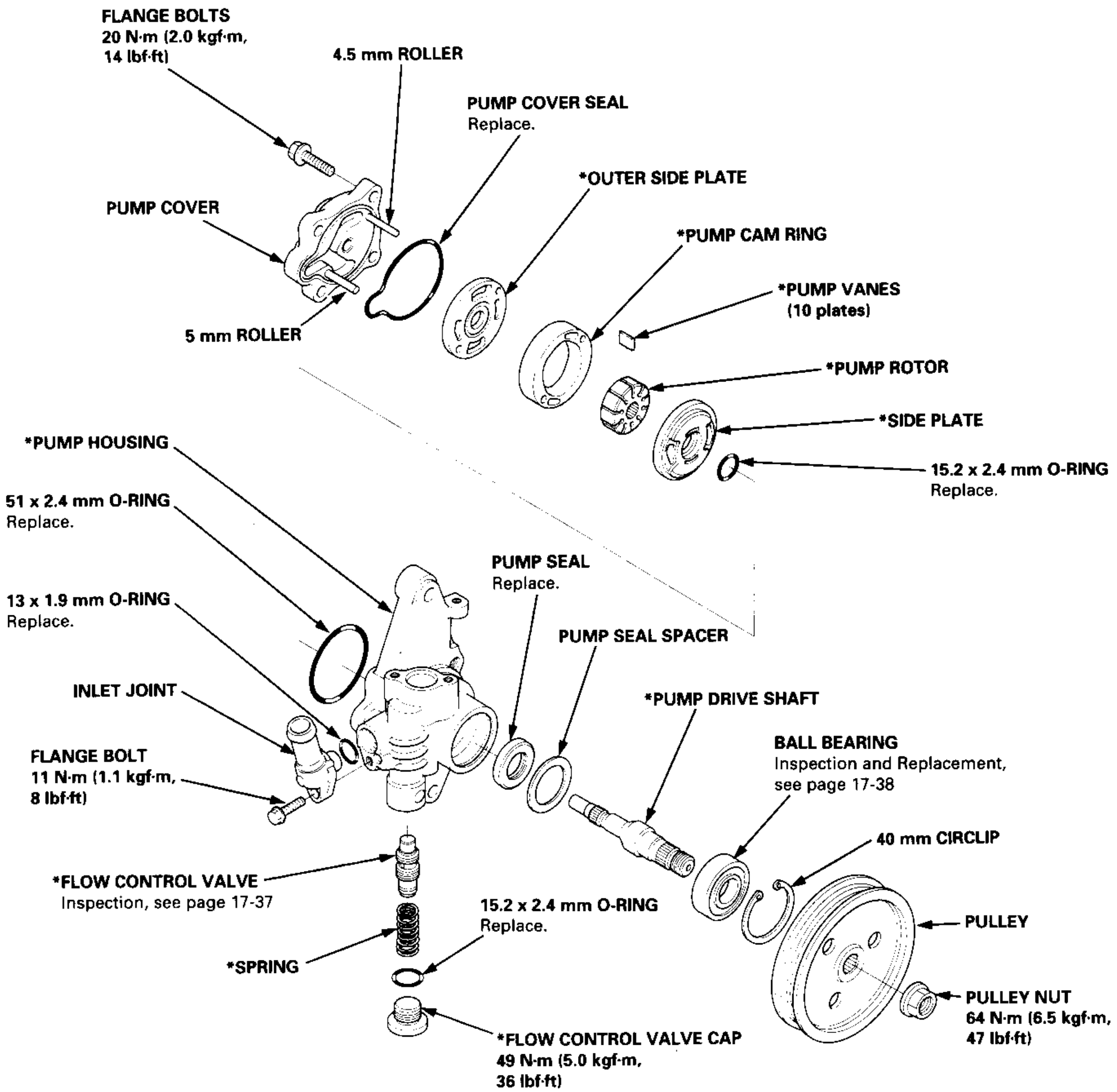
8. Adjust the pump belt (see page 17-20).
9. Fill the reservoir to the upper level line (see page 17-21).

Power Steering Pump

Disassembly

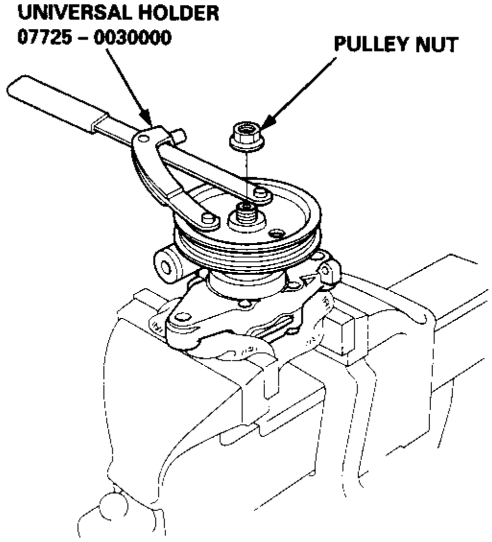
CAUTION: **The power steering components are made of aluminum. Avoid damaging the components during assembly.**

NOTE:
- Clean the disassembled parts with a solvent, and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply recommended power steering fluid to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



1. Drain the fluid from the pump.
2. Hold the steering pump in a vise with soft jaws, hold the pulley with the special tool, and remove the pulley nut and pulley.

   CAUTION: Be careful not to damage the pump housing with the jaws of the vise.

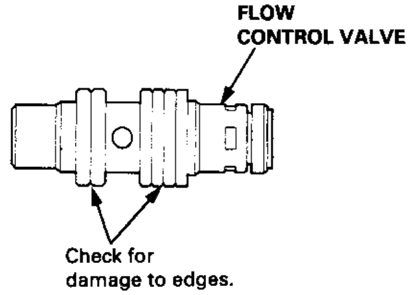


3. Loosen the flow control valve cap with a hex wrench and remove it.
4. Remove the O-ring, flow control valve and spring.
5. Remove the inlet joint and O-ring.
6. Remove the pump cover and pump cover seal.
7. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.
8. Remove the circlip, then remove the pump drive shaft by tapping the shaft end with the plastic hammer.
9. Remove the pump seal spacer and pump seal.

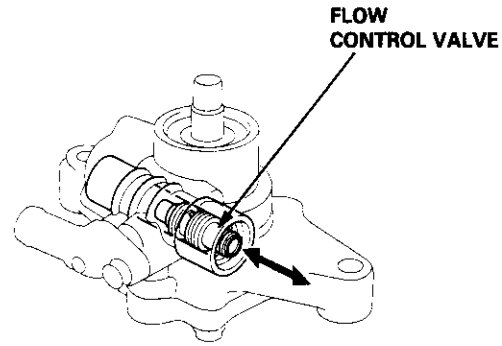
Inspection

Flow Control Valve:

1. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.

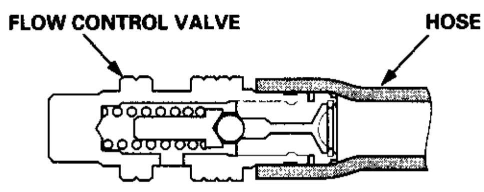


2. Inspect the bore the flow control valve for scratches or wear.
3. Slip the valve back in the pump, and check that it moves in and out smoothly.



If OK, go on step 4; if not, replace the pump as an assembly. The flow control valve is not available separately.

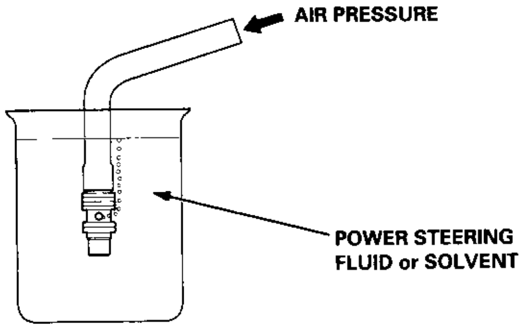
4. Attach a hose to the end of the valve as shown.



(cont'd)

Inspection (cont'd)

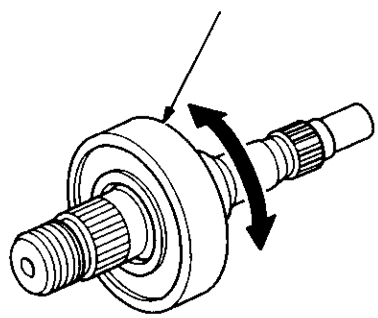
5. Submerge the valve in a container of power steering fluid or solvent, and blow in the hose. If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), replace the pump as an assembly.



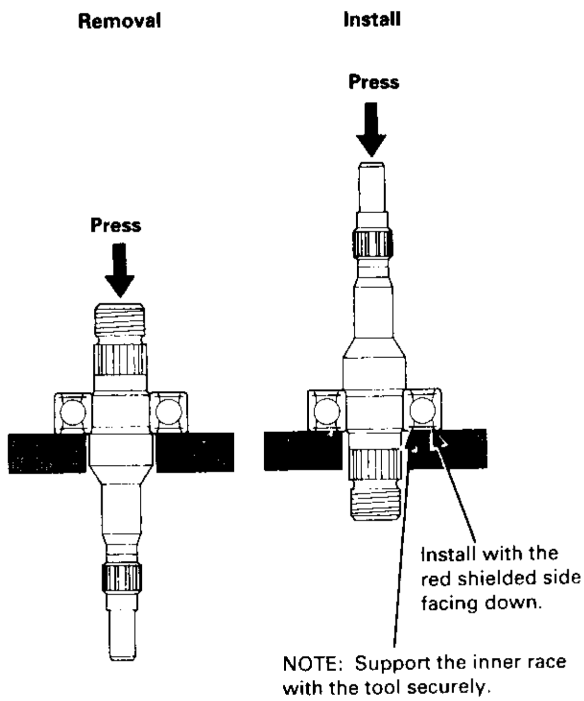
6. If the flow control valve tests OK, reinstall it in the pump. If the flow control valve still leaks air, replace the pump as an assembly. The flow control valve is not available separately.

Ball Bearing:

1. Inspect the ball bearing by rotating the outer race slowly. If any play or roughness is felt, replace the ball bearing.



2. Replace the ball bearing using a press.



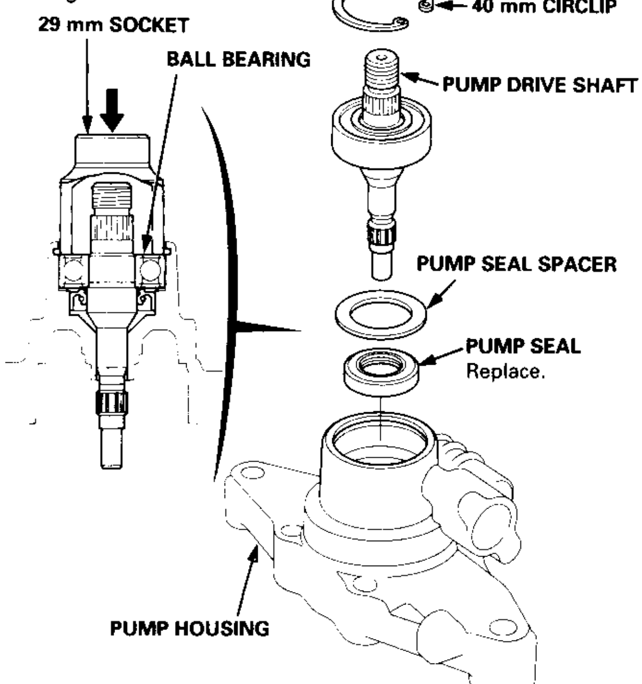
Reassembly

1. Install the new pump seal in the pump housing by hand, then install the pump seal spacer.

   NOTE: Insert the pump seal with its grooved side facing in.

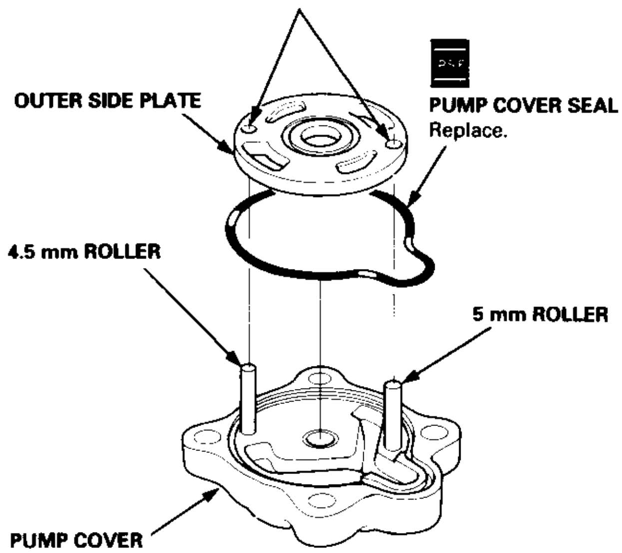
2. Position the pump drive shaft in the pump housing, then drive the it in using a 29 mm socket as shown.

3. Install the 40 mm circlip with its radiused side facing out.

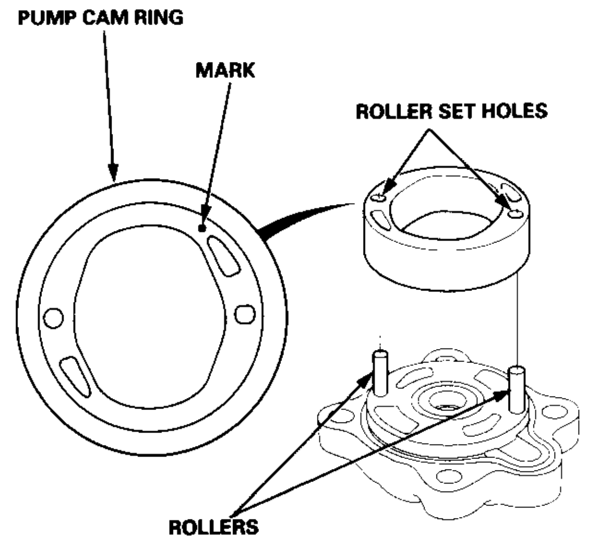


4. Coat the pump cover seal with the power steering fluid, and install it into the groove in the pump cover.

5. Install the outer side plate over the two rollers.



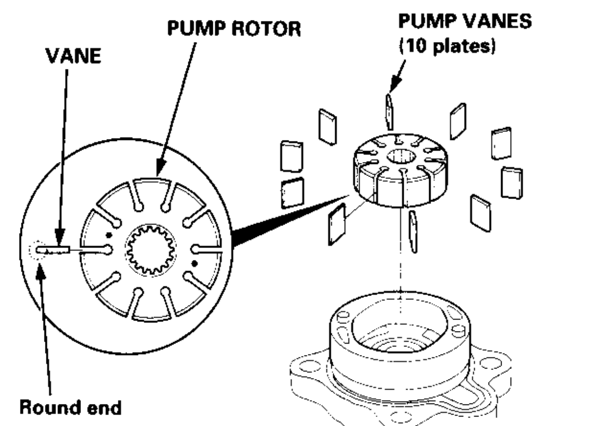
6. Set the pump cam ring over the two rollers with the " ○ " mark on the cam ring upward.



7. Assemble pump rotor to the pump cover with the " ○ " marks on the rotor facing down.

8. Set the 10 vanes in the grooves in the rotor.

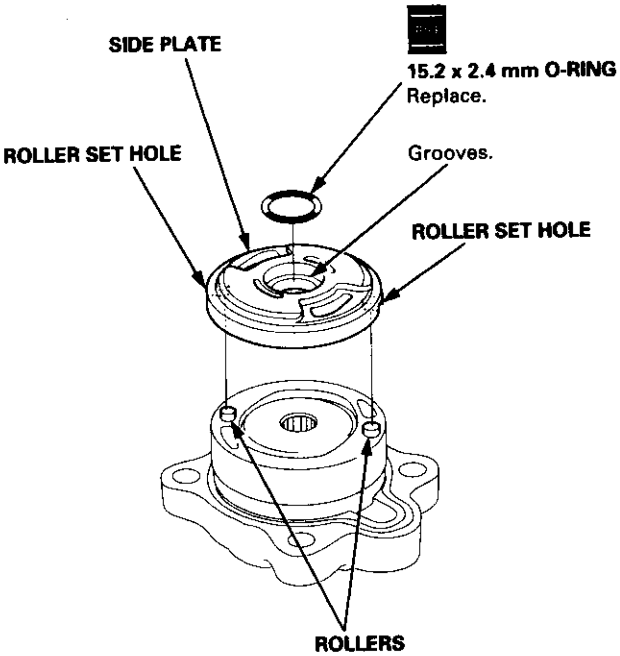
   NOTE: Be sure that the round ends of the vanes are in contact with the sliding surface of the cam ring.



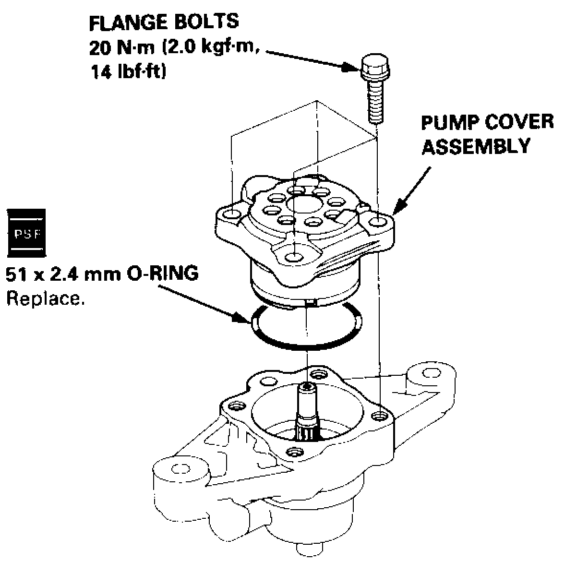
(cont'd)

Reassembly (cont'd)

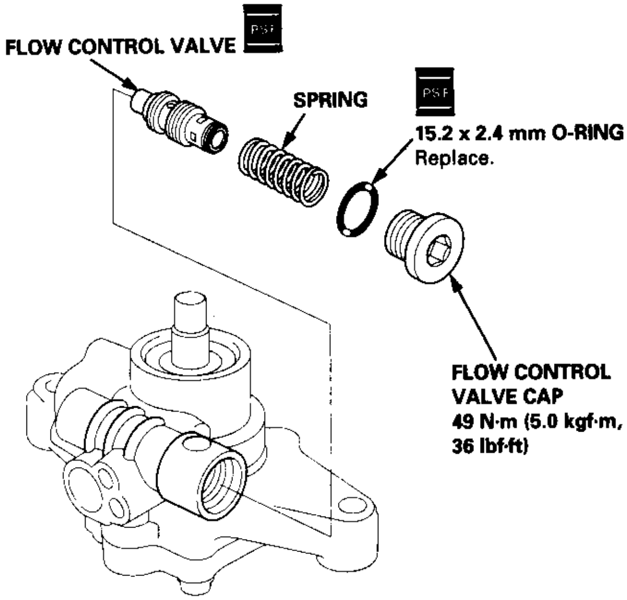
9. Coat the O-ring with power steering fluid, and install it into the grooves in the side plate.
10. Install the side plate on the cam ring by aligning the roller set holes in the side plate with the rollers.



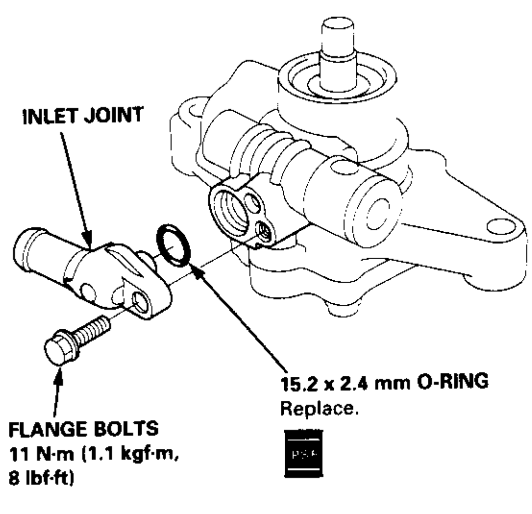
11. Coat the O-ring with power steering fluid, and position it into the pump housing.
12. Install the pump cover assembly in the pump housing.



13. Coat the flow control valve with power steering fluid.
14. Install the flow control valve and spring on the pump housing.
15. Coat the O-ring with power steering fluid, and install it on the flow control valve cap.
16. Install the flow control valve cap on the pump housing, and tighten it.

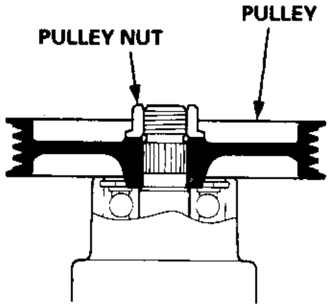


17. Coat the O-ring with power steering fluid, and install it into the grooves in the inlet joint.
18. Install the inlet joint on the pump housing.

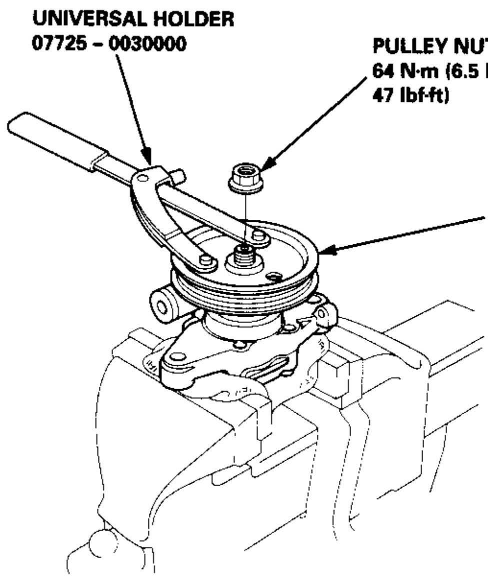


19. Install the pulley as shown below, then loosely install the pulley nut. Hold the steering pump in a vise with soft jaws.

    CAUTION: Be careful not to damage the pump housing with the jaws of the vise.



20. Hold the pulley with the special tool, and tighten the pulley nut.

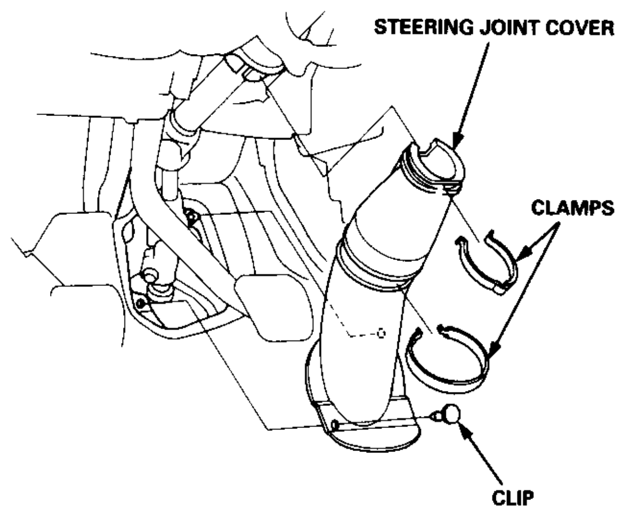


21. Check that the pump turns smoothly by turning the pulley by hand.

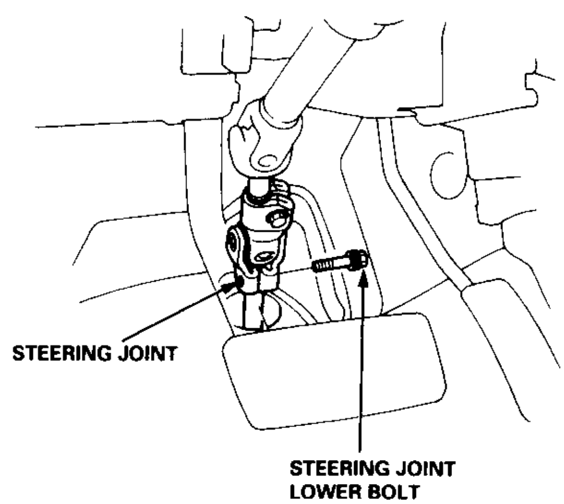
Removal

NOTE: Using solvent and a brush, wash any oil and dirt off the valve body unit, its lines, and the end if the gearbox. Blow dry with compressed air.

1. Drain the power steering fluid as described on page 17-21.
2. Raise the front of vehicle, and support on safety stands in the proper locations (see section 1).
3. Remove the front wheels.
4. When the vehicle is equipped with the SRS airbag system, remove the steering wheel (see page 17-24).
5. Remove the steering joint cover.



6. Remove the steering joint lower bolt, and move the joint toward the column.



(cont'd)

Power Steering Gearbox

Removal (cont'd)

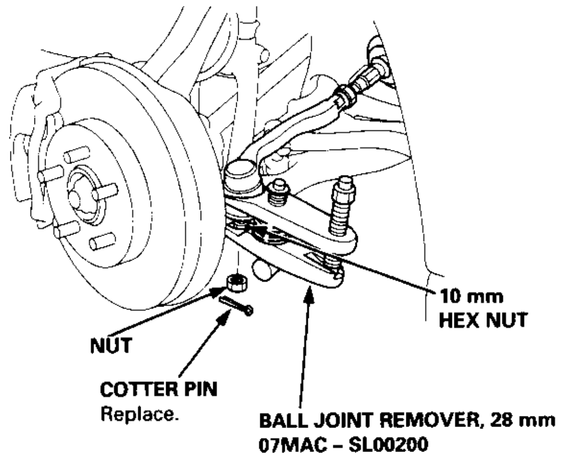
7. Remove the cotter pin from the ball joint pin and remove the nut.

8. Install the 10 mm hex nut on the ball joint.
   Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

   NOTE: Remove the ball joint using the special tool. Refer to section 18 for the ball joint remover usage instructions.

9. Separate the tie-rod ball joint and knuckle using the special tool.

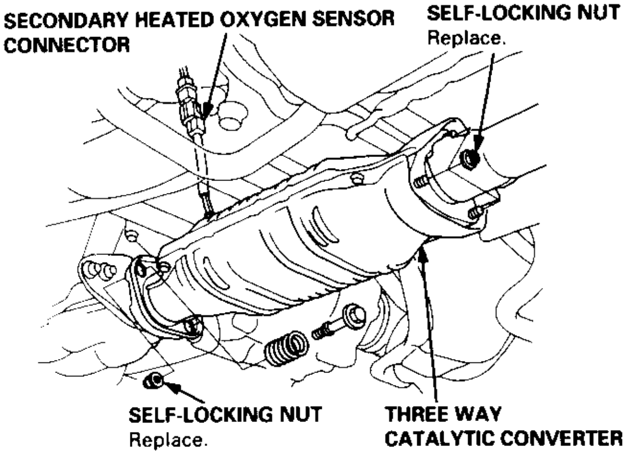
   CAUTION: Avoid damaging the ball joint boot.



10. Disconnect the shift linkage (M/T model: see section 13, A/T model: see section 14).

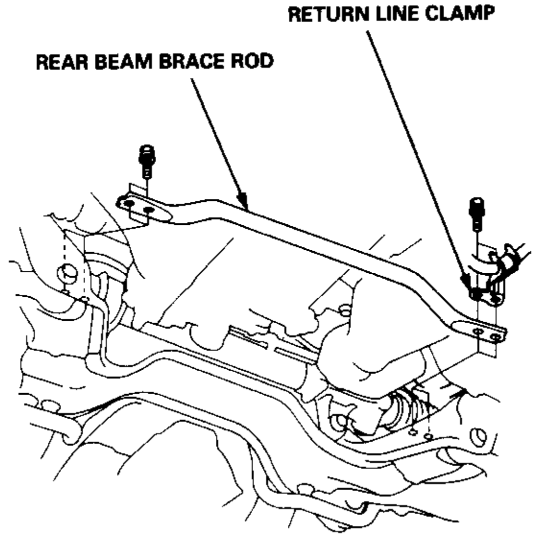
11. Disconnect the secondary heated oxygen sensor (H02S) connector, and separate the three way catalytic converter by removing the self-locking nuts.

    NOTE: Always replace the gaskets with new ones.

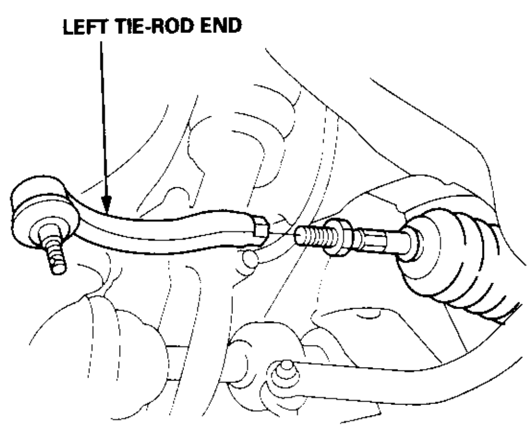


12. Remove the return line clamp from the left side of the rear beam, and move the return line above the steering gearbox.

13. Remove the rear beam brace rod.



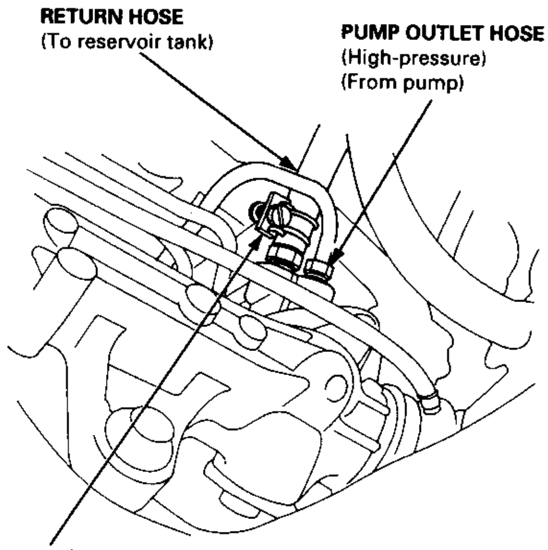
14. Remove the left tie-rod end, then slide the rack all the way to the right.



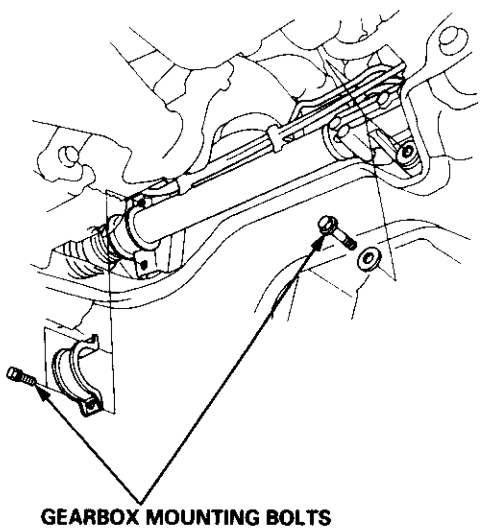
15. Disconnect the two lines from the valve body unit on the steering gearbox.

CAUTION: After disconnecting the hose and line, plug or seal the hose and line with a piece of tape or equivalent to prevent foreign materials from entering the valve body unit.

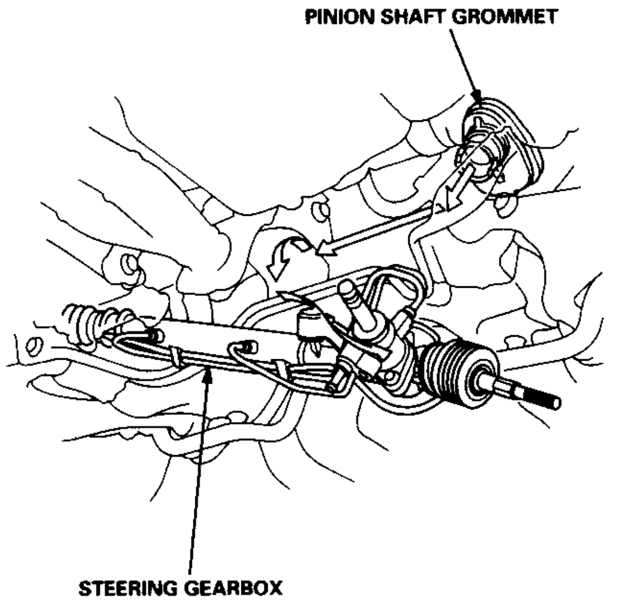
NOTE:
- Place the line disconnected in the previous step at the rear side of the gearbox so that they do not hinder in the gearbox removal.
- Do not loosen the cylinder lines A and B between the valve body unit and cylinder.



16. Remove the steering gearbox mounting bolts.



17. Pull the steering gearbox all the way down to clear the pinion shaft from the bulkhead, and remove the pinion shaft grommet.
18. Move the steering gearbox to the right so the left rack end clears the rear beam.
19. Move the steering gearbox to the left, and tilt the left side down to remove it from the vehicle.



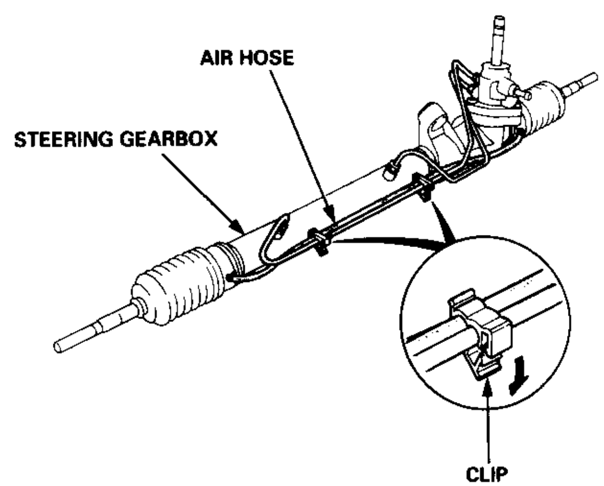
Power Steering Gearbox

Disassembly

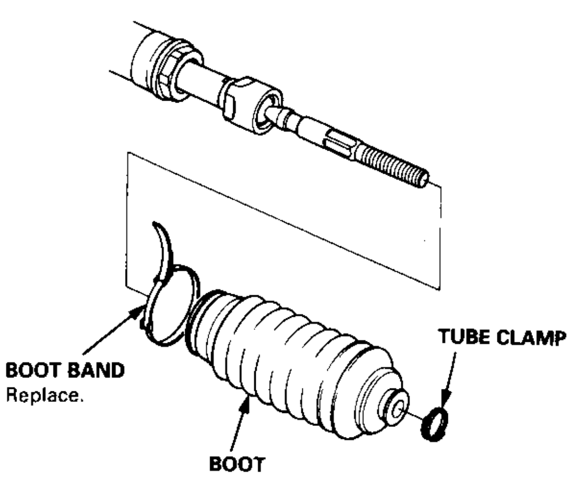
Steering Rack Disassembly

NOTE:
- Before disassembling the gearbox, wash it off with solvent and a brush.
- Do not dip seals and O-rings in solvent.

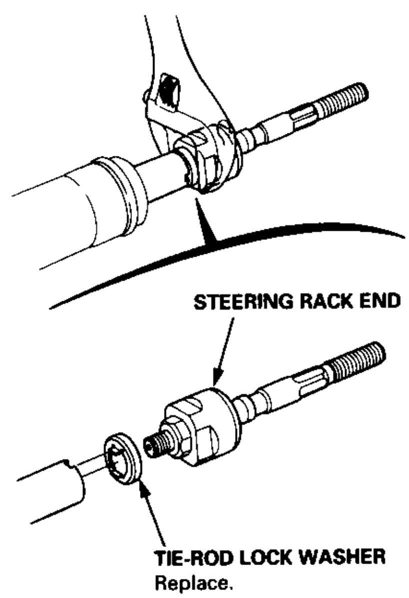
1. Remove the steering gearbox (see page 17-41).
2. Remove the air hose and clips.
3. Remove the tie-rod end and locknut.



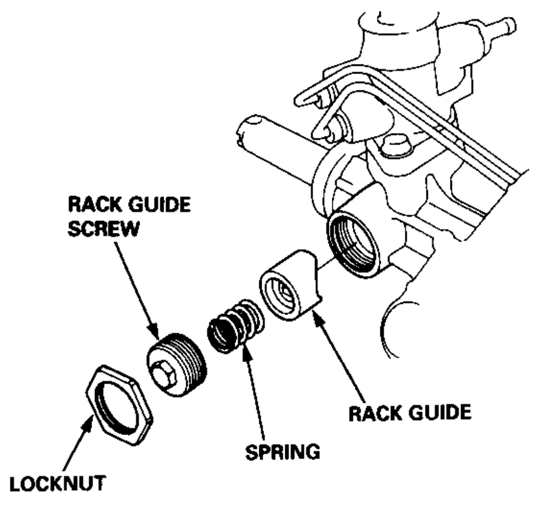
4. Remove the boot bands and tube clamps. Pull the boots away from the ends of the gearbox.



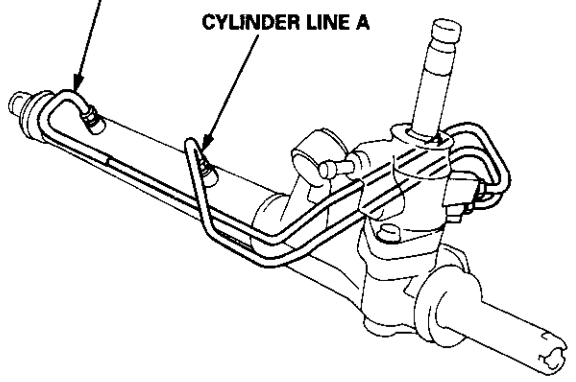
5. Hold the left end of the steering rack with a wrench and unscrew the rack end with a wrench.



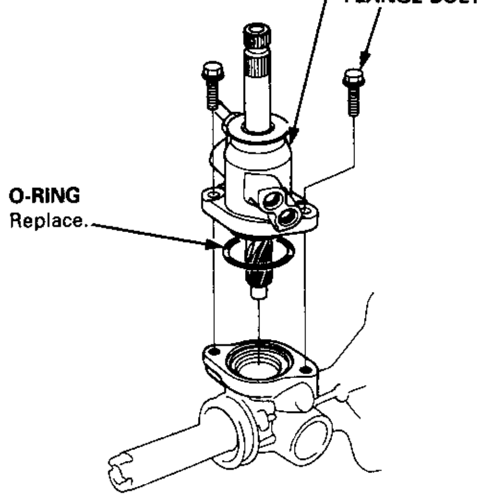
6. Loosen the locknut and remove the rack guide screw.
7. Remove the spring and rack guide from the gearbox housing.



8. Remove the cylinder line A and B from the gearbox.
9. Drain the fluid from the cylinder fittings by moving the steering rack back and forth.

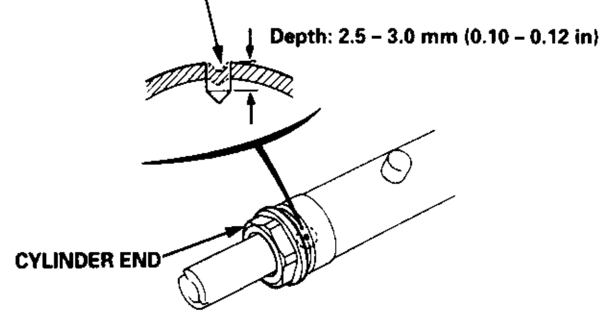


10. Remove the two flange bolts, then remove the valve body unit from the gearbox. (See page 17-47 for valve body unit disassembly.)

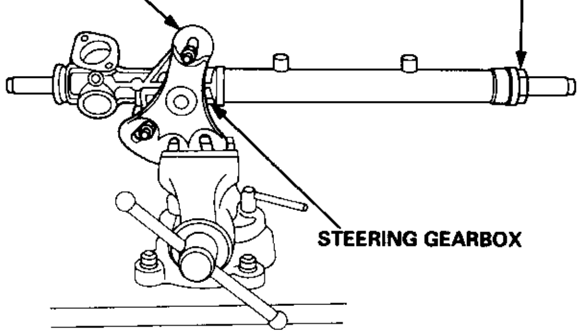


11. Drill a 3 mm (0.12 in) diameter hole approximately 2.5 – 3.5 mm (0.10 – 0.14 in) in depth in the staked-point on the cylinder.

NOTE: Do not allow metal shavings to enter the cylinder housing.



12. Install a puller yoke to the steering gearbox. Clamp the puller yoke in a vise with soft jaws as shown, then loosen and remove the cylinder end.



(cont'd)

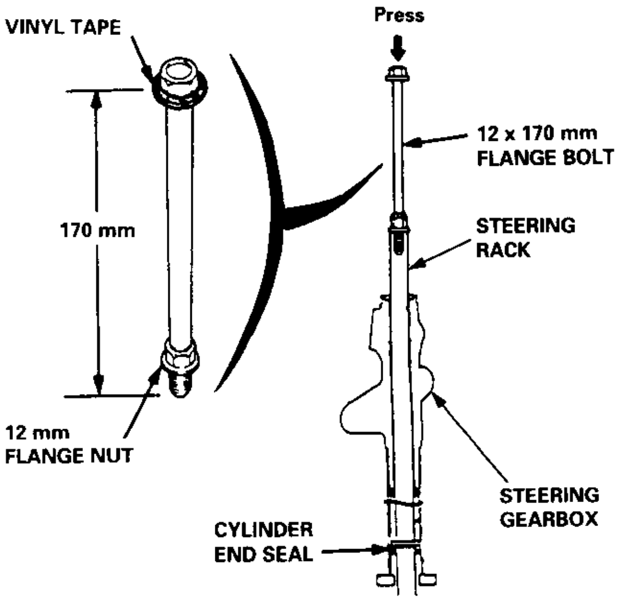
Disassembly (cont'd)

13. Set the gearbox in a press so the gearbox housing points upward.

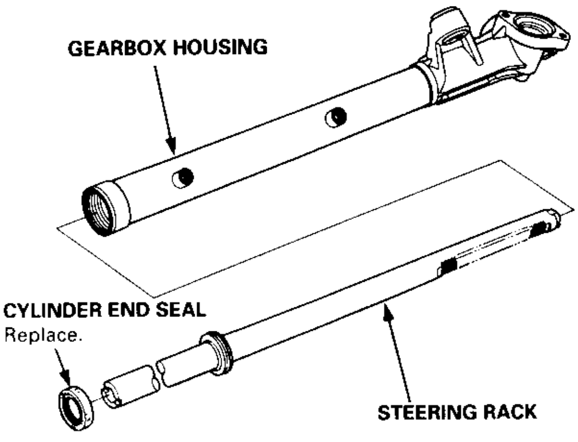
14. Install the flange bolt into the end of the steering rack until it bottoms in the hole, then back the flange bolt out 1/4 turn. Hold the flange bolt and tighten the flange nut against the rack by hand.

15. Press the cylinder end seal and steering rack out of the gearbox.

    NOTE: Hold the steering rack to keep it from falling when pressed clear.



16. Remove the flange bolt and cylinder end seal from the steering rack.

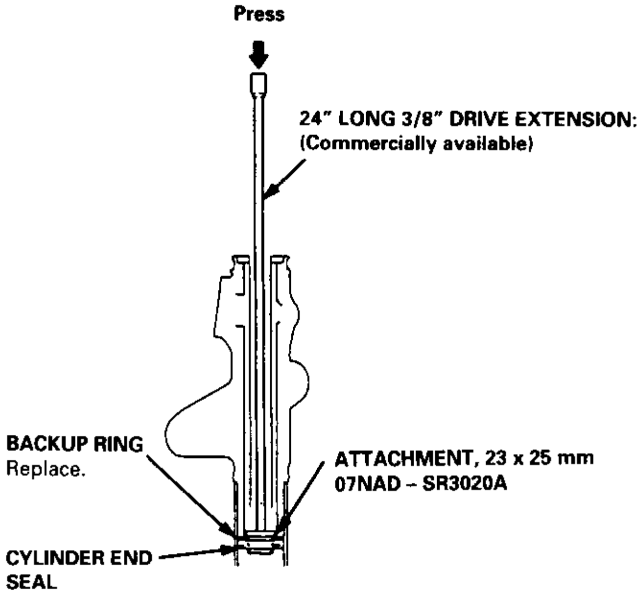


17. Insert a 24" long, 3/8" drive extension, and the special tool into the cylinder from the gearbox side.

    CAUTION: Be careful not to damage the inside surface of the housing with the tools.

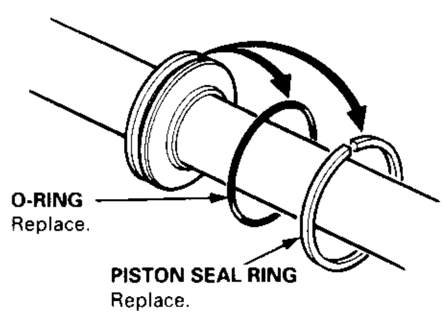
18. Set the gearbox in a press, then press out the cylinder end seal and backup ring from the gearbox.

    CAUTION:
    - **Keep the tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct if necessary, when removing the cylinder end seal.**
    - **Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool. It will break the backup ring and the cylinder end seal will remain in the gearbox.**



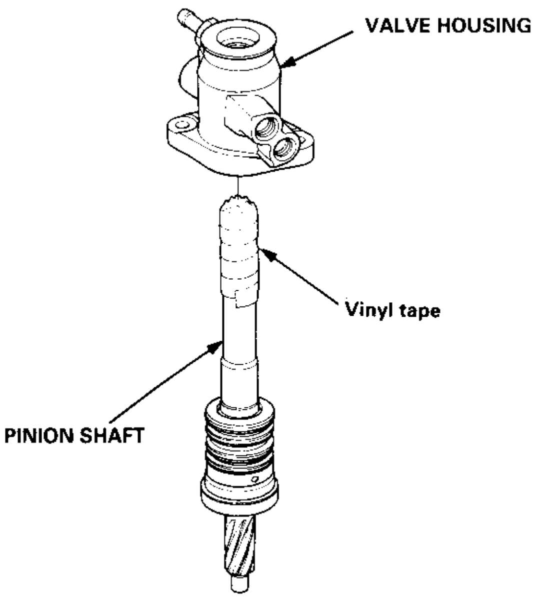
19. Carefully pry the piston seal ring and O-ring off the piston of the rack.

    CAUTION: Be careful not to damage the inside of seal ring groove when removing the seal ring.



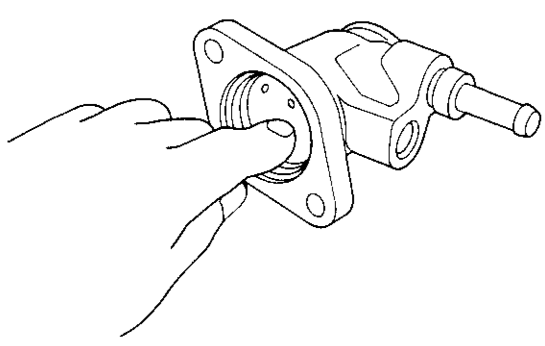
20. Apply vinyl tape to the pinion shaft.

21. Separate the valve housing from the pinion shaft/valve using a press.



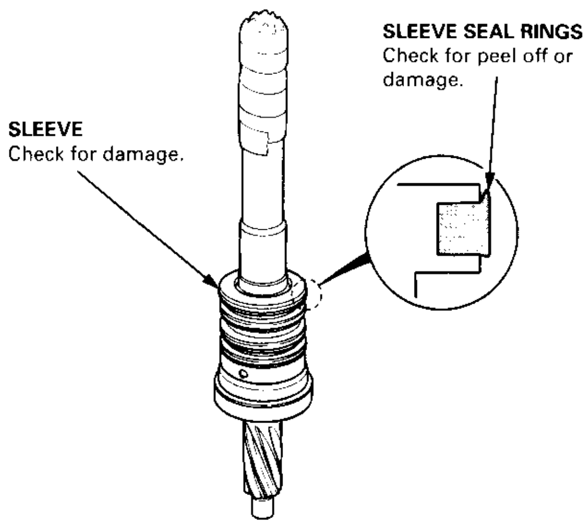
22. Check the inner wall of the valve housing where the seal ring slides with your finger. If there is a step in the wall, the valve housing is worn. Replace the valve housing.

NOTE: There may be the sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

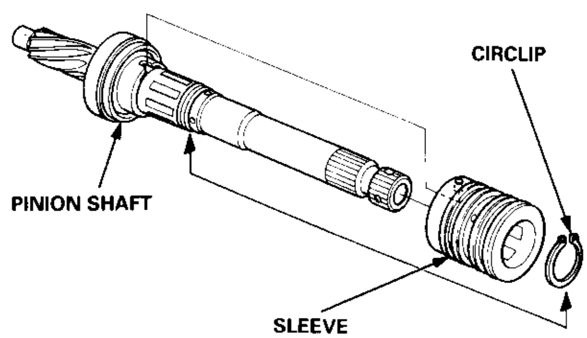


23. Check for wear, burrs and other damage to the edges of the grooves in the sleeve.

NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace the both parts as a set.



24. Remove the circlip and pinion shaft sleeve from the pinion shaft.

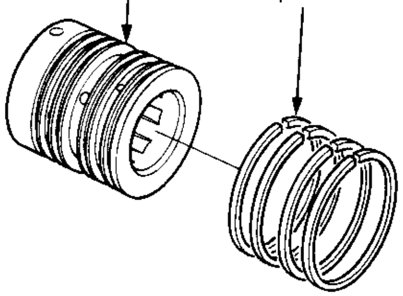


(cont'd)

Disassembly (cont'd)

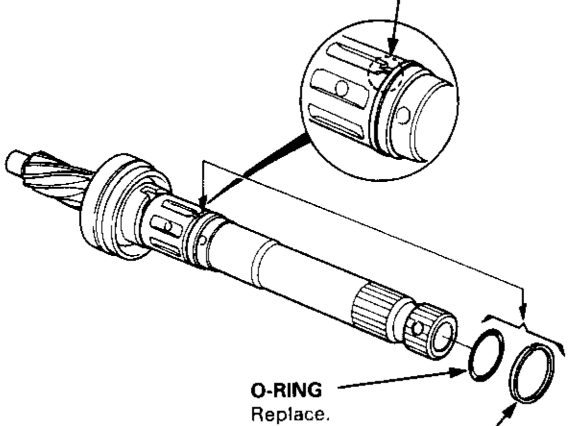
25. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve.

CAUTION: Be careful not to damage the edges of the sleeve grooves when removing the seal rings and O-ring.



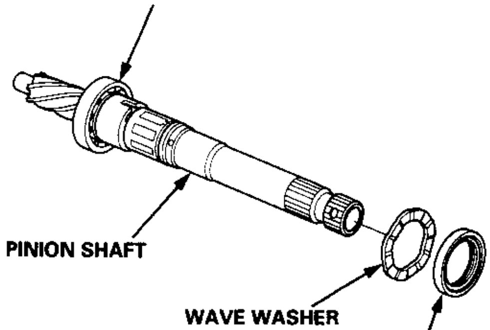
26. Using a cutter or an equivalent tool, cut the valve seal ring and O-ring at the groove the pinion shaft. Remove the valve seal ring and O-ring.

CAUTION: Be careful not to damage the edges of the pinion shaft groove when removing the valve seal ring and O-ring.

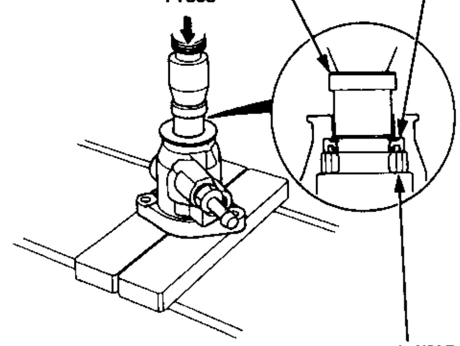


27. Remove the valve oil seal and wave washer ring from the pinion shaft.

NOTE:
- Inspect the ball bearing by rotating the outer race slowly. If there is excessive play, replace the pinion shaft and sleeve as an assembly.
- The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.



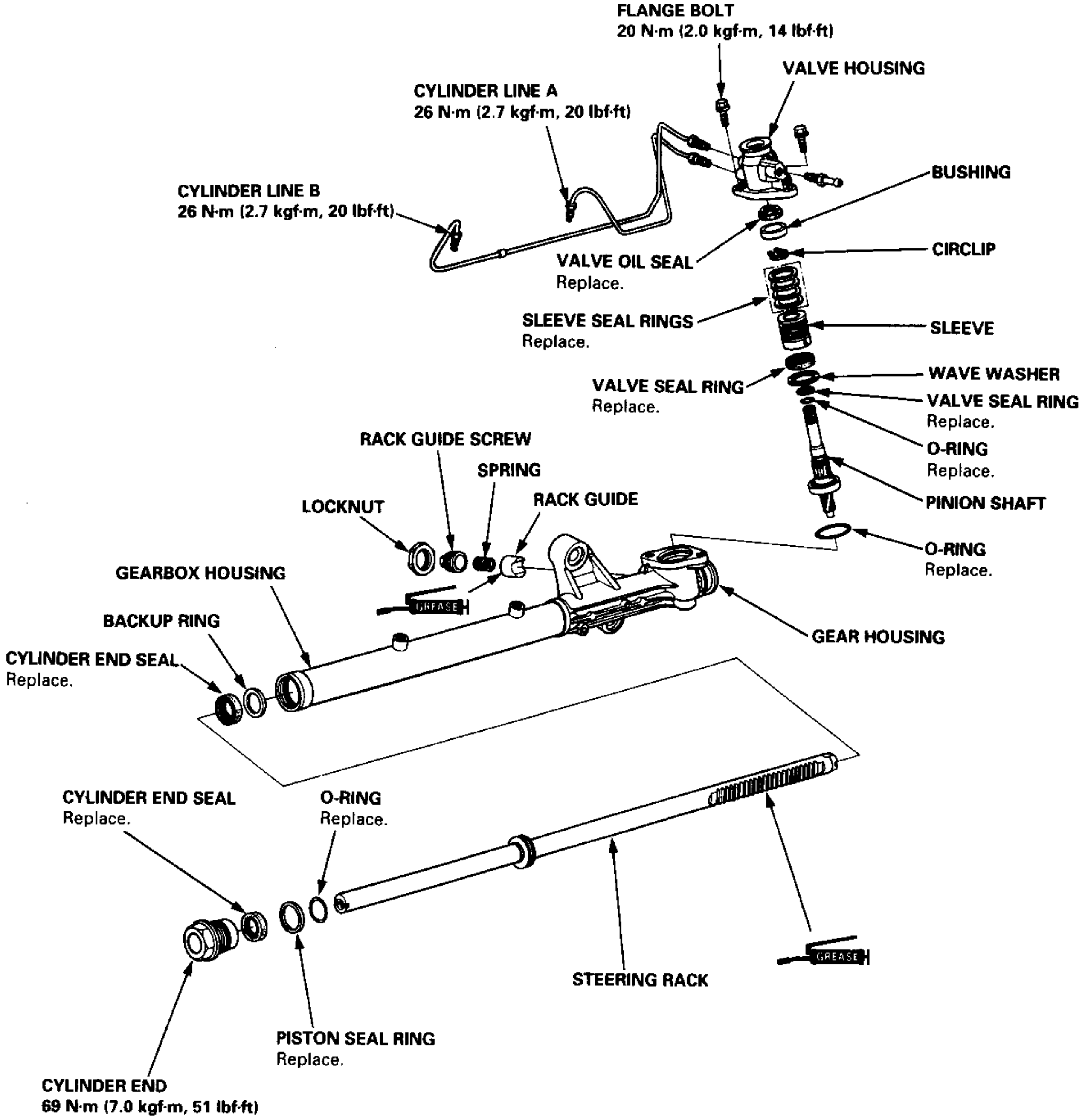
28. Press the valve oil seal and bushing out of the valve housing using a hydraulic press and special tool shown below.



Reassembly

NOTE:

- Clean the disassembled parts with a solvent and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply recommended power steering fluid to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Use the appropriate special tools where necessary.

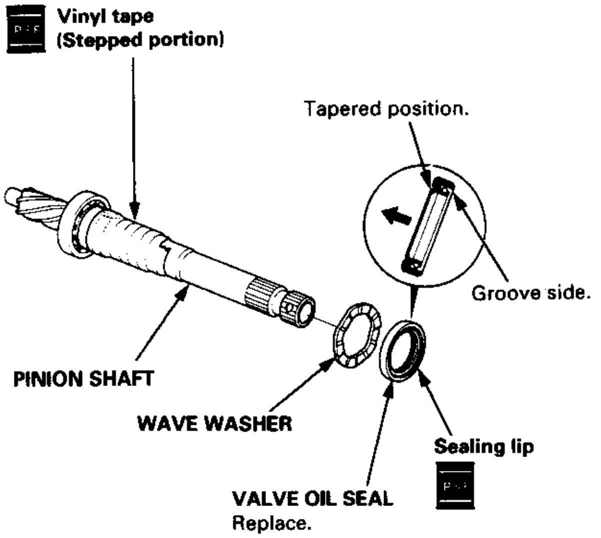


(cont'd)

Reassembly (cont'd)

Valve Body Reassembly

1. Apply vinyl tape to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.

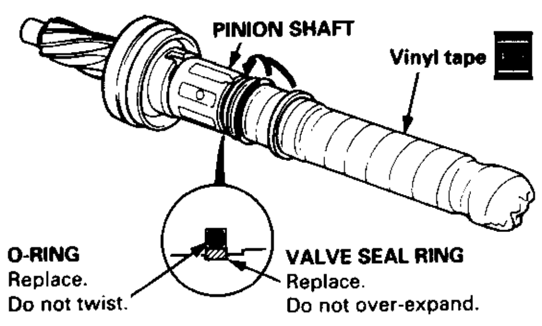


2. Install the wave washer.
3. Coat the inside surface of the new valve oil seal with power steering fluid.
4. Slide the valve oil seal over the pinion shaft, being careful not to damage the sealing lip.

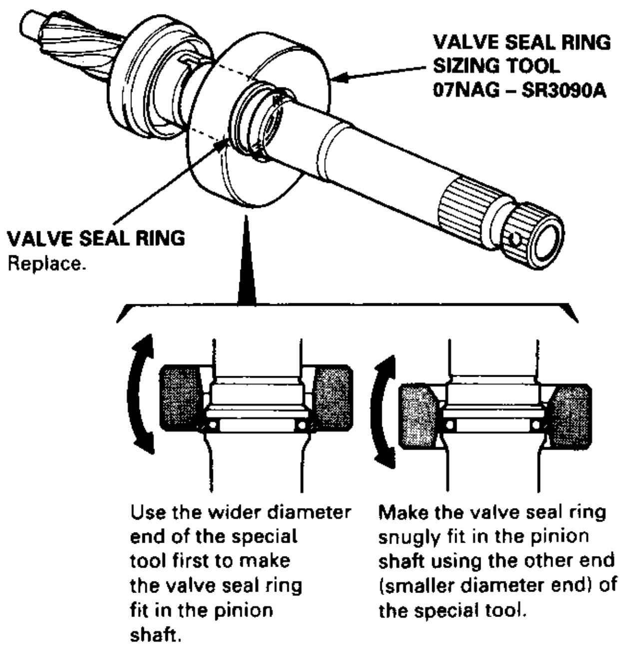
   CAUTION: Install the valve oil seal with its grooved side facing opposite the bearing.

5. Fit the new O-ring in the groove of the pinion shaft. Then slide the new valve seal ring over the shaft and groove in on the pinion shaft.
6. Remove the vinyl tape from the pinion shaft.

   NOTE: Do not over - expand the valve seal ring.



7. Apply power steering fluid to the surface of the valve seal ring that was installed on the pinion shaft.
8. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring.
9. Move the special tool up and down several times to make the valve seal ring fit in the pinion shaft.



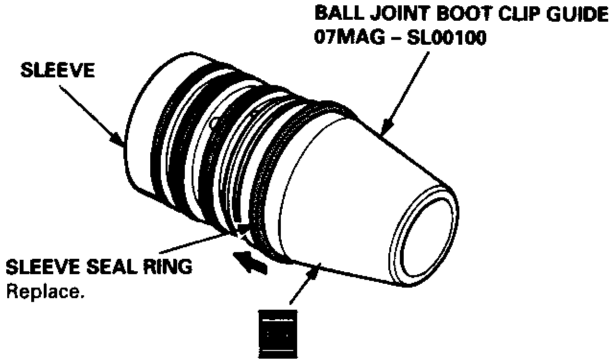
10. Remove the special tool.
11. Turn the special tool over and set the smaller diameter end of the special tool over the valve seal ring. Move the special tool up and down several times to make the valve seal ring snugly fit in the pinion shaft.

12. Apply power steering fluid to the surface of the special tool. Set the new seal rings over the special tool from the smaller diameter end of the tool, and expand the seal rings. Do two rings at a time from each end of the sleeve.

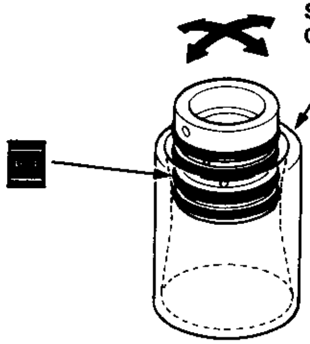
NOTE:
- Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
- There are two types of sleeve seal rings: black and brown. Do not mix the different types of sleeve seal rings as they are not compatible.

13. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove.

NOTE: After installation, compress the seal rings with your fingers temporarily.



14. Apply power steering fluid to the seal rings on the sleeve and to the entire inside surface of the special tool.



15. Insert the sleeve into the special tool slowly.

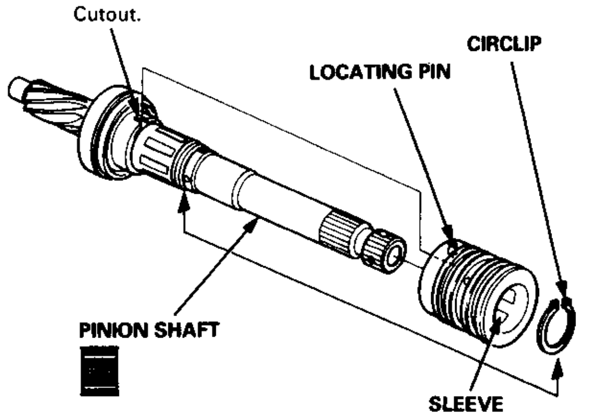
16. Move the sleeve each direction several times to make the seal rings snugly fit in the sleeve.

NOTE: Be sure that the seal rings are not turned up.

17. Apply power steering fluid to the surface of the pinion shaft, assemble the sleeve over the pinion shaft by aligning the locating pin on the inside of the sleeve with the cutout in the shaft. Then install the new circlip securely in the pinion shaft groove.

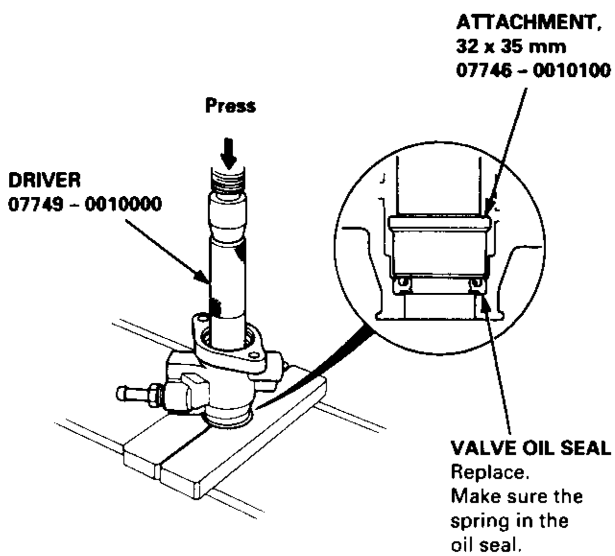
NOTE:
- Be careful not to damage the valve seal ring when inserting the sleeve.
- Install the circlip with its radiused side facing in.

18. Install the circlip securely in the pinion shaft groove.



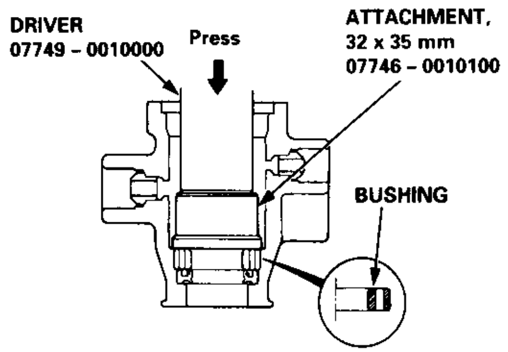
19. Apply power steering fluid to the seal ring lip of the valve oil seal. Then install the seal in the valve housing using a hydraulic press and special tools as shown.

CAUTION: Install the valve oil seal with its grooves side facing the tool.

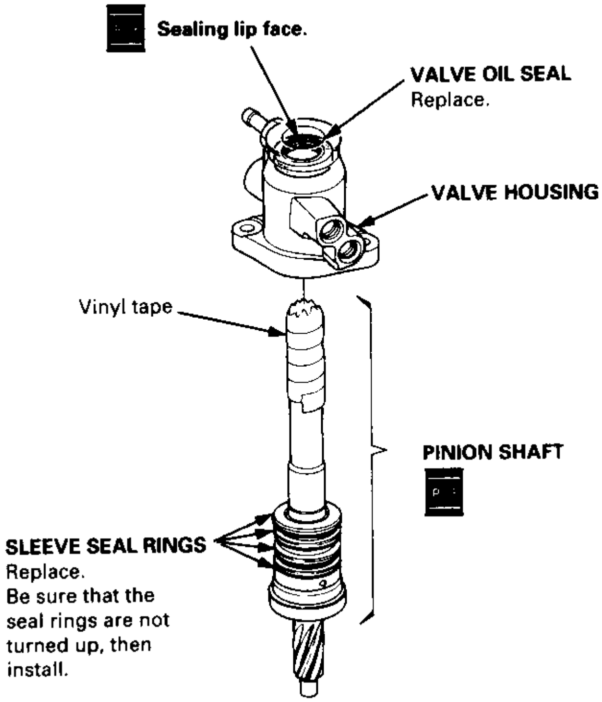


(cont'd)

20. Press the bushing into the valve housing using a hydraulic press and special tool as shown.



21. Apply vinyl tape to the pinion shaft, then coat the vinyl tape with power steering fluid.



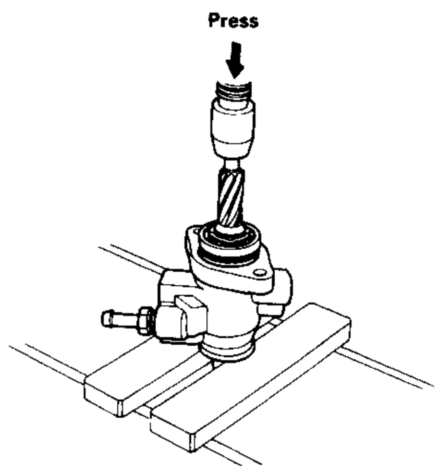
22. Insert the pinion shaft into the valve housing.

    CAUTION: Be careful not to damage the valve seal rings.

23. Remove the vinyl tape from the pinion shaft.

24. Press the pinion shaft/sleeve into the valve housing using a hydraulic press as shown.

    NOTE: Check that the pinion shaft/sleeve turns smoothly by turning the pinion shaft with your hand.



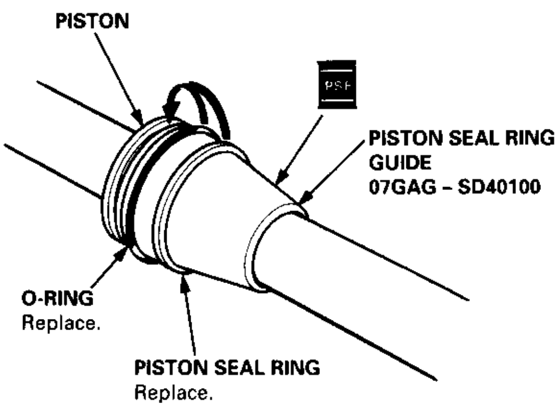
Steering Rack Reassembly

25. Coat the special tool with power steering fluid, and slide it onto the rack, big end first.

26. Position the new O-ring and new piston seal ring on the special tool, then slide them down towards big end of the tool.

    NOTE:
    - Do not over expand resin seal rings. Install the resin seal ring with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
    - Replace piston's O-ring and seal ring as a set.

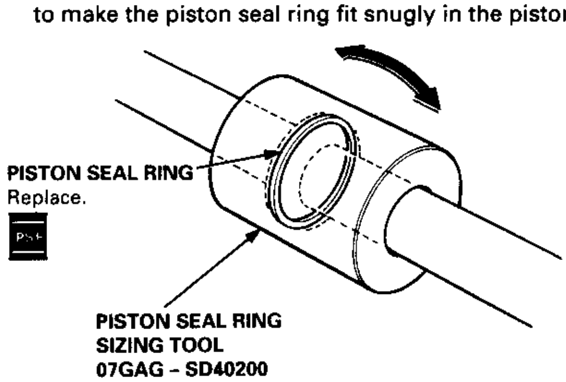
27. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring as shown.



28. Coat the piston seal ring and inside of the special tool with power steering fluid.

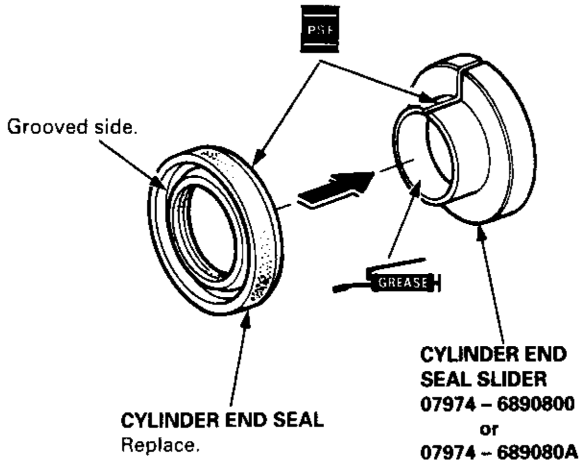
29. Carefully slide the tool onto the rack and over the piston seal ring.

30. Move the special tool back and forth several times to make the piston seal ring fit snugly in the piston.



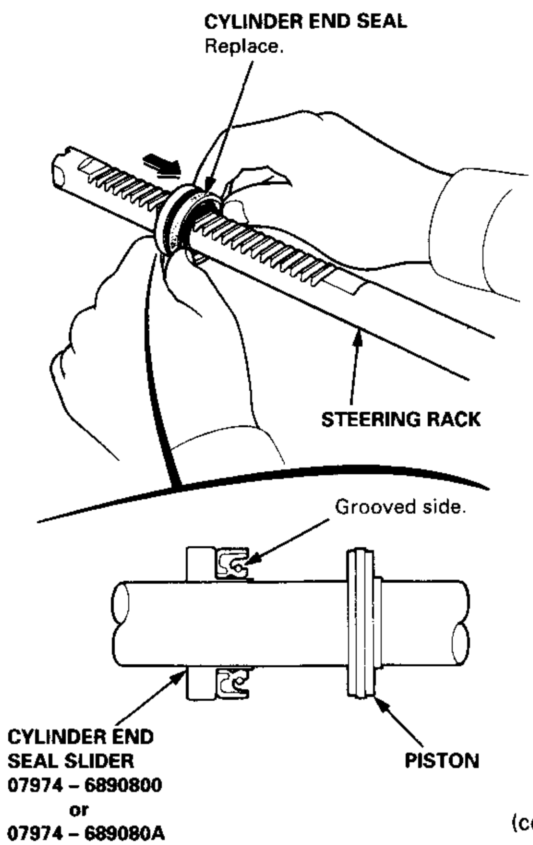
31. Coat the sliding surface of the special tool and new cylinder end seal with power steering fluid.

32. Place the seal on the special tool with its grooved side facing opposite the special tool.



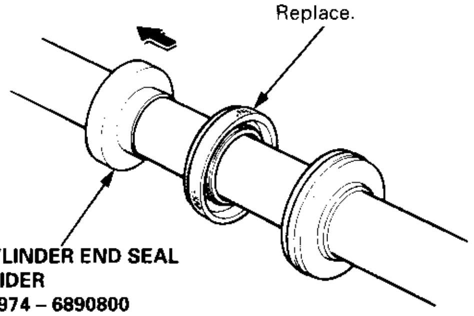
33. Apply a thin coat of grease to the inside of the special tool, and install it on the steering rack.

    CAUTION: Make sure the rack teeth do not face the slot in the special tool.

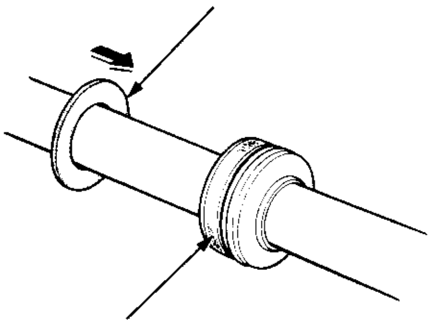


(cont'd)

34. Separate the cylinder end seal from the special tool, then remove the tool from the steering rack.

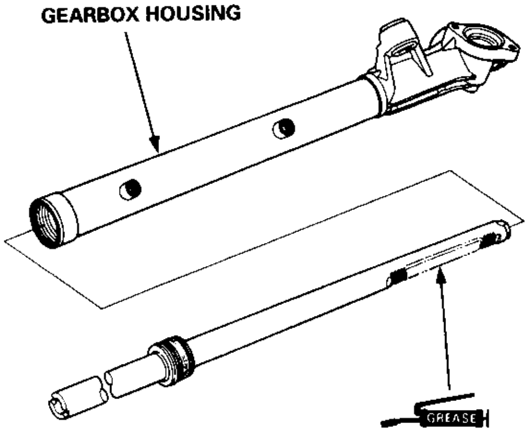


35. Install the backup ring on the steering rack, then place the cylinder end seal to piston.



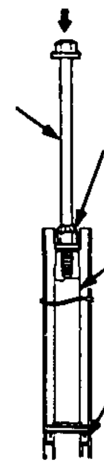
36. Grease the steering rack teeth, then insert the steering rack into the gearbox housing.

CAUTION: Be careful not to damage to inner surface of the gearbox housing with the rack edges.



37. Set the gearbox in a press with the cylinder housing facing upward.
38. Install the flange bolt into the end of the steering rack until it bottoms in the hole, then back the flange bolt out 1/4 turn. Hold the flange bolt and tighten the flange nut against the rack by hand.
39. Install the cylinder end seal into the bottom of the cylinder by pressing on the bolt with a press as shown.

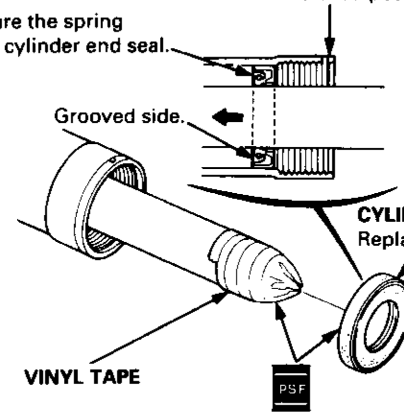
    CAUTION: Do not push on the bolt with excessive force; as it may damage the cylinder end seal.



40. Wrap vinyl tape around the rack end edges, and coat the surface of the tape with the power steering fluid.

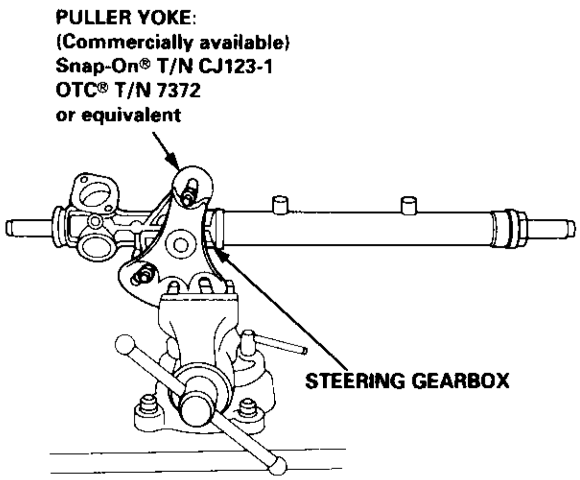
    NOTE: Make sure that the vinyl tape is wrapped carefully so that there is no stepped portion.
41. Coat the inside surface of the new cylinder end seal with power steering fluid.
42. Install the cylinder end seal onto the steering rack with its grooved side toward the piston.

    CAUTION: When installing the cylinder end seal, be careful not to damage the sealing lip face of the seal with the edges of the steering rack.



43. Remove the vinyl tape from the steering rack, then push in the cylinder end seal with your finger.
NOTE:
- Remove any resideue of tape adhesive.
- Take care not to damage the cylinder end seal with the threads and burrs at the staked position of the gearbox.

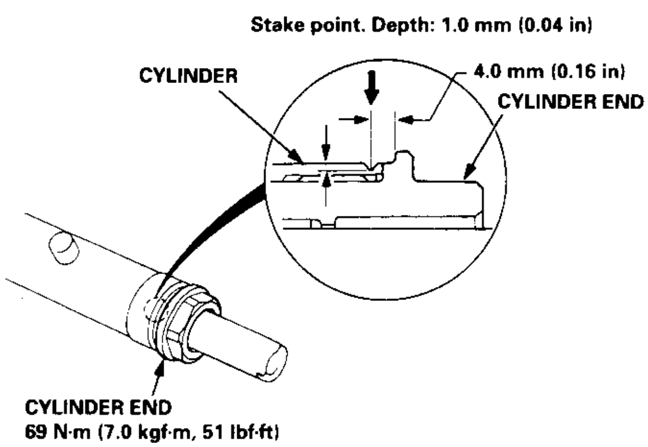
44. Install a puller yoke to the steering gearbox, then clamp the puller yoke in a vise with soft jaws as shown.



45. Grease the inside surface of the cylinder end, then install the cylinder end by screwing it into the cylinder.

46. After tightening the cylinder end, stake the point of the cylinder housing shown below.

NOTE: Stake in the cylinder in the position opposite from where the stake was removed during disassembly.

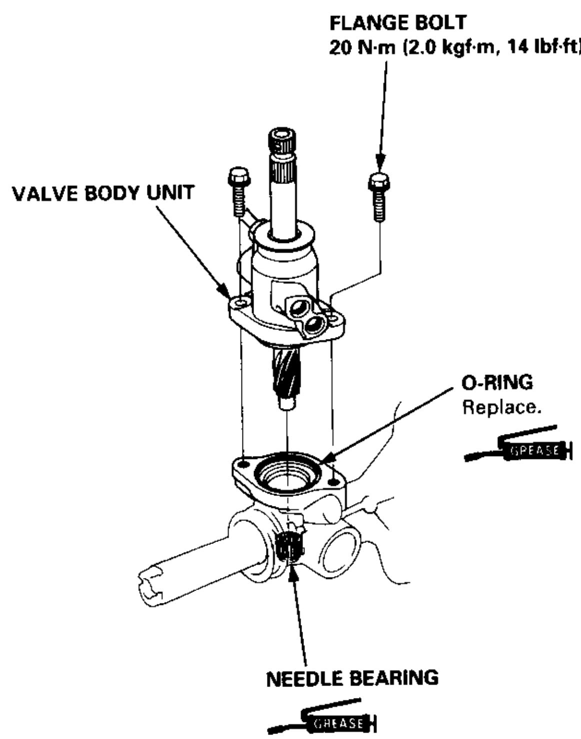


47. Coat the new O-ring with grease and install it in the groove in the gearbox housing.

48. Apply grease to the needle bearing in the gearbox housing.

49. Install the valve body unit on the gearbox housing by engaging the gears. Tighten the flange bolts to the specified torque.

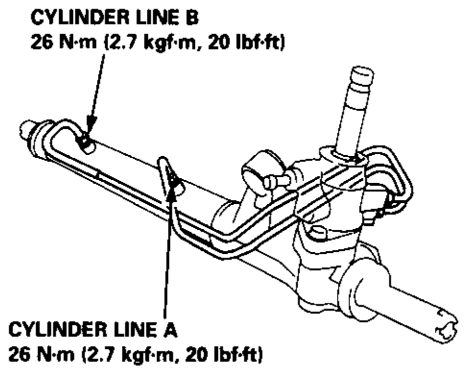
NOTE: Note the valve body unit installation position (direction of pipe connection).



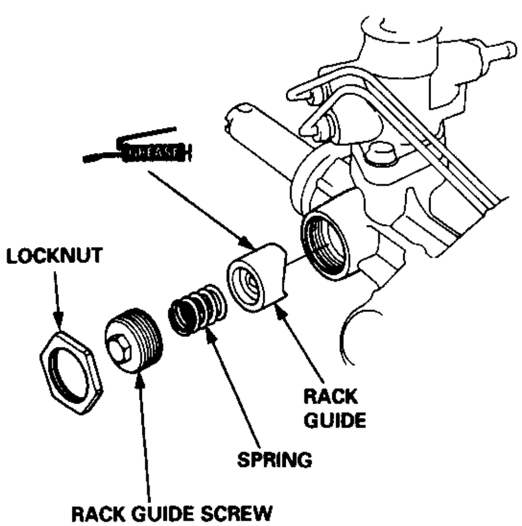
(cont'd)

50. Install the cylinder lines A and B.

    NOTE:
    - Clean the joints of the cylinder line A and B thoroughly. The joints must be free of foreign material.
    - Install the cylinder line A and B by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque starting with the cylinder side nuts.



51. Grease the sliding surface of the rack guide and install it onto the gearbox housing.



52. Install the spring, rack guide screw and locknut on the gearbox housing.

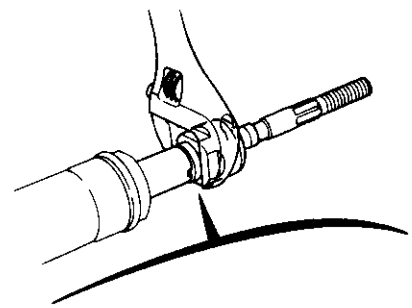
53. Adjust the rack guide screw (see page 17-21).

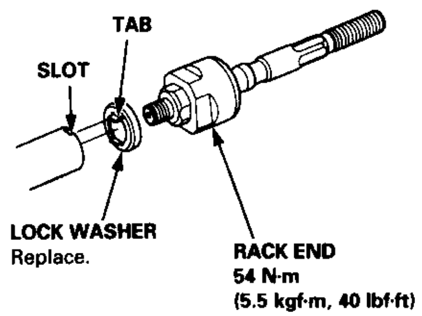
    NOTE: After adjusting, check that the rack moves smoothly by sliding to rack right and left.

54. Install the new lock washer in the groove in the steering rack.

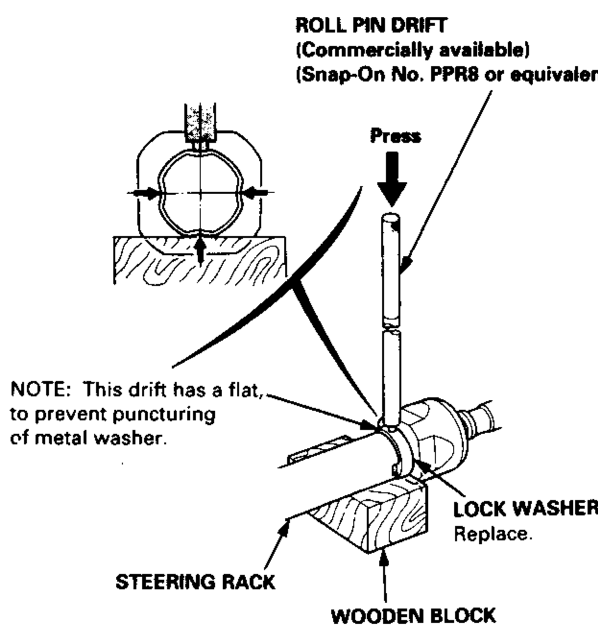
55. Screw each rack end into the rack.

56. Hold the left end of the steering rack with a wrench and tighten to the rack ends with another.



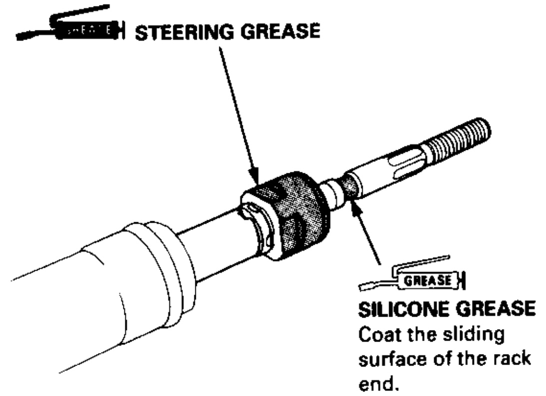


57. After tightening the rack end, stake the four sections of lock washer with a commercially available roll pin drift and a mallet.



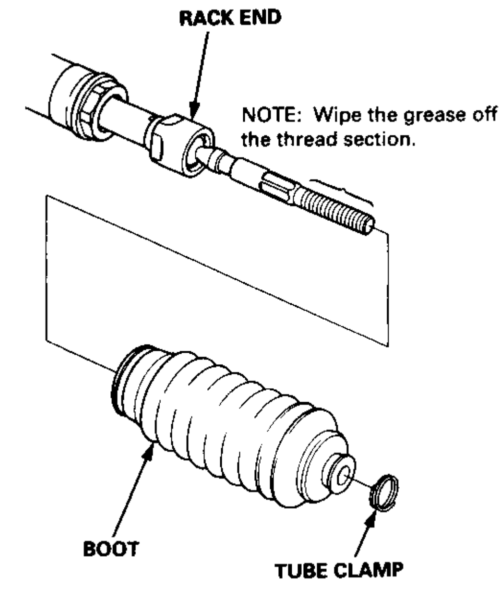
58. Apply steering grease to the circumference of the rack end housing.

59. Coat the rack end groove and inside of the boot with silicone grease.

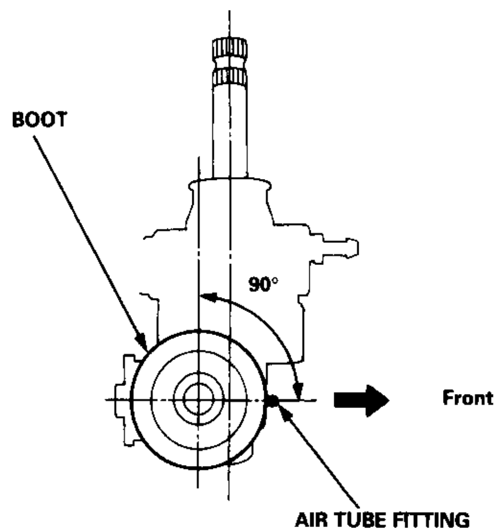


60. Install the boots in the rack end with the tube clamps.

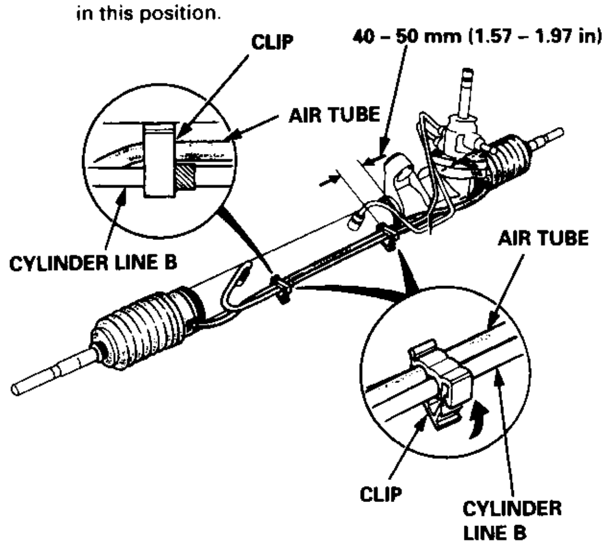
NOTE: Install the boots with the rack in the straight ahead position (right and left tie-rods are equal in length).



61. Adjust the air tube fitting position of the boots by turning it as shown below.



62. Connect the air tube between the right and left boot, then install the clips on the cylinder line B as shown.

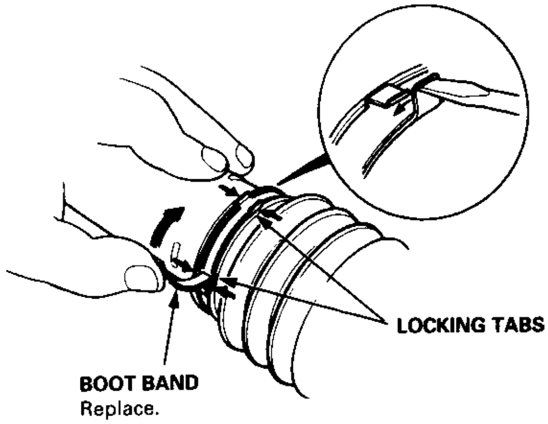


(cont'd)

Power Steering Gearbox

Reassembly (cont'd)

63. Install new boot bands on the boot and bend both sets of locking tabs.



64. Lightly tap on the doubled-over portions to reduce their height.

    CAUTION: Stake the band locking tabs firmly.

65. Slide the rack right and left to be certain that the boots are not deformed or twisted.

66. Install the right and left tie-rod ends on the rack ends.

Installation

CAUTION: Be careful not to bend or damage the power steering lines when installing the gearbox.

1. Before installing the gearbox, slide the rack all the way to right.

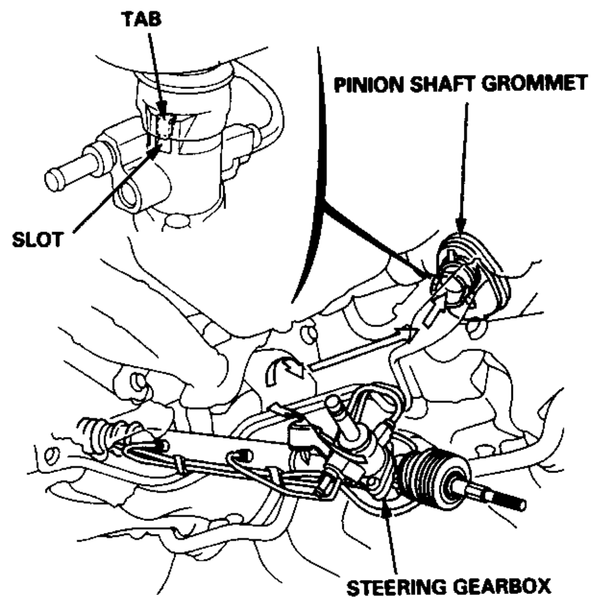
2. Pass the right side of the steering gearbox above and through the right side of the rear beam.

3. Hold the steering gearbox and slide the rack all the way to the right.

4. Raise the left side of the steering gearbox above and through the left side of the rear beam.

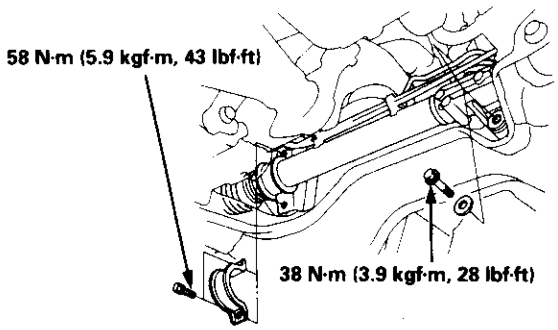
5. Install the pinion shaft grommet and insert the pinion shaft up through the bulkhead.

   NOTE: Align the tab on the pinion shaft grommet with the slot in the valve body.

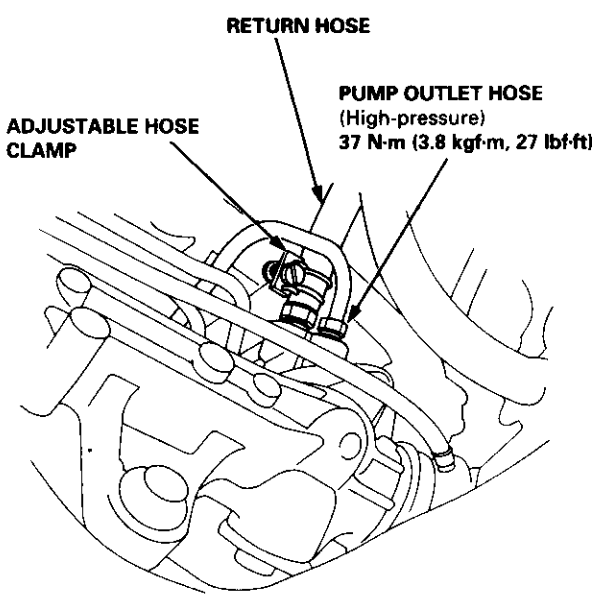


6. Install and tighten the gearbox mounting bolts.

   NOTE: After installing the gearbox, check the air tube connections for interference with adjacent parts.



7. Connect the power steering fluid lines to the valve body unit.



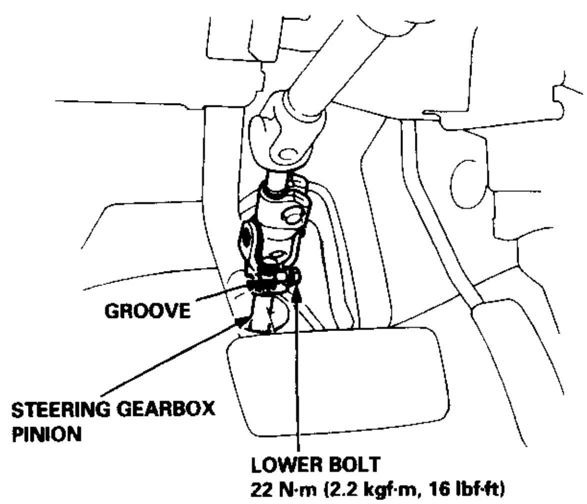
8. Center the steering rack within its stroke.

9. Before connecting the steering joint, perform the following operation.

   - Center the cable reel by first rotating it clockwise (approximately two turns) until the arrow mark on the label points straight up.

10. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft), and tighten the lower bolt.

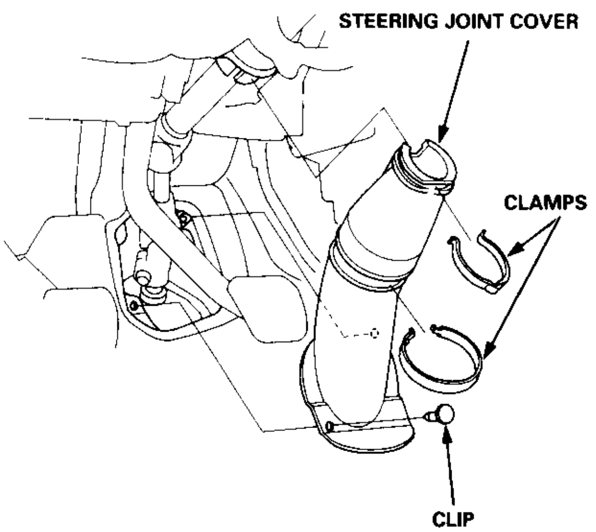
    NOTE:
    - Connect the steering shaft and pinion with the cable reel and steering rack centered.
    - Be sure that the lower steering joint bolt is securely in the groove in the steering gearbox pinion.
    - If the steering wheel and rack are not centered, reposition the serrations at lower end of the steering joint.



(cont'd)

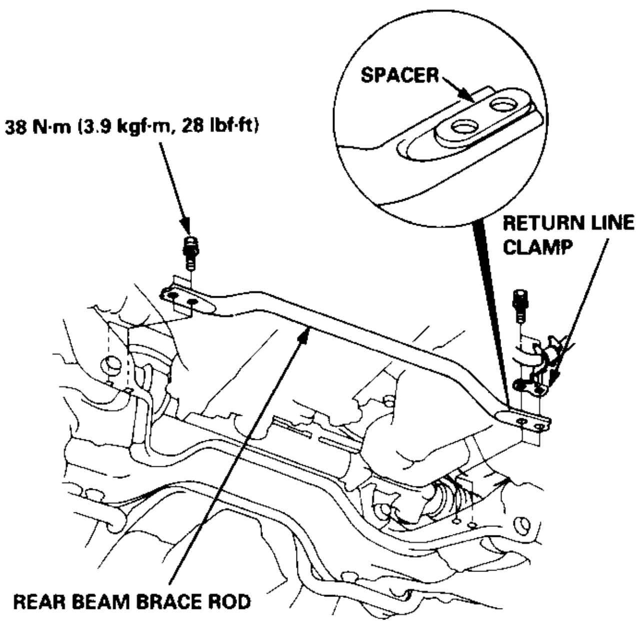
Installation (cont'd)

11. Install the steering joint cover with the clamps and clips.

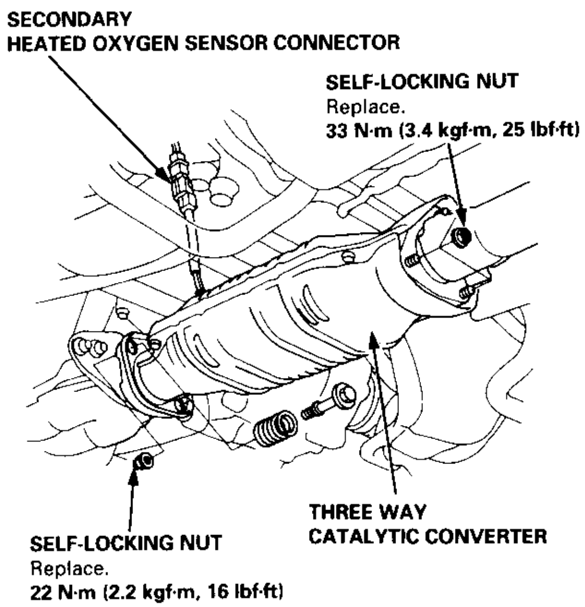


12. Install the rear beam brace rod and return line clamp on the rear beam.

    NOTE: Install the rear beam brace toward the return line clamp.

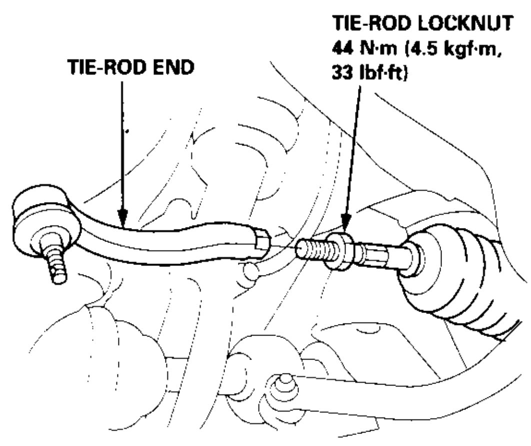


13. Install the three way catalytic converter with the new gaskets and new self-locking nuts, and connect the secondary heated oxygen sensor (HO2S) connector.

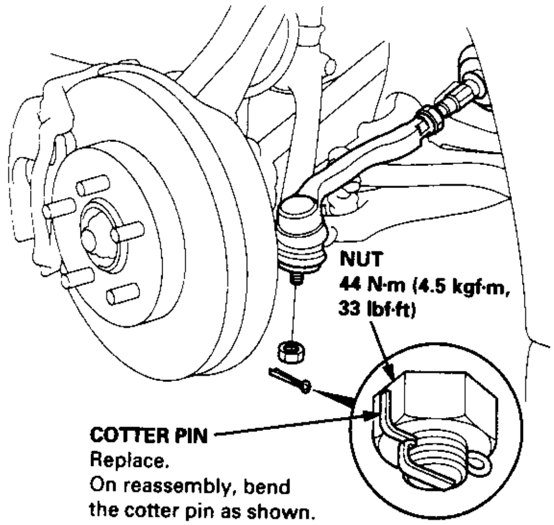


14. Connect the shift linkage (M/T model: see section 13, A/T model: see section 14).

15. Thread the right and left tie-rod ends onto the rack an equal number of turns.



16. Reconnect the tie-rod ends to the steering knuckles, tighten the nut to the specified torque, and install new cotter pins.



17. Install the front wheels.

18. Fill the system with power steering fluid and bleed air from the system (see page 17-21).

19. After installation, perform the following checks.

- Check the gearbox for leaks (see page 17-23).
- Adjust the front toe (see section 18).
- Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods equally, if necessary.

Ball Joint Boot Replacement

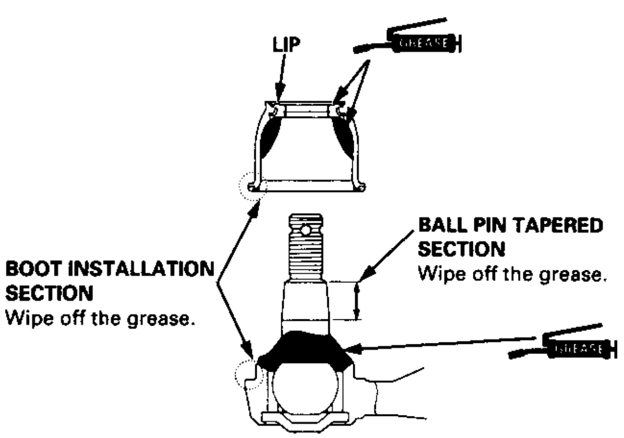
CAUTION: Do not contaminate the boot installation section with grease.

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.

2. Pack the lower area of the ball pin with fresh grease.

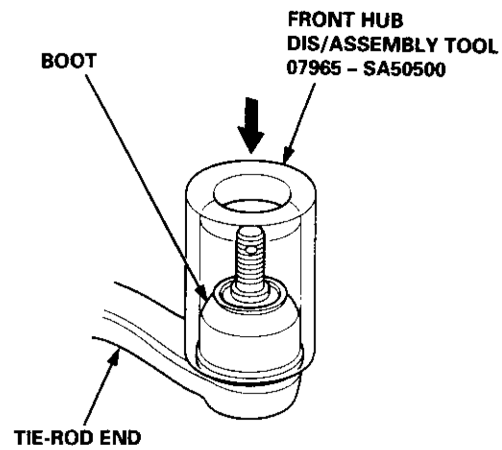
3. Pack the interior of the new boot and lip with fresh grease.

   CAUTION:
   - **Keep grease off the boot installation section and the tapered section if the ball pin.**
   - **Do not allow dust, dirt, or other foreign materials to enter the boot.**



4. Install the new boot using the special tool as shown below.

   NOTE: The boot must not be a gap at the boot installation sections.

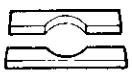


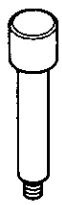
CAUTION: After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.

Suspension

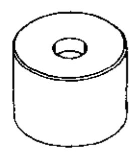
Special Tools

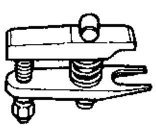
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF – SD40700	Hub/Dis Assembly Base	2	18-14
②	07GAF – SE00100	Hub Dis/Assembly Tool	1	18-14, 15
③	07GAG – SD40700	Ball Joint Boot Clip Guide	1	18-18, 19
④	07JAF – SH20200	Ball Joint Remover Base	1	18-18
⑤	07MAC – SL00200	Ball Joint Remover, 28 mm	1	18-12, 13
⑥	07746 – 0010500	Attachment, 62 x 68 mm	1	18-14, 15
⑦	07749 – 0010000	Driver	1	18-14, 15
⑧	07965 – SB00100	Ball Joint Remover/Installer	1	18-17
⑨	07965 – SB00200	Ball Joint Installer Base	1	18-17
⑩	07965 – SD90100	Support Base	1	18-14, 15
⑪	07974 – SA50700	Ball Joint Boot Clip Guide	1	18-19

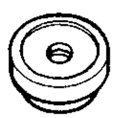

①


②

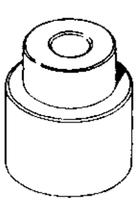

③ ⑪

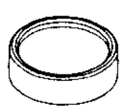

④

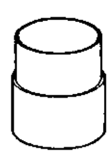

⑤


⑥


⑦


⑧

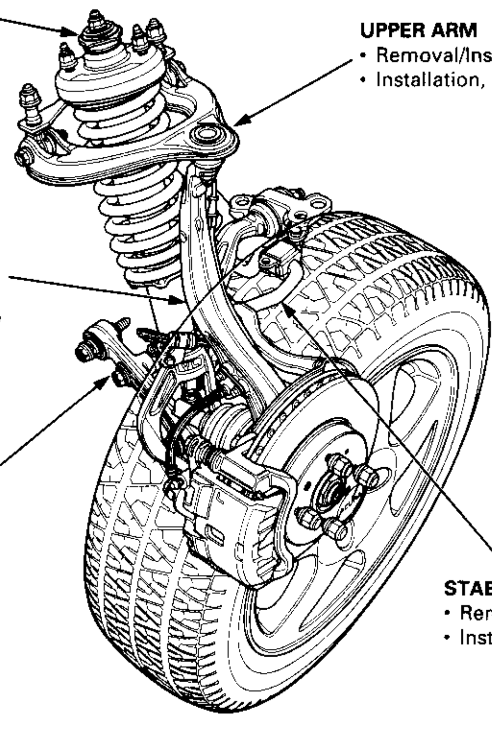

⑨


⑩

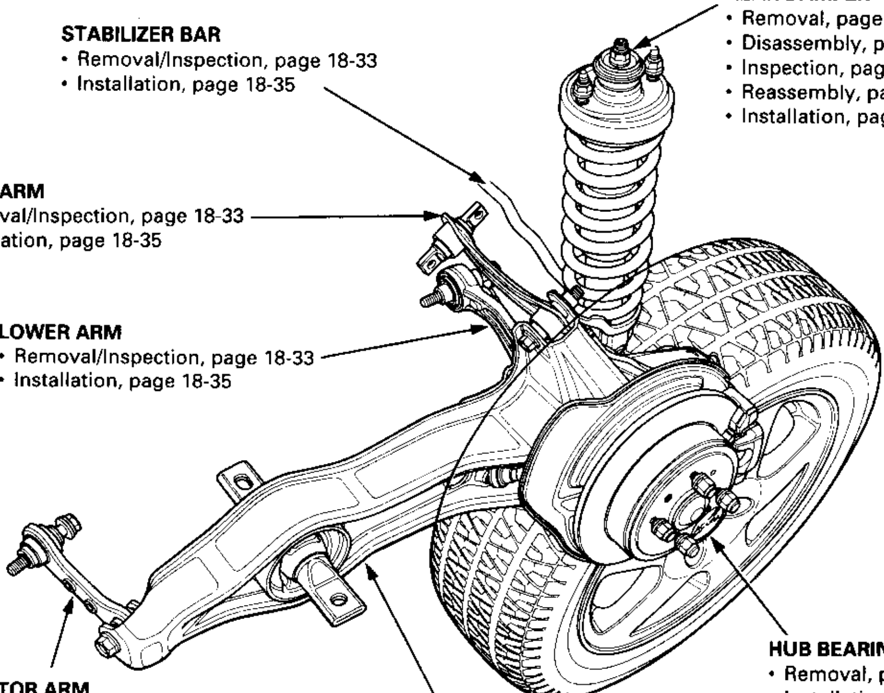
Index

Wheel Alignment, page 18-4

Front Suspension:



Rear Suspension:

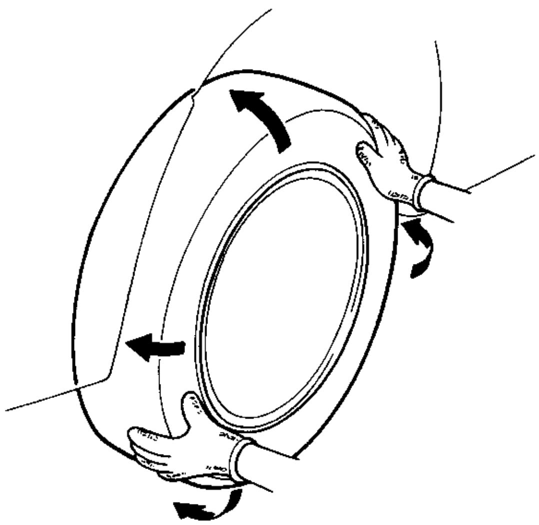


Wheel Alignment

Caster

NOTE: For proper inspection/adjustment of the wheel alignment check and adjust the following before checking the alignment.

- Check that the suspension is not modified.
- Check the tire size and tire pressure.
- Check the runout of the wheels and tires.
- Check the suspension ball joints. (Hold a wheel with your hands and move it up and down and right and left to check for wobbling.)



Inspection

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Check the caster angle.

   Caster angle: 1°10′ ± 1°

2. If out of specification, check for bent or damaged suspension components.

Camber

Inspection

NOTE: Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Check the camber angle.

   Camber angle:
   Front:
   Type R Model: −0°30′ ± 1°
   All except Type R Model: −0°10′ ± 1°
   Rear: $-0°45'^{+0°45'}_{-1°15'}$

2. If out of specification, check for bent or damaged suspension components.

Front Toe Inspection/Adjustment

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

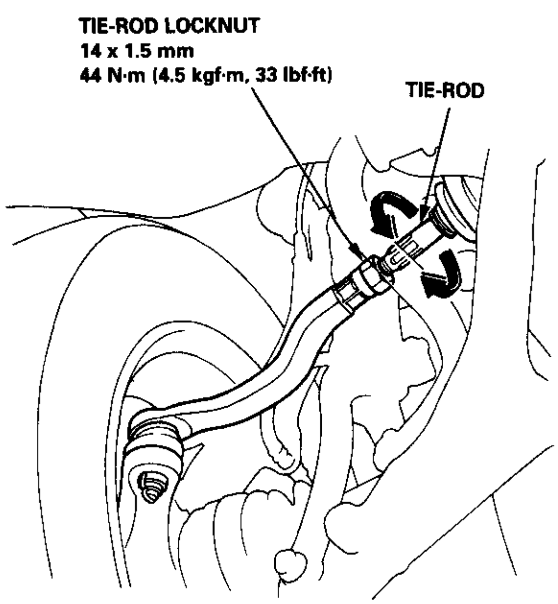
1. Check the tire pressure.
2. Center steering wheel spokes.
3. Check the toe with the wheels pointed straight ahead.

   Front toe: 0 ± 2 mm (0 ± 1/16 in)

   — If adjustment is required, go on to step 4.

   — If no adjustment is required, remove alignment equipment.
4. Loosen the tie-rod locknuts and turn both tie-rods in the same direction until the front wheels are in straight ahead position.
5. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
6. After adjusting, tighten the tie-rod locknuts.

   NOTE: Reposition the tie-rod boot if it is twisted or displaced.



Rear Toe Inspection/Adjustment

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

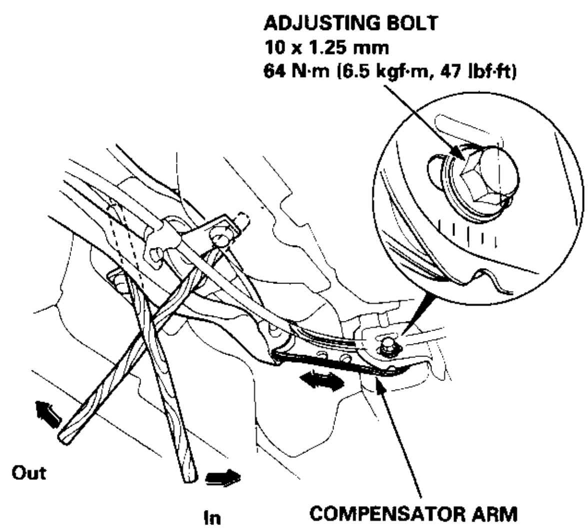
1. Release parking brake.

   NOTE:
   - Measure difference in toe measurements with the wheels pointed straight ahead.
   - If the parking brake is engaged, you may get an incorrect reading.

   Rear toe-in: 2^{+2}_{-1} mm (1/16 ± 1/16 in)

   — If adjustment is required, go to step 2.

   — If no adjustment is required, remove alignment equipment.
2. Before adjustment, note the locations of adjusting bolts on the right and left compensator arms.
3. Loosen the adjusting bolts and slide the compensator arm in or out as shown, to adjust the toe.
4. Tighten the adjusting bolts.



- Example:
  After the rear toe inspection, the wheel is 2 mm (0.08 in) out of the specification.

— Move the arm so the adjusting bolt moves 2 mm (0.08 in) inward from the position recorded before the adjustment.

— The distance the adjusting bolt is moved should be equal to the amount out-of-specification.

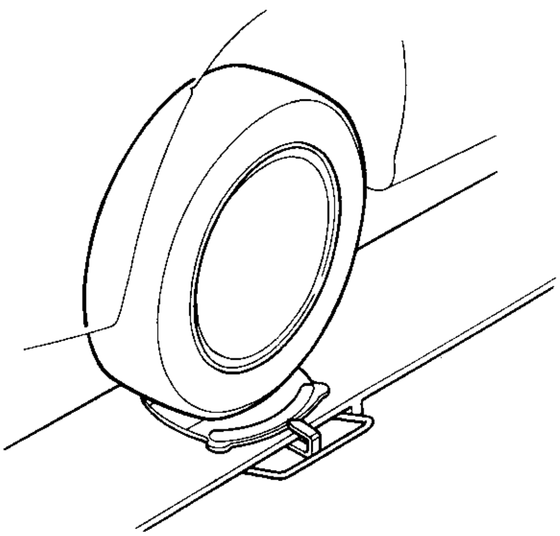
Wheel Alignment

Turning Angle Inspection

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

   Turning angle:
   Inward wheel: 36°00' ± 2°
   Outward wheel: 30°30'(reference)



2. If the turning angle is not within the specifications, check for bent or damaged suspension components.

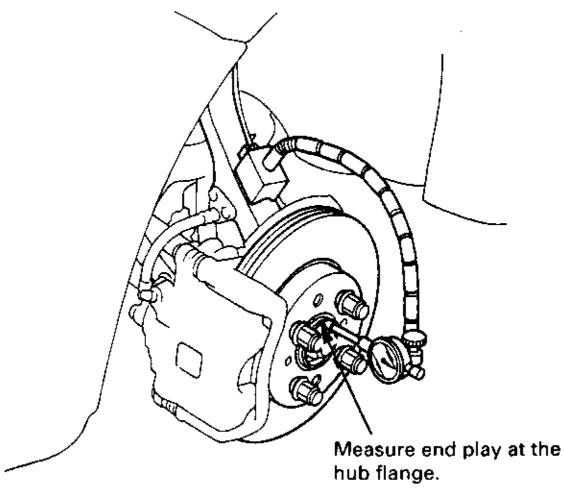
Wheel/Hub Inspection

Bearing End Play

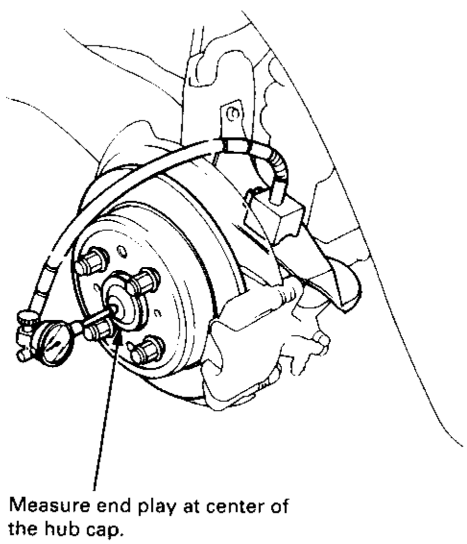
1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge as shown.
4. Measure the bearing end play by moving the disc in or outward.

Front/Rear:
Standard: 0 – 0.05 mm (0 – 0.002 in)

Front:



Rear:

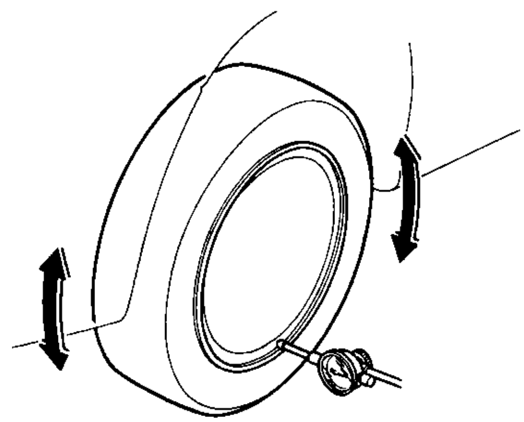


5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

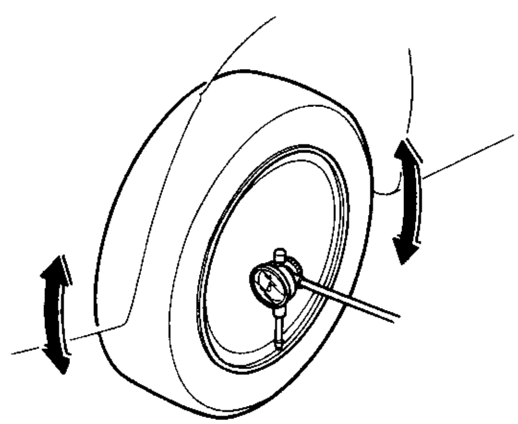
Wheel Runout

1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Check for bent or deformed wheels.
3. Attach the dial gauge as shown.
4. Measure the wheel runout by turning the wheel.

Front and Rear Wheel Axial Runout:
Standard:
Steel Wheel: 0 – 1.0 mm (0 – 0.04 in)
Aluminum Wheel: 0 – 0.7 mm (0 – 0.03 in)
Service Limit: 2.0 mm (0.08 in)



Front and Rear Wheel Radial Runout:
Standard:
Steel Wheel: 0 – 1.0 mm (0 – 0.04 in)
Aluminum Wheel: 0 – 0.7 mm (0 – 0.03 in)
Service Limit: 1.5 mm (0.06 in)



5. If the wheel runout is more than the service limit, replace the wheel.

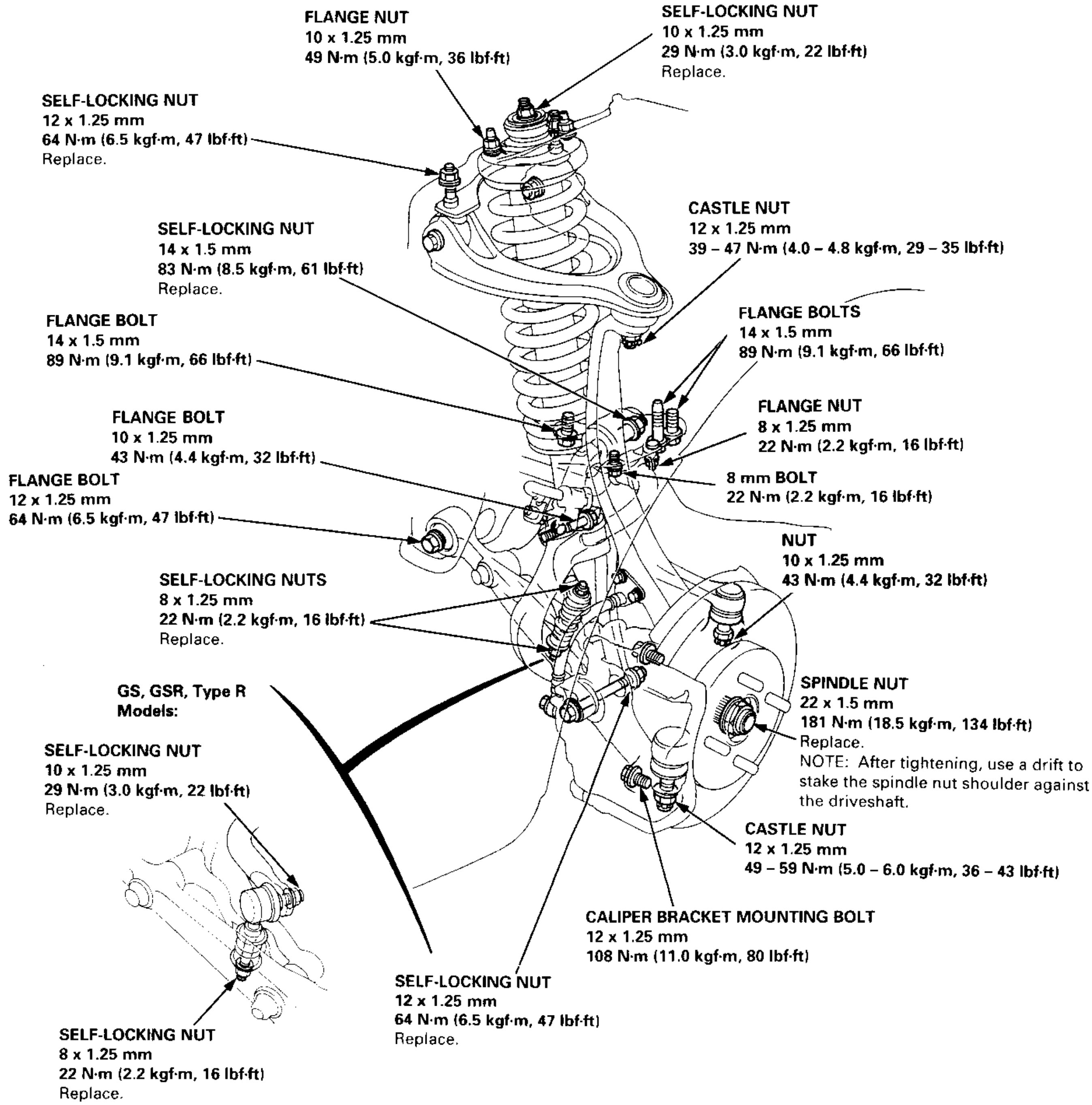
Front Suspension

Torque Specifications

CAUTION:

- **Replace the self-locking nuts after removal.**
- **The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.**
- **Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.**

NOTE: Wipe off the grease before tightening the nut at the ball joint.

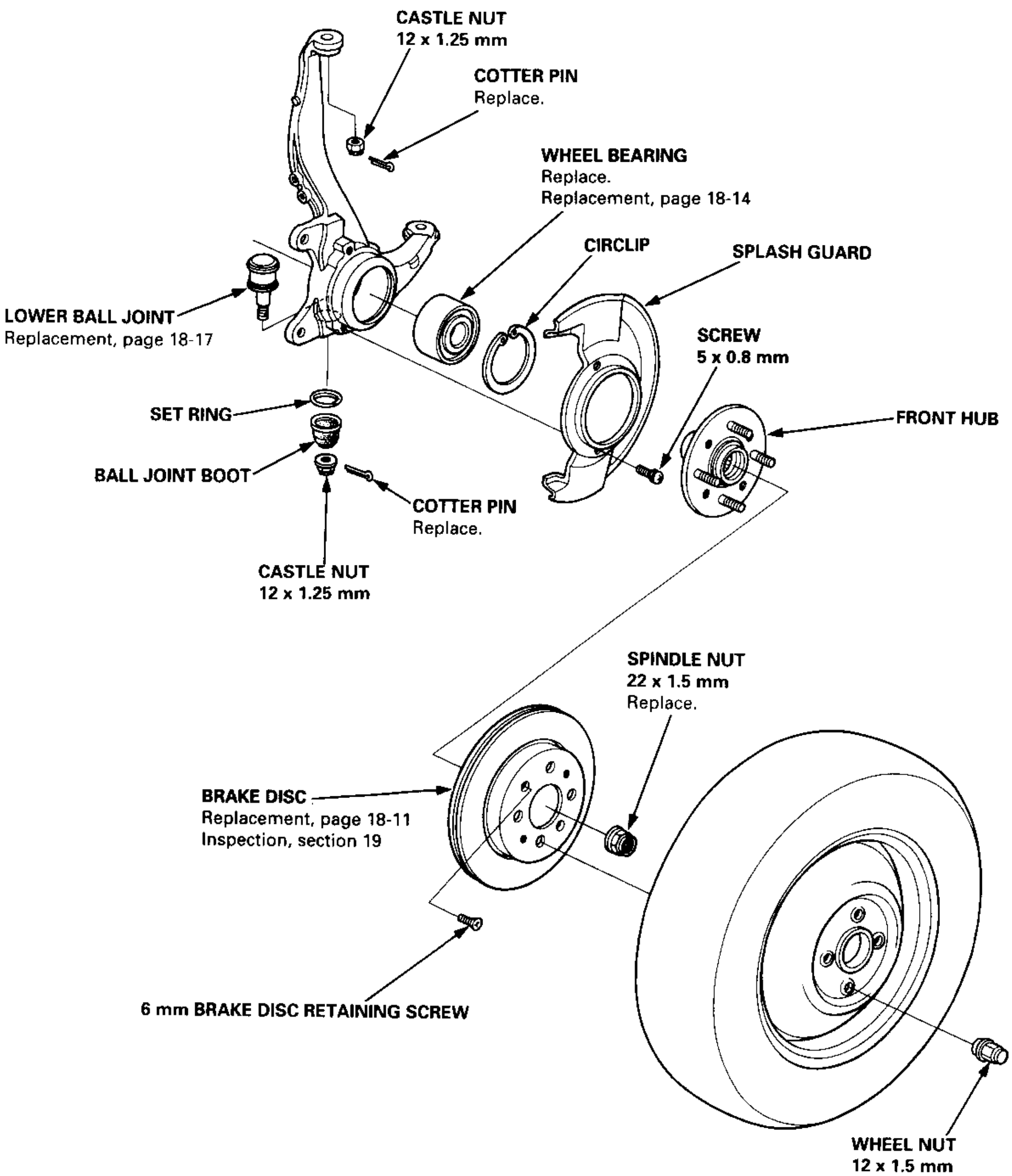


Illustrated Index

Note these items during installation:

- Before installing the brake disc, clean the mating surfaces of the front hub and the brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.

All except Type R Models:



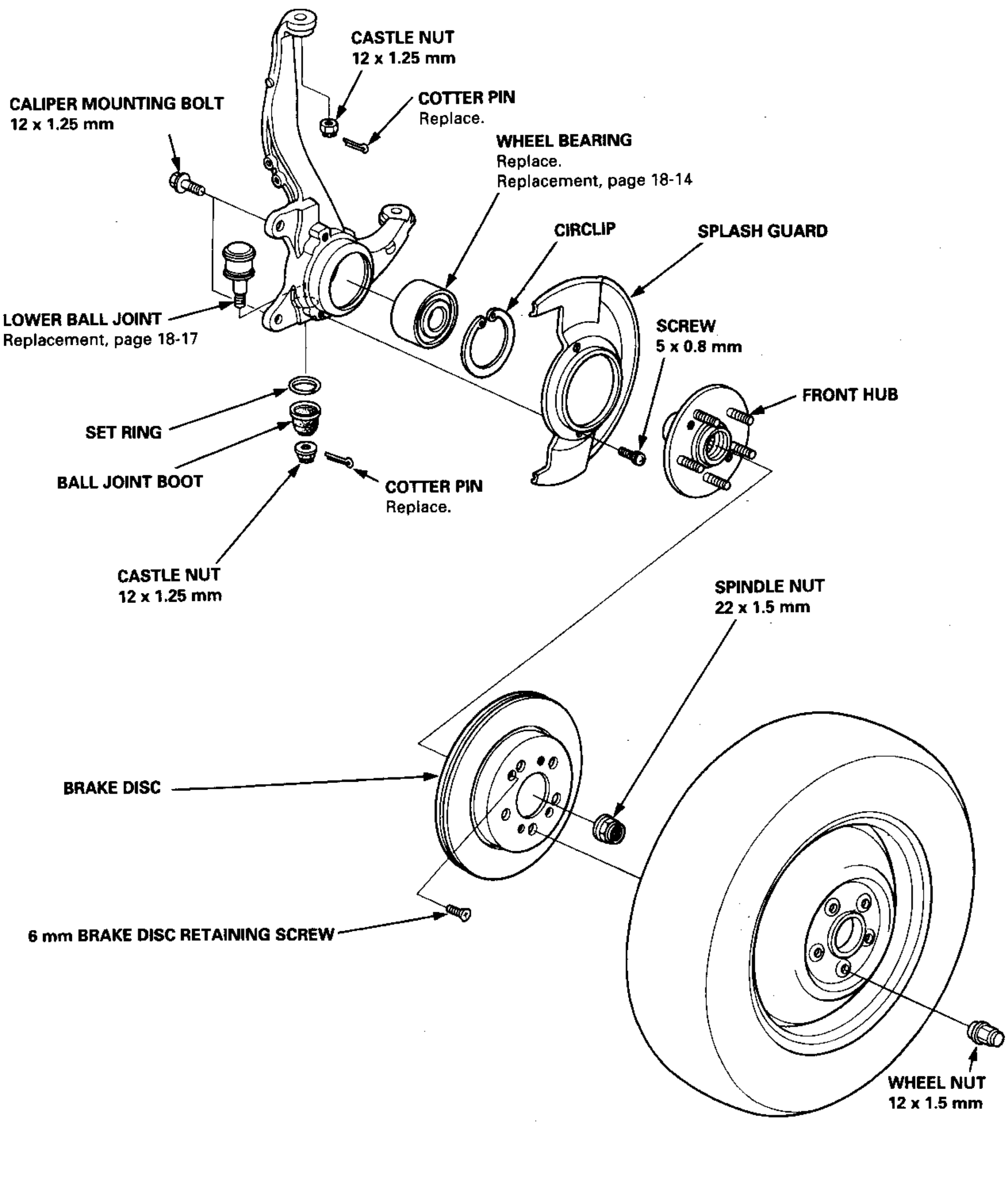
(cont'd)

Illustrated Index

Note these items during replacement:

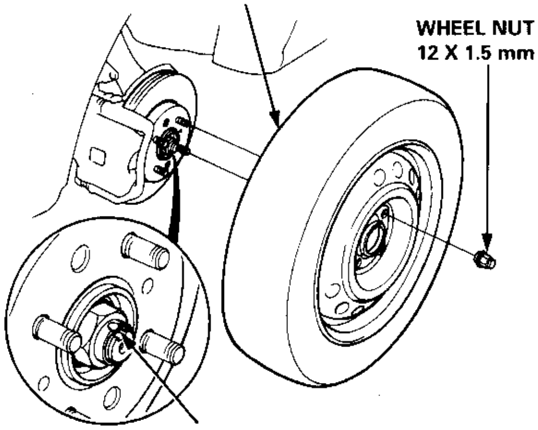
- Before installing the brake disc, clean the mating surfaces of the front hub and brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and wheel.

Type R Model:



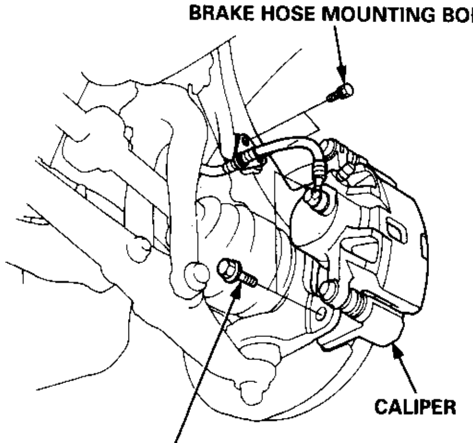
Knuckle Removal

1. Loosen the wheel nuts slightly.
2. Raise the front of vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and front wheel.

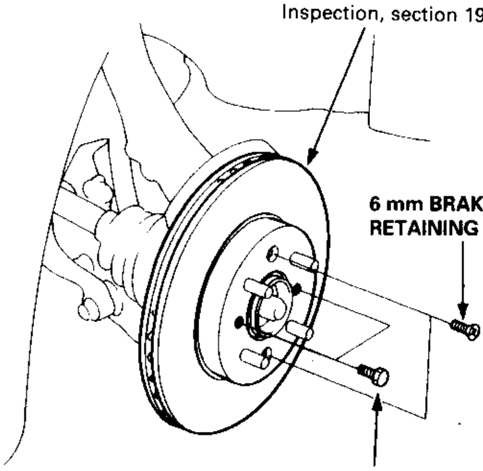


4. Raise the locking tab on the spindle nut, then remove the nut.
5. Remove the brake hose mounting bolts.
6. Remove the caliper bracket mounting bolts, and hang the caliper to one side.

   CAUTION: To prevent accidental damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.



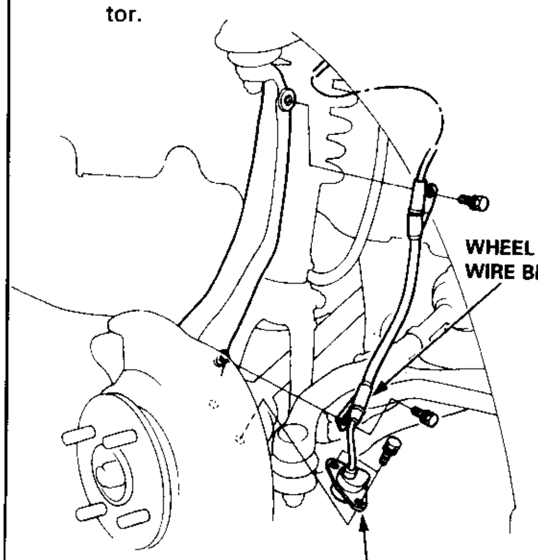
7. Remove the 6 mm brake disc retaining screws.



8. Screw the two 8 x 1.25 mm bolts into the disc to push it away from the hub.

   NOTE: Turn each bolt two turns at a time to prevent cocking the disc excessively.
9. Remove the brake disc from the knuckle.
10. Check the front hub for damage or cracks.
11. Remove the wheel sensor wire bracket, then remove the wheel sensor from the knuckle (for vehicles with ABS).

    NOTE: Do not disconnect the wheel sensor connector.



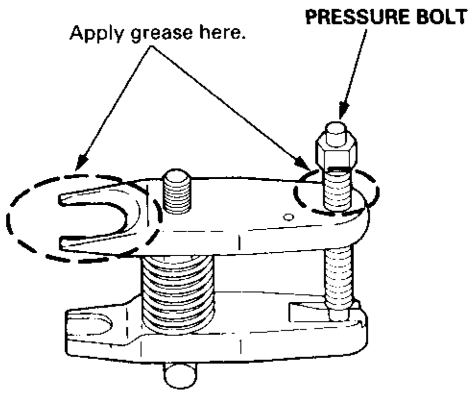
(cont'd)

Knuckle/Hub (cont'd)

NOTE: Use ball joint remover, 28 mm, to separate the ball joints from the suspension or tie-rod end.

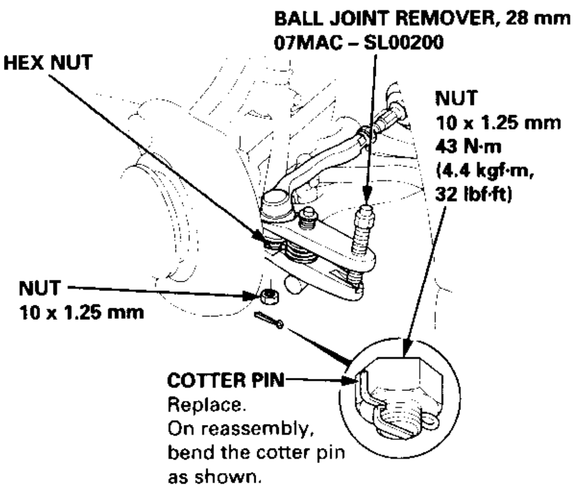
CAUTION: Be careful not to damage the ball joint boot.

12. Clean any dirt or grease off the ball joint.
13. Remove the cotter pin from the tie-rod end ball joint castle nut, and remove the nut.
14. Apply grease to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt threads.

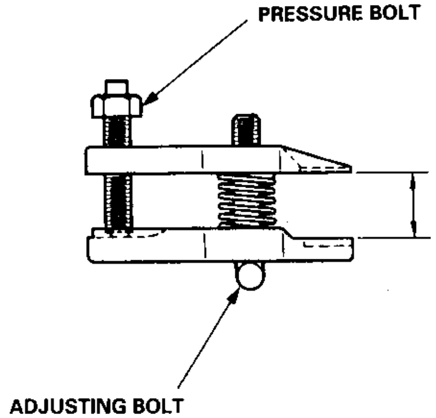


15. Install a 10 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end to prevent damage to the threaded end of the ball joint.
16. Install the special tool as shown.
    Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



17. Once the tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt, and recheck the jaws to make sure they are still parallel.



18. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

    WARNING Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris in your eyes.

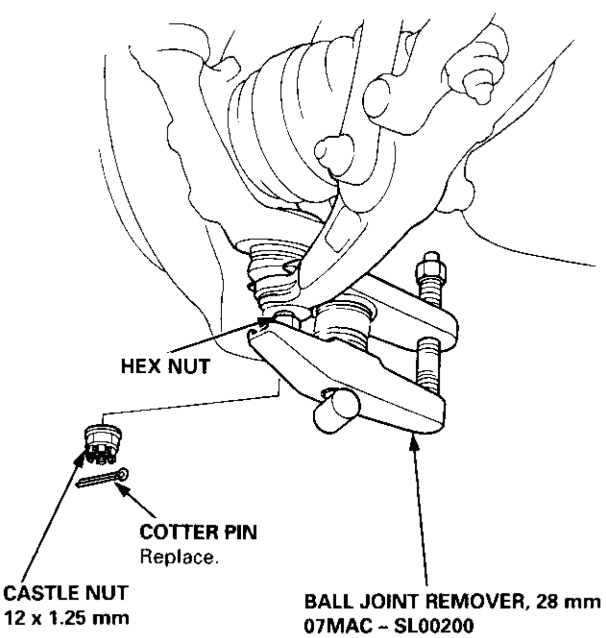
19. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot, and replace it if damaged.

20. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.

21. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

22. Use the special tool as shown on page 18-12 to separate the ball joint and lower arm.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

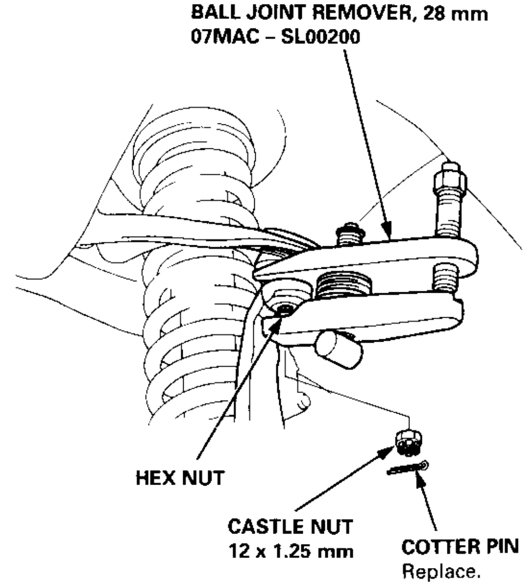


23. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.

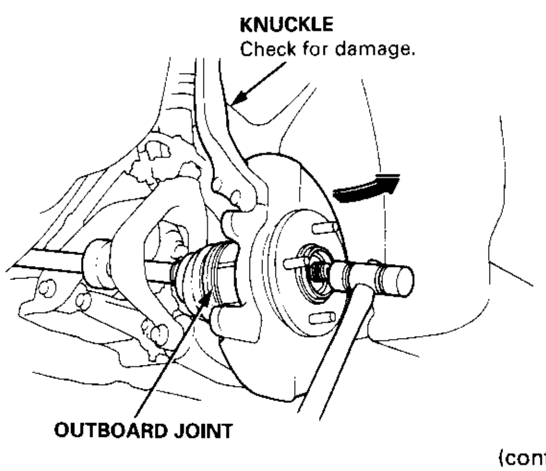
24. Install the 12 mm hex nut on the ball joint.
    Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

25. Use the special tool as shown on page 18-12 to separate the ball joint and knuckle.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



26. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle using a plastic hammer, then remove the knuckle.



(cont'd)

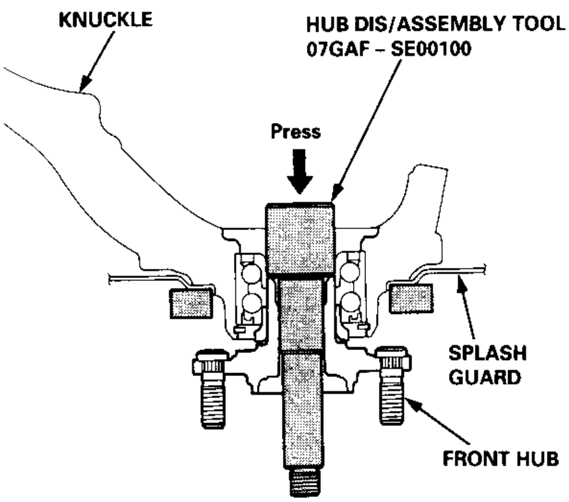
Knuckle/Hub (cont'd)

Wheel Bearing Replacement

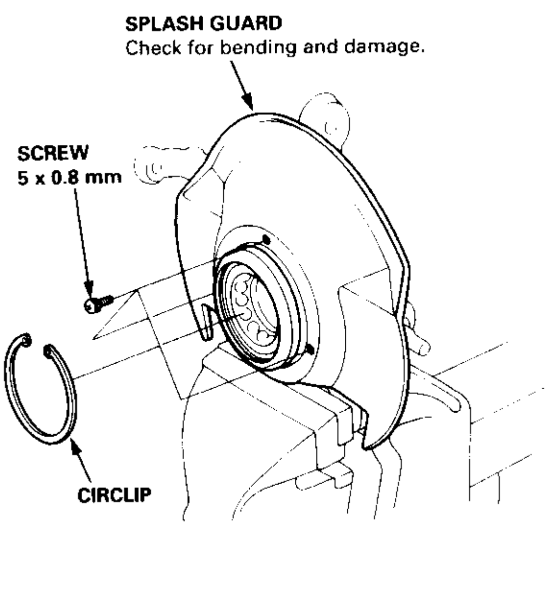
NOTE: Replace the bearing with a new one after removal.

1. Separate the front hub from the knuckle using the special tools and a press as shown.

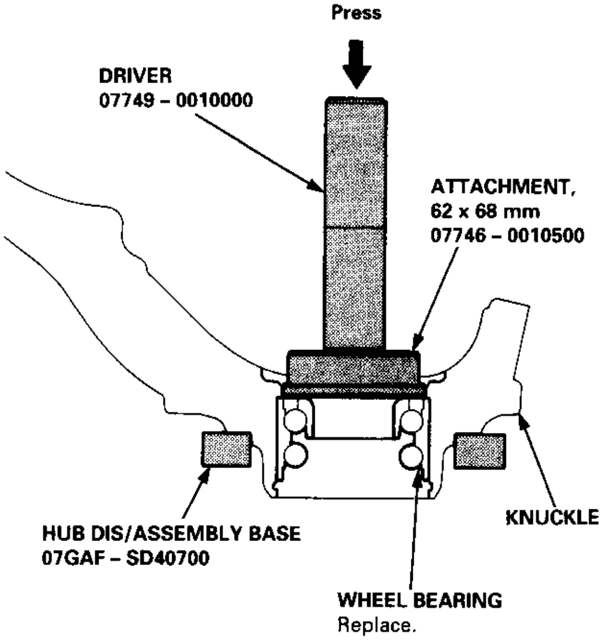
   CAUTION:
   - **Take care not to distort the splash guard.**
   - **Hold onto the hub to keep it from falling when pressed clear.**



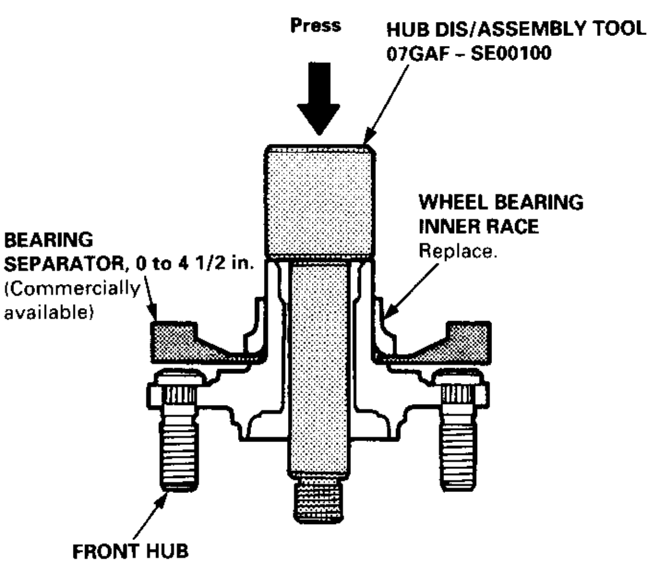
2. Remove the circlip and the splash guard from the knuckle.



3. Press the wheel bearing out of the knuckle using the special tools and a press as shown.



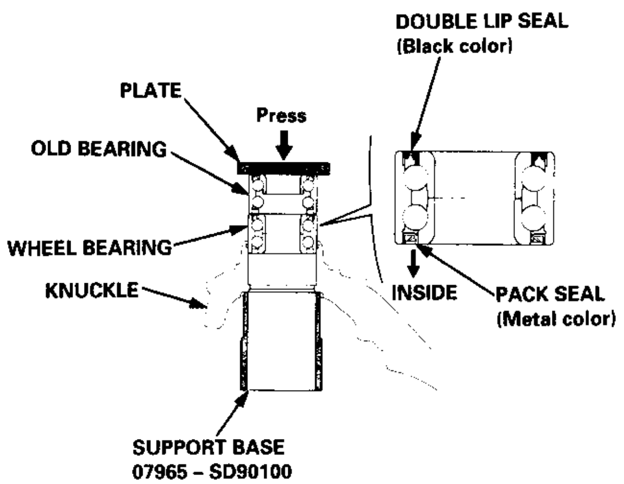
4. Remove the wheel bearing inner race from the front hub using the special tool and a commercially-available bearing separator as shown.



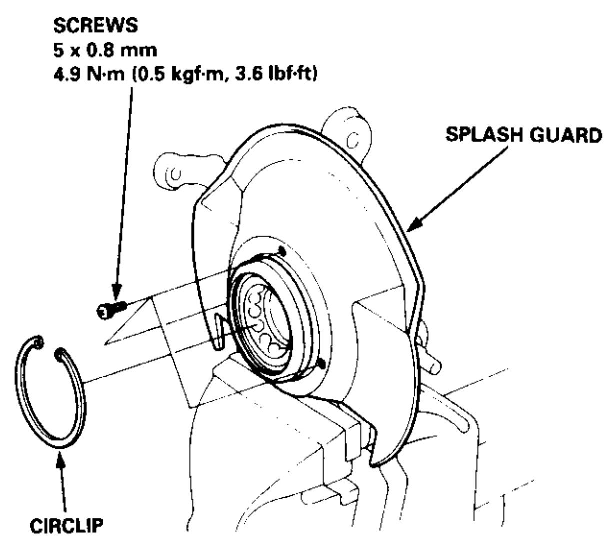
NOTE: Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

5. Press a new wheel bearing into the knuckle using the old bearing, a plate and a press.

   NOTE: Press the wheel bearing into the knuckle with the pack seal (metal color) toward the inside. Be careful not to damage the sleeve of the pack seal.



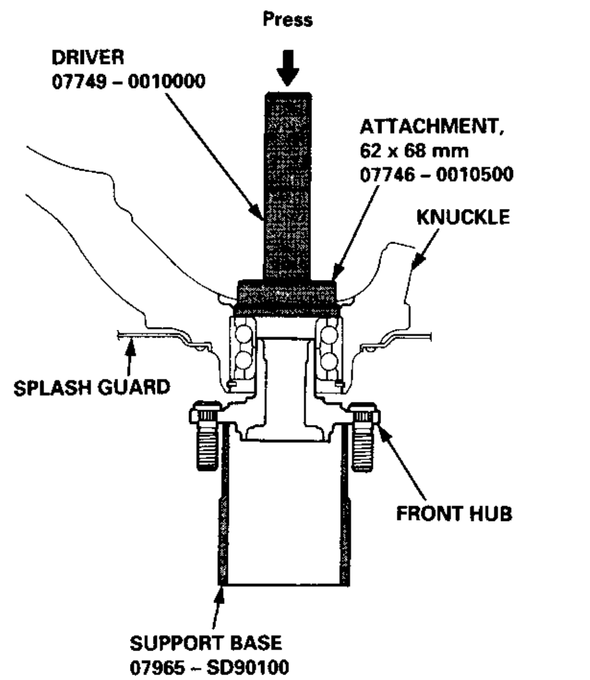
6. Install the circlip securely in the knuckle groove.



7. Install the splash guard and tighten the screws.

8. Install the front hub on the knuckle using the special tools and a press as shown.

   CAUTION: Take care not to distort the splash guard.



(cont'd)

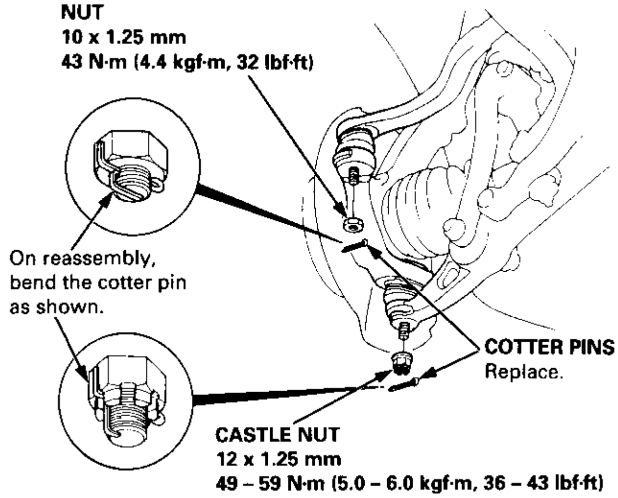
Knuckle Installation

1. Install the knuckle on the driveshaft.

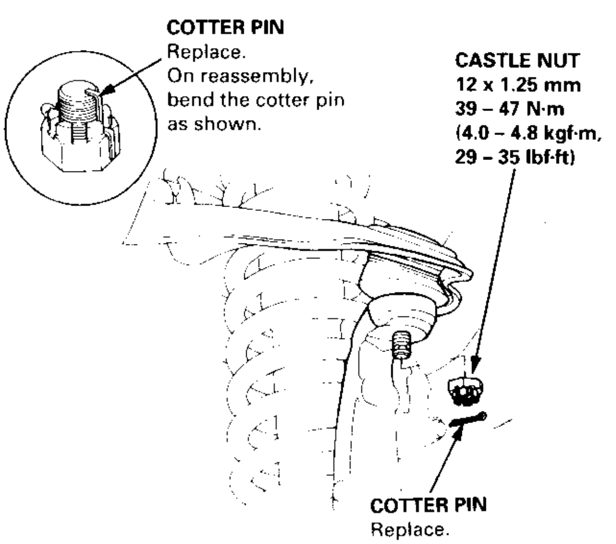
2. Install the knuckle on the lower arm and the tie-rod, then tighten the nuts and install new cotter pins.

   CAUTION:
   - **Be careful not to damage the ball joint boot.**
   - **Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.**

   NOTE: Wipe off the grease before tightening the nut at the ball joint.



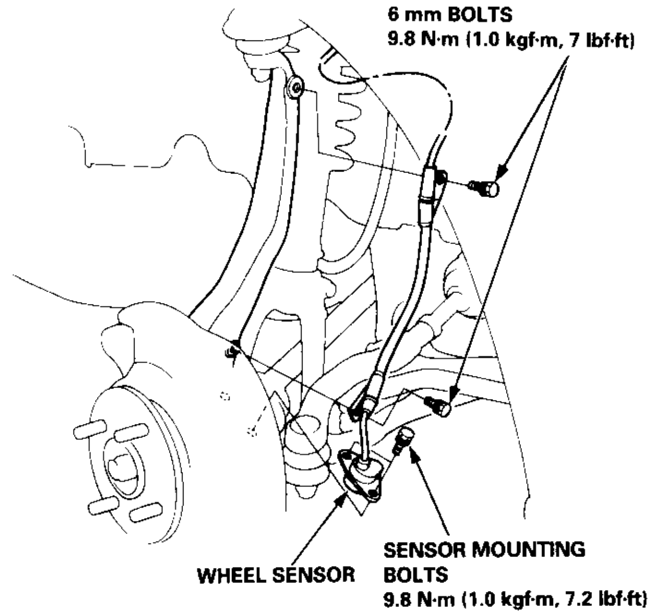
3. Install the knuckle on the upper arm, then tighten the castle nut and install a new cotter pin.



4. Install the wheel sensor with the sensor mounting bolts (for vehicles with ABS).

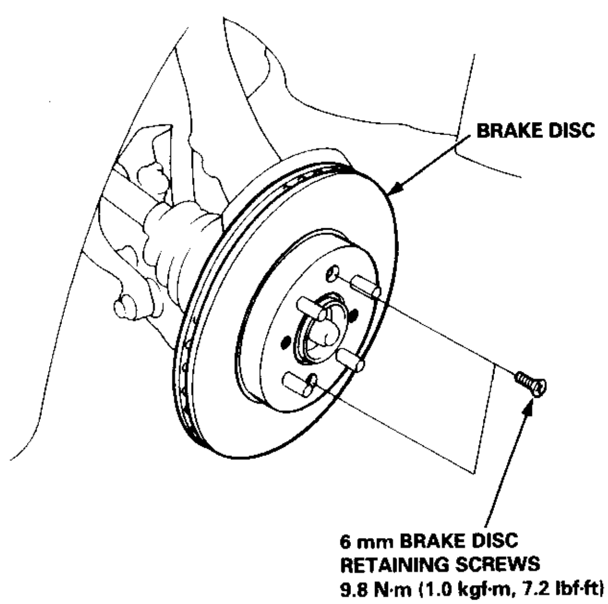
5. Install the sensor wire with the two 6 mm bolts (for vehicles with ABS).

   NOTE: Be careful when installing the sensors to avoid twisting wires.



6. Install the brake disc with the 6 mm brake disc retaining screws.

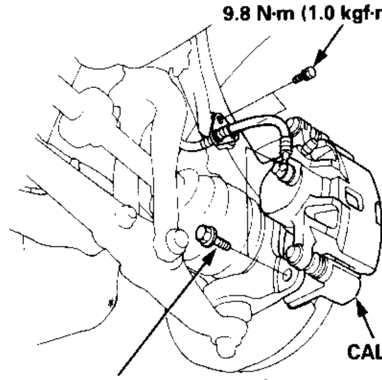
   NOTE: Before installing the brake disc, clean the mating surfaces of the front hub and the brake disc.



7. Install the brake caliper with the caliper bracket mounting bolts.

8. Install the brake hose with the brake hose mounting bolts.

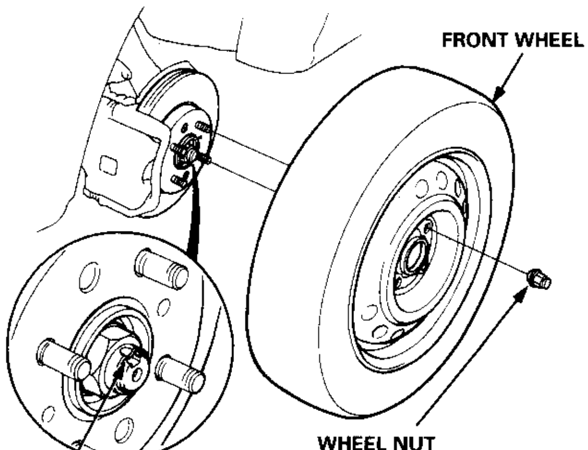
CAUTION: Be careful not to twist the hose more than necessary.



9. Install a new spindle nut, then tighten the nut.

10. Install the wheel with the wheel nuts.

NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.



11. Check the front wheel alignment and adjust if necessary (see page 18-4).

Lower Ball Joint Replacement

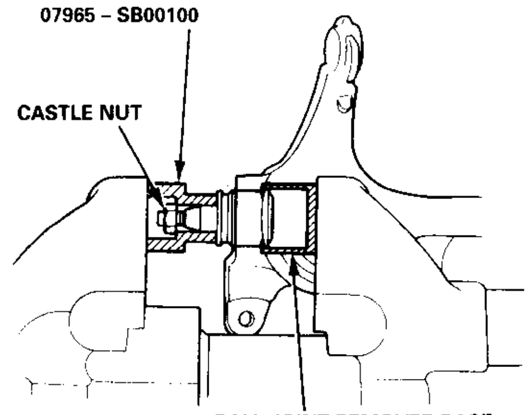
1. Remove the knuckle (see page 18-11).

2. Remove the boot by prying the set ring off.

3. Check the boot for deterioration and damage, replace if necessary.

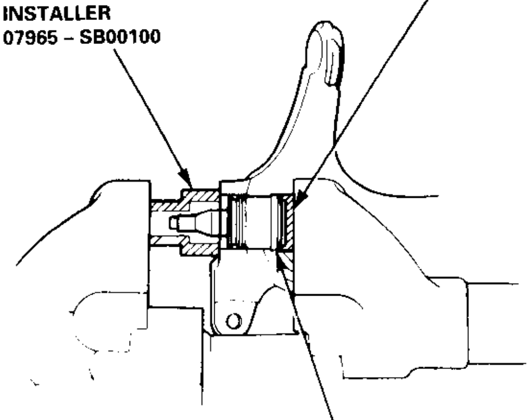
4. Install the special tools on the ball joint and tighten the castle nut.

5. Position the special tools over the ball joint as shown then set the assembly in a vise. Press the ball joint out of the knuckle.



6. Place the ball joint in position by hand.

7. Install the special tools over the ball joint as shown, then press the ball joint in.

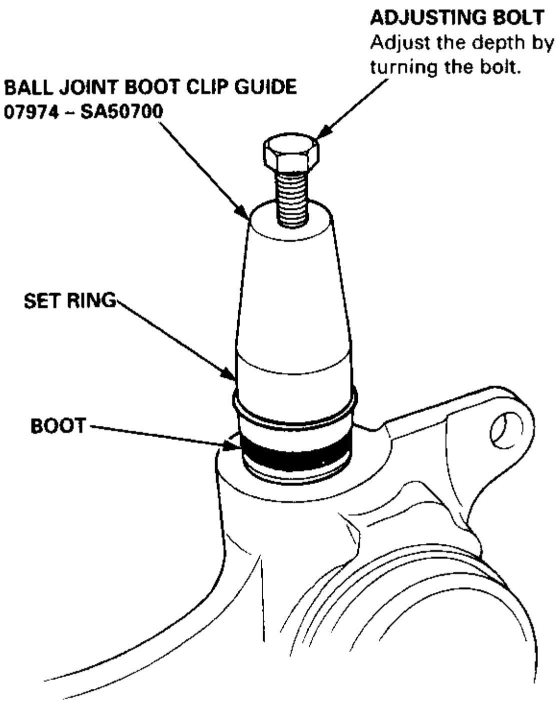


(cont'd)

Front Suspension

Lower, Ball Joint Replacement (cont'd)

8. Install the ball joint boot and set ring using the special tool.



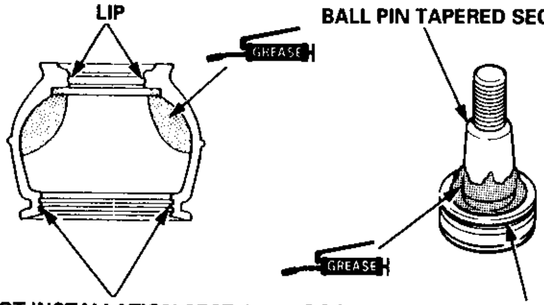
9. Install the knuckle (see page 18-16).
10. Check the front wheel alignment and adjust if necessary (see page 18-4).

Ball Joint Boot Replacement

1. Remove the boot set ring.

   CAUTION: Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.



3. Wipe the grease off the sliding surface of the ball pin and pack with fresh grease.

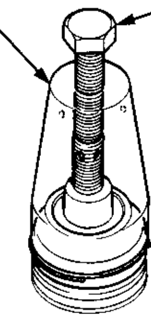
   CAUTION:
   - **Keep grease off the boot installation section and the tapered section of the ball pin.**
   - **Do not allow dust, dirt, or other foreign materials to enter the boot.**

4. Install the boot in the groove of the boot installation section securely, then bleed air.

5. Install the upper and lower ball joint boot set rings using the special tools as follows:

   Lower ball joint: Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the set ring over the tool and into position.

   Upper ball joint: Hold the tool over the ball joint, then slide the set ring over the tool and into position.



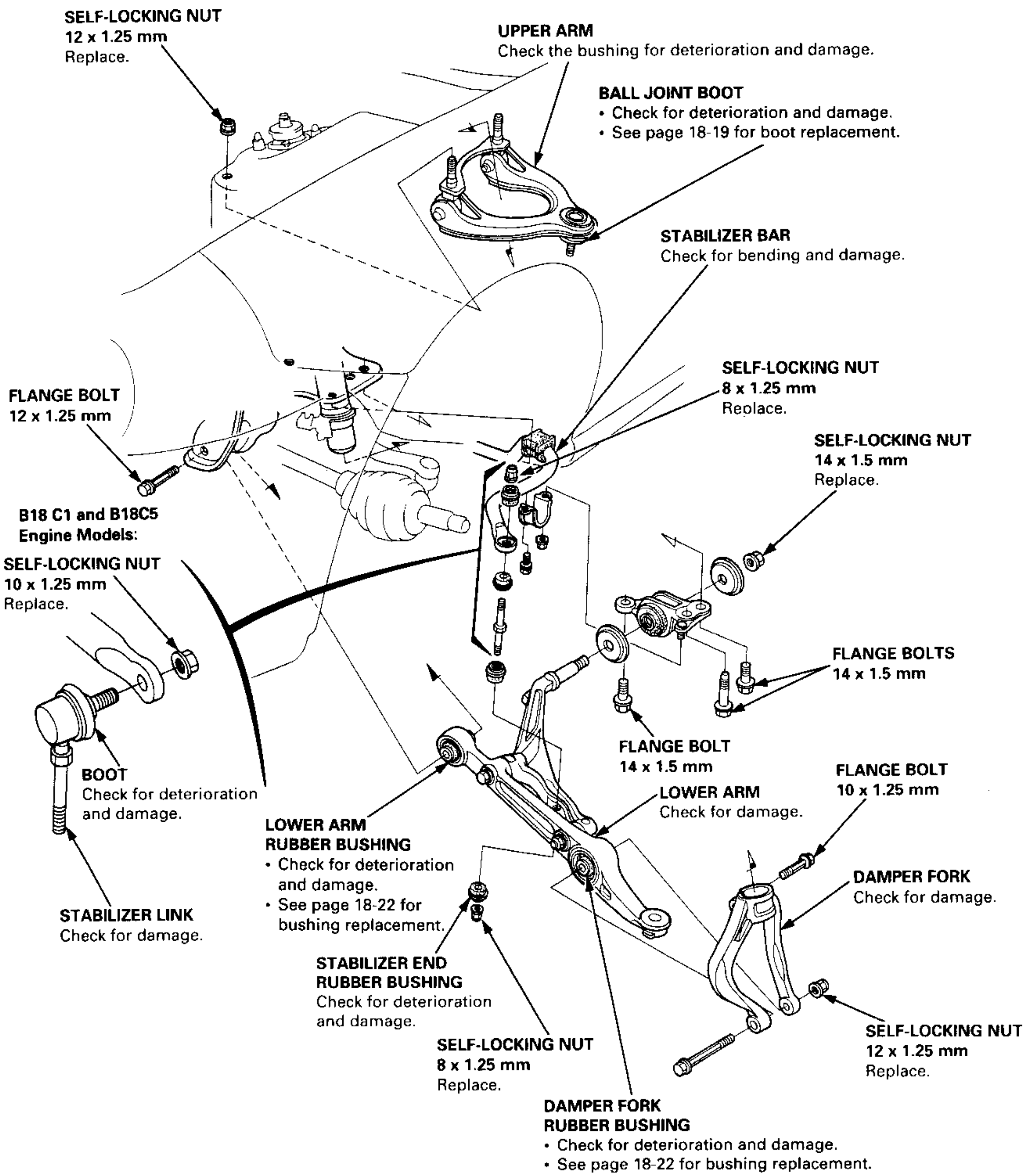
CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

Front Suspension

Suspension Arms

Removal/Inspection

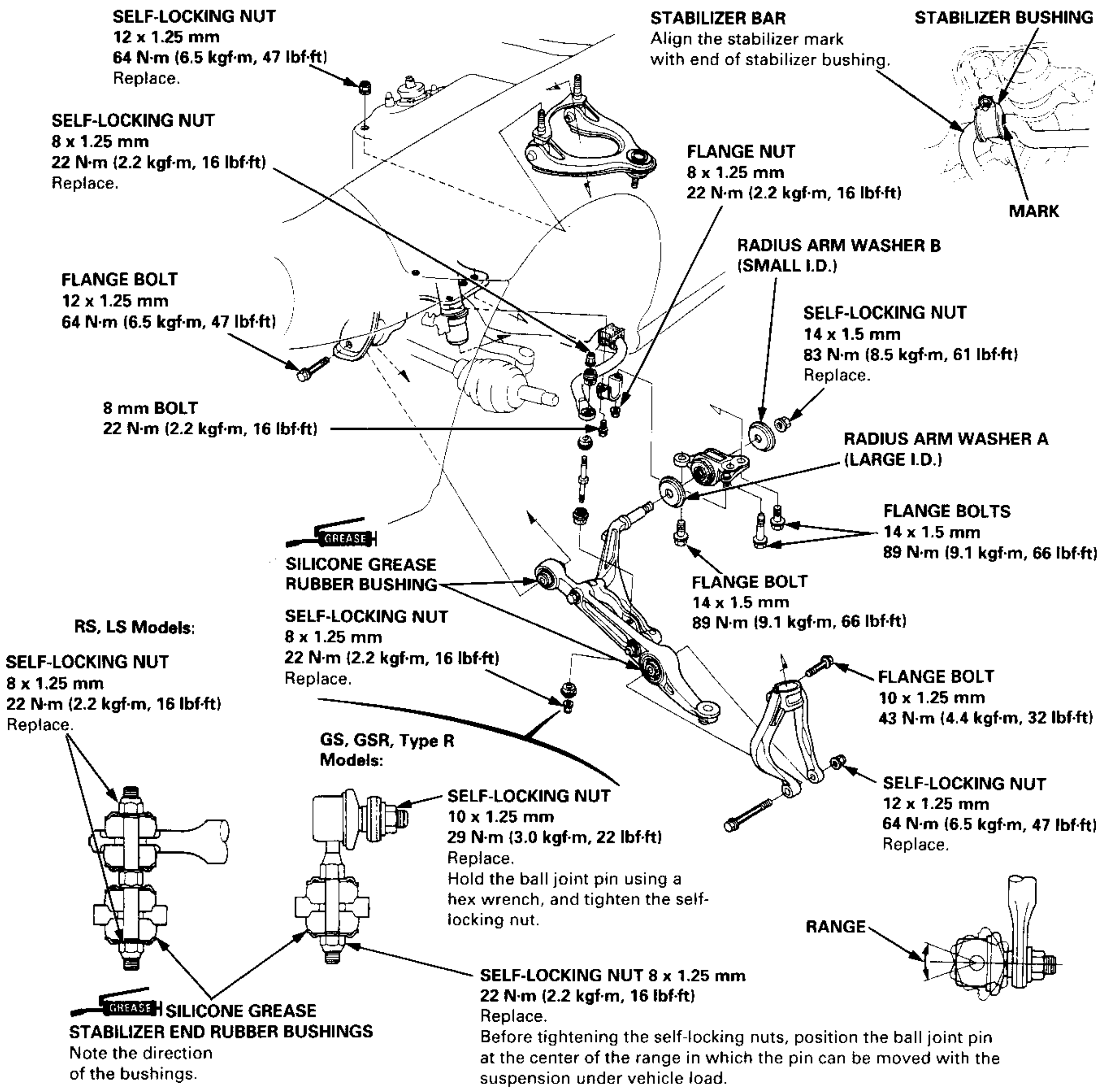
CAUTION:
- **Replace the self-locking nuts after removal.**



Installation

CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.

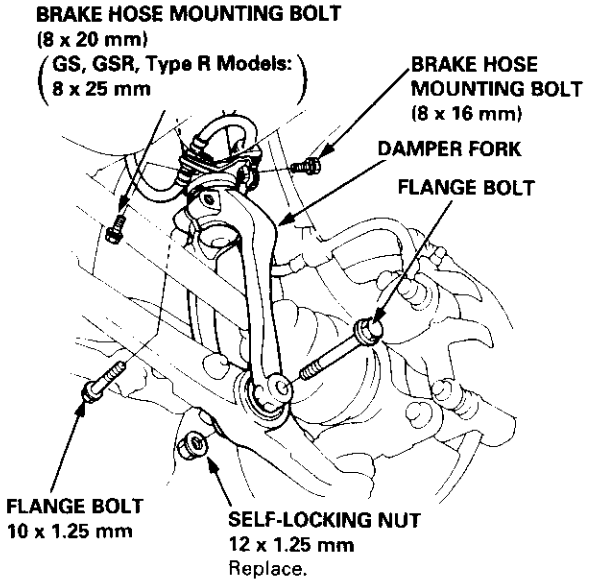
NOTE:
- Wipe off the dirt, oil or grease on the threads before tightening the fasteners.
- The right and left damper forks are not interchangeable. The left damper fork is marked with "VL" while the right damper fork is marked with "VR".
- The right and left upper arms are not interchangeable. The left upper arm is marked with "SRZ-L" while the right arm is marked with "SRZ-R".
- Before tightening the upper and lower mounting nuts on the stabilizer link, adjust the location of the link with the suspension under vehicle load.
- When installing the radius arm washers, the "FR" mark faces the front of the car.
- After installing the suspension arm, check the front wheel alignment and adjust if necessary (see page 18-4).



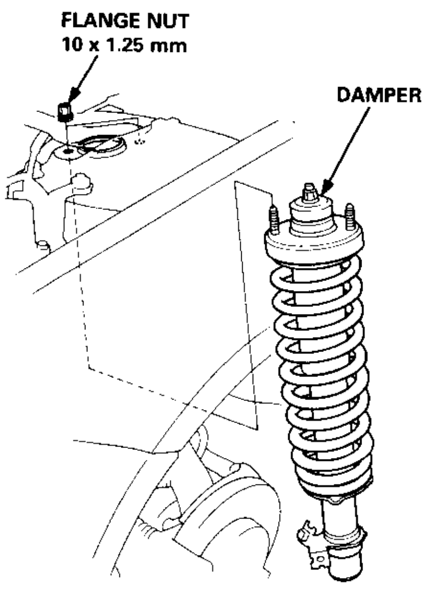
Front Damper

Removal

1. Remove the front wheels (see page 18-11).
2. Remove the brake hose mounting bolts from the damper.
3. Remove the flange bolt.
4. Remove the flange bolt and self-locking nut, then remove the damper fork.



5. Remove the damper by removing the two flange nuts.

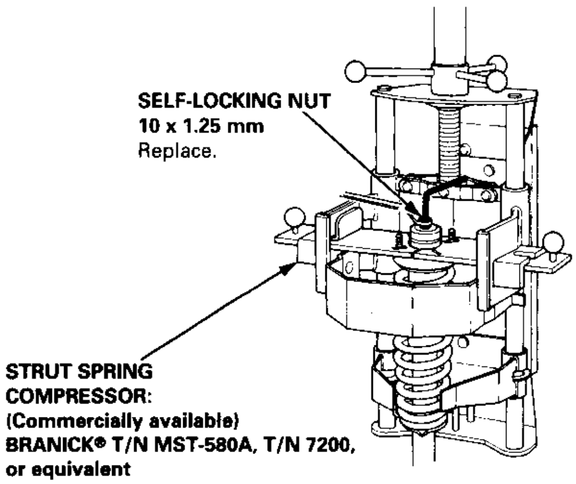


Disassembly/Inspection

Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

   CAUTION: Do not compress the spring more than necessary to remove the nut.

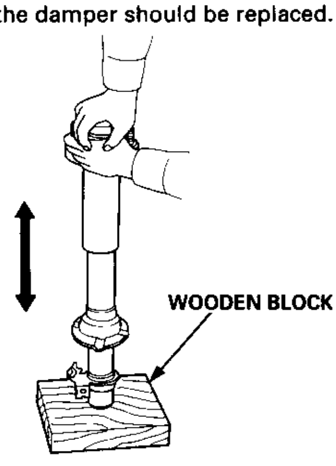


2. Remove the spring compressor, then disassemble the damper as shown on the next page.

Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper as shown.
3. Check for smooth operation through a full stroke, both compression and extension.

   NOTE: The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.

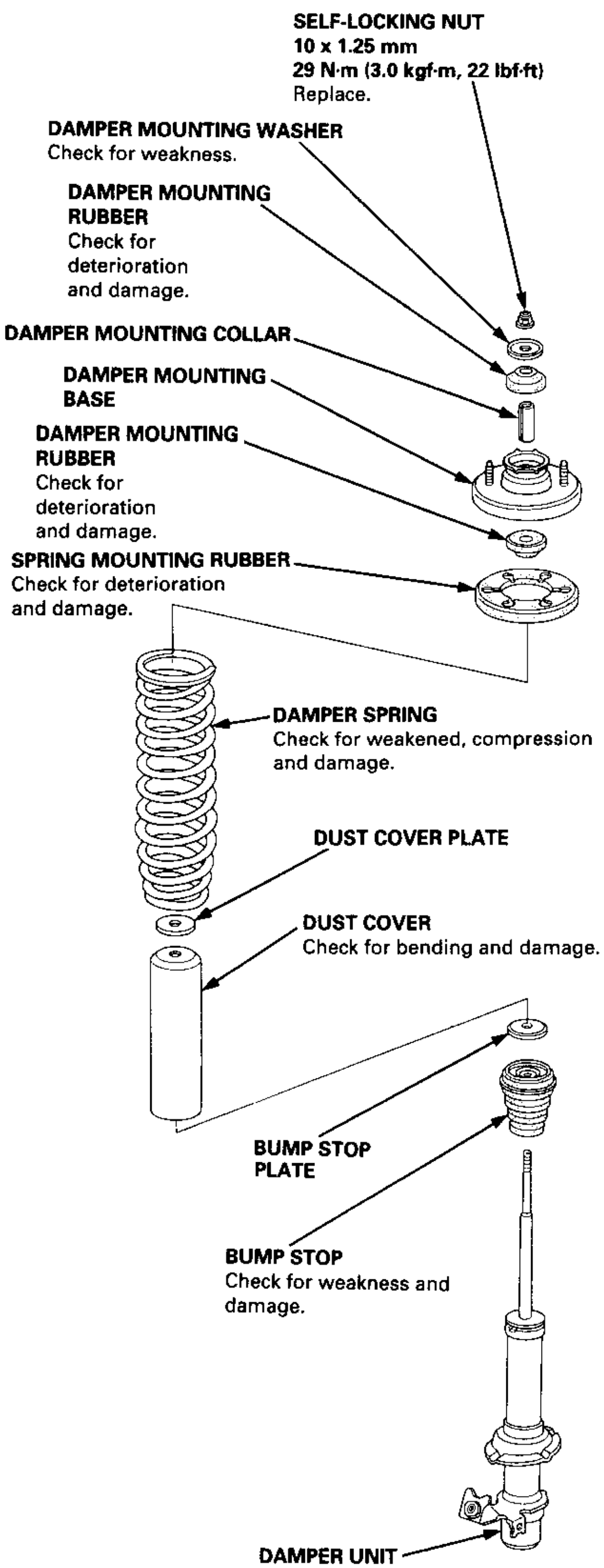


4. Check for oil leaks, abnormal noises or binding during these tests.

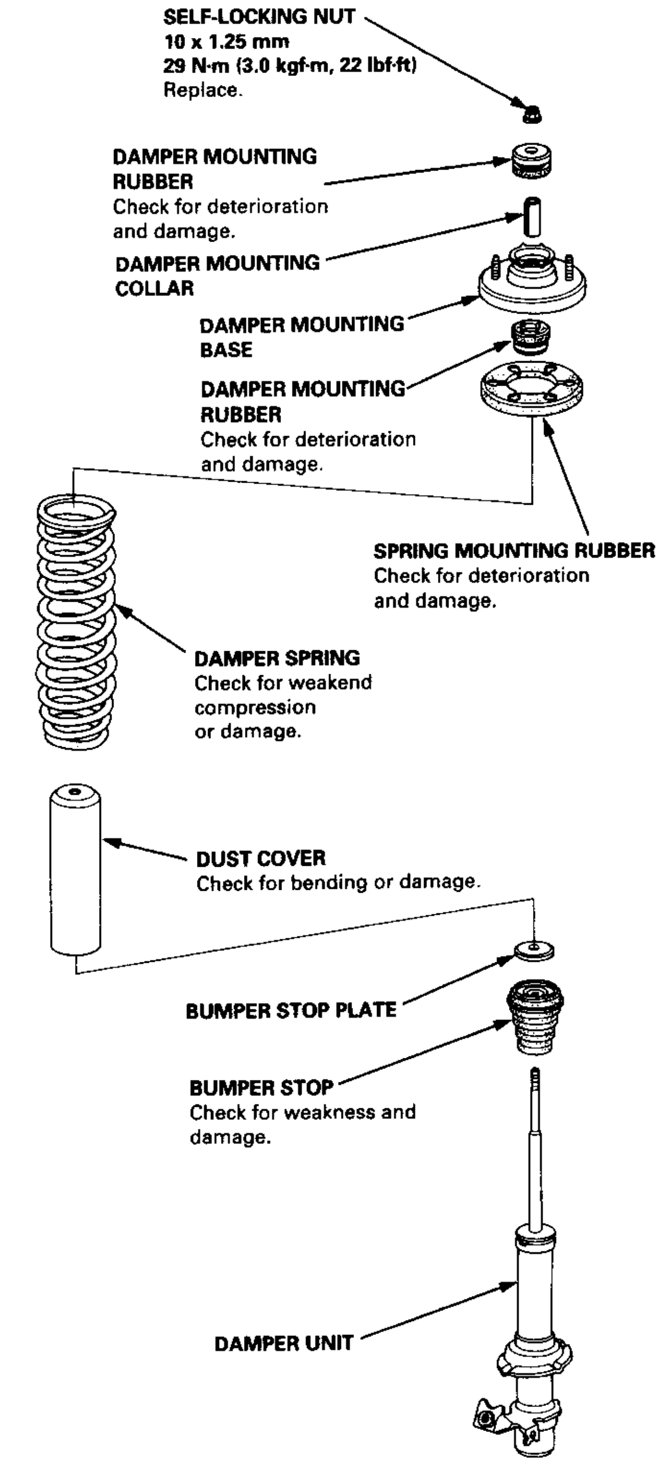
Disassembly/Inspection

Inspection

All except Type R Models:



Type R Model:



Reassembly

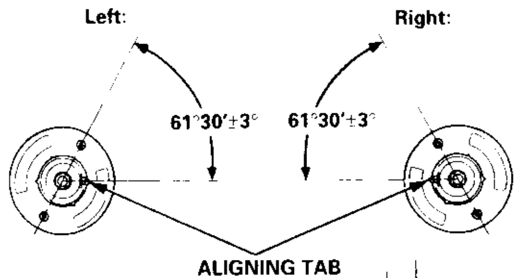
1. Install the damper unit on a spring compressor.

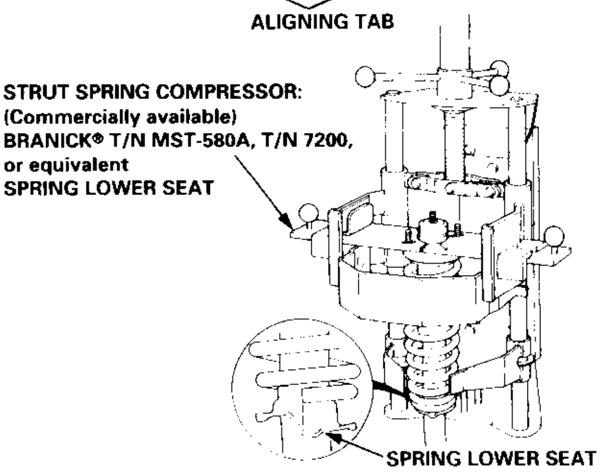
   NOTE: Follow the manufacturer's instructions.

2. Assemble the damper in reverse order of disassembly except the damper mounting washer and self locking nut.

   NOTE: Align the bottom of damper spring and spring lower seat as shown.

3. Position the damper mounting base on the damper unit as shown.

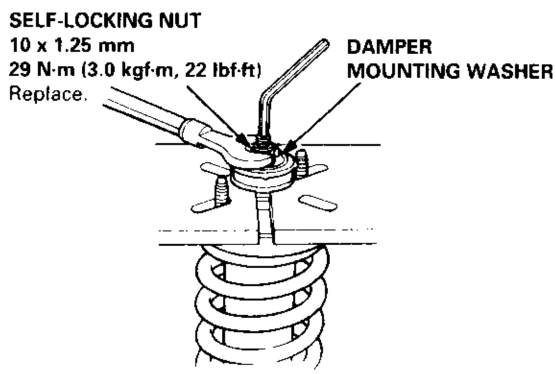




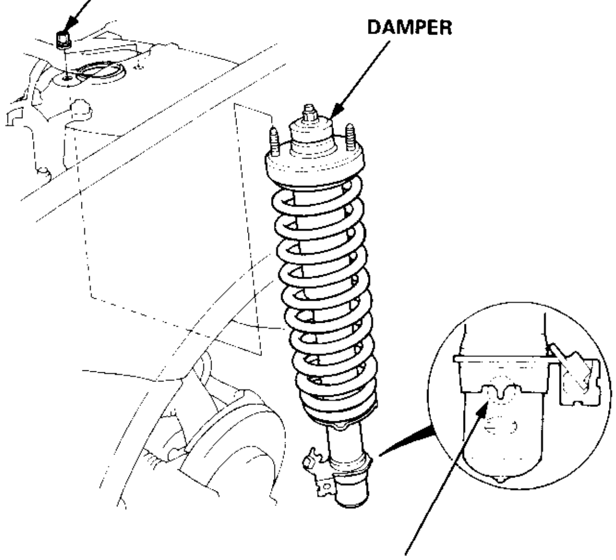
4. Compress the damper spring with the spring compressor.

5. Install the damper mounting washer, and loosely install a new self-locking nut.

6. Hold the damper shaft with a hex wrench and tighten the self-locking nut.



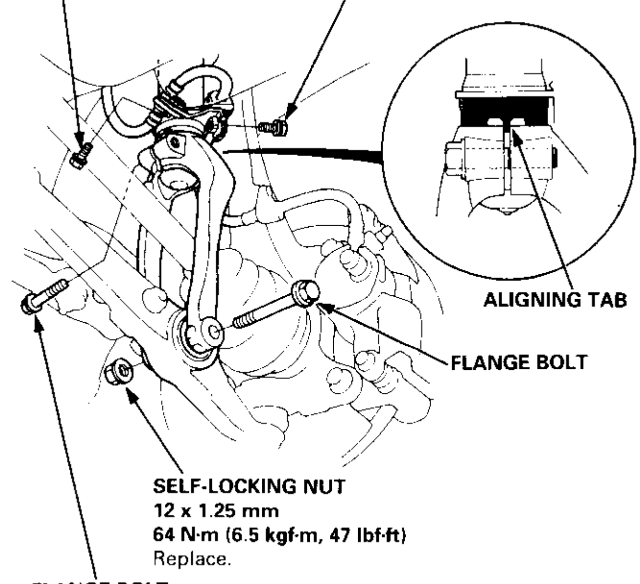
1. Loosely install the damper on the frame with the aligning tab facing inside, then loosely install the two flange nuts.



2. Install the damper fork over the driveshaft and onto the lower arm. Install the front damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.
3. Loosely install the flange bolt.
4. Loosely install a new self-locking nut with the flange bolt.
5. Raise the knuckle with a floor jack until the vehicle just lifts off the safety stand.

⚠ WARNING The floor jack must be securely positioned or personal injury may result.

6. Tighten the flange bolt.
7. Tighten the self-locking nut.
8. Tighten the flange nuts on the top of the damper to the specified torque.
9. Install the brake hose mounts with the brake hose mounting bolts.



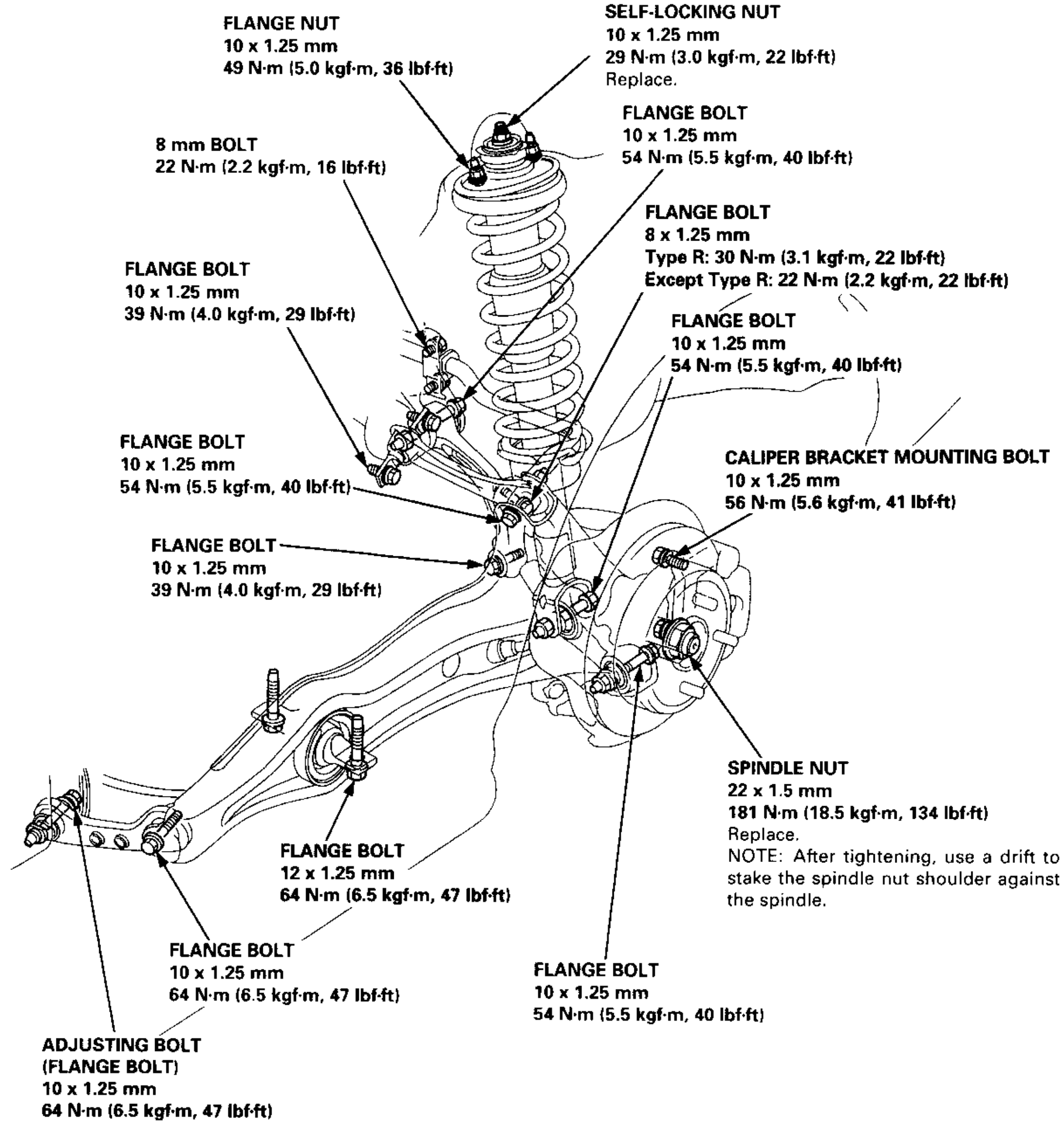
10. Install the front wheel (see page 18-17).

Rear Suspension

Torque Specifications

CAUTION:

- Replace the self-locking nut after removal.
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.



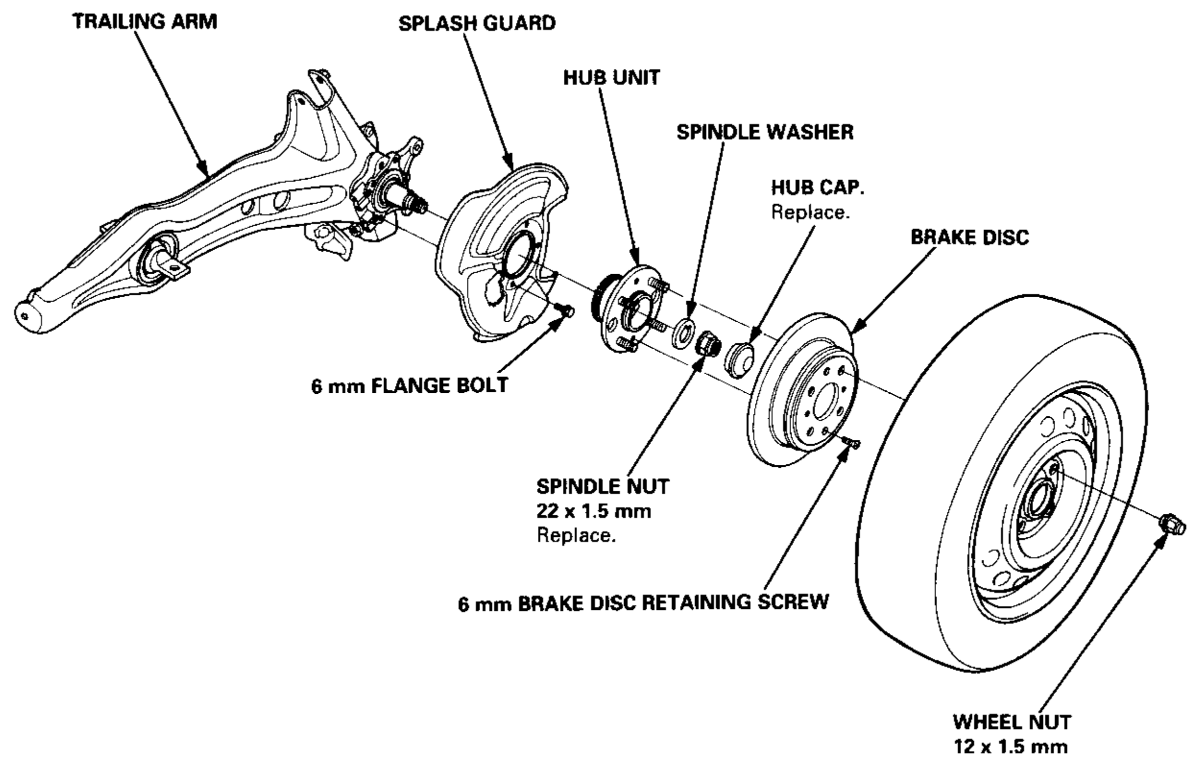
Hub Bearing Unit

Illustrated Index

Note the following during installation:

- Before installing the brake disc, clean the mating surfaces of the rear hub and the brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.

All except Type R Models:

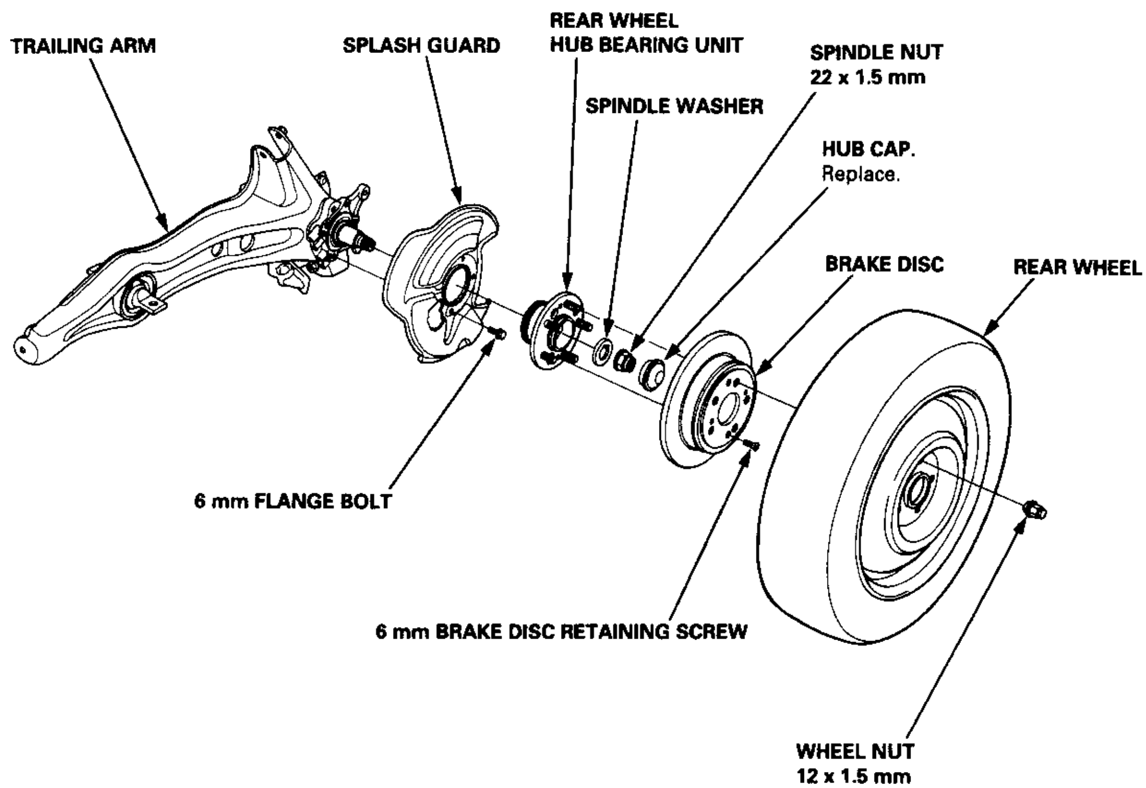


(cont'd)

Rear Suspension

Hub Bearing Unit (cont'd)

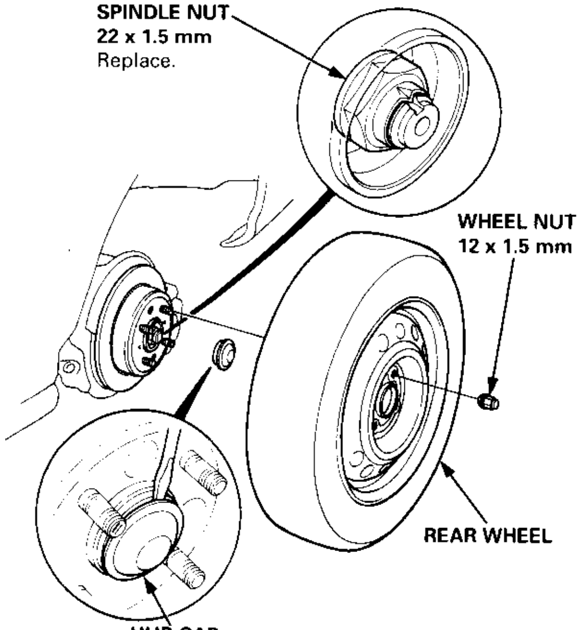
Type R Model:



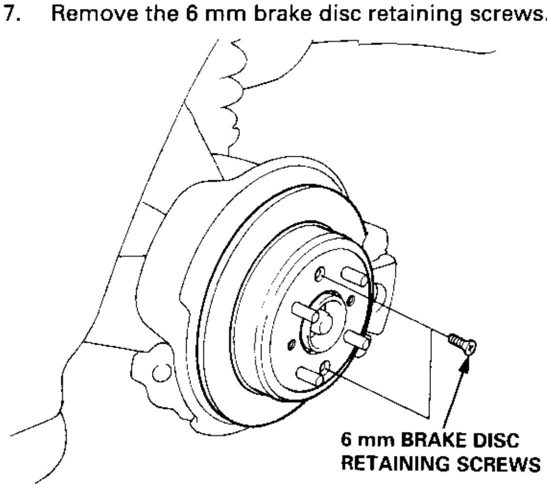
Hub Bearing Unit

Removal

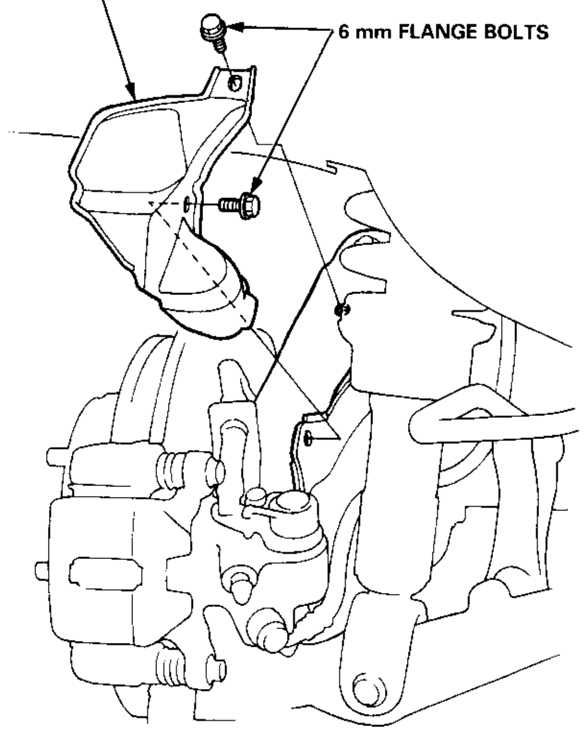
1. Loosen the wheel nuts slightly.
2. Raise the rear of vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and rear wheel.



4. Pull the parking brake lever up.
5. Remove the hub cap.
6. Raise the locking tab on the spindle nut, then remove the nut.
7. Remove the 6 mm brake disc retaining screws.



8. Release the parking brake lever.
9. Remove the 6 mm flange bolts and caliper shield.



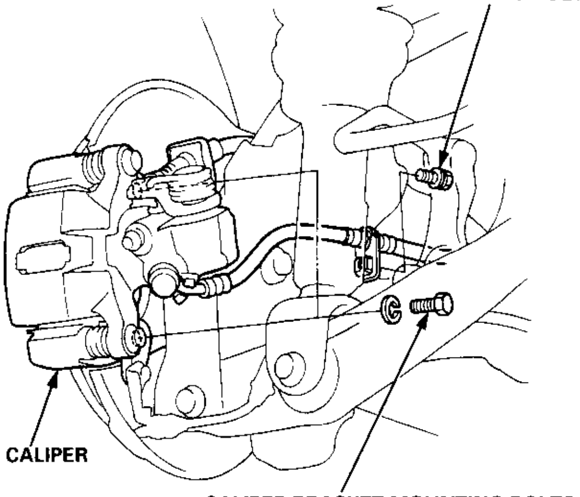
(cont'd)

Hub Bearing Unit (cont'd)

10. Remove the brake hose mounting bolt.

11. Remove the caliper bracket mounting bolts and hang the caliper to one side.

CAUTION: To prevent accidental damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

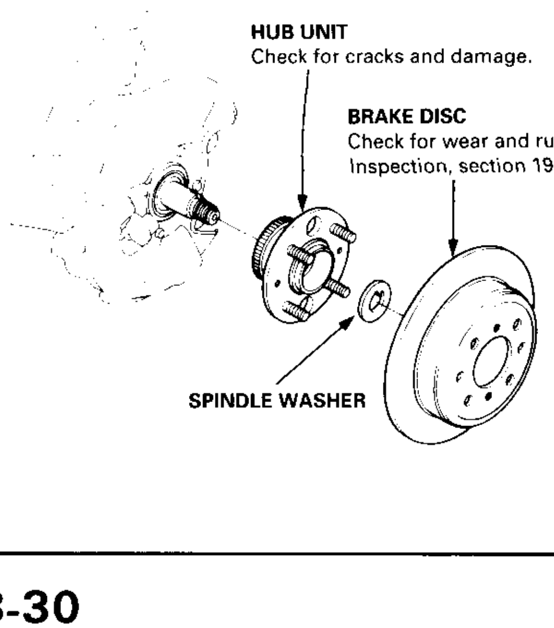


12. Screw two 8 x 1.25 mm bolts into the disc to push it away from the hub.

NOTE: Turn each bolt two turns at a time to prevent cocking the disc excessively.

13. Remove the brake disc.

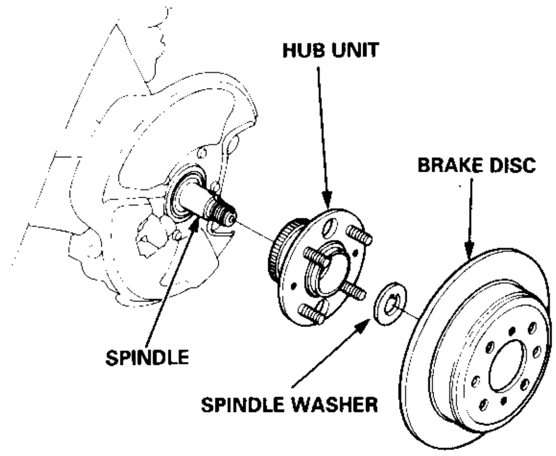
14. Remove the hub unit from the knuckle.



Installation

1. Install the hub unit, spindle washer and brake disc.

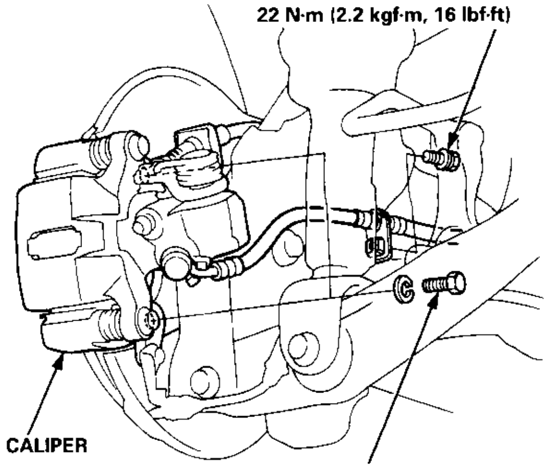
NOTE:
- Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.
- Before installing the brake disc, clean the mating surfaces of the rear hub and the brake disc.



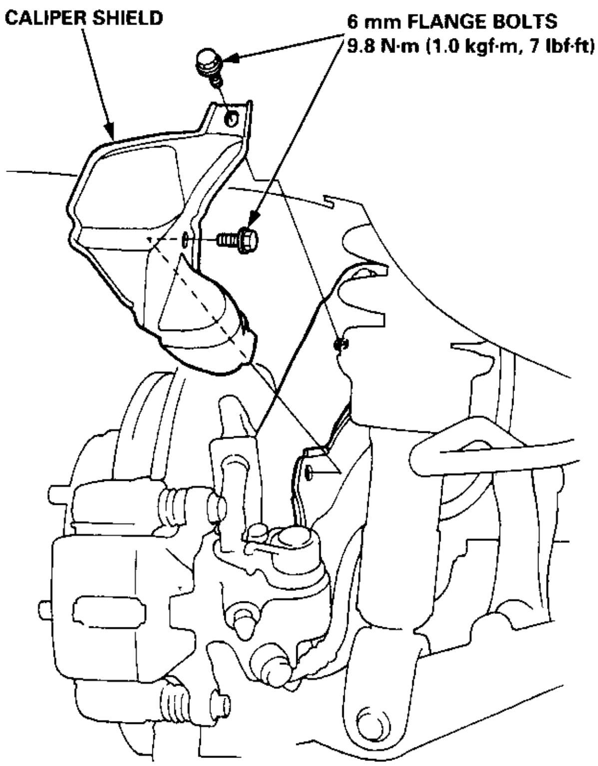
2. Install the brake caliper with the caliper bracket mounting bolts.

3. Install the brake hose with the brake hose mounting bolt.

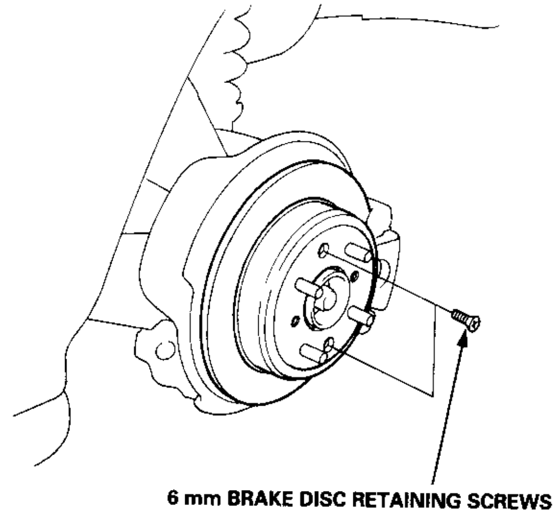
CAUTION: Be careful not to twist the hose more than necessary.



4. Install the caliper shield with the 6 mm flange bolts.

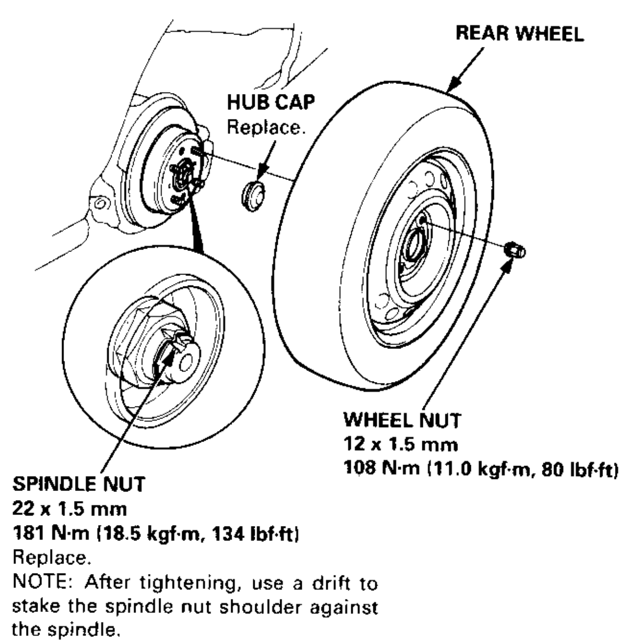


5. Tighten the 6 mm brake disc retaining screws.



6. Install a new spindle nut, then tighten the nut.
7. Install a new hub cap.
8. Install the rear wheel with the wheel nuts.

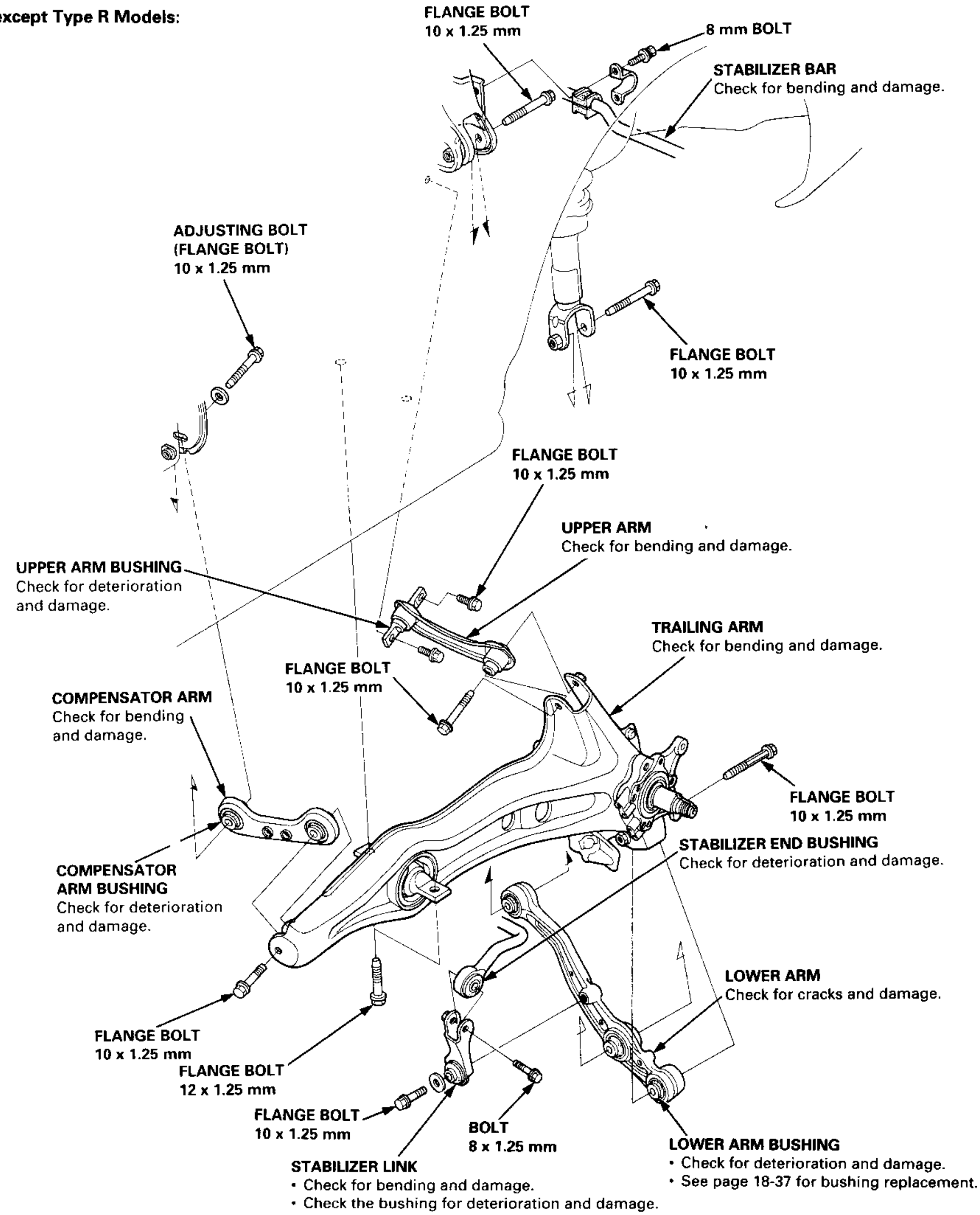
   NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.



(cont'd)

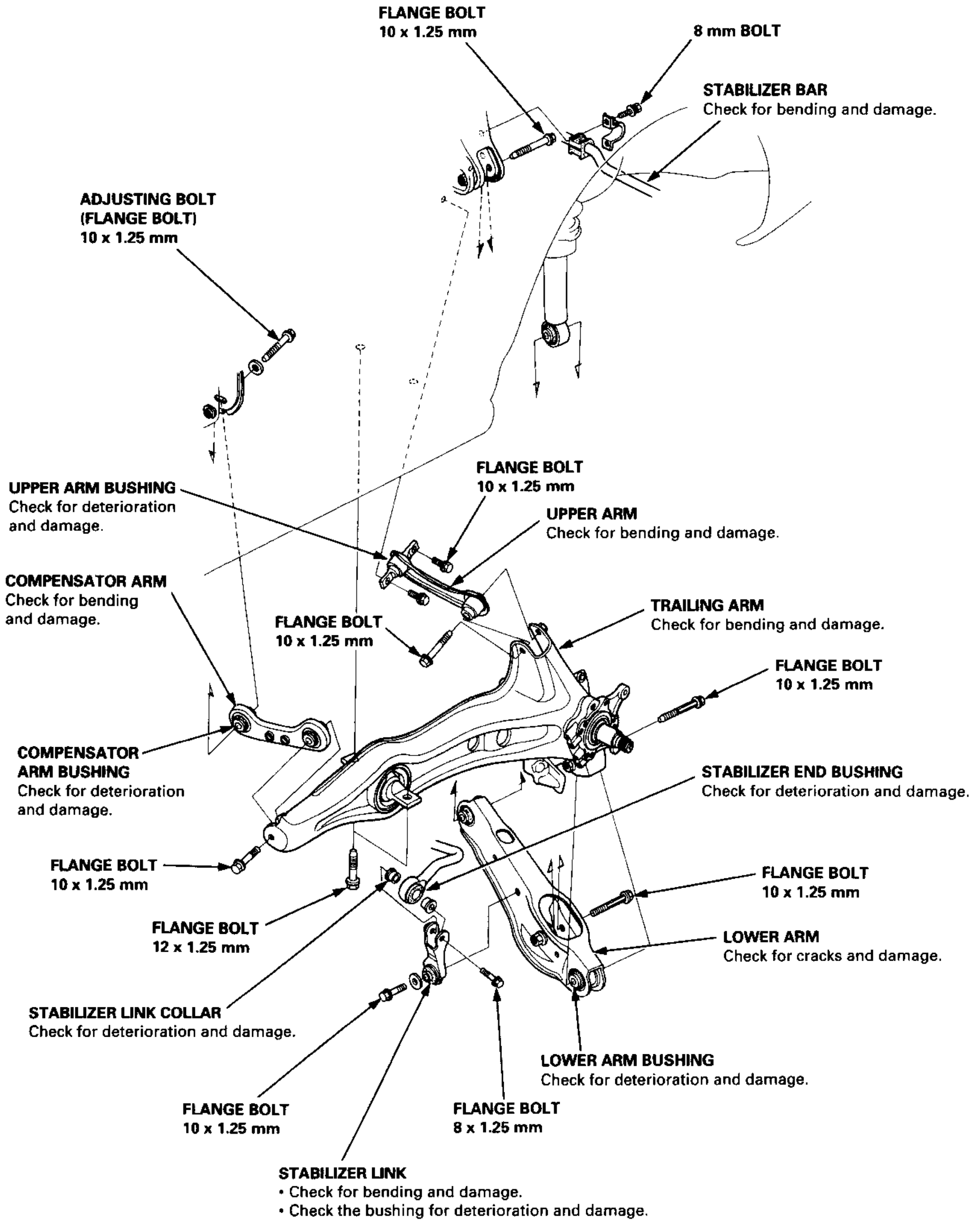
Removal/Inspection

All except Type R Models:



Removal/Inspection

Type R Model:



(cont'd)

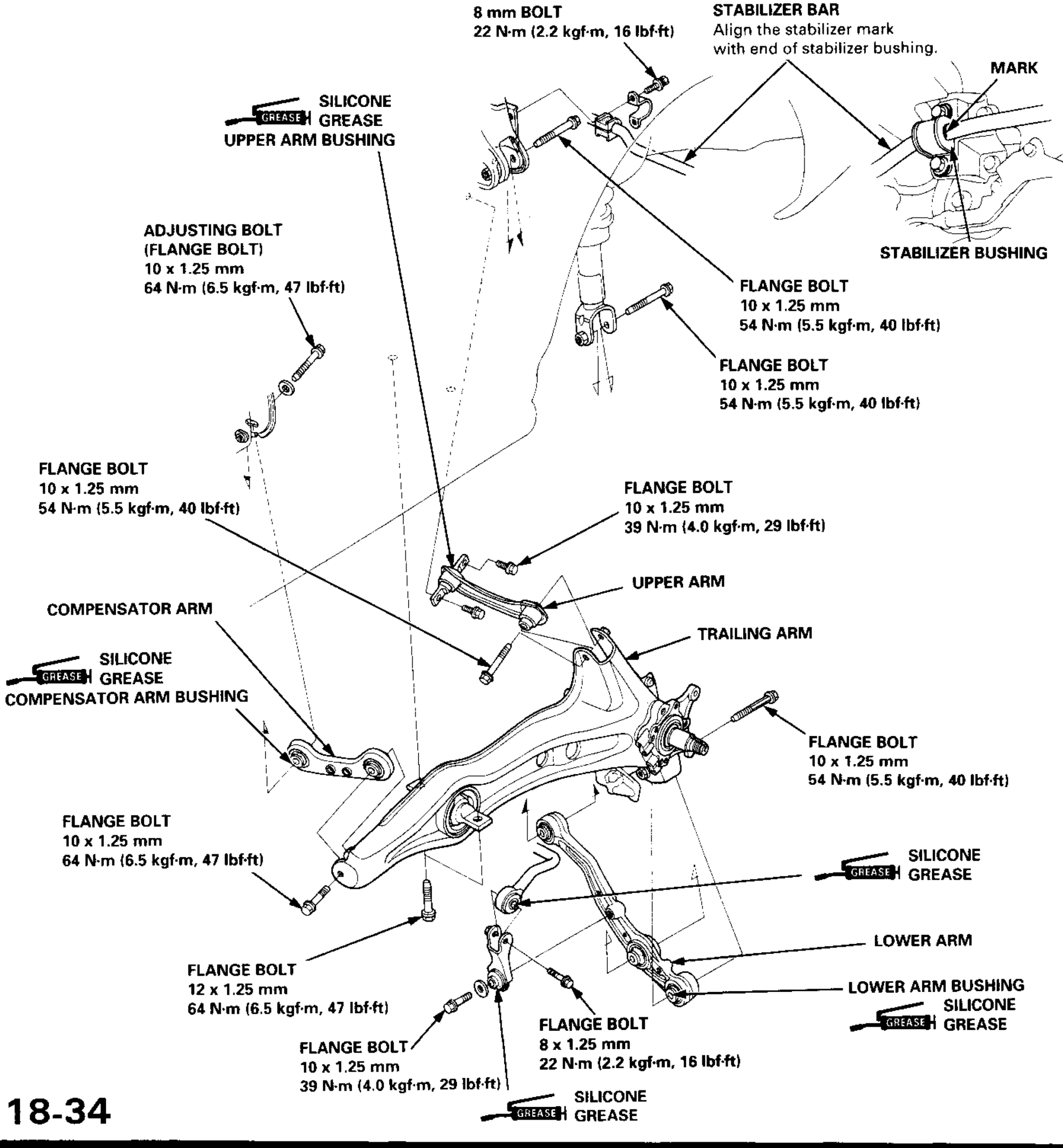
Suspension Arms (cont'd)

Installation

CAUTION: Any bolts or nuts connected to rubber mounts or bushings should be tightened with the vehicle on the ground.

All except Type R Models:

NOTE:
- Make sure the self-locking bolts on the compensator arms are installed in the same direction.
- "LV" is stamped on the left lower arm and "RV" on the right lower arm.
- "↑ UP LSR" is stamped on the left upper arm and "↑ UP RSR" on the right upper arm.
- The right and left compensator arm are symmetrical. Install so the "↑ UP" mark stamped side faces forward.
- After installing the suspension arm, check the rear wheel alignment and adjust if necessary (see page 18-4).

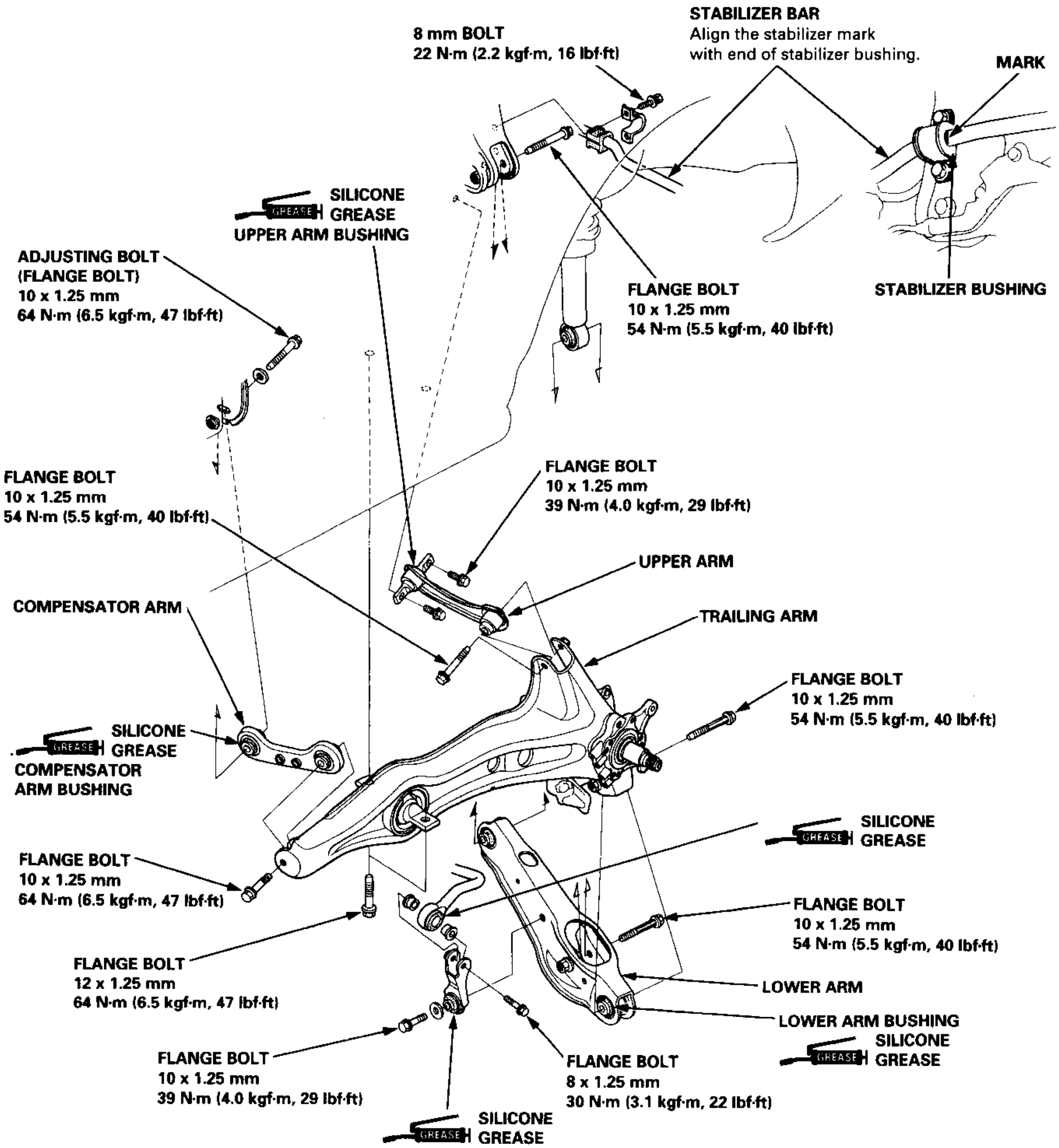


Installation

Type R Model:

NOTE:

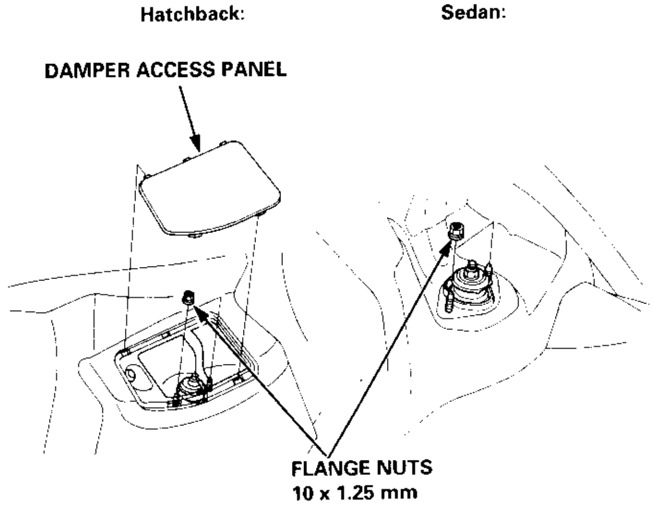
- Any bolts or nuts connected to rubber mounts or bushings should be tightened with the vehicle on the ground.
- "L" is stamped on the left lower arm and "R" is stamped on the right lower arm.
- "↑ UP LS" is stamped on the left upper arm and "↑ UP RS" is stampedon the right upper arm.
- The right and left compensator arms are symmetrical. Install then with the "↑ UP" mark facesing forward.
- After installing the suspension arm, check the rear wheel alignment and adjust it if necessary (see page 18-4).



Rear Damper

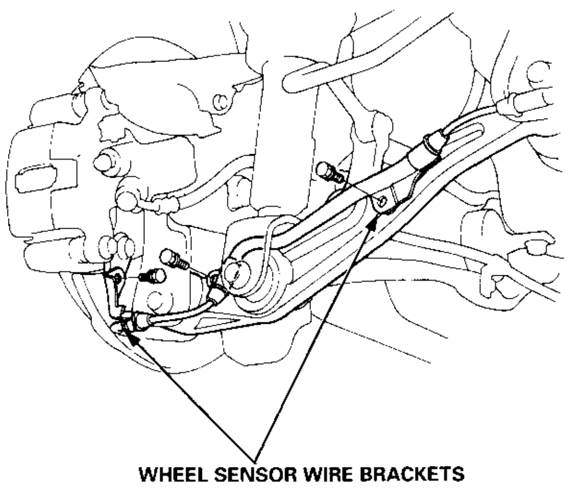
Removal

1. Remove the rear wheels (see page 18-30).
2. Remove the damper access panel.
   - Sedan only: Remove the trunk side panel (see section 20).
3. Remove the two flange nuts.

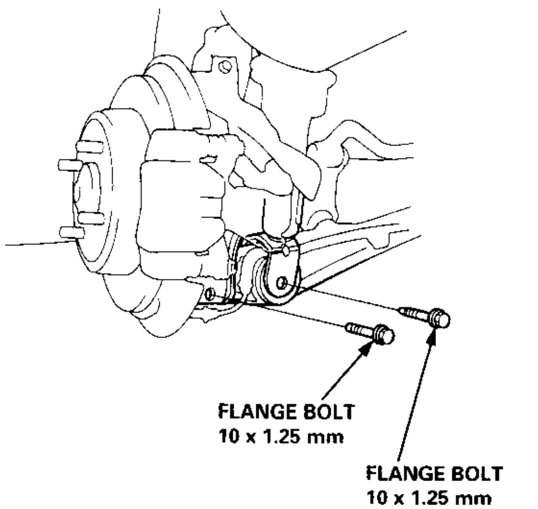


4. Remove the wheel sensor wire brackets (for vehicles with ABS).

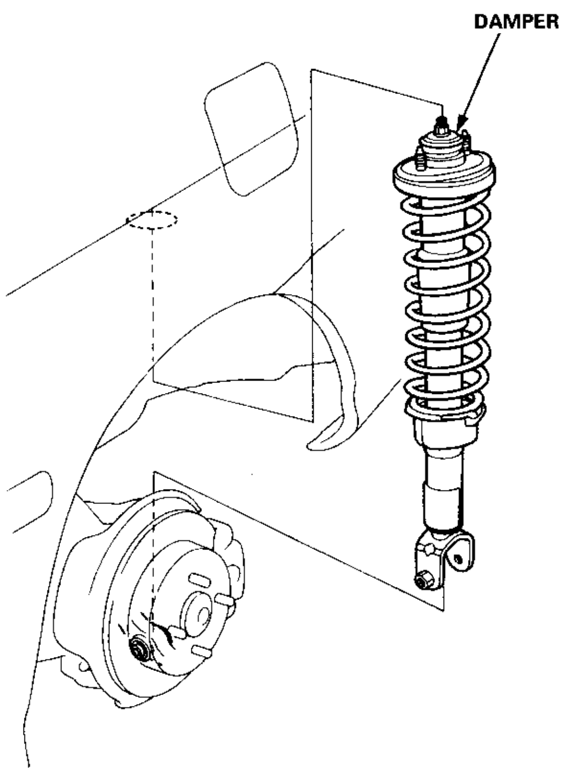
   NOTE: Do not disconnect the wheel sensor connector.



5. Remove the flange bolt on the damper.
6. Remove the flange bolt that connects the lower arm to the trailing arm.



7. Lower the rear suspension and remove the damper.

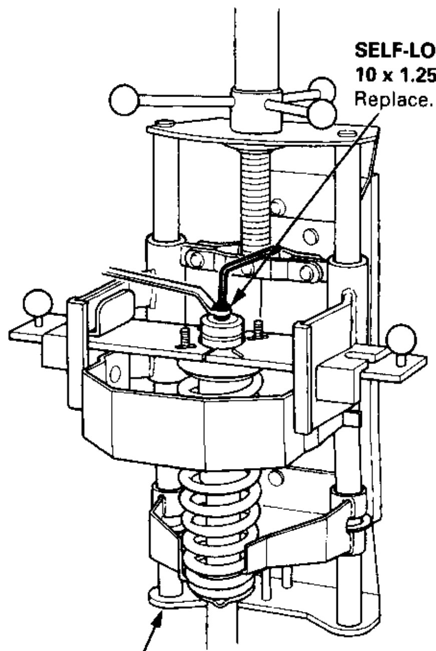


Disassembly/Inspection

Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

   CAUTION: Do not compress the spring more than necessary to remove the self-locking nut.

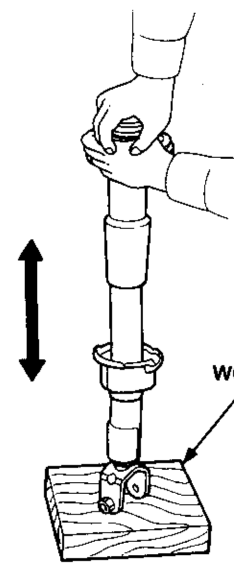


2. Remove the spring compressor, then disassemble the damper as shown on the next page.

Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper as shown.
3. Check for smooth operation through a full stroke, both compression and extension.

   NOTE: The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.



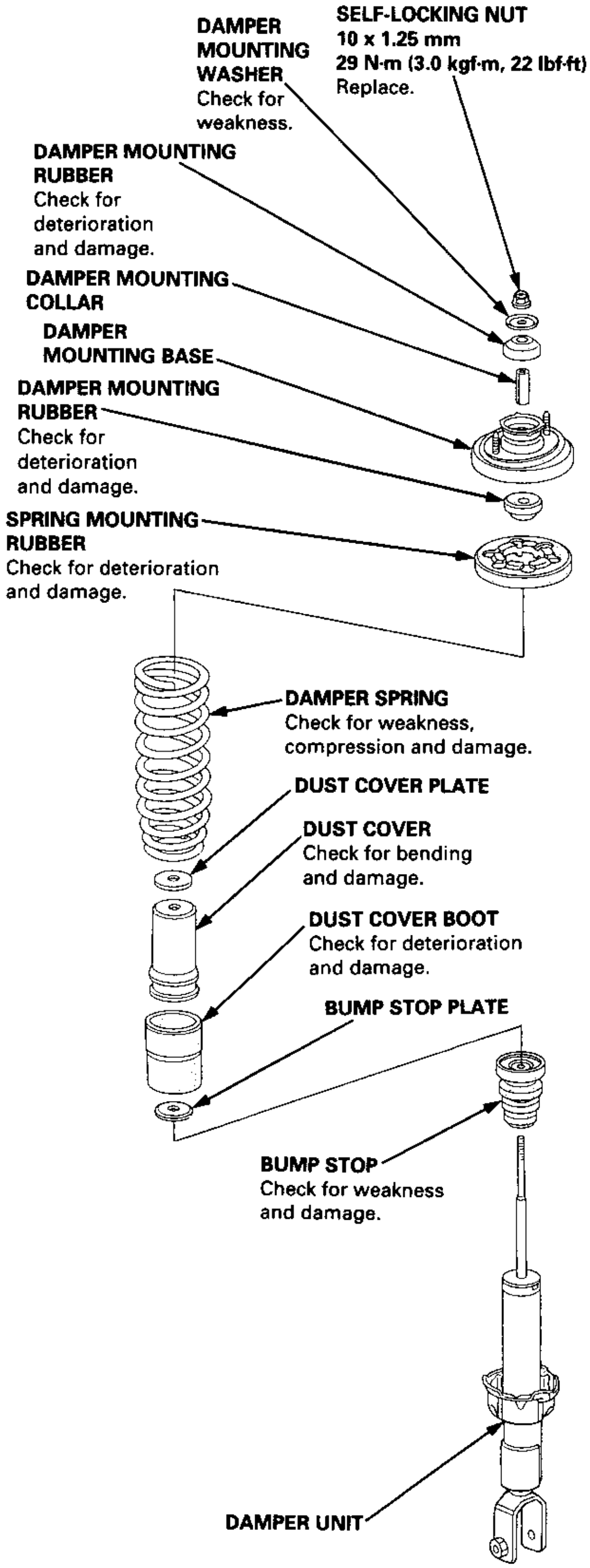
4. Check for oil leaks, abnormal noises or binding during these tests.

(cont'd)

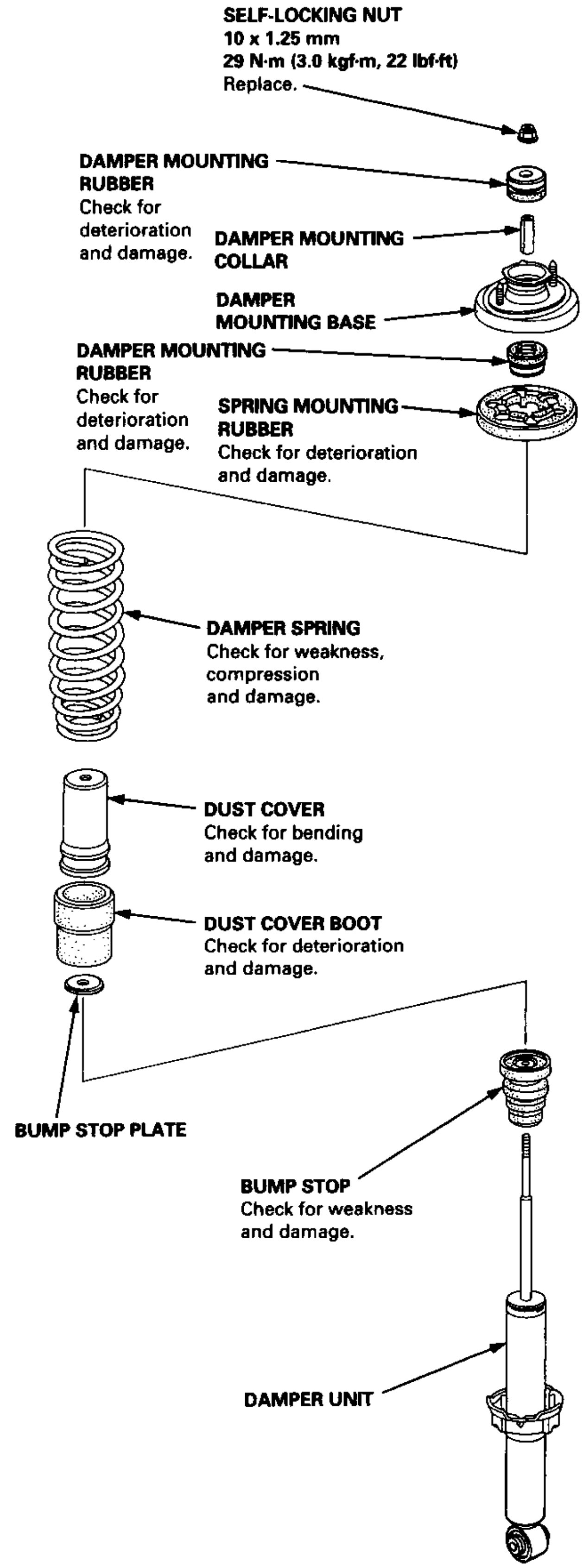
Disassembly/Inspection (cont'd)

Inspection

All except Type R Models:



Type R Model:



Reassembly

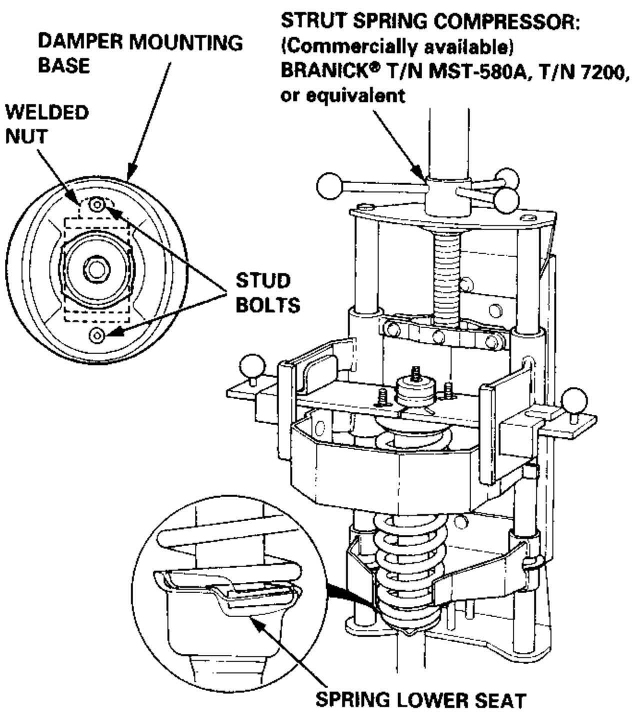
1. Install the damper unit on a spring compressor.

   NOTE: Follow the manufacturer's instructions.

2. Assemble the damper in reverse order of disassembly except the damper mounting washer and self-locking nut.

   NOTE: Align the bottom of damper spring and spring lower seat as shown.

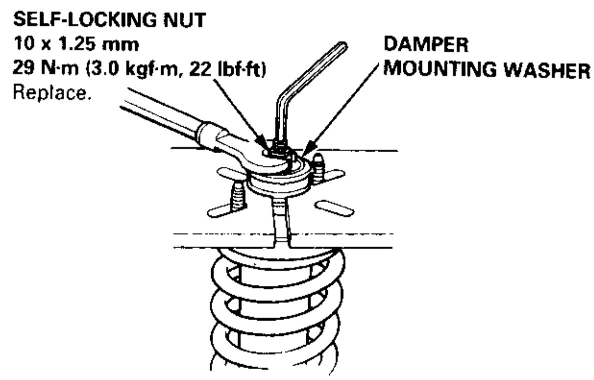
3. Position the damper mounting base on the damper unit as shown.



4. Compress the damper spring with the spring compressor.

5. Install the damper mounting washer, and loosely install a new self-locking nut.

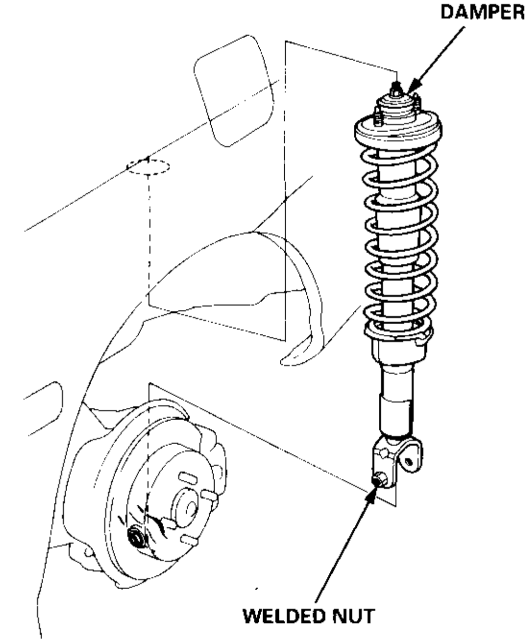
6. Hold the damper shaft with a hex wrench and tighten the self-locking nut.



Rear Damper

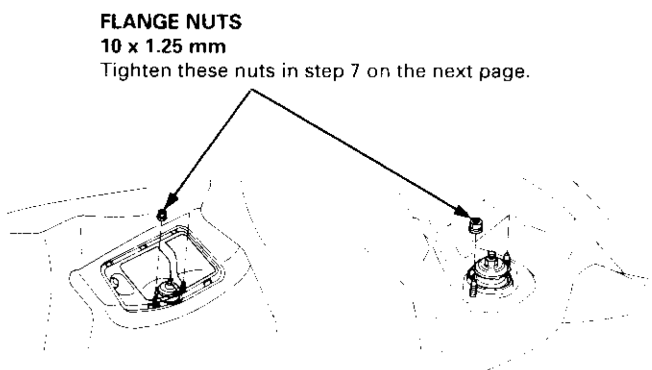
Installation

1. Lower the rear suspension and position the damper with the welded nut pointed toward the front of the vehicle.



2. Loosely install the two flange nuts.

Hatchback: Sedan:



3. Install the wheel sensor wire bracket.

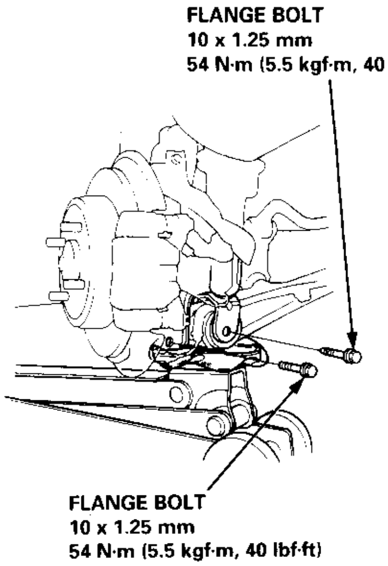
   NOTE: Be careful when installing the sensors to avoid twisting wires.

4. Raise the rear suspension with a floor jack until the vehicle just lifts off the safety stand.

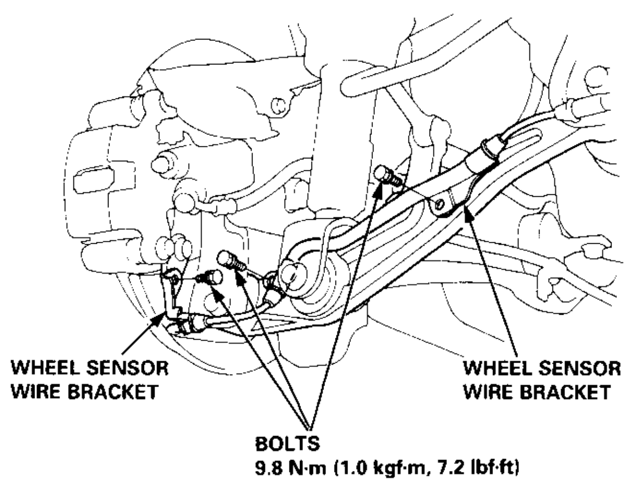
   WARNING The floor jack must be securely positioned or personal injury may result.

5. Install the damper mounting bolt and the flange bolt, then tighten the bolts.

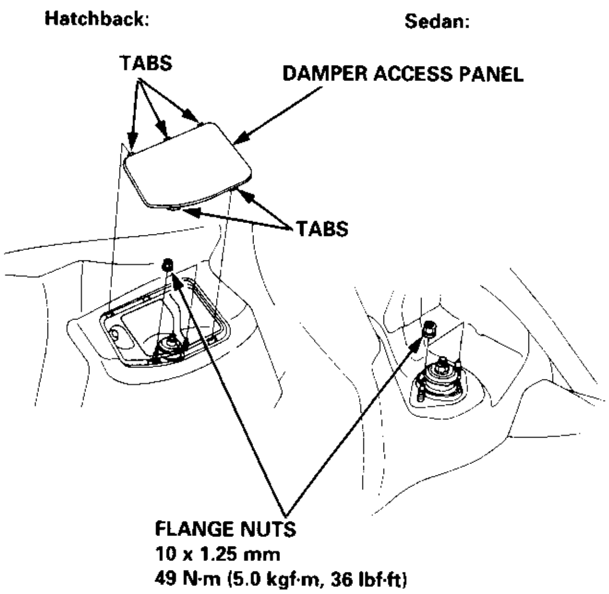
   NOTE: The damper mounting bolt and the flange bolt should be tightened with the damper under vehicle load.



6. Tighten the three wheel sensor wire bracket bolts (for vehicles with ABS).



7. Tighten the two flange nuts on top of the damper to the specified torque.
8. Install the damper access panel by aligning the tabs on the panel.
9. Sedan only: Install the trunk side panel (see section 20).

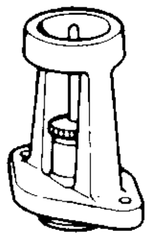


10. Install the rear wheels (see page 18-32).

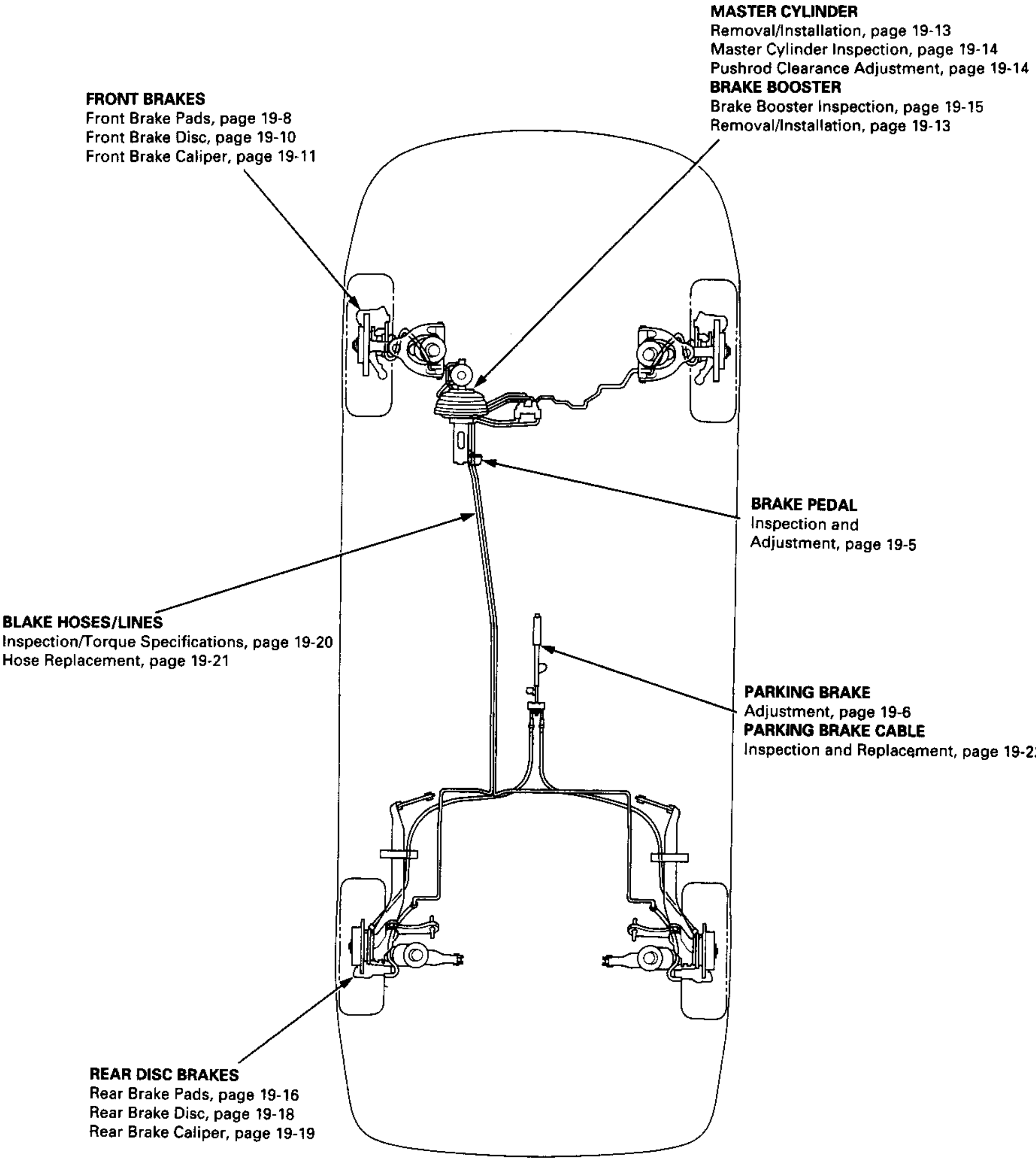
Brakes

Brakes

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAG – SD40100	Pushrod Adjustment Gauge	1	19-14



①



MASTER CYLINDER
Removal/Installation, page 19-13
Master Cylinder Inspection, page 19-14
Pushrod Clearance Adjustment, page 19-14
BRAKE BOOSTER
Brake Booster Inspection, page 19-15
Removal/Installation, page 19-13
FRONT BRAKES
Front Brake Pads, page 19-8
Front Brake Disc, page 19-10
Front Brake Caliper, page 19-11
BRAKE PEDAL
Inspection and
Adjustment, page 19-5
BLAKE HOSES/LINES
Inspection/Torque Specifications, page 19-20
Hose Replacement, page 19-21
PARKING BRAKE
Adjustment, page 19-6
PARKING BRAKE CABLE
Inspection and Replacement, page 19-22
REAR DISC BRAKES
Rear Brake Pads, page 19-16
Rear Brake Disc, page 19-18
Rear Brake Caliper, page 19-19

Inspection and Adjustment

Brake System Rubber Parts and Brake Booster

Ⓐ **Brake Booster**
Check brake operation by applying the brakes.
If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.

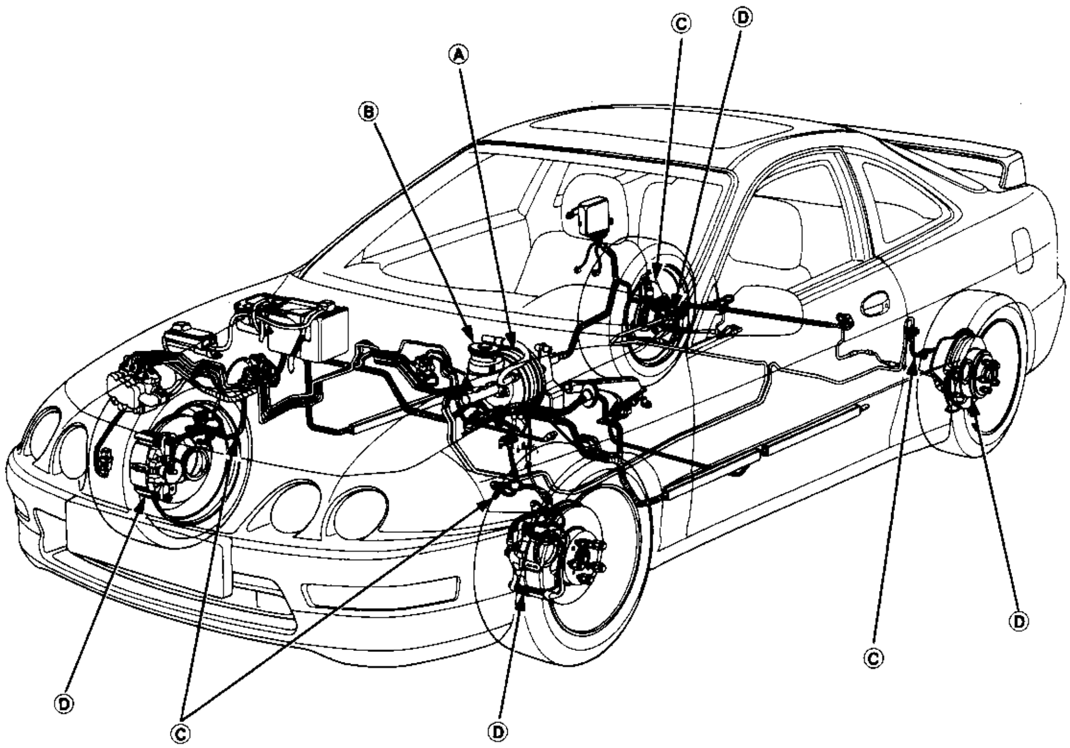
Ⓑ **Piston Cup and Pressure Cup Inspection**

- Check brake operation by applying the brakes. Visually check for damage or signs of fluid leakage. Replace the master cylinder as an assembly if the pedal does not work properly or if there is damage or signs of fluid leakage.

- Check for a difference in brake pedal stroke between quick and slow brake applications. Replace the master cylinder if there is a difference in pedal stroke.

Ⓒ **Brake Hoses**
Visually check for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.

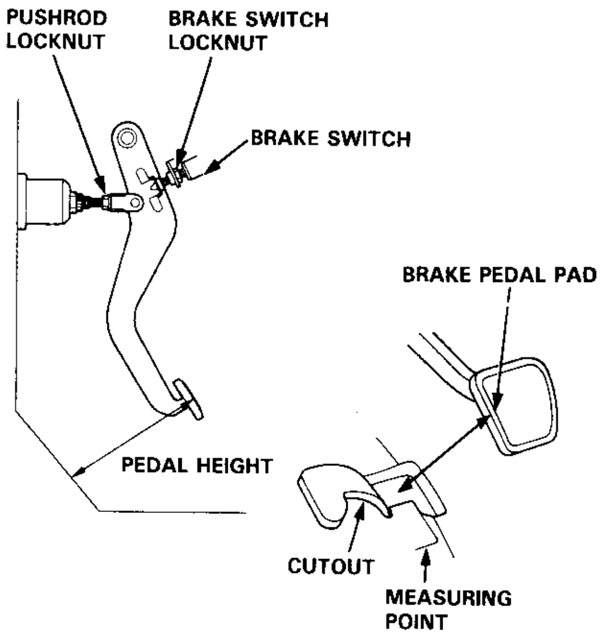
Ⓓ **Caliper Piston Seal and Piston Boots**
Check brake operation by applying the brakes.
Visually check for damage or signs of fluid leakage.
If the pedal does not operate properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.



Brake Pedal

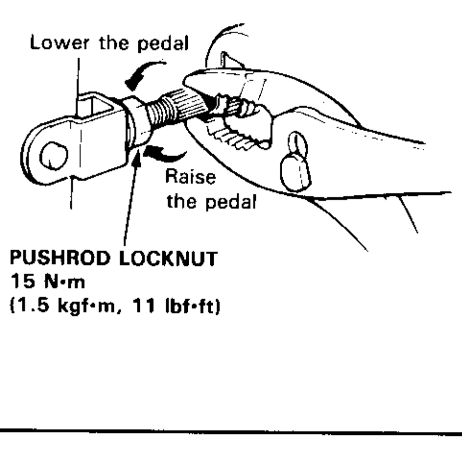
Pedal Height

1. Disconnect the brake switch connector, loosen the brake switch locknut, and back off the brake switch until it is no longer touching the brake pedal.
2. Turn up the floor mat, and measure the pedal height from the left side center of the pedal pad.



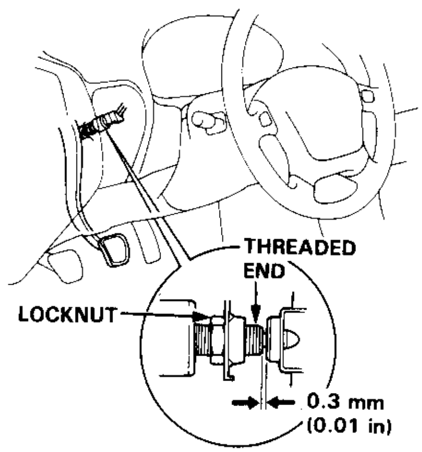
Standard Pedal Height (with floor mat removed):
M/T: 160 mm (6 5/16 in)
A/T: 165 mm (6 1/2 in)

3. Loosen the pushrod locknut, and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly. Do not adjust the pedal height with the pushrod depressed.



4. Screw in the brake switch until its plunger is fully depressed (threaded end touching the pad on the pedal arm). Then back off the switch 1/4 turn to make 0.3 mm (0.01 in) of clearance between the threaded end and the pad. Tighten the locknut firmly. Connect the brake switch connector.

CAUTION: Make sure that the brake lights go off when the pedal is released.



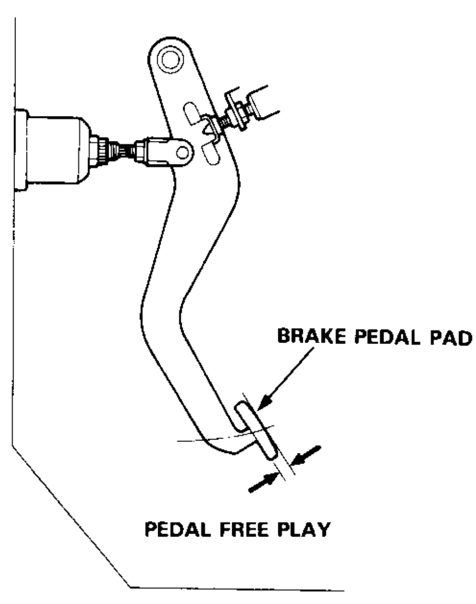
5. Check the brake pedal free play as described below.

Pedal Free Play

1. Stop the engine, and inspect the play on the pedal pad by pushing the pedal by hand.

Free Play: 1 – 5 mm (1/16 – 3/16 in)

2. If the pedal free play is out of specification, adjust the brake switch. If the pedal free play is insufficient, it may result in brake drag.



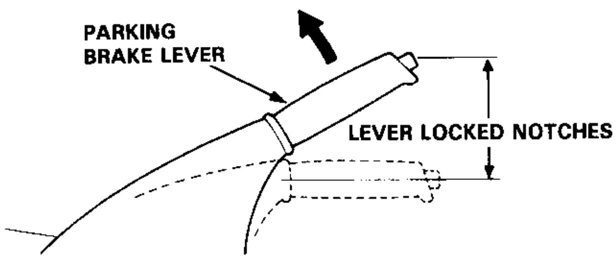
Inspection and Adjustment

Parking Brake

Inspection

1. Pull the parking brake lever with 196 N (20 kgf, 44 lbf) of force to fully apply the parking brake. The parking brake lever should be locked within the specified notches.

   Lever Locked Notches: 6 – 10



2. Adjust the parking brake if the lever notches are out of specification.

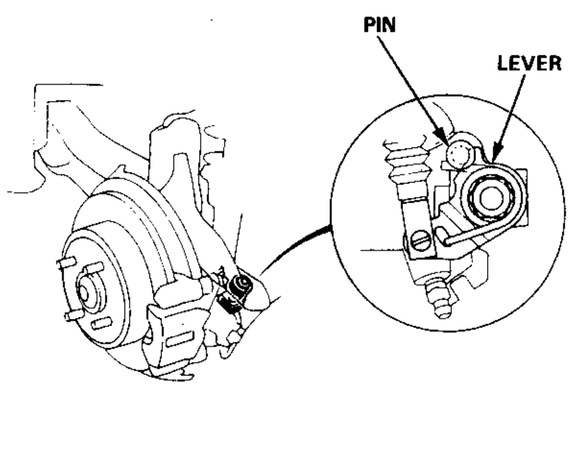
Adjustment

NOTE: After rear brake caliper servicing, loosen the parking brake adjusting nut, start the engine, and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

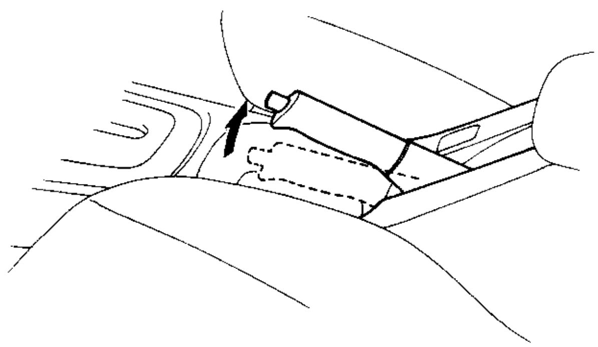
1. Raise the rear wheels off the ground, and support the car on safety stands.

   ⚠ WARNING Block the front wheels before jacking up the rear of the car.

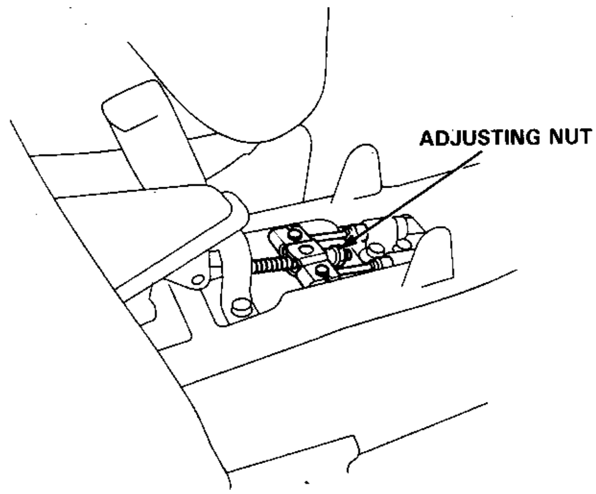
2. Make sure the parking brake arm on the rear brake caliper contacts the brake caliper pin.



3. Pull the parking brake lever up one notch.



4. Remove the rear console (see section 20).
5. Tighten the adjusting nut until the rear wheels drag slightly when turned.



6. Release the parking brake lever fully, and check that the rear wheels do not drag when turned. Readjust if necessary.
7. Make sure the parking brakes are fully applied when the parking brake lever is pulled up fully.
8. Install the cap onto the parking brake cable end, and reinstall the rear console.

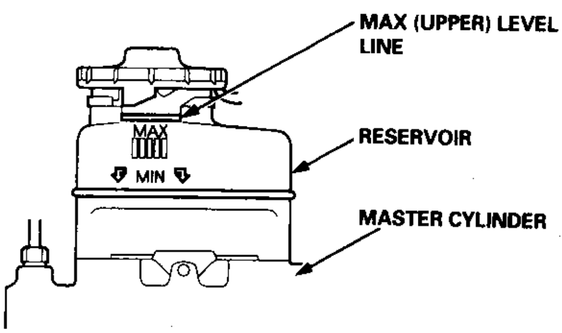
Bleeding

CAUTION:

- **Do not reuse the drained fluid.**
- **Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not spill brake fluid on the car, it may damage the pain; if brake fluid does contact the paint, wash it off immediately with water.**

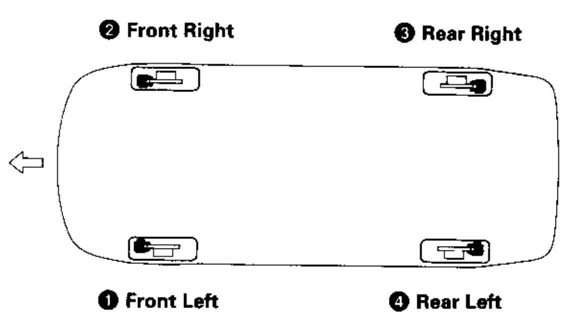
NOTE: The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of bleeding procedure, and checked after bleeding each brake caliper. Add fluid as required.

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line.



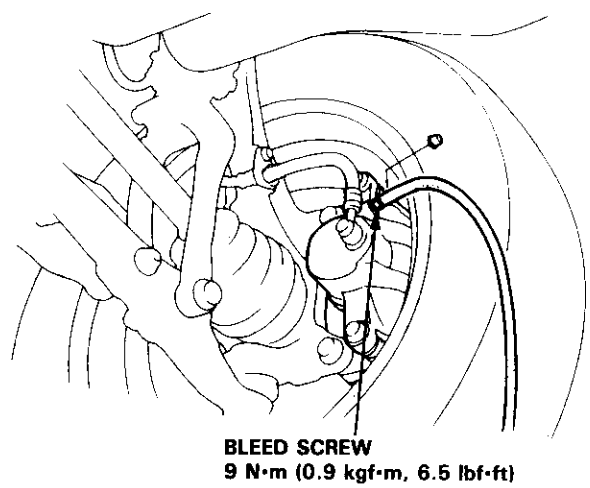
2. Have someone slowly pump the brake pedal several times, then apply steady pressure.
3. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
4. Repeat the procedure for each wheel in the sequence shown below, until air bubbles no longer appear in the fluid.
5. Refill the master cylinder reservoir to the MAX (upper) level line.

BLEEDING SEQUENCE:

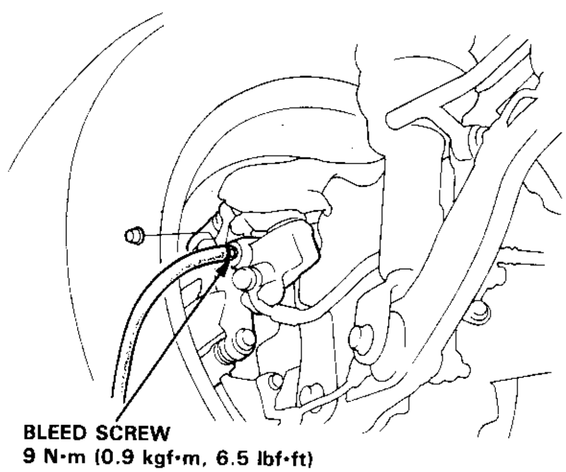


NOTE: Bleed the front calipers first.

FRONT:



REAR:



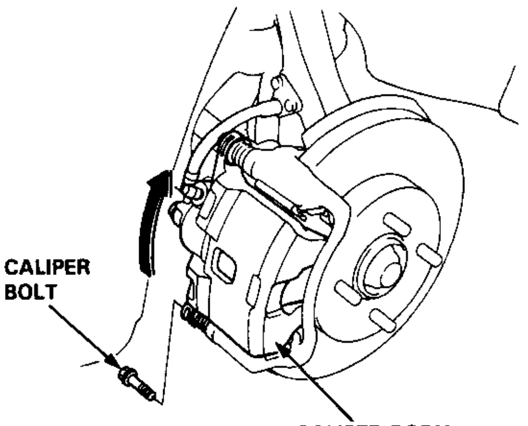
Front Brake Pads

Inspection and Replacement

⚠ WARNING

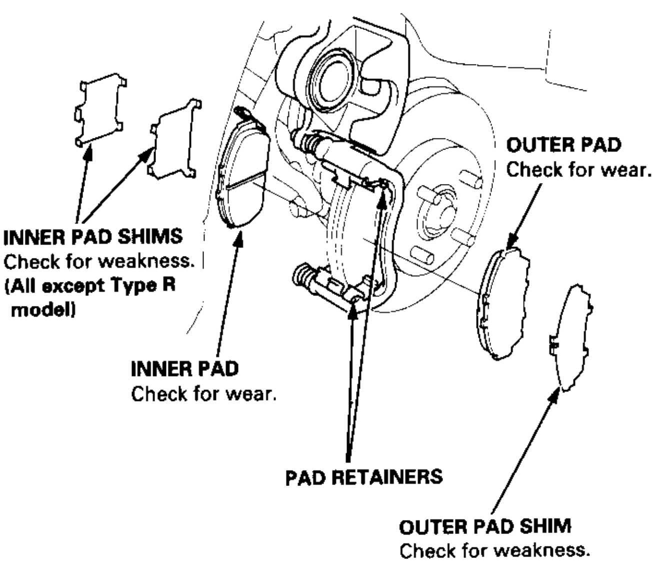
- **Never use an air hose or dry brush to clean brake assembiles.**
- **Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.**

1. Loosen the front wheel nuts slightly, then raise the vehicle and support it on safety stands.
2. Remove the caliper bolt, and pivot the caliper up out of the way.



NOTE: Check the hoses and pin boots for damage or deterioration.

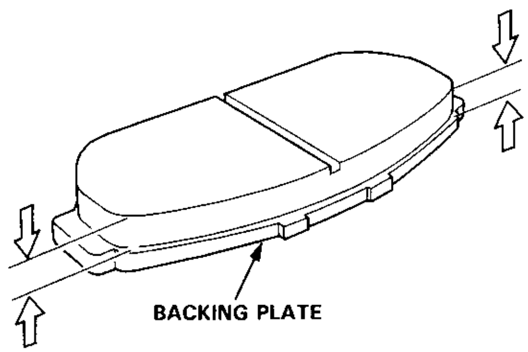
3. Remove the pad shim, pad retainers and pads.



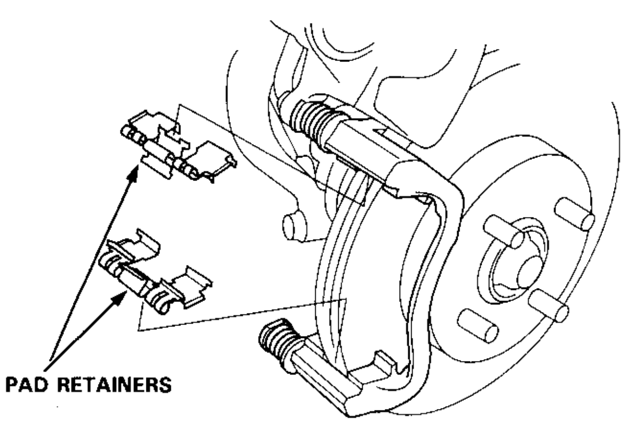
4. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include pad backing plate thickness.

Brake Pad Thickness:
Standard:
Type R Model:
10.5 - 11.5 mm (0.41 - 0.45 in)
All except Type R Model:
9.5 - 10.5 mm (0.37 - 0.41 in)

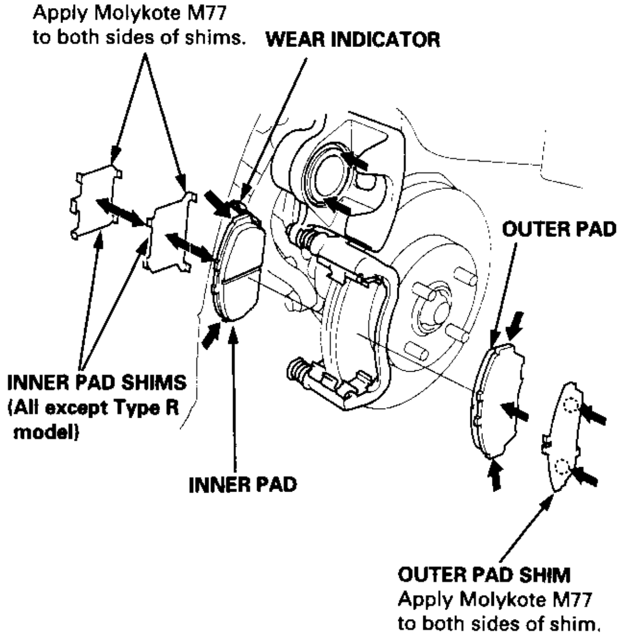
Service Limit: 1.6 mm (0.06 in)



5. If the brake pad thickness is less than the service limit, replace the front pads as a set.
6. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
7. Check the brake disc for damage and cracks.
8. Install the pad retainers.



9. Apply Molykote M77 grease to both sides of the, pad shims and to the back of the pads. Wipe excess grease off the shim.



10. Install the brake pads and pad shims correctly.

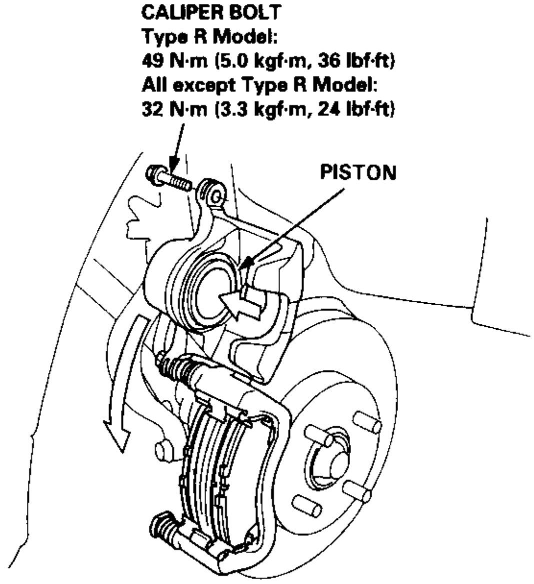
WARNING

- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**
- **Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.**

NOTE: Install the pad with the wear indicator on the inside.

11. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.

12. Pivot the caliper down into position, then install the caliper bolt and tighten it. Be careful not damage the pin boot when pivoting the caliper down.



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

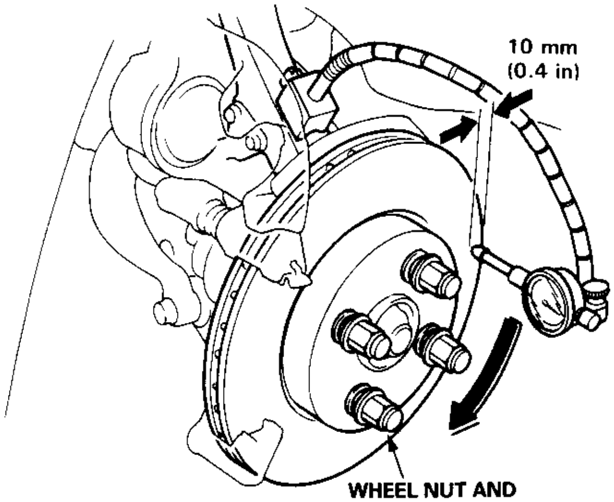
14. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Front Brake Disc

Disc Runout Inspection

1. Loosen the front wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-8).
3. Inspect the disc surface for damage or cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable plain washers to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout aat 10 mm (0.4 in) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in)



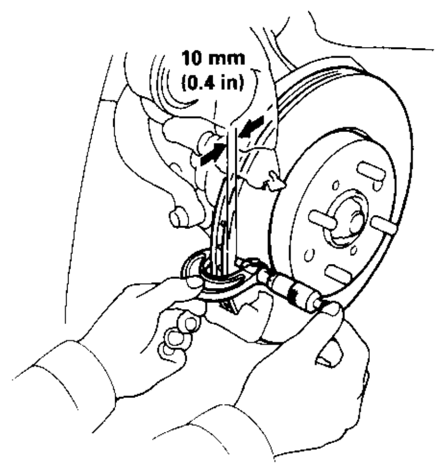
5. If the disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   Max. Refinish Limit:
   Type R Model:
   21.0 mm (0.83 in)
   All except Type R Model:
   19.0 mm (0.75 in)

NOTE:
- A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in).
- See section 18 for brake disc replacement.
- When the vehicle is equipped with a limited slip differential, raise both front wheels off the ground.

Disc Thickness and Parallelism Inspection

1. Loosen the front wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-8).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.



   Brake Disc Thickness:
   Standard:
   Type R Model:
   22.9 – 23.1 mm (0.90 – 0.91 in)
   All except Type R Model:
   20.9 – 21.1 mm (0.82 – 0.83 in)

   Max. Refinishing Limit:
   Type R Model:
   21.0 mm (0.83 in)
   All except Type R Model:
   19.0 mm (0.75 in)

   Brake Disc Parallelism: 0.015 mm (0.0006 in) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.

4. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

NOTE:
- See section 18 for brake disc replacement.
- When the vehicle is equipped with a limited slip differential, raise both front wheels off the ground.

Front Brake Caliper

Disassembly/Reassembly

⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.**
- **Contaminated brake discs or pads reduce stopping ability.**
- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**

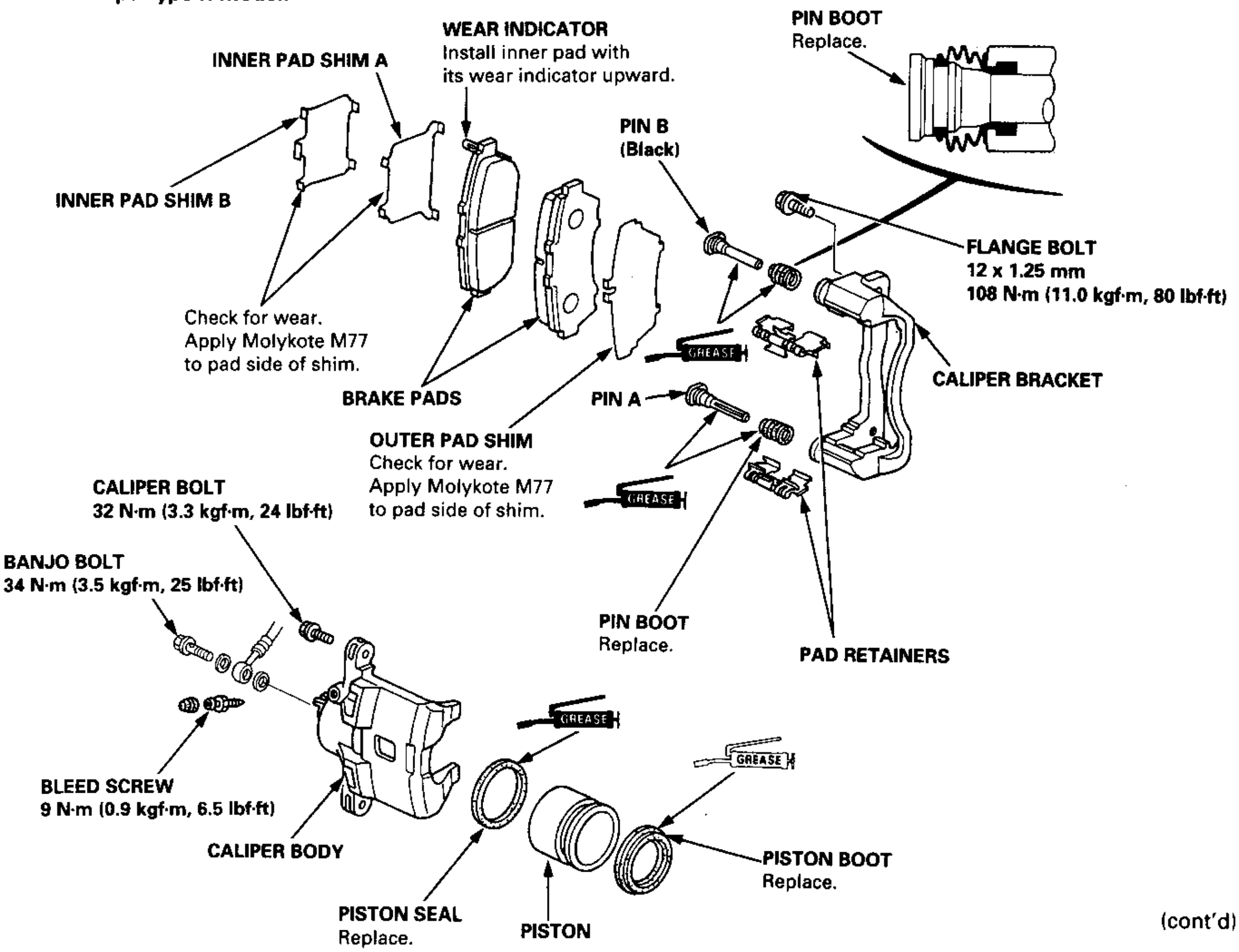
CAUTION: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

NOTE:
- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Always use Genuine Honda DOT3 Brake Fluid. Using non-Honda brake fluid can cause corrosion and decrease the lift of the system.

GREASE: Use recommended rubber grease in the caliper seal set.

GREASE: Use recommended seal grease in the caliper seal set.

All except Type R Model:



(cont'd)

Front Brake Caliper

Disassembly/Reassembly (cont'd)

⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.**
- **Contaminated brake discs or pads reduce stopping ability.**
- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**

CAUTION: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

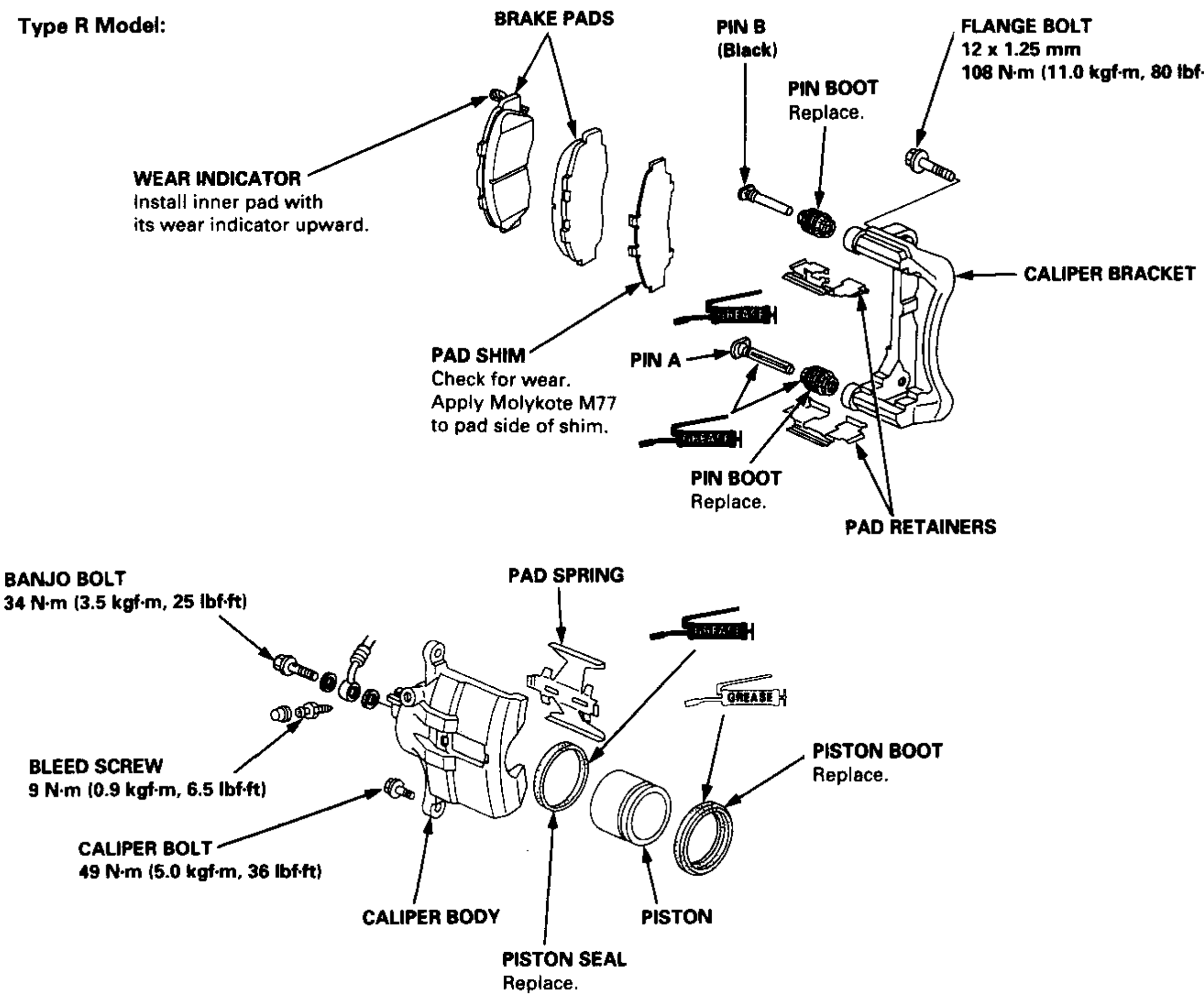
NOTE:

- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Always use Genuine Honda DOT3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

GREASE: Use recommended rubber grease in the caliper seal set.

GREASE: Use recommended seal grease in the caliper seal set.

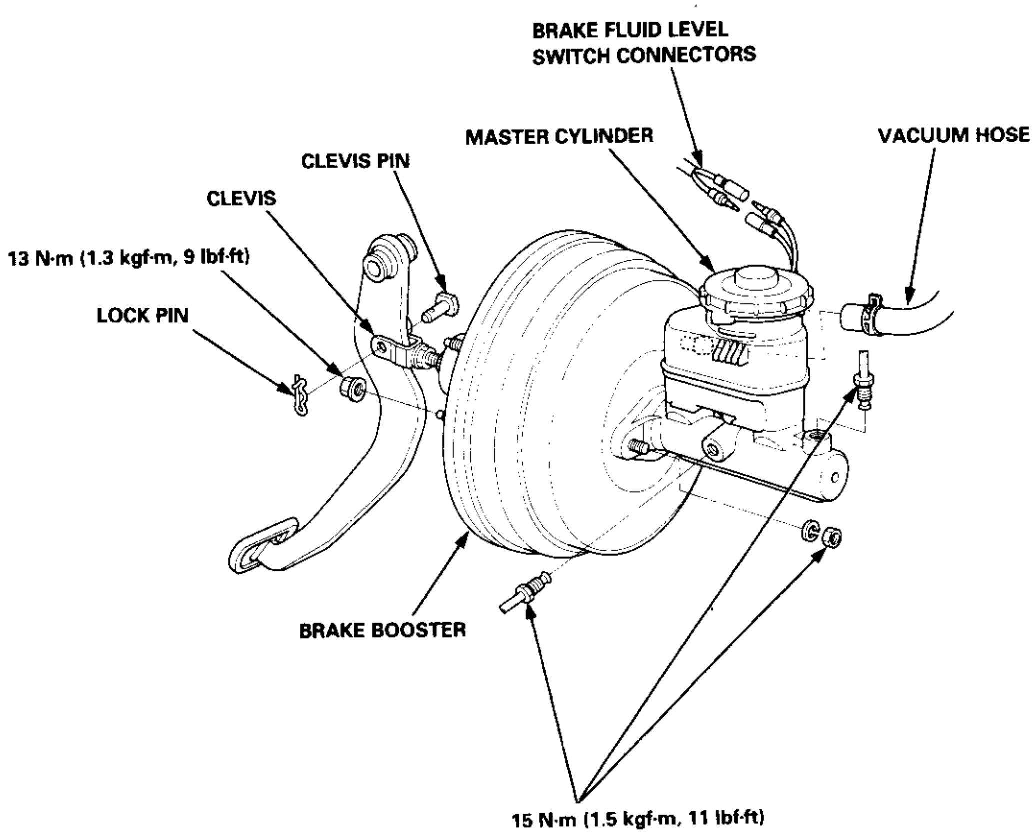
Type R Model:



Removal/Installation

CAUTION: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

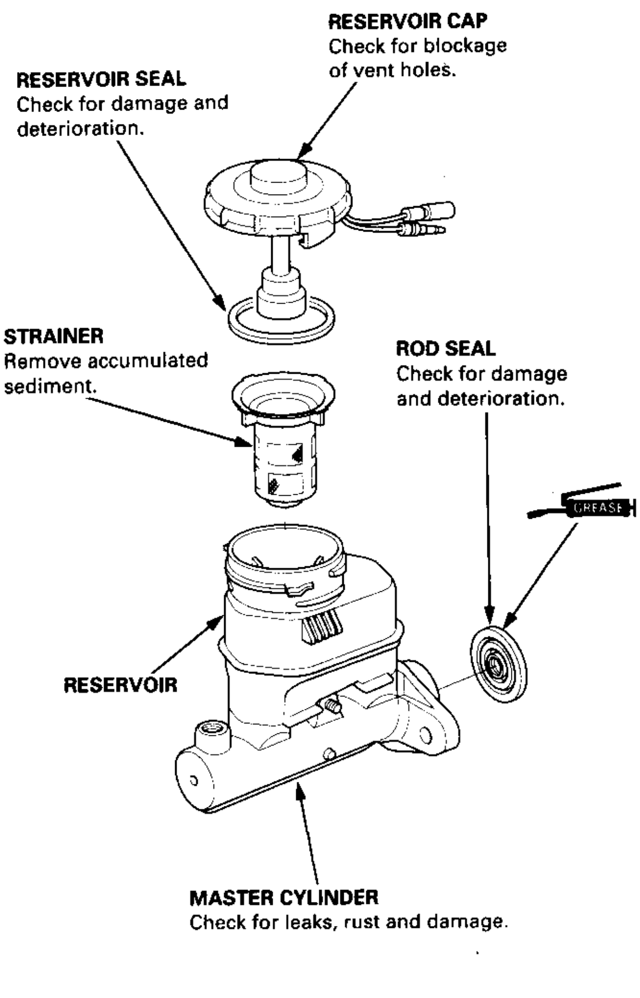
1. Disconnect the brake fluid level switch connectors.
2. Remove the reservoir cap from the master cylinder.
3. Remove the brake fluid from the master cylinder reservoir with a syringe.
4. Disconnect the brake lines from the master cylinder. Be careful not to bend or damage the brake lines when removing the master cylinder.
5. Remove the master cylinder mounting nuts and washers.
6. Remove the master cylinder from the brake booster. To prevent spills, cover the line joints with rags or shop towels.
7. Disconnect the vacuum hose from the brake booster.
8. Remove the lock pin and clevis pin from the clevis. Do not disconnect the clevis by removing it from the operating rod of the brake booster. If the clevis is loosened, adjust the pushrod length before installing the brake booster.
9. Remove the four booster mounting nuts.
10. Pull the brake booster forward until the clevis is clear of the bulkhead.
11. Remove the brake booster from the engine compartment.
12. Install the brake booster and master cylinder in the reverse order of removal and note these items:
    - When connecting the brake lines, make sure that there is no interference between the brake lines and other parts.
    - Be careful not to bend or damage the brake lines when installing the master cylinder.
    - If replacing the master cylinder or brake booster, check and adjust the pushrod clearance before installing the master cylinder (see page 19-14).
13. Fill the master cylinder reservoir, and bleed the brake system (see page 19-7).
14. After installation, check the brake pedal height and brake pedal free play and adjust if necessary (see page 19-5).



Master Cylinder/Brake Booster

Master Cylinder Inspection

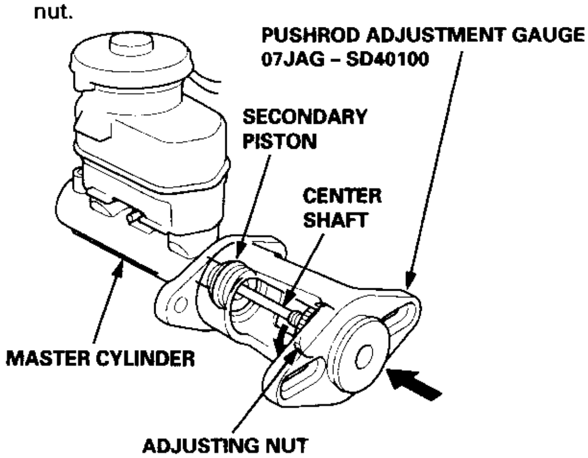
CAUTION:
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Do not try to disassemble the master cylinder assembly. Replace the master cylinder assembly with a new part if necessary.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**



Pushrod Clearance Adjustment

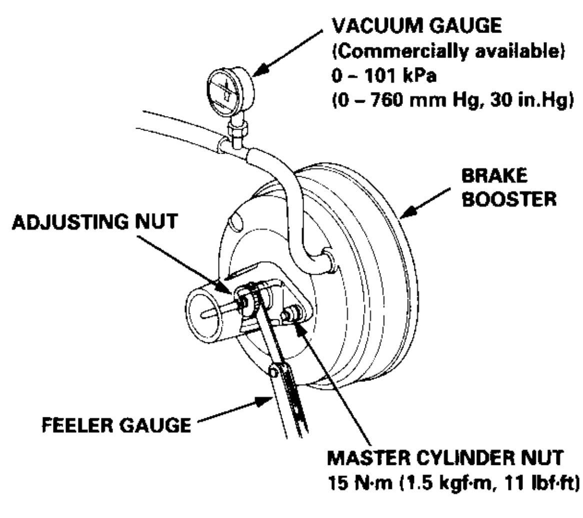
NOTE: Master cylinder pushrod-to piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Set the special tool on the master cylinder body; push in the center shaft until the top of it contacts the end of the secondary piston by turning the adjusting nut.



2. Without disturbing the center shaft's position, install the special tool upside down on the booster.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge 0 – 101 kPa (0 – 760 mmHg, 30 in.Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mmHg, 20 in.Hg) vacuum.
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut as shown.

Clearance: 0 – 0.4 mm (0 – 0.02 in)

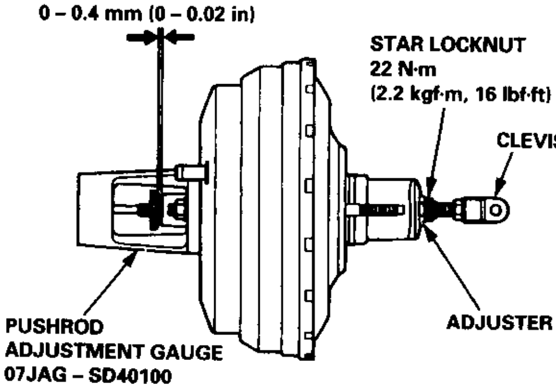


NOTE: If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in) or more. Therefore it must be adjusted and rechecked.

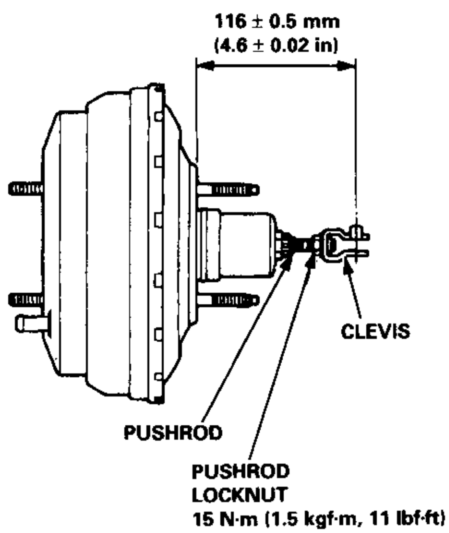
6. If clearance is incorrect, loosen the star locknut and turn the adjuster in or out to adjust.

   NOTE:
   - Adjust the clearance while the specified vacuum is applied to the booster.
   - Hold the clevis while adjusting.

7. Tighten the star locknut securely.
8. Remove the special tool.



9. Adjust the pushrod length as shown if the booster is removed.



10. Install the master cylinder.

Brake Booster Inspection

Functions Test

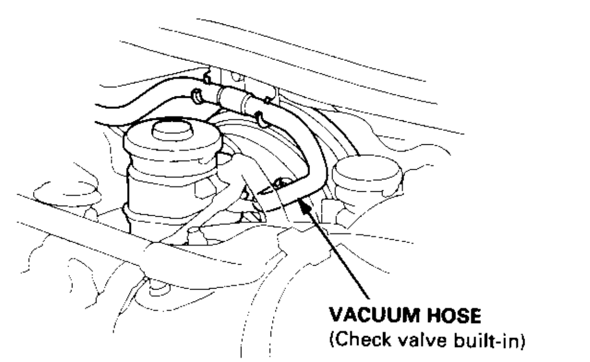
1. With the engine stopped, depress the brake pedal several times to deplete the vacuum reservoir, then depress the pedal hard and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally; or the brake system (master cylinder, lines, modulator proportioning valve, or caliper) are leaking.
2. Start the engine with the pedal depressed. If the pedal sinks slightly, the vacuum booster is operating normally. If the pedal height does not vary, the booster or check valve is faulty.
3. With the engine running, depress the brake pedal lightly. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 25 mm (1.0 in.) in three minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

Leak Test

1. Depress the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while depressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.
2. With the engine stopped, depress the brake pedal several times using normal pressure. When the pedal is first depressed, it should be low. On consecutive applications, the pedal height should gradually rise. If the pedal position does not vary, check the booster check valve.

Booster Check Valve Test

1. Disconnect the brake booster vacuum hose at the booster.
2. Start the engine and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.



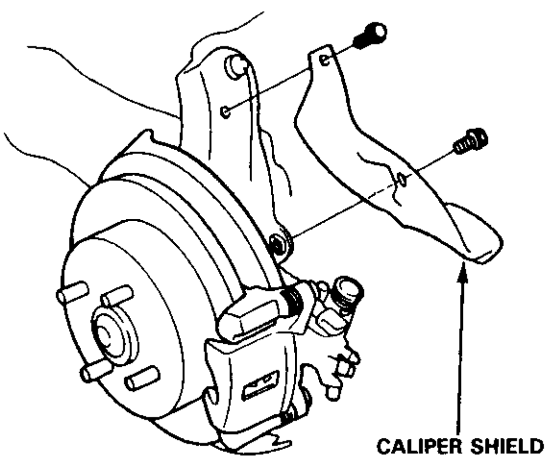
Rear Brake Pads

Inspection and Replacement

WARNING

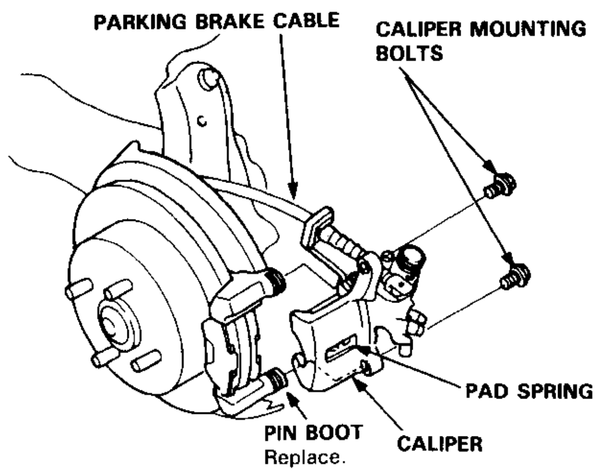
- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.

1. Block the front wheels, loosen the rear wheel nuts slightly, support the rear of vehicle on safety stands, then remove the rear wheels.
   Release the parking brake.
2. Remove the caliper shield.



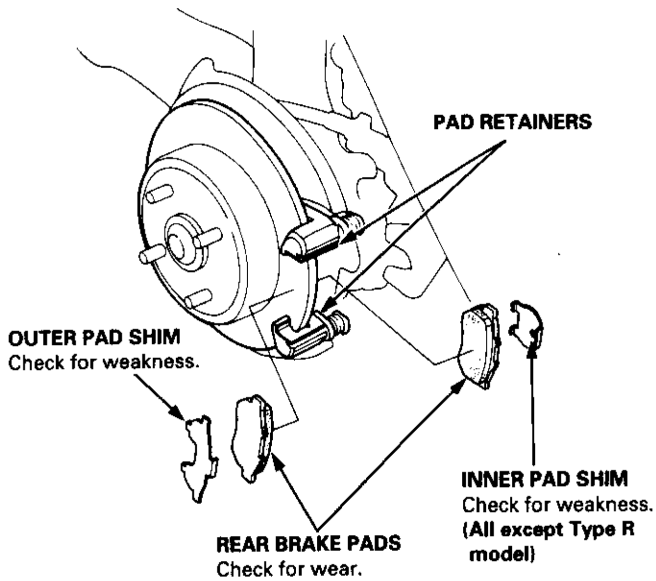
3. Remove the two caliper mounting bolts and the caliper from the bracket.

CAUTION:
- **Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.**
- **Support the caliper with a piece of wire so that it does not hang from the brake hose.**



NOTE: Check the hoses and pin boots for damage or deterioration.

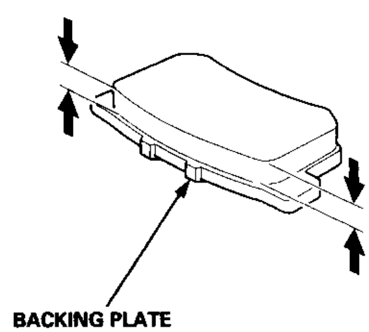
4. Remove the pad shims, pads and pad retainer.



5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

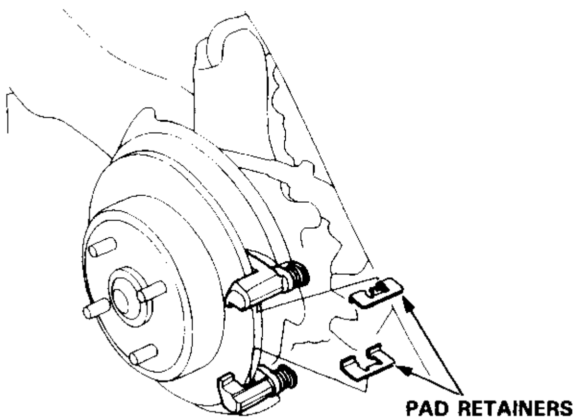
Brake Pad Thickness:
Standard:
Type R Model:
8.5 – 9.5 mm (0.33 – 0.37 in)
All except Type R Model:
7.0 – 8.0 mm (0.27 – 0.31 in)

Service Limit: 1.6 mm (0.06 in)



6. If the pad thickness is less than the service limit, replace the pads and shims together as a set.

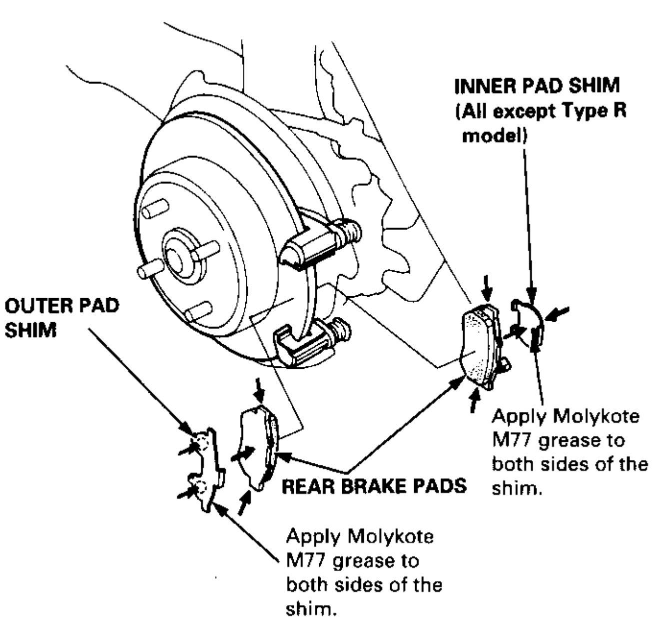
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Make sure that the pad retainers are installed in the correct positions.



10. Apply Molykote M77 to both sides of the shims and to the back of the pads. Wipe excess grease off the shims.
11. Install the brake pads and pad shims on the caliper bracket. Install the inner pad with its wear indicator facing downward.

WARNING

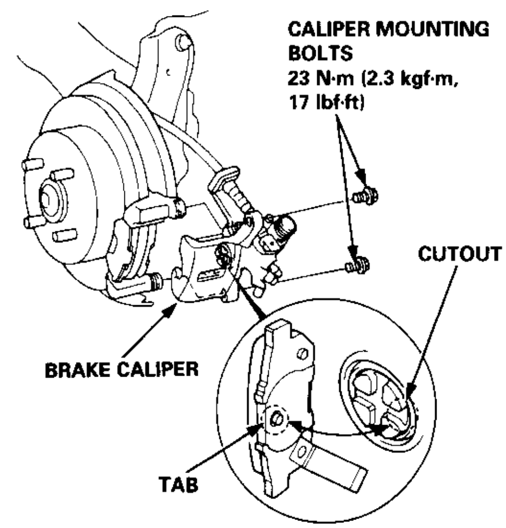
- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**
- **Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.**



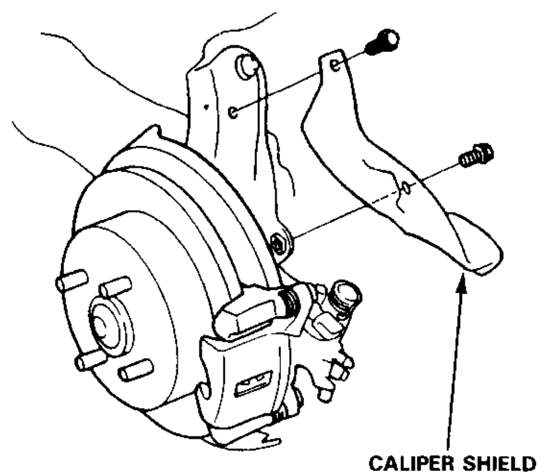
12. Rotate the caliper piston clockwise into place in the cylinder, then align the cutout in the piston with the tab on the inner pad by turning the piston back.

CAUTION: Lubricate the boot with rubber grease to avoid twisting the piston boot. If the piston boot is twisted, back it out so it sits properly.

13. Install the brake caliper.
14. Install and tighten the caliper mounting bolts.



15. Install the caliper shield.



16. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.
17. Depress the brake pedal several times to make sure the brakes work, then road-test.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

Rear Brake Disc

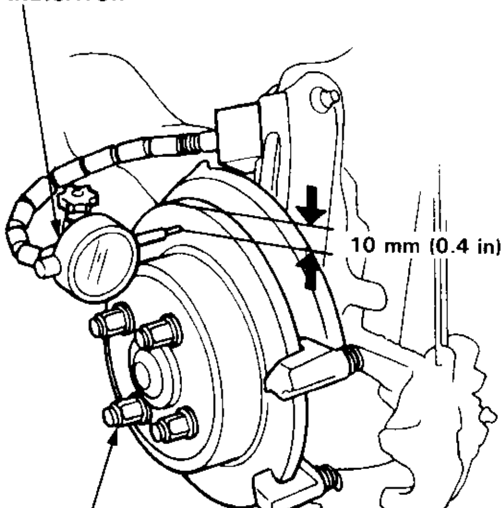
Disc Runout Inspection

1. Loosen the rear wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the rear wheels.
2. Remove the brake pads (see page 19-16).
3. Inspect the disc surface for damage or cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable plain washers to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout at 10 mm (0.4 in) in from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in) max.

5. If the disc is beyond the service limit, refinish the brake disc.

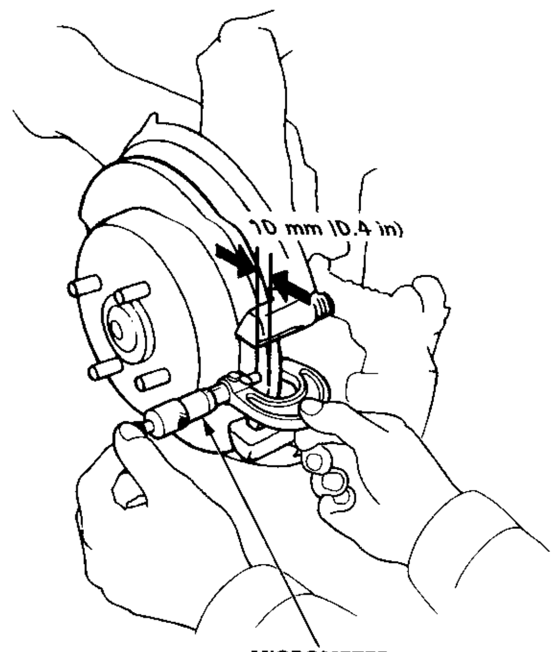
   Max. Refinishing Limit: 8.0 mm (0.32 in)



NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in).

Disc Thickness and Parallelism Inspection

1. Loosen the rear wheel lug nuts slightly, then raise the vehicle and support it on safety stands. Remove the rear wheels.
2. Remove the brake pads (see page 19-16).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.



Brake Disc Thickness:

Standard:	**8.9–9.1 mm (0.35–0.36 in)**
Max. Refinishing Limit:	**8.0 mm (0.31 in)**

NOTE: Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

Brake Disc Parallelism: 0.015 mm (0.0006 in) max.

NOTE: This is the maximum allowable difference between the thickness measurement.

4. If the disc is beyond the service limit for parallelism, refinish the brake disc.

   NOTE: See section 18 for brake disc replacement.

Rear Brake Caliper

Disassembly/Reassembly

⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.**
- **Contaminated brake discs or pads reduce stopping ability.**
- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**

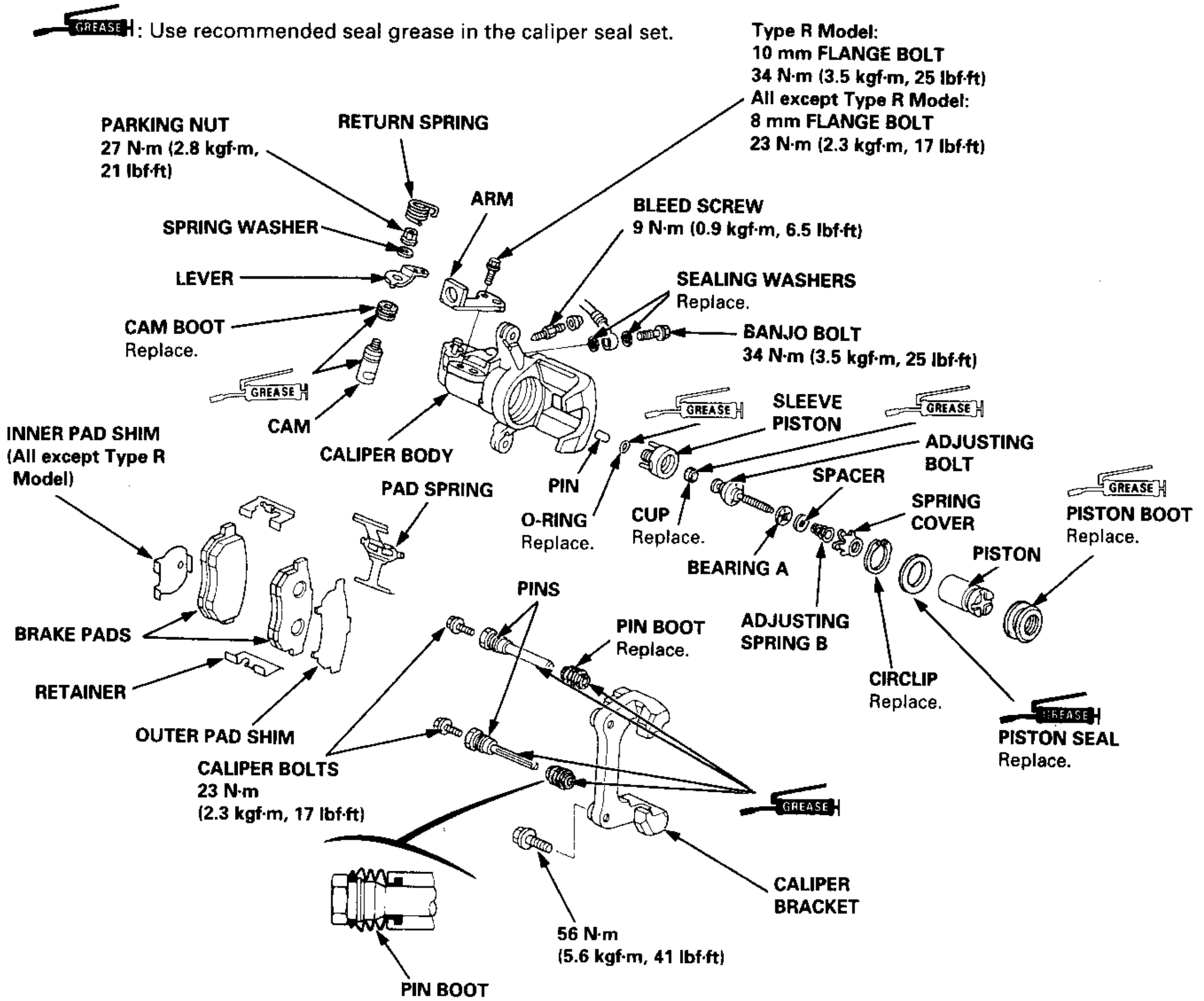
CAUTION: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

NOTE:

- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Always use Genuine Honda DOT3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

GREASE: Use recommended rubber grease in the caliper seal set.

GREASE: Use recommended seal grease in the caliper seal set.

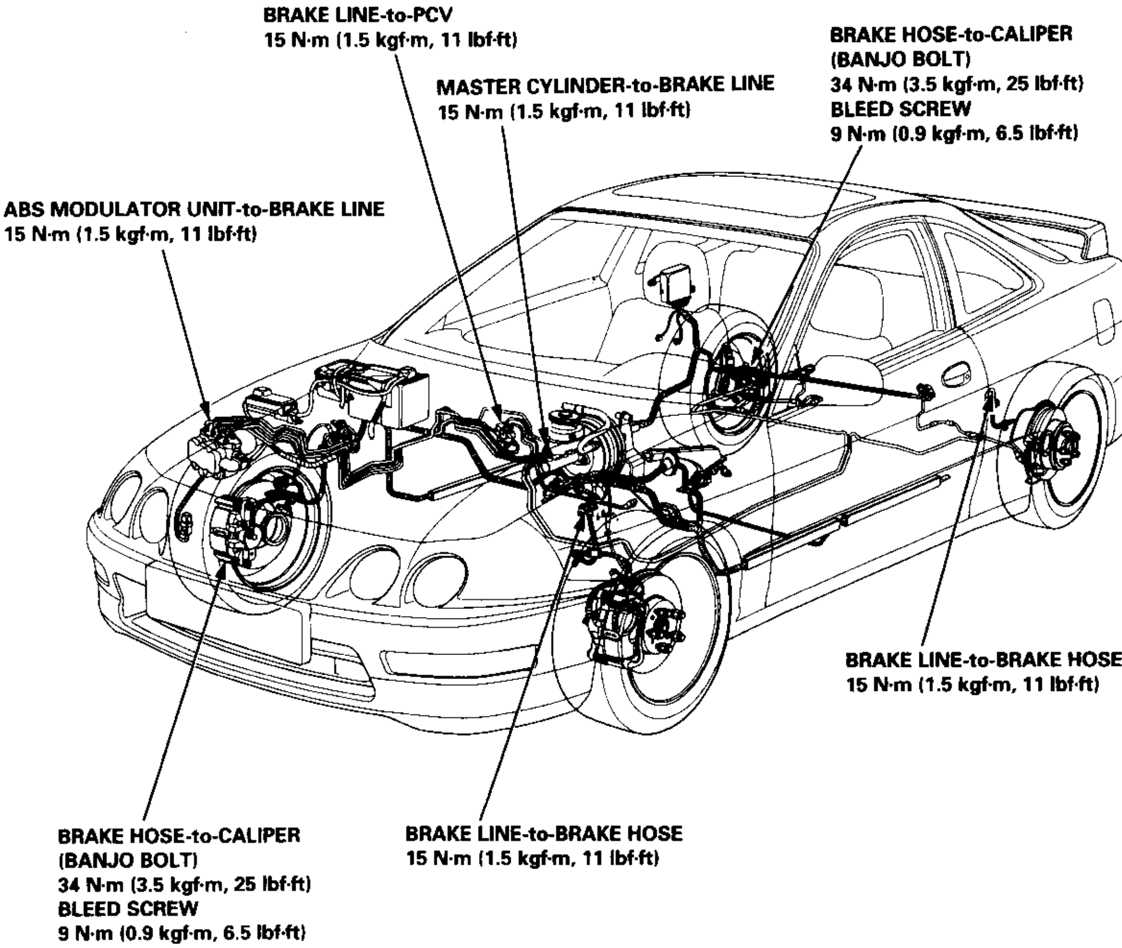


Brake Hoses/Lines

Inspection/Torque Specifications

1. Inspect the brake hoses for damage, deterioration, leaks, interference and twisting.
2. Check the brake lines for damage, rusting and leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints and connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator unit (if equipped) for damage and leakage.

CAUTION: Replace the brake hose clip whenever the brake hose is serviced.

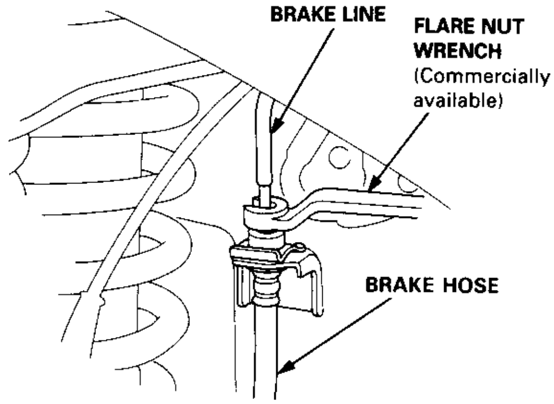


Hose Replacement

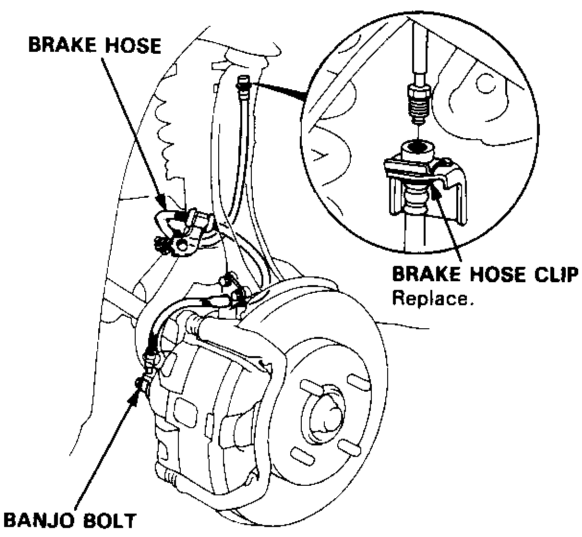
CAUTION:

- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**

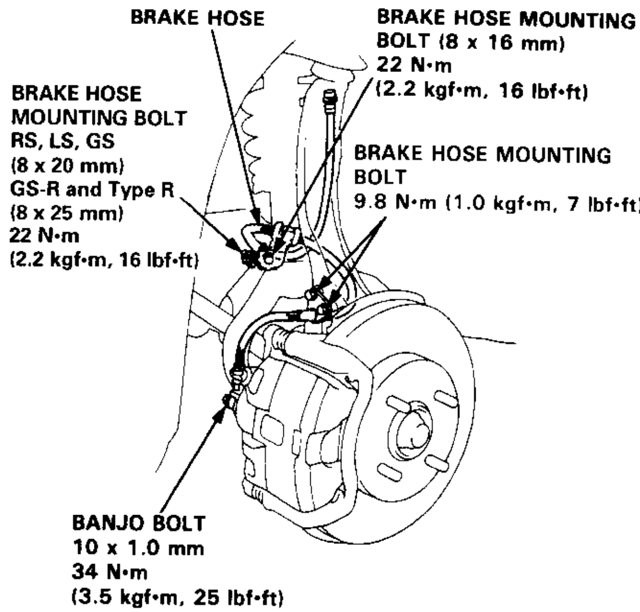
1. Replace the brake hose if the hose is twisted, cracked, or if it leaks.
2. Disconnect the brake hose from the brake line using a 10 mm flare nut wrench.



3. Remove and discard the brake hose clip from the brake hose.
4. Remove the banjo bolt, and disconnect the brake hose from the caliper.

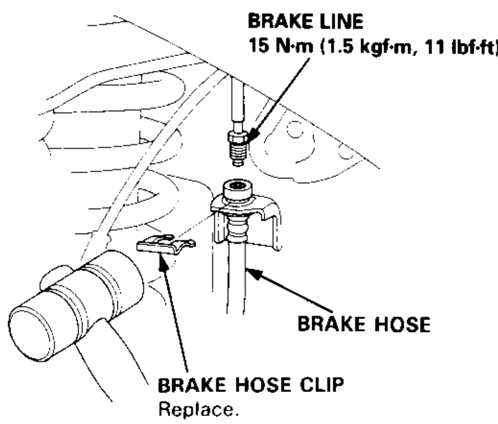


5. Install the brake hose on the knuckle and damper first, then connect the brake hose to the caliper with the banjo bolt and new sealing washers.



CAUTION: Do not twist the brake hose excessively.

6. Install a new brake hose clip on the brake hose.
7. Connect the brake line to the brake hose.

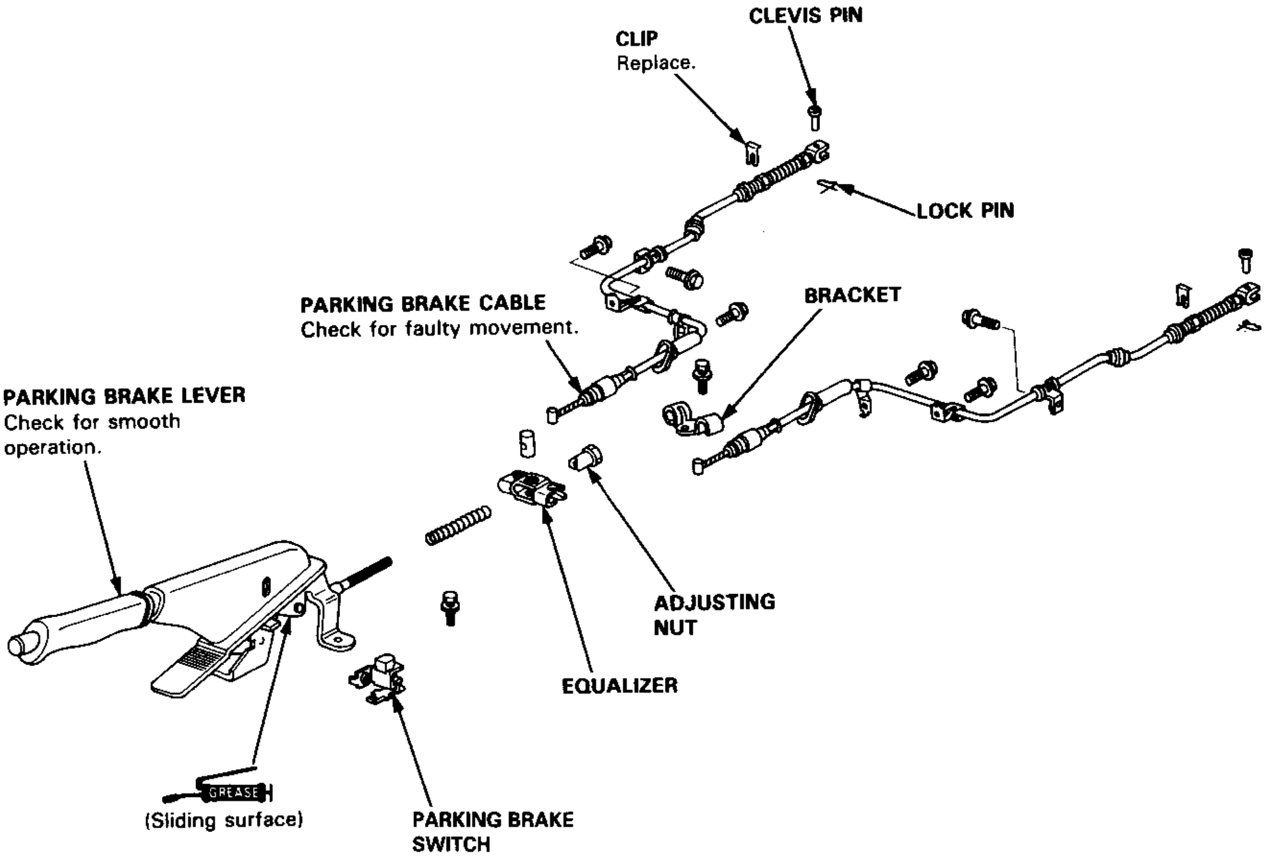


8. After installing the brake hose, bleed the brake system (see page 19-7).
9. Perform the following checks.
   - Check the brake hose and line joint for leaks, and tighten if necessary.
   - Check the brake hoses for interference or twisting.

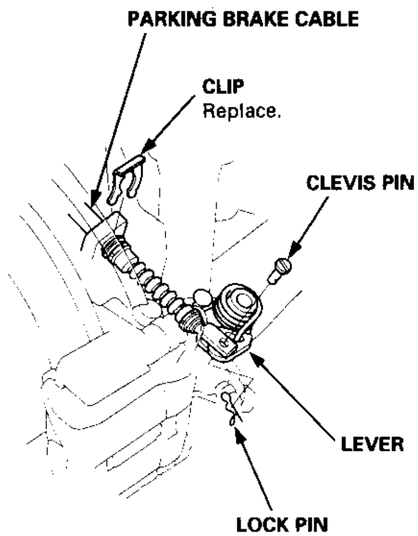
Parking Brake Cable

Inspection and Replacement

CAUTION: The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature cable failure.



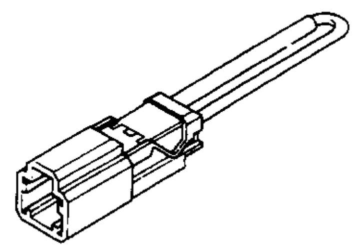
Disconnect the parking brake cable from the lever on the caliper by removing the lock pin and clevis pin, and remove the cable from the arm by removing the clip



Anti-lock Brake System (ABS)

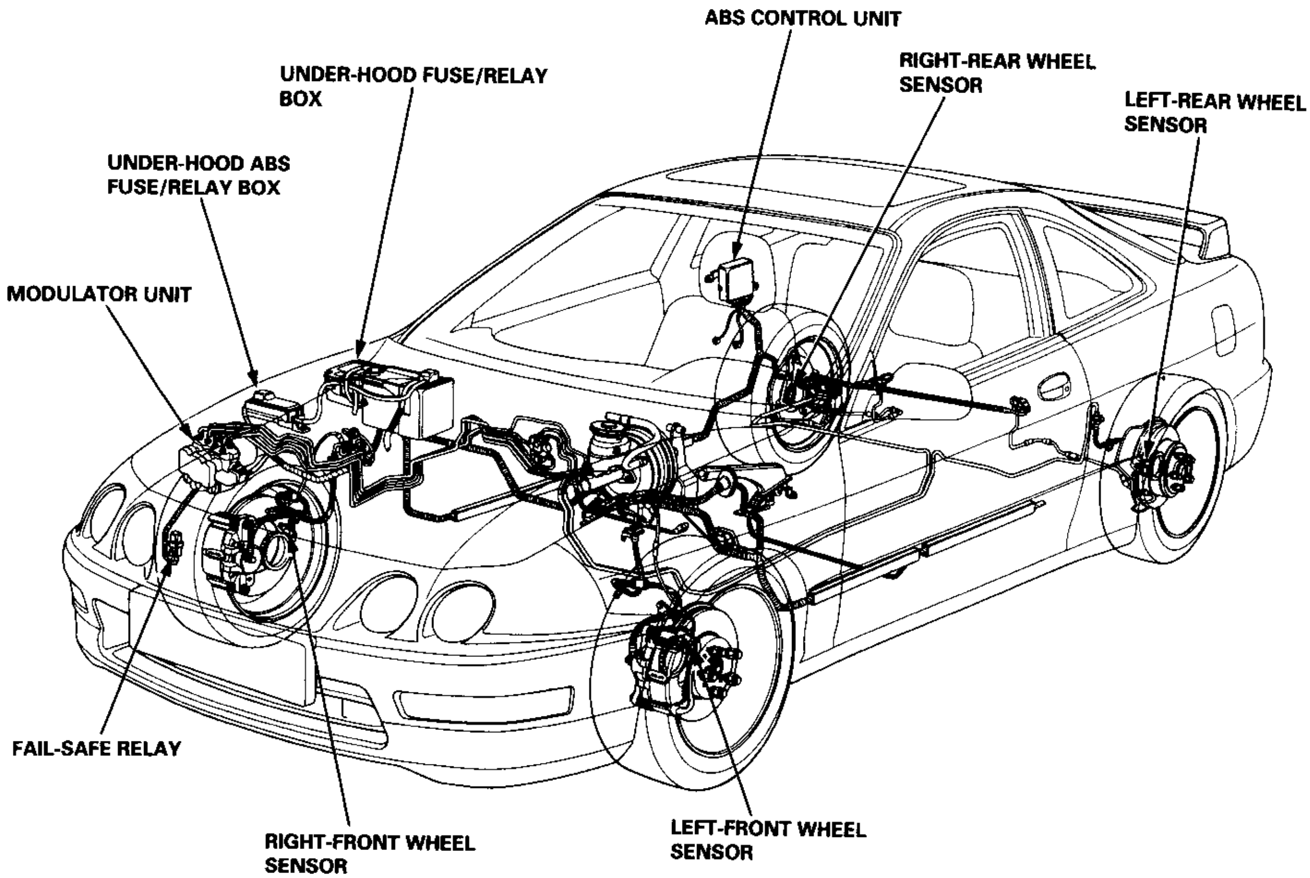
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07PAZ – 0010100	SCS Service Connector	1	19-37

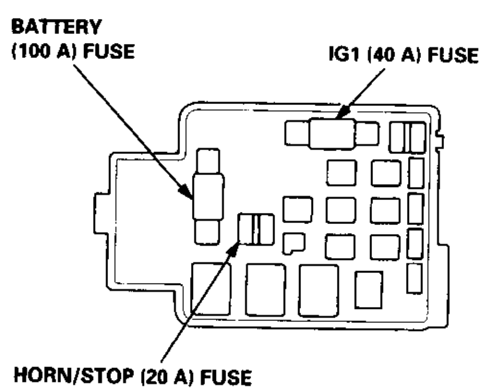


①

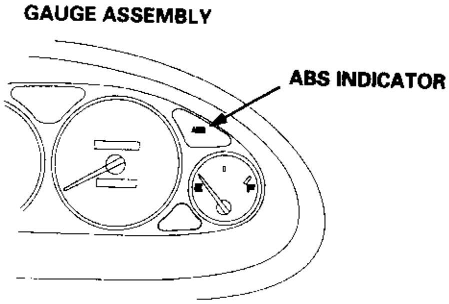
Component Locations



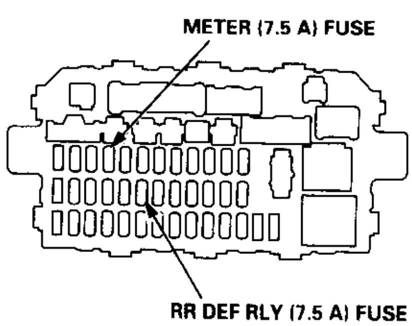
UNDER-HOOD FUSE/RELAY BOX



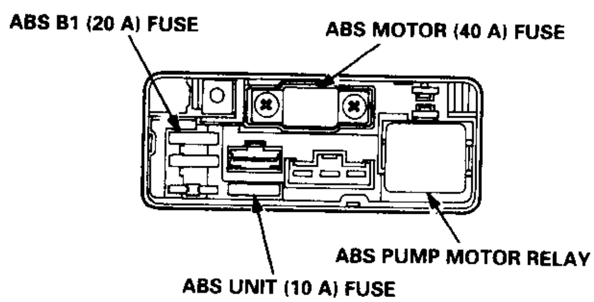
GAUGE ASSEMBLY



UNDER-DASH FUSE/RELAY BOX



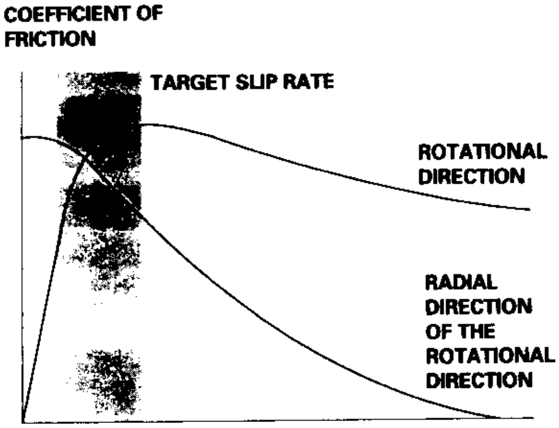
UNDER-HOOD ABS FUSE/RELAY BOX



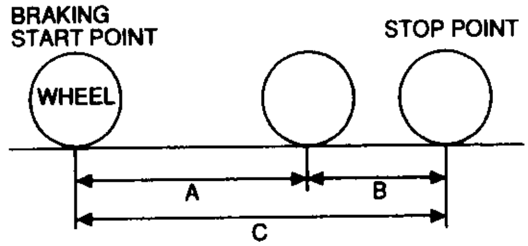
Features/Construction

When the brake pedal is depressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, and it thereby ensures maneuverbility and stability of the vehicle.
The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to attain the target slip rate.

Grip Force of Tire and Road Surface

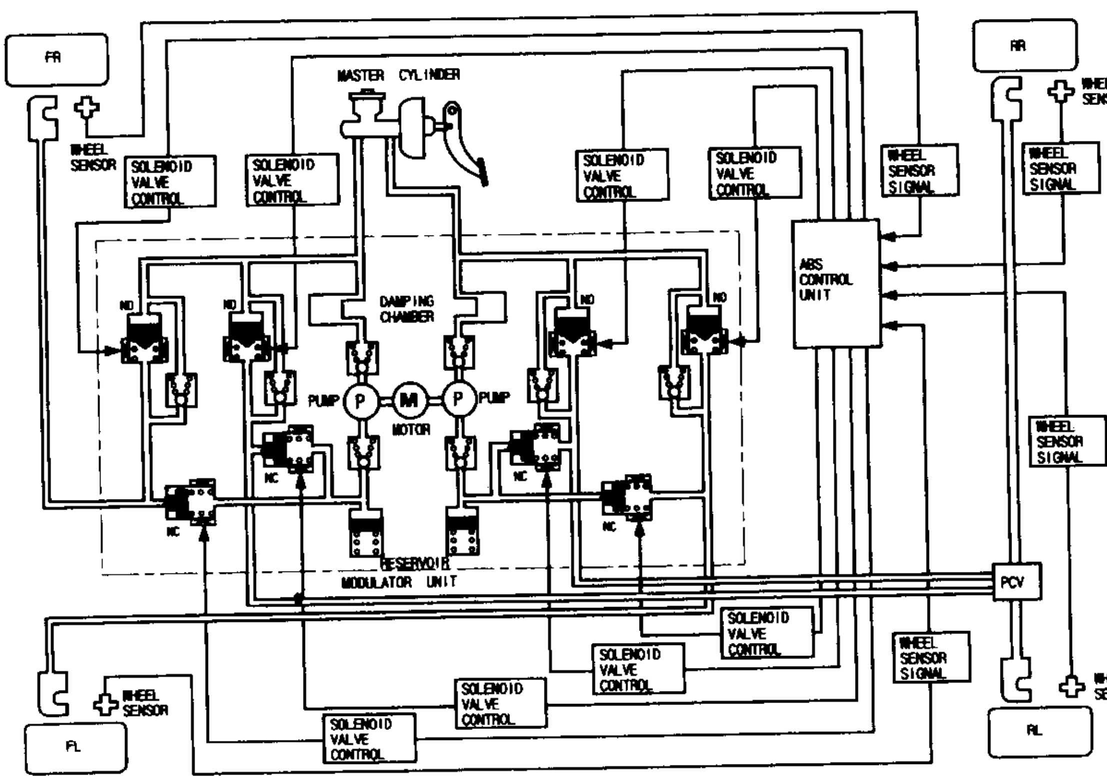


Slip Rate



A: Distance without slip
B: Slipped distance
C: Actual distance to stop

$$\text{SLIP RATE} = \frac{B}{C} = \frac{\text{VEHICLE SPEED} - \text{WHEEL SPEED}}{\text{VEHICLE SPEED}}$$



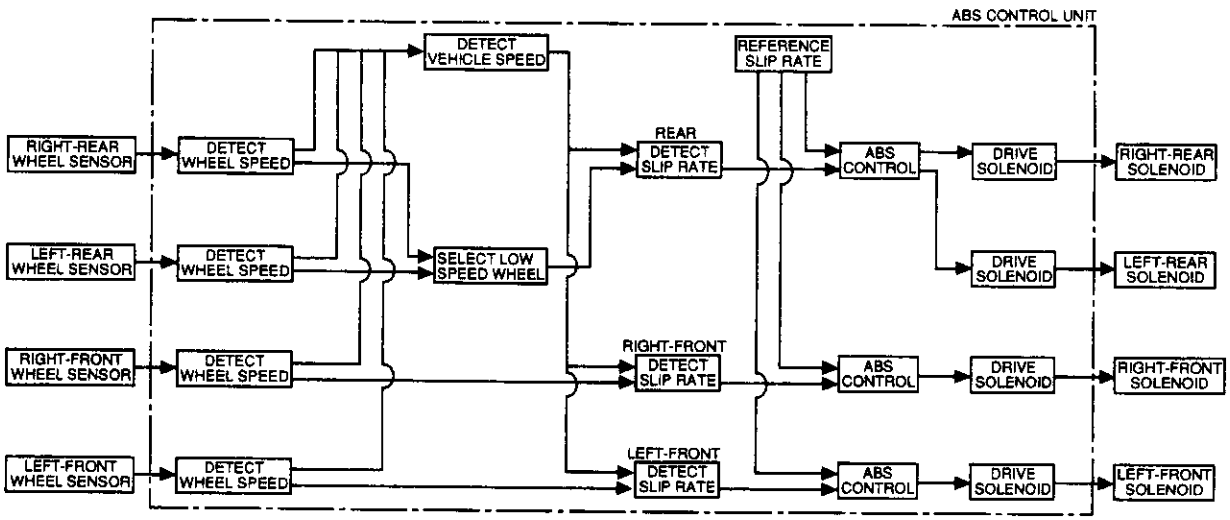
NO: Normally Open
NC: Normally Closed

ABS Control

The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The ABS control unit calculates the slip rate of each wheel, and it transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The pressure reduction control has three-modes: pressure reduction, pressure retaining, and pressure intensifying.



Self-diagnosis Function

The CPUs in the ABS control unit check the circuit of the system.

The self-diagnosis can be classifield into two categories.

- Initial diagnosis: Performed right after the engine starts and until the ABS indicator gose off.
- Regular diagnosis: Performed right after the initial diagnosis until the ignition switch is turned off.

On-board Diagnosis Function

The ABS control unit is connected to the data link connector (16P).

The ABS system can be diagnosed with the Honda PGM Tester.

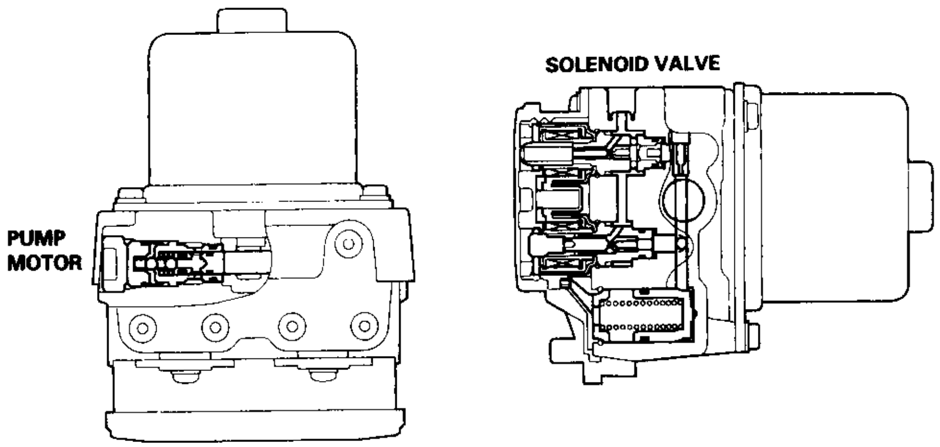
(cont'd)

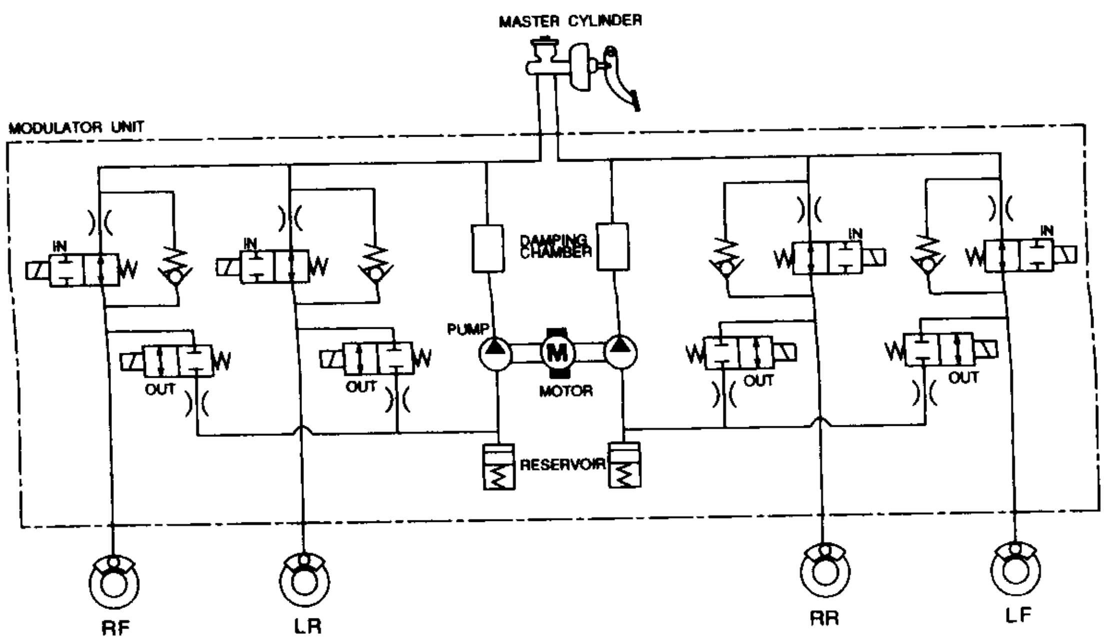
Anti-lock Brake System (ABS)

Features/Construction (cont'd)

ABS Modulator

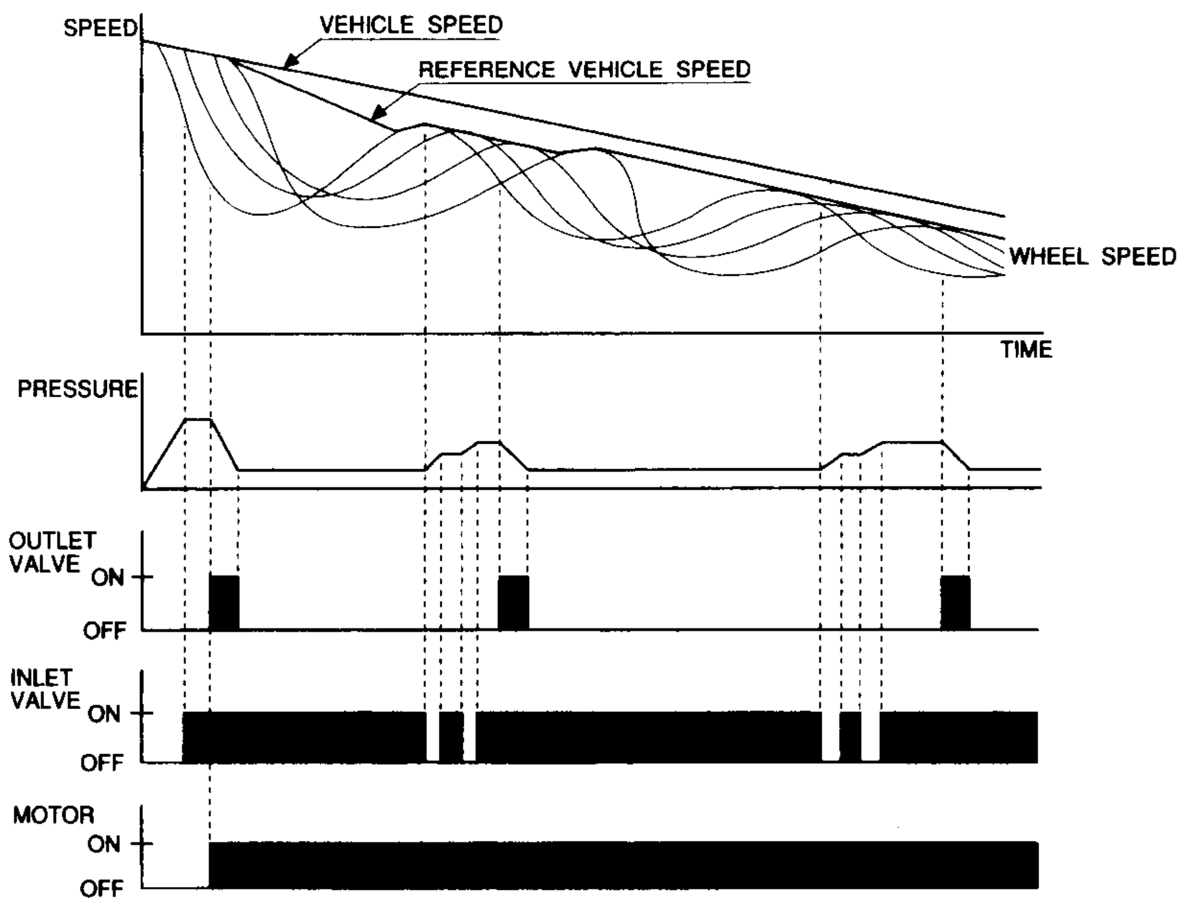
The ABS modulator consists of the inlet solenoid valve, outlet solenoid valve, reservoir, pump, pump motor and the damping chamber.
The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, reservoir and the master cylinder.
The hydraulic control has three modes: pressure reduction, pressure retaining and pressure intensifying.
The hydraulic circuit is the independent four channel-type, one channel for each wheel.





Pressure intensifying mode:	Inlet valve open, outlet valve closed Master cylinder fluid is pumped out to the caliper.
Pressure retaining mode:	Inlet valve closed, outlet valve closed Caliper fluid is retained by the inlet valve and outlet valve.
Pressure reduction mode:	Inlet valve closed, outlet valve open Caliper fluid flows through the outlet valve to the reservoir.
Motor operation mode:	When starting the pressure reduction mode, the pump motor is ON. When stopping ABS operation, the pump motor is OFF. The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.

Wheel Speed and Modulator Control

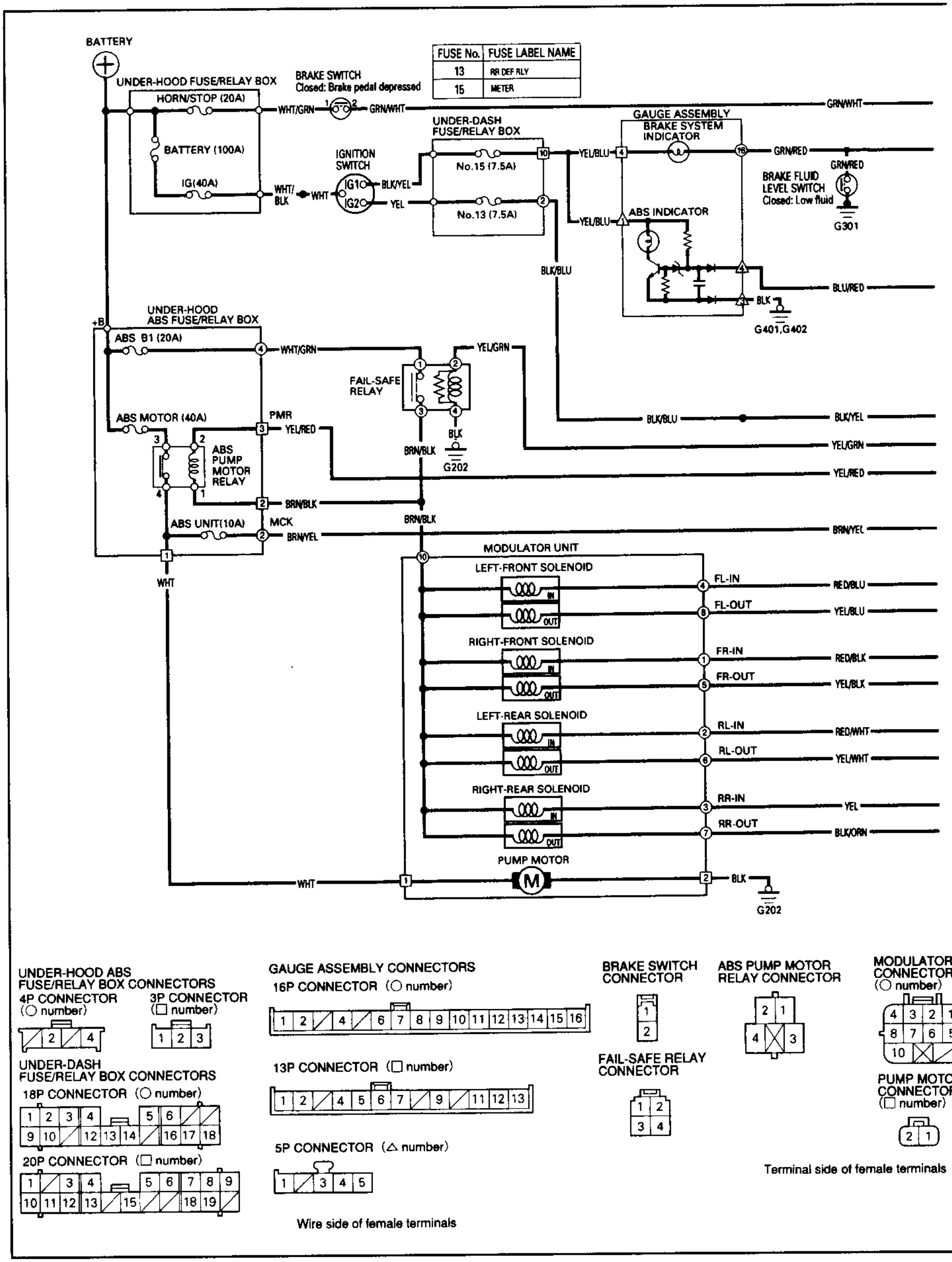


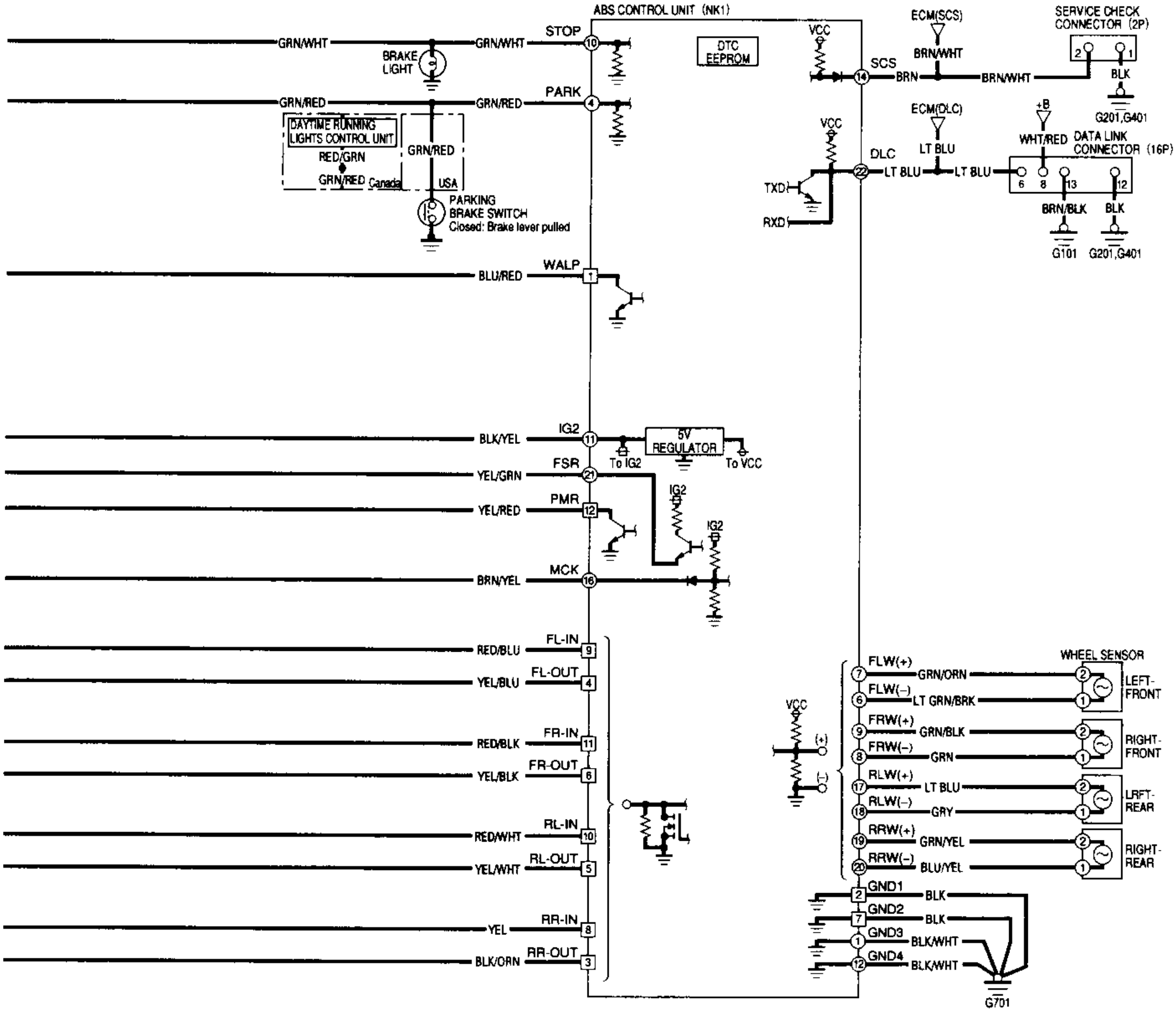
When the wheel speed drops sharply below the vehicle speed, the inlet valve closes to retain the caliper fluid pressure. When the wheel speed drops further, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time.
As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

Wheel Sensor

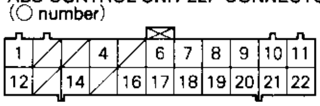
The four wheel sensors are the magnetic contactless type. As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.

Circuit Diagram

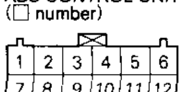




ABS CONTROL UNIT 22P CONNECTOR
(○ number)

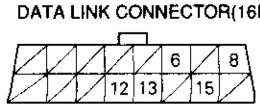


ABS CONTROL UNIT 12P CONNECTOR
(□ number)



SERVICE CHECK
CONNECTOR (2P)

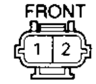
DATA LINK CONNECTOR(16P)



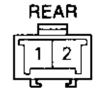
Wire side of female terminals

WHEEL SENSOR
CONNECTOR

FRONT



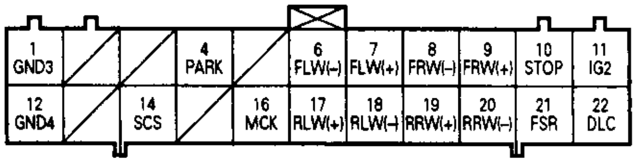
REAR



Terminal side of
male terminals

ABS Control Unit Terminal Arrangement

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

<table>
<tr><th rowspan="2">Terminal number</th><th rowspan="2">Wire color</th><th rowspan="2">Terminal sign (Terminal name)</th><th rowspan="2">Description</th><th colspan="4">Measurement</th></tr>
<tr><th>Terminal</th><th colspan="2">Conditions (Ignition switch ON (II))</th><th>Voltage</th></tr>
<tr><td>1</td><td>BLK/WHT</td><td>GND3 (Ground 3)</td><td>Ground</td><td>1-GND</td><td colspan="2">——</td><td>Below 0.3 V</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">GRN/RED</td><td rowspan="2">PARK (Parking)</td><td rowspan="2">Detects parking brake switch signal</td><td rowspan="2">4-GND</td><td rowspan="2">Parking brake</td><td>Pulled</td><td>Below 0.3 V</td></tr>
<tr><td>Released</td><td>Battery voltage</td></tr>
<tr><td>6</td><td>LT GRN/BLK</td><td>FLW (–) (Front-left wheel negative)</td><td rowspan="2">Detects left-front wheel sensor signal</td><td rowspan="2">6-7</td><td rowspan="5">Wheel</td><td rowspan="4">Turn wheel at 1 turn/second</td><td rowspan="4">AC: 0.053 V or above

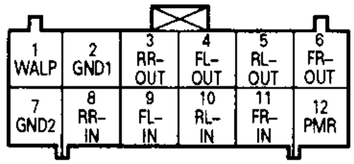
Oscilloscope: 0.15 Vp-p or above</td></tr>
<tr><td>7</td><td>GRN/ORN</td><td>FLW (+) (Front-left wheel positive)</td></tr>
<tr><td>8</td><td>GRN</td><td>FRW (–) (Front-right wheel negative)</td><td rowspan="3">Detects right-front wheel sensor signal</td><td rowspan="3">8-9</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">GRN/BLK</td><td rowspan="2">FRW (+) (Front-right wheel positive)</td></tr>
<tr><td>Stops</td><td>0.25 – 1.15 V</td></tr>
<tr><td rowspan="2">10</td><td rowspan="2">GRN/WHT</td><td rowspan="2">STOP</td><td rowspan="2">Detects brake switch signal</td><td rowspan="2">10-GND</td><td rowspan="2">Brake pedal</td><td>Depressed</td><td>Battery voltage</td></tr>
<tr><td>Released</td><td>Below 0.3 V</td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">BLK/YEL</td><td rowspan="2">IG2 (Ignition 2)</td><td rowspan="2">Power source for activating the system</td><td rowspan="2">11-GND</td><td rowspan="2">Ignition switch</td><td>ON (II)</td><td>Battery voltage</td></tr>
<tr><td>Start (III)</td><td>Below 0.3 V</td></tr>
</table>

<table>
<tr><th rowspan="2">Terminal number</th><th rowspan="2">Wire color</th><th rowspan="2">Terminal sign (Terminal name)</th><th rowspan="2">Description</th><th colspan="4">Measurement</th></tr>
<tr><th>Terminal</th><th colspan="2">Conditions (Ignition switch ON (II))</th><th>Voltage</th></tr>
<tr><td>12</td><td>BLK/WHT</td><td>GND4 (Ground 4)</td><td>Ground</td><td>12-GND</td><td colspan="2"></td><td>Below 0.3 V</td></tr>
<tr><td rowspan="2">14</td><td rowspan="2">BRN</td><td rowspan="2">SCS (Service check signal)</td><td rowspan="2">Detects service check connector signal (DTC indication or DTC erasure)</td><td rowspan="2">14-GND</td><td rowspan="2">SCS short connector</td><td>Connected</td><td>Below 0.3 V</td></tr>
<tr><td>Disconnected</td><td>Approx. 5 V</td></tr>
<tr><td rowspan="2">16</td><td rowspan="2">BRN/YEL</td><td rowspan="2">MCK (Motor check)</td><td rowspan="2">Detects pump motor drive signal</td><td rowspan="2">16-GND</td><td rowspan="2">Pump motor</td><td>ON</td><td>Battery voltage</td></tr>
<tr><td>OFF</td><td>Below 0.3 V</td></tr>
<tr><td>17</td><td>LT BLU</td><td>RLW (+) (Rear-left wheel positive)</td><td rowspan="2">Detects left-rear wheel sensor signal</td><td rowspan="2">17-18</td><td rowspan="5">Wheel</td><td rowspan="4">Turn wheel at 1 turn/second</td><td rowspan="4">AC:
0.053 V or above

Oscilloscope:
0.15 Vp-p or above</td></tr>
<tr><td>18</td><td>GRY</td><td>RLW (–) (Rear-left wheel negative)</td></tr>
<tr><td>19</td><td>GRN/YEL</td><td>RRW (+) (Rear-right wheel positive)</td><td rowspan="3">Detects right-rear wheel sensor signal</td><td rowspan="3">19-20</td></tr>
<tr><td rowspan="2">20</td><td rowspan="2">BLU/YEL</td><td rowspan="2">RRW (–) (Rear-right wheel negative)</td></tr>
<tr><td>Stops</td><td>0.25 – 1.15 V</td></tr>
<tr><td rowspan="2">21</td><td rowspan="2">YEL/GRN</td><td rowspan="2">FSR (Fail-safe relay)</td><td rowspan="2">Drives fail-safe relay (Fail-safe relay is turned OFF to shut off the power source to the solenoid and pump motor relay when problem occurs.)</td><td rowspan="2">21-GND</td><td rowspan="2">ABS indicator</td><td>ON</td><td>Below 0.3 V</td></tr>
<tr><td>OFF</td><td>Approx. 11 V</td></tr>
<tr><td>22</td><td>LT BLU</td><td>DLC (Data link connector)</td><td>Communicates with Honda PGM Tester</td><td>22-GND</td><td colspan="2">——</td><td>——</td></tr>
</table>

ABS Control Unit Terminal Arrangement

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement: Terminal	Measurement: Conditions (Ignition switch ON (II))	Measurement: Voltage
1	BLU/RED	WALP (Warning lamp)	Drives ABS indicator	1-GND	ABS indicator ON	3 – 6 V
					ABS indicator OFF	Below 0.3 V
2	BLK	GND1 (Ground 1)	Ground	2-GND		Below 0.3 V
3	BLK/ORN	RR-OUT (Rear-right outlet)	Drives right-rear outlet solenoid valve	3-GND	ABS indicator OFF	Battery voltage
4	YEL/BLU	FL-OUT (Front-left outlet)	Drives left-front outlet solenoid valve	4-GND	ABS indicator OFF	Battery voltage
5	YEL/WHT	RL-OUT (Rear-left outlet)	Drives left-rear outlet solenoid valve	5-GND	ABS indicator ON	Below 0.3 V
6	YEL/BLK	FR-OUT (Front-right outlet)	Drives right-front outlet solenoid valve	6-GND	ABS indicator ON	Below 0.3 V
7	BLK	GND2 (Ground 2)	Ground	7-GND		Below 0.3 V
8	YEL	RR-IN (Rear-right inlet)	Drives right-rear inlet solenoid valve	8-GND	ABS indicator OFF	Battery voltage
9	RED/BLU	FL-IN (Front-left inlet)	Drives left-front inlet solenoid valve	9-GND	ABS indicator OFF	Battery voltage
10	RED/WHT	RL-IN (Rear-left inlet)	Drives left-rear inlet solenoid valve	10-GND	ABS indicator ON	Below 0.3 V
11	RED/BLK	FR-IN (Front-right inlet)	Drives right-front inlet solenoid valve	11-GND	ABS indicator ON	Below 0.3 V
12	YEL/RED	PMR (Pump motor relay)	Drives pump motor relay	12-GND	ABS indicator OFF, Pump motor ON	Below 1.0 V
					ABS indicator OFF, Pump motor OFF	Battery voltage
					ABS indicator ON	Below 0.3 V

ABS Indicator

1. If the system is OK, the ABS indicator goes off two seconds after turning the ignition switch ON (II) without starting the engine, and then comes on again and goes off after two seconds. This occurs because the ABS control unit is turned on by the IG2 power source.

2. The ABS indicator comes on when the ABS control unit detects a problem in the system. However, even though the system is operating properly, the ABS indicator will come on under the following conditions.
   - Only drive wheels rotate
   - One drive wheel is stuck
   - Vehicle spin
   - ABS continues to operate for a long time
   - Signal disturbance

   To determine the actual cause of problem, question the customer about the problem, taking these conditions into consideration.

3. When a problem is detected and the ABS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal. For DTCs 61 and 62, the indicator goes off automatically when the system returns normal. For all other codes, the indicator stays on until the ignition switch is turned OFF.

4. For DTCs 12, 14, 16, 18, 21, 22, 23, 24, 51, 52 and 53, the indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II). However, if the DTC is erased, the CPU is reset and the indicator goes off right after the engine is started if the system is OK.

Diagnostic Trouble Code (DTC)

1. If the CPU cannot be activated and the indicator comes on, the DTC is not memorized.

2. The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the later one is written over the old one. Therefore, when the same problem is detected repeatedly, it is memorized as one DTC.

3. The DTCs are indicated in the order of ascending number, not in the order they occur.

4. The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Perform the specified procedures to erase the DTCs.

Self-diagnosis

1. Self-diagnosis can be classifield into two categories.
   - Initial diagnosis: Performed right after the engine starts and until the ABS indicator goes off.
   - Regular diagnosis: Performed right after the initial diagnosis until the ignition switch is turned OFF.

2. When a problem is detected by self-diagnosis, the system
   - Turns the fail-safe relay OFF
   - Turns the solenoid valve OFF
   - Turns the pump motor OFF
   - Turns the ABS indicator ON

Troubleshooting Precautions

Kickback

1. The motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

1. The pump motor operates when the ABS is functioning.
2. The ABS control unit checks the pump motor operation during initial diagnosis and when the vehicle is started. You may hear the motor operate at this time, but it is normal.

Brake Fluid Replacement/Air Bleeding

1. Brake fluid replacement and air bleeding procedures are the same as vehicles without ABS. To ease bleeding, start with the front wheels.

Troubleshooting

1. The troubleshooting flowcharts procedures assume that the cause of the problem is still present and the ABS indicator is still on. Following the flowchart when the ABS indicator does not come on can result in incorrect diagnosis.
2. Question the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting.
   Find out when the ABS indicator came on, such as during initial diagnosis, during ABS control, after ABS control, when vehicle speed was at a certain speed, etc.
3. When the ABS indicator does not come on during the test-drive, but troubleshooting is performed based on the DTC, check for loose connectors, poor contact at the terminals, etc. before you start troubleshooting.
4. After troubleshooting, erase the DTC and test-drive the vehicle. Be sure the ABS indicator does not come on.
5. The connector illustrations show the female terminals with a single outline and the male terminals with a double outline.

Diagnostic Trouble Code (DTC)

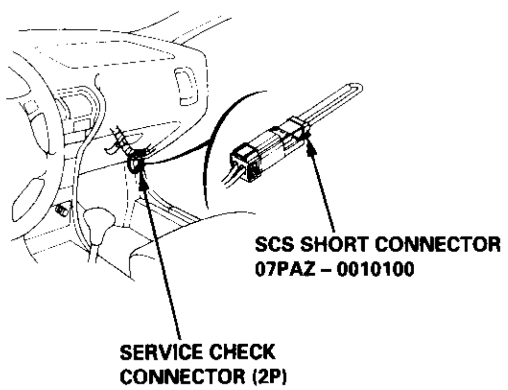
DTC Indication

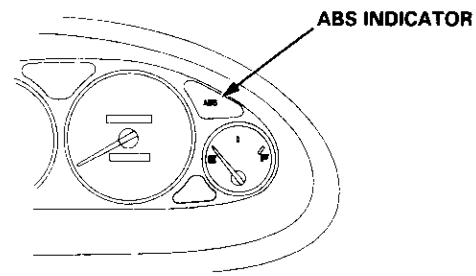
NOTE: This operation can also be done with the Honda PGM Tester.

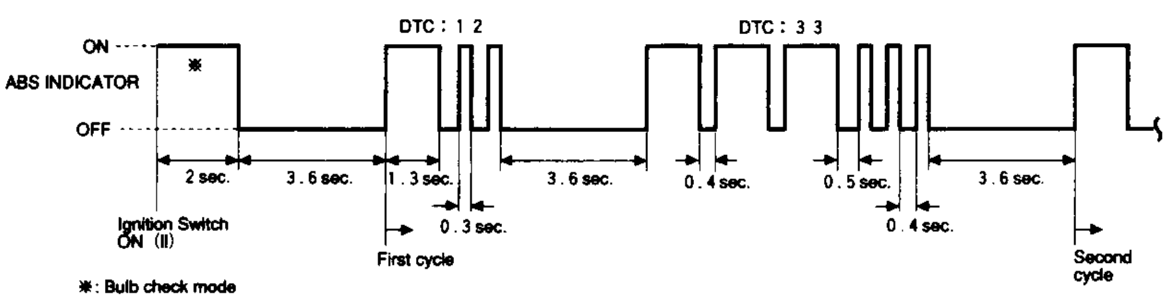
1. Connect the SCS short connector to the service check connector (2P) under the glove box.
2. Turn the ignition switch ON (II) without the brake pedal depressed.
   NOTE: If the brake pedal is depressed when turning the ignition switch ON (II), the system shifts to the DTC Erasure mode.
3. The blinking frequency indicates the DTC.
   NOTE: If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.
4. Turn the ignition switch OFF, and remove the SCS short connector.
   NOTE: The Malfunction Indicator Lamp (MIL) will stay on after the engine is started if the SCS short connector is connected.

Conditions for DTC indication

- Vehicle speed is 6 mph (10 km/h) or less.
- The SCS short connector is connected before the ignition switch is turned ON (II).
- The brake pedal is released.







*: Bulb check mode

Diagnostic Trouble Code (DTC)

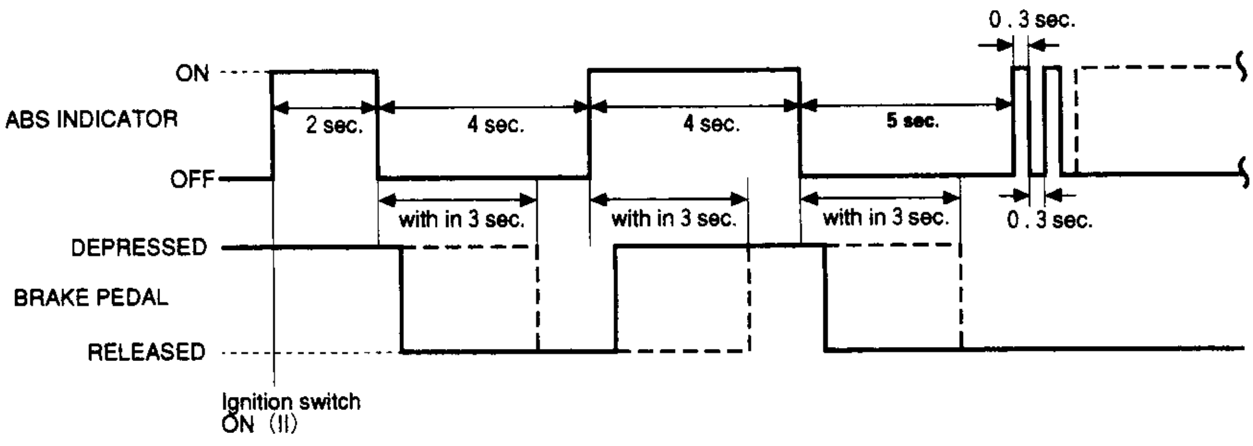
DTC Erasure (MES Mode)

NOTE: This operation can also be done with the Honda PGM Tester.

1. Connect the SCS short connector to the service check connector (2P) under the glove box.
2. Depress the brake pedal.
3. Turn the ignition switch ON (II) while keeping the brake pedal depressed.
4. After the ABS indicator goes off, release the brake pedal.
5. After the indicator comes on, depress the brake pedal again.
6. After the indicator goes off, release the brake pedal again.
7. After a few seconds, the ABS indicator blinks twice and the DTC is erased. If the indicator does not blink twice, repeat steps 1 through 6. If the indicator stays ON after the indicator blinks twice, check the DTC because a problem was detected during initial diagnosis before shifting to DTC Erasure mode.
8. Turn the ignition switch OFF, and remove the SCS short connector.

Conditions for DTC erasure

- Vehicle speed is 6 mph (10 km/h) or less.
- The SCS short connector is connected before the ignition switch is turned ON (II).
- The brake pedal is depressed before the ignition switch is turned ON (II).



Troubleshooting Index

DTC	ABS INDICATOR	DIAGNOSIS/SYMPTOM	DETECTION TIMING: INITIAL DIAGNOSIS	DETECTION TIMING: REGULAR DIAGNOSIS	PROBLEM LOCATION	REFER TO PAGE
NO DTC	OFF	ABS indicator does not come on.				19-40
	ON	ABS indicator does not go off.				19-42
11	ON	Wheel sensor (open/short to body ground/short to power)		○	FR	19-44
13					FL	
15					RR	
17					RL	
12	ON	Wheel sensor (electrical noise/intermittent interuption)		○	FR	19-45
14					FL	
16					RR	
18					RL	
21	ON	Pulser		○	FR	19-46
22					FL	
23					RR	
24					RL	
31	ON	Solenoid (short to body ground/short to wire)	○	○	FR-IN	19-47
32					FR-OUT	
33					FL-IN	
34					FL-OUT	
35					RR-IN	
36					RR-OUT	
37					RL-IN	
38					RL-OUT	
41	ON	Wheel lock		○	FR	19-50
42					FL	
43					RR	
44					RL	
51	ON	Motor lock		○		19-51
52	ON	Motor stuck OFF		○		19-52
53	ON	Motor stuck ON	○	○		19-55
54	ON	Fail-safe relay	○			19-57
61	ON	Ignition voltage		○		19-59
62						
71	ON	Different diameter tire		○		19-60
81	ON	Central Processing Unit (CPU)	○	○		19-60

ABS Indicator Does Not Come On

The ABS indicator light does not come on when ignition switch is turned ON (II).

Check the METER (7.5 A) fuse in the under-dash fuse/relay box, and reinstall the fuse if it is OK.

Is the fuse OK?

- NO → **Replace the fuse and recheck.**
- YES ↓

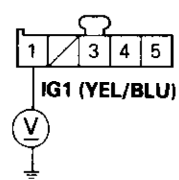
Check the ABS control unit:
Disconnect the ABS control unit 12P connector.

Does the ABS indicator come on?

- YES → **Check for loose ABS control unit connectors. If necessary substitute a known-good ABS control unit and recheck.**
- NO ↓

Check for an open in the IG1 circuit:
1. Disconnect the gauge assembly 5P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the gauge assembly 5P connector terminal No. 1 and body ground.

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

Is there battery voltage?

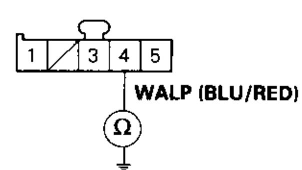
- NO →
  - **Repair open in the wire between the METER (7.5 A) fuse and gauge assembly.**
  - **Replace the under-dash fuse/relay box. (Open circuit inside the box.)**
- YES ↓

Check the ABS indicator bulb in the gauge assembly.

Is the bulb OK?

- NO → **Replace the ABS indicator bulb.**
- YES ↓

Check for a short to body ground in the WALP circuit:
Check for continuity between the gauge assembly 5P connector terminal No. 4 and body ground.



Is there continuity?

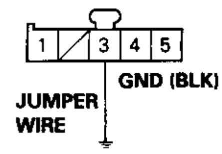
- YES → **Repair short to body ground in the wire between the gauge assembly and the ABS control unit.**
- NO ↓

(To page 19-41)

(From page 19-40)

Check for an open in the indicator light GND circuit:
1. Turn the ignition switch OFF.
2. Connect the gauge assembly 5P connector.
3. Connect the gauge assembly 5P connector terminal No. 3 to body ground with a jumper wire.
4. Turn the ignition switch ON (II).

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

Does the ABS indicator come on?

YES

- **Repair open in the wire between the gauge assembly and body ground.**
- **Repair poor ground (G401).**

NO

Replace the printed circuit board in the gauge assembly.

Troubleshooting

ABS Indicator Does Not Go Off

- The ABS indicator light does not go off after the engine is started.
- With the SCS service connector connected (see page 19-37), no DTC is indicated.

Check the REAR DEFROSTER RELAY (7.5 A) fuse in the under-dash fuse/relay box, and reinstall the fuse if it is OK.

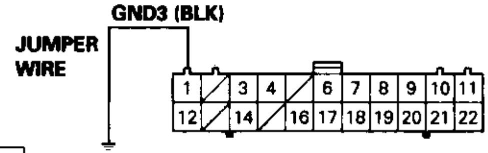
Is the fuse OK?

NO — **Replace the fuse and recheck.**

YES

Check for an open GND circuit:
1. Connect the ABS control unit 22P connector terminal No. 1 to body ground with a jumper wire.
2. Turn the ignition switch ON (II).

ABS CONTROL UNIT 22P CONNECTOR



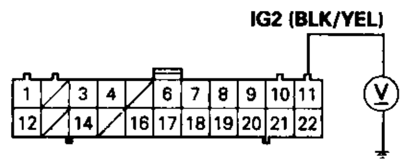
Wire side of female terminals

Does the ABS indicator go off?

YES —
- **Repair open in the wire between the ABS control unit and body ground.**
- **Repair poor ground (G701).**

NO

Check for an open in the IG2 circuit:
Measure the voltage between the ABS control unit 22P connector terminal No. 11 and body ground.



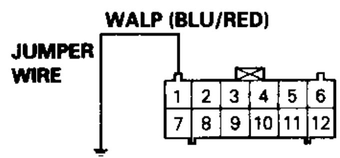
Is there battery voltage?

NO — **Repair open in the wire between the REAR DEFROSTER RELAY (7.5 A) fuse and the ABS control unit.**

YES

Check the ABS control unit:
Connect the ABS control unit 12P connector terminal No. 1 to body ground with a jumper wire.

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

Does the ABS indicator go off?

YES — **Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

NO

(To page 19-43)

(From page 19-42)

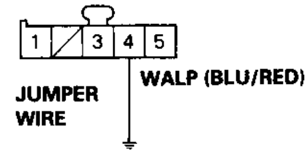
Check for an open in the WALP circuit:
Connect the gauge assembly 5P connector terminal No. 4 to body ground with a jumper wire.

Does the ABS indicator go off?

YES — **Repair open in the wire between the gauge assembly and the ABS control unit.**

NO — **Replace the printed circuit board in the gauge assembly.**

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

DTC 11, 13, 15, 17: Wheel Sensor (open/short to body ground/short to power)

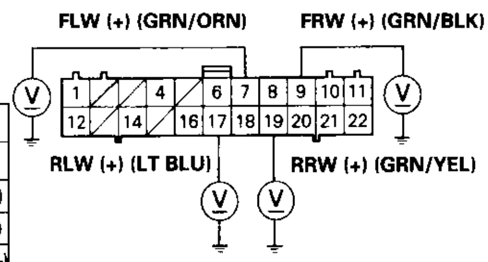
— With the ignition switch ON (II), the ABS indicator does not go off.
— With the SCS service connector connected (see page 19-37), DTCs 11, 13, 15, 17 are indicated.

NOTE: If you do not erase the DTC, the ABS indicator will not go off until vehicle speed exceeds 6 mph (10 km/h).

Check for a short to power in the wheel sensor circuit:
1. Disconnect the ABS control unit 22P connector.
2. Start the engine.
3. Measure the voltage between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

DTC	Appropriate Terminal	
	(+) Side	(–) Side
11 (Right-front)	No. 9: FRW (+)	No. 8: FRW (–)
13 (Left-front)	No. 7: FLW (+)	No. 6: FLW (–)
15 (Right-rear)	No. 19: RRW (+)	No. 20: RRW (–)
17 (Left-rear)	No. 17: RLW (+)	No. 18: RLW (–)

ABS CONTROL UNIT 22P CONNECTOR



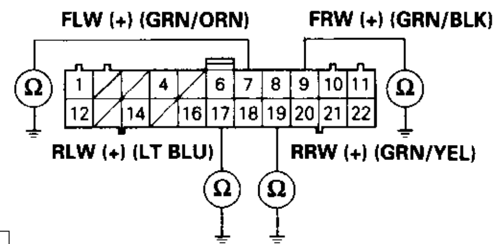
Wire side of female terminals

Is there 2 V or more?

YES → **Repair short to power in the (+) circuit wire between the ABS control unit and the appropriate wheel sensor.**

NO ↓

Check for a short to body ground in the wheel sensor circuit:
Check for continuity between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

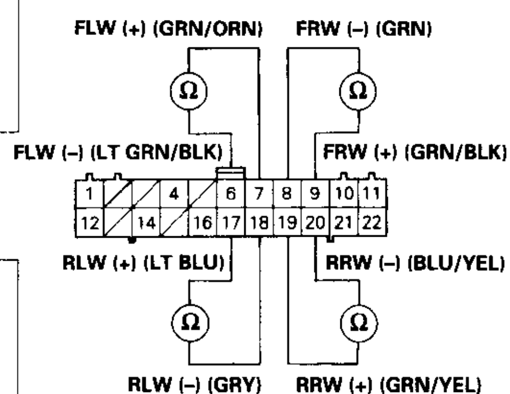


Is there continuity?

YES →
- **Repair short to body ground in the (+) or (–) circuit wire between the ABS control unit and the appropriate wheel sensor.**
- **Replace the appropriate wheel sensor.**

NO ↓

Check for an open in the wheel sensor circuit:
Check the resistance between the appropriate wheel sensor (+) and (–) circuit terminals (see table).



Is the resistance OK?
Front/Rear: 450 – 2,050 Ω/ 20°C (68°F)

NO →
- **Repair open in the (+) or (–) circuit wire, or short to the (+) circuit wire in the (–) circuit wire between the ABS control unit and the appropriate wheel sensor.**
- **Replace the appropriate wheel sensor.**

YES ↓

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

DTC 12, 14, 16, 18: Wheel Sensor (Electrical Noise/Intermittent Interruption)

— With the ignition switch ON (II), the ABS indicator does not go off.
— With the SCS service connector connected (see page 19-37), DTCs 12, 14, 16, or 18 are indicated.

NOTE: If the ABS indicator comes on for the reasons described below, the indicator should go off when you test-drive the vehicle at speeds above 19 mph (30 km/h).
- Only the drive wheels rotated
- The vehicle spun
- Electrical noise

Visually check for appropriate wheel sensor and pulser installation (see table).

DTC	Appropriate Wheel Sensor
12	Right – front
14	Left – front
16	Right – rear
18	Left – rear

Are they installed correctly?

NO → **Reinstall or replace the appropriate wheel sensor or pulser.**

YES

Check for a short to wire in the one wheel sensor circuit:
1. Disconnect the ABS control unit 22P connector.
2. Measure the resistance between the appropriate wheel sensor (+) and (–) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side	(–) Side
12 (Right-front)	No. 9: FRW (+)	No. 8: FRW (–)
14 (Left-front)	No. 7: FLW (+)	No. 6: FLW (–)
16 (Right-rear)	No. 19: RRW (+)	No. 20: RRW (–)
18 (Left-rear)	No. 17: RLW (+)	No. 18: RLW (–)

Is there less than 450 Ω?

YES → **Repair short to wire between the appropriate wheel sensor (+) and (–) circuits.**

NO

Check for a short to another wire in the wheel sensor circuits:
Check for continuity between the appropriate wheel sensor (+) circuit terminal and other wheel sensor (+) circuit terminals (see table).

DTC	Appropriate Terminal	Other Terminal		
12 (Right-front)	No. 9: FRW (+)	No. 7: FLW (+)	No. 19: RRW (+)	No. 17: RLW (+)
14 (Left-front)	No. 7: FLW (+)	No. 9: FRW (+)	No. 19: RRW (+)	No. 17: RLW (+)
16 (Right-rear)	No. 19: RRW (+)	No. 9: FRW (+)	No. 7: FLW (+)	No. 17: RLW (+)
18 (Left-rear)	No. 17: RLW (+)	No. 9: FRW (+)	No. 7: FLW (+)	No. 19: RRW (+)

Is there continuity?

YES → **Repair short to wire between the appropriate wheel sensor and the other wheel sensor.**

NO

Erase the DTC and test-drive the vehicle. If ABS indicator comes on and same DTC is indicated, replace the ABS control unit.

Troubleshooting

DTC 21 – 24: Pulser

— With the ignition switch ON (II), the ABS indicator does not go off.
— With the SCS service connector connected (see page 19-37), DTCs 21 – 24 are indicated.

Problem verification:
1. Erase the DTC.
2. Test-drive the car at 19 mph (30 km/h) or more.

Does the ABS indicator come on and are DTCs 21 – 24 indicated?

NO → **The system is OK at this time.**

YES ↓

Check the appropriate pulser gear for a chipped tooth (see table).

DTC	Appropriate Pulser
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

Is the pulser OK?

NO → **Replace the driveshaft or the hub unit. (Chipped pulser gear.)**

YES ↓

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

DTC 31 – 38: Solenoid

- With the ignition switch ON (II), the ABS indicator does not go off.
- With the SCS service connector connected (see page 19-37), DTCs 31 – 38 are indicated.

Problem verification:
1. Turn the ignition switch OFF, then turn the ignition switch ON (II) again.
2. Verify the DTC.

Is DTC 54 indicated?

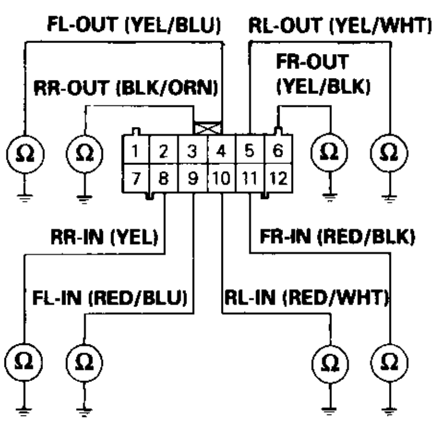
YES → **Perform the appropriate troubleshooting for DTC 54.**

NO ↓

Check for a short to body ground in the solenoid circuit:
1. Turn the ignition switch OFF.
2. Disconnect the modulator unit connector and the ABS control unit 12P connector.
3. Check for continuity between the appropriate ABS control unit 12P connector solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

Is there continuity?

YES → **Repair short to body ground in the appropriate solenoid circuit wire between the ABS control unit and the modulator unit.**

NO ↓

Check for a short to body ground in the solenoid:
1. Connect the modulator unit connector.
2. Check for continuity between the appropriate ABS control unit 12P connector solenoid circuit terminal and body ground (see table).

Is there continuity?

YES → **Replace the modulator unit.**

NO ↓

(To page 19-48)

(cont'd)

DTC 31 – 38: Solenoid (cont'd)

(From page 19-47)

Check for an open in the solenoid circuit:
1. Disconnect the modulator unit connector.
2. Connect the appropriate solenoid circuit terminal to body ground with a jumper wire (see table).
3. Check for continuity between the appropriate ABS control unit 12P connector solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal	
	ABS control unit 12P connector	Modulator unit connector
31: FR-IN	No. 11	No. 1
32: FR-OUT	No. 6	No. 5
33: FL-IN	No. 9	No. 4
34: FL-OUT	No. 4	No. 8
35: RR-IN	No. 8	No. 3
36: RR-OUT	No. 3	No. 7
37: RL-IN	No. 10	No. 2
38: RL-OUT	No. 5	No. 6

Is there continuity?

NO → **Repair open in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.**

YES ↓

Check for an open in the solenoid:
1. Remove the jumper wire from the modulator unit connector.
2. Connect the modulator unit connector.
3. Connect the fail-safe relay connector terminal No. 3 to body ground with a jumper wire.
4. Check the resistance between the appropriate ABS control unit 12P connector terminal and body ground (see table).

Is the resistance OK?
IN: 8 – 10 Ω/20°C (68°F)
OUT: 3 – 5 Ω/20°C (68°F)

NO → **Replace the modulator unit.**

YES ↓

Check for a short to another wire in the solenoid circuit:
1. Disconnect the modulator unit connector.
2. Check for continuity between the appropriate ABS control unit 12P connector terminal and all other solenoid circuit terminals (see table).

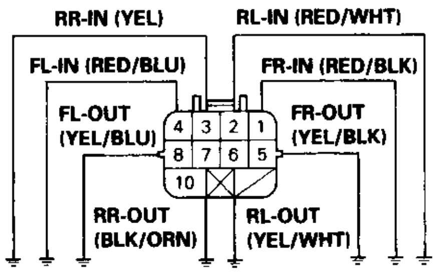
Is there continuity?

YES → **Replace the modulator unit.**

NO ↓

(To page 19-49)

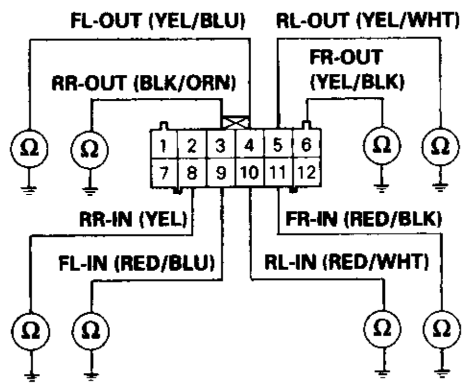
MODULATOR UNIT CONNECTOR



JUMPER WIRE

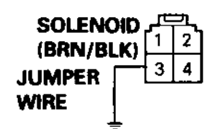
Terminal side of female terminals

ABS CONTROL UNIT 12P CONNECTOR



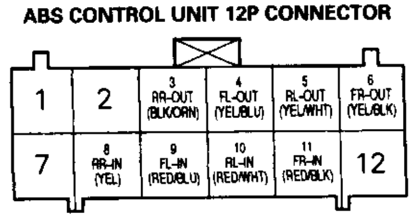
Wire side of female terminals

FAIL-SAFE RELAY CONNECTOR



Wire side of female terminals

ABS CONTROL UNIT 12P CONNECTOR



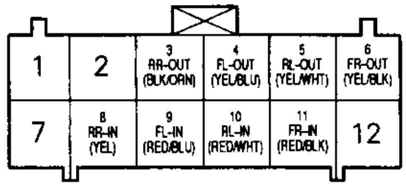
Wire side of female terminals

(From page 19-48)

Check for a short to another wire in the solenoid:
1. Connect the modulator unit connector.
2. Check for continuity between the appropriate ABS control unit 12P connector terminal and all other solenoid circuit terminals (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

Is there less than 3 Ω?

YES → **Replace the modulator unit.**

NO ↓

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

Troubleshooting

DTC 41 – 44: Wheel Lock

- **While driving and depressing the brake pedal, the ABS indicator comes on.**
- **With the SCS service connector connected (see page 19-37), DTCs 41 – 44 are indicated.**

Check for brake drag.

Do the brakes drag?

YES → **Repair the brake drag.**

NO ↓

Check the installation of the appropriate wheel sensor installation (see table).

DTC	Appropriate Wheel Sensor
41	Right-front
42	Left-front
43	Right-rear
44	Left-rear

Is it correct?

NO → **Reinstall the wheel sensor correctly.**

YES ↓

- **The probable cause was the vehicle spun during cornering.**
- **If the problem occurs again, check the modulator using the Honda PGM Tester.**

DTC 51: Motor Lock

— When the vehicle starts, the ABS indicator comes on.
— With the SCS service connector connected (see page 19-37), DTC 51 is indicated.

Problem verification:
1. Erase the DTC.
2. Test-drive the vehicle at 6 mph (10 km/h) or more.

Does the ABS indicator come on and is DTC 51 indicated?

YES → **Replace the modulator unit.**

NO → **The system is OK at this time.**

DTC 52: Motor Stuck OFF

- **When the vehicle starts, the ABS indicator comes on.**
- **With the SCS service connector connected (see page 19-37), DTC 52 is indicated.**

Check the ABS MOTOR (40 A) fuse in the under-hood ABS fuse/relay box, and reinstall the fuse if it is OK.

Is the fuse OK?

NO — **Replace the fuse and recheck.**

NOTE: Connect the pump motor relay connector terminal No. 3 to No. 4 for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the motor power source circuit.

YES

Check the ABS UNIT (10 A) fuse in the under-hood ABS fuse/relay box, and reinstall the fuse if it is OK.

Is the fuse OK?

NO — **Replace the fuse and recheck.**

NOTE: Connect the pump motor relay connector terminal No. 3 to No. 4 for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the MCK circuit.

YES

Check the pump motor relay (see section 23).

Is the relay OK?

NO — **Replace the pump motor relay.**

YES

Check the motor circuit:
Connect the pump motor relay connector terminal No. 3 to No. 4 with a jumper wire for a moment.

Does the pump motor operate?

YES — Check the PMR circuit. (To page 19-54)

NO

Check for an open in the MOTOR circuit:
1. Disconnect the pump motor connector.
2. Connect the pump motor relay connector terminal No. 3 to No. 4 with a jumper wire.
3. Measure the voltage between the pump motor connector terminal No. 1 and body ground.

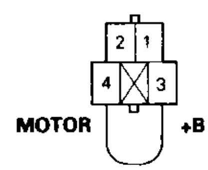
Is there battery voltage?

NO — **Repair open in the wire between the under-hood ABS fuse/relay box and the pump motor.**

YES

(To page 19-53)

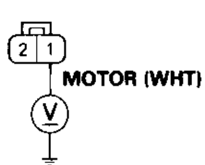
PUMP MOTOR RELAY CONNECTOR



JUMPER WIRE

Terminal side of female terminals

PUMP MOTOR CONNECTOR



Terminal side of female terminals

(From page 19-B-52)

Check for an open in the MOTOR GND circuit:
Measure the voltage between the pump motor connector terminal No. 1 and No. 2.

Is there battery voltage?

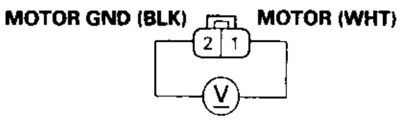
NO

- **Repair open in the wire between the pump motor and body ground.**
- **Repair poor ground (G202).**

YES

Replace the modulator unit.

PUMP MOTOR CONNECTOR



Terminal side of female terminals

(cont'd)

DTC 52: Motor Stuck OFF (cont'd)

(From page 19-52)

Check for an open in the PMR circuit:
1. Connect the pump motor relay connector terminal No. 2 to No. 3 with a jumper wire.
2. Measure the voltage between the ABS control unit 12P connector terminal No. 12 and body ground.

Is there battery voltage?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and the ABS control unit.**

YES ↓

Check for a short to power in the PMR circuit:
1. Remove the jumper wire from pump motor relay connector.
2. Start the engine.
3. Measure the voltage between the ABS control unit 12P connector terminal No. 12 and body ground.

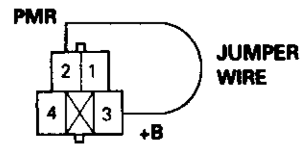
Is there battery voltage?

YES → **Repair short to power in the wire between the under-hood ABS fuse/relay box and the ABS control unit.**

NO ↓

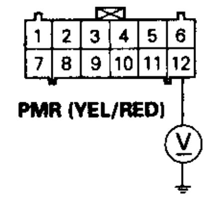
If the problem occurs again, replace the ABS control unit.

PUMP MOTOR RELAY CONNECTOR



Terminal side of female terminals

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

DTC 53: Motor Stuck ON

— With the ignition switch ON (II), the ABS indicator does not go off.
— With the SCS service connector connected (see page 19-37), DTC 53 is indicated.

Check that the pump motor operates with the ignition switch OFF.

Does the pump motor operate?

YES → **Replace the pump motor relay. (Pump motor relay stuck ON.)**

NO ↓

Check the ABS UNIT (10 A) fuse in the under-hood fuse/relay box, and reinstall the fuse if it is OK.

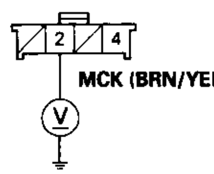
Is the fuse OK?

NO → **Replace the fuse and recheck.**

YES ↓

Check for an open in the MCK circuit:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the under-hood ABS fuse/relay box 4P connector terminal No. 2 and body ground.

UNDER-HOOD ABS FUSE/RELAY BOX 4P CONNECTOR



Wire side of female terminals

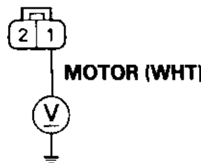
Is there approx. 10 V?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and the ABS control unit.**

YES ↓

Check for an open in the MOTOR circuit:
1. Disconnect the pump motor connector.
2. Measure the voltage between terminal No. 1 and body ground.

PUMP MOTOR CONNECTOR



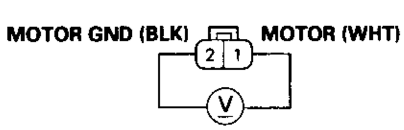
Terminal side of female terminals

Is there approx. 10 V?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and the pump motor.**

YES ↓

Check for an open in the MOTOR GND circuit:
Measure the voltage between the pump motor connector terminal No. 1 and No. 2.



Is there approx. 10 V?

NO →
- **Repair open in the wire between the pump motor and body ground.**
- **Repair poor ground (G202).**

YES ↓

(To page 19-56)

(cont'd)

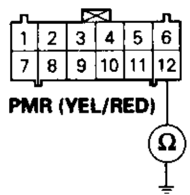
Troubleshooting

DTC 53: Motor Stuck ON (cont'd)

(From page 19-55)

Check for a short to body ground in the PMR circuit:
1. Remove the pump motor relay.
2. Disconnect the ABS control unit 12P connector.
3. Check for continuity between terminal No. 12 and body ground.

ABS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

Is there continuity?

YES → **Repair short to body ground between the under-hood ABS fuse/relay box and the ABS control unit.**

NO → **If the problem occurs again, replace the ABS control unit.**

DTC 54: Fail-safe Relay

— With the ignition switch ON (II), the ABS indicator does not go off.
— With the SCS service connector connected (see page 19-37), DTC 54 is indicated.

Check the ABS B1 (20 A) fuse in the under-hood ABS fuse/relay box, and reinstall the fuse if it is OK.

Is the fuse OK?

- NO → **Replace the fuse and recheck.**

  NOTE: If the fuse is blown after the fail-safe relay is on, check for a short to body ground in the wire between the fail-safe relay, pump motor relay and modulator unit.

- YES ↓

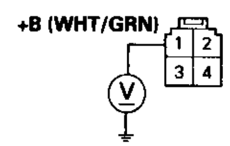
Check the fail-safe relay (see section 23) and leave the fail-safe relay removed.

Is the relay OK?

- NO → **Replace the fail-safe relay.**
- YES ↓

Check for an open in the +B circuit:
Measure the voltage between the fail-safe relay connector terminal No. 1 and body ground.

FAIL-SAFE RELAY CONNECTOR



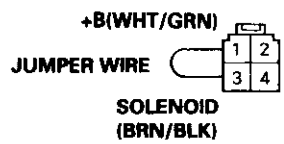
Wire side of female terminals

Is there battery voltage?

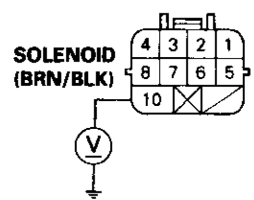
- NO → **Repair open in the wire between the under-hood ABS fuse/relay box and the fail-safe relay.**
- YES ↓

Check for an open in the solenoid power source circuit:

1. Connect the fail-safe relay connector terminal No. 1 to No. 3 with a jumper wire.
2. Disconnect the modulator unit connector.
3. Measure the voltage between the modulator unit connector terminal No. 10 and body ground.



MODULATOR UNIT CONNECTOR



Terminal side of female terminals

Is there battery voltage?

- NO → **Repair open in the wire between the fail-safe relay and the modulator unit.**
- YES ↓

(To page 19-58)

(cont'd)

DTC 54: Fail-safe Relay (cont'd)

(From page 19-57)

Check for a short to power in the solenoid power source circuit:
1. Remove the jumper wire from the fail-safe relay connector.
2. Measure the voltage between the modulator unit connector terminal No. 10 and body ground.

Is there battery voltage?

YES → **Repair short to power in the wire between the fail-safe relay, modulator unit and the under-hood ABS fuse/relay box.**

NO ↓

Check for a short to power in the FSR circuit:
1. Disconnect the ABS control unit 22P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the terminal No. 21 and body ground.

Is there battery voltage?

YES → **Repair short to power in the wire between the ABS control unit and the fail-safe relay.**

NO ↓

Check for a short to body ground in the FSR circuit:
Check for continuity between the ABS control unit 22P connector terminal No. 21 and body ground.

Is there continuity?

YES → **Repair short to body ground in the wire between the ABS control unit and the fail-safe relay.**

NO ↓

Check for an open in the FSR GND circuit:
Check for continuity between the fail-safe relay connector terminal No. 4 and body ground.

Is there continuity?

NO → **Repair open in the wire between the fail-safe relay and body ground.**

YES ↓

Check for an open in the FSR circuit:
1. Install the fail-safe relay.
2. Check for continuity between the ABS control unit 22P connector terminal No. 21 and body ground.

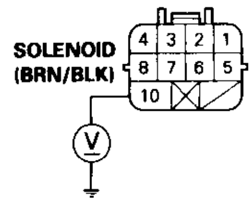
Is there continuity?

NO → **Repair open in the wire between the ABS control unit and the fail-safe relay.**

YES ↓

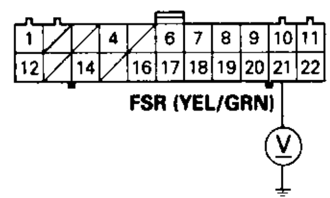
If the problem occurs again, replace the ABS control unit.

MODULATOR UNIT CONNECTOR

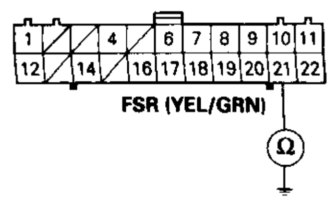


Terminal side of female terminals

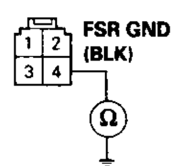
ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

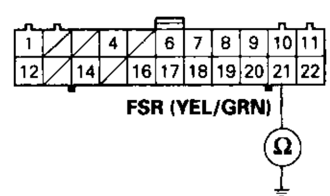


FAIL-SAFE RELAY CONNECTOR



Wire side of female terminals

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

DTC 61, 62: Ignition Voltage

— With the ignition switch ON (II), the ABS indicator comes on.
— With the SCS service connector connected (see page 19-37), DTC 61, 62 are indicated.

Problem verification:
1. Erase the DTC.
2. Test-drive the vehicle at 6 mph (10 km/h) or more.

Does the ABS indicator come on?

NO → **The system is OK at this time.**

YES ↓

Verify the DTC.

Is DTC 61 or 62 indicated?

NO → **Perform the appropriate troubleshooting for the code.**

YES ↓

Check the charging system.

Troubleshooting

DTC 71: Different Diameter tire

- While driving the vehicle, the ABS indicator comes on.
- With the SCS service connector connected (see page 19-37), DTC 71 is indicated.

Replace the tire(s) with the specified size.

DTC 81: Central Processing Unit (CPU)

- With the ignition switch ON (II), the ABS indicator does not go off.
- With the SCS service connector connected (see page 19-37), DTC 81 is indicated.

Problem verification:
1. Erase the DTC.
2. Test-drive the vehicle.

Does the ABS indicator come on and is DTC 81 indicated?

YES — **Replace the ABS control unit.**

NO — **Intermittent failure; the vehicle is OK at this time.**

Modulator Unit

Removal/Installation

CAUTION:

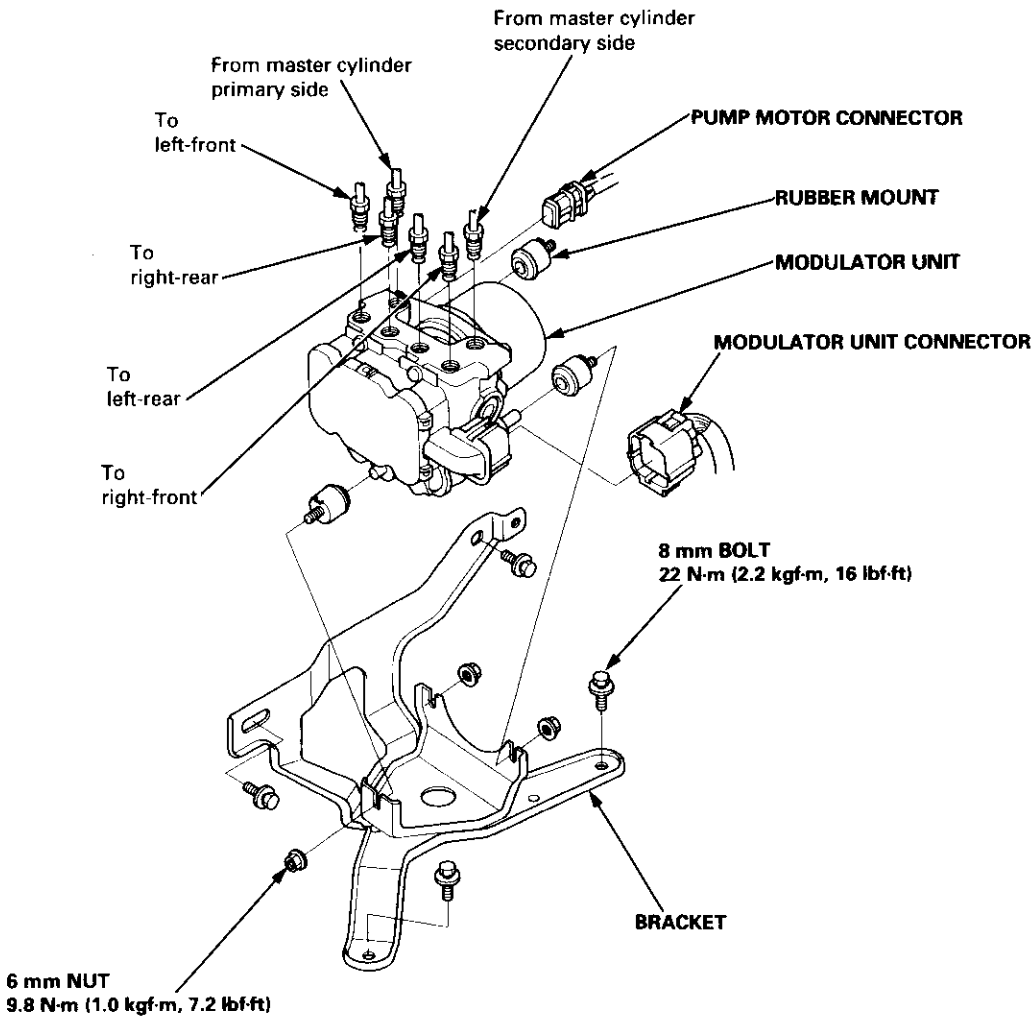
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Take care not to damage or deform the brake lines during removal and installation.**
- **To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.**

Removal

1. Disconnect the modulator unit and pump motor connectors.
2. Disconnect the brake lines, then remove the modulator unit.

Installation

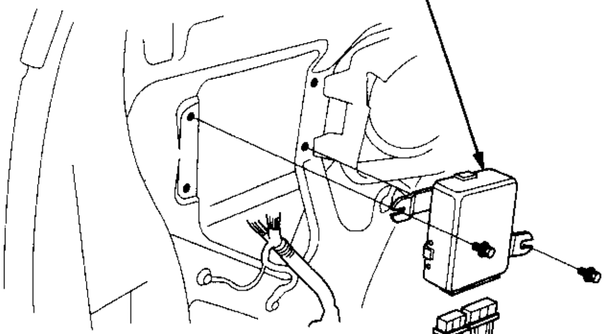
1. Install the modulator unit, then connect the brake lines. Tighten the flare nuts to 15 N·m (1.5 kgf·m, 11 lbf·ft).
2. Connect the modulator unit and pump motor connectors.
3. Bleed the brake system, starting with the front wheels.
4. Start the engine, and check that the ABS indicator goes off.
5. Test-drive the vehicle, and check that the ABS indicator does not come on.



ABS Control Unit

Removal/Installation

1. Remove the right quarter trim panel.
2. Disconnect the ABS control unit connectors.
3. Remove the ABS control unit.



4. Install the ABS control unit in the reverse order of removal.
5. Start the engine, and check that the ABS indicator goes off.
6. Test-drive the vehicle, and check that the ABS indicator does not come on.

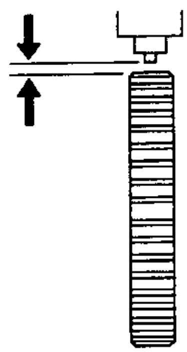
Pulsers/Wheel Sensors

Inspection

1. Check the front and rear pulser for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser.

   Standard: 0.4 – 1.0 mm (0.02 – 0.04 in)

   NOTE: If the gap exceeds 1.0 mm (0.04 in), the probability is a distorted suspension arm which should be replaced.

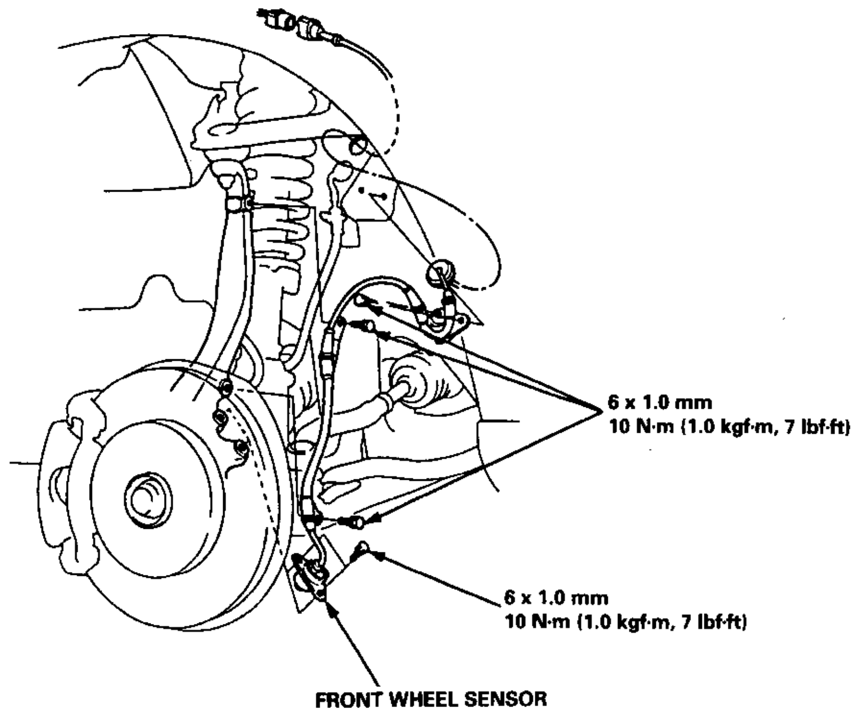


Wheel Sensors

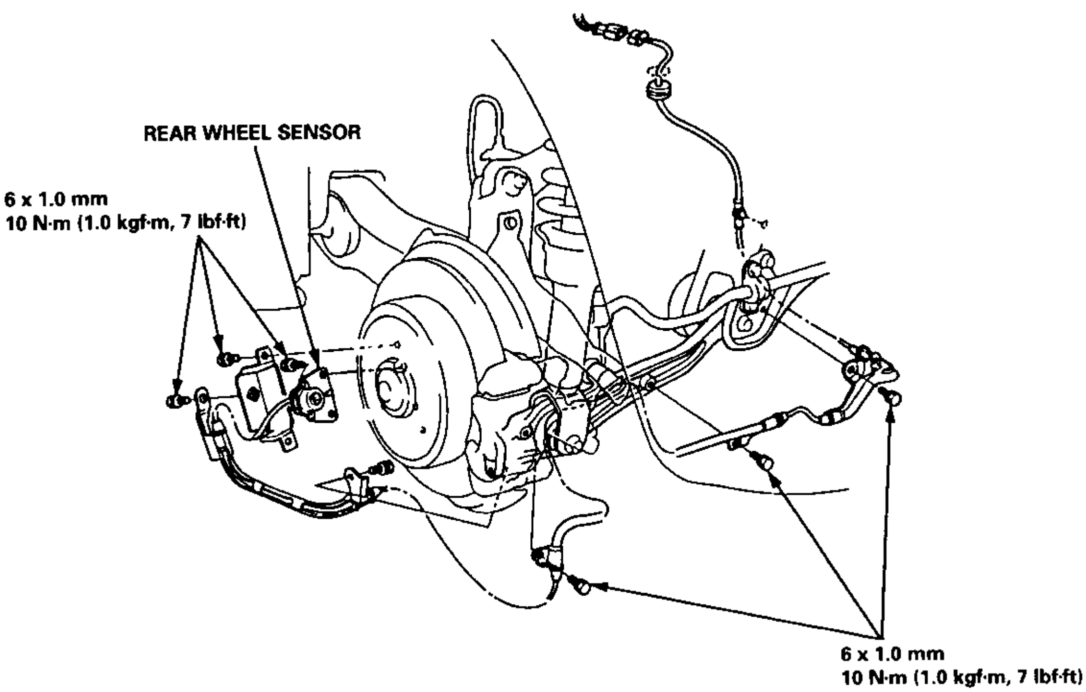
Replacement

NOTE: Be careful when installing the sensors to avoid twisting the wires.

Front



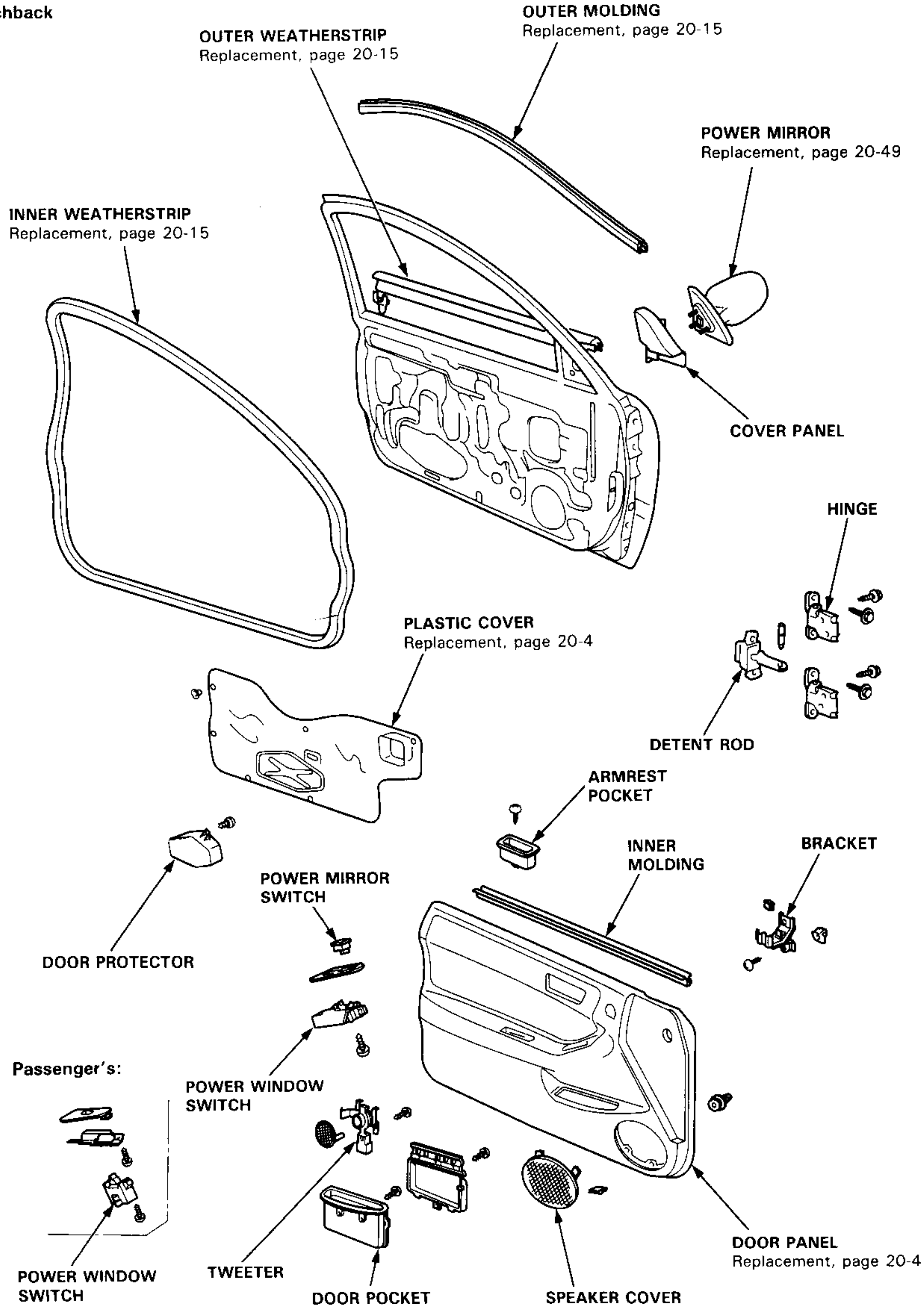
Rear

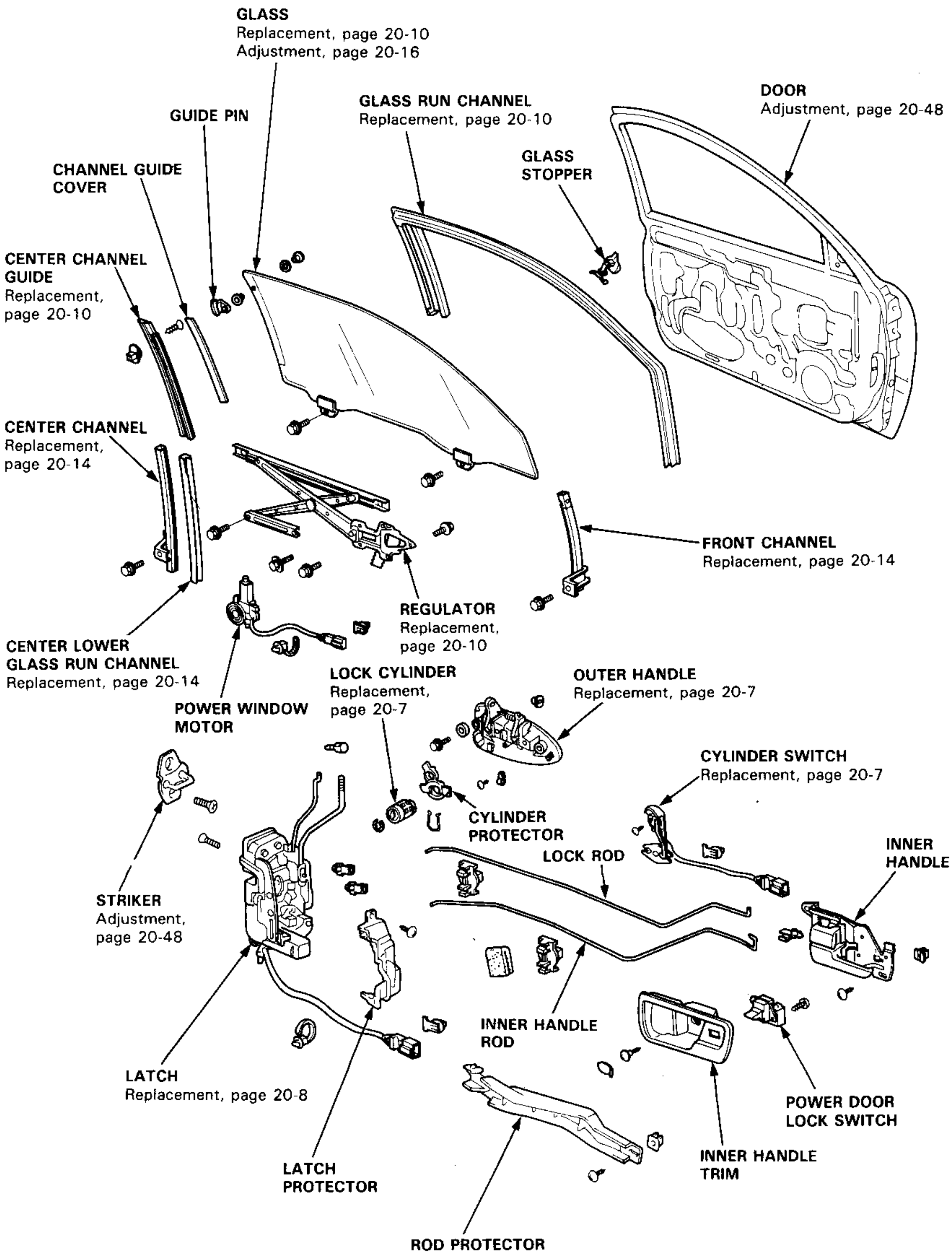


Body

Door Index

Hatchback



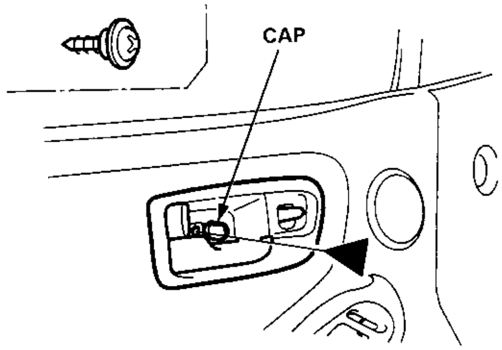

GLASS
Replacement, page 20-10
Adjustment, page 20-16
GUIDE PIN
GLASS RUN CHANNEL
Replacement, page 20-10
DOOR
Adjustment, page 20-48
GLASS STOPPER
CHANNEL GUIDE COVER
CENTER CHANNEL GUIDE
Replacement, page 20-10
CENTER CHANNEL
Replacement, page 20-14
FRONT CHANNEL
Replacement, page 20-14
REGULATOR
Replacement, page 20-10
CENTER LOWER GLASS RUN CHANNEL
Replacement, page 20-14
POWER WINDOW MOTOR
LOCK CYLINDER
Replacement, page 20-7
OUTER HANDLE
Replacement, page 20-7
CYLINDER SWITCH
Replacement, page 20-7
CYLINDER PROTECTOR
LOCK ROD
INNER HANDLE
STRIKER
Adjustment, page 20-48
INNER HANDLE ROD
LATCH
Replacement, page 20-8
POWER DOOR LOCK SWITCH
INNER HANDLE TRIM
LATCH PROTECTOR
ROD PROTECTOR

Door Panel/Plastic Cover Replacement

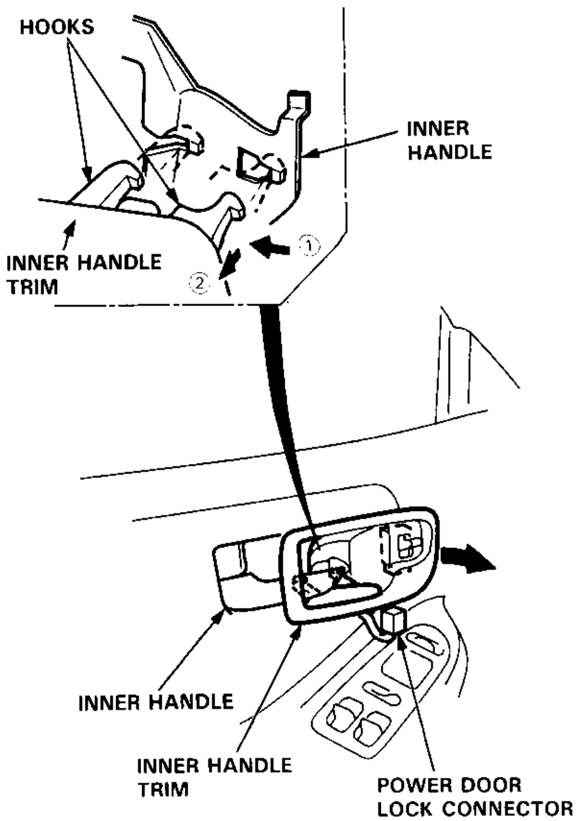
NOTE: Take care not to scratch the door panel and other parts.

1. Pry out the cap and remove the screw.

◀ : Screw location, 1

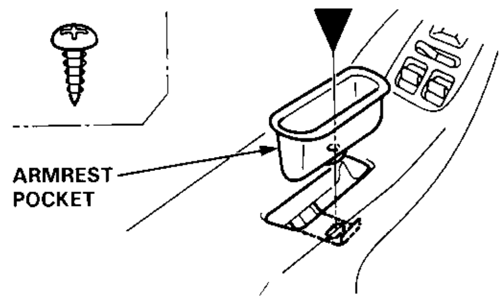


2. Remove the inner handle trim while pulling the inner handle.
   Disconnect the power door lock connector.



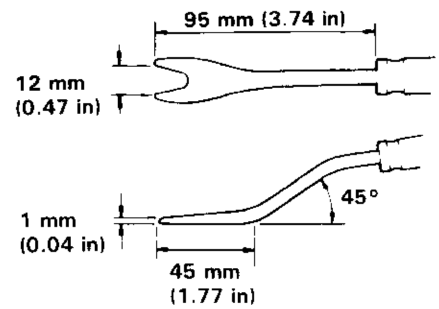
3. Remove the armrest pocket.

▼ : Screw location, 1



4. Release the clips that hold the door panel.

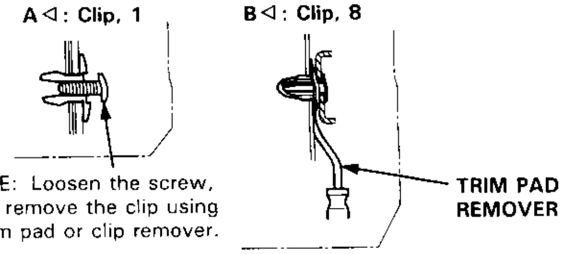
   NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.



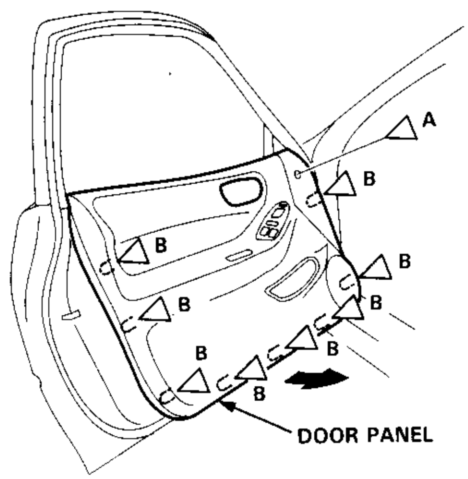
◁ : Clip locations

A◁ : Clip, 1

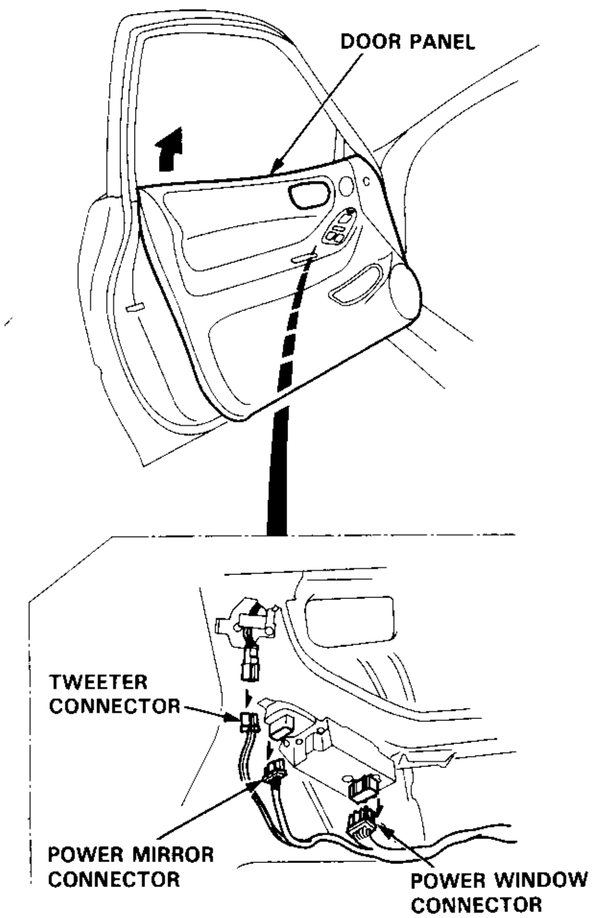
B◁ : Clip, 8



NOTE: Loosen the screw, then remove the clip using a trim pad or clip remover.

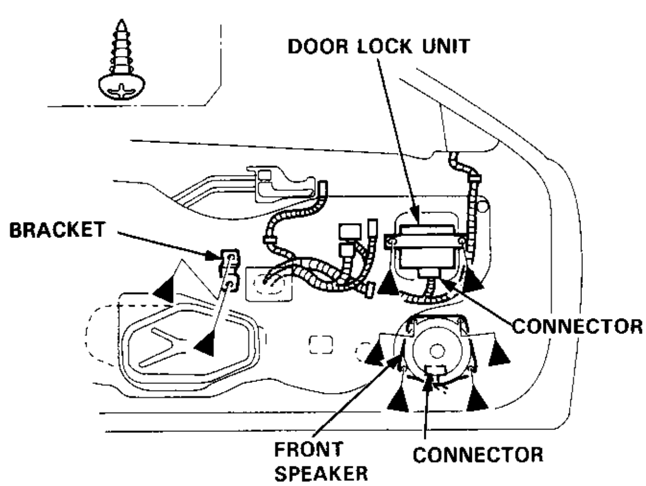


5. Remove the door panel by pulling it upward. Disconnect the following:
   - Power window connector
   - Power mirror connector
   - Tweeter connector



6. Remove the bracket and door lock unit. If necessary, remove the front speaker. Disconnect the connectors.

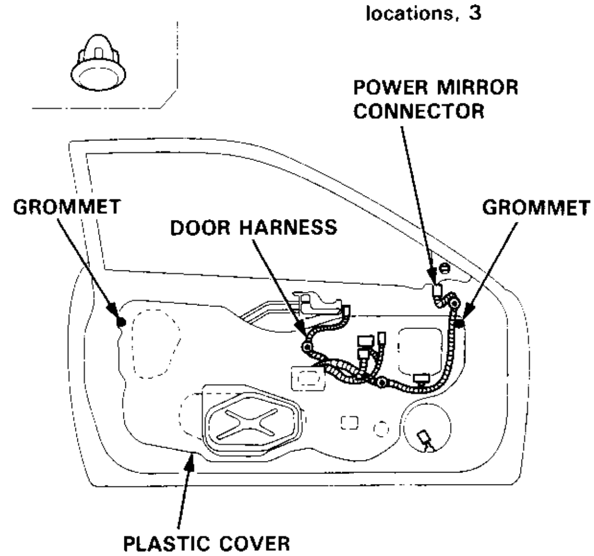
▲ : Screw locations, 8



7. Remove the cover panel, then disconnect the power mirror connector (see page 20-49).

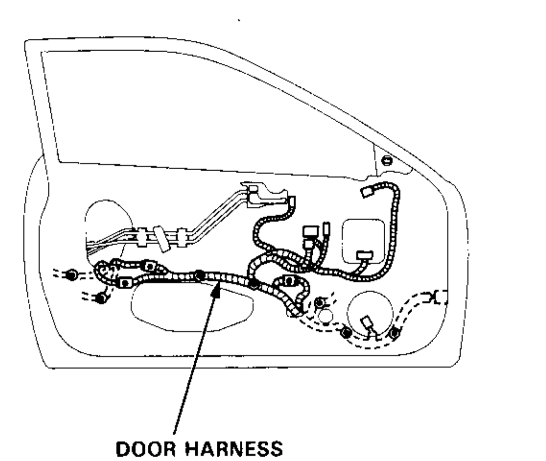
8. Detach the grommets and harness clips, then carefully remove the plastic cover.

●: Grommet locations, 2   ⊙: Harness clip locations, 3



9. Before installing the plastic cover, make sure the door harness and connectors are fastened correctly on the door.

● : Connector clip locations, 3
⊙: Harness clip locations, 7



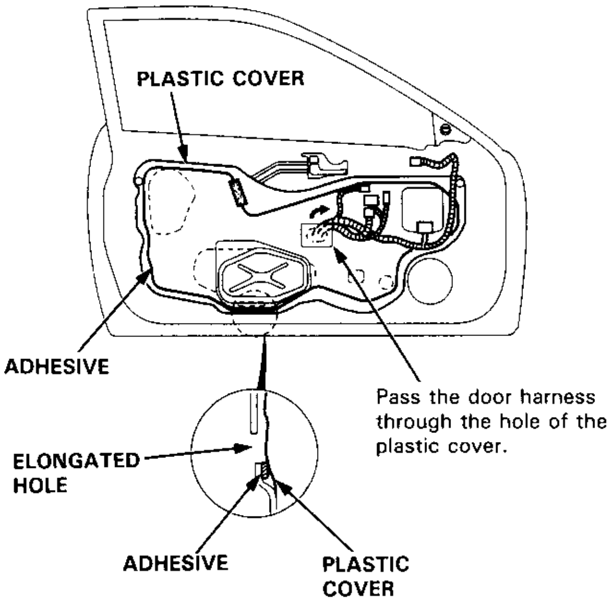
(cont'd)

Doors

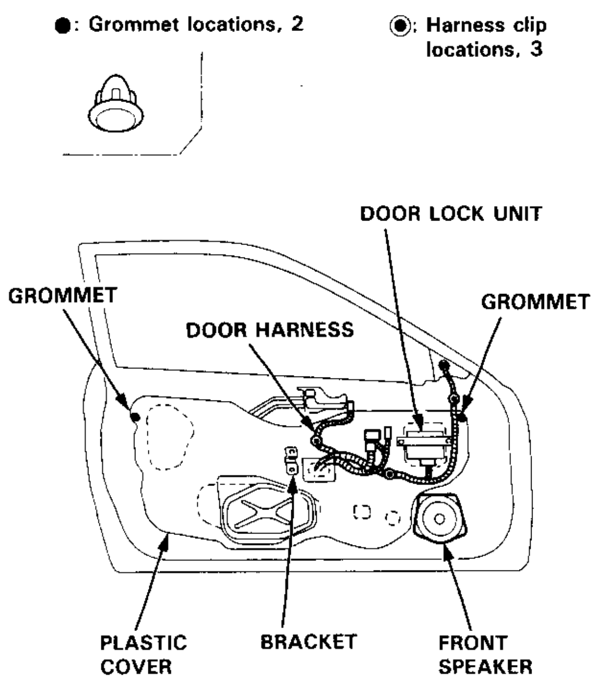
Door Panel/Plastic Cover Replacement (cont'd)

10. Install the plastic cover.

    NOTE:
    - Apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks.
    - Do not plug the elongated hole.



11. Install all removed parts, and fasten the door harness correctly.



12. Install the door panel (see page 20-4).

    NOTE:
    - Make sure the door harness is not pinched.
    - If necessary, replace any damaged clips.
    - Make sure the connectors are connected properly.

13. Install the armrest pocket and inner handle trim (see page 20-4).

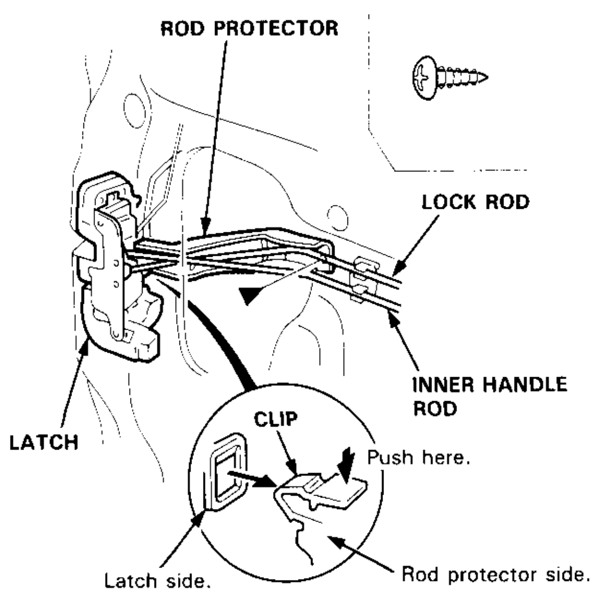
    NOTE: Make sure the connector is connected properly.

Outer Handle Replacement

NOTE: Raise the glass fully.

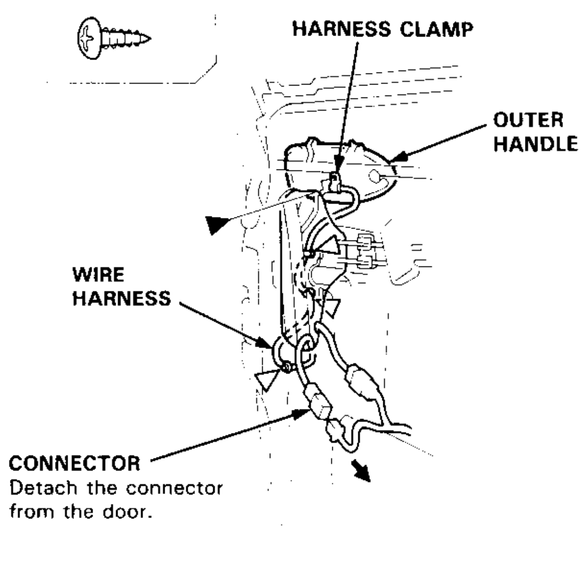
1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-4)
2. Remove the rod protector.

▶: Screw location, 1



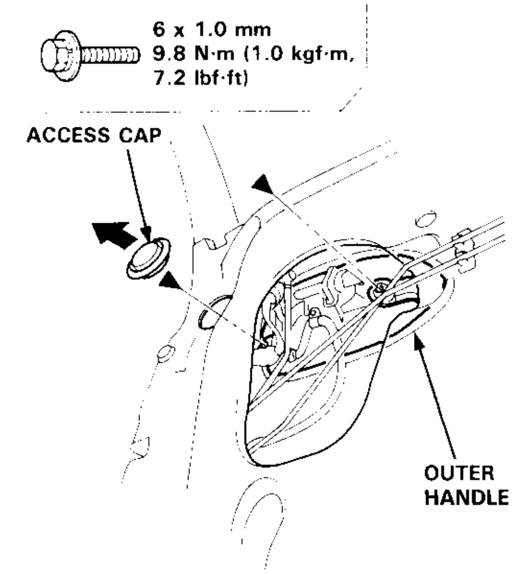
3. Disconnect the connector, and remove the harness clamp and clips.

▶: Screw location, 1   ▷: Clip locations, 3



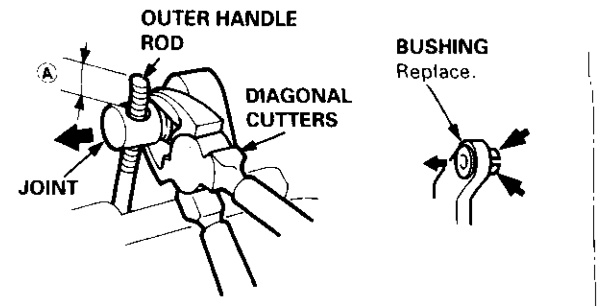
4. Remove the bolts.

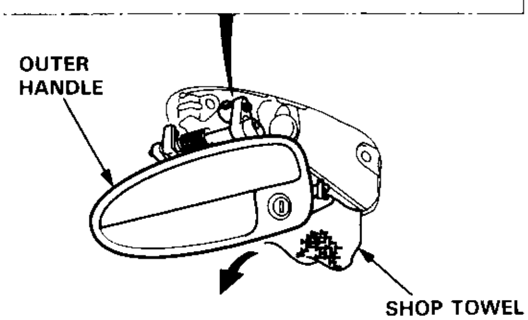
▶: Bolt locations, 2



5. Pull out the outer handle.
   Pry the outer handle rod out of its joint using diagonal cutters.

   NOTE:
   - To ease reassembly, note location (A) of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.
   - Use a shop towel to protect the opening in the door.



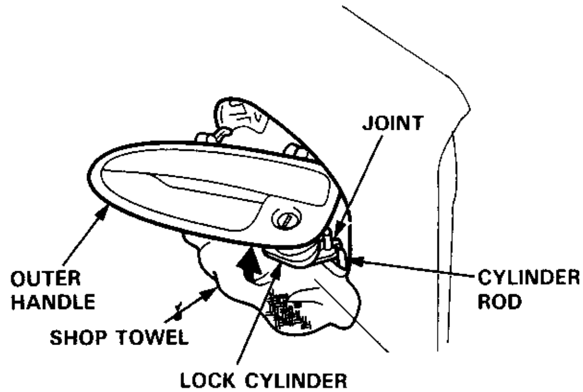


(cont'd)

Outer Handle Replacement (cont'd)

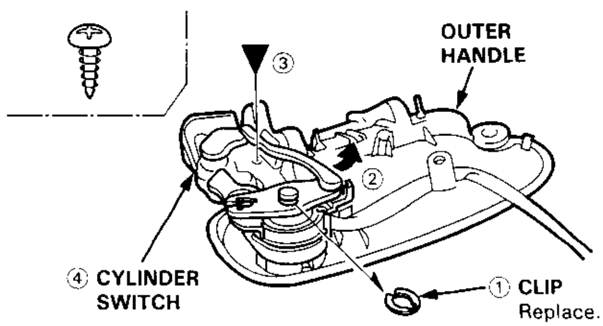
6. Disconnect the cylinder rod as shown.

   NOTE: Take care not to damage the lock cylinder joint.

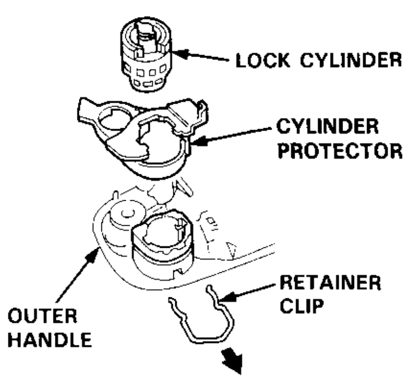


7. Remove the cylinder switch from the outer handle.

▼ : Screw location, 1



8. Pull out the retainer clip, then remove the lock cylinder and cylinder protector.



9. Installation is the reverse of the removal procedure.

   NOTE:
   - Make sure the outer handle rod and connector are connected securely.
   - Make sure the wire harness is routed properly.
   - Make sure the door locks and opens properly.

Latch Replacement

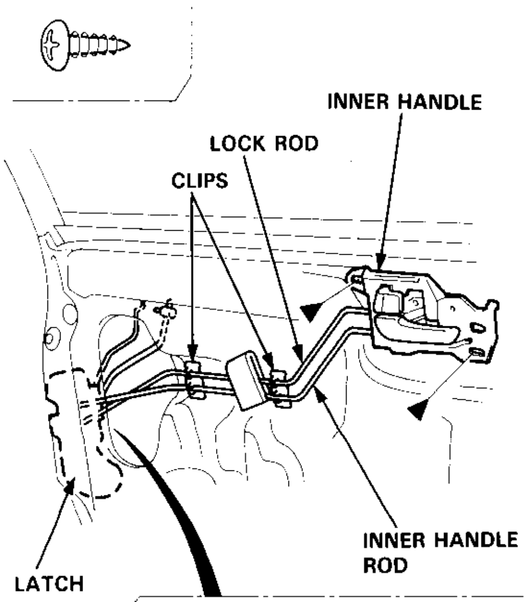
NOTE: Raise the glass fully.

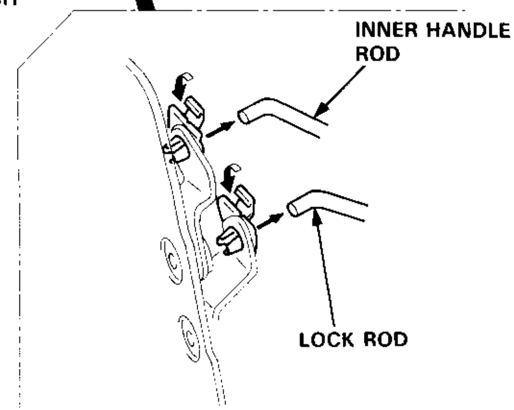
1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-4)
   - Outer handle (see page 20-7)

2. Disconnect the inner handle rod and lock rod from the latch.
   Detach the inner handle rod and lock rod, then remove the inner handle.

   NOTE: Take care not to bend the rods.

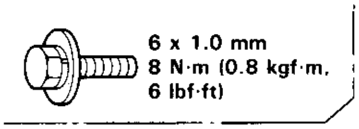
►: Screw locations, 2

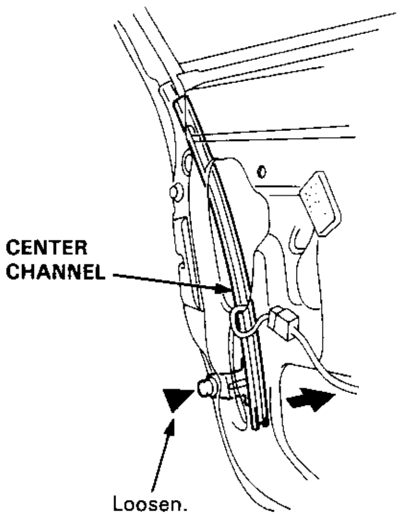




3. Loosen the bolt, then move the center channel outward.

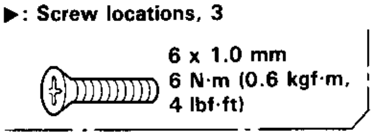
▶: **Bolt location, 1**

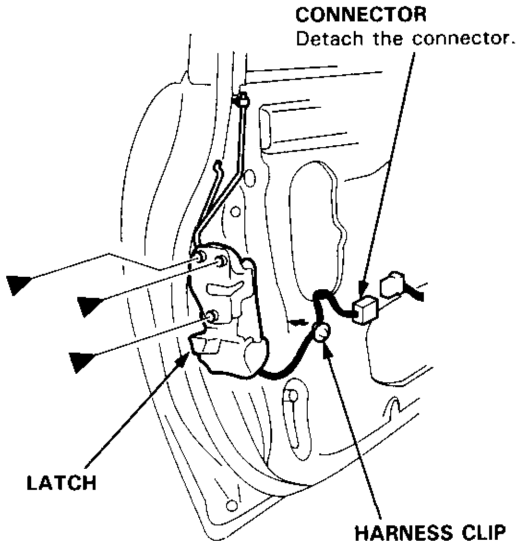




4. Disconnect the connector, and detach the harness clip from the door.
Remove the screw.

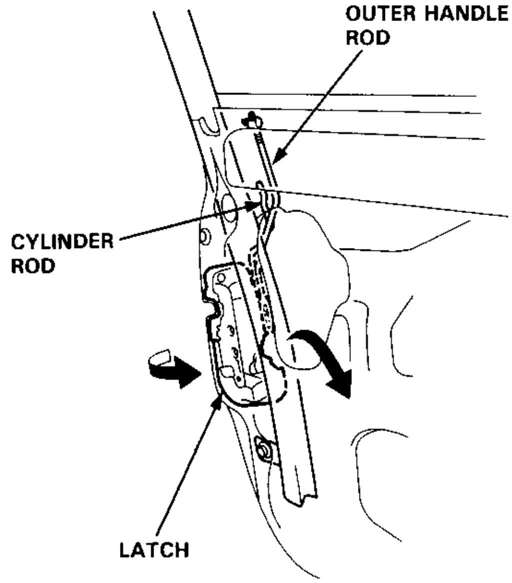
▶: **Screw locations, 3**





5. Remove the latch through the hole in the door.

NOTE: Take care not to bend the outer handle rod and cylinder rod.



6. Installation is the reverse of the removal procedure.

NOTE:
- Make sure the inner handle rod, lock rod and connector are connected properly.
- Make sure the door locks and opens properly.

Doors

Glass/Regulator/Glass Run Channel Replacement

1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-4)

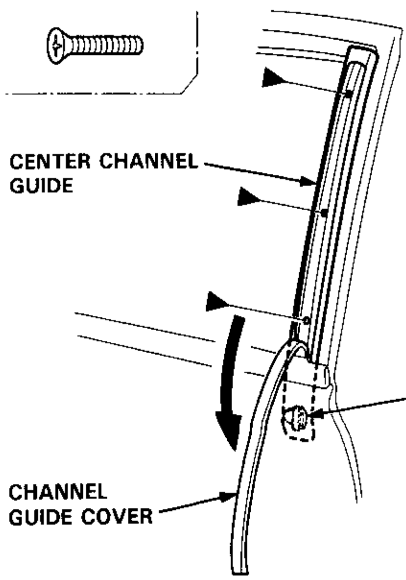
2. Remove the power window switch from the door panel, then connect it to the door harness (see page 20-16).

3. Lower the glass fully.

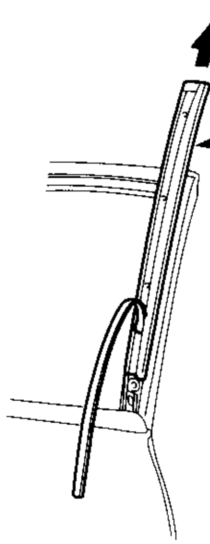
4. Peel off the channel guide cover, then remove the screws.

   NOTE: When installing the channel guide cover, apply the double-faced adhesive tape to it.

▶: Screw locations, 3



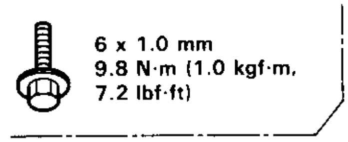
5. Remove the center channel guide by pulling it upward.

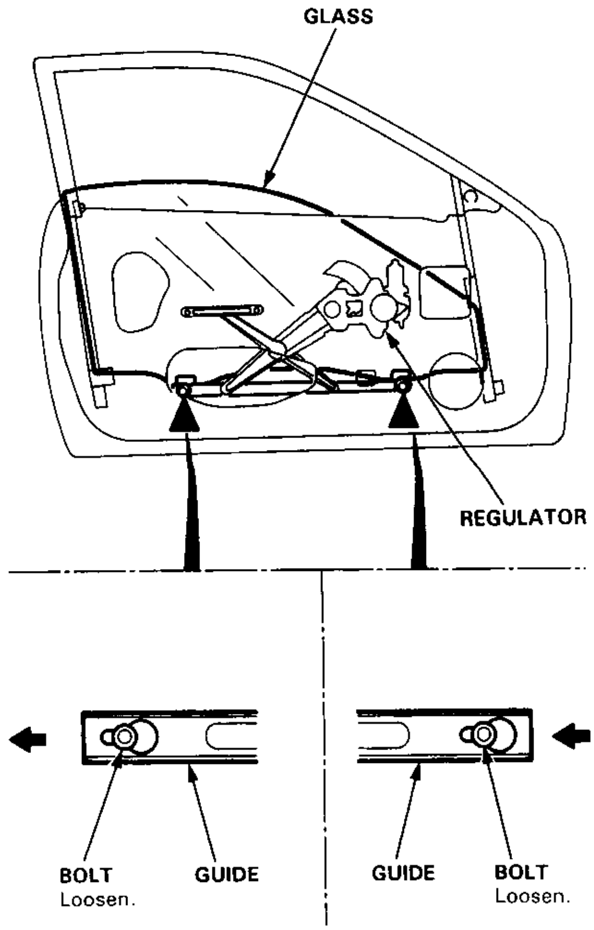


6. Carefully move the glass until you can see the bolts, then loosen them.
   Slide the guide to the rear, then remove the glass from the guide.

   NOTE: Take care not to drop the glass inside the door.

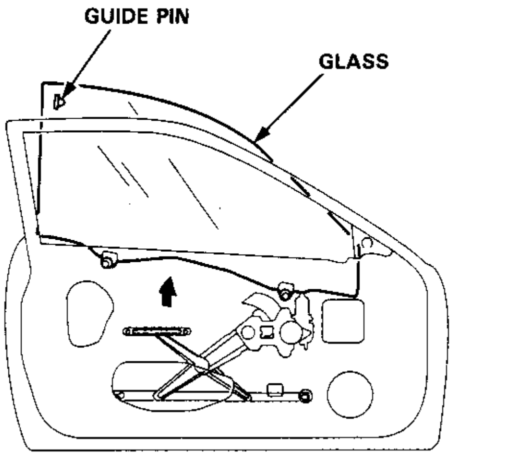
▲: Bolt locations, 2



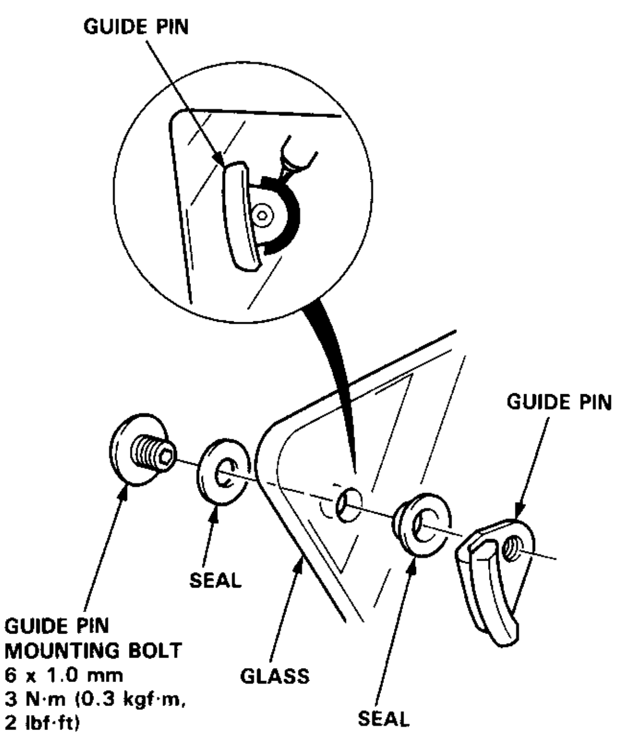


7. Carefully pull the glass out through the window slot.

NOTE:
- Take care not to drop the glass inside the door.
- Check the guide pin for damage, and replace it if necessary.

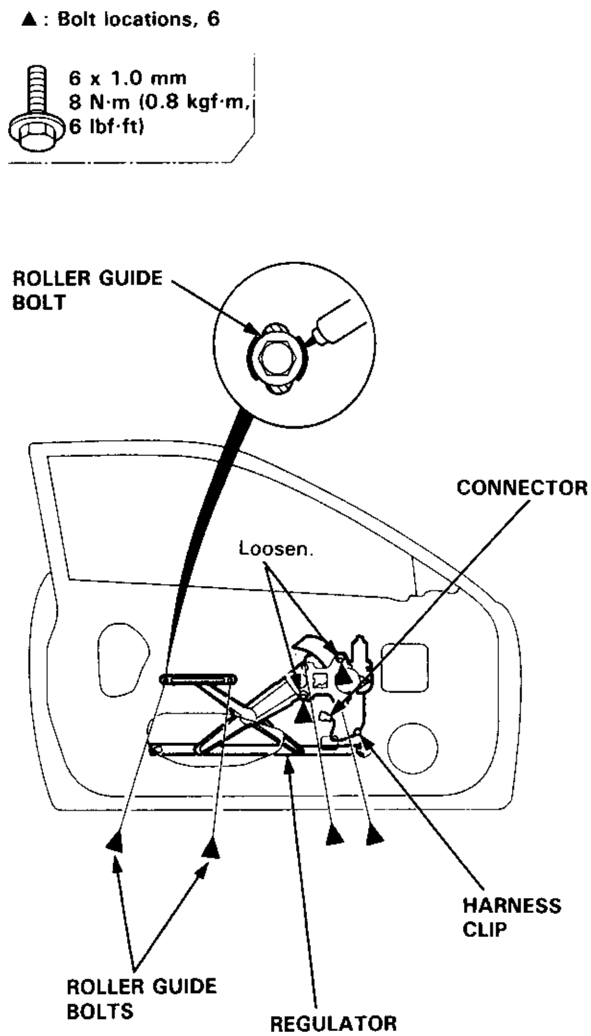


NOTE: Scribe a line around the guide pin to show the original location.



8. Disconnect the connector, then remove the regulator through the center hole in the door.

NOTE: Scribe a line around the rear roller guide bolt to show the original adjustment.



(cont'd)

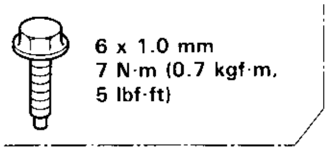
Doors

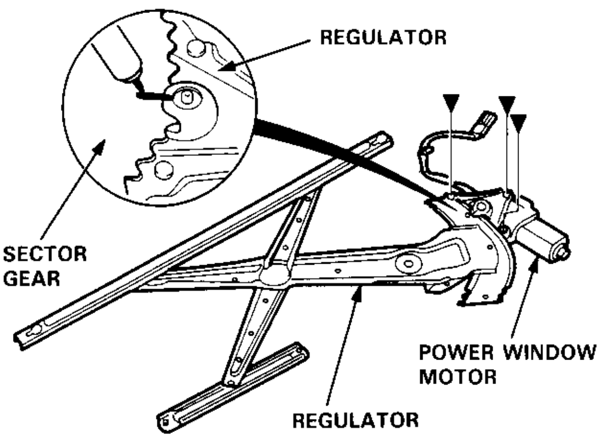
Glass/Regulator/Glass Run Channel Replacement (cont'd)

9. Remove the power window motor from the regulator.

   NOTE: Before removing the power window motor, mark the location by scribing a line across the sector gear and regulator.

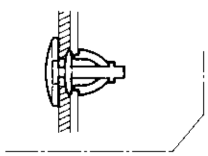
   ▼: Bolt locations, 3

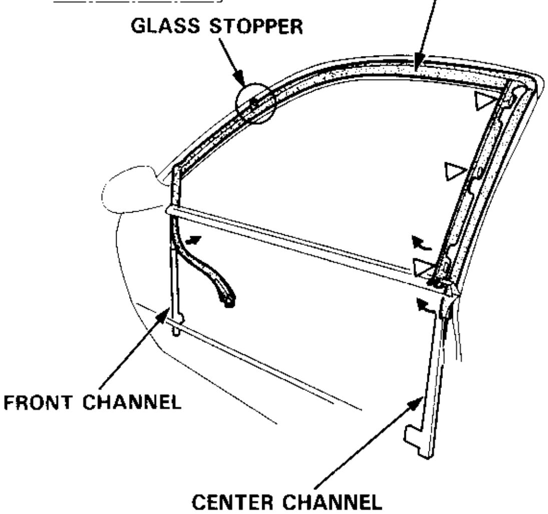




10. Detach the clips, then peel and remove the glass run channel.

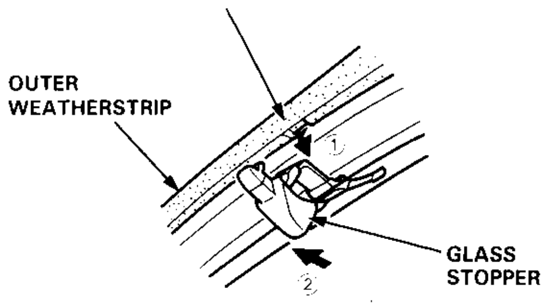
    ▷: Clip locations, 3



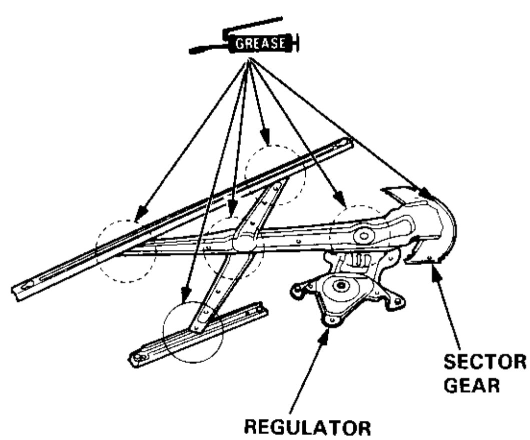


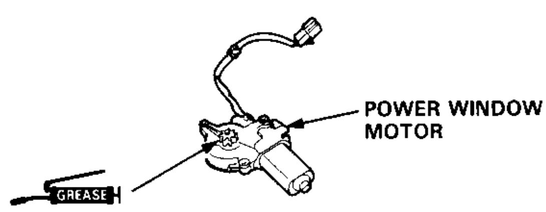
NOTE: If necessary, remove the glass stopper.

When installing the glass stopper, align it with the notch in the outer weatherstrip.



11. Grease all the sliding surfaces of the regulator where shown. Install the power window motor on the regulator.
    Check that the regulator moves smoothly by connecting a 12 V battery to the power window motor (see section 23).



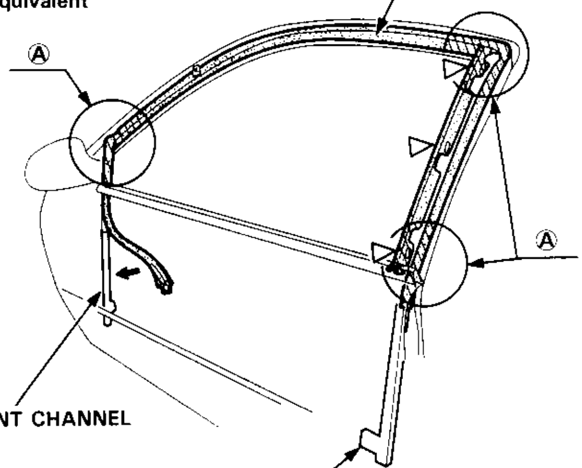


12. Apply clear sealant to locations Ⓐ on the door as shown, then install the glass run channel.

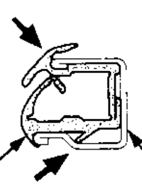
NOTE:
- If necessary, replace any damaged clips.

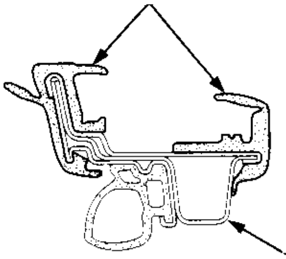
▷: Clip location, 3

Sealant: Cemedine #8500, or equivalent



- Fit the glass run channel into the front channel and on the door as shown.





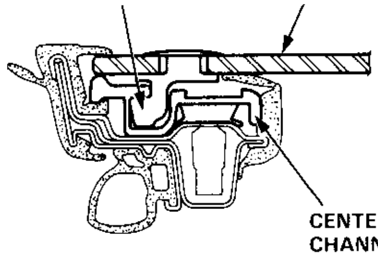
13. Install the regulator (see page 20-11).

NOTE: Make sure the connector is connected properly.

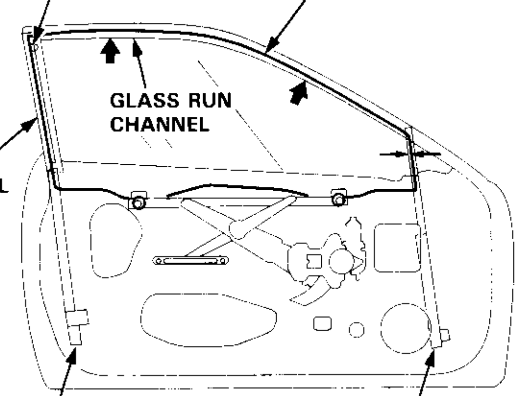
14. Install the glass (see page 20-10).

15. Install the center channel guide and channel guide cover.

NOTE: Make sure the guide pin is installed in the center channel guide properly.



16. Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and glass run channel when the glass is closed. Adjust the position of the glass as necessary (see page 20-16).



17. Attach the door harness to the door correctly (see page 20-5).

18. Disconnect the power window switch from the door harness, then install the power window switch on the door panel (see page 20-16).

19. When reinstalling the plastic cover, apply adhesive along the edge where neccessary to maintain a continuous seal and prevent water leaks (see page 20-6).

20. Install the door panel (see page 20-4).

Doors

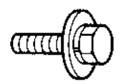
Front and Center Channel Replacement

NOTE: Raise the glass fully.

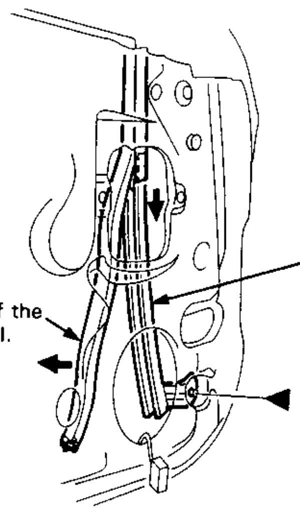
1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-4)

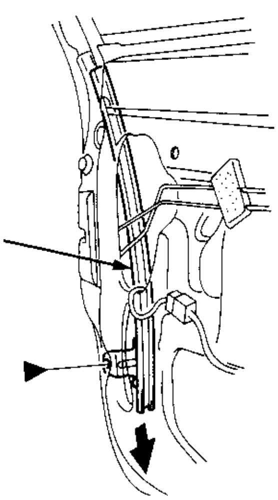
2. Remove the front and center channels.

◄ : Bolt locations, 2



6 x 1.0 mm
8 N·m (0.8 kgf·m, 6 lbf·ft)

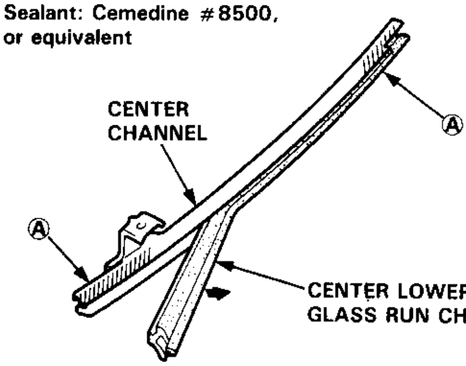




3. Peel the center lower glass run channel out of the center channel.

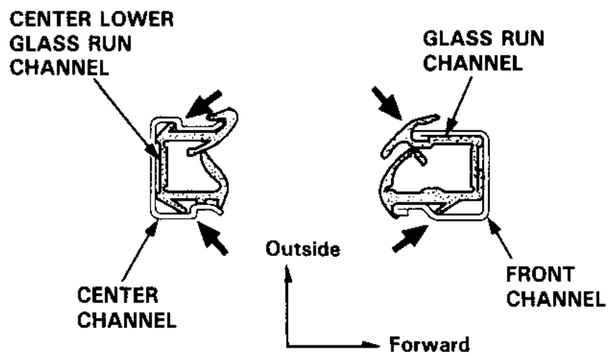
   NOTE: When installing, apply clear sealant to locations (A) on the center channel.

Sealant: Cemedine #8500, or equivalent

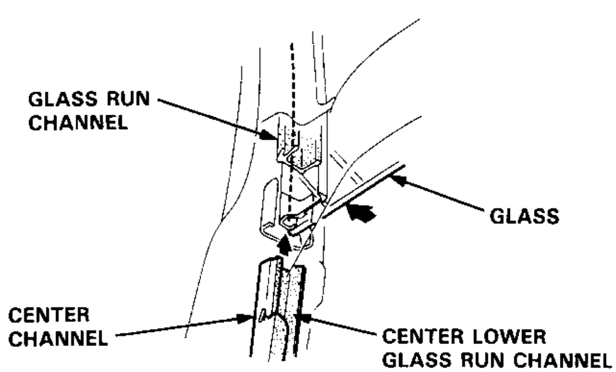


14. Installation is the reverse of the removal procedure.

    NOTE:
    - Fit the glass run channels into the front and center channels as shown.



- Install the center channel while pushing the glass as shown.
- Make sure the glass run channels are not twisted.



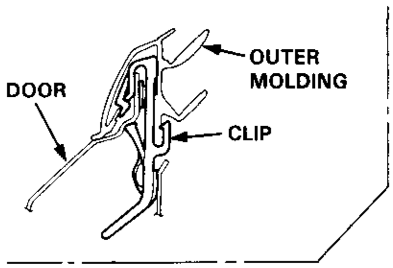
Outer Molding Replacement

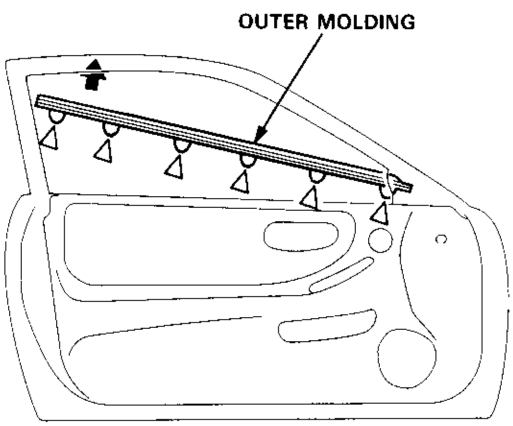
CAUTION: Wear gloves to remove the outer molding.

1. Remove the power mirror (see page 20-49).
2. Lower the glass.
3. Starting at the rear, pry the outer molding up and detach the clips, then remove the outer molding.

   NOTE: Take care not to twist or scratch the outer molding.

   △ : Clip locations, 6





4. Installation is the reverse of the removal procedure.

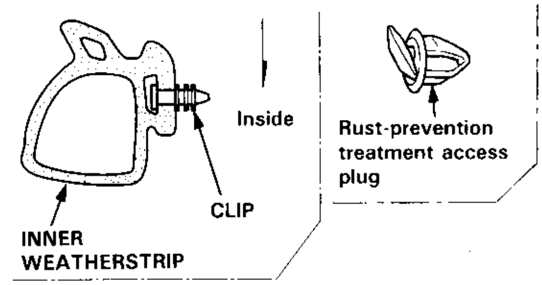
   NOTE:
   - If necessary, replace any damaged clips.
   - When installing, align the rear edge of the outer molding with the rear edge of the door.

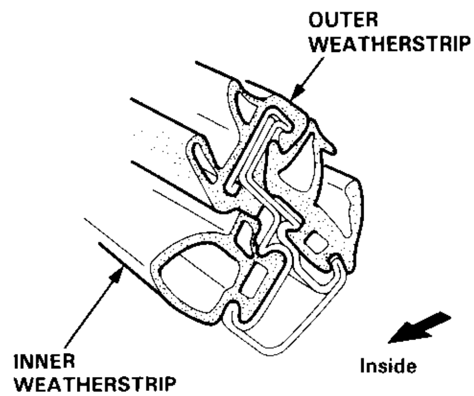
Weatherstrip Replacement

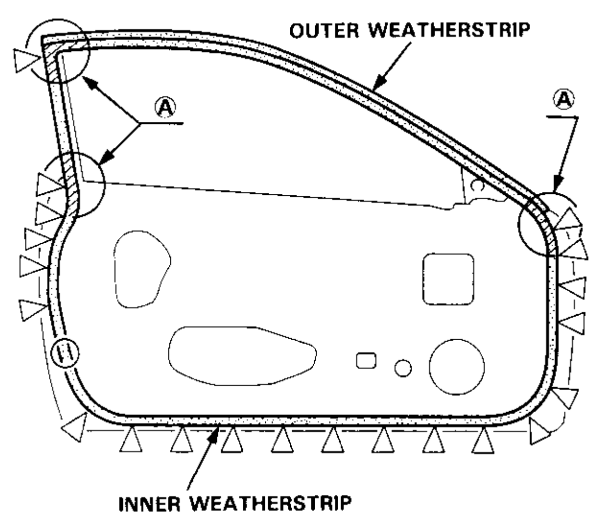
NOTE:
- Before installing the inner weatherstrip, apply clear sealant to locations Ⓐ on the door as shown.
- If necessary, replace any damaged clips.

Sealant: Cemedine #8500, or equivalent

▷ : Clip locations, 21 **○ : Clip location, 1**







Doors

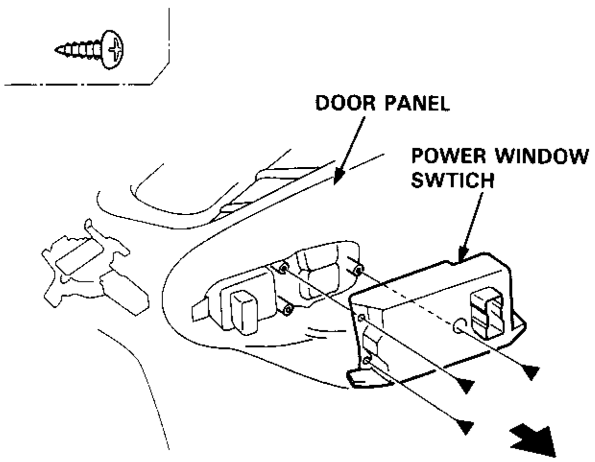
Glass Adjustment

NOTE:

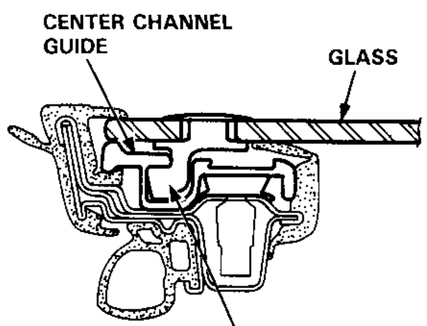
- Place the vehicle on a firm, level surface when adjusting the glass.
- Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.

1. Remove the door panel, and peel off the plastic cover (see page 20-4).
2. Remove the power window switch from the door panel.

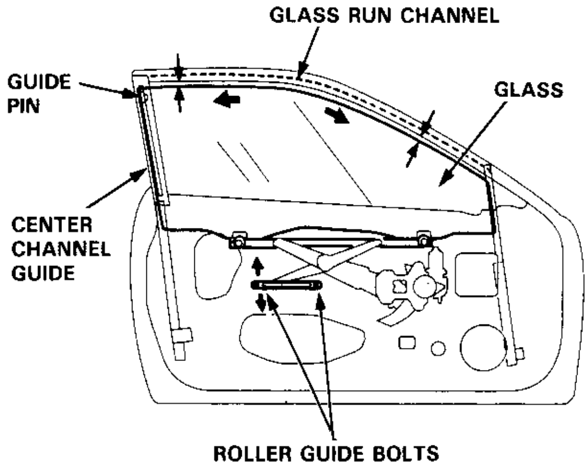
◄: Screw locations, 5



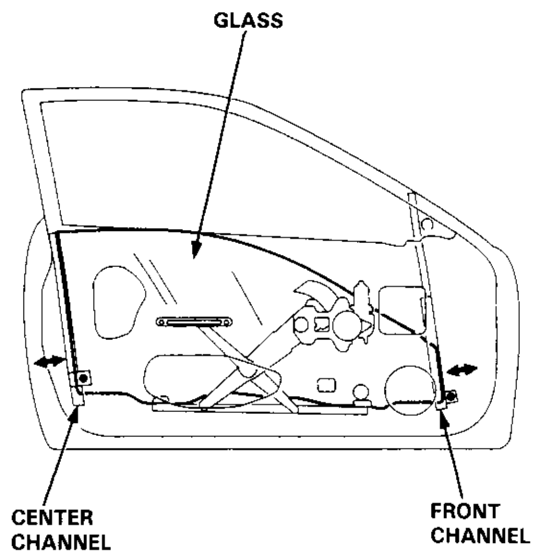
3. Connect the power window switch to the door harness.
4. Make sure the guide pin is installed in the center channel guide properly.



5. Raise the glass as far up as possible, and hold it against the glass run channel.
6. Loosen the roller guide bolts, and adjust the glass so it is parallel with the glass run channel.



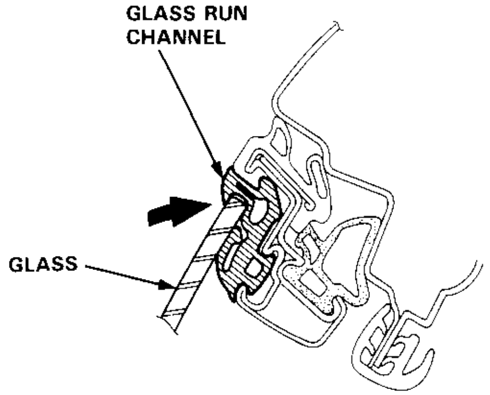
7. Tighten the roller guide bolts.
8. Check that the glass moves smoothly.
9. If necessary, adjust the front and center channels.



10. Raise the glass fully and check for gaps.

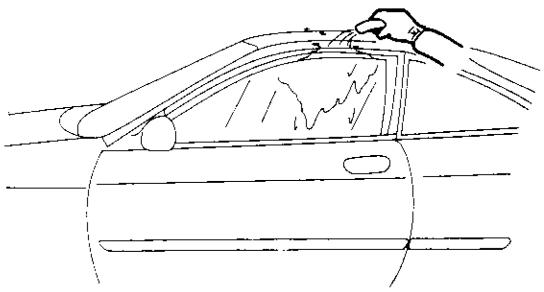
11. Check the glass operation.

NOTE: Check that the glass contacts the glass run channel evenly.



12. Check for water leaks.

NOTE: Do not use high-pressure water.



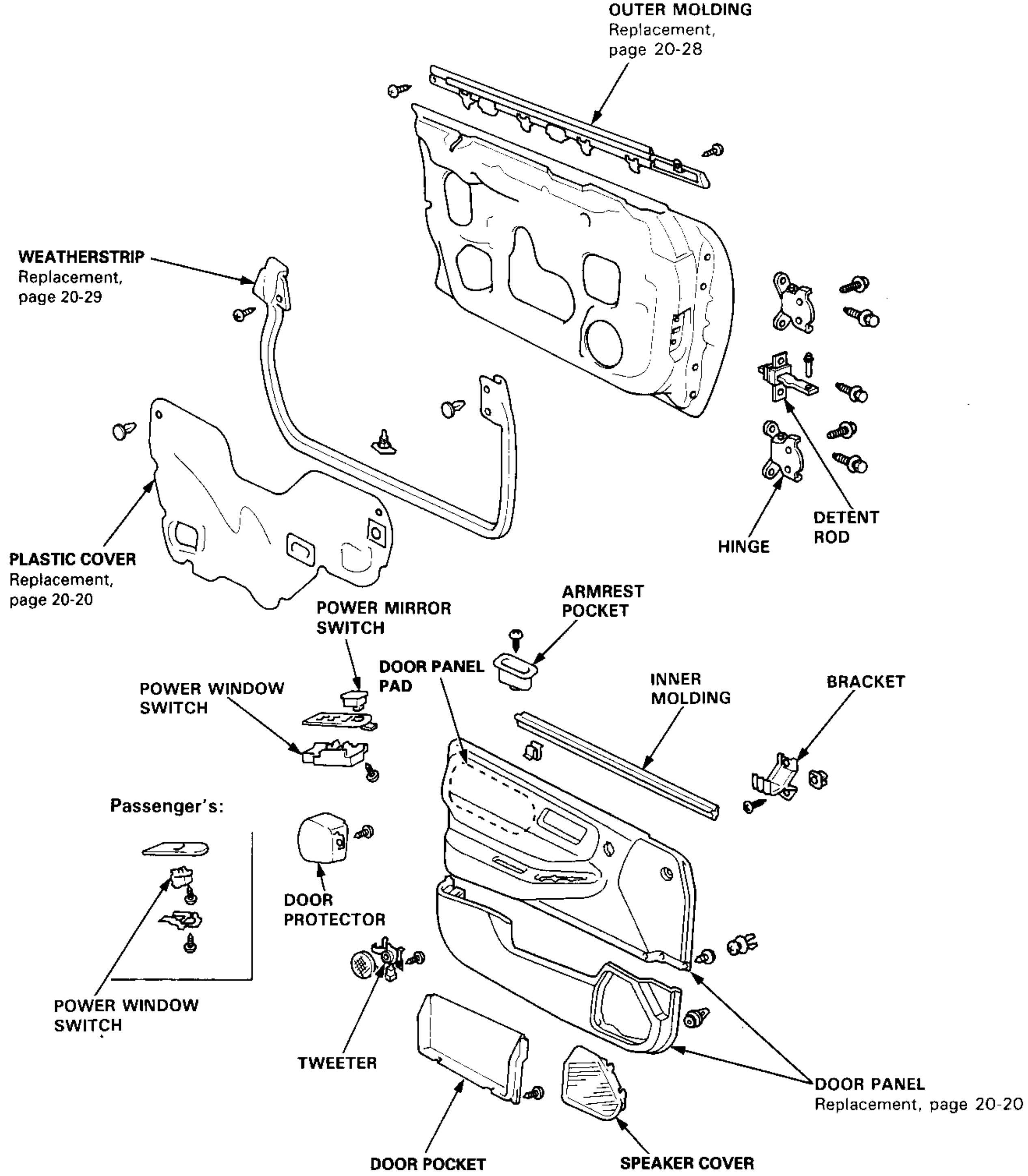
13. Route the door harness and connectors, and fasten them to the door (see page 20-5).

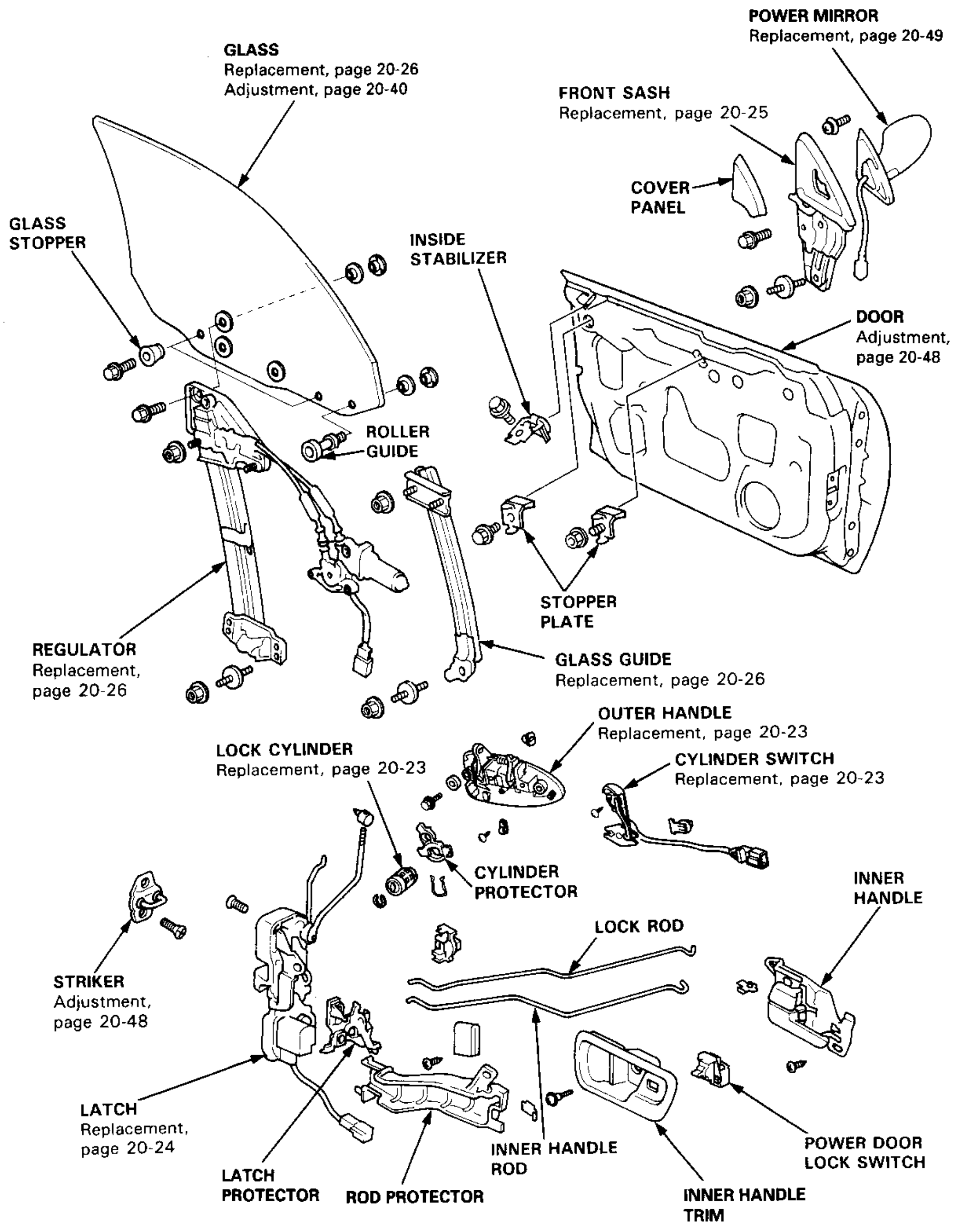
14. Disconnect the power window switch from the door harness, then install the power window switch in the door panel (see page 20-16).

15. Attach the plastic cover, then install the door panel (see page 20-4).

Front Door Index

Sedan




POWER MIRROR
Replacement, page 20-49
GLASS
Replacement, page 20-26
Adjustment, page 20-40
FRONT SASH
Replacement, page 20-25
COVER PANEL
GLASS STOPPER
INSIDE STABILIZER
DOOR
Adjustment, page 20-48
ROLLER GUIDE
STOPPER PLATE
REGULATOR
Replacement, page 20-26
GLASS GUIDE
Replacement, page 20-26
OUTER HANDLE
Replacement, page 20-23
LOCK CYLINDER
Replacement, page 20-23
CYLINDER SWITCH
Replacement, page 20-23
CYLINDER PROTECTOR
INNER HANDLE
LOCK ROD
STRIKER
Adjustment, page 20-48
LATCH
Replacement, page 20-24
INNER HANDLE ROD
POWER DOOR LOCK SWITCH
LATCH PROTECTOR
ROD PROTECTOR
INNER HANDLE TRIM

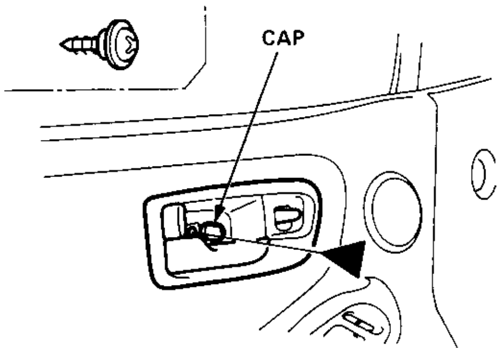
Doors

Door Panel/Plastic Cover Replacement

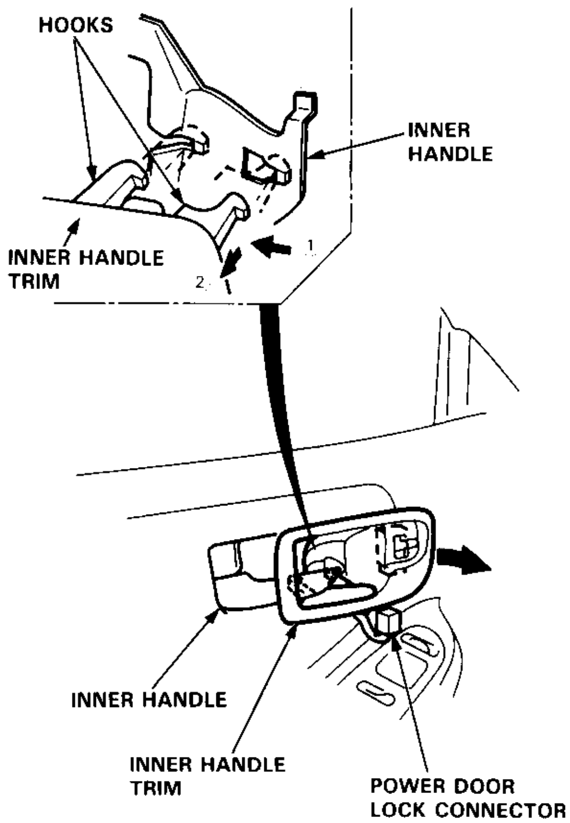
NOTE: Take care not to scratch the door panel and other parts.

1. Pry out the cap and remove the screw.

◀ : Screw location, 1

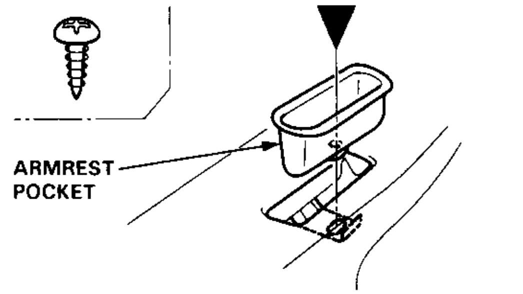


2. Remove the inner handle trim while pulling the inner handle.
   Disconnect the power door lock connector.



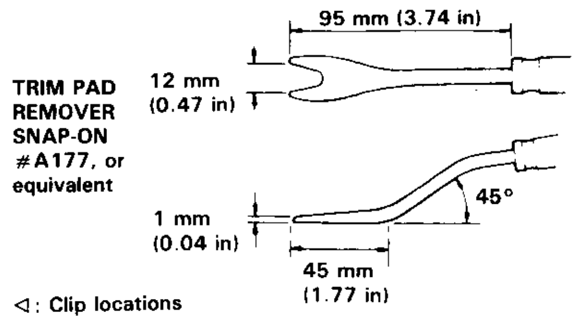
3. Remove the armrest pocket.

▼ : Screw location, 1



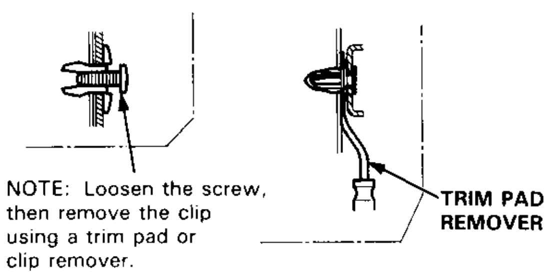
4. Release the clips that hold the door panel.

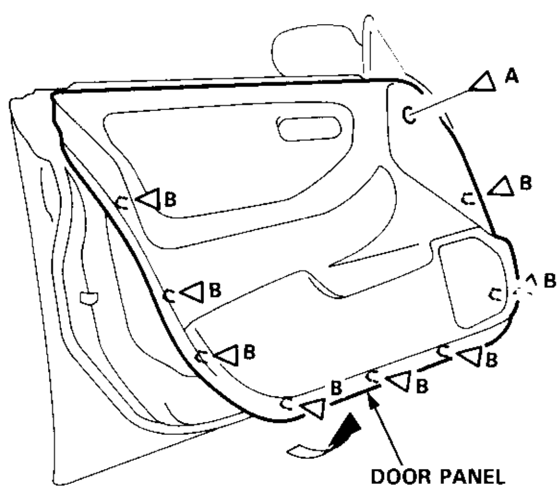
   NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.



◁ : Clip locations

A◁ : Clip, 1 B◁ : Clip, 8



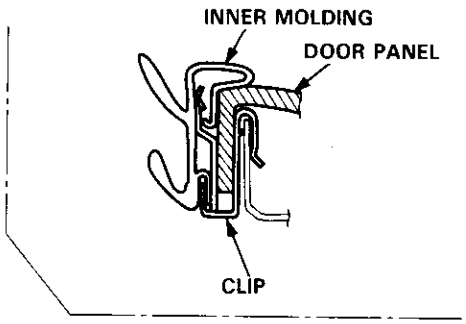


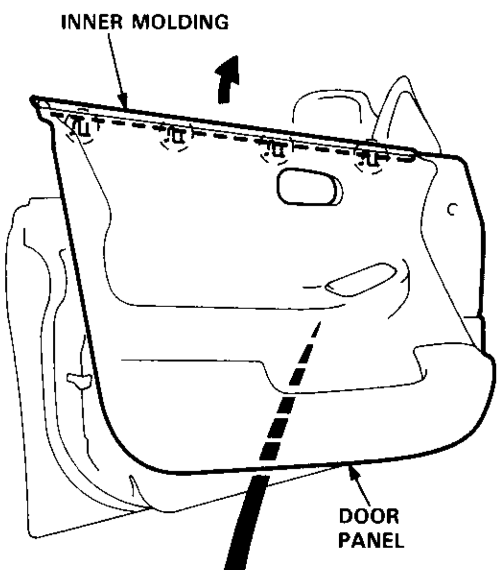
5. Detach the clips, and remove the door panel by pulling it upward.

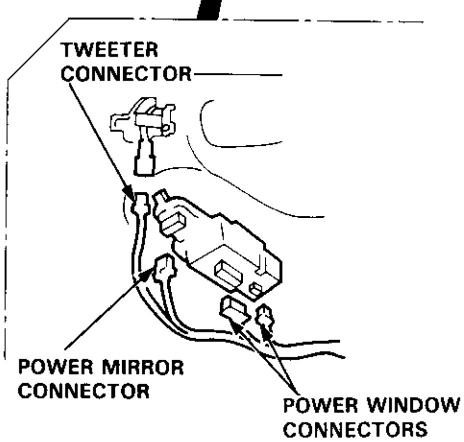
NOTE: Take care not to twist or scratch the inner molding.

Disconnect the following:
- Power window connectors
- Power mirror connector
- Tweeter connector

◌: Clip locations, 4

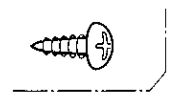


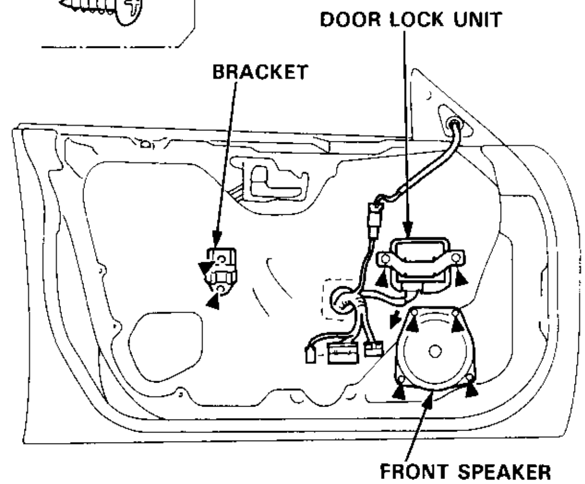




6. Remove the bracket, door lock unit and front speaker.

◀: Screw locations, 8

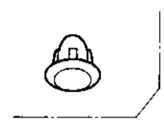


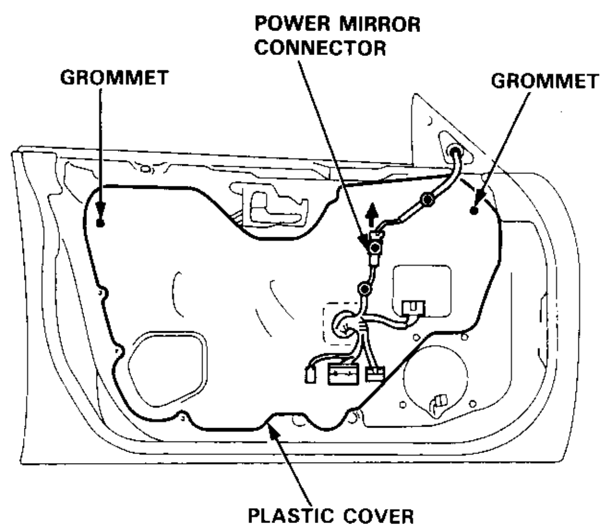


7. Remove the cover panel, then disconnect the power mirror connector (see page 20-49).

8. Detach the grommets and harness clips, then carefully remove the plastic cover.

●: Grommet locations, 2 **◉: Harness clip locations, 3**



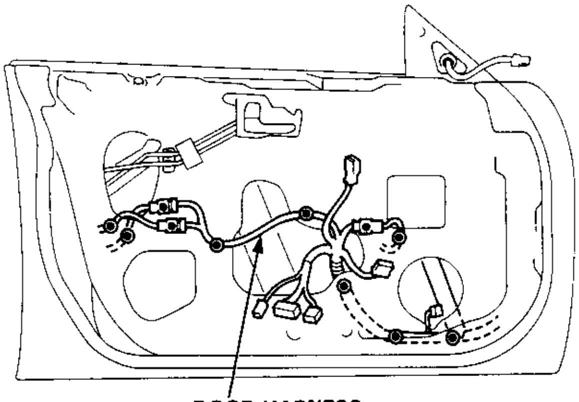


(cont'd)

Door Panel/Plastic Cover Replacement (cont'd)

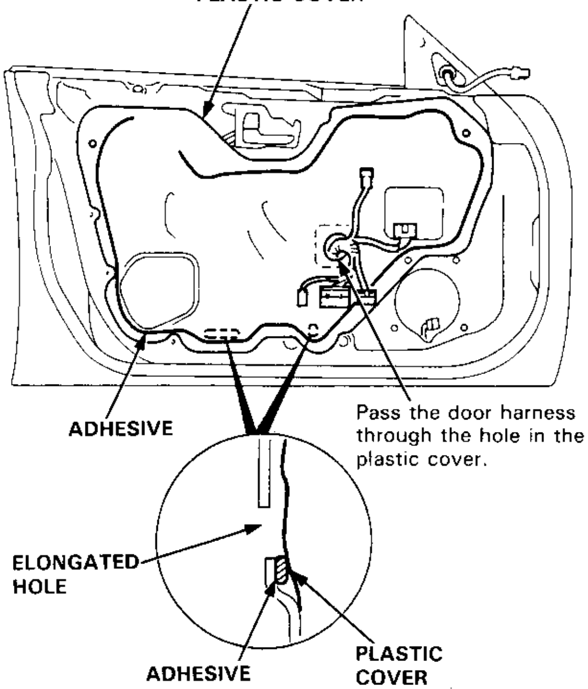
9. Before installing the plastic cover, make sure the door harness and connectors are fastened correctly on the door.

● : Connector clip locations, 3
◉ : Harness clip locations, 8



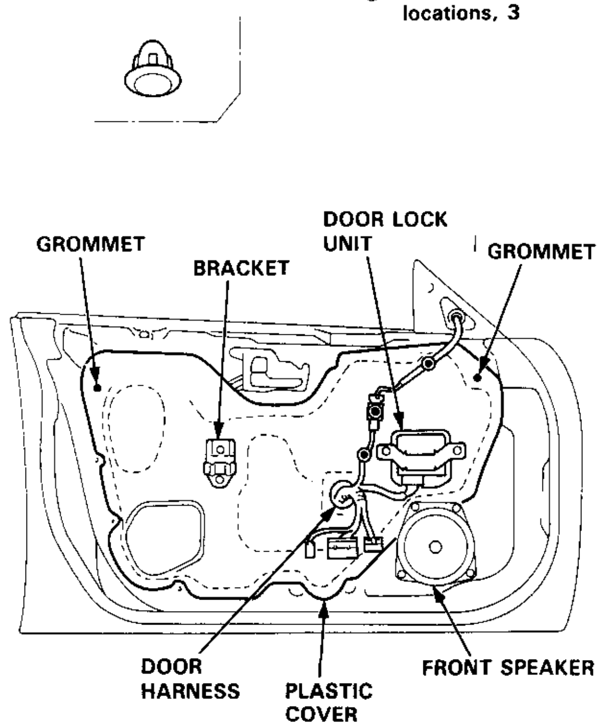
10. Install the plastic cover.

NOTE:
- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks.
- Do not plug the elongated hole.



11. Install all removed parts, and fasten the door harness correctly.

● : Grommet locations, 2
◉ : Harness clip locations, 3



12. Install the door panel (see page20-21).

NOTE:
- Make sure the door harness is not pinched.
- If necessary, replace any damaged clips.
- Make sure the connectors are connected properly.

13. Install the armrest pocket and inner handle trim (see page 20-20).

NOTE: Make sure the connector is connected properly.

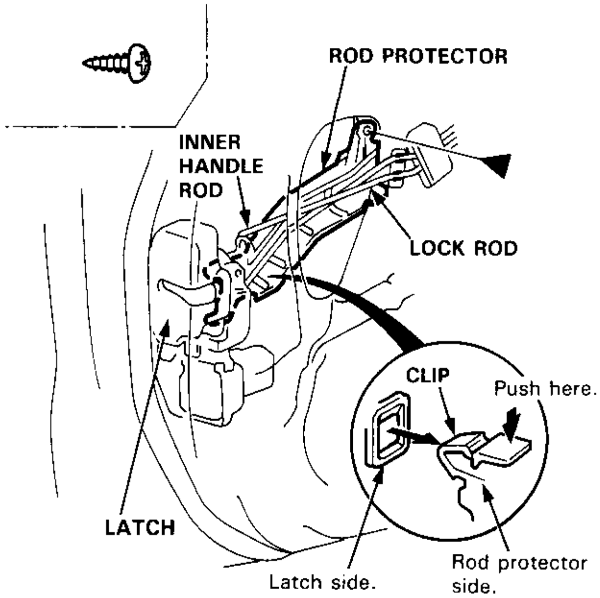
Outer Handle Replacement

NOTE: Raise the glass fully.

1. Remove:
   - Door panel (see page 20-20)
   - Plastic cover (see page 20-20)

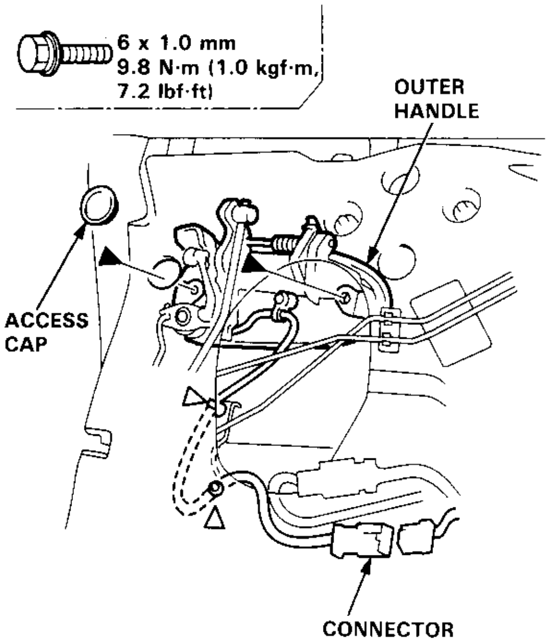
2. Remove the rod protector.

▶: Screw location, 1



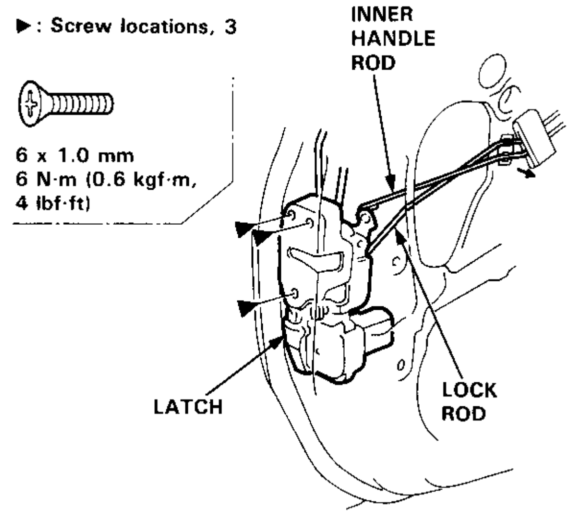
3. Remove the bolts and disconnect the connector.

▶: Bolt locations, 2 ▷: Clip locations, 2



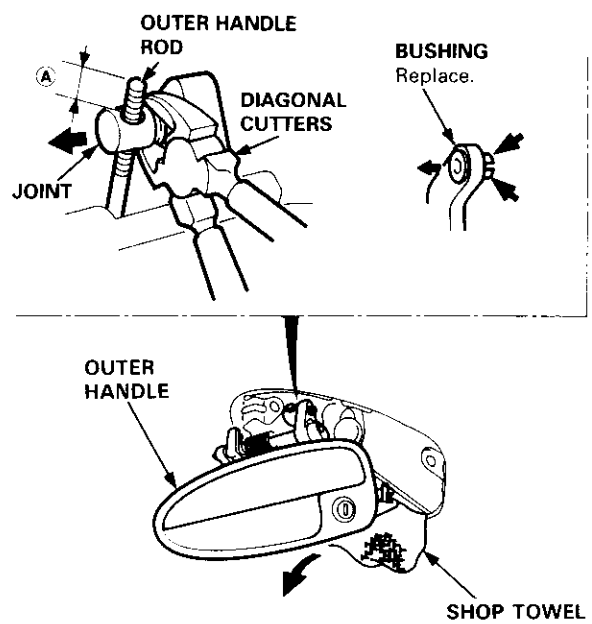
4. Remove the latch.

▶: Screw locations, 3



5. Pull out the outer handle with the latch.
   Pry the outer handle rod out of its joint using diagonal cutters.

   NOTE:
   - To ease reassembly, note location (A) of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.
   - Use a shop towel to protect the opening in the door.

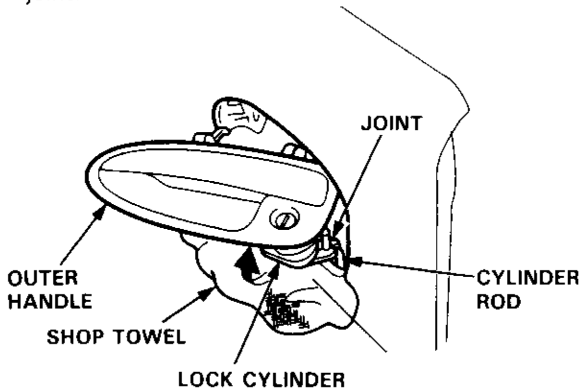


(cont'd)

Outer Handle Replacement (cont'd)

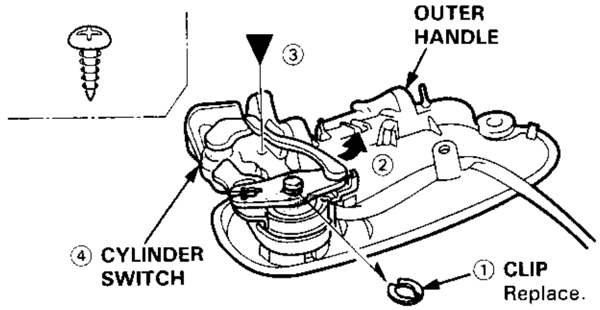
6. Disconnect the cylinder rod as shown.

   NOTE: Take care not to damage the lock cylinder joint.

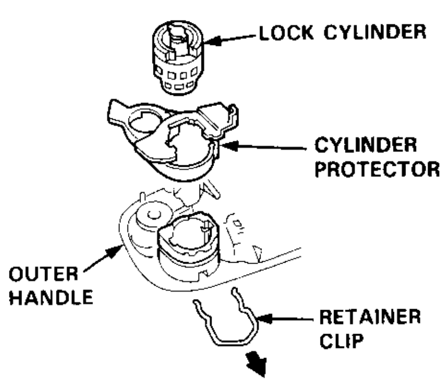


7. Remove the cylinder switch from the outer handle.

▼: Screw location, 1



8. Pull out the retainer clip, then remove the lock cylinder and cylinder protector.



9. Installation is the reverse of the removal procedure.

   NOTE:
   - Make sure the outer handle rod and connector are connected securely.
   - Make sure the wire harness is routed properly.
   - Make sure the door locks and opens properly.

Latch Replacement

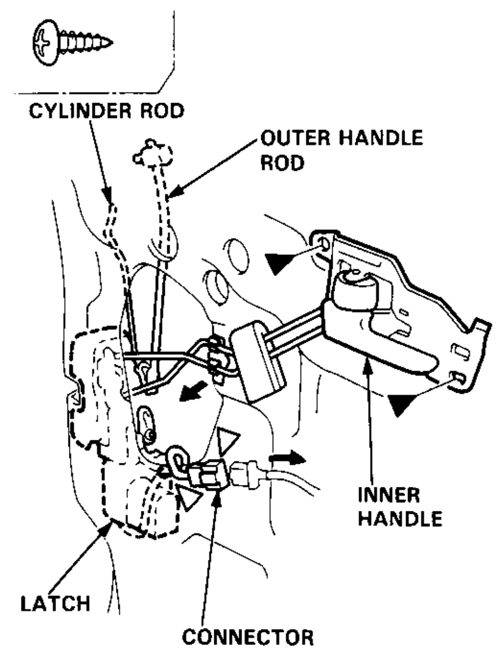
NOTE: Raise the glass fully.

1. Remove:
   - Door panel (see page 20-20)
   - Plastic cover (see page 20-20)
   - Outer handle (see page 20-23)

2. Remove the screws and disconnect the connector, then remove the inner handle and latch.

   NOTE: Take care not to bend the rods.

▶: Screw locations, 2 ▷: Clip locations, 2



3. Installation is the reverse of the removal procedure.

   NOTE: Make sure the inner handle rod, lock rod and connector are connected properly.

Front Sash Replacement

NOTE: Lower the glass.

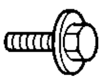
1. Remove:
   - Door panel (see page 20-20)
   - Plastic cover (see page 20-20)
   - Power mirror (see page 20-49)
   - Outer molding (see page 20-38)

2. Detach the clips, then pry the weatherstrip away from the front sash.

3. Remove the bolts and locknut.

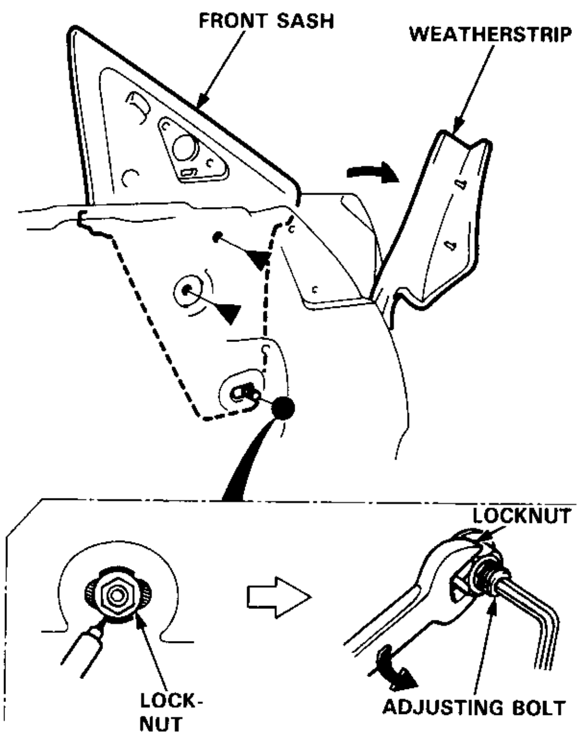
   NOTE:
   - Hold the adjusting bolt with a hex wrench when removing the locknut.
   - Scribe a line around the locknut to show the original adjustment.

▶: Bolt locations, 2 **●: Nut location, 1**

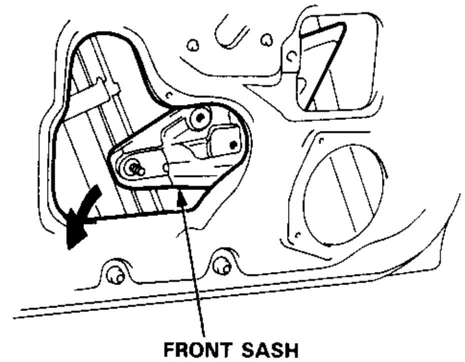


6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)

8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)



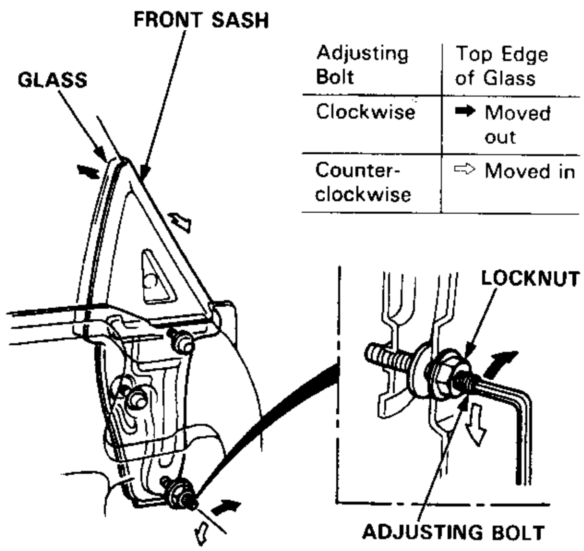
4. Remove the front sash through the center hole in the door as shown.



5. Installation is the reverse of the removal procedure.

   NOTE: After installing, adjust the position of the front sash as necessary.

   - Align the front sash with the glass using the adjusting bolt at the bottom of the front sash.



Adjusting Bolt	Top Edge of Glass
Clockwise	➡ Moved out
Counter-clockwise	⇨ Moved in

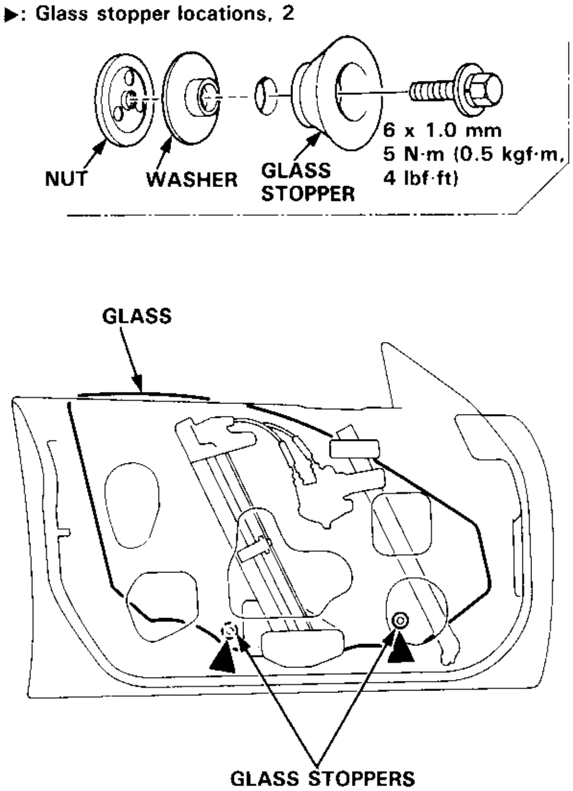
   - Check for water leaks.

   NOTE: Do not high-pressure water.

Doors

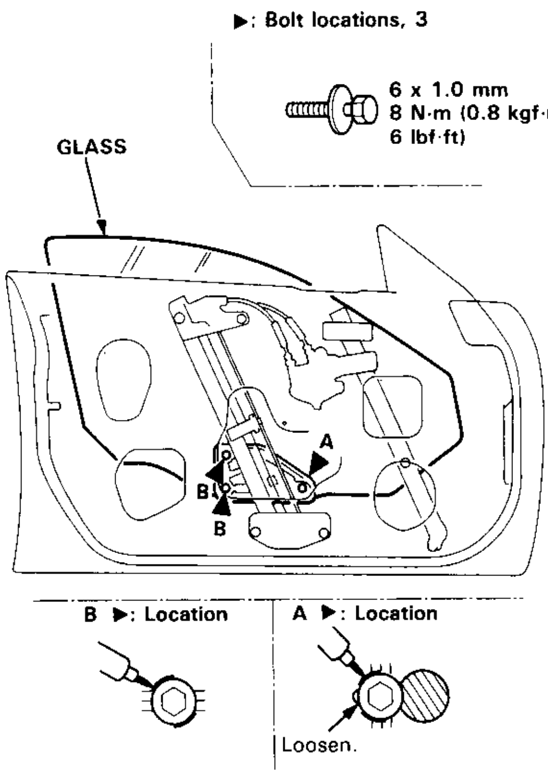
Glass/Regulator/Glass Guide Replacement

1. Remove:
   - Door panel (see page 20-20)
   - Plastic cover (see page 20-20)
2. Remove the power window switch from the door panel, then connect the door harness (see page 20-41).
3. Move the glass until you can see the glass stoppers, then remove them.



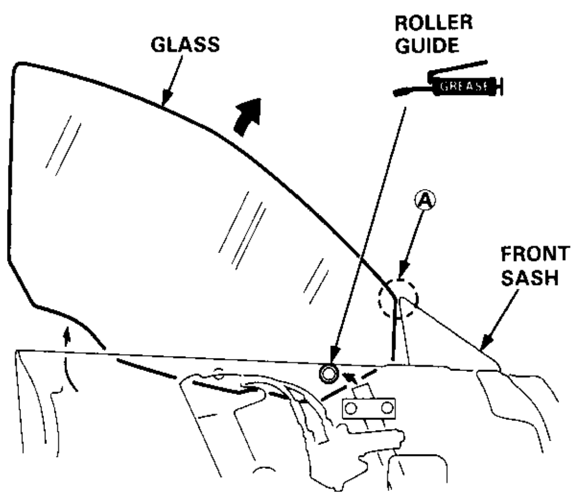
4. Carefully move the glass until you can see the glass mounting bolts, then remove them.

NOTE: Scribe a line around the glass mounting bolts to show the original adjustment.



5. Carefully pull the glass out of the window slot.

NOTE: Take care not to damage location (A) on the front sash.



6. Remove the inner handle (see page 20-24).

7. Disconnect the connector, and remove the regulator through the center hole in the door.

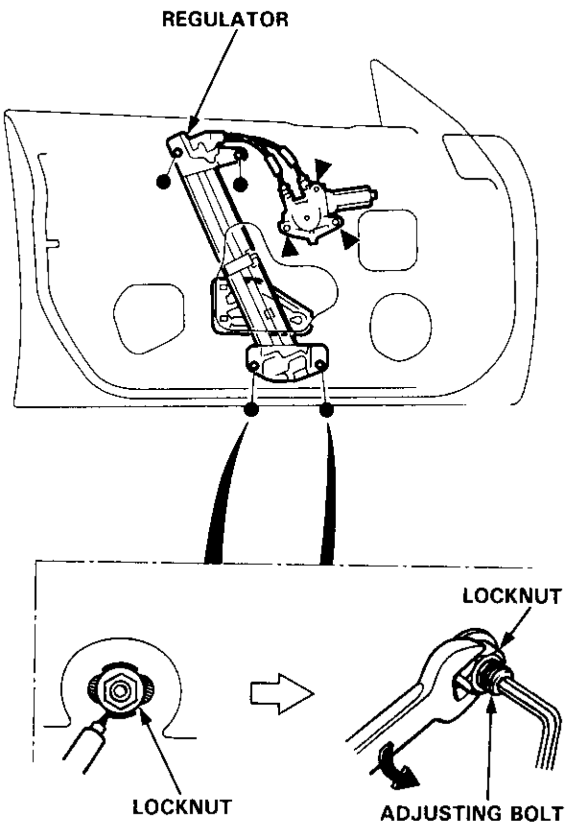
NOTE:
- Hold the adjusting bolts with a hex wrench when removing the locknuts.
- Scribe a line around the locknuts to show the original adjustment.

●: Nut locations, 4

8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

▲: Bolts locations, 3

6 x 1.0 mm
8 N·m (0.8 kgf·m, 6 lbf·ft)
Loosen.

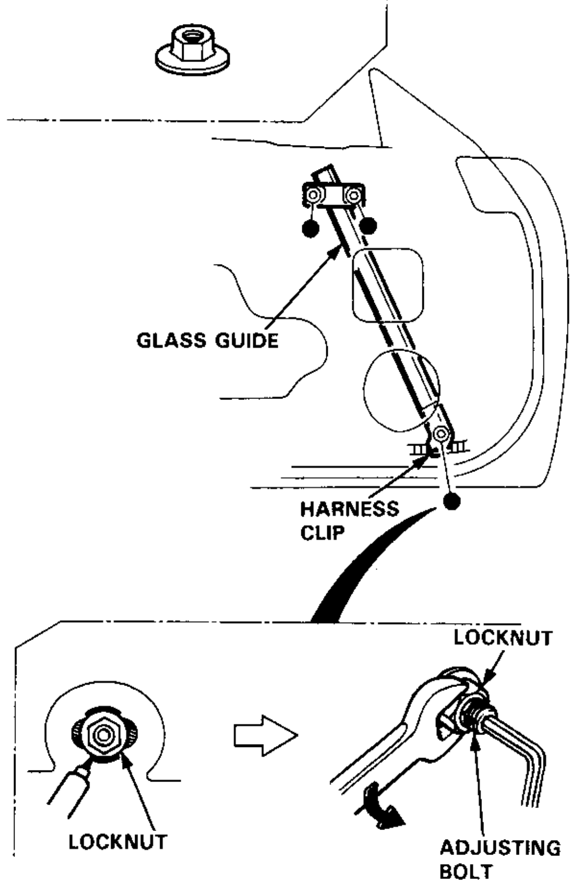


8. Remove the glass guide.

NOTE:
- Hold the adjusting bolt with a hex wrench when removing the locknut.
- Scribe a line around the mounting nut to show the original adjustment.

●: Nut locations, 3

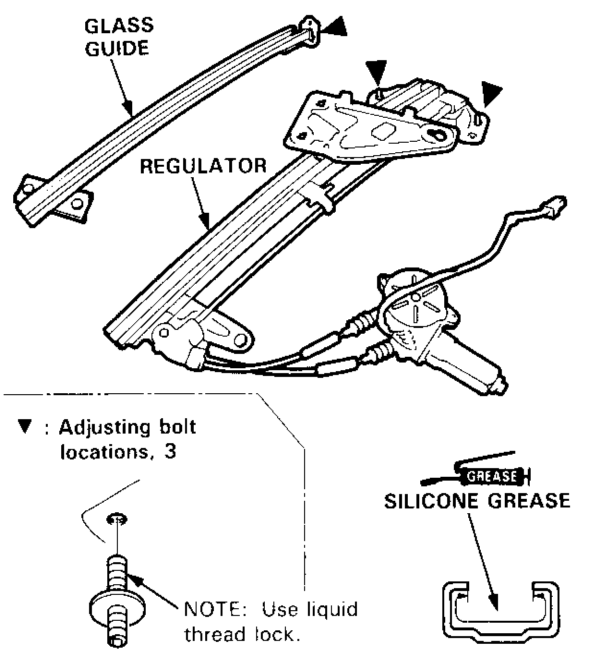
8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)



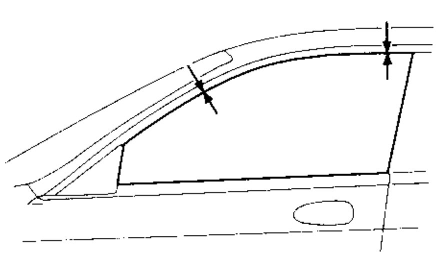
(cont'd)

Glass/Regulator/Glass Guide Replacement (cont'd)

9. Grease all the sliding surfaces of the regulator and glass guide where shown.



10. Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and weatherstrip when the glass is closed. Adjust the position of the glass as necessary (see page 20-40).



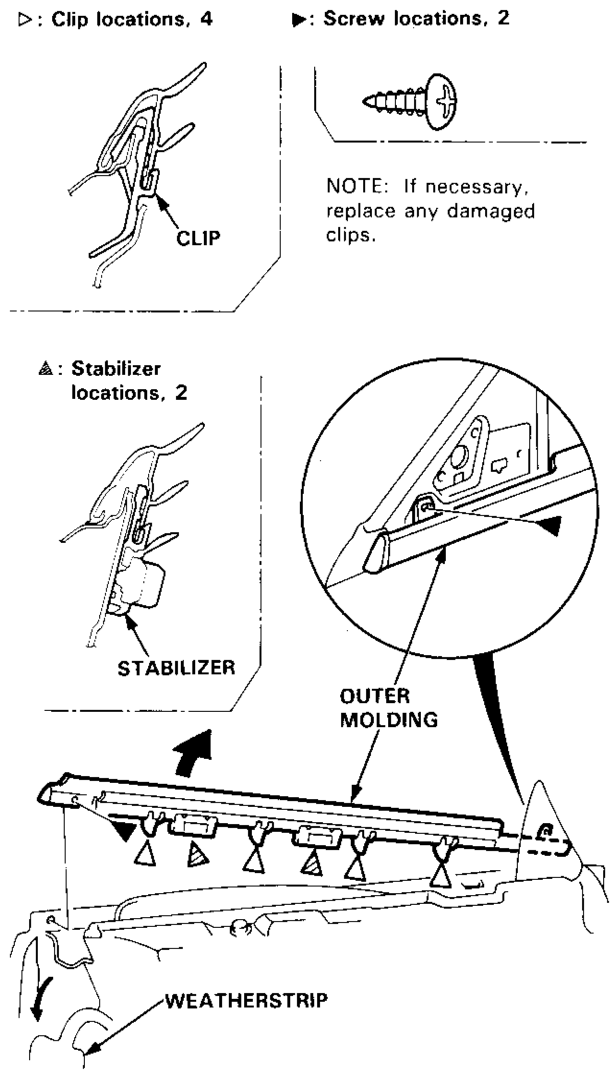
11. Attach the door harness to the door correctly (see page 20-22).
12. Disconnect the power window switch from the door harness, then install the power window switch on the door panel (see page 20-41).
13. When reinstalling the plastic cover, apply adhesive along the edge where neccessary to maintain a continuous seal and prevent water leaks (see page 20-22).
14. Install the door panel (see page 20-21).

Outer Molding Replacement

NOTE: Lower the glass fully.

1. Remove:
   - Door panel (see page 20-20)
   - Power mirror (see page 20-49)
2. Peel the weatherstrip away from the door (see page 20-29), then remove the screw.
3. Starting at the rear, pry the outer molding up and detach the clips, then remove the outer molding.

   NOTE: Take care not to twist or scratch the outer molding.

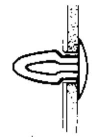


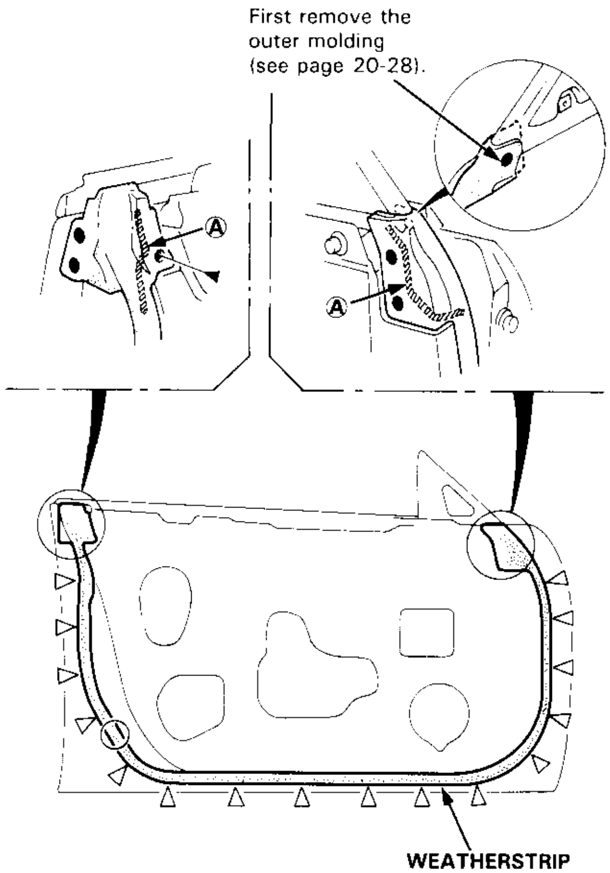
4. Installation is the reverse of the removal procedure.

Weatherstrip Replacement

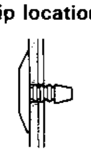
◄ : Screw location, 1

● : Clip locations, 5





▷ : Clip locations, 16



○ : Clip location, 1

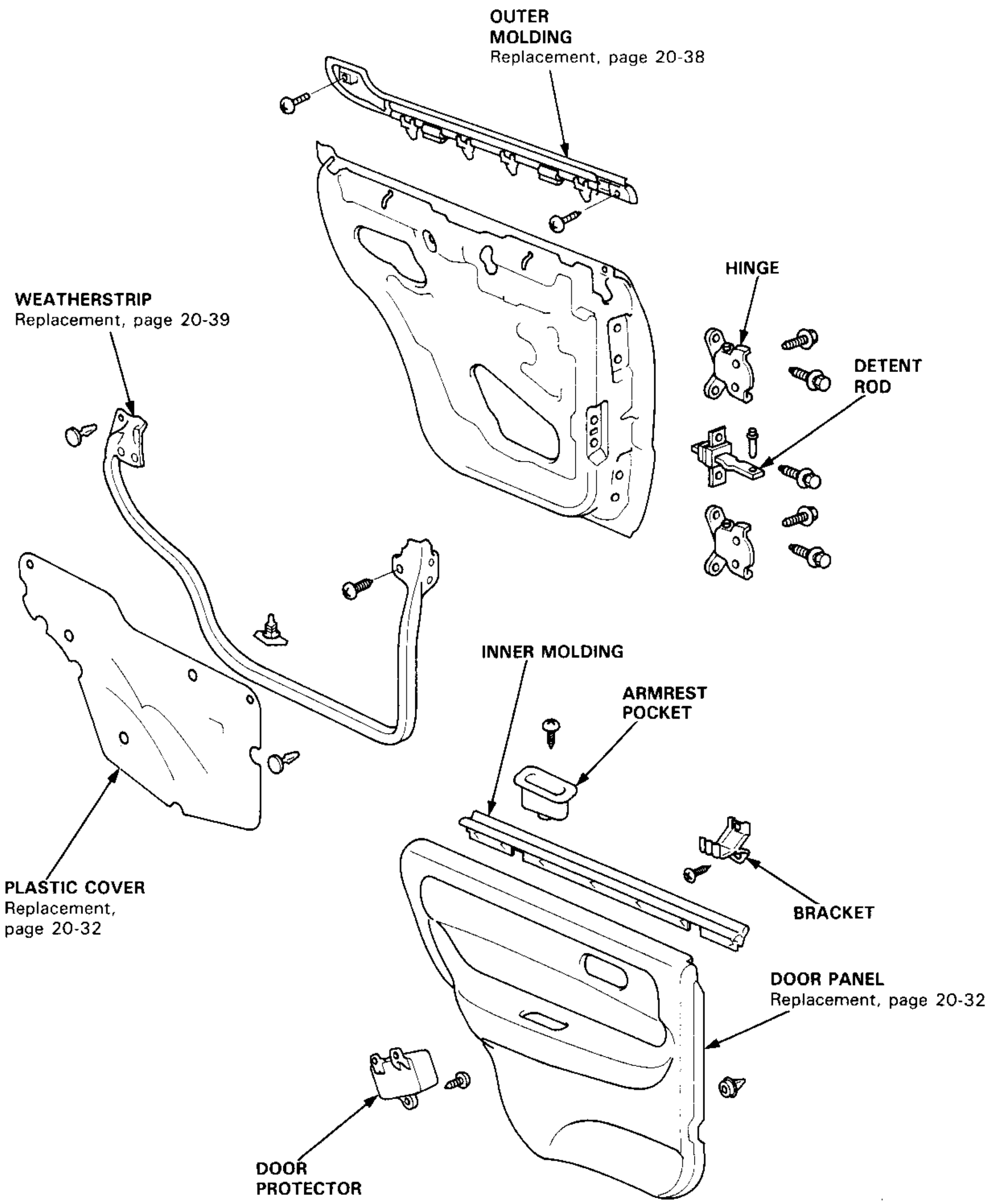
Rust-prevention treatment access plug

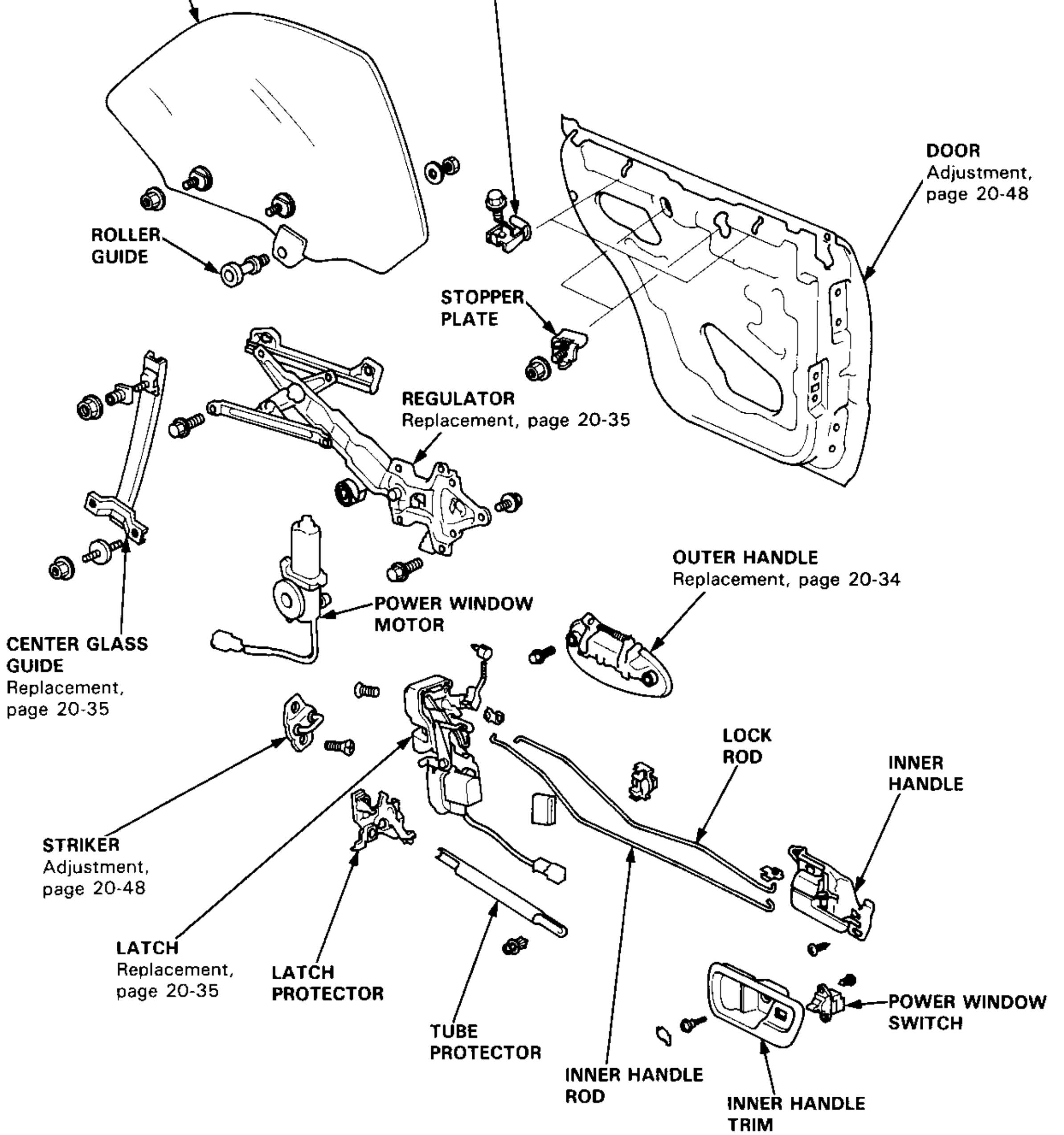
NOTE:
- Before installing the weatherstrip, apply clear sealant to locations Ⓐ.

Sealant: Cemedine #8500, or equivalent
- If necessary, replace any damaged clips.

Rear Door Index

Sedan



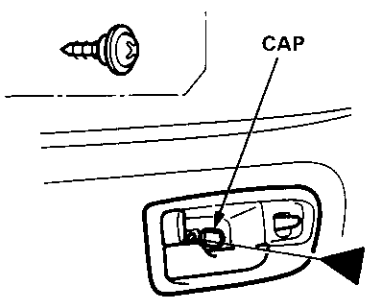

GLASS
Replacement, page 20-35
Adjustment, page 20-40
INSIDE
STABILIZER
DOOR
Adjustment,
page 20-48
ROLLER
GUIDE
STOPPER
PLATE
REGULATOR
Replacement, page 20-35
OUTER HANDLE
Replacement, page 20-34
POWER WINDOW
MOTOR
CENTER GLASS
GUIDE
Replacement,
page 20-35
LOCK
ROD
INNER
HANDLE
STRIKER
Adjustment,
page 20-48
LATCH
Replacement,
page 20-35
LATCH
PROTECTOR
TUBE
PROTECTOR
POWER WINDOW
SWITCH
INNER HANDLE
ROD
INNER HANDLE
TRIM

Door Panel/Plastic Cover Replacement

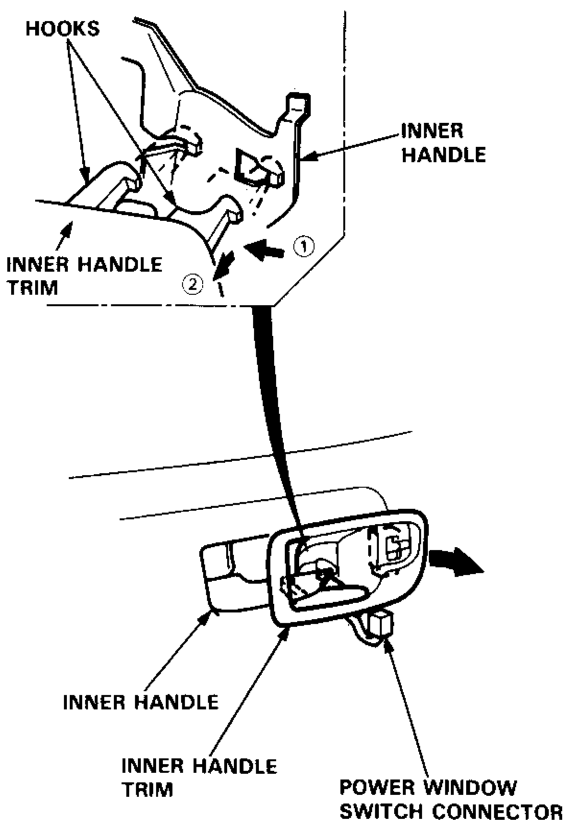
NOTE: Take care not to scratch the door panel and other parts.

1. Pry out the cap and remove the screw.

◀ : Screw location, 1

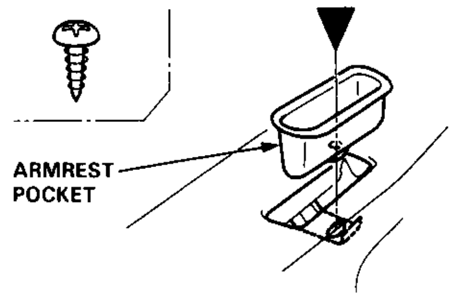


2. Remove the inner handle trim while pulling the inner handle.
   Disconnect the power window switch connector.



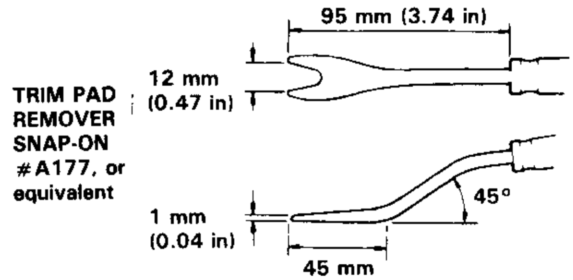
3. Remove the armrest pocket.

▼ : Screw location, 1

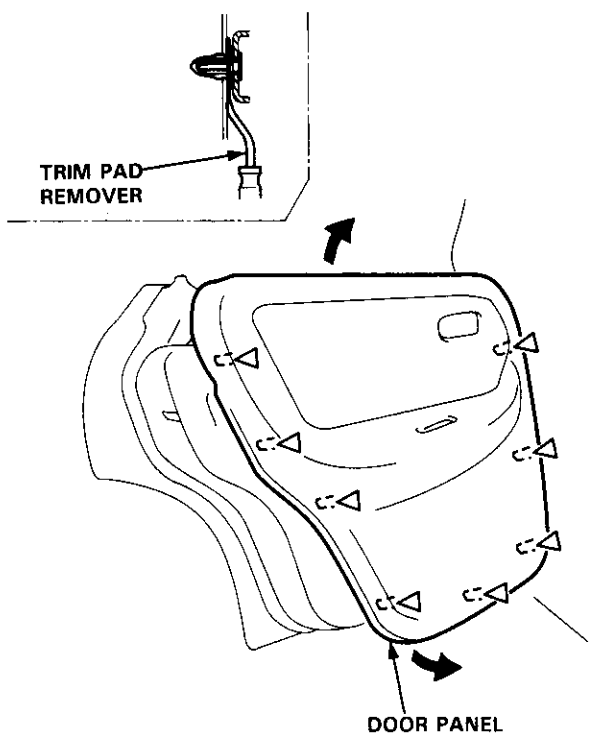


4. Release the clips that hold the door panel.

   NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.



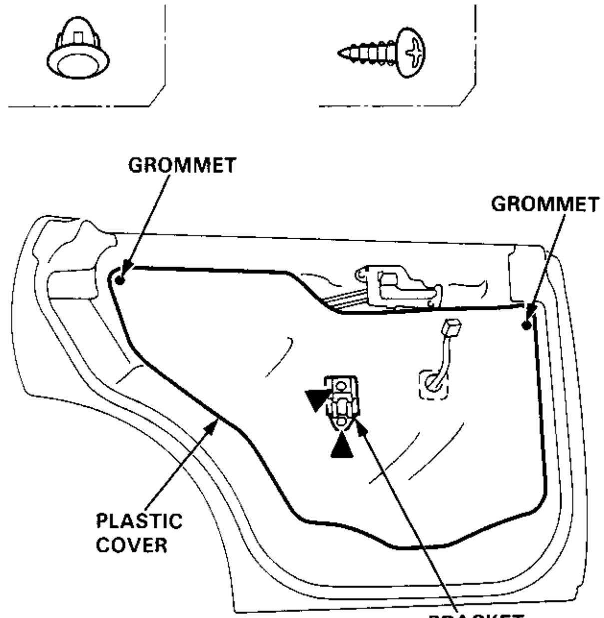
◁: Clip locations, 8



5. Remove the door panel by pulling it upward.

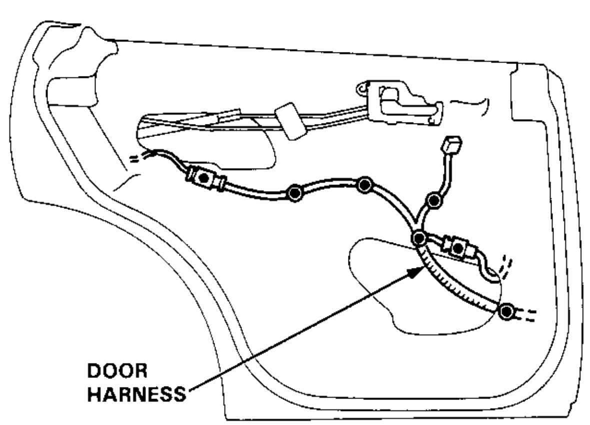
6. Remove the bracket and detach the grommets, then carefully remove the plastic cover.

● : Grommet locations, 2 ◄: Screw locations, 2



7. Before installing the plastic cover, make sure the door harness and connectors are fastened correctly on the door.

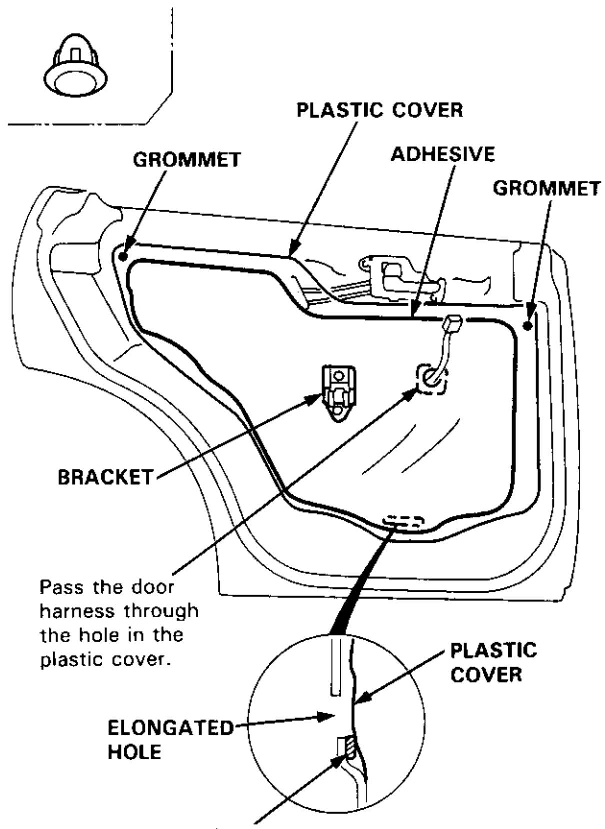
● : Connector clip locations, 2
◉: Harness clip locations, 5



8. Install the plastic cover and bracket.

NOTE:
- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks.
- Do not plug the elongated hole.

● : Grommet locations, 2



9. Install the door panel (see page 20-32).

NOTE:
- Make sure the door harness is not pinched.
- If necessary, replace any damaged clips.
- Make sure the connectors are connected properly.

10. Install the armrest pocket and inner handle trim (see page 20-32).

NOTE: Make sure the connector is connected properly.

Doors

Outer Handle Replacement

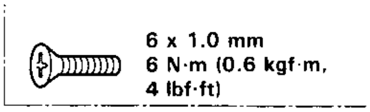
NOTE: Raise the glass fully.

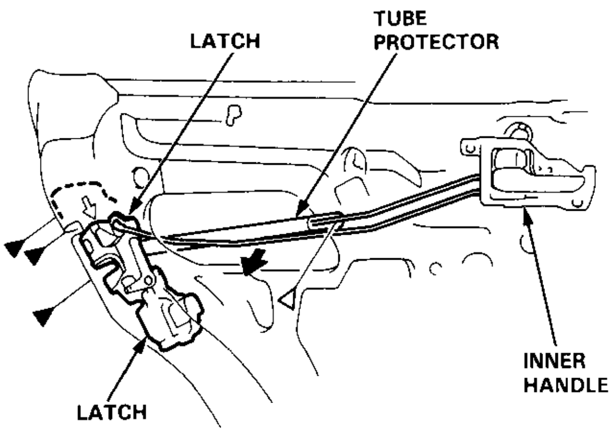
1. Remove:
   - Door panel (see page 20-32)
   - Plastic cover (see page 20-32)

2. Remove the screws and clip, then move the latch.

▶ : Screw locations, 3

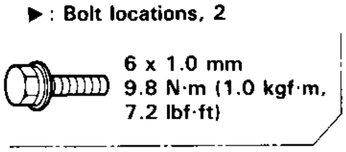
△ : Clip location, 1

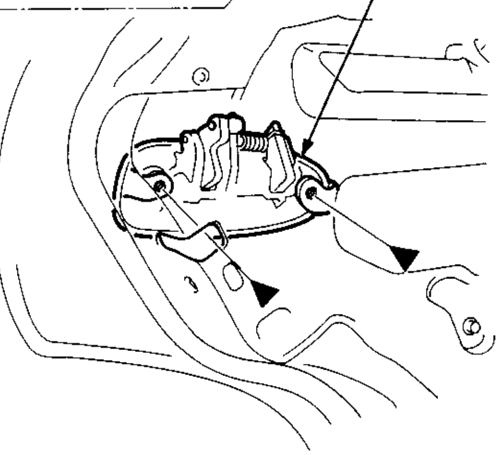




3. Remove the bolts.

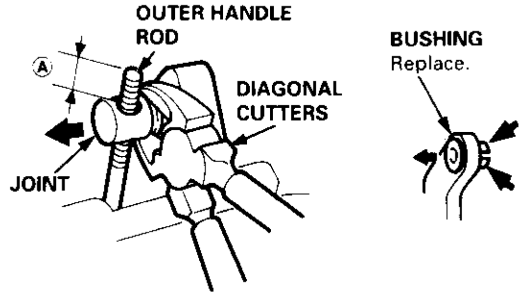
▶ : Bolt locations, 2

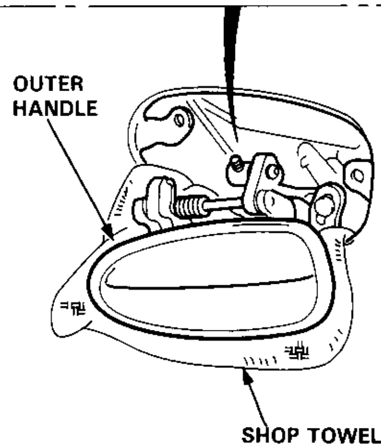




4. Pull out the outer handle with the latch. Pry the outer handle rod out of its joint using diagonal cutters.

   NOTE:
   - To ease reassembly, note location Ⓐ of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.
   - Use a shop towel to protect the opening in the door.





5. Installation is the reverse of the removal procedure.

   NOTE: Make sure the door locks and opens properly.

Latch Replacement

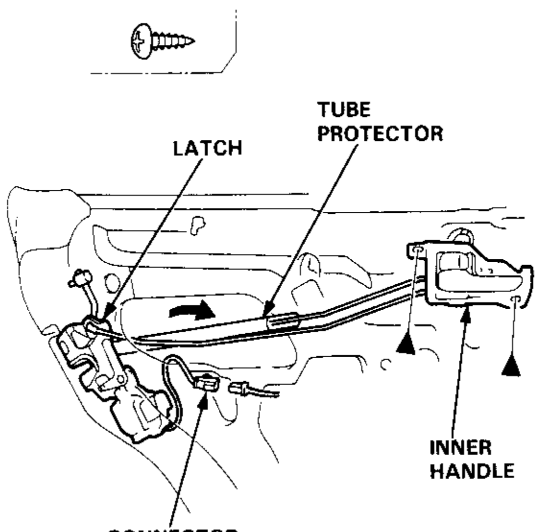
NOTE: Raise the glass fully.

1. Remove:
   - Door panel (see page 20-32)
   - Plastic cover (see page 20-32)
   - Outer handle (see page 20-34)

2. Remove the screws and disconnect the connector, then remove the inner handle and latch.

   NOTE: Take care not to bend the rods.

▶: Screw locations, 2



3. Installation is the reverse of the removal procedure.

   NOTE: Make sure the inner handle rod, lock rod and connector are connected properly.

Glass/Regulator/Center Glass Guide Replacement

1. Remove:
   - Door panel (see page 20-32)
   - Plastic cover (see page 20-32)

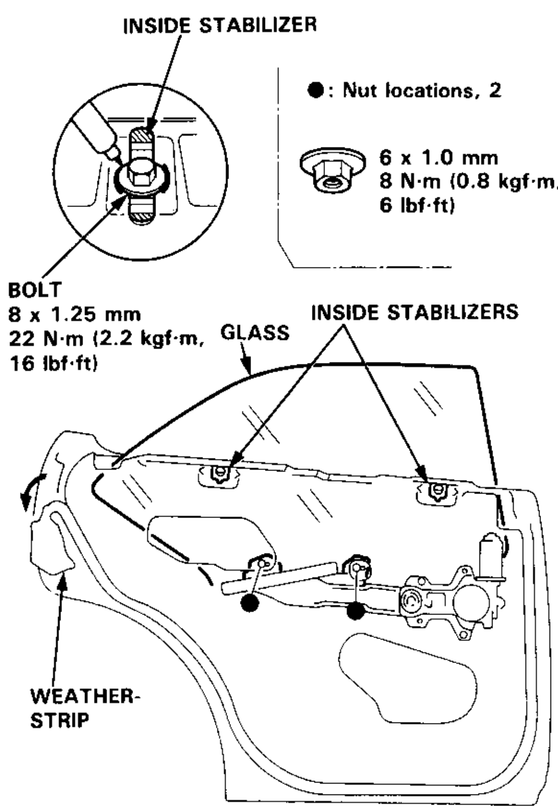
2. Connect the power window switch to the door harness (see page 20-41).

3. Peel the weatherstrip away from the door (see page 20-39).

4. Loosen the inside stabilizers.

   NOTE: Scribe a line around the bolts to show the original adjustment.

   Carefully move the glass until you can see the glass mounting nuts, then remove them.

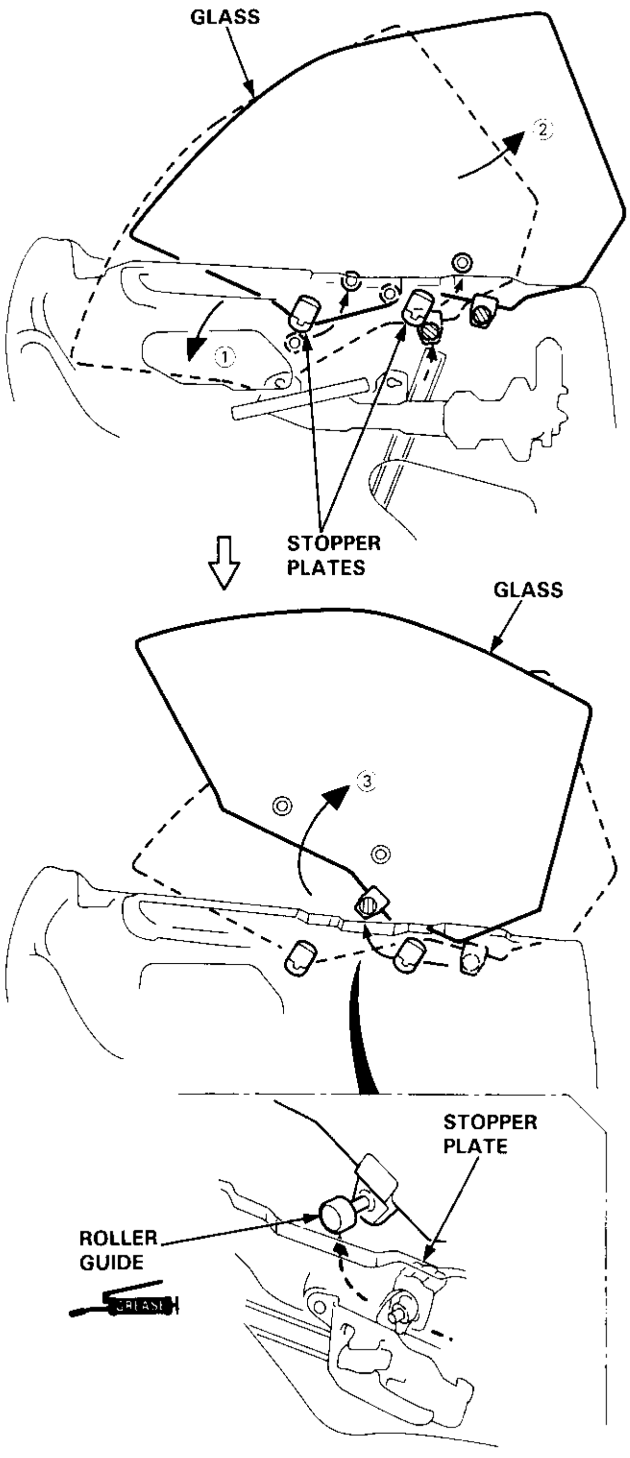


(cont'd)

Glass/Regulator/Center Glass Guide Replacement (cont'd)

5. Carefully remove the glass from the window slot as shown.

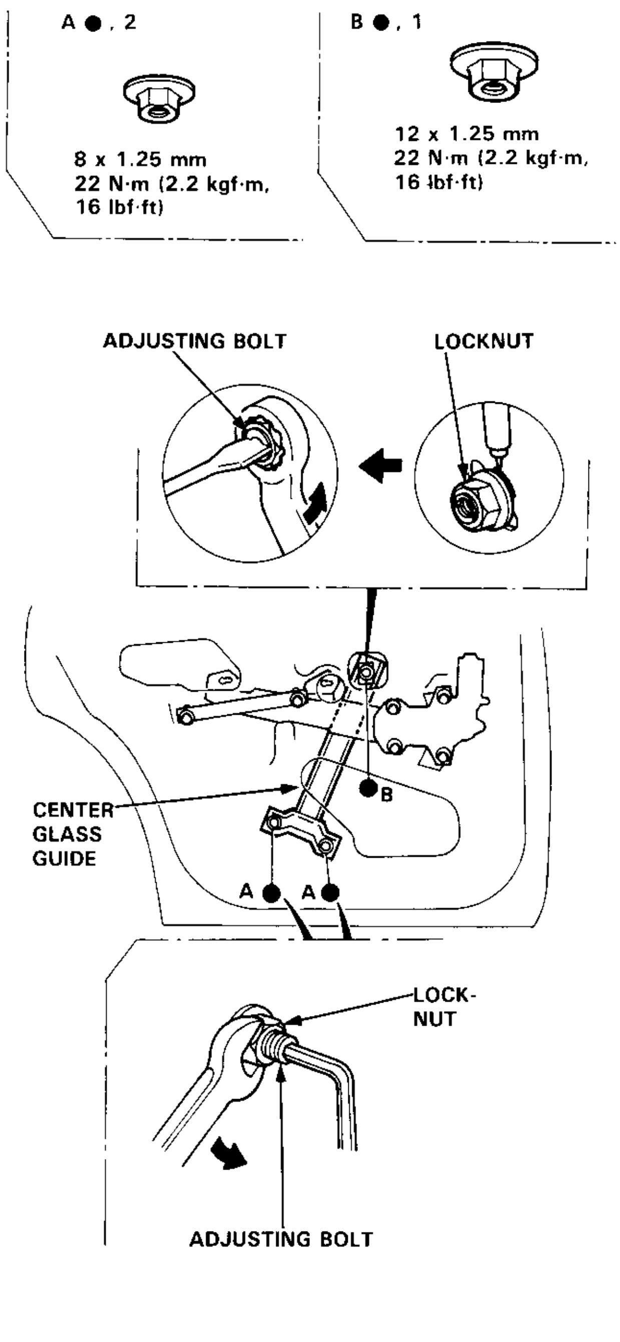
   NOTE: Take care not to drop the glass inside the door.



6. Remove the center glass guide.

   NOTE:
   - Hold the adjusting bolts with a hex wrench when removing the locknuts.
   - Scribe a line around the locknuts to show the original adjustment.

●: Nut locations

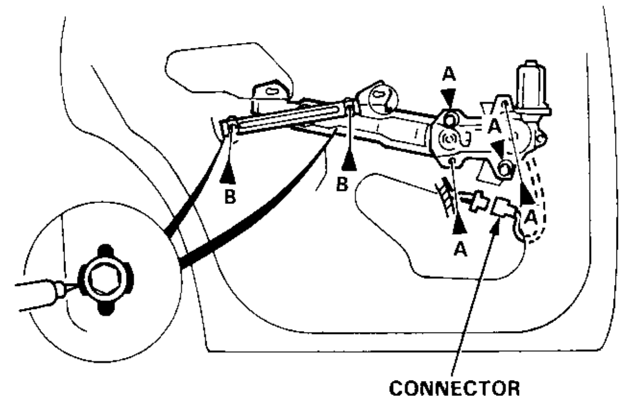


7. Disconnect the connector, and remove the regulator through the center hole in the door.

NOTE: Scribe a line around the roller guide bolts to show the original adjustment.

▶: Bolt locations

▶ A, 4	▶ B, 2
6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft)	6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft)

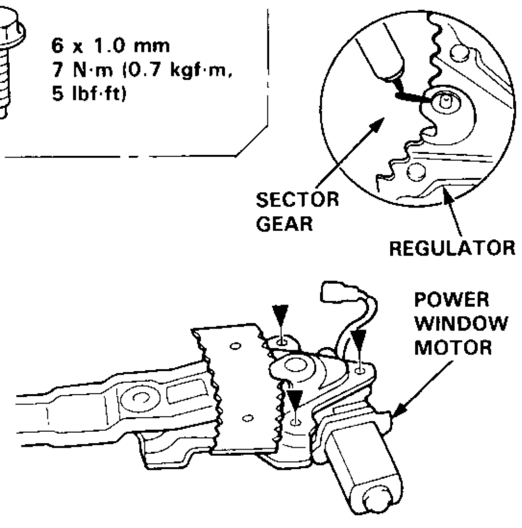


8. Remove the power window motor from the regulator.

NOTE: Before removing the power window motor, mark the location by scribing a line across the sector gear and regulator.

▼: Bolt locations, 3

6 x 1.0 mm
7 N·m (0.7 kgf·m, 5 lbf·ft)



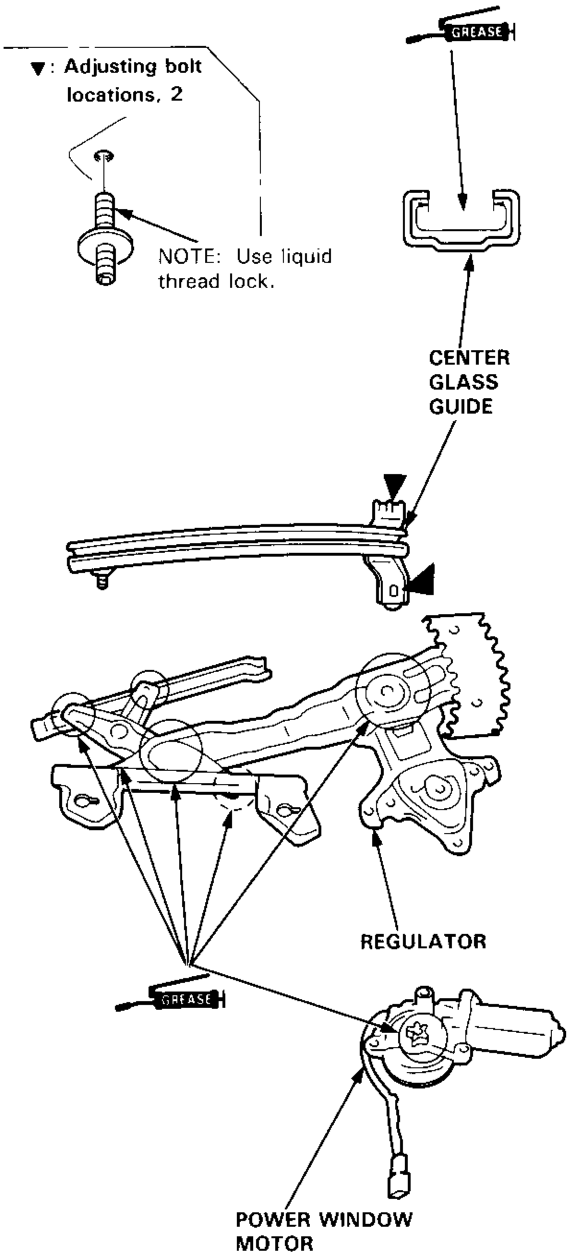
9. Grease all the sliding surfaces of the regulator and center glass guide where shown.

10. Install the power window motor on the regulator.

11. Check that the regulator moves smoothly by connecting a 12 V battery to the power window motor (see section 23).

▼: Adjusting bolt locations, 2

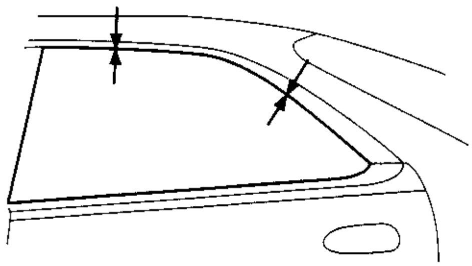
NOTE: Use liquid thread lock.



(cont'd)

Glass/Regulator/Center Glass Guide Replacement (cont'd)

12. Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and weatherstrip when the glass is closed. Adjust the position of the glass as necessary (see page 20-40).



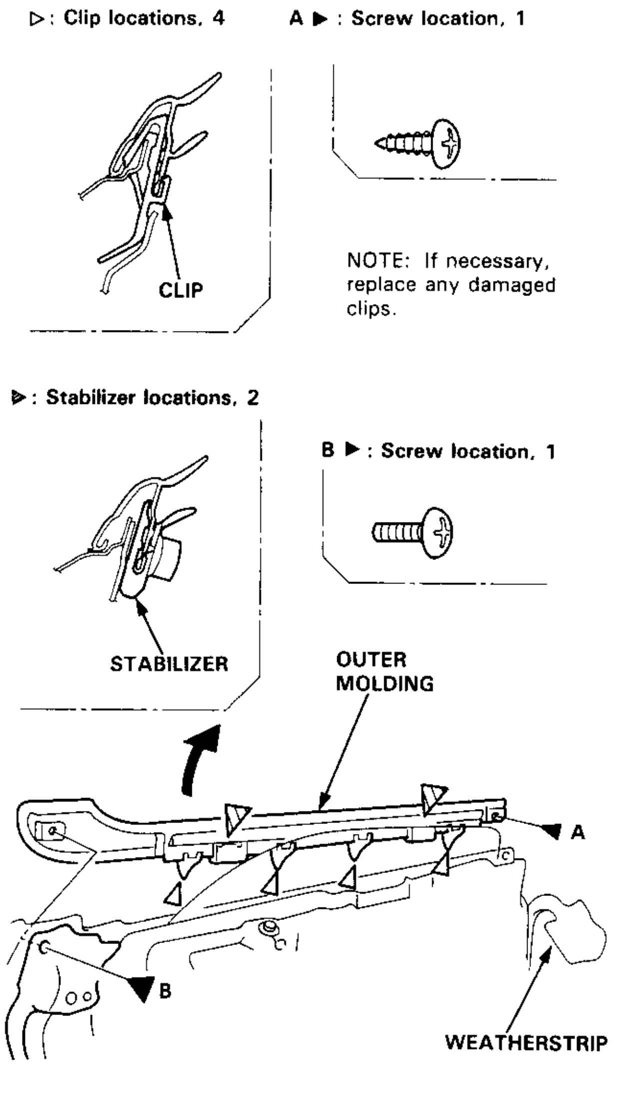
13. Attach the door harness to the door correctly (see page 20-33).
14. Disconnect the power window switch from the door harness.
15. When reinstalling the plastic cover, apply adhesive along the edge where neccessary to maintain a continuous seal and prevent water leaks (see page 20-33).
16. Install the door panel (see page 20-32).

Outer Molding Replacement

NOTE: Lower the glass fully.

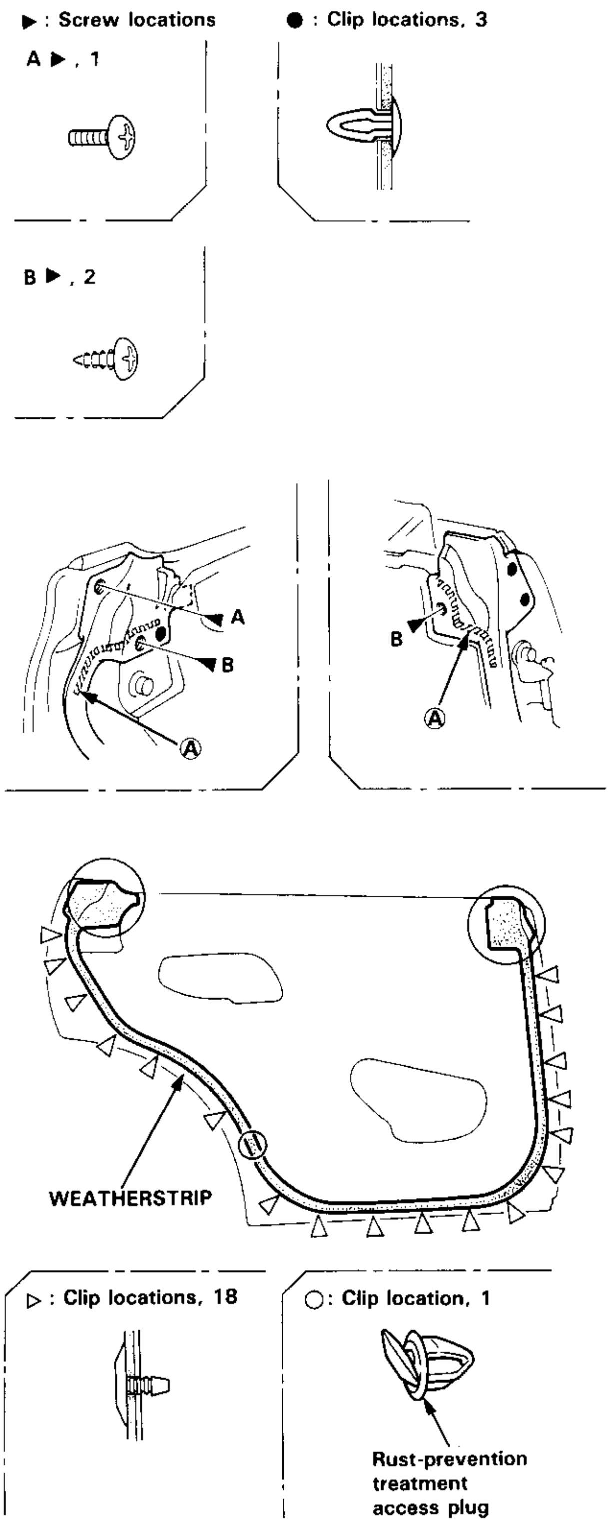
1. Remove the door panel (see page 20-32).
2. Peel the weatherstrip away from the door (see page 20-39), then remove the screw.
3. Starting at the rear, pry the outer molding up and detach the clips, then remove the outer molding.

   NOTE: Take care not to twist or scratch the outer molding.



4. Installation is the reverse of the removal procedure.

Weatherstrip Replacement



NOTE:
- Before installing the weatherstrip, apply clear sealant to locations Ⓐ.

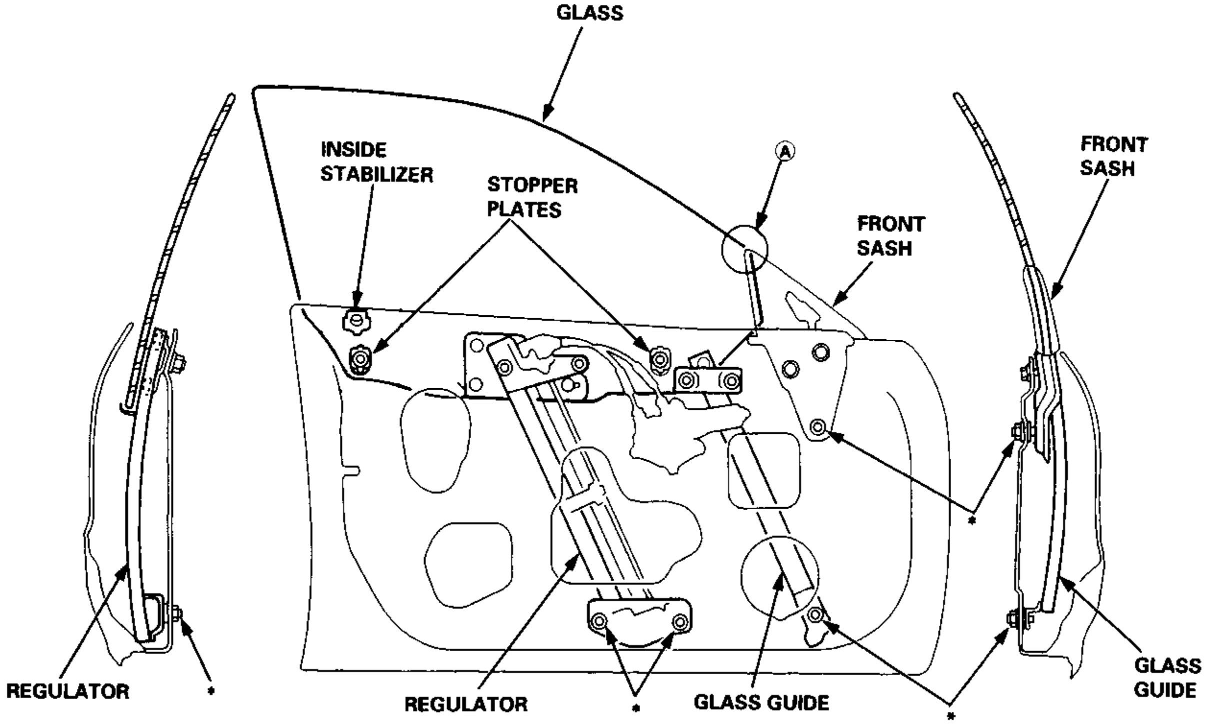
Sealant: Cemedine #8500, or equivalent
- If necessary, replace any damaged clips.

Doors

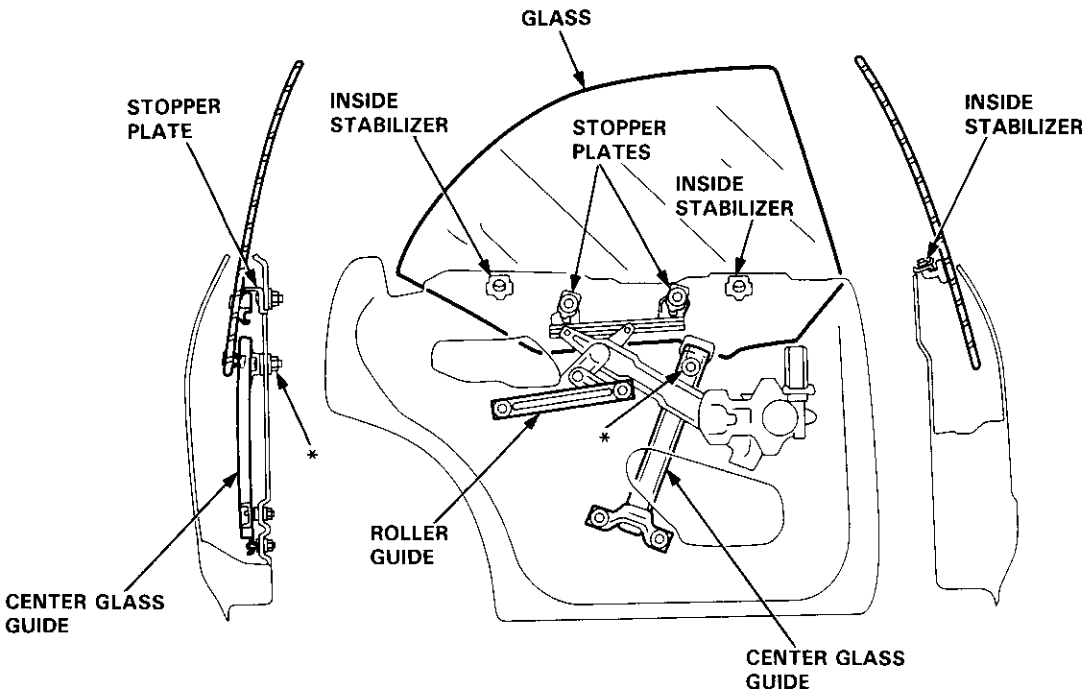
Glass Adjustment

*: Adjusting bolt/locknut locations
NOTE: Take care not to damage location Ⓐ on the front sash.

Front:



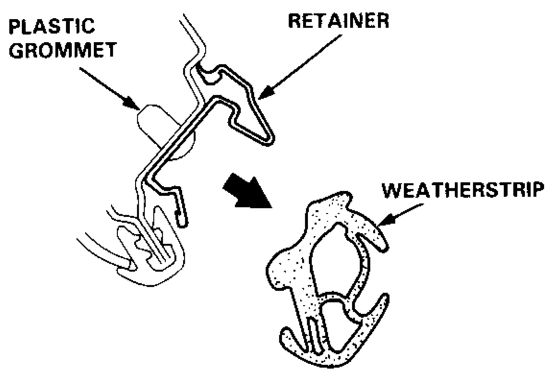
Rear:



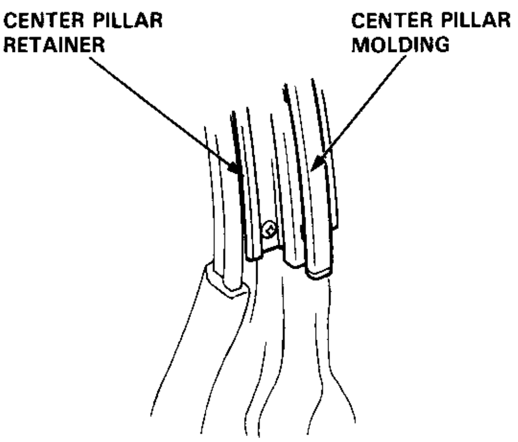
NOTE: Place the vehicle on a firm, level surface when adjusting the glass.

1. Remove the weatherstrip (see page 20-160).

   NOTE: Check the weatherstrip for damage and deterioration, and replace it if necessary.



2. Install the center pillar molding.

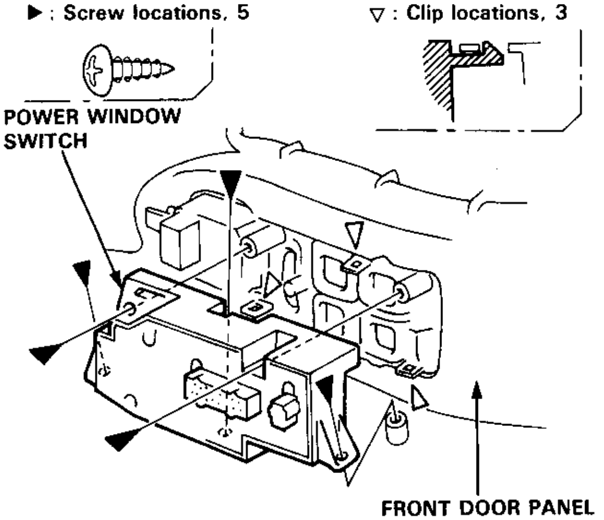


3. Remove the door panel (see pages 20-20, 32).

   NOTE: If necessary, peel off the plastic cover.

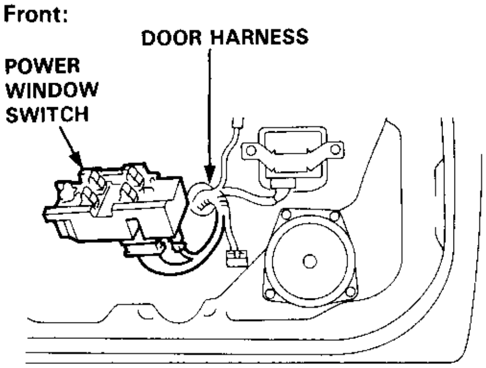
4. Remove the power mirror (see page 20-49).

5. Remove the power window switch from the front door panel.

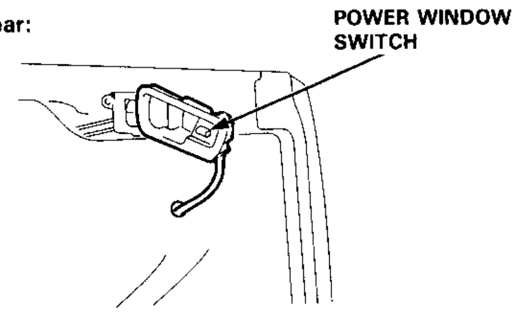


6. Connect the power window switch to the door harness connectors.

   Front:



   Rear:



7. To prevent the glass from contacting the body, hold the glass, and close the door carefully.

8. Raise the glass fully.

   NOTE: Check the door fit to the body opening.

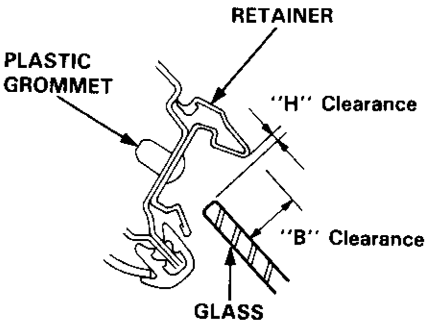
(cont'd)

Glass Adjustment (cont'd)

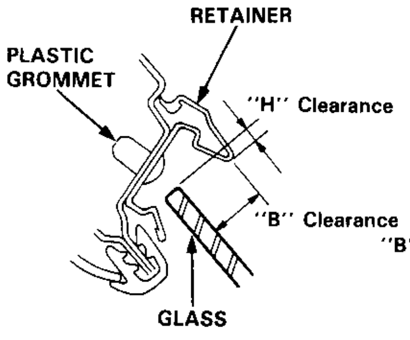
9. Measure and record clearances "H" and "B" at the locations shown.

10. Adjust the clearance as described in steps (11) thru (14).

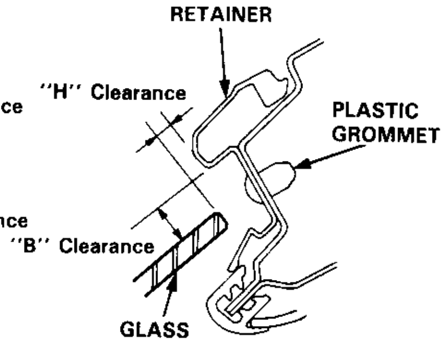
Measuring Points



Section ①



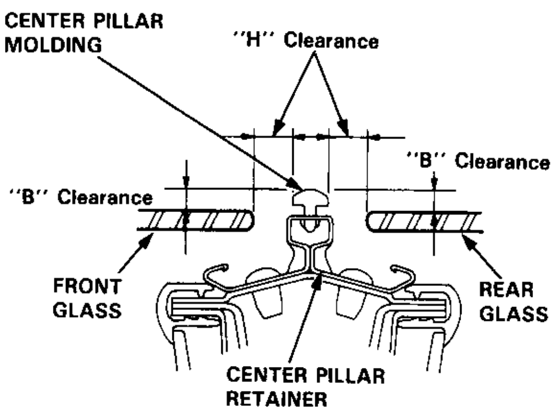
Section ②, ③



Section ④

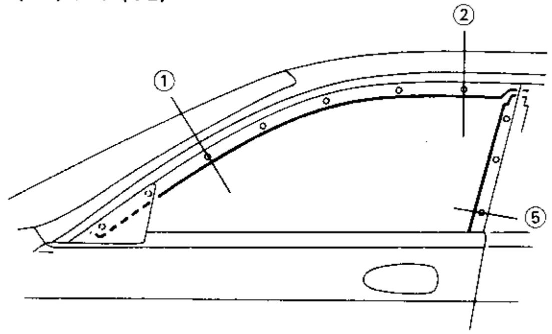
(Standard Clearance)

- Permissible tolerance: ±0.1 mm (0.04 in)



Section ⑤

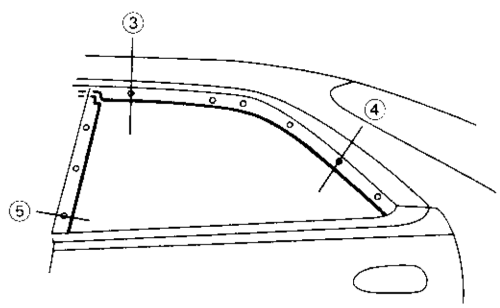
Front: (11) and (12)



Unit: mm (in)

Measuring Point		①	②	⑤
Clearance	H	0.8 (0.03)	3.0 (0.12)	10.3 (0.41)
	B	9.3 (0.37)	9.9 (0.389)	5.6 (0.22)

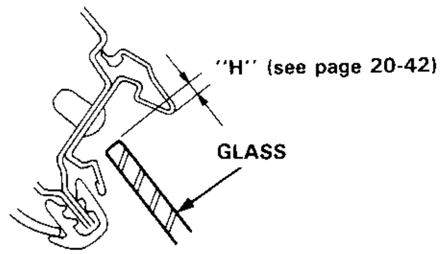
Rear: (13) and (14)



Measuring Point		⑤	③	④
Clearance	H	10 (0.39)	2.5 (0.1)	6.0 (0.24)
	B	5.1 (0.2)	11.5 (0.45)	12.1 (0.48)

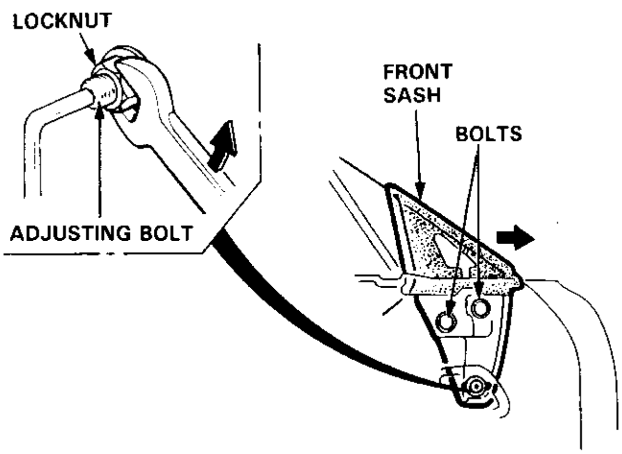
Front Door:

11. Adjust clearance "H" as follows.



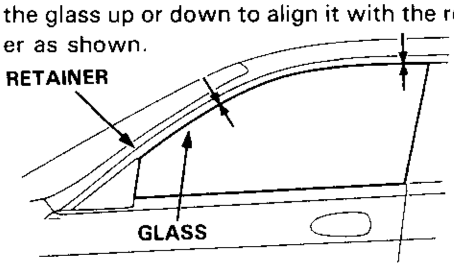
–1 Loosen the bolts and locknut securing the front sash, and move the front sash all the way forward.

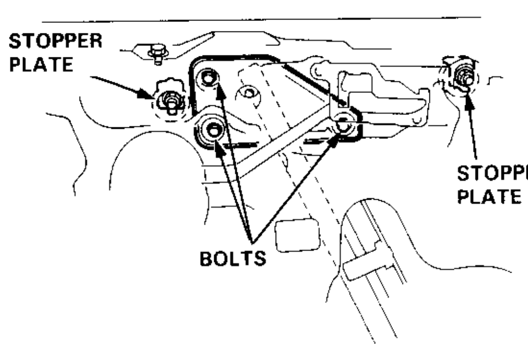
NOTE: Hold the adjusting bolt with a hex wrench when loosening the locknut.



–2 Loosen the nut securing the stopper plates.

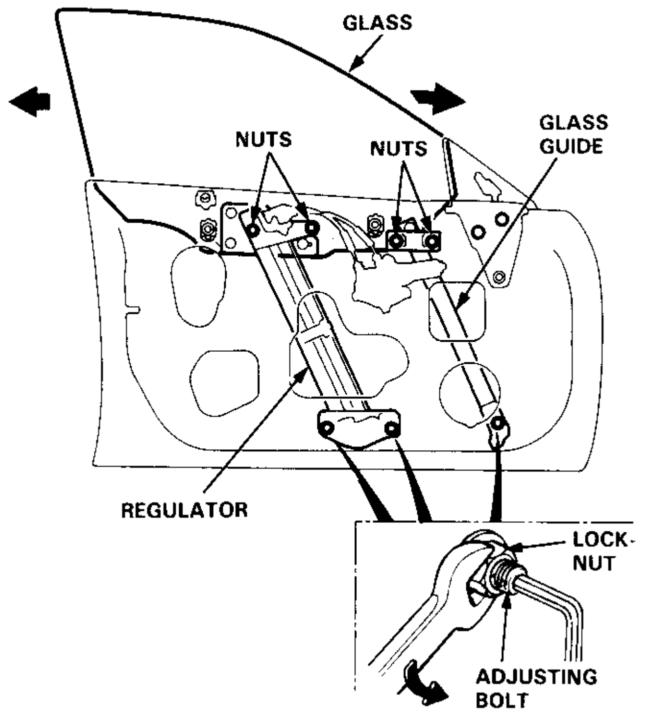
–3 Loosen the bolts securing the glass, and move the glass up or down to align it with the retainer as shown.





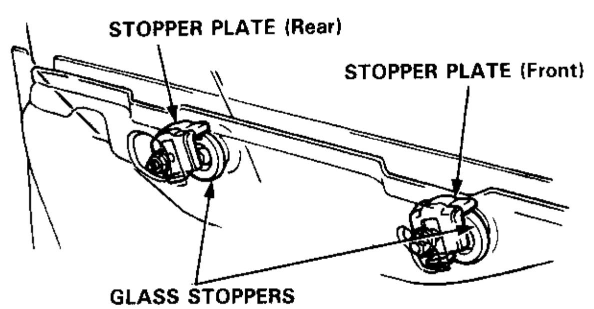
–4 Loosen the nuts and locknuts securing the glass guide, and regulator. Adjust the glass fore and aft by moving the glass guide and regulator.

NOTE: Hold the adjusting bolts with a hex wrench when loosening the locknuts.



–5 Repeat steps –3 thru –4 until clearance "H" is within the specified limits, then fasten the glass guide and regulator.
Press the stopper plates against the glass stoppers, then fasten the stopper plates.

NOTE: Check that the stopper plates contact the glass stoppers evenly.

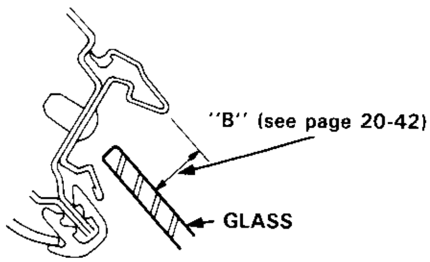


–6 Align the front sash with the glass, then fasten the front sash.

(cont'd)

Glass Adjustment (cont'd)

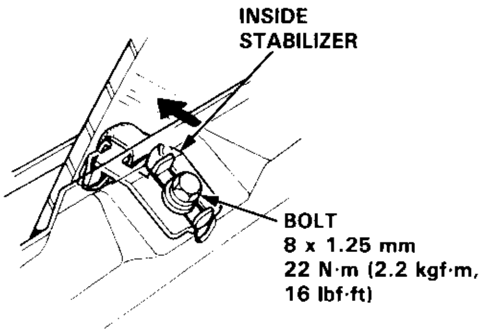
12. Adjust clearance "B" as follows.



-1 Lower the glass 10 mm (0.39 in).

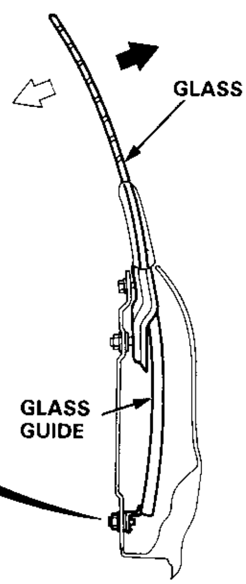
-2 Push the glass outward 10 mm (0.39 in), then push the inside stabilizers against the glass lightly. Fasten the inside stabilizers.

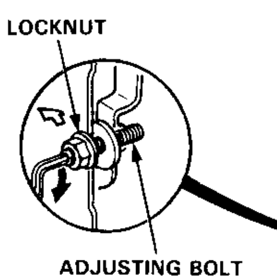
NOTE: Check that the glass moves smoothly.



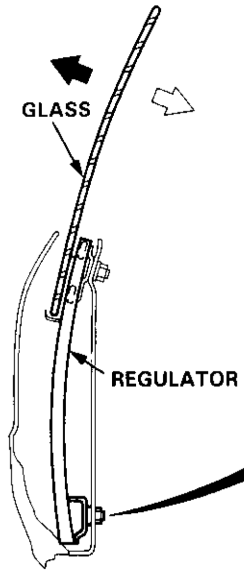
-3 Loosen the locknut, and turn the adjusting bolt until the clearance "B" is within the specified value.

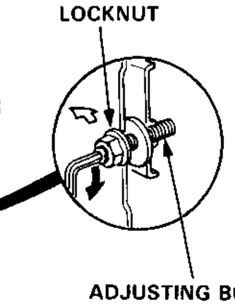
Adjusting Bolt	Top Edge of Glass
Clockwise	➡ Moved out
Counter-clockwise	⇦ Moved in



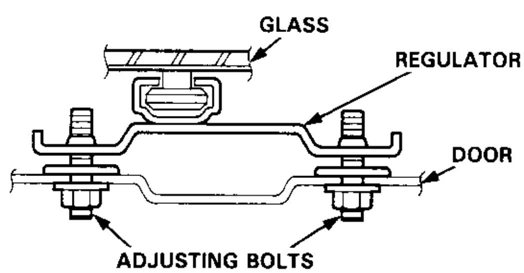


Adjusting Bolt	Top Edge of Glass
Clockwise	⬅ Moved out
Counter-clockwise	⇨ Moved in





NOTE: Turn the front and rear adjusting bolts the same amount to keep the regulator parallel with the seating surface of the door.
After tightening the adjusting bolts, make sure that the ends of the adjusting bolts still project out of the locknuts.



-4 Align the front sash with the glass using the adjusting bolt at the bottom of the front sash.

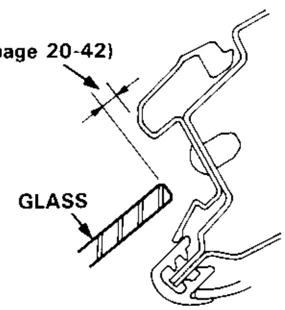
-5 Move the glass up and down to seat it, then measure clearance "B" at the designated locations.

-6 Measure clearance "H" again to make sure it is still within the specified limits at the designated locations.

NOTE: Repeat the above steps until the correct clearances are obtained.

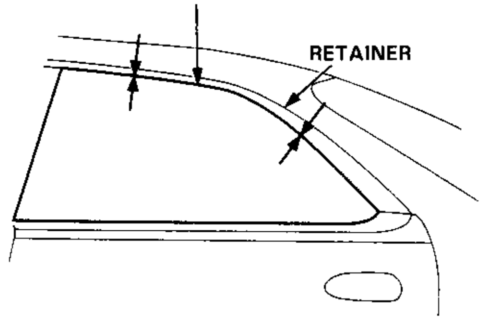
Rear Door:

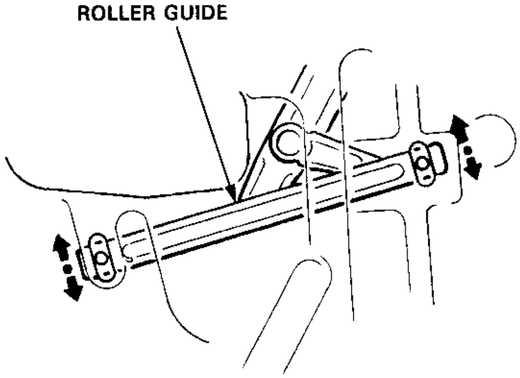
13. Adjust clearance "H" as follows.



–1 Loosen the nut securing the stopper plates.

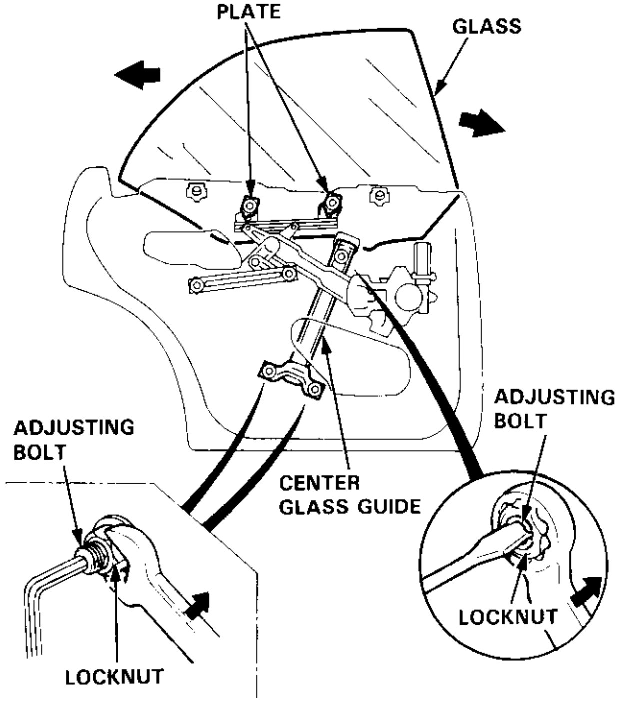
–2 Loosen the nut securing the roller guide, and move the guide up or down to align the glass with the body at the rear and center pillars.





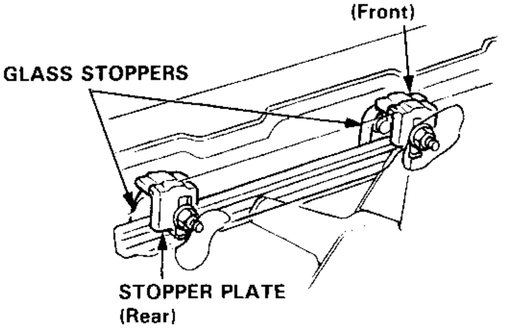
–3 Loosen the locknuts securing the center glass guide, and adjust the glass fore and aft by moving the center glass guide.

NOTE: Hold the adjusting bolts with a hex wrench or flat tip screwdriver when loosening the locknuts.



–4 Repeat steps –2 and –3 until clearance "H" is within the specified limits, then fasten the center glass guide and roller guide.
Press the stopper plates against the glass stoppers, then fasten the stopper plates.

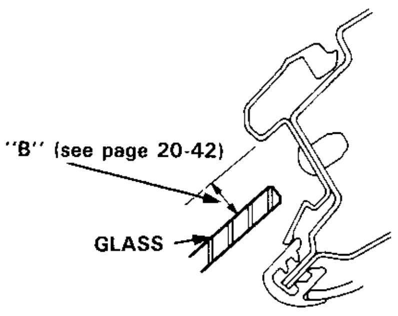
NOTE: Check that the stopper plates contact the glass stoppers evenly.



(cont'd)

Glass Adjustment (cont'd)

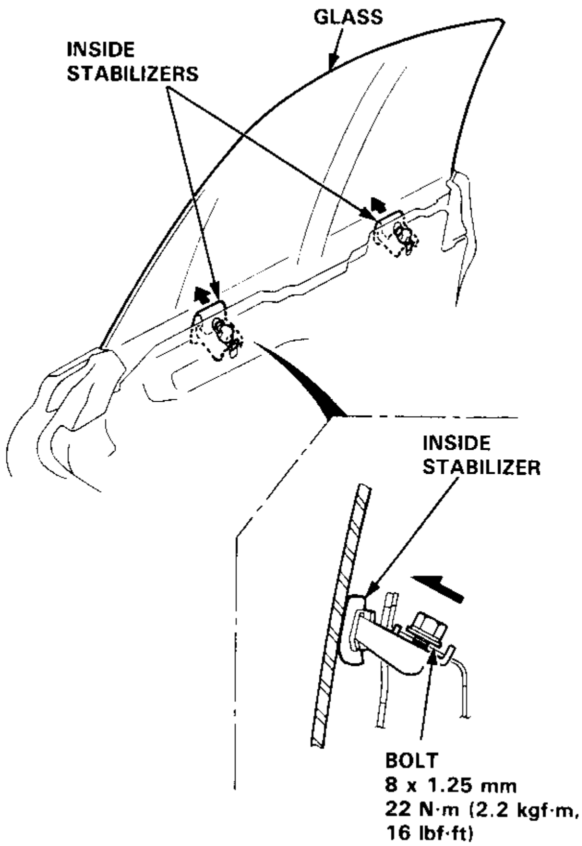
14. Adjust clearance "B" as follows.



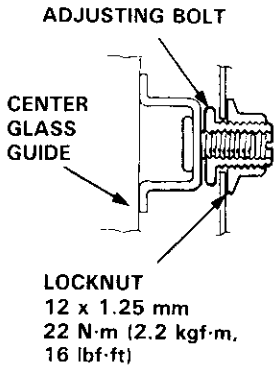
–1 Lower the glass 10 mm (0.39 in).

–2 Push the glass outward 10 mm (0.39 in), then push the inside stabilizers against the glass lightly. Fasten the inside stabilizers.

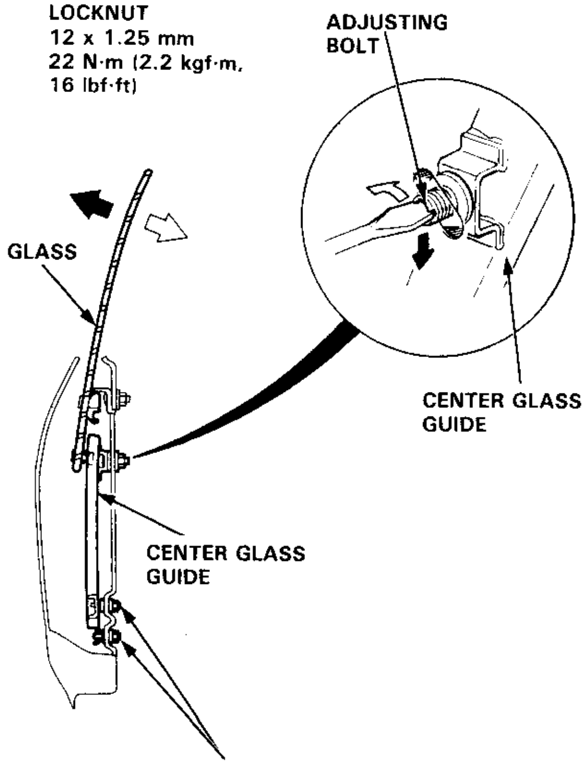
NOTE: Check that the glass moves smoothly.



–3 Loosen the upper locknut on the center glass guide, and turn the adjusting bolt until clearance "B" is within the specified value.



Adjusting Bolt	Top Edge of Glass
Clockwise	← Moved out
Counter-clockwise	⇨ Moved in



NOTE: Do not adjust the lower adjusting bolts on the center glass guide.

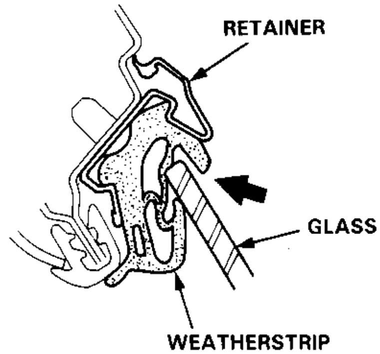
–4 Move the glass up and down to seat it, then measure clearance "B" at the designated locations.

–5 Measure clearance "H" again to make sure it is still within the specified limits at the designated locations.

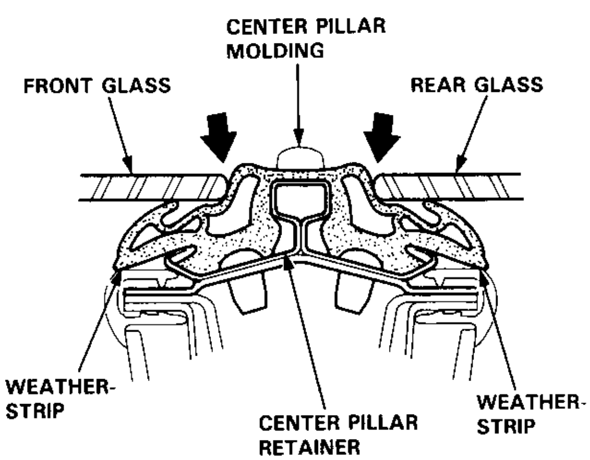
NOTE: Repeat the above steps until the correct clearances are obtained.

15. After the clearances have been adjusted properly, reinstall the weatherstrip.
16. Check that the glass contacts the weatherstrip evenly.

NOTE: Measuring points are described on page 20-42.

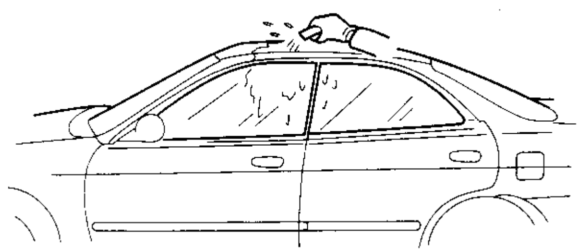


Center Pillar section:



17. Check for water leaks.

NOTE: Do not use high-pressure water.



18. Route the door harness and connectors, and fasten them to the door (see pages 20-22, 33).
19. Disconnect the power window switch from the door harness, then install the power window switch on the door panel (see page 20-41).
20. Attach the plastic cover, then install the door panel (see pages 20-20, 32).

Doors

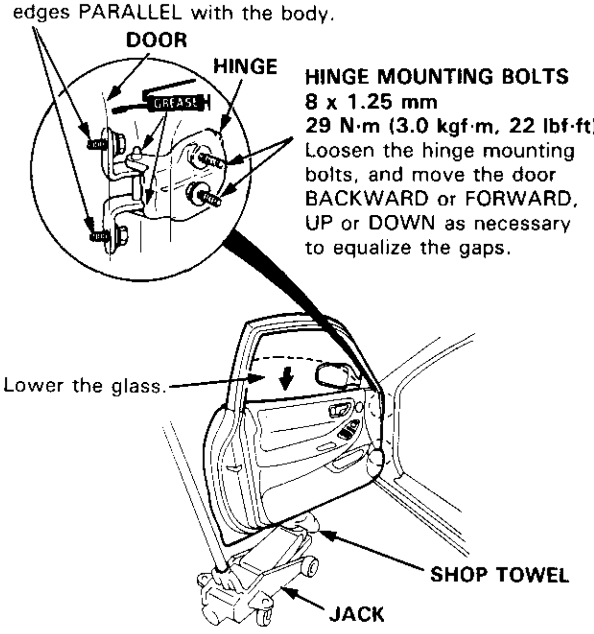
Position Adjustment

NOTE: Place the vehicle on a firm, level surface when adjusting the doors.

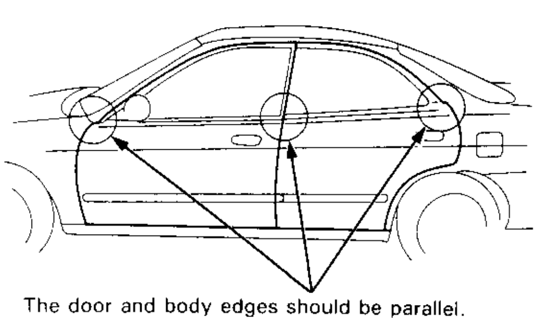
After installing the door, check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body.
The door and body edges should also be parallel. Adjust at the hinges as shown.

CAUTION: Place a shop towel on the jack to prevent damage to the door when loosening the door and hinge mounting bolts for adjustment.

DOOR MOUTING BOLTS
8 x 1.25 mm
29 N·m (3.0 kgf·m, 22 lbf·ft)
Loosen the door mounting bolts slightly to move the door IN or OUT until it's flush with the body. If necessary, you can install a shim behind one hinge to make the door edges PARALLEL with the body.



HINGE MOUNTING BOLTS
8 x 1.25 mm
29 N·m (3.0 kgf·m, 22 lbf·ft)
Loosen the hinge mounting bolts, and move the door BACKWARD or FORWARD, UP or DOWN as necessary to equalize the gaps.



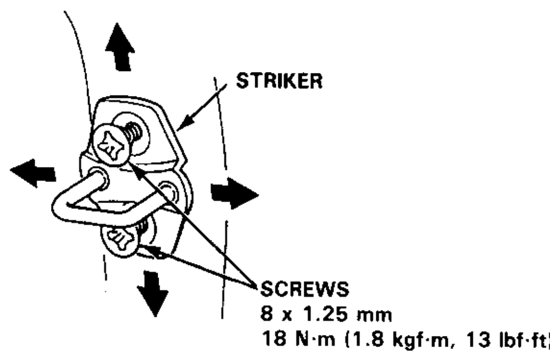
The door and body edges should be parallel.

NOTE: Check for water leaks.

Striker Adjustment

Make sure the door latches securely without slamming. If it needs adjustment:

1. Draw a line around the striker for reference.
2. Loosen the screws, and move the striker IN or OUT to make the latch fit tighter or looser. Move the striker UP or DOWN to align it with the latch opening. Then lightly tighten the screws and recheck.



NOTE: Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit.

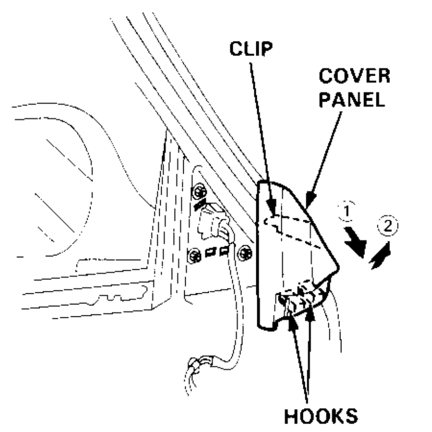
3. If the door latches properly, tighten the screws and recheck.

Power Mirror Replacement

Hatchback

1. Pry out the cover panel with a flat tip screwdriver, then remove it.

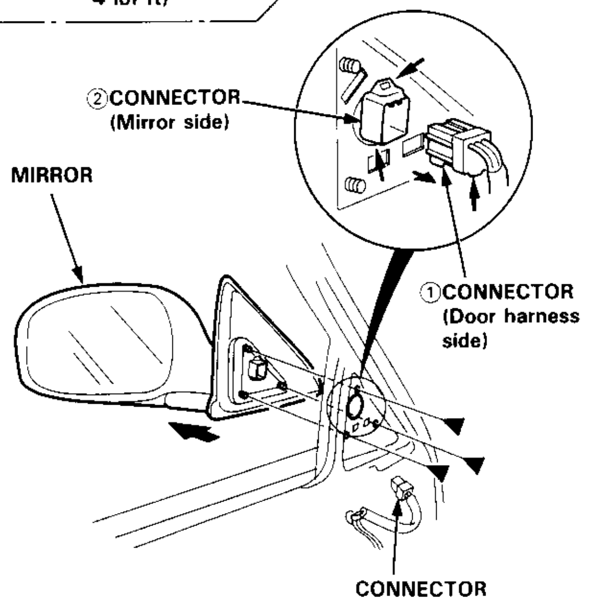
   CAUTION: **When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.**



2. Disconnect the connector. Remove the nuts, then remove the mirror while holding it.

◄ : Nut locations, 3

5 x 0.8 mm
5 N·m (0.5 kgf·m, 4 lbf·ft)



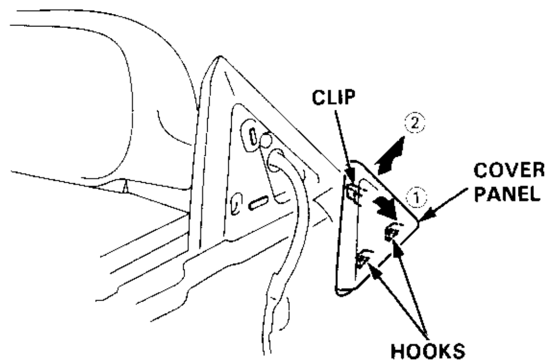
3. Installation is the reverse of the removal procedure.

Sedan

1. Remove the door panel (see page 20-20), and disconnect the connector.

2. Pry out the cover panel with a flat tip screwdriver, then remove it.

   CAUTION: **When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.**



3. Remove the screws while holding the mirror.

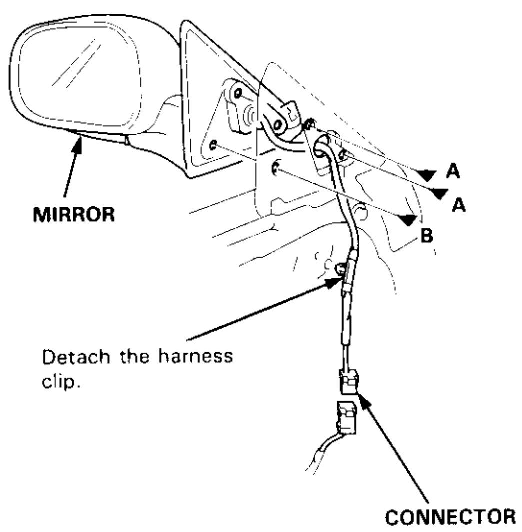
◄ : Screw locations

A◄ : Screw, 2

5 x 0.8 mm
5 N·m (0.5 kgf·m, 4 lbf·ft)

B◄ : Screw, 1

5 x 0.8 mm
5 N·m (0.5 kgf·m, 4 lbf·ft)



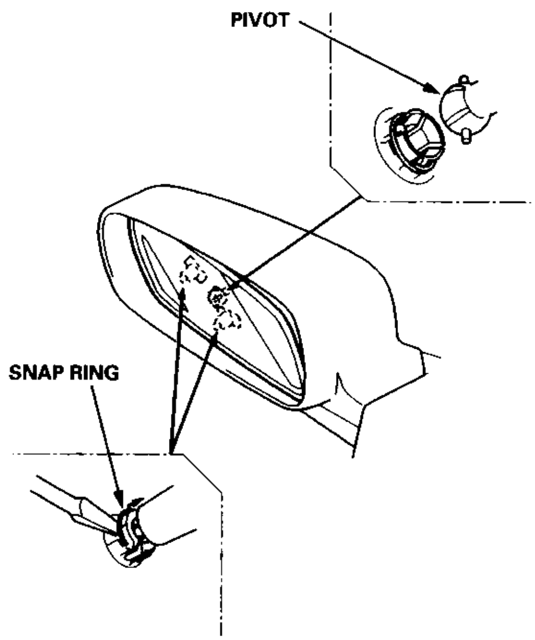
4. Installation is the reverse of the removal procedure.

Mirrors

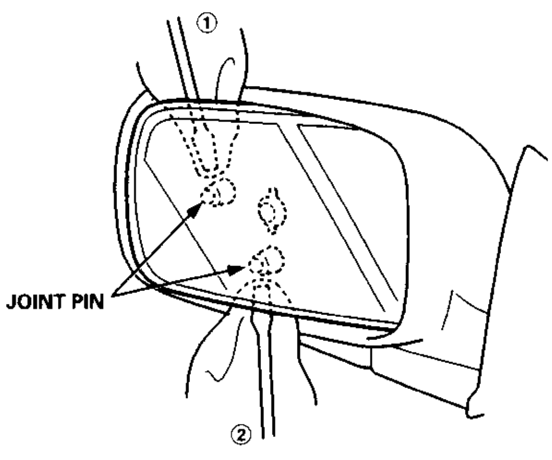
Mirror Holder Removal

CAUTION: To prevent damage to the mirror, wrap the end of a flat tip screwdriver with a shop towel.

1. Remove the pivot, then remove the snap ring as shown.

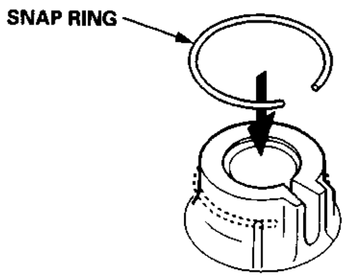


2. Remove the joint pin, then remove the mirror holder as shown.



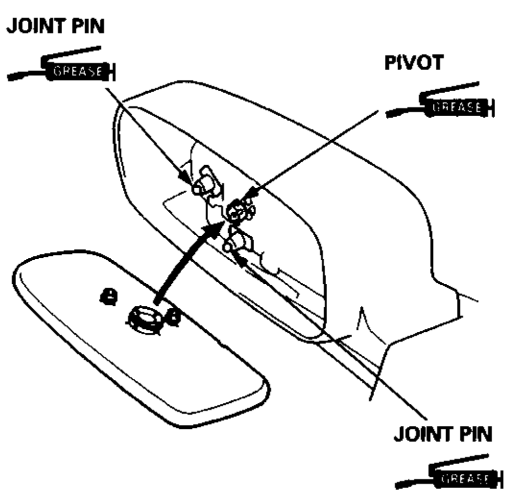
Mirror Holder Installation

1. Install the snap ring.

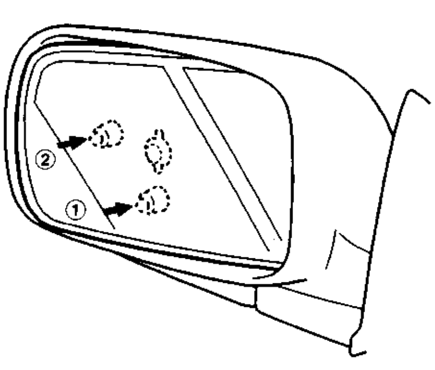


2. Install the pivot.

   NOTE: Apply grease to the locations indicated by the arrows.



3. Install the joint pin.

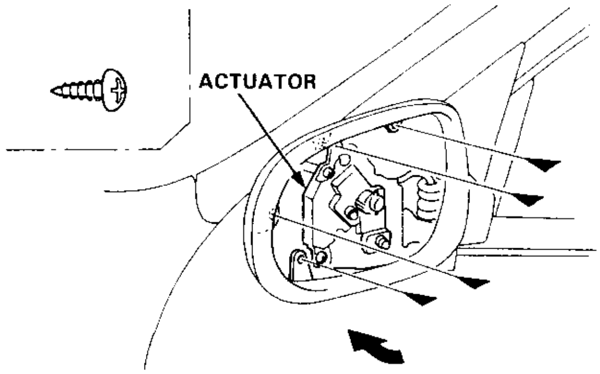


Mirror Visor and Mirror Cover Replacement

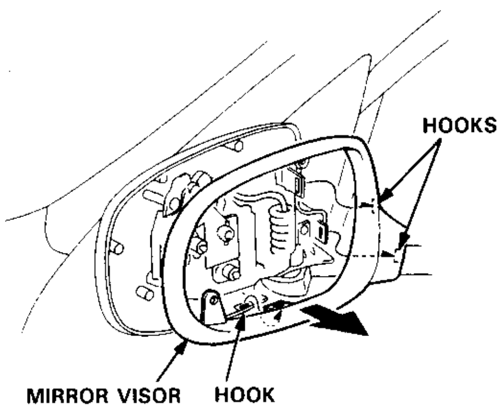
Hatchback

1. Remove the mirror holder.
2. Turn the actuator forward, then remove the screws.

◄ : Screw locations, 4

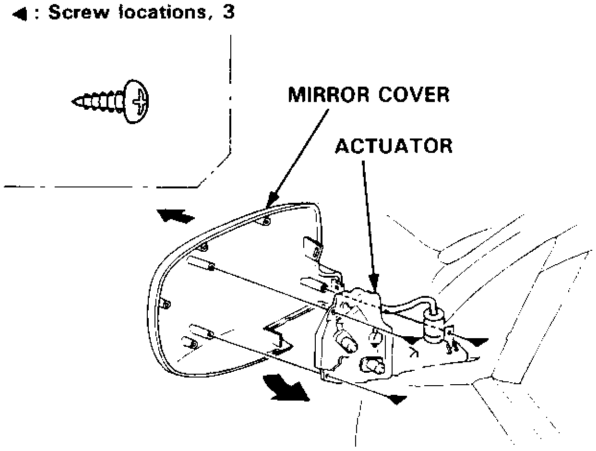


3. Detach the hooks, then remove the mirror visor.



4. Turn the actuator to the original position.
Remove the screws, then remove the mirror cover.

◄ : Screw locations, 3



5. Installation is the reverse of the removal procedure.

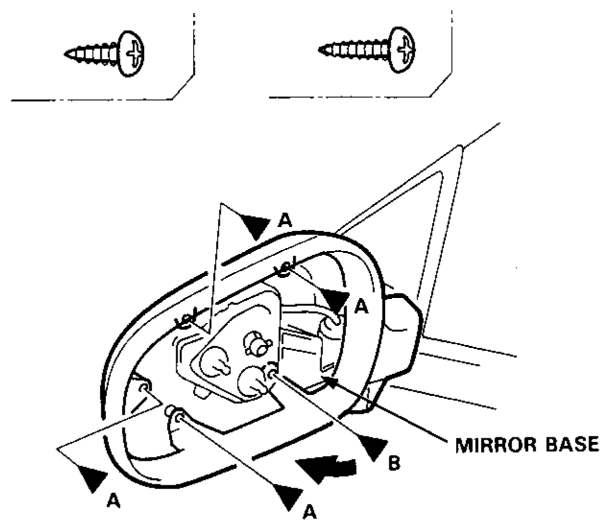
Sedan

1. Remove the mirror holder.
2. Turn the mirror base forward, then remove the screws.

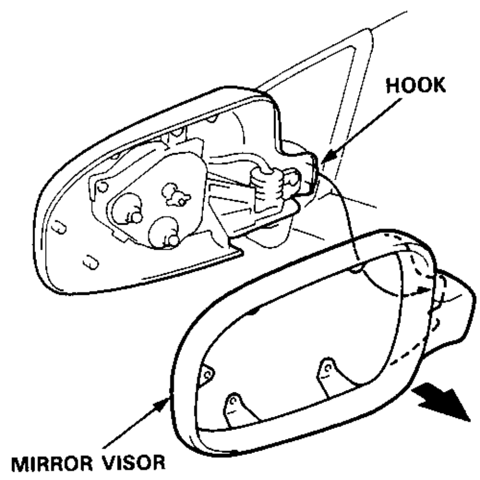
◄ : Screw locations

A◄ : Screw, 4

B◄ : Screw, 1



3. Detach the hook, then remove the mirror visor.



(cont'd)

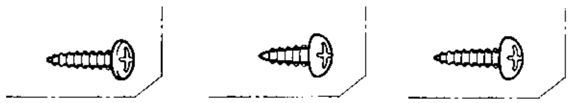
Mirrors

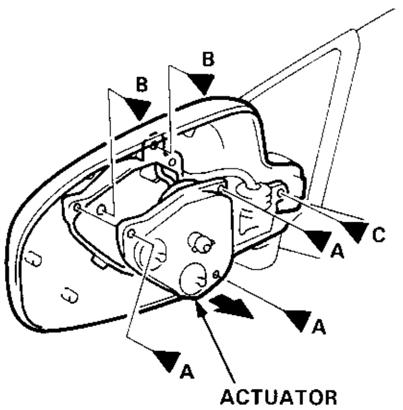
Mirror Visor and Mirror Cover Replacement (cont'd)

4. Remove the actuator, then remove the screws.

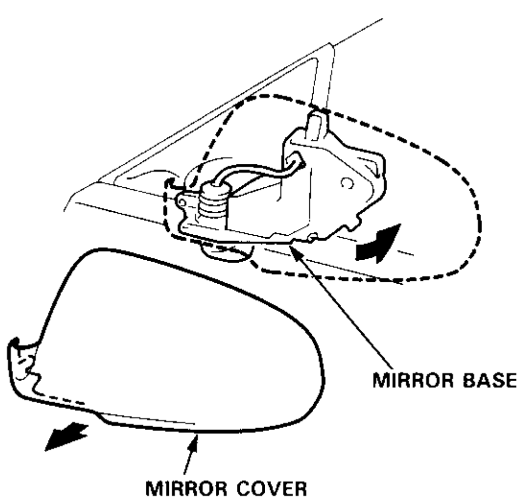
◀: Screw locations

A◀: Screw, 3 B◀: Screw, 2 C◀: Screw, 1





5. Turn the mirror base as shown, then remove the mirror cover



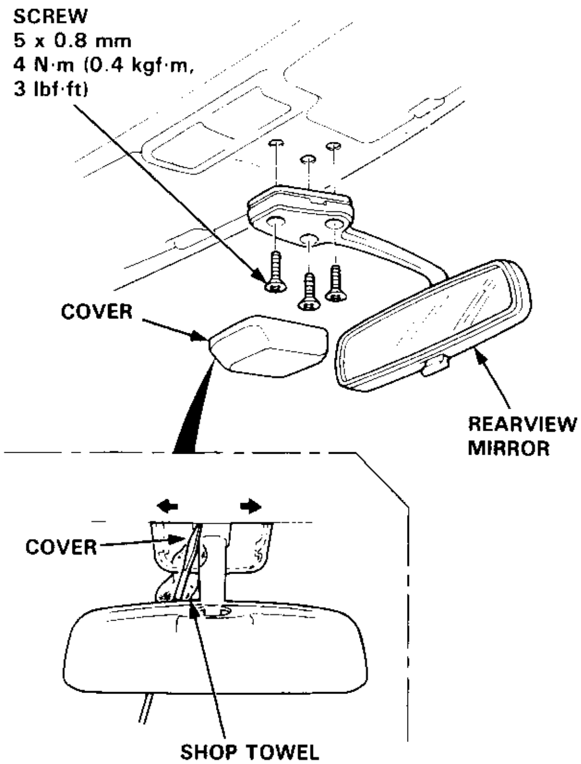
6. Installation is the reverse of the removal procedure.

Rearview Mirror Replacement

1. Pry the cover off using the end of a flat tip screwdriver.

   CAUTION: To prevent damage to the mirror and cover, wrap the end of the screwdriver with a shop towel.

2. Remove the screws, then remove the rearview mirror.



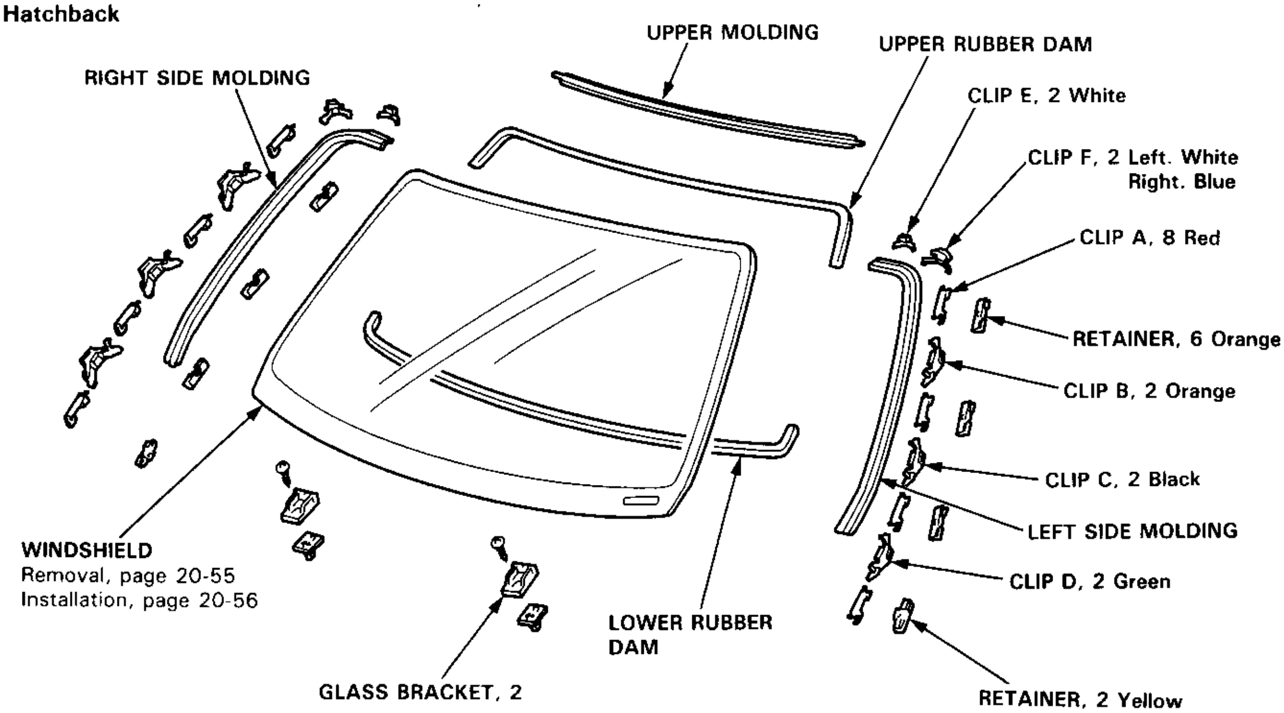
3. Installation is the reverse of the removal procedure.

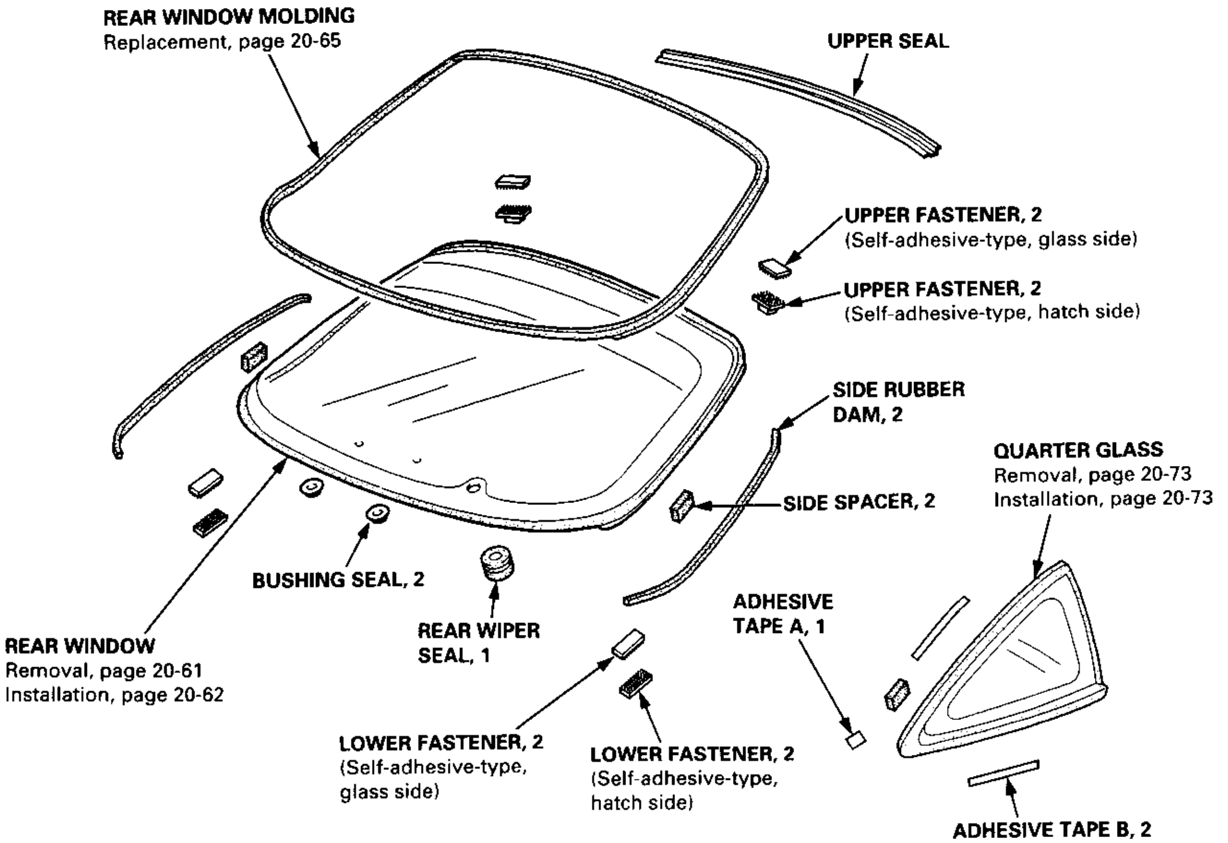
Windshield, Rear Window, Quarter Glass

Index

NOTE: The numbers after the part names show the quantities of the parts used.

Hatchback



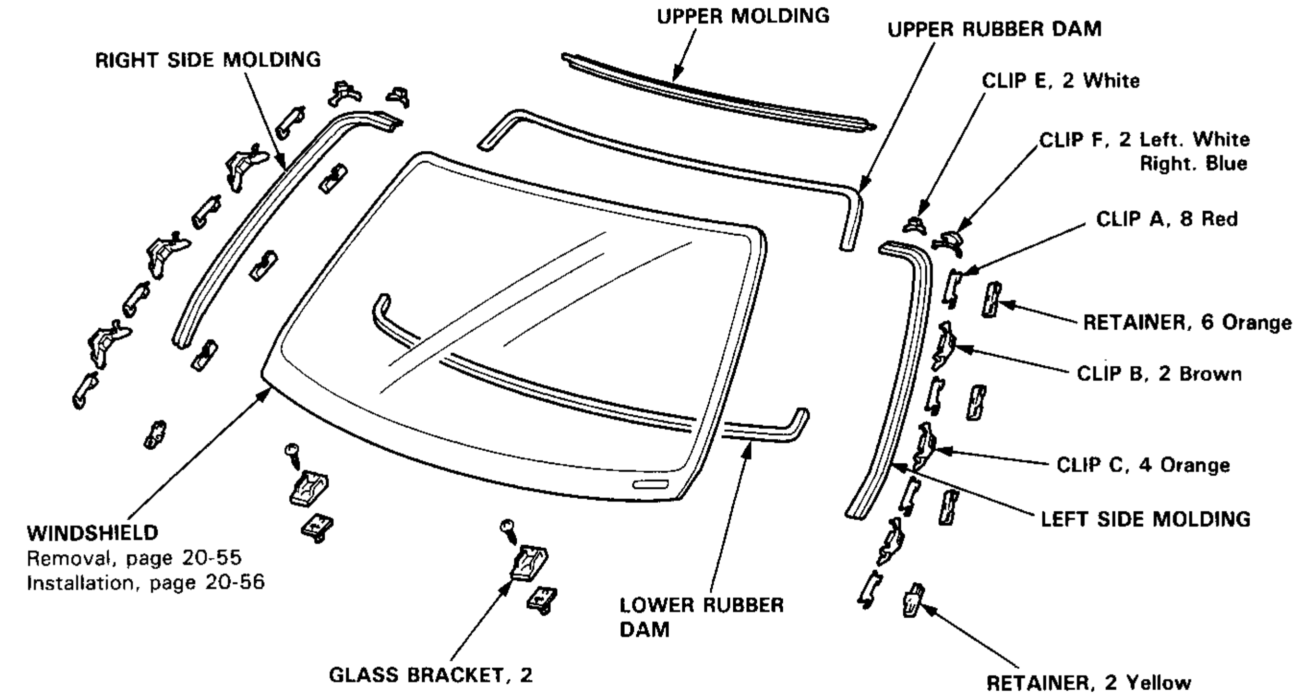


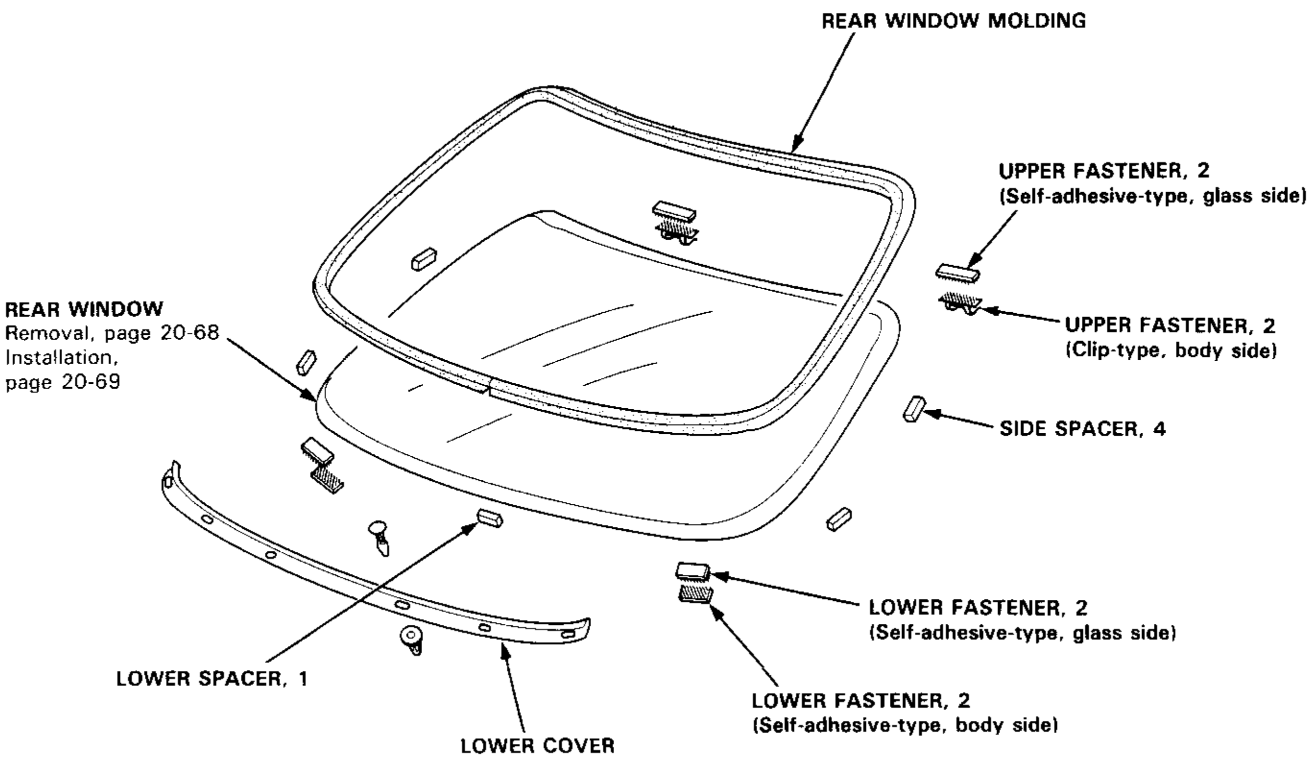
Windshield, Rear Window

Index

NOTE: The numbers after the part names show the quantities of the parts used.

Sedan



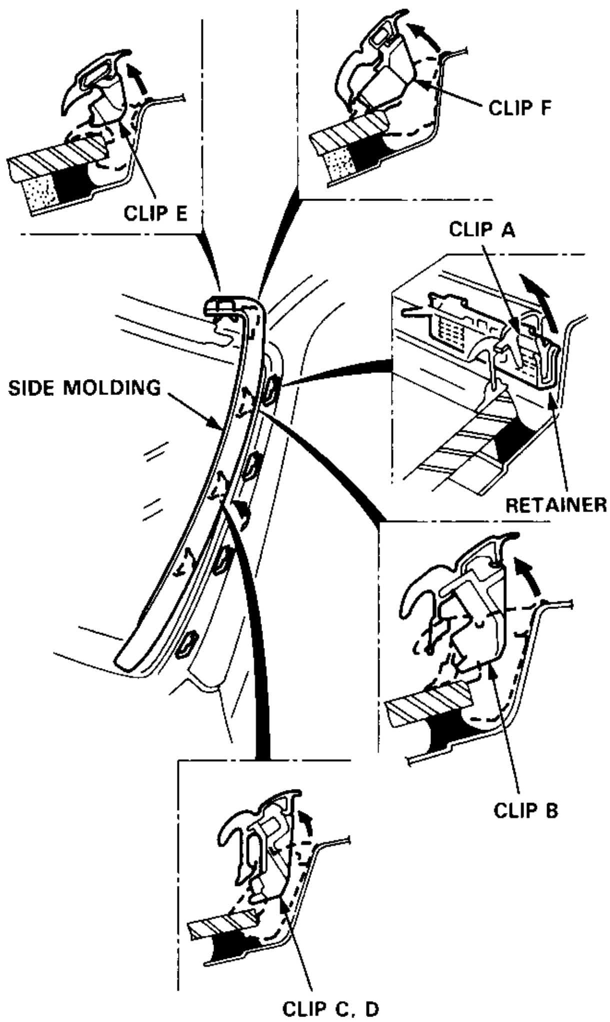


Removal

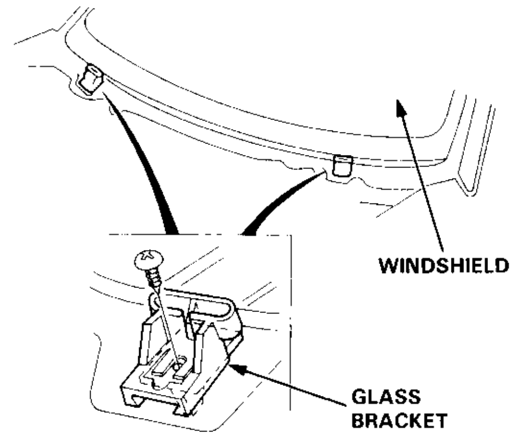
CAUTION:
- **Wear gloves to remove and install the windshield.**
- **Use seat covers to avoid damaging any surfaces.**

1. To remove the windshield, first remove the:
   - Front pillar trim (see page 20-91)
   - Headliner (see pages 20-98, 100)
   - Windshield wiper arms and air scoop (see section 23)
2. Detach the clips from the retainers, then remove both side moldings as shown.

   NOTE: If necessary, replace any damaged clips.

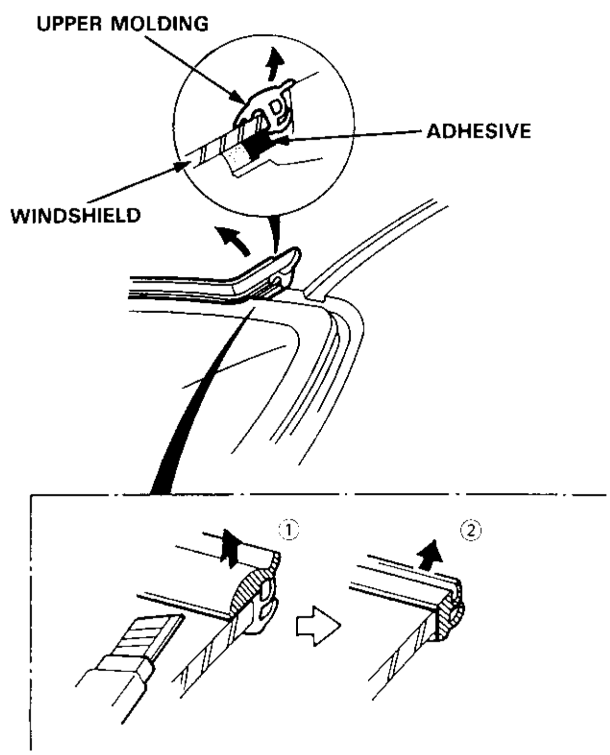


3. Remove the right and left glass brackets.



4. Peel off the upper molding.

   NOTE: When the upper molding removal is difficult, cut the upper rubber portion ① off, then cut the side rubber portion ②.

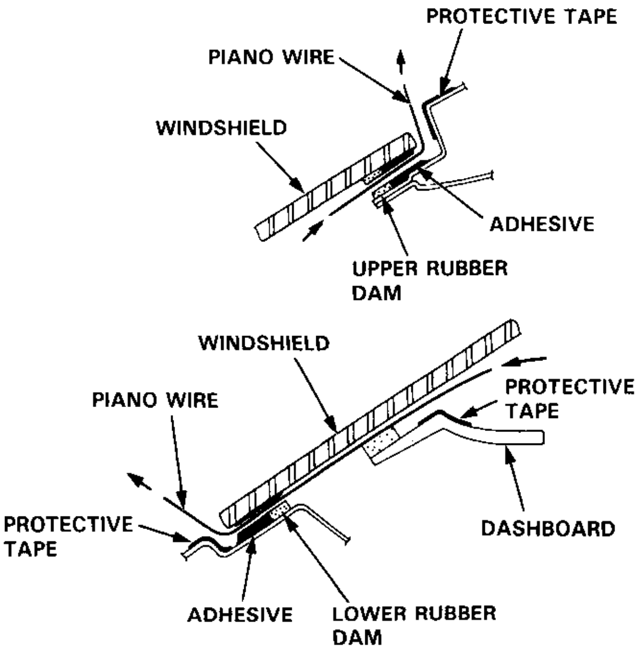


5. Remove the other retainers from the body.

(cont'd)

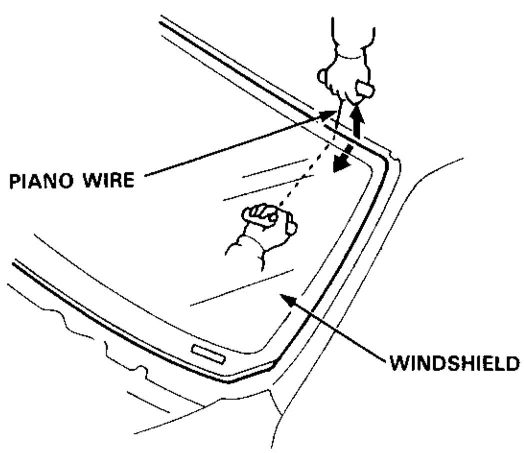
Removal (cont'd)

6. Apply protective tape to along the edge of the dashboard and body as shown.
Using an awl, make a hole through the rubber dam and adhesive from inside the car. Push the piano wire through the hole, and wrap each end around a piece of wood.



7. With a helper on the outside, pull the piano wire back and forth in a sawing motion, and carefully cut through the rubber dam and adhesive around the entire windshield.

CAUTION: Hold the piano wire as close to the windshield as possible to prevent damage to the body and dashboard.



8. Carefully remove the windshield.

Installation

1. Scrape the old adhesive smooth with a knife to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire windshield opening flange.

NOTE:
- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove the rubber dam from the body.
- Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

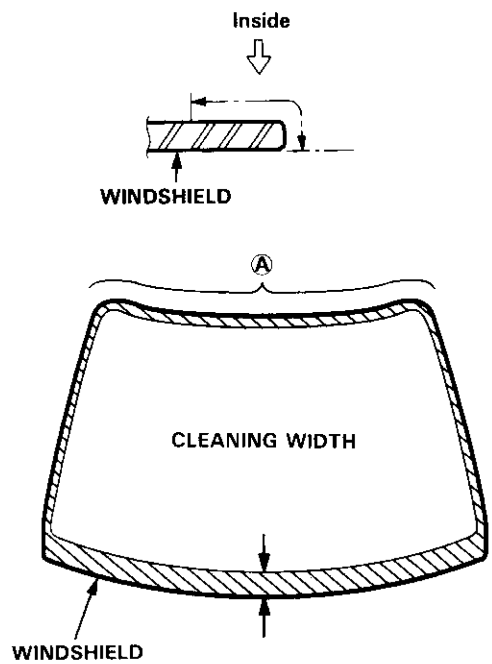
NOTE: After cleaning, keep oil, grease and water from getting on the surface.

3. If the old windshield is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the windshield surface with alcohol where new adhesive is to be applied.

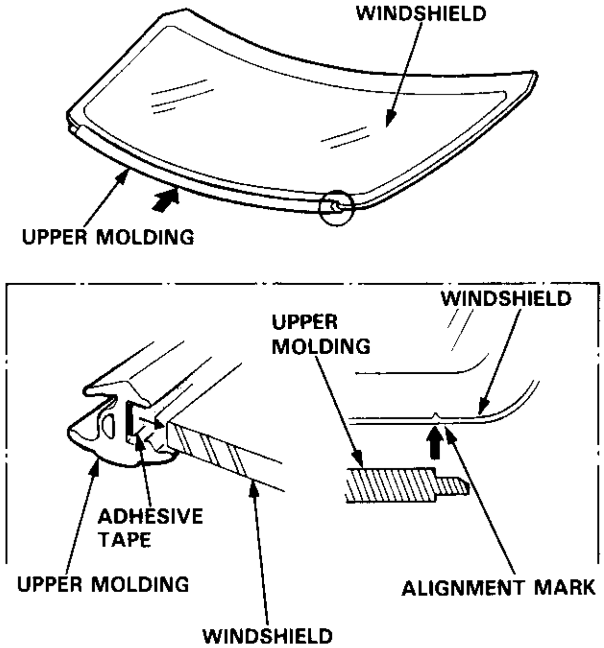
NOTE: Make sure the bonding surface is kept free of water, oil and grease.

CAUTION: Avoid setting the windshield on its edges; small chips may later develop into cracks.

NOTE:
- Clean the shadowed area.
- Clean area Ⓐ as shown.

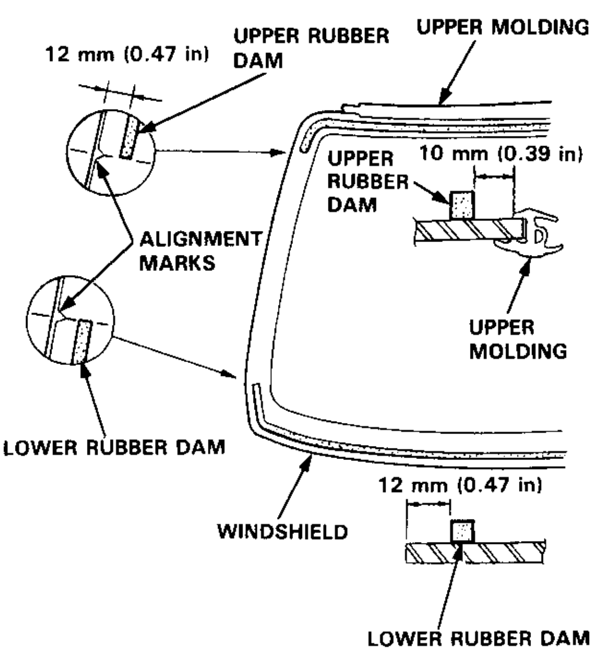


4. Center and glue the upper molding to the upper edge of the windshield.



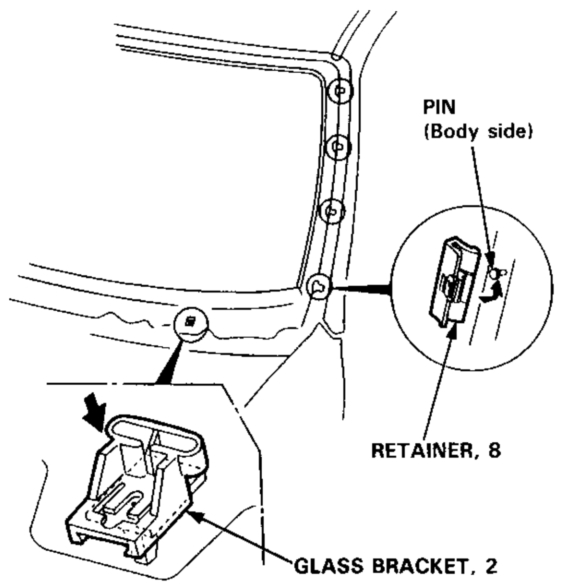
5. Glue the upper and lower rubber dams to the inside face of the windshield, as shown, to contain the adhesive during installation.

NOTE: Be careful not to touch the windshield where adhesive will be applied.

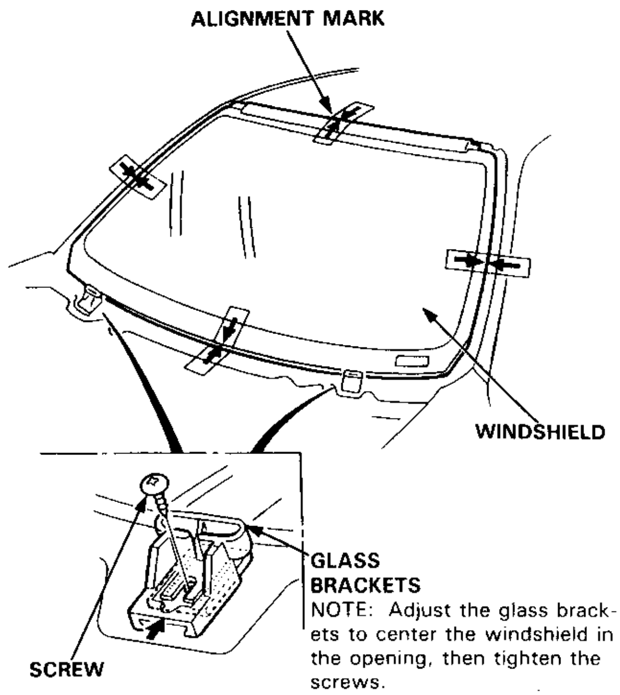


6. Install the glass brackets and retainers as shown

NOTE: The numbers after the part names show the quantities of the parts used.



7. Set the windshield on the glass brackets, then center it in the opening. Make alignment marks across the windshield and body with a grease pencil at the four points shown.



8. Remove the windshield.

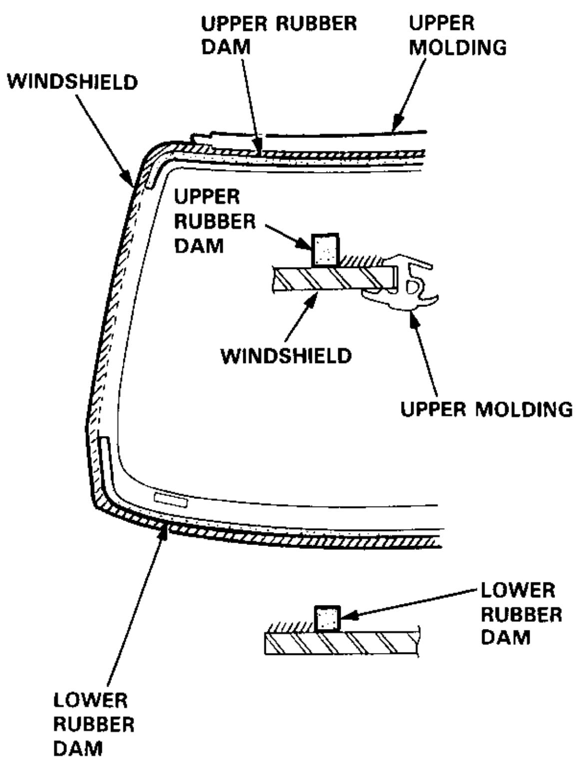
(cont'd)

Installation (cont'd)

9. With a sponge, apply a light coat of glass primer around the edge of the windshield as shown, then lightly wipe it off with gauze or cheesecloth.

   NOTE:
   - Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
   - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
   - Keep water, dust, and abrasive materials away from the primed surface.

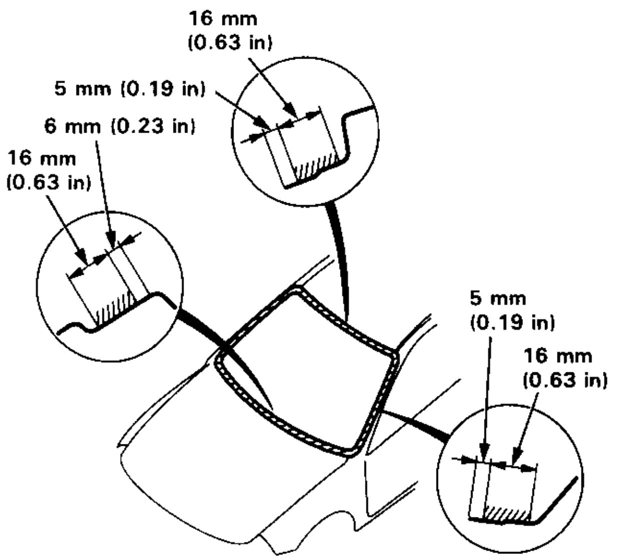
   ////: Apply glass primer here.



10. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes.

    NOTE:
    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.
    - Mask off the dashboard before painting the flange.

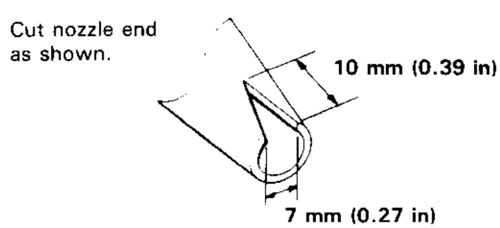
    ////: Apply body primer here.



11. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

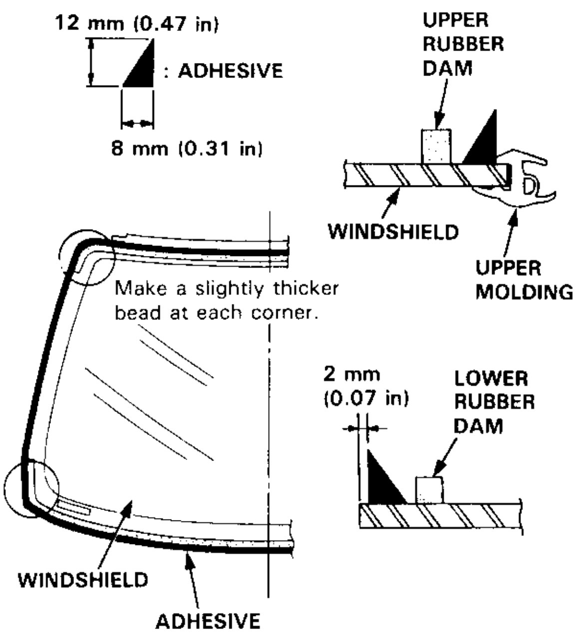
    NOTE:
    - Clean the plate with a sponge and alcohol before mixing.
    - Follow the instructions that come with the adhesive.

12. Before filling a cartridge, cut the end of the nozzle as shown.



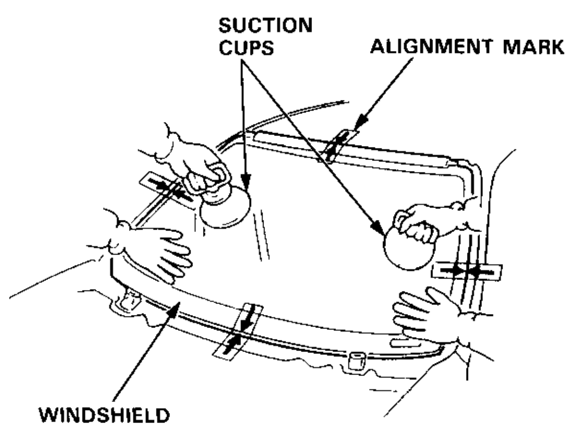
13. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the windshield as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.

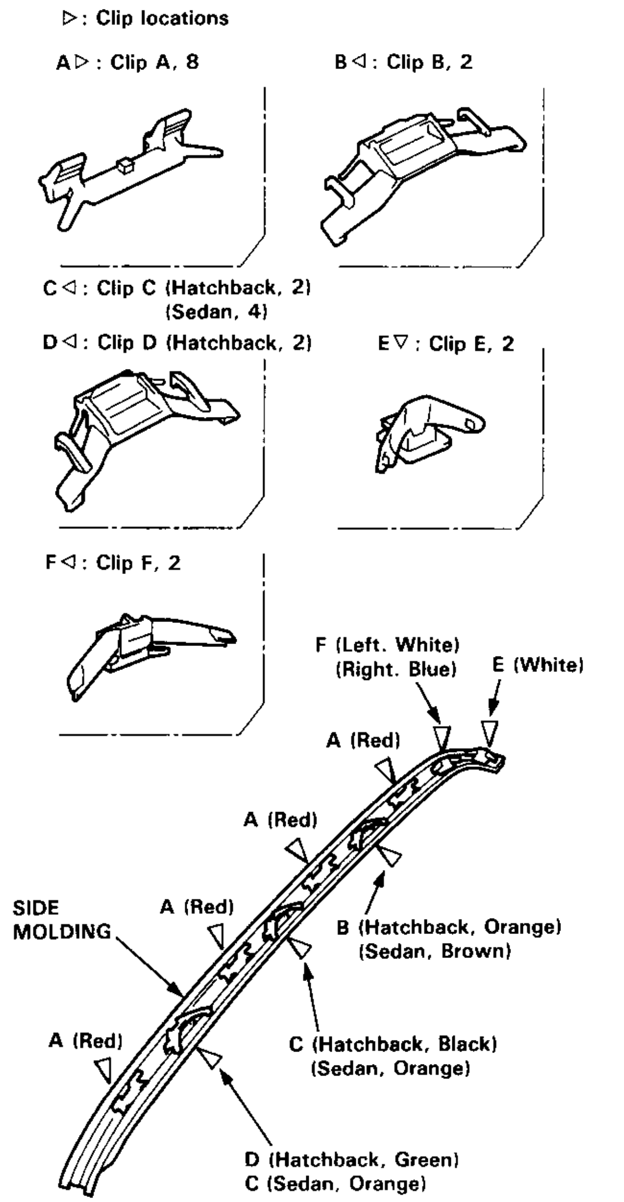


14. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 7, and set it down on the adhesive. Lightly push on the windshield until its edge is fully seated on the adhesive all the way around.

    NOTE: Do not close or open the doors until adhesive is dry.



15. Install the clips on both side moldings.



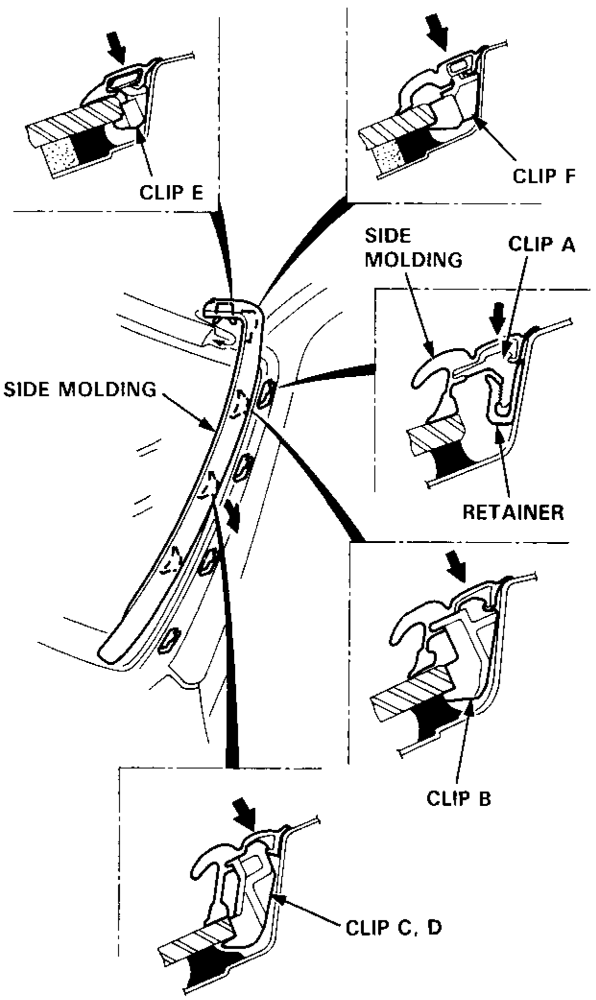
16. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

(cont'd)

Installation (cont'd)

17. Install both side moldings.



18. Let the adhesive dry for at least one hour, then spray water over the windshield and check for leaks. Mark leaking areas, and let the windshield dry, then seal with sealant.

    NOTE:
    - Let the car stand for at least four hours after windshield installation. If the car has to be used within the first four hours, it must be driven slowly.
    - Keep the windshield dry for the first hour after installation.
    - Check that the ends of the side molding are set under the air scoop.

19. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for two to three days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

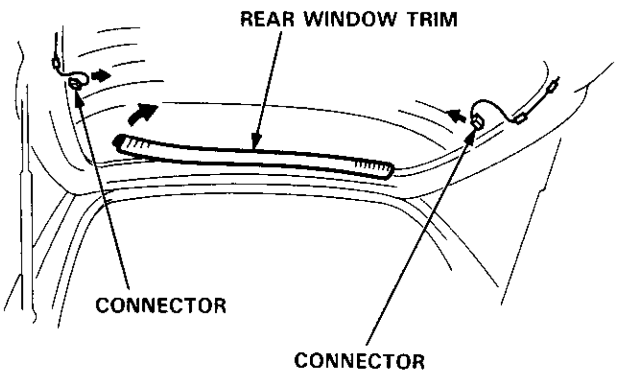
Rear Window

Removal

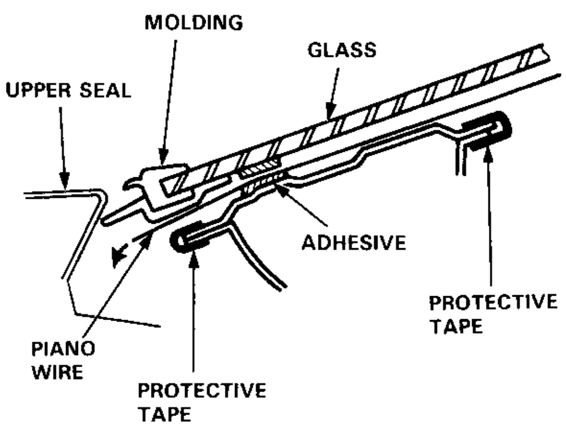
Hatchback

CAUTION:
- **Use covers to avoid damaging the interior.**
- **Wear gloves to remove and install the glass.**
- **Do not damage the defroster grid lines.**
- **Take care not scratch the rear window molding.**

1. To remove the rear window, first remove the:
   - Rear shelf (see page 20-91)
   - Hatch side trim and hatch trim panel (see page 20-148)
   - High mount brake light (see section 23)
   - Rear window wiper arm and rear window wiper motor (see section 23)
2. Remove the rear window trim, and disconnect the connectors.

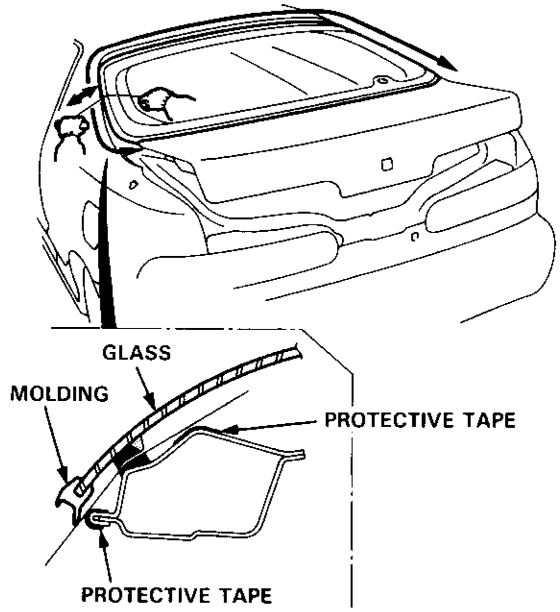


3. Apply protective tape to the inner and outer edges of the hatch.
   Using an awl, make a hole through the adhesive from the inside, at the top of the hatch. Push piano wire through the hole, and wrap each end around a piece of wood.



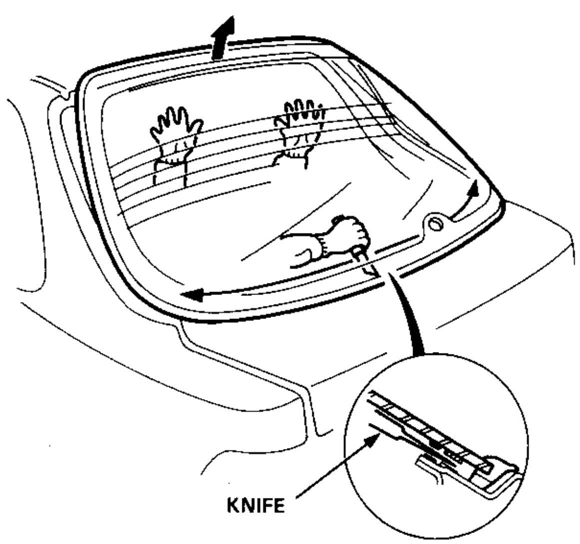
4. With a helper on the outside, pull the piano wire back and forth in a sawing motion, and carefully cut through the adhesive along the too and the sides of the rear window.

   CAUTION: Hold the piano wire as close to the rear window as possible to prevent damage to the body and molding.



5. Cut the adhesive with a knife at the bottom of the rear window.

   NOTE: Do not use piano wire in this area.
6. Carefully remove the rear window.



NOTE: Replace the fasteners with new ones whenever the rear window has been removed.

Rear Window

Installation

1. Scrape the old adhesive smooth with a knife to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire rear window opening flange.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the upper and lower fasteners from the hatch.
   - Mask off surrounding surfaces before applying primer.

2. Clean the hatch bonding surface with a sponge dampened in alcohol.

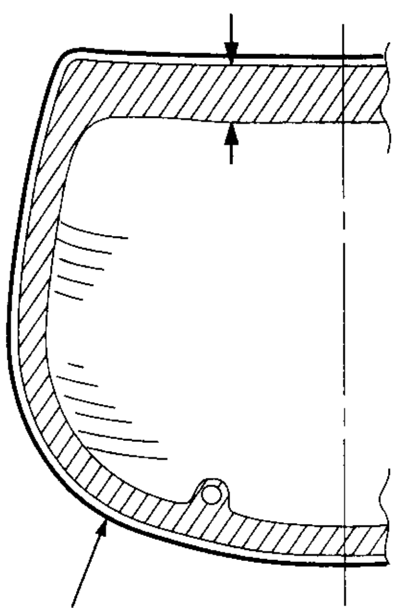
   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the rear window surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

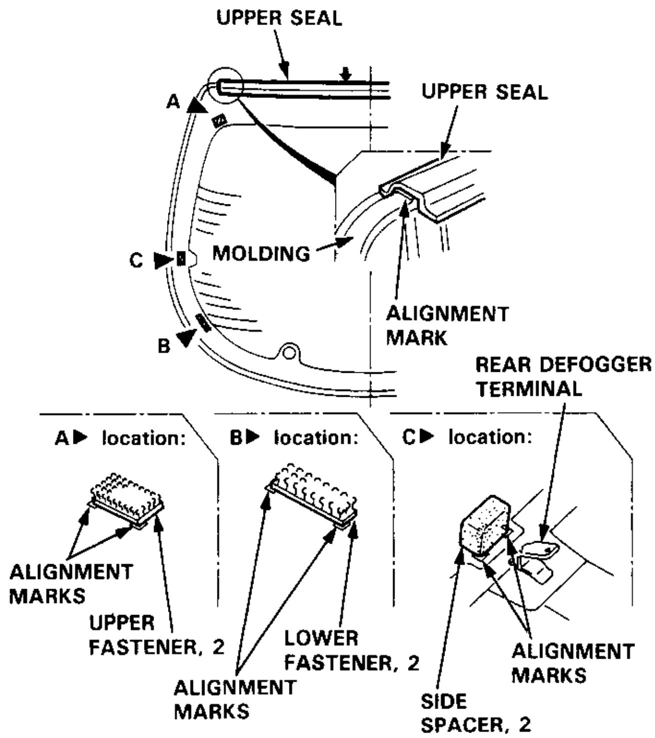
   CAUTION: Avoid setting the rear window on its edges; the molding can be permanently deformed.

   NOTE: Clean the shadowed area.

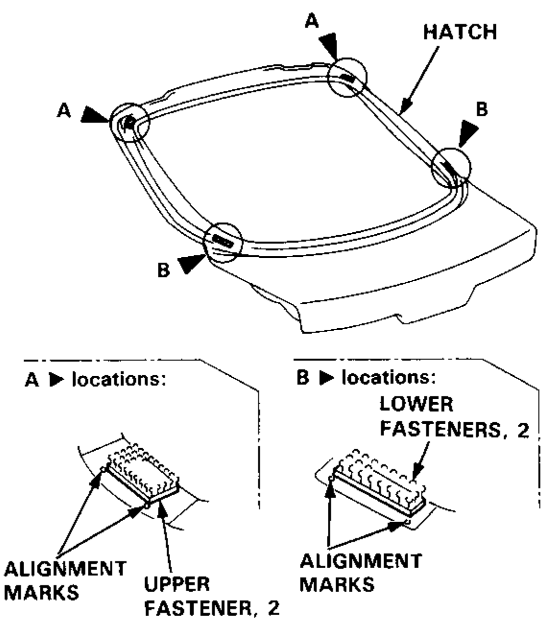


4. Apply the upper seal to the inside face of glass as shown.

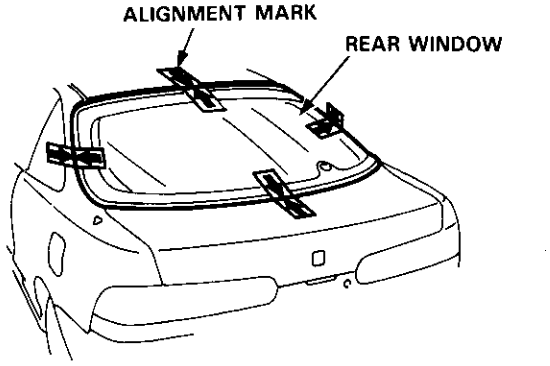
5. Glue the upper fasteners, lower fasteners and side spacers, to the inside face of the rear window on each side.



6. Glue the lower fasteners and upper fasteners to the hatch as shown.



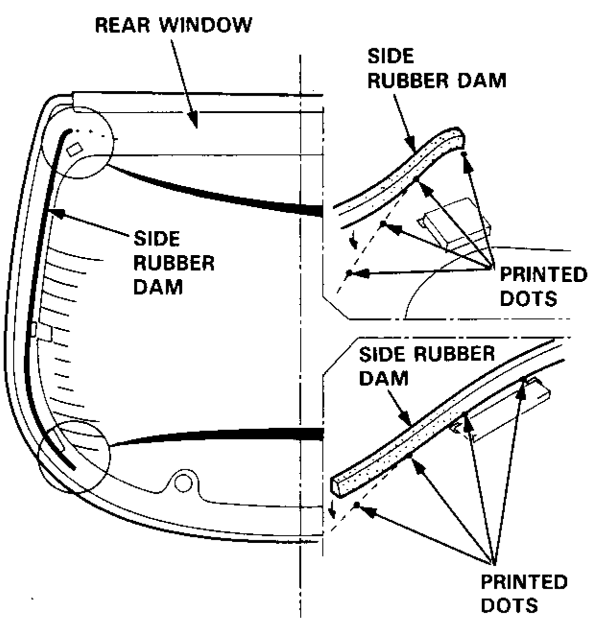
7. Set the rear window upright on the hatch, then center it in the opening. Make alignment marks across the rear window and body with a grease pencil at the four points shown.



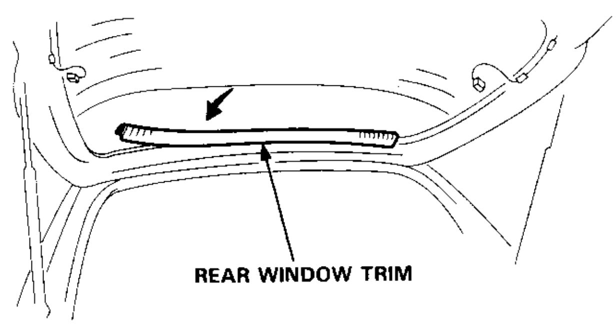
8. Remove the rear window.

9. Center and glue the side rubber dams to the inside face of the rear window, as shown, to contain the adhesive during installation.

NOTE:
- Glue the side rubber dams, using the printed dots as a guide.
- Be careful not to touch the rear window where adhesive will be applied.
- Mask off surrounding surfaces before applying primer.



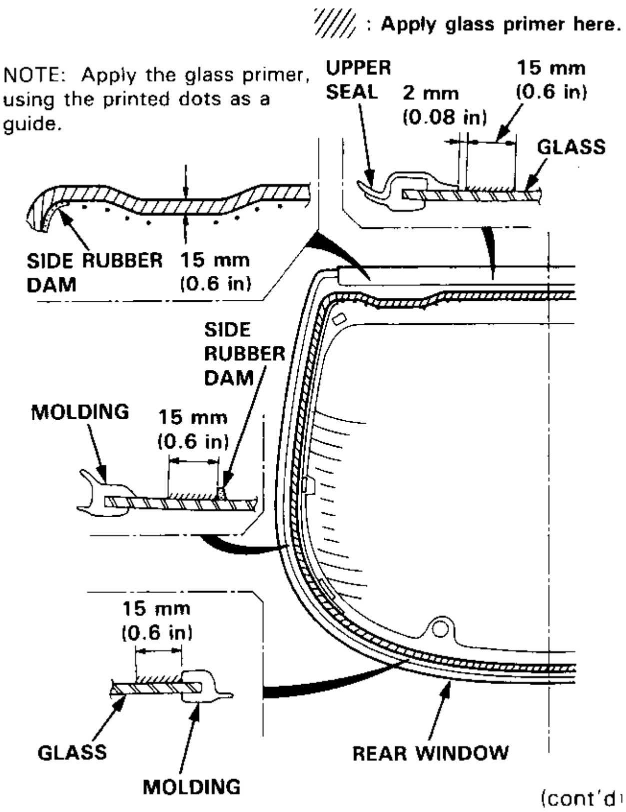
10. Install the rear window trim.



11. With a sponge, apply a light coat of glass primer around the edge of the rear window, then lightly wipe it off with gauze or cheesecloth.

NOTE:
- Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

NOTE: Apply the glass primer, using the printed dots as a guide.



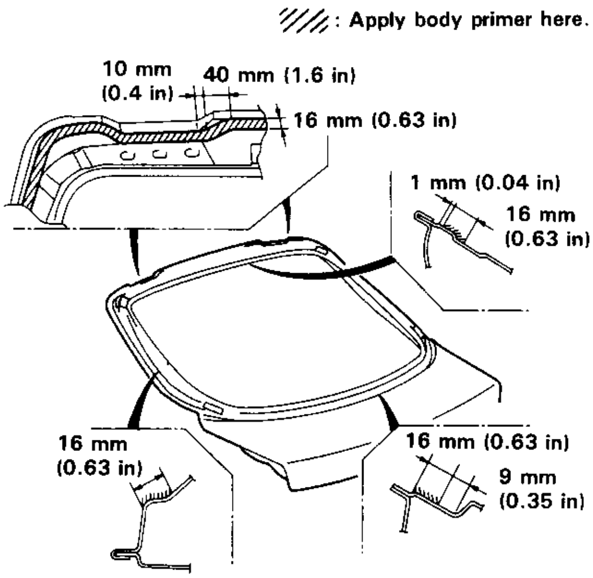
(cont'd)

Rear Window

Installation (cont'd)

12. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes.

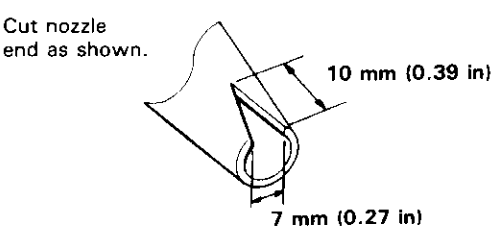
    NOTE:
    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.



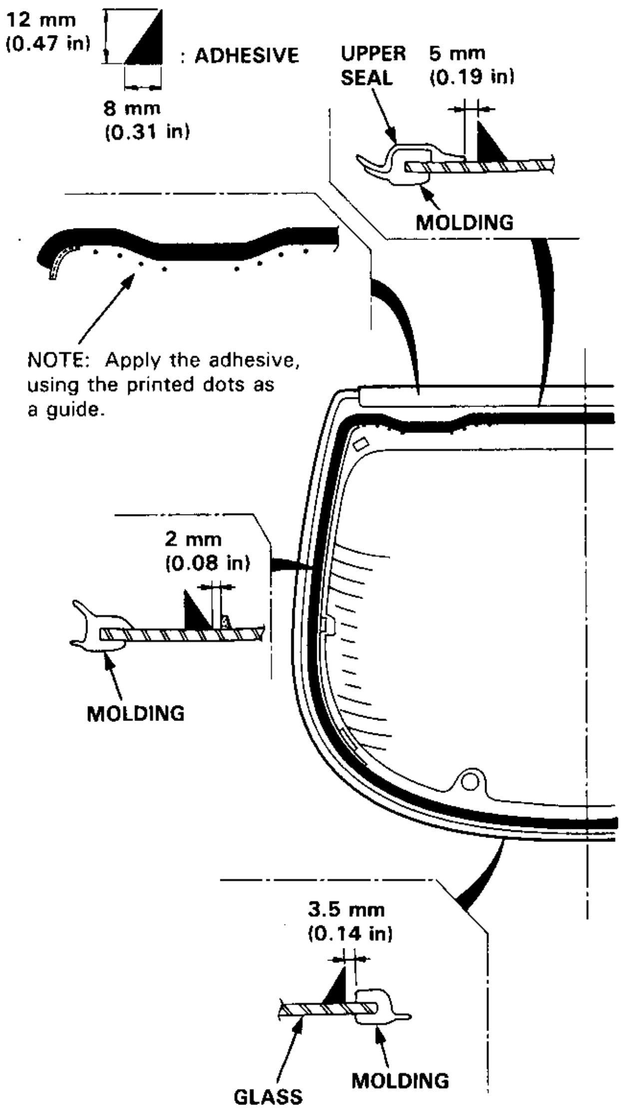
13. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

    NOTE:
    - Clean the plate with a sponge and alcohol before mixing.
    - Follow the instructions that came with the adhesive.

14. Before filling a cartridge, cut the end of the nozzle as shown.

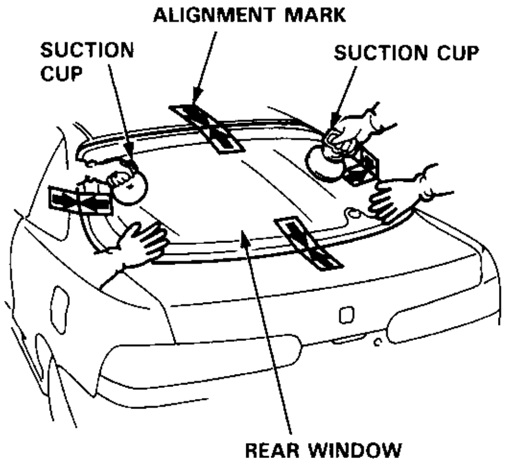


15. Pack adhesive into the cartridge without air pockets to ensure continous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the rear window as shown.



16. Use suction cups to hold the rear window over the opening, align it with the alignment marks made in step 7, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around.

    NOTE: Do not open or close the doors until the adhesive is dry.



17. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

18. Let the adhesive dry for at least one hour, then spray water over the rear window and check for leaks. Mark leaking areas and let the rear window dry, then seal with sealant.

    NOTE: Let the car stand for at least four hours after rear window installation. If the car has to be used within the first four hours, it must be driven slowly.

19. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for two to three days:

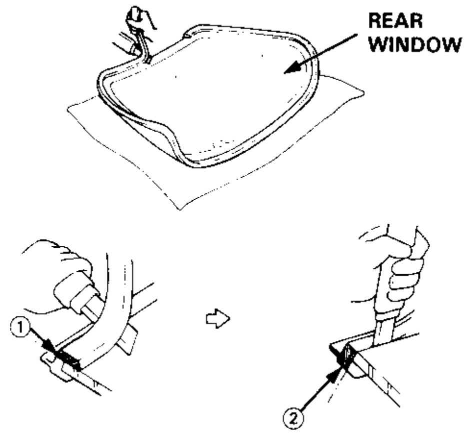
    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Replacement

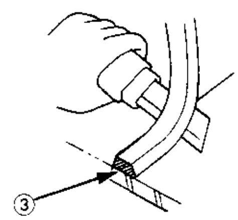
1. Remove the rear window (see page 20-61), then remove the upper seal.
2. Place the rear window on its surface, as shown, with a helper holding the rear window.

   CAUTION: Avoid setting the rear window on its edges; small chips may later develop into cracks.

3. Cut the inner side rubber portion ① off the molding, then cut the top rubber portion ②.

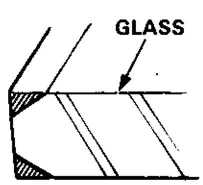


4. Turn the rear window over, then cut the outer side rubber portion ③ of the molding.



5. Scrape all traces of old molding from the chamfered edges of the glass.

   NOTE: Be sure to scrape all traces of old molding thoroughly.



6. Clean the rear window surface with alcohol where new molding is to be installed.

   NOTE: Make sure the surface is kept free of water, oil and grease.

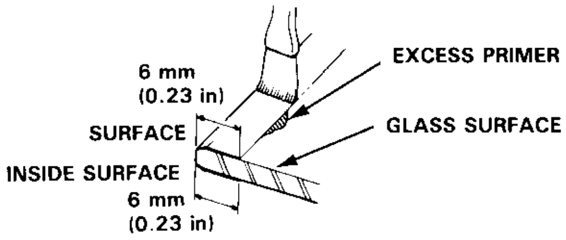
(cont'd)

Rear Window Molding

Replacement (cont'd)

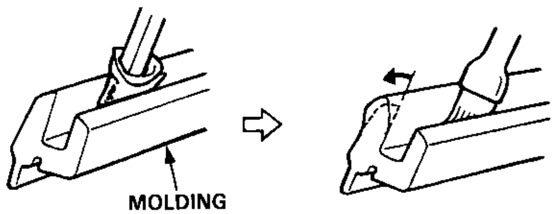
7. With a brush, apply a light coat of glass primer around the edge of the glass.

   NOTE: Scrape off excess glass primer with a putty knife after installing the new molding.

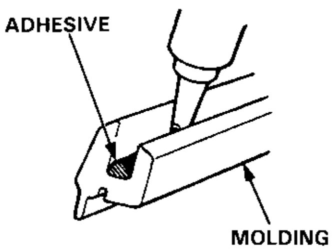


8. Degrease the inner surfaces of new molding thoroughly, then apply a light coat of glass primer to the surfaces.

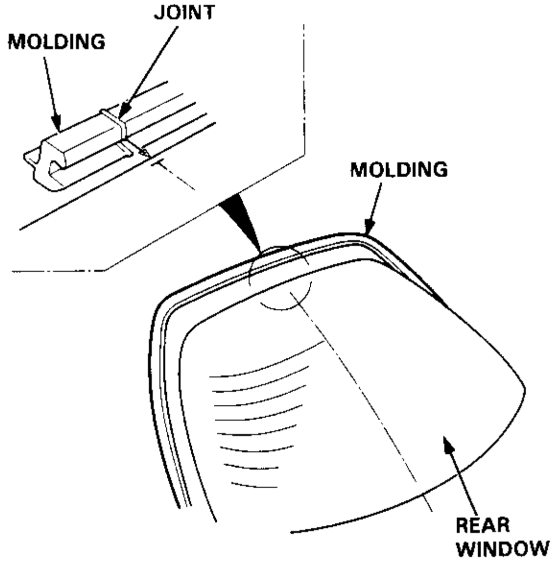
   NOTE:
   - Apply glass primer around the entire groove of the new molding.
   - Do not apply glass primer to the outer surface.



9. Run a bead of adhesive in the groove of the molding.

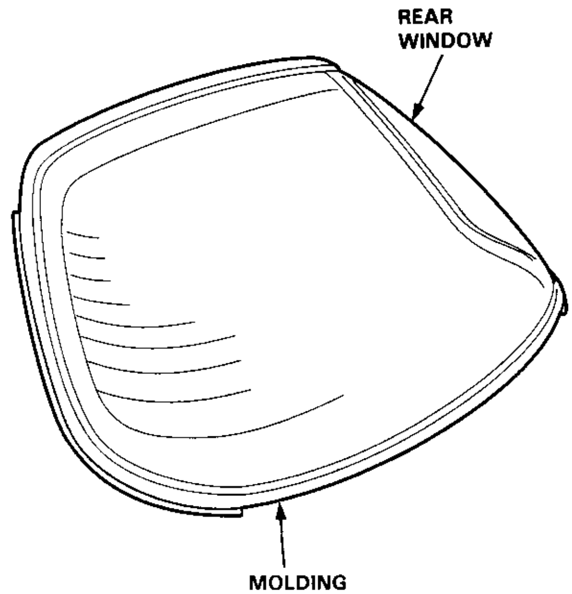


10. Place the rear window outside-up, then align the joint of the molding with the "T" mark at the top of the glass as shown.



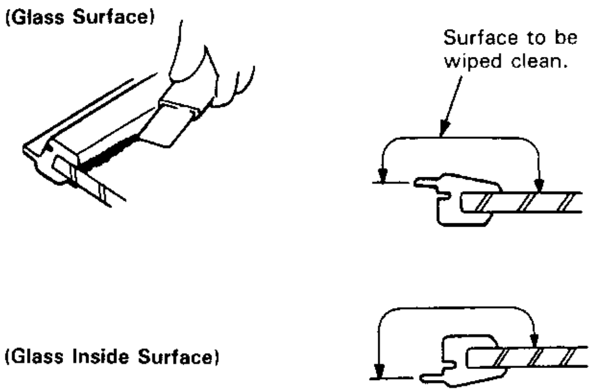
11. Press the molding into position around the entire edge of the rear window.

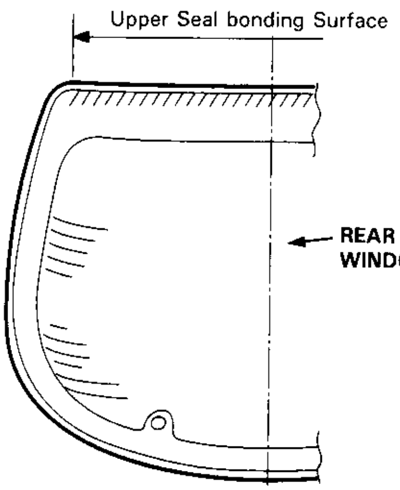
    NOTE: Check that the molding is not wrinkled or lifted away at corners.



12. Scrape or wipe the excess adhesive off with a putty knife or gauge.

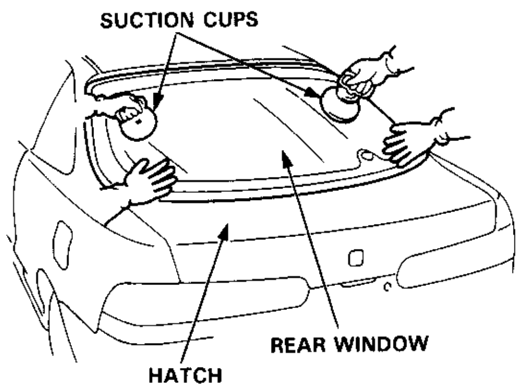
NOTE: Clean the molding and rear window surface with alcohol where upper seal is to be applied.



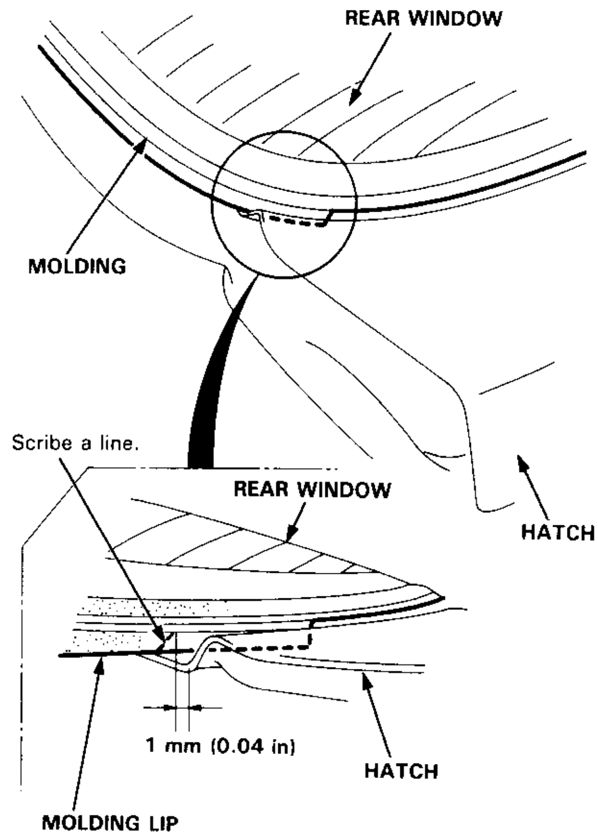


13. Apply the upper seal to the inside face of glass (see page 20-62).

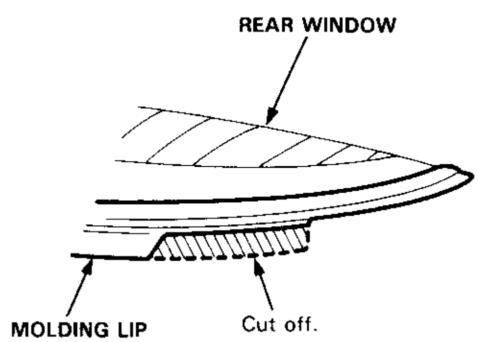
14. After the adhesive is dry, use suction cups to hold the rear window over the opening, set the rear window on the hatch, then center it in the opening.



15. Mark the molding lip with a grease pencil as shown.



16. Trim the molding lip as shown.



17. Close the hatch, then check the gap between the molding lip and body.

18. If the molding lip contacts the body, trim the molding lip as needed, keeping the gap parallel with the body.

Rear Window

Removal

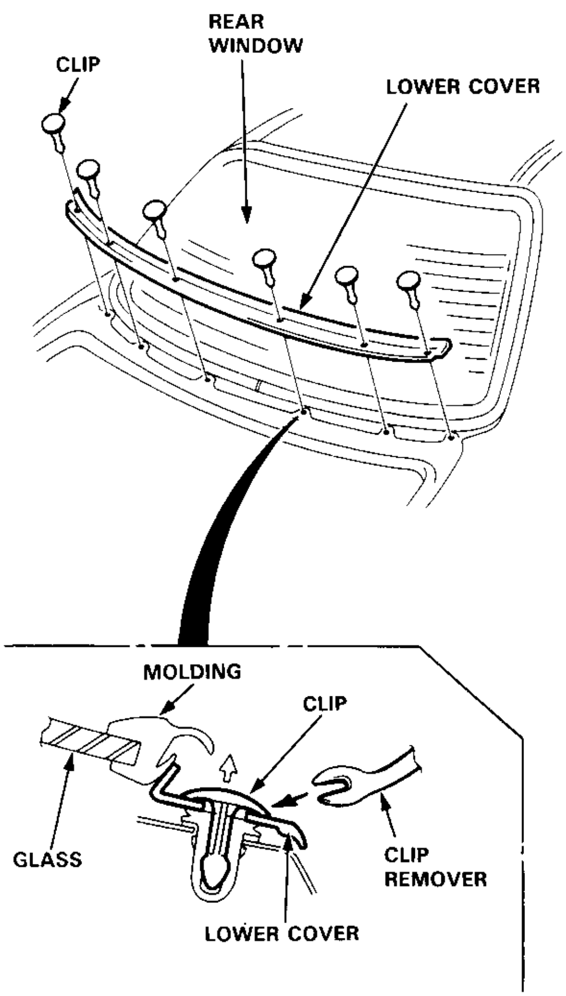
Sedan

CAUTION:
- **Wear gloves to remove and install the rear window.**
- **Do not damage the defroster grid lines.**

1. To remove the rear window, first remove:
   - Trunk lid (see page 20-151)
   - Rear seat-back side bolsters (see page 20-113)
   - Rear shelf (see page 20-95)
   - Rear pillar trim panel (see page 20-95)
2. Disconnect the defroster leads, and remove their holders.

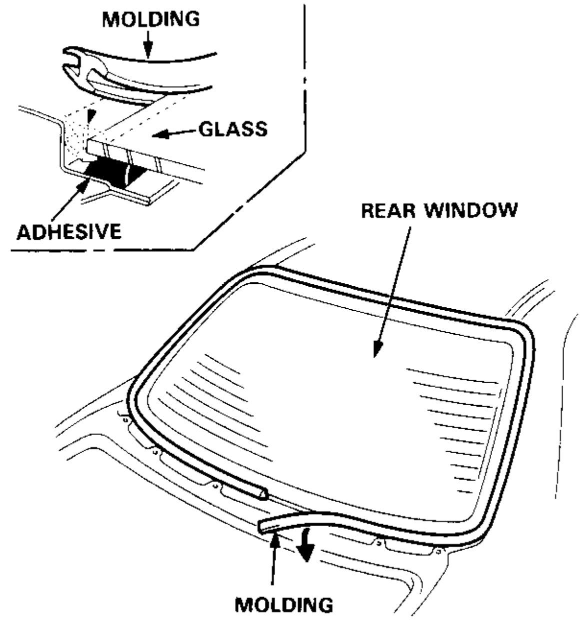
   NOTE: Avoid scratching the rear window with the cutter blade.
3. Remove the clips, then remove the lower cover.

   NOTE: Use a clip remover to remove the clips.



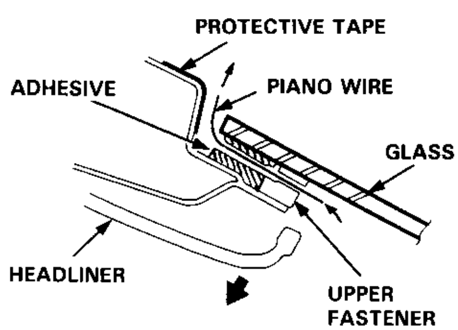
4. Peel off the molding.

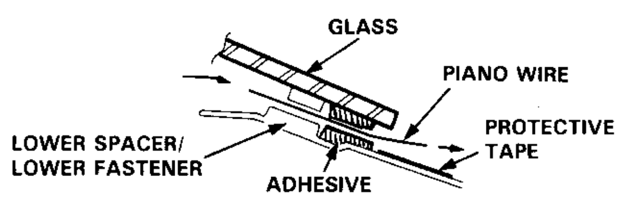
   NOTE: When molding removal is difficult, cut the molding with a knife.



5. Pull down the rear of the headliner (see page 20-100).

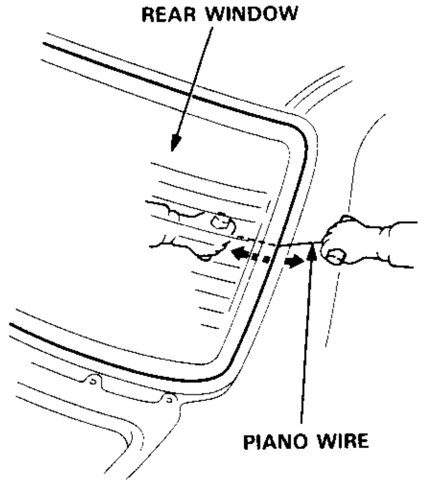
   CAUTION: Take care not to bend the headliner excessively.
6. Apply protective tape to the edge of the body as shown.
   Using an awl, make a hole through the adhesive from inside the car. Push the piano wire through the hole, and wrap each end around a piece of wood.





7. With a helper on the outside, pull the piano wire back and forth in a sawing motion, and carefully cut through the adhesive around the entire rear window.

CAUTION: Hold the piano wire as close to the rear window as possible to prevent damage to the body.



8. Carefully remove the rear window.

Installation

1. Scrape the old adhesive smooth with a knife to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire rear window opening flange.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the upper and lower fasteners from the body.
   - Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

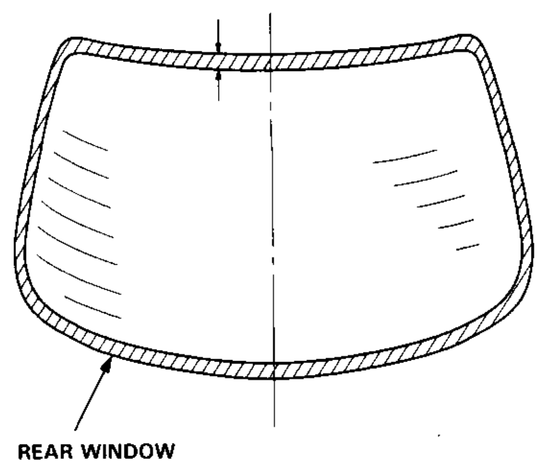
   NOTE: After cleaning, keep oil, grease and water from getting on the surface.

3. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the rear window surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

   CAUTION: Avoid setting the rear window on its edges; small chips may later develop into cracks.

NOTE: Clean the shadowed area.

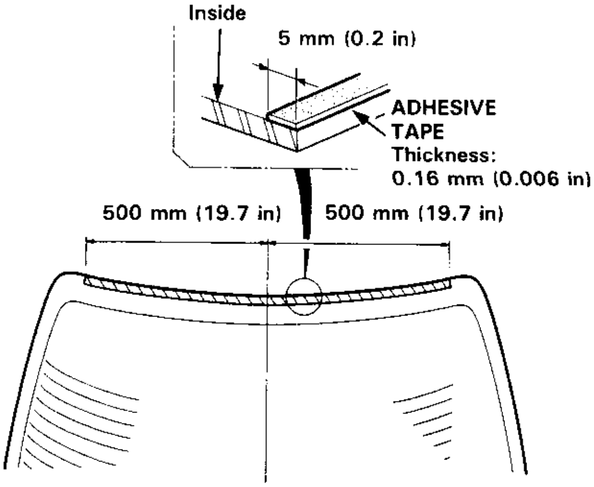


(cont'd)

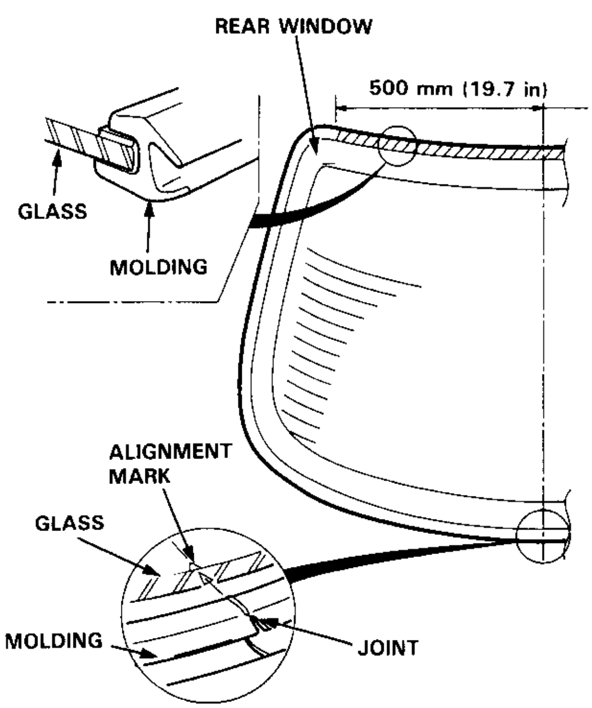
Rear Window

Installation (cont'd)

4. Apply the double-faced adhesive tape to the inside of the rear window as shown.

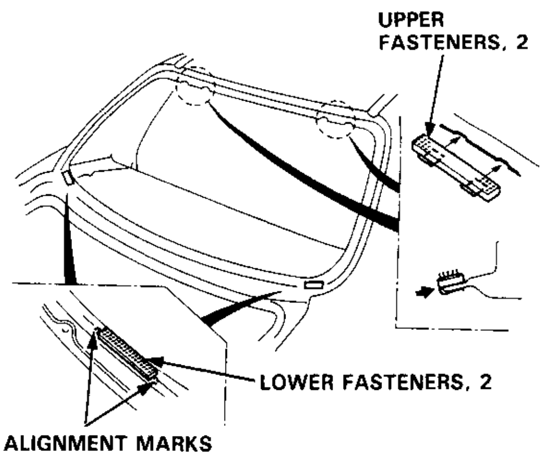


5. Glue the molding around the edge of the rear window as shown.



6. Install the upper fasteners, and glue the lower fasteners to the body as shown.

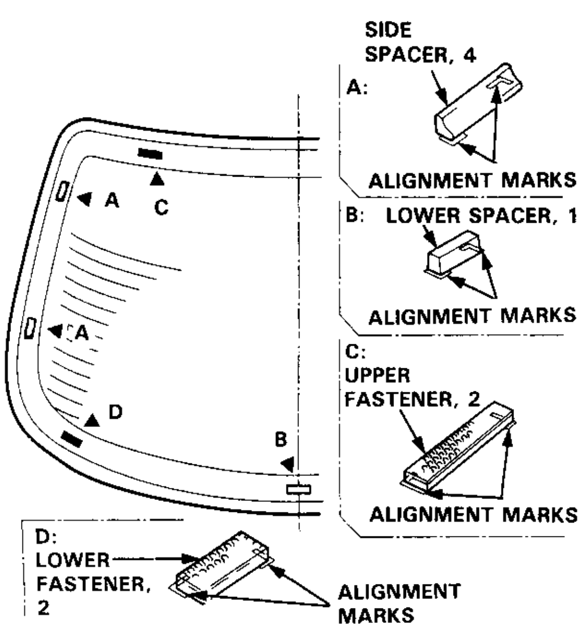
NOTE: The numbers after the parts names show quantity of the part used.



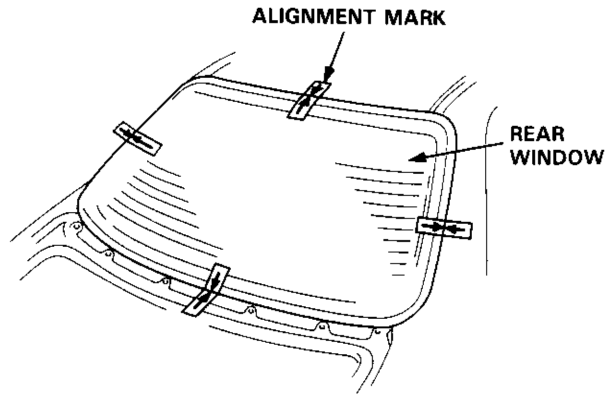
7. Glue the side and lower spacers and fasteners to the inside face of the rear window and molding as shown.

NOTE: The numbers after the part names show the quantities of the parts used.

▶ : Spacer, fastener locations



8. Set the rear window, then center it in the opening. Make alignment marks across the rear window and body with a grease pencil at the four points shown.



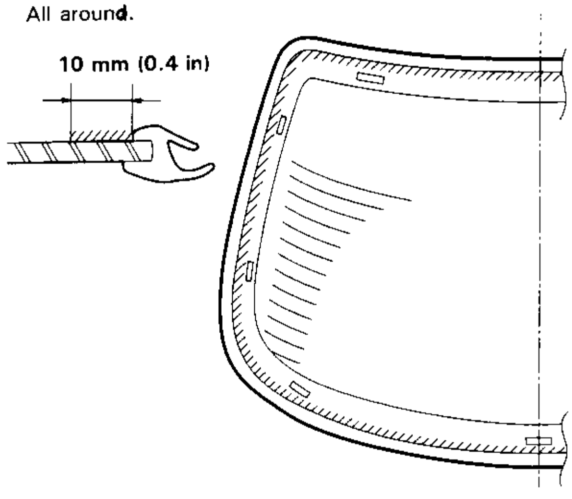
9. Remove the rear window.

10. With a sponge, apply a light coat of glass primer around the edge of the rear window as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:
- Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

////: **Apply glass primer here.**

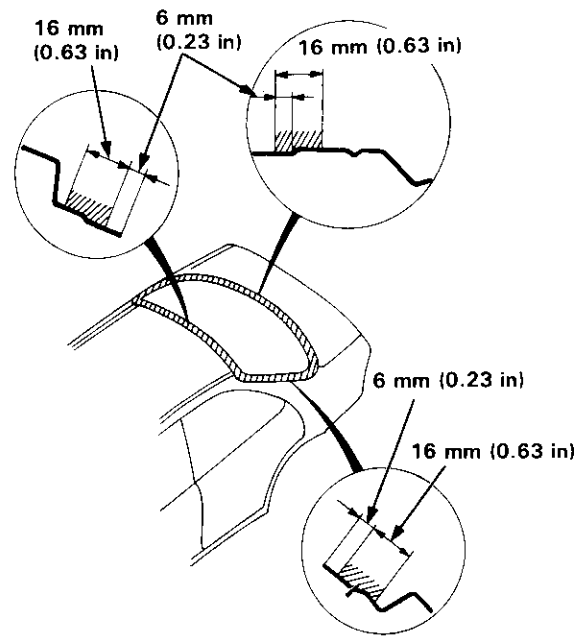
All around.



11. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes.

NOTE:
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.

////: **Apply body primer here.**

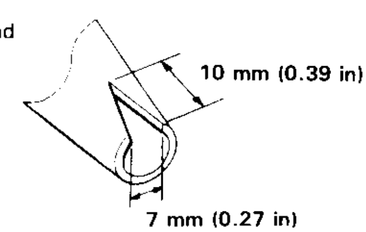


12. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.

NOTE: Clean the plate with a sponge and alcohol before mixing.

13. Before filling a cartridge, cut the end of the nozzle as shown.

Cut nozzle end as shown.



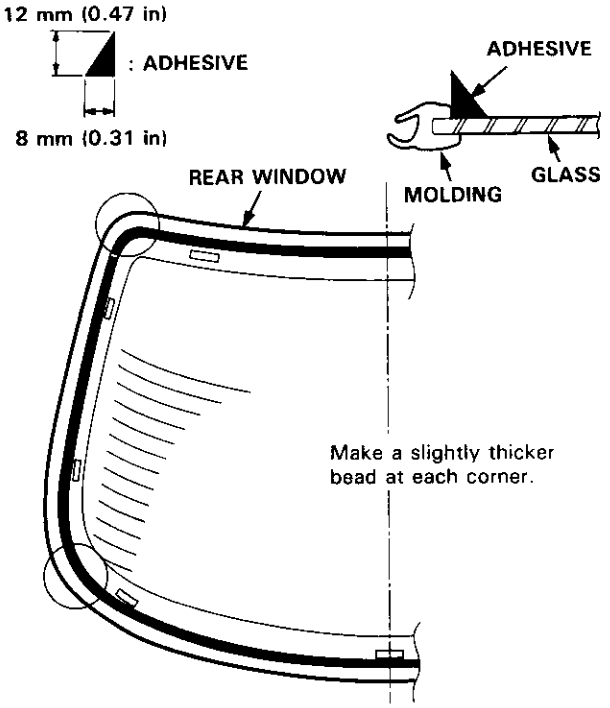
(cont'd)

Rear Window

Installation (cont'd)

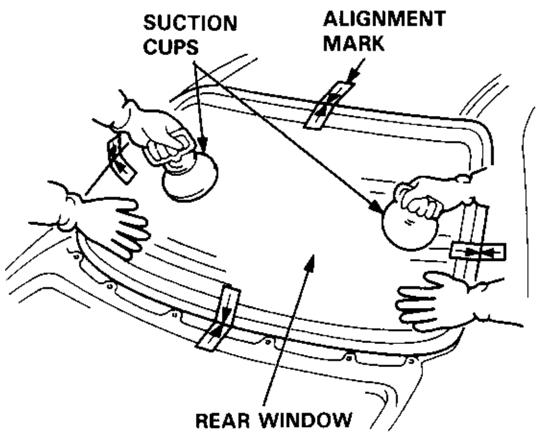
14. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the rear window as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



15. Use suction cups to hold the rear window over the opening, align it with the alignment marks made in step 8, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around.

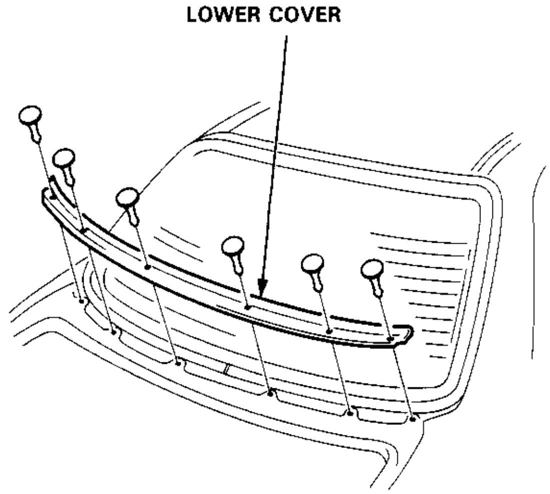
    NOTE: Do not open or close the doors until the adhesive is dry.



16. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

17. Install the lower cover.



18. Let the adhesive dry for at least one hour, then spray water over the rear window and check for leaks. Mark leaking areas, let the rear window dry, then seal with sealant.

    NOTE: Let the car stand for at least four hours after rear window installation. If the car has to be used within the first four hours, it must be driven slowly.

19. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for two to three days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

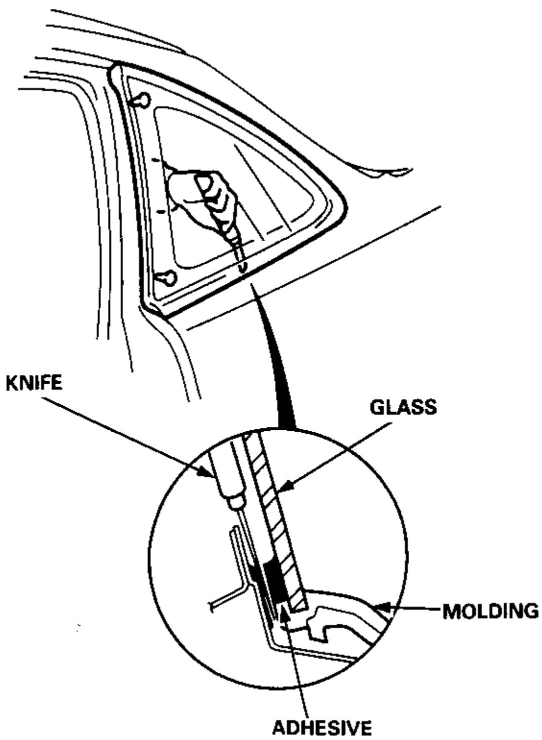
Quarter Glass

Removal

CAUTION:
- **Wear gloves to remove and install the quarter glass.**
- **Use seat covers to avoid damaging any surfaces.**

1. To remove the quarter glass, first remove the quarter trim (see page 20-93).
2. From inside the car, use a knife to cut through the quarter glass adhesive all the way around.

   NOTE:
   - If the quarter glass is to be reinstalled, take care not to damage the molding.
   - If the molding is damaged, replace the quarter glass, molding and clips as an assembly.
   - If any of the clips are broken, the quarter glass can be reinstalled using butyl tape.



3. Carefully remove the quarter glass.

   NOTE:
   - Check the molding for damage, and replace the quarter glass if necessary.
   - Remove any broken clips from the body.

Installation

1. Scrape the old adhesive smooth with a knife to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire quarter glass opening flange.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

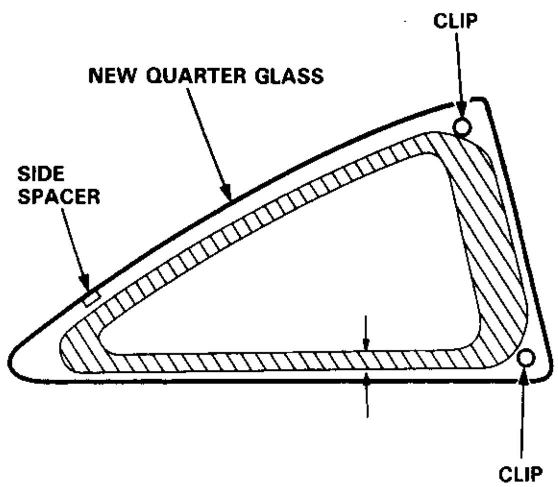
   NOTE: After cleaning, keep oil, grease and water off the surface.

3. If the old quarter glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the quarter glass surface with alcohol where adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

   CAUTION: Avoid setting the quarter glass on its edges; the molding can be permanently deformed.

   NOTE: Clean the shadowed area.



(cont'd)

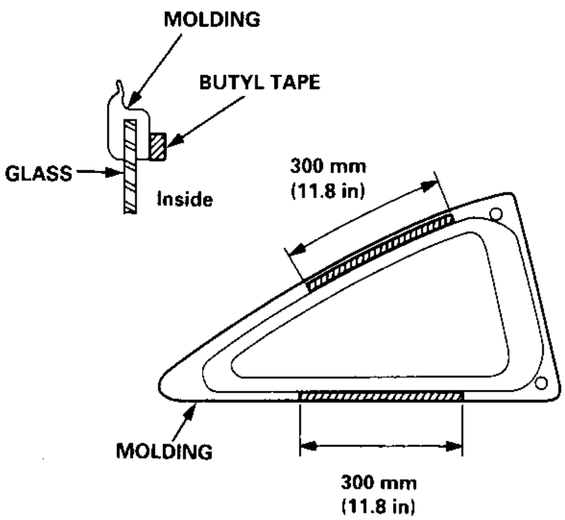
Quarter Glass

Installation (cont'd)

4. If the old quarter glass is to be reinstalled (and either of the clips are broken off the molding), apply a light coat of primer (C-100, or equivalent), then apply the butyl tape to the molding as shown.

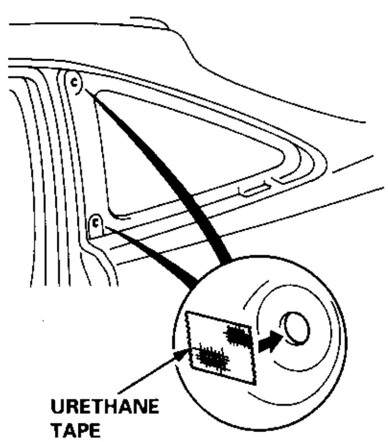
   NOTE:
   - Be careful not to touch the quarter glass where adhesive will be applied.
   - Do not peel the separator off the butyl tape.

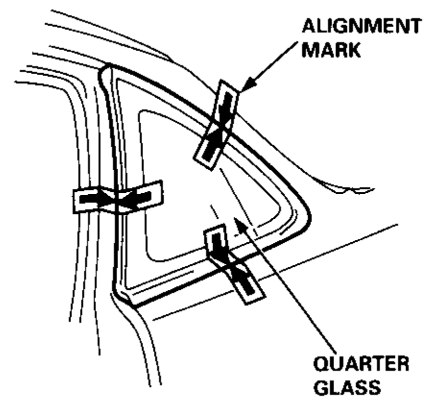
   ////: Butyl tape locations (8628, or equivalent)
   Thickness: 3.2 mm (0.13 in)
   Width: 6.4 mm (0.25 in)



5. If the old quarter glass is to be reinstalled (and either of the clips are broken off the molding), seal the body holes with pieces of urethane tape. Set the quarter glass upright in the opening, make alignment marks across the quarter glass and body with a grease pencil at the three points shown, then remove the quarter glass.

   NOTE: Be careful not to touch the quarter glass where adhesive will be applied.

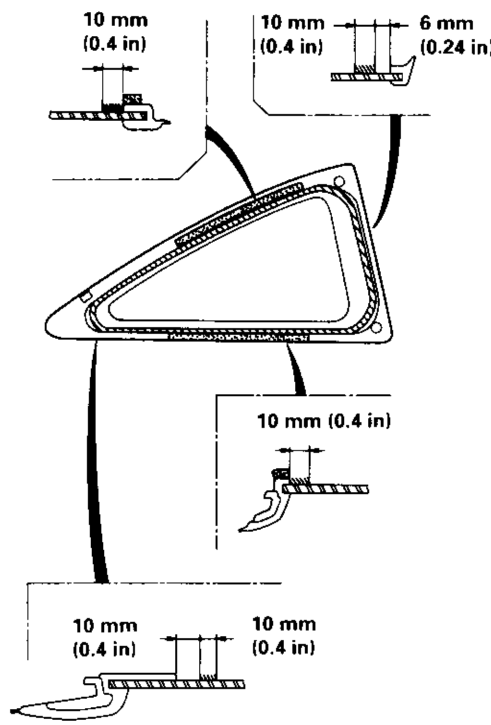




6. With a sponge, apply a light coat of glass primer to the inside face of the quarter glass as shown, then lightly wipe it off with gauze or cheesecloth.

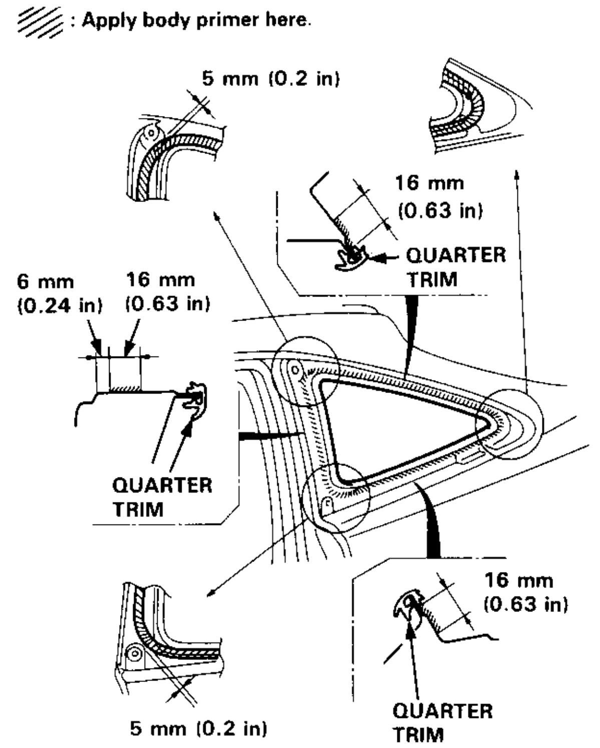
   NOTE:
   - Do not apply body primer to the quarter glass, and do not get body and glass primer sponges mixed up.
   - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the quarter glass properly, causing a leak after the quarter glass is installed.
   - Keep water, dust, and abrasive materials away from the primed surface.

   ////: Apply glass primer here.



7. With a sponge, apply a light coat of body primer to the original adhesive remaining around the quarter glass opening flange. Let the body primer dry for at least 10 minutes.

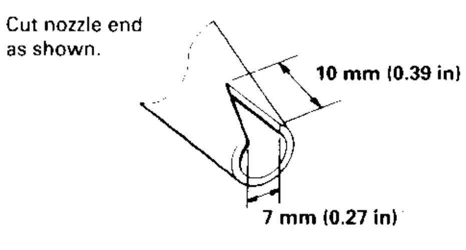
NOTE:
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.



8. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

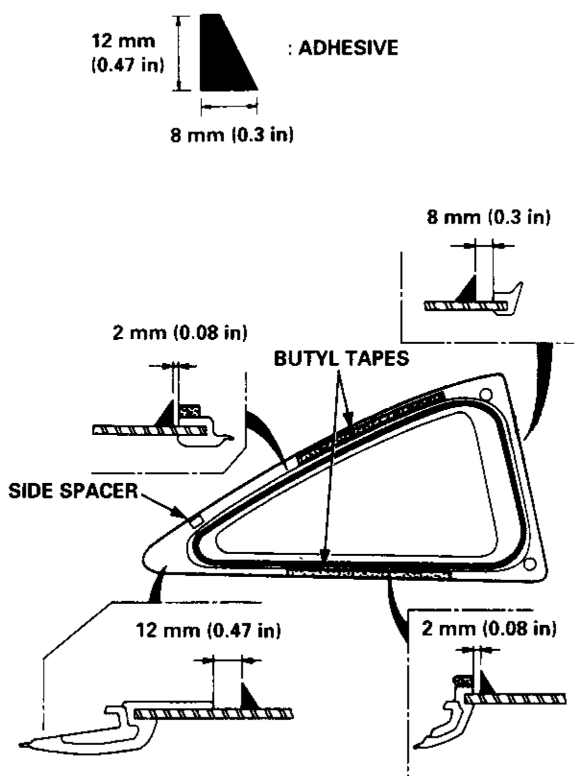
NOTE:
- Clean the plate with a sponge and alcohol before mixing.
- Follow the adhesive manufactur's instructions.

9. Before filling a cartridge, cut the end of the nozzle as shown.



10. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the quarter glass as shown.

NOTE:
- If the old quarter glass is to be reinstalled, peel the separator off the butyl tape after applying the adhesive.
- Apply the adhesive within 30 minutes after applying the glass primer.

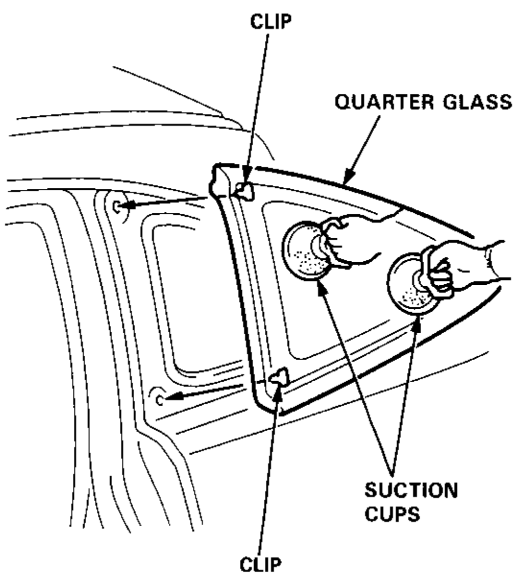


(cont'd)

Installation (cont'd)

11. Use suction cups to hold the quarter glass over the opening, align the clips or the alignment marks made in step 5, and set it down on the adhesive. Lightly push on the quarter glass until its edges are fully seated on the adhesive all the way around.

    NOTE: Do not open or close the doors until the adhesive is dry.



12. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: Use a soft shop towel dampened with alcohol to remove adhesive from a painted surface or the quarter glass.

13. Let the adhesive dry for at least one hour, then spray water over the quarter glass and check for leaks. Mark leaking areas, and let the quarter glass dry, then seal with sealant.

    NOTE: Let the car stand for at least four hours after quarter glass installation. If the car has to be used within the first four hours, it must be driven slowly.

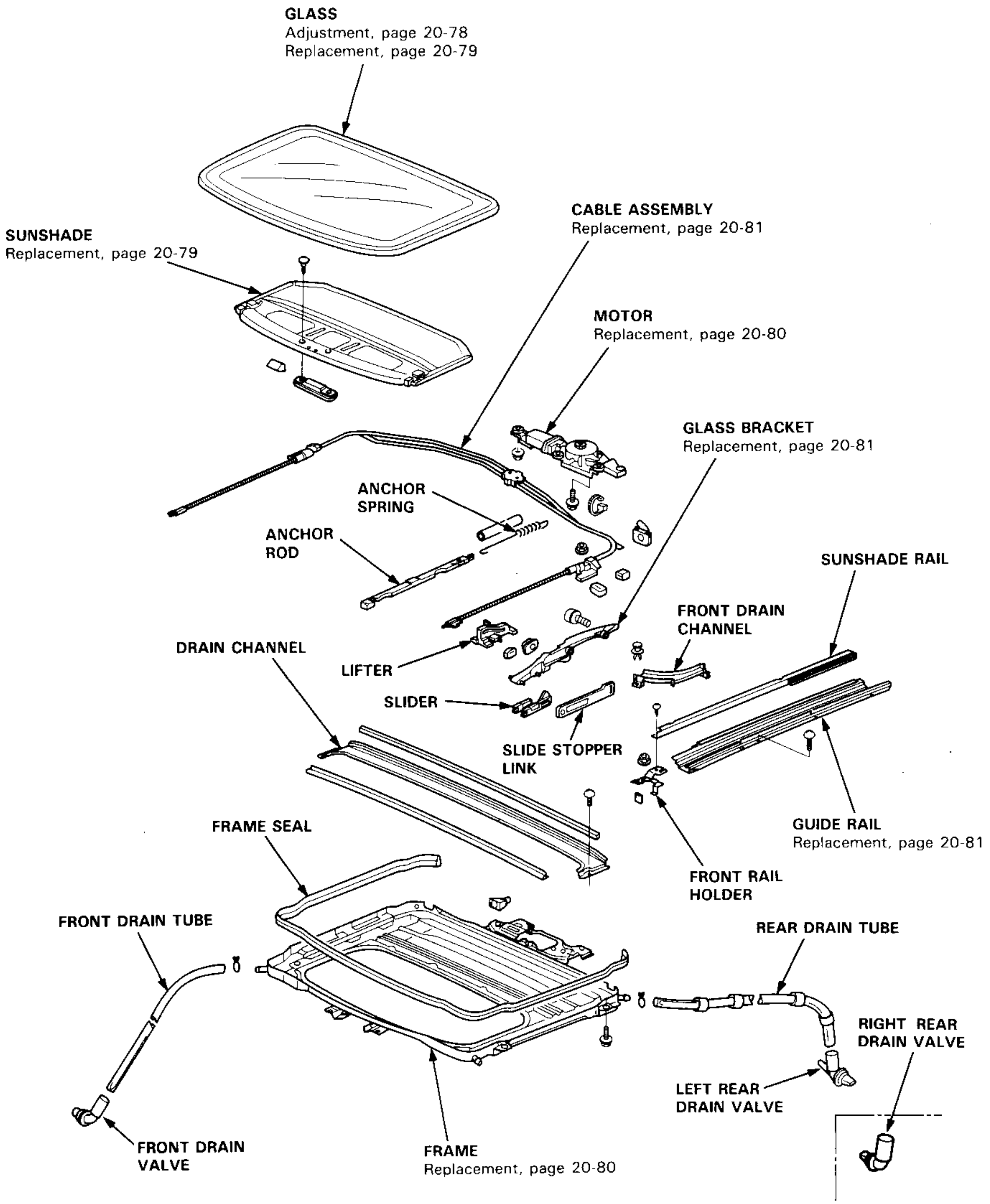
14. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for two to three days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Index

Hatchback



Moonroof

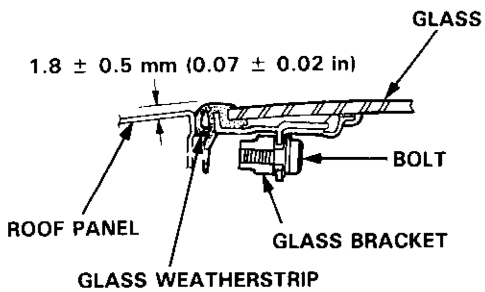
Troubleshooting

Symptom	Probable Cause
Water leaks	1. Clogged drain tube. 2. Gap between glass weatherstrip and roof panel. 3. Defective or improperly installed glass weatherstrip. 4. Gap between drain seal and roof panel.
Wind noise	1. Excessive clearance between glass weatherstrip and roof panel.
Motor noise	1. Loose motor. 2. Worn gear or bearing. 3. Cable assembly deformed.
Glass does not move, but motor turns	1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Cable assembly not attached properly.
Glass does not move and motor does not turn (glass can be moved with moonroof wrench)	1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor. 5. Faulty relay.

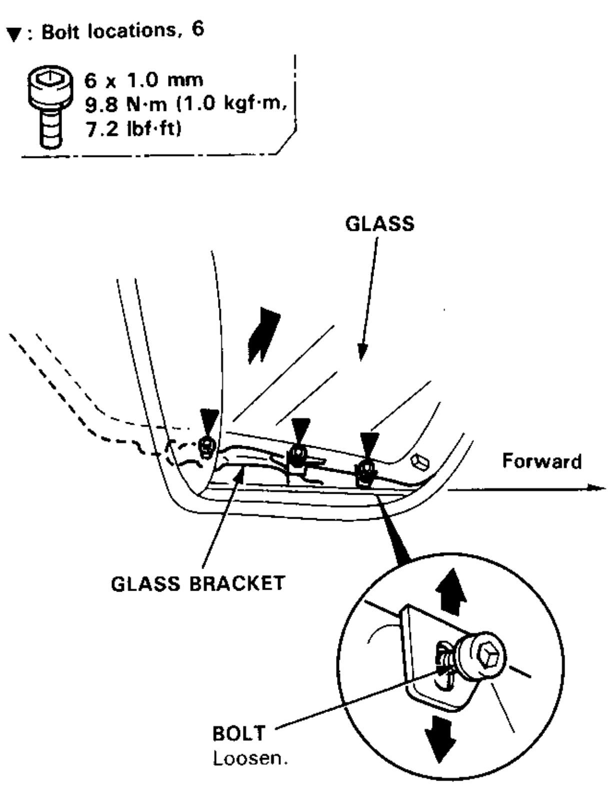
Glass Height Adjustment

The roof panel should be even with the glass weatherstrip, to within 1.8 ± 0.5 mm (0.07 ± 0.02 in) all the way around. If not, slide the sunshade back, and:

1. Tilt-up the glass.
2. Loosen the bolts and adjust the glass.
3. Repeat on opposite side if necessary.



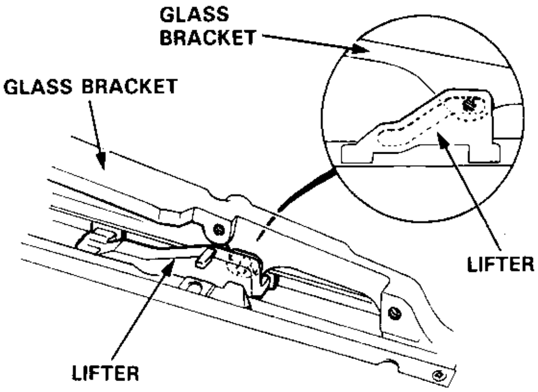
4. Side-to-side fit of glass weatherstrip can be adjusted by loosening the frame mounting bolts and moving the frame right or left and forward or backward by hand (see page 20-80).



Rear Edge Closing Adjustment

Open the glass about a foot, then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against the roof panel, or too late and does not seat tightly enough, adjust it.

1. Remove the headliner (see page 20-98).
2. Remove the glass.
3. Remove the motor (see page 20-80).
4. Align the tilt-up position of the lifter on each side.



5. Check that the alignment left and right, then install the motor.
6. Install the glass, then check for water leaks.

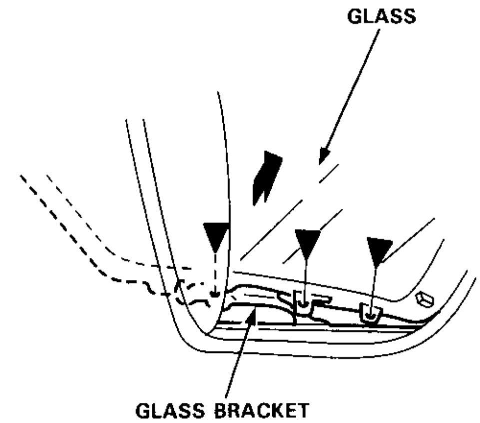
   NOTE: Do not use high-pressure water.
7. Install the headliner.

Glass and Sunshade Replacement

1. Open the sunshade.
2. Tilt-up the glass.
3. Remove the bolts, then remove the glass from the glass bracket.

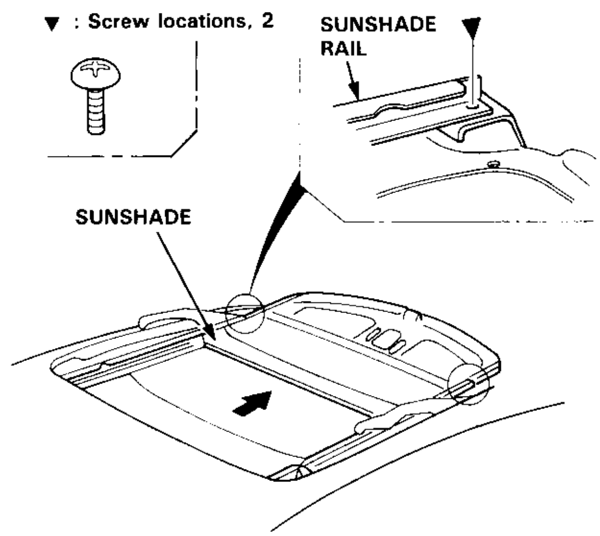
▼ : Bolt locations, 6

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



4. Remove the screw, and lift the sunshade rail on each side.
5. Slide the sunshade forward, then remove the sunshade.

▼ : Screw locations, 2



6. Installation is the reverse of the removal procedure.
7. Check for water leaks.

   NOTE: Do not use high-pressure water.

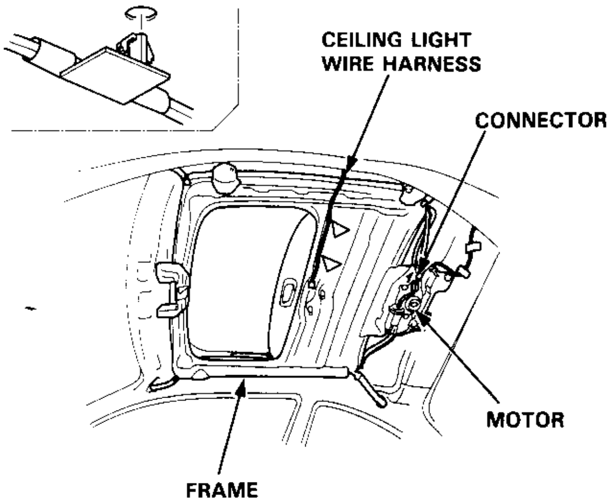
Moonroof

Motor, Drain Tube and Frame Replacement

CAUTION: Be careful not to damage the seats, dashboard and other interior trim.

1. Remove the glass (see page 20-79) and headliner (see page 20-98).
2. Disconnect the motor connector, and remove the clips securing the ceiling light wire harness.

◁ : Clip locations, 2



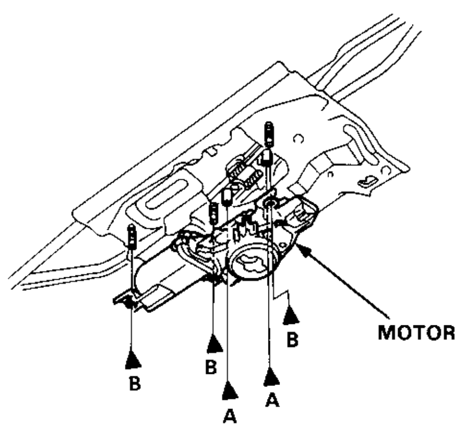
3. Remove the bolts and nuts, then remove the motor, if necessary.

   NOTE: Make sure both sliders are parallel when installing the motor.

▲ : Bolt, nut locations

A▲ : Bolt, 2 — 6 x 1.0 mm, 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

B▲ : Nut, 3 — 6 x 1.0 mm, 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



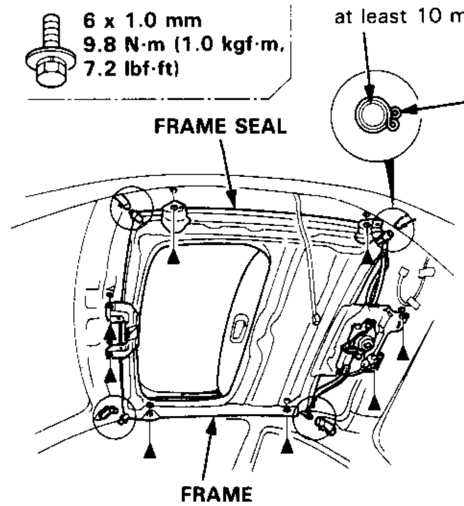
4. Disconnect the drain tubes.
5. Remove the bolts, then remove the frame from the car.

   NOTE: You may require assistance when removing the frame.

▲ : Bolt locations, 8

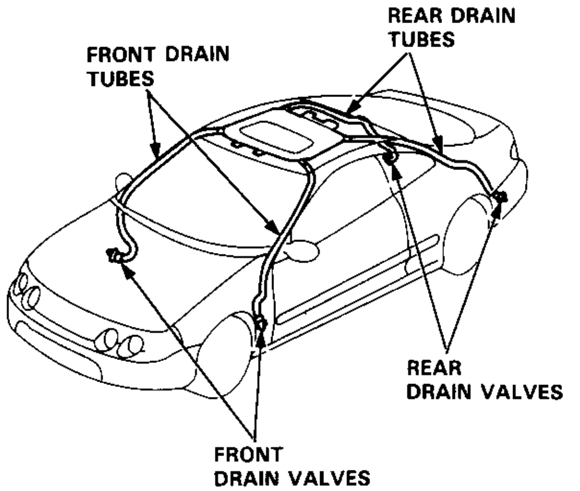
6 x 1.0 mm, 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

DRAIN TUBE
To install, slide the drain tube over the frame nozzle at least 10 mm (0.4 in).



6. Pull the drain tubes out the front and rear pillars.

   NOTE: Before pulling out the drain tube, tie a string to the end of it so it can be reinstalled.



7. Installation is the reverse of the removal procedure.

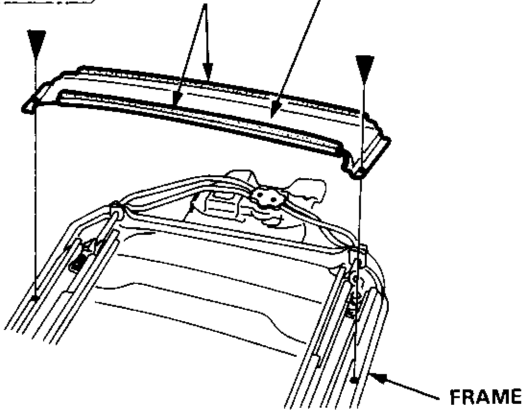
   NOTE:
   - Clean the surface of the frame.
   - Check the frame seal.
   - Check for water leaks.

Glass Bracket/Slider, Lifter, Guide Rails and Cable Assembly Replacement

1. Remove the frame from the car (see page 20-80).
2. Remove the motor (see page 20-80).
3. Remove the drain channel.

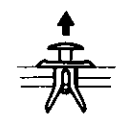
   NOTE: Take care not to damage, twist or lift the seal.

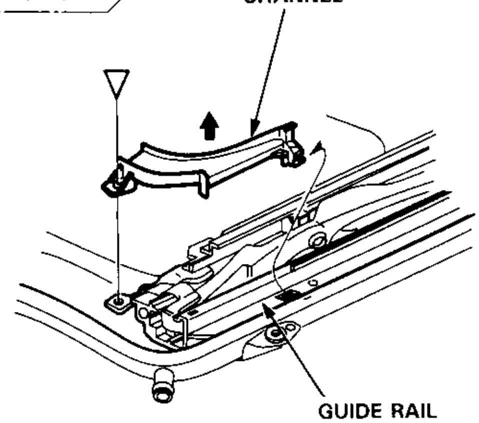
▼ : Screw locations, 2



4. Remove the front drain channel on each side.

▽ : Clip locations, 2





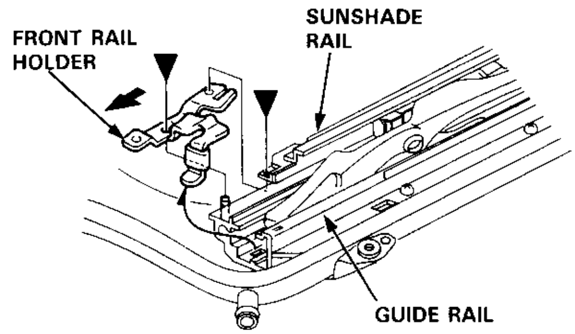
5. Remove the front rail holder on each side.

▼ : Nut, screw locations

A▼ : Nut, 2

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)

B▼ : Screw, 2



6. Remove the anchor spring on each side.
7. Remove the nuts and screws, then lift and remove both guide rails and cable assembly from the frame. Remove the sunshade and both sunshade rails.

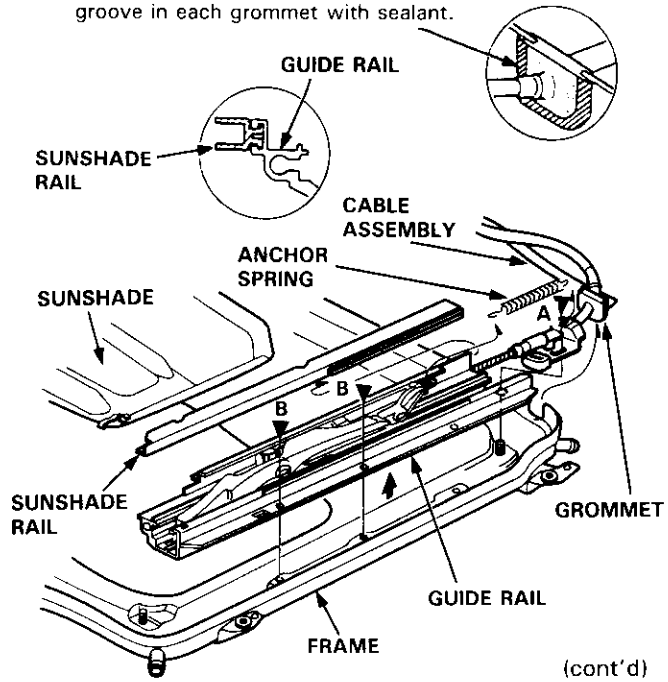
▼ : Nut, screw locations

A▼ : Nut, 2

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

B▼ : Screw, 4

NOTE: To install, fill the groove in each grommet with sealant.



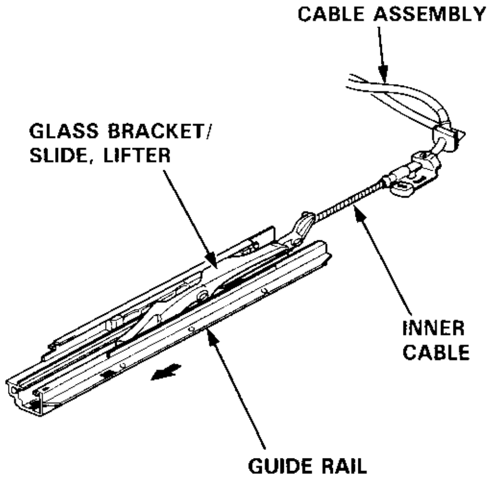
(cont'd)

Moonroof

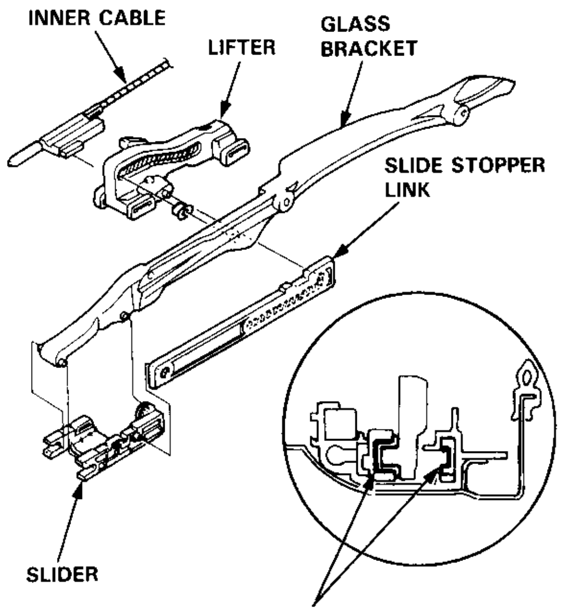
Glass Bracket/Slider, Lifter, Guide Rails and Cable Assembly Replacement (cont'd)

8. Slide the guide rail forward, then remove it.

   NOTE: Take care not to bend the inner cable.

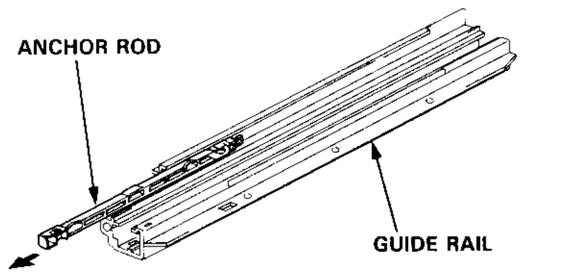


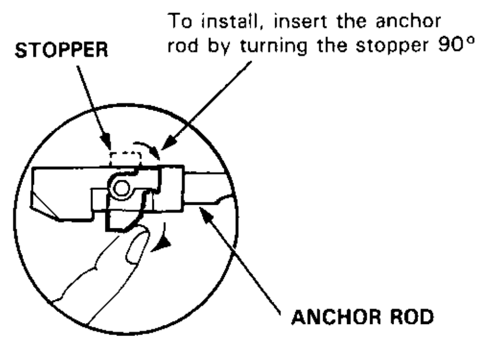
9. Separate the glass bracket, lifter, slide stopper link and slider.



NOTE: To install, apply multipurpose grease to the lifter and slide stopper link.

10. Slide the anchor rod forward, then remove it from the guide rail.





11. Installation is the reverse of the removal procedure.

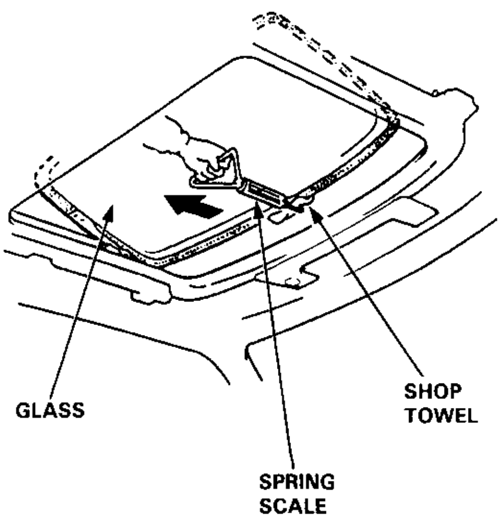
    NOTE:
    - Damaged parts should be replaced.
    - Apply grease to the sliding portion.

Opening Drag Check (Motor Removed)

Before installing the motor, measure the effort required to open the glass using a spring scale as shown.

CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

If load is over 40 N (4 kgf, 9 lbf), check side clearance and glass height adjustment (see page 20-78).

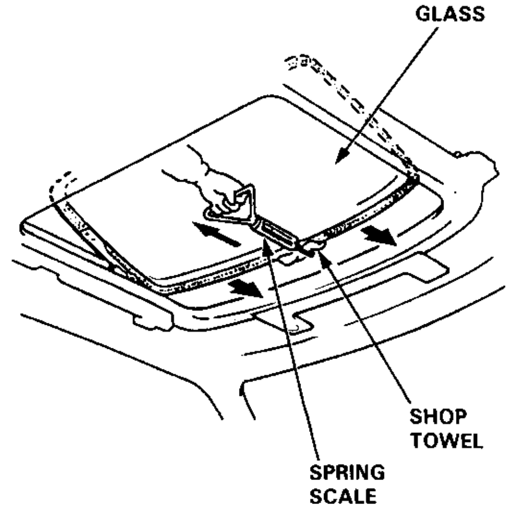


Closing Force Check (Motor Installed)

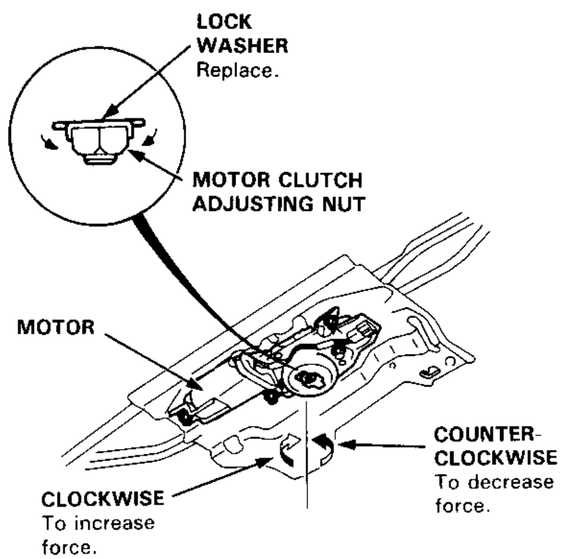
1. After installing all removed parts, have a helper hold the switch to close the glass while you measure force required to stop it. Attach a spring scale as shown. Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

   CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

   Closing Force: 200—290 N
   (20—30 kgf, 44—66 lbf)



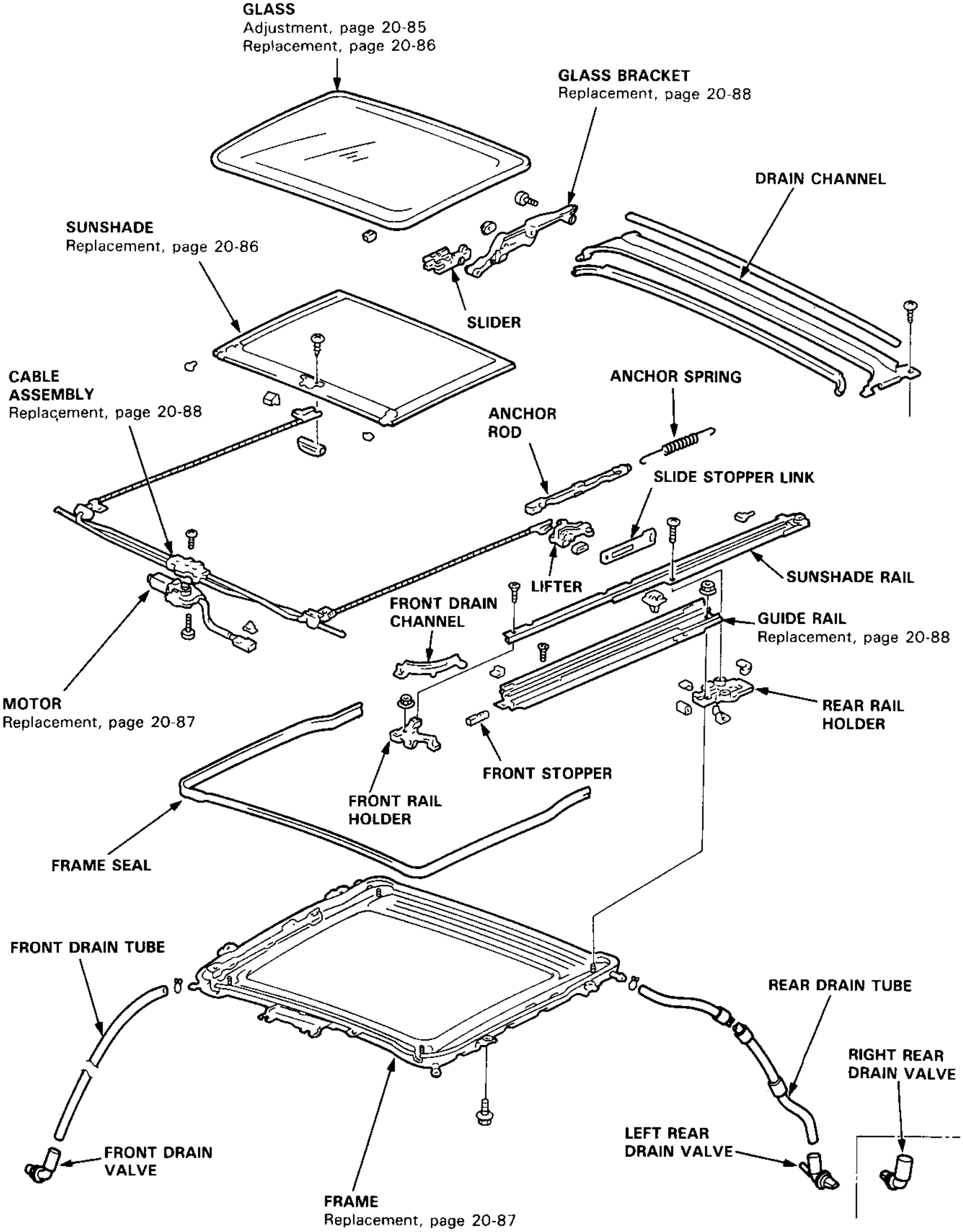
2. If the force is not within specification, install a new lock washer, adjust the tension by turning the motor clutch adjusting nut, and bend the lock washer against the motor clutch adjusting nut.



Moonroof

Index

Sedan



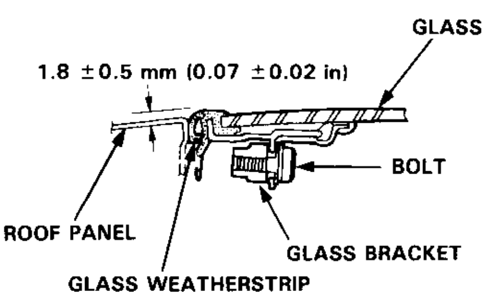
Troubleshooting

Symptom	Probable Cause
Water leaks	1. Clogged drain tube. 2. Gap between glass weatherstrip and roof panel. 3. Defective or improperly installed glass weatherstrip. 4. Gap between drain seal and roof panel.
Wind noise	1. Excessive clearance between glass weatherstrip and roof panel.
Motor noise	1. Loose motor. 2. Worn gear or bearing. 3. Cable assembly deformed.
Glass does not move, but motor turns	1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Cable assembly not attached properly.
Glass does not move and motor does not turn (glass can be moved with moonroof wrench)	1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor. 5. Faulty relay.

Glass Height Adjustment

The roof panel should be even with the glass weatherstrip, to within 1.8 ±0.5 mm (0.07 ±0.02 in) all the way around. If not, slide the sunshade back, and:

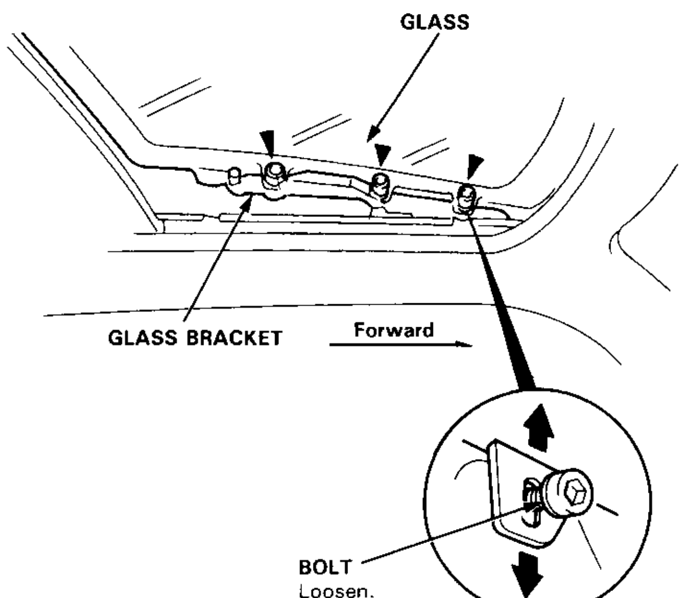
1. Tilt-up the glass.
2. Loosen the bolts and adjust the glass.
3. Repeat on opposite side if necessary.



4. Side-to-side fit of glass weatherstrip can be adjusted by loosening the frame mounting bolts and moving the frame right or left and forward or backward by hand (see page 20-87).

▼: Bolt locations, 6

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

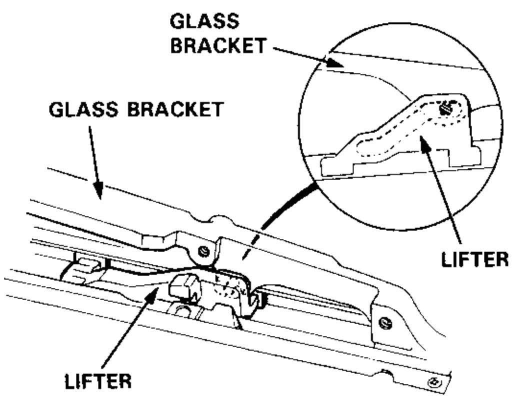


Moonroof

Rear Edge Closing Adjustment

Open the glass about a foot, then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against the roof panel, or too late and does not seat tightly enough, adjust it.

1. Remove the headliner (see page 20-100).
2. Remove the glass.
3. Remove the motor (see page 20-87).
4. Align the tilt-up position of the lifter on each side.



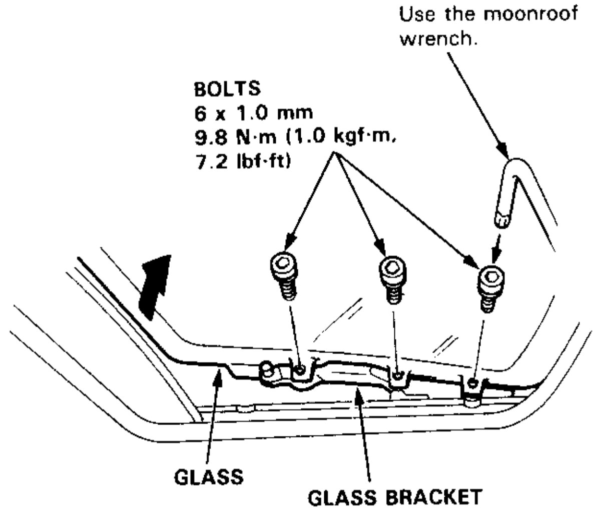
5. Check that the alignment left and right, then install the motor.
6. Install the glass, then check for water leaks.

   NOTE: Do not use high-pressure water.

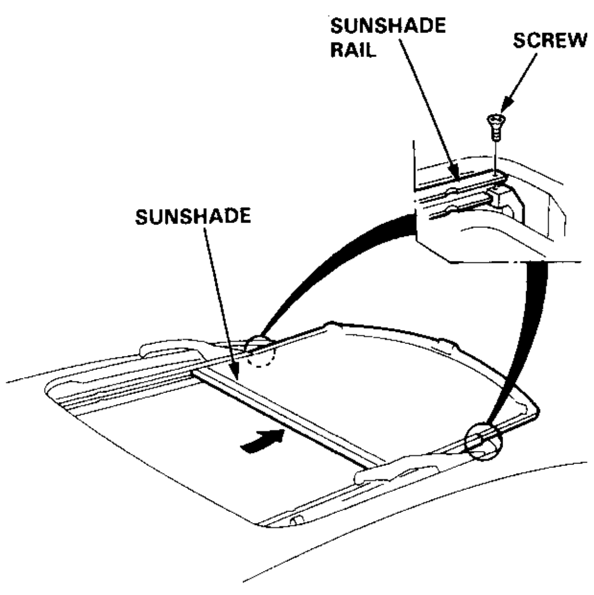
7. Install the headliner.

Glass and Sunshade Replacement

1. Open the sunshade.
2. Tilt-up the glass.
3. Remove the bolts, then remove the glass from the glass bracket.



4. Remove the screws and lift the sunshade rails.
5. Silde the sunshade forward, then remove the sunshade.



6. Installation is the reverse of the removal procedure.
7. Check for water leaks.

   NOTE: Do not use high-pressure water.

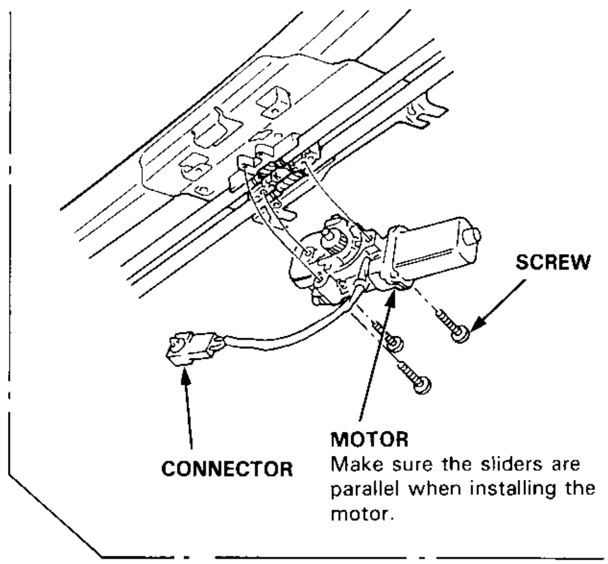
Motor, Drain Tube and Frame Replacement

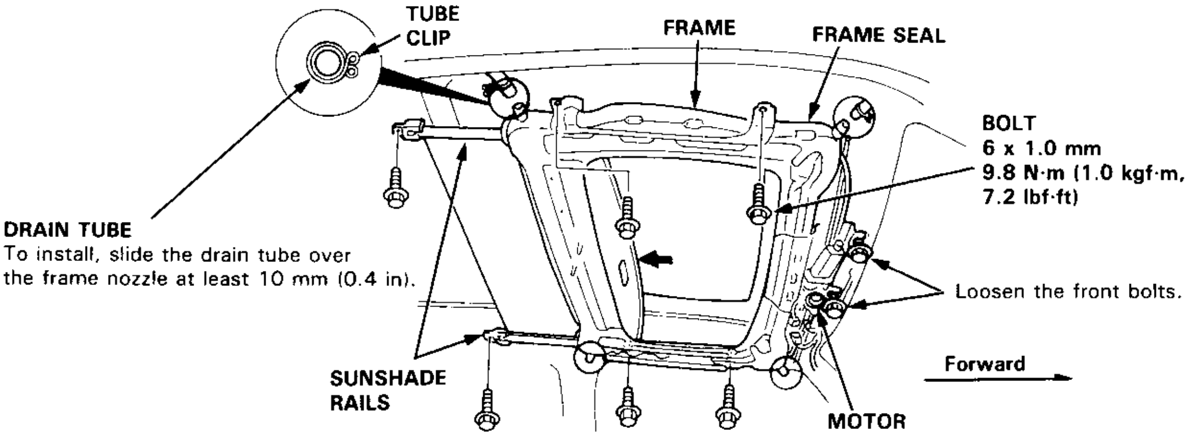
CAUTION: Be careful not to damage the seats, dashboard and other interior trim.

1. Remove the glass (see page 20-86) and headliner (see page 20-100).
2. Disconnect the motor connector, and remove the clips securing the ceiling light wire harness.

   NOTE: To remove the motor, remove the screws.
3. Disconnect the drain tubes.
4. Loosen the front bolts.
5. Remove the bolts, then remove the frame from the car.

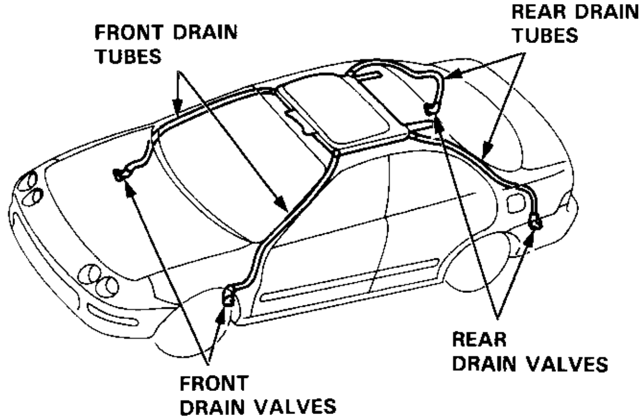
   NOTE:
   - You may require assistance when removing the frame.
   - Take care not to bend the sunshade rails.





6. Pull the drain tubes out of the front and rear pillars.

   NOTE: Before pulling out the drain tube, tie a string to the end of it so it can be reinstalled.



7. Installation is the reverse of the removal procedure.

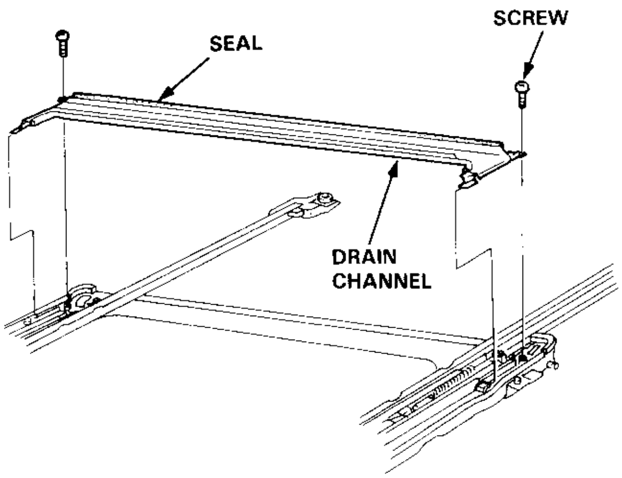
   NOTE:
   - Install the tube clips with the ends facing the side to ease installation of the headliner.
   - Clean the surface of the frame.
   - Check the frame seal.
   - Check for water leaks.
   - Make sure the sunshade moves smoothly.

Moonroof

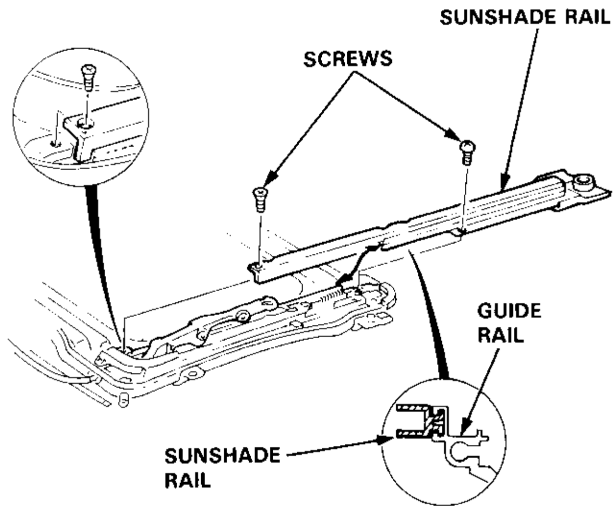
Glass Bracket/Slider, Lifter, Guide Rails and Cable Assembly Replacement —

1. Remove the frame (see page 20-87).
2. Remove the drain channel.

   NOTE: Take care not to damage, twist or lift the seal.

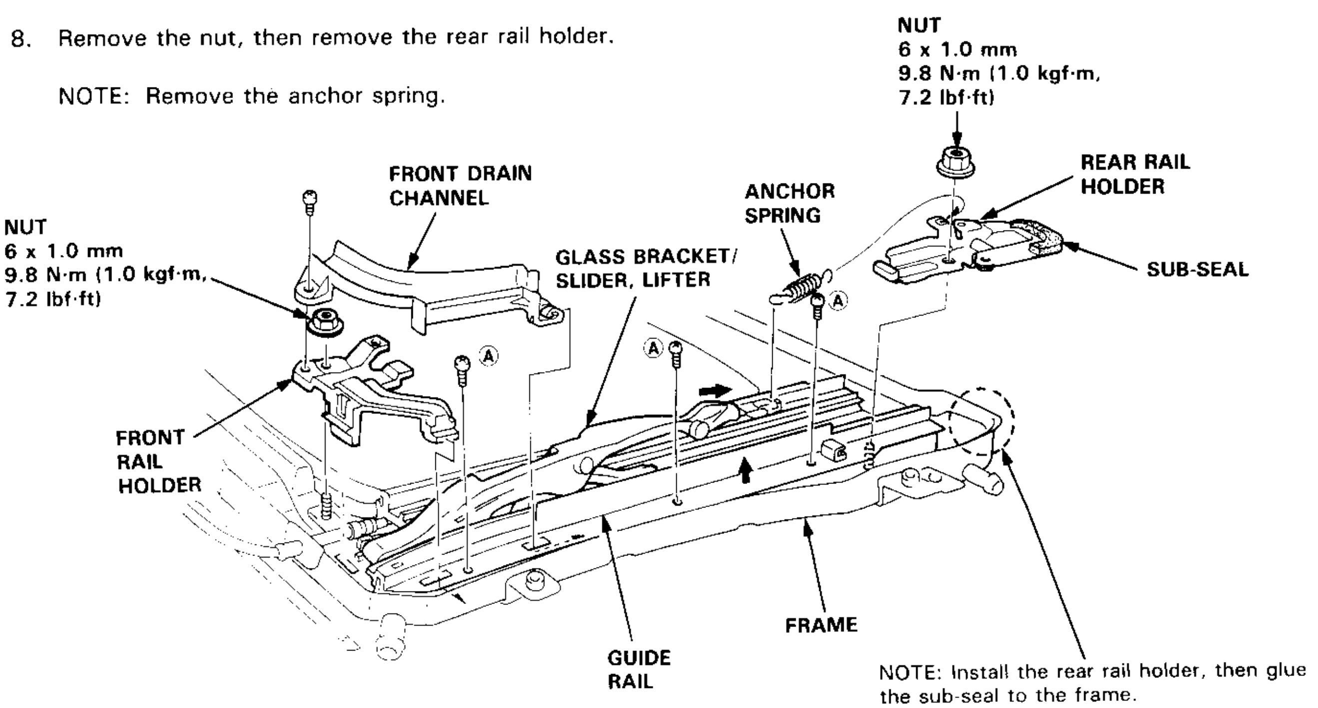


3. Remove the screws, then remove the sunshade rail by sliding it backward.



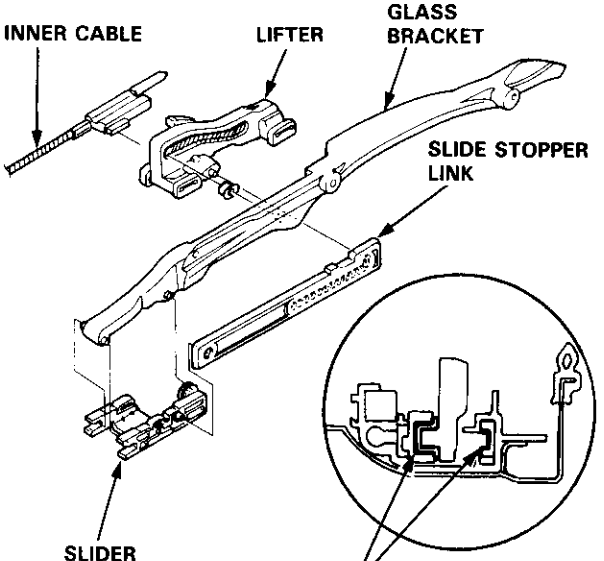
4. Remove the motor (see page 20-87).
5. Remove the front drain channel.
6. Remove the nut, then remove the front rail holder.
7. Remove the screws Ⓐ attaching the guide rail, then lift the guide rail.
8. Remove the nut, then remove the rear rail holder.

   NOTE: Remove the anchor spring.



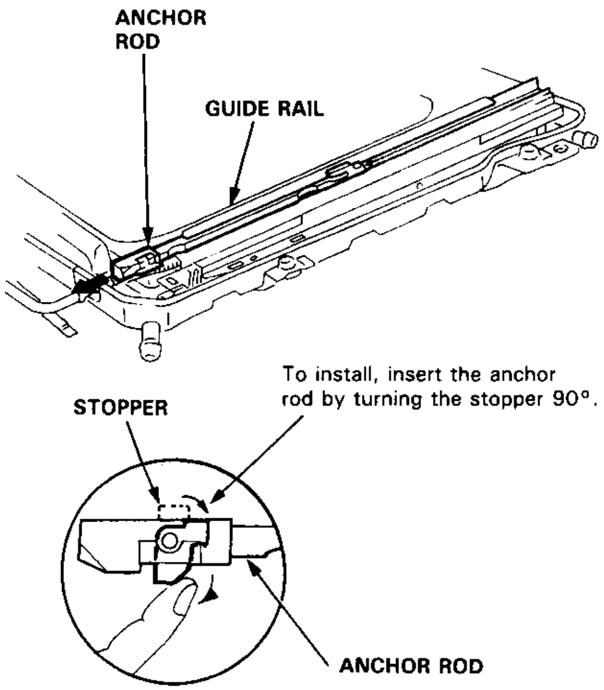
9. Slide the glass bracket/slider, lifter backward, then remove it.

10. Separate the glass bracket, lifter, slide stopper link and slider.



NOTE: To install, apply multipurpose grease to the lifter and slide stopper link.

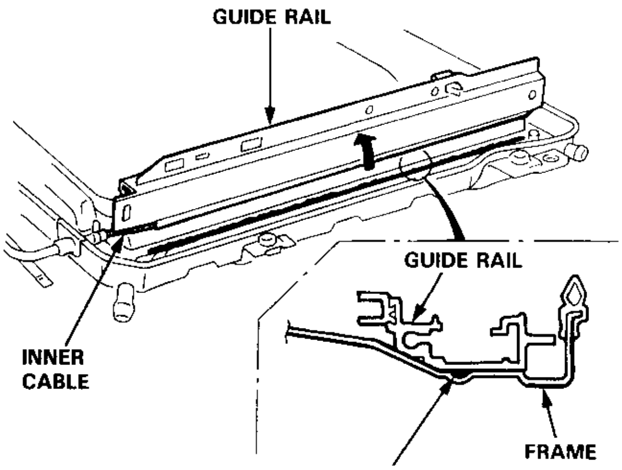
11. Slide the anchor rod forward, then remove it from the guide rail.



To install, insert the anchor rod by turning the stopper 90°.

12. Slide the guide rail backward, then remove the guide rail from the inner cable.

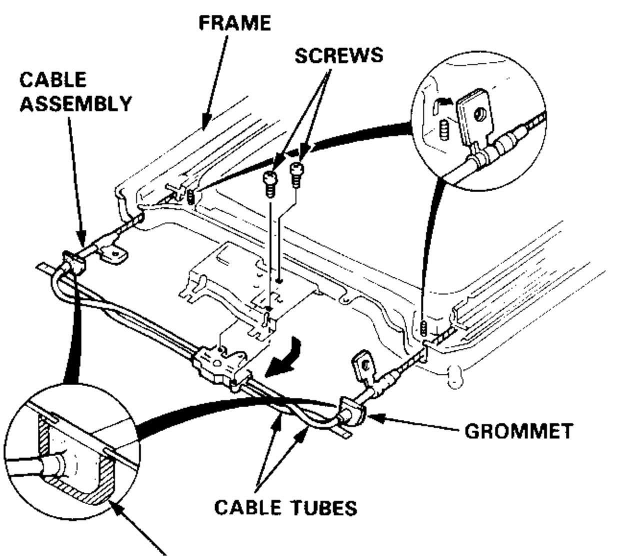
NOTE: To install, apply caulking to the guide rail mounting surface on the frame.



Apply caulking before installing the guide rail.

13. Remove the screws, then remove the cable assembly from the frame.

NOTE: Take care not to bend the cable tubes.



NOTE: To install, fill the groove in each grommet with sealant.

14. Installation is the reverse of the removal procedure.

NOTE:
- Damaged parts should be replaced.
- Apply grease to the sliding portion.

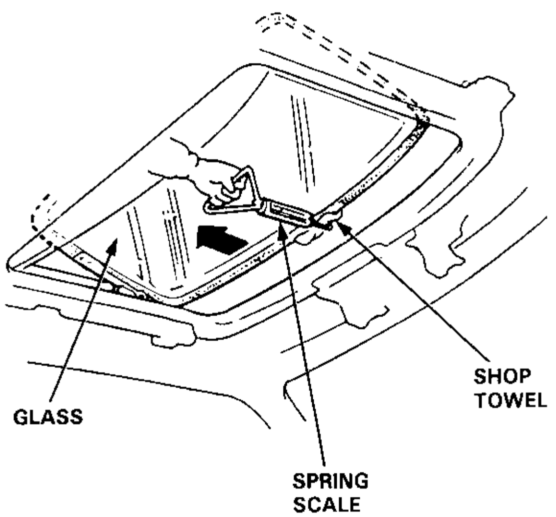
Moonroof

Opening Drag Check (Motor Removed)

Before installing the motor, measure the effort required to open the glass using a spring scale as shown.

CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

If load is over 40 N (4 kgf, 9 lbf), check side clearance and glass height adjustment (see page 20-85).

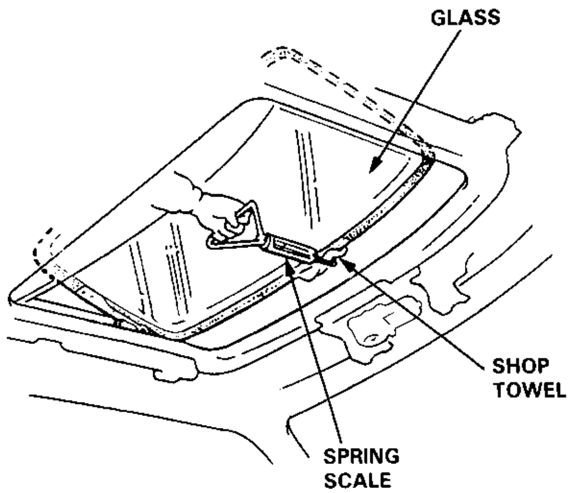


Closing Force Check (Motor Installed)

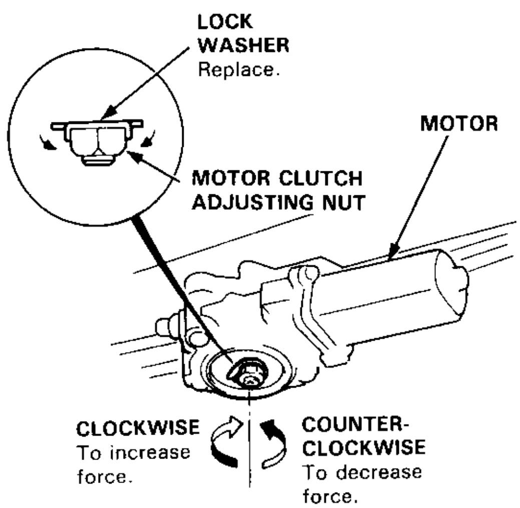
1. After installing all removed parts, have a helper hold the switch to close the glass while you measure force required to stop it. Attach a spring scale as shown. Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

   CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

   Closing Force: 200—290 N (20—30 kgf, 44—66 lbf)



2. If the force is not within specification, install a new lock washer, adjust the tension by turning the motor clutch adjusting nut, and bend the lock washer against the motor clutch adjusting nut.



Replacement

CAUTION:
- Wear gloves to remove and install the trim and panels.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

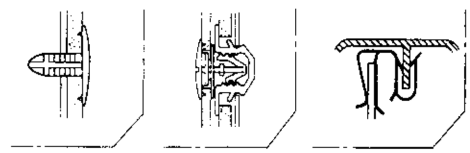
NOTE: Take care not to bend or scratch the trim and panels.

Kick panel/Front pillar trim removal:

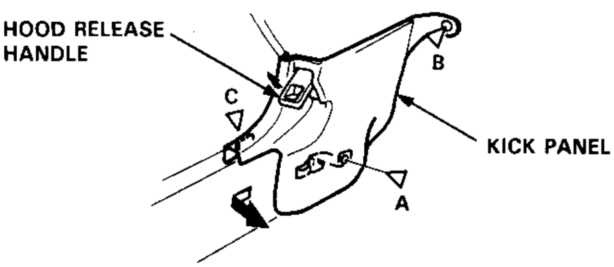
1. Remove the kick panel.

◁ : Clip locations

A◁: Clip, 1　B◁: Clip, 1　C▽: Clip, 1

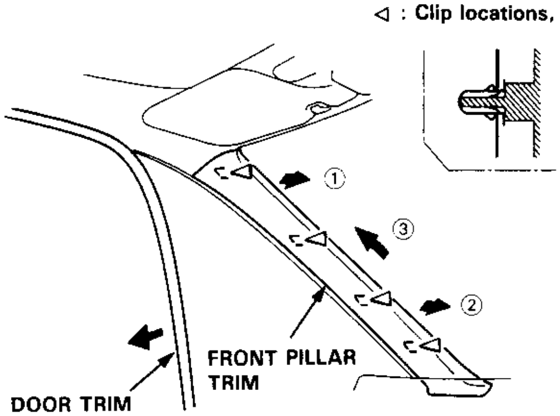


NOTE: Remove the driver's kick panel while pulling the hood release handle.



2. Pull the door trim back, then remove the front pillar trim.

◁ : Clip locations, 4



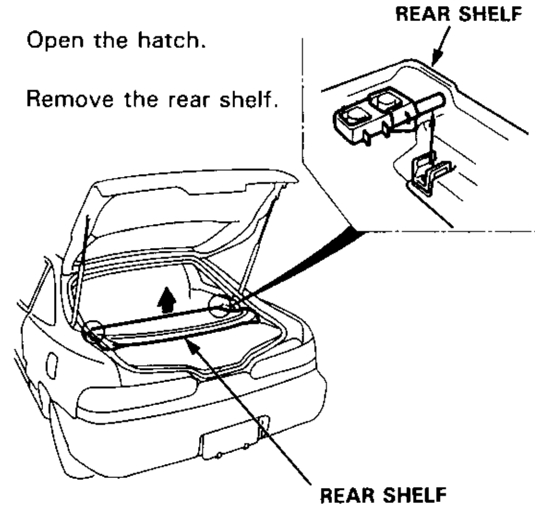
3. Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

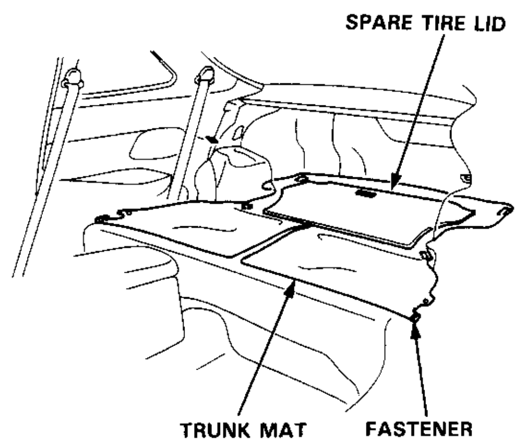
Hatchback

Rear trim panel/Side trim panel/Quarter pillar trim panel removal:

1. Open the hatch.
2. Remove the rear shelf.



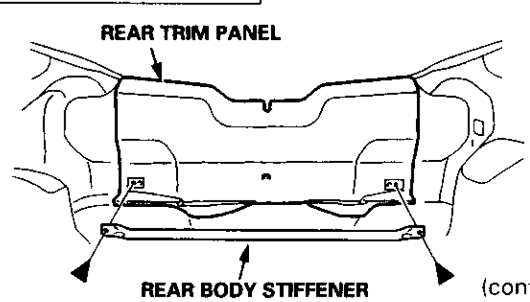
3. Remove the rear seat (see page 20-110).
4. Remove the trunk mat and spare tire lid.



5. Remove the rear body stiffener (Type R).

▶: Bolt locations, 2

8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)



(cont'd)

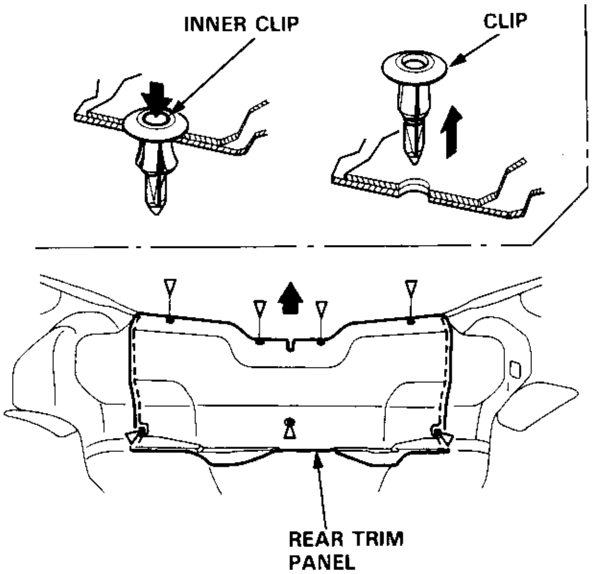
Replacement (cont'd)

6. Remove the rear trim panel.

▽ : Clip locations, 7

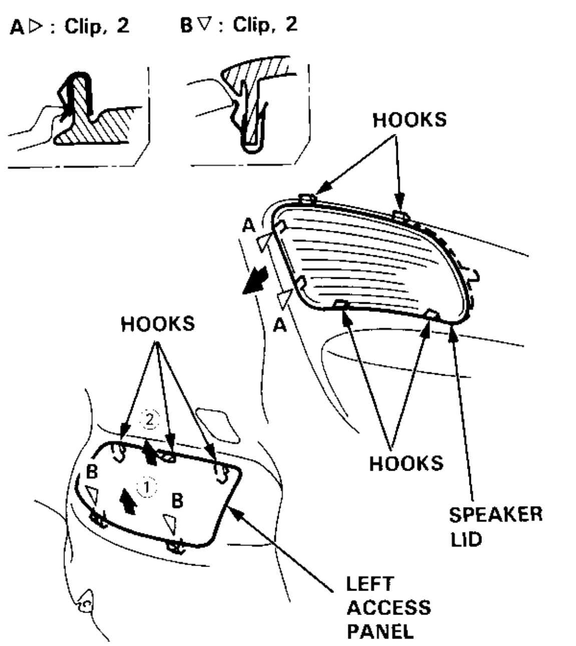
1) Push the inner clip.
NOTE: Do not push it in too far.

2) Detach the clip by pulling it.



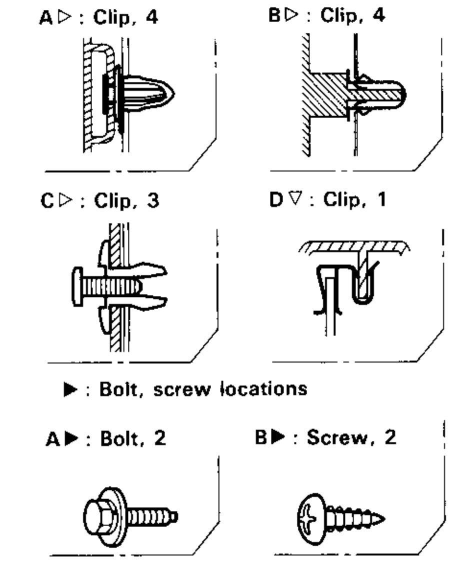
7. Remove the speaker lid and left access panel from the side trim panel.

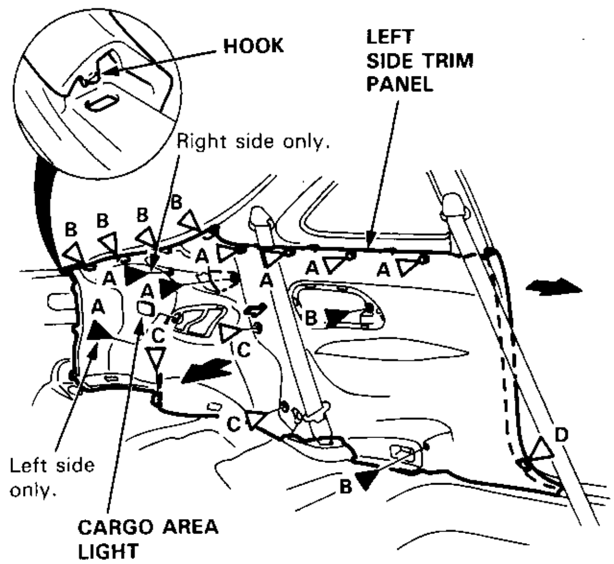
▷ : Clip locations



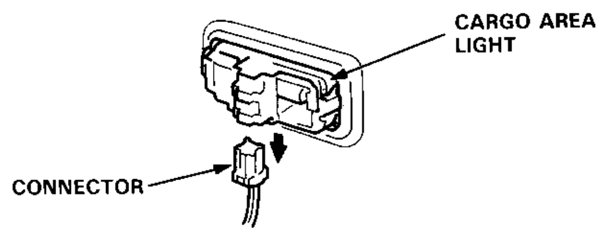
8. Remove the side trim panel.

▷ : Clip locations





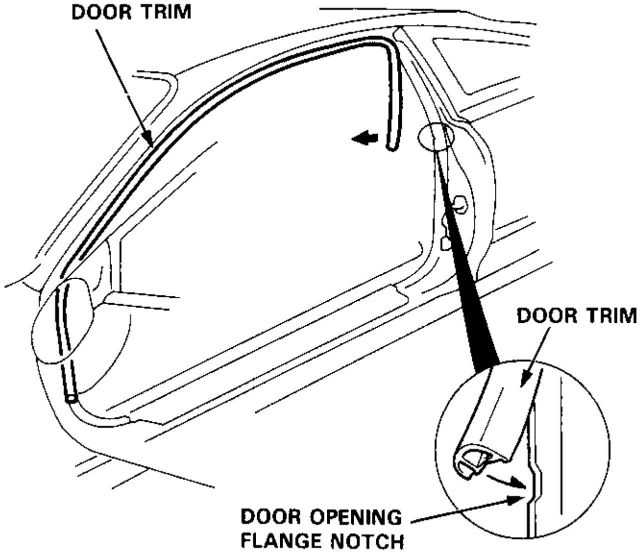
NOTE: Disconnect the cargo area light connector from the left side trim panel.



9. Remove the upper anchor bolts from the front and rear seat belts (see pages 20-117, 121)

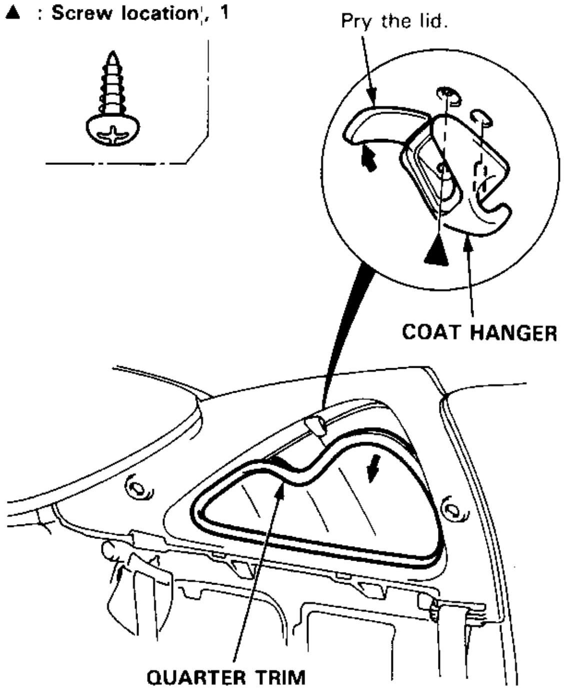
10. Remove the door trim.

    NOTE: When installing the door trim, align it with the door opening flange notch.



11. Remove the quarter trim and coat hanger (left side).

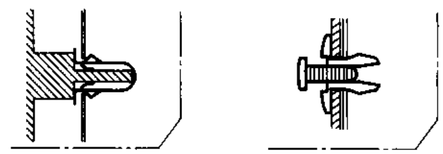
▲ : Screw location, 1



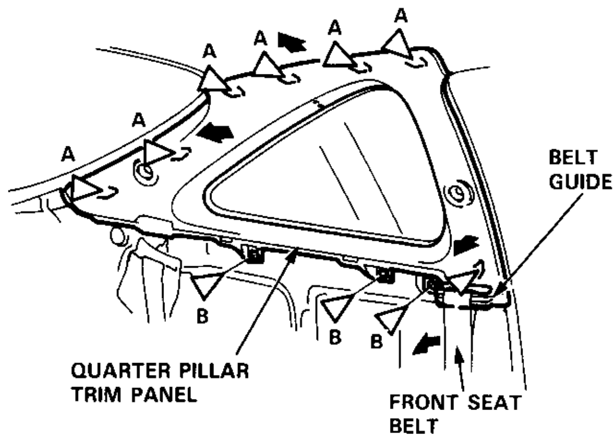
12. Remove the quarter pillar trim panel.

▷ : Clip locations

A▷ : Clip, 7   B▷ : Clip, 3



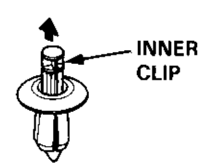
NOTE: Remove the front seat belt from the belt guide.



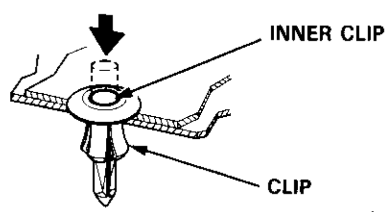
13. Installation is the reverse of the removal procedure.

    NOTE:
    - If necessary, replace any damaged clips.
    - When installing the side trim panel, make sure there are no twists or kinks in the front and rear seat belts.
    - When installing the rear trim panel, install the clips as follows.

    —1) Pull the inner clip up as shown.



    —2) Install the clip in the rear trim panel, then push the inner clip until it's flush.



(cont'd)

Interior Trim

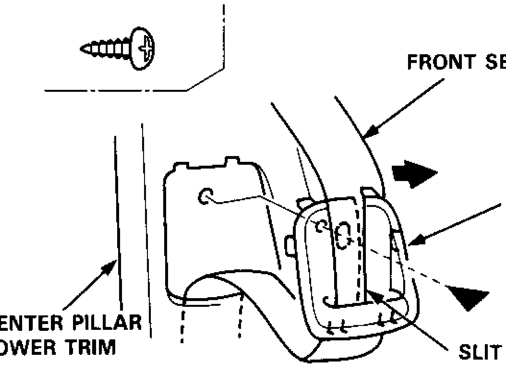
Replacement (cont'd)

Sedan

Center pillar lower trim/Center pillar trim removal:

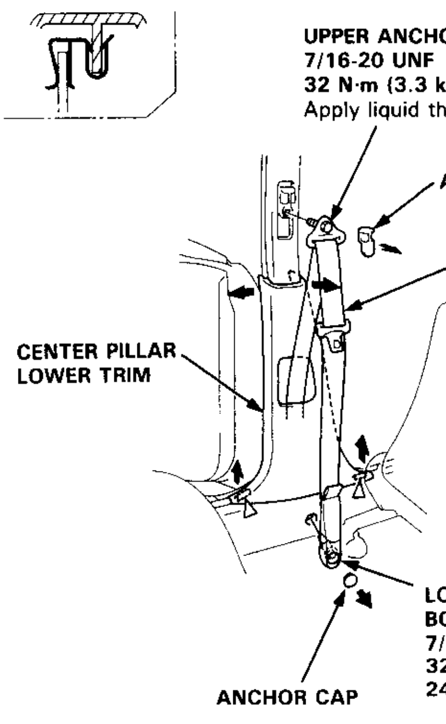
1. Remove the belt hole cap, then slip the front seat belt through the slit in the belt hole cap.

◀ : Screw location, 1



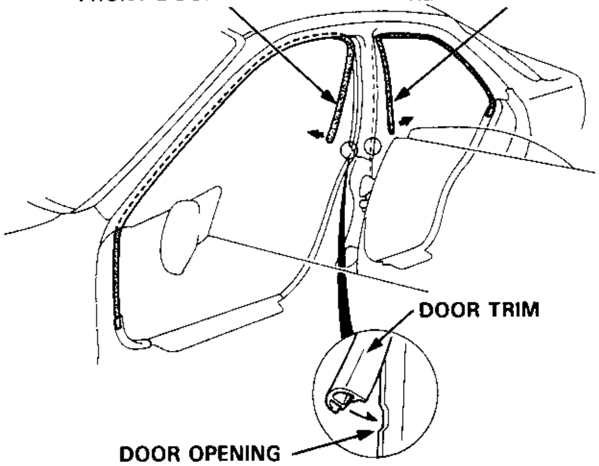
2. Remove the upper and lower anchor bolts from the front seat belt, then remove the center pillar lower tirm.

△ : Clip locations, 2



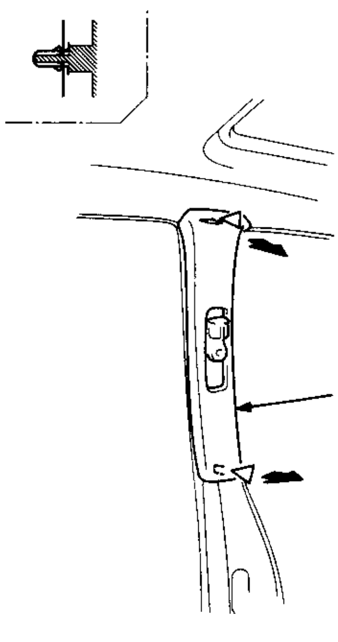
3. Remove the front and rear door trim.

   NOTE: When installing the front and rear door trim, align them with the door opening flange notch.



4. Remove the center pillar trim.

◁ : Clip locations, 2



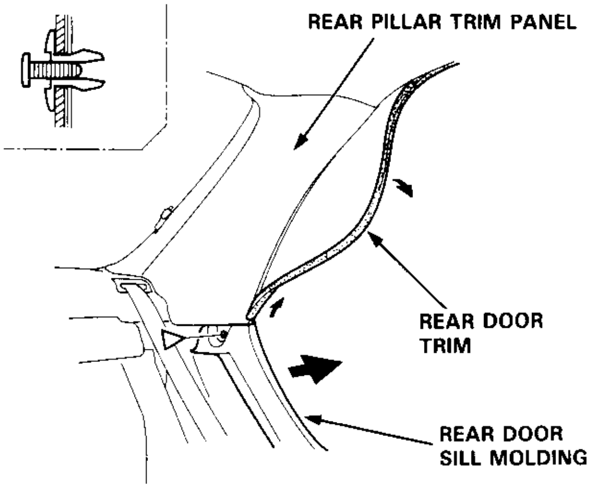
5. Installation is the reverse of the removal procedure.

   NOTE:
   - If necessary, replace any damaged clips.
   - Before attaching the center pillar lower trim and belt hole cap, make sure there are no twists or kinks in the front seat belt.

Rear pillar trim panel/Rear shelf trim panel/Rear shelf removal:

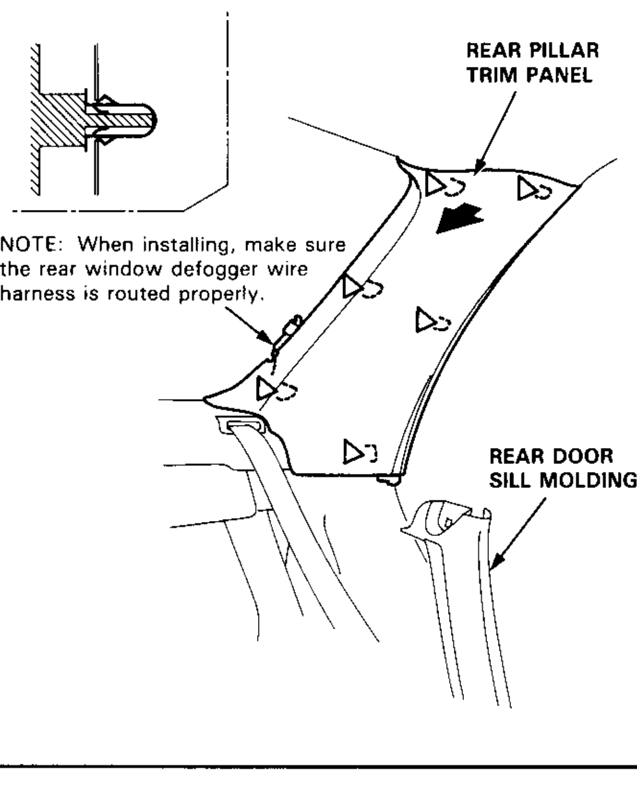
1. Remove both seat-back side bolsters (see page 20-113).
2. Remove the upper portion of the rear door sill molding, then pull the rear door trim away on each side.

▷ : **Clip locations, 2**



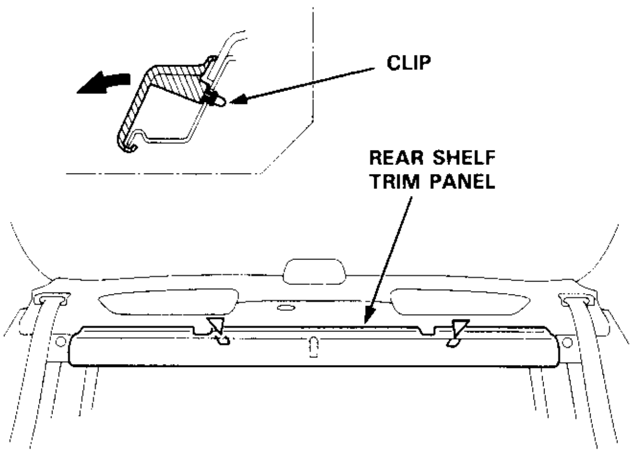
3. Remove both rear pillar trim panels.

▷ : **Clip locations, 12**

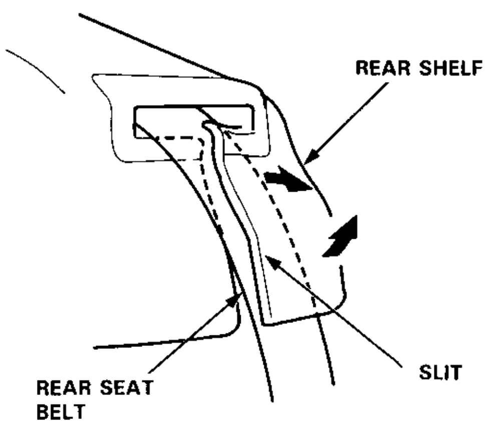


4. Remove the rear shelf trim panel.

▽ : **Clip locations, 2**



5. Slip the rear seat belt through the slit in the rear shelf.



6. Remove the seat lock cover (see page 20-113) and high mount brake light (see section 23).

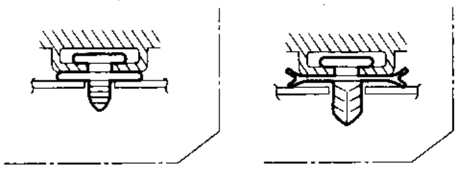
(cont'd)

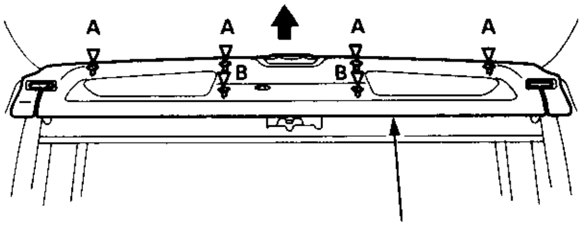
Replacement (cont'd)

7. Remove the rear shelf.

▽ : **Clip locations**

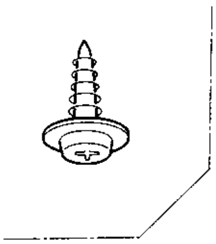
A▽ : **Clip, 4** B▽ : **Clip, 2**

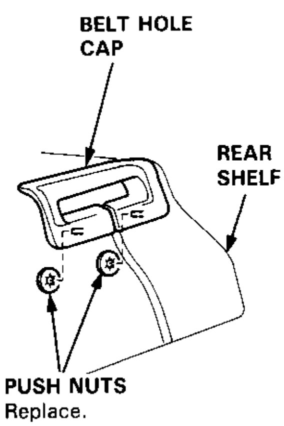


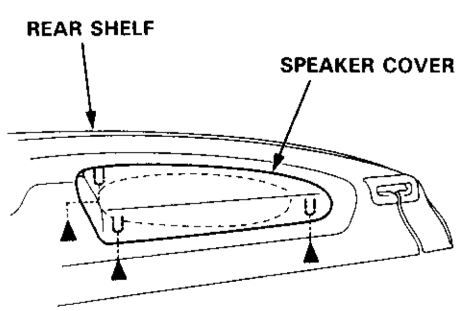


8. If necessary, remove the belt hole cap and speaker cover from the rear shelf.

▲ : **Screw locations, 3**







9. Installation is the reverse of the removal procedure.

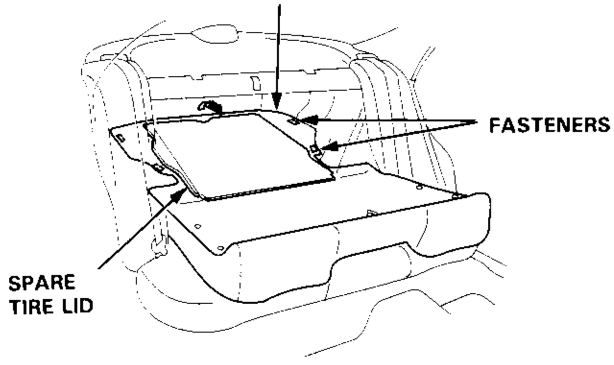
NOTE:
- If necessary, replace any damaged clips.
- When installing the rear shelf, make sure there are no twists or kinks in the rear seat belt.

Trunk Trim

Replacement

NOTE: Take care not to bend or scratch the panels.

1. Fold the rear seat-back forward.
2. Lift the trunk mat, then remove the spare tire lid.



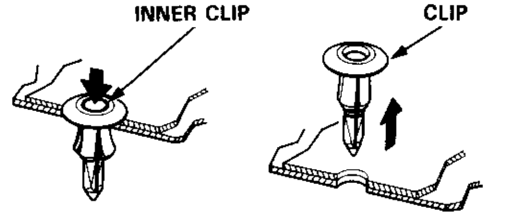
3. Remove the clips, then remove the rear trim panel.

▽ : Clip locations

A▽ : Clip, 4

–1) Push the inner clip.
NOTE: Do not push it in too far.

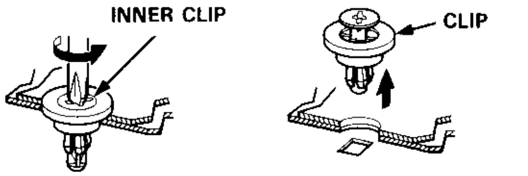
–2) Detach the clip by pulling it.

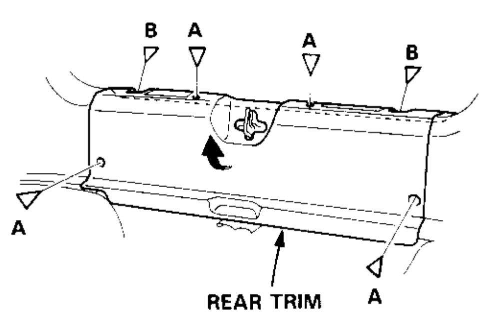


B▽ : Clip, 2

–1) Loosen the inner clip.

–2) Detach the clip by pulling it.



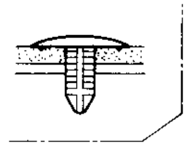


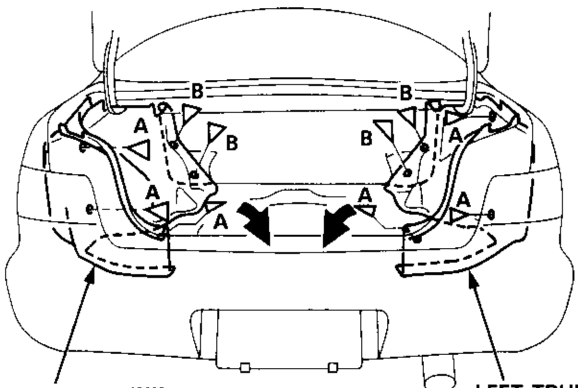
4. Remove the clips, then remove the trunk side panel on each side.

NOTE: The clips on the trunk side panel can be removed in the same way as those on the rear trim panel.

◁ : Clip locations

A◁ : Clip, 6
B▽ : Clip, 4

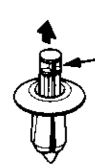




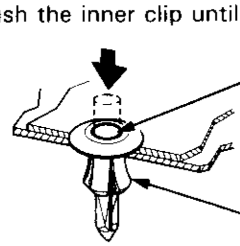
5. Installation is the reverse of the removal procedure.

NOTE:
- If necessary, replace any damaged clips.
- When installing the rear trim panel, install the A clips as follows.

–1) Pull the inner clip up as shown.



–2) Install the clip in the rear trim panel, then push the inner clip until it's flush.



Replacement

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

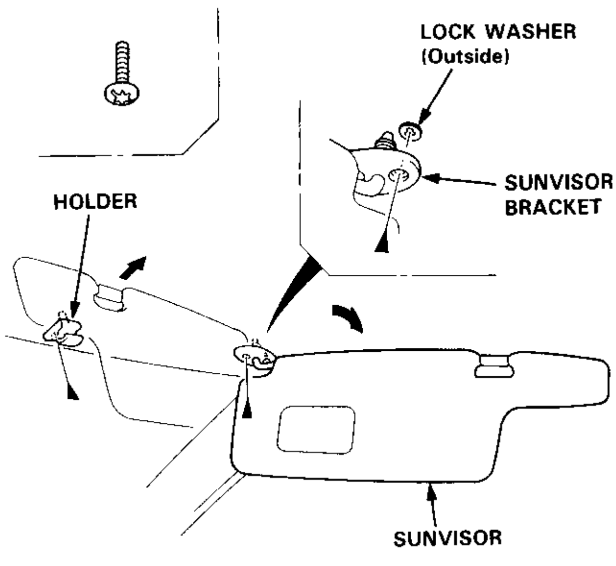
NOTE:
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.
- Fold the front seat-back backward.

Hatchback

1. Remove:
   - Door trim (see page 20-93)
   - Front pillar trim (see page 20-91)
   - Quarter trim (see page 20-93)
   - Coat hanger (see page 20-93)
   - Rearview mirror (see page 20-52)

2. Remove the sunvisor and holder from each side.

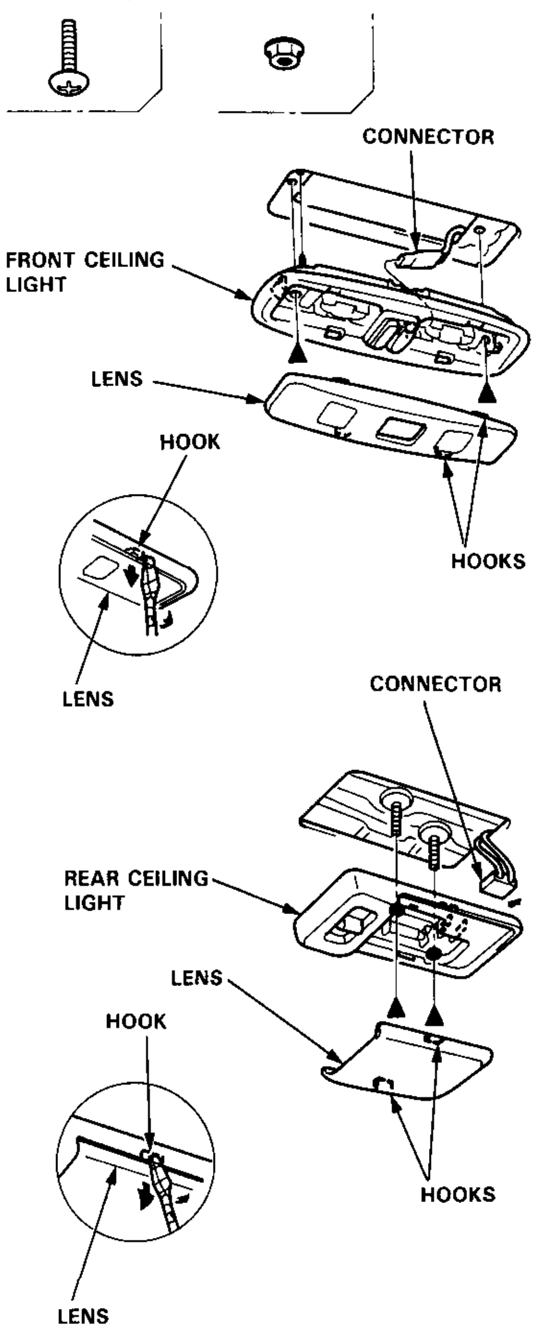
▲ : Screw locations, 6



3. Remove the front and rear ceiling lights, then disconnect the connectors.

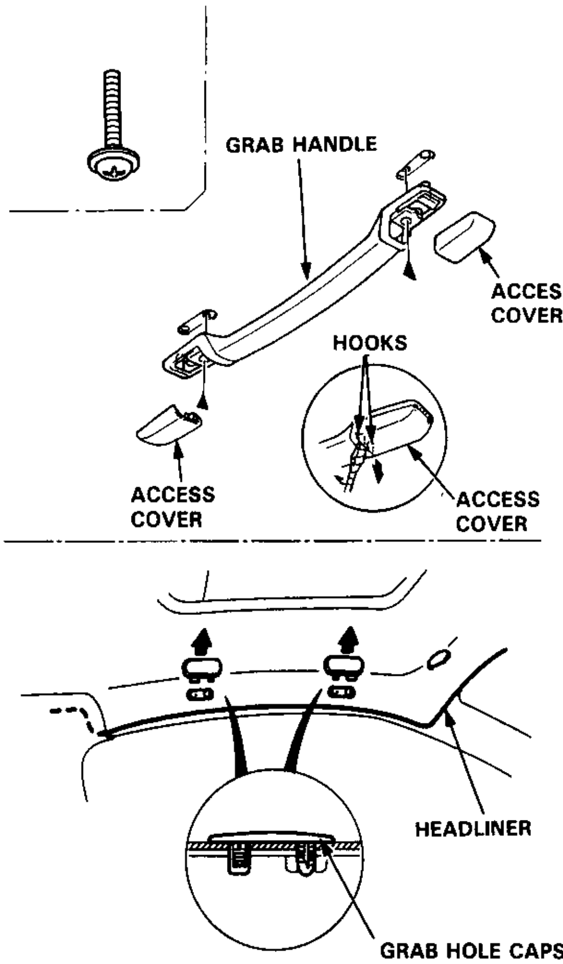
▲ : Screw, nut locations

A▲ : Screw, 2 B▲ : Nut, 2

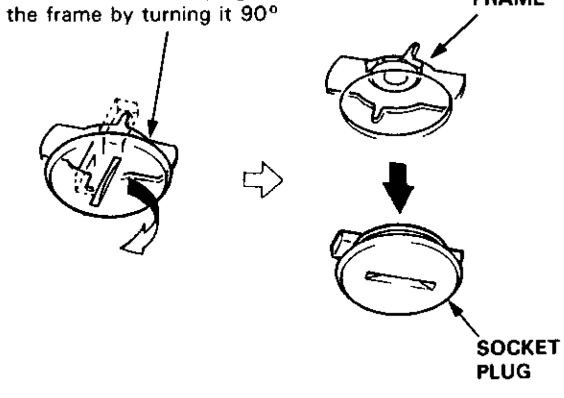


4. Remove the grab handle (front passenger's) and grab hole caps (driver's).

▲ : Screw locations, 2



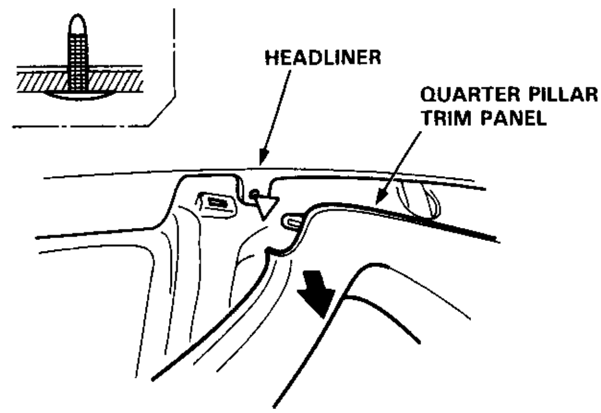
5. Remove the socket plug (moonroof model).



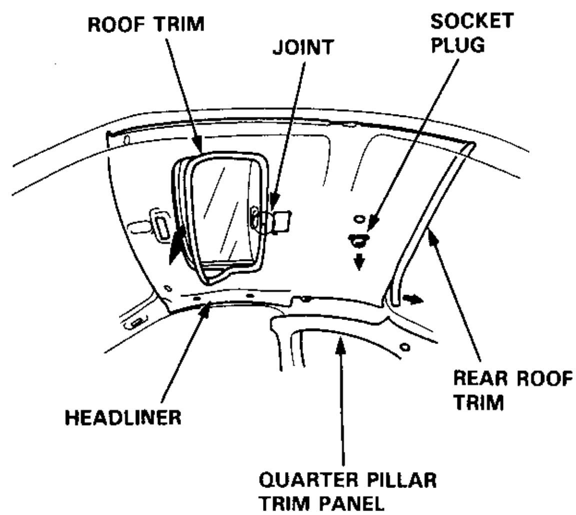
6. Remove the upper anchor bolts from the front and rear seat belts (see pages 20-117, 121).

7. Remove the upper portion of the quarter pillar trim panel, then detach the headliner clip on each side.

△ : Clip locations, 2



8. Remove the roof trim (moonroof model).
Open the hatch, then remove the rear roof trim.
Remove the headliner.



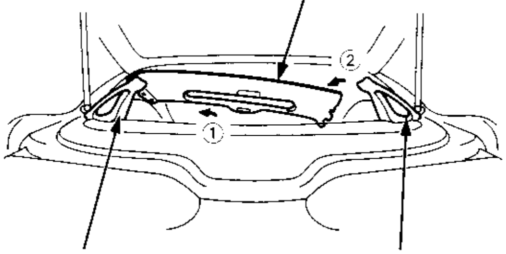
(cont'd)

Headliner

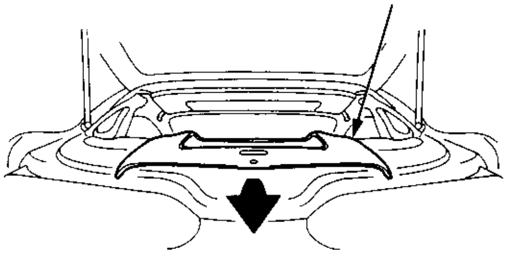
Replacement (cont'd)

9. Lower the headliner as shown.

   NOTE: Take care not to bend and scratch the headliner.



10. Remove the headliner through the hatch opening.



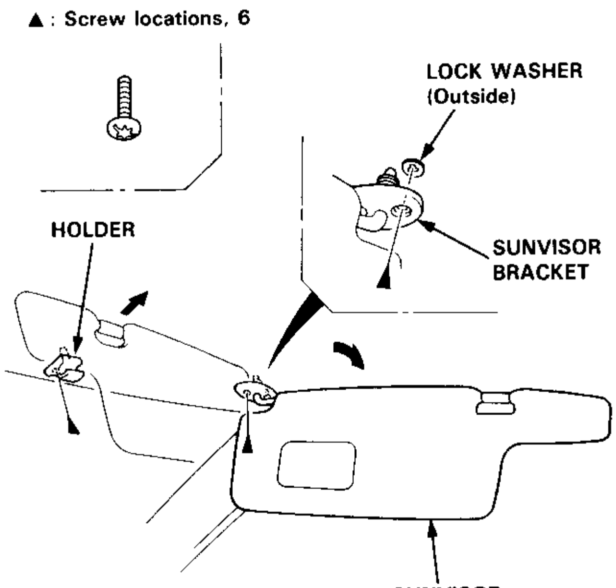
11. Installation is the reverse of the removal procedure.

    NOTE:
    - When inserting the headliner through the hatch opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
    - Check that both sides of the headliner are securely attached to the trim and panels.
    - When installing the roof trim, install the joint toward the rear.

Sedan

1. Remove:
   - Center pillar lower trim (see page 20-94)
   - Front and rear door trim (see page 20-94)
   - Front pillar trim (see page 20-91)
   - Center pillar trim (see page 20-94)
   - Rear pillar trim panel (see page 20-95)
   - Rearview mirror (see page 20-52)

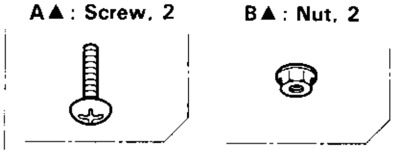
2. Remove the sunvisor and holder from each side.

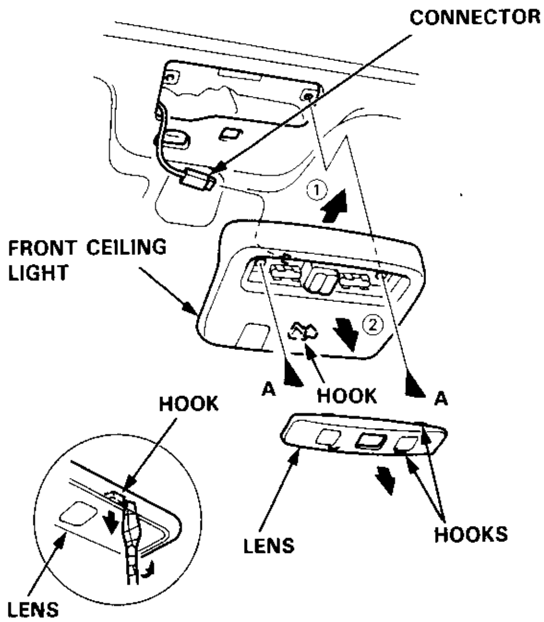


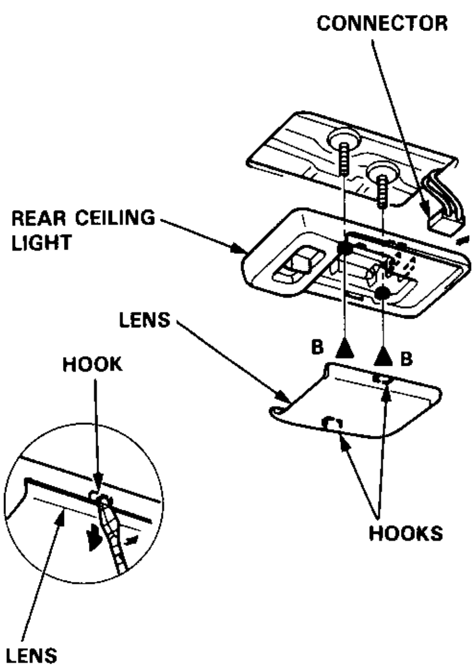
3. Remove the front and rear ceiling lights, then disconnect the connectors.

▲ : Screw, nut locations

A▲ : Screw, 2 B▲ : Nut, 2

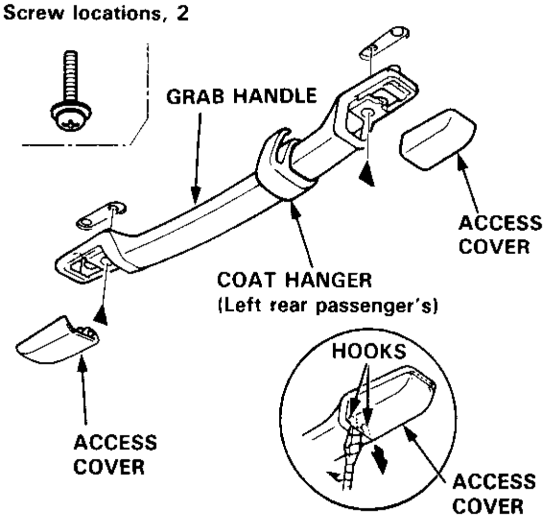


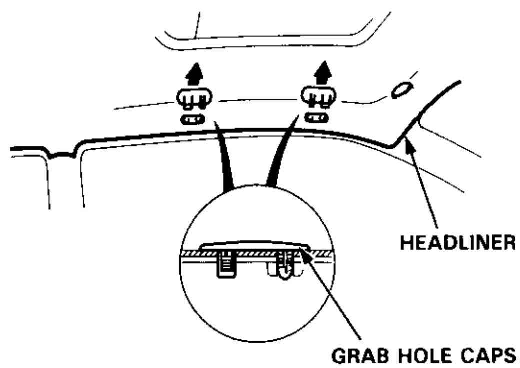




4. Remove the grab handles (front and rear passenger's) and grab hole caps (driver's).

▲ : Screw locations, 2





(cont'd)

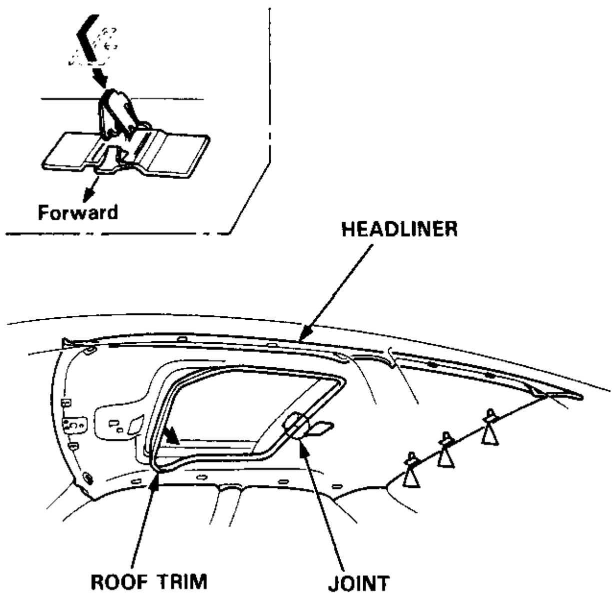
Headliner

Replacement (cont'd)

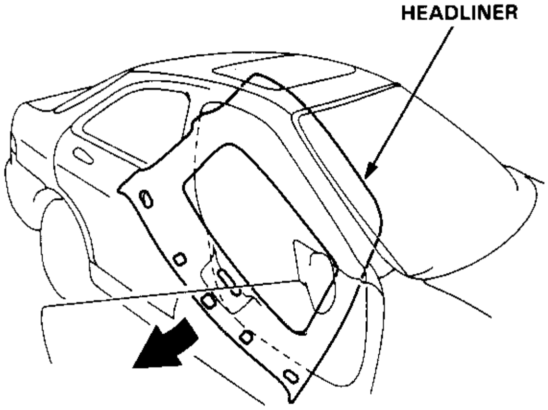
5. Remove the roof trim (moonroof model).

6. Detach the clips by sliding the headliner forward.

△ : Clip locations, 3



7. Remove the headliner through the passenger's door opening.



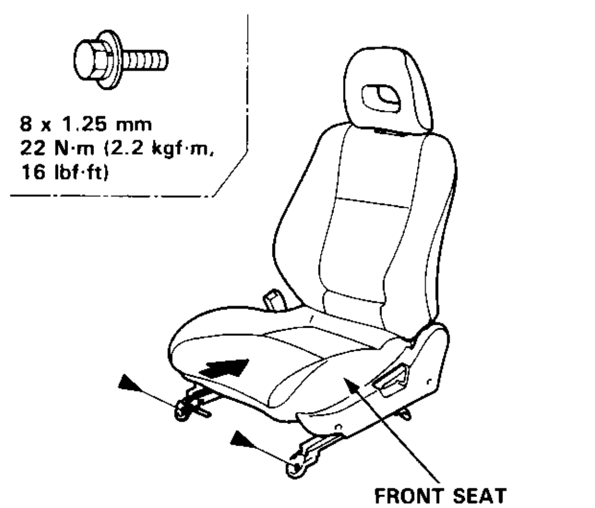
8. Installation is the reverse of the removal procedure.

   NOTE:
   - When inserting the headliner through the door opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
   - Check that both sides of the headliner are securely attached to the trim and panels.
   - When installing the roof trim, install the joint toward the rear.

Front Seat Removal

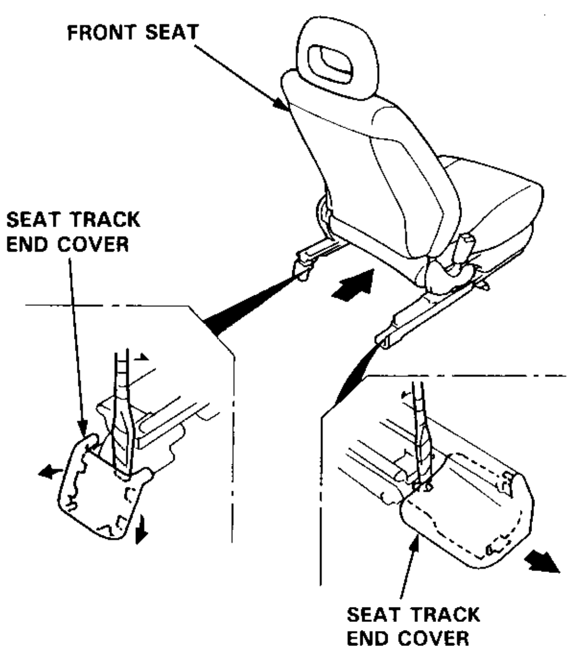
NOTE: Take care not to scratch the seat covers and body.

1. Slide the front seat backward, then remove the bolts.

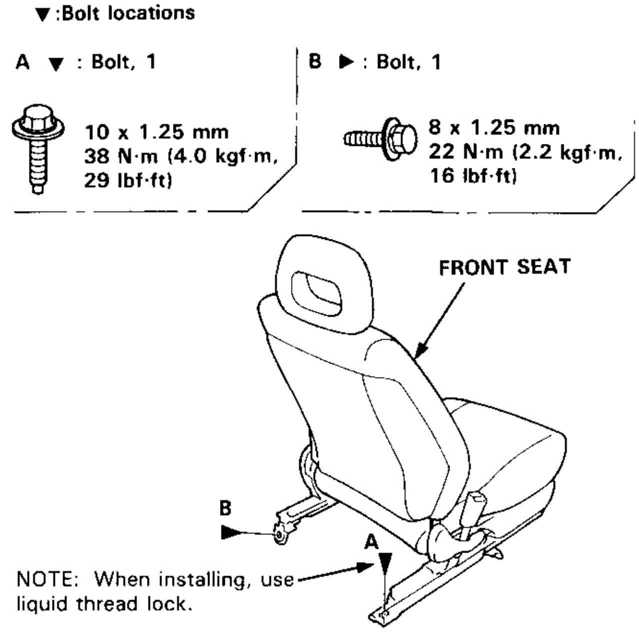


2. Slide the front seat forward, then remove the seat track end covers.

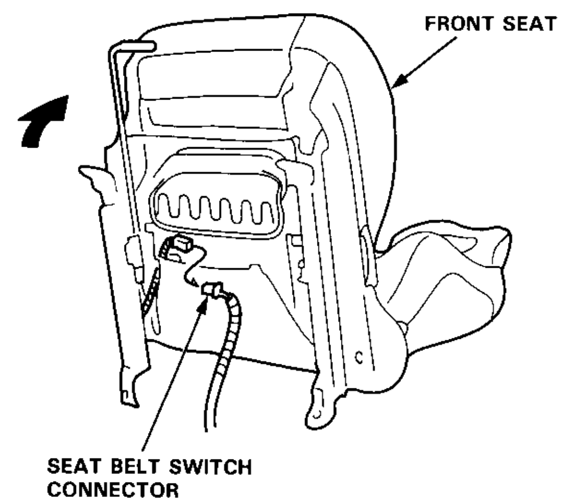
CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.



3. Remove the bolts.



4. Lift the front seat, then disconnect the seat belt switch connector (driver's).

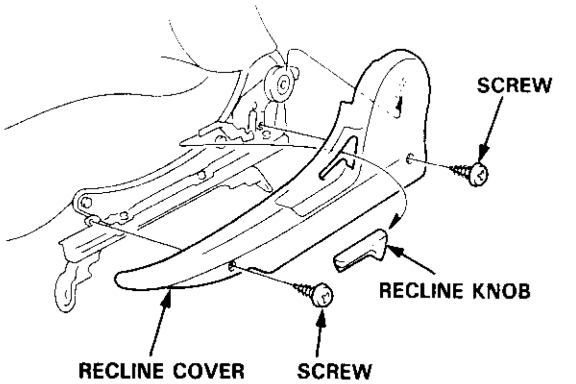


5. Carefully remove the front seat through the door opening.
6. Installation is the reverse of the removal procedure.

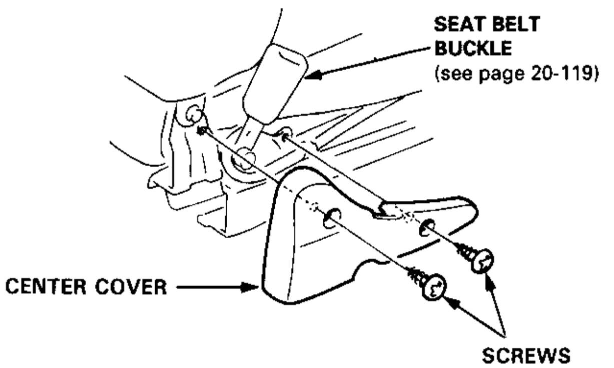
Front Seat Replacement

NOTE: Take care not to scratch the seat covers and body.

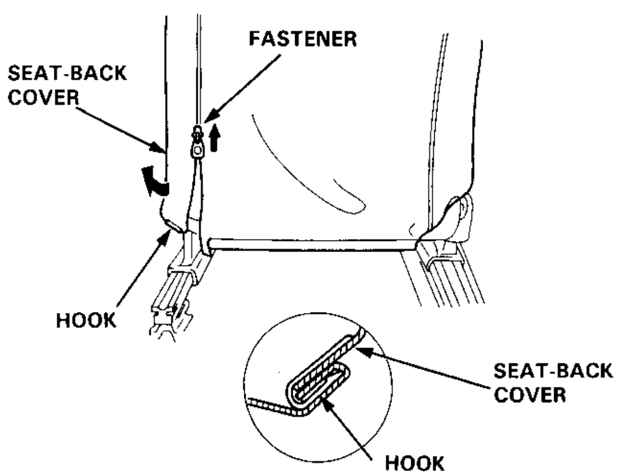
1. Remove the front seat through the door opening (see page 20-103).
2. Remove the screws and recline knob, then remove the recline cover.



3. Remove the screws, then remove the center cover.

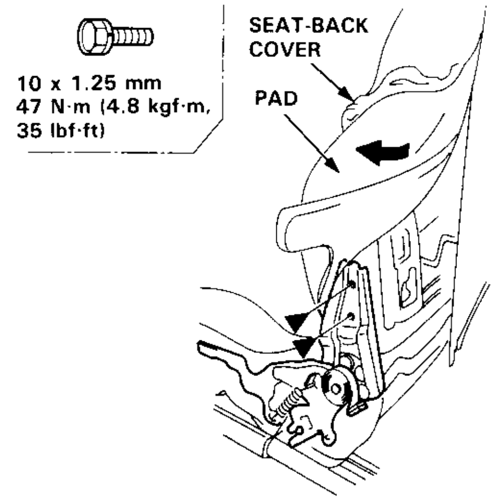


4. Remove the hook and fastener, then fold the seat-back cover back.

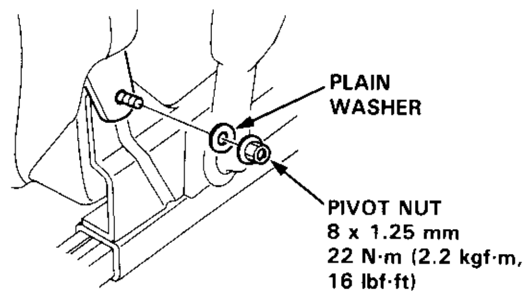


5. Fold the seat-back cover and pad, then remove the bolts.

▶ : Bolt locations, 2

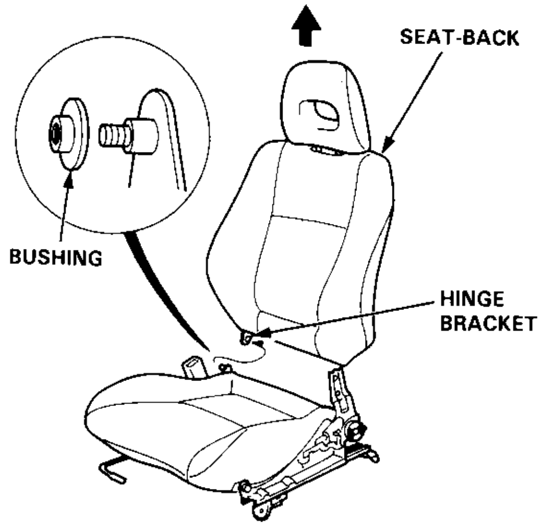


6. Remove the pivot nut.



7. Remove the seat-back.

NOTE: Take care not to bend the hinge bracket.

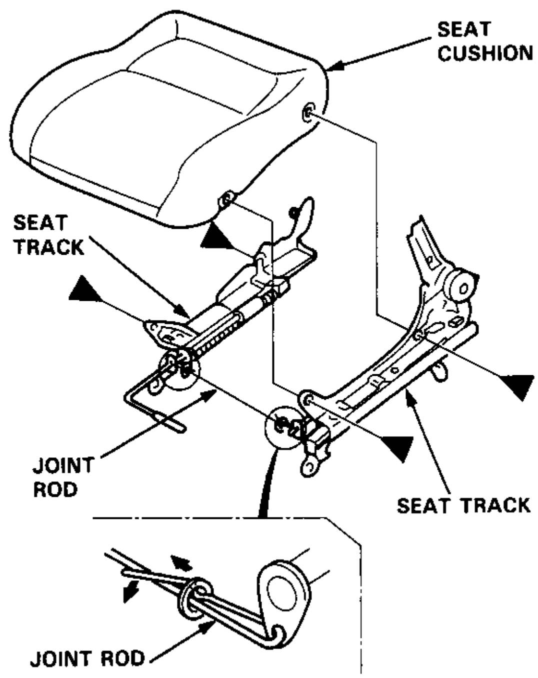


8. Separate the seat cushion and seat tracks.

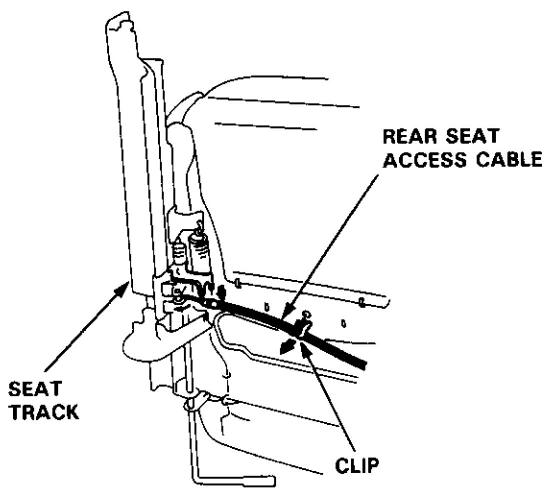
NOTE:
- Before separating, slide the seat cushion backward.
- Take care not to bend the joint rod.

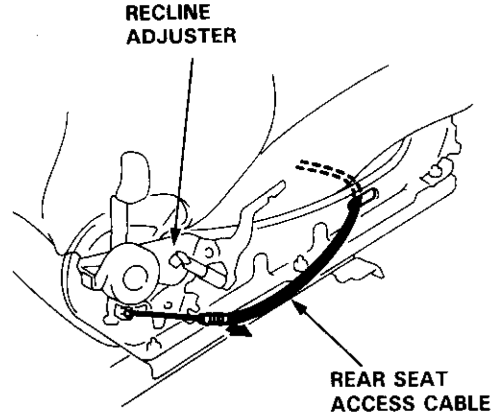
◄ : Bolt locations, 4

10 x 1.25 mm
47 N·m (4.8 kgf·m, 35 lbf·ft)



- Disconnect the rear seat access cable (hatchback passenger's).





9. Separate the seat track and recline adjuster.

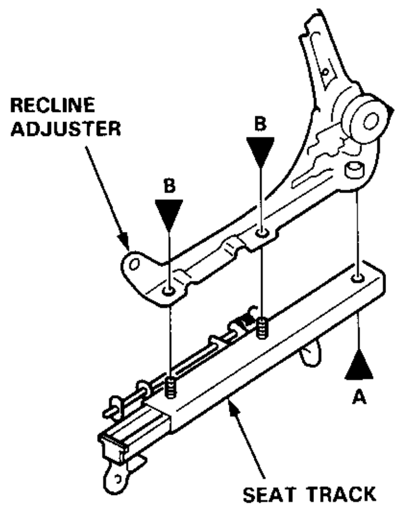
▲ : Bolt, nut locations

A▲ : Bolt, 1

8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

B▼ : Nut, 2

8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)



10. Installation is the reverse of the removal procedure.

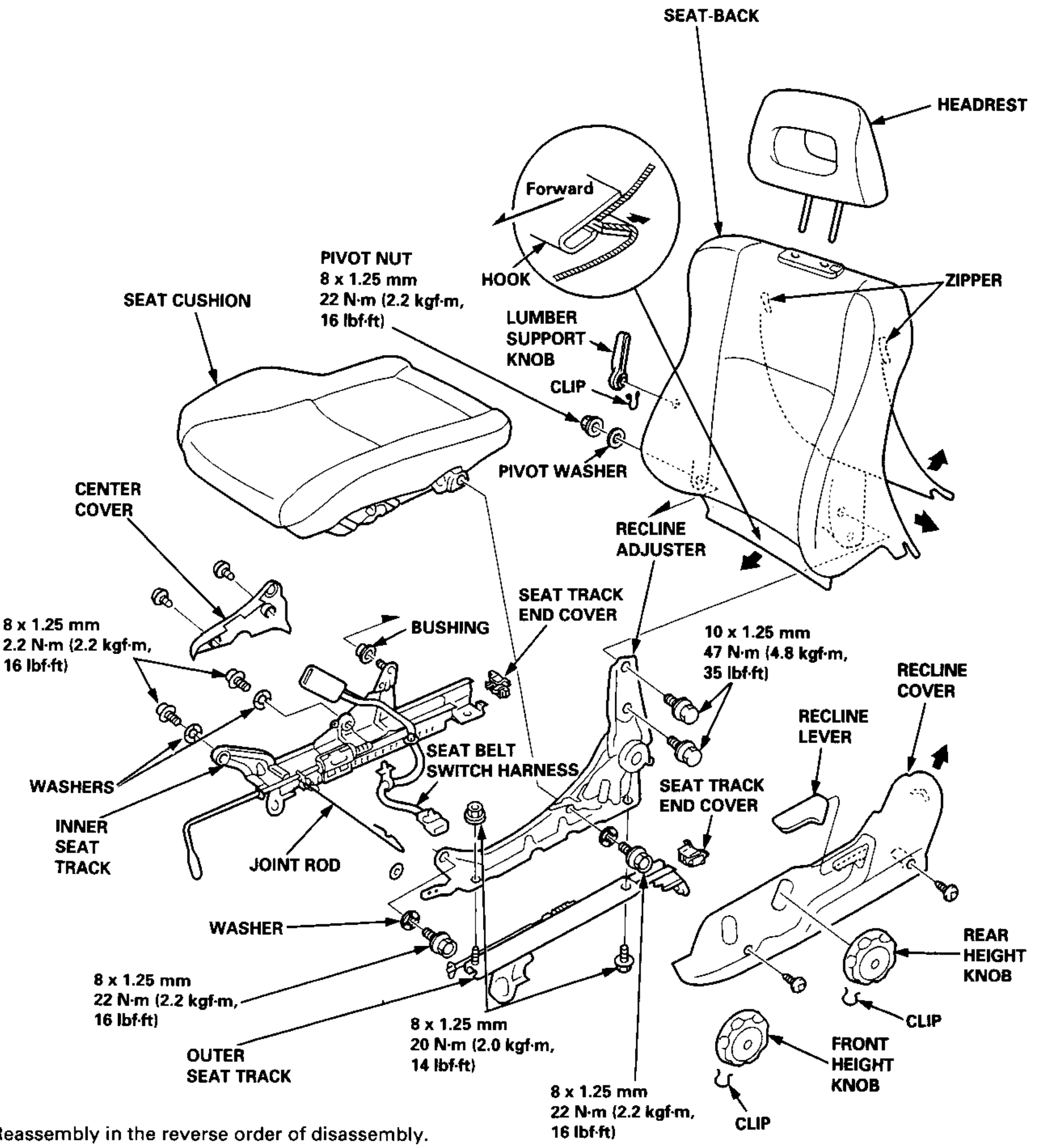
NOTE:
- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing all the hooks.
- Apply grease to the moving surfaces.

Front Seat Disassembly and Reassembly

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE: Take care not to scratch the body or tear the seat covers.

Driver's seat (manual height adjustment):



Reassembly in the reverse order of disassembly.

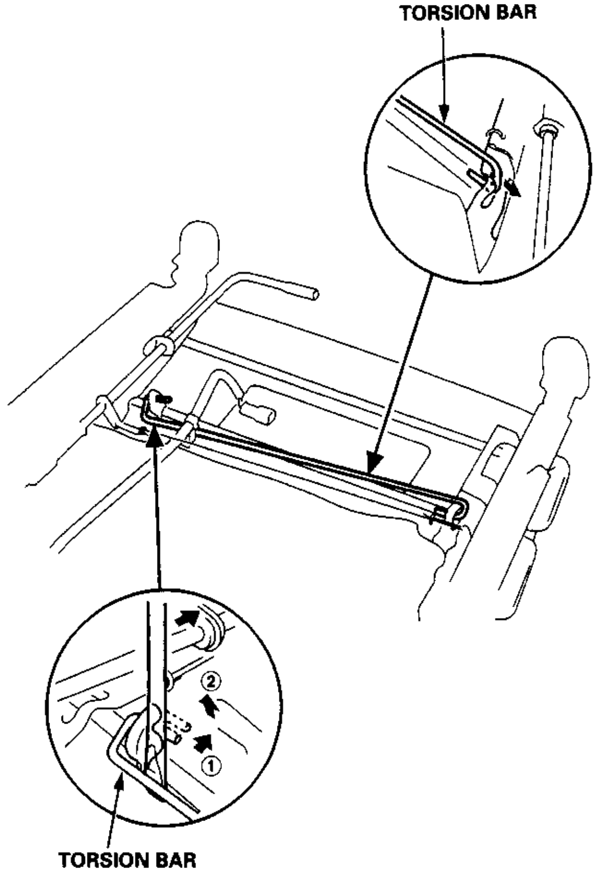
NOTE:
- Make sure the bushing and pivot washer are installed properly.
- To prevent wrinkles when installing the seat-back cover, make sure the material is stretched evenly over the pad.
- Grease all moving portion.

Torsion Bar Replacement

CAUTION: Were gloves to remove and install the torsion bar.

NOTE: Take care not to damage the seat track.

1. When removing the torsion bar, use a flat-tip screwdriver.

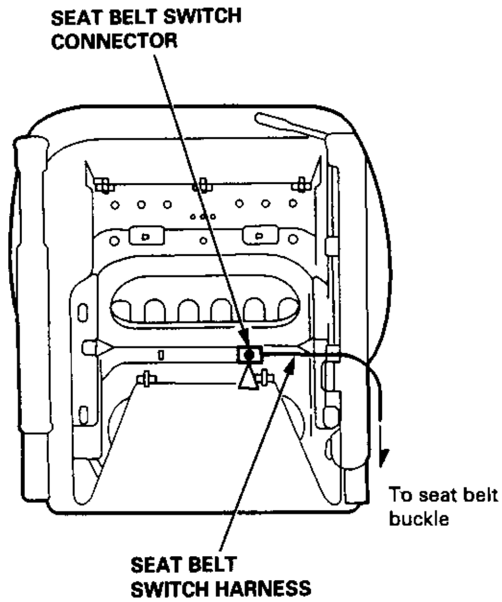


2. Installation is the reverse of the removal procedure.

Seat Belt Switch Harness Location

NOTE: When installing the seat cushion, make sure the seat belt switch harness and connector are fastened correctly on the seat cushion frame.

▷: Harness clip locations



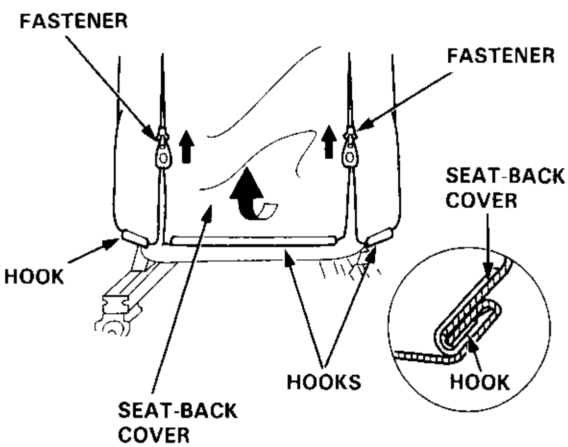
Front Seat Cover Replacement

CAUTION: **Wear gloves to remove and install the seat covers.**

NOTE: Take care not to tear the seams or damage the seat covers.

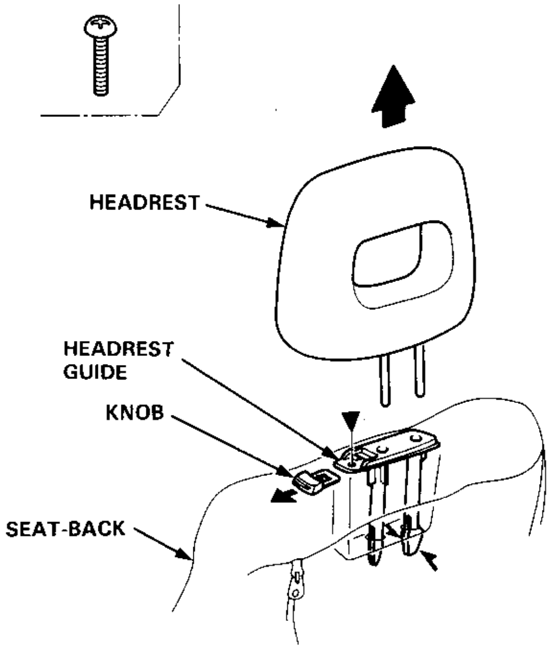
Seat-back cover removal:

1. Slide the front seat forward and fold the seat-back forward.
2. Remove the hooks and fasteners, then fold the seat-back cover back.

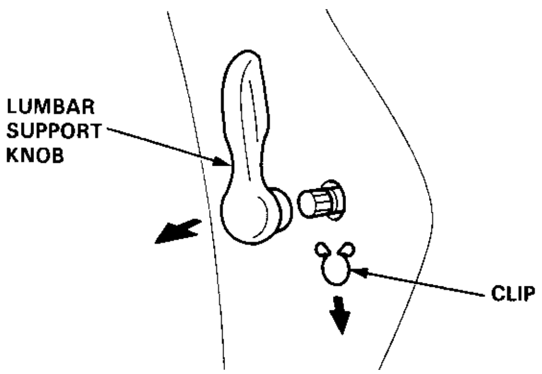


3. Remove the headrest and headrest guide.

▼ : Screw location, 1

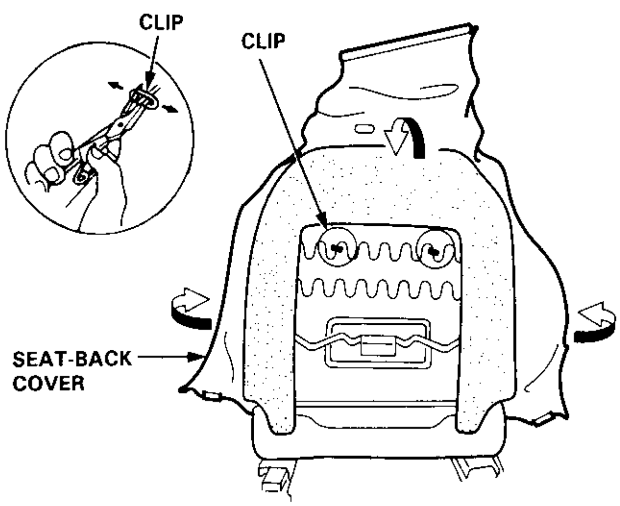


4. Remove the lumbar support knob.

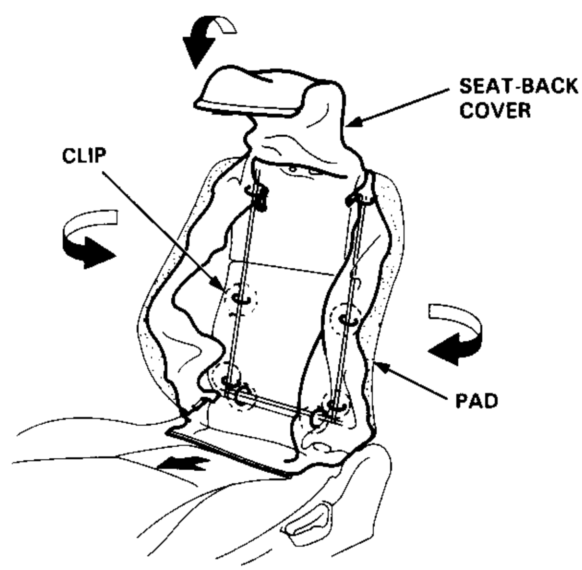


5. Remove the seat-back cover by releasing the inside clips.

Clip removal:



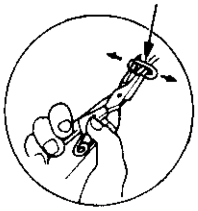
6. Pull back the edge of the seat-back cover all the way around, then release the clips.

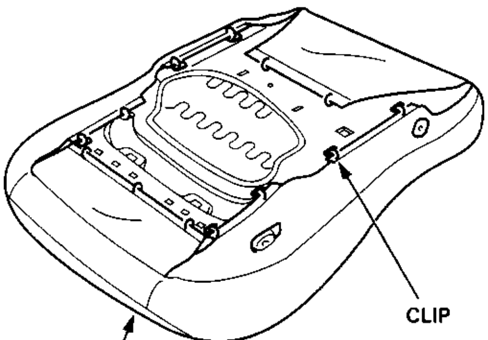


Seat cushion cover removal:

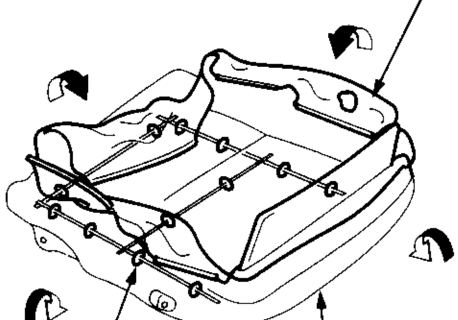
1. Remove the seat cushion from the seat tracks (see page 20-105).
2. Remove all clips from under the seat cushion, then loosen the seat cushion cover.

Clip removal:



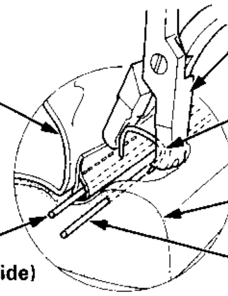


3. Pull back the edge of the seat cushion cover all the way around, then release the clips.



Installation is the reverse of the removal procedure.

NOTE:
- To prevent wrinkles when installing a seat cover, make sure the material is stretched evenly over the pad before securing all the clips.
- Replace the released clips with new ones.

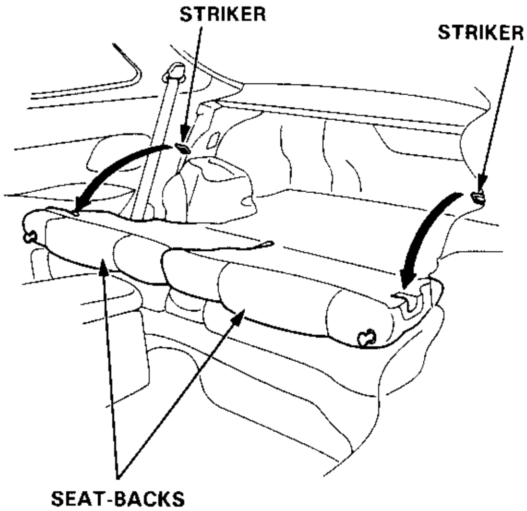


Rear Seat Replacement

Hatchback

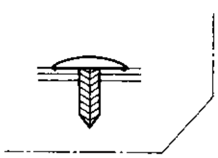
NOTE: Take care not to scratch the seat covers and body.

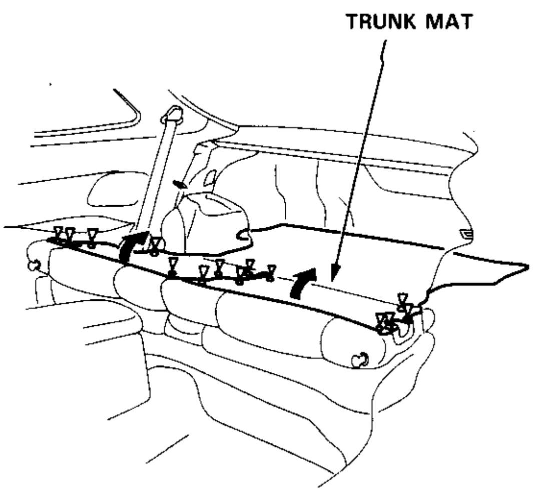
1. Fold the seat-backs forward.



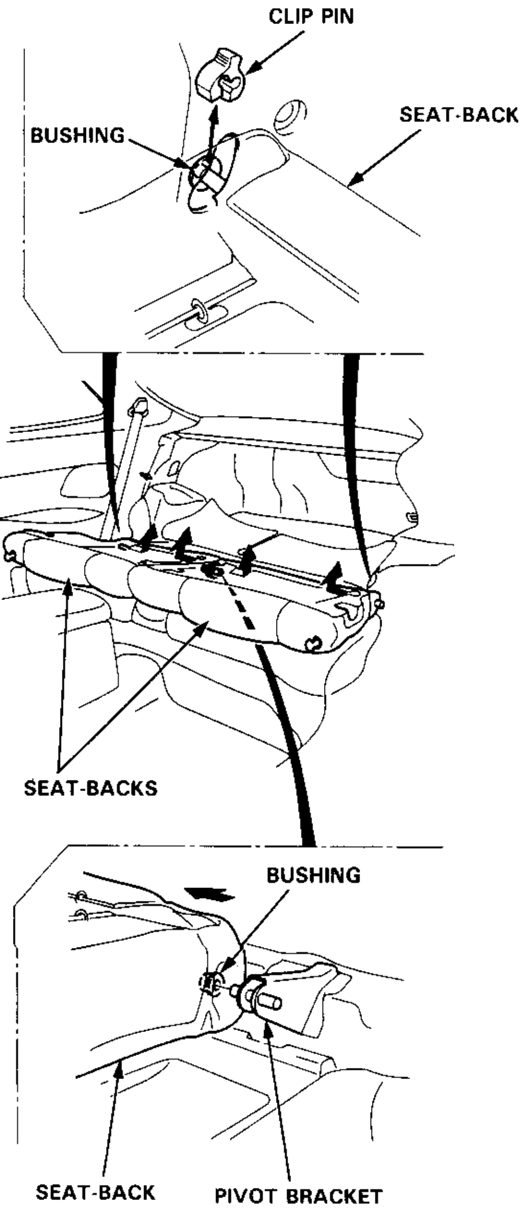
2. Remove the clips, then fold the trunk mat.

▽ : Clip locations, 14

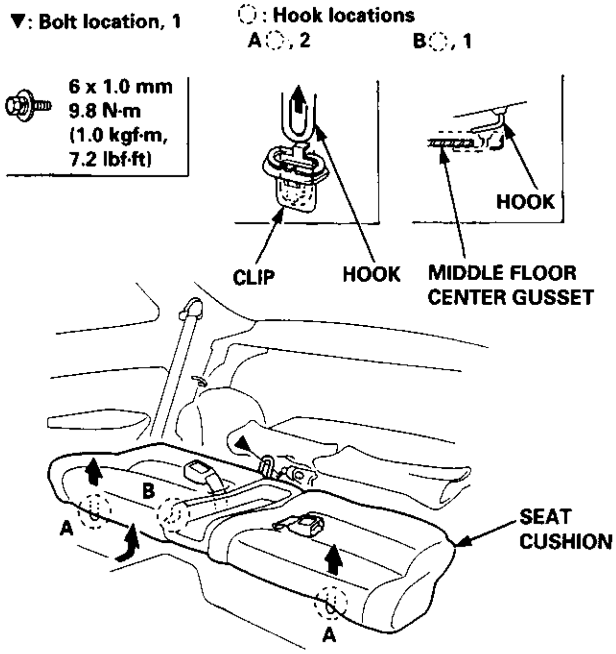




3. Remove the clip pin on each side.
   Slide the seat-backs outward, then remove the seat-backs from the pivot bracket.

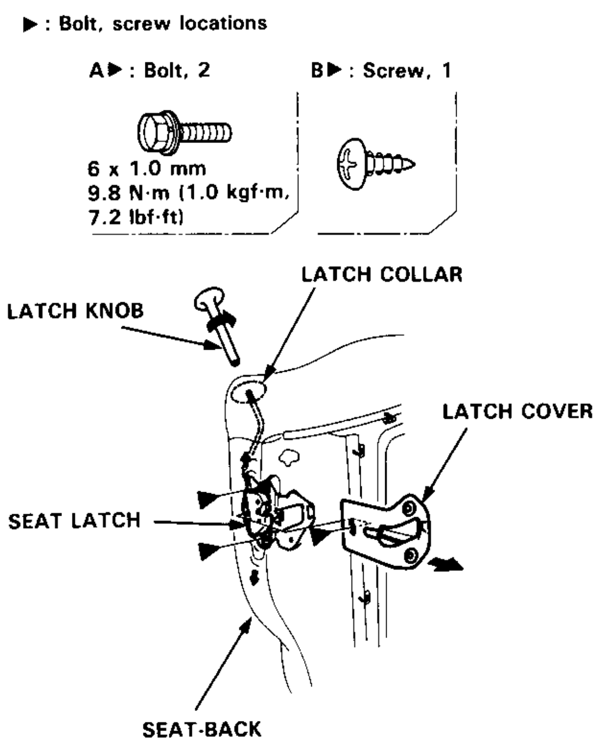


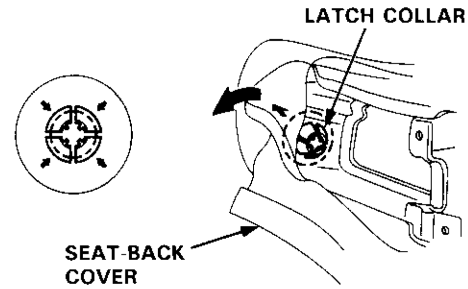
4. Remove the bolt, then remove the seat cushion.



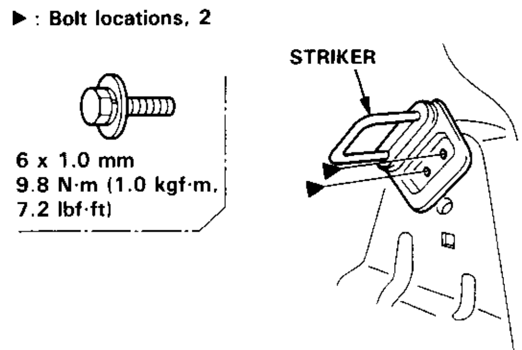
5. If necessary, remove the seat latch from the seat-back and remove the striker.

CAUTION: Wear gloves to remove and install the seat latch and latch collar.



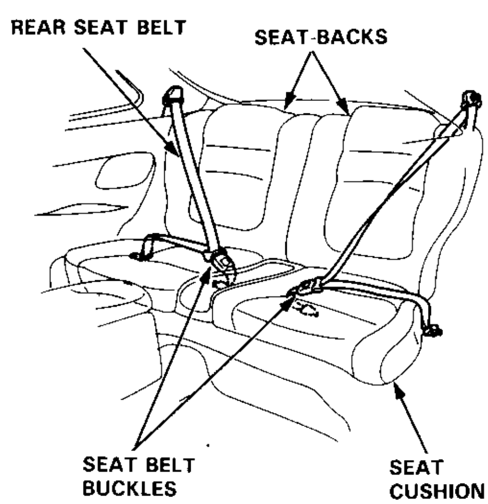


NOTE: When removing the striker, remove the side trim panel (see page 20-91).



6. Installation is the reverse of the removal procedure.

NOTE:
- Make sure the seat-backs lock securely.
- If necessary, adjust the strikers.
- Before attaching the seat-backs and seat cushion, make sure there are no twists or kinks in the rear seat belts.
- When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.



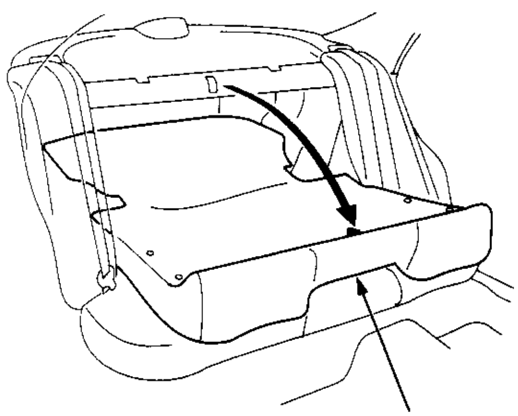
(cont'd)

Rear Seat Replacement (cont'd)

Sedan

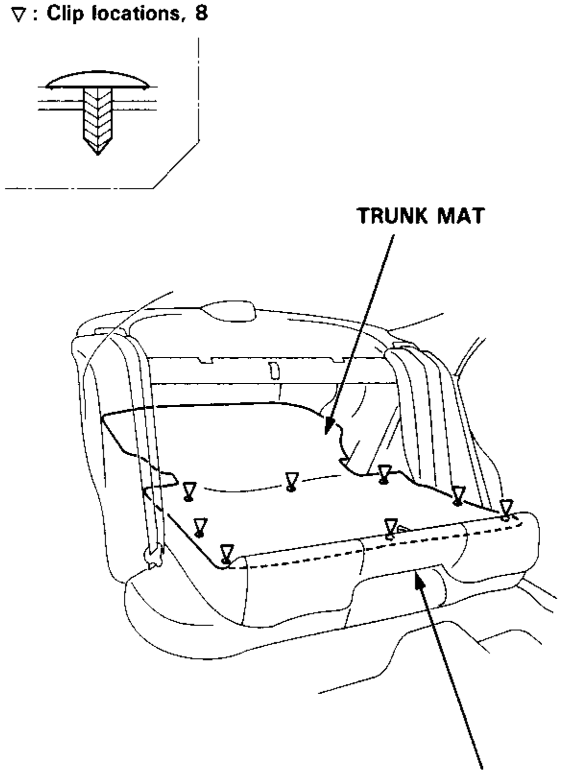
NOTE: Take care not to scratch the seat covers and body.

1. Fold the seat-back forward.

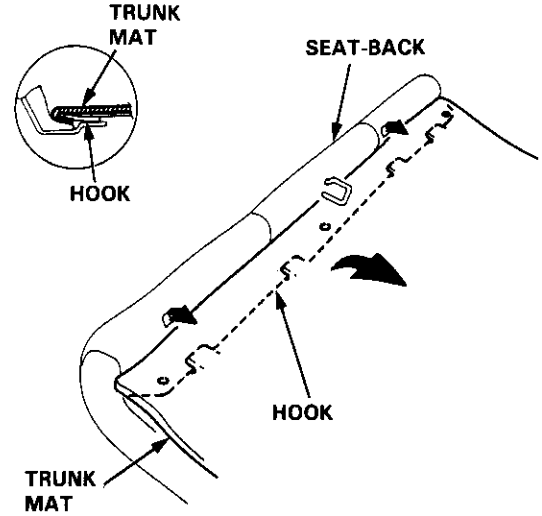


2. Remove the clips.

▽ : Clip locations, 8

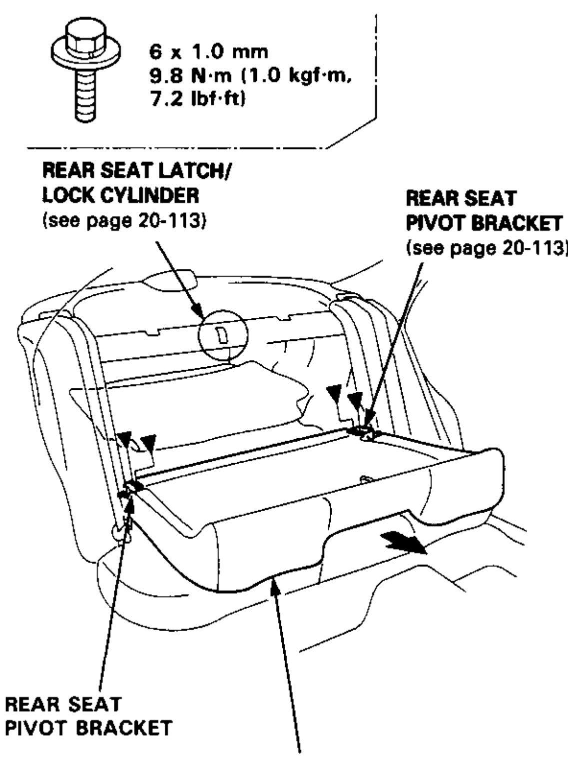


3. Detach the hook, then remove the trunk mat.



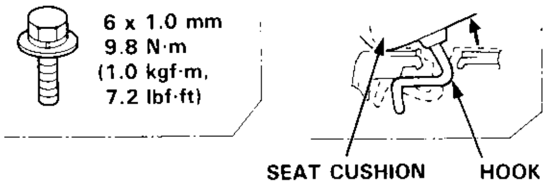
4. Remove the bolts, then remove the seat-back.

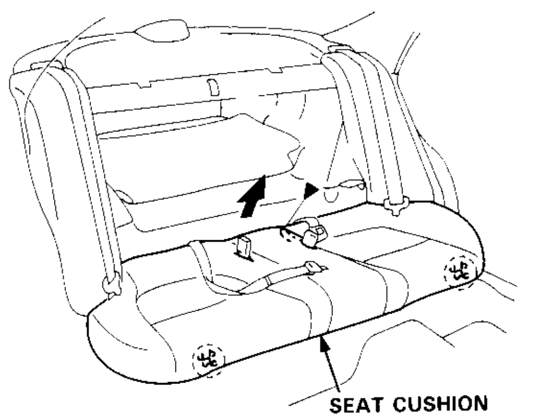
▼ : Bolt locations, 4



5. Remove the bolt, then remove the seat cushion.

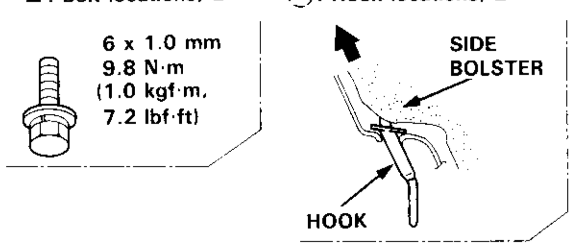
▼ : Bolt location, 1 ◌ : Hook locations, 2

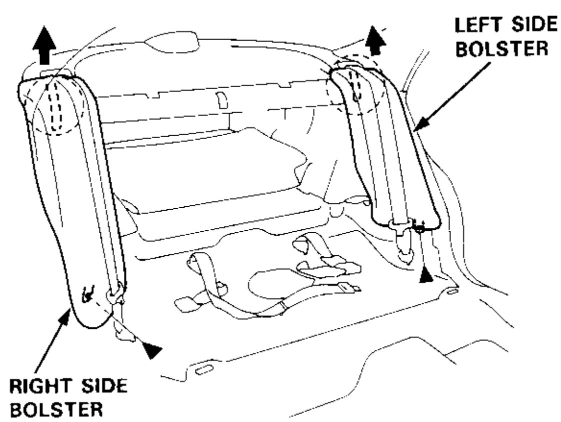




6. Remove the bolts, then remove the seat-back side bolsters by lifting them upward.

▲ : Bolt locations, 2 ◌ : Hook locations, 2





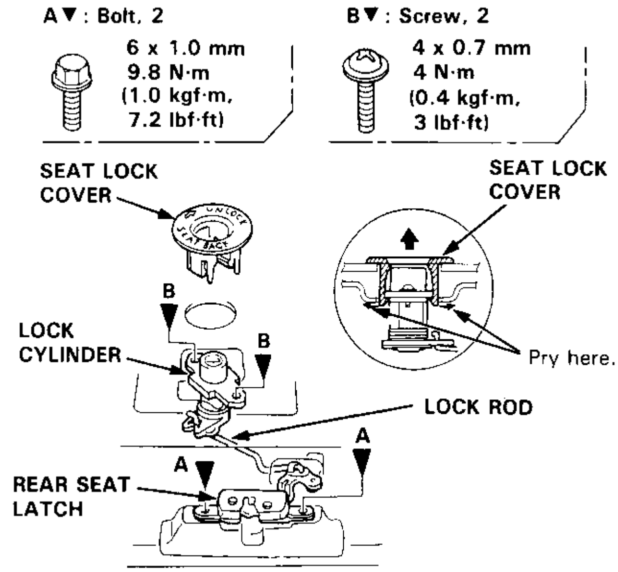
7. If necessary, remove the rear seat latch, lock cylinder and rear seat pivot bracket.

Rear seat latch/Lock cylinder removal:

Pry the rear shelf up after removing the rear shelf trim panel (see page 20-95) and seat lock cover.

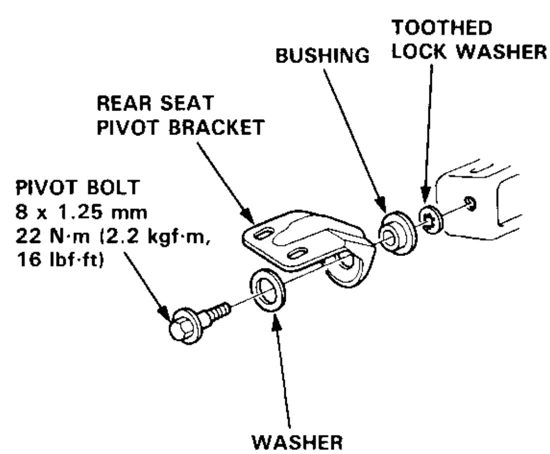
NOTE: Take care not to bend the lock rod.

▼ : Bolt, screw locations



Rear seat pivot bracket removal:

NOTE: When installing the pivot bolt, apply grease to it.

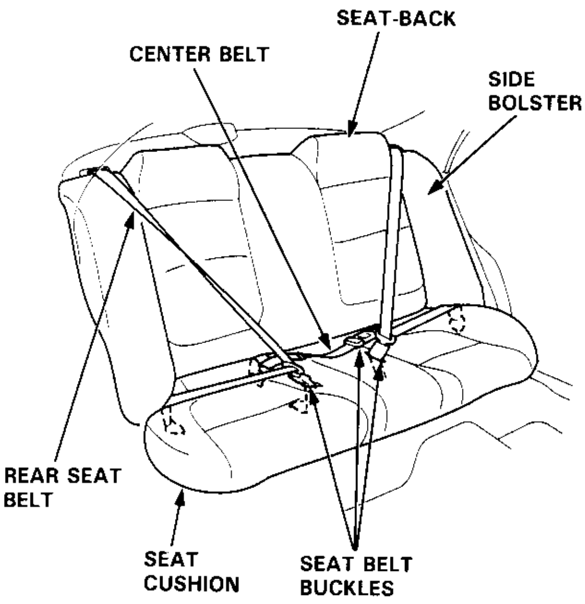


(cont'd)

Rear Seat Replacement (cont'd)

8. Installation is the reverse of the removal procedure.

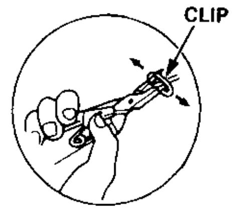
NOTE:
- Make sure the seat-back locks securely.
- If necessary, adjust the rear seat latch and seat-back.
- Before attaching the seat-back, side bolsters and seat cushion, make sure there are no twists or kinks in the rear seat belts and center belt.
- When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.



Rear Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat covers.

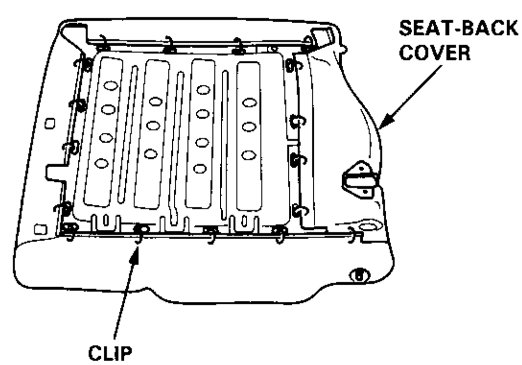
NOTE:
- Take care not to tear the seams or damage the seat covers.
- Remove the clips as shown.



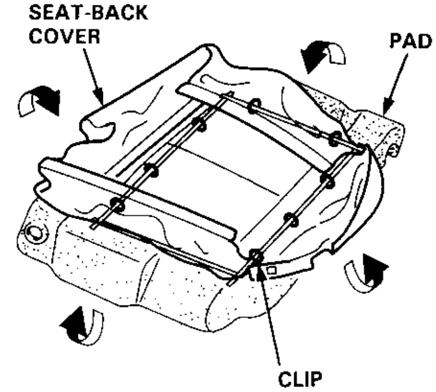
Seat-back cover removal:

Hatchback

1. Remove the seat-back (see page 20-110).
2. Remove the latch cover and latch collar (see page 20-111).
3. Remove all the clips from the back of the seat-back, then loosen the seat-back cover.



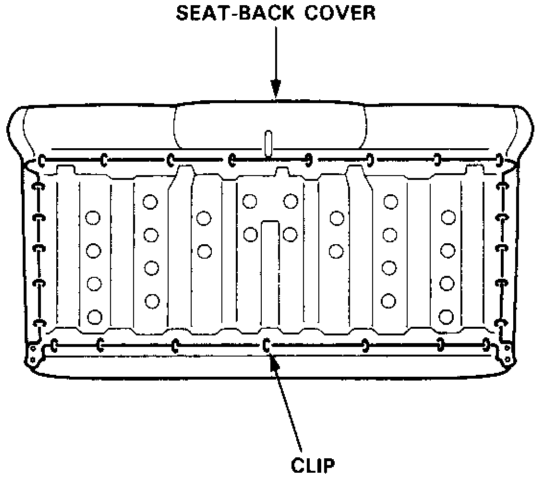
4. Pull back the edge of the seat-back cover all the way around, then release the clips.



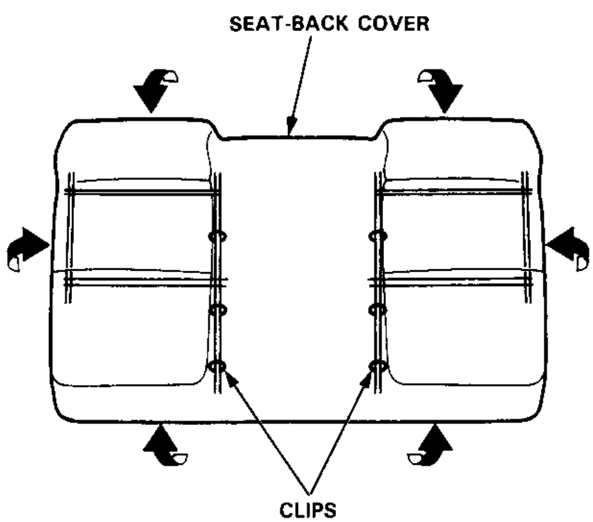
Sedan

1. Remove the seat-back (see page 20-112).

2. Remove all the clips from the back of the seat-back, then loosen the seat-back cover.



3. Pull back the edge of the seat-back cover all the way around, then release the clips.

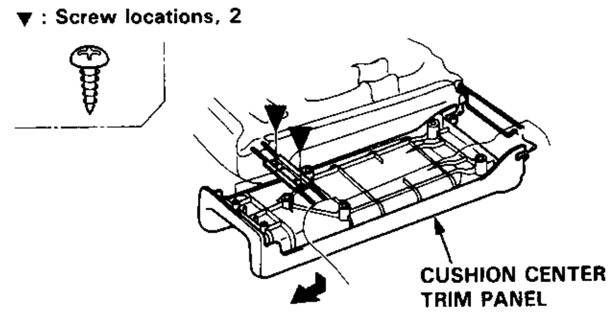


Seat cushion cover removal:

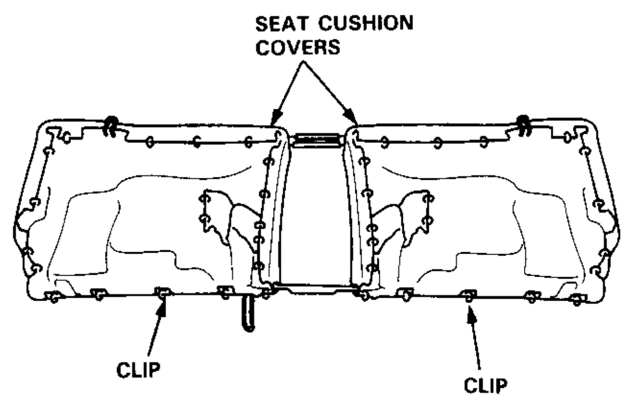
Hatchback

1. Remove the seat cushion (see page 20-111).

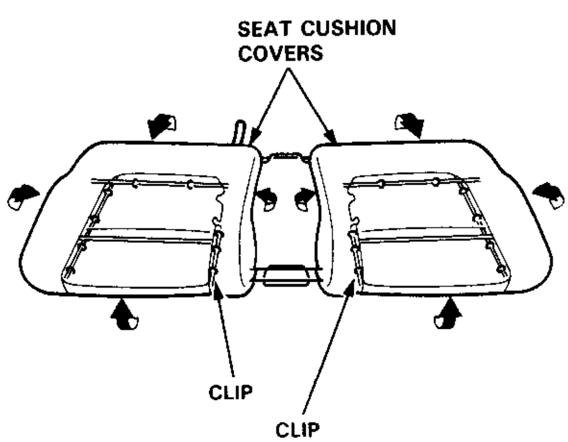
2. Remove the cushion center trim panel.



3. Remove all the clips from under the seat cushion, then loosen the seat cushion covers.



4. Pull back the edges of the seat cushion covers all the way around, then release the clips.



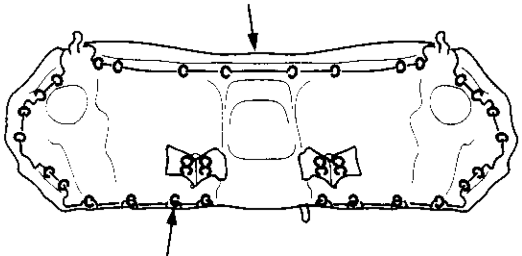
(cont'd)

Seats

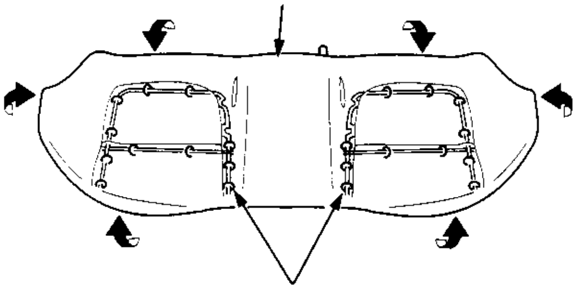
Rear Seat Cover Replacement (cont'd)

Sedan

1. Remove the seat cushion (see page 20-113).
2. Remove all the clips from under the seat cushion, then loosen the seat cushion cover.

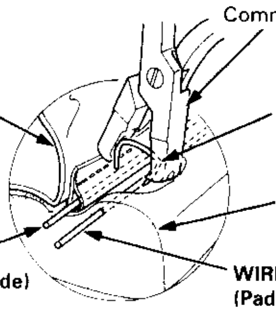


3. Pull back the edge of the seat cushion cover all the way around, then release the clips.



Installation is the reverse of the removal procedure.

NOTE:
- To prevent wrinkles when installing a seat cover, mark sure the material is stretched evenly over the pad before securing all the clips.
- Replace the released clips with new ones.



Front Seat Belt Replacement

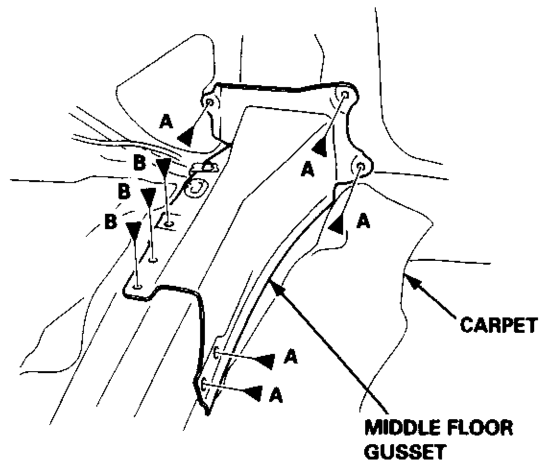
CAUTION: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Hatchback

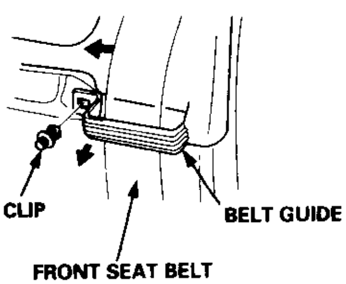
1. Slide the front seat forward fully.
2. Remove.
   - Rear shelf (see page 20-91)
   - Rear trim panel (see page 20-92)
   - Rear seat (see page 20-110)
   - Side trim panel (see page 20-92)
3. Pull back the carpet as necessary, remove the bolts, then remove the middle floor gusset.

▶: Bolt locations

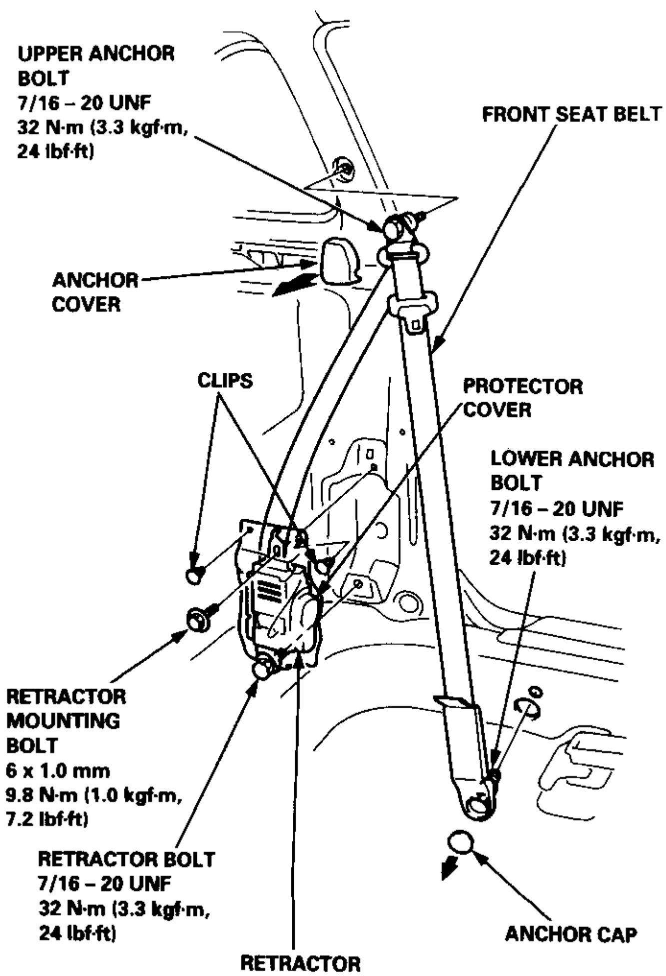
A▶, 5	B▶, 3
8 x 1.25 mm 22 N·m (2.2 kgf·m, 16 lbf·ft)	10 x 1.25 mm 38 N·m (3.9 kgf·m, 28 lbf·ft)



4. Remove the front seat belt from the belt guide.



5. Remove the anchor cover and anchor cap.



6. Remove all the anchor bolts and the retractor bolt, remove the retractor mounting bolt, then remove the front seat belt and retractor.
7. Installation is the reverse of the removal procedure.

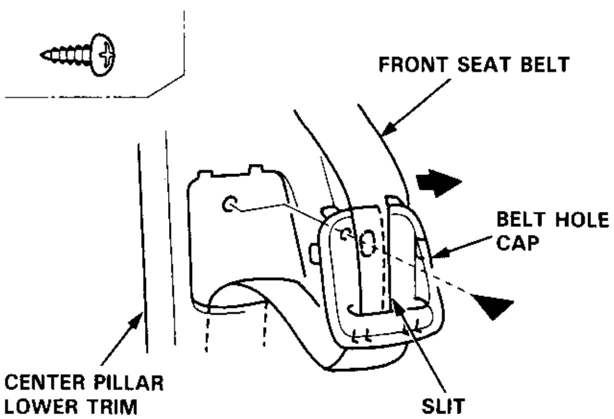
   NOTE:
   - Check that the retractor locking mechanism functions.
   - Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
   - Before installing the anchor bolts, make sure there are no twists or kinks in the front seat belt.

Front Seat Belt Replacement (cont'd)

Sedan

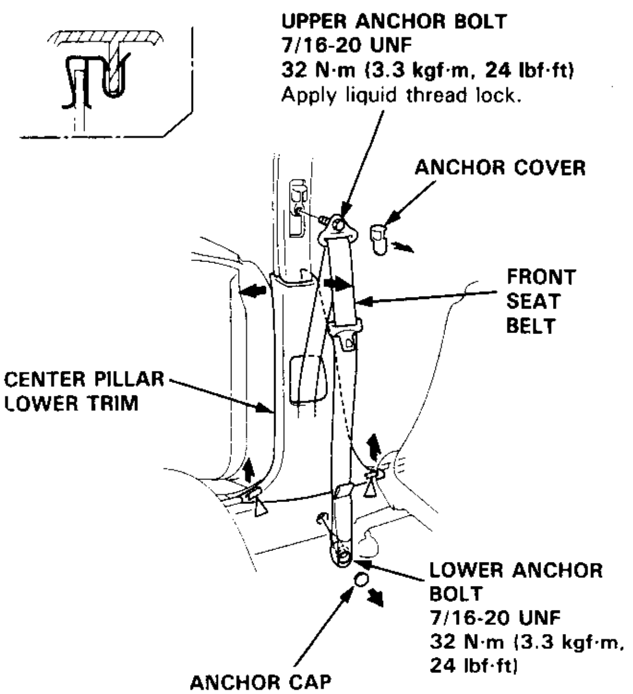
1. Slide the front seat fully forward.
2. Remove the belt hole cap, then slip the front seat belt through the slit in the belt hole cap.

◄ : Screw location, 1

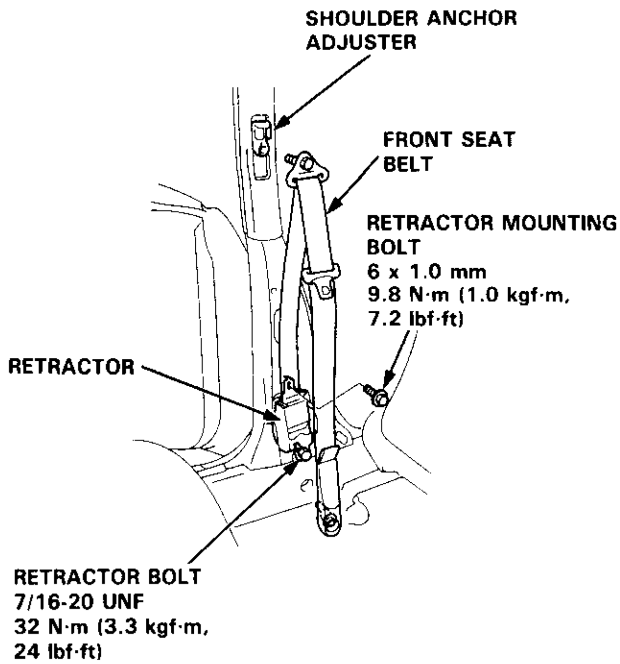


3. Remove the upper and lower anchor bolts from the front seat belt, then remove the center pillar lower trim.

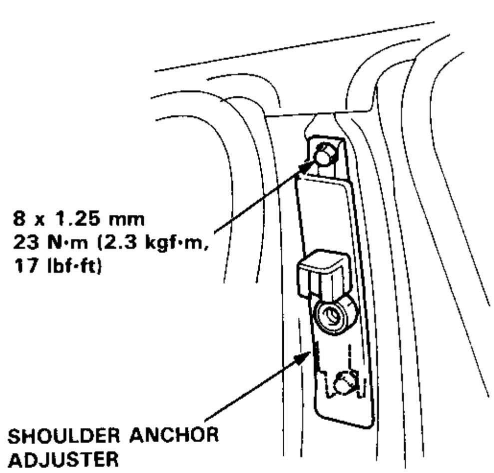
△ : Clip locations, 2



4. Remove the retractor bolt and retractor mounting bolt, then remove the front seat belt.

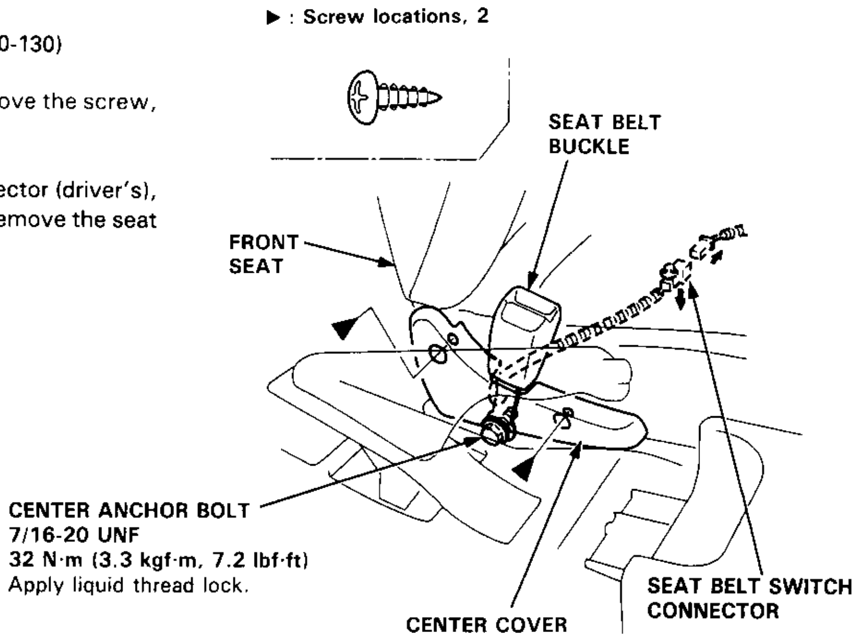


5. Check that the retractor locking mechanism functions as described on page 20-124.
6. Remove the center pillar trim (see page 20-94), then remove the shoulder anchor adjuster.



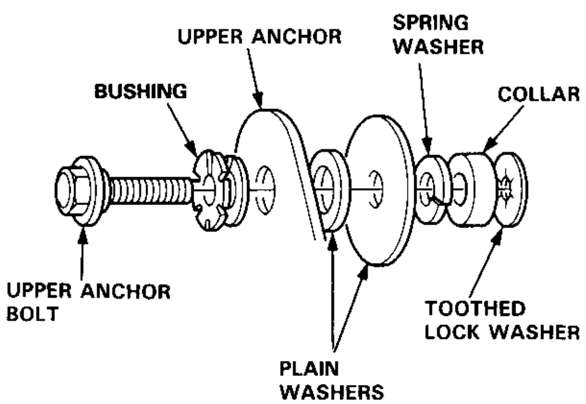
Seat belt buckle removal:

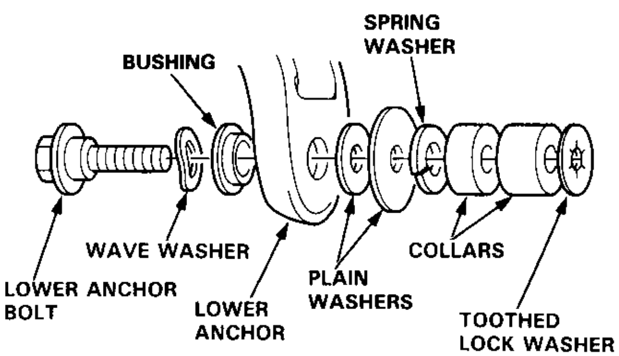
1. Remove the rear console (see page 20-130)
2. Slide the front seat until you can remove the screw, then remove the center cover.
3. Disconnect the seat belt switch connector (driver's), remove the center anchor bolt, then remove the seat belt buckle.



Upper and lower anchor bolt construction:

Hatchback



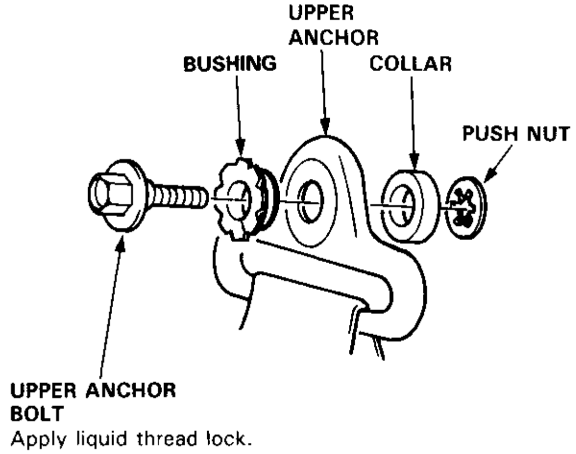


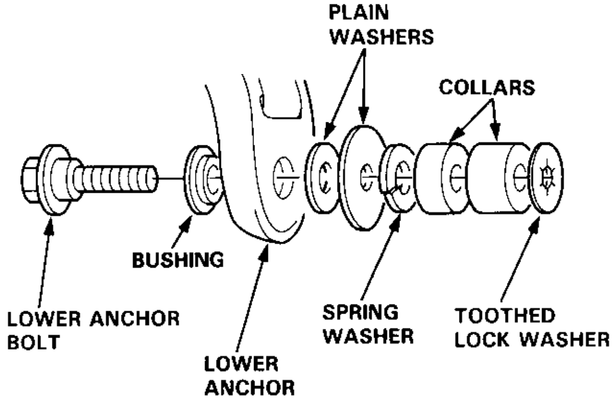
(cont'd)

Seat Belts

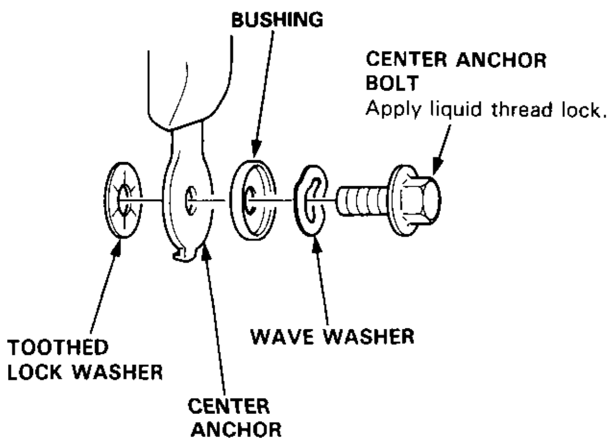
Front Seat Belt Replacement (cont'd)

Sedan

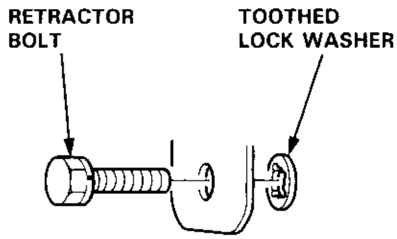




Center anchor bolt construction:



Retractor bolt construction:



Installation is the reverse of the removal procedure.

NOTE:

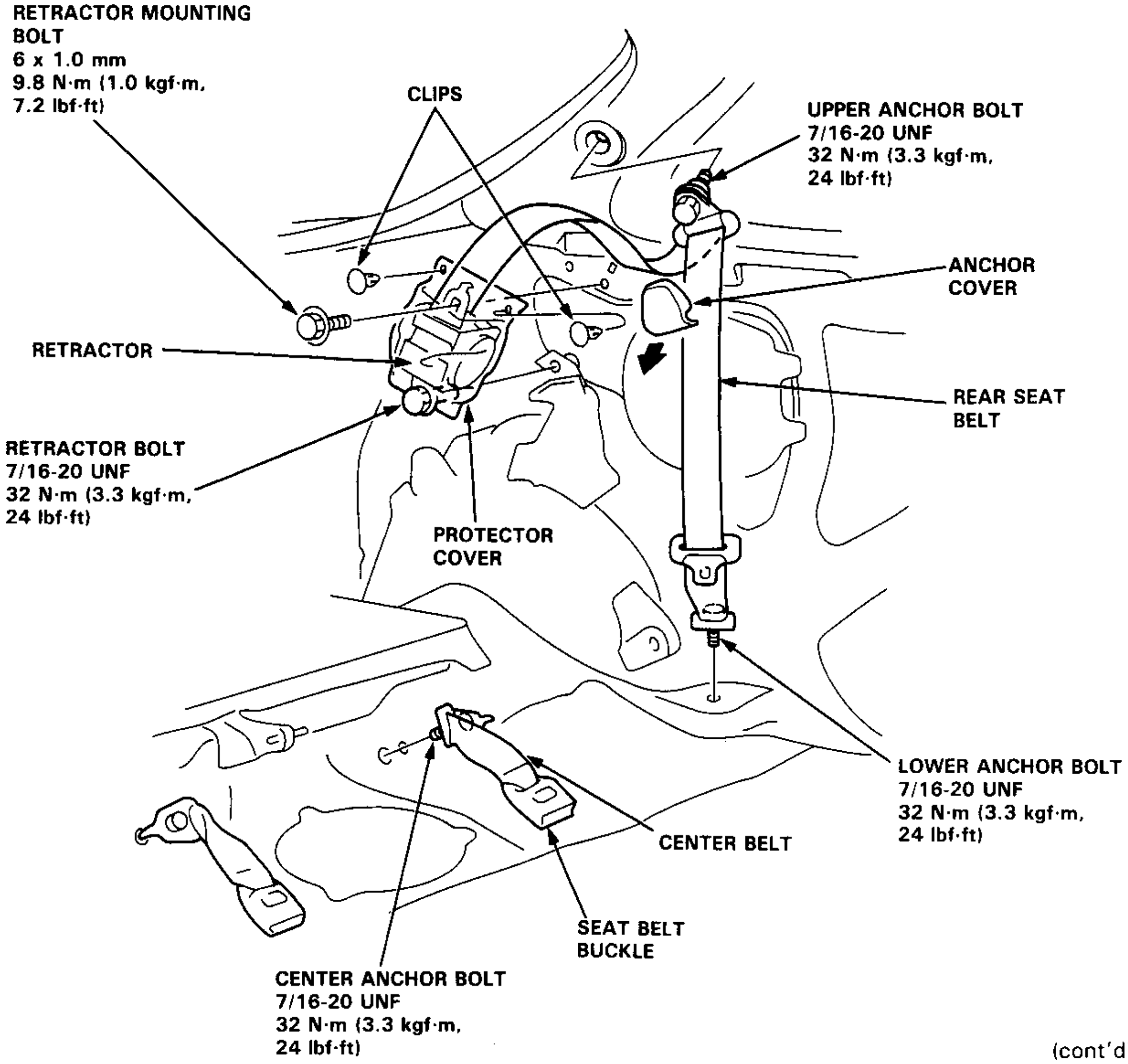
- Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
- Before attaching the side trim panel (Hatchback) or center pillar lower trim (Sedan), make sure there are no twists or kinks in the front seat belt.

Rear Seat Belt Replacement

CAUTION: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Hatchback

1. Remove:
   - Rear shelf (see page 20-91)
   - Rear trim panel (see page 20-92)
   - Rear seat (see page 20-110)
   - Side trim panel (see page 20-92)
2. Remove all the anchor bolts, the retractor bolt and the retractor mounting bolt, then remove the rear seat belt and center belt.
3. Check that the retractor locking mechanism functions as described on page 20-124.



(cont'd)

Rear Seat Belt Replacement (cont'd)

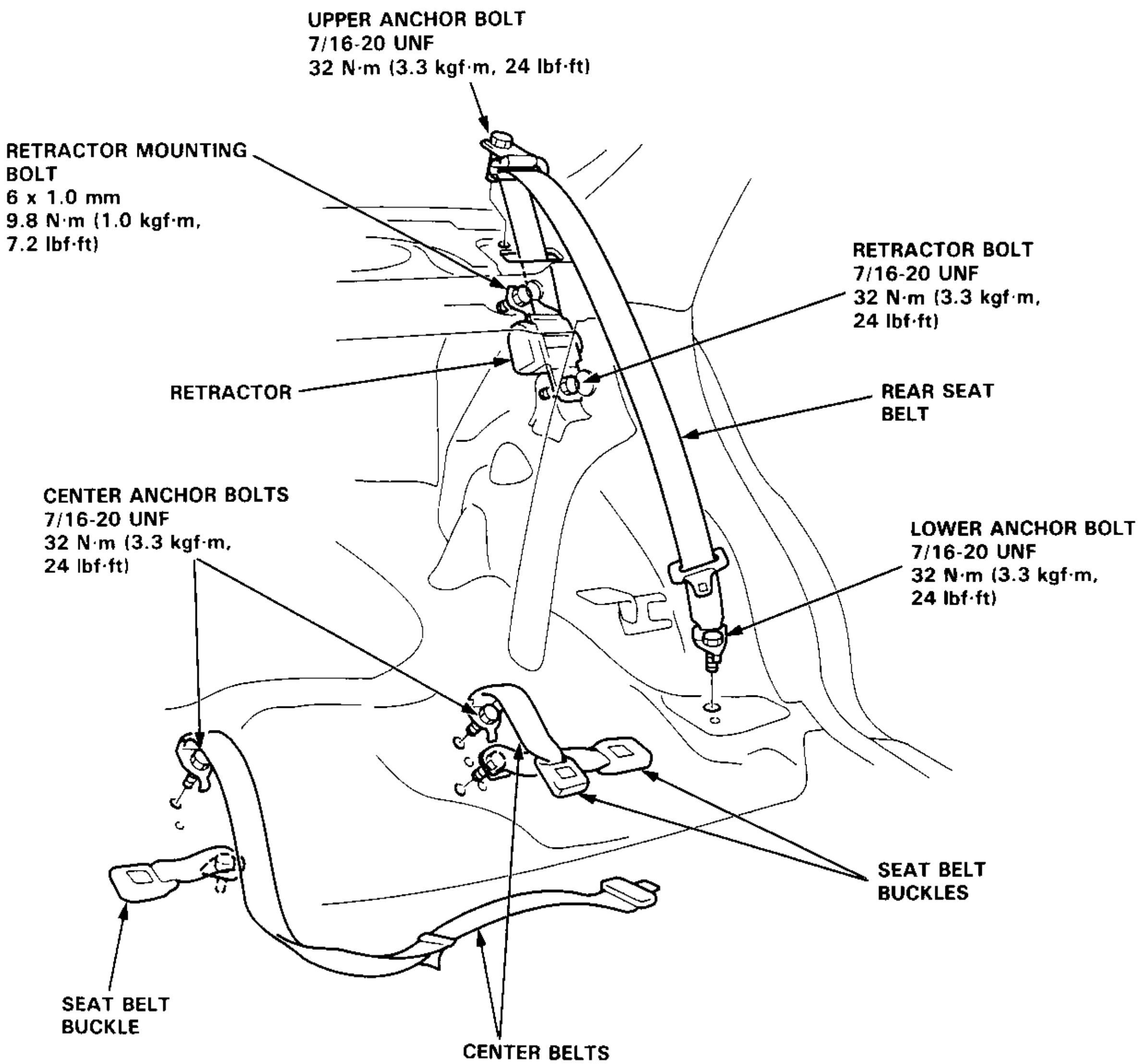
Sedan

1. Remove:

- Rear seat (see page 20-112)
- Rear pillar trim panel (see page 20-95)
- Rear shelf trim panel (see page 20-95)
- Rear shelf (see page 20-96)
- Trunk mat (see page 20-97)
- Rear trim panel (see page 20-97)
- Trunk side panel (see page 20-97)

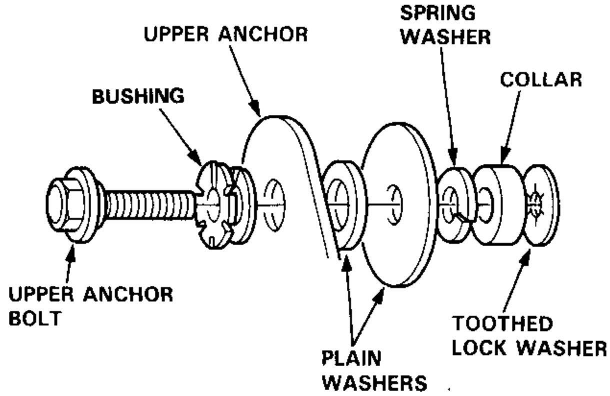
2. Remove all the anchor bolts, the retractor bolt and the retractor mounting bolts, then remove the rear seat belts and center belts.

3. Check that the retractor locking mechanism functions as described on page 20-124.

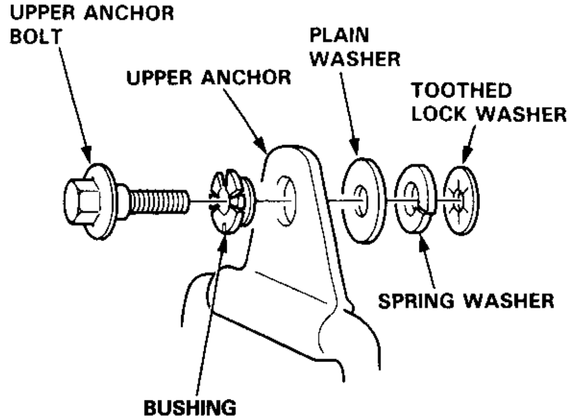


Upper anchor bolt construction:

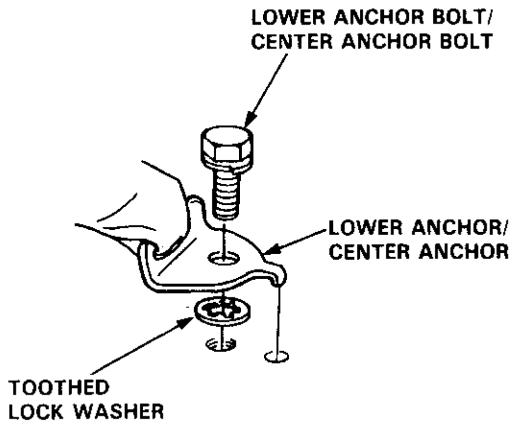
Hatchback



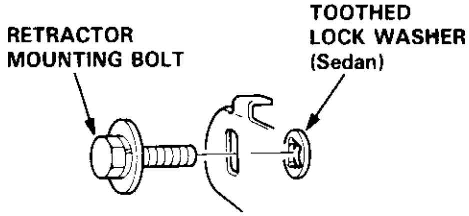
Sedan



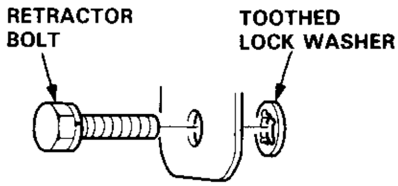
Lower and center anchor bolt construction:



Retractor mounting bolt construction:



Retractor bolt construction:



Installation is the reverse of the removal procedure.

NOTE:
- Make sure you assemble the washers and collars on the upper anchor bolt as shown.
- Before attaching the side trim panel (Hatchback) or rear shelf (Sedan), make sure there are no twists or kinks in the rear seat belt.
- Before attaching the seat-back, side bolsters (Sedan) and seat cushion, make sure there are no twists or kinks in the rear seat belts.
- When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.

Seat Belts

Inspection

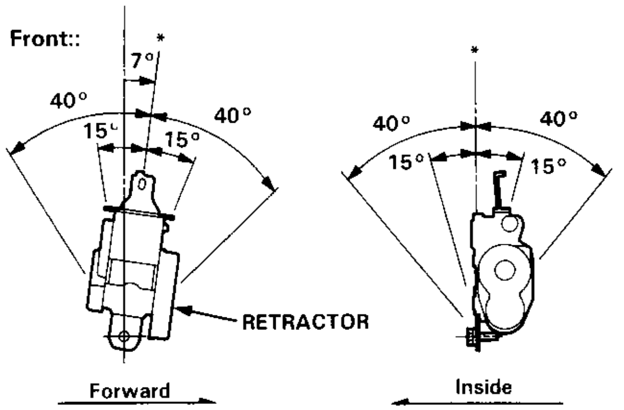
Retractor Inspection

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°.

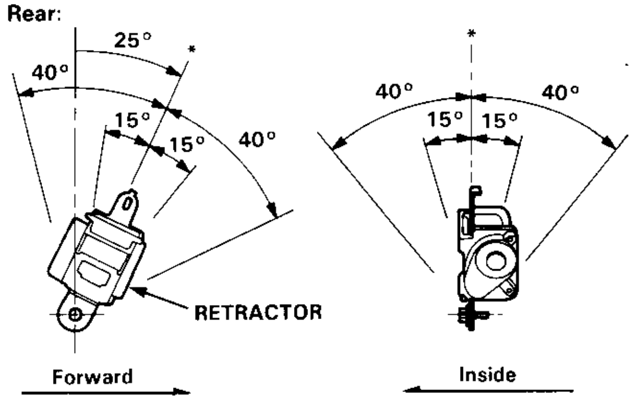
   CAUTION: Do not attempt to disassemble the retractor.

Hatchback * : Mounted Position

Front::

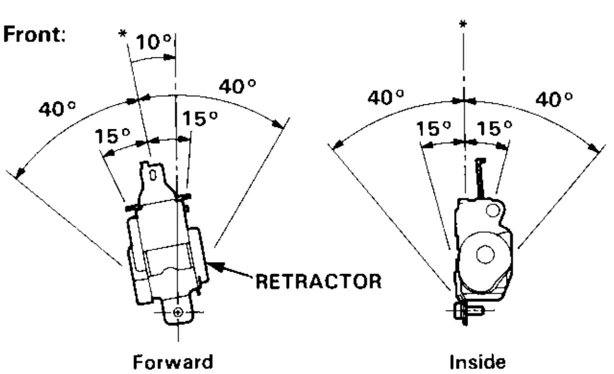


Rear:

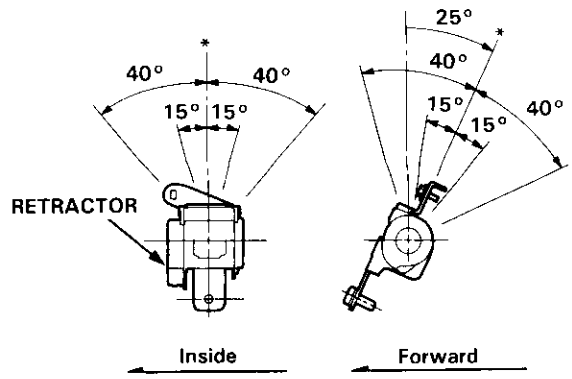


Sedan

Front:



Rear:



3. Replace the seat belt with a new one if there is any abnormality.

On-the-Car Seat Belt Inspection

1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary.

   CAUTION: Use only soap and water to clean.

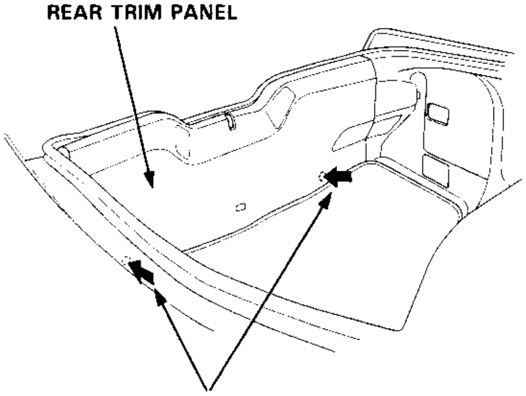
   NOTE: Dirt build-up in the metal loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Make sure that the seat belt retracts automatically when released.
6. For each passenger's seat belt, make sure that the locking mechanism in the seat belt retractor engages when the seat belt is pulled all the way out.
7. Replace the seat belt with a new one if there is any abnormality.

Child Seat Anchor Plate

Attachment points are provided for a rear seat mounted child restraint system which uses a top tether.
The attachment points are located on the rear trim panel or rear shelf, just behind the rear seat-back.
When using a child seat with a top tether, install the child seat anchor plates securely.

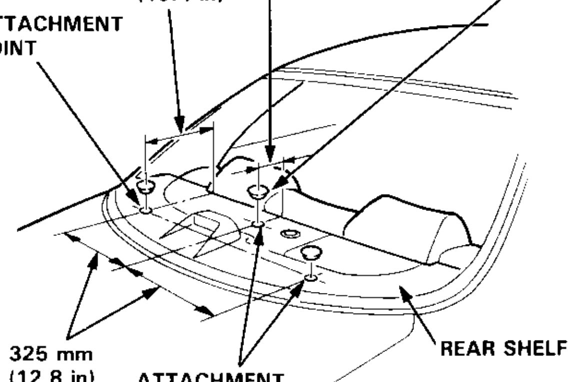
Hatchback

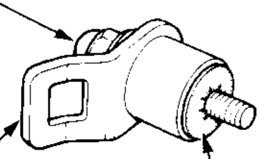
NOTE: The rear trim panel has perforations at each attachment point. Cut the rear trim panel along the perforations to make a hole.



Sedan

NOTE: Remove the plug covers from the attachment points of the rear shelf (Canada).
Use a razor blade or sharp knife to carefully cut a 1 inch diameter circle at the location of the attachment point (USA).





NOTE:
- Do not remove the toothed washer from the child seat anchor plate. Use the child seat anchor plate with the toothed washer attached to it.
- When installing a child seat on the rear seat, follow the intructions of the manufacturer of the child seat.
- Additional anchor plates are available.

WARNING

- **Do not use the child seat anchor plate for any other purpose; it is designed exclusively for installation of a child seat.**
- **Make sure the rear seat-back is locked firmly when installing a child seat.**

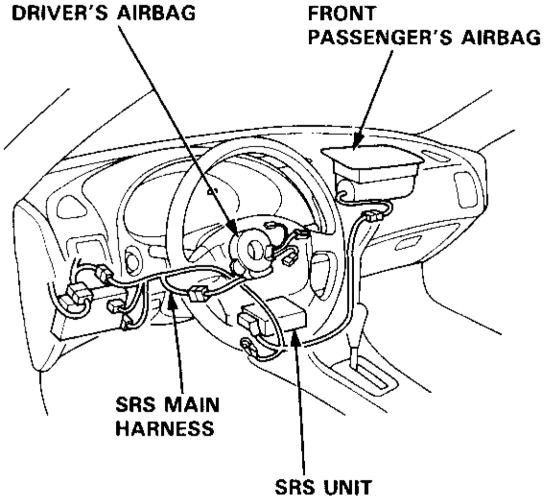
Carpet

Replacement

SRS wire harnesses are routed near the carpet.

CAUTION:

- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**



1. Remove:

   Hatchback

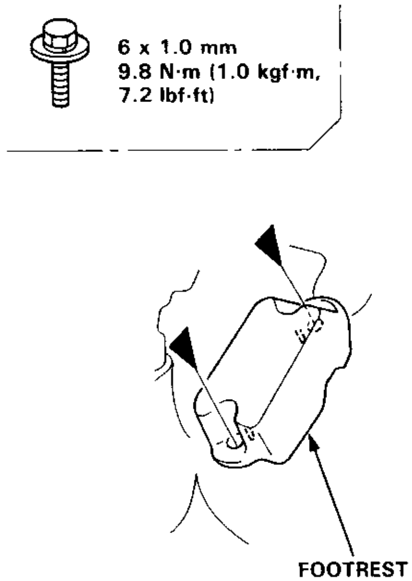
   - Front seat (see page 20-103)
   - Rear seat (see page 20-110)
   - Rear shelf (see page 20-91)
   - Rear trim panel (see page 20-92)
   - Side trim panel (see page 20-92)
   - Front seat belt lower anchor (see page 20-117)
   - Front and rear consoles (see page 20-130)
   - Kick panel (see page 20-91)
   - Dashboard lower cover (see page 20-133)
   - Opener cover (see page 20-156)

   Sedan

   - Front seat (see page 20-103)
   - Rear seat (see page 20-112)
   - Rear pillar trim panel (see page 20-95)
   - Center pillar lower trim (see page 20-94)
   - Front seat belt lower anchor (see page 20-118)
   - Front and rear consoles (see page 20-130)
   - Kick panel (see page 20-91)
   - Dashboard lower cover (see page 20-133)
   - Opener cover (see page 20-157)

2. Remove the footrest.

▼: **Bolt locations, 2**

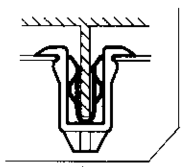


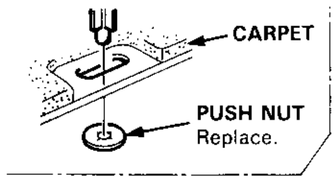
3. Remove the door sill molding from each side.

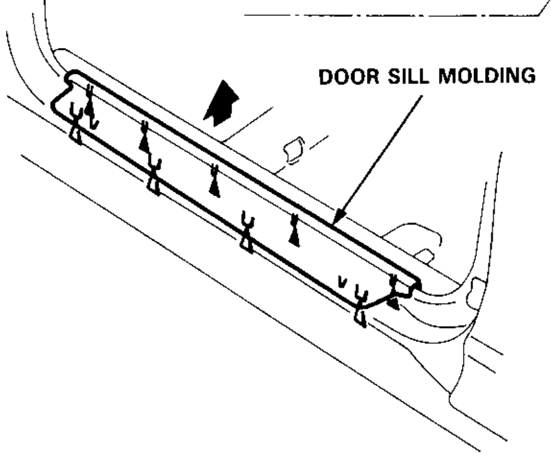
NOTE:
- Take care not to damage the door sill moldings.
- If necessary, separate the door sill molding and carpet.

Hatchback

△: Clip locations, 4　　▲: Push nut locations, 5

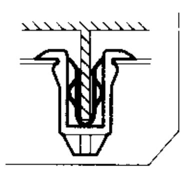


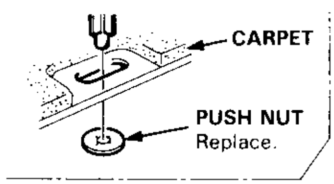


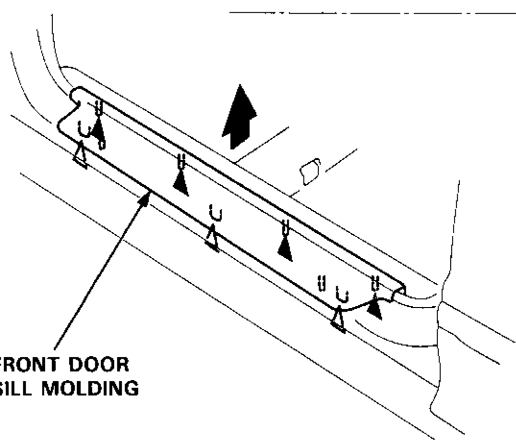


Sedan

△ : Clip locations, 3　　▲ : Push nut locations, 4

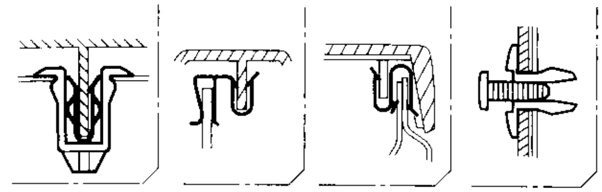




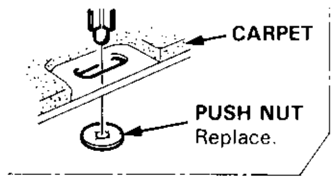


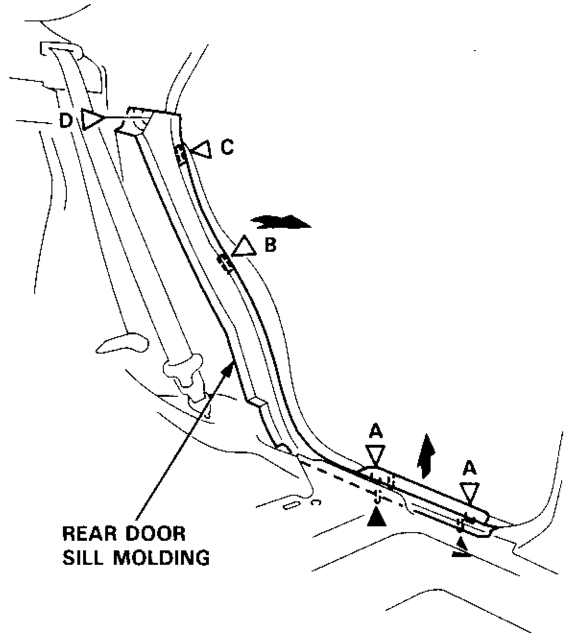
▽ : Clip locations

A▽ : Clip, 2　　B◁ : Clip, 1　　C◁ : Clip, 1　　D▷ : Clip, 1



▲ : Push nut locations, 2





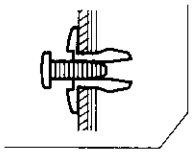
(cont'd)

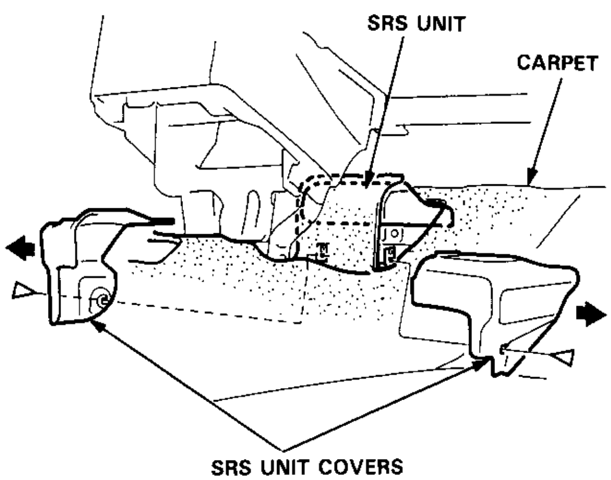
Carpet

Replacement (cont'd)

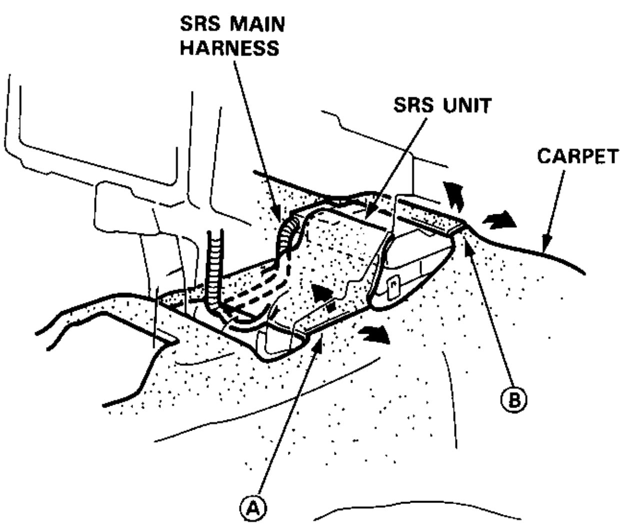
4. Remove the SRS unit covers.

▷ : Clip locations, 2

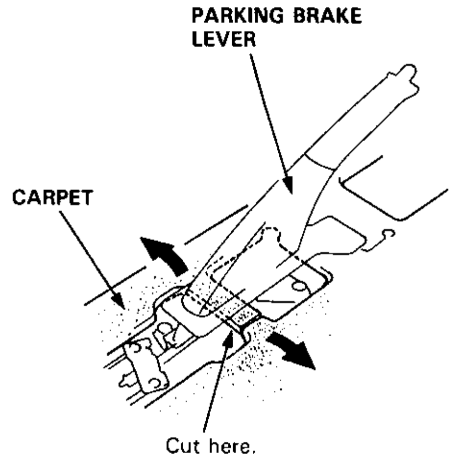




5. Cut areas Ⓐ and Ⓑ in the carpet, then pull it back as shown.



6. Cut the carpet under the parking brake lever.



7. Remove the dashboard center bracket and center beam bracket.

▼ : Bolt locations

A▼ : Bolt, 4

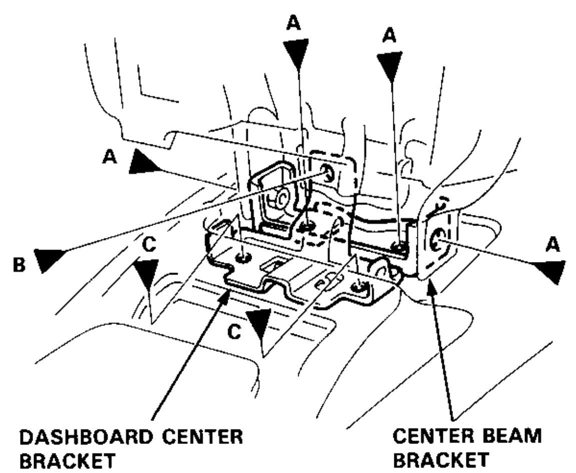
8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)

B▶ : Bolt, 1

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

C▶ : Bolt, 2

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)

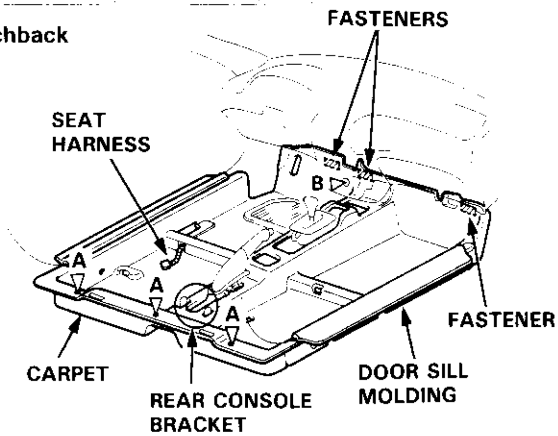


8. Remove the carpet by sliding it rearward.

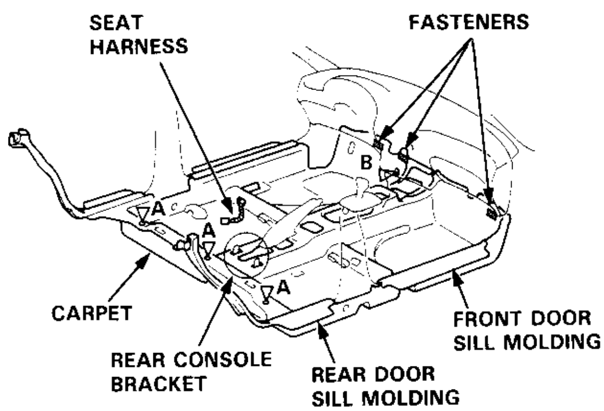
▽ : Clip locations

A▽ : Clip, 3   B▷ : Clip, 1

Hatchback

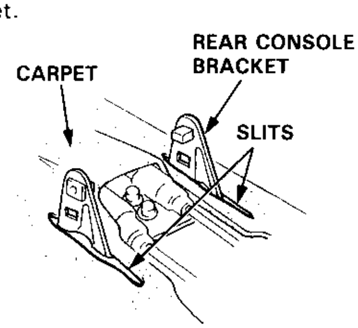


Sedan

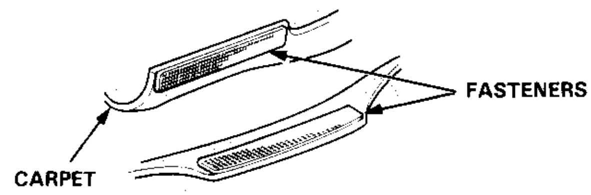


9. Installation is the reverse of the removal procedure.

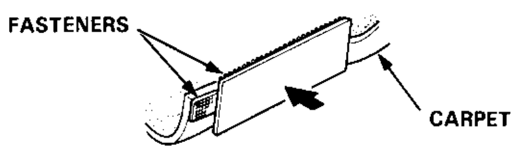
NOTE:
- Take care not to damage, wrinkle or twist the carpet.
- Make sure the seat harness is routed correctly.
- Slip the slits in the carpet over the rear console bracket.



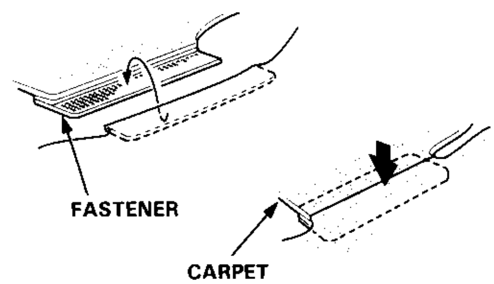
- Reattach the cut area Ⓐ in the carpet (see page 20-128) as follow:
  - 1) Clean the back of the carpet with a sponge dampened in alcohol.
    Attach the fasteners to the edge of the carpet with double-faced adhesive tape.



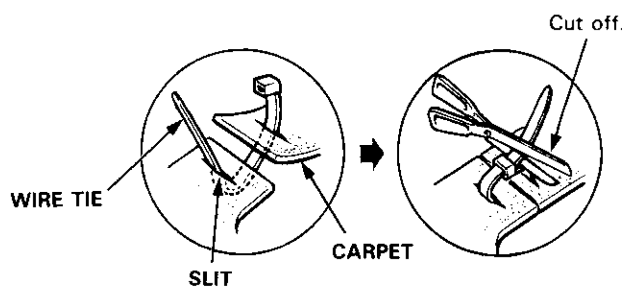
  - 2) Attach the other fastener as shown.



  - 3) Align the carpet with the fastener, then press the carpet down securely.



- Reattach the cut area under the parking brake lever and cut area Ⓑ (see page 20-128) with wire ties as shown.



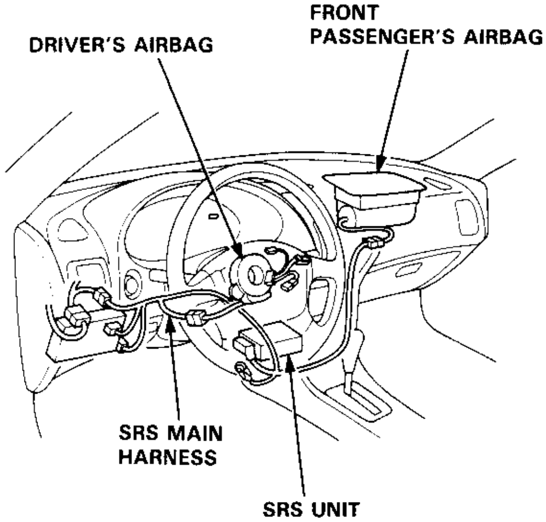
- If necessary, replace any damaged clips.

Consoles, Front and Rear

Replacement

SRS wire harnesses are routed near the front console.

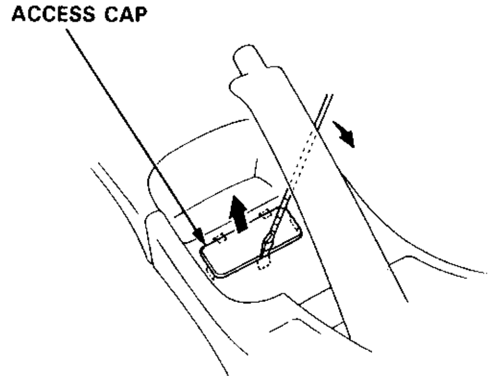
CAUTION:
- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**



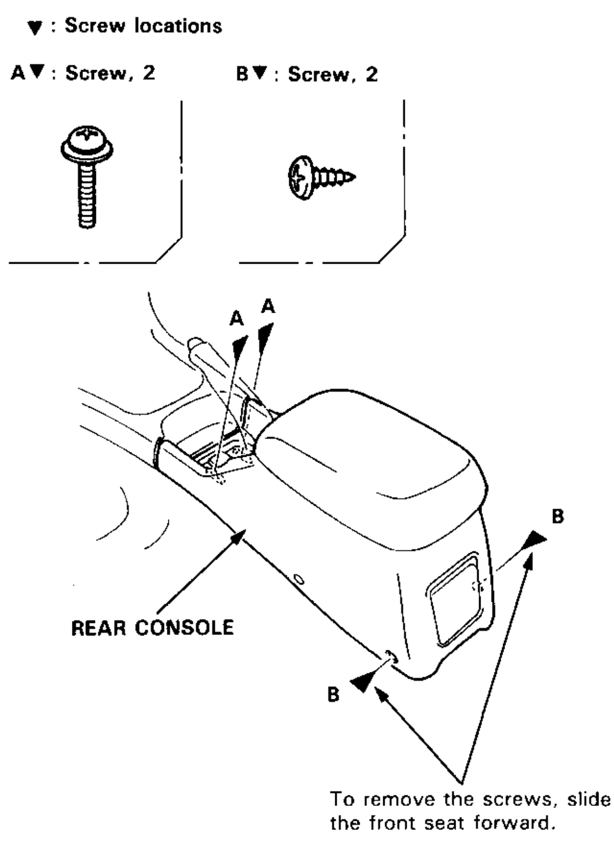
NOTE: Take care not to scratch the front and rear consoles, and dashboard.

1. Remove the access cap.

   CAUTION: **When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.**

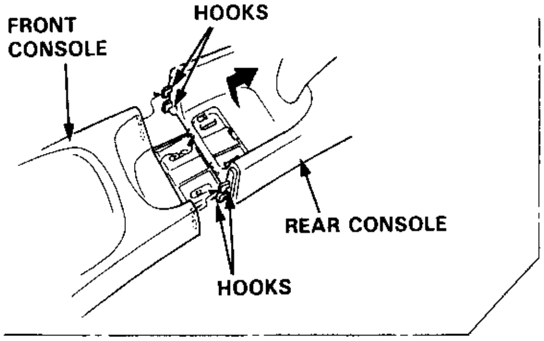


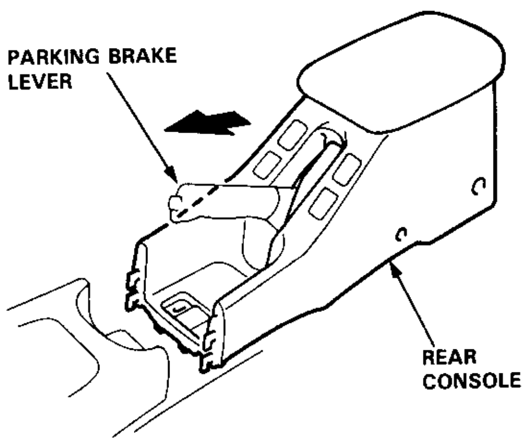
2. Remove the screws.



3. Remove the rear console.

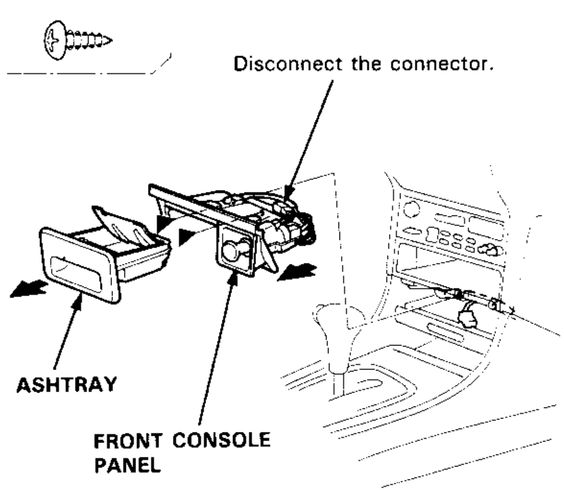
NOTE:
- Lift up the parking brake lever.
- Detach the hooks by lifting the front of the rear console and sliding it rearward.





4. Remove the ashtray and front console panel.

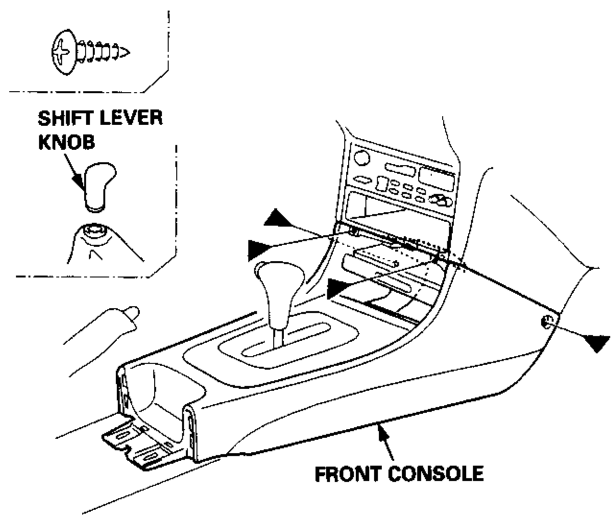
▶ : Screw locations, 2



5. Remove the Screws.

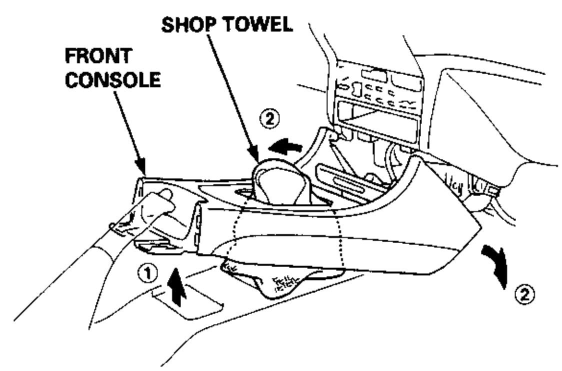
NOTE: Remove the shift lever knob (M/T).

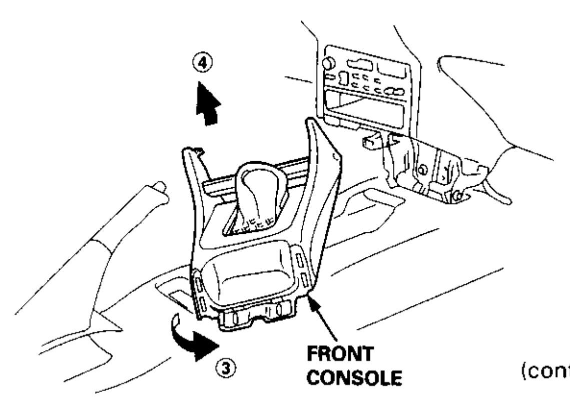
▶: Screw locations, 4



6. Remove the front console as shown.

NOTE: Wrap the shift lever and A/T gear position indicator panel with a shop towel to prevent damage.





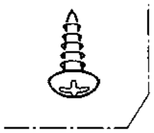
(cont'd)

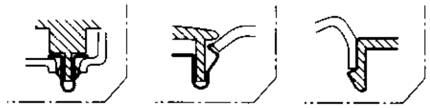
Consoles, Front and Rear

Replacement (cont'd)

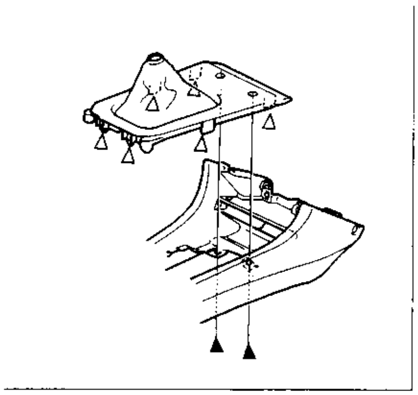
7. If necessary, disassemble the front and rear consoles.

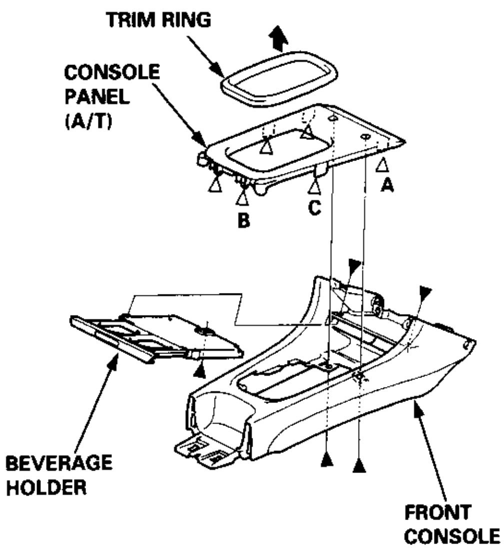
▶: Screw locations, 5 ▷: Clip locations A ▷: Clip, 2 B ▷: Clip, 2 C ▷: Clip, 2



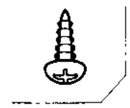


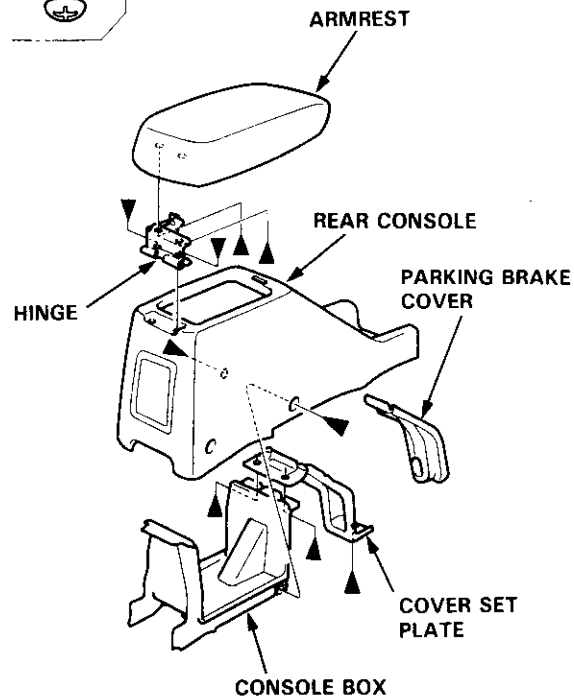
M/T:





▲ : Screw locations, 9



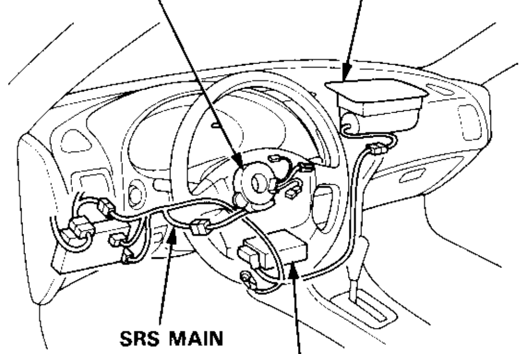


8. Installation is the reverse of the removal procedure.

Component Removal/Installation

SRS wire harnesses are routed near the dashboard and steering column.

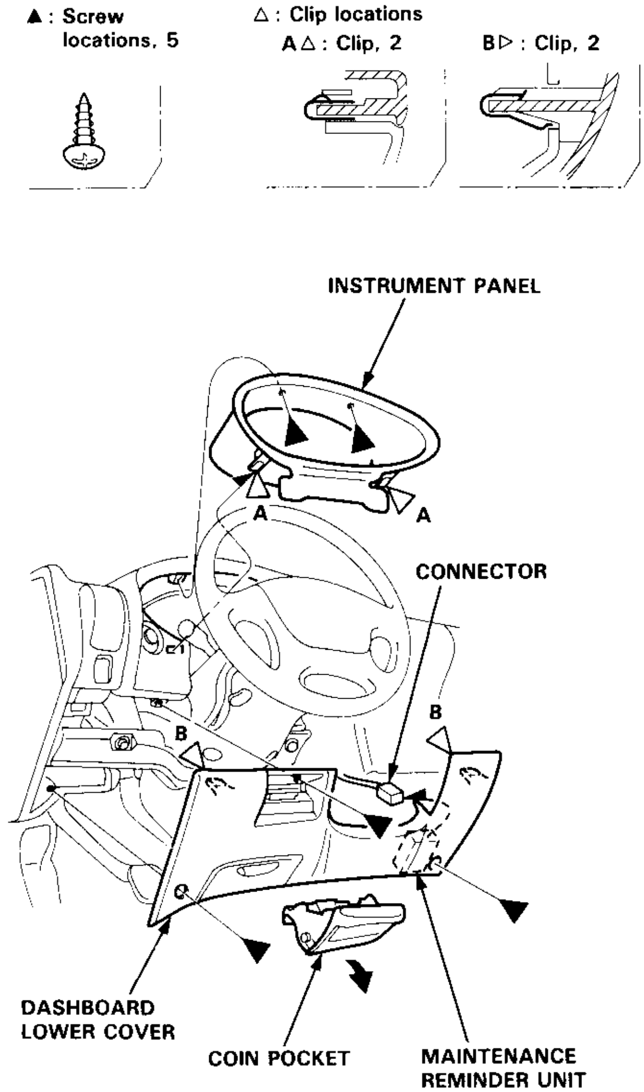
CAUTION:
- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**



CAUTION: **When prying with a flat tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.**

Instrument panel, Dashboad lower cover, Knee bolster removal:

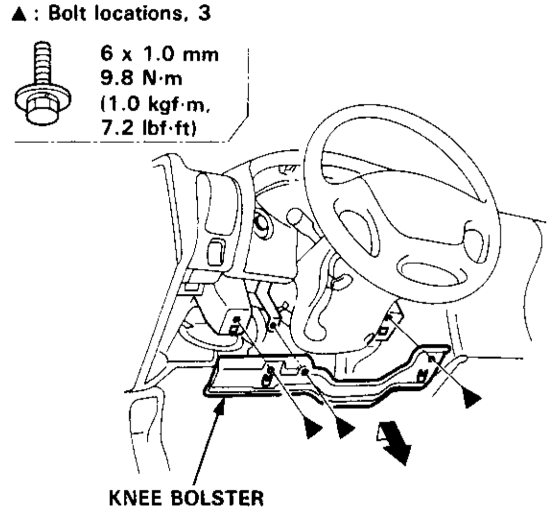
1. Lower the steering column.
2. Remove the screws and detach the clips, then remove the instrument panel.
3. Remove the coin pocket.
4. Remove the screws and detach the clips, then remove the dashboard lower cover.
   Disconnect the connector.



(cont'd)

Component Removal/Installation (cont'd)

5. Remove the knee bolster.



6. Installation is the reverse of the removal procedure.

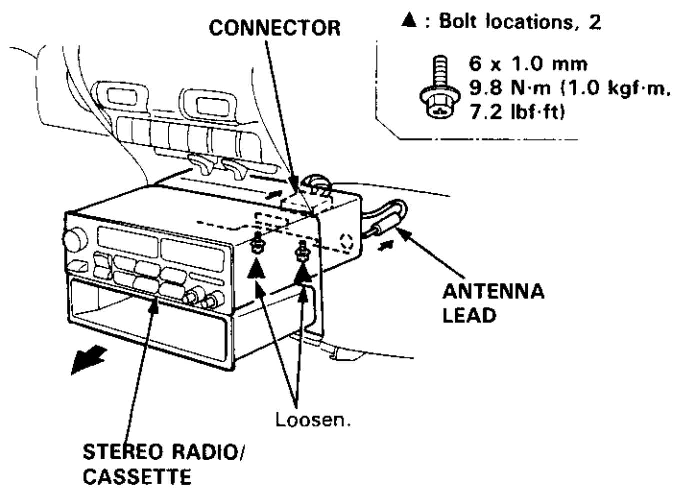
Stereo radio/cassette, Heater control panel removal:

1. Remove the rear console, then remove the front console (see page 20-130).

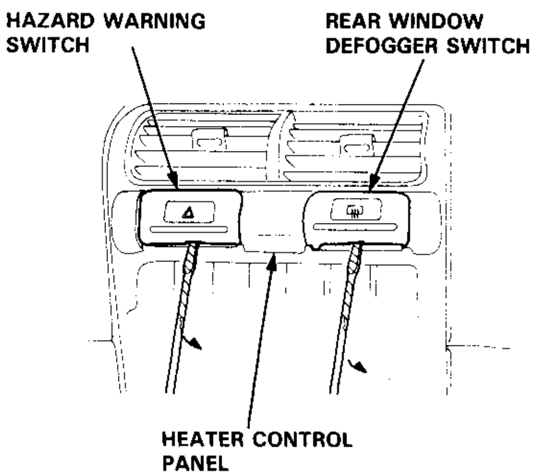
2. Loosen the bolts, then remove the stereo radio/cassette by pulling it out.
   Disconnect the connector and antenna lead.

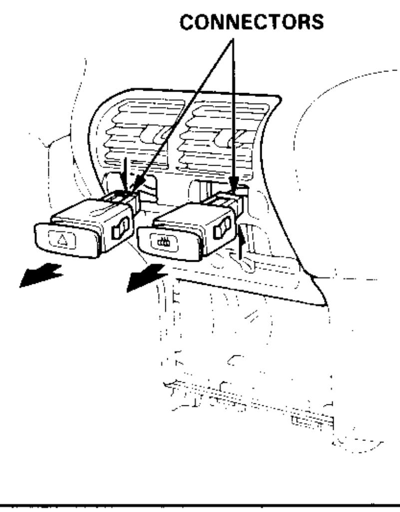
   NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
   — disconnecting the battery.
   — removing the No. 47 (7.5 A) fuse from the underhood fuse/relay box.
   — removing the radio.

   After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.



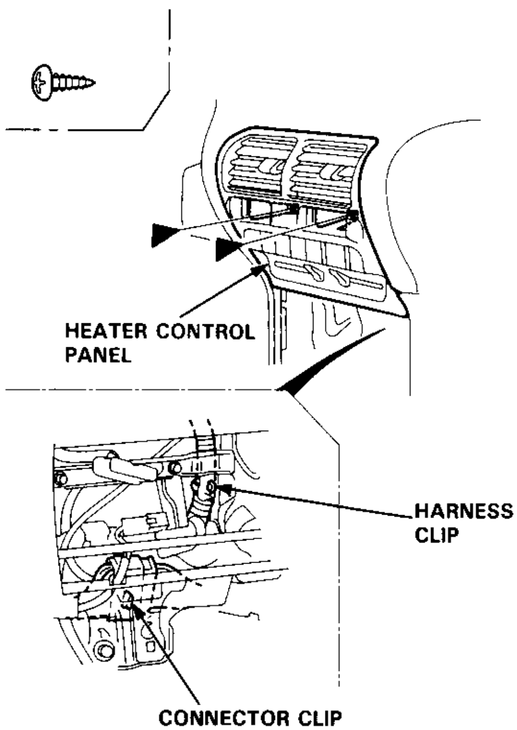
3. Carefully pry the hazard warning switch and rear window defogger switch out of the heater control panel.
   Disconnect the connectors.



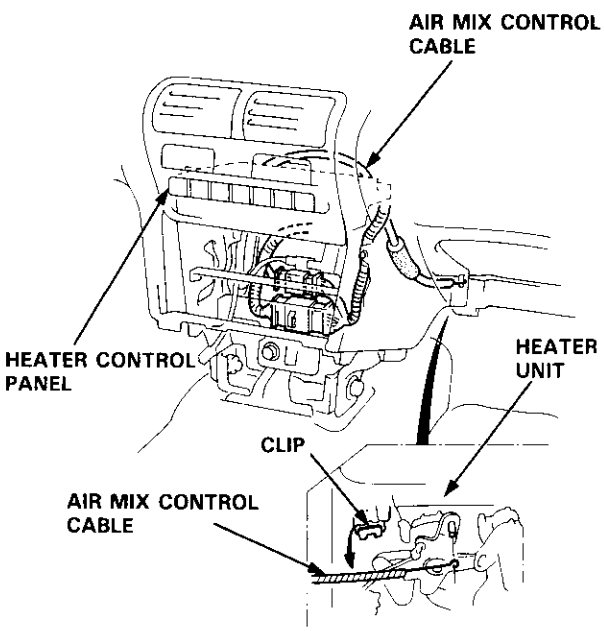


4. Remove the screws.
Detach the harness clip and connector clip.

▶ : Screw locations, 2

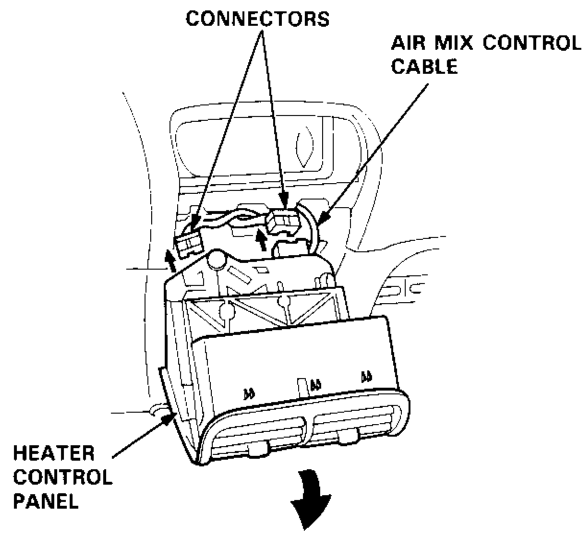


5. Disconnect the air mix control cable from the heater unit.



6. Pull the heater control panel out, then disconnect the connectors.

NOTE: Take care not to bend the air mix control cable.



7. Installation is the reverse of the removal procedure.

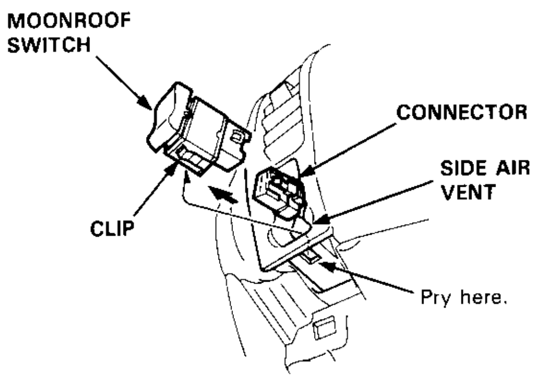
NOTE: Make sure the connector and air mix control cable are connected properly.

(cont'd)

Side air vent removal:

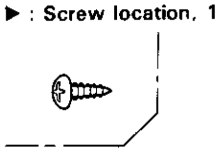
Driver's

1. Remove the dashboard lower cover (see page 20-133).
2. Carefully pry the moonroof switch out of the side air vent, then disconnect the connector.



3. Remove the screw, then remove the side air vent.

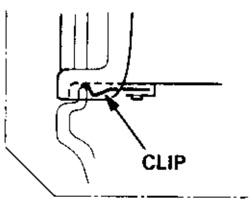
▶ : Screw location, 1

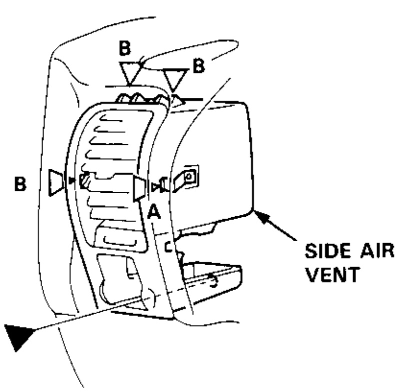


◁ : Clip, hook locations

A◁ : Clip, 1

B▽ : Hook, 3





4. Installation is the reverse of the removal procedure.

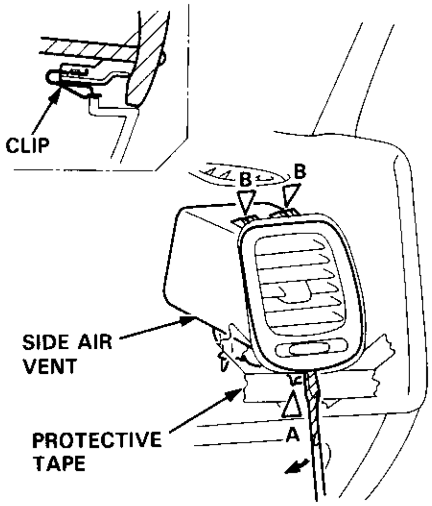
   NOTE: Make sure the connector is connected properly.

Front passenger's

Carefully pry the side air vent at the lower edge, then pull it out.

△ : Clip, hook locations

A△ : Clip, 1　　B▽ : Hook, 2

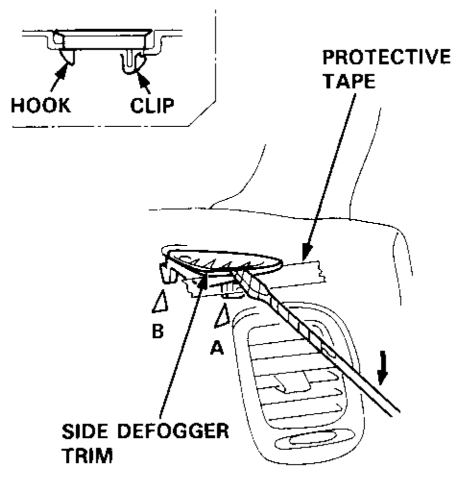


Side defogger trim removal:

Carefully pry the side defogger trim at the rear edge, then remove it.

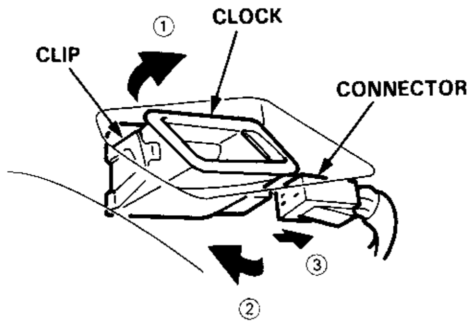
△ : Clip, hook locations

A△ : Clip,1　　B △ : Hook, 1



Clock removal:

Carefully pry the clock at the left edge, then pull it out. Disconnect the connector.

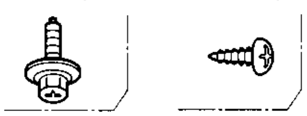


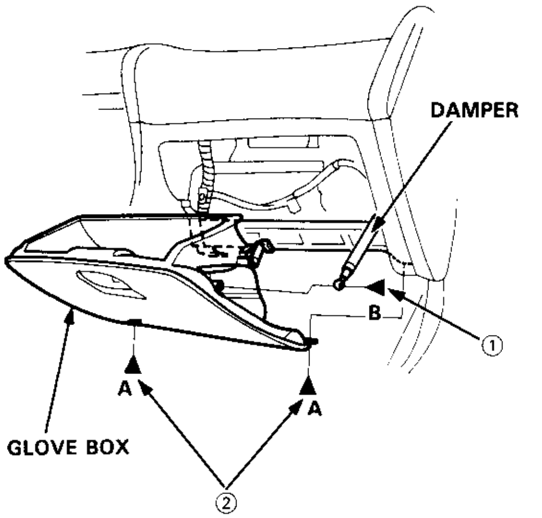
Glove box removal:

1. Open the glove box.
2. Remove the screw, then remove the damper from the glove box.
3. Remove the screw, then remove the glove box.

▲ : Bolt, screw locations

A▲ : Bolt, 2 B◄ : Screw, 1

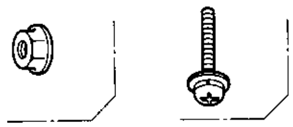


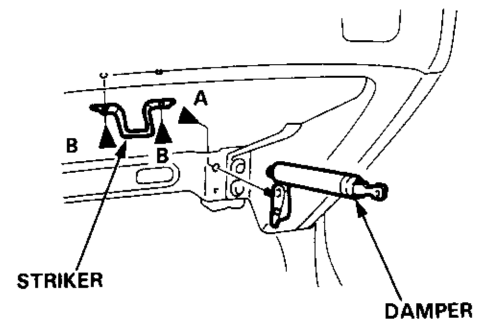


4. Remove the damper and striker.

▶ : Nut, screw locations

A▶ : Nut, 1 B▲ : Screw, 2





5. Installation is the reverse of the removal procedure.

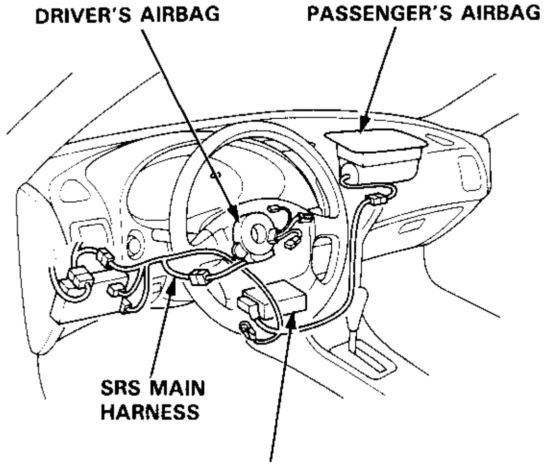
Dashboard

Replacement Precautions

SRS wire harnesses are routed near the dashboard and steering column.

CAUTION:

- **All SRS wire harnesses are covered with yellow insulation. Before you disconnect any part of an SRS wire harness, disconnect the airbag connectors.**
- **Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.**
- **For additional precautions, refer to the SRS sub-section in section 23.**



Before removing the dashboard:

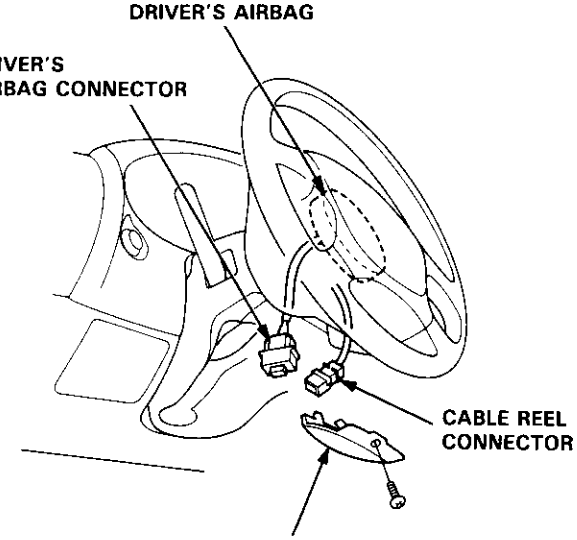
1. Disconnect the battery negative cable, then disconnect the positive cable.

   NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
   - disconnecting the battery.
   - removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
   - removing the radio.

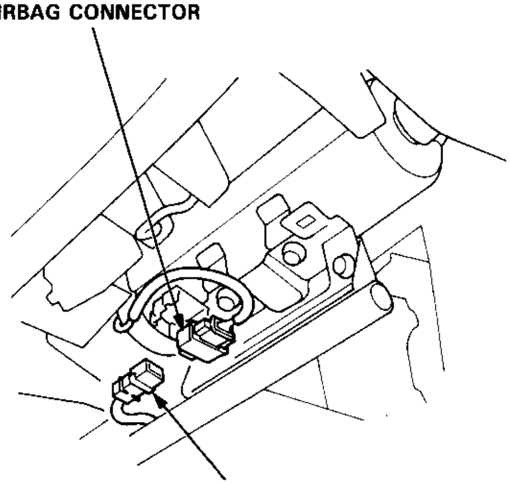
   After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

2. Install the short connectors (RED).

   Driver's:
   Remove the access panel, then disconnect the connector between the cable reel and driver's airbag.



   Front passenger's:
   Remove the glove box (see page 20-137), then disconnect the connector between the front passenger's airbag and SRS main harness.



Replacement

1. To remove the dashboard, first remove the:

- Front seats (see page 20-103)
- Front and rear consoles (see page 20-130)
- Dashboard lower cover (see page 20-133)
- Knee bolster (see page 20-134)
- Glove box (see page 20-137)
- Clock (see page 20-137)
- Moonroof switch (see page 20-136)
- Stereo radio/cassette (see page 20-134)

2. Lower the steering column (see section 17).

NOTE: To prevent damage to the steering column, wrap it with a shop towel.

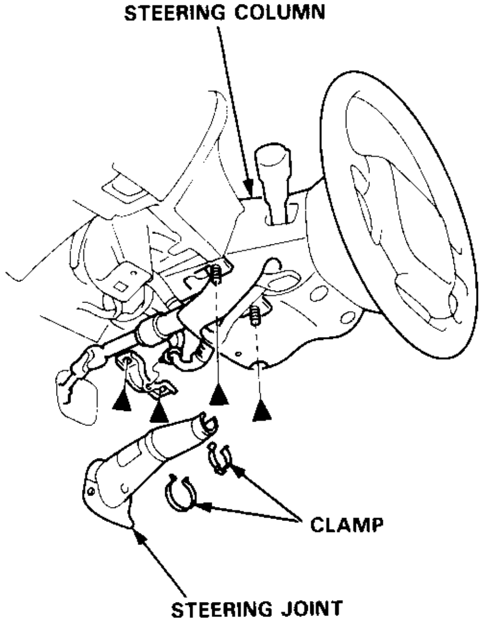
▲ : Bolt, nut locations

A▲ : Bolt, 2

8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

B▲ : Nut, 2

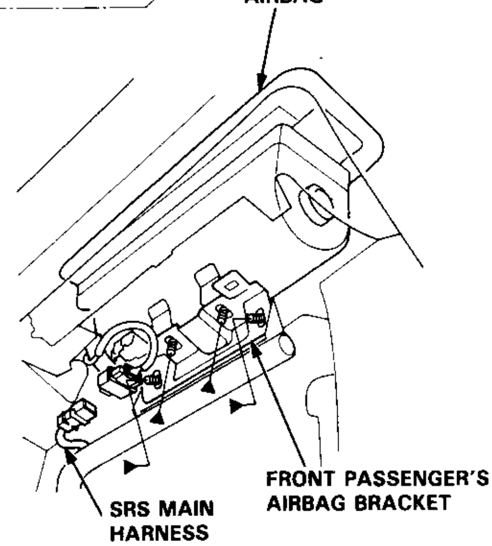
8 x 1.25 mm
13 N·m (1.3 kgf·m, 9 lbf·ft)
Replace.



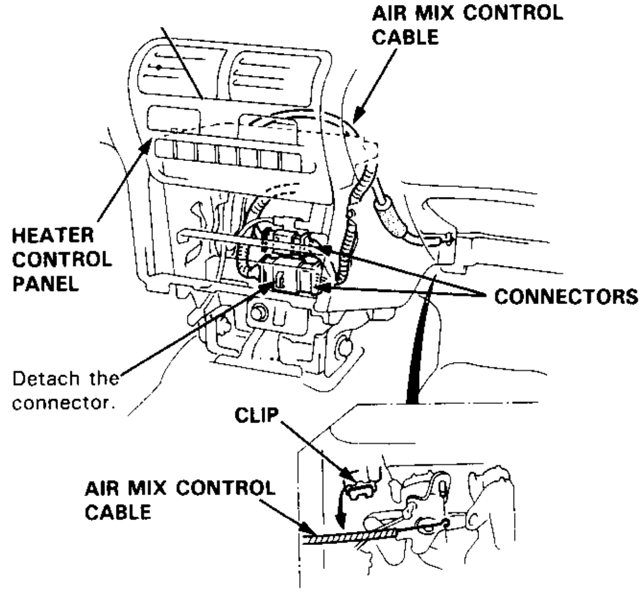
3. Remove the nuts, then remove the front passenger's airbag bracket.

▲ : Nut locations, 4

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m, 7.2 lbf·ft)



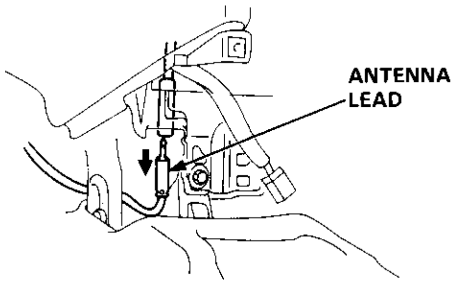
4. Disconnect the air mix control cable and connectors.



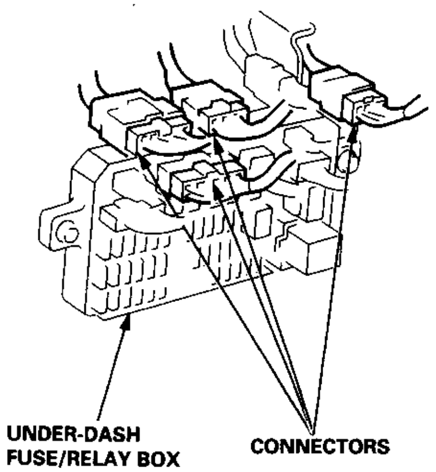
(cont'd)

Replacement (cont'd)

5. Disconnect the antenna lead.

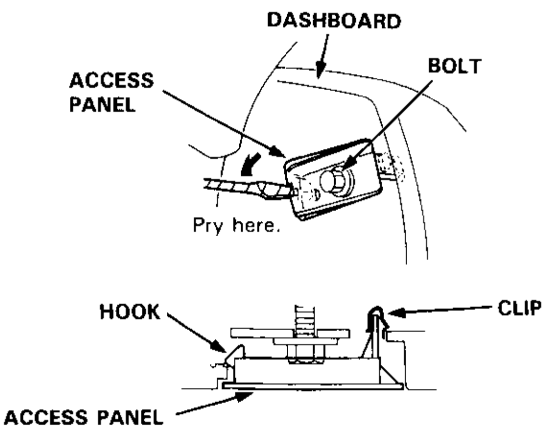


6. Disconnect the connectors from the under-dash fuse/relay box.



7. Remove the access panels on both sides.

   CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

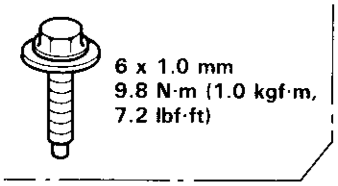


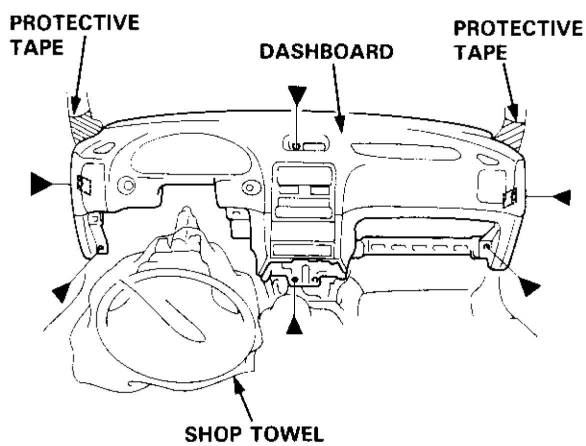
8. Remove the bolts, then lift and remove the dashboard.

   CAUTION: Use protective tape on the bottom of the front pillar trim.

   NOTE:
   - Take care not to scratch the dashboard.
   - To prevent damage to the shift lever and A/T gear position indicator panel, wrap them with a shop towel.

▼ : Bolt locations, 6





9. Installation is the reverse of the removal procedure.

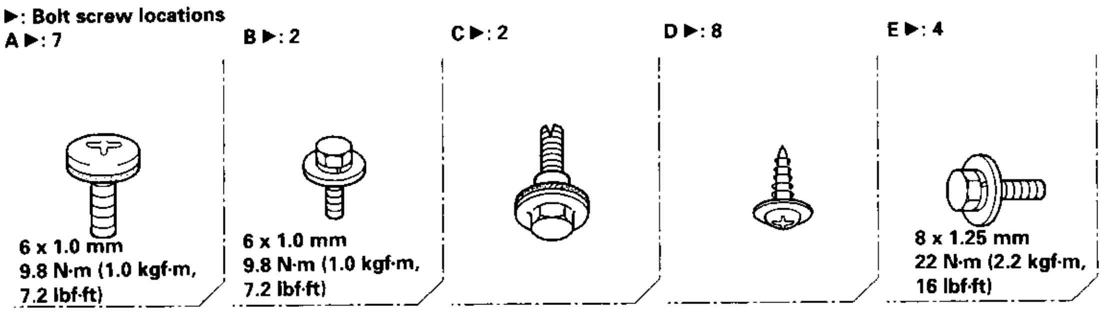
   NOTE:
   - Make sure the dashboard fits onto the body correctly.
   - Before tightening the bolts, make sure the dashboard wire harnesses are not pinched, and that the dashboard is not interfering with the air mix control cable.

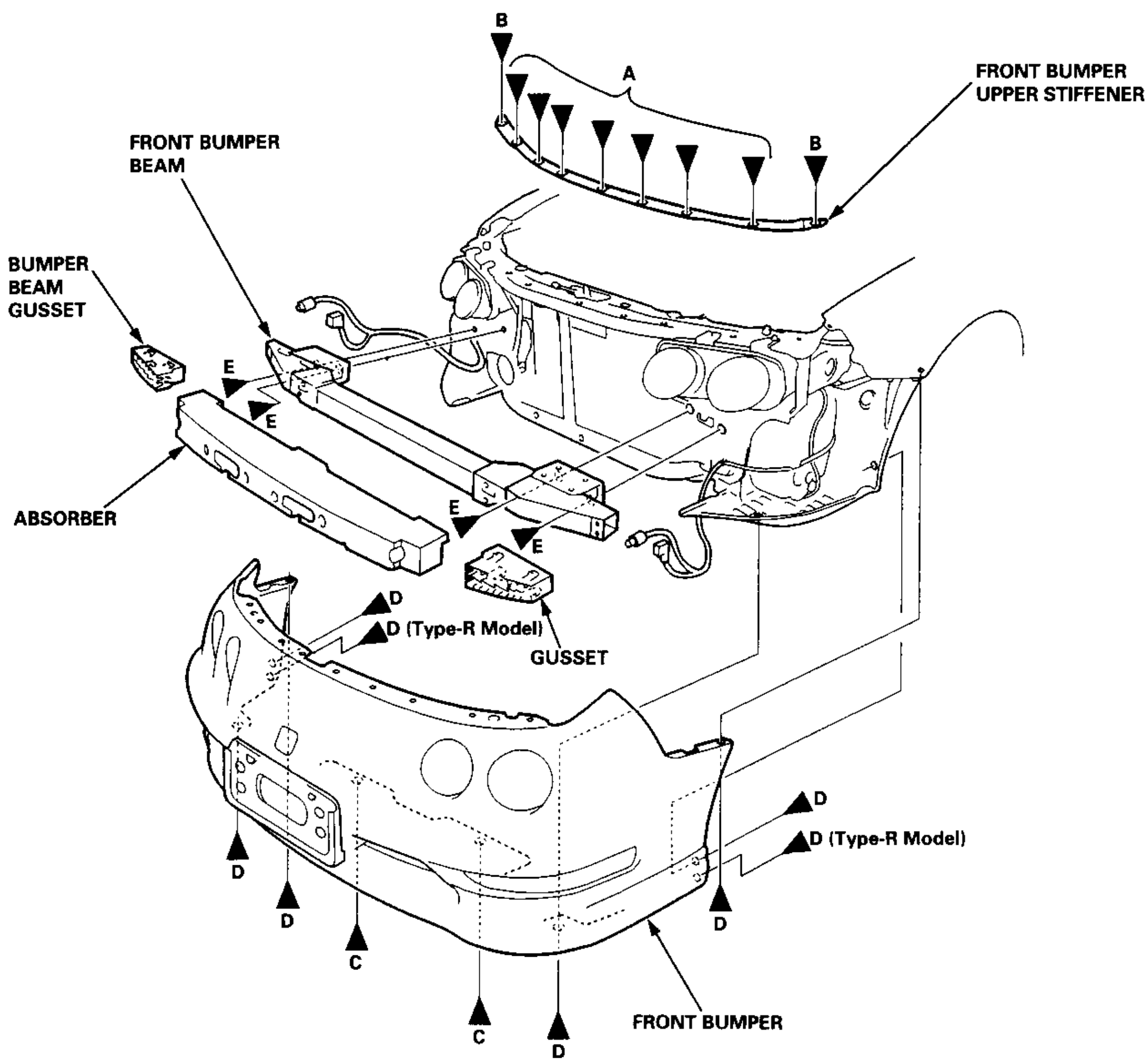
Front Bumper Replacement

CAUTION: Wear gloves to remove and install the front bumper.

NOTE:

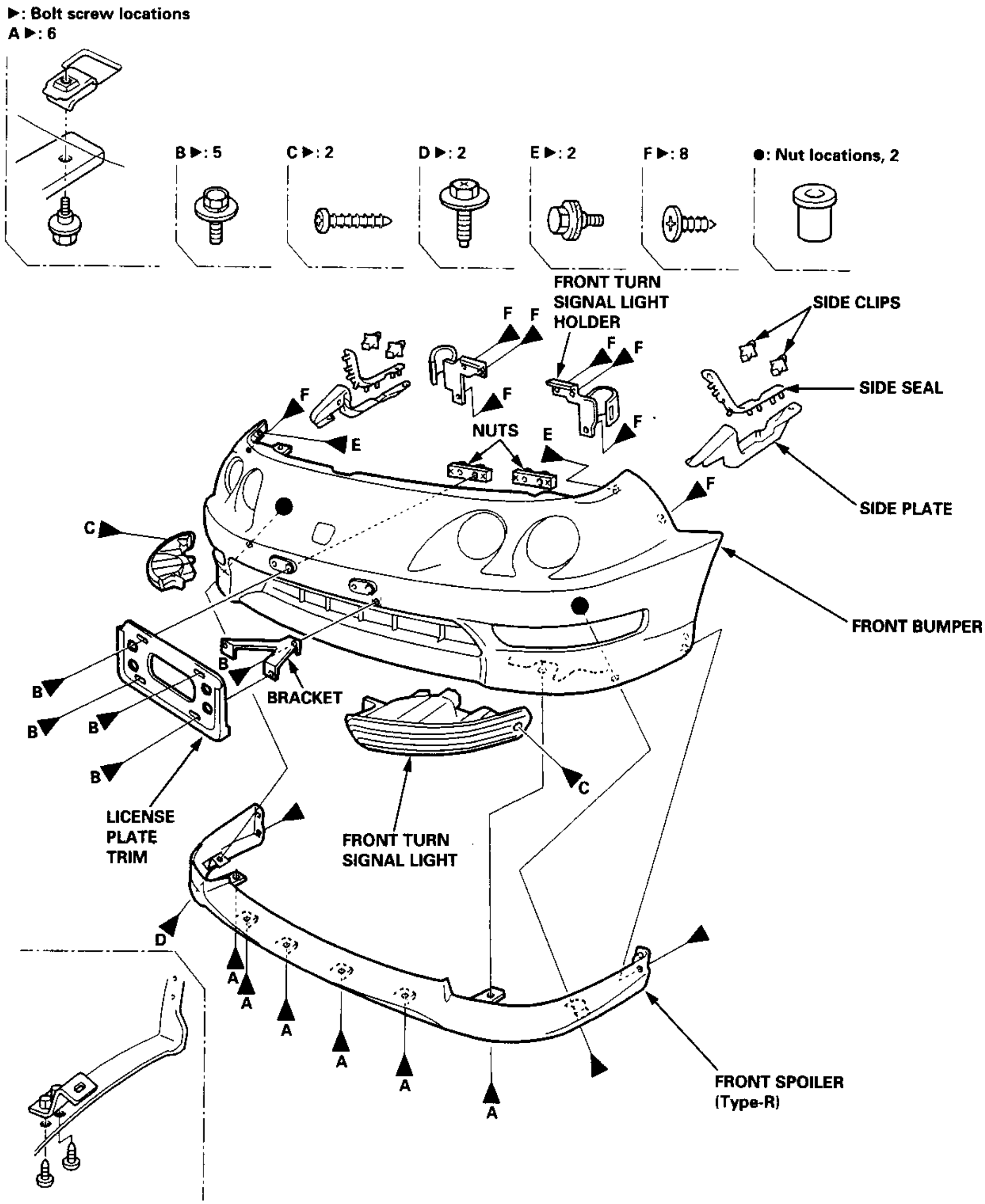
- An assistant is helpful when removing the front bumper.
- Take care not to scratch the front bumper and body.





(cont'd)

Front Bumper Replacement (cont'd)



Installation is the reverse of the removal procedure.

Rear Bumper Replacement

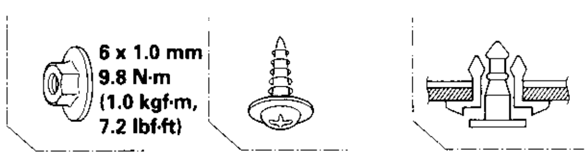
CAUTION: Wear gloves to remove and install the rear bumper.

NOTE:
- An assistant is helpful when removing the rear bumper.
- Take care not to scratch the rear bumper and body.

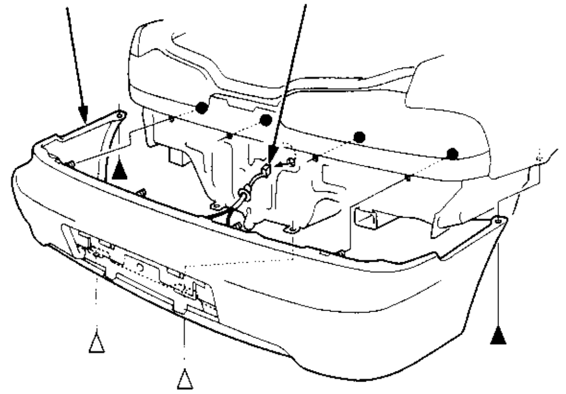
Hatchback:

1. Remove the nuts, screws and clips, then remove the rear bumper.

●: Nut locations, 4 ▶: Screw locations, 2 ▷: Clip locations, 2

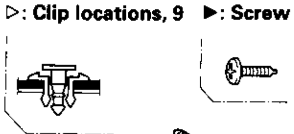


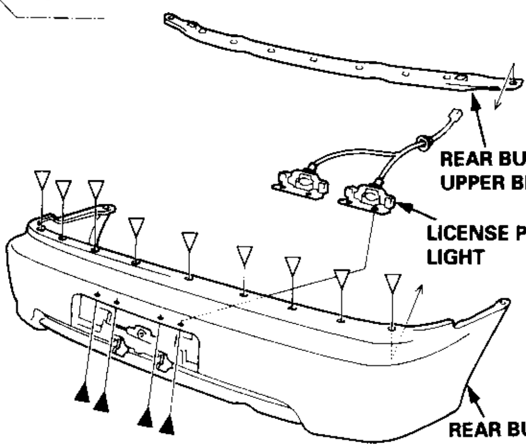
6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



NOTE: If necessary, disassemble the rear bumper.

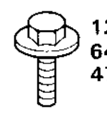
▷: Clip locations, 9 ▶: Screw locations, 4



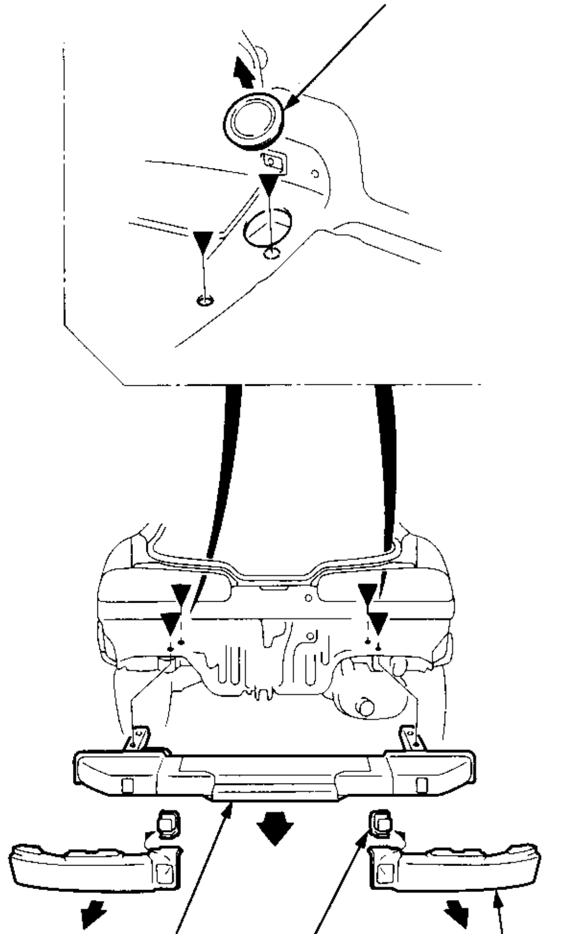


2. Remove the absorber, bumper beam gusset and rear bumper beam.

▼: Bolt locations, 4



12 x 1.25 mm
64 N·m (6.5 kgf·m,
47 lbf·ft)



3. Installation is the reverse of the removal procedure.

   NOTE: Make sure the license plate light connector is connected, and the grommet is installed properly.

(cont'd)

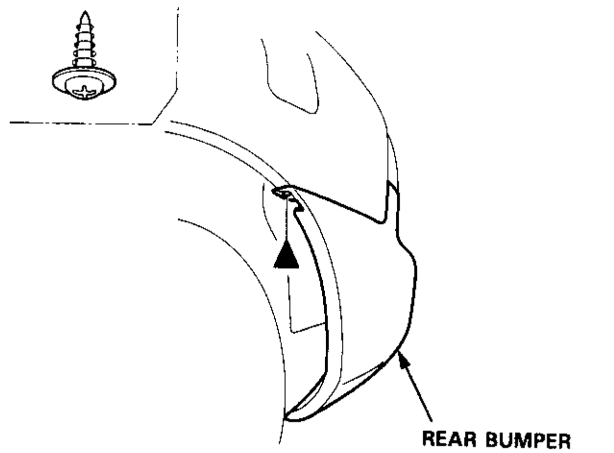
Bumpers

Rear Bumper Replacement (cont'd)

Sedan:

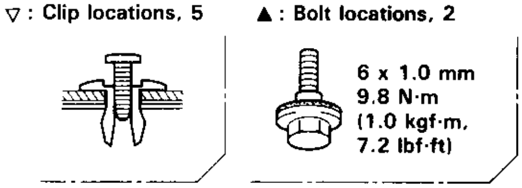
1. Remove the screw from each side.

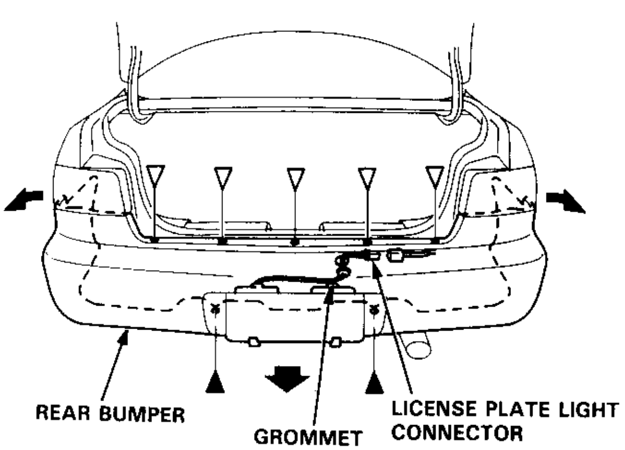
▲ : Screw locations, 2



2. Open the trunk lid, then remove the rear trim panel (see page 20-97).
3. Disconnect the license plate light connector and grommet from the rear trunk area. Remove the clips and bolts, then remove the rear bumper.

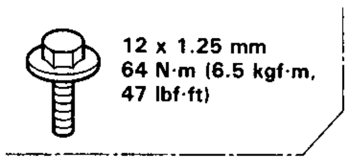
▽ : Clip locations, 5　　▲ : Bolt locations, 2

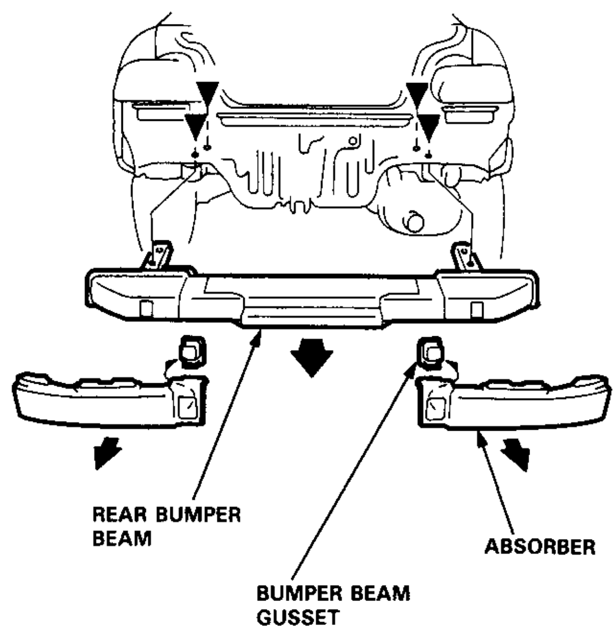




4. If necessary, remove the license plate light harness, bracket and lens from the rear bumper (see page 20-143).
5. Remove the absorber, bumper beam gusset and rear bumper beam.

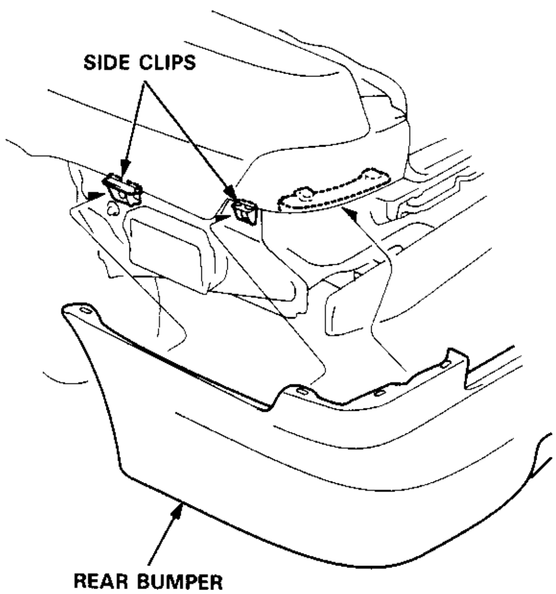
▼ : Bolt locations, 4





6. Installation is the reverse of the removal procedure.

NOTE:
- Make sure the license plate light connector is connected, and the grommet is installed properly.
- Make sure the rear bumper engages the side clips securely.

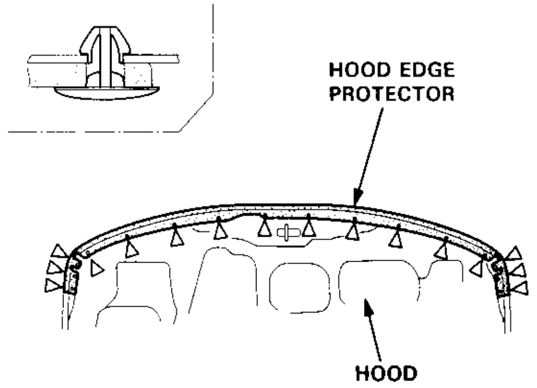


Replacement

NOTE:
- An assistant is helpful when removing the hood.
- Take care not to damage the hood and body.
- When removing the clips, use a clip remover.
- Open the hood.

1. If necessary, remove the hood edge protector.

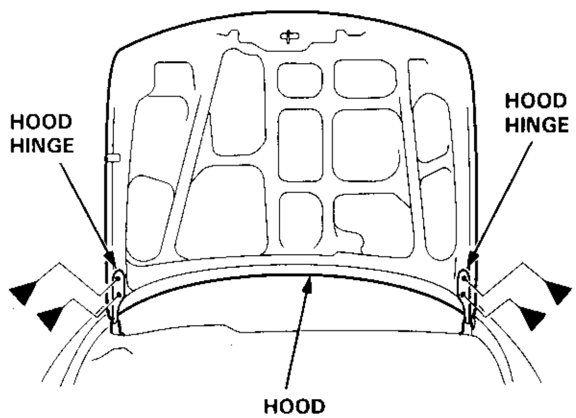
△ : Clip locations, 16



2. Remove the bolts, then remove the hood.

▲ : Bolt locations, 4

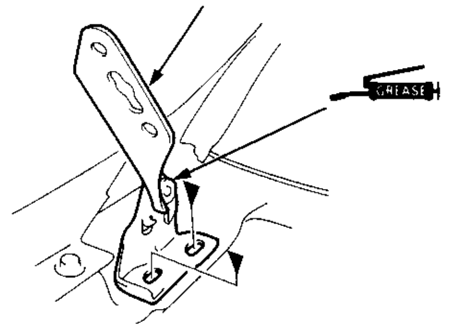
6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



NOTE: If necessary, remove the hood hinge.

▼ : Bolt locations, 4

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)



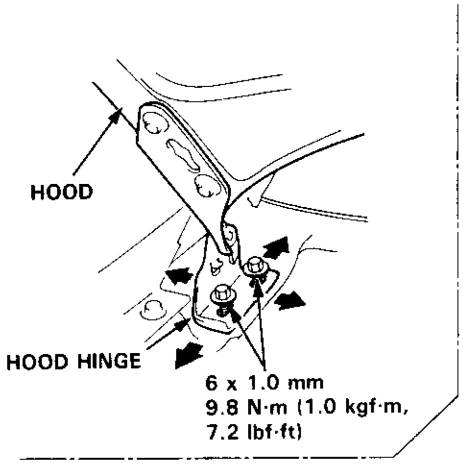
3. Installation is the reverse of the removal procedure.

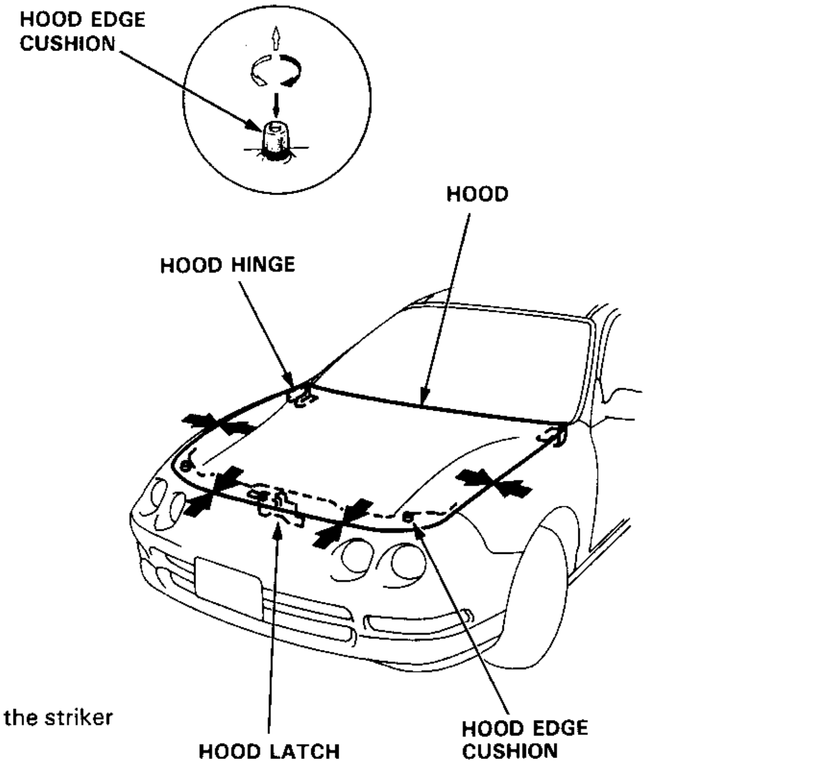
   NOTE:
   - If necessary, replace any damaged clips.
   - Make sure the hood locks securely.
   - Make sure the hood opens properly.
   - Adjust the hood alignment.

Adjustment

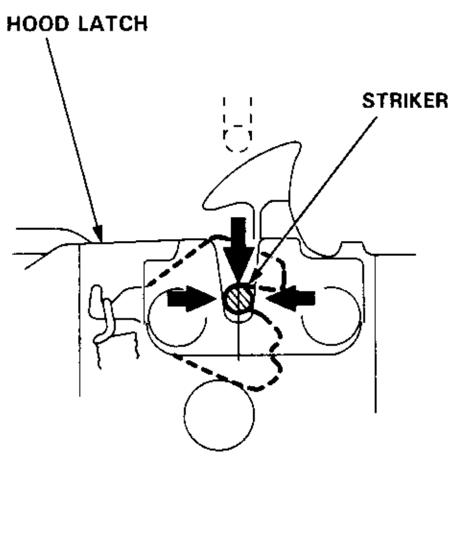
NOTE: Before adjusting the hood, loosen each bolt slightly.

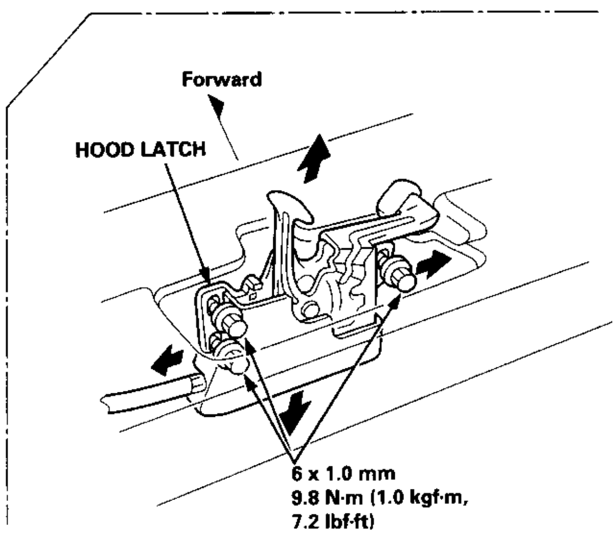
1. Adjust the hood hinges right and left, as well as fore and aft, by using the elongated holes.
2. Turn the hood edge cushions, as necessary, to make the hood fit flush with the body at front and side edges.
3. Adjust the hood latch to obtain the proper height at the forward edge.





NOTE: Move the hood latch right or left until the striker is centered in the hood latch as shown.



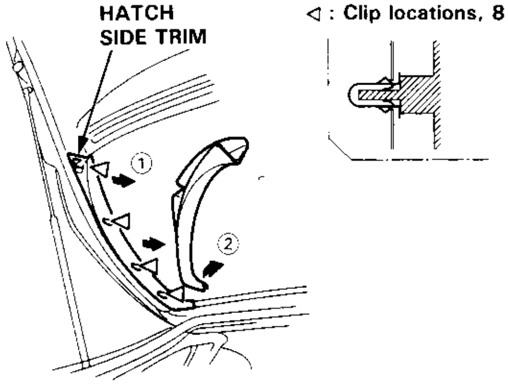


4. After adjustment, tighten each bolt securely.

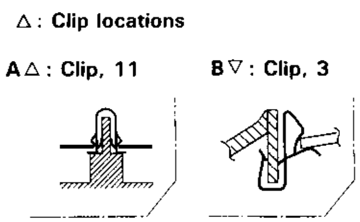
Replacement

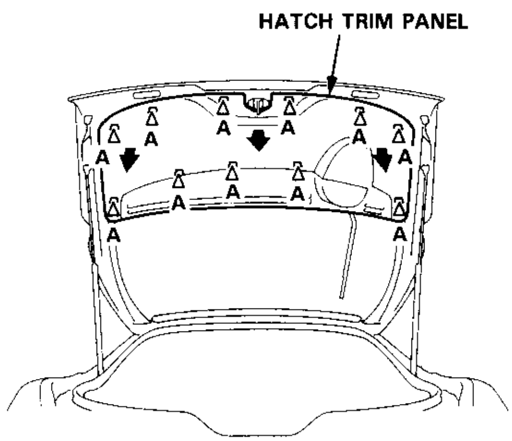
NOTE:
- An assistant is helpful when removing the hatch.
- Take care not to damage the hatch and body.
- Take care not to scratch the hatch side trim and hatch trim panel.
- Open the hatch.
- Remove the high mount brake light (see section 23).

1. Remove the hatch side trim on each side.

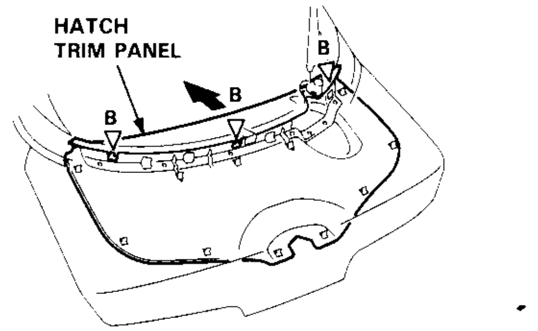


2. Remove the hatch trim panel.

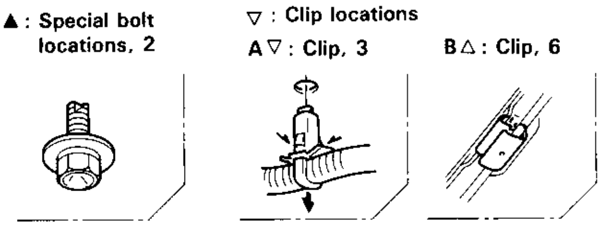




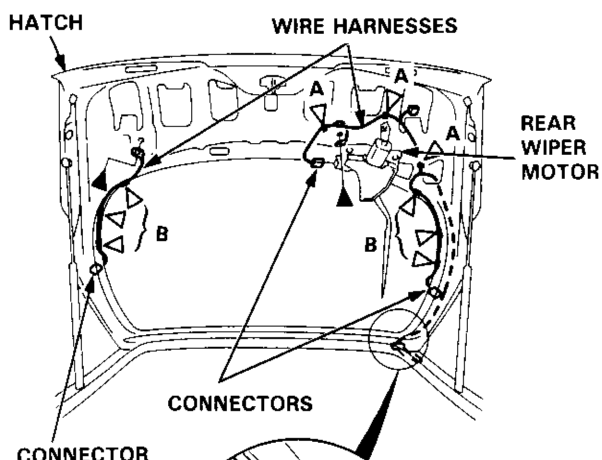
NOTE: Detach the clips by sliding the hatch trim panel forward, then remove it.

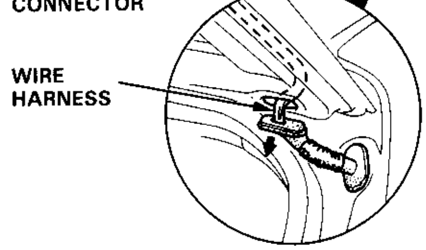


3. Remove the hatch spoiler as described on page 20-161 (if so equipped).
4. Disconnect the connectors, then remove the wire harnesses from the hatch.



NOTE: Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the hatch is reinstalled.





5. Remove the rear wiper motor (see section 23).

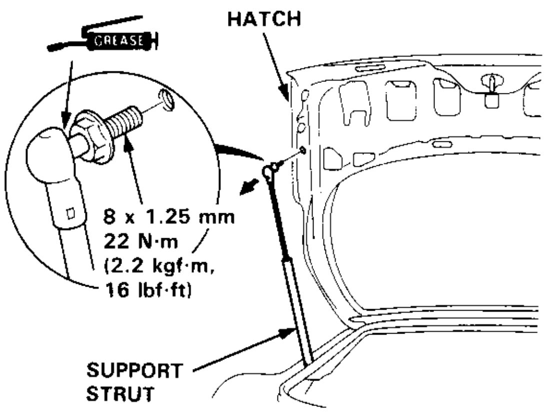
6. Remove the upper anchor bolts from the front and rear seat belts (see pages 20-117, 121), then remove the upper portion of the quarter pillar trim panel (see page 20-99).

7. Remove the rear roof trim, then pull the rear of the headliner down (see page 20-99).

   NOTE: Take care not to bend the headliner.

8. Remove the support strut on each side while holding the hatch.

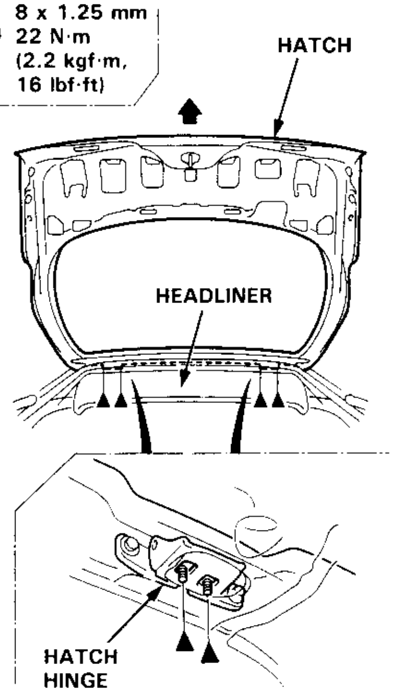
   NOTE: Do not raise the hatch too far; the corners of the glass may hit the roof and break.



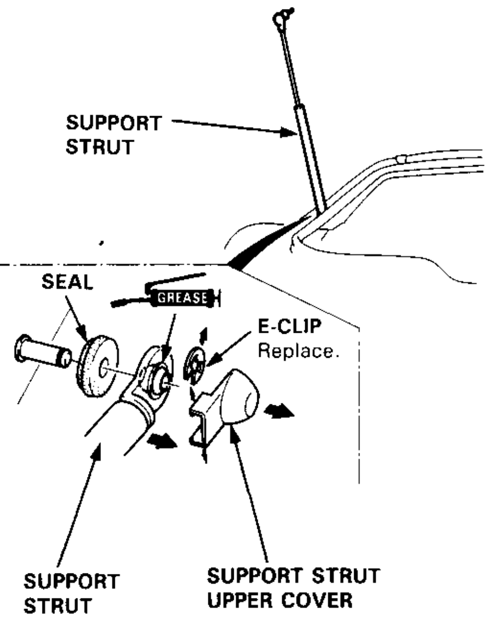
9. Remove the nuts, then remove the hatch.

   ▲ : Nut locations, 4

   8 x 1.25 mm
   22 N·m
   (2.2 kgf·m,
   16 lbf·ft)



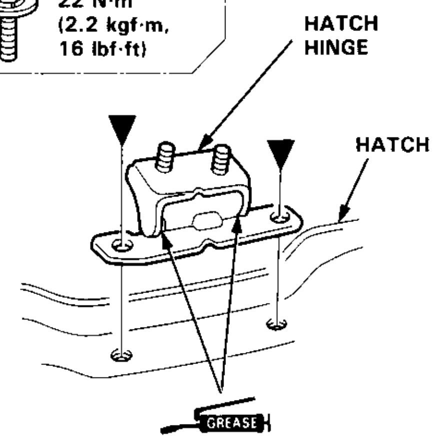
NOTE: If necessary, replace the support strut.



- If necessary, remove the hatch hinge.

  ▼ : Bolt locations, 4

  8 x 1.25 mm
  22 N·m
  (2.2 kgf·m,
  16 lbf·ft)



10. Installation is the reverse of the removal procedure.

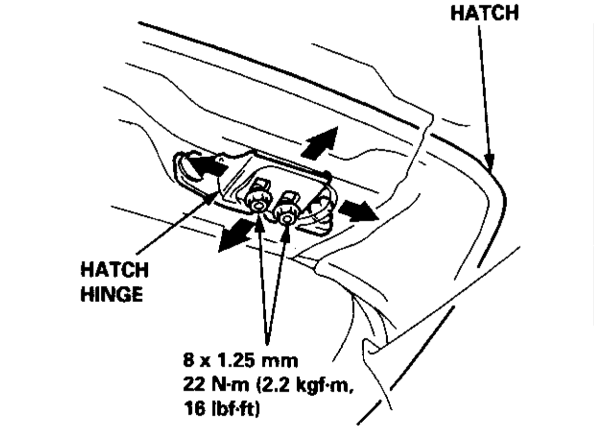
    NOTE:
    - If necessary, replace any damaged clips.
    - Make sure the connectors are connected properly.
    - Make sure the hatch locks securely.
    - Make sure the hatch opens properly.
    - Adjust the hatch alignment (see page 20-150).

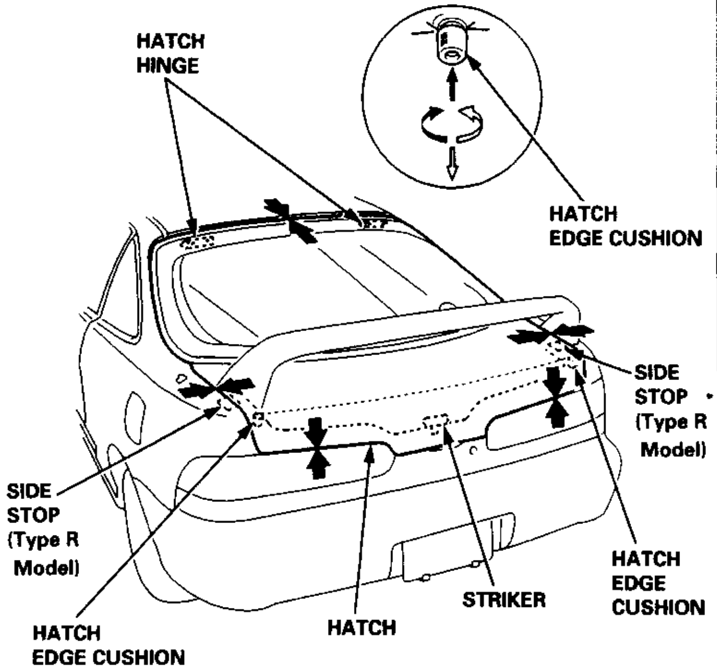
Hatch

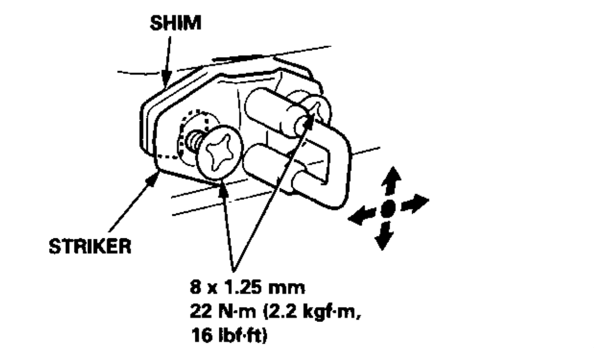
Adjustment

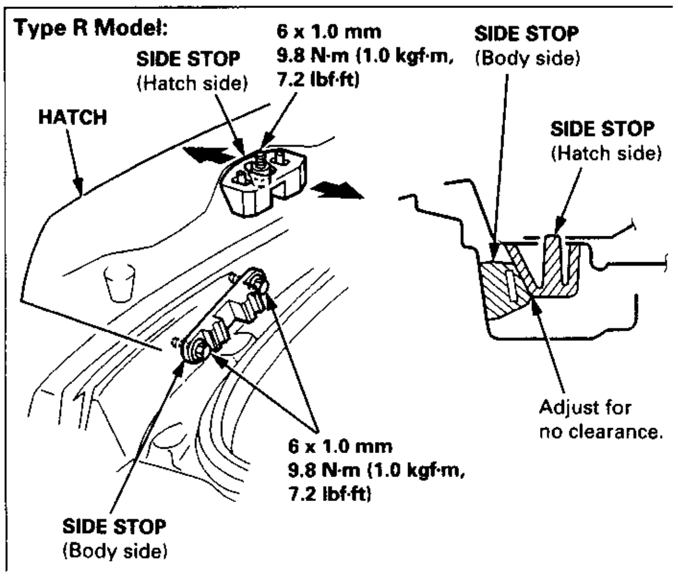
NOTE:
- Before adjusting the hatch, loosen each bolt and nut slightly.
- Do not install the support struts.

1. Adjust the hatch hinges right and left, as well as fore and aft, by using the elongated holes.
2. Turn the hatch edge cushions, as necessary, to make the hatch fit flush with the body at each side.
3. Adjust the hatch fit to the hatch opening by moving the striker.
4. Use shims, as necessary, to make the hatch fit flush with the body at the rear edge.
5. Adjust the hatch side stop so that there is no clearance between it and the body side stop, then tighten the mounting bolt (Type R).

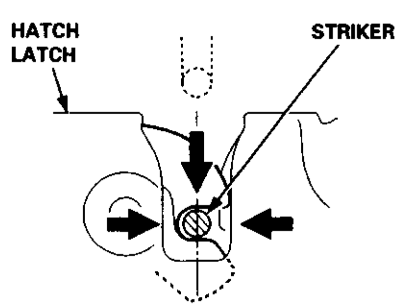








NOTE: Move the striker right or left until it's centered in the hatch latch as shown.



Trunk Lid

Replacement

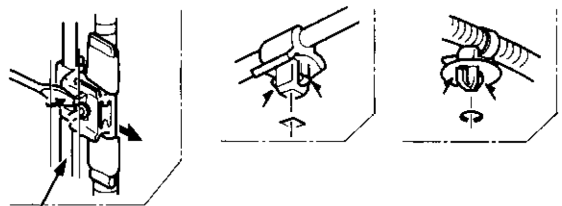
NOTE:
- An assistant is helpful when removing the trunk lid.
- Take care not to damage the trunk lid and body.
- Open the trunk lid.

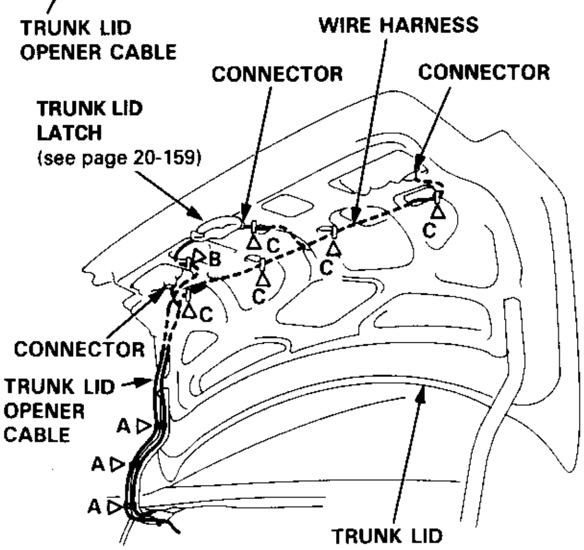
1. Disconnect the connectors and trunk lid opener cable. Remove the wire harness and trunk lid opner cable from the trunk lid.

   NOTE: Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the trunk lid is reinstalled.

▷ : Clip locations

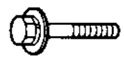
A▷ : Clip, 3 B◁ : Clip, 1 C△ : Clip, 5



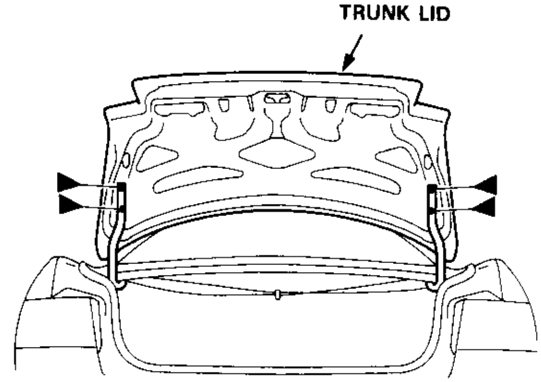


2. Remove the bolts, then remove the trunk lid.

▶ : Bolt locations, 4

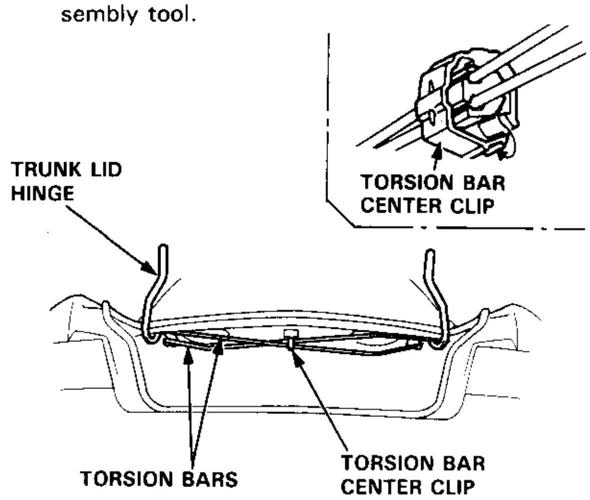


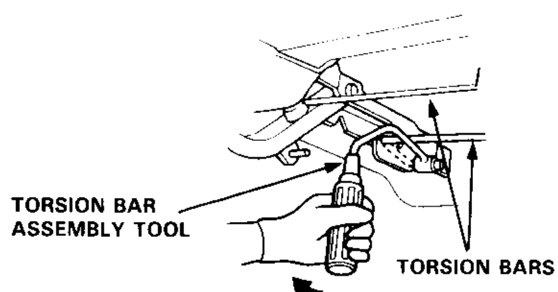
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



3. If necessary, remove the trunk lid hinge.

   NOTE:
   - Remove the rear shelf (see page 20-95).
   - Remove the torsion bars with the torsion bar assembly tool.



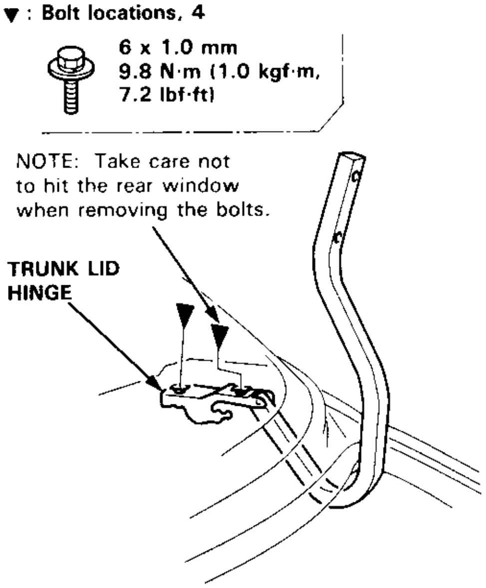


(cont'd)

Trunk Lid

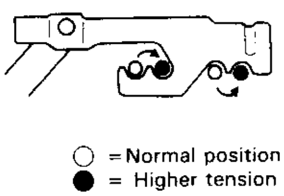
Replacement (cont'd)

- Remove the bolts, then remove the trunk lid hinge.



4. Installation is the reverse of the removal procedure.

   NOTE:
   - Make sure the connectors are connected properly.
   - Adjust the torsion bars fore or aft with the torsion bar assembly tool as shown.

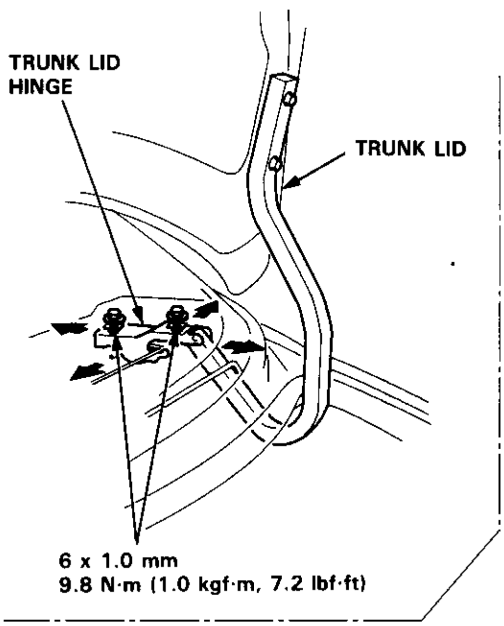


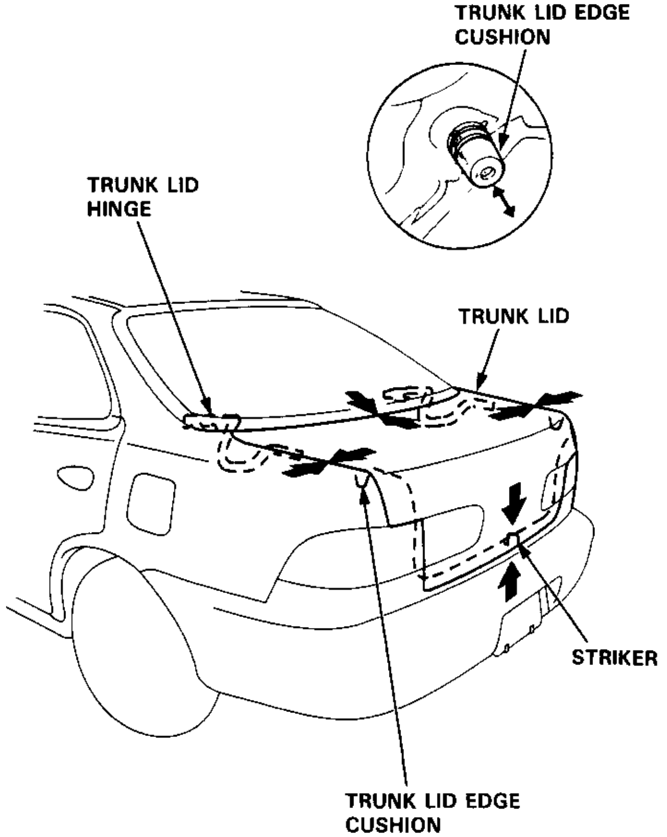
   - Make sure the trunk lid locks securely.
   - Make sure the trunk lid opens properly.
   - Adjust the trunk lid alignment.

Adjustment

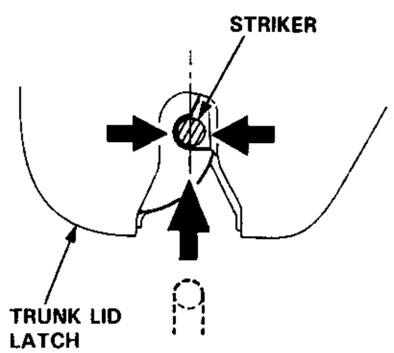
NOTE: Before adjusting the trunk lid, loosen each bolt slightly.

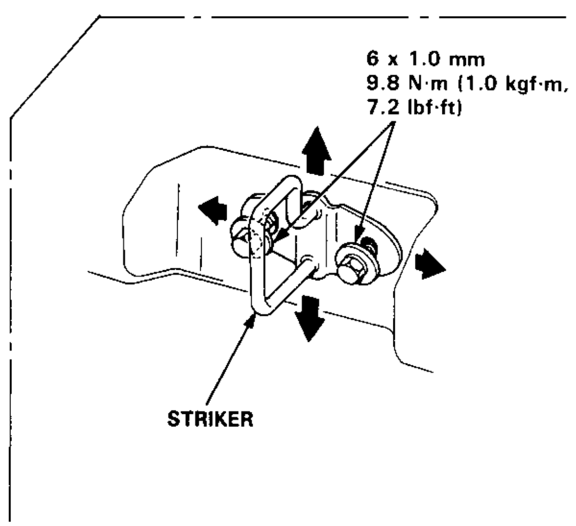
1. Adjust the trunk lid hinges right and left, as well as fore and aft, by using the elongated holes.
2. Turn the trunk lid edge cushions, as necessary, to make the trunk lid fit flush with the body at the rear and side edges.
3. Adjust the fit between the trunk lid and the trunk lid opening by moving the striker.





NOTE: Move the striker right or left until it's centered in the trunk lid latch as shown.





4. After adjustment, tighten each bolt securely.

Opener Cables

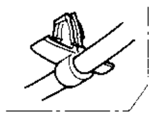
Replacement

NOTE:
- When removing the clips, use a clip remover.
- Take care not to bend the opener cables.

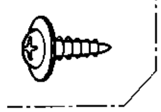
Hood Opener Cable:

▽ : Clip locations

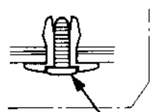
A ▽ : Clip, 5



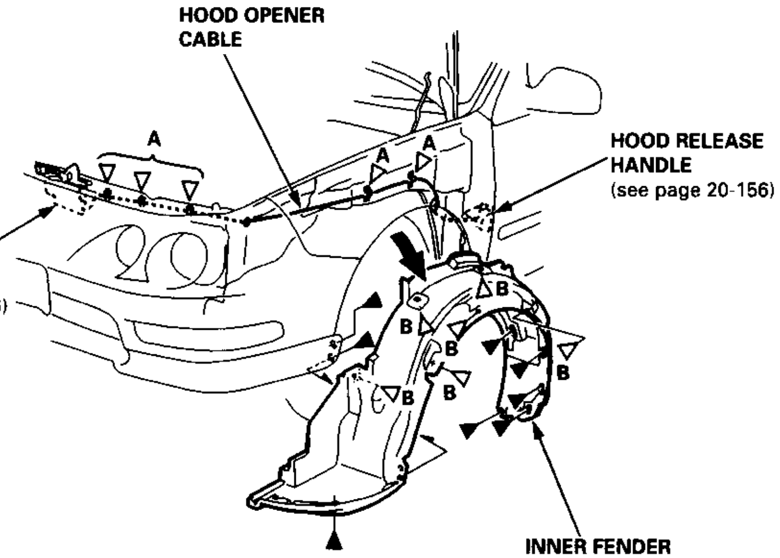
▶: Screw locations, 8



B ▽ : Clip, 6



NOTE: Loosen the screw, then remove the clip using a clip remover.

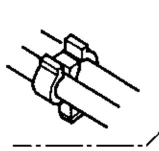


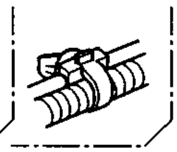
Fuel Lid Opener Cables (Hatchback):

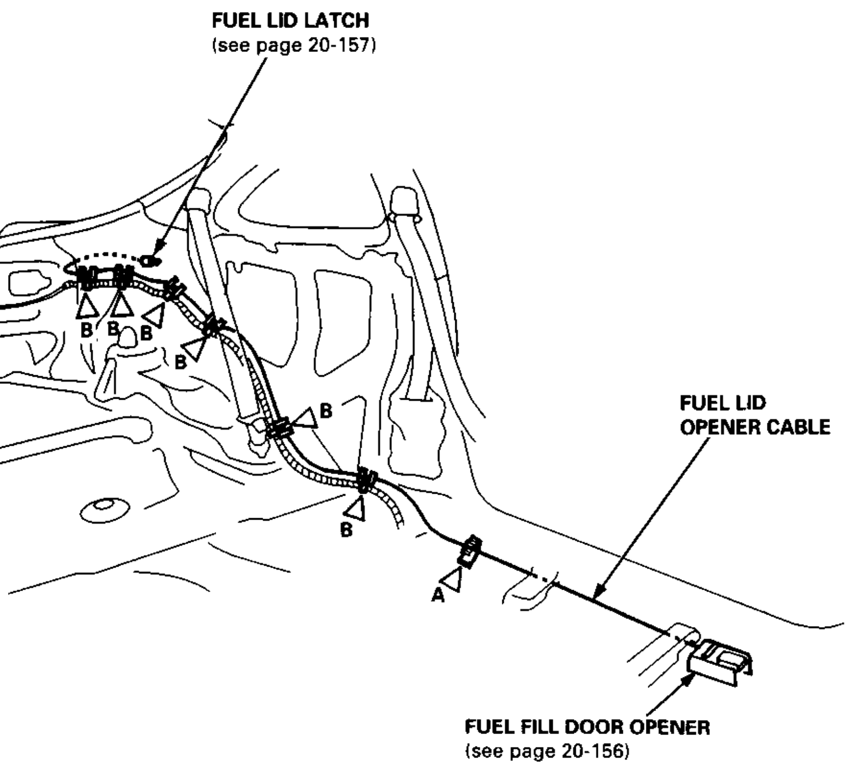
NOTE: Remove the rear seat (see page 20-110), rear trim panel and side trim panel (see page 20-91), then pull the carpet back, as necessary (see page 20-126).

△: Clip, cable cushion locations

A △: Clip, 1 B △: Clip, 6





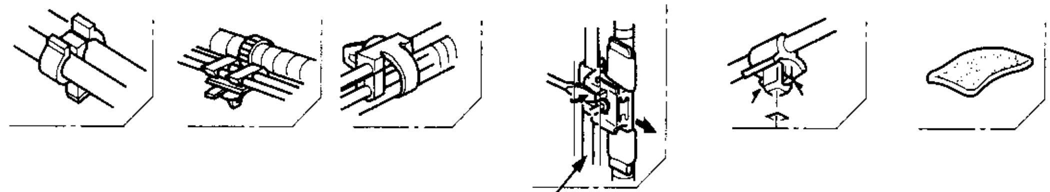


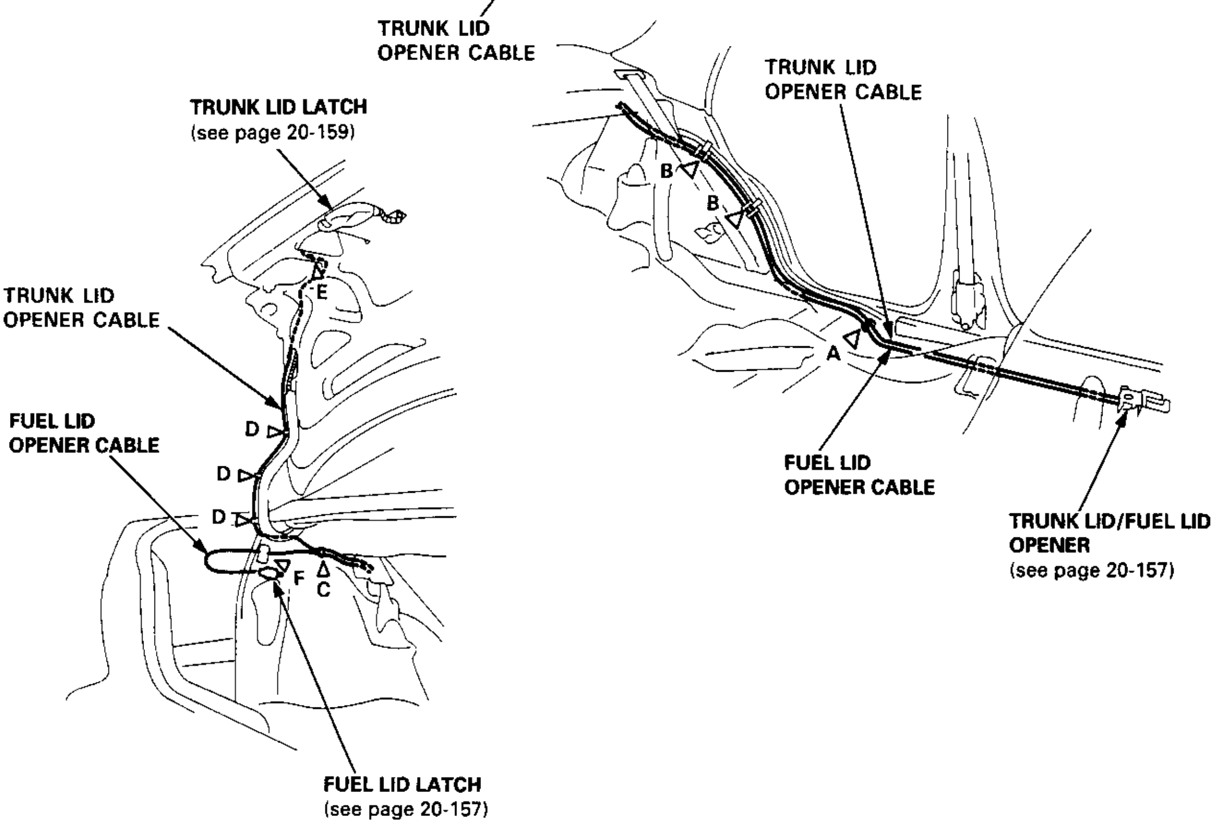
Trunk Lid/Fuel Lid Opener Cable (Sedan):

NOTE: Remove the rear seat (see page 20-112) and center pillar lower trim (see page 20-94), then pull the carpet back, as necessary (see page 20-126). Remove the left trunk side panel (see page 20-97).

▷ : Clip, cable cushion locations

A ▷: Clip, 1   B ▽: Clip, 2   C △: Clip, 1   D ▷: Clip, 3   E △: Clip, 1   F ◁ : Cable cushion, 1





Installation is the reverse of the removal procedure.

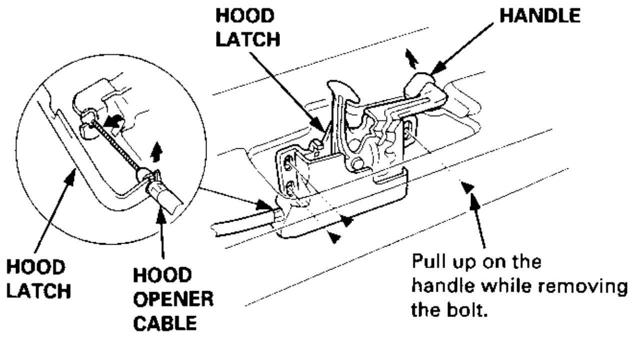
NOTE:

- Make sure each opener cable is routed and connected properly.
- Make sure the hood, hatch, trunk lid and fuel lid open properly.

Opener and Latch

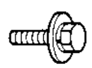
Replacement

NOTE: Take care not to bend the opener cables.

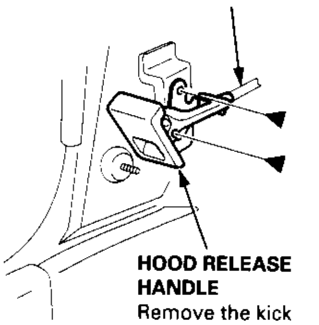


Hood Release Handle:

◀ : Bolt locations, 2

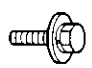


6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



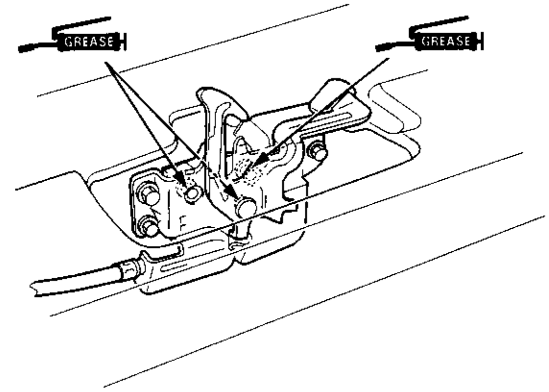
Hood Latch:

◀ : Bolt locations



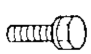
6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)

NOTE: Grease each location of the hood latch indicated by the arrows.



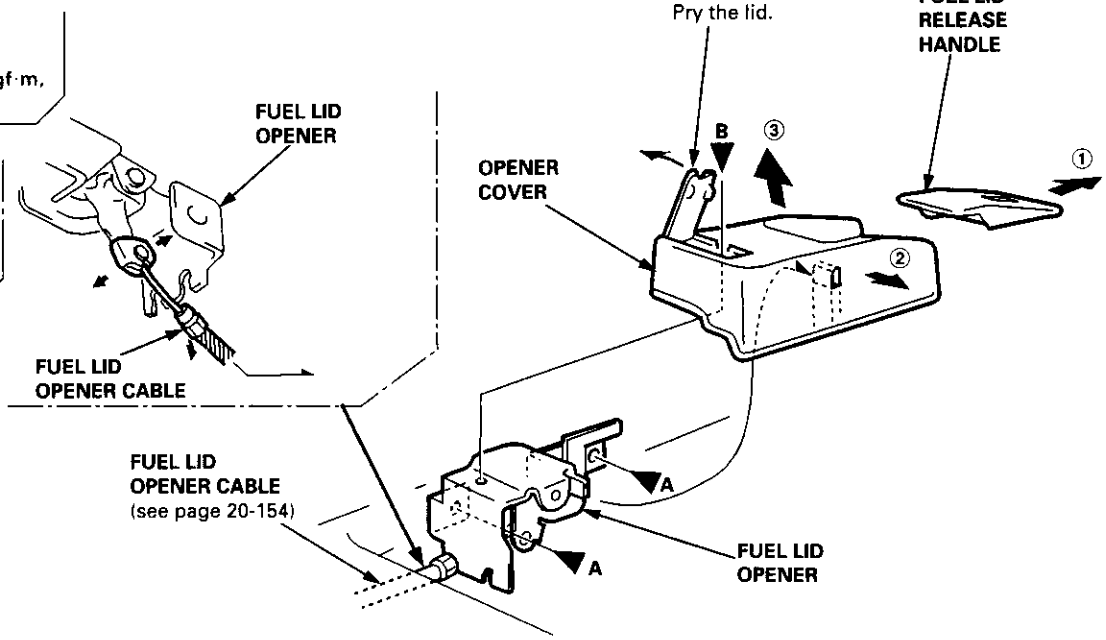
Fuel Lid Opener (Hatchback):

◀: Bolt, screw locations
A ◀: Bolt, 2



6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

B ▼ : Screw, 1

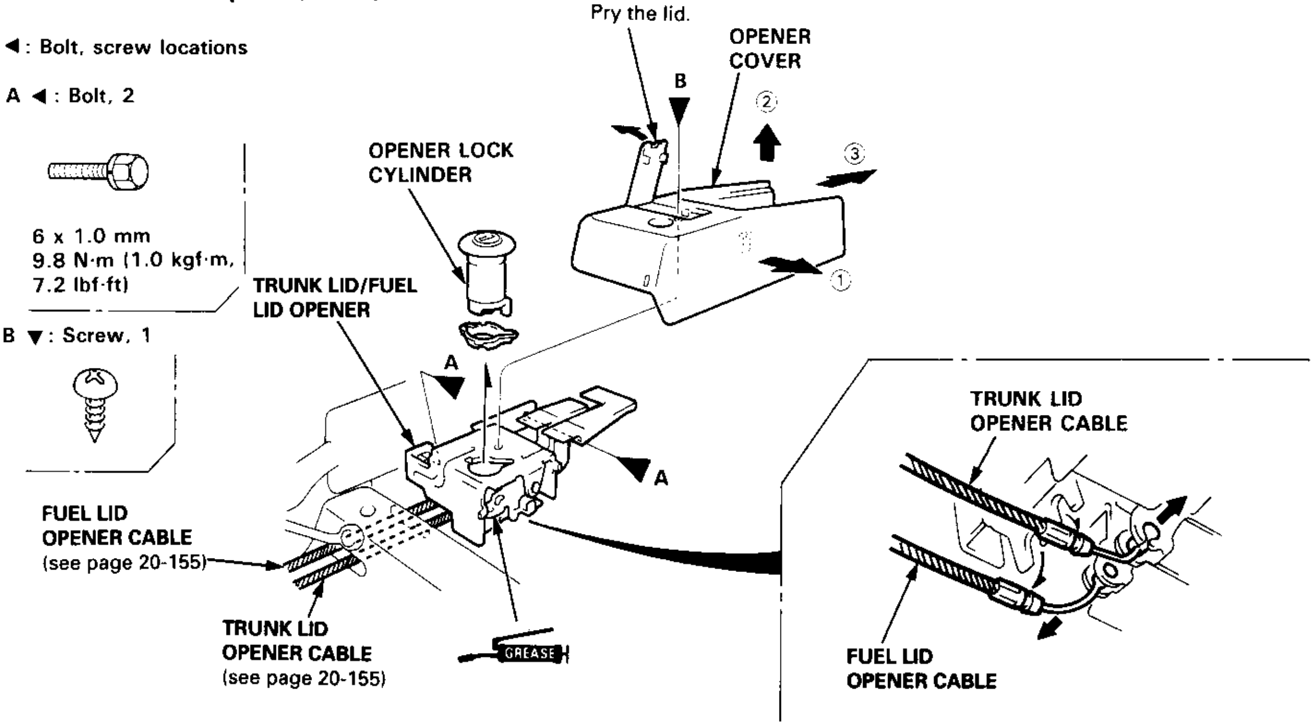


Installation is the reverse of the removal procedure.

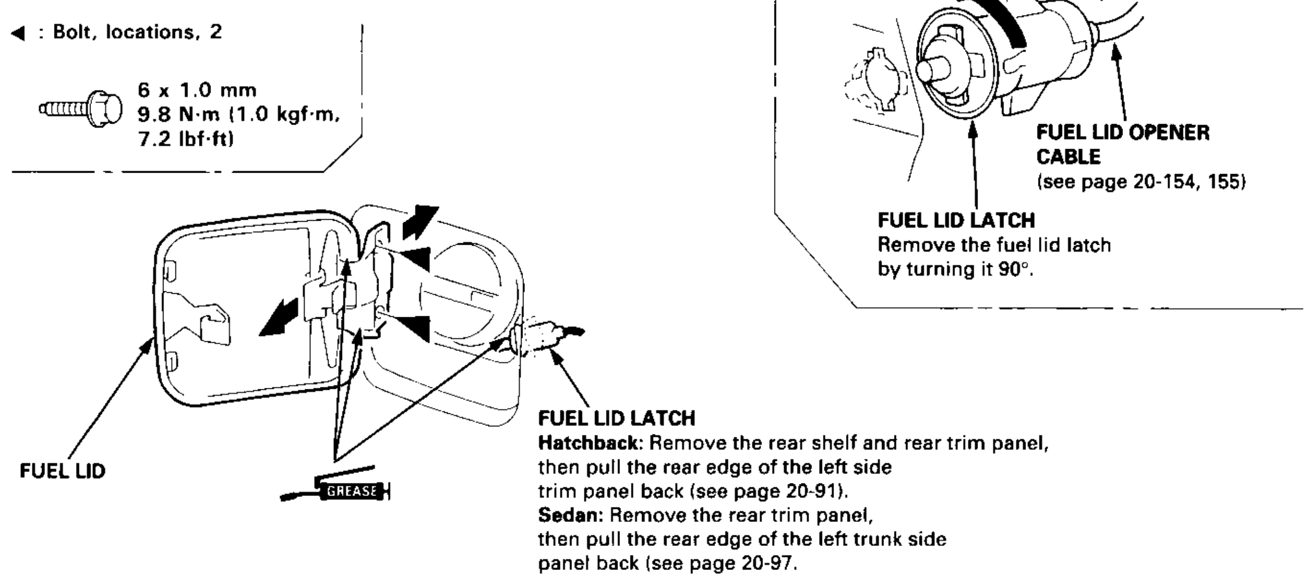
NOTE:
- Make sure each opener cable is connected properly.
- Make sure the hood locks securely.
- Make sure the hood and lid door open properly.

NOTE: Take care not to bend the opener cables.

Trunk Lid/Fuel Lid Opener (Sedan):



Fuel Lid Latch:



Installation is the reverse of the removal procedure.

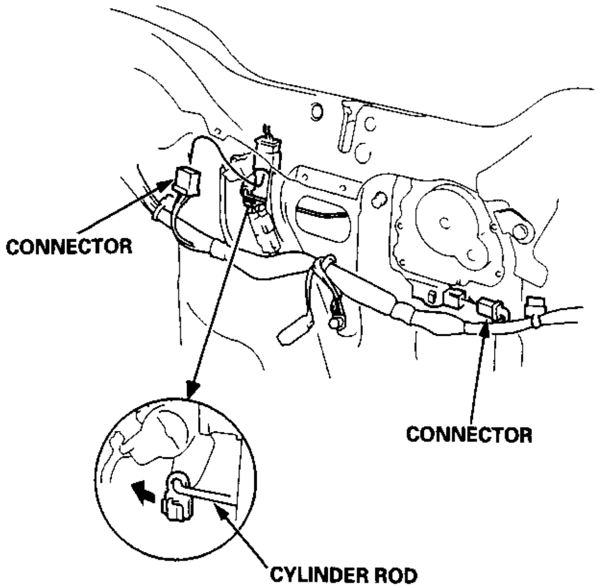
NOTE:
- Make sure each opener cable is connected properly.
- Make sure the fuel lid fits flush with the body.
- Make sure the fuel lid locks securely.
- Make sure the trunk lid and fuel lid open properly.

Hatch Latch and Lock Cylinder

Replacement

NOTE: Take care not to bend the cylinder rod and actuator rod.

1. Remove the rear trim panel (see page 20-92).
2. Disconnect the cylinder rod and each connector.



3. Remove the bolts, then disconnect actuator rod. Remove the hatch latch and actuator.

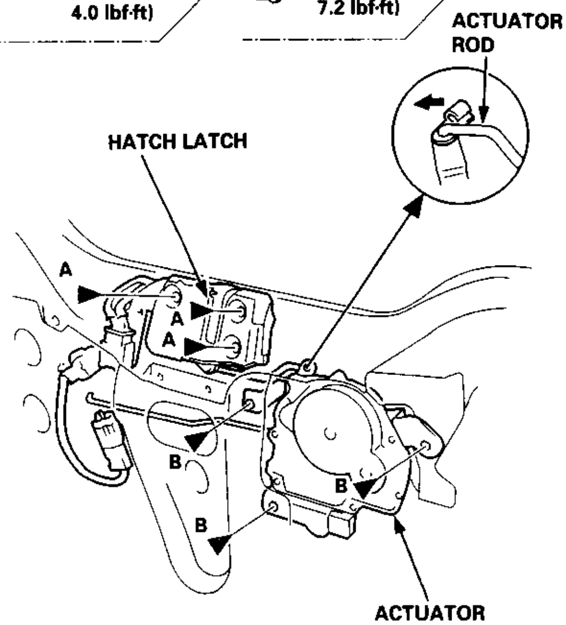
▶: Screw locations

A ▶: 3

6 x 1.0 mm
5.4 N·m
(0.55 kgf·m,
4.0 lbf·ft)

B ▶: 3

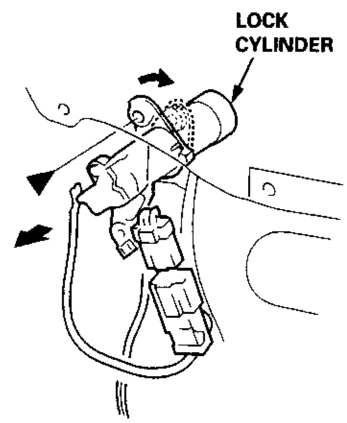
6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



4. Remove the lock cylinder by turning it 45°.

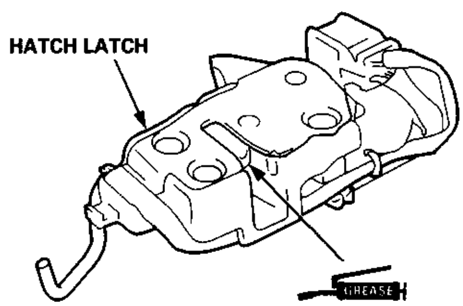
▶: Bolt location, 1

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)



5. Installation is the reverse of the removal procedure.

NOTE:
- Apply grease to the hatch latch.



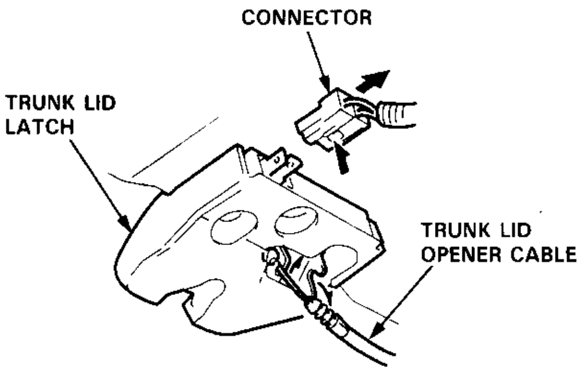
- Make sure the hatch locks securely.
- Make sure the hatch opens properly.
- Make sure the connector is connected properly.

Trunk Lid Latch and Lock Cylinder

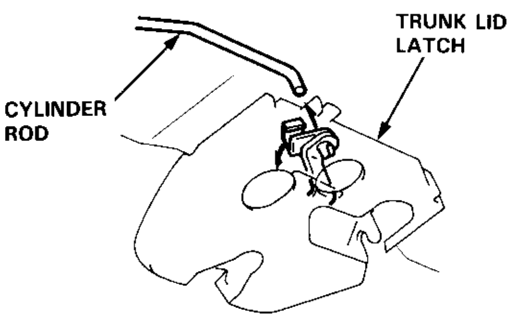
Replacement

NOTE: Take care not to bend the cylinder rod and trunk lid opener cable.

1. Disconnect the connector and trunk lid opener cable.

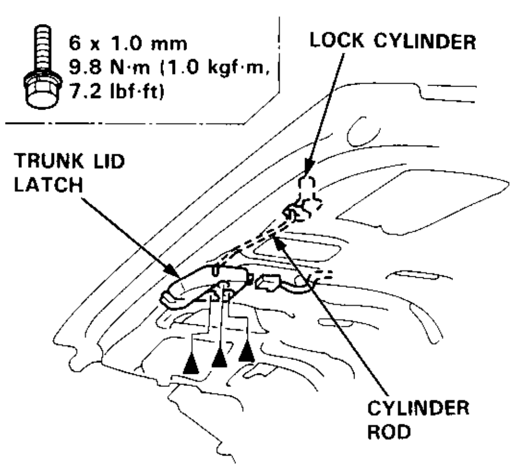


2. Disconnect the cylinder rod.



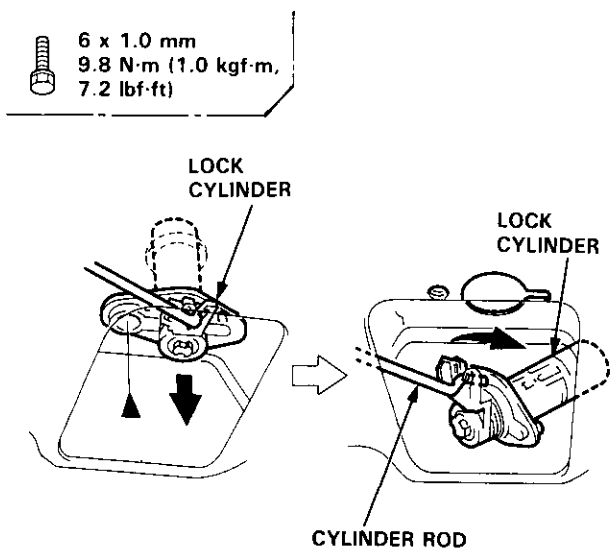
3. Remove the bolts, then remove the trunk lid latch.

▲ : Bolt locations, 3



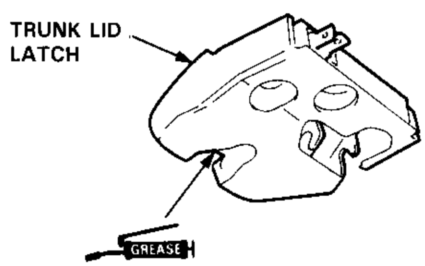
4. Remove the bolt, then pull the lock cylinder out. Remove the lock cylinder from the cylinder rod, then take them out.

▲ : Bolt location, 1



5. Installation is the reverse of the removal procedure.

NOTE:
- Apply grease to the trunk lid latch.



- Make sure the trunk lid locks securely.
- Make sure the trunk lid opens properly.
- Make sure the connector is connected properly.

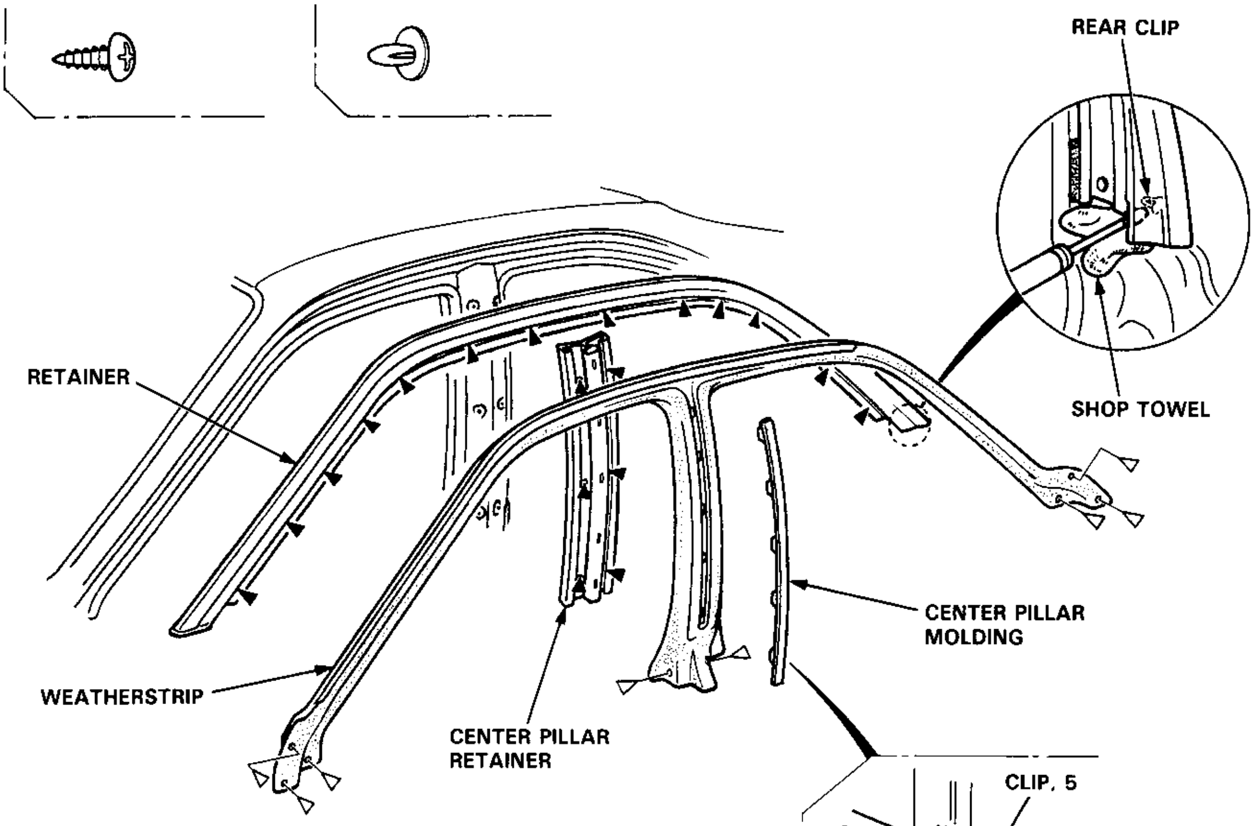
Retainers and Weatherstrip

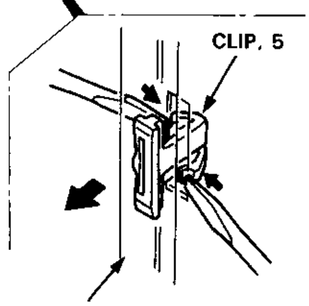
Replacement

CAUTION: Wear gloves to remove and install the retainers.

NOTE: Take care not to bend the retainers.

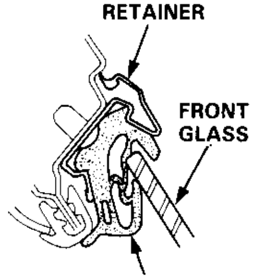
◄ : Screw locations, 19   ◁ : Clip locations, 8



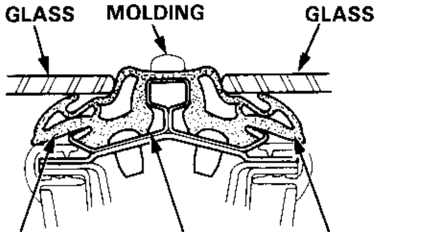


NOTE: The numbers after the part names show the quantities of the parts used.

Roof side section:



Center pillar section:



Installation is the reverse of the removal procedure.

NOTE:
- Check the weatherstrip for damage or deterioration, and replace it if necessary.
- After installing the weatherstrip, check for water leaks.
- If necessary, adjust the position of the door glass (see page 20-40).
- If necessary, replace any damaged clips.

Hatch Spoiler

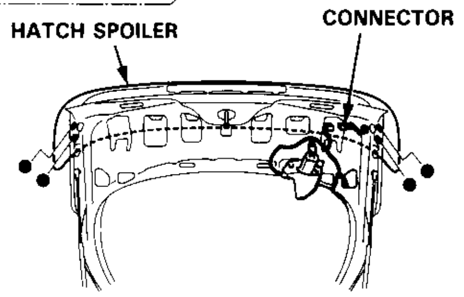
Replacement

NOTE:
- Take care not to scratch the hatch.
- Open the hatch.

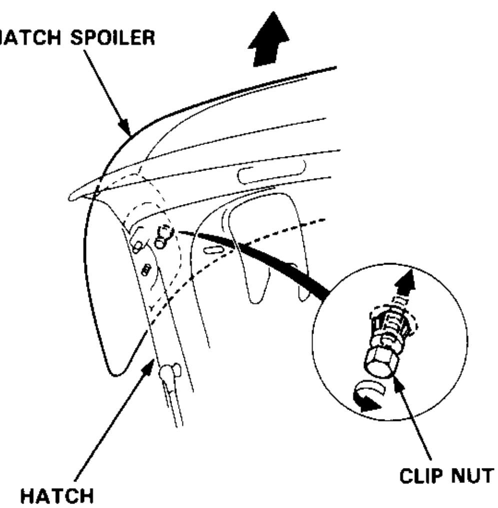
1. Remove the hatch side trim and hatch trim panel (see page 20-148).
2. Remove the nuts and disconnect the connector.

●: Nut locations, 4

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



3. Remove the hatch spoiler by turning the clip nut on the left side counterclockwise.

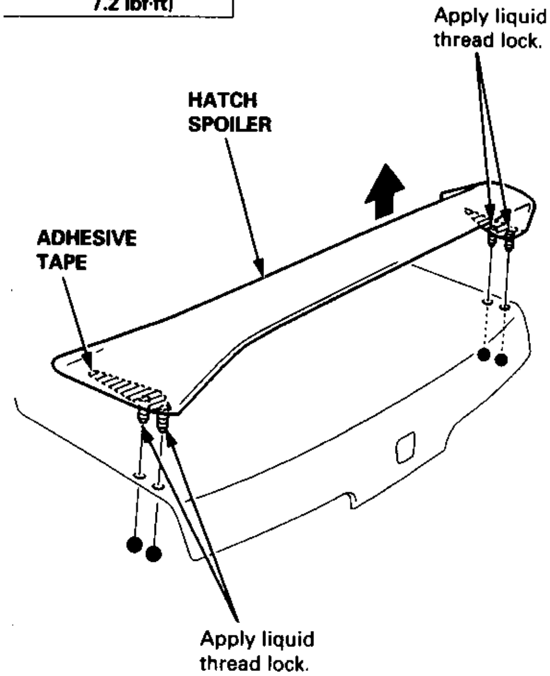


4. Installation is the reverse of the removal procedure.

Type R Model:

●: Nut locations, 4

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



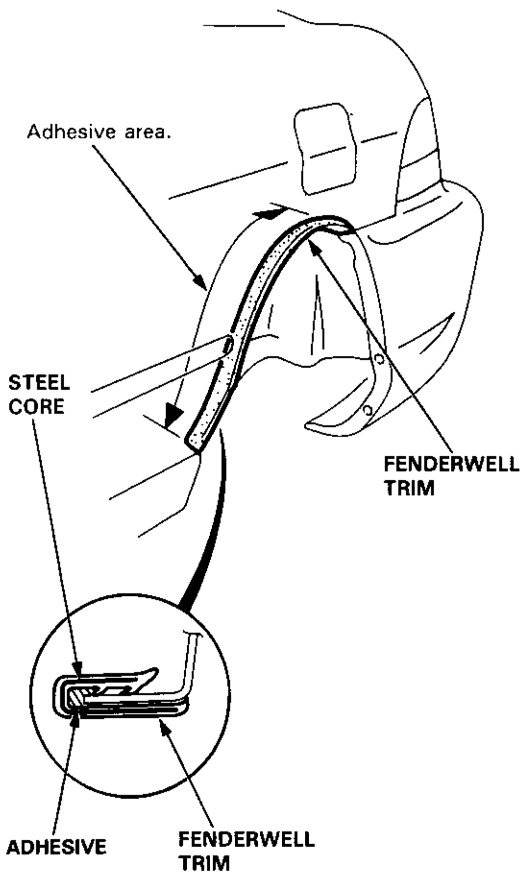
Installation is the reverse of the removal procedure.

Fenderwell Trim

Replacement

NOTE:

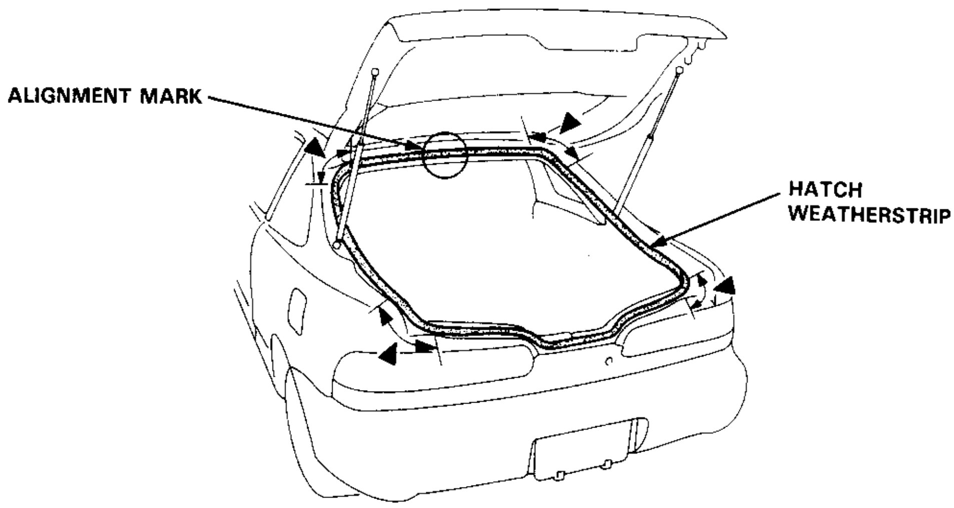
- Take care not to bend the fenderwell trim.
- Before installing the fenderwell trim, clean the body bonding surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease or water from getting on the surface.



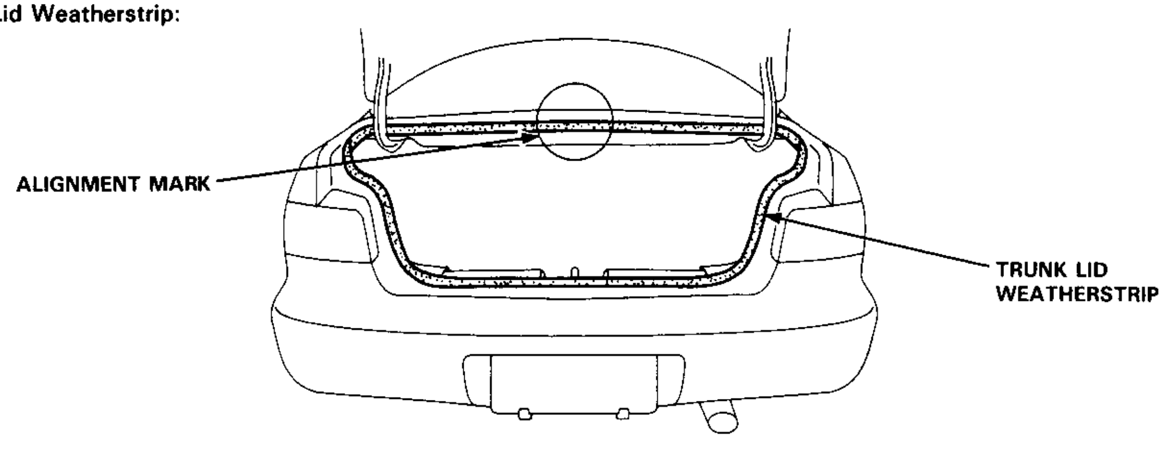
Replacement

Hatch Weatherstrip:

NOTE:
- Before installing the hatch weatherstrip, apply clear sealant in its channel at the ▶ locations.
- After applying the sealant, install the hatch weatherstrip.

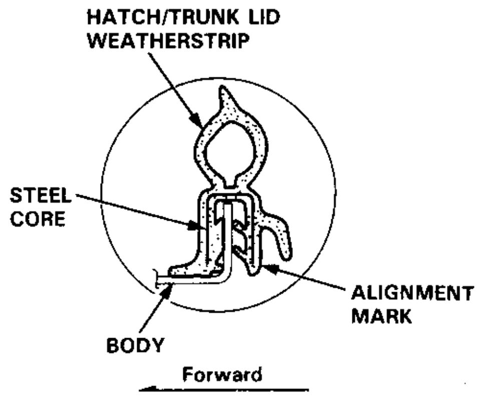


Trunk Lid Weatherstrip:



When installing the hatch or trunk lid weatherstrip, align it with the alignment mark on the hatch or trunk lid opening.

NOTE:
- Make sure there are no wrinkles in the weatherstrip.
- Check for water leaks.



Roof Molding

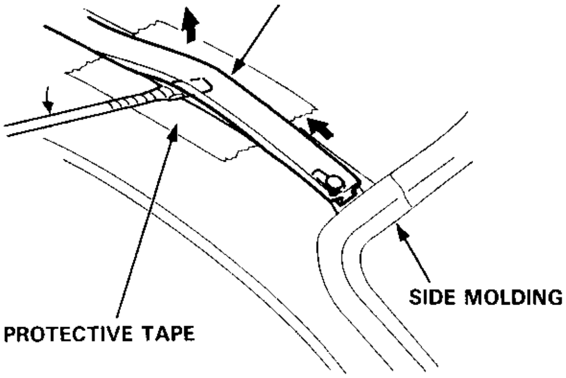
Replacement

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

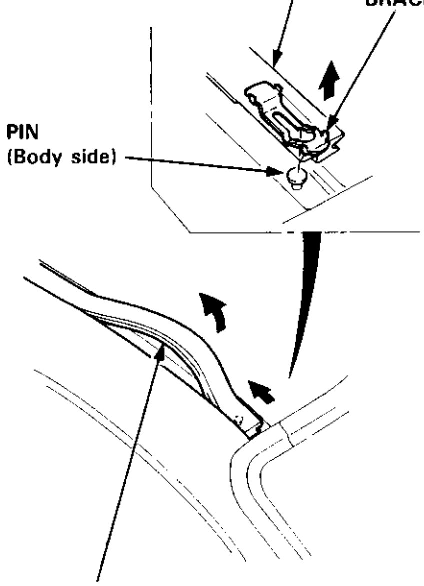
NOTE: Take care not to scratch the body and roof molding.

1. Pry the roof molding with a flat tip screwdriver as shown.

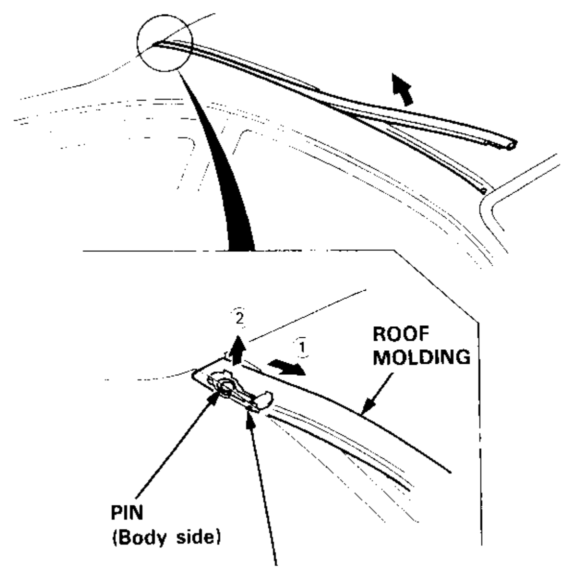
   CAUTION: Use protective tape on the body.



2. Pull and slide the roof molding, then detach the bracket on the end of the roof molding from the pin.

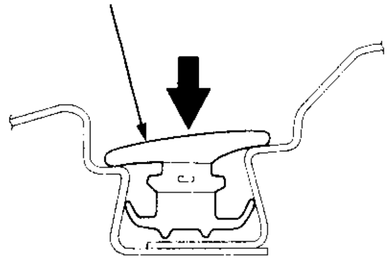


3. Pull the roof molding up, detach the bracket from the pin, then remove the roof molding.



4. Installation is the reverse of the removal procedure.

   NOTE:
   - Take care not to damage the windshield side molding.
   - Make sure the roof molding is installed securely.



Door and Side Moldings

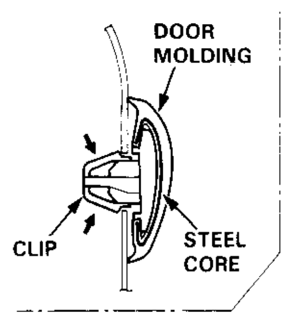
Replacement

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

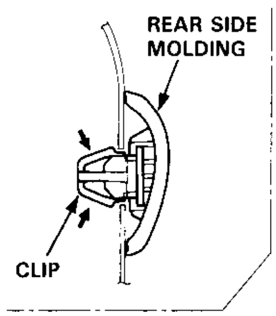
NOTE:
- To remove the door molding, remove the door panel and plastic cover (see pages 20-4, 20, 32).
- To remove the rear side molding, remove the side trim panel (see page 20-91).
- Take care not to bend the door moldings.
- The steel core in the door molding cannot be restored to its original shape once it is bent. Replace the door molding if the steel core is bent.

▽ : Clip locations

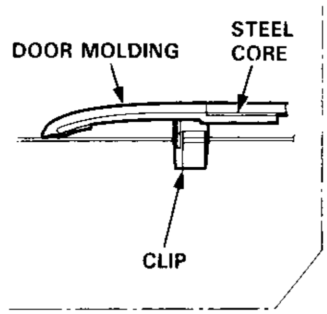
A▽ : Clip (Hatchback, 5) (Sedan, 6)



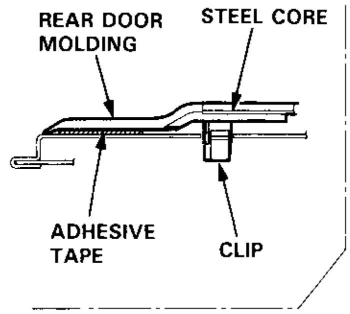
B▽ : Clip (Hatchback, 3)



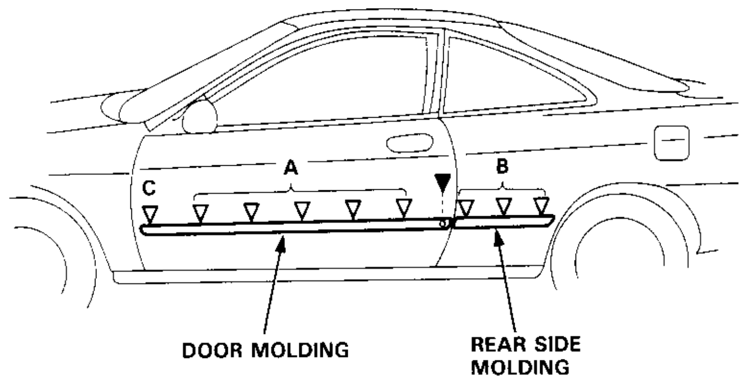
C▽ : Clip (Hatchback, 1) (Sedan, 2)



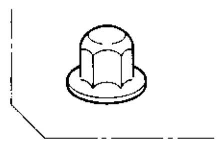
D▽ : Clip (Sedan, 1)



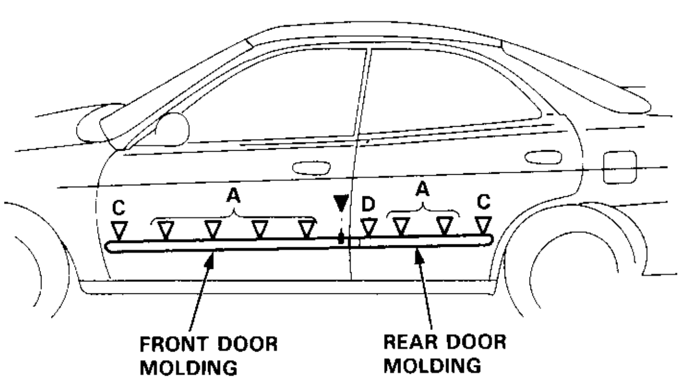
Hatchback



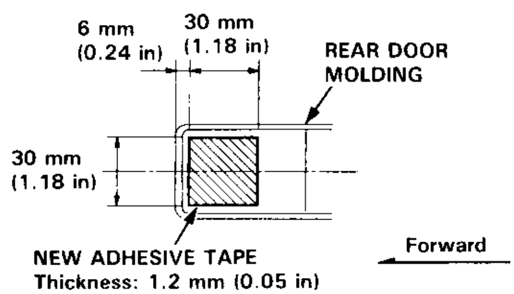
▼ : Plastic nut location (Hatchback, 1) (Sedan, 1)



Sedan



NOTE:
- Before installing the rear door molding, scrape the adhesive tape from the molding and body.
- Clean the molding and door bonding surfaces with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- Glue the new adhesive tape to the molding as shown.



Installation is the reverse of the removal procedure.

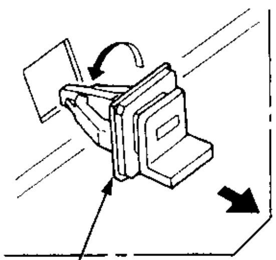
NOTE: If necessary, replace any damaged clips.

Side Sill Panel

Replacement

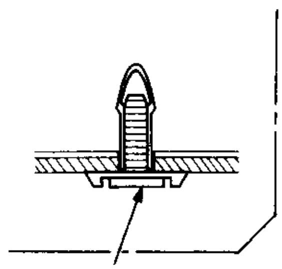
▽ : Clip locations

A▽ : Clip (Hatchback, 7)
(Sedan, 7)



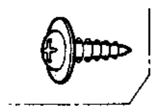
SIDE CLIP
Remove the side clips from the body by turning them 45°

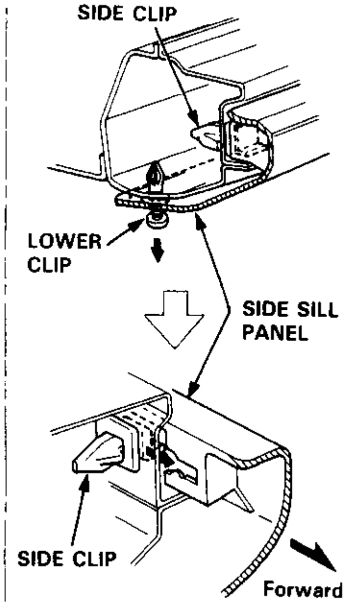
B△ : Clip (Hatchback, 6)
(Sedan, 6)



NOTE: Loosen the screw, then remove the lower clip using a clip remover.

▶ : Screw locations, 4

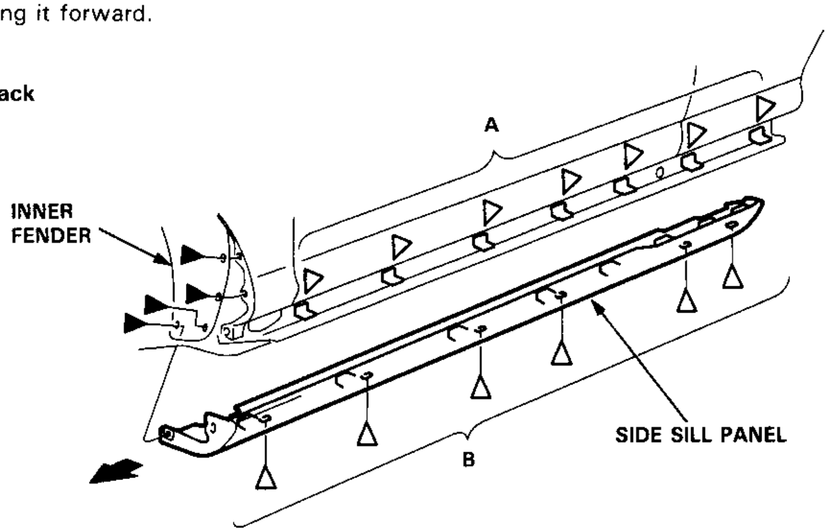




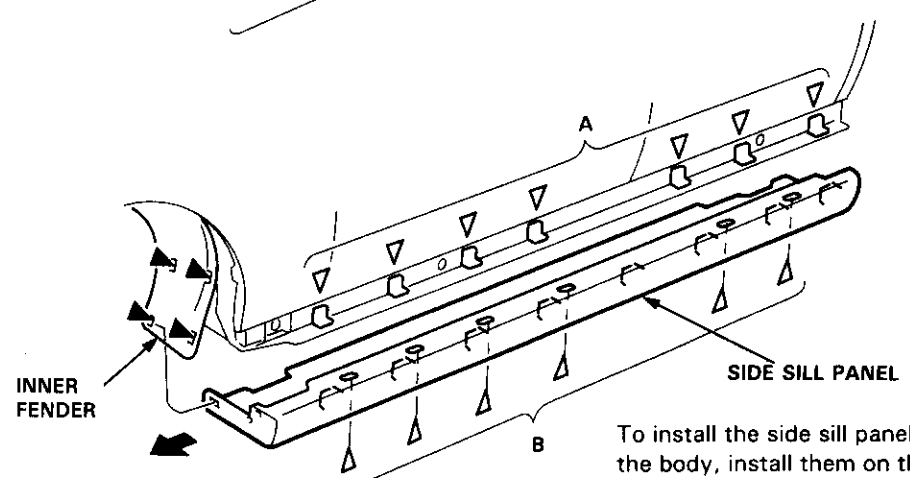
NOTE: When removing the side sill panel, the side clips will stay in the body.

Remove the lower clips, then remove the side sill panel by sliding it forward.

Hatchback



Sedan



To install the side sill panel, remove the side clips from the body, install them on the side sill panel, then install the side sill panel on the car.

NOTE:
- Take care not to twist the side sill panel.
- If necessary, replace any damaged side and lower clips.

Emblems

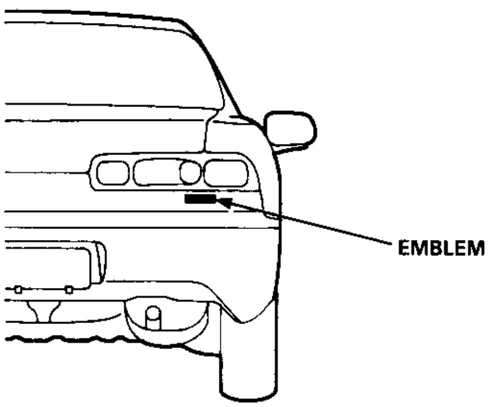
Installation

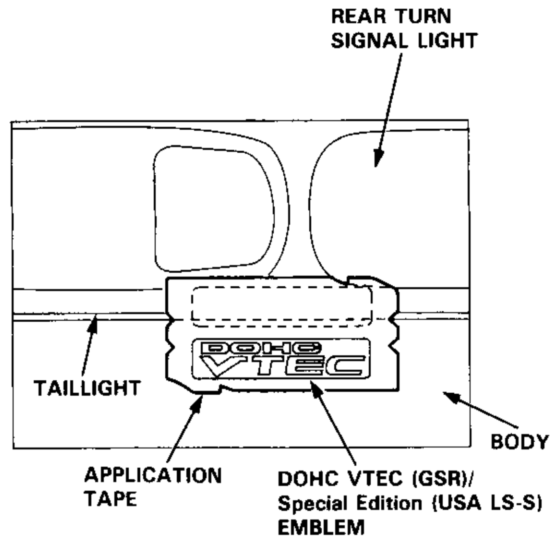
Align the application tape with the rear turn signal light and the gap between the taillight and body, as shown, then press the emblem into place. Remove the application tape.

NOTE:
- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- When applying, make sure there are no wrinkles in the rear emblem.

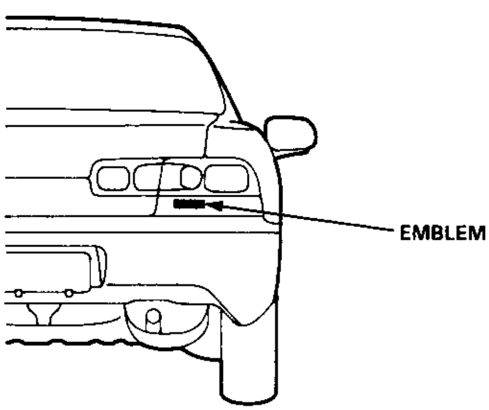
Attachment Point:

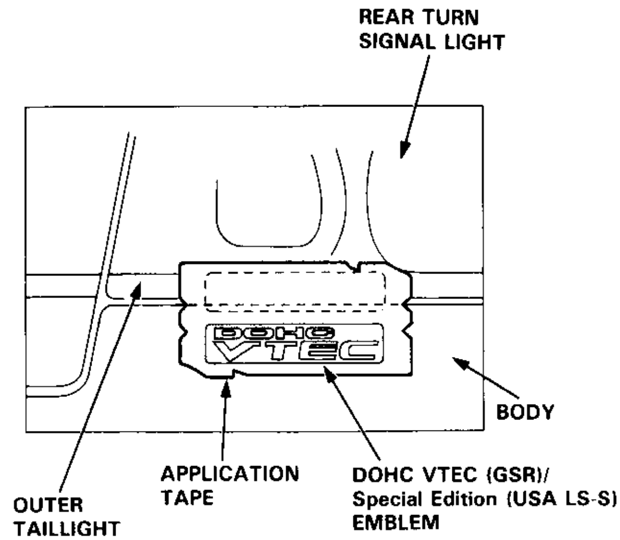
Hatchback





Sedan





(cont'd)

Installation (cont'd)

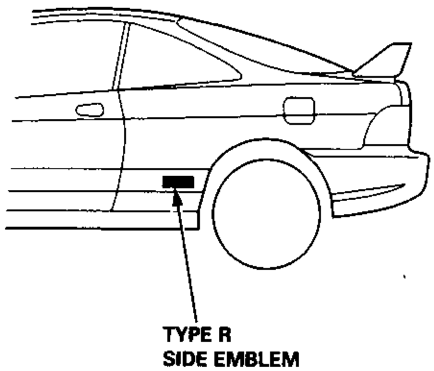
Type R Model:

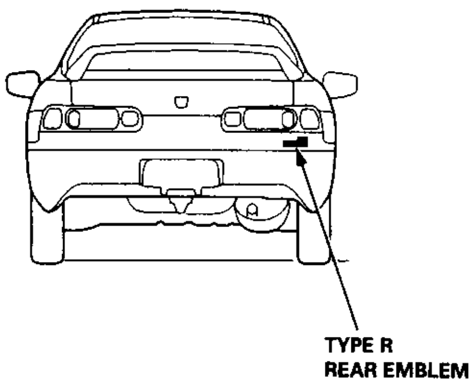
Align the rear emblem application tape with the rear turn signal light and the gap between the taillight and body, as shown, then press the emblem into place. Remove the application tape.

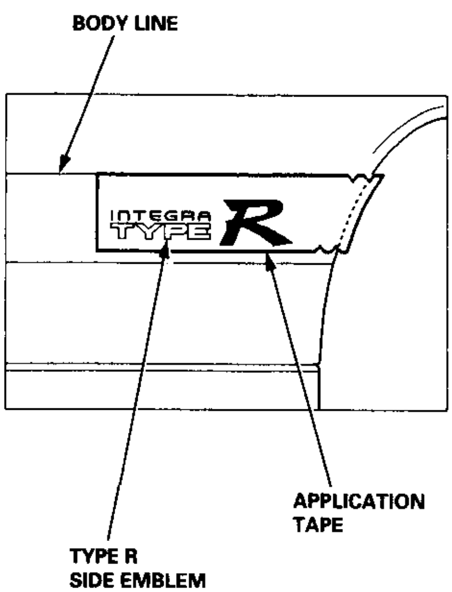
Align the side emblem application tape with the body line and the wheelwell opening, as shown, then press the emblem into place. Remove the application tape.

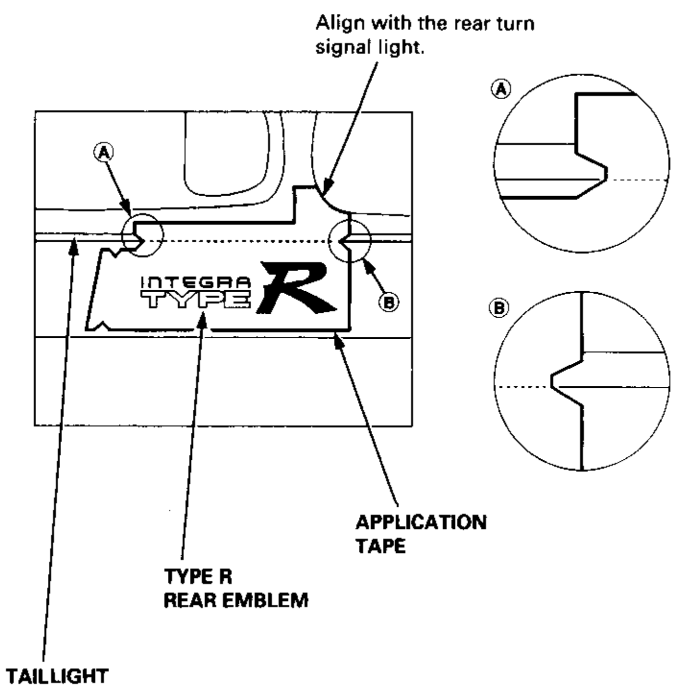
NOTE:
- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- When applying, make sure there are no wrinkles in the rear emblem.

Attachment Point:



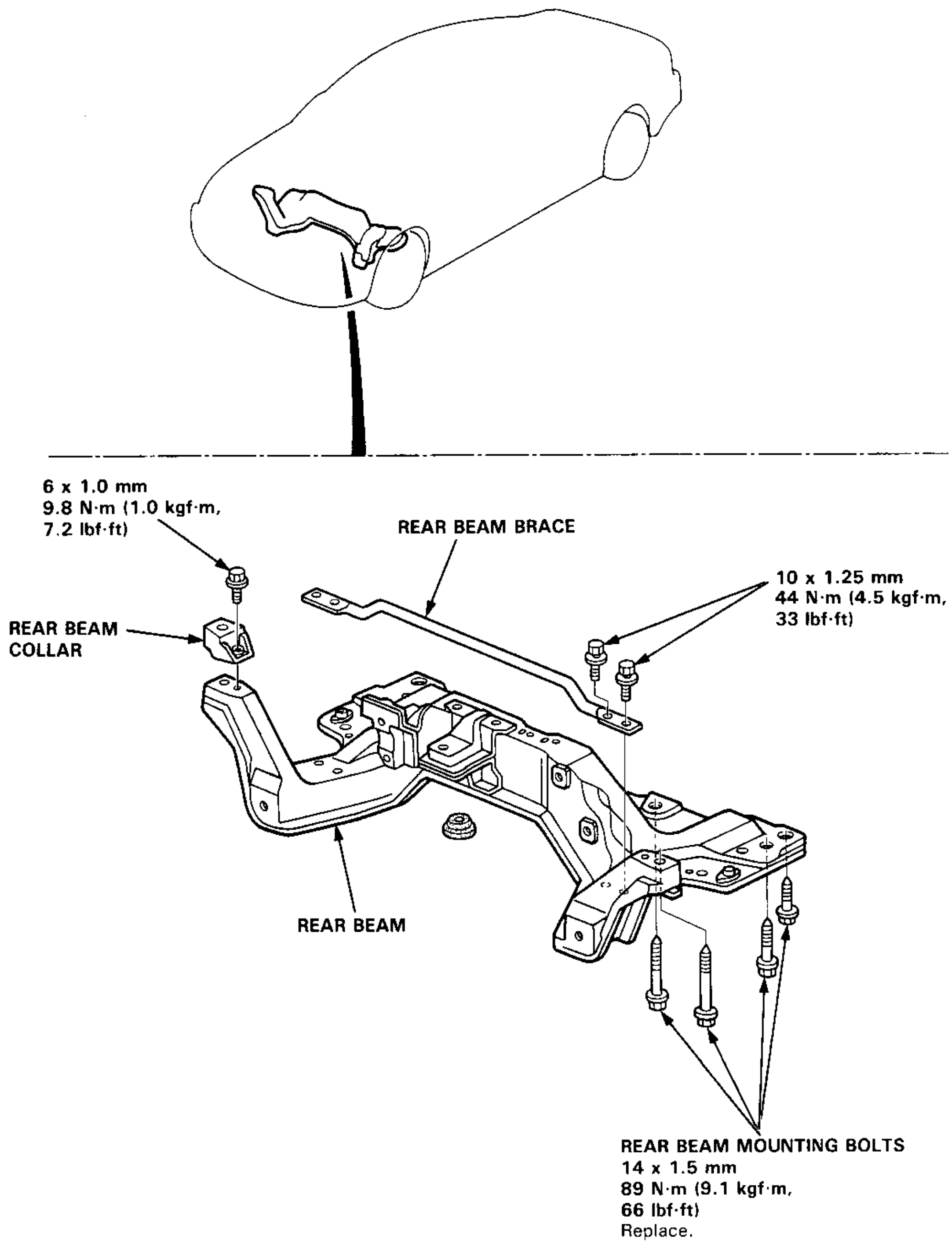






Sub-frame Torque Sequence:

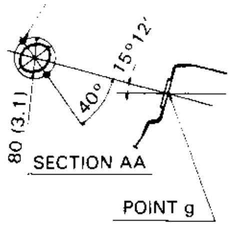
CAUTION: After loosening the rear beam mounting bolts, be sure to replace them with new ones.

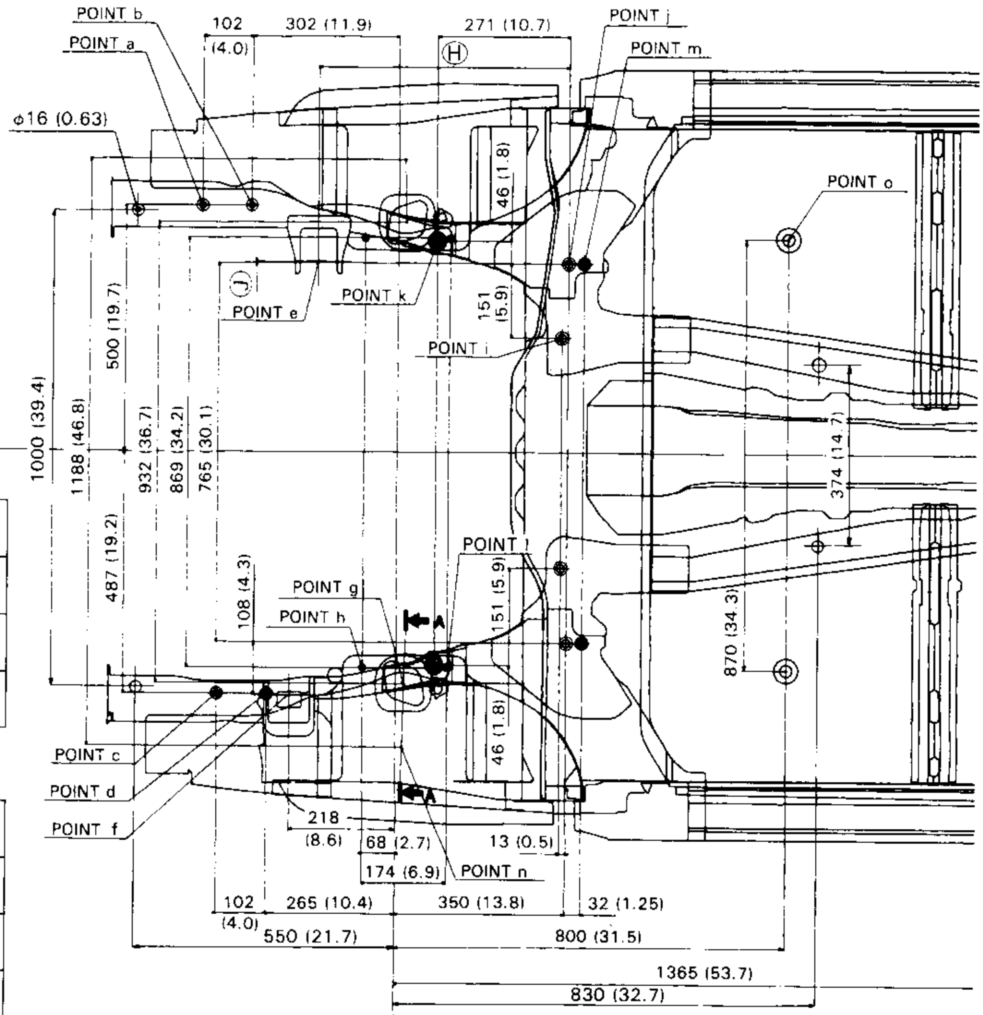


Frame Repair Chart

Unit: mm (in)

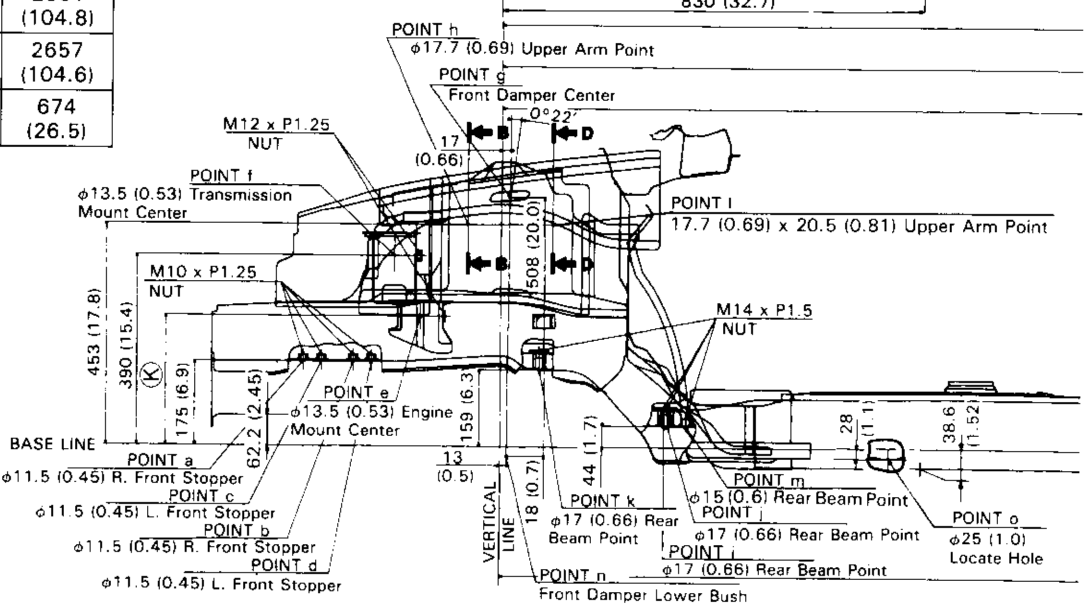
ϕ: Inner diameter

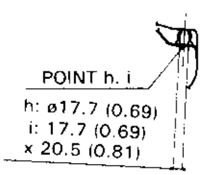




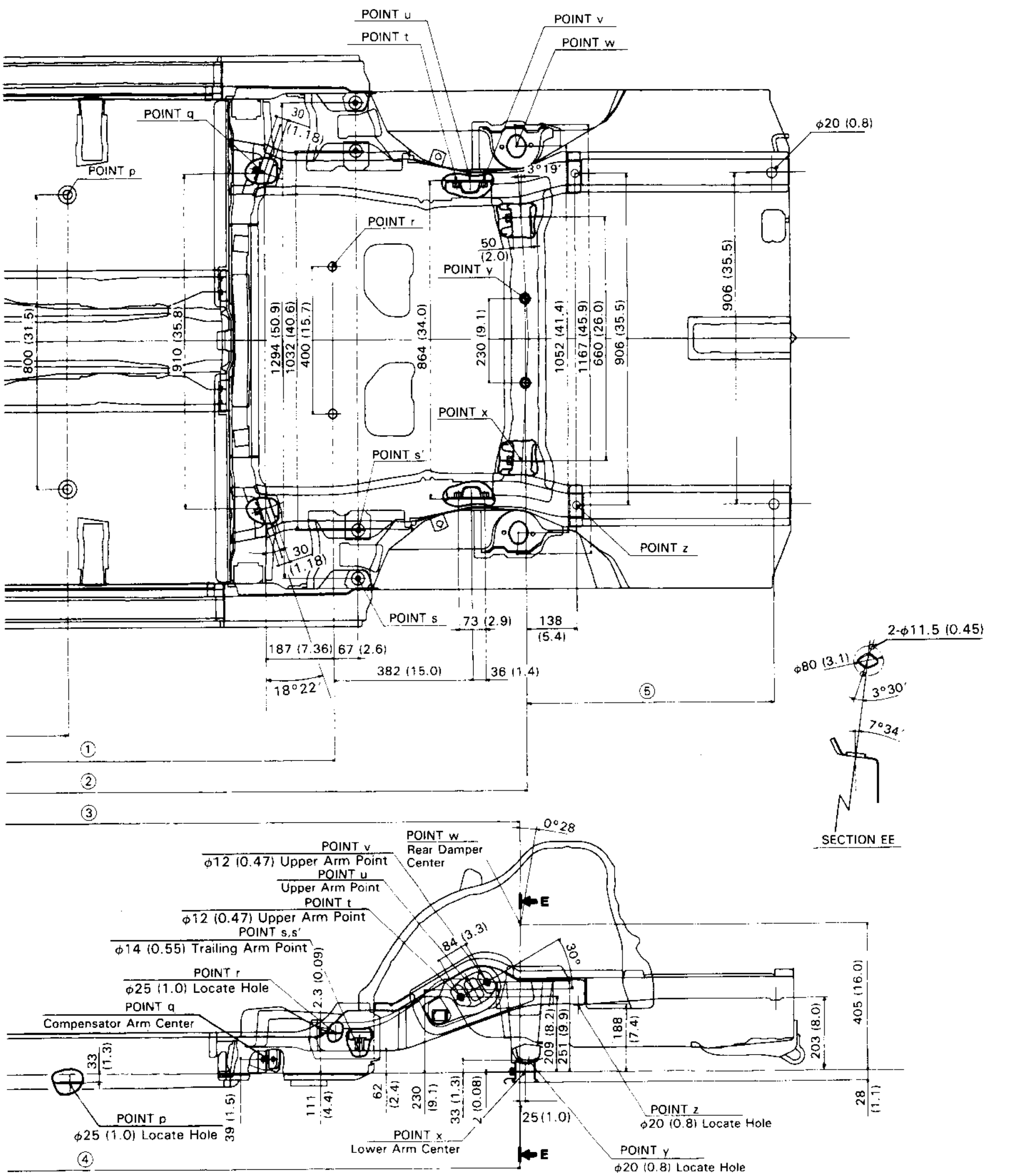
Model / Distance	M/T	A/T
Ⓗ	514.5 (20.26)	501.5 (19.7)
Ⓙ	2.5 (0.10)	25 (0.98)
Ⓚ	267.5 (10.53)	305.5 (12.03)

Model / Distance	Hatchback	Sedan
①	2100 (82.7)	2150 (84.6)
②	2632 (103.6)	2682 (105.6)
③	2611 (102.8)	2661 (104.8)
④	2607 (102.6)	2657 (104.6)
⑤	558 (22.0)	674 (26.5)





SECTION BB, DD


POINT u
POINT t
POINT v
POINT w
POINT q
POINT p
POINT r
POINT y
POINT x
POINT s'
POINT z
POINT s
φ20 (0.8)
30
(1.18)
3°19'
50
(2.0)
800 (31.5)
910 (35.8)
1294 (50.9)
1032 (40.6)
400 (15.7)
864 (34.0)
230 (9.1)
1052 (41.4)
1167 (45.9)
660 (26.0)
906 (35.5)
73 (2.9)
138
(5.4)
187 (7.36)
67 (2.6)
382 (15.0)
36 (1.4)
18°22'
2-φ11.5 (0.45)
φ80 (3.1)
3°30'
7°34'
SECTION EE
0°28
POINT w
Rear Damper Center
POINT v
φ12 (0.47) Upper Arm Point
POINT u
Upper Arm Point
POINT t
φ12 (0.47) Upper Arm Point
POINT s,s'
φ14 (0.55) Trailing Arm Point
POINT r
φ25 (1.0) Locate Hole
POINT q
Compensator Arm Center
84 (3.3)
30°
2.3 (0.09)
33
(1.3)
39 (1.5)
111
(4.4)
62
(2.4)
230
(9.1)
33 (1.3)
2 (0.08)
209 (8.2)
251 (9.9)
188
(7.4)
405 (16.0)
203 (8.0)
28
(1.1)
25 (1.0)
POINT p
φ25 (1.0) Locate Hole
POINT x
Lower Arm Center
POINT z
φ20 (0.8) Locate Hole
POINT y
φ20 (0.8) Locate Hole
E

Heater and Air Conditioning

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Integra SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box.

Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

⚠ WARNING

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before

— disconnecting the battery.

— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.

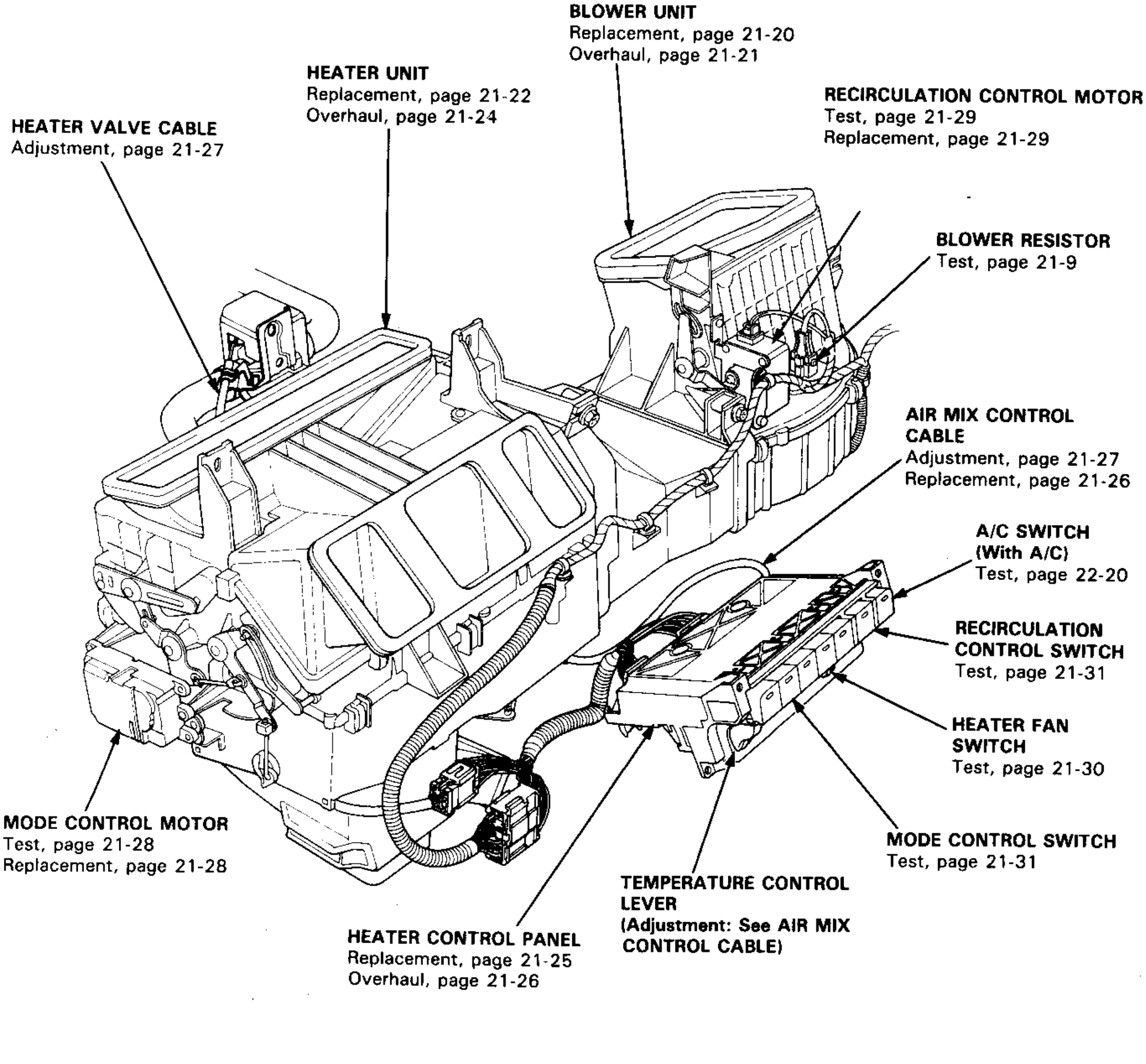
— removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

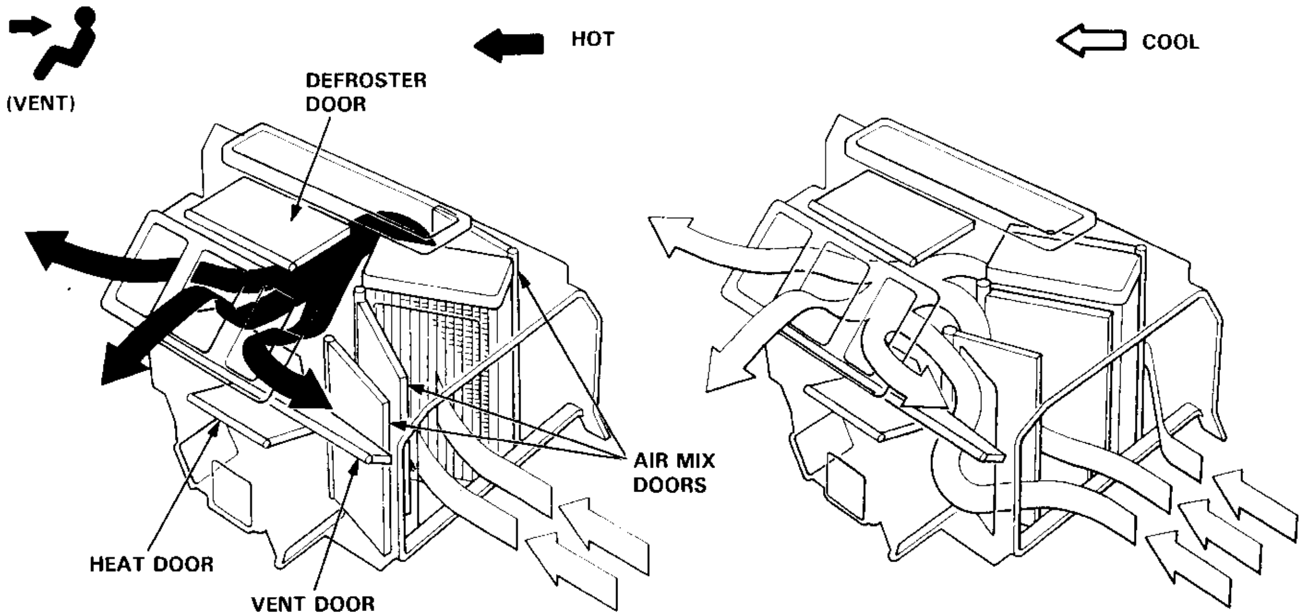
Heater

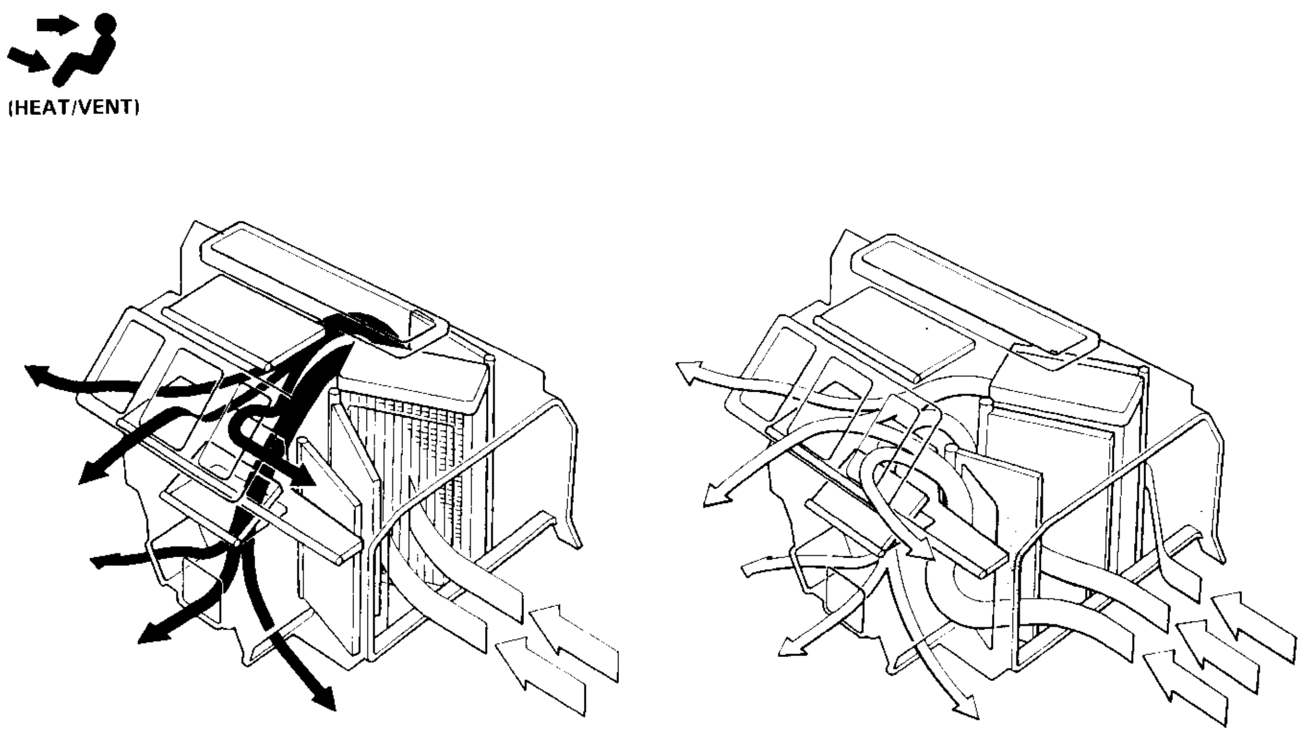
*: Read SRS precautions before working in this area.

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.



Heater Door Positions

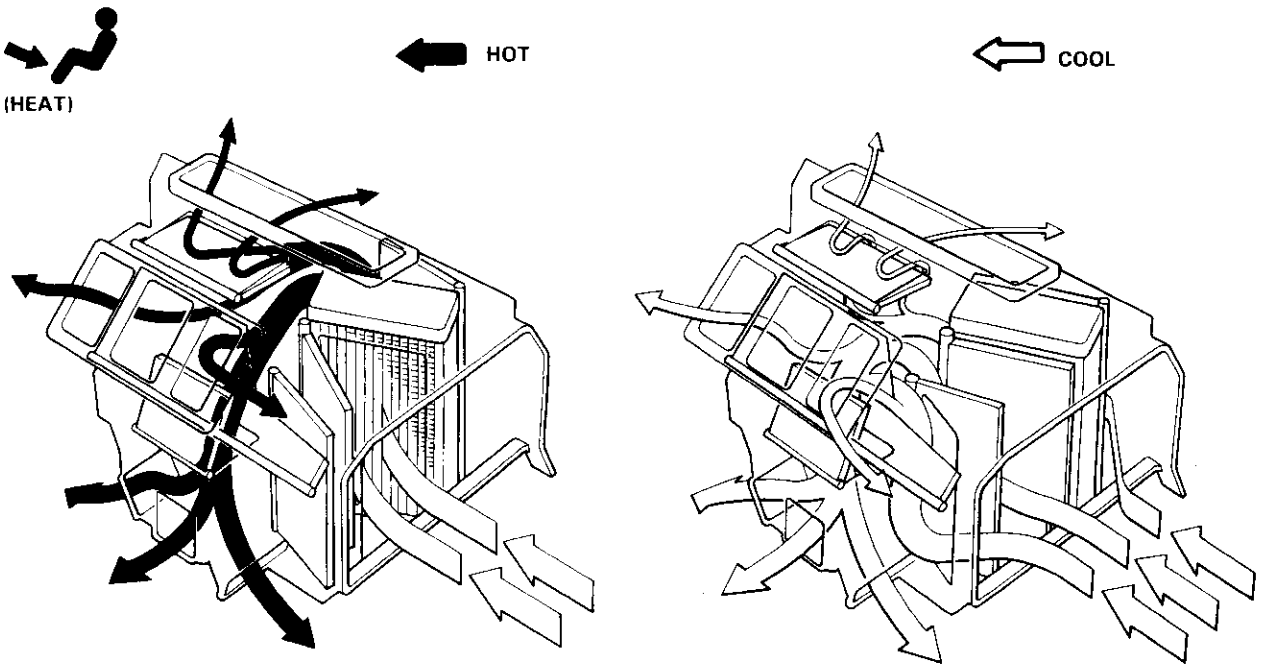


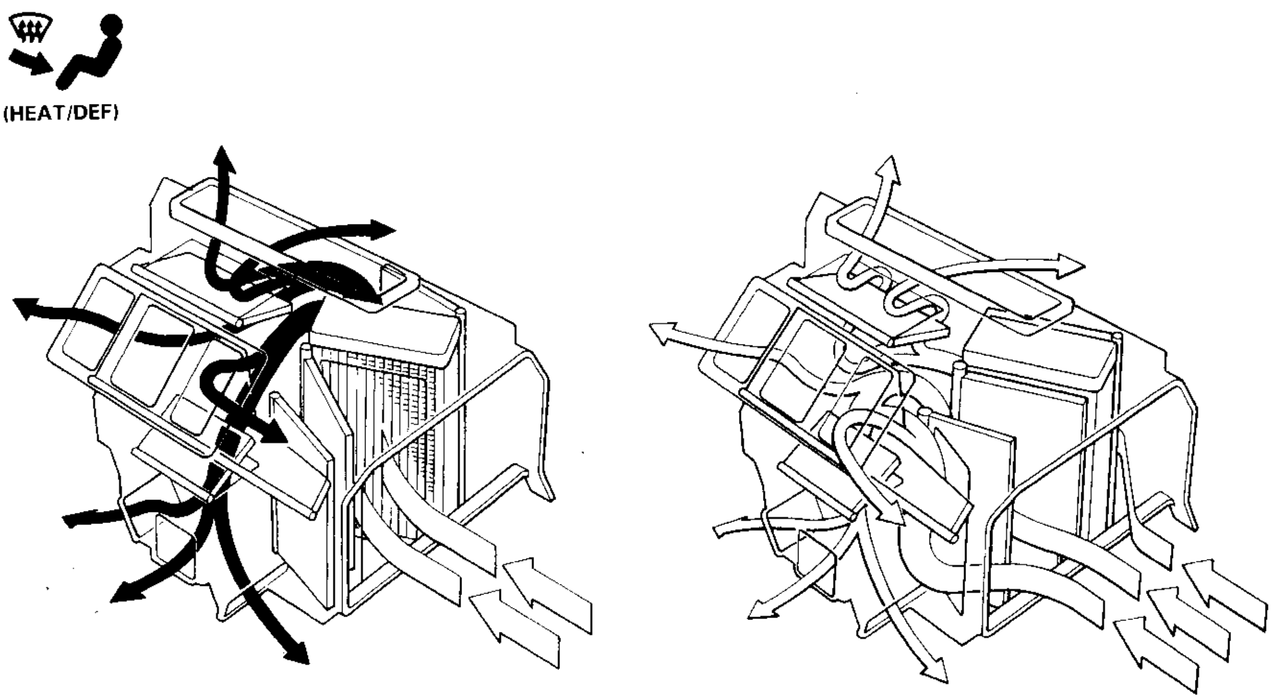


(cont'd)

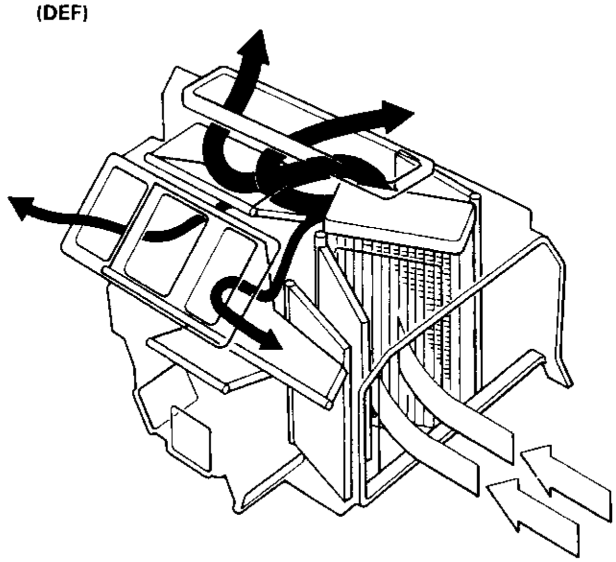
Heater Door Positions

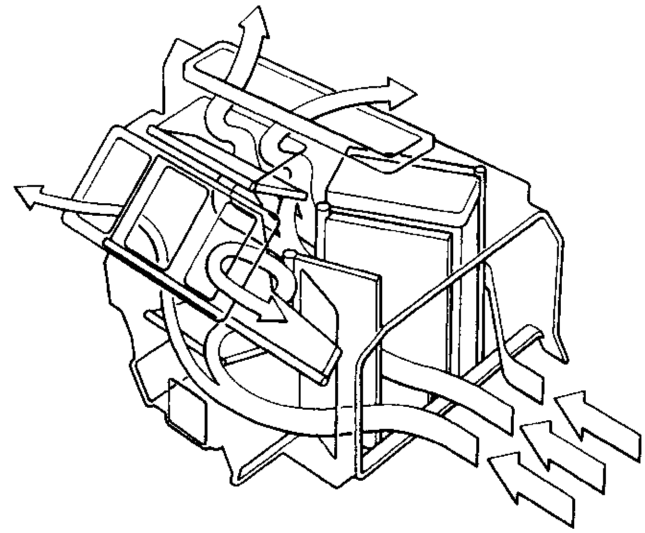
(cont'd)



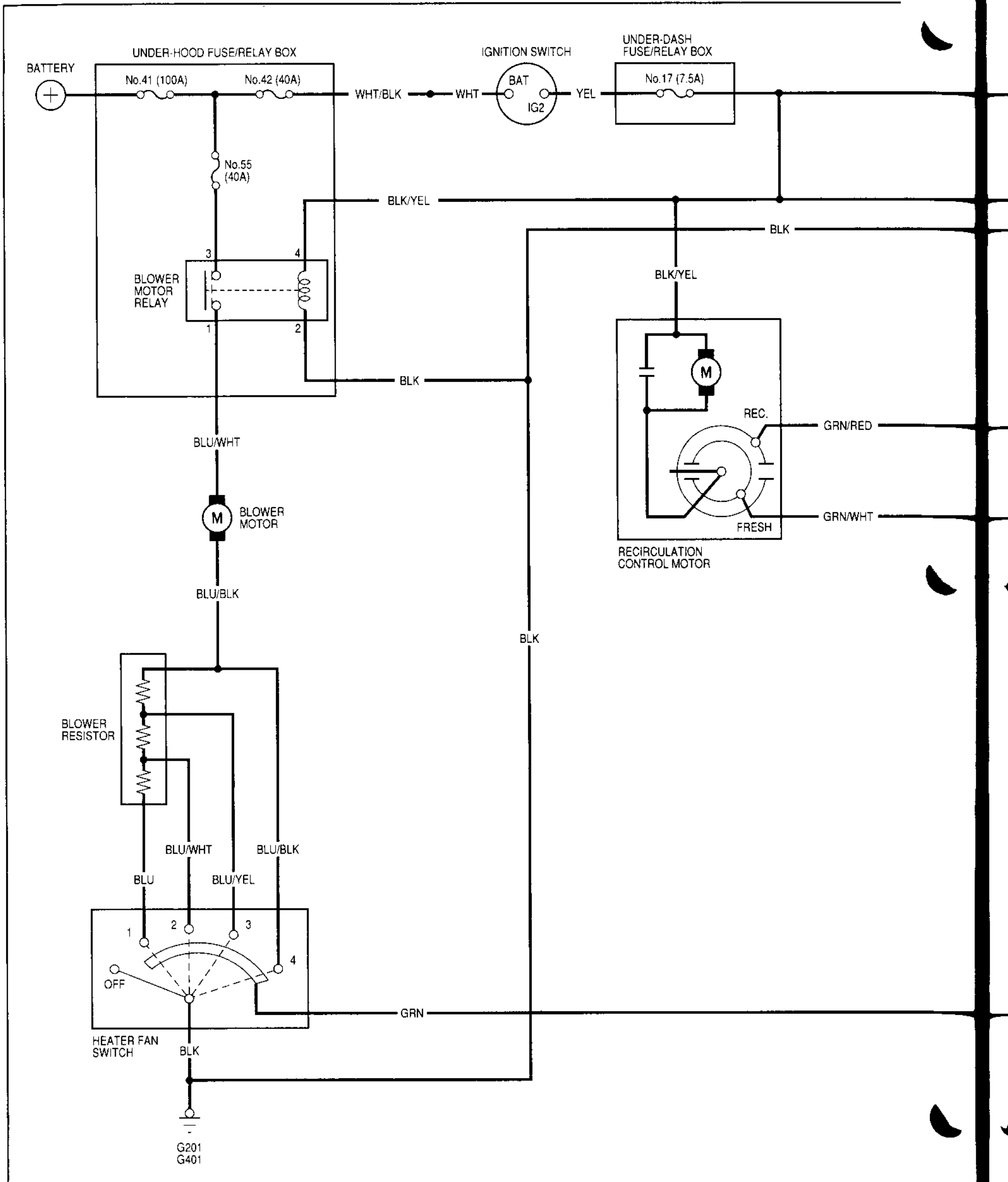


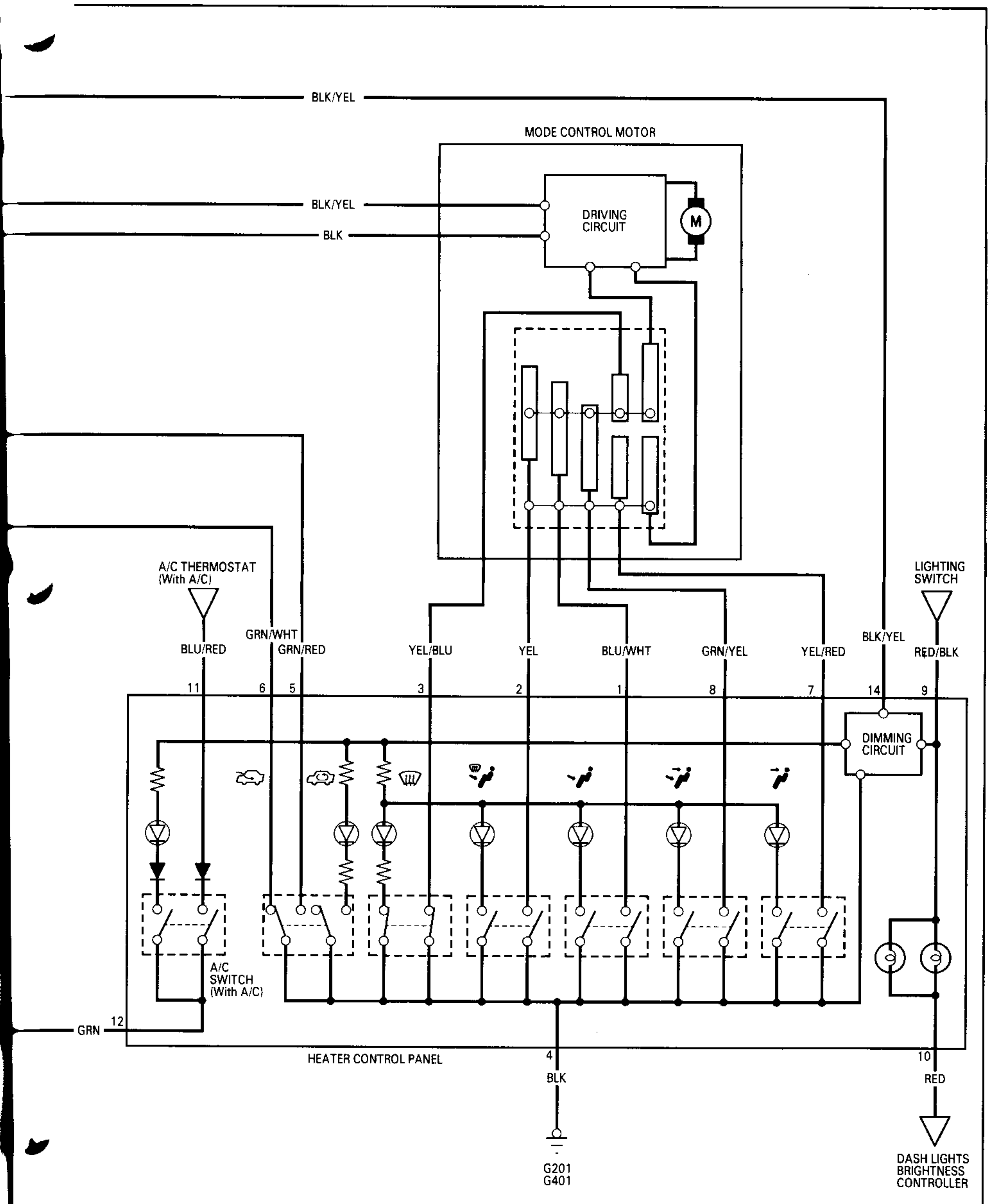
(DEF)





Circuit Diagram




BLK/YEL
MODE CONTROL MOTOR
BLK/YEL
BLK
DRIVING CIRCUIT
M
A/C THERMOSTAT (With A/C)
LIGHTING SWITCH
GRN/WHT
BLU/RED
GRN/RED
YEL/BLU
YEL
BLU/WHT
GRN/YEL
YEL/RED
BLK/YEL
RED/BLK
11
6
5
3
2
1
8
7
14
9
DIMMING CIRCUIT
A/C SWITCH (With A/C)
GRN
12
HEATER CONTROL PANEL
4
BLK
10
RED
G201
G401
DASH LIGHTS BRIGHTNESS CONTROLLER

Troubleshooting

Symptom Chart

NOTE: Check the engine coolant level and allow the engine to warm up before troubleshooting.

SYMPTOM		REMEDY
Hot air flow is low.	Blower motor runs, but one or more speeds are inoperative.	Follow the flowchart (see page 21-9).
	Blower runs properly.	Check for the following: • Clogged heater duct • Clogged heater outlet • Incorrect door position
No hot air flow	Blower motor does not run at all.	Follow the flowchart (see page 21-11).
	Blower motor runs.	Check for the following: • Clogged heater duct • Clogged blower outlet • Clogged heater valve • Faulty air mix door • Heater valve cable adjustment (see page 21-27) • Air mix control cable adjustment (see page 21-27) • Faulty thermostat (see section 10) • Clogged evaporator (with air conditioning) • Frozen evaporator (with air conditioning)
Mode control motor does not run, or one or more modes are inoperative.		Follow the flowchart (see page 21-14).
Recirculation control door does not change between FRESH and RECIRCULATE.		Follow the flowchart (see page 21-17).

Blower Motor Speed

Blower motor runs, but one or more speeds are inoperative.

Turn the ignition switch ON (II), and the heater fan switch OFF.

Does the blower motor run?

YES → B To page 21-10

NO ↓

Turn the ignition switch OFF.

Disconnect the blower resistor 4P connector.

Measure the resistance between the No. 2 and No. 4 terminals of the blower resistor.

Is there approx. 2–3 ohms?

NO → **Replace the blower resistor.**

YES ↓

Reconnect the blower resistor 4P connector.

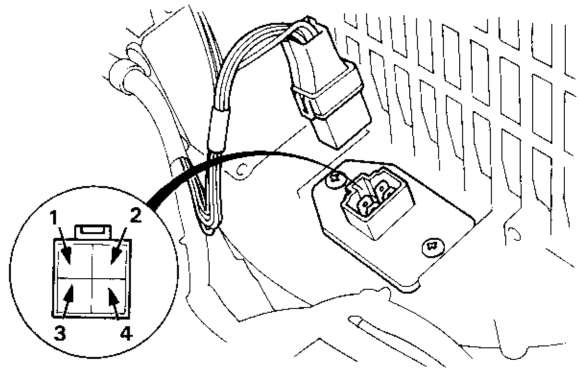
Remove the heater control panel (see page 21-25).

Disconnect the heater fan switch 6P connector.

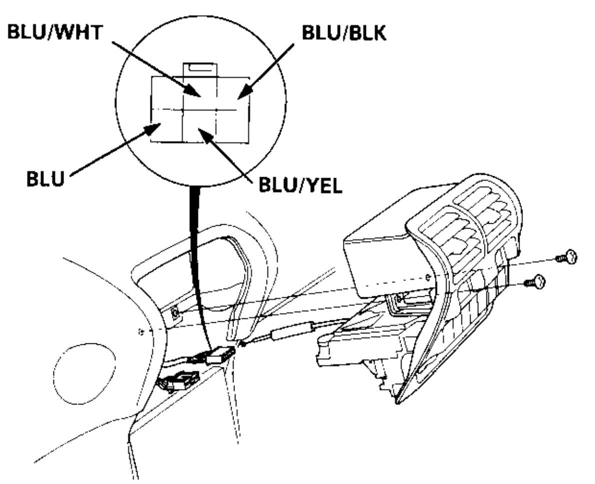
Turn the ignition switch ON (II).

At the heater fan switch 6P connector, ground each of these wires individually in the following order:
- BLU wire
- BLU/WHT wire
- BLU/YEL wire
- BLU/BLK wire

A To page 21-10



View from wire side



(cont'd)

Troubleshooting

Blower Motor Speed (cont'd)

From page 21-9

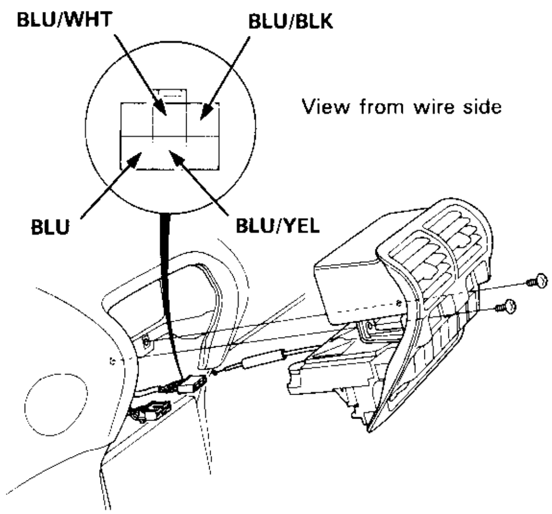
A

Does the blower motor run at progressively higher speeds?

YES → **Replace the heater fan switch.**

NO ↓

Repair open or cause of excessive resistance in the appropriate wire(s) between the heater fan switch and the blower resistor.



From page 21-9

B

Turn the ignition switch OFF.

↓

Remove the heater control panel (see page 21-25).

↓

Disconnect the heater fan switch 6P connector.

↓

Disconnect the blower resistor 4P connector.

↓

Check each wire for continuity between the heater fan switch 6P connector and body ground.
- BLU wire
- BLU/WHT wire
- BLU/YEL wire
- BLU/BLK wire

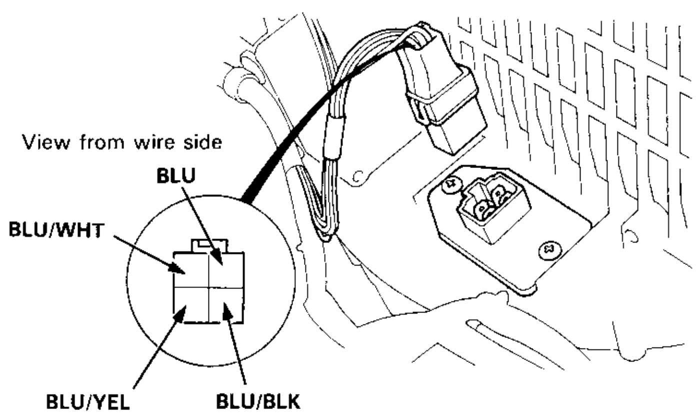
↓

Is there continuity?

NO → **Replace the heater fan switch.**

YES ↓

Repair short in the wire(s) between the heater fan switch and the blower resistor.



Blower Motor

Blower motor does not run at all.

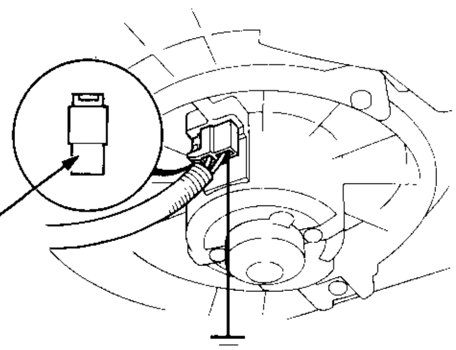
Check the No. 55 (40 A) fuse in the under-hood fuse/relay box.

Is the fuse OK? — NO → **Replace the fuse.**

YES

At the blower motor 2P connector, connect the BLU/BLK wire terminal to body ground with a jumper wire.

View from wire side



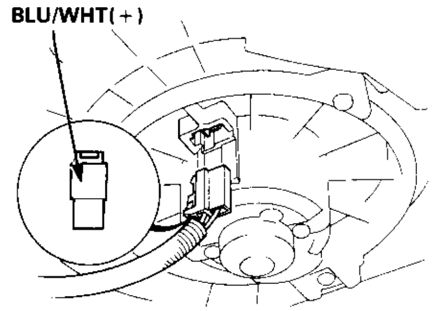
Turn the ignition switch ON (II).

Does the blower motor run? — YES → To page 21-12

NO

Disconnect the blower motor 2P connector, and measure the voltage between the BLU/WHT wire terminal (+) and body ground (−).

View from wire side



Is there battery voltage? — YES → **Replace the blower motor.**

NO

Turn the ignition switch OFF.

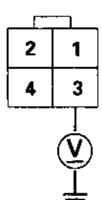
Remove the blower motor relay from the under-hood fuse/relay box and test it (see page 21-30).

Is the relay OK? — NO → **Replace the blower motor relay.**

YES

Measure the voltage between the No. 3 terminal (+) and body ground (–)

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage? — NO → **Replace the under-hood fuse/relay box.**

YES

To page 21-13

(cont'd)

Blower Motor (cont'd)

From page 21-11

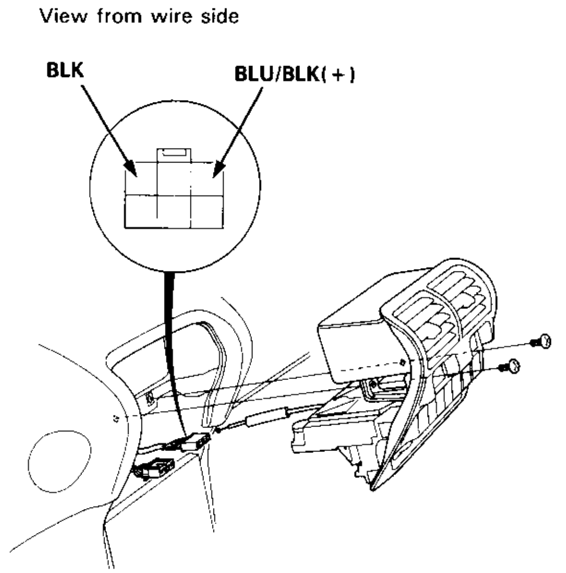
Turn the ignition switch OFF.

Remove the heater control panel (see page 21-25).

Disconnect the heater fan switch 6P connector.

Turn the ignition switch ON (II).

Measure the voltage between the BLU/BLK wire terminal (+) and body ground (−).



Is there battery voltage?

NO → **Repair open in the BLU/BLK wire between the blower motor and the heater fan switch.**

YES

Turn the ignition switch OFF.

Check for continuity in the BLK wire between the heater fan switch and body ground.

Is there continuity?

NO → **Check for an open in the BLK wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G201 and 401.**

YES

Replace the heater fan switch.

From page 21-11

Turn the ignition switch ON (II).

Measure the voltage between the No. 4 terminal (+) and body ground (−).

Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the under-hood fuse/relay box and the under-dash fuse/relay box.**

YES

Turn the ignition switch OFF.

Check for continuity between the No. 2 terminal and body ground.

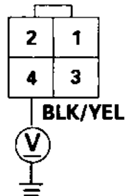
Is there continuity?

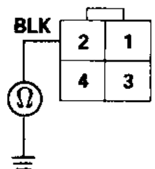
NO → **Check for an open in the BLK wire between the under-hood fuse/relay box and body ground. If the wire is OK, check for poor ground at G201 and G401.**

YES

Repair open in the BLU/WHT wire between the under-hood fuse/relay box and the blower motor.

BLOWER MOTOR RELAY 4P SOCKET





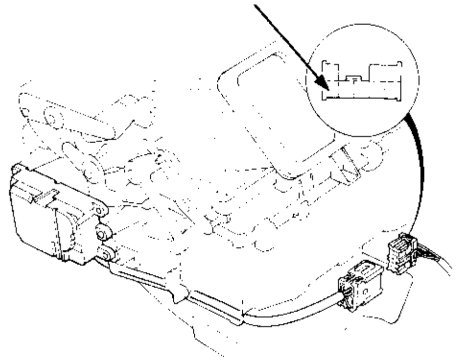
Mode Control Motor

Mode control motor does not run, or one or more mode are inoperative.

Disconnect the mode control motor 8P connector.

Turn the ignition switch ON (II).

Measure the voltage between the BLK/YEL wire terminal (+) and body ground (−).



Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the under-dash fuse/relay box and the mode control motor.**

YES ↓

Turn the ignition switch OFF.

To page 21-15

From page 21-14

Check for continuity in the BLK wire between the mode control motor and body ground.

Is there continuity?

- NO → **Check for an open in the BLK wire between the mode control motor and body ground. If the wire is OK, check for poor ground at G201 and G401.**
- YES ↓

Test the mode control motor (see page 21-28).

Is the mode control motor OK?

- NO → Remove the mode control motor (see page 21-28).
  - Check the mode control linkage and doors for smooth movement.
  - Do the mode control linkage and doors move smoothly?
    - NO → **Repair the mode control linkage or doors.**
    - YES → **Replace the mode control motor.**
- YES ↓

Remove the heater control panel (see page 21-25).

Disconnect the heater control panel 14P connector.

Check each wire for continuity between the mode control motor and body ground.
- YEL/BLU wire
- YEL wire
- BLU/WHT wire
- GRN/YEL wire
- YEL/RED wire

Is there continuity?

- YES → **Repair any short in the wire(s) between the mode control motor and the heater control panel.**
- NO ↓

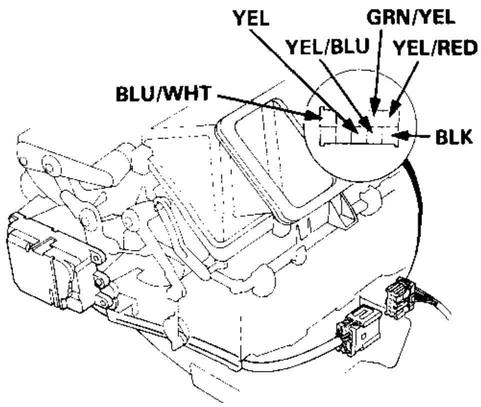
Check the same wires for voltage.

Is there any voltage?

- YES → **Repair short to power in the BLK/YEL wire between the mode control motor and the heater control panel. (This damages the heater control panel.)**
- NO ↓

To page 21-16

View from wire side



(cont'd)

Mode Control Motor (cont'd)

From page 21-15

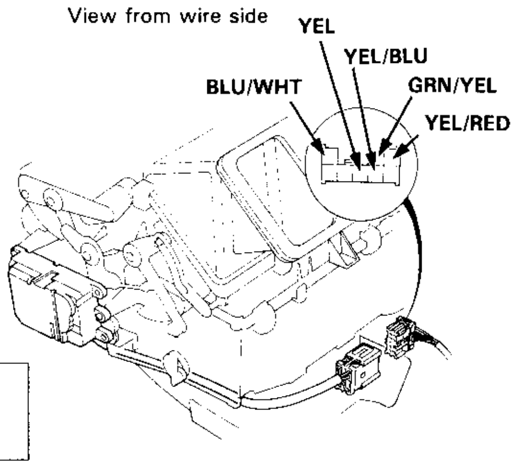
Check each wire for continuity between the mode control motor and the heater control panel.

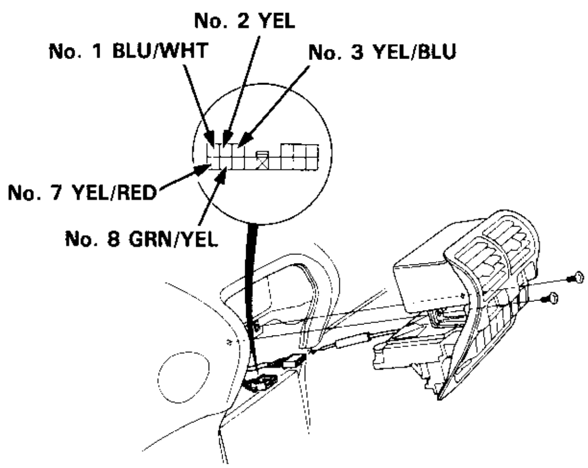
- YEL/BLU wire
- YEL wire
- BLU/WHT wire
- GRN/YEL wire
- YEL/RED wire

Is there continuity?

NO — **Repair any open in the wire(s) between the mode control motor and the heater control panel.**

YES — **Replace the heater control panel.**





Recirculation Control Motor

Recirculation control door does not change between FRESH and RECIRCULATE.

Disconnect the recirculation control motor 4P connector.

Turn the ignition switch ON (II).

Measure the voltage between the BLK/YEL wire terminal (+) and body ground (−).

Is there battery voltage?

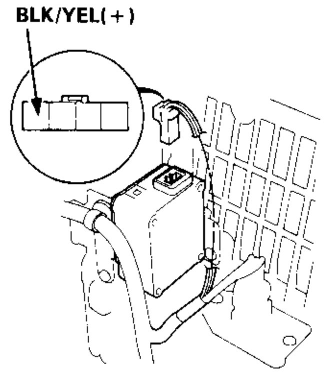
NO → **Repair open in the BLK/YEL wire between the under-dash fuse/relay box and the recirculation control motor.**

YES

Turn the ignition switch OFF.

To page 21-18

View from wire side



(cont'd)

Recirculation Control Motor (cont'd)

From page 21-17

Test the recirculation control motor (see page 21-29).

Is the recirculation control motor OK?

- NO → Remove the recirculation control motor (see page 21-29).
  - Check the recirculation control linkage and door for smooth movement.
  - Do the recirculation control linkage and door move smoothly?
    - NO → **Repair the recirculation control linkage or door.**
    - YES → **Replace the recirculation control motor.**
- YES ↓

Remove the heater control panel (see page 21-25).

Disconnect the heater control panel 14P connector.

Check for continuity in the GRN/WHT and GRN/RED wires between the recirculation control motor and body ground.

Is there continuity?

- YES → **Repair short in the GRN/WHT and/or GRN/RED wire(s) between the recirculation control motor and the heater control panel.**
- NO ↓

Check the same wires for voltage.

Is there any voltage?

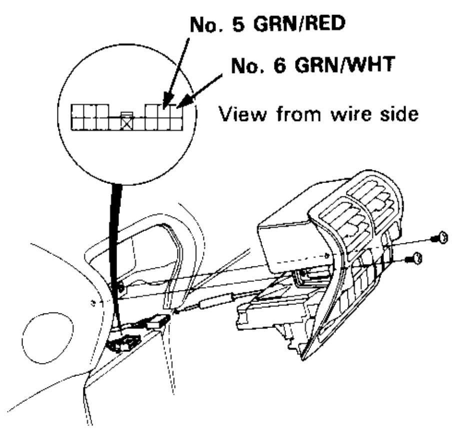
- YES → **Repair short to power in the BLK/YEL wire between the recirculation control motor and the heater control panel. (This damages the heater control panel.)**
- NO ↓

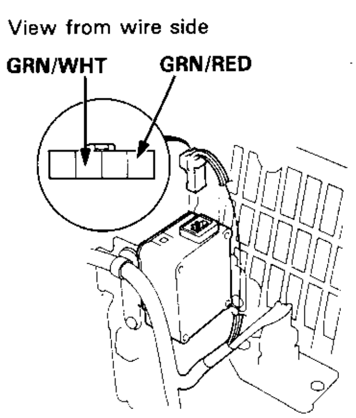
Check for continuity in the GRN/WHT and GRN/RED wires between the recirculation control motor and the heater control panel.

Is there continuity?

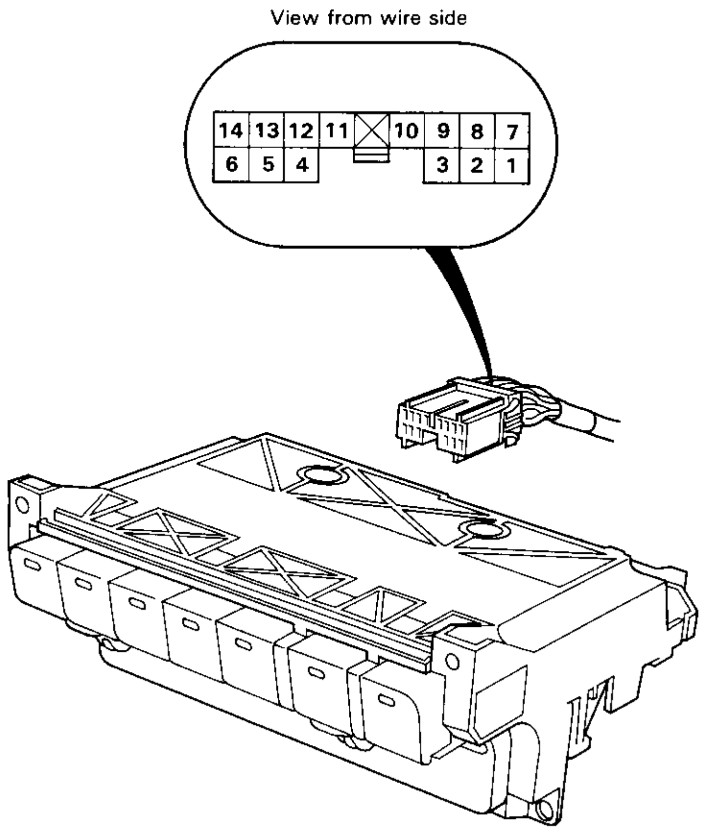
- NO → **Repair open in the GRN/WHT and/or GRN/RED wire(s) between the recirculation control motor and the heater control panel.**
- YES ↓

Replace the heater control panel.





Heater Control Panel Input/Output Signals



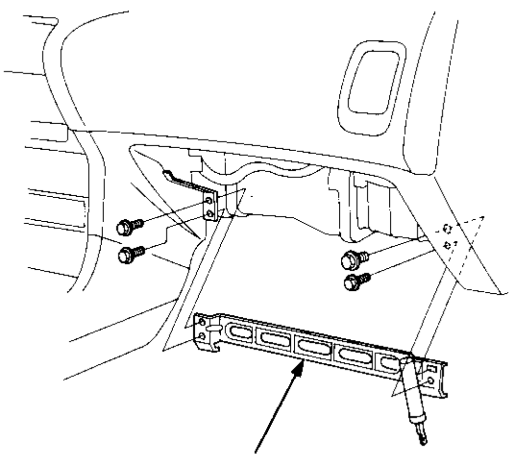
No.	Wire Color	Signal		No.	Wire Color	Signal	
1	BLU/WHT	HEAT	INPUT	8	GRN/YEL	HEAT/VENT	INPUT
2	YEL	HEAT/DEF	INPUT	9	RED/BLK	COMBINATION LIGHT SWITCH	INPUT
3	YEL/BLU	DEF	INPUT	10	RED	BRIGHTNESS CONTROLLER	OUTPUT
4	BLK	GROUND	OUTPUT	11	BLU/RED	A/C THERMOSTAT	INPUT
5	GRN/RED	RECIRCULATE	INPUT	12	GRN	HEATER FAN SWITCH	OUTPUT
6	GRN/WHT	FRESH	INPUT	13			
7	YEL/RED	VENT	INPUT	14	BLK/YEL	IG2	INPUT

Blower Unit

Replacement

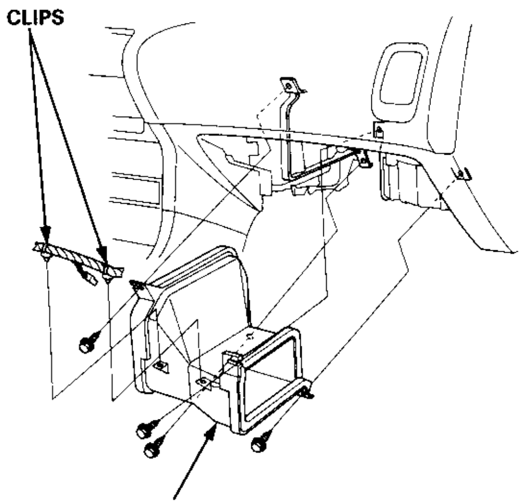
NOTE: The blower motor, recirculation control motor and blower resistor can be replaced without removing the blower unit (see page 21-21).

1. Remove the glove box (see section 20).
2. Remove the four bolts and the glove box frame.



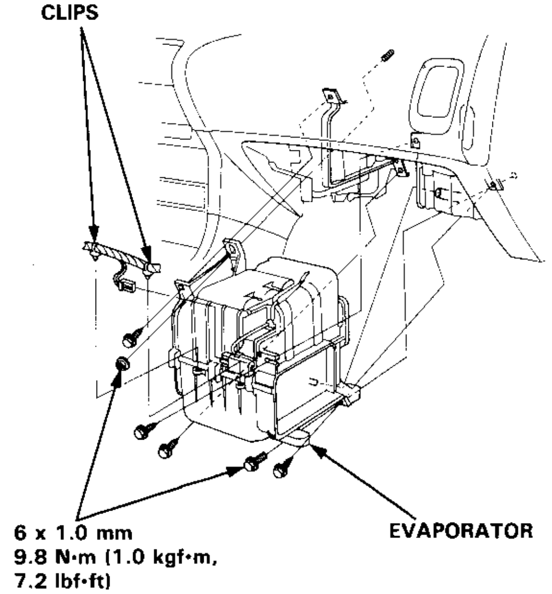
Without Air Conditioning

3-a. Remove the wire harness clips from the heater duct. Remove the four self-tapping screws and the heater duct.

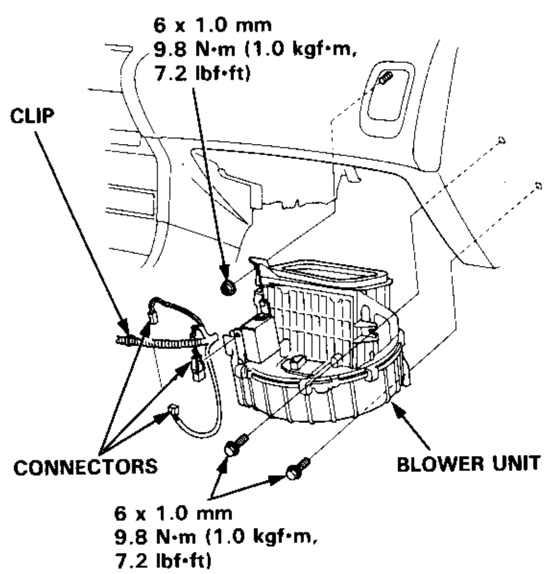


With Air Conditioning

3-b. Remove the evaporator (see page 22-26).



4. Disconnect the connectors from the blower motor, the blower resistor and the recirculation control motor.
5. Remove the wire harness clip from the recirculation control motor, and release the wire harness from the clamp on the blower unit.
   Remove the two mounting bolts, the mounting nut and the blower unit.

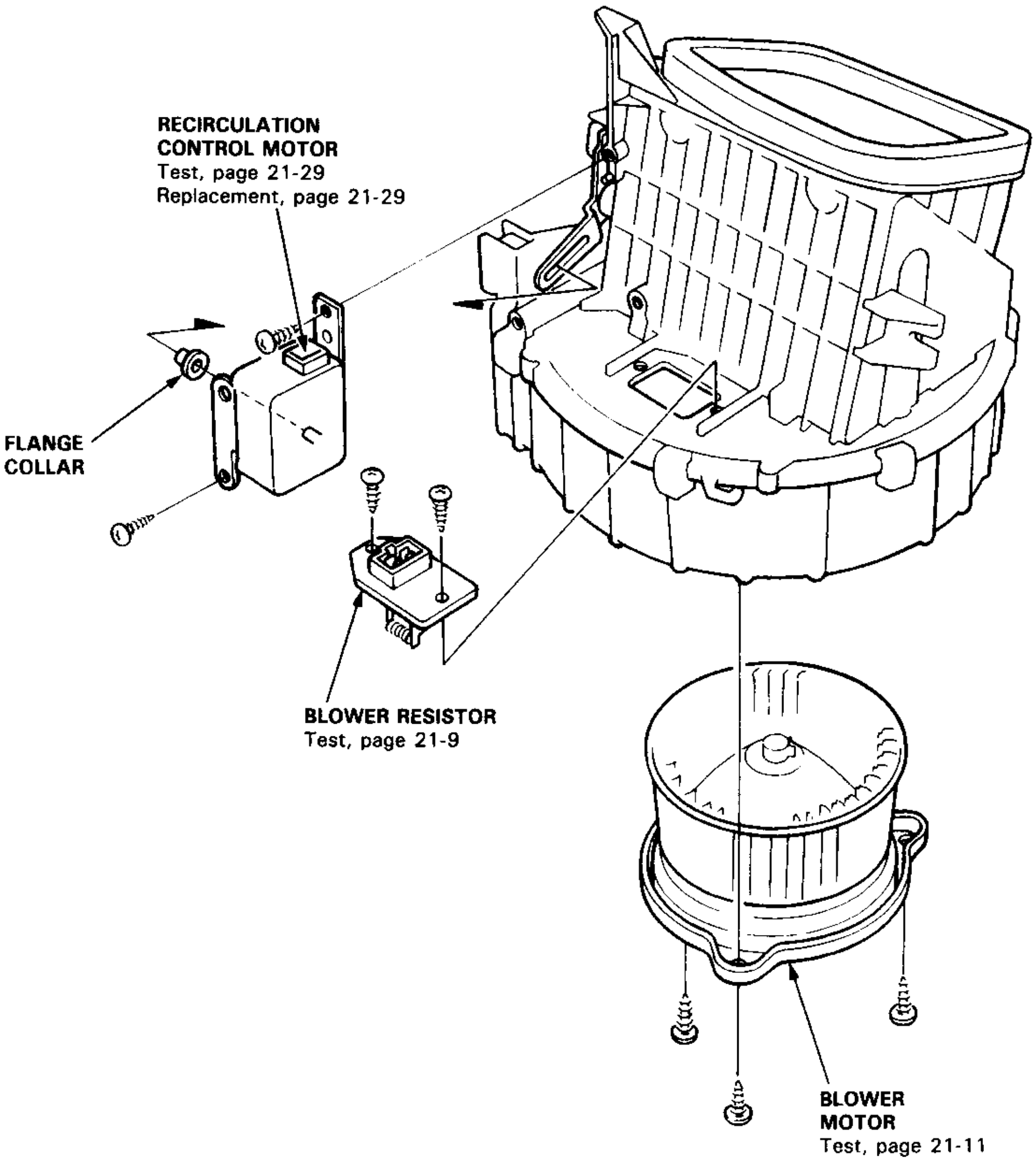


6. Install in the reverse order of removal, and make sure there are no air leaks.

Overhaul

NOTE:

- Before reassembly, make sure that the recirculation control door and linkage move smoothly without binding.
- When reattaching the recirculation control motor, make sure its positioning will not allow the recirculation control door to be pulled too far. Attach the recirculation control motor and all links, then connect power and ground, and watch the movement of the recirculation control door.



Heater Unit

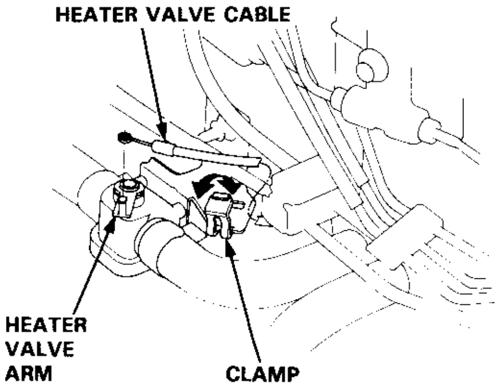
Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

1. When the engine is cool, drain the engine coolant from the radiator (see section 10).

   ⚠ WARNING Do not remove the radiator cap when the engine is hot; the engine coolant is under pressure and could severely scald you.

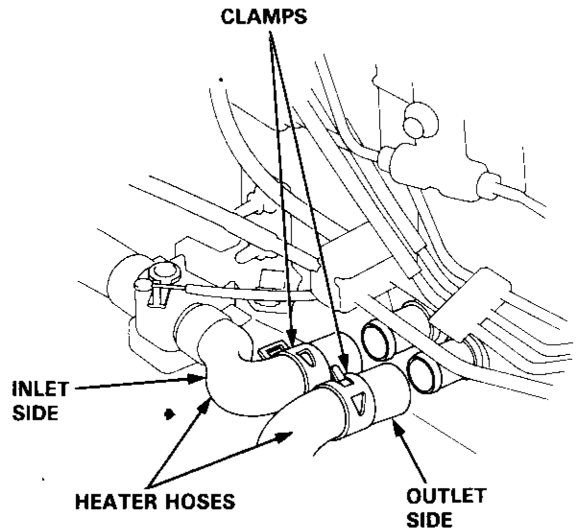
2. Open the clamp, then disconnect the heater valve cable from the heater valve arm.



3. Disconnect the heater hoses from the heater unit.

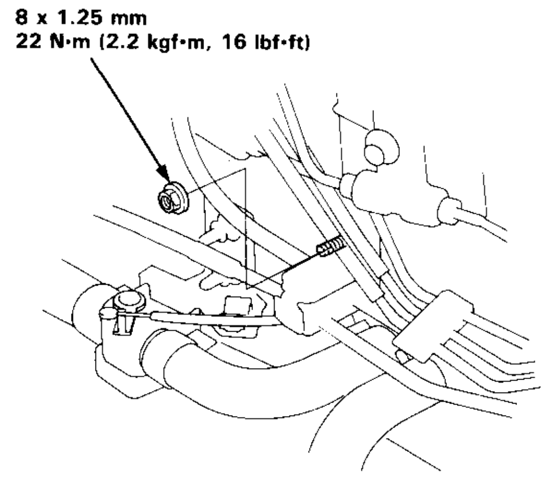
   CAUTION: Engine coolant will damage paint. Quickly rinse any spilled engine coolant from painted surfaces.

   NOTE: Engine coolant will run out when the hoses are disconnected, drain it into a clean drip pan.



4. Remove the mounting nut from the heater unit.

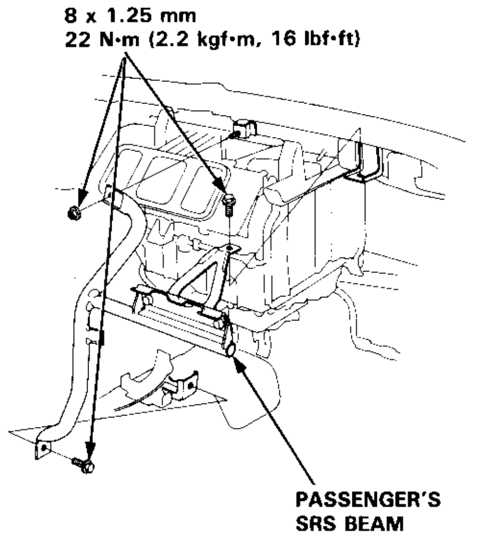
   NOTE: When removing the mounting nut, take care not to damage or bend the fuel pipes, brake pipes, etc.



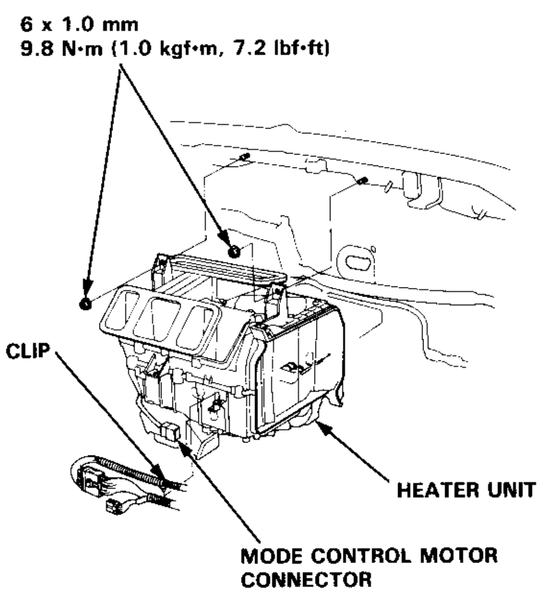
5. Remove the dashboard (see section 20).

6. Remove the heater duct (see page 21-20) or the evaporator (see page 22-26).

7. Remove the two bolts, the nut and the passenger's SRS beam.



8. Disconnect the mode control motor connector, and remove the wire harness clip from the heater unit. Remove the two mounting nuts and the heater unit.



9. Install in the reverse order of removal. Make note of these items:

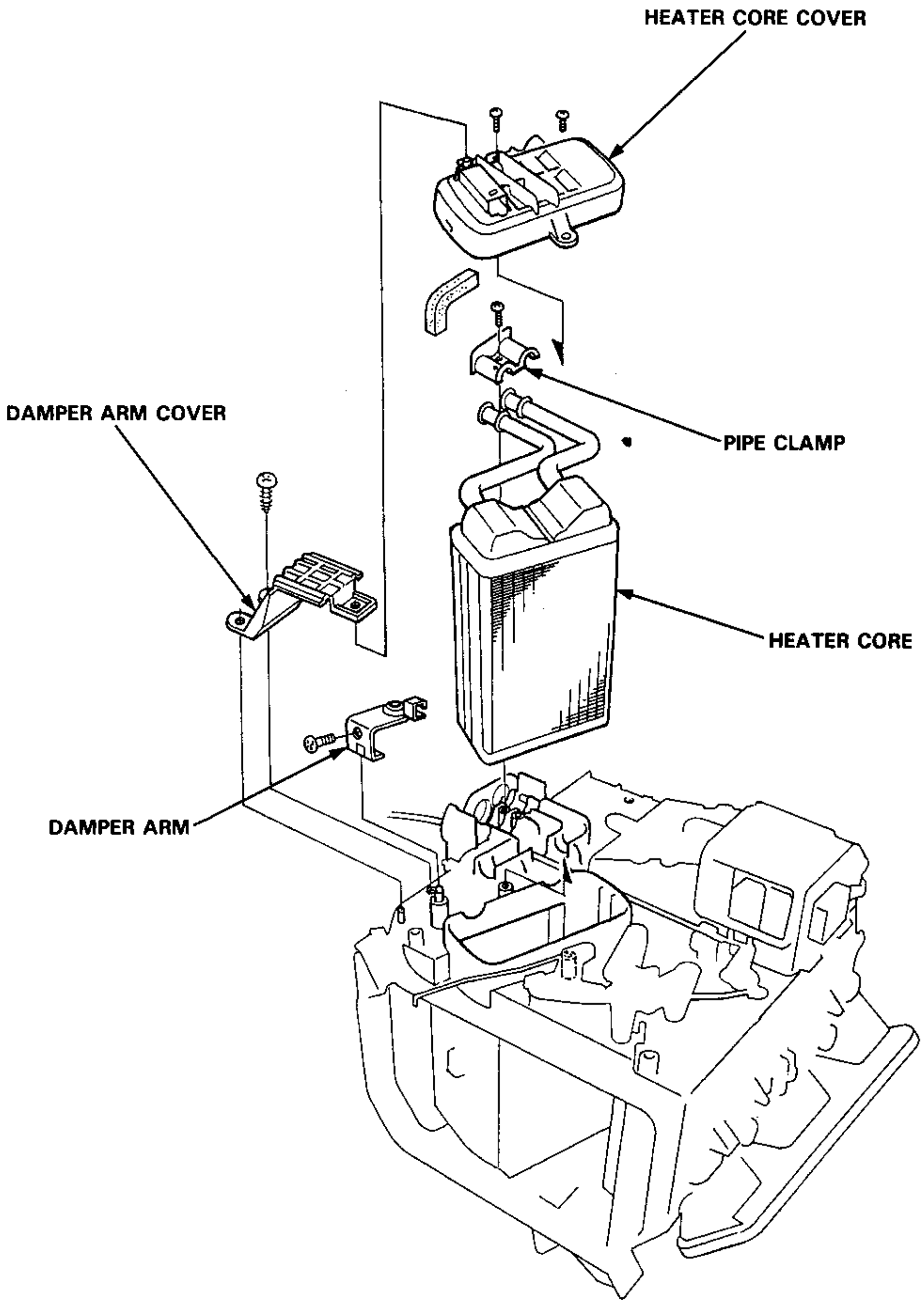
- Apply sealant to the grommets
- Do not interchange the inlet and outlet hoses. Make sure that the hose clamps are secure.
- Loosen the bleed bolt on the engine and refill the radiator and coolant reservoir with the proper engine coolant mixture (see section 10).
  Tighten the bleed bolt when all the trapped air has escaped and engine coolant begins to flow from it (see section 10).
- Connect all cables and make sure they are properly adjusted (see page 21-27).

Heater Unit

Overhaul

1. Remove the screw and the damper arm cover.
2. Disconnect the link from the damper arm, and remove the screw and the damper arm.
3. Remove the two screws and the heater core cover.
4. Remove the screw and the pipe clamp.
5. Pull out the heater core.

   NOTE: Be careful not to bend the inlet and outlet pipes during heater core removal.
6. Assemble in the reverse order of disassembly.

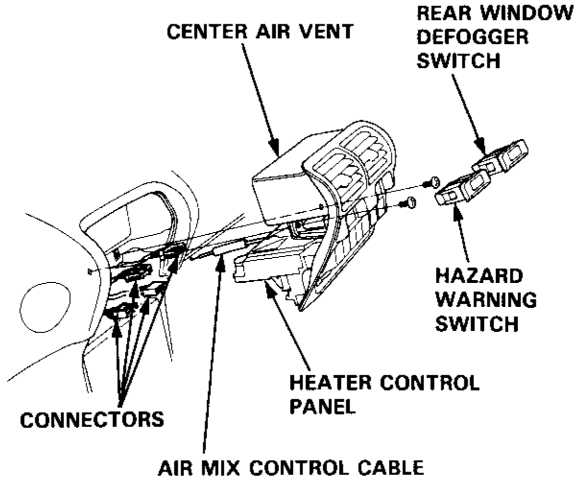


Heater Control Panel

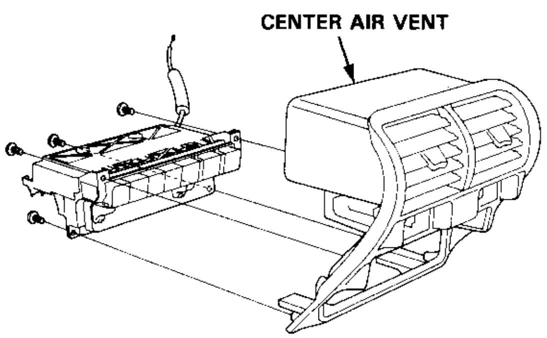
Replacement

1. Disconnect the air mix control cable from the heater unit (see page 21-27).
2. Remove the rear window defogger switch and the hazard warning switch.
3. Remove the two self-tapping screws, then pull out the heater control panel and the center air vent. Disconnect the connectors, and remove the heater control panel and the center air vent.

   NOTE: The locking tabs of the hazard warning switch and heater control panel connectors are on the bottom.



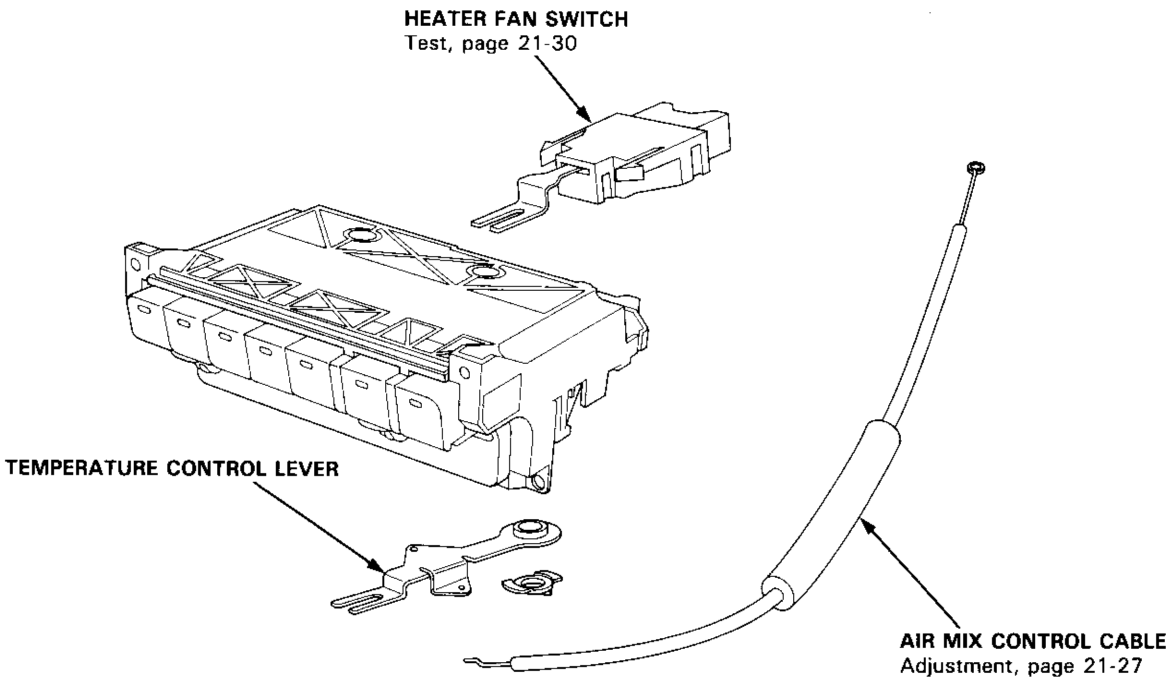
4. Remove the four self-tapping screws and the center air vent.



5. Install in the reverse order of removal, and adjust the air mix control cable at the heater unit (see page 21-27). If necessary, adjust the heater valve cable (see page 21-27).

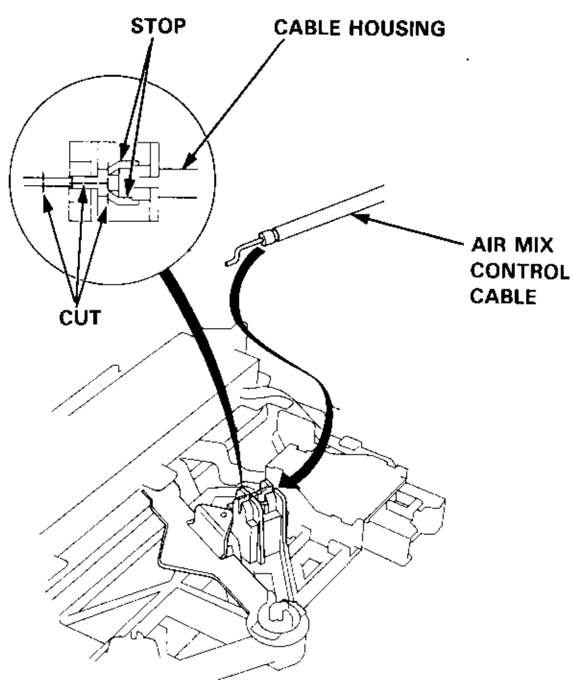
Heater Control Panel

Overhaul



Air Mix Control Cable Replacement

1. Cut the inner cable on the lever side of the cable holder, then remove both pieces of the inner cable.
2. Using a sharp knife, cut completely through the end of the cable housing at the two locations.
3. Slide the large section of the cable housing out of the cable holder, being careful not to damage the cable stops.
4. Carefully remove the cut pieces of the cable housing with a small flat tip screwdriver.
5. Hook the tip of the new air mix cable to the temperature control lever, then push the cable housing into the cable holder until it locks place.

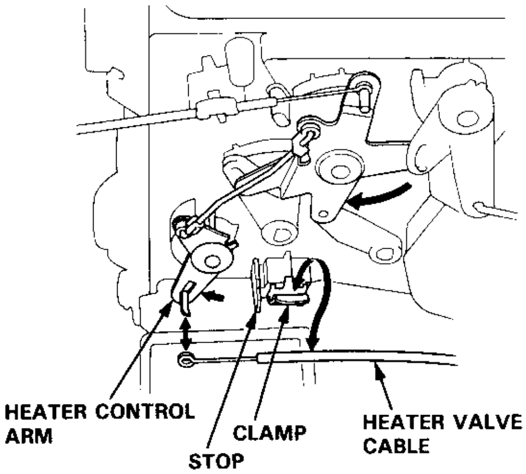


NOTE: After assembly, check that the temperature control lever slides smoothly through the full stroke from right to left.

Heater Valve Cable

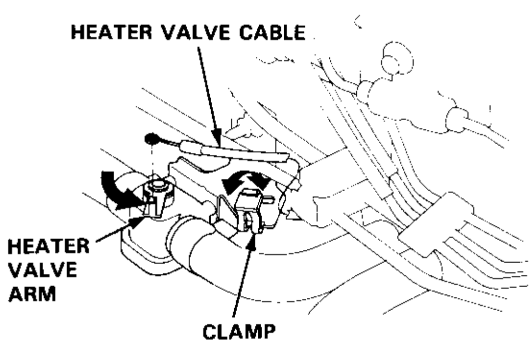
Adjustment

1. Disconnect the heater valve cable from the heater valve arm and the clamp, and from the heater control arm and the clamp.
2. Set the temperature control lever to MAX. HEAT.
3. Turn the heater control arm, as shown, then connect the end of the heater valve cable to the heater control arm.
4. Gently slide the heater valve cable housing back from the end enough to take up any slack in the heater valve cable, but not enough to make the temperature control lever move. Hold the end of the heater valve cable housing against the stop, then snap the heater valve cable housing into the clamp.



5. Turn the heater valve arm as shown, and connect the end of the heater valve cable to the heater valve arm.
6. Gently slide the heater valve cable housing back from the end enough to take up any slack in the heater valve cable, but not enough to make the temperature control lever move, then snap the heater valve cable housing into the clamp.

NOTE: The air mix control cable should always be adjusted whenever the heater valve cable has been disconnected.

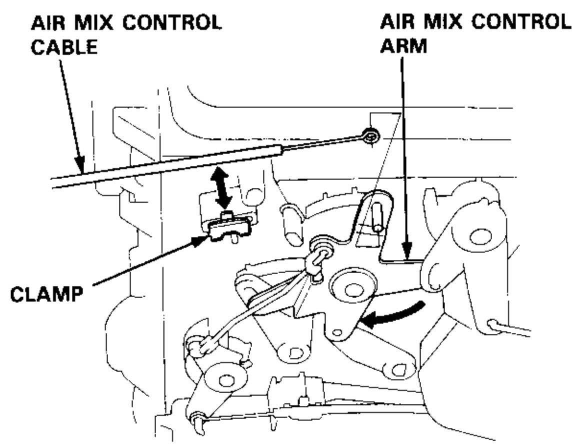


Air Mix Control Cable

Adjustment

1. Disconnect the air mix control cable from the air mix control arm and the clamp.
2. Set the temperature control lever to MAX. HEAT.
3. Turn the air mix control arm, as shown, then connect the end of the air mix control cable to the air mix control arm.
4. Gently slide the air mix control cable housing back from the end enough to take up any slack in the air mix control cable, but not enough to make the temperature control lever move, then snap the air mix control cable housing into the clamp.

NOTE: The heater valve cable should always be adjusted whenever the air mix control cable has been disconnected.



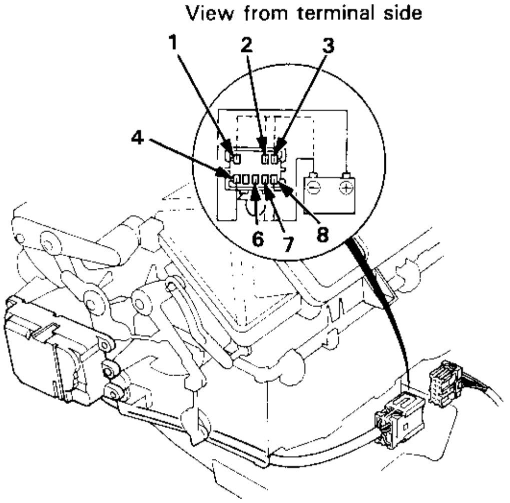
Mode Control Motor

Test

1. Connect battery power to the No. 4 terminal of the mode control motor and connect ground to the No. 8 terminal.

2. Using a jumper wire, connect the No. 8 terminal individually to the No. 1, 2, 3, 6 and 7 terminals, in that order. Each time the short circuit is made, the mode control motor should run smoothly and stop.

   NOTE: If the mode control motor does not run when shorting the first terminal, short that terminal again after shorting the other terminals.
   The mode control motor is OK if it runs when jumping the first terminal again.

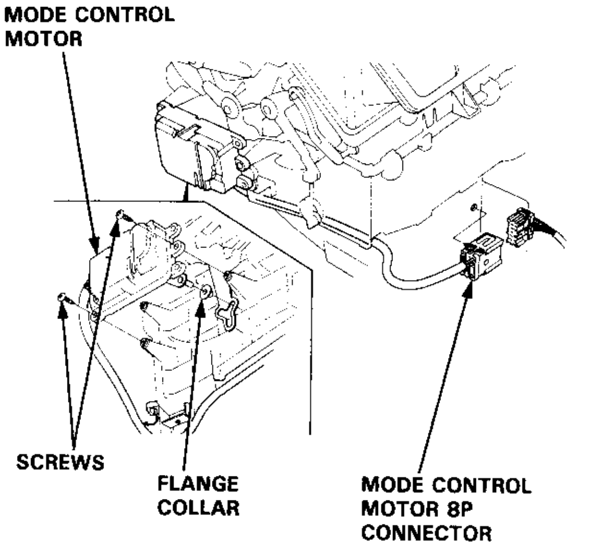


3. If the mode control motor does not run in step 2, remove it, and check the mode control linkage and doors for smooth movement. If the mode control linkage and doors move smoothly, replace the mode control motor.

Replacement

1. Disconnect the mode control motor 8P connector, and remove it from the heater unit.

2. Remove the two screws, the mode control motor, and the flange collar.



3. Install in the reverse order of removal. After installation, make sure the mode control motor runs smoothly.

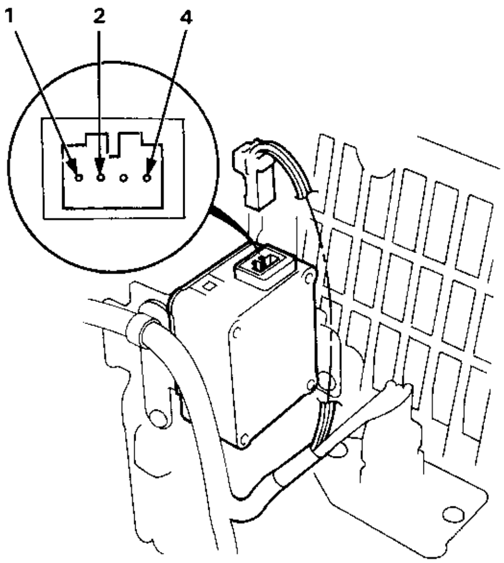
Recirculation Control Motor

Test

1. Connect battery power to the No. 1 terminal of the recirculation control motor, and connect ground to the No. 2 and No. 4 terminals; the recirculation control motor should run smoothly.
2. Disconnect the No. 2 or No. 4 terminal from ground; the recirculation control motor should stop at FRESH or RECIRCULATE.

   CAUTION: Never connect the battery in the opposite direction.

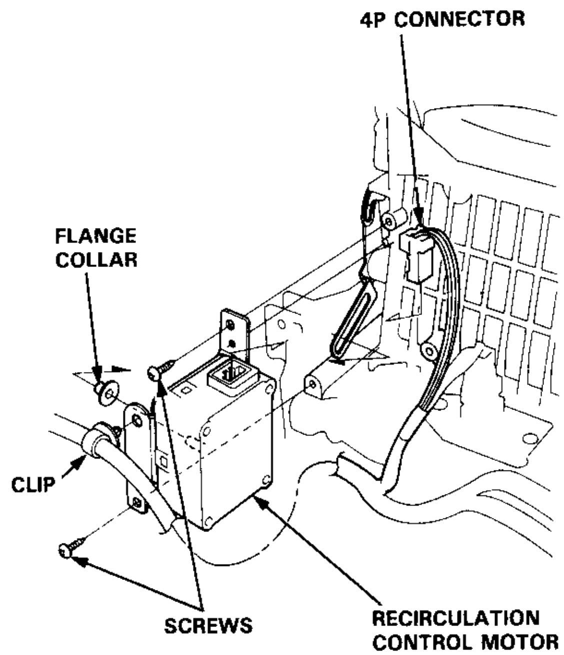
   NOTE: Don't cycle the recirculation control motor for a long time.



3. If the recirculation control motor does not run in step 1, remove it, and check the recirculation control linkage and door for smooth movement. If the recirculation control linkage and door move smoothly, replace the recirculation control motor.

Replacement

1. Disconnect the 4P connector from the recirculation control motor, and remove the wire harness clip from it.
2. Remove the two screws, the recirculation control motor and the flange collar.

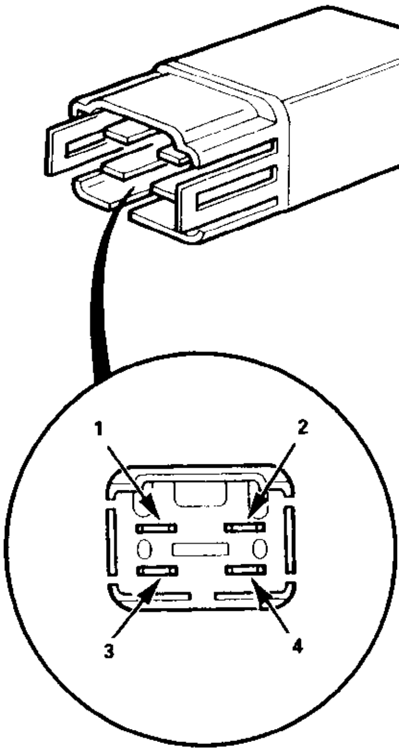


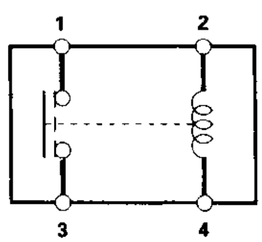
3. Install in the reverse order of removal. After installation, make sure the recirculation control motor runs smoothly.

Relay

Test

There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals, and there should be no continuity when power is disconnected.



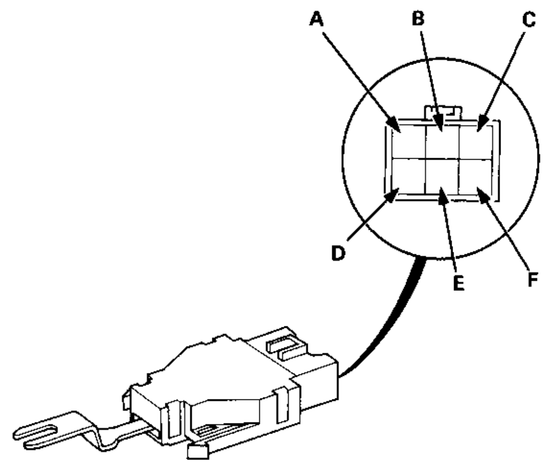


Heater Fan Switch

Test

Check for continuity between the terminals according to the table below.

Position \ Terminal	A	F	D	B	E	C
OFF						
1	○	○	○			
2	○	○		○		
3	○	○			○	
4	○	○				○

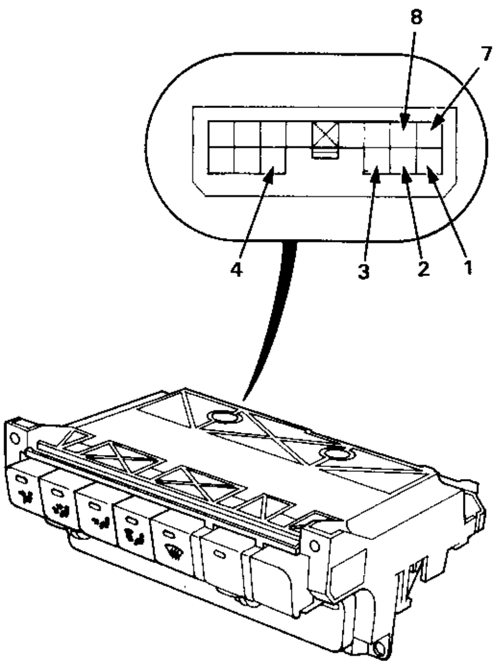


Mode Control Switch

Test

Check for continuity between the terminals according to the table below.

Position \ Terminal	4	1	2	3	7	8
Heat	O	O				
Heat/Def	O		O			
Def	O			O		
Vent	O				O	
Heat/Vent	O					O

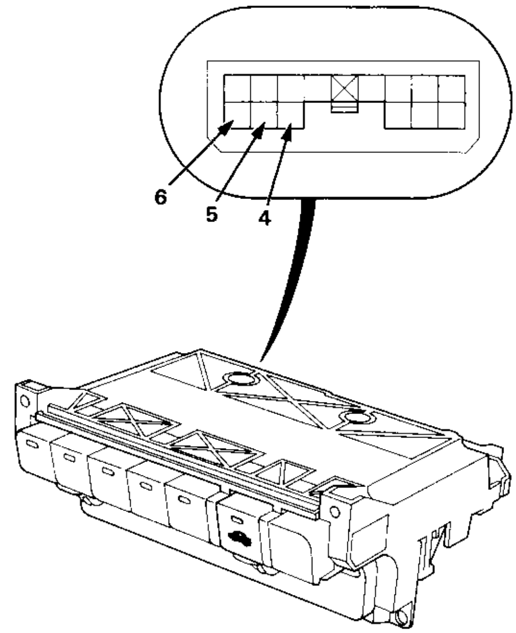


Recirculation Control Switch

Test

Check for continuity between the terminals according to the table below.

Position \ Terminal	4	5	6
Fresh	O		O
Recirculate	O	O	



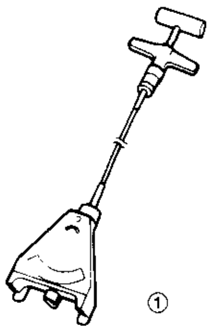
Air Conditioning

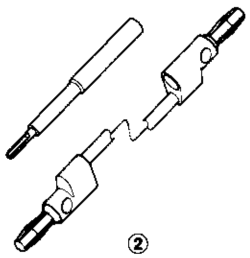
*: Read SRS precautions before working in this area.

Special Tools

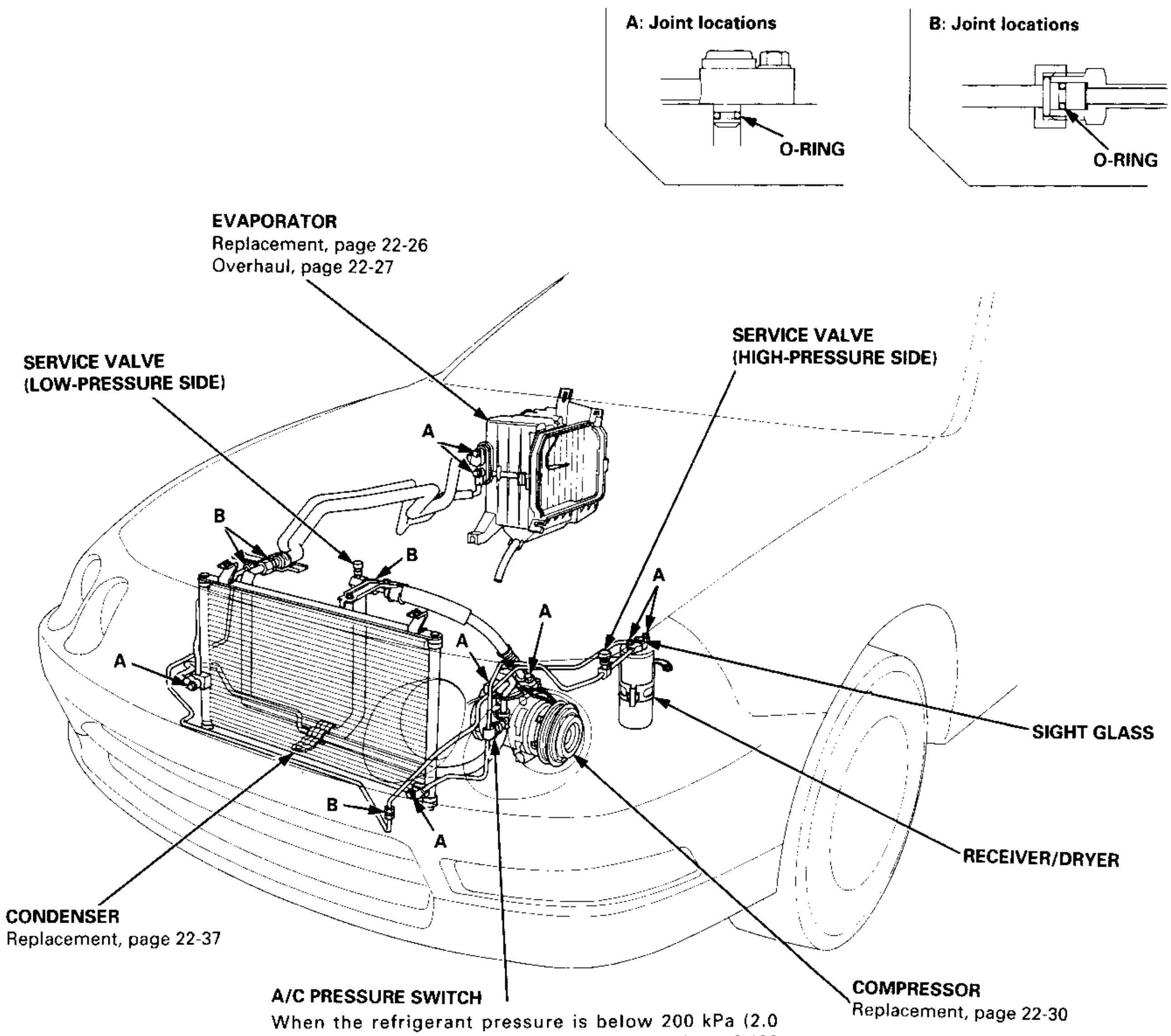
Ref. No.	Tool Number	Description	Qty	Page Reference
*①	07JGG – 001010A	Belt Tension Gauge	1	22-36
②	07SAZ – 001000A	Backprobe Set	2	22-15

*Included in the Belt Tension Gauge Set, T/N 07TGG – 001000A


①

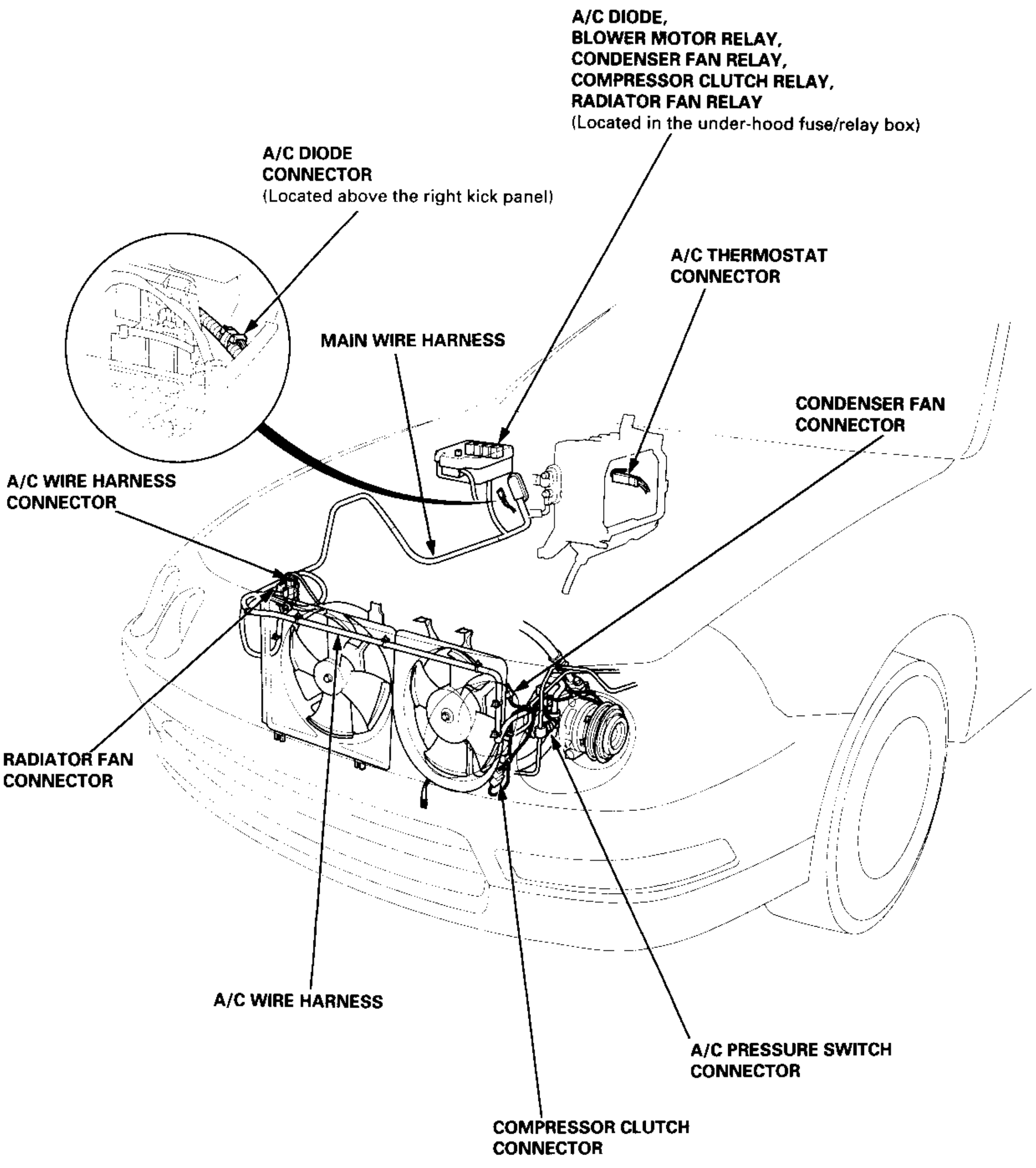

②

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

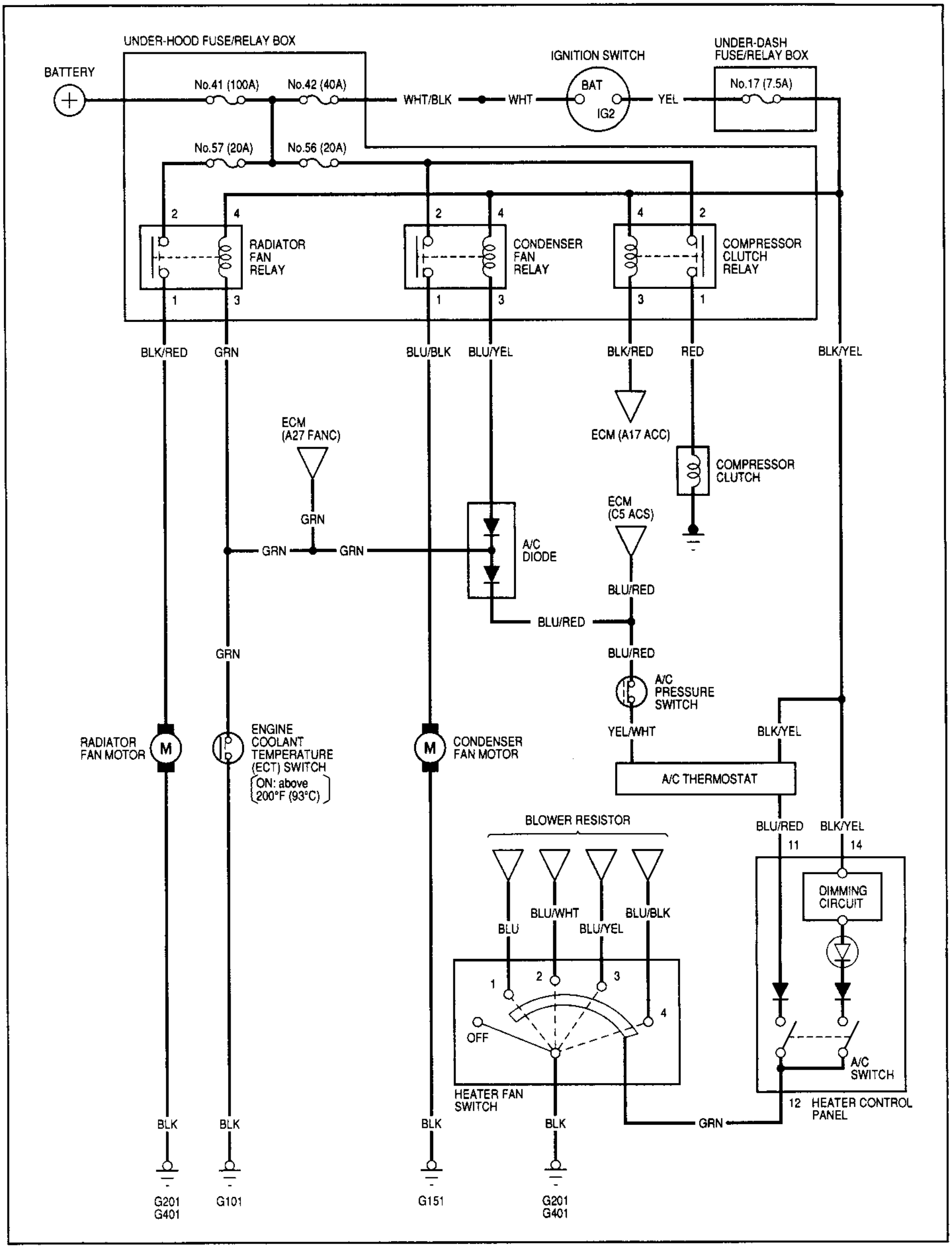


When the refrigerant pressure is below 200 kPa (2.0 kgf/cm², 28 psi) due to refrigerant leakage or above 3,100 kPa (32 kgf/cm², 460 psi) due to refrigerant blockage, the A/C pressure switch opens the circuit to the A/C switch and stops the air conditioning to protect the compressor.

Wiring/Connector Locations



Circuit Diagram



Description

Outline

The air conditioner system delivers cooled air into the passenger compartment by circulating refrigerant through the system as shown below.

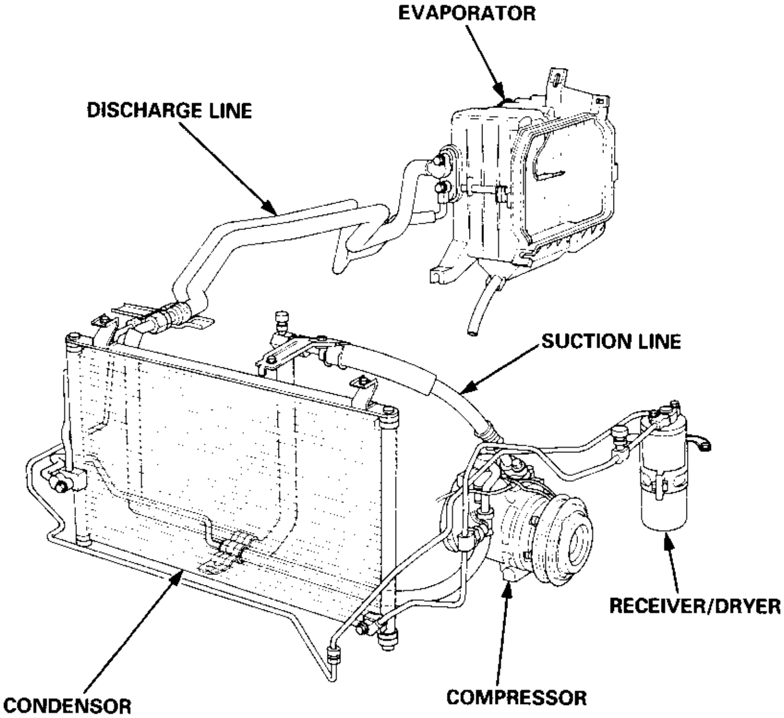
Suction and compression	High-temperature/ high-pressure gas	Radiation of heat	High-temperature/ high-pressure liquid	Traps debris and removes moisture	High-temperature/ high-pressure liquid

COMPRESSOR → CONDENSER → RECEIVER/DRYER → EXPANSION VALVE → EVAPORATOR → COMPRESSOR

Less moisturized low-pressure vapor

Absorption of heat

More liquidified low-pressure vapor



This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (ND-OIL 8: P/N 38897-PR7-A01AH or 38899-PR7-A01) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a Recovery/Recycling/Charging System that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning systems.
- Always recover the refrigerant R-134a with an approved Recovery/Recycling/Charging System before disconnecting any A/C fitting.

Troubleshooting

Reference Chart

- Any abnormality must be corrected before continuing the test.
- Because of the precise measurements needed, use a multimeter when testing.

Before performing any troubleshooting procedures check:
- Fuses No. 56 (20 A), No. 57 (20 A) in the under-hood fuse/relay box, and No. 17 (7.5 A) in the under-dash fuse/relay box.
- Grounds No. G401, G201, G151, G101
- Cleanliness and tightness of all connectors

SYMPTOM	REMEDY
Radiator fan does not run at all.	Perform the procedures in the flowchart (see page 22-8).
Condenser fan does not run at all.	Perform the procedures in the flowchart (see page 22-10).
Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.	Perform the procedures in the flowchart (see page 22-12).
Both fans do not run at all.	Perform the procedures in the flowchart (see page 22-13).
Compressor clutch does not engage.	Perform the procedures in the flowchart (see page 22-14).
A/C system does not come on (compressor and both fans).	Perform the procedures in the flowchart (see page 22-16).

Radiator Fan

Radiator fan does not run at all.

Check the No. 57 (20 A) fuse in the under-hood fuse/relay box.

Is the fuse OK? — NO → **Replace the fuse.**

YES

Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 22-19).

Is the relay OK? — NO → **Replace the radiator fan relay.**

YES

Measure the voltage between the No. 2 terminal (+) and body ground (–).

Is there battery voltage? — NO → **Replace the under-hood fuse/relay box.**

YES

Connect the No. 1 and No. 2 terminals with a jumper wire.

Does the radiator fan run? — YES → To page 22-9

NO

Disconnect the jumper wire.

Disconnect the radiator fan 2P connector.

Check for continuity in the BLK/RED wire between the No. 1 terminal and the radiator fan.

Is there continuity? — NO → **Repair open in the BLK/RED wire between the under-hood fuse/relay box and the radiator fan.**

YES

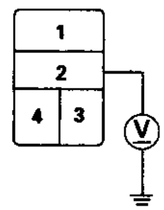
Check for continuity in the BLK wire between the radiator fan and body ground.

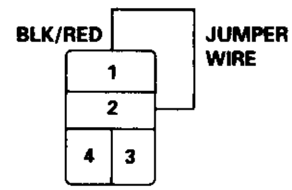
Is there continuity? — NO → **Check for an open in the BLK wire between the radiator fan and body ground. If the wire is OK, check for poor ground at G201 and G401.**

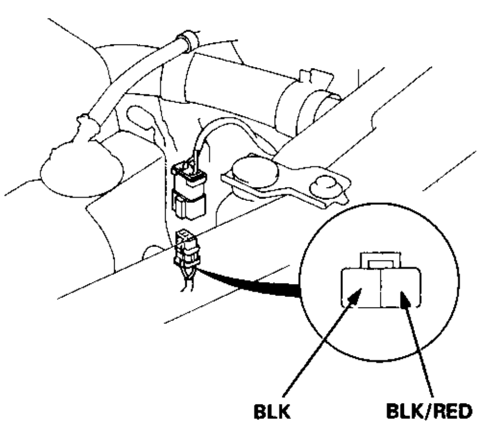
YES

Replace the radiator fan motor.

RADIATOR FAN RELAY 4P SOCKET







View from wire side

From page 22-8

Disconnect the jumper wire and turn the ignition switch ON (II).

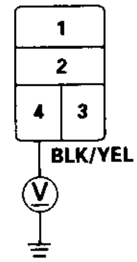
Measure the voltage between the No. 4 terminal (+) and body ground (–).

Is there battery voltage?

YES — **Repair open in the GRN wire between the under-hood fuse/relay box and the A/C diode.**

NO — **Repair open in the BLK/YEL wire between the under-hood fuse/relay box and the under-dash fuse/relay box.**

RADIATOR FAN RELAY 4P SOCKET



Condenser Fan

Condenser fan does not run at all.

Remove the condenser fan relay from the under-hood fuse/relay box, and test it (see page 22-19).

Is the relay OK?

- NO → **Replace the condenser fan relay.**
- YES ↓

Measure the voltage between the No. 2 terminal (+) and body ground (–).

Is there battery voltage?

- NO → **Replace the under-hood fuse/relay box.**
- YES ↓

Connect the No. 1 and No. 2 terminals with a jumper wire.

Does the condenser fan run?

- YES → To page 22-11
- NO ↓

Disconnect the jumper wire.

Disconnect the condenser fan 2P connector.

Check for continuity in the BLU/BLK wire between the No. 1 terminal and the condenser fan.

Is there continuity?

- NO → **Repair open in the BLU/BLK wire between the under-hood fuse/relay box and the condenser fan.**
- YES ↓

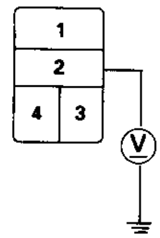
Check for continuity in the BLK wire between the condenser fan and body ground.

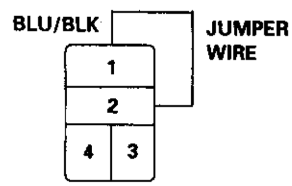
Is there continuity?

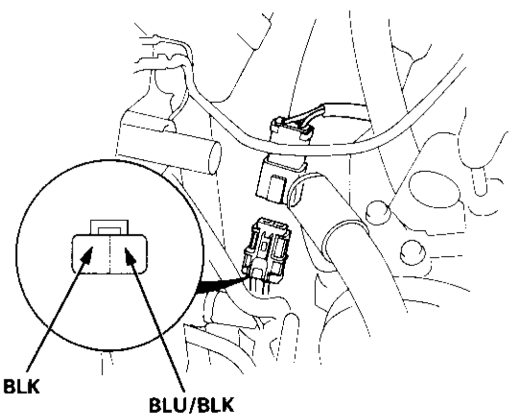
- NO → **Check for an open in the BLK wire between the condenser fan and body ground. If the wire is OK, check for poor ground at G151.**
- YES ↓

Replace the condenser fan motor.

CONDENSER FAN RELAY 4P SOCKET







From page 22-10

Disconnect the jumper wire and turn the ignition switch ON (II).

Measure the voltage between the No. 4 terminal (+) and body ground (–).

Is there battery voltage?

- NO → **Repair open in the BLK/YEL wire between the under-hood fuse/relay box and the under-dash fuse/relay box.**
- YES ↓

Remove the A/C diode from the under-hood fuse/relay box.

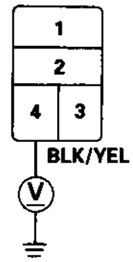
Test the A/C diode (see page 22-20).

Is the A/C diode OK?

- NO → **Replace the A/C diode.**
- YES ↓

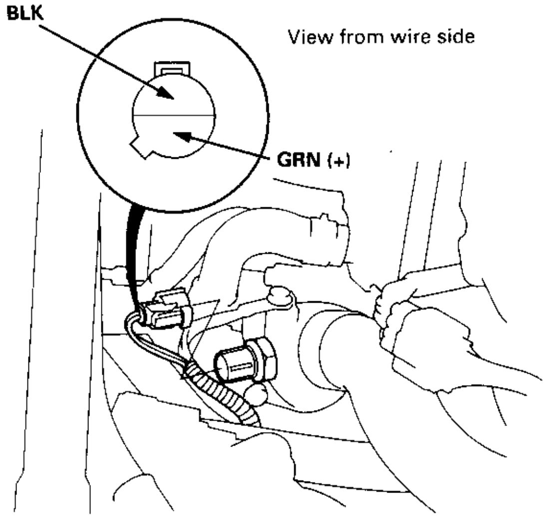
Repair open in the BLU/YEL wire between the under-hood fuse/relay box and the A/C diode.

CONDENSER FAN RELAY 4P SOCKET



Troubleshooting

Engine Coolant Temperature (ECT) Switch



Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.

Disconnect the engine coolant temperature (ECT) switch 2P connector.

Turn the ignition switch ON (II).

Measure the voltage between the GRN wire terminal (+) and body ground (–).

Is there battery voltage?

- NO → **Repair open in the GRN wire between the ECT switch and the under-hood fuse/relay box.**
- YES ↓

Turn the ignition switch OFF and check for continuity in the BLK wire between the ECT switch and body ground.

Is there continuity?

- NO → **Check for an open in the BLK wire between the ECT switch and body ground. If the wire is OK, check for poor ground at G101.**
- YES ↓

Check the temperature gauge.

Does it read above normal?

- NO → **Repair the cooling system.**
- YES ↓

Replace the ECT switch.

Both Fans

Both fans do not run at all.

Remove the A/C diode from the under-hood fuse/relay box.

Test the A/C diode (see page 22-20).

Is the A/C diode OK?

NO → **Replace the A/C diode.**

YES → **Repair open in the BLU/RED wire between the A/C diode and the A/C pressure switch.**

Compressor clutch does not engage.

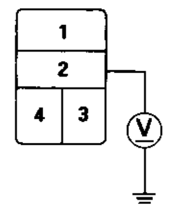
Remove the compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22-19).

Is the relay OK?

- NO → **Replace the compressor clutch relay.**
- YES ↓

Measure the voltage between the No. 2 terminal (+) and body ground (–).

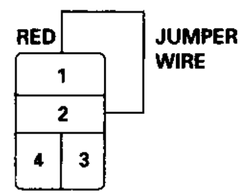
COMPRESSOR CLUTCH RELAY 4P SOCKET



Is there battery voltage?

- NO → **Replace the under-hood fuse/relay box.**
- YES ↓

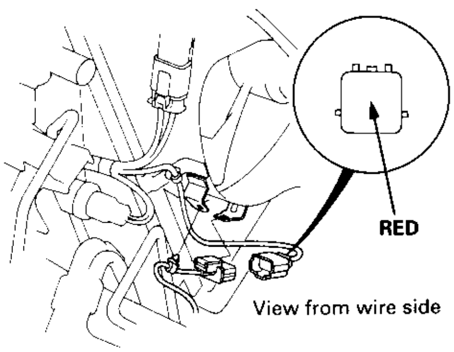
Connect the No. 1 and No. 2 terminals with a jumper wire.



Does the compressor clutch click?

- YES ↓ Disconnect the jumper wire. → To page 22-15
- NO → Disconnect the jumper wire.

Disconnect the compressor clutch 1P connector.



Check for continuity in the RED wire between the No. 1 terminal and the compressor clutch.

Is there continuity?

- NO → **Repair open in the RED wire between the under-hood fuse/relay box and the compressor clutch.**
- YES → **Inspect the compressor clutch clearance and the compressor clutch field coil (see page 22-32).**

From page 22-14

Turn the ignition switch ON (II).

Measure the voltage between the No. 4 wire terminal (+) and body ground (–).

Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the under-dash fuse/relay box and the under-hood fuse/relay box.**

YES

Turn the ignition switch OFF, and reinstall the compressor clutch relay.

Make sure the A/C and heater fan switches are OFF.

Turn the ignition switch ON (II).

Using a *Backprobe Set (T/N 07SAZ - 001000A), measure the voltage between the No. 17 terminal of the ECM connector A (32P) and body ground with the ECM connectors connected.

Is there battery voltage?

NO → **Repair open in the BLK/RED wire between the under-hood fuse/relay box and the ECM.**

YES

Using a *Backprobe Set (T/N 07SAZ - 001000A), measure the voltage between the No. 5 terminal of the ECM connector C (31P) and body ground with the ECM connectors connected.

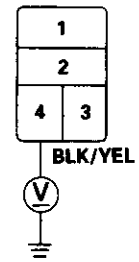
Is there battery voltage?

NO → **Repair open in the BLU/RED wire between the A/C diode and the ECM.**

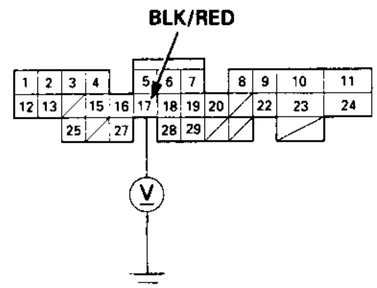
YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

COMPRESSOR CLUTCH RELAY 4P SOCKET

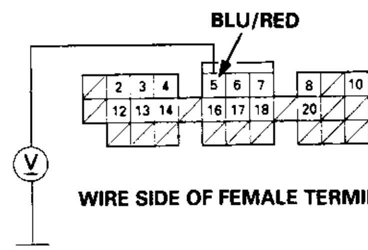


ECM CONNECTOR A (32P)



WIRE SIDE OF FEMALE TERMINALS

ECM CONNECTOR C (31P)



WIRE SIDE OF FEMALE TERMINALS

*How to use the backprobe sets
Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire (see section 11).

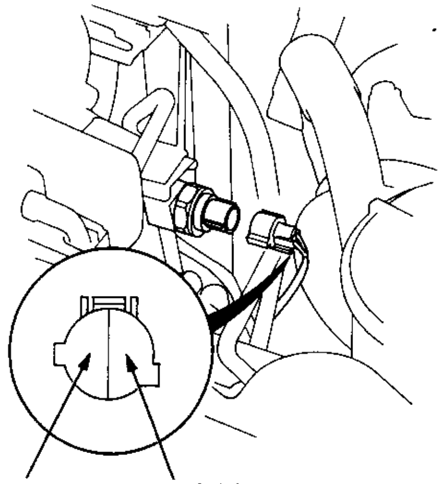
A/C System

A/C system does not come on (compressor and both fans).

Disconnect the A/C pressure switch 2P connector.

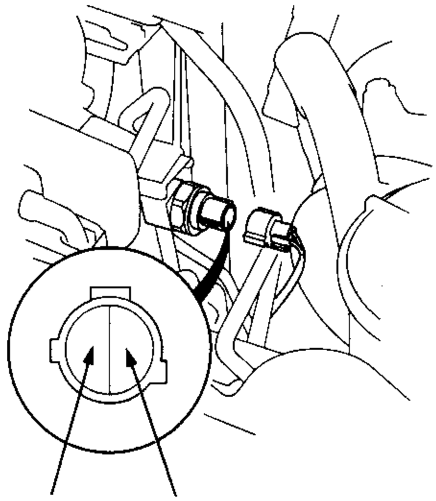
Turn the ignition switch ON (II).

Measure the voltage between the BLU/RED wire terminal (+) and body ground (–).



Is there battery voltage?

- NO → **Repair open in the BLU/RED wire between the A/C pressure switch and the A/C diode.**
- YES → Turn the ignition switch OFF.



Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

Is there continuity?

- NO → Check for A/C system pressure.
  - Is the pressure within specifications?
    - NO → **Repair the A/C pressure problem.**
    - YES → **Replace the A/C pressure switch.**
- YES → Reconnect the A/C pressure switch 2P connector.

To page 22-17

From page 22-16

Disconnect the A/C thermostat 3P connector.

Turn the ignition switch ON (II).

Measure the voltage between the BLK/YEL wire terminal (+) and body ground (–).

Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the under-dash fuse/relay box and the A/C thermostat.**

YES

Measure the voltage between the YEL/WHT wire terminal (+) and body ground (–).

Is there battery voltage?

NO → **Repair open in the YEL/WHT wire between the A/C pressure switch and the A/C thermostat.**

YES

Turn the ignition switch OFF.

Reconnect the A/C thermostat 3P connector and connect the BLU/RED wire terminal to ground with a jumper wire.

Start the engine.

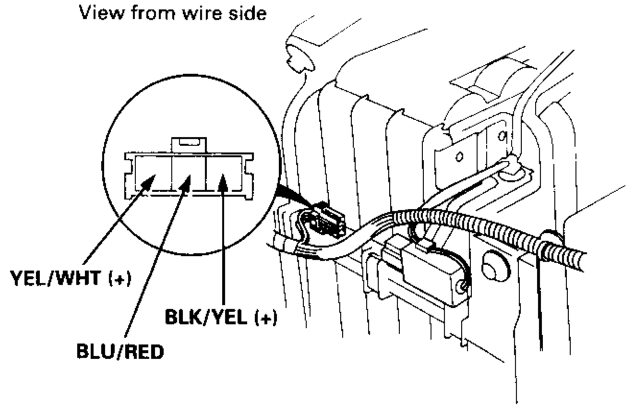
Do the radiator and condenser fans run and the compressor clutch engage?

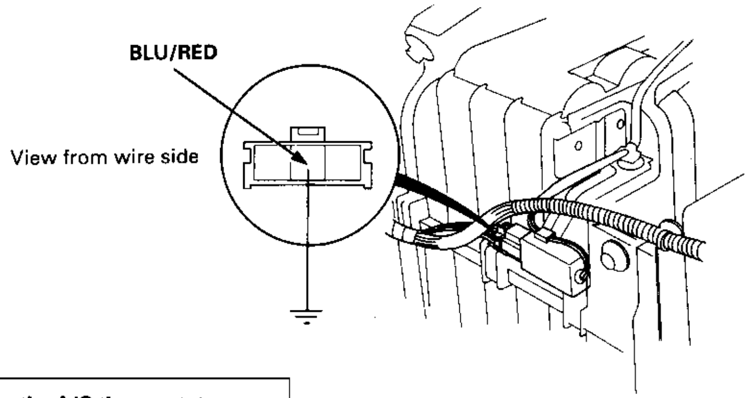
NO → **Replace the A/C thermostat.**

YES

Turn the ignition switch OFF and disconnect the jumper wire.

To page 22-18





(cont'd)

A/C System (cont'd)

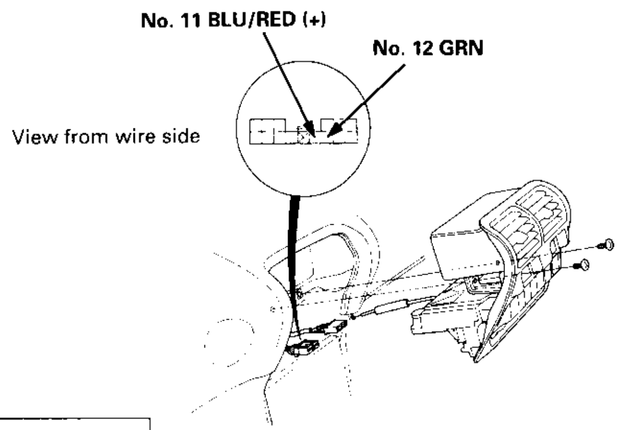
From page 22-17

Remove the heater control panel (see page 21-25).

Disconnect the heater control panel 14P connector.

Turn the ignition switch ON (II).

Measure the voltage between the BLU/RED wire terminal (+) and body ground (–).



Is there battery voltage?

NO → **Repair open in the BLU/RED wire between the A/C thermostat and the heater control panel.**

YES

Turn the ignition switch OFF.

Test the A/C switch (see page 22-20).

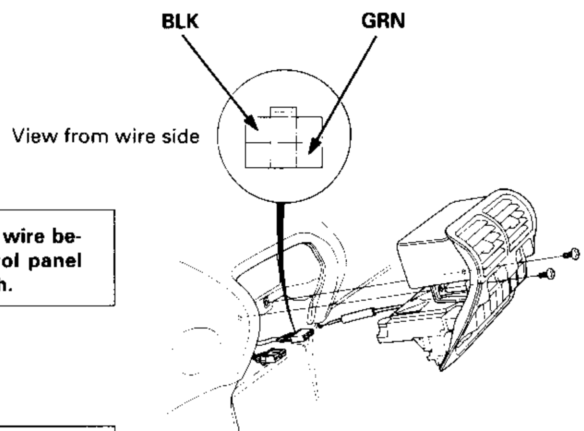
Is the A/C switch OK?

NO → **Replace the heater control panel (A/C switch).**

YES

Disconnect the heater fan switch 6P connector.

Check for continuity in the GRN wire between the heater control panel and the heater fan switch.



Is there continuity?

NO → **Repair open in the GRN wire between the heater control panel and the heater fan switch.**

YES

Check for continuity in the BLK wire between the heater fan switch and body ground.

Is there continuity?

NO → **Check for an open in the BLK wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G401 and G402.**

YES

Replace the heater fan switch.

A/C Thermostat

Test

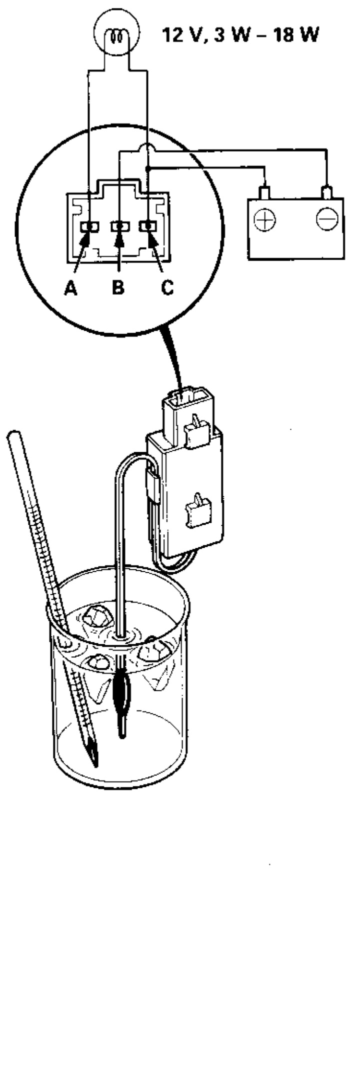
Connect battery power to terminal C and ground terminal B, and connect a test light between terminals A and C.

NOTE: Use a 12 V, 3 W – 18 W test light.

Dip the A/C thermostat into a cup filled with ice water, and check the test light.

The light should go off at 37°F (3°C) or less, and should come on at 39°F (4°C) or more.

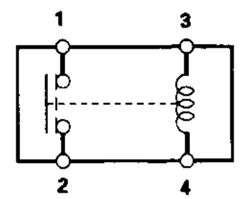
If the light doesn't come on and go off as specified, replace the A/C thermostat.



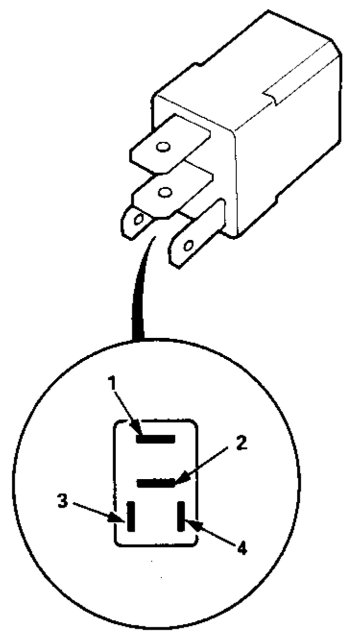
Relays

Test

There should be continuity between the No.1 and No.2 terminals when power and ground are connected to the No.3 and No.4 terminals, and there should be no continuity when power is disconnected.



- Radiator fan relay
- Condenser fan relay
- A/C compressor clutch relay

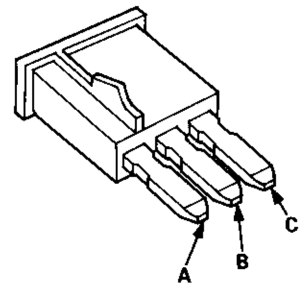


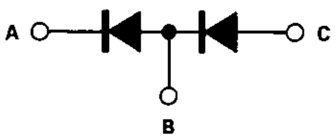
Diode

Test

NOTE: The diode is designed to pass current in one direction while blocking it in the opposite direction.
Use an analog ohmmeter, or a digital ohmmeter equipped with a diode tester.

Check for current flow in both directions between the A and B, and B and C terminals. There should be current flow in only one direction.





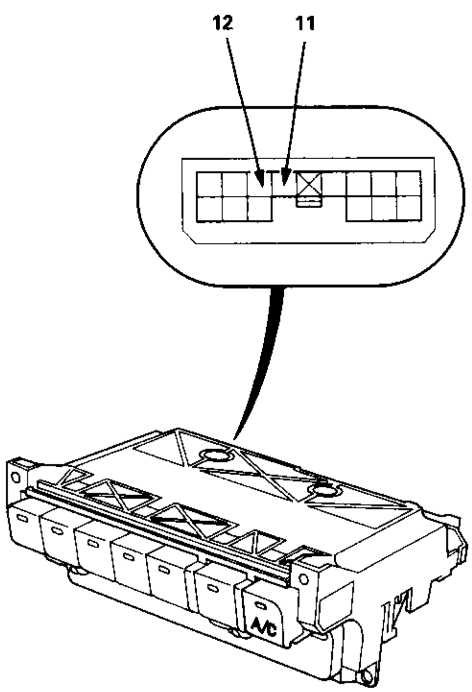
A/C Switch

Test

NOTE: The A/C switch contains a diode. Use an analog ohmmeter, or a digital ohmmeter equipped with a diode tester.

Check for current flow in both directions between terminals 11 and 12. There should be current flow in only one direction.

Position \ Terminal	11	12
ON	○—▶|—	—○
OFF		



The air conditioner system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil (ND-OIL 8: P/N 38897-PR7-A01AH or 38899 - PR7 - A01), which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioner system or your servicing equipment will result.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

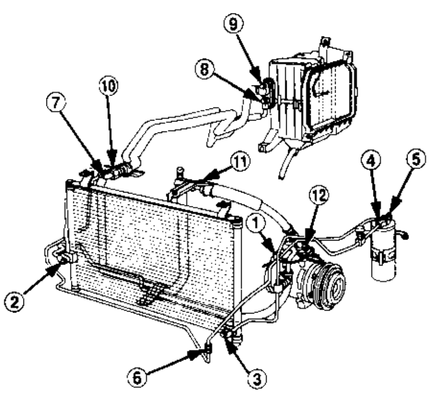
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When recovering the system, use a R-134a refrigerant Recovery/Recycling/Charging System; don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts.

   NOTE:
   - To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
   - Immediately after using the oil, replace the cap on the container and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

   Condenser .... **25 mℓ (5/6 fl·oz, 0.9 Imp·oz)**
   Evaporator .... **40 mℓ (1 1/3 fl·oz, 1.4 Imp·oz)**
   Line or hose .... **10 mℓ (1/3 fl·oz, 0.4 Imp·oz)**
   Receiver/Dryer .... **10 mℓ (1/3 fl·oz, 0.4 Imp·oz)**
   Leakage repair .... **25 mℓ (5/6 fl·oz, 0.9 Imp·oz)**
   Compressor ....**For compressor replacement, subtract the volume of oil drained from the removed compressor from 140 mℓ (4 2/3 fl·oz, 4.9 imp·oz), and drain the calculated volume of oil from the new compressor: 140 mℓ (4 2/3 fl·oz, 4.9 imp·oz)–Volume of removed compressor = Volume to drain from new compressor.**

   NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 mℓ (1 2/3 fl·oz, 1.8 Imp·oz) from the new compressor.



① Discharge hose to the compressor (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
② Discharge hose to the condenser (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
③ Condenser pipe to the condenser (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
④ Condenser pipe to the receiver/dryer (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
⑤ Receiver pipe A to the receiver/dryer (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
⑥ Receiver pipe A to the receiver pipe B .... **13 N·m (1.3 kgf·m, 9.4 lbf·ft)**
⑦ Receiver pipe B to the receiver pipe C .... **13 N·m (1.3 kgf·m, 9.4 lbf·ft)**
⑧ Receiver pipe C to the evaporator (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
⑨ Suction pipe B to the evaporator (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**
⑩ Suction pipe A to the suction pipe B .... **31 N·m (3.2 kgf·m, 23 lbf·ft)**
⑪ Suction hose to the suction pipe A .... **31 N·m (3.2 kgf·m, 23 lbf·ft)**
⑫ Suction hose to the compressor (6 x 1.0 mm) .... **9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**

A/C System Service

Recovery

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

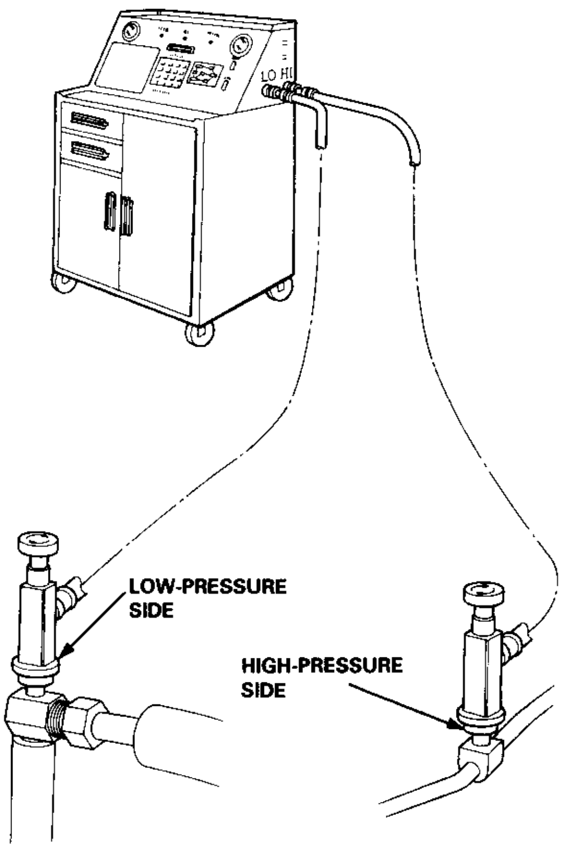
⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufactures.

1. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.
2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed.

   NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

Recovery/Recycling/Charging System.



Pressure Test Chart

NOTE: Performance Test on page 22-24.

TEST RESULTS	RELATED SYMPTOMS	PROBABLE CAUSE	REMEDY
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops about 200 kPa (2.0 kgf/cm², 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate and recharge with specified amount. Evacuation: see page 22-38 Charging: see page 22-39
	Reduced or no air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean • Check voltage and fan rpm • Check fan direction
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	High and low pressures are balanced soon after stopping compressor. Low side is higher than normal.	• Faulty compressor discharge valve • Faulty compressor seal	Replace the compressor.
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum.	• Faulty expansion valve • Moisture in system	• Replace • Recover, evacuate and recharge with specified amount.
Suction (low) pressure abnormally low	Expansion valve is not frosted and low-pressure line is not cold. Low pressure gauge indicates vacuum.	• Frozen expansion valve • Faulty expansion valve	Replace the expansion valve.
	Discharge temperature is low and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check A/C thermostat.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
	Receiver/dryer outlet is cool and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace
Suction pressure abnormally high	Low-pressure hose and service valve are cooler than the temperature around evaporator.	• Expansion valve open too long • Loose expansion capillary tube	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate and recharge with specified amount.
	High and low pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high-pressure valve • Foreign particle stuck in high pressure valve	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly.	• Clean condenser and radiator • Check voltage and fan rpm • Check fan direction
	No bubbles in sight glass when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate and recharge with specified amount.
Suction and discharge pressure abnormally low	Low-pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high-pressure line	Repair or replace.
Refrigerant leaks	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.

Performance Test

The performance test will help determine if the air conditioner system is operating within specifications.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

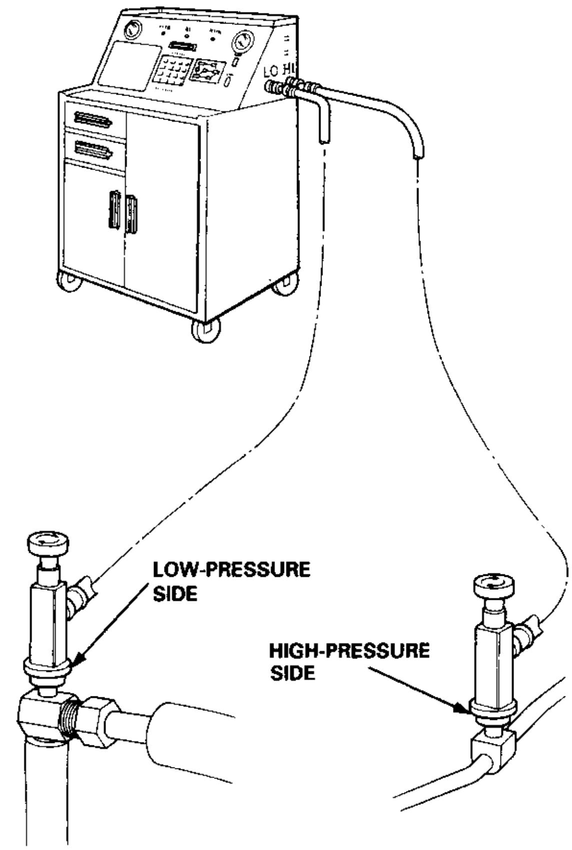
R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

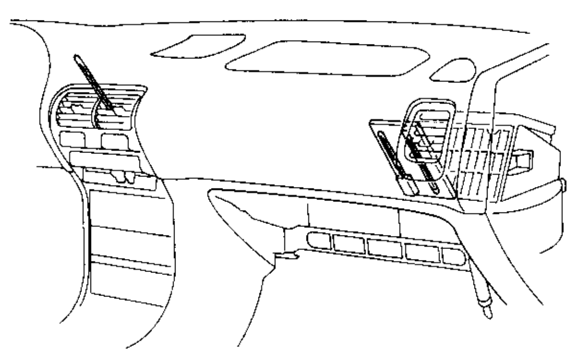
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

Recovery/Recycling/Charging System.

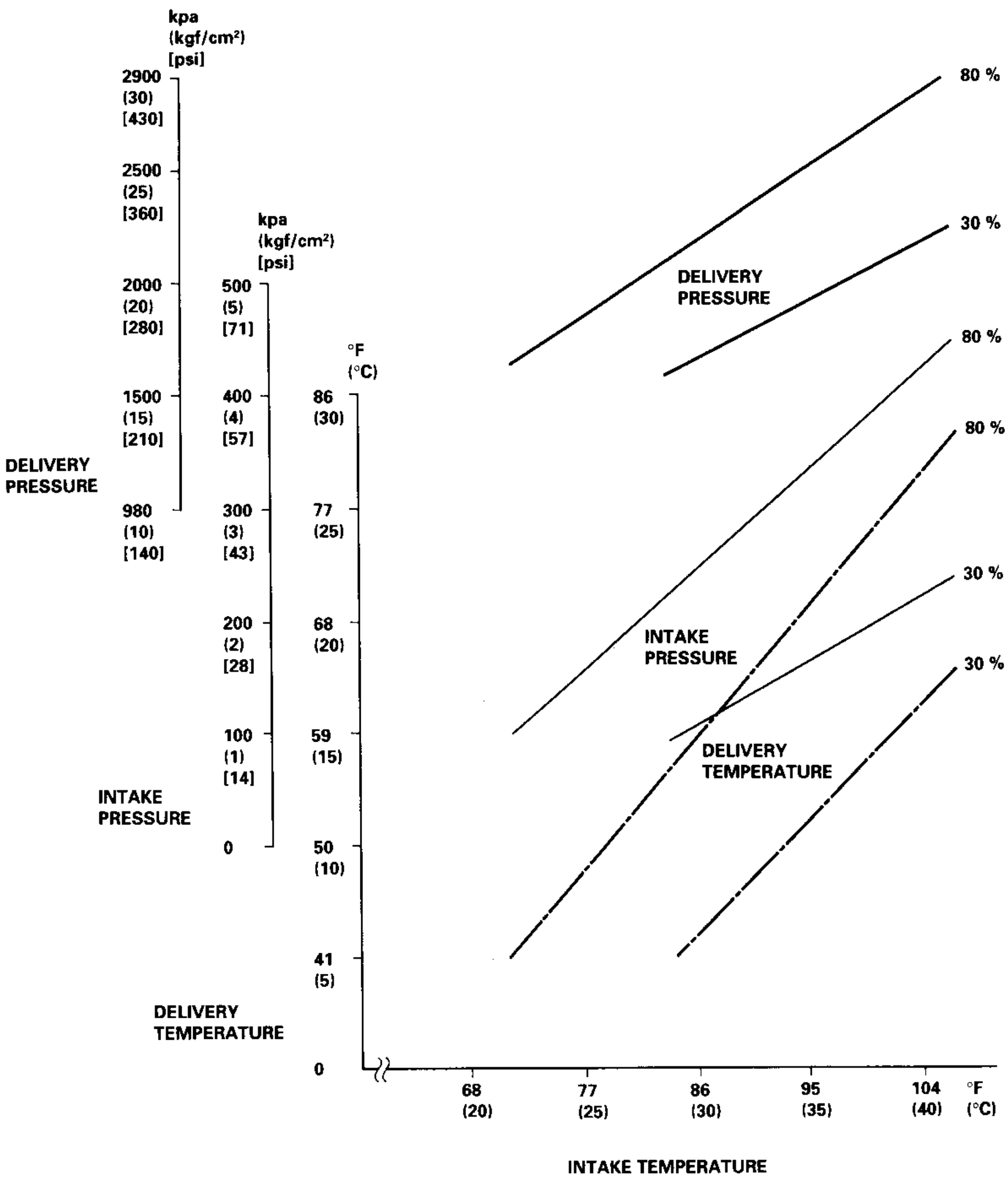


2. Insert a thermometer in the center vent outlet. Determine the relative humidity and air temperature.



3. Test conditions:
   - Avoid direct sunlight.
   - Open hood.
   - Open front doors.
   - Set the temperature control lever to MAX COOL, the mode control switch on VENT and the recirculation control switch on RECIRCULATE.
   - Slide the heater fan switch on MAX.
   - Run the engine at 1,500 rpm.
   - No driver or passengers in vehicle.
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent, and the high and low system pressure from the A/C gauges.

5. To complete the charts:
   - Mark the delivery temperature along the vertical line.
   - Mark the intake temperature (ambient air temperature) along the bottom line.
   - Draw a line straight up from the air temperature to the humidity.
   - Mark a point one line above and one line below the humidity level (10 % above and 10 % below the humidity level).
   - From each point, draw a horizontal line across the delivery temperature.
   - The delivery temperature should fall between the two lines.
   - Complete the low side pressure test and high side pressure test in the same way.
   - Any measurements outside the line may indicate the need for further inspection.



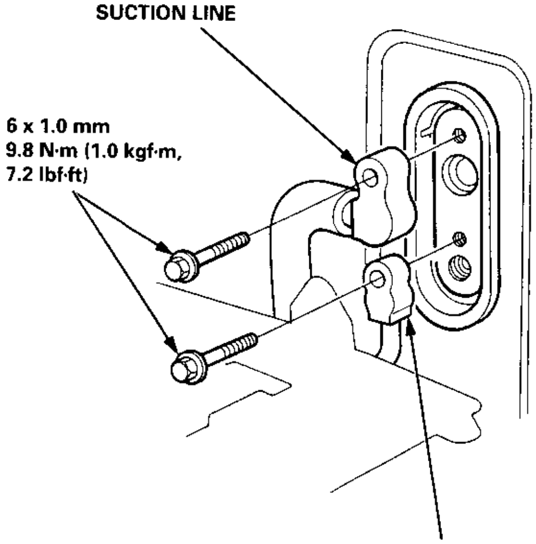
Evaporator

Replacement

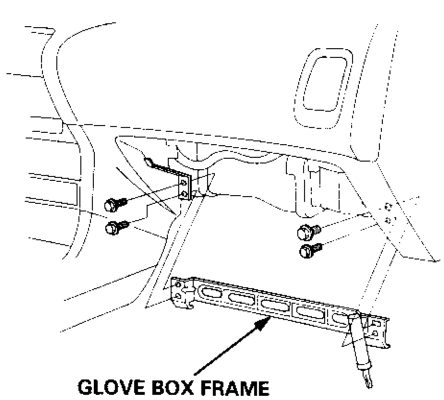
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

1. Recover the refrigerant with a Recovery/Recycling/Charging System (see page 22-22).
2. Remove the bolts, and disconnect the receiver line and the suction line from the evaporator.

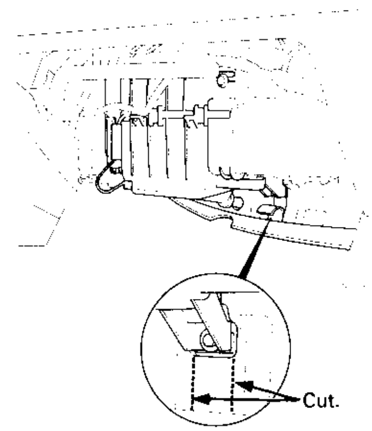
   NOTE: Plug or cap the lines immediately after disconnecting to avoid moisture and dust contamination.



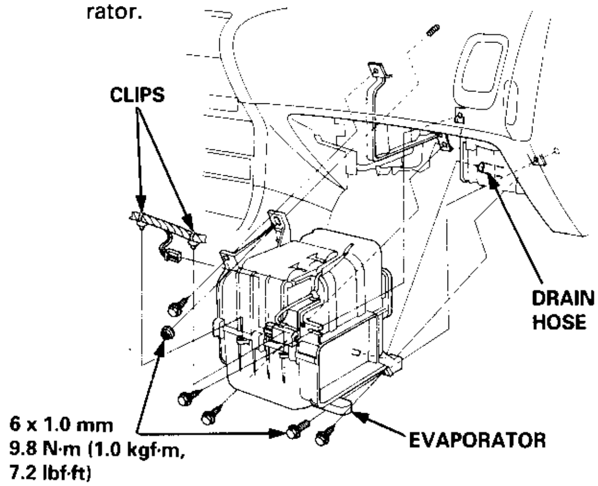
3. Remove the glove box (see section 20).
4. Remove the four bolts and the glove box frame.



5. Cut the dashboard insulator at the areas shown.



6. Disconnect the connector from the A/C thermostat, and remove the wire harness clips from the evaporator.



7. Remove the four self-tapping screws, the mounting bolt and the mounting nut.
8. Disconnect the drain hose, and remove the evaporator.
9. Install in the reverse order of removal, and:

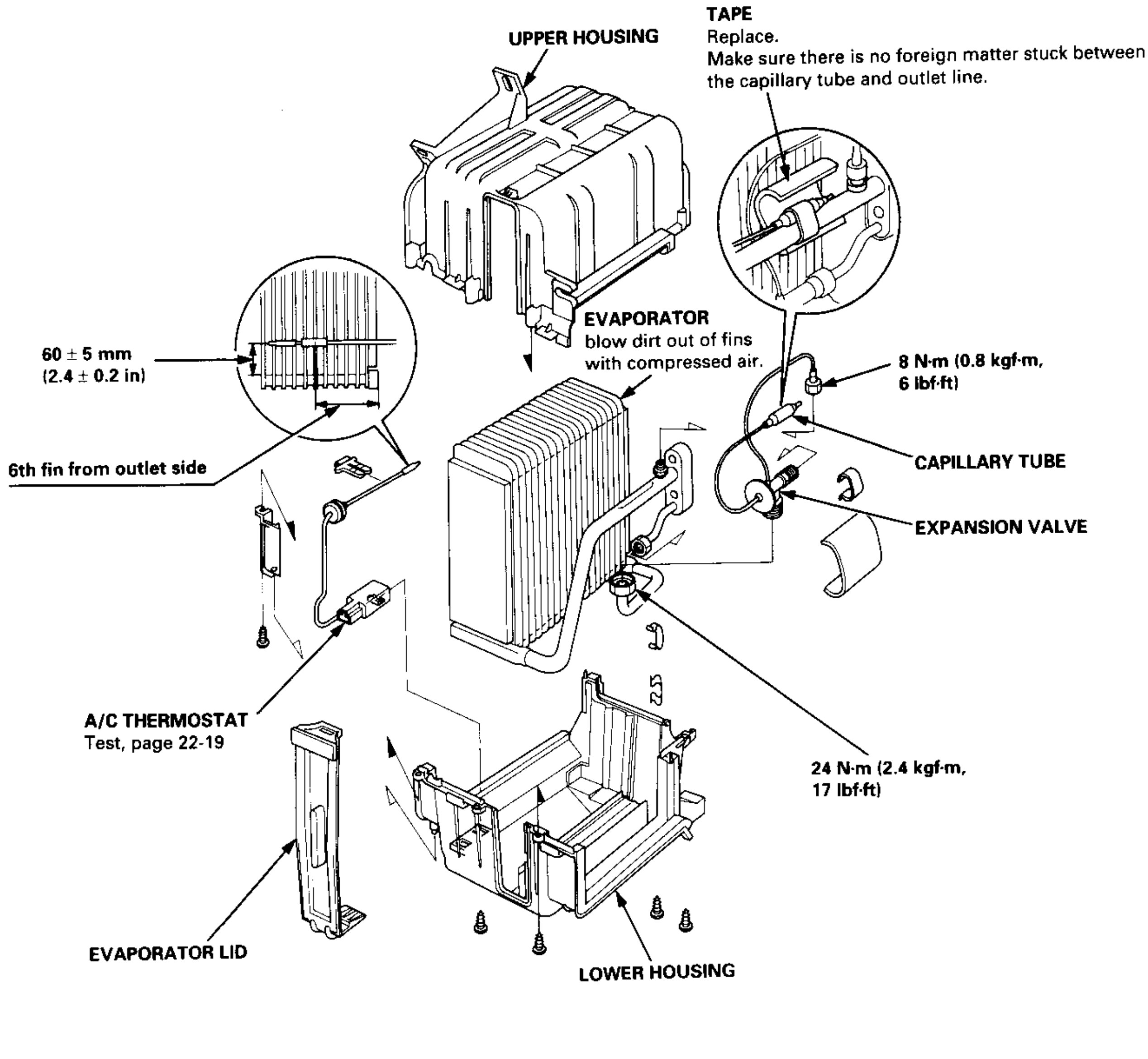
   - if you're installing a new evaporator, add refrigerant oil (ND-OIL 8: P/N 38897 - PR7 - A01AH or 38899 - PR7 - A01) (see page 22-21).
   - replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - apply sealant to the grommets.
   - make sure that there is no air leakage.
   - charge the system (see page 22-39) and test its performance (see page 22-24).

Overhaul

1. Pull out the A/C thermostat sensor from the evaporator fins.
2. Remove the self-tapping screws and clamps from the housing.
3. Carefully separate the housings and remove the evaporator.
4. If necessary, remove the expansion valve.

   NOTE: When loosening the expansion valve nuts, use a second wrench to hold the expansion valve or evaporator pipe. Otherwise, they can be damaged.

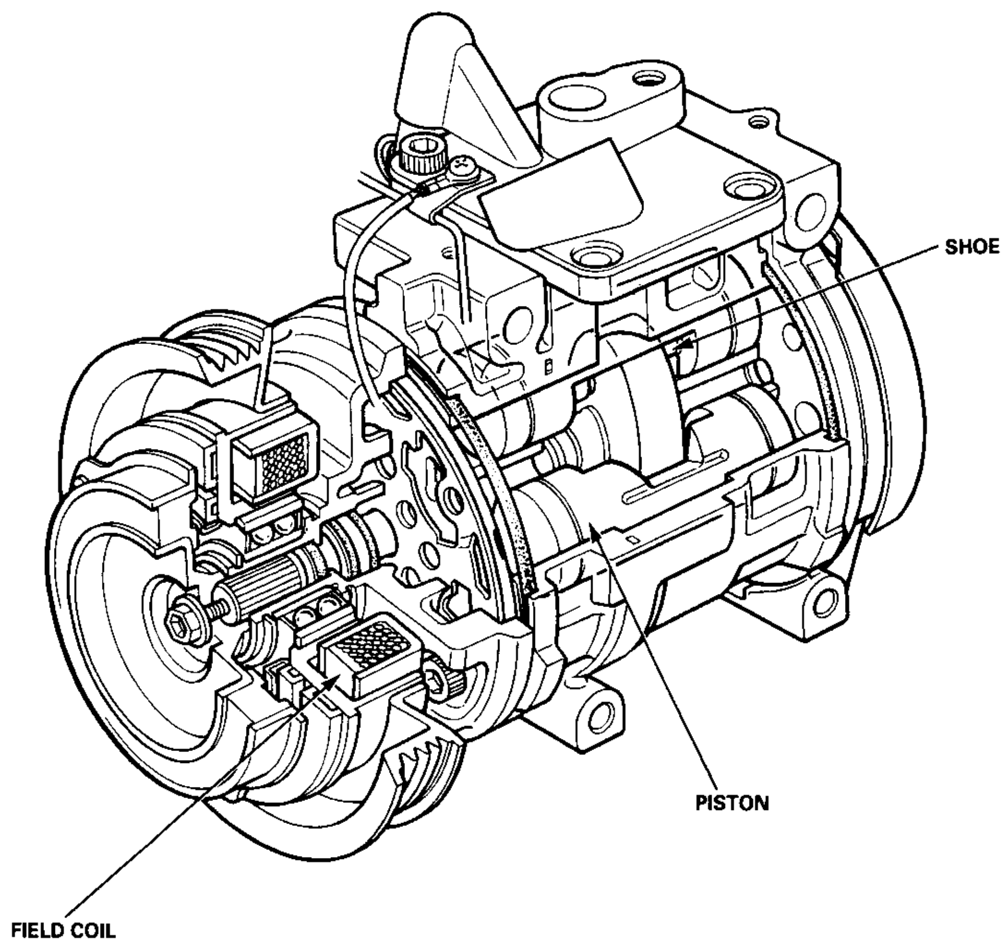
5. Assemble in the reverse order of disassembly. Make note of these items:
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38897 – PR7 – A01AH or 38899 – PR7 – A01) before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Install the expansion valve capillary tube with the capillary tube in contact with the suction line directly, and wrap it with tape.
   - Reinstall the A/C thermostat sensor to its original location.

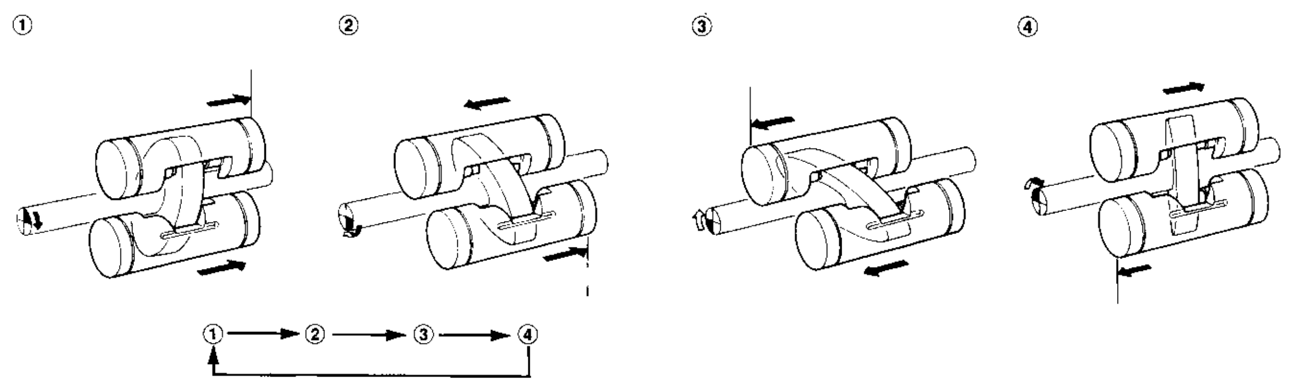


Compressor

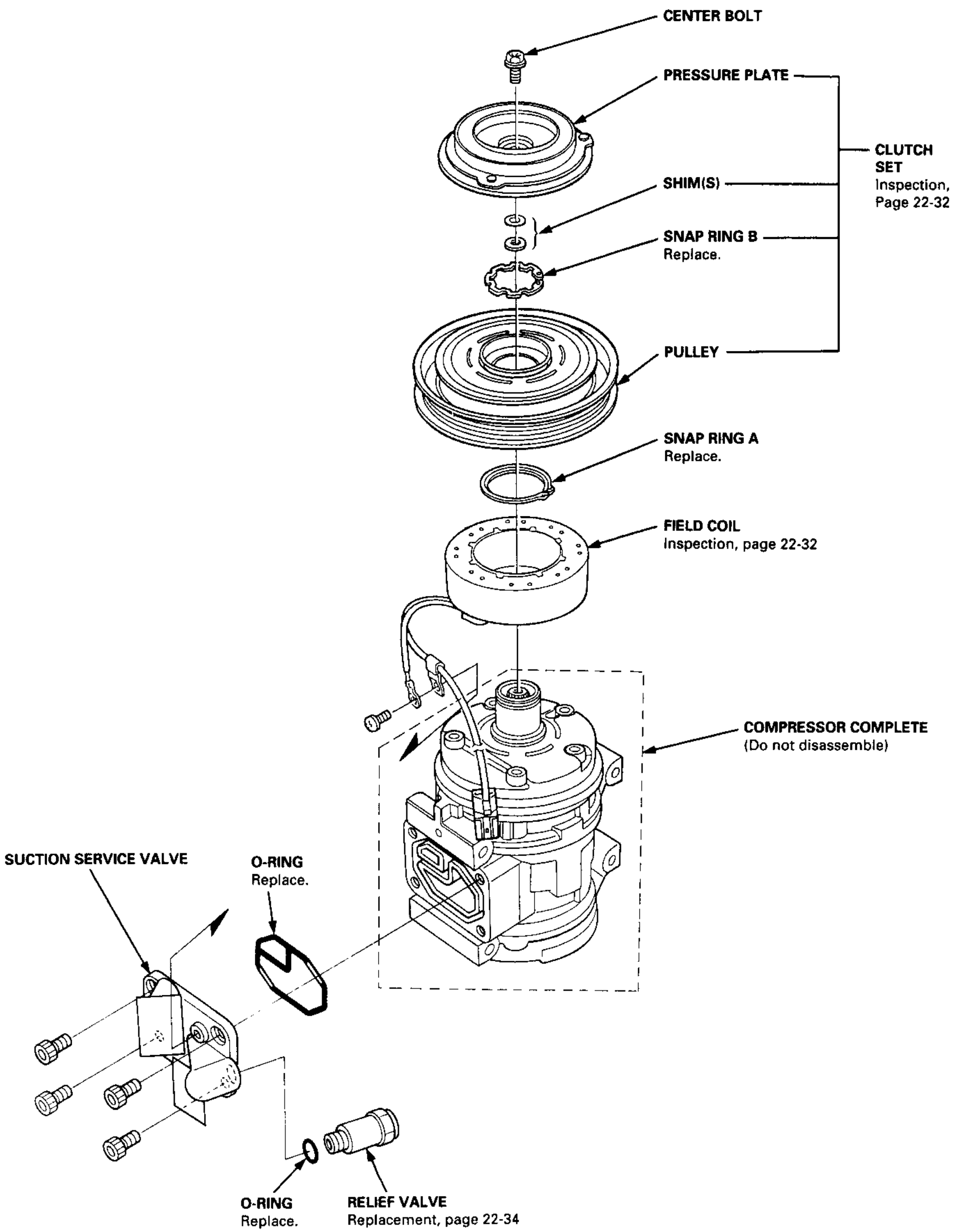
Description

This compressor is a Nippondenso piston type compressor for HFC-134a (R-134a). A revolving inclined disc drives the surrounding 10 reciprocating pistons. As the inclined disc revolves, it pushes the pistons, protected by a ceramic shoe, thus compressing the refrigerant.





Illustrated Index



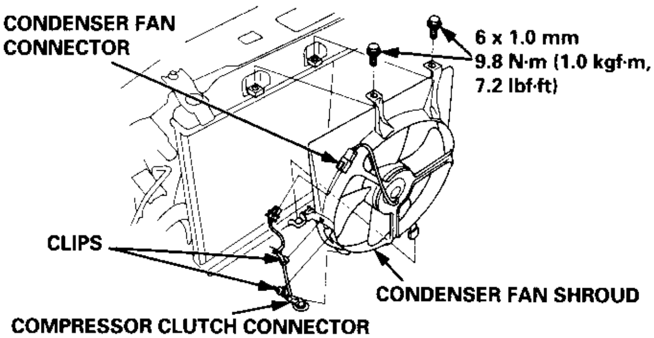
Compressor

Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioner work a few minutes. Then shut the engine off.
2. Recover the refrigerant with a Recovery/Recycling/Charging System (see page 22-22).
3. Remove the power steering pump (see section 17).

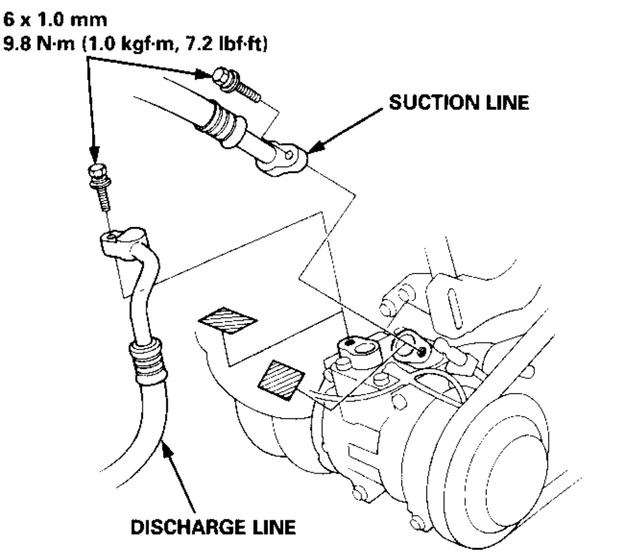
   NOTE: Do not disconnect the hoses from the power steering pump.
4. Disconnect the condenser fan connector.
   Disconnect the compressor clutch connector, then remove the compressor clutch connector and the clips from the condenser fan shroud.
   Remove the two mounting bolts and the condenser fan shroud.

   NOTE: Be careful not to damage the radiator fins when removing the condenser fan shroud.

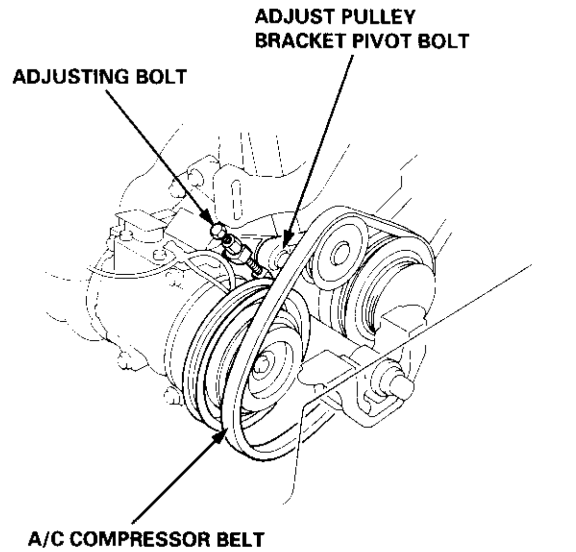


5. Remove the bolts, then disconnect the suction line and the discharge line from the compressor.

   NOTE: Plug or cap the lines immediately after disconnecting to avoid moisture and dust contamination.

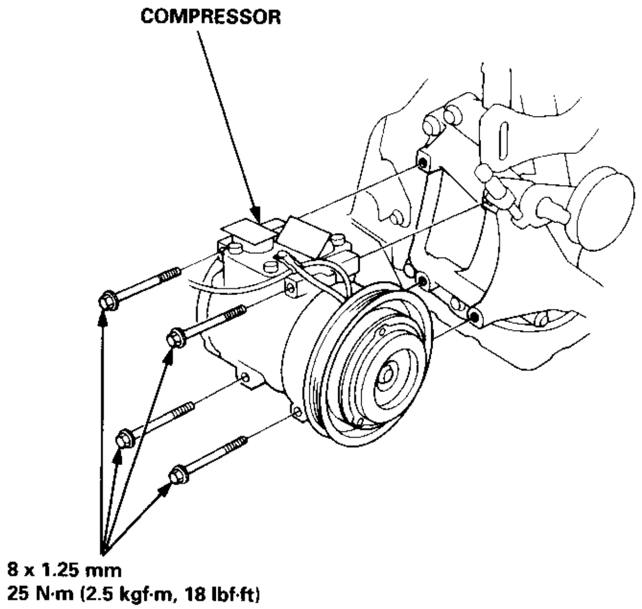


6. Loosen the adjust pulley bracket pivot bolt and the adjusting bolt, then remove the A/C compressor belt from the pulley as shown.

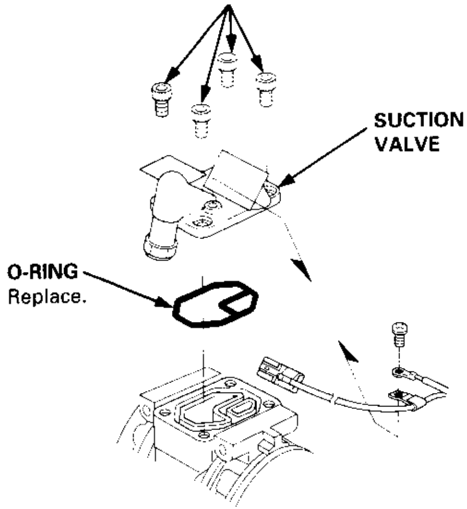


7. Remove the four mounting bolts and the compressor.

   NOTE: Be careful not to damage the radiator fins when removing the compressor.



8. Remove the four bolts and the suction service valve from the compressor.

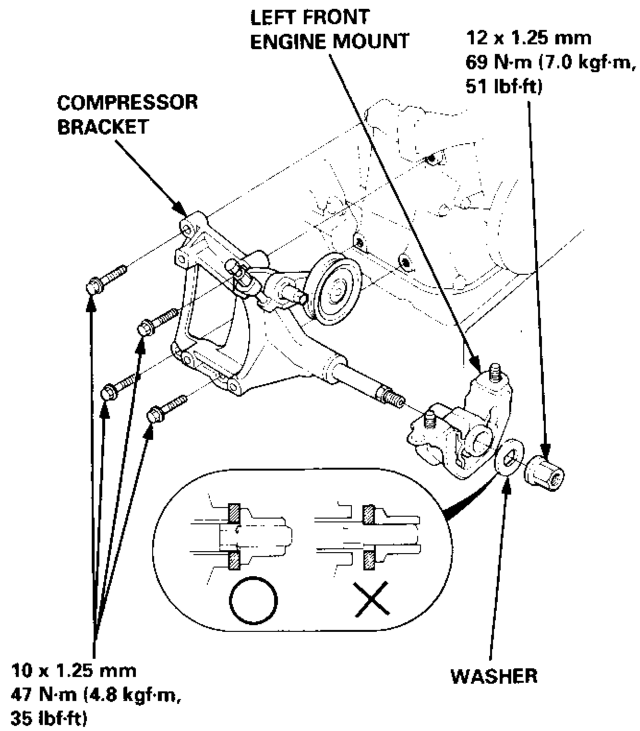


9. If necessary, remove the compressor bracket as follows.

— Remove the engine mount nut and the washer.

NOTE: When tightening the engine mount nut, make sure the washer is set properly on the left front engine mount as shown.

— Remove the four mounting bolts and the compressor bracket.



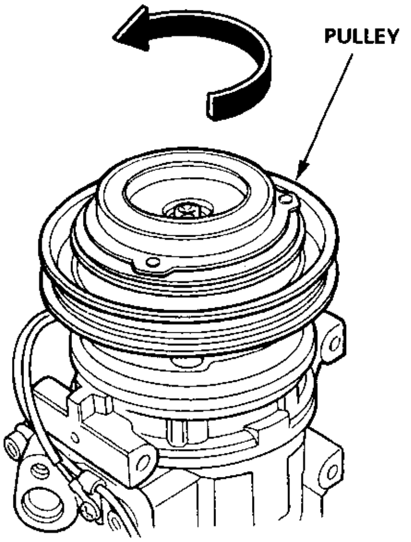
10. Install in the reverse order of removal. Make note of these items:

- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 140 mℓ (4 2/3 fl·oz, 4.93 imp·oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
  NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (ND-OIL 8: P/N 38897-PR7-A01AH or 38899 - PR7 - A01) for R-134a DENSO piston type compressors only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Do not damage the radiator fins when installing the condenser fan shroud and the compressor.
- Adjust the A/C compressor belt (see page 22-36).
- Adjust the power steering pump belt (see section 17).
- Charge the system (see page 22-39) and test its performance (see page 22-24).

Compressor

Clutch Inspection

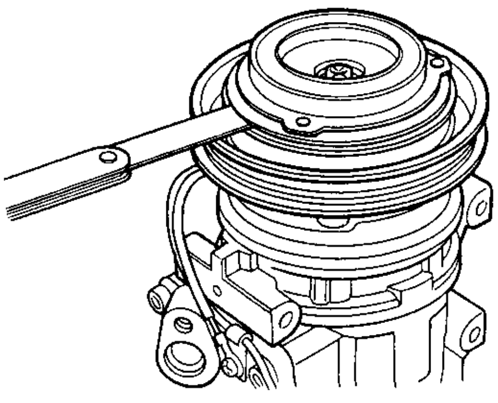
- Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



- Measure the clearance between the pulley and the pressure plate all the way around. If the clearance is not within specified limits, the pressure plate must be removed and shims added or removed as required, following the procedure on page 22-33.

Clearance: 0.50 ± 0.15 mm (0.020 ± 0.006 in)

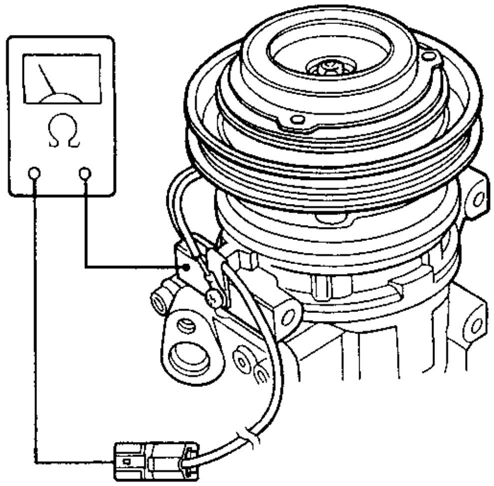
NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



- Check resistance of the field coil.

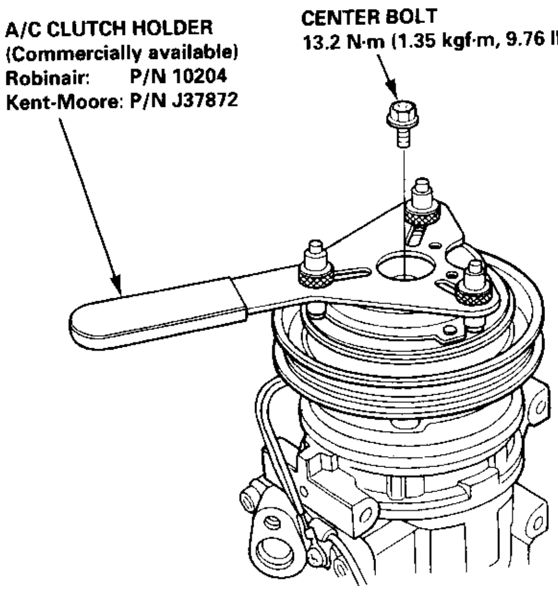
Field Coil Resistance: 3.6 ± 0.2 ohm at 68°F (20°C)

If resistance is not within specifications, replace the field coil.

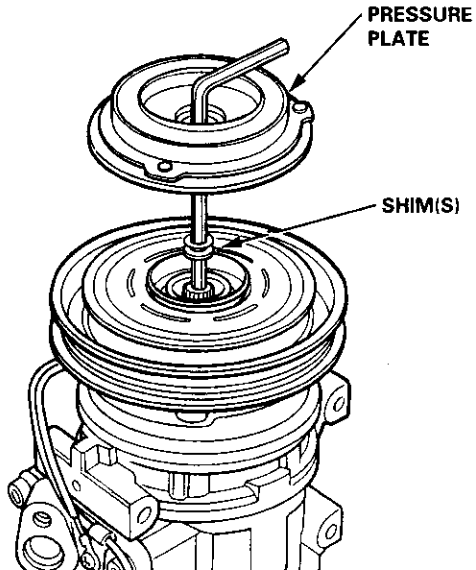


Clutch Overhaul

1. Remove the center bolt while holding the pressure plate.



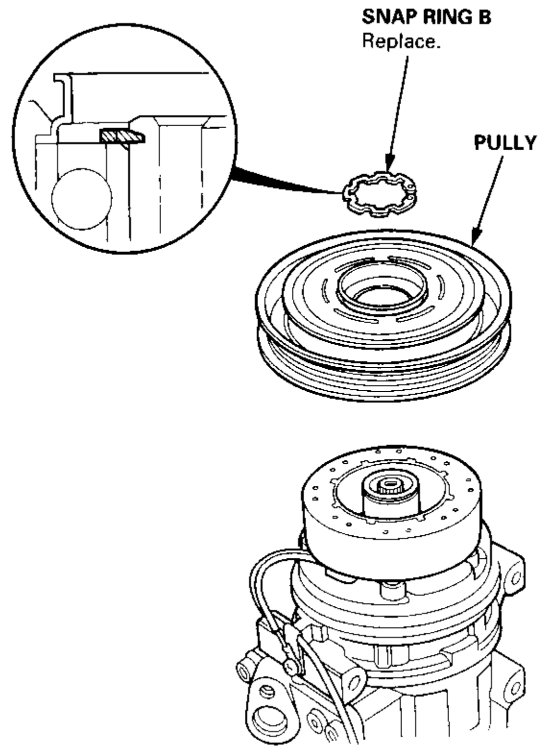
2. Remove the pressure plate and shim(s) taking care not to lose the shim(s).



3. Remove the snap ring B with a snap ring pliers, then remove the pulley.

NOTE:

- Be careful not to damage the pulley and compressor during removal/installation.
- Once the snap ring B is removed, replace it with a new one.



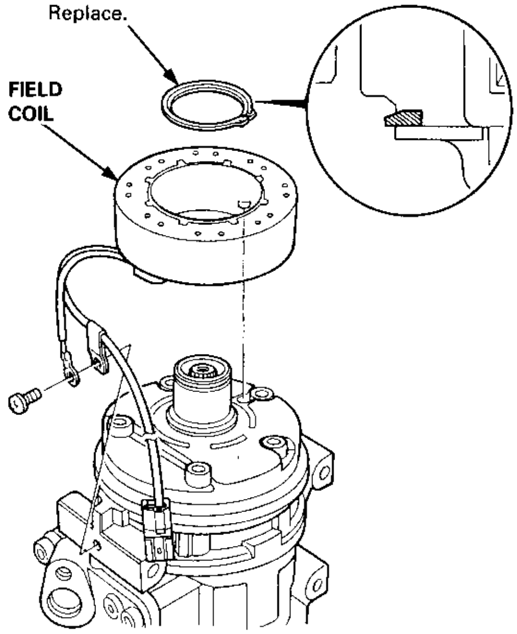
(cont'd)

Compressor

Clutch Overhaul (cont'd)

4. Remove the screw from the field coil ground terminal. Remove snap ring A with snap ring pliers, then remove the field coil.

   NOTE:
   - Be careful not to damage the field coil and compressor during removal/installation.
   - Once snap ring A is removed, replace it with a new one.

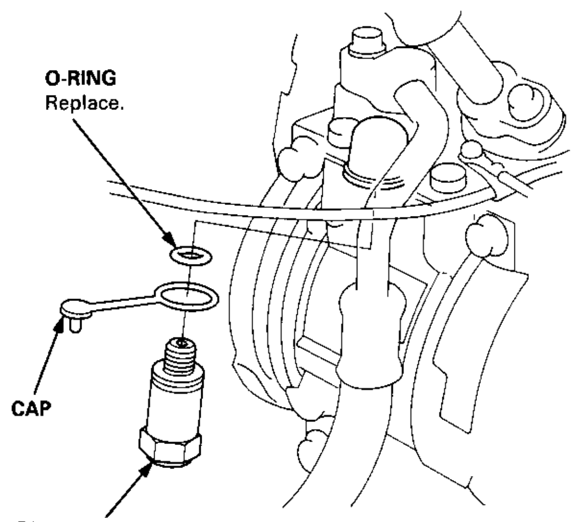


5. Install in the reverse order of removal, and:
   - install the field coil with the wire side facing down (see above).
   - clean the pulley and compressor sliding surfaces with non-petroleum solvent.
   - check the pulley bearings for excessive play.
   - make sure the snap rings are in the groove properly.
   - apply locking agent to the threads of the center bolt, and tighten it securely.
   - make sure that the pulley turns smoothly after it's reassembled.

Relief Valve Replacement

1. Recover the refrigerant with Recovery/Recycling/Charging System (see page 22-22).
2. Remove the relief valve and the O-ring. Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.

   NOTE:
   - Do not let the compressor oil run out.
   - Make sure there is no foreign matter in the system.



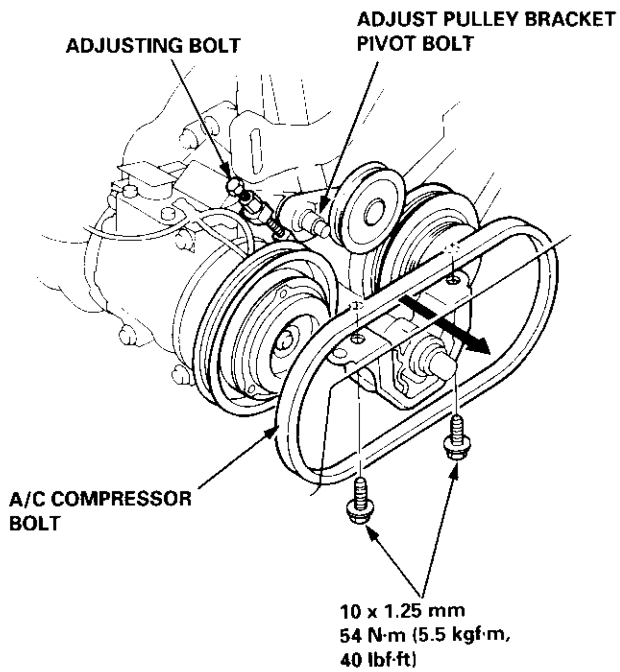
3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38897-PR7-A01AH or 38899-PR7-A01) before installing it.
5. Charge the system (see page 22-39), and test its performance (see page 22-24).
6. Check for leaks, and insert the cap in the top of the valve.

A/C Compressor Belt

Replacement

Automatic Transmission Type

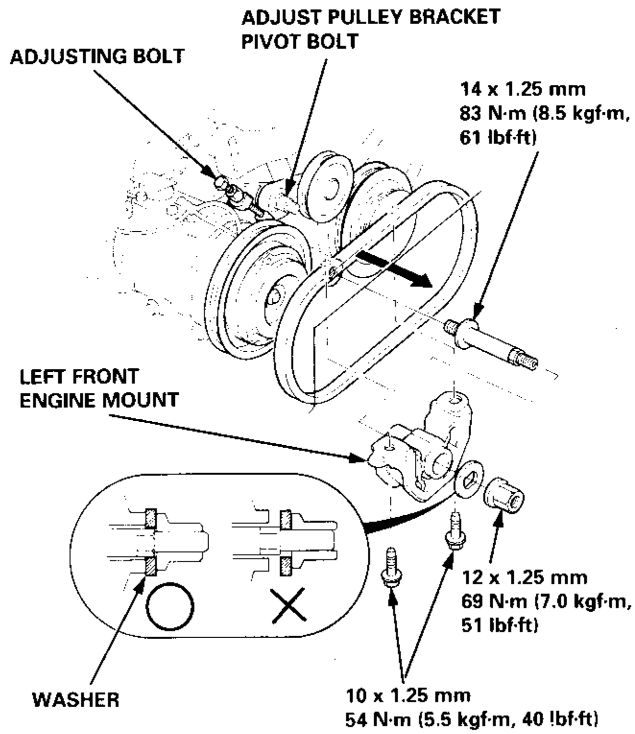
1. Loosen the adjust pulley bracket pivot bolt and the adjusting bolt, then remove the A/C compressor belt from the pulleys.
2. Remove the two mounting bolts from the left front engine mount, then pass the A/C compressor belt through the gap between the body and left front engine mount.



3. Install in the reverse order of removal, and adjust the A/C compressor belt (see page 22-36).

Manual Transmission Type

1. Loosen the adjust pulley bracket pivot bolt and the adjusting bolt, then remove the A/C compressor belt from the pulleys.
2. Remove the two mounting bolts from the left front engine mount.
   Remove the engine mount nut, washer, bolt and the left front engine mount.
   Remove the A/C compressor belt.



3. Install in the reverse order of removal, and adjust the A/C compressor belt (see page 22-36).

   NOTE: When tightening the engine mount nut, make sure the washer is set properly on the left front engine mount as shown.

A/C Compressor Belt

Adjustment

Deflection Method

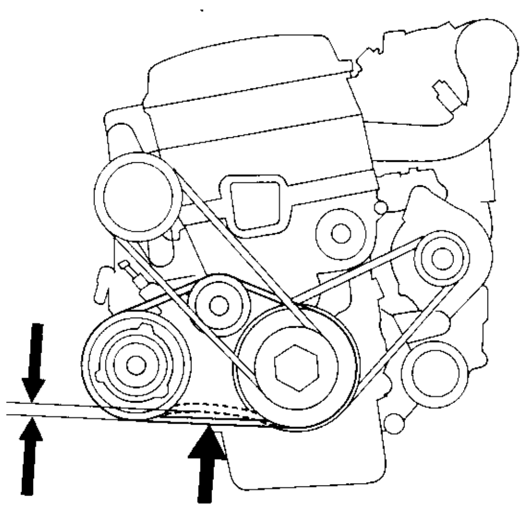
1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection between the A/C compressor and the crankshaft pulley.

   A/C Compressor Belt
   Used Belt: 7.5 – 9.5 mm (0.30 – 0.37 in)
   New Belt: 5.0 – 7.0 mm (0.20 – 0.28 in)

   Power Steering Pump Belt
   Used Belt: 11.5 – 13.5 mm (0.45 – 0.53 in)
   New Belt: 8.0 – 10.0 mm (0.31 – 0.39 in)

   NOTE:
   - If there are cracks or any damage evident on the belt, replace it with a new one.
   - "Used belt" means a belt which has been used for five minutes or more.
   - "New belt" means a belt which has been used for less than five minutes.

2. Loosen the adjust pulley bracket pivot bolt and the adjusting bolt lock nut of the A/C compressor belt.
3. Turn the adjusting bolt to get proper belt tension, then retighten the adjust pulley bracket pivot bolt and the adjusting bolt lock nut.
4. Recheck the deflection of the A/C compressor belt.



Tension Gauge Method

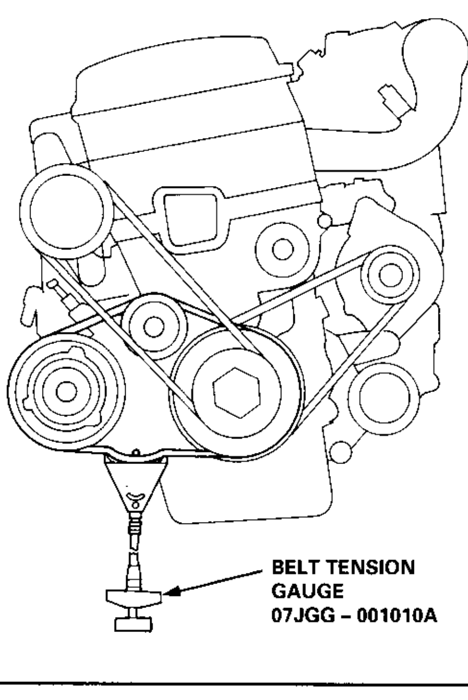
1. Attach the belt tension gauge to the A/C compressor belt as shown below, and measure the tension of the belt.

   A/C Compressor Belt
   Used Belt: 390 – 540 N (40 – 55 kgf, 88 – 120 lbf)
   New Belt: 740 – 880 N (75 – 90 kgf, 170 – 200 lbf)

   Power Steering Pump Belt
   Used Belt: 390 – 540 N (40 – 55 kgf, 88 – 120 lbf)
   New Belt: 740 – 880 N (75 – 90 kgf, 170 – 200 lbf)

   NOTE:
   - If there are cracks or any damage evident on the belt, replace it with a new one.
   - Follow the manufacturer's instructions for the belt tension gauge.
   - "Used belt" means a belt which has been used for five minutes or more.
   - "New belt" means a belt which has been used for less than five minutes.

2. Loosen the adjust pulley bracket pivot bolt and the adjusting bolt lock nut of the A/C compressor belt.
3. Turn the adjusting bolt to get proper belt tension, then retighten the adjust pulley bracket pivot bolt and the adjusting bolt lock nut.
4. Recheck the tension of the A/C compressor belt.

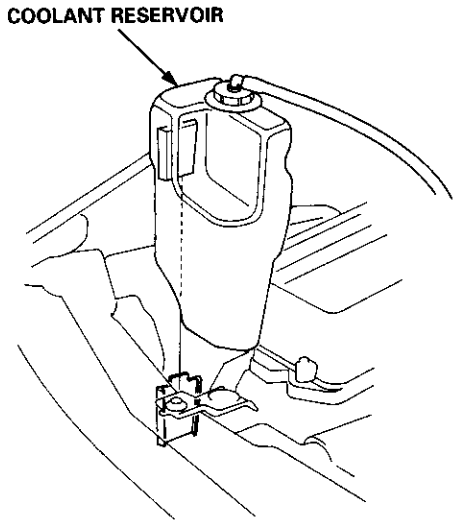


Condenser

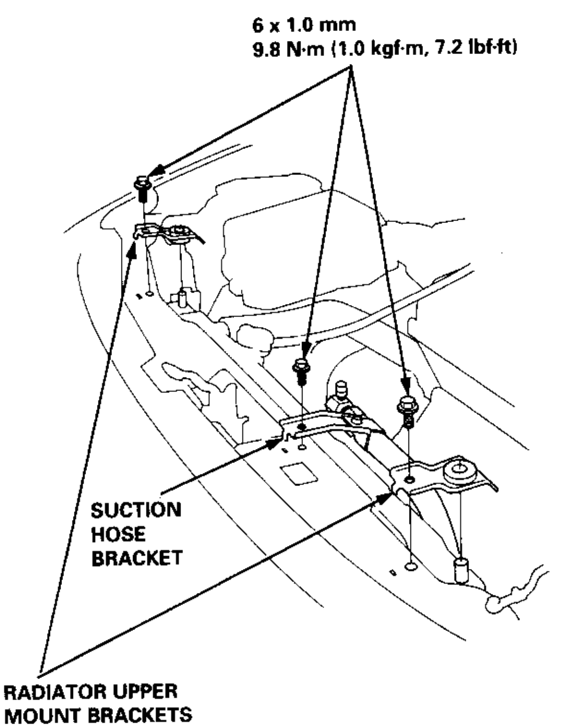
Replacement

1. Recover the refrigerant with a Recovery/Recycling/Charging System (see page 22-22).
2. Remove the coolant reservoir.

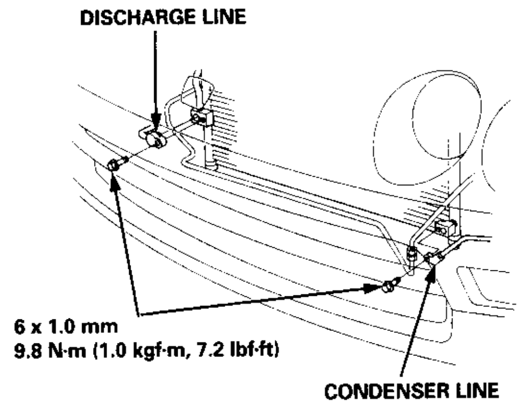
   NOTE: Do not disconnect the reservoir hose from the coolant reservoir and the radiator.



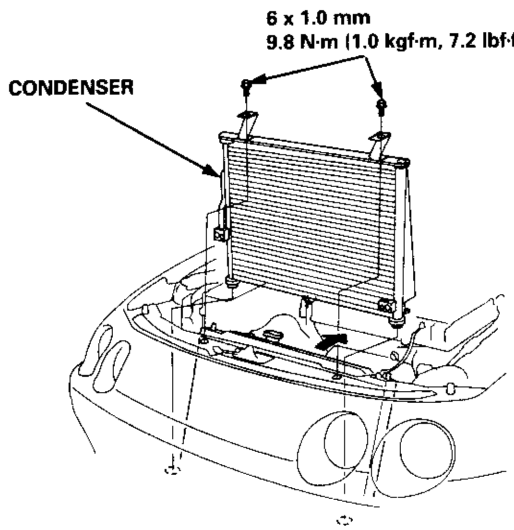
3. Remove the bolts and the radiator upper mount brackets, then remove the bolt from the suction hose bracket.



4. Remove the bolts, then disconnect the discharge line and the condenser line from the condenser.
   NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



5. Remove the two mounting bolts, then lift out the condenser as shown.
   NOTE: Be careful not to damage the radiator and condenser fins when removing the condenser.



6. Install in the reverse order of removal. Make note of these items:
   - If you're installing a new condenser, add refrigerant oil (ND-OIL 8: P/N 38897-PR7-A01AH or 38899 - PR7 - A01) (see page 22-21).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Do not damage the radiator and condenser fins when installing the condenser.
   - Be sure to install the condenser mount cushions securely into the holes.
   - Charge the system (see page 22-39) and test its performance (see page 22-24).

A/C System Service

Evacuation

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

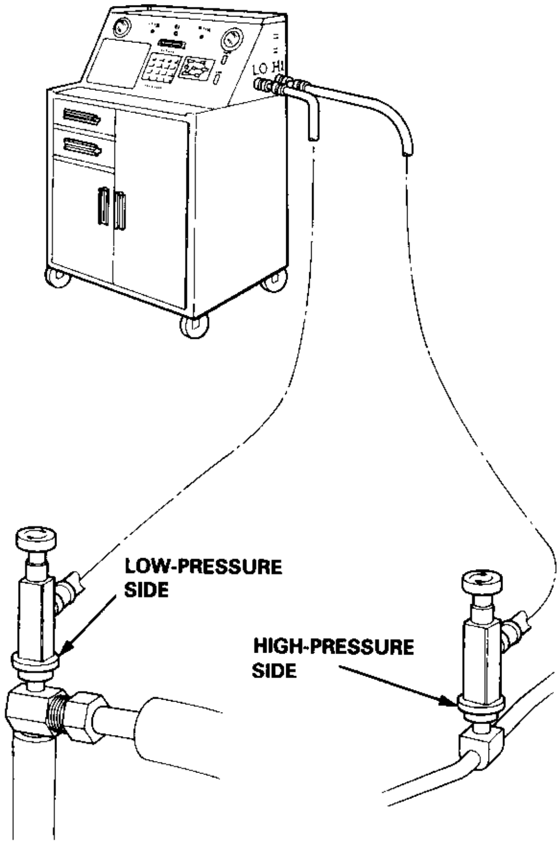
⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant Recovery/Recycling/Charging System. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

   NOTE: If low pressure does not reach more than 93.3 kPa (700 mm Hg, 27.6 in-Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see Leak Test).

Recovery/Recycling/Charging System



Charging

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

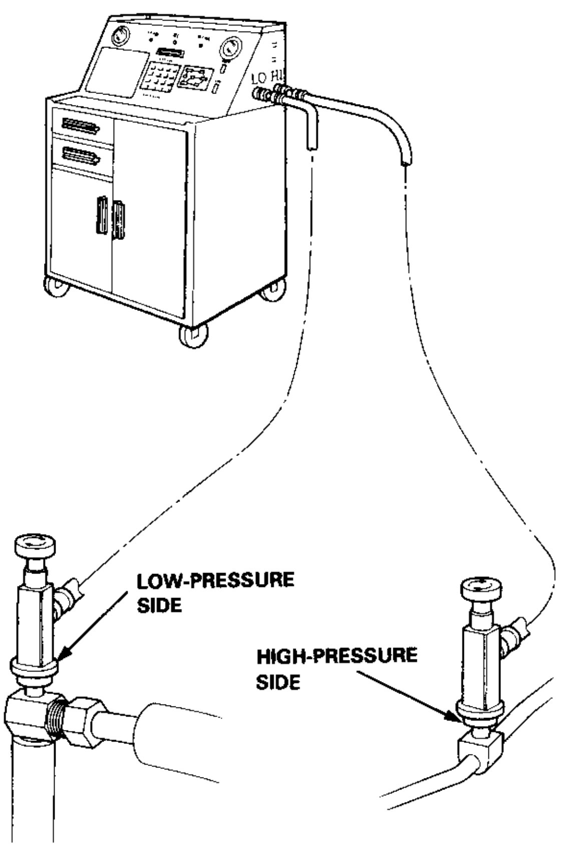
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufactures.

Refrigerant capacity: 700^{+0}_{-50} g ($24.7^{+0}_{-1.8}$ oz)

CAUTION: Do not overcharge the system; the compressor will be damaged.

Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

Recovery/Recycling/Charging System



Leak Test

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breating the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufactures.

1. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown in the previous column, following the equipment manufacturer's instructions.

   NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

2. Open high pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

   Refrigerant capacity: 700^{+0}_{-50} g ($24.7^{+0}_{-1.8}$ oz)

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.

4. If you find leaks that require the system to be opened (to repair or replace houses, fittings, etc.), recover the system according to the Recover Procedure on page 22-22.

5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-38).

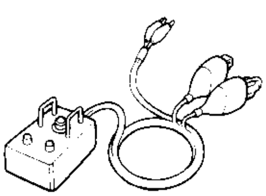
Electrical

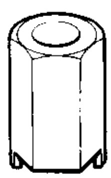
* Read SRS precautions on Page 23-283 before working in these areas.

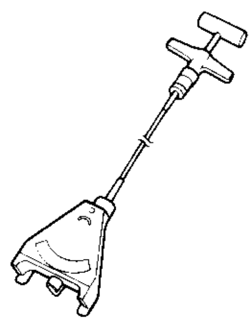
Special Tools

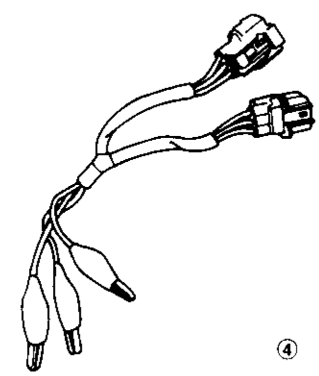
Ref. No.	Tool Number	Description	Qty	Page Reference
①*1	07HAZ – SG00400	Deployment Tool	1	23-320
②	07JAA – 001000C	Antenna Nut Wrench	1	23-203
③	07JGG – 001010A	Belt Tension Gauge	1	23-115
④	07LAJ – PT3020A	Test Harness	1	23-128
⑤	07NAC – SR20100	Fuel Sender Wrench	1	23-132
⑥	07PAZ – 0010100	SCS Service Connector	1	23-90, 288
⑦	07SAZ – TB4011A	SRS Inflator Simulator	1	23-301
⑧	07TAZ – SZ5011A	SRS Simulator Lead C	1	23-301
⑨	07TAZ – SZ50200	SCS Service Connector (2 Ω)	1	23-301
⑩*2	07TAZ – 001020A	Backprobe Adapter, 17 mm	2	23-287

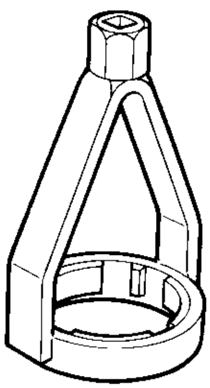
*1: Included in SRS Tool Set 07MAZ – SM5000B
*2: Use with the staking patch cords from T/N 07SAZ – 001000A, Backprobe Set.

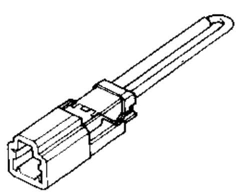

①

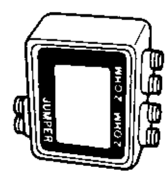

②


③

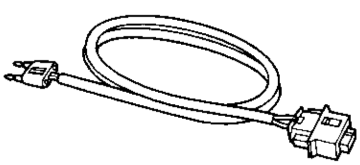

④

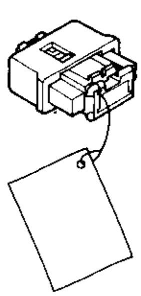

⑤

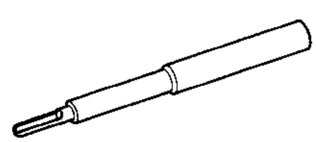

⑥



⑦


⑧


⑨


⑩

Troubleshooting

Tips and Precautions

Before Troubleshooting

- Check applicable fuses in the appropriate fuse/relay box.
- Check the battery for damage, state of charge, and clean and tight connections.
- Check the alternator belt tension.

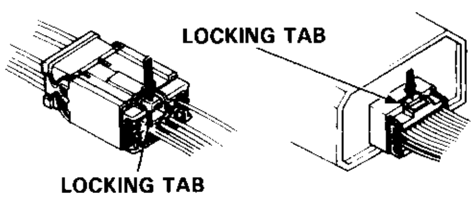
CAUTION:

- **Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.**
- **Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.**
- **The original radio has a coded theft protection circuit. Be sure to get the customer's code number before**
  - **disconnecting the battery.**
  - **removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.**
  - **removing the radio.**

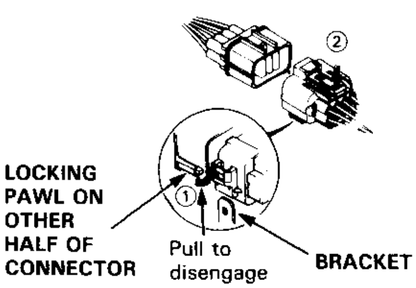
  After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Handling Connectors

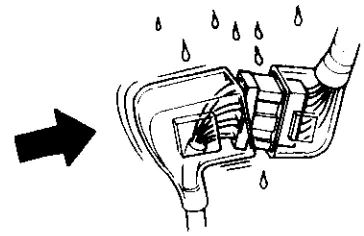
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks.



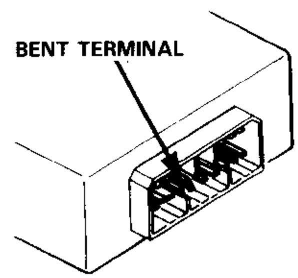
- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its bracket.



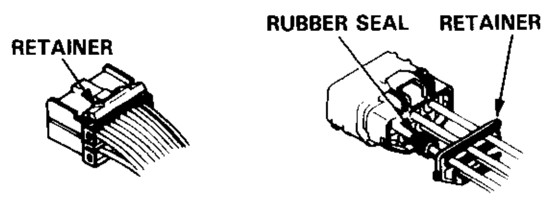
- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



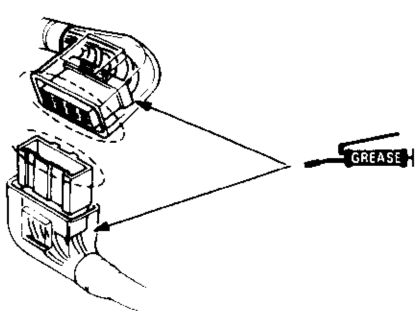
- Before connecting connectors, make sure the terminals are in place and not bent.



- Check for loose retainer and rubber seals.



- The backs of some connectors are packed with grease. Add grease if needed. If the grease is contaminated, replace it.

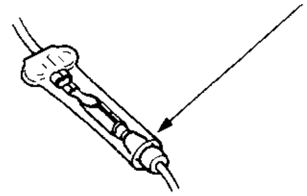


(cont'd)

Troubleshooting

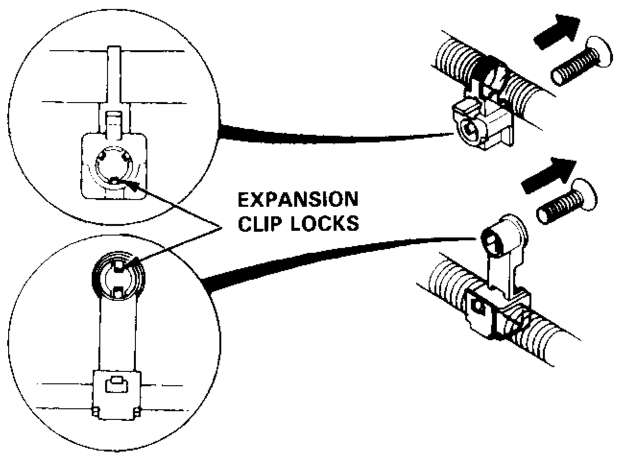
Tips and Precautions (cont'd)

- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

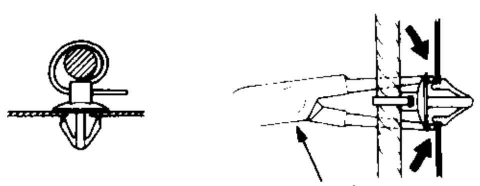


Handling Wires and Harnesses

- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks.

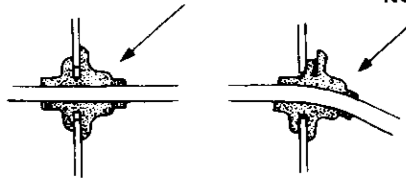


Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



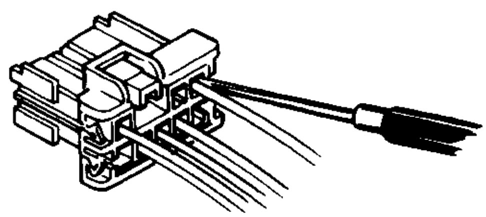
- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.

- Seat grommets in their grooves properly.

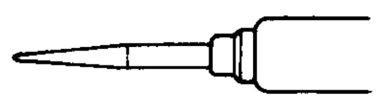


Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

Five-step Troubleshooting

1. **Verify The Complaint**
   Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. **Analyze The Schematic**
   Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

   Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

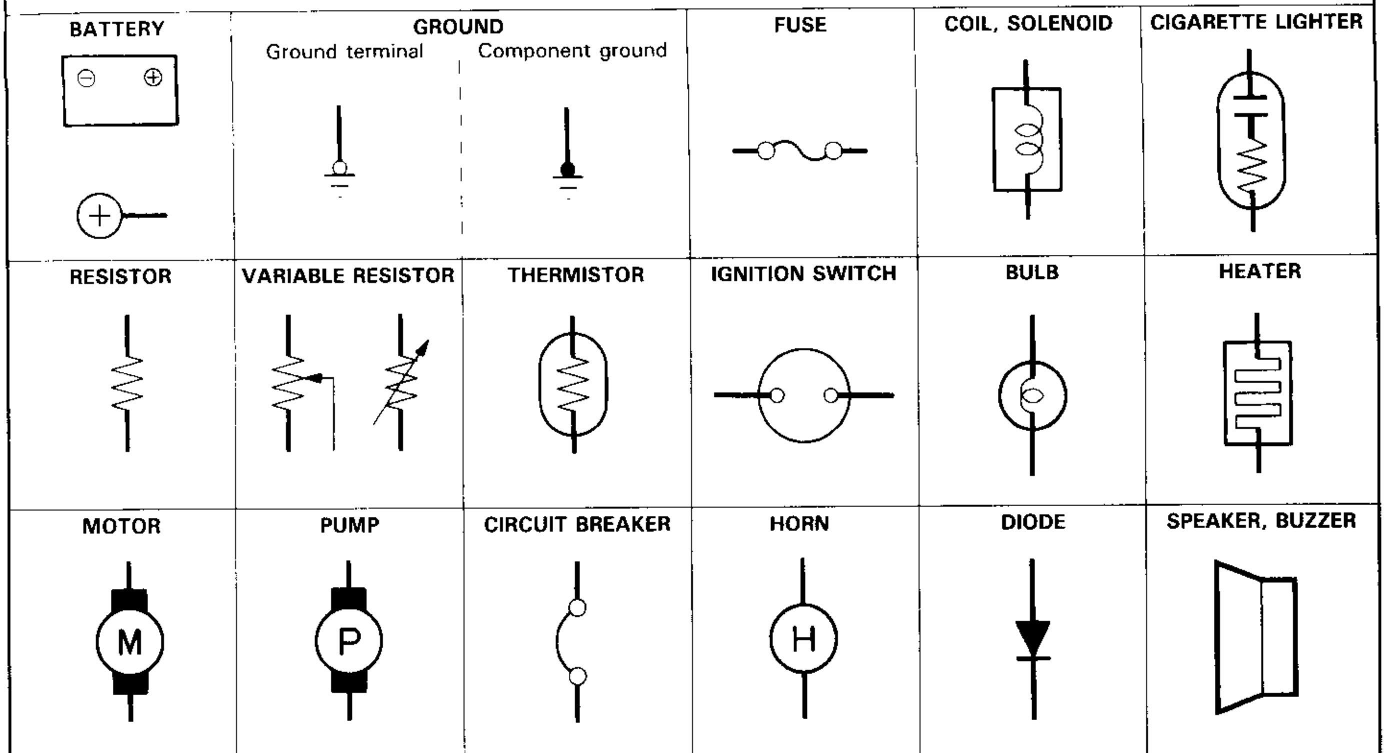
3. **Isolate The Problem By Testing The Circuit**
   Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

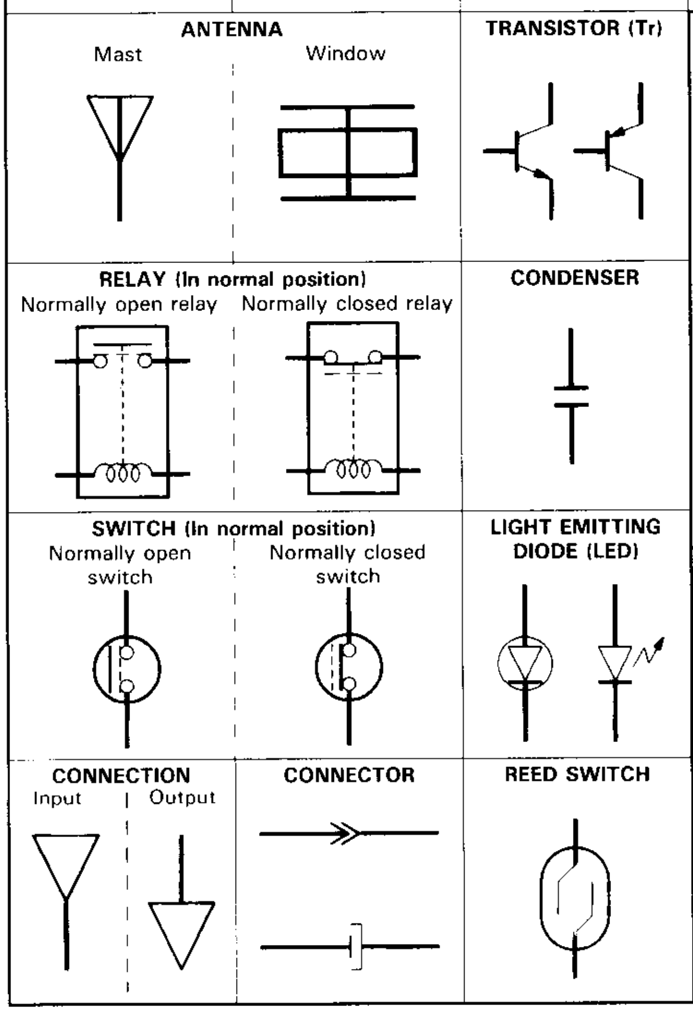
4. **Fix The Problem**
   Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. **Make Sure The Circuit Works**
   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on that fuse. Make sure no new problems turn up and the original problem does not recur.

Troubleshooting

Schematic Symbols



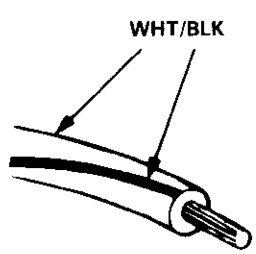


Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

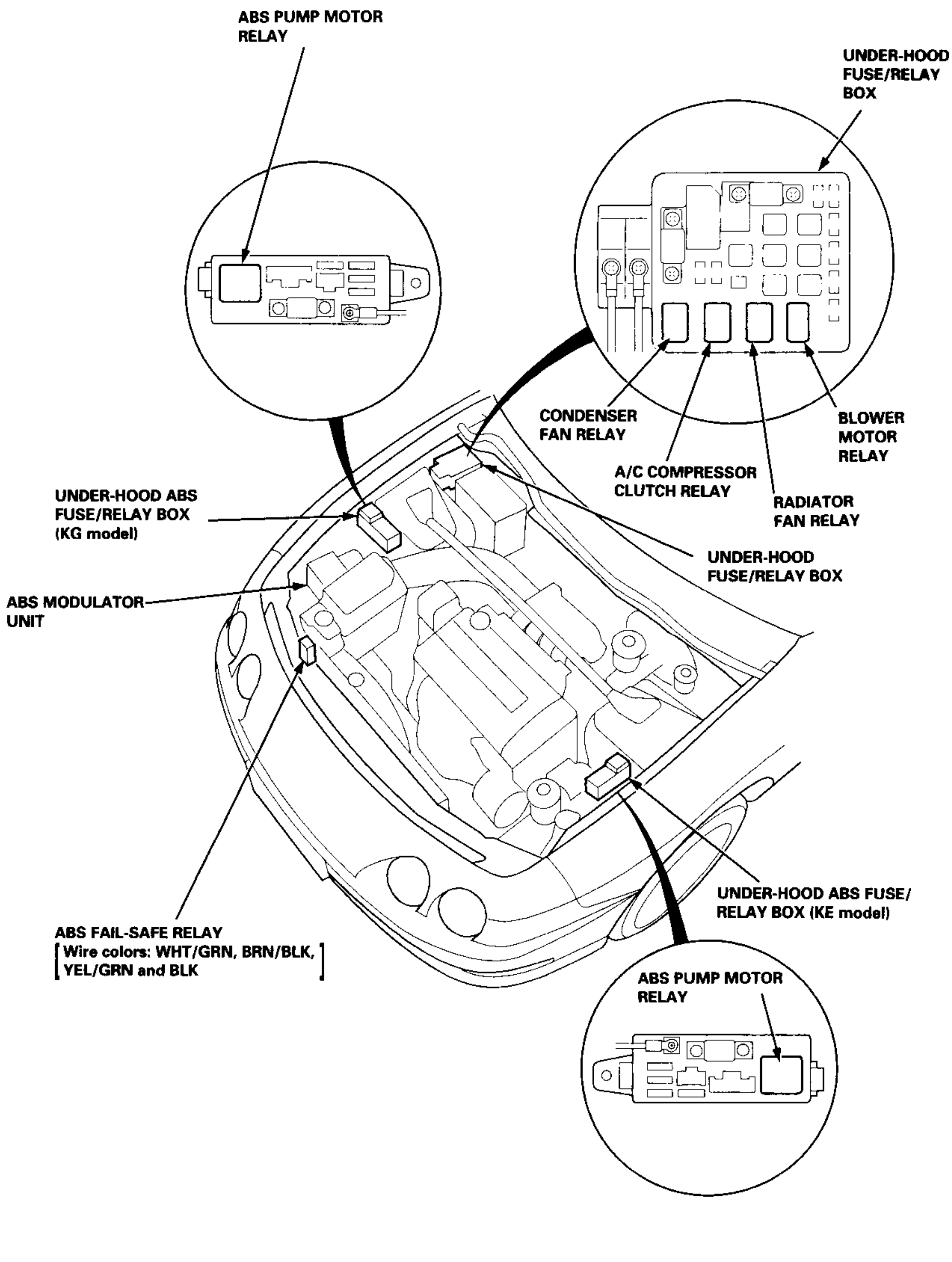
- WHT .... White
- YEL .... Yellow
- BLK .... Black
- BLU .... Blue
- GRN .... Green
- RED .... Red
- ORN .... Orange
- PNK .... Pink
- BRN .... Brown
- GRY .... Gray
- PUR .... Purple
- LT BLU .... Light Blue
- LT GRN .... Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.



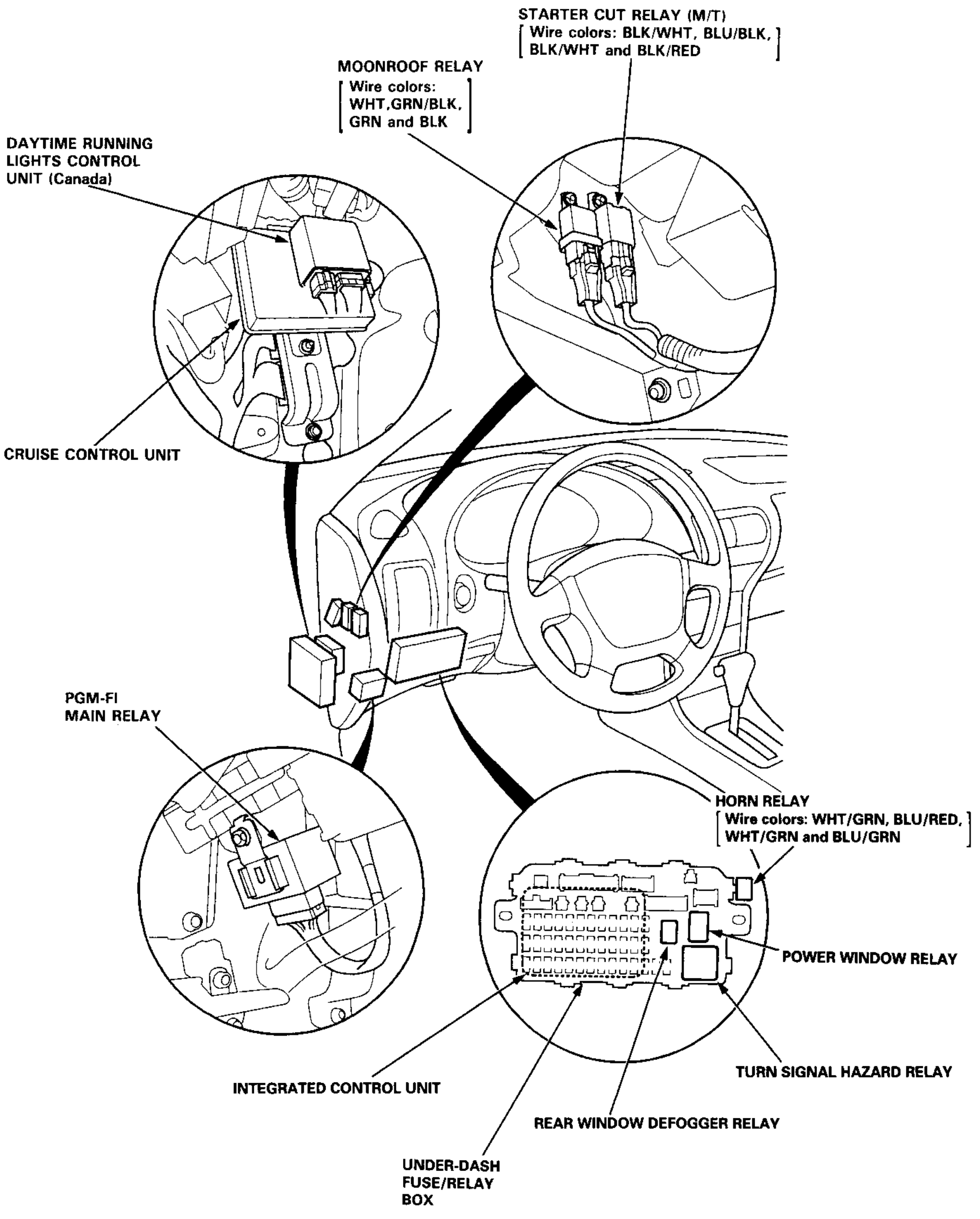
Relay and Control Unit Locations

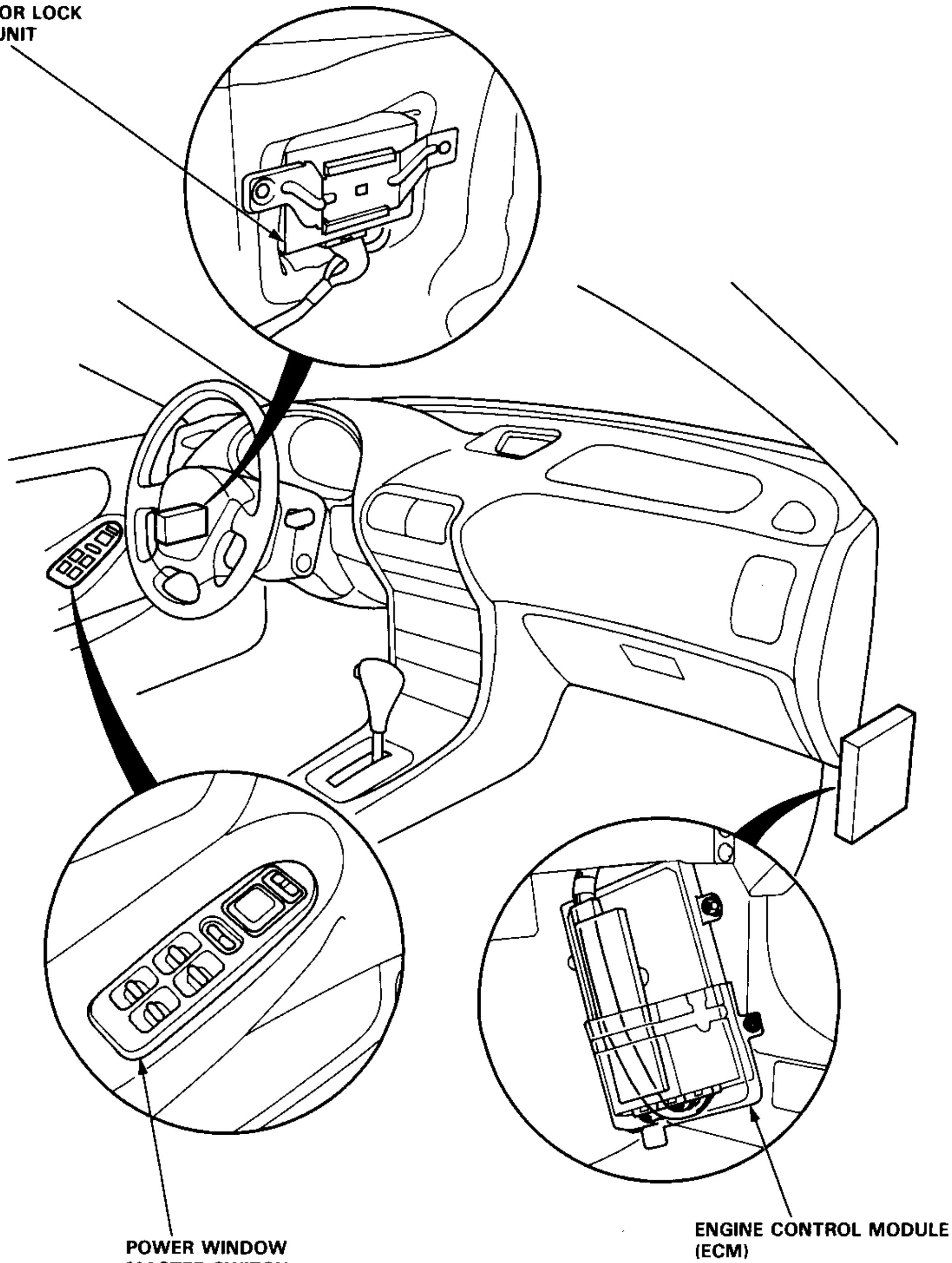
Engine Compartment



Relay and Control Unit Locations

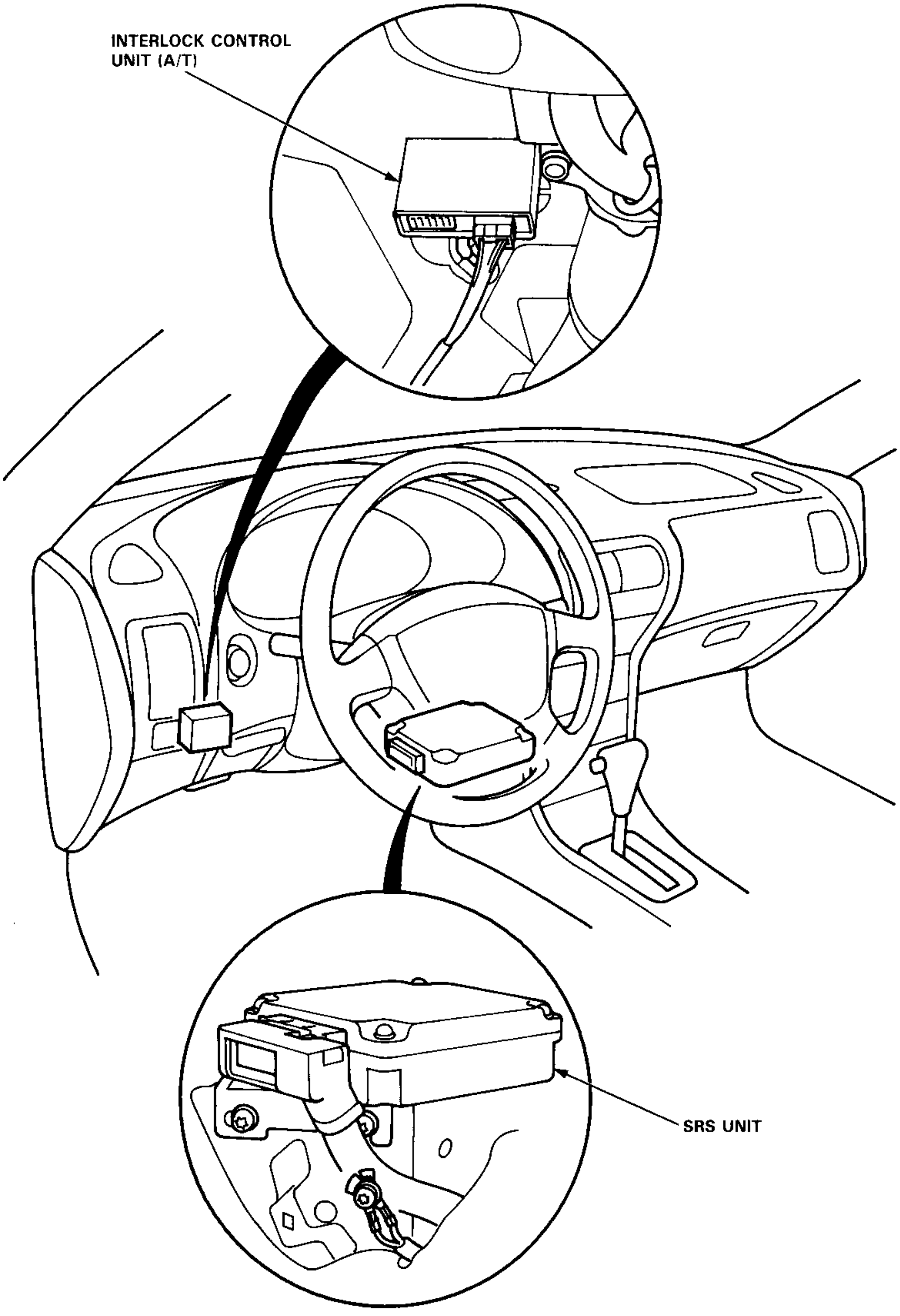
Dashboard and Door

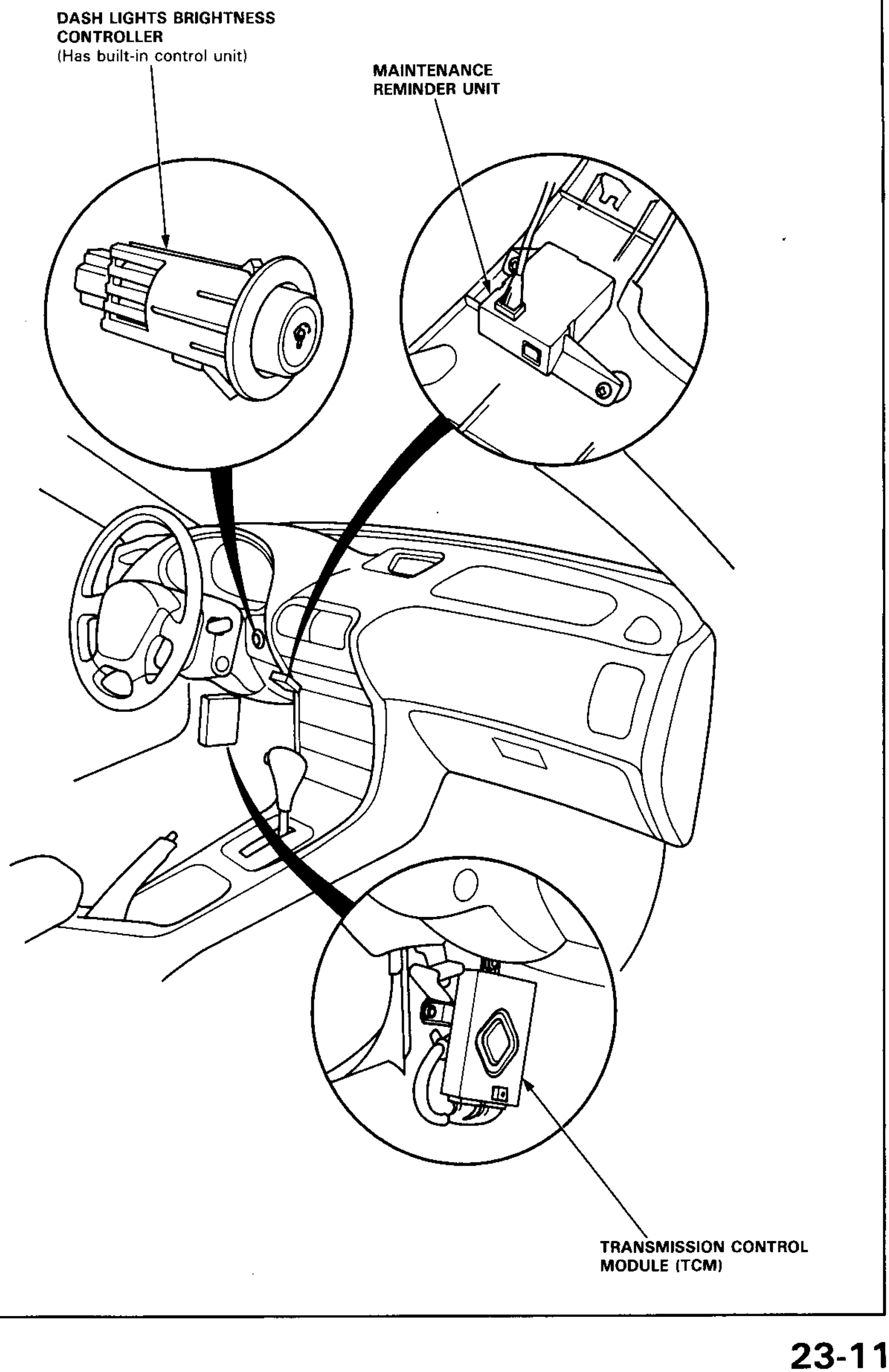



POWER DOOR LOCK
CONTROL UNIT
POWER WINDOW
MASTER SWITCH
(Has built-in control unit)
ENGINE CONTROL MODULE
(ECM)

Relay and Control Unit Locations

Dashboard and Floor

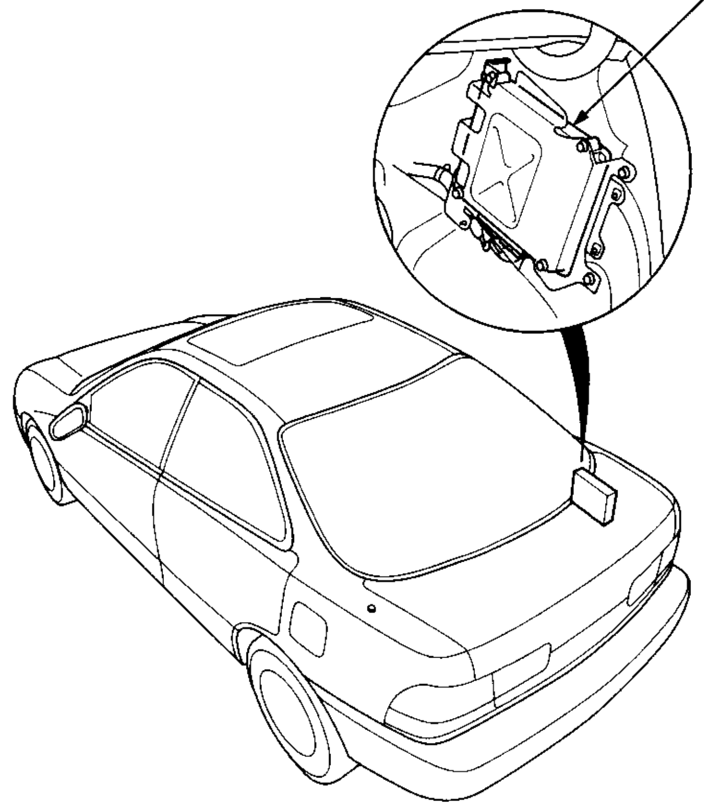



DASH LIGHTS BRIGHTNESS CONTROLLER
(Has built-in control unit)
MAINTENANCE REMINDER UNIT
TRANSMISSION CONTROL MODULE (TCM)

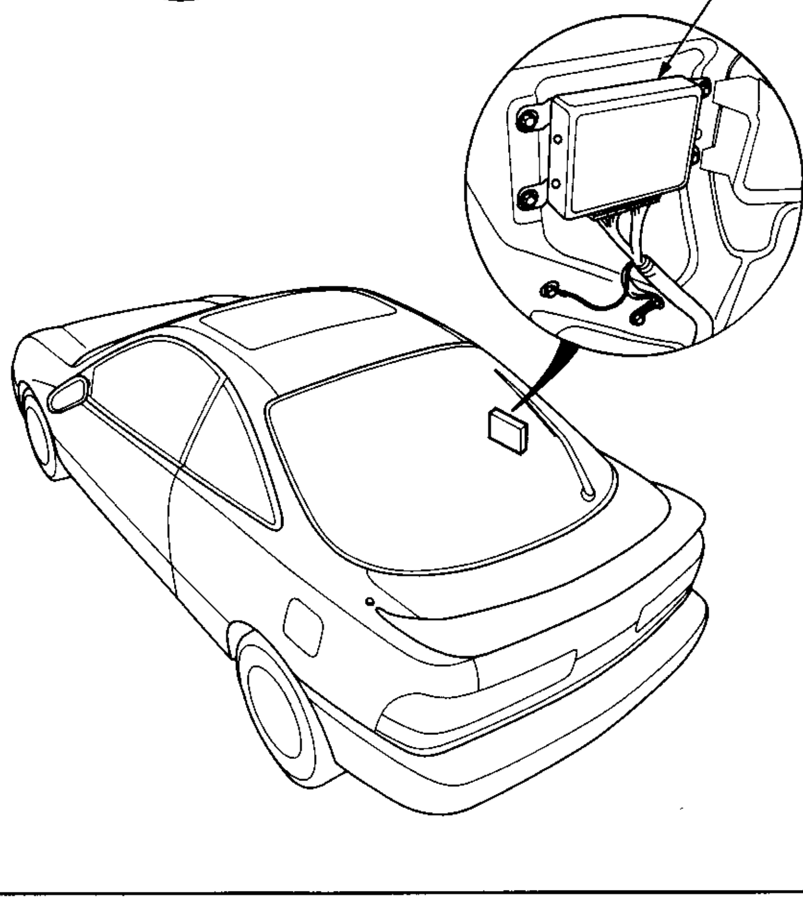
Relay and Control Unit Locations

Quarter Panel

Sedan:



Hatchback:



Connector Identification and Wire Harness Routing

How to Identify Connectors:
Identification numbers have been assigned to all connectors. The number is preceded by the letter ''C'' for connectors, ''G'' for single ground terminals or ''T'' for single non-ground terminals.

Harness \ Location	Engine Compartment	Dashboard	Others (Floor, Door, Trunk, Roof)
Starter cables	T1, T2, and ⊕		
Battery ground cable	G1 and ⊖		
Engine ground cable A	T3 G2		
Engine ground cable B	T4 G3		
Under-hood ABS fuse/relay box cable	T5 and ⊕		
Engine wire harness	C101 through C134 T101 and T102 G101		
A/C wire harness	C151 through C156 G151		
Engine compartment wire harness	C301 through C320 G301		
Main wire harness	C201 through C223 G201 and G202	C401 through C454 G401	
Rear wire harness			C501 through C536 G501 (Sedan), G502 and G503
Dashboard wire harness		C551 through C569 G551	
Driver's door wire harness			C601 through C612
Front passenger's door wire harness			C626 through C634
Left rear door wire harness (Sedan)			C651 through C654
Right rear door wire harness (Sedan)			C656 through C659
Roof wire harness			C661 through C667
Heater sub-harness A		C671 through C677	
Heater sub-harness B		C681 through C684	
ABS sub-harness			C701 through C706 G701 and G702
Hatch wire harness (Hatchback)			C751 through C758 G751
Spoiler sub-harness (Hatchback)			C761 through C763
Rear window defogger ground wire (Hatchback)			C771 G771
SRS main harness			C801 through C808 G801

Starter Cables

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T1 T2		Right side of engine compartment Right side of engine compartment	Under-hood fuse/relay box Starter motor	
⊕		Battery	Battery positive terminal	

Battery Ground Cable

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
G1		Right front shock tower	Body ground, via battery ground cable	
⊖		Battery	Battery negative terminal	

Engine Ground Cable A

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T3		Left side of engine	Valve cover	
G2		Left side of engine compartment	Body ground, via engine ground wire A	

Engine Ground Cable B

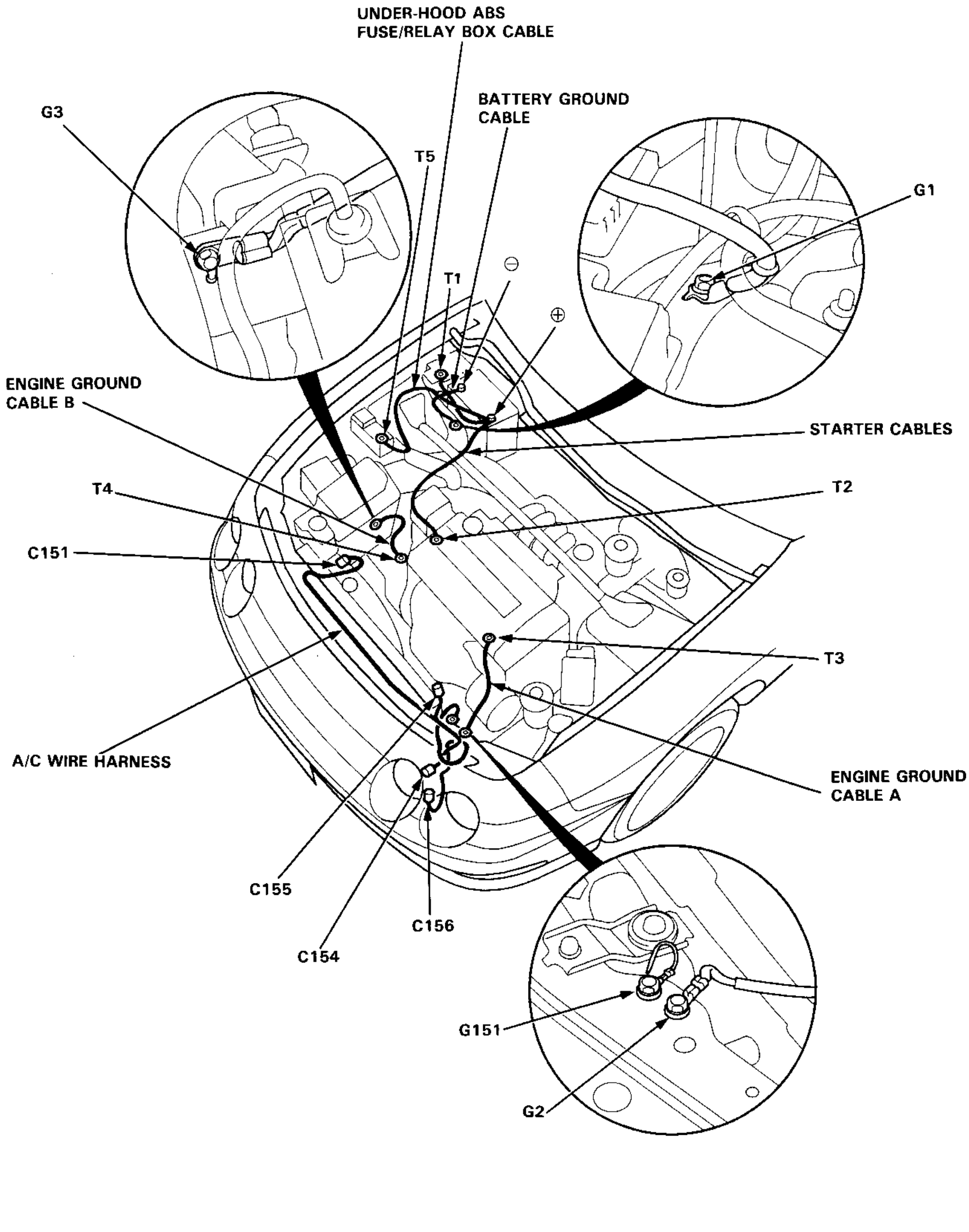
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T4		Right side of engine compartment	Transmission housing	
G3		Right side of front frame	Body ground, via engine ground wire B	

A/C Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C151 C154 C155 C156	8 2 2 1	Right side of engine compartment Left side of engine compartment Left side of engine compartment Left side of engine compartment	Main wire harness (C207) A/C pressure switch Condenser fan motor A/C compressor clutch	
G151		Right side of front frame		

Under-hood ABS Fuse/Relay Box Cable

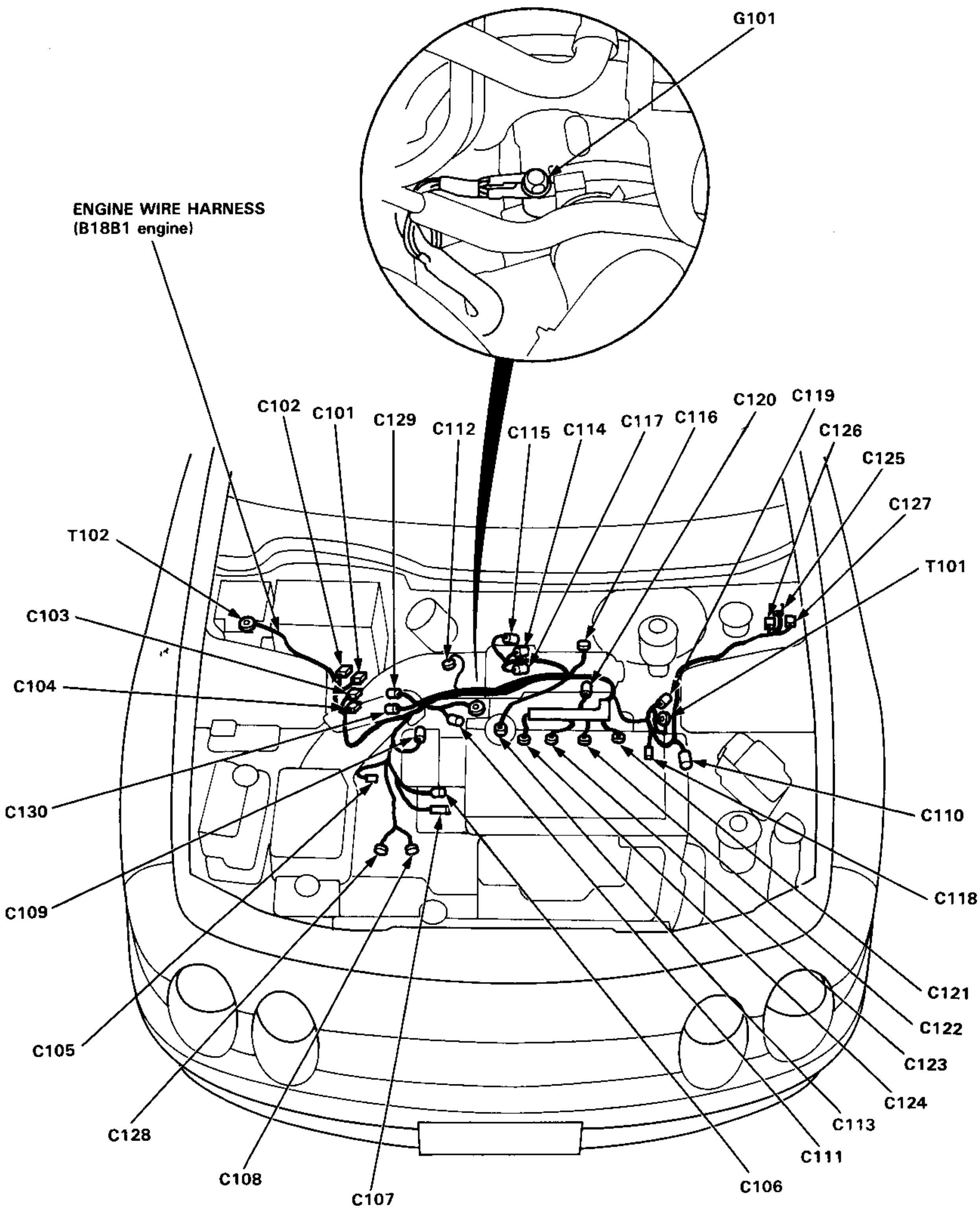
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T5		Right side of engine compartment	Under-hood ABS fuse/relay box	
⊕		Right side of engine compartment	Battery positive terminal	


UNDER-HOOD ABS
FUSE/RELAY BOX CABLE
BATTERY GROUND
CABLE
G3
T5
G1
T1
⊖
⊕
ENGINE GROUND
CABLE B
STARTER CABLES
T4
T2
C151
T3
A/C WIRE HARNESS
ENGINE GROUND
CABLE A
C155
C156
C154
G151
G2

Connector Identification and Wire Harness Routing

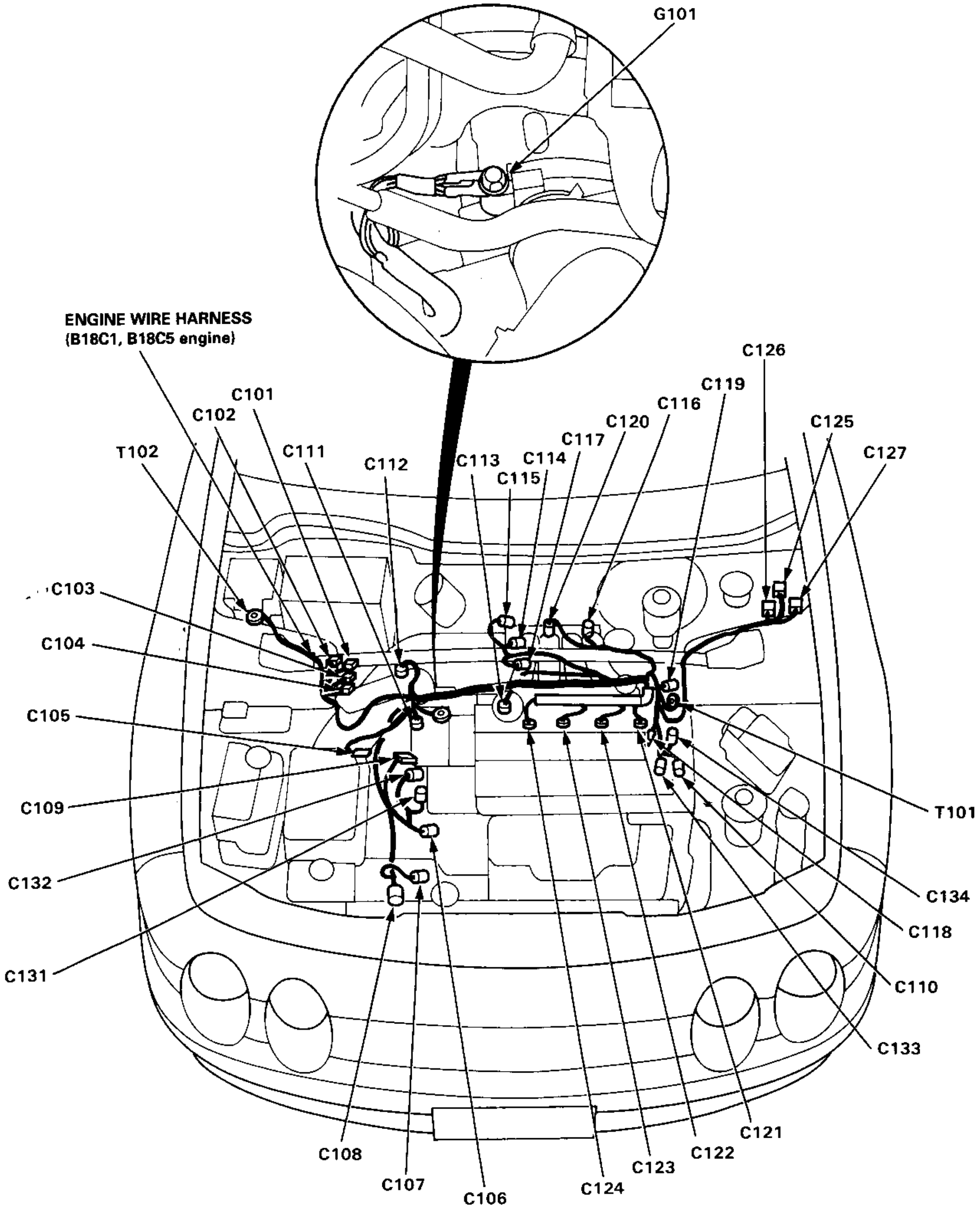
Engine Wire Harness (B18B1 engine)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C101	4	Right side of engine compartment	Main wire harness (C221)	
C102	10	Right side of engine compartment	Main wire harness (C222)	
C103	14	Right side of engine compartment	Main wire harness (C223)	
C104	6	Right side of engine compartment	Main wire harness (C220)	A/T
C105	1	Right side of engine compartment	Starter solenoid	
C106	2	Right side of engine	Engine coolant temperature (ECT) sensor	
C107	1	Right side of engine	Engine coolant temperature (ECT) gauge sending unit	
C108	2	Transmission	Back-up light switch	M/T
C108	2	Transmission	Lock-up control solenoid valve A and B	A/T
C109	10	Middle of engine	Distributor	
C110	2	Middle of engine	Crankshaft speed fluctuation (CKF) sensor	
C111	2	Right side of engine	Engine coolant temperature (ECT) switch	
C112	3	Right side of engine compartment	Vehicle speed sensor (VSS)	
C113	4	Middle rear of engine compartment	Primary HO2S	
C114	3	Middle of engine	MAP sensor	
C115	3	Middle of engine	Throttle position (TP) sensor	
C116	2	Middle of engine	Idle air control (IAC) valve	
C117	2	Middle of engine	EVAP purge control solenoid valve	
C118	1	Middle of engine	Engine oil pressure switch	
C119	4	Left side of engine	Alternator	USA
C119	3	Left side of engine	Alternator	Canada
C120	2	Middle of engine	Intake air temperature (IAT) sensor	
C121	2	Middle of engine	No. 1 fuel injector	
C122	2	Middle of engine	No. 2 fuel injector	
C123	2	Middle of engine	No. 3 fuel injector	
C124	2	Middle of engine	No. 4 fuel injector	
C125	8	Left side of engine compartment	Junction connector	
C126	2	Left side of engine compartment	Engine compartment wire harness (C304)	
C127	14	Left side of engine compartment	Engine compartment wire harness (C305)	
C128	3	Transmission	Shift control solenoid valve A and B	A/T
C129	2	Transmission	Countershaft speed sensor	A/T
C130	3	Transmission	Mainshaft speed sensor	A/T
T101		Left side of engine	Alternator	
T102		Right side of engine compartment	Under-hood fuse/relay box	
G101		Right side of engine	Engine ground, via engine wire harness	


G101
ENGINE WIRE HARNESS
(B18B1 engine)
C102
C101
C129
C112
C115
C114
C117
C116
C120
C119
C126
C125
C127
T101
T102
C103
C104
C110
C130
C118
C109
C121
C122
C105
C123
C124
C113
C128
C111
C108
C106
C107

Engine Wire Harness (B18C1 engine)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C101	4	Right side of engine compartment	Main wire harness (C221)	
C102	10	Right side of engine compartment	Main wire harness (C222)	
C103	14	Right side of engine compartment	Main wire harness (C223)	
C104	3	Right side of engine compartment	Main wire harness (C220)	
C105	1	Right side of engine compartment	Starter solenoid	
C106	2	Right side of engine	Engine coolant temperature (ECT) sensor	
C107	1	Right side of engine	Engine coolant temperature (ECT) gauge sending unit	
C108	2	Transmission	Back-up light switch	
C109	10	Middle of engine	Distributor	
C110	2	Middle of engine	Crankshaft speed fluctuation (CKF) sensor	
C111	2	Right side of engine	Engine coolant temperature (ECT) switch	
C112	3	Right side of engine compartment	Vehicle speed sensor (VSS)	
C113	4	Middle rear of engine compartment	Primary HO2S	
C114	3	Middle of engine	MAP sensor	
C115	3	Middle of engine	Throttle position (TP) sensor	
C116	2	Middle of engine	Idle air control (IAC) valve	
C117	2	Middle of engine	EVAP purge control solenoid valve	
C118	1	Middle of engine	Engine oil pressure switch	
C119	4	Left side of engine	Alternator	USA
C119	3	Left side of engine	Alternator	Canada
C120	2	Middle of engine	Intake air temperature (IAT) sensor	
C121	2	Middle of engine	No. 1 fuel injector	
C122	2	Middle of engine	No. 2 fuel injector	
C123	2	Middle of engine	No. 3 fuel injector	
C124	2	Middle of engine	No. 4 fuel injector	
C125	8	Left side of engine compartment	Junction connector	
C126	2	Left side of engine compartment	Engine compartment wire harness (C304)	
C127	14	Left side of engine compartment	Engine compartment wire harness (C305)	
C131	1	Right side of engine	VTEC solenoid valve	
C132	2	Right side of engine	VTEC oil pressure switch	
C133	2	Middle of engine	Knock sensor (KS)	
C134	2	Middle of engine	Intake air bypass (IAB) control solenoid valve	
T101		Left side of engine	Alternator	
T102		Right side of engine compartment	Under-hood fuse/relay box	
G101		Right side of engine	Engine ground, via engine wire harness	

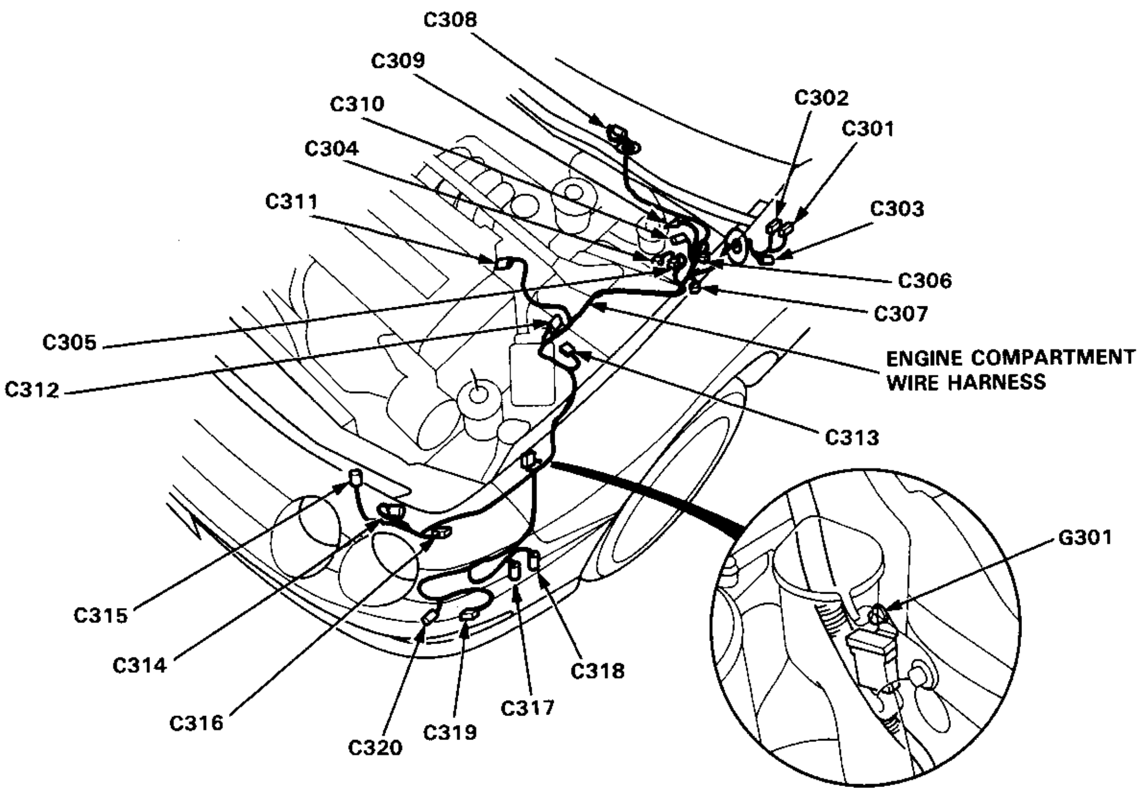


G101
ENGINE WIRE HARNESS
(B18C1, B18C5 engine)
C126
C119
C101
C116
C102
C120
C125
C117
T102
C111
C112
C113
C114
C127
C115
C103
C104
C105
C109
T101
C132
C134
C118
C131
C110
C133
C121
C108
C122
C123
C107
C124
C106

Engine Compartment Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C301	20	Behind left kick panel	Main wire harness (C423)	
C302	12	Behind left kick panel	Main wire harness (C424)	*1
C302	18	Behind left kick panel	Main wire harness (C424)	*2
C303	1	Behind left kick panel	Front fog light system	Option
C304	2	Left side of engine compartment	Engine wire harness (C126)	
C305	14	Left side of engine compartment	Engine wire harness (C127)	
C306	2	Left side of engine compartment	Test tachometer connector	
C307	3	Left side of engine compartment	Daytime running lights resistor	Canada
C308	5	Left side of engine compartment	Windshield wiper motor	
C309	1	Left side of engine compartment	Brake fluid level switch (+)	
C310	1	Left side of engine compartment	Brake fluid level switch (−)	
C311	2	Middle of engine compartment	Power steering pressure (PSP) switch	USA
C312	2	Left side of engine compartment	Left front wheel sensor	ABS
C313	4	Left side of engine compartment	Cruise control actuator	
C314	2	Behind left headlight	Left headlight (Low beam)	
C315	2	Behind left headlight	Left headlight (High beam)	
C316	1	Behind left headlight	Front fog light system	Option
C317	2	Behind left corner of front bumper	Windshield washer motor	
C318	2	Behind left corner of front bumper	Rear window washer motor	
C319	2	Behind left corner of front bumper	Left front side marker light	
C320	3	Behind left corner of front bumper	Left front turn signal/parking lights	
G301		Left side of engine compartment	Body ground, via engine compartment wire harness	

*1: RS
*2: Except RS

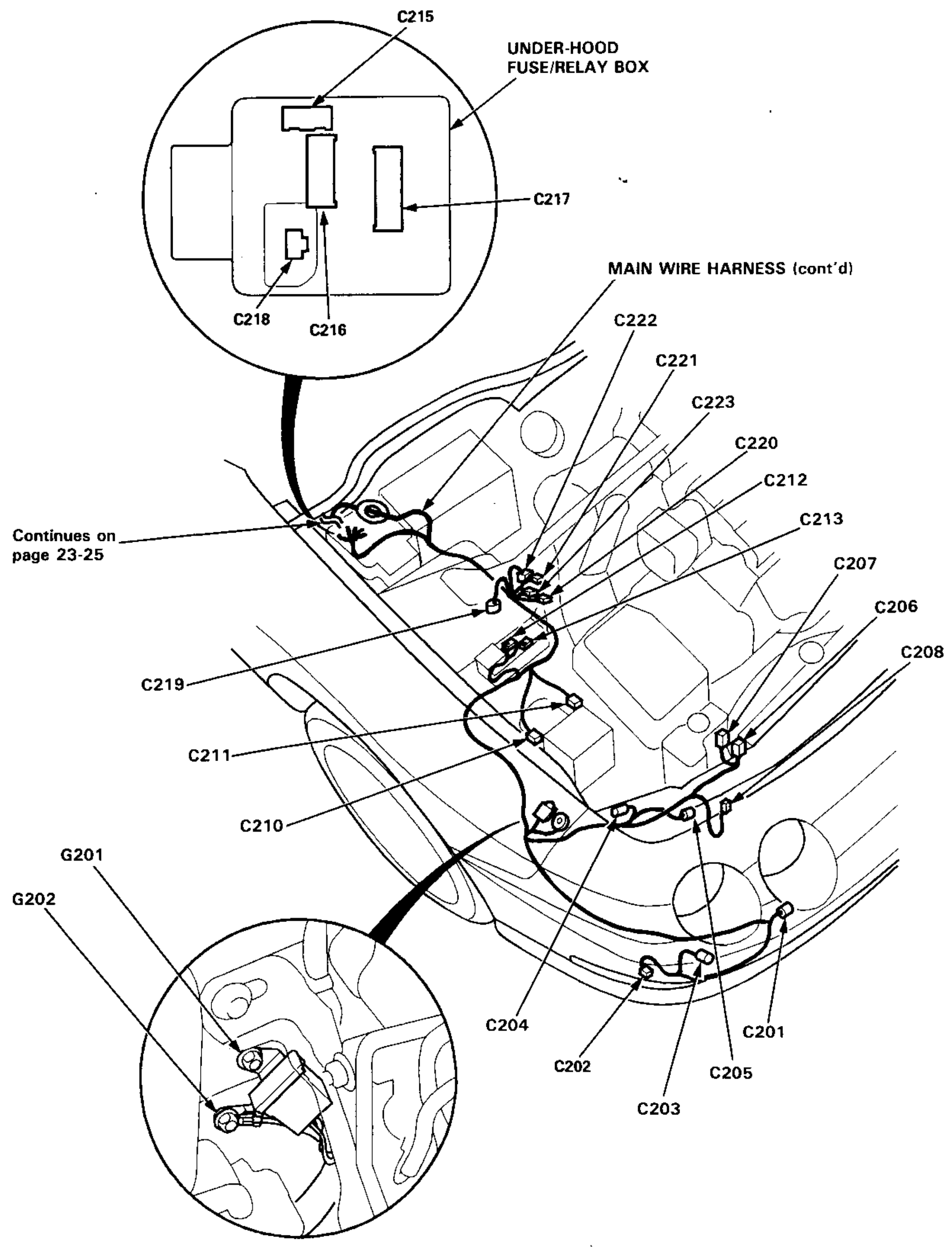

C308
C309
C310
C304
C311
C305
C312
C302
C301
C303
C306
C307
ENGINE COMPARTMENT
WIRE HARNESS
C313
G301
C315
C314
C316
C320
C319
C317
C318

Connector Identification and Wire Harness Routing

Main Wire Harness (Under-hood branch)

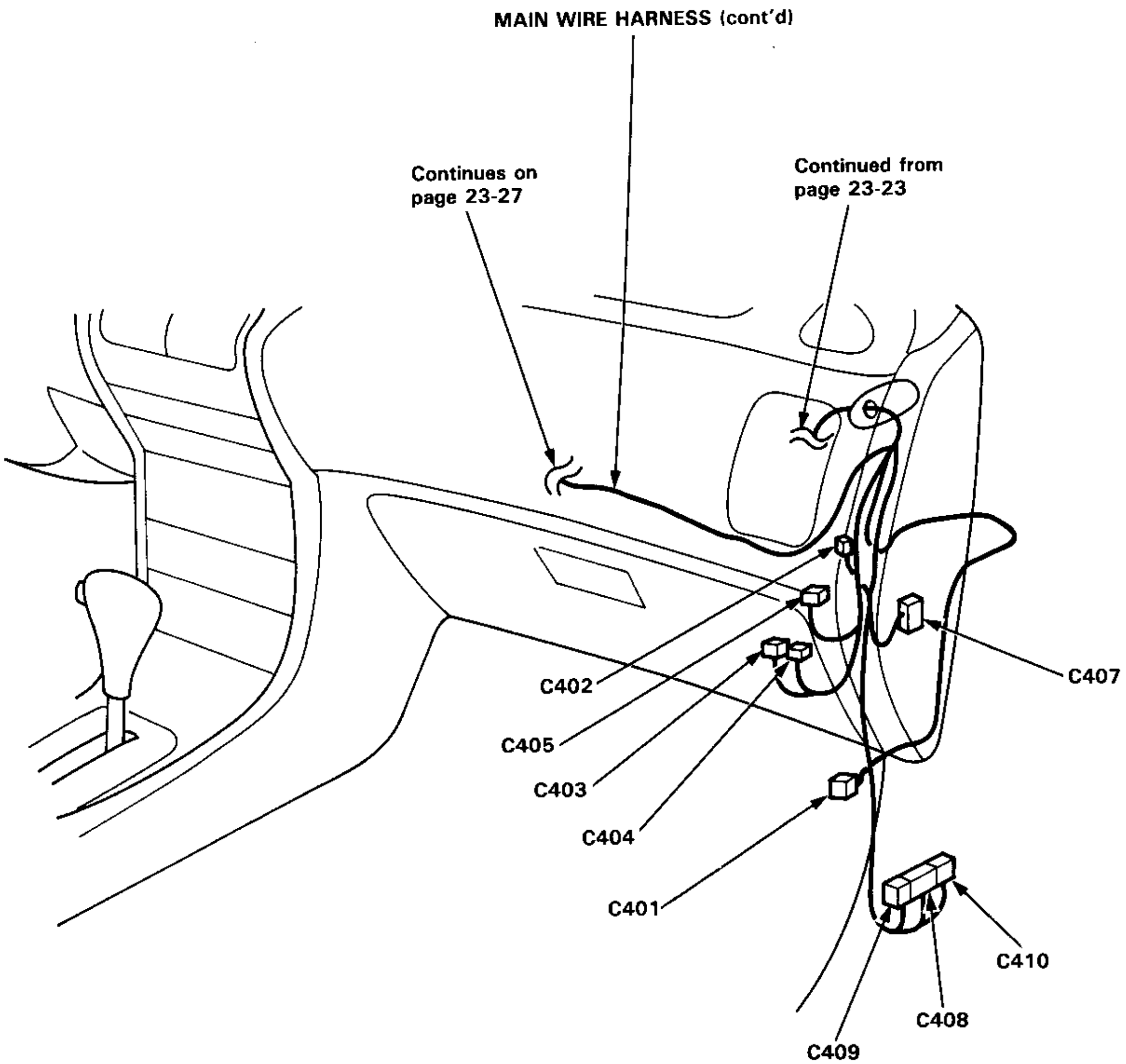
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C201	1	Behind right side of front bumper	Horn	
C202	2	Behind right corner of front bumper	Right front side marker light	
C203	3	Behind right corner of front bumper	Right front turn signal/parking light	
C204	2	Behind right headlight	Right headlight (Low beam)	
C205	2	Behind right headlight	Right headlight (High beam)	
C206	2	Right side of engine compartment	Radiator fan motor	
C207	8	Right side of engine compartment	A/C wire harness (C151)	
C208	4	Right side of engine compartment	ABS front fail safe relay	
C210	2	Right side of engine compartment	ABS pump motor	
C211	10	Right side of engine compartment	ABS modulator unit (C161)	
C212	3	Right side of engine compartment	Under-hood ABS fuse/relay box (C901)	
C213	4	Right side of engine compartment	Under-hood ABS fuse/relay box (C902)	
C215	5	Right side of engine compartment	Under-hood fuse/relay box (C909)	
C216	9	Right side of engine compartment	Under-hood fuse/relay box (C910)	
C217	11	Right side of engine compartment	Under-hood fuse/relay box (C908)	
C218	3	Right side of engine compartment	Under-hood fuse/relay box (C911)	*1
C219	2	Right side of engine compartment	Right front wheel sensor	ABS
C220	3	Right side of engine compartment	Engine wire harness (C104)	*2
C220	6	Right side of engine compartment	Engine wire harness (C104)	*3
C221	4	Right side of engine compartment	Engine wire harness (C101)	
C222	10	Right side of engine compartment	Engine wire harness (C102)	
C223	14	Right side of engine compartment	Engine wire harness (C103)	
G201		Right side of engine compartment	Body ground, via main wire harness	
G202		Right side of engine compartment	Body ground, via main wire harness	ABS

*1: With ELD unit
*2: B18C1, B18C5 engine
*3: B18B1 engine (A/T)


C215
UNDER-HOOD
FUSE/RELAY BOX
C217
C218
C216
MAIN WIRE HARNESS (cont'd)
C222
C221
C223
C220
C212
C213
C207
C206
C208
Continues on
page 23-25
C219
C211
C210
G201
G202
C204
C202
C203
C205
C201

Main Wire Harness (Right branch)

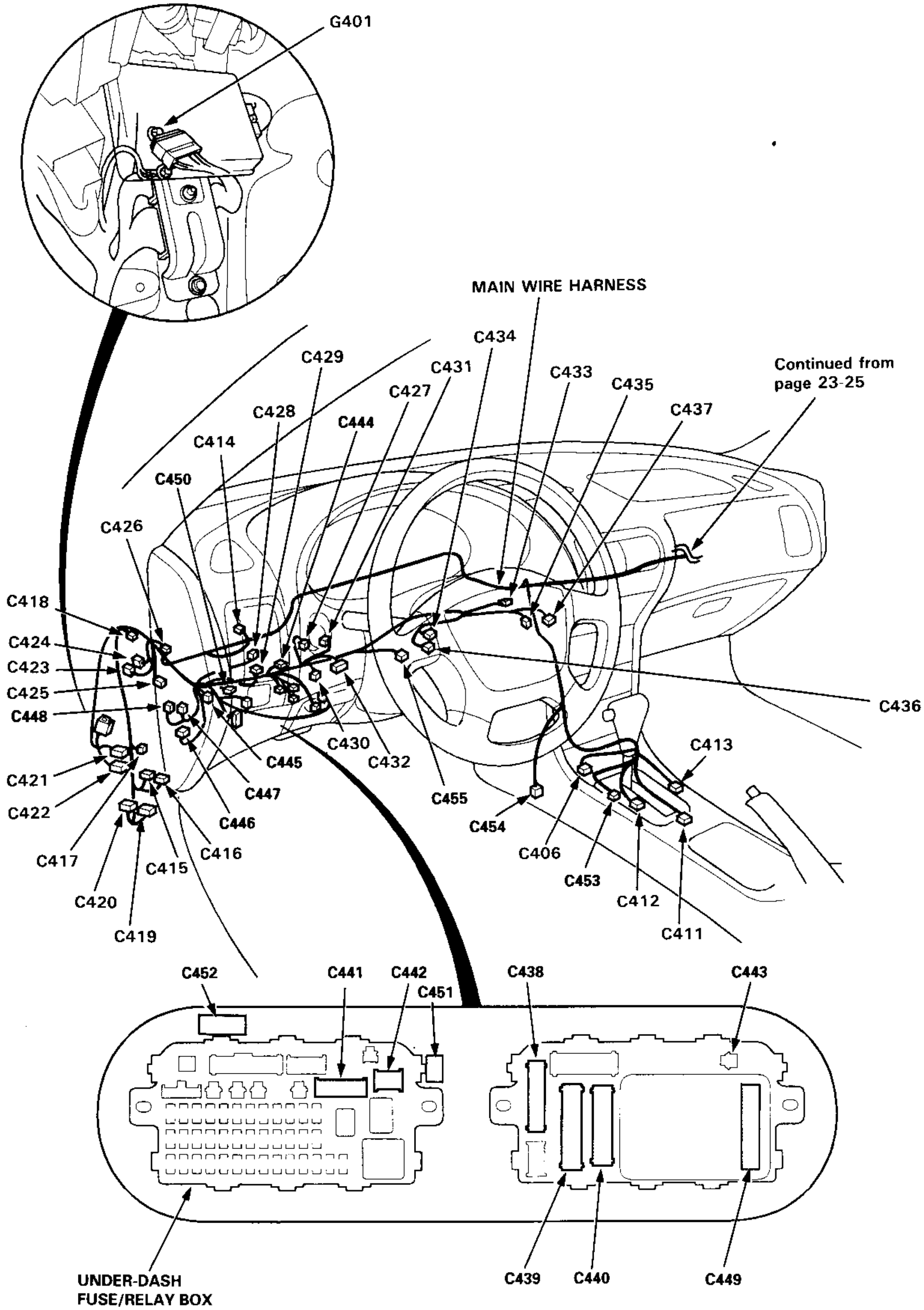
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C401	25	Front passenger's door	Front passenger's door wire harness (C626)	
C402	3	Under right side of dash	A/C diode	
C403	2	Under right side of dash	Heater sub-harness A (C672)	
C404	10	Under right side of dash	Heater sub-harness A (C671)	
C405	2	Under right side of dash	Service check connector	
C407	22	Behind right kick panel	ABS sub-harness (C701)	
C408	32	Behind right kick panel	Engine control module (ECM)	
C409	31	Behind right kick panel	Engine control module (ECM)	
C410	16	Behind right kick panel	Engine control module (ECM)	


MAIN WIRE HARNESS (cont'd)
Continues on page 23-27
Continued from page 23-23
C402
C405
C403
C404
C401
C407
C410
C408
C409

Main Wire Harness (Left branch)

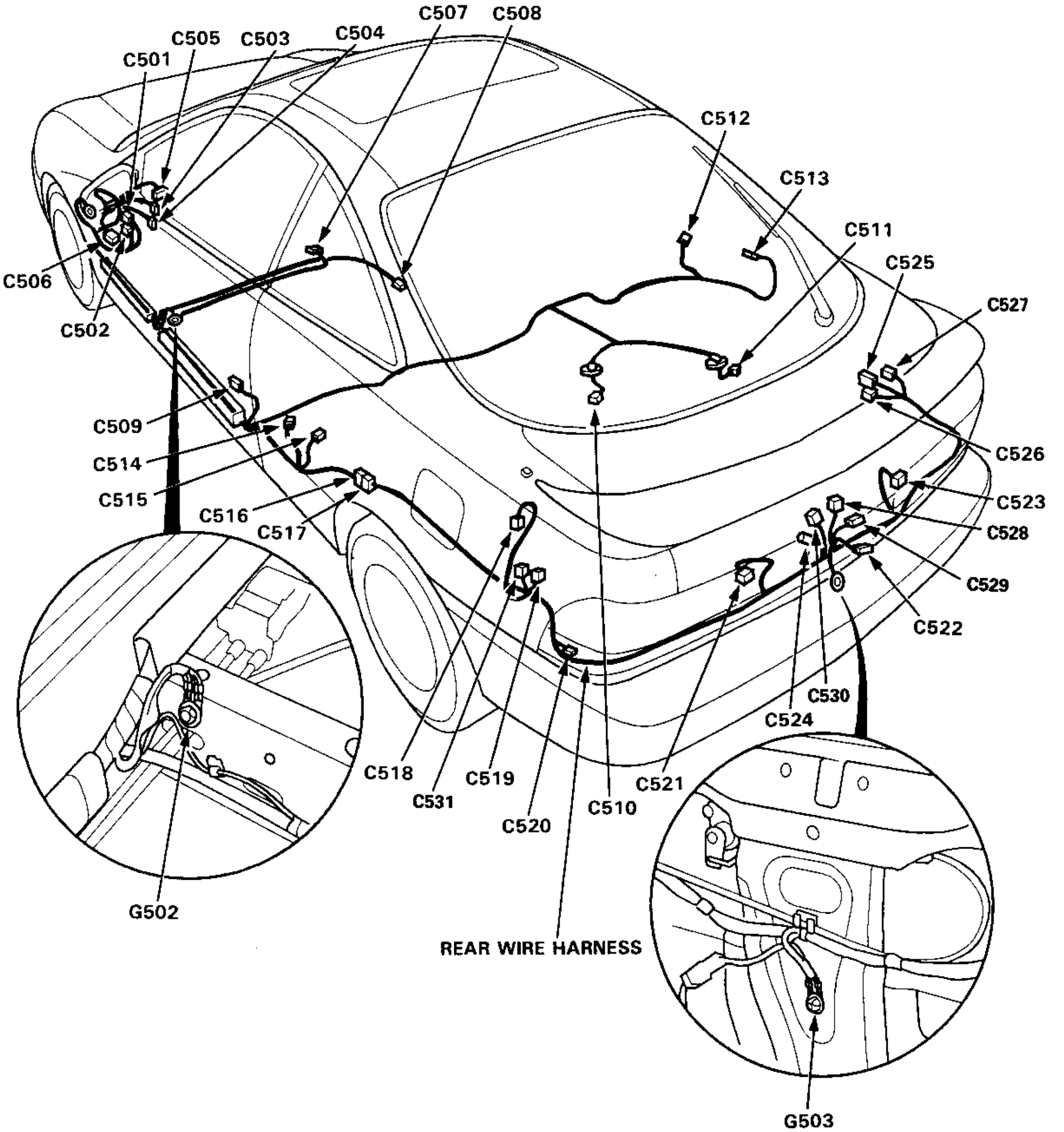
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C406	16	Center floor	Data link connector (DLC)	
C411	2	Center floor	A/T gear position console light	A/T
C412	2	Center floor	Shift lock solenoid	A/T
C413	14	Center floor	A/T gear position switch	A/T
C414	8	Under left side of dash	Interlock control unit	A/T
C415	4	Behind left kick panel	Daytime running lights control unit	Canada
C416	8	Behind left kick panel	Daytime running lights control unit	Canada
C417	14	Behind left kick panel	Cruise control unit	
C418	20	Behind left kick panel	Junction connector	
C419	22	Behind left kick panel	Transmission control module (TCM)	A/T
C420	26	Behind left kick panel	Transmission control module (TCM)	A/T
C421	16	Behind left kick panel	Rear wire harness (C501)	
C422	14	Behind left kick panel	Rear wire harness (C502)	
C423	20	Under left side of dash	Engine compartment wire harness (C301)	
C424	12	Under left side of dash	Engine compartment wire harness (C302)	*1
C424	18	Under left side of dash	Engine compartment wire harness (C302)	*2
C425	2	Under left side of dash	Roof wire harness (C663)	
C426	14	Under left side of dash	Security system (Option)	Canada
C427	3	Under left side of dash	SRS main harness (C802)	
C428	2	Under left side of dash	Clutch interlock switch	M/T
C429	2	Under left side of dash	Clutch switch (With cruise control)	M/T
C430	8	Under left side of dash	Dashboard wire harness (C552)	A/T
C431	2	Under left side of dash	Brake switch (Without cruise control)	
C431	4	Under left side of dash	Brake switch (With cruise control)	
C432	7	Under left side of dash	Ignition switch	
C433	2	Under left side of dash	Security system (Option)	Canada
C434	4	Under left side of dash	Combination light switch	
C435	6	Under left side of dash	Combination light switch	
C436	7	Under left side of dash	Combination light switch	
C437	8	Under left side of dash	Combination light switch	
C438	18	Behind dashboard lower cover	Under-dash fuse/relay box (C913)	
C439	20	Behind dashboard lower cover	Under-dash fuse/relay box (C916)	
C440	18	Behind dashboard lower cover	Under-dash fuse/relay box (C917)	
C441	7	Behind dashboard lower cover	Under-dash fuse/relay box (C923)	
C442	6	Behind dashboard lower cover	Under-dash fuse/relay box (C924)	
C443	1	Behind dashboard lower cover	Under-dash fuse/relay box (C918)	Optional
C444	6	Under left side of dash	Security system (Option)	Canada
C445	4	Under left side of dash	Security system (Option)	Canada
C446	7	Under left side of dash	PGM-FI main relay	
C447	4	Under left side of dash	Starter cut relay	M/T
C448	4	Under left side of dash	Rear window defogger relay	
C449	15	Behind under-dash fuse/relay box	Integrated control unit	
C450	3	Under left side of dash	Security system (Option)	Canada
C451	4	Behind dashboard lower cover	Horn relay	
C452	14	Behind dashboard lower cover	Dashboard wire harness (C553)	*1
C452	16	Behind dashboard lower cover	Dashboard wire harness (C553)	*2
C453	3	Center floor	Parking pin switch	A/T
C454	4	Under middle of dash	Secondary HO2S	
C455	3	Under left side of dash	Cable reel	
G401		Behind left kick panel	Body ground, via main wire harness	

*1: RS
*2: Except RS


G401
MAIN WIRE HARNESS
C434
C429
C431
C433
C435
C427
C428
C444
C437
Continued from page 23-25
C414
C450
C426
C418
C424
C423
C425
C448
C436
C413
C430
C432
C445
C447
C455
C454
C421
C422
C446
C417
C416
C415
C420
C419
C406
C453
C412
C411
C452
C441
C442
C451
C438
C443
UNDER-DASH FUSE/RELAY BOX
C439
C440
C449

Rear Wire Harness (Hatchback)

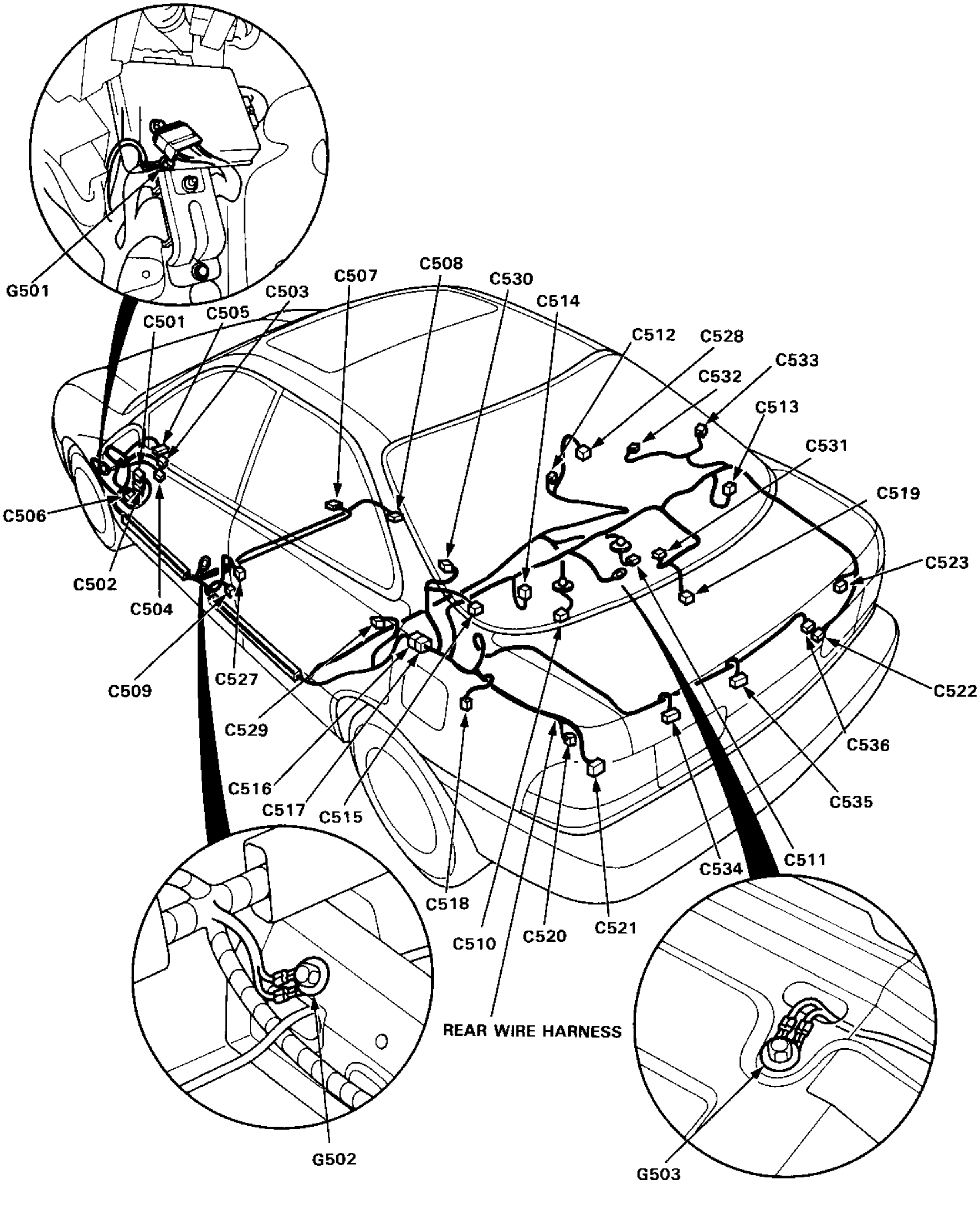
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C501	16	Behind left kick panel	Main wire harness (C421)	
C502	14	Behind left kick panel	Main wire harness (C422)	
C503	8	Behind dashboard lower cover	Under-dash fuse/relay box (C912)	
C504	16	Behind dashboard lower cover	Under-dash fuse/relay box (C915)	
C505	14	Behind dashboard lower cover	Dashboard wire harness (C554)	
C506	25	Driver's door	Driver's door wire harness (C601)	
C507	2	Center floor	Driver's seat belt switch	
C508	1	Center floor	Parking brake switch	
C509	1	Left quarter panel	Driver's door switch	
C510	8	Fuel tank	Fuel pump	
C511	3	Fuel tank	Fuel gauge sending unit	
C512	1	Right quarter panel	Passenger's door switch	
C513	2	Right quarter panel	Right rear speaker	
C514	2	Left quarter panel	Left rear speaker	
C515	2	Left quarter panel	Noise condenser	
C516	20	Left quarter panel	Connector C517	
C517	20	Left quarter panel	Connector C516	
C518	3	Left side corner of cargo area	Power antenna motor	
C519	2	Left side corner of cargo area	Cargo area light	
C520	6	Left side corner of cargo area	Trailer lighting connector	
C521	6	Left rear corner of cargo area	Left taillight	
C522	2	Center of cargo area bulkhead	License plate lights	
C523	6	Right rear corner of cargo area	Right taillight	
C524	2	Center of cargo area bulkhead	Hatch latch switch	
C525	2	Right side of cargo area	Hatch wire harness (C752)	
C526	4	Right side of cargo area	Hatch wire harness (C751)	
C527	2	Right side of cargo area	Hatch wire harness (C757)	
C528	6	Center of cargo area bulkhead	Hatch lock actuator	
C529	3	Center of cargo area bulkhead	Hatch key cylinder switch	
C530	2	Center of cargo area bulkhead	Hatch opener actuator	
C531	4	Left side corner of cargo area	Hatch opener relay	
G502		Left side of floor	Body ground, via rear wire harness	
G503		Center of cargo area bulkhead	Body ground, via rear wire harness	


C501
C505
C503
C504
C507
C508
C512
C513
C511
C525
C527
C506
C502
C509
C514
C515
C516
C517
C526
C523
C528
C529
C522
C530
C524
C518
C531
C519
C520
C510
C521
G502
REAR WIRE HARNESS
G503

Connector Identification and Wire Harness Routing

Rear Wire Harness (Sedan)

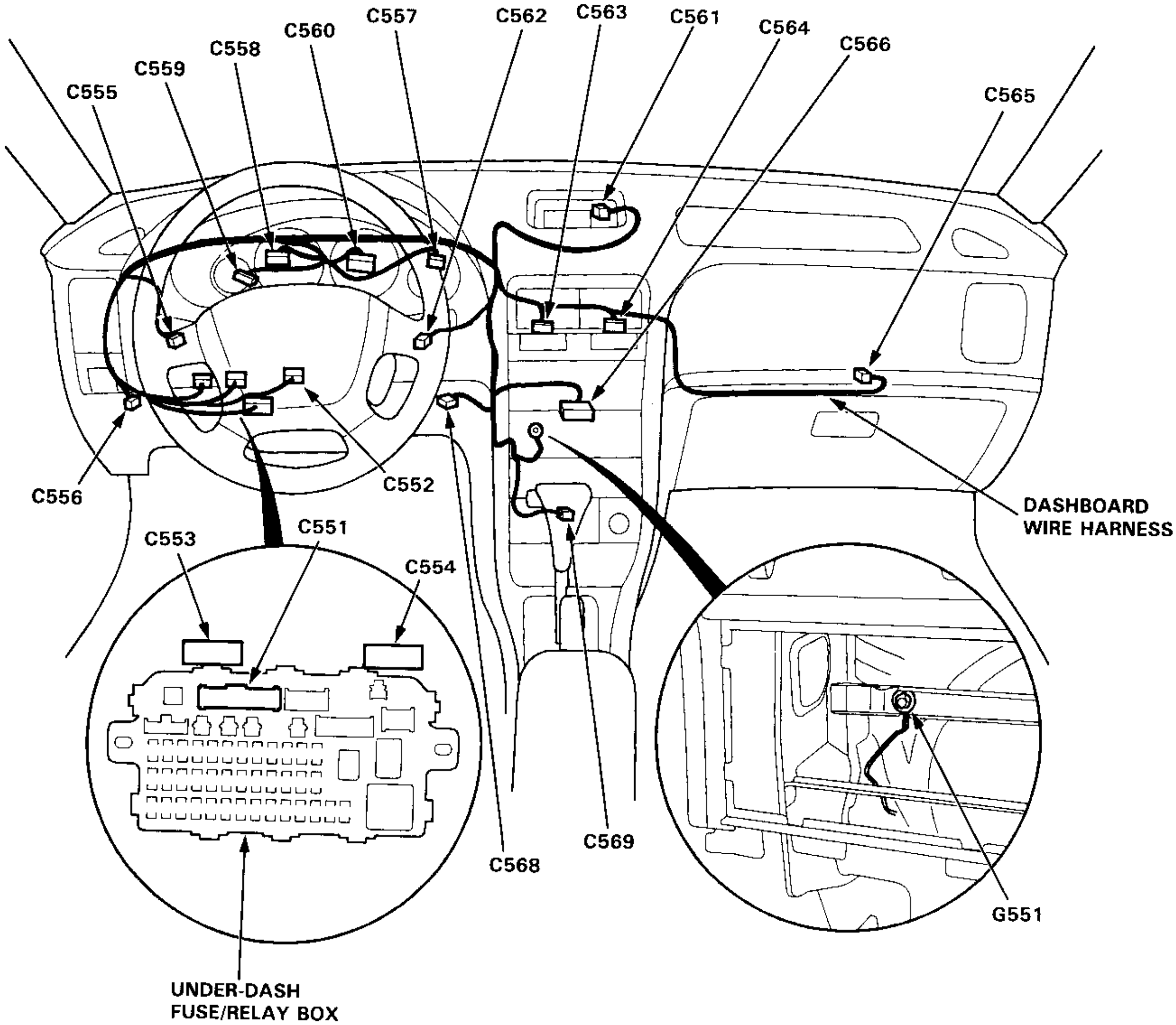
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C501	16	Behind left kick panel	Main wire harness (C421)	
C502	14	Behind left kick panel	Main wire harness (C422)	
C503	8	Behind dashboard lower cover	Under-dash fuse/relay box (C912)	
C504	16	Behind dashboard lower cover	Under-dash fuse/relay box (C915)	
C505	14	Behind dashboard lower cover	Dashboard wire harness (C554)	
C506	25	Driver's door	Driver's door wire harness (C601)	
C507	2	Center floor	Driver's seat belt switch	
C508	1	Center floor	Parking brake switch	
C509	1	Left B-pillar	Driver's door switch	
C510	8	Fuel tank	Fuel pump	
C511	3	Fuel tank	Fuel gauge sending unit	
C512	1	Right B-pillar	Front passenger's door switch	
C513	2	Above right side of trunk	Right rear speaker	
C514	2	Above left side of trunk	Left rear speaker	
C515	1	Left quarter panel	Noise condenser	
C516	20	Left quarter panel	Connector C517	
C517	20	Left quarter panel	Connector C516	
C518	3	Left side corner of trunk	Power antenna motor	
C519	2	Above center of trunk	Trunk light	
C520	6	Left side corner of trunk	Trailer lighting connector	
C521	4	Left rear corner of trunk	Left outer taillight	
C522	2	Right rear corner of trunk	License plate lights	
C523	4	Right rear corner of trunk	Right outer taillight	
C527	6	Left rear door	Left rear door wire harness (C651)	
C528	6	Right rear door	Right rear door wire harness (C656)	
C529	1	Left quarter panel	Left rear door switch	
C530	1	Left side of rear window	Rear window defogger (+)	
C531	2	Above right side of trunk	High mount brake light	
C532	1	Right quarter panel	Right rear door switch	
C533	1	Right side of rear window	Rear window defogger (−)	
C534	4	Left side of trunk lid	Left inner taillight	
C535	2	Center of trunk lid	Trunk latch switch	
C536	4	Right side of trunk lid	Right inner taillight	
G501		Behind left kick panel	Body ground, via rear wire harness	
G502		Left side of floor	Body ground, via rear wire harness	
G503		Above center of trunk	Body ground, via rear wire harness	


G501
C501
C505
C503
C507
C508
C530
C514
C512
C528
C533
C532
C513
C531
C519
C523
C522
C536
C535
C511
C534
C521
C520
C510
C518
C515
C517
C516
C529
C527
C509
C504
C502
C506
REAR WIRE HARNESS
G502
G503

Dashboard Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C551	20	Behind dashboard lower cover	Under-dash fuse/relay box (C921)	
C552	8	Behind dashboard lower cover	Main wire harness (C430)	A/T
C553	14	Behind dashboard lower cover	Main wire harness (C452)	*1
C553	16	Behind dashboard lower cover	Main wire harness (C452)	*2
C554	14	Behind dashboard lower cover	Rear wire harness (C505)	
C555	5	Under left side of dash	Cruise main switch	
C556	20	Under left side of dash	Junction connector	
C557	5	Behind gauges	Gauge assembly	
C558	10	Behind gauges	Gauge assembly	A/T
C559	13	Behind gauges	Gauge assembly	
C560	16	Behind gauges	Gauge assembly	
C561	4	Behind middle of dash	Clock	
C562	3	Left side of dash	Dash lights brightness controller	
C563	10	Behind middle of dash	Hazard warning switch	
C564	6	Behind middle of dash	Rear window defogger switch	
C565	2	Right side of dash	Glove box light	
C566	16	Under middle of dash	Stereo radio/cassette player	
C568	5	Behind dashboard lower cover	Maintenance reminder unit	
C569	4	Under middle of dash	Cigarette lighter	
G551		Under middle of dash	Body ground, via dashboard wire harness	

*1: RS
*2: Except RS

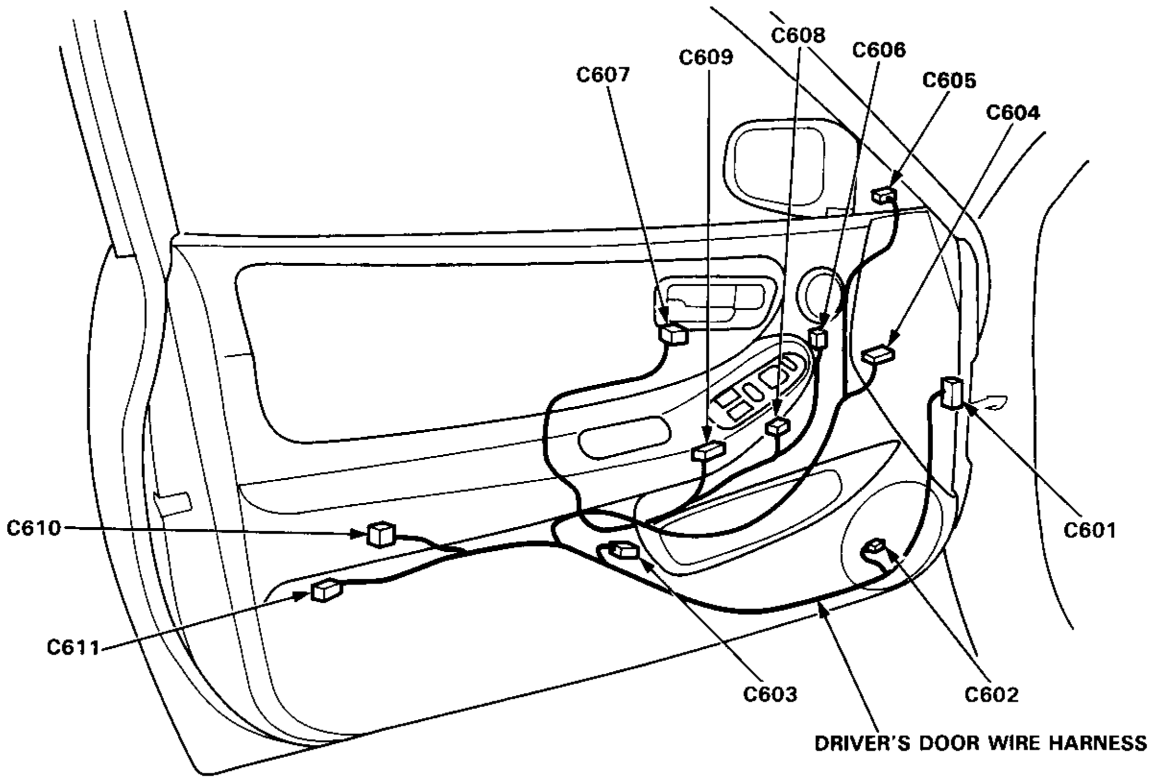


C555
C559
C558
C560
C557
C562
C563
C561
C564
C566
C565
C556
C552
C553
C551
C554
C568
C569
G551
DASHBOARD
WIRE HARNESS
UNDER-DASH
FUSE/RELAY BOX

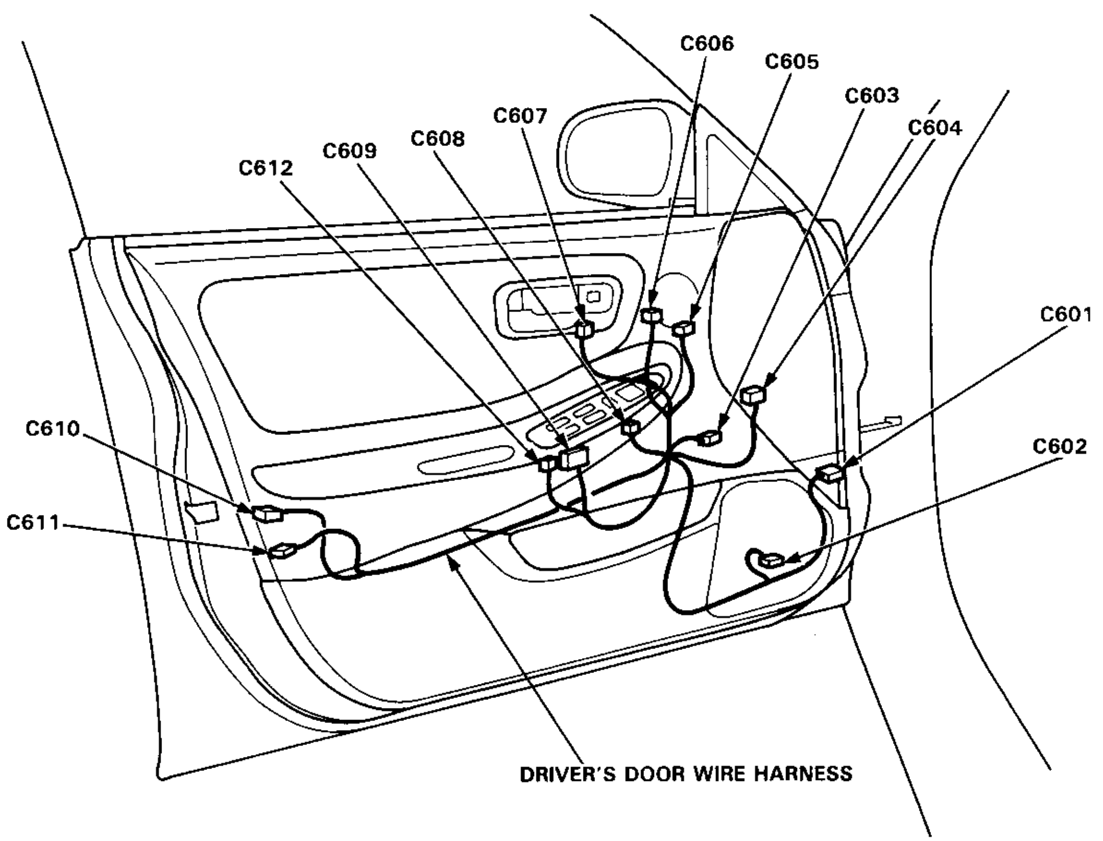
Driver's Door Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C601	25	Driver's door	Driver's door wire harness (C506)	
C602	2	Driver's door	Driver's door speaker	
C603	4	Driver's door	Driver's power window motor	
C604	14	Driver's door	Power door lock control unit	
C605	8	Behind mirror panel	Left power mirror	Hatchback
C605	3	Driver's door	Left power mirror	Sedan
C606	2	Driver's door	Left tweeter	
C607	3	Driver's door	Driver's door lock switch	
C608	10	Driver's door	Power mirror switch	
C609	10	Driver's door	Power window master switch	Hatchback
C609	16	Driver's door	Power window master switch	Sedan
C610	6	Driver's door	Driver's door lock actuator	
C611	2	Driver's door	Driver's key cylinder switch	
C612	1	Driver's door	Power window master switch	Sedan

Hatchback:



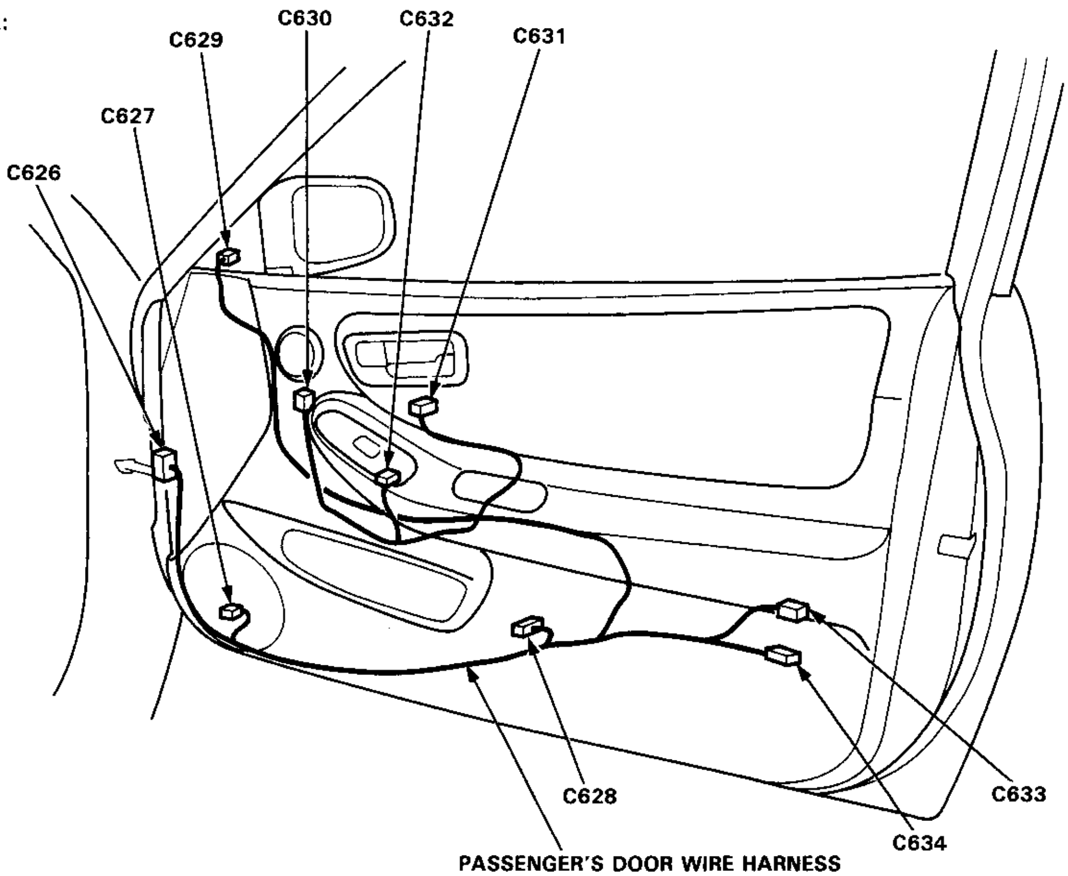
Sedan:



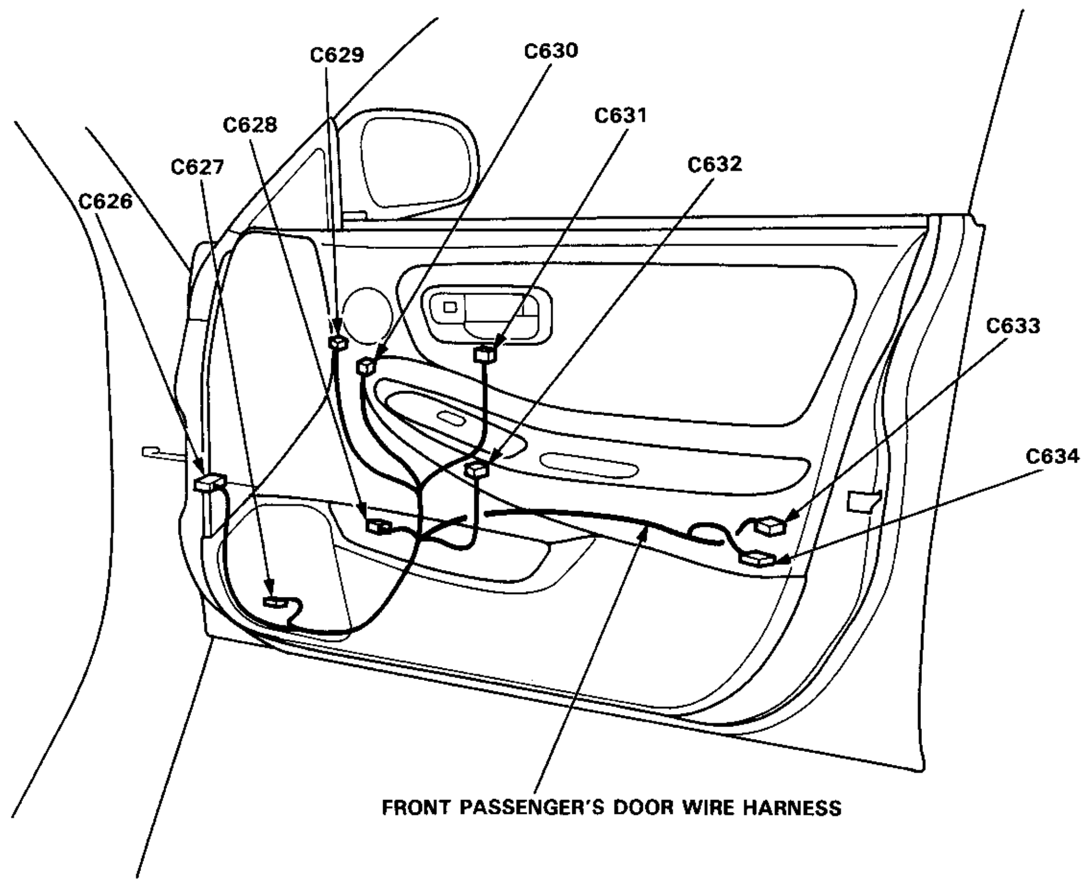
Front Passenger's Door Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C626	25	Front passenger's door	Main wire harness (C401)	
C627	2	Front passenger's door	Front passenger's door speaker	
C628	2	Front passenger's door	Front passenger's power window motor	
C629	8	Behind cover panel	Right power mirror	Hatchback
C629	3	Front passenger's door	Right power mirror	Sedan
C630	2	Front passenger's door	Right tweeter	
C631	3	Front passenger's door	Front passenger's door lock switch	
C632	5	Front passenger's door	Front passenger's power window switch	
C633	2	Front passenger's door	Front passenger's door lock actuator	
C634	3	Front passenger's door	Front passenger's door key cylinder switch	

Hatchback:



Sedan:



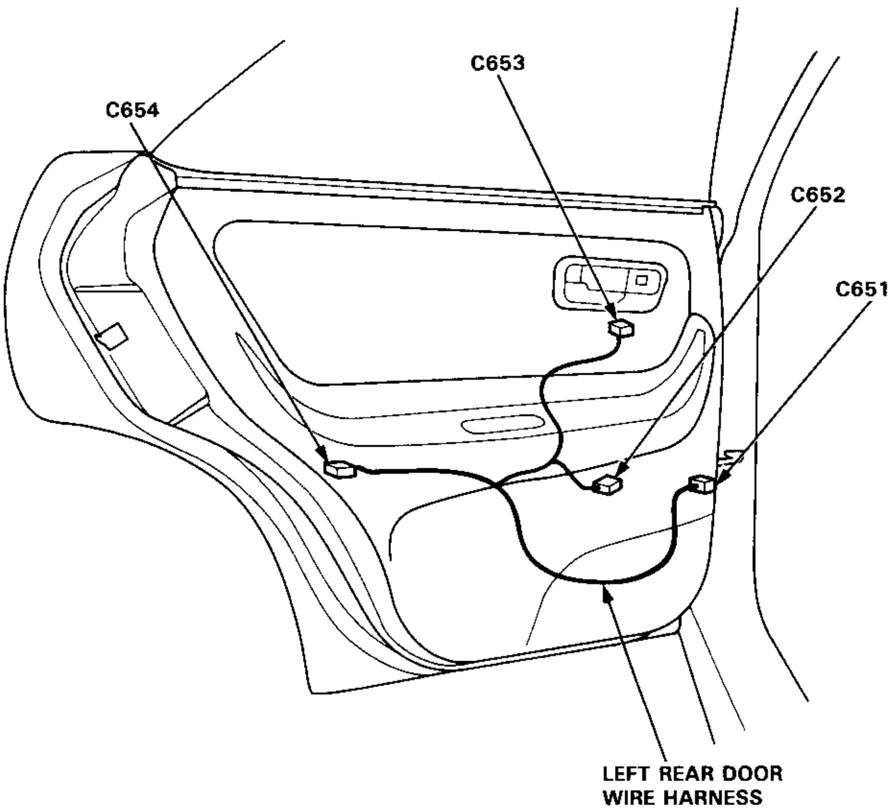
Connector Identification and Wire Harness Routing

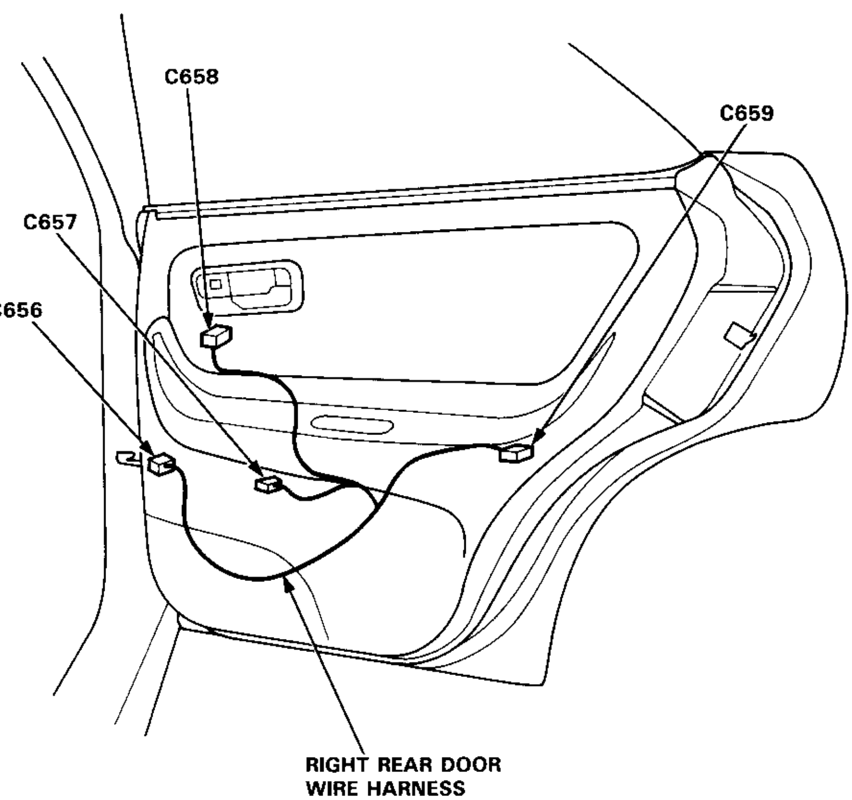
Left Rear Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C651	6	Left rear door	Rear wire harness (C527)	
C652	2	Left rear door	Left rear power window motor	
C653	5	Left rear door	Left rear power window switch	
C654	2	Left rear door	Left rear power door lock actuator	

Right Rear Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C656	6	Right rear door	Rear wire harness (C528)	
C657	2	Right rear door	Right rear power window motor	
C658	5	Right rear door	Right rear power window switch	
C659	2	Right rear door	Right rear power door lock actuator	

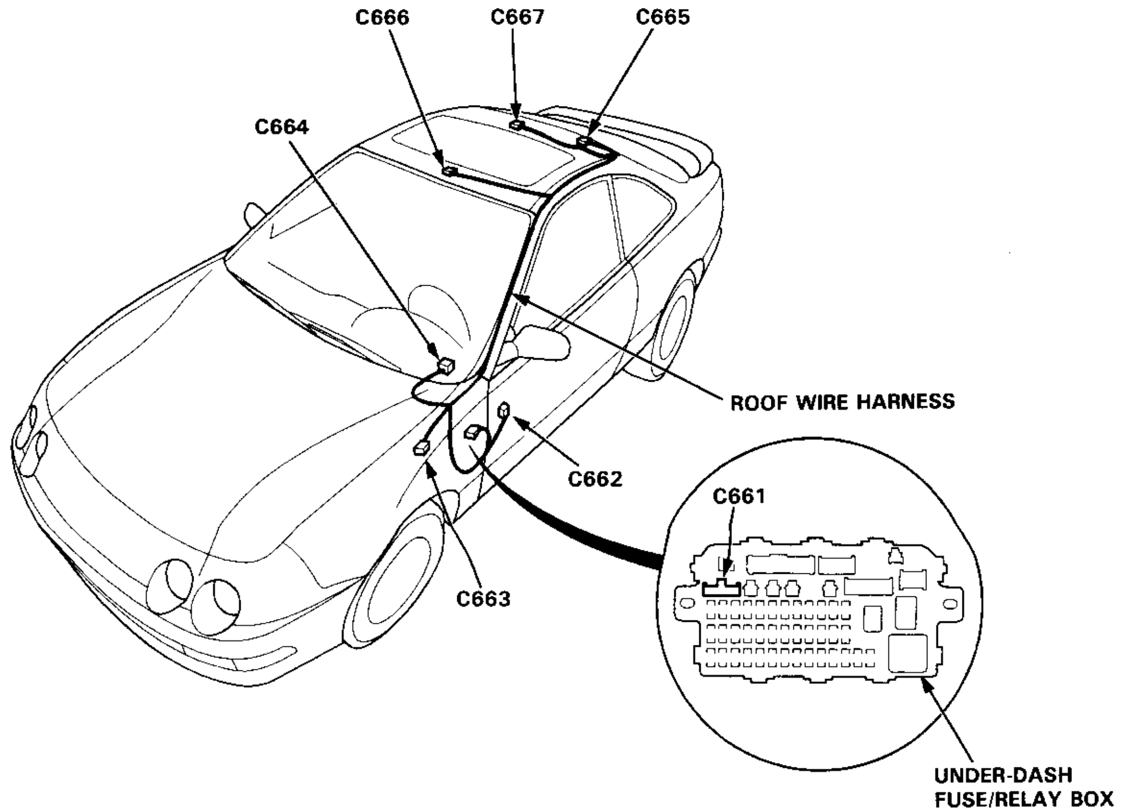

C653
C654
C652
C651
LEFT REAR DOOR
WIRE HARNESS


C658
C659
C657
C656
RIGHT REAR DOOR
WIRE HARNESS

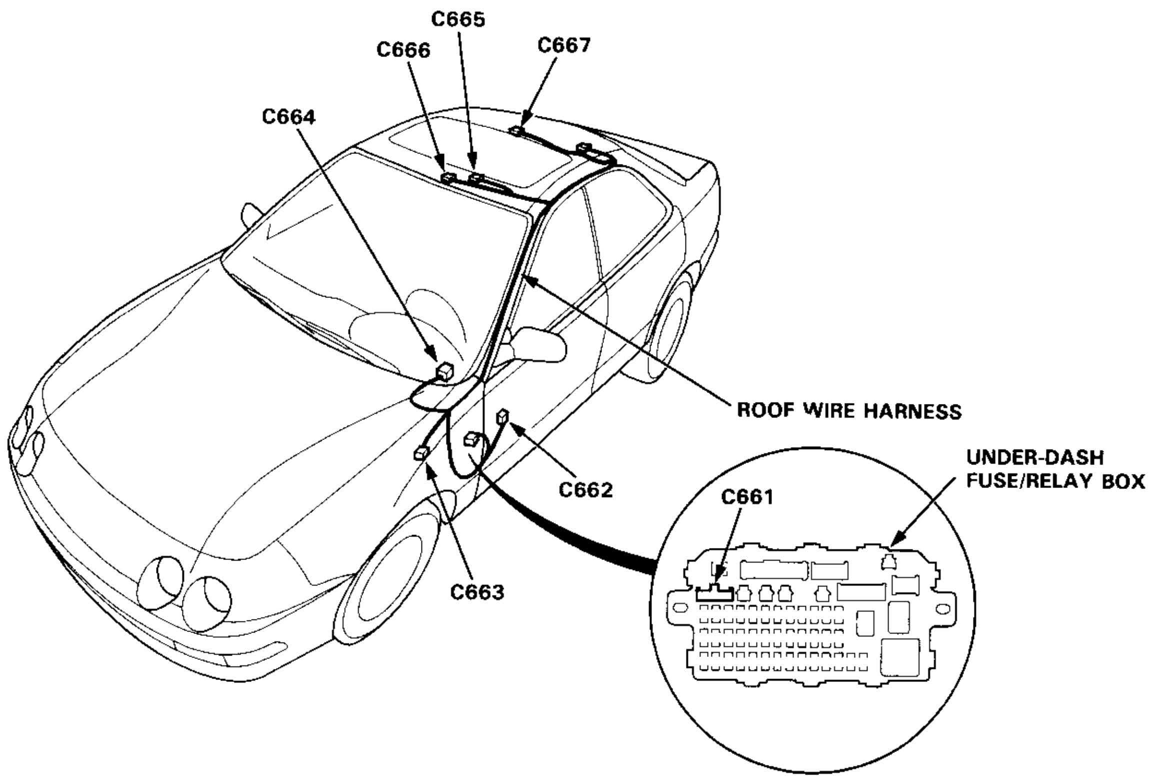
Roof Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C661	3	Behind left kick panel	Under-dash fuse/relay box (C919)	With moonroof
C662	4	Behind left kick panel	Moonroof relay	With moonroof
C663	2	Behind left kick panel	Main wire harness (C425)	
C664	4	Left side of dashboard	Moonroof switch	With moonroof
C665	2	Roof	Moonroof motor	With moonroof
C666	1	Roof	Spotlight	With moonroof
C667	3	Roof	Ceiling light	

Hatchback:



Sedan:

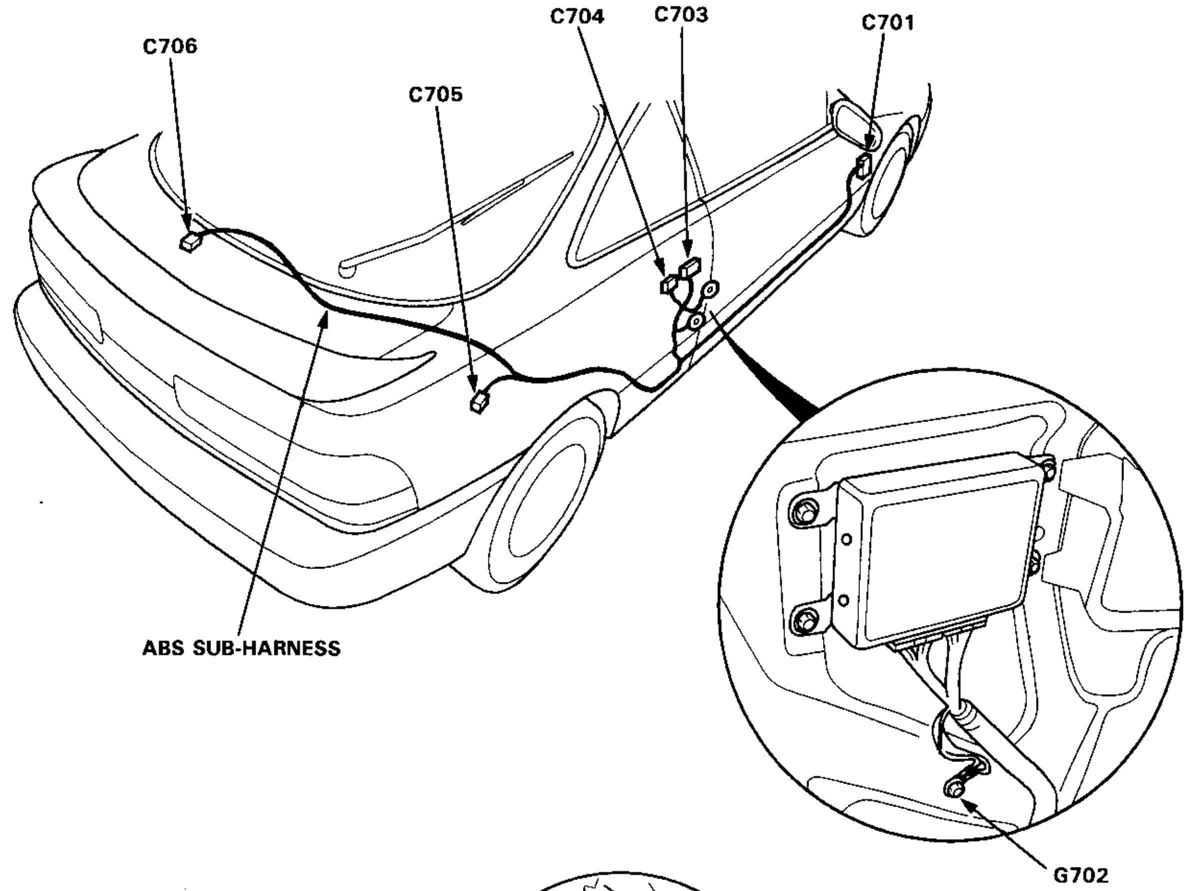


Connector Identification and Wire Harness Routing

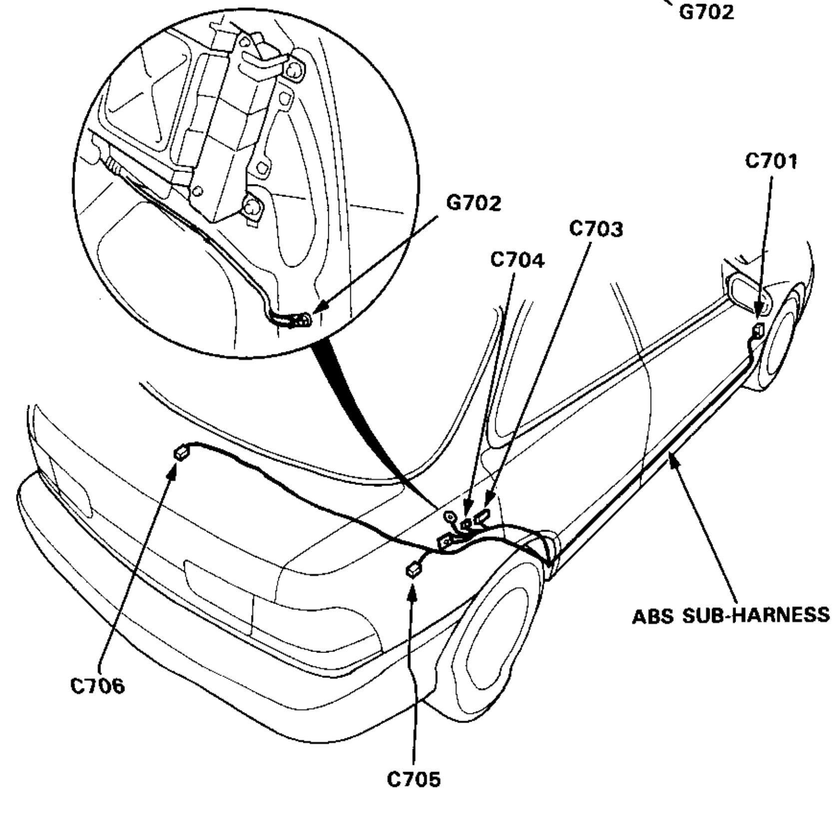
ABS Sub-harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C701	22	Behind right kick panel	Main wire harness (C407)	
C703	12	Right quarter panel	ABS control unit	
C704	22	Right quarter panel	ABS control unit	
C705	2	Right side of cargo area	ABS right rear wheel sensor	Hatchback
C705	2	Right side of trunk	ABS right rear wheel sensor	Sedan
C706	2	Left side of cargo area	ABS left rear wheel sensor	Hatchback
C706	2	Left side of trunk	ABS left rear wheel sensor	Sedan
G702		Right quarter panel	Body ground, via ABS sub-harness	

Hatchback:



Sedan:



Hatch Wire Harness (Hatchback)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C751	4	Right side of cargo area	Rear wire harness (C526)	*1
C752	2	Right side of cargo area	Rear wire harness (C525)	
C753	1	Right side of rear window	Rear window defogger (+)	
C754	2	Right side of hatch	Spoiler sub-harness (C761)	
C755	4	Middle of hatch	Rear window wiper motor	
C756	2	Middle of hatch	High mount brake light	
C757	2	Right side of cargo area	Rear wire harness (C527)	
C758	2	Middle of hatch	Tailgate open switch	
G751		Right side of hatch	Body ground, via hatch wire harness	

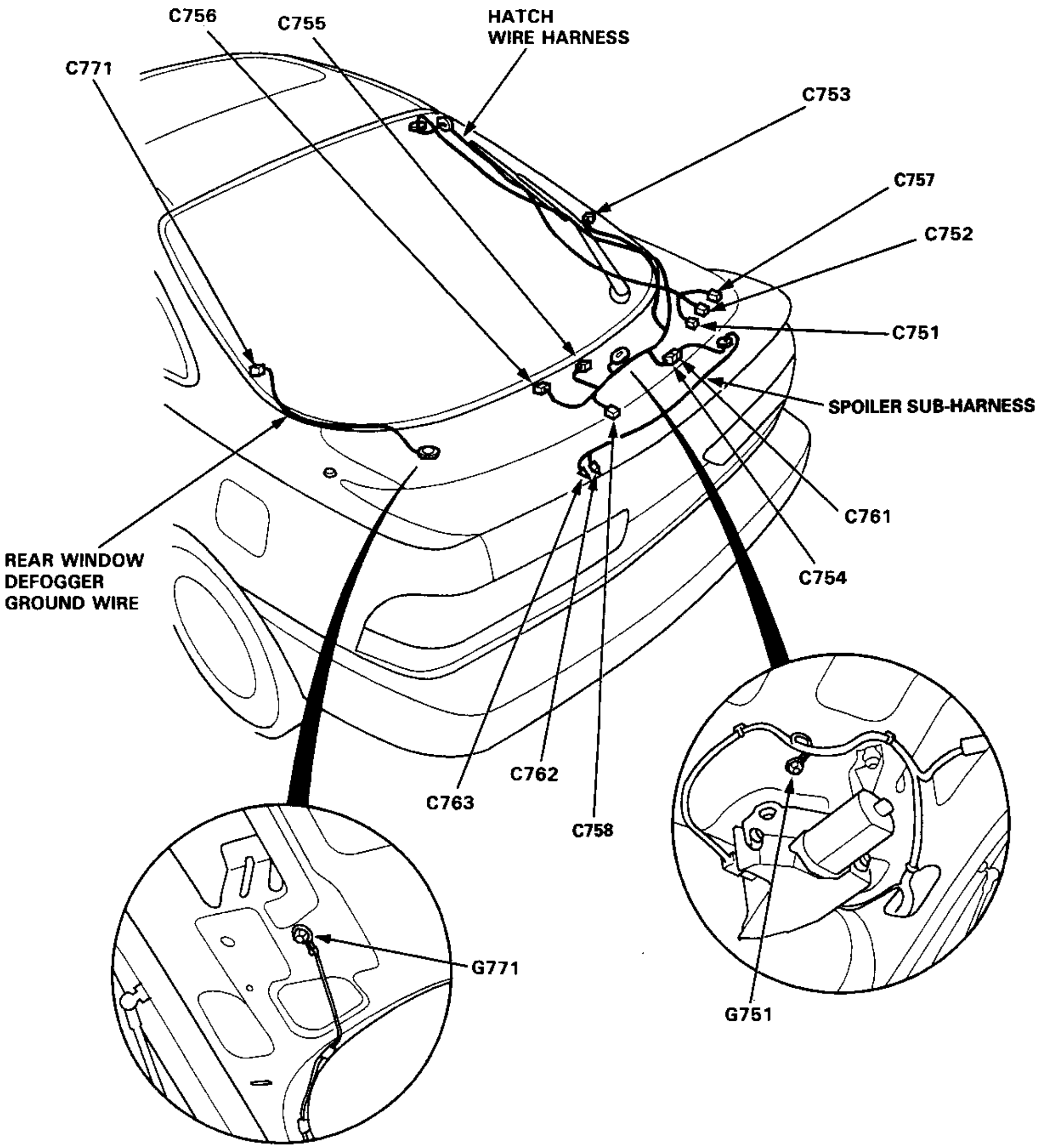
*1: Hatchback with rear spoiler

Spoiler Sub-harness (Hatchback with Rear Spoiler)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C761	2	Right side of hatch	Hatch wire harness (C754)	
C762	1	Middle of hatch	High mount brake light (+)	
C763	1	Middle of hatch	High mount brake light (–)	

Rear Window Defogger Ground Wire (Hatchback)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C771	1	Left side of rear window	Rear window defogger (–)	
G771		Left side of rear window	Body ground, via rear window defogger ground wire	


C756
C755
HATCH
WIRE HARNESS
C771
C753
C757
C752
C751
SPOILER SUB-HARNESS
C761
C754
REAR WINDOW
DEFOGGER
GROUND WIRE
C762
C763
C758
G771
G751

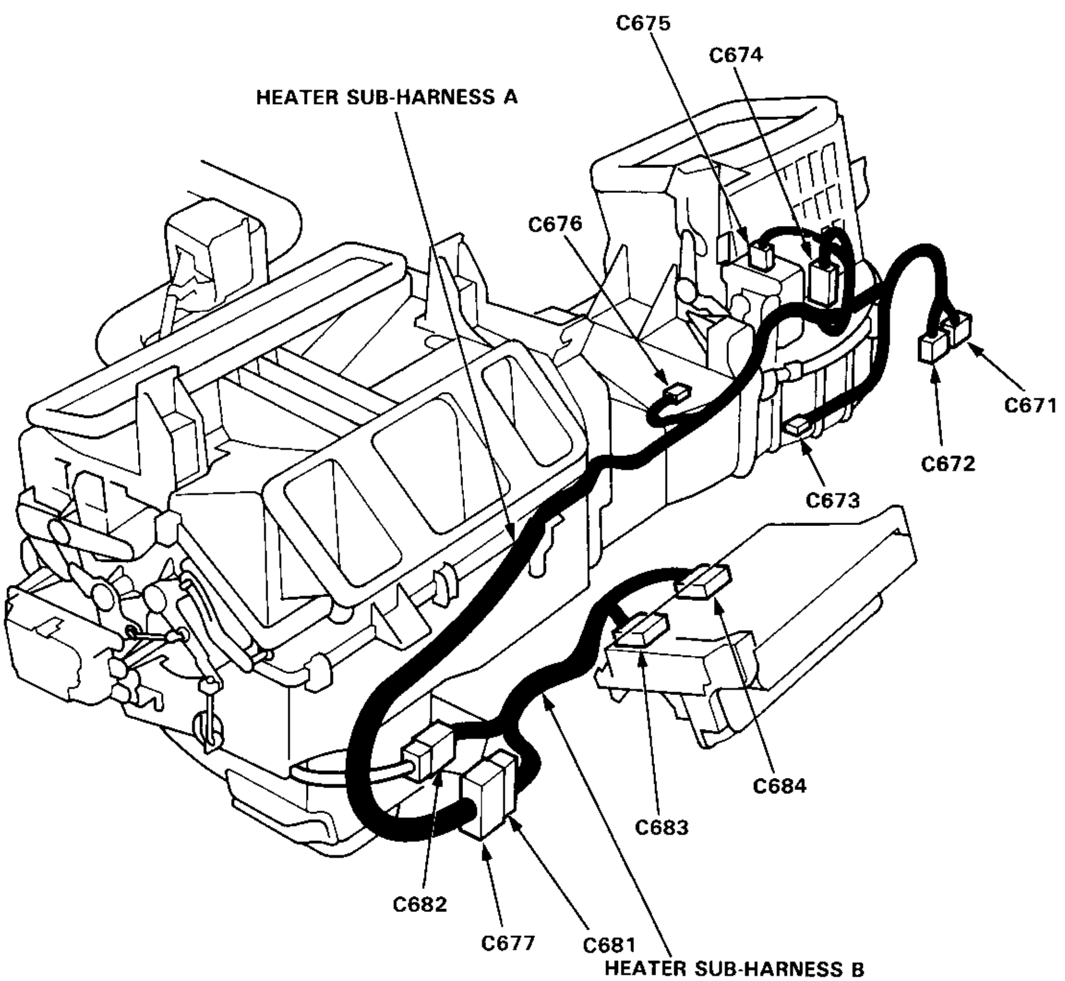
Connector Identification and Wire Harness Routing

Heater Sub-harness A

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C671	10	Under right side of dash	Main wire harness (C404)	
C672	2	Under right side of dash	Main wire harness (C403)	
C673	2	Under right side of dash	Blower motor	
C674	4	Behind glove box	Blower resistor	
C675	4	Behind glove box	Recirculation control motor	
C676	3	Behind glove box	A/C thermostat	
C677	14	Behind middle of dash	Heater sub-harness B (C681)	

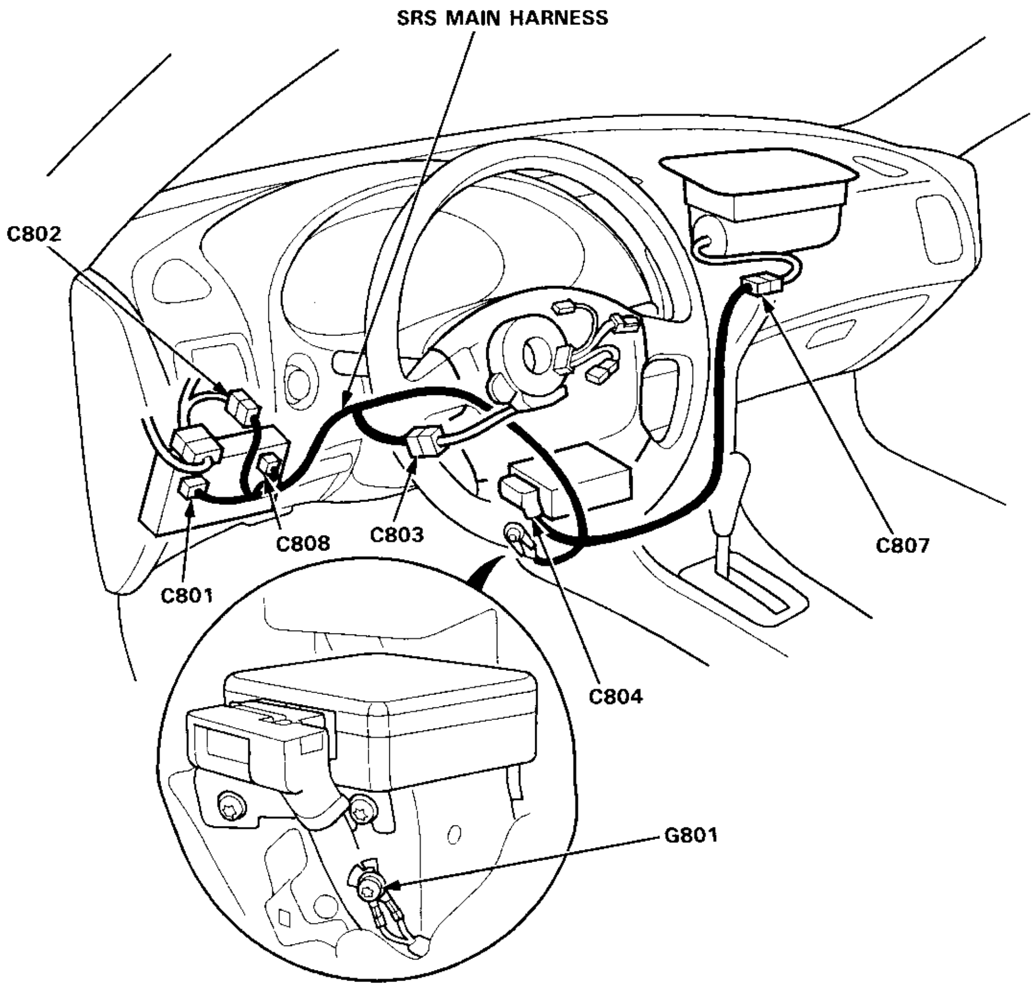
Heater Sub-harness B

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C681	14	Behind middle of dash	Heater sub-harness A (C677)	
C682	8	Middle of floor	Mode control motor	
C683	6	Behind middle of dash	Heater fan switch	
C684	14	Behind middle of dash	Heater control panel	



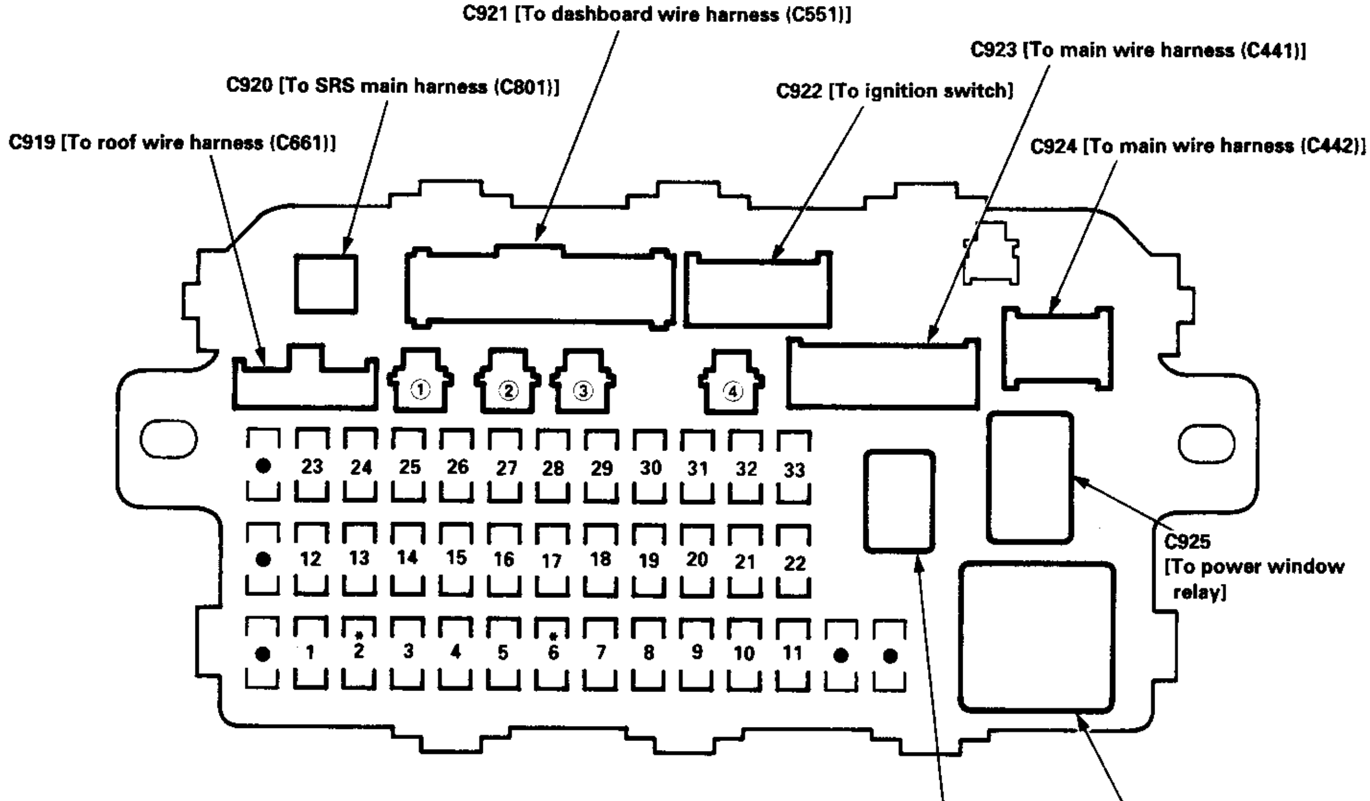
SRS Main Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C801 C802 C803 C804 C807 C808	2 3 2 18 2 2	Behind dashboard lower cover Under left side of dash Under left side of dash Middle of floor Behind glove box Under left side of dash	Under-dash fuse/relay box (C920) Main wire harness (C427) Cable reel SRS unit Front passenger's airbag assembly Memory erase signal (MES) connector	
G801		Middle of floor	Body ground, via SRS main harness	



Fuses

Under-dash Fuse/Relay Box



●: Spare fuse
1: Option connector (+B)
2: Option connector (Dash lights)
3: Option connector (ACC)
4: Option connector (IG2)
*: Not used

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	20 A	WHT/GRN	Power door lock control unit
2	——	——	Not used
3	10 A	GRN/WHT	Rear window washer motor
		GRN/BLK	Rear window wiper motor
4	10 A	RED/BLU	Right headlight (high beam)
5	10 A	RED/GRN	Left headlight (high beam), high beam indicator light
6	——	——	Not used
7	20 A	GRN/BLK	Left rear power window motor
8	20 A	YEL/BLK	Right rear power window motor
9	15 A	BLK/YEL	Ignition coil
10	20 A	BLU/BLK	Passenger's power window motor
11	20 A	WHT/YEL	Power window master switch, power window control unit

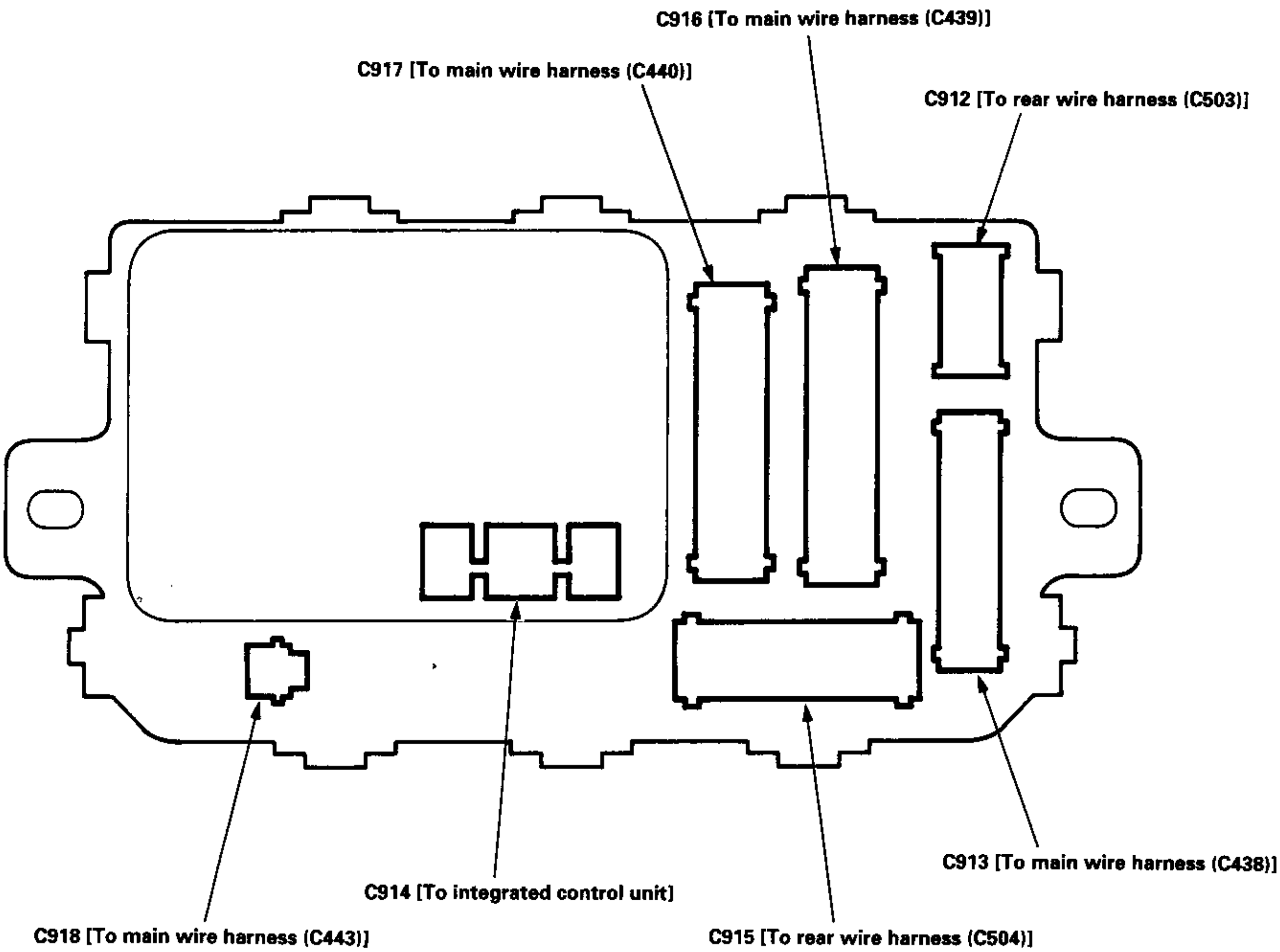
Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
12	10 A	YEL/BLK	Turn signal/hazard relay
13	15 A	YEL/GRN	PGM-FI main relay
		GRN or RED	SRS unit (VA)
14	7.5 A	BLK/WHT	Cruise control system
15	7.5 A	BLK/YEL	Alternator, VSS, ELD unit (USA), TCM, charging system light
16	7.5 A	BLK/BLU	ABS control unit, rear window defogger relay (Via switch)
17	7.5 A	BLK/YEL	A/C system, heater system, power mirror
18	7.5 A	YEL/BLK	Daytime running lights relay (Canada)
19	7.5 A	YEL	Back-up lights
20	10 A	WHT/YEL	Daytime running lights control unit (Canada)
21	10 A	RED/WHT	Right headlight (low beam)
22	10 A	RED/YEL	Left headlight (low beam)
23	10 A	GRN or PNK	SRS unit (VB)
24	7.5 A	GRN/ORN	Moonroof relays
		——	Power window relay
25	7.5 A	YEL/BLU	Clock, gauge and indicator lights
		——	Integrated control unit
26	20 A	GRN/BLK	Windshield wiper motor, windshield washer motor
27	10 A	YEL/GRN	Cigarette lighter
28	10 A	YEL/RED	Audio unit connector
29	7.5 A	——	Integrated control unit
30	7.5 A	RED/BLK	Dash lights, clock
		——	Integrated control unit
31	7.5 A	BLU/WHT	ECM, PGM-FI main relay
32	10 A	RED/BLK	Front parking lights, taillights, license plate lights
33	7.5 A	WHT/GRN	Interlock control unit, key interlock solenoid

(cont'd)

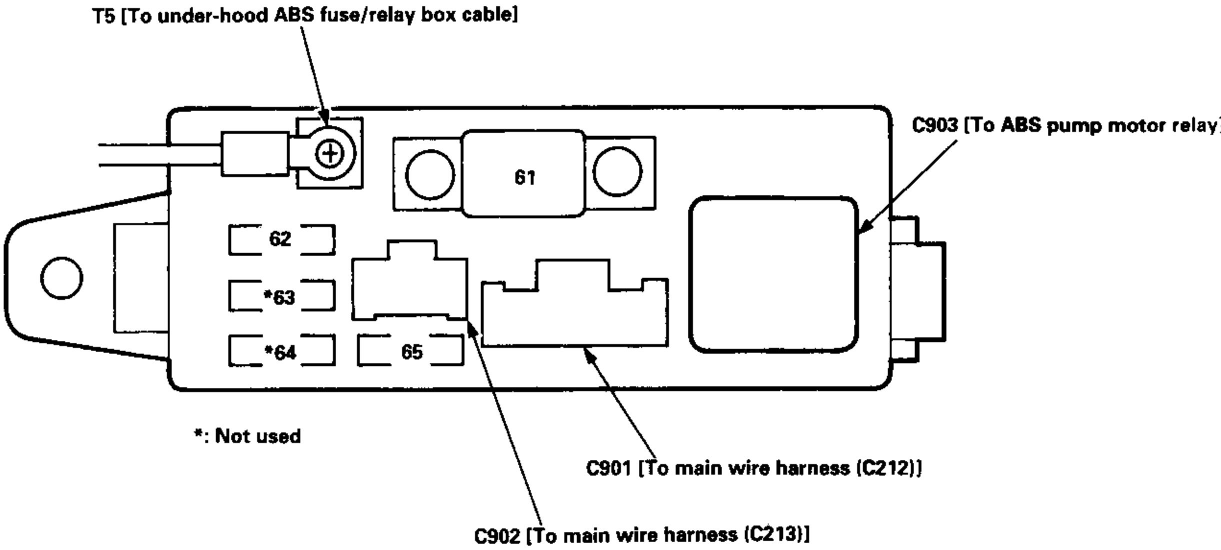
Fuses

Under-dash Fuse/Relay Box (cont'd)

NOTE: View from the backside of the under-dash fuse/relay box.



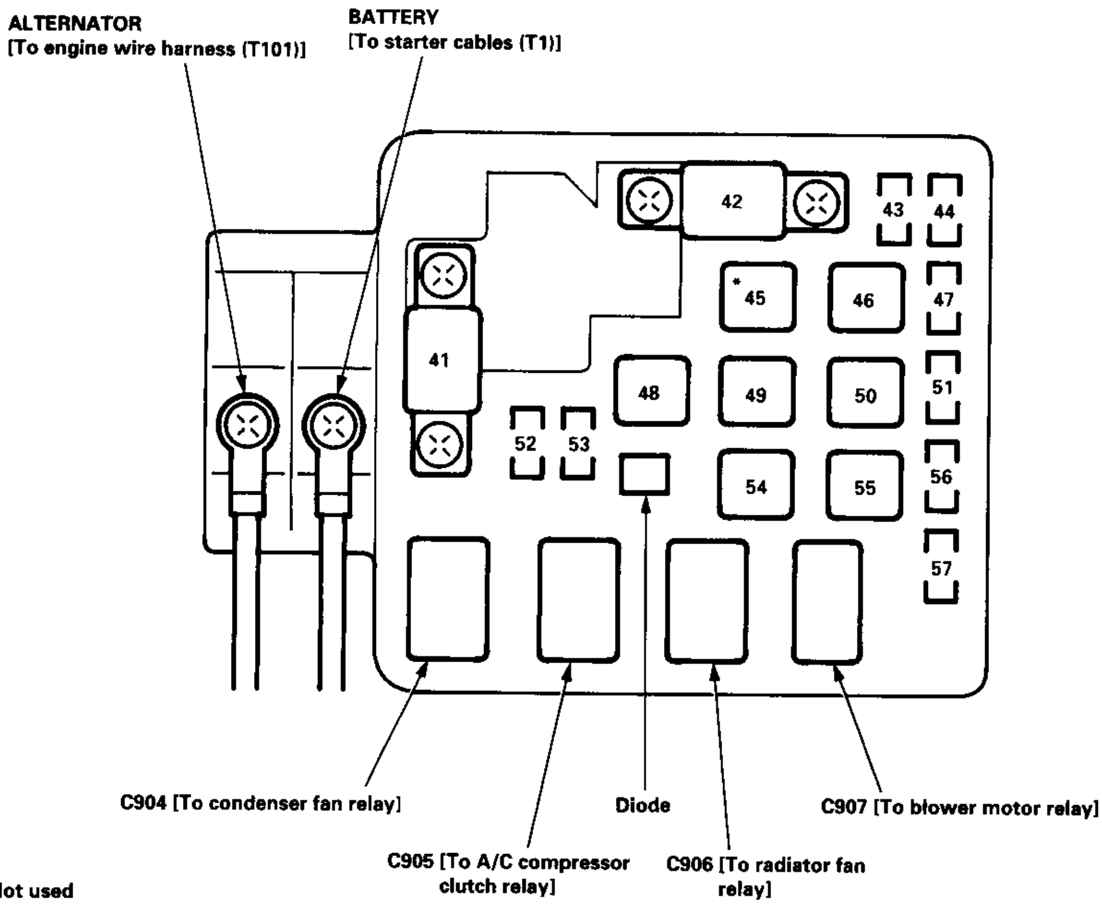
Under-hood ABS Fuse/Relay Box



Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
61	40 A	WHT	ABS pump motor
		——	No. 65 (10 A) fuse
62	20 A	WHT/GRN	ABS modulator unit (Via ABS fail-safe relay), ABS pump motor relay (Via ABS fail-safe relay)
63	——	——	Not used
64	——	——	Not used
65	10 A	BRN/YEL	ABS control unit (MCK)

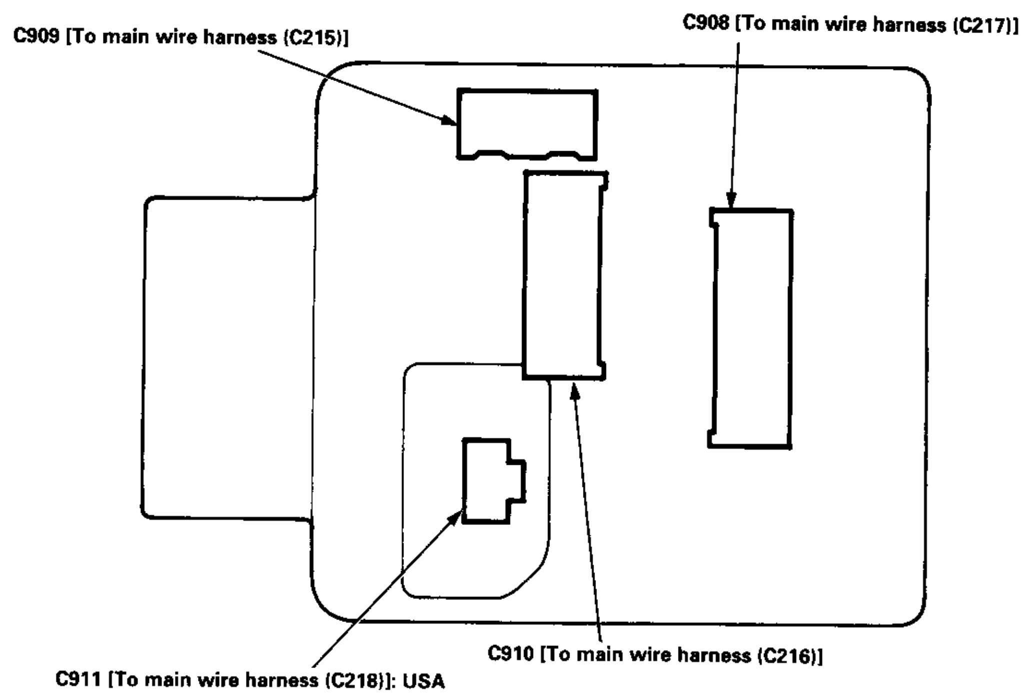
Fuses

Under-hood Fuse/Relay Box



*: Not used

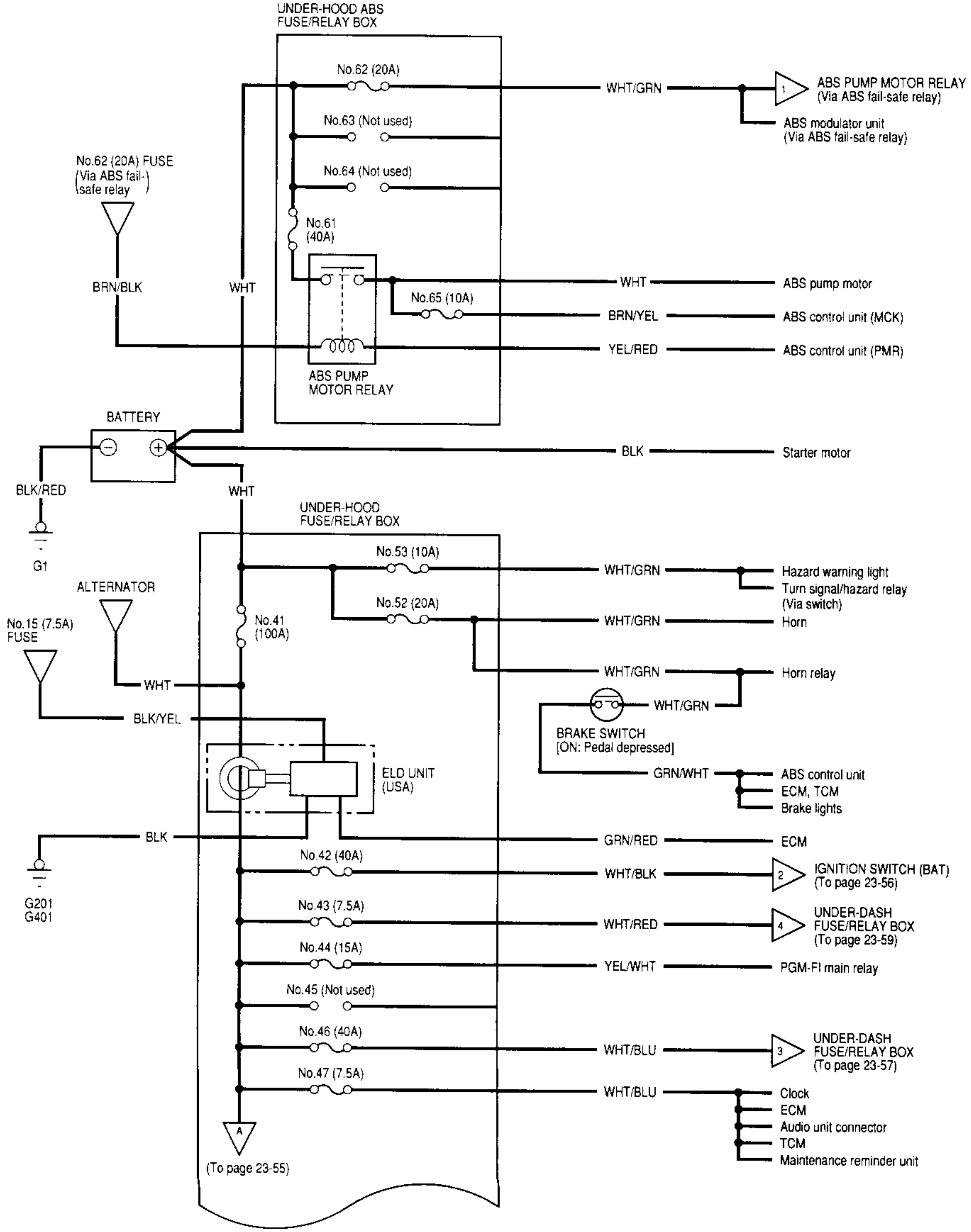
NOTE: View from the backside of the under-hood fuse/relay box.

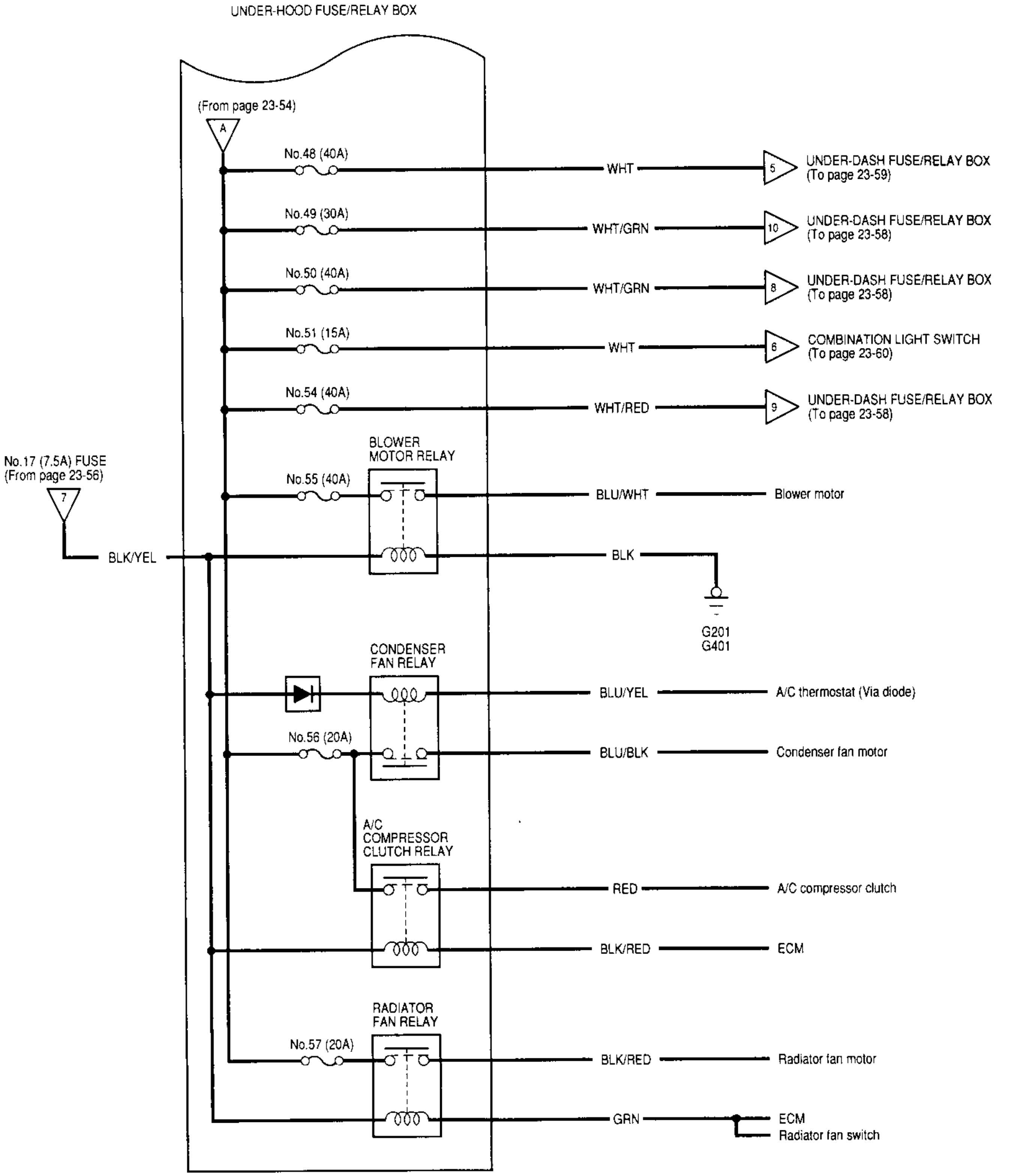


Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
41	100 A	——	Battery, power distribution
42	40 A	WHT/BLK	Ignition switch (BAT)
43	7.5 A	WHT/RED	Ceiling light, cargo area light, data link connector (DLC), power antenna connector
44	15 A	YEL/WHT	PGM-FI main relay
45	——	——	Not used
46	40 A	WHT/BLU	No. 7 (20 A) fuse (Via power window relay), No. 8 (20 A) fuse (Via power window relay) No. 10 (20 A) fuse (Via power window relay), No. 11 (20 A) fuse (Via power window relay)
47	7.5 A	WHT/BLU	Clock, audio unit connector, ECM, TCM, Maintenance reminder unit
48	40 A	WHT	Combination light switch (Headlight)
49	30 A	WHT/BLU	Moonroof relay
50	40 A	WHT/GRN	Rear window defogger (Via rear window defogger relay)
51	15 A	WHT	Combination light switch (Dash lights)
52	20 A	WHT/GRN	Horn, horn relay, brake lights, ABS control unit, ECM, TCM
53	10 A	WHT/GRN	Turn signal/hazard relay, hazard warning light
54	40 A	WHT/RED	No. 1 (20 A) fuse
55	40 A	BLU/WHT	Blower motor (Via blower motor relay)
56	20 A	BLU/BLK	Condenser fan motor (Via condenser fan motor relay)
		RED	A/C compressor clutch (Via A/C compressor clutch relay)
57	20 A	BLK/RED	Radiator fan motor (Via radiator fan relay)

Power Distribution

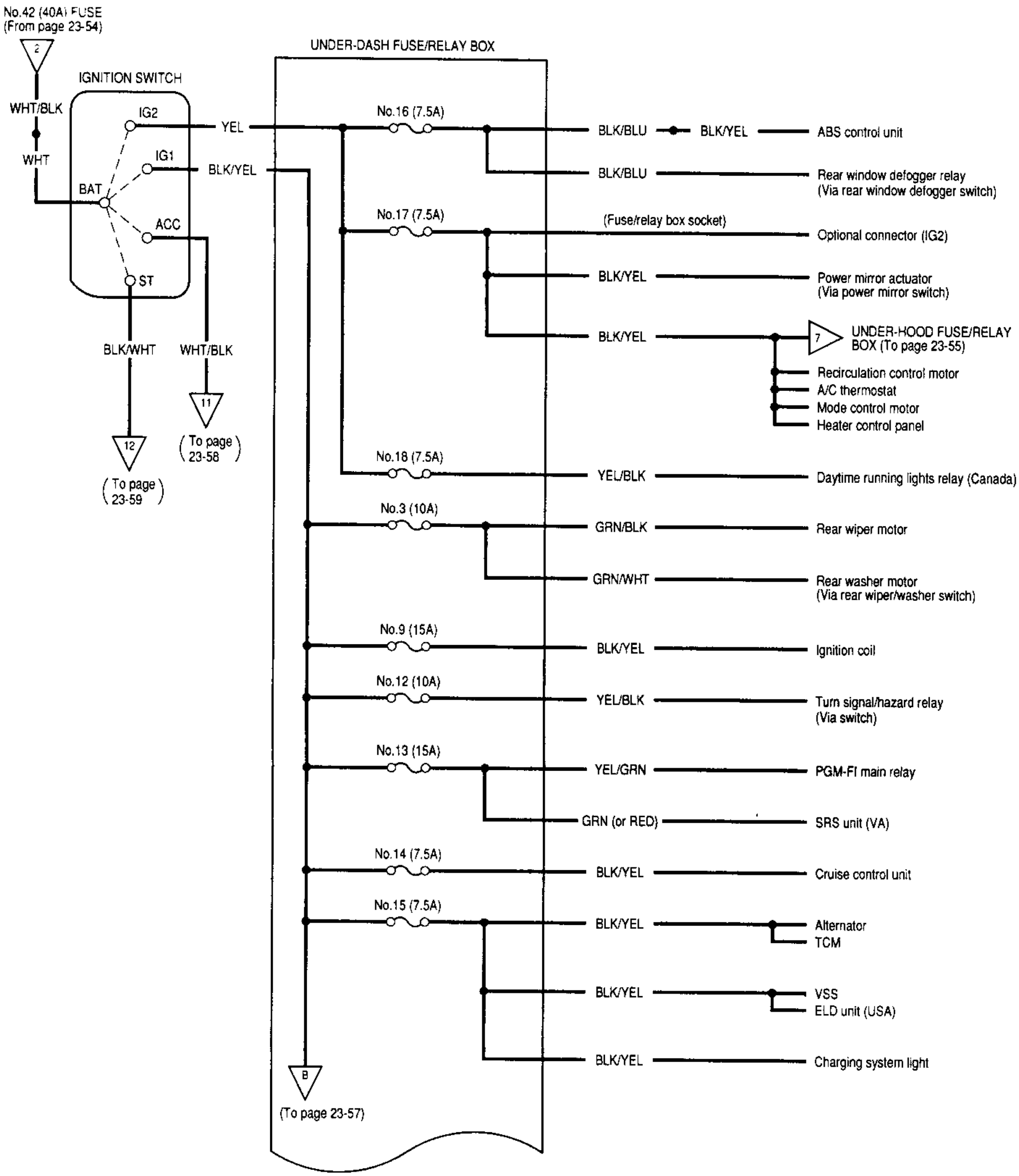
Circuit Identification

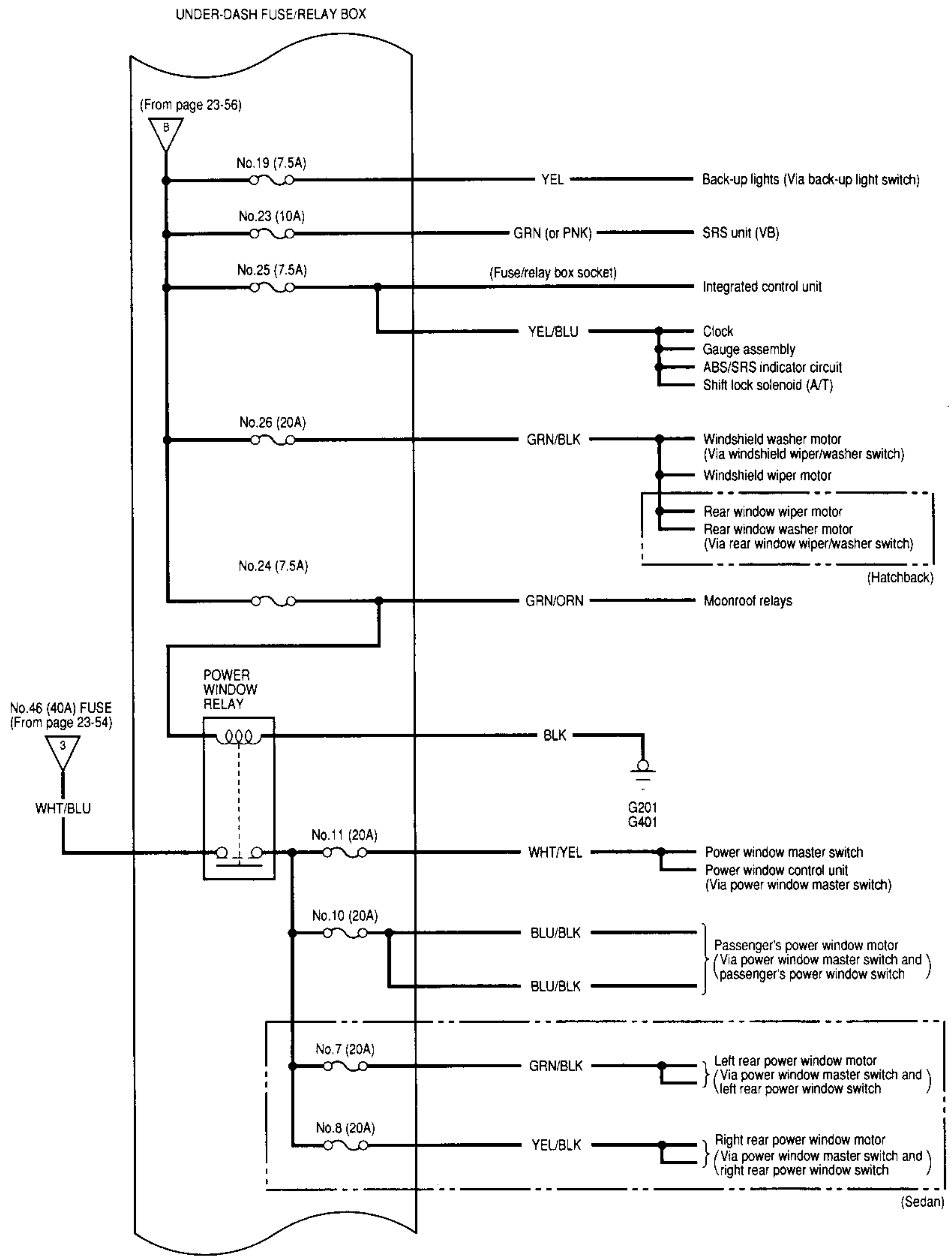



UNDER-HOOD FUSE/RELAY BOX
(From page 23-54)
A
No.48 (40A)
WHT
5
UNDER-DASH FUSE/RELAY BOX
(To page 23-59)
No.49 (30A)
WHT/GRN
10
UNDER-DASH FUSE/RELAY BOX
(To page 23-58)
No.50 (40A)
WHT/GRN
8
UNDER-DASH FUSE/RELAY BOX
(To page 23-58)
No.51 (15A)
WHT
6
COMBINATION LIGHT SWITCH
(To page 23-60)
No.54 (40A)
WHT/RED
9
UNDER-DASH FUSE/RELAY BOX
(To page 23-58)
No.17 (7.5A) FUSE
(From page 23-56)
7
BLK/YEL
BLOWER
MOTOR RELAY
No.55 (40A)
BLU/WHT
Blower motor
BLK
G201
G401
CONDENSER
FAN RELAY
BLU/YEL
A/C thermostat (Via diode)
No.56 (20A)
BLU/BLK
Condenser fan motor
A/C
COMPRESSOR
CLUTCH RELAY
RED
A/C compressor clutch
BLK/RED
ECM
RADIATOR
FAN RELAY
No.57 (20A)
BLK/RED
Radiator fan motor
GRN
ECM
Radiator fan switch

(cont'd)

Circuit Identification (cont'd)

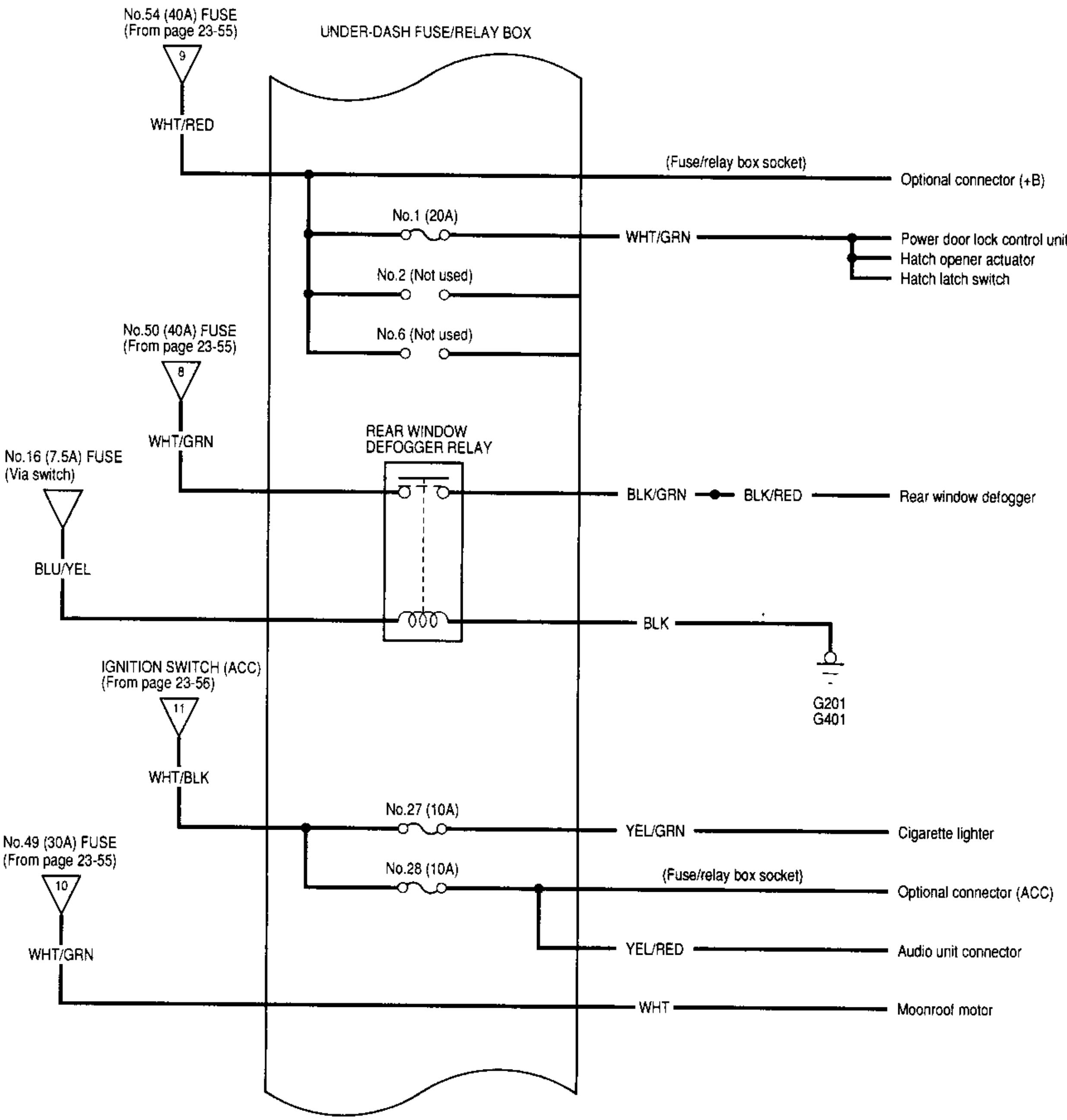


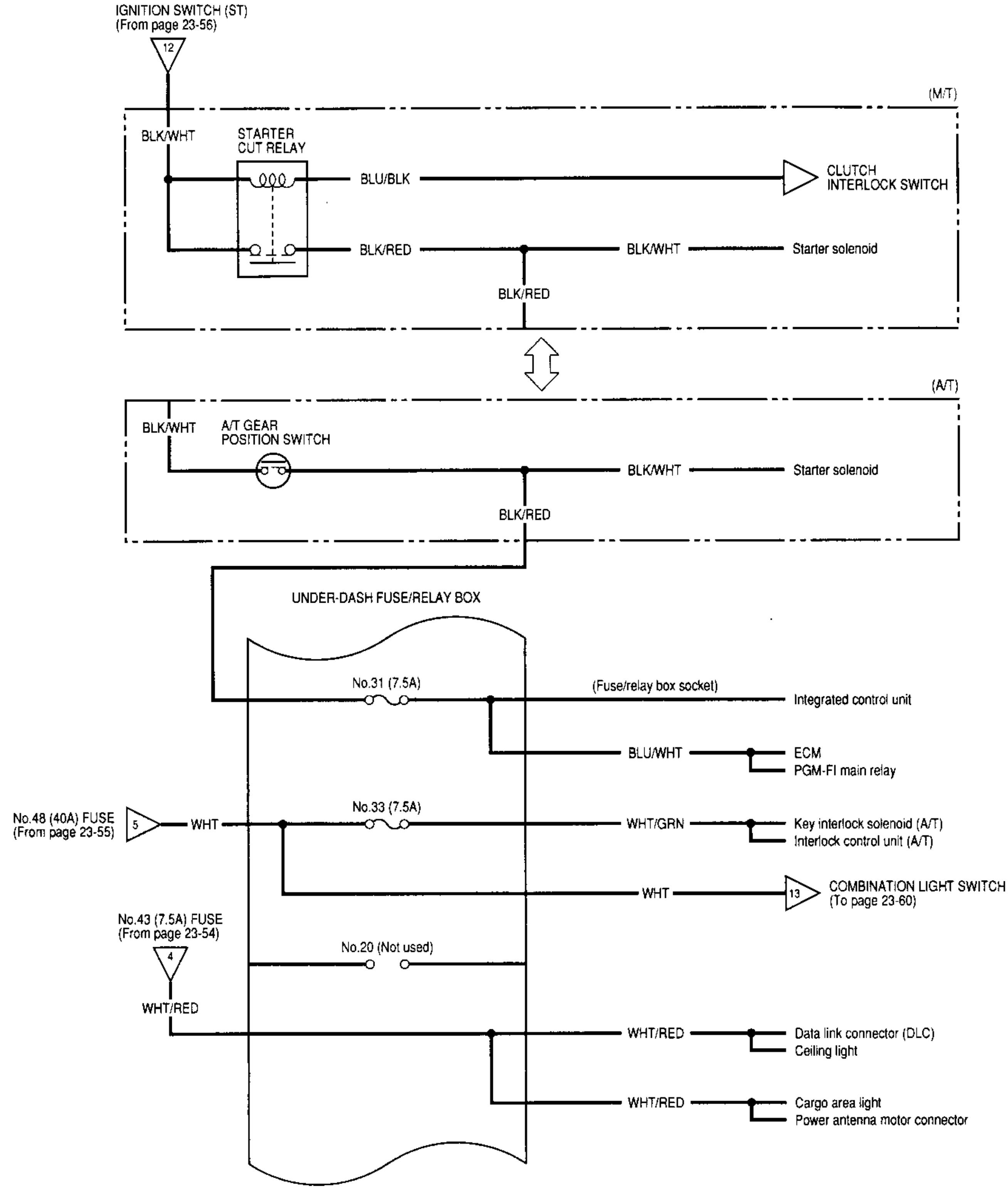


UNDER-DASH FUSE/RELAY BOX
(From page 23-56)
B
No.19 (7.5A)
YEL
Back-up lights (Via back-up light switch)
No.23 (10A)
GRN (or PNK)
SRS unit (VB)
No.25 (7.5A)
(Fuse/relay box socket)
Integrated control unit
YEL/BLU
Clock
Gauge assembly
ABS/SRS indicator circuit
Shift lock solenoid (A/T)
No.26 (20A)
GRN/BLK
Windshield washer motor
(Via windshield wiper/washer switch)
Windshield wiper motor
Rear window wiper motor
Rear window washer motor
(Via rear window wiper/washer switch)
(Hatchback)
No.24 (7.5A)
GRN/ORN
Moonroof relays
POWER
WINDOW
RELAY
No.46 (40A) FUSE
(From page 23-54)
3
WHT/BLU
BLK
G201
G401
No.11 (20A)
WHT/YEL
Power window master switch
Power window control unit
(Via power window master switch)
No.10 (20A)
BLU/BLK
BLU/BLK
Passenger's power window motor
(Via power window master switch and passenger's power window switch)
No.7 (20A)
GRN/BLK
Left rear power window motor
(Via power window master switch and left rear power window switch)
No.8 (20A)
YEL/BLK
Right rear power window motor
(Via power window master switch and right rear power window switch)
(Sedan)

(cont'd)

Circuit Identification (cont'd)

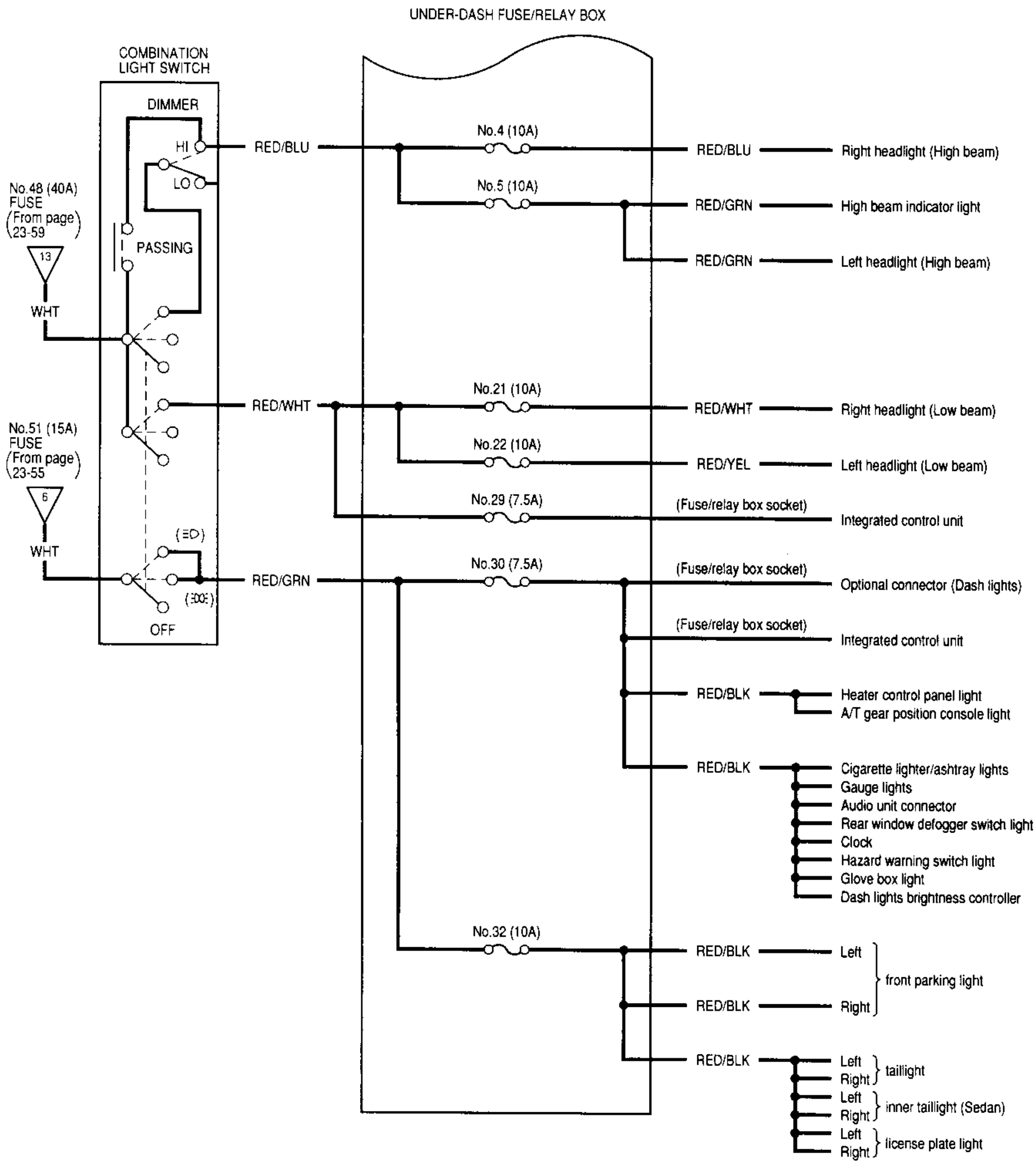




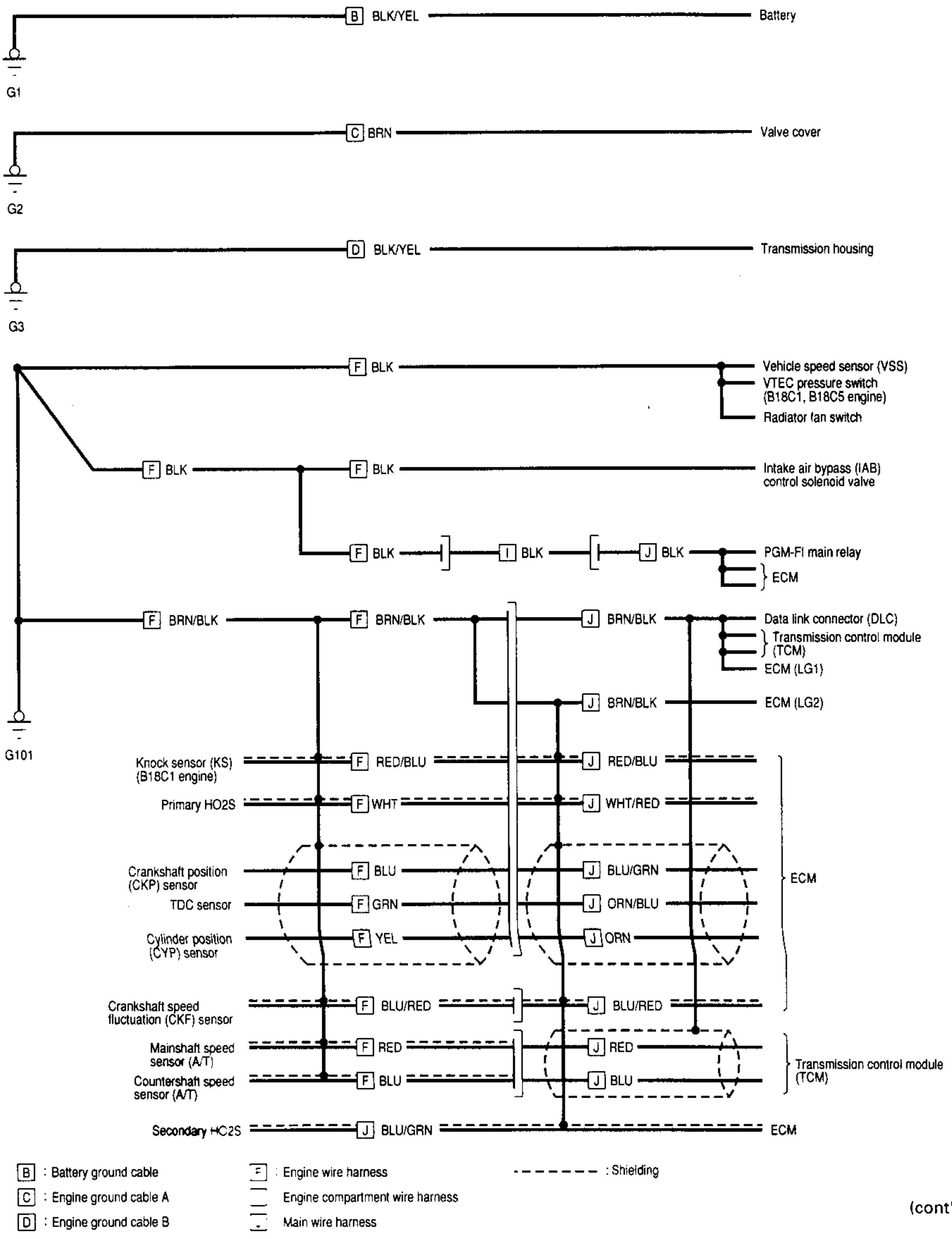
IGNITION SWITCH (ST)
(From page 23-56)
12
(M/T)
BLK/WHT
STARTER CUT RELAY
BLU/BLK
CLUTCH INTERLOCK SWITCH
BLK/RED
BLK/WHT
Starter solenoid
BLK/RED
(A/T)
BLK/WHT
A/T GEAR POSITION SWITCH
BLK/WHT
Starter solenoid
BLK/RED
UNDER-DASH FUSE/RELAY BOX
No.31 (7.5A)
(Fuse/relay box socket)
Integrated control unit
BLU/WHT
ECM
PGM-FI main relay
No.48 (40A) FUSE
(From page 23-55)
5
WHT
No.33 (7.5A)
WHT/GRN
Key interlock solenoid (A/T)
Interlock control unit (A/T)
WHT
13
COMBINATION LIGHT SWITCH
(To page 23-60)
No.43 (7.5A) FUSE
(From page 23-54)
4
No.20 (Not used)
WHT/RED
WHT/RED
Data link connector (DLC)
Ceiling light
WHT/RED
Cargo area light
Power antenna motor connector

(cont'd)

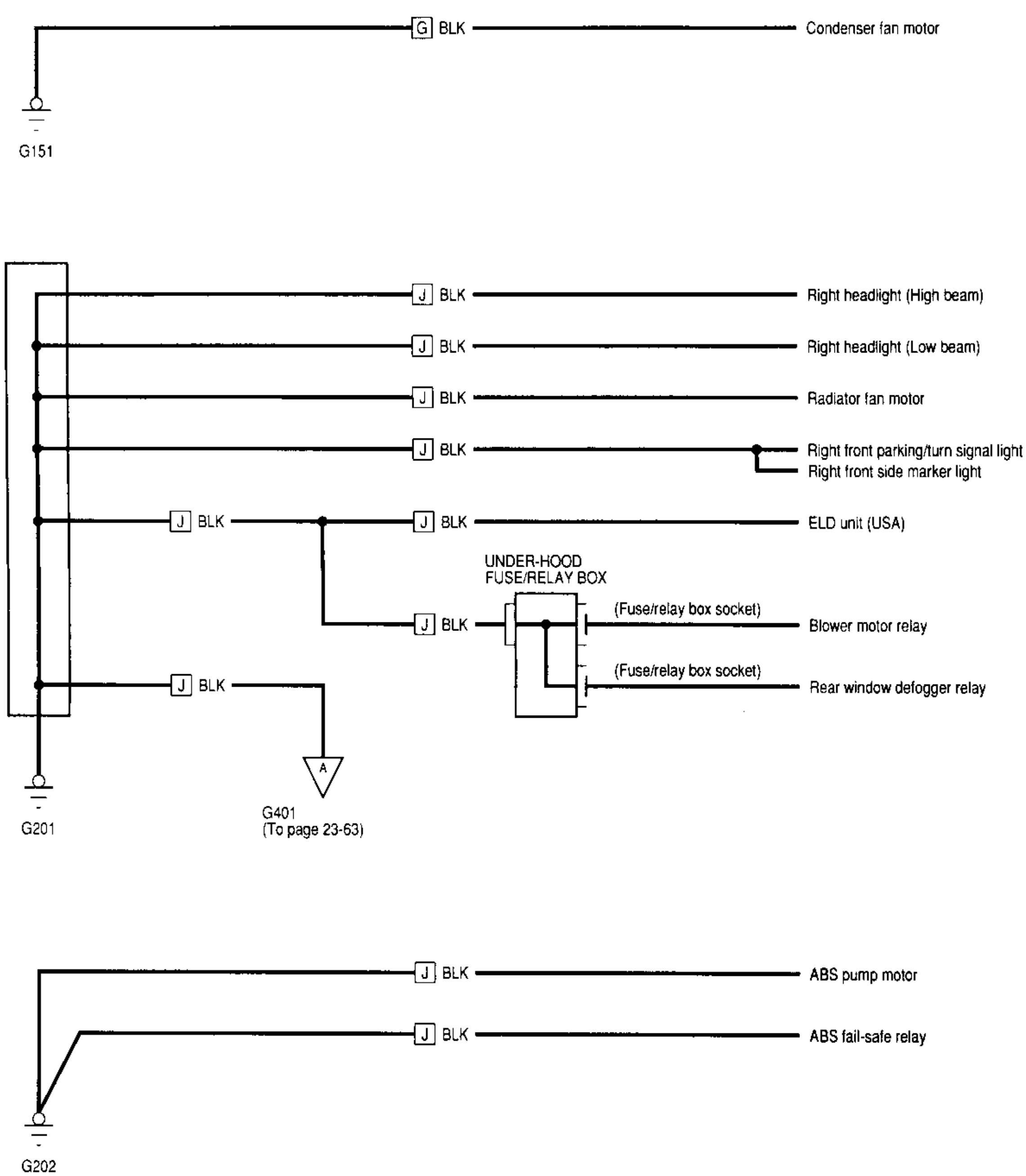
Circuit Identification (cont'd)



Circuit Identification

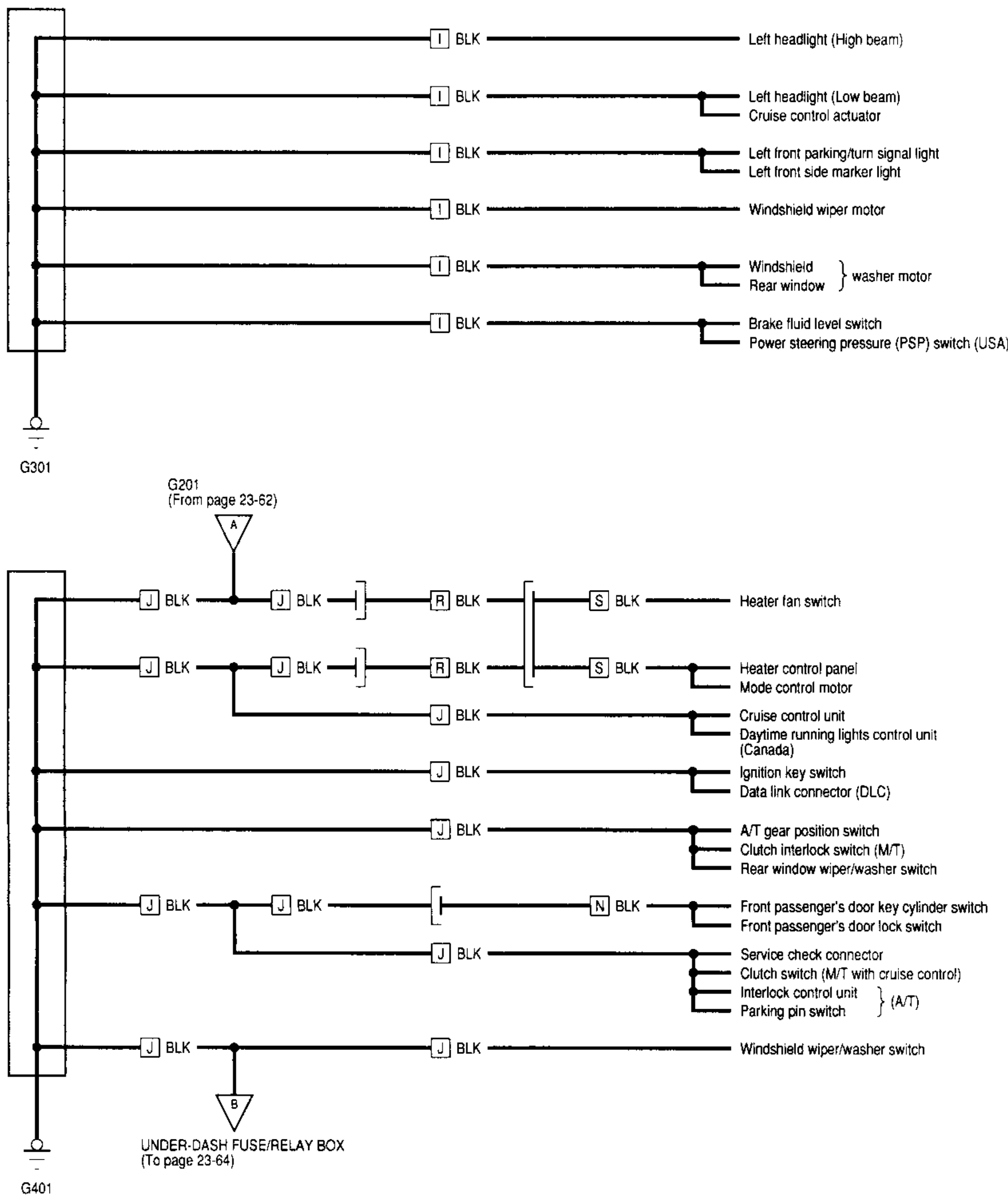


(cont'd)



G : A/C wire harness

J : Main wire harness



I : Engine compartment wire harness

J : Main wire harness

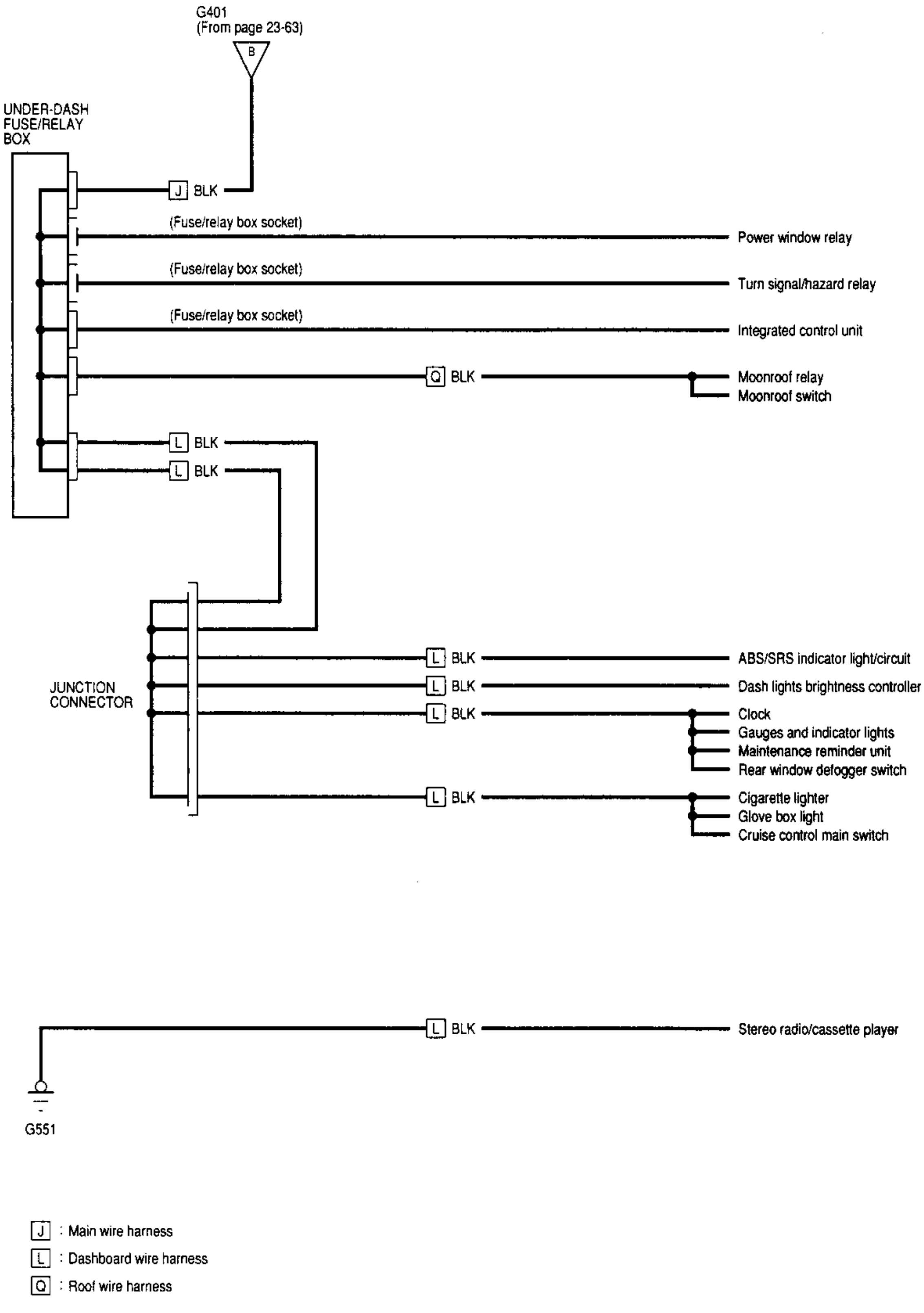
N : Front passenger's door wire harness

R : Heater sub-harness A

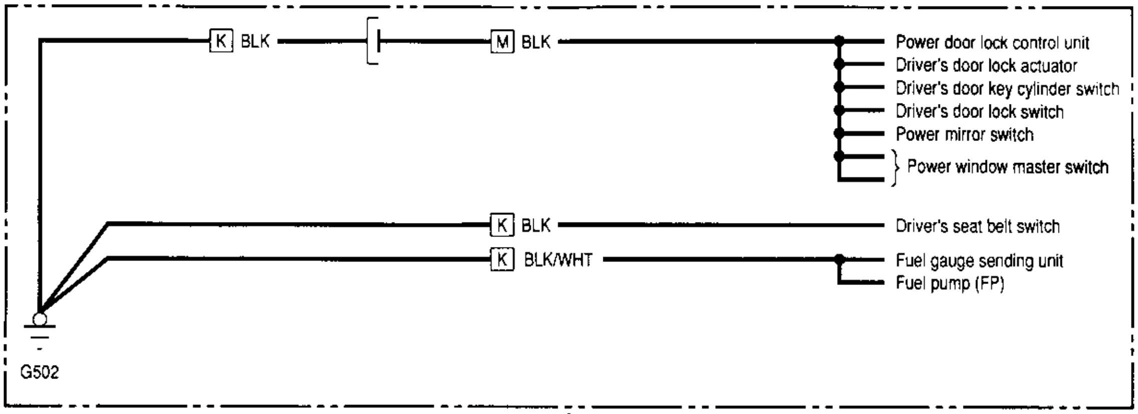
S : Heater sub-harness B

(cont'd)

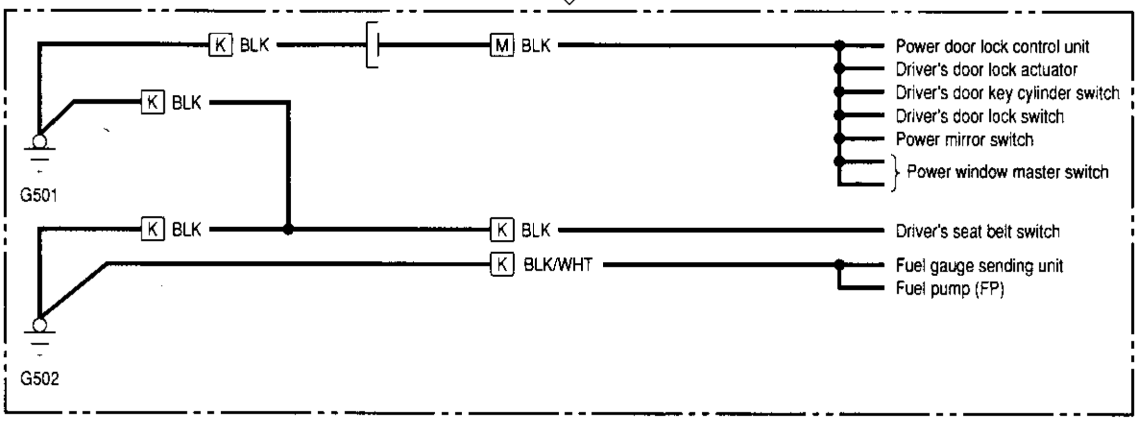
Circuit Identification (cont'd)



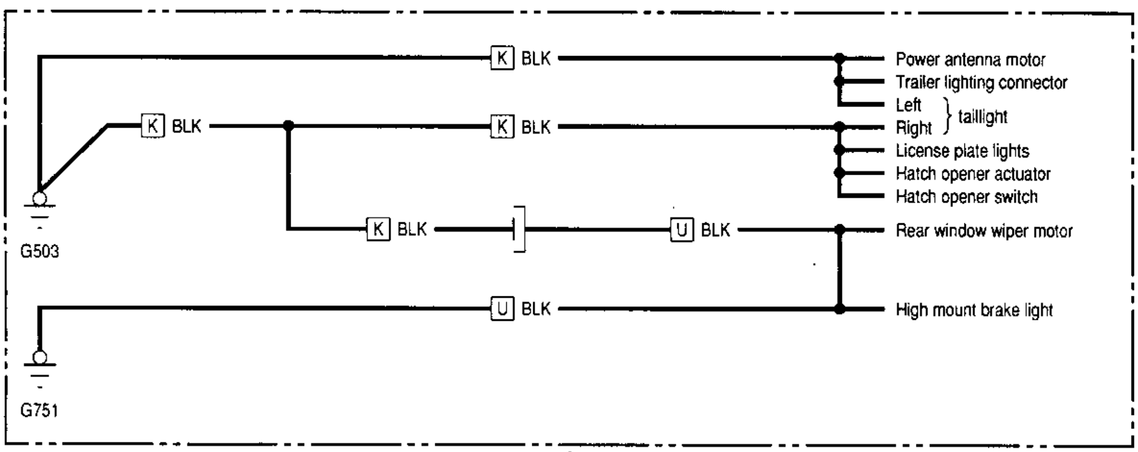
(Hatchback)



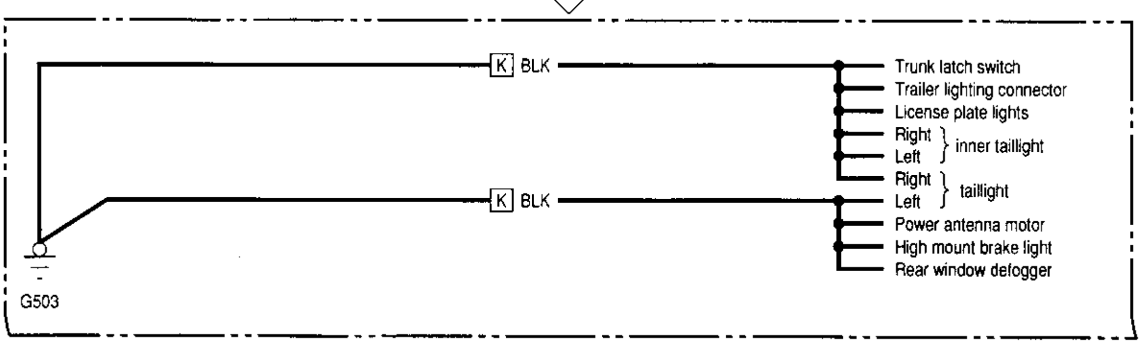
(Sedan)



(Hatchback)



(Sedan)

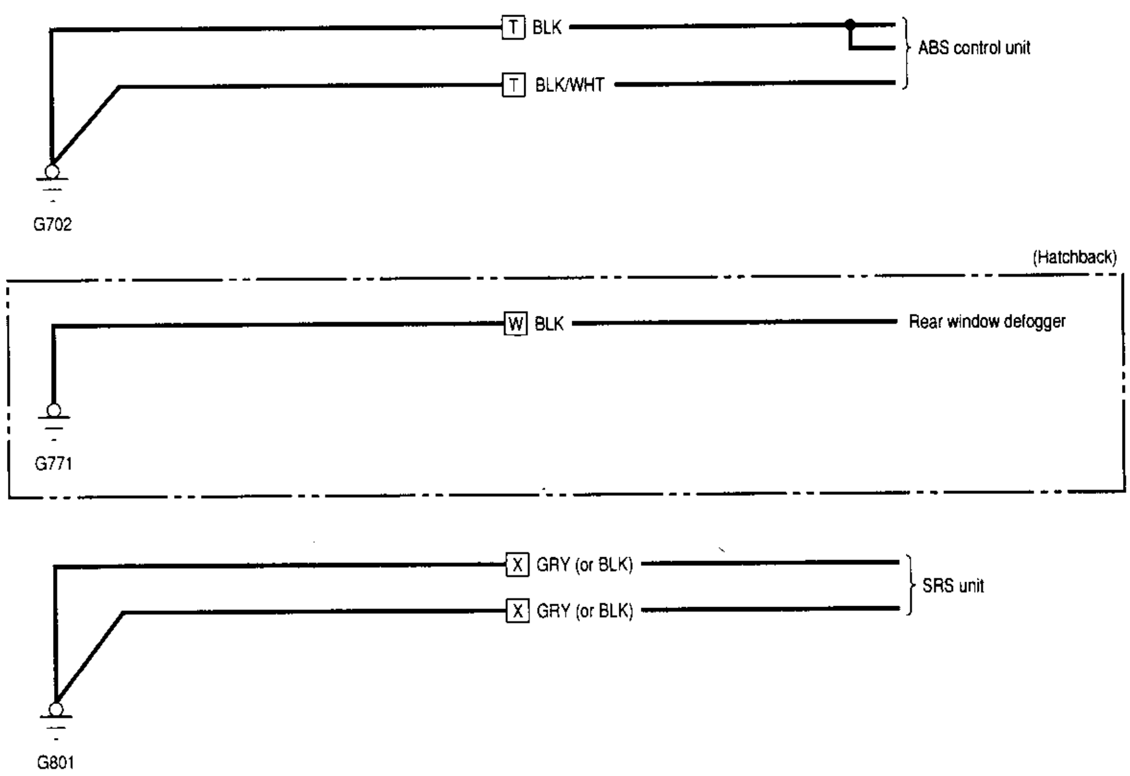


(cont'd)

K : Rear wire harness M : Driver's door wire harness U : Hatch wire harness

Ground Distribution

Circuit Identification (cont'd)



T : ABS sub-harness
W : Rear window defogger ground wire
X : SRS main harness

Test

⚠ WARNING

- Battery fluid (electrolyte) contains sulfuric acid. It may cause severe burns if it gets on your skin or in your eyes. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin or clothes, rinse it off with water immediately.
  - If electrolyte gets in your eyes, flush it out by splashing water in your eyes for at least 15 minutes; call a physician immediately.
- A battery gives off hydrogen gas. If ignited, the hydrogen will explode and could crack the battery case and splatter acid on you. Keep sparks, flames, and cigarettes away from the battery.
- Overcharging will raise the temperature of the electrolyte. This may force electrolyte to spray out of the battery vents. Follow the charger manufacturer's instructions and charge the battery at a proper rate.

NOTE: The original radio has a coded theft protection circuit. If service to the car requires any of the following, be sure to get the customer's code number before
— disconnecting the battery.
— removing No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word ''CODE'' is displayed, enter the customer's 5-digit code to restore radio operation.

Use either a JCI or Bear ARBST tester, and follow the manufacturer's procedures. If you don't have one of these computerized testers, follow this conventional test procedure:
To get accurate results, the temperature of the electrolyte must be between 70°F (21°C) and 100°F (38°C).

Check For Damage

If the case is cracked or the posts are loose, replace the battery.

Check Indicator EYE Color

If the indicator shows low electrolyte, add distilled water if possible.

EYE Indicates OK

EYE Indicates LOW CHARGE

Test Load Capacity (# 1)

- Apply 300 amp load for 15 seconds to remove surface charge.
- Allow 15 seconds recovery period.
- Apply test load (see Test Load Chart).
- Record voltage at the end of 15 seconds.

Voltage stays above 9.6 volts: The battery is OK.

Voltage drops below 9.6 volts.

Ⓐ

(cont'd)

Test (cont'd)

Ⓐ

Charge on High Setting (40 amps)

Charge until EYE shows charge is OK; plus an additional 30 minutes to assure full charge.
NOTE: If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.
If the EYE does not show charge is OK within three hours, the battery is no good; replace it.
Write down how long the battery was charged.

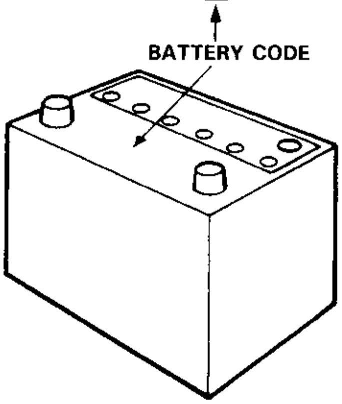
Test Load Capacity (#2)

- Apply 300 amp load for 15 seconds to remove surface charge.
- Allow 15 seconds recovery period.
- Apply test load (see Test Load Chart).
- Record voltage at the end of 15 seconds.

Voltage stays above 9.6 volts: The battery is OK.

Voltage drops below 9.6 volts: The battery is no good.

For example: 55B24L-MF



TEST LOAD CHART

Use the test load or 1/2 the cold cranking amps (CCA) printed on the label on the top of the battery. If neither is indicated, use the information below:

BATTERY CODE	COLD CRANKING AMPS (CCA)	TEST LOAD (amps)
55	405	200

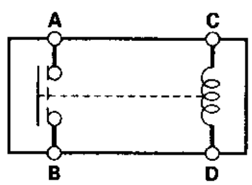
Relay Test

NOTE: See page 23-194 for turn signal/hazard relay input test.

Normally-open type:

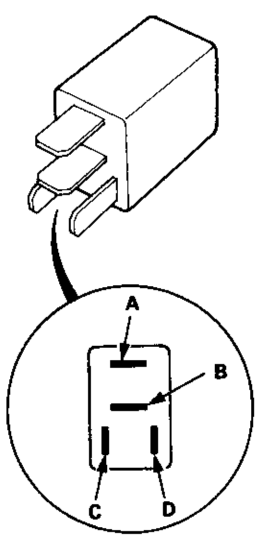
1. Check for continuity between the terminals.
   - There should be continuity between the A and B terminals when power and ground are connected to the C and D terminals.
   - There should be no continuity between the A and B terminals when power is disconnected.

Terminal / Power (C – D)	A	B
Disconnected		
Connected	O—	—O

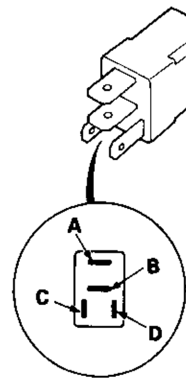


- Power window relay
- Radiator fan relay
- Condenser fan relay
- A/C compressor clutch relay

Type1:



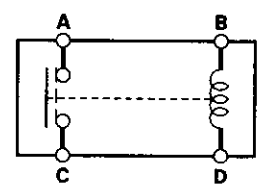
Type2:



Normally-open type:

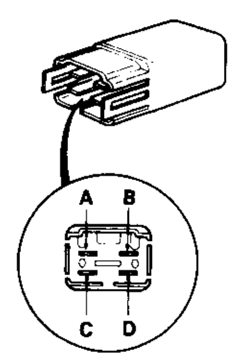
1. Check continuity between relay terminals.
   - There should be continuity between the A and C terminals when power and ground are connected to the B and D terminals.
   - There should be no continuity when power is disconnected.

Terminal / Power (B – D)	A	C
Connected	O—	—O
Disconnected		



- Blower motor relay
- Rear window defogger relay

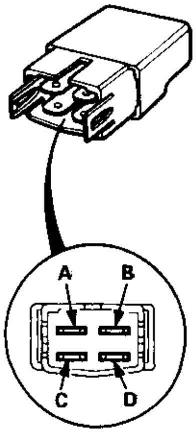
Type1:



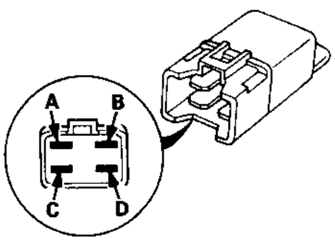
Power Relays

Relay Test

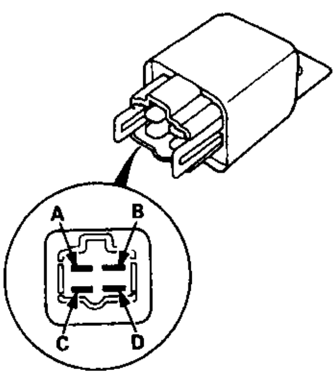
Type2:



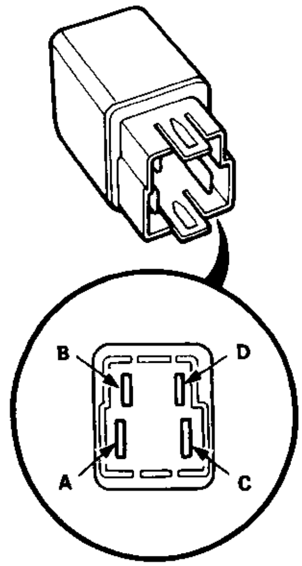
- Horn relay
- Hatch release relay



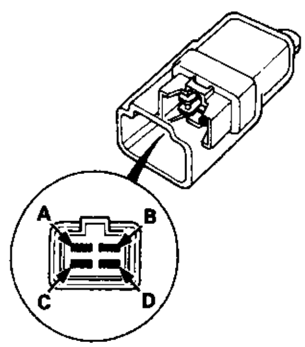
- Starter out relay



- ABS pump motor relay



- ABS fail-safe relay

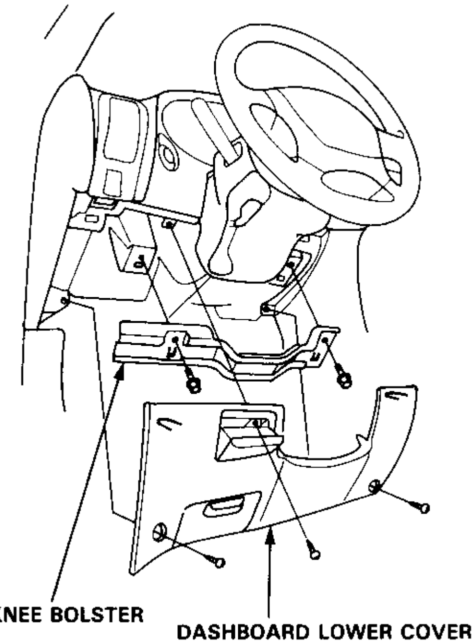


Ignition Switch

Test

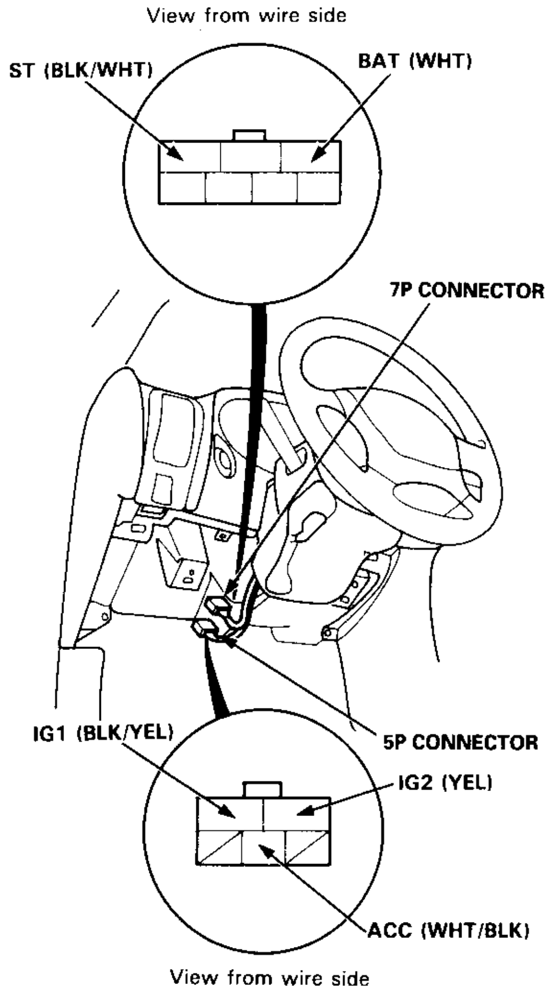
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

1. Remove the dashboard lower cover and knee bolster.



2. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness.

3. Check for continuity between the terminals in each switch position according to the table.



Position \ Terminal	ACC	BAT	IG1	IG2	ST
0					
I	○	○			
II	○	○	○	○	
III		○	○		○

4. If continuity checks do not agree with the table, replace the electrical part of the switch (see page 23-72).

Ignition Switch

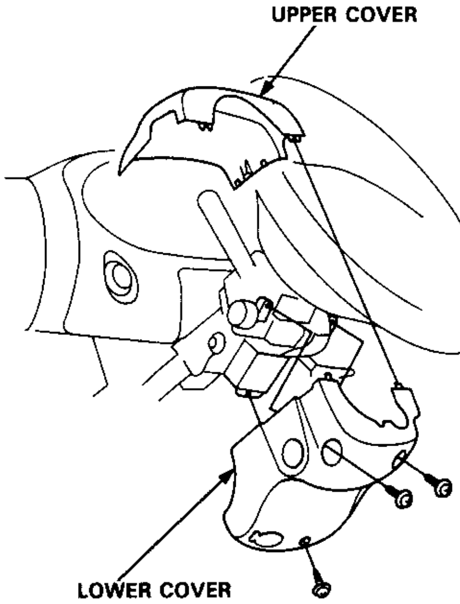
Electrical Switch Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

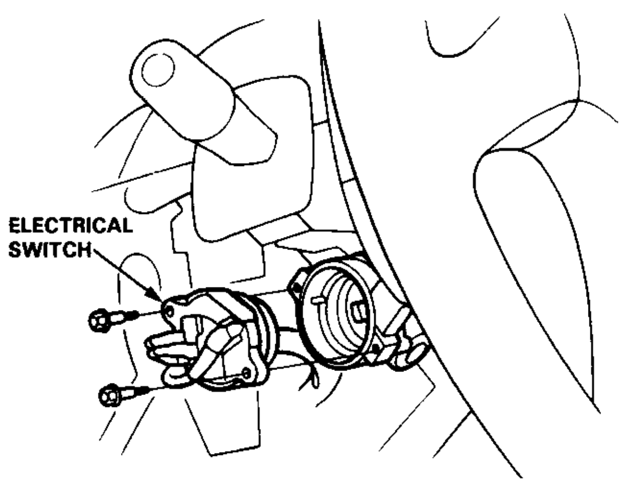
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the negative cable from the battery.
2. Remove the dashboard lower cover and knee bolster (see page 23-71).
3. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see page 23-71).
4. Remove the steering column covers.



5. Insert the key and turn it to "0".
6. Remove the two bolts and replace the switch.



7. Install in the reverse order of removal.

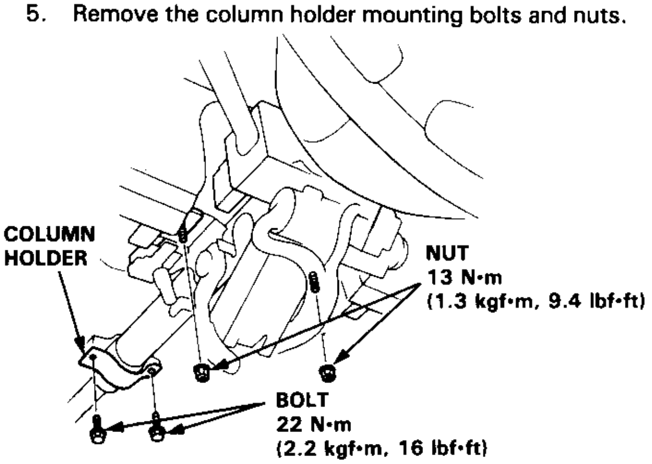
Steering Lock Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

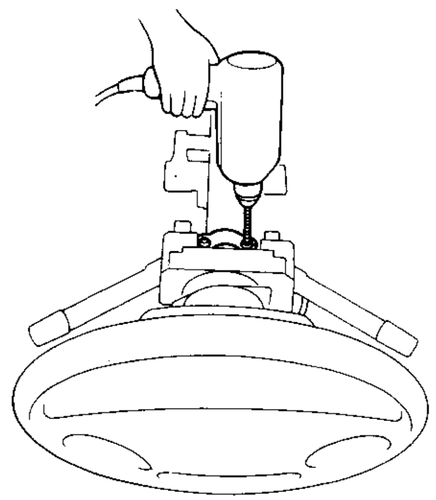
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the negative cable from the battery.
2. Remove the dashboard lower cover and knee bolster (see page 23-72).
3. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see page 23-72).
4. Remove the steering column covers (see page 23-72).
5. Remove the column holder mounting bolts and nuts.

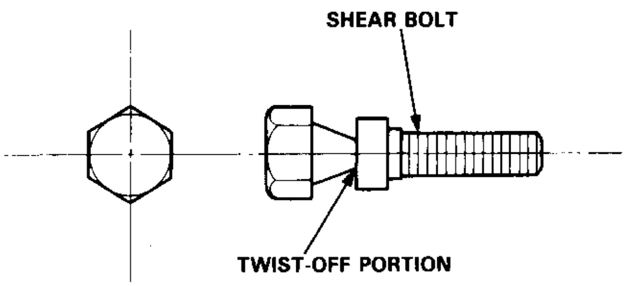


6. Lower the steering column assembly.
7. Center-punch each of the two shear bolts and drill their heads off with a 5 mm (3/16 in) drill bit.

CAUTION: Do not damage the switch body when removing the shear bolts.

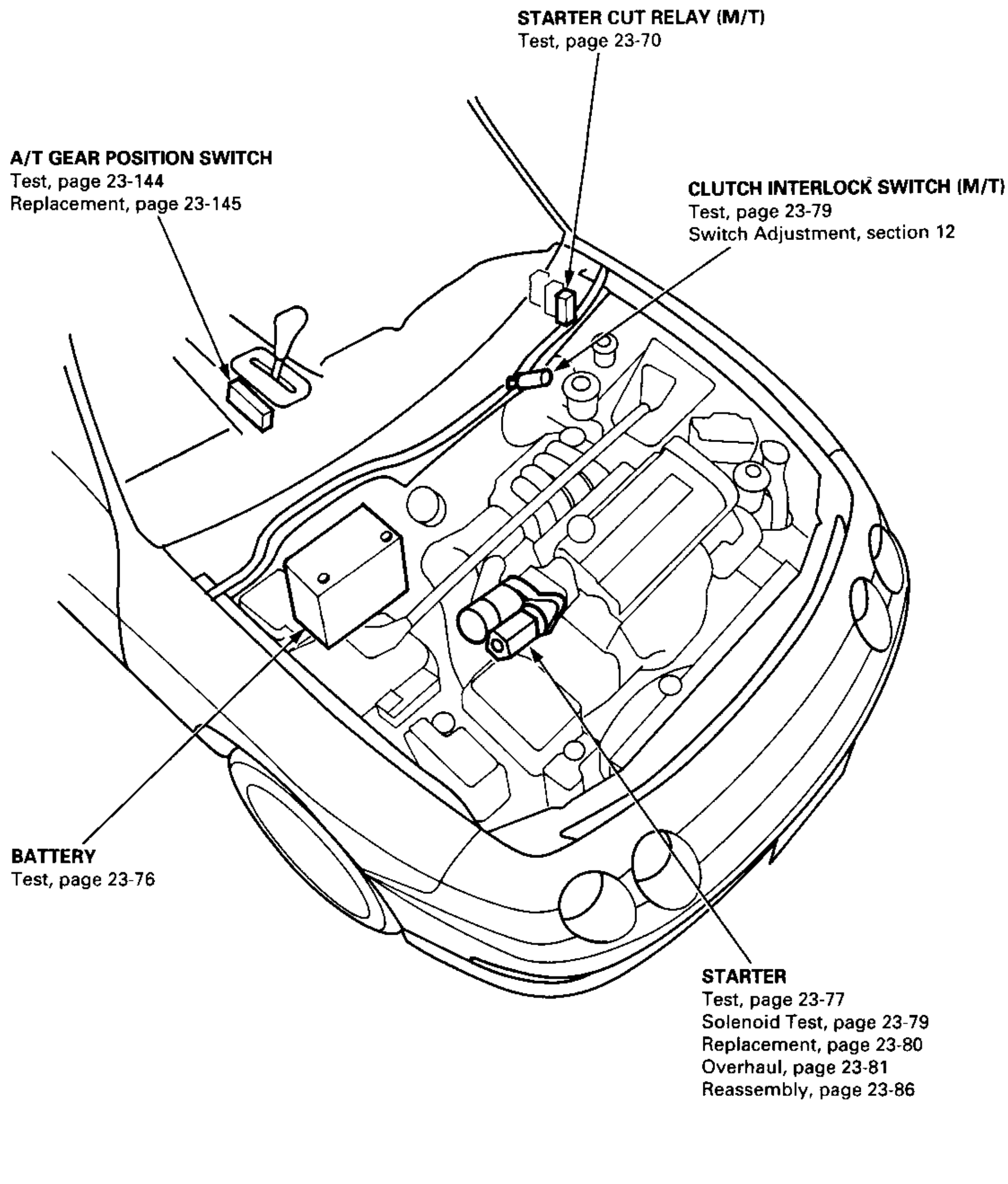


8. Remove the shear bolts from the switch body.
9. Install the new ignition switch without the key inserted.
10. Loosely tighten the new shear bolts.
11. Insert the ignition key and check for proper operation of the steering wheel lock and that the ignition key turns freely.
12. Tighten the shear bolts until the hex heads twist off.

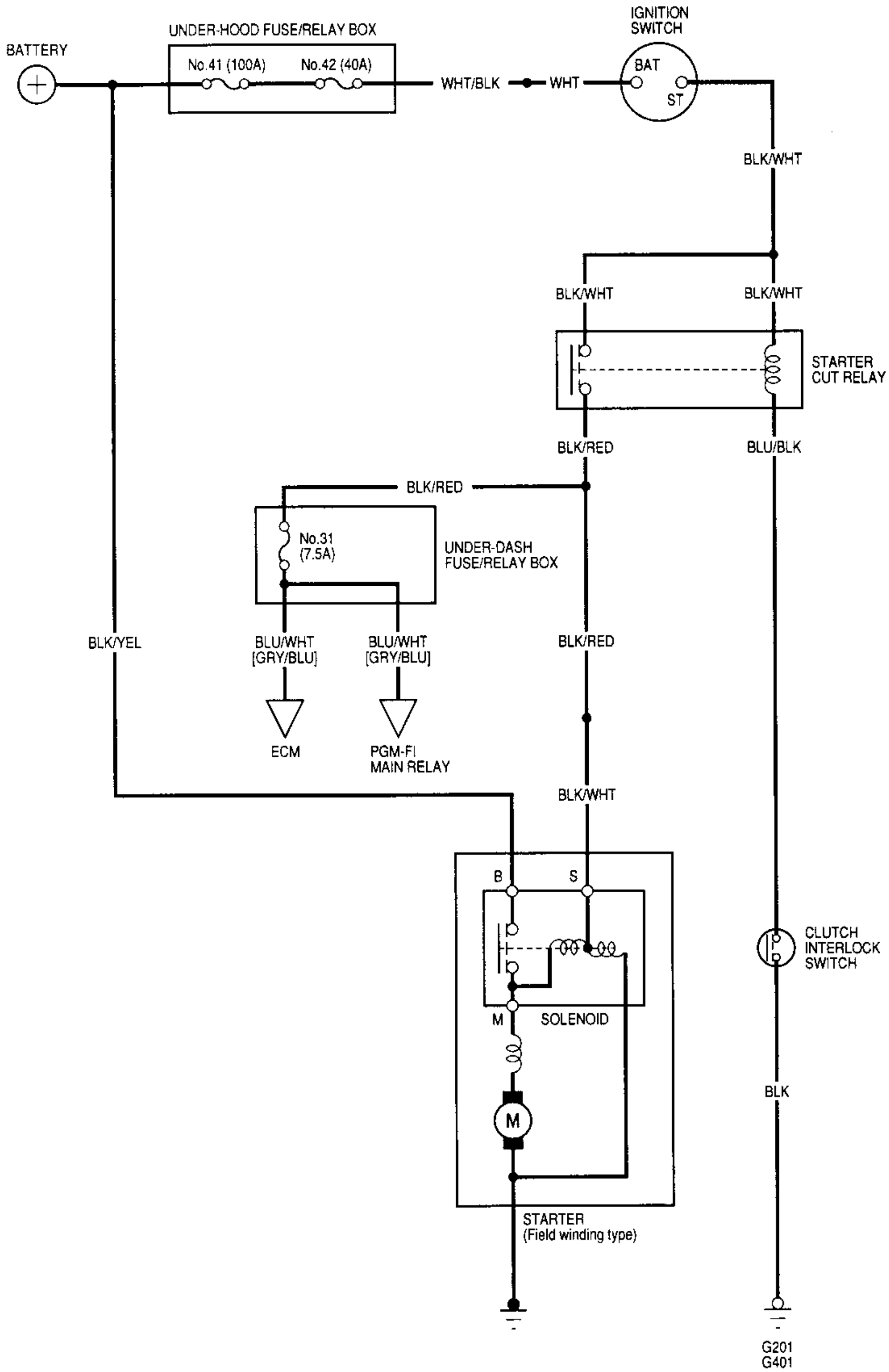


Starting System

Component Location Index

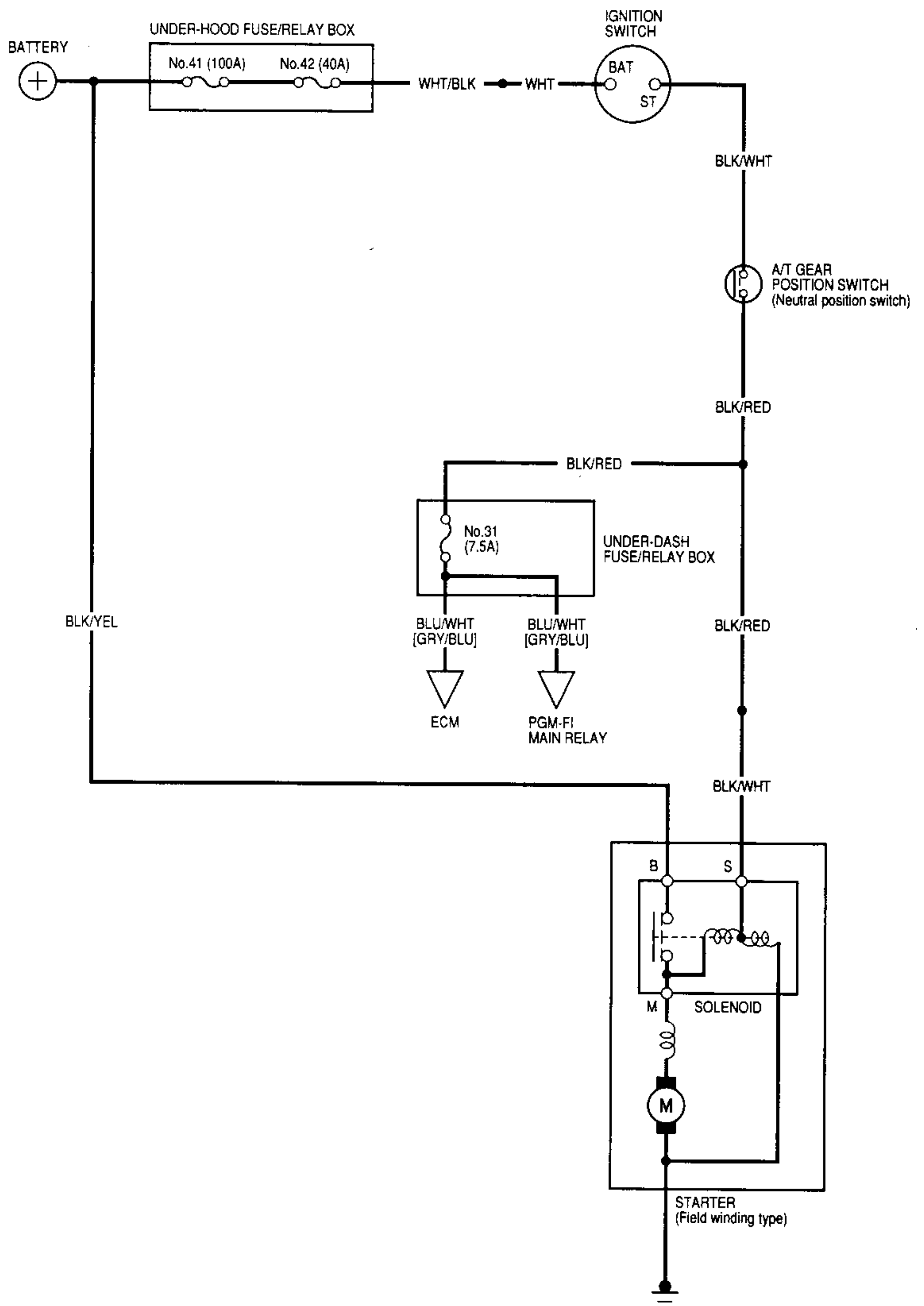


Circuit Diagram (M/T)



Starting System

Circuit Diagram (A/T)



Starter Test

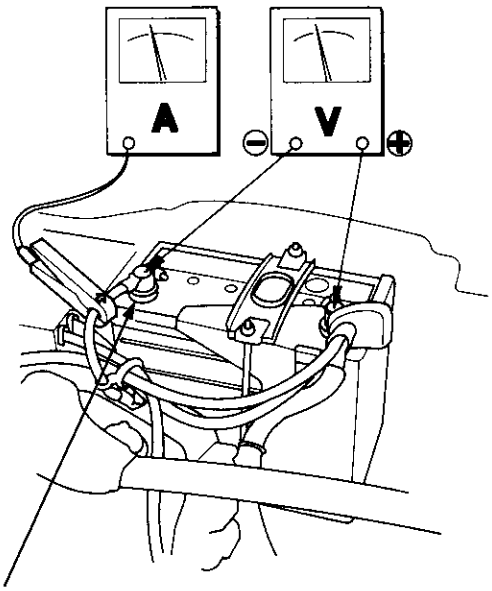
NOTE: The air temperature must be between 59 and 100°F (15 and 38°C) before testing.

Recommended Procedure:

- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.
- Test and troubleshoot as described.

Alternate Procedure:

- Use the following equipment:
  - Ammeter, 0—400 A
  - Voltmeter, 0—20 V (accurate within 0.1 volt)
  - Tachometer, 0—1200 rpm
- Hook up voltmeter and ammeter as shown.



NOTE: After this test, or any subsequent repair, reset the ECM to clear any codes (see section 11).

Check Starter Engagement:

1. Remove the No. 44 (15 A) fuse from the under-hood fuse/relay box.

2. Press the clutch pedal all the way in (M/T), and turn the ignition switch to "Start". The starter should crank the engine.

   NOTE: On cars equipped with manual transmission, the engine will not crank unless the clutch pedal is fully depressed.

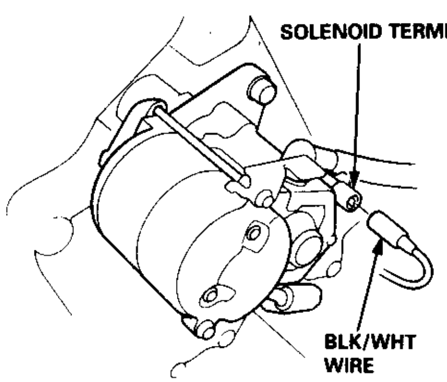
   If the starter does not crank the engine, go to step 3.

3. Check the battery, battery positive cable, ground, and the wire connections for looseness and corrosion.

   Test again. If the starter still does not crank the engine, go to step 4.

4. Bypass the ignition switch circuit as follows (make sure the transmission is in neutral):
   Unplug the connector (BLK/WHT wire and solenoid terminal) from the starter. Then connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.

   - If the starter still does not crank the engine, replace it and diagnose its internal problems.
   - If the starter cranks the engine, go to step 5.



(cont'd)

Starter Test (cont'd)

5. Check for an open in the BLK/WHT wire circuit between the starter and ignition switch, and connectors.
6. Check the ignition switch (see page 23-71).
7. On cars with automatic transmission, check the A/T gear position switch (neutral position switch) and connector. On cars with manual transmission, check the starter cut relay, clutch interlock switch, and connectors.

NOTE: Check the No. 42 (40 A) fuse in the under-hood fuse/relay box for the starter cut relay.

Check for Wear and Damage:

The starter should crank the engine smoothly and steadily. If the starter engages, but cranks the engine erratically, remove it. Inspect the starter, drive gear, and flywheel or torque converter ring gear for damage.

- Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held. Replace the gears if damaged.

Check Cranking Voltage and Current Draw:

Cranking voltage should be no less than 8.0 volts.
Current draw should be no more than * amperes.
* 1.2 kW: 270 A
1.4 kW: 360 A

If cranking voltage is too low, or current draw too high, check for:

- Dead or low charged battery
- Open circuit in starter armature commutator segments
- Starter armature dragging
- Shorted armature winding
- Excessive drag in engine

Check Cranking rpm:

Engine speed during cranking should be above 100 rpm.

If speed is too low, check for:

- Loose battery or starter terminals
- Excessively worn starter brushes
- Open circuit in commutator segments
- Dirty or damaged helical spline or drive gear
- Defective drive gear overrunning clutch

Check Starter Disengagement:

Press the clutch pedal all the way in (M/T), turn the ignition switch to "III" and release to "II".
The starter drive gear should disengage from the flywheel or torque converter ring gear when you release the key.

If the drive gear hangs up on the flywheel or torque converter ring gear, check for:

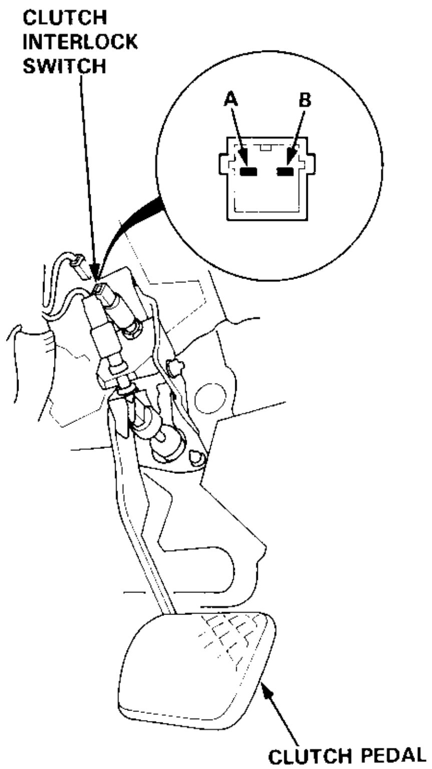
- Solenoid plunger and switch malfunction
- Dirty drive gear assembly or damaged overrunning clutch

Clutch Interlock Switch Test

1. Remove the dashboard lower cover and knee bolster (see page 23-71), then disconnect the 2P connector from the switch.

2. Check for continuity between the terminals according to the table.

Clutch Pedal \ Terminal	A	B
RELEASED		
PUSHED	O	O

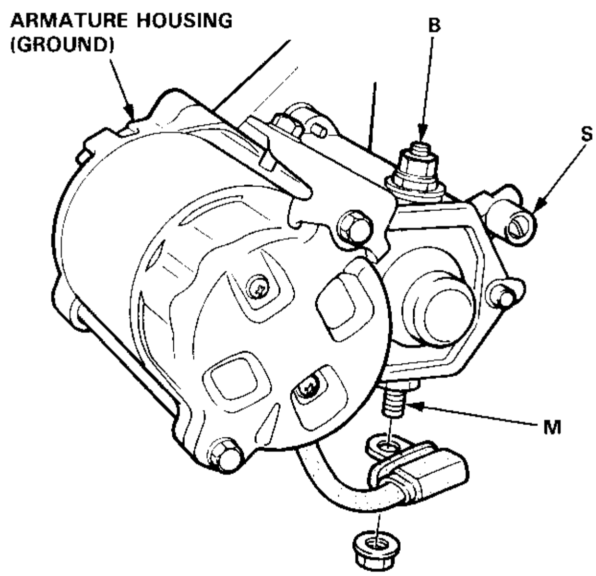


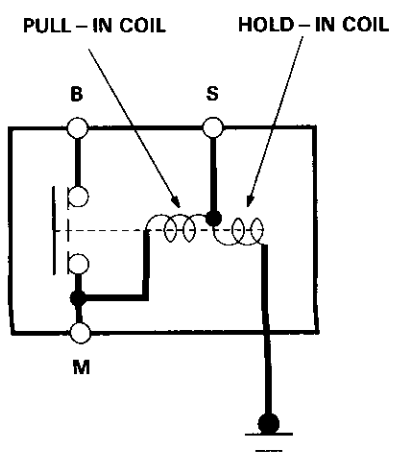
3. If necessary, replace the switch or adjust the switch position (see section 12).

Starter Solenoid Test

1. Check for continuity between the terminals according to the table.

Coil \ Terminal	M	S	Housing
HOLD-IN		O	O
PULL-IN	O	O	





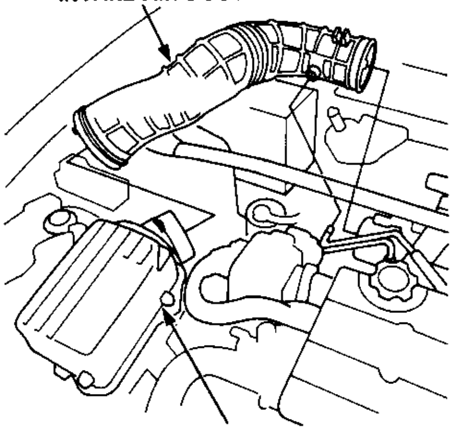
Starting System

Starter Replacement

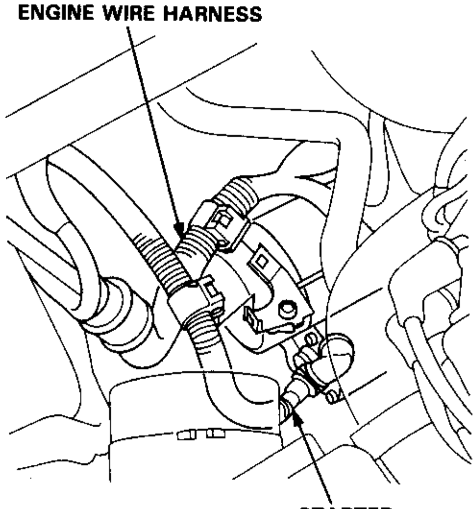
NOTE: The original radio has a coded theft protection citcuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

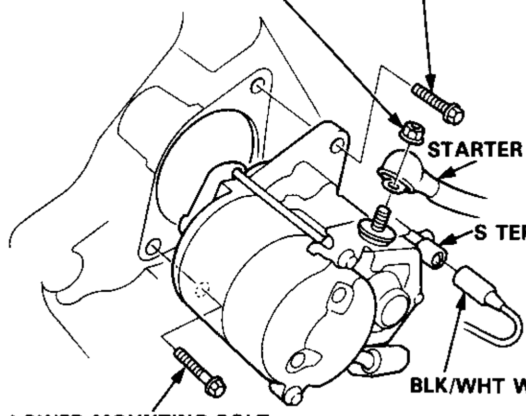
1. Disconnect the negative cable from the battery.
2. Remove the intake air duct.



3. Remove the engine wire harness and starter cables from their brackets.



4. Disconnect the starter cable from the B terminal on the solenoid, then disconnect the BLK/WHT wire from the S terminal.
5. Remove the two bolts holding the starter, then remove the starter.



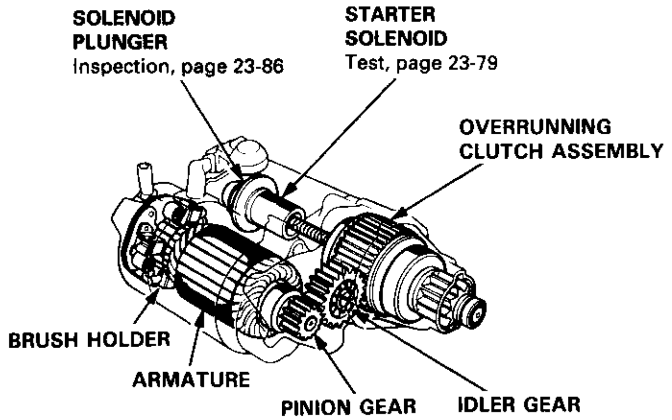
6. Install in the reverse order of removal.

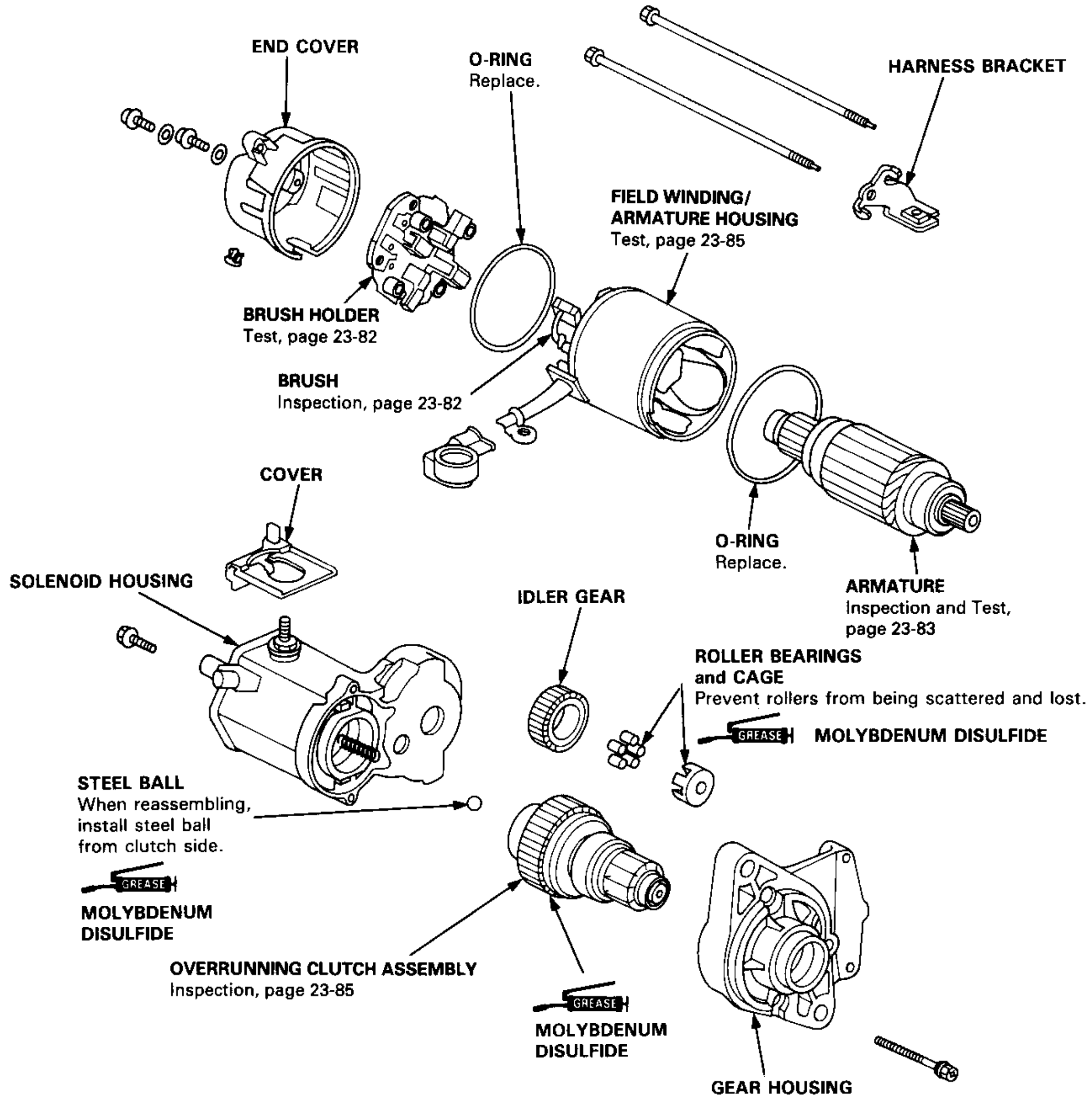
Starter Overhaul

CAUTION: Disconnect the battery negative cable before removing the starter.

NOTE: The original radio has a coded theft protection citcuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

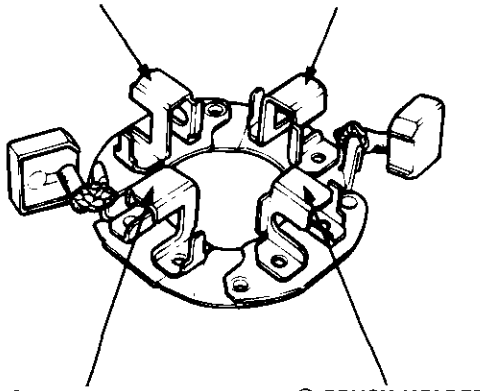




Starting System

Starter Brush Holder Test

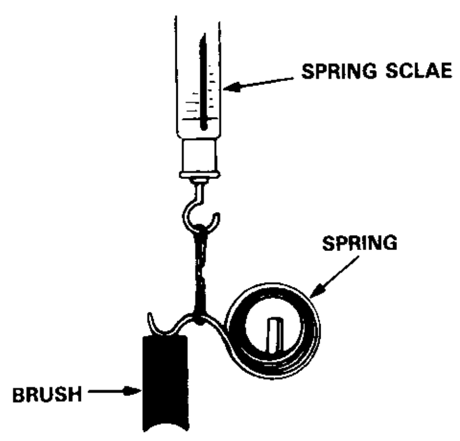
1. Check that there is no continuity between the ⊕ and ⊖ brush holders. If there is continuity, replace the brush holder assembly.



2. Insert the brush into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale to the spring. Measure the spring tension at the moment the spring lifts off the brush.

Spring Tension:

1.2 kW	12.7–20.5 (1.3–2.1 kgf, 2.87–4.62 lbf)
1.4 kW	17.7–23.5 N (1.8–2.4 kgf, 3.97–5.28 lbf)

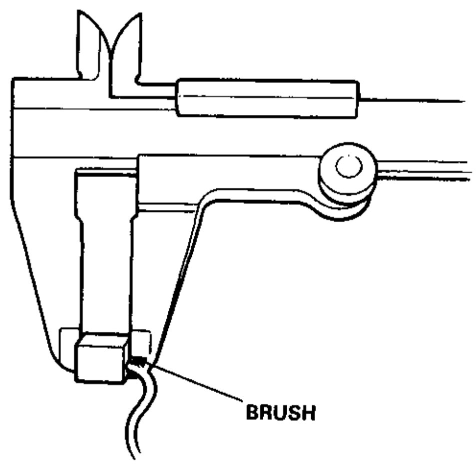


Starter Brush Inspection

Measure the brush length. If it is less than the service limit, replace the armature housing and brush holder assembly.

Brush Length

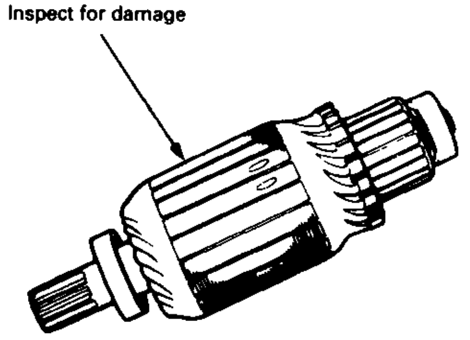
Standard (New)	15.0–15.5 mm (0.59–0.61 in)
Service Limit	10.0 mm (0.39 in)



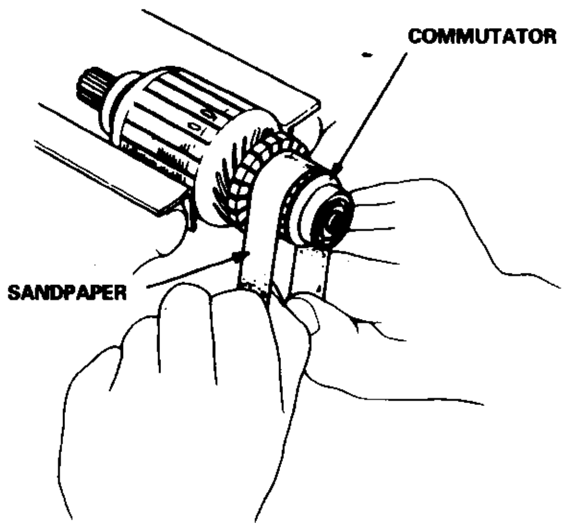
NOTE: To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

Armature Inspection and Test

1. Inspect the armature for wear or damage due to contact with the field winding. If there is wear or damage, replace the armature.



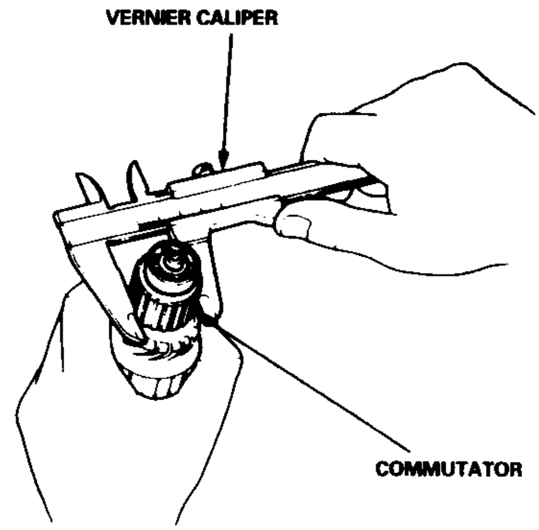
2. Check commutator surface and diameter.
   - If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with #500 or #600 sandpaper.



   - If commutator diameter is below the service limit, replace the armature.

Commutator Diameter

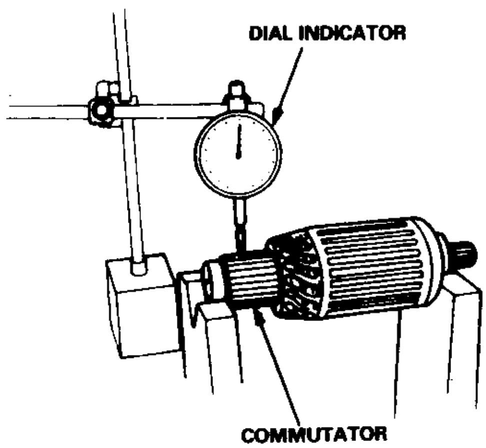
Standard (NEW)	Service Limit
29.9 – 30.0 mm (1.177 – 1.181 in)	29.0 mm (1.14 in)



3. Measure the commutator runout.
   - If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
   - If the commutator runout is not within the service limit, replace the armature.

Commutator Runout

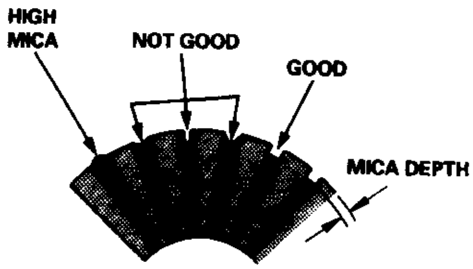
Standard (NEW)	Service Limit
0 – 0.02 mm (0 – 0.0008 in)	0.05 mm (0.002 in)



(cont'd)

Armature Inspection and Test (cont'd)

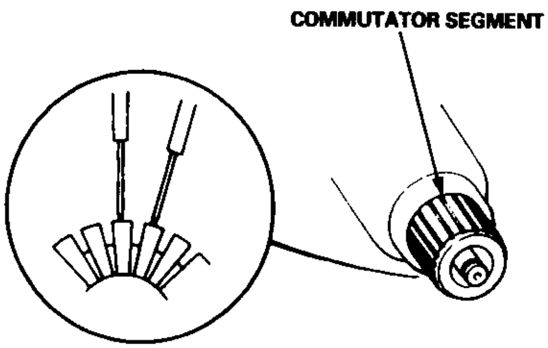
4. Check the mica depth. If necessary, undercut the mica with a hacksaw blade to achieve proper depth. If the service limit cannot be maintained, replace the armature.



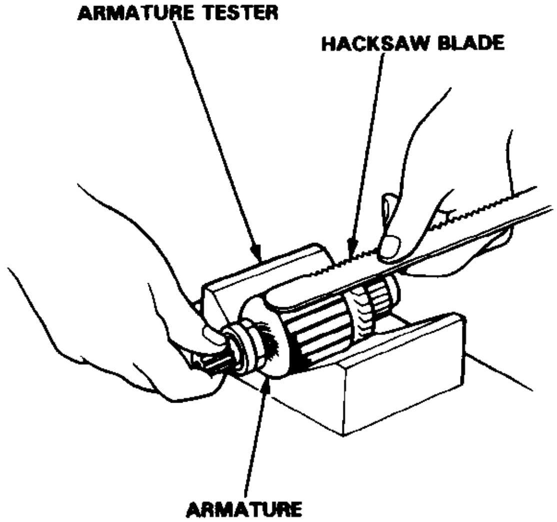
Commutator Mica Depth

Standard (NEW)	Service Limit
0.5 – 0.8 mm (0.02 – 0.03 in)	0.20 mm (0.008 in)

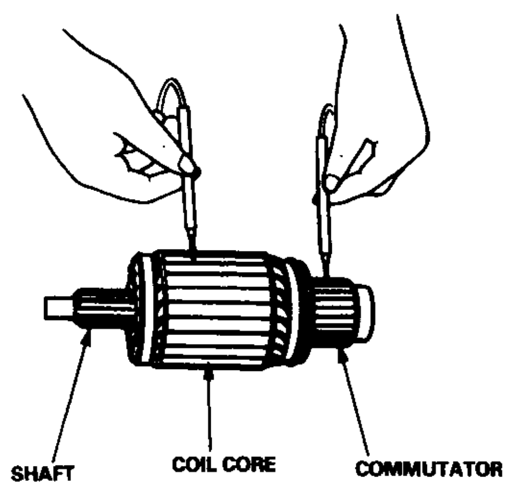
5. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.

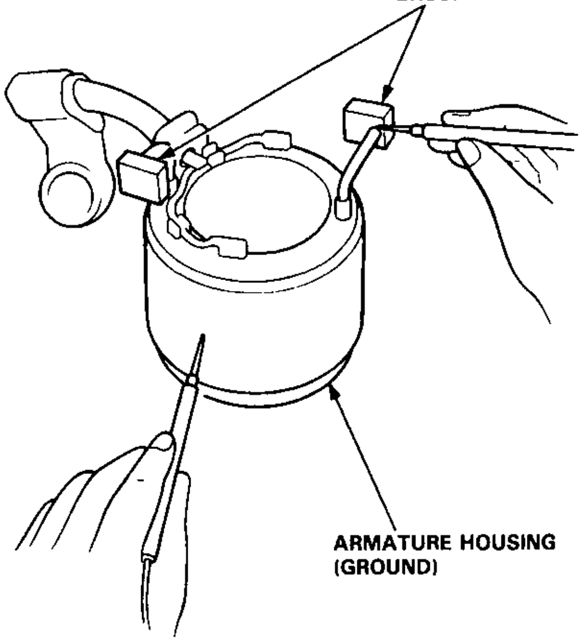


7. With an ohmmeter, check for continuity between the commutator and armature coil core, and between the commutator and armature shaft. If there is continuity, replace the armature.



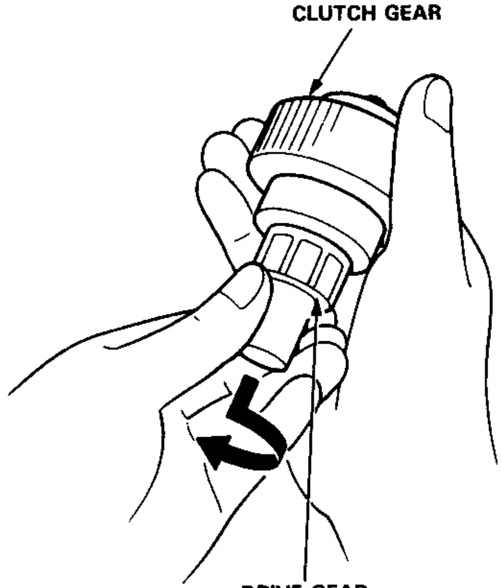
Starter Field Winding Test

1. Check for continuity between the brushes. If there's no continuity, replace the armature housing.
2. Check for continuity between each brush and the armature housing (ground). If there is continuity, replace the armature housing.



Overrunning Clutch Inspection

1. Slide the overrunning clutch along the shaft.
   Does it move freely? If not, replace it.
2. Rotate the overrunning clutch both ways.
   Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.

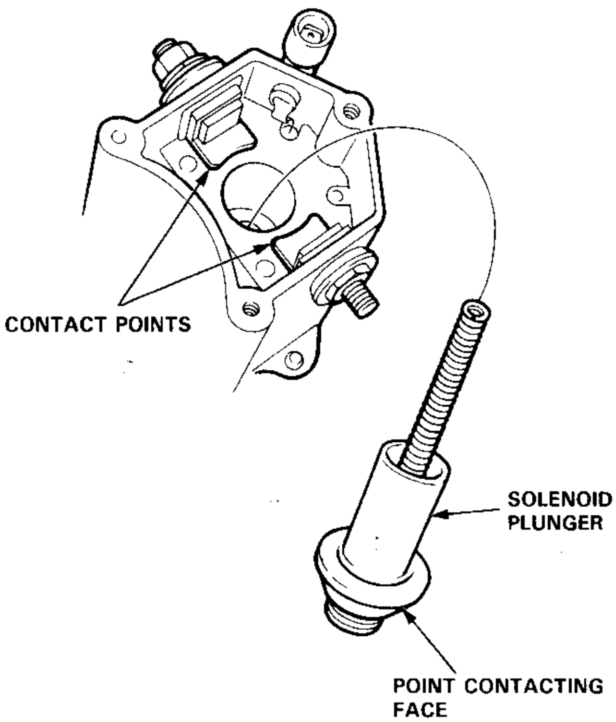


3. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
4. Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

Starting System

Solenoid Plunger Inspection

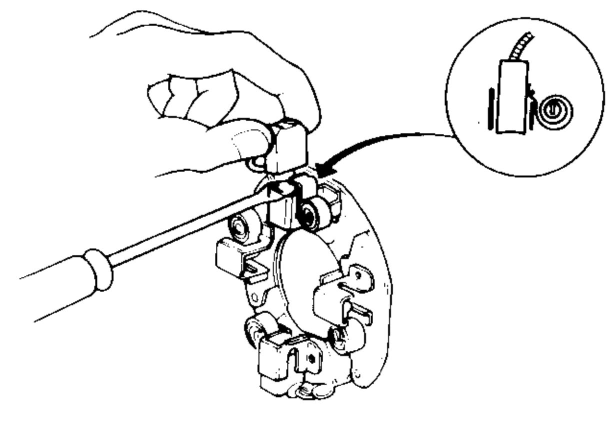
Check the contact points and the face of the starter solenoid plunger for burning, pitting or any other defects. If surfaces are rough, recondition them with a strip of #500 or #600 sandpaper.



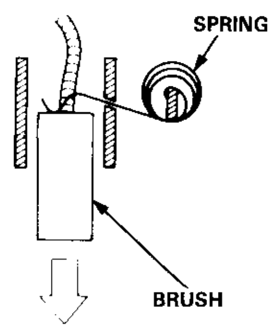
Starter Reassembly

NOTE: Use the illustration on page 23-81 as a reference for reassembly.

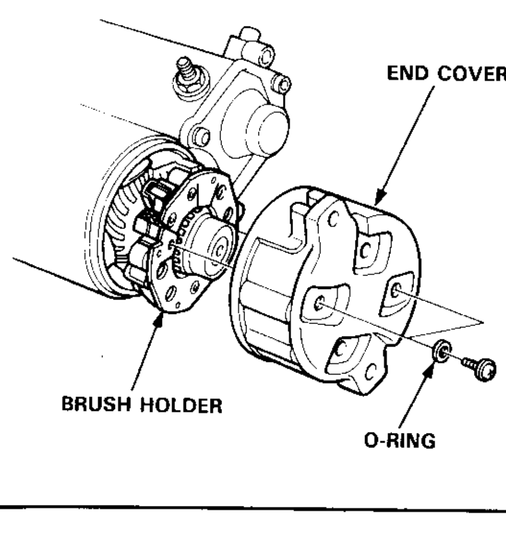
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



2. Install the armature in the housing. Next pry back each brush spring again and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



3. Install the end cover on the brush holder.



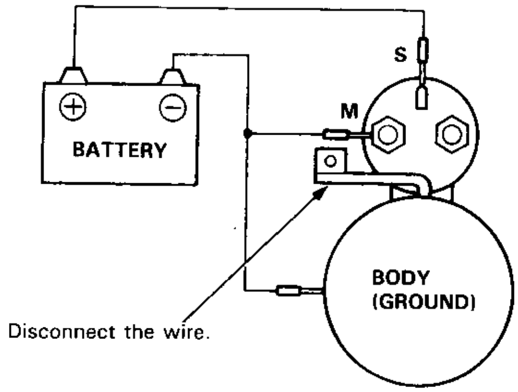
Performance Test

NOTE: Before starting the following checks, disconnect the wire from terminal M, and make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the car).

Pull-in Coil Test:

Connect the battery as shown. If the starter pinion pops out, it is working properly.

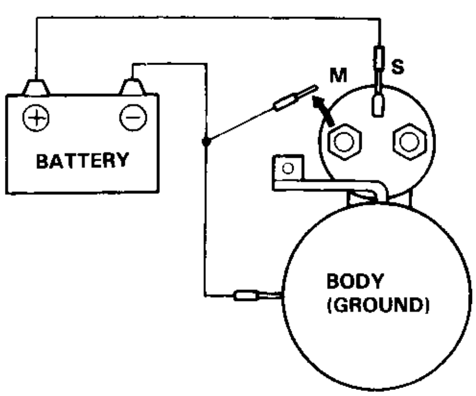
CAUTION: Do not leave the battery connected for more than 10 seconds.



Hold-in Coil Test:

Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil is working properly.

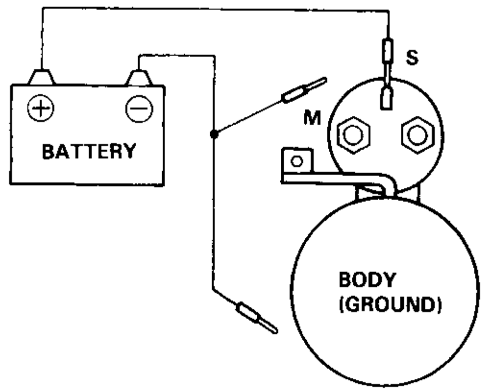
CAUTION: Do not leave the battery connected for more than 10 seconds.



Retracting Test:

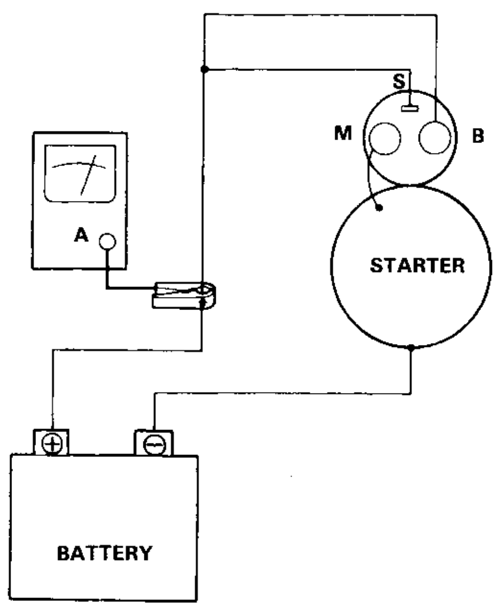
Disconnect the battery negative cable. If the pinion retracts immediately, it is working properly.

CAUTION: Do not leave the battery connected for more than 10 seconds.



Starter No-load Test:

1. Clamp the starter firmly in a vise.
2. Connect the starter to the battery as shown, and confirm that the motor starts and keeps rotating.



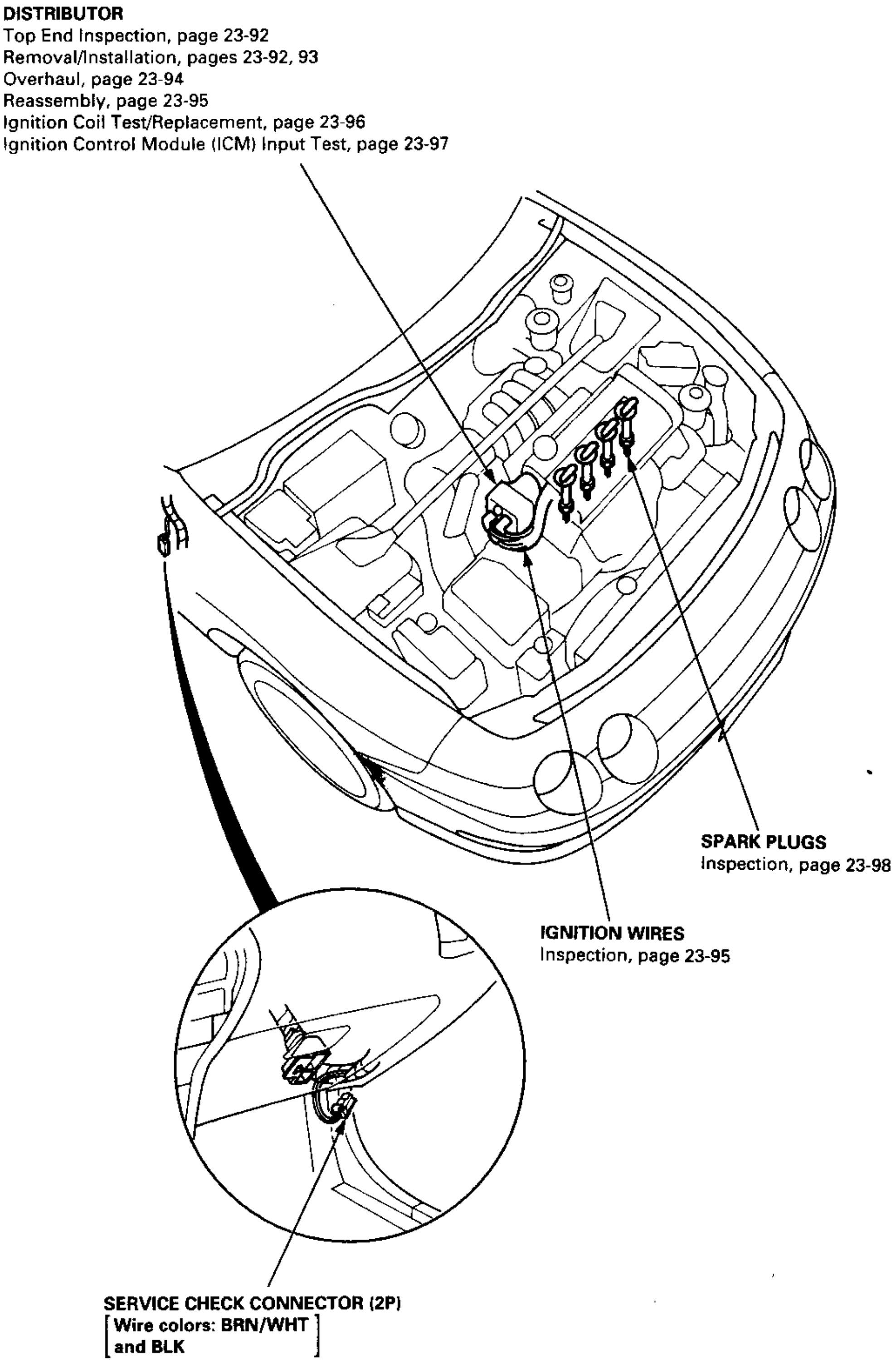
3. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications: 90 A or less (Electric current), 3000 rpm or more (Motor speed)

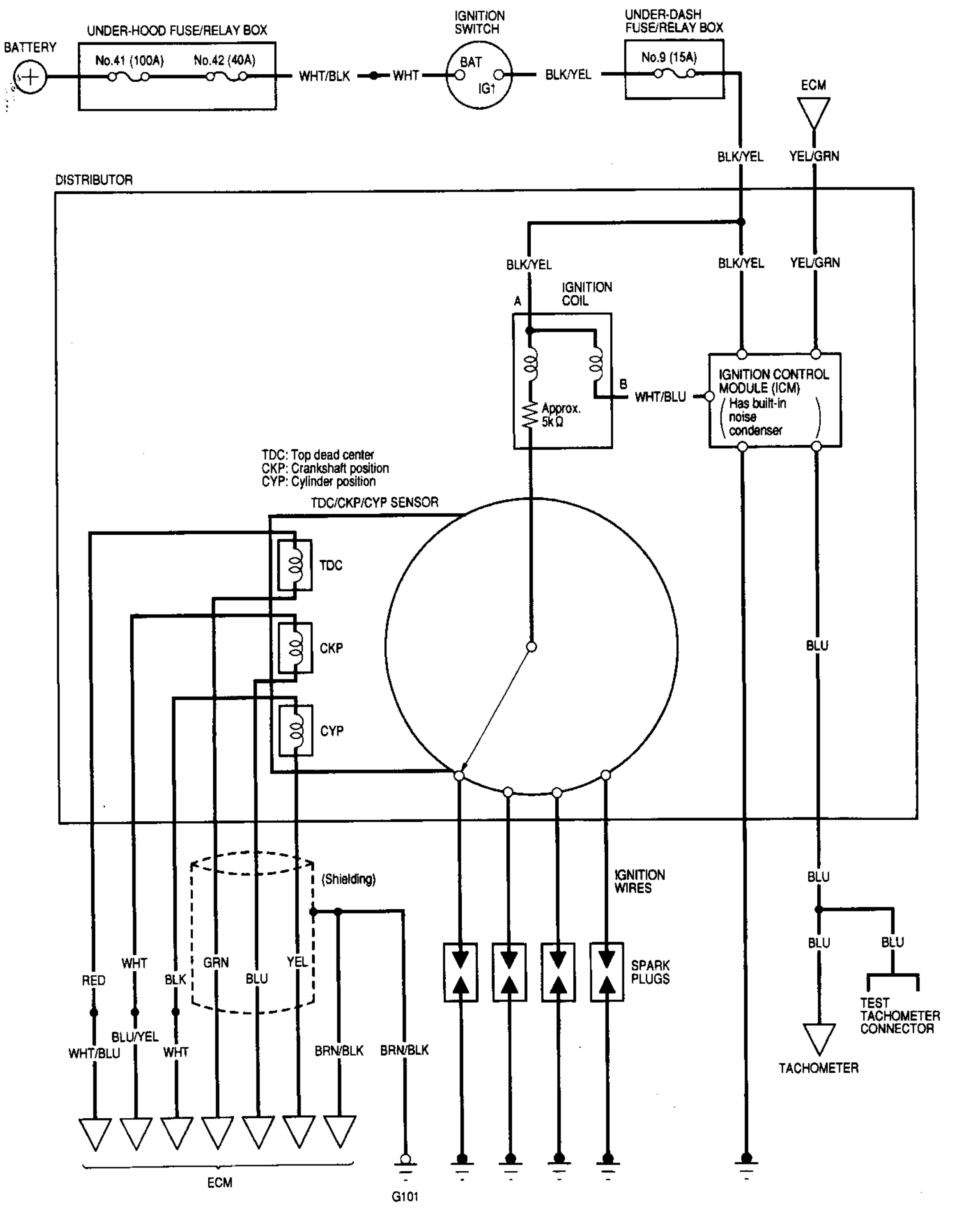
Ignition System

Component Location Index

IGNITION TIMING CONTROL SYSTEM
- Inspection and setting, page 23-90



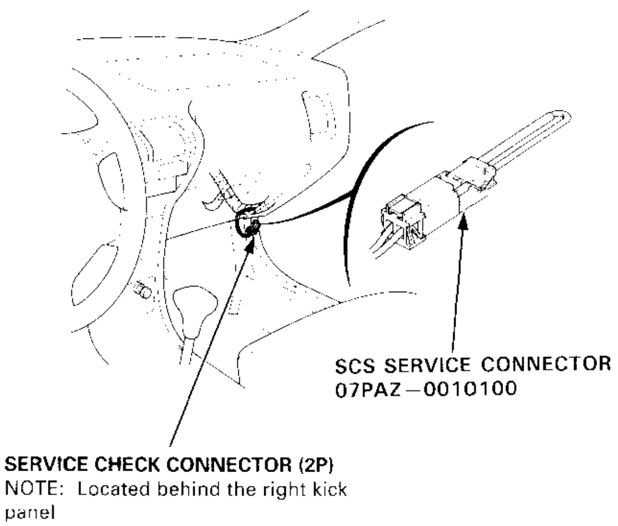
Circuit Diagram



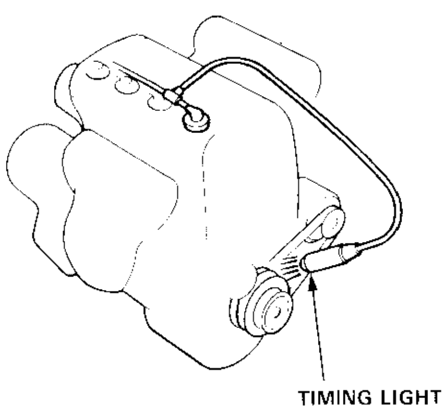
Ignition Timing Inspection and Setting

1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.

2. Pull out the service check connector located behind the right kick panel. Connect the service check connector with the special tool.



3. Connect a timing light to the No. 1 ignition wire, and point it toward the pointer on the timing belt cover.

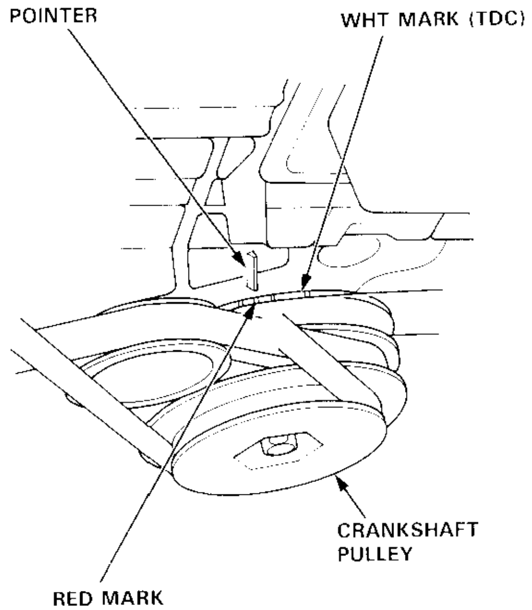


4. Adjust ignition timing, if necessary, to the following specifications:

Ignition Timing:
Except B18C5 engine:
M/T 16° ± 2° BTDC (RED) at 750 ± 50 rpm in neutral
A/T 16° ± 2° BTDC (RED) at 750 ± 50 rpm in park or neutral

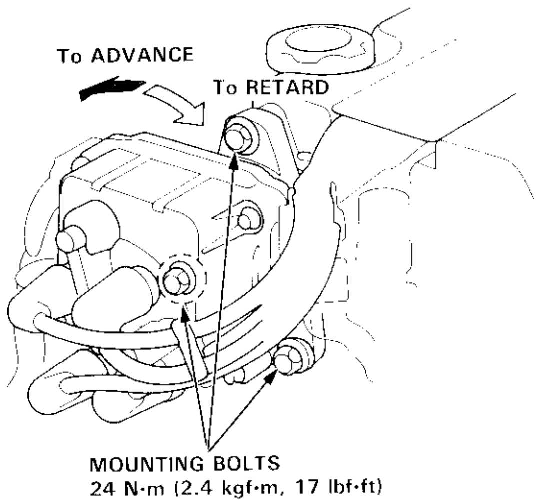
B18C5 engine:
16° ± 2° BTDC (RED) at 800 ± 50 rpm in neutral

NOTE:
- Shift lever must be in neutral.
- All electrical systems should be turned OFF.



– Ignition Timing Inspection and Setting

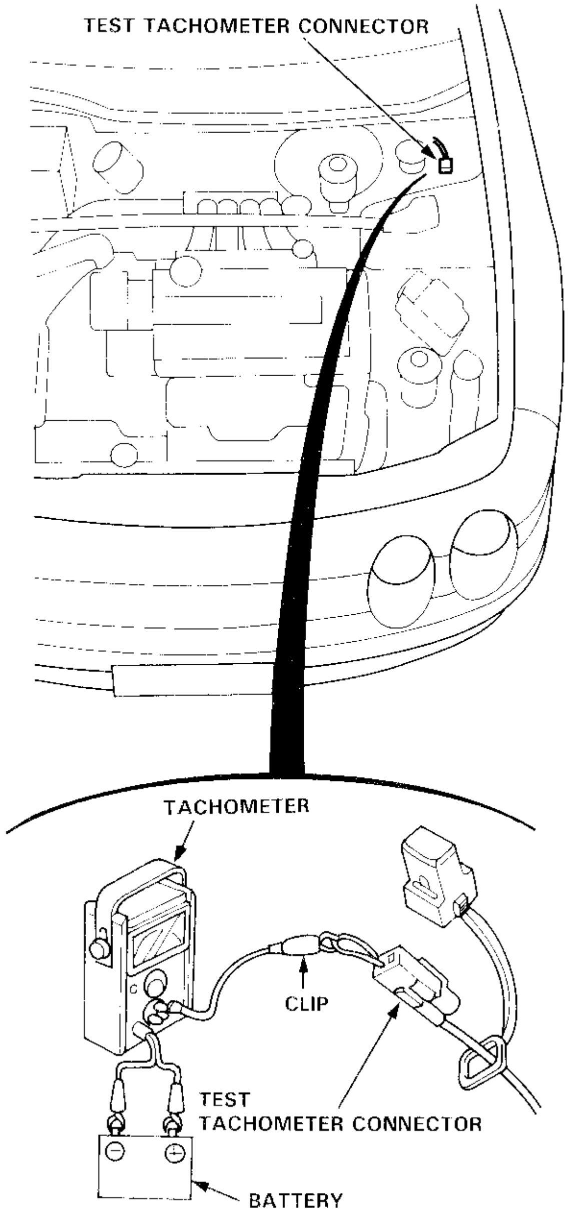
5. To adjust ignition timing, loosen the distributor mounting bolts, and turn the distributor ignition (DI) housing counterclockwise to advance the timing or clockwise to retard the timing.



6. Tighten the adjusting bolts and recheck the timing.
7. Remove the special tool from the service check connector.

Idle Speed Inspection

1. Shift to neutral or [P] and start the engine. Hold the engine at 3,000 rpm with no load until the radiator fan comes on, then let it idle.
2. Connect a tachometer to the test tachometer connector.



Idle speed
Except B18C5 engine:
M/T: 750 ± 50 rpm in neutral
A/T: 750 ± 50 rpm in [N] or [P]
B18C5 engine:
800 ± 50 rpm in neutral

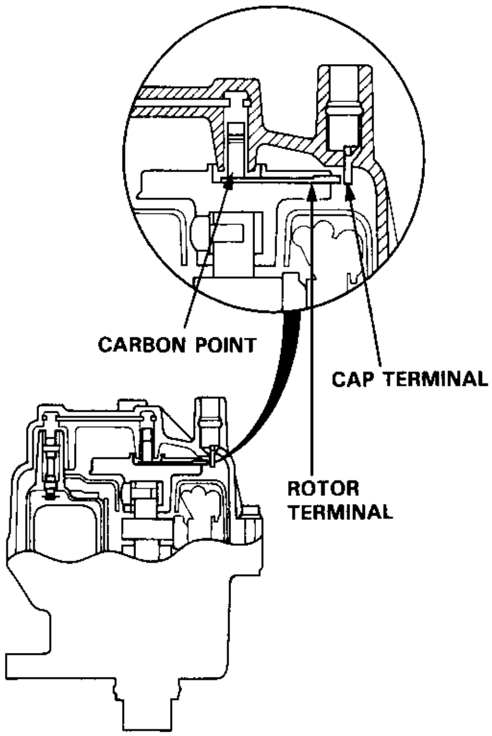
NOTE: All electrical systems should be turned OFF.

3. Adjust the idle speed if necessary (see section 11).

Ignition System

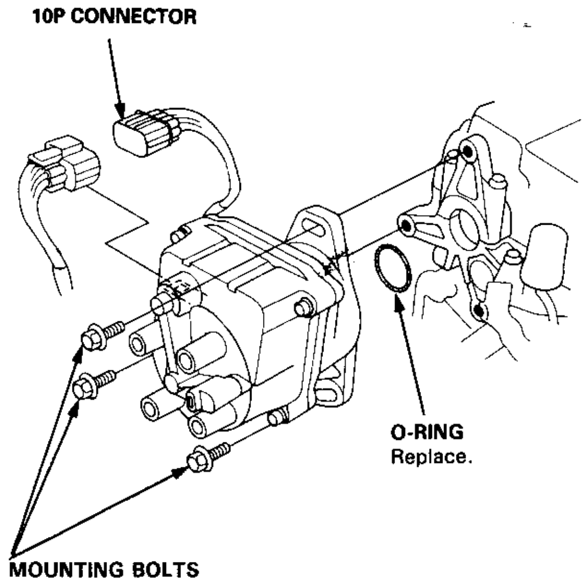
Distributor Top End Inspection

1. Check for rough or pitted rotor and cap terminals.
2. Scrape or file off the carbon deposits.
   Smooth the rotor terminal with an oil stone or #600 sandpaper if rough.
3. Check the distributor ignition (DI) cap for cracks, wear, and damage. If necessary, clean or replace it.



Distributor Removal

1. Disconnect the 10P connector from the distributor.
2. Disconnect the ignition wires from the distributor ignition (DI) cap.

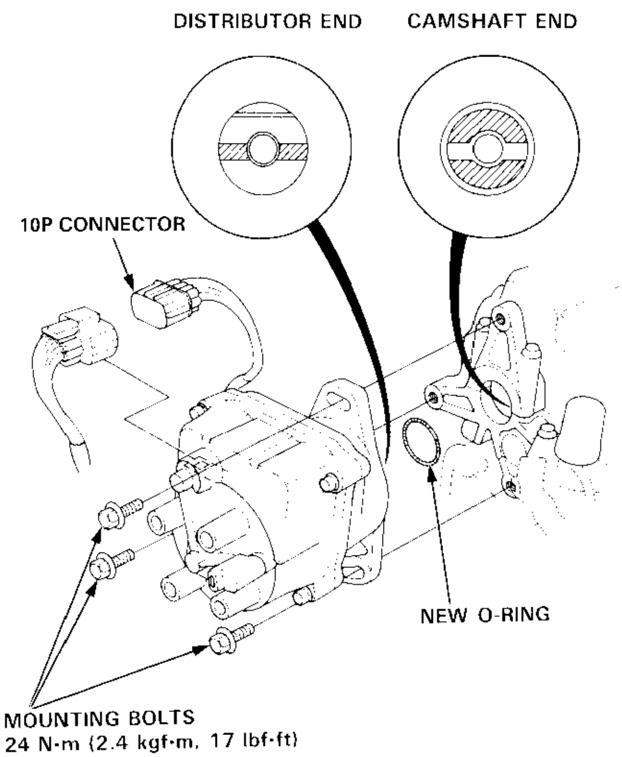


3. Remove the distributor mounting bolts, then remove the distributor from the cylinder head.

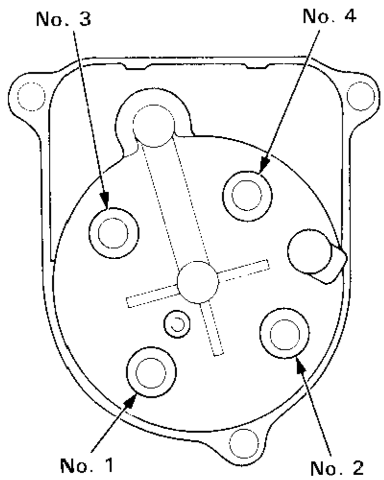
Distributor Installation

1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

   NOTE: The lugs on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.



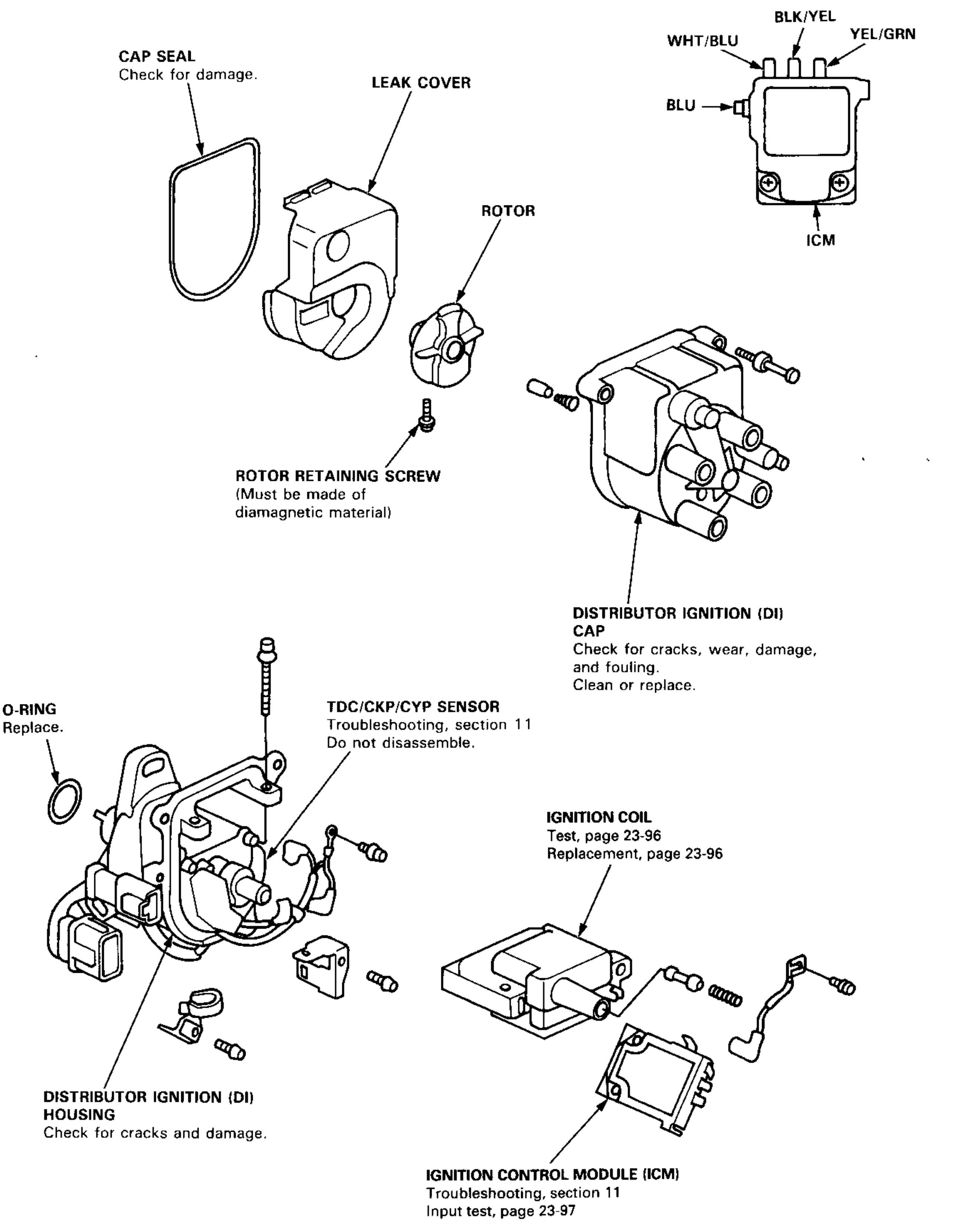
3. Install the mounting bolts, and tighten them temporarily.
4. Connect the 10P connector to the distributor.
5. Connect the ignition wires as shown.



6. Set the timing with a timing light (see page 23-90).
7. After setting the timing, tighten the mounting bolts.

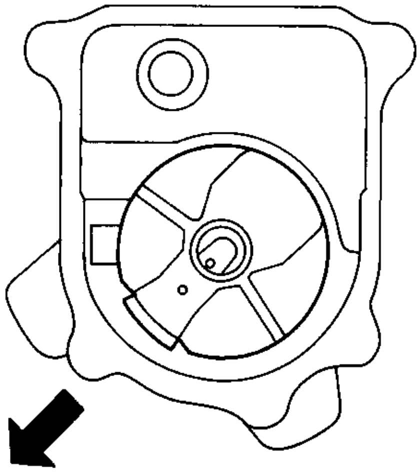
Ignition System

Distributor Overhaul

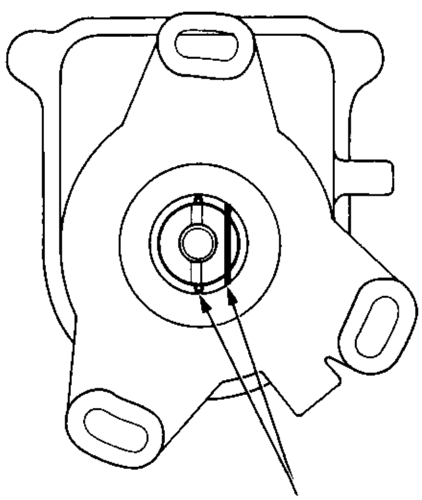


Distributor Reassembly

1. When reassembling the distributor, install the rotor on the shaft so that it faces in the direction shown (toward the No. 1 cylinder).



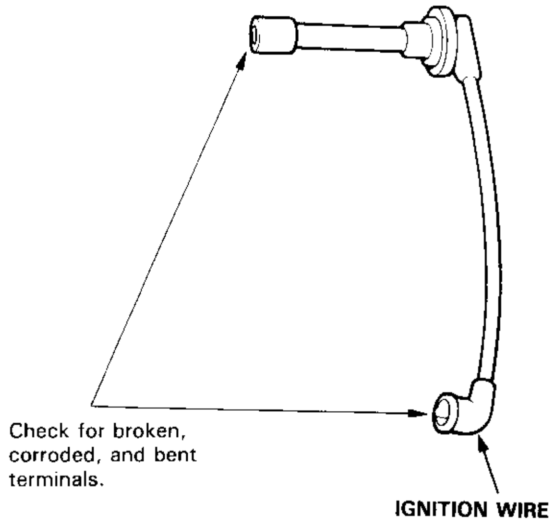
2. Align the index mark on the distributor ignition (DI) housing with the index mark on the end of the shaft.



Ignition Wire Inspection and Test

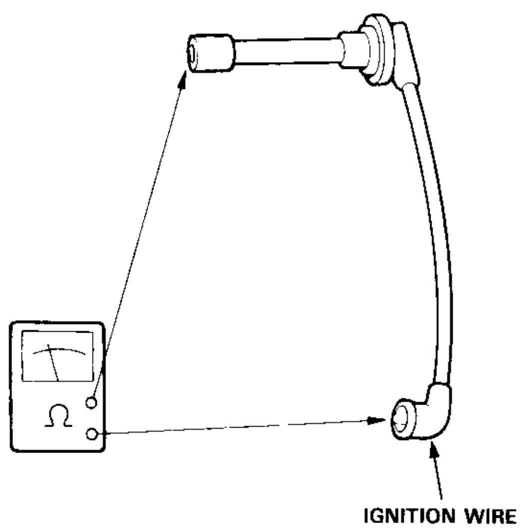
CAUTION: Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.

1. Check the condition of the wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the wire.



2. Connect ohmmeter probes and measure resistance.

   Ignition Wire Resistance:
   25 kΩ max. at 68°F (20°C)



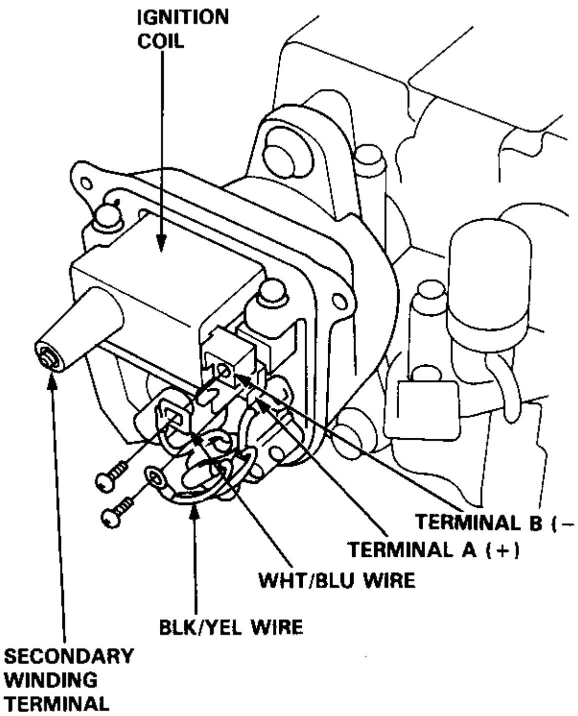
3. If resistance exceeds 25 kΩ, replace the ignition wire.

Ignition System

Ignition Coil Test

1. With the ignition switch OFF, remove the distributor ignition (DI) cap.

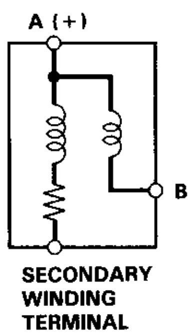
2. Remove the two screws to disconnect the BLK/YEL and WHT/BLU wires from terminals A (+) and B (−) respectively.



3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

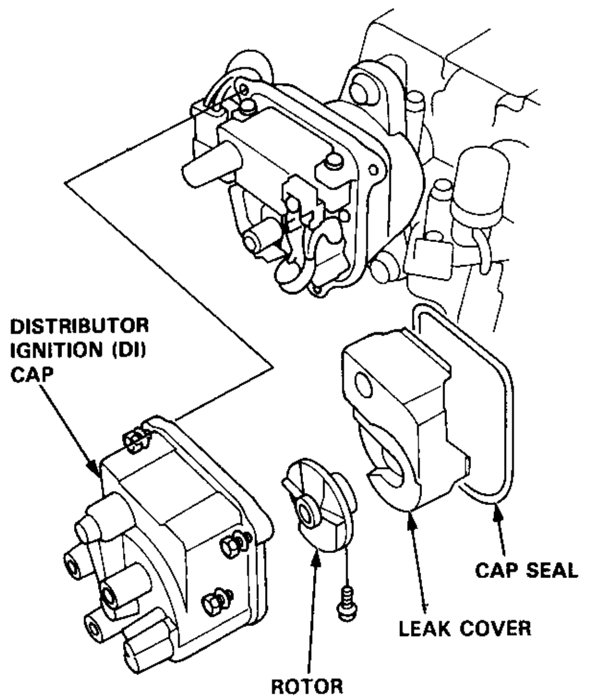
   NOTE: Resistance will vary with the coil temperature; specifications are at 68°F (20°C)

   Primary Winding Resistance
   (Between the A and B terminals): 0.6−0.8 ohms
   Secondary Winding Resistance
   (Between the A and secondary winding terminals): 12.8−19.2 kΩ



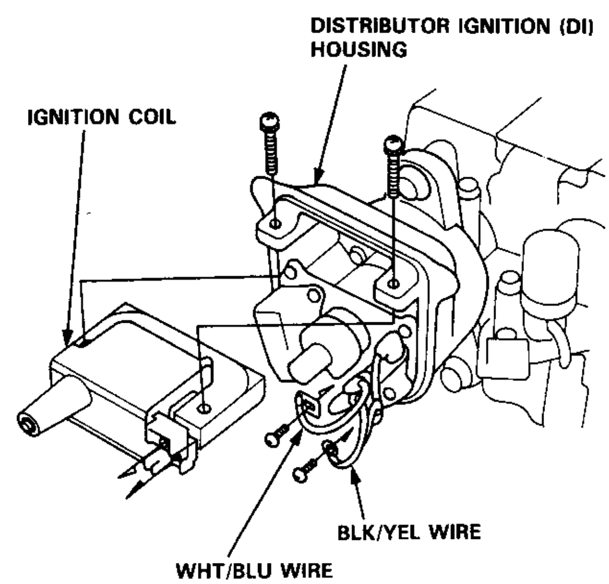
Ignition Coil Replacement

1. With the ignition switch OFF, remove the distributor ignition (DI) cap, rotor, and cap seal, then remove the leak cover.



2. Remove the two screws to disconnect the BLK/YEL and WHT/BLU wires from the coil.

3. Remove the two screws, and slide the ignition coil out of the distributor ignition (DI) housing.

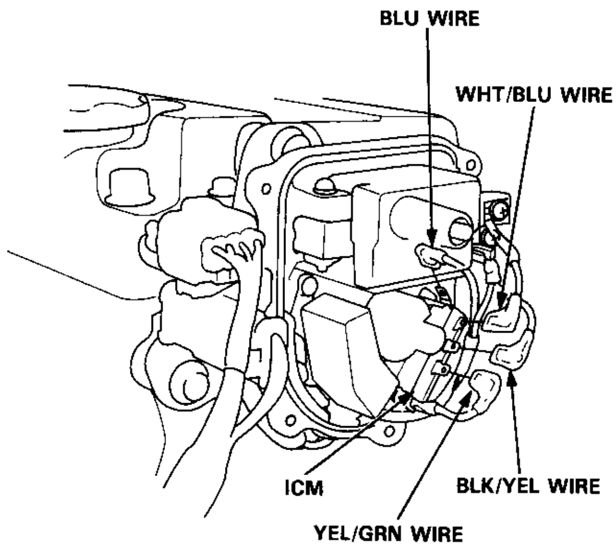


Ignition Control Module (ICM) Input Test

NOTE:
- See section 11 if the malfunction indicator lamp (MIL) has been reported on.
- Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emissions systems.
- The tachometer should operate normally.

1. Remove the distributor ignition (DI) cap, the rotor, and the leak cover.

2. Disconnect the BLK/YEL, WHT/BLU, YEL/GRN, and BLU wires from the ICM.



3. Turn the ignition switch ON (II). Check for voltage between the BLK/YEL wire and body ground.
There should be battery voltage.

   - If there is no battery voltage, check the BLK/YEL wire between the ignition switch and the ICM.
   - If there is battery voltage, go to step 4.

4. Turn the ignition switch ON (II). Check for voltage between the WHT/BLU wire and body ground.
There should be battery voltage.

   - If there is no battery voltage, check:
     - ignition coil.
     - WHT/BLU wire between the ignition coil and ICM.
   - If there is battery voltage, go to step 5.

5. Disconnect the 32P connector from the ECM, and check for continuity on the YEL/GRN wire between the ICM and ECM.
There should be continuity.

6. Check for continuity on the YEL/GRN wire to body ground.
There should be no continuity.

7. Reconnect the ECM 32P connector.

8. Disconnect the gauge assembly 13P connector, TCM 26P connector, and cruise control 14P connector.

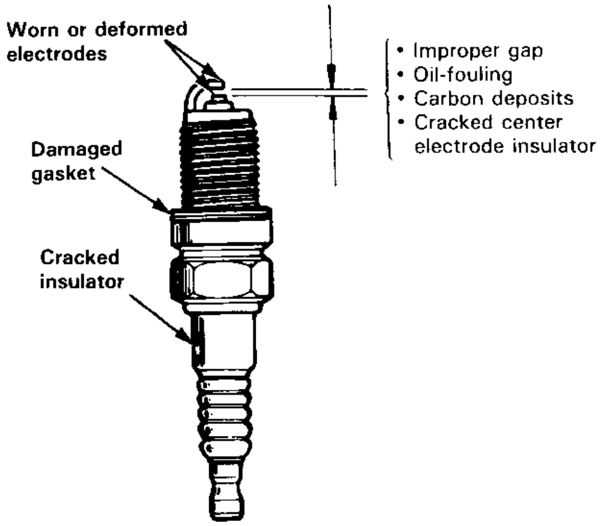
9. Check for continuity on the BLU wire between the ICM and tachometer.
There should be continuity.

10. Check for continuity on the BLU wire to body ground.
There should be no continuity.

11. If all the tests are normal, reconnect the connectors, and replace the ICM.

Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator for:



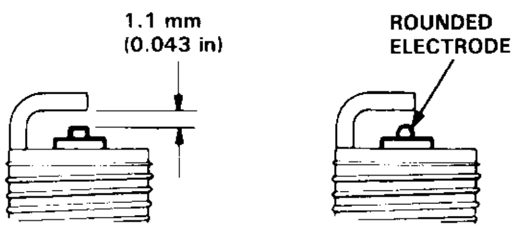
Burned or worn electrodes may be caused by:
- Advanced ignition timing
- Loose spark plug
- Plug heat range too low
- Insufficient cooling

Fouled plugs may be caused by:
- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Plug heat range too high
- Excessive idling/low speed running
- Clogged air cleaner element
- Deteriorated ignition coil or ignition wires

2. **B18B1, B18C5 engine:**
   - Adjust the gap with a suitable gapping tool, and replace the plug if the center electrode is rounded as shown below.

   Electrode Gap:

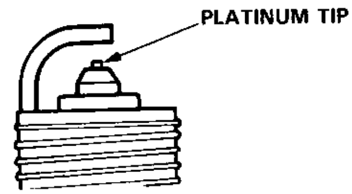
Standard	$1.1^{\,0}_{-0.1}$ mm ($0.043^{\,0}_{-0.004}$ in)



3. **B18C1 engine:**
   - Do not adjust the gap of a platinum tip plug; replace the spark plug if the center electrode is rounded or if the gap is not within the specifications.

   Electrode Gap:

Standard	$1.3^{\,0}_{-0.1}$ mm ($0.051^{\,0}_{-0.004}$ in)



NOTE: Use only the spark plugs listed below.

Spark plug
B18B1 engine:

NGK	ZFR5F-11
DENSO	KJ16CR-L11

B18C1 engine:

NGK	PFR6G-13
DENSO	PK20PR-L13

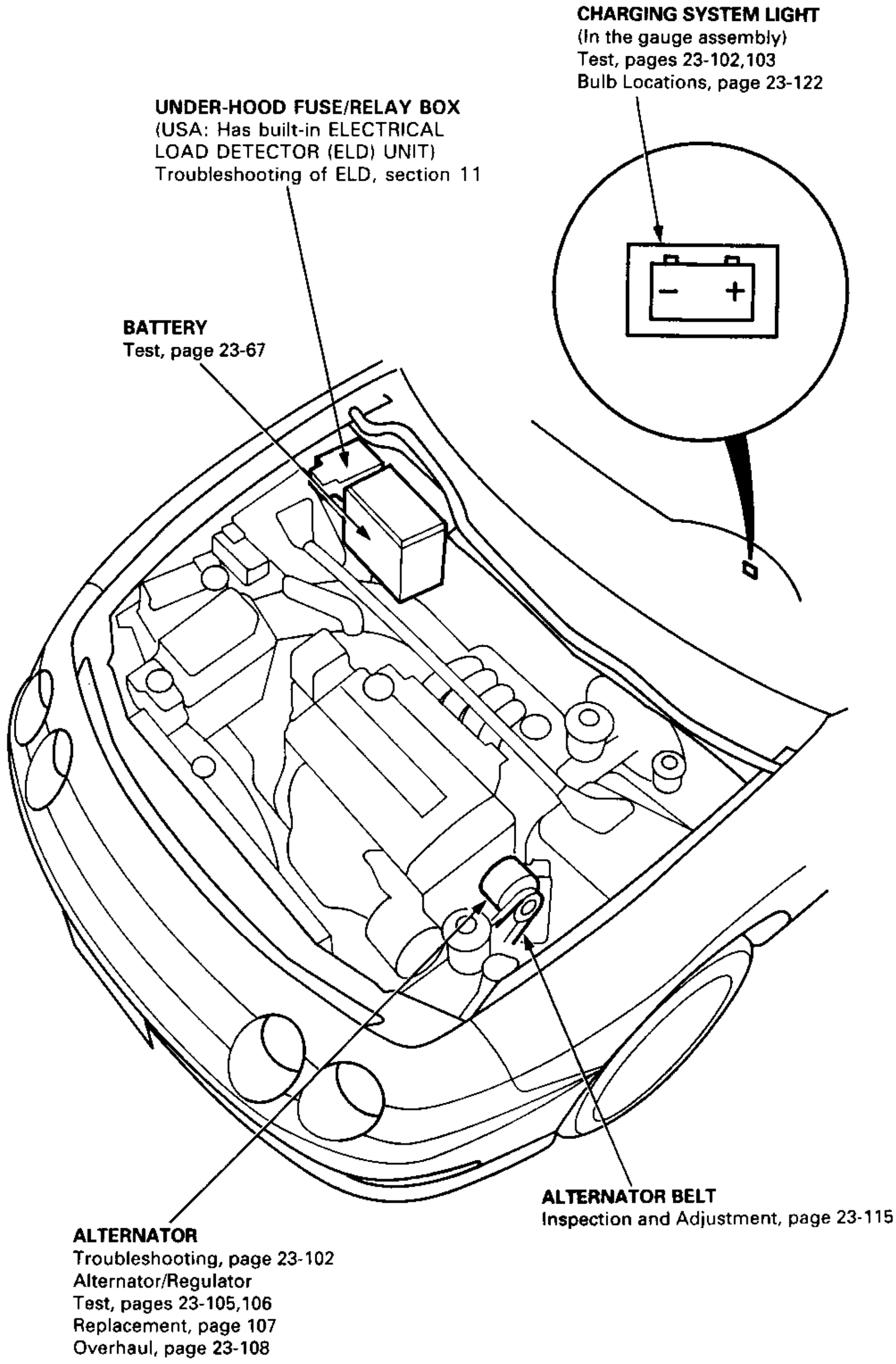
B18C5 engine:

NGK	PFR6G-11
DENSO	PK20PR-L11

4. Apply a small quantity of anti-seize compound to the plug threads before installing the plugs.

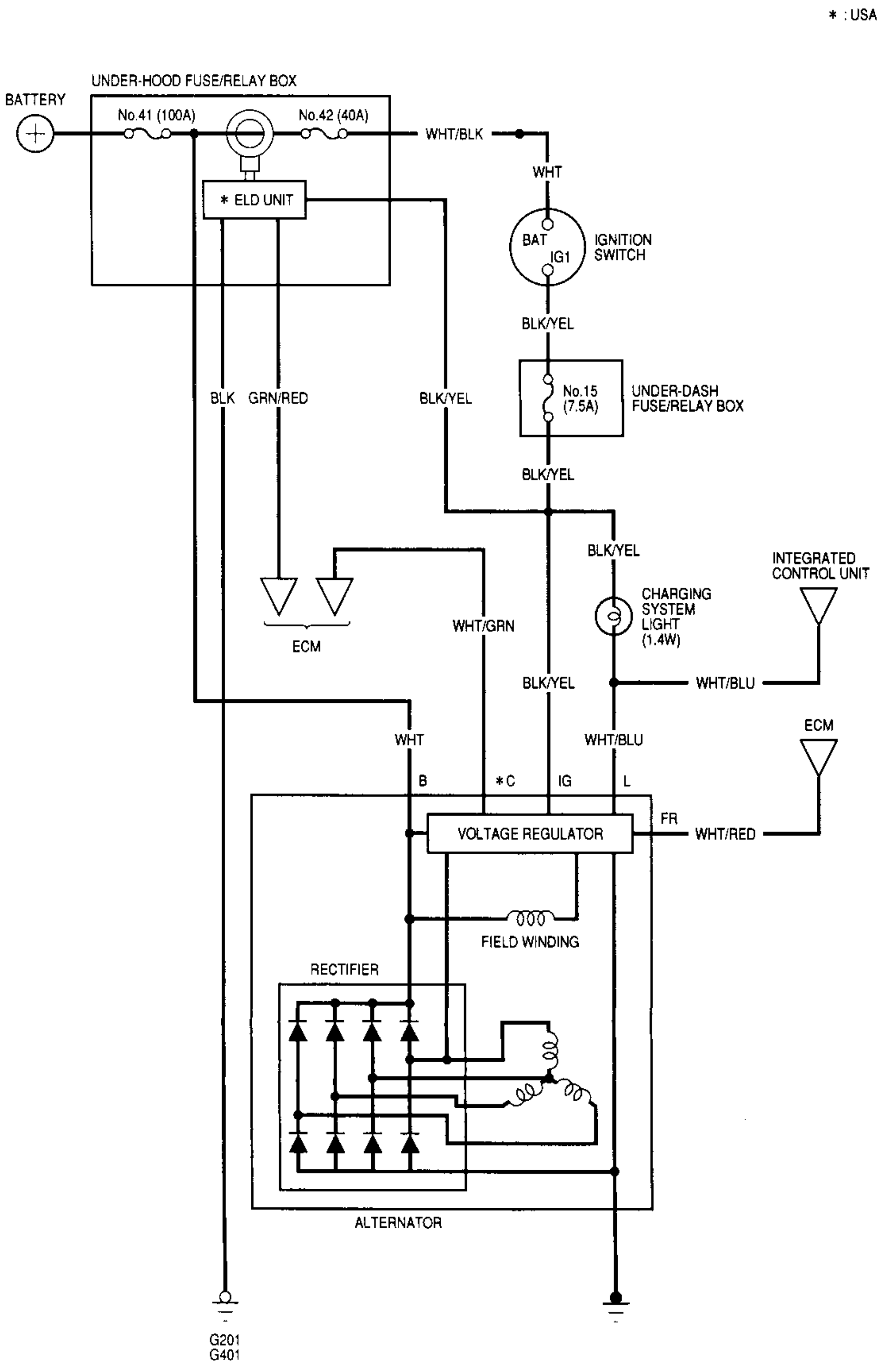
5. Screw the plugs into the cylinder head finger-tight, then torque them to 18 N•m (1.8 kgf•m, 13 lbf•ft).

Component Location Index

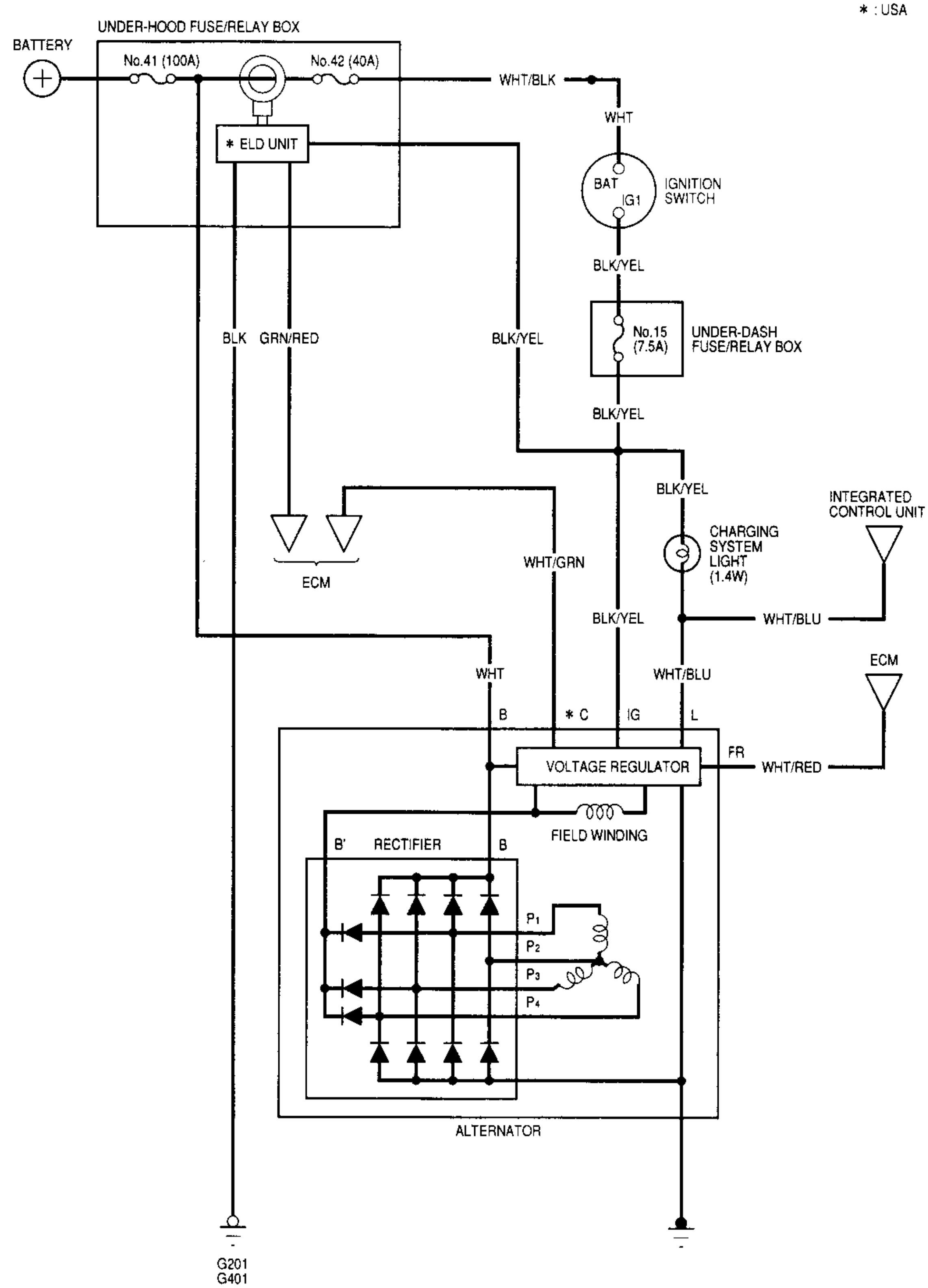


Charging System

Circuit Diagram



Circuit Diagram



Charging System

Troubleshooting

If the charging system light does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:

1. Battery
2. Charging system light
3. Voltage
4. Alternator control system
5. Alternator/regulator

Charging System Light Test

Charging System Light Check:
Make sure the charging system light comes on.

↓

Does the charging system light come on?

- NO → **Check for a blown No. 15 (7.5 A) fuse and a blown charging system light bulb. If the fuse and bulb are OK, repair the open in the WHT/BLU or BLK/YEL wire.**
- YES ↓

Charging System Light Check (cont'd):
Start the engine.

↓

Does the charging system light go off?

- YES → **Perform the Alternator/Regulator Test (see page 23-10).**
- NO ↓

Voltage Check:
Measure the voltage at the No. 1 [No. 2] terminal of the 4P [3P] connector with the ignition switch ON (II).

[ ]: Canada

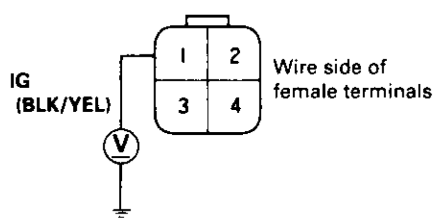
↓

Is there battery voltage?

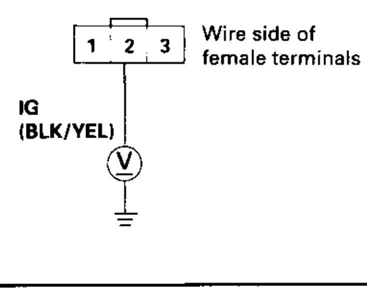
- NO → **Repair the open in the BLK/YEL wire between the alternator and under-dash fuse/relay box.**
- YES ↓

(To next page)

ALTERNATOR 4P CONNECTOR (USA)



ALTERNATOR 3P CONNECTOR (Canada)



(From previous page)

Check for an open in the L circuit:
1. Turn the ignition switch OFF.
2. Disconnect the 4P connector from the alternator.
3. Ground the No. 3 terminal of the 4P [3P] connector.
4. Turn the ignition switch ON (II).

[ ]: Canada

Does the charging system light come on?

NO → **Repair the open in the WHT/BLU or BLK/YEL wire.**

YES ↓

Check for a short in the L circuit (cont'd):
Disconnect the No. 3 terminal of the 4P [3P] connector from the ground.

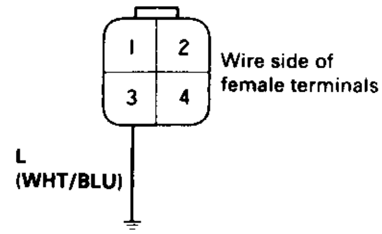
Does the charging system light go off?

YES → **Test and repair the alternator components.**

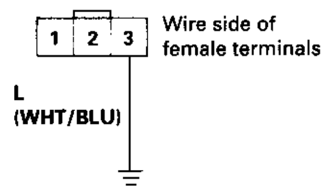
NO ↓

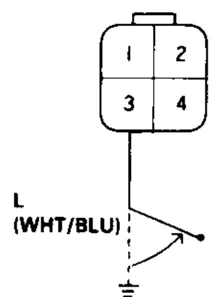
Repair the short to ground in the WHT/BLU wire.

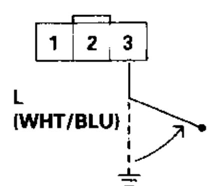
ALTERNATOR 4P CONNECTOR



ALTERNATOR 3P CONNECTOR (Canada)







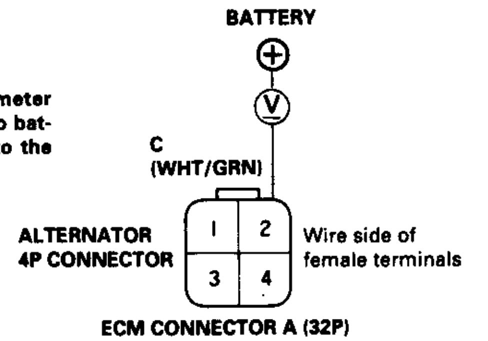
Troubleshooting

Alternator Control System Test (USA)

NOTE: Before testing, check proper operation of the ELD by confirming with the MIL (see section 11).

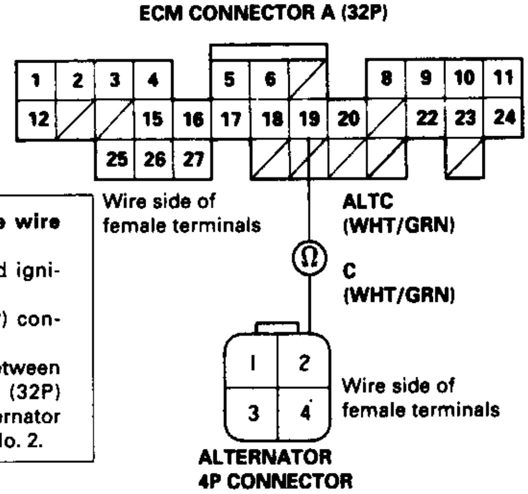
Check for a short in the circuit (ALTC line):
1. Disconnect the 4P connector from the alternator.
2. Start the engine, and turn the headlights (high beam) ON.
3. Measure voltage between the 4P connector terminal No. 2 and the positive terminal of the battery.

CAUTION: Be sure to use a voltmeter with its plus terminal connected to battery plus and its minus terminal to the 4P connector terminal No. 2.



Is there 1 V or less?

YES → **Check for an open in the wire (ALTC line):**
1. Turn the headlight and ignition switch OFF.
2. Disconnect the A (32P) connector from the ECM.
3. Check for continuity between the ECM connector A (32P) terminal No. 19 and alternator 4P connector terminal No. 2.

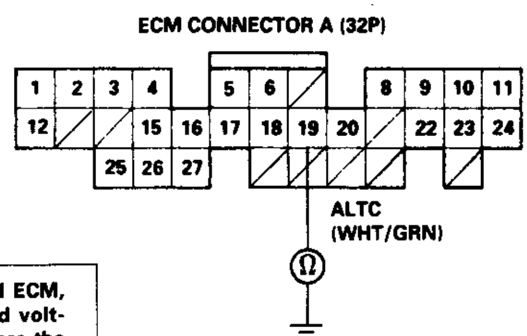


Is there continuity?

NO → **Repair open in the wire between the alternator and ECM.**

YES → **Test the alternator/regulator.**

NO → **Check for short in the wire (ALTC line):**
1. Turn the headlight and ignition switch OFF.
2. Disconnect the A (32P) connector from the ECM.
3. Check for continuity between the ECM connector A (32P) terminal No. 19 and body ground.



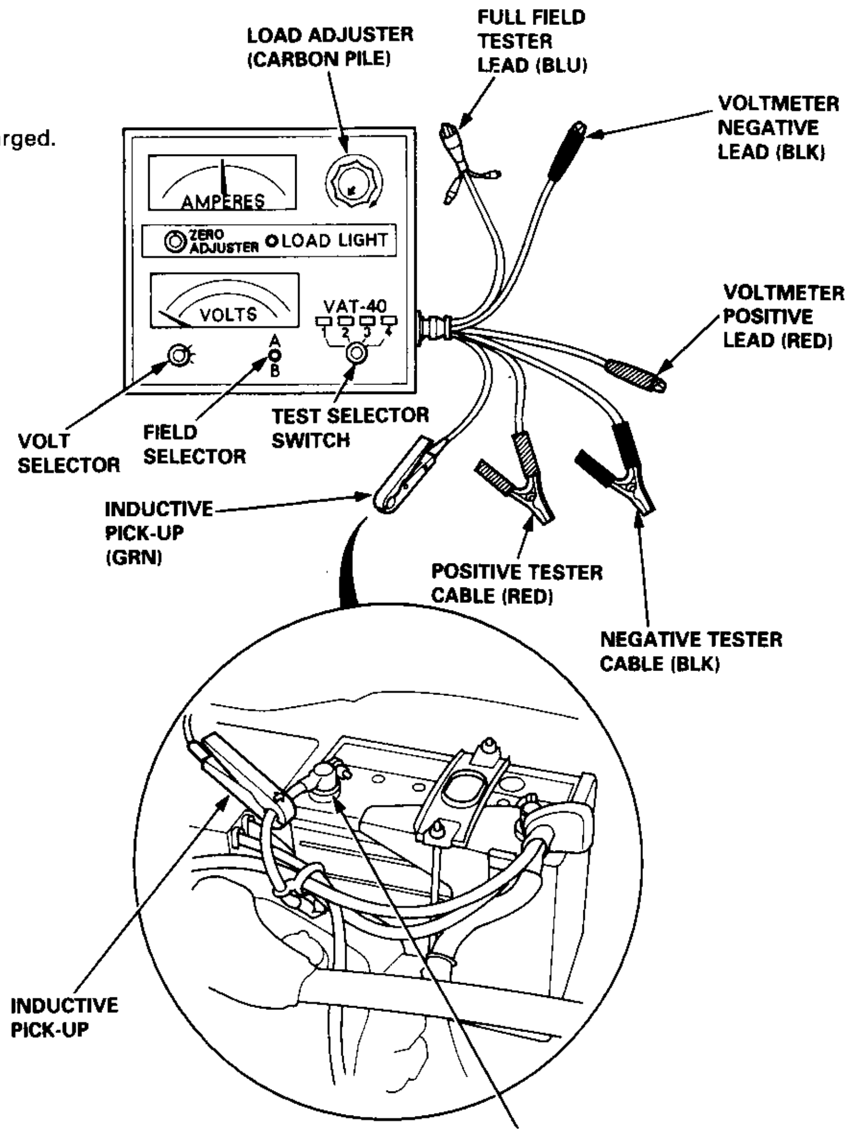
Is there continuity?

NO → **Substitute a known-good ECM, and recheck. If prescribed voltage is now available, replace the original ECM.**

YES → **Repair short in the wire between the alternator and ECM.**

Alternator/Regulator Test

NOTE: Be sure the battery is sufficiently charged.



Alternator/Regulator Test-1:
1. Connect a Sun VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).
2. Shift to neutral position, and start the engine. Hold the engine at 3,000 rpm with no load until the radiator fan comes on, then let it idle.
3. Raise the engine speed to 2,000 rpm, and hold it there.

Is the voltage over 15.1 V?

YES → **Replace the voltage regulator.**

NO ↓

Alternator/Regulator Test-2:
1. Release the accelerator pedal, and let the engine idle.
2. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).
3. Remove the inductive pick-up, and zero the ammeter.
4. Place the inductive pick-up over the battery ground cable so that the arrow points toward the battery negative terminal.
5. Raise the engine speed to 2,000 rpm, and hold it there.

Is the voltage less than 13.5 V?

YES → **Test and repair the alternator components.**

NO ↓

Alternator/Regulator Test-3:
Apply a load with the VAT-40 until the battery voltage drops to between 12 – 13.5 V.

To next page

(cont'd)

Troubleshooting (cont'd)

From previous page

Is the amperage 70 A or more?

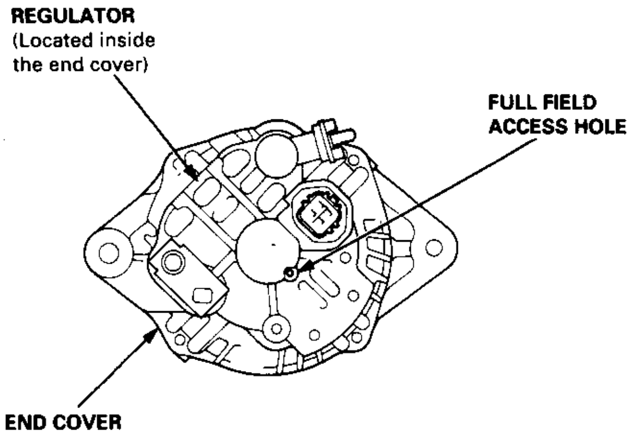
YES → **The charging system is OK.**

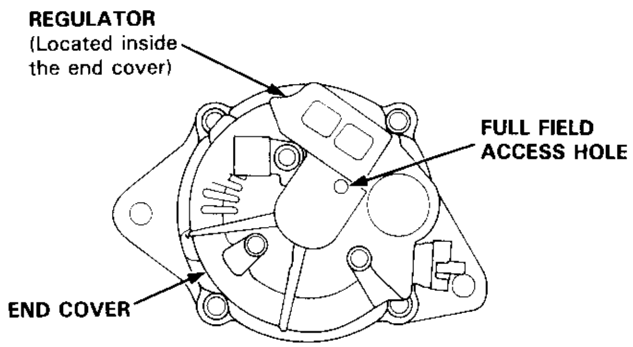
NO ↓

Alternator/Regulator Test-4:
With the engine speed still at 2,000 rpm, full-field the alternator.

CAUTION: The voltage will rise quickly when the alternator is full-fielded. Do not allow the voltage to exceed 18 V; it may damage the electrical system.

NOTE: Attach a probe to the VAT-40 full field test lead, and insert the probe into the full field access hole at the back of the alternator. Switch the field selector to the "A (Ground)" position momentarily, and check the amperage reading.





Is the alternator output 70 A or more?

NO → **Test and repair the alternator components.**

YES ↓

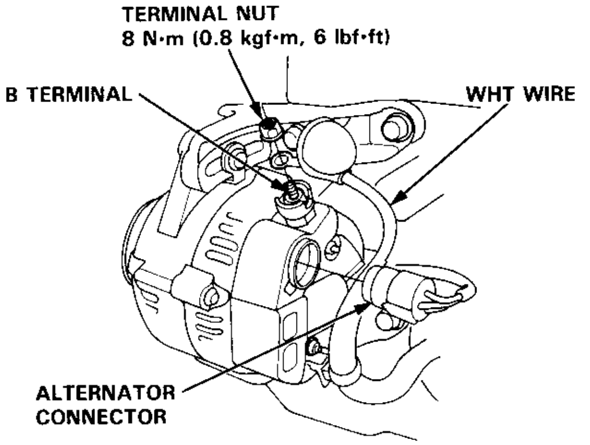
Replace the voltage regulator.

Alternator Replacement

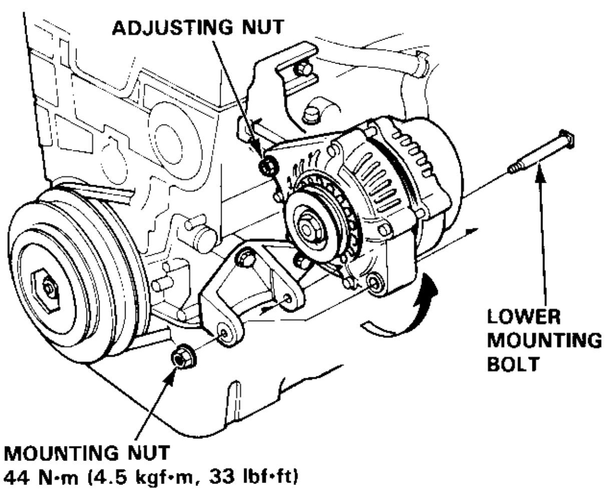
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

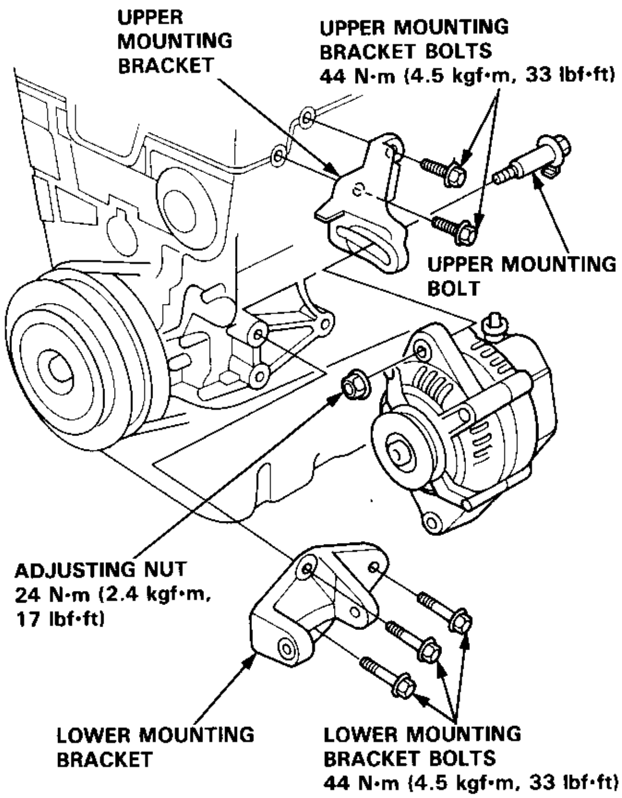
1. Disconnect the ground cable from the battery negative (−) terminal.
2. Disconnect the alternator connector from the alternator.



3. Remove the terminal nut and the WHT wire from the B terminal.
4. Loosen the adjusting nut, then remove the mounting nut.



5. Remove the alternator belt from the alternator pulley.
6. Remove the lower mounting bolt, then lift the alternator upward.
7. Remove the lower and upper mounting bracket bolts and the mounting brackets.



8. Remove the adjusting nut and upper mounting bolt, then lift out the alternator.
9. Install the alternator in the reverse order of removal.

CAUTION: Adjust the alternator belt tension after installation (see page 23-115).

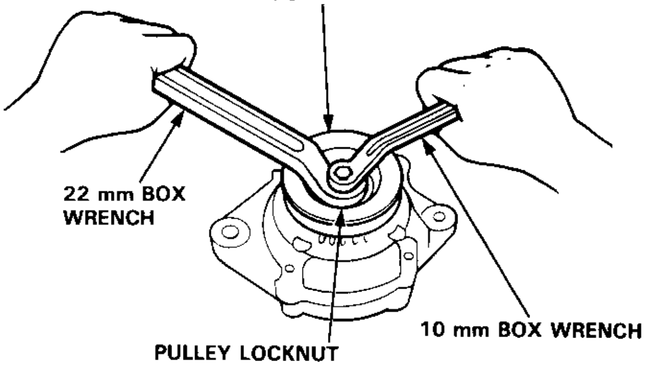
NOTE: Reconnect the battery ground cable and turn the radio on. When the word "CODE" is displayed, enter the customer's 5-digit code.

Charging System

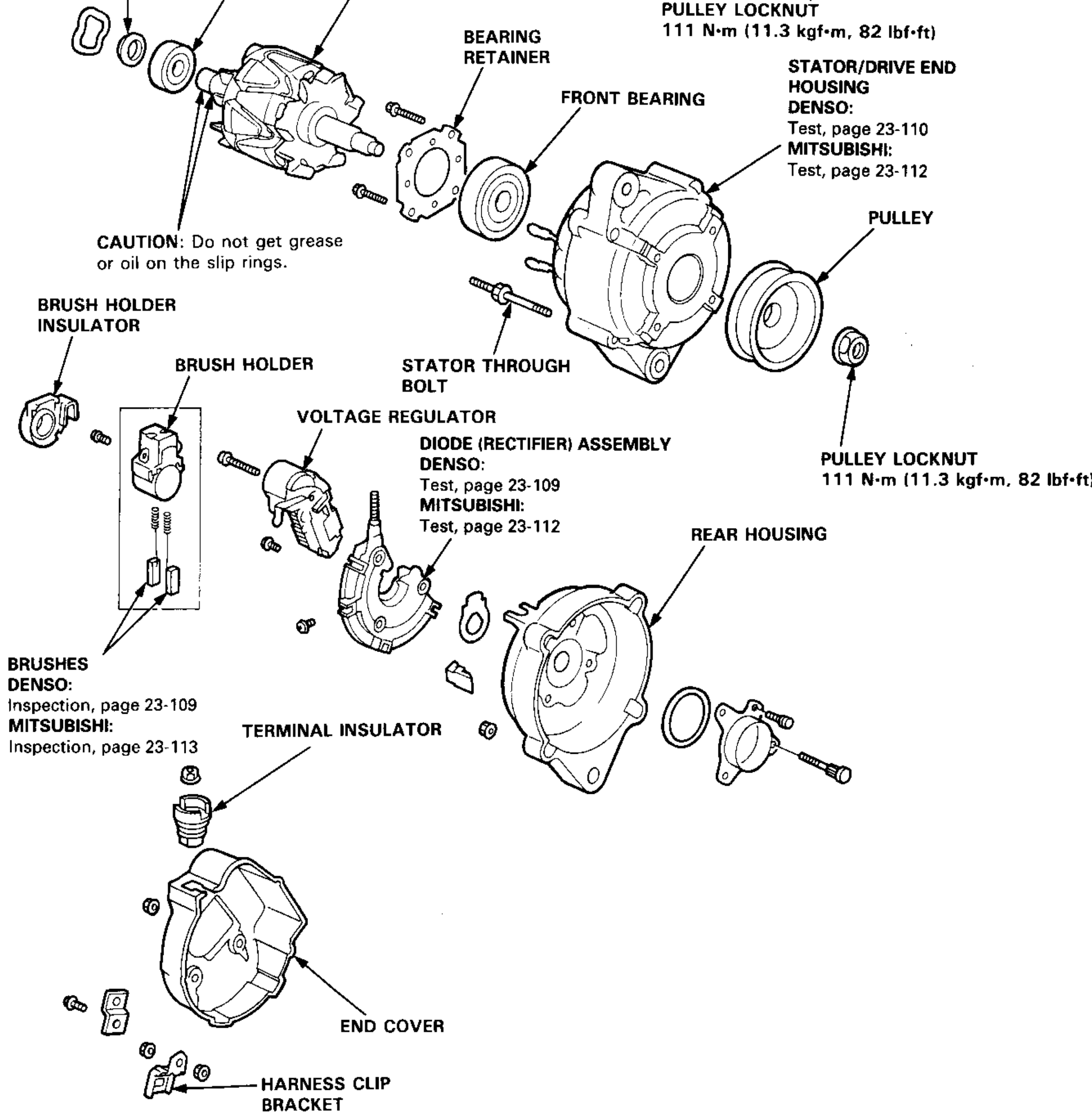
Alternator Overhaul

CAUTION: Do not remove the pulley unless the front bearing needs replacement.

To loosen the pulley locknut, use 10 mm and 22 mm wrenches. If necessary, use an impact wrench.



DENSO:

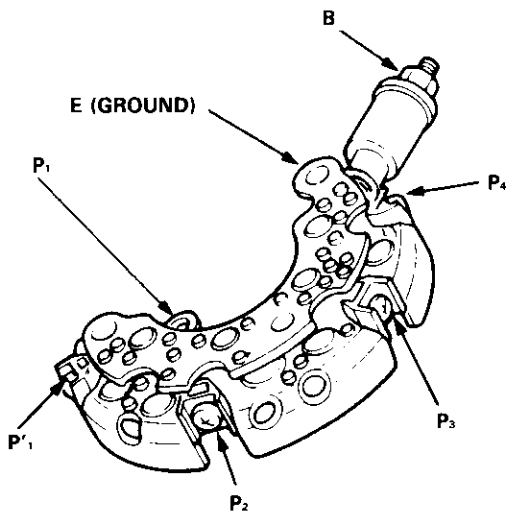


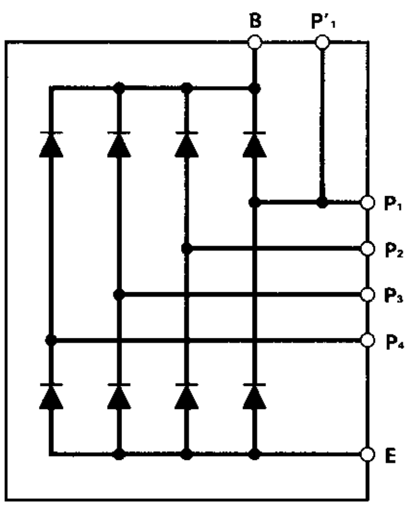
Rectifier Test

DENSO:

NOTE: The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability. Since the alternator rectifier is made up of eight diodes (four pairs), there are a total of 16 checks.

1. Check for continuity in each direction between the B and P terminals, and between the E (ground) and P terminals of each diode pair. All diodes should have continuity in only one direction.



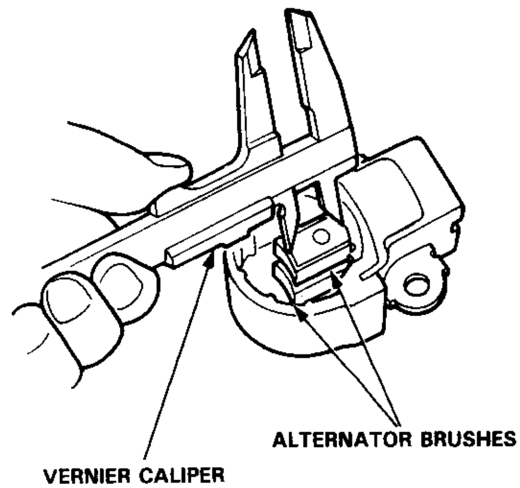


2. If any of the eight diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

Alternator Brush Inspection

1. Remove the end cover, then take out the brush holder by removing its two screws.
2. Measure the length of the brushes with a vernier caliper.

Alternator Brush Length:
Standard: 10.5 mm (0.41 in)
Service Limit: 1.5 mm (0.06 in)



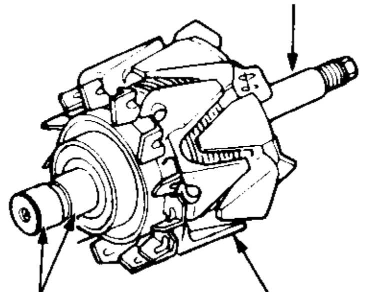
If the brushes are less than the service limit, replace the brush holder assembly.

Charging System

Rotor Slip Ring Test

DENSO:

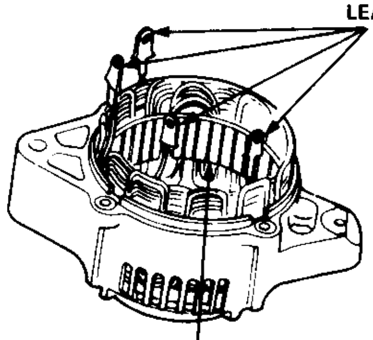
1. Check that there is continuity between the slip rings.



2. Check that there is no continuity between the slip rings and the rotor or rotor shaft.
3. If the rotor fails either continuity check, replace the alternator.

Stator Test

1. Check that there is continuity between each pair of leads.

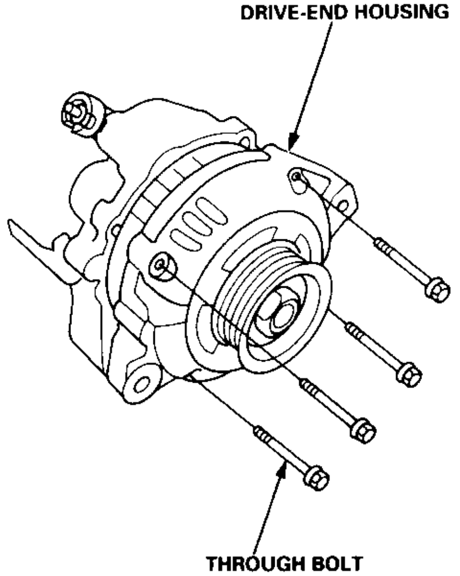


2. Check that there is no continuity between each lead and the coil core.
3. If the coil fails either continuity check, replace the alternator.

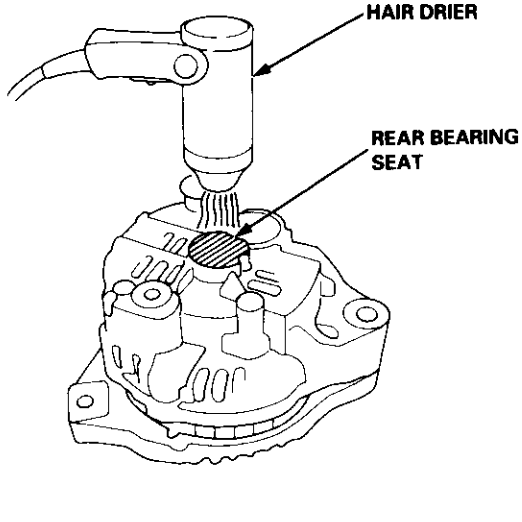
Rectifier Removal

MITSUBISHI:

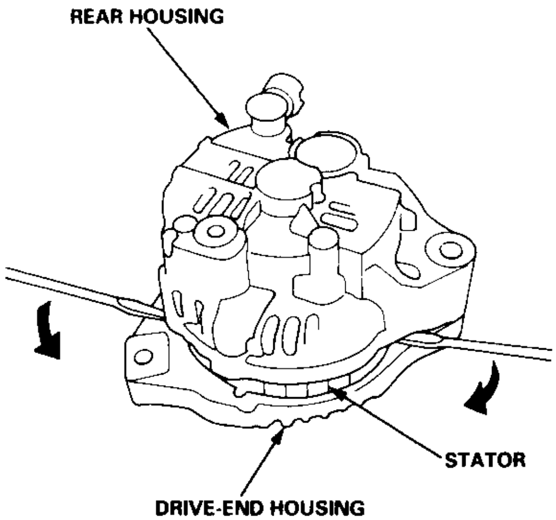
1. Remove the four through bolts.



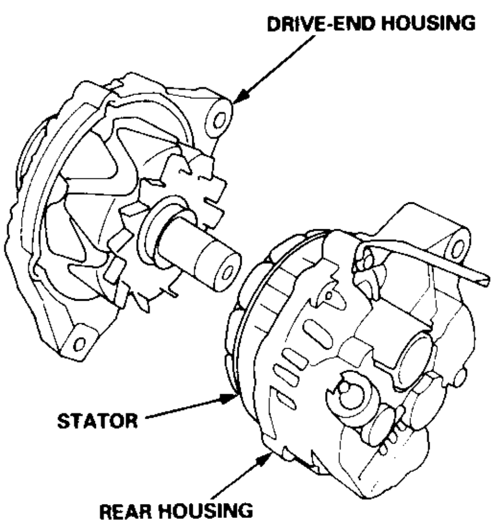
2. Heat the rear bearing seat with a 1,000 W hair drier for about five minutes (120 – 140°F, 50 – 60°C).



3. Separate the rear housing from the drive-end housing by inserting a flat tip screwdriver into the openings and prying them a part. Be careful not to damage the stator with the tip of the screwdriver.



4. Separate the rear housing and drive-end housing with the stator attached to the rear housing.



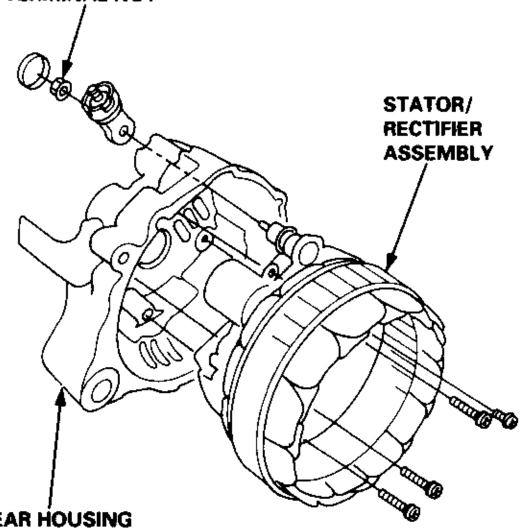
(cont'd)

Charging System

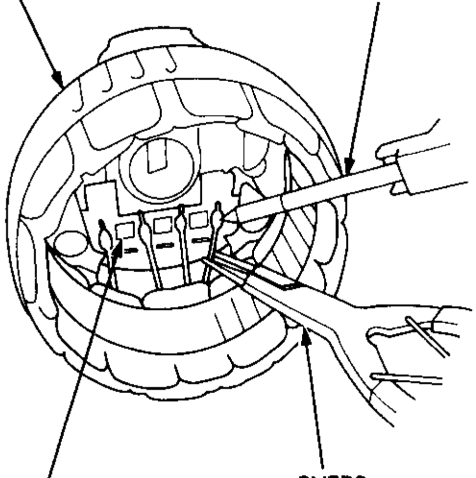
Rectifier Removal (cont'd)

MITSUBISHI:

5. Separate the rear housing from the stator/rectifier assembly by removing the four screws and the terminal nut.



6. Unsolder the rectifier from the stator leads.
   - To avoid damaging the diodes with heat, pinch the stator leads between pliers to carry heat off, and apply the soldering iron only long enough to separate the leads from the rectifier.
   - Use a 100 W soldering iron.



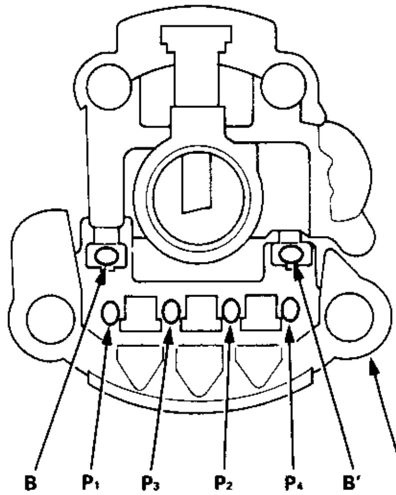
7. Install the new rectifier in the reverse order of removal.
   - Apply the soldering iron only long enough to ensure a good connection so the heat will not damage the diodes.
   - Use only a rosin core type solder or solder joints will corrode.

Rectifier Test

NOTE: The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Since the alternator rectifier is made up of nine diodes, each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability; a total of 22 checks.

1. Check for continuity in each direction between
   — the B and P terminals.
   — the B' and P terminals.
   — E (ground) and the P terminals.

   All diodes should have continuity in only one direction.

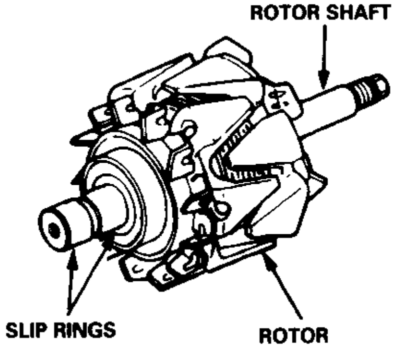


2. If any of the diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

Rotor Slip Ring Test

MITSUBISHI:

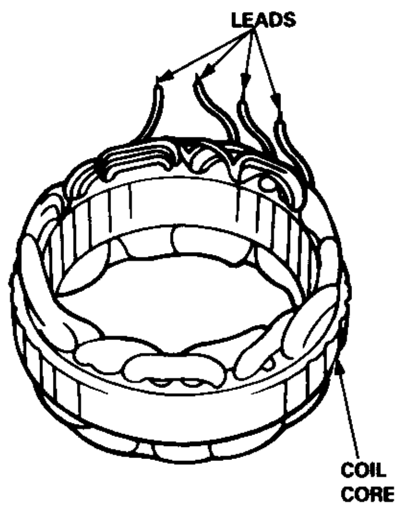
1. Check the resistance between the slip rings.
   There should be 1.8 – 3.0 ohms.
   - If resistance meets the specification, go to step 2.
   - If resistance does not meet the specification, replace the alternator.



2. Check that there is no continuity between the slip rings and the rotor or rotor shaft.
3. If the rotor fails either continuity check, replace the alternator.

Stator Test

1. Check that there is continuity between each pair of leads.



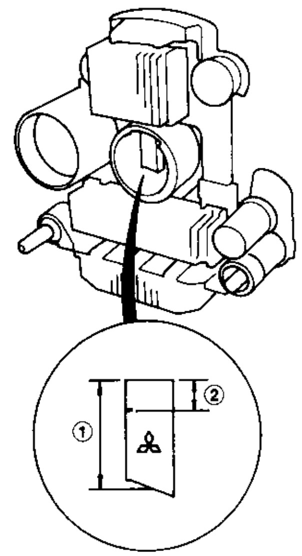
2. Check that there is no continuity between each lead and the coil core.
3. If the coil core fails either continuity check, replace the alternator.

Alternator Brush Inspection

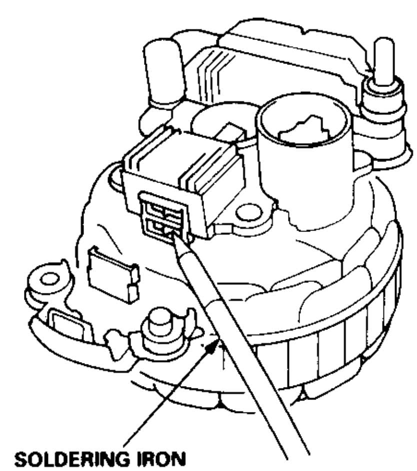
1. Separate the drive-end housing from the rear housing as described on page 23-111.
2. Separate the rear housing from the stator/rectifier assembly by removing the four screws and the terminal nut from the rear housing (see page 23-111).
3. Measure the length of the brushes with vernier calipers.

Alternator Brush Length:

① Standard (NEW)	② Service Limit
19.0 mm (0.75 in)	5.0 mm (0.20 in)



4. If the brushes are less than the service limit, replace them.

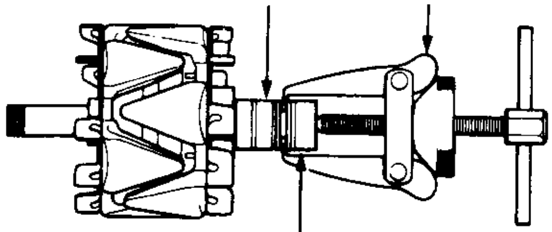


Rear Bearing Replacement

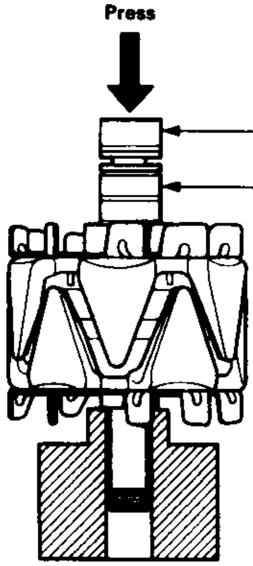
MITSUBISHI:

1. Pull off the rear bearing.

   - Make sure the tips of the bearing puller jaws are thin enough to fit between the bearing and the slip rings.
   - Do not reuse the bearing.

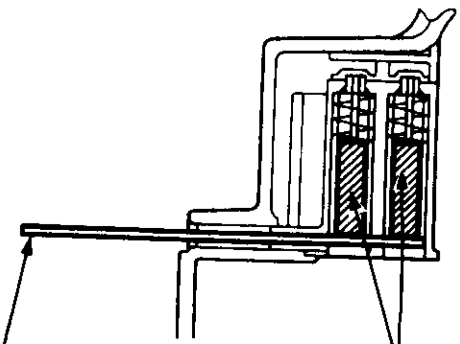


2. Use a hand press to install the new bearing. Apply pressure only on the inner race to avoid damaging the bearing.



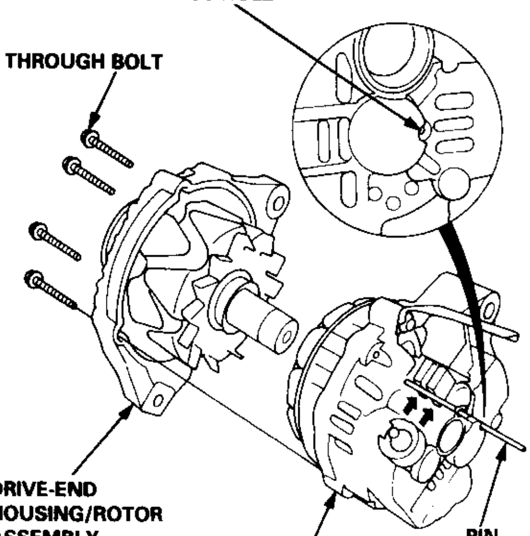
Alternator Reassembly

1. Push the brushes in, then insert a pin or drill bit (about 1.8 mm diameter) to hold them there.



2. Heat the rear bearing seat in the rear housing as described on page 23-12. After heating, continue immediately with assembling before the rear bearing seat cools completely.

3. Put the rear housing/stator assembly and drive-end housing/rotor assembly together, tighten the four through bolts and pull out the pin.



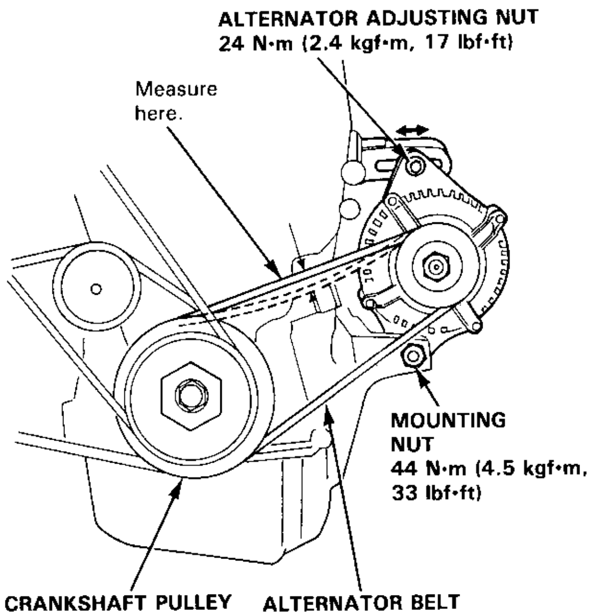
4. After assembling the alternator, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.

Alternator Belt Inspection and Adjustment

Deflection Method:
Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the alternator and the crankshaft pulley.

Deflection: 9–11 mm (0.35–0.43 in)

NOTE: On a brand-new belt (one that has been run for less than five minutes), the deflection should be B18B1, B18C1 engine: 6 - 8 mm (0.23 - 0.32 in), B18C5 engine: 7 - 9 mm (0.28 - 0.35 in) when first measured. If the belt is worn or damaged, replace it.



If adjustment is necessary:

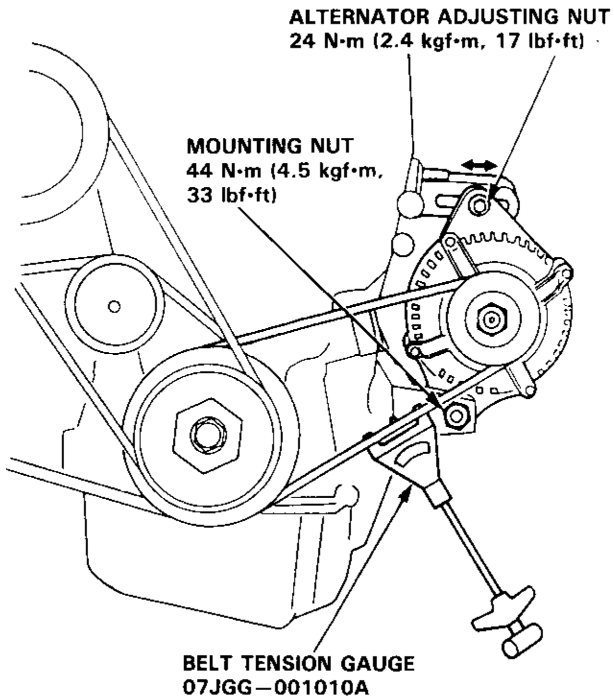
1. Loosen the alternator adjusting nut and mounting nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting nut and mounting nut to the specified torques.
3. Recheck the deflection of the belt.

   NOTE: If necessary, adjust the P/S pump belt (see section 17) and A/C compressor belt (see section 22).

Belt Tension Gauge Method:
Following the gauge manufacturer's instructions, attach the belt tension gauge to the belt and measure the tension.

Tension: 340–490 N (35–50 kgf, 77–110 lbf)

NOTE: On a brand-new belt (one that has been run for less than five minutes), tension should be B18B1, B18C1 engine: 690 - 880 N (70 - 90 kgf, 154 - 198 lbf), B18C5 engine: 540 - 740 N (55 - 75 kgf, 121 - 165 lbf) when first measured. If the belt is worn or damaged, replace it.



If adjustment is necessary:

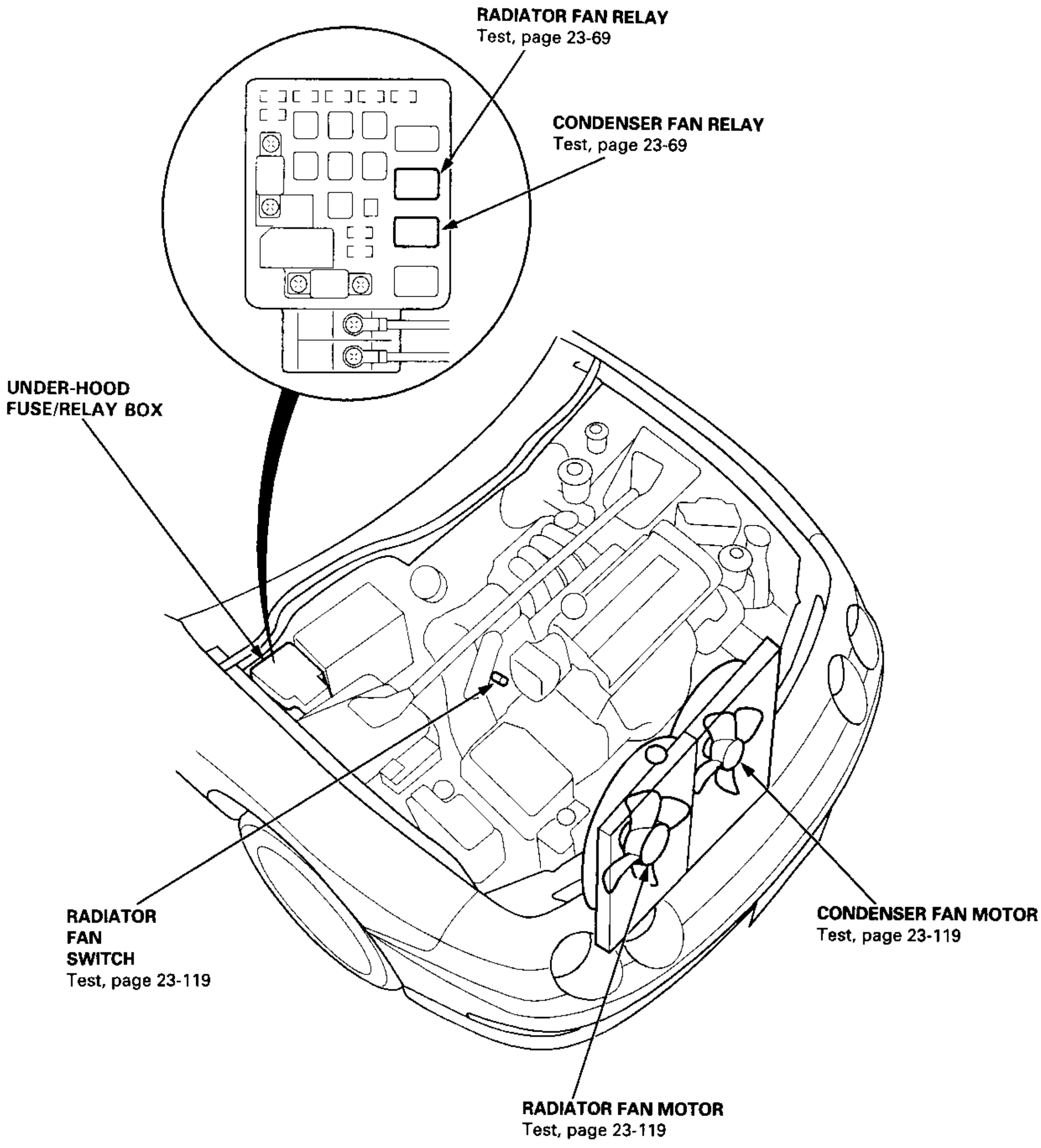
1. Loosen the alternator adjusting nut and mounting nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting nut and mounting nut to the specified torques.
3. Recheck the tension of the belt.

   NOTE: If necessary, adjust the P/S pump belt (see section 17) and A/C compressor belt (see section 22).

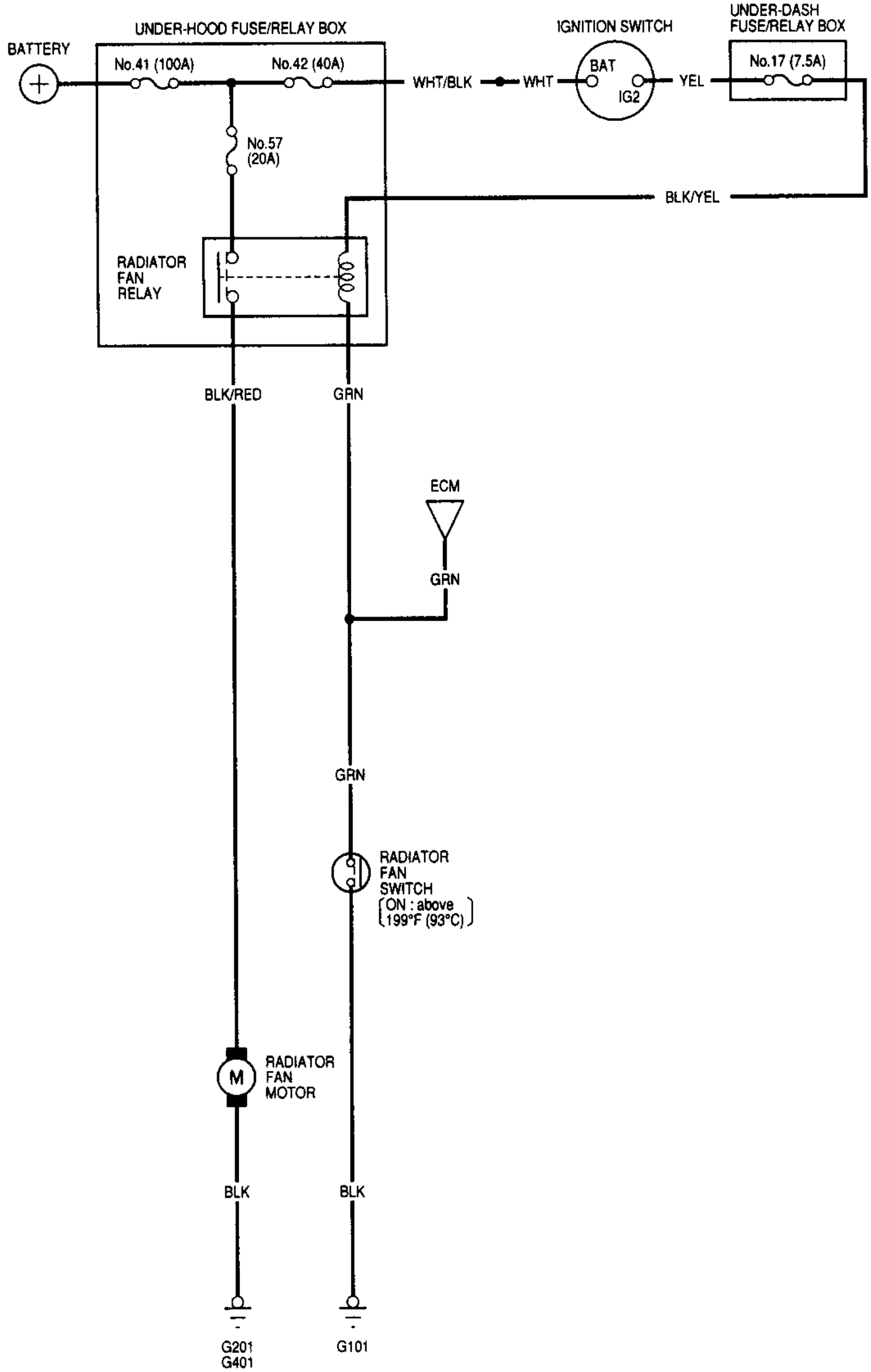
Fan Controls

Component Location Index

For the A/C system, see section 22.

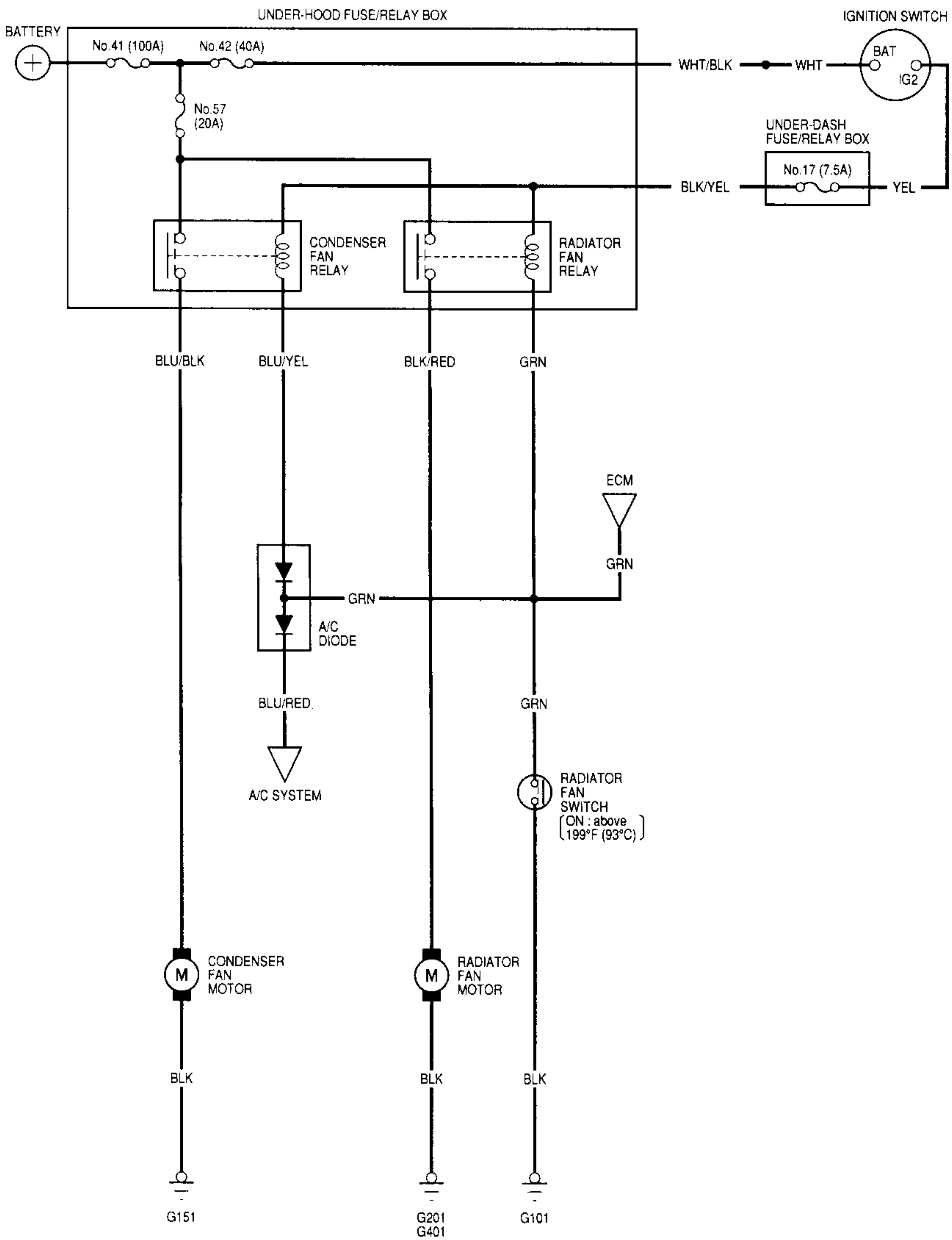


Circuit Diagram (Without A/C)



Fan Controls

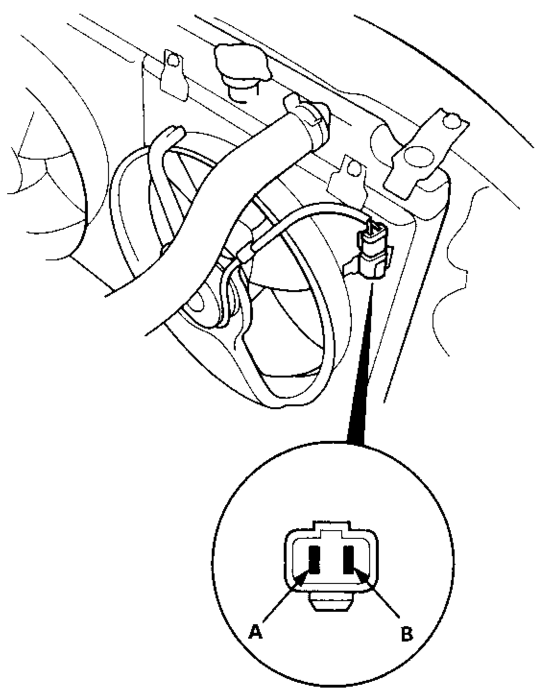
Circuit Diagram (With A/C)



Fan Motor Test

1. Disconnect the 2P connector from the fan motor.
2. Test the motor by connecting battery power to the B terminal, and ground to the A terminal.
3. If the fan motor fails to run smoothly, replace it.

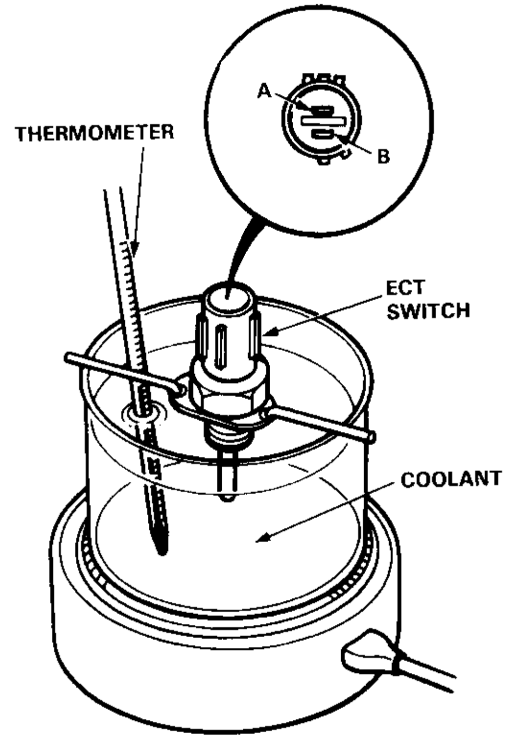
   NOTE: The illustration shows the radiator fan.



Radiator Fan Switch Test

NOTE: Bleed air from the cooling system after installing the radiator fan switch (see section 10).

1. Remove the radiator fan switch from the thermostat housing.
2. Suspend the radiator fan switch in a container of coolant as shown.

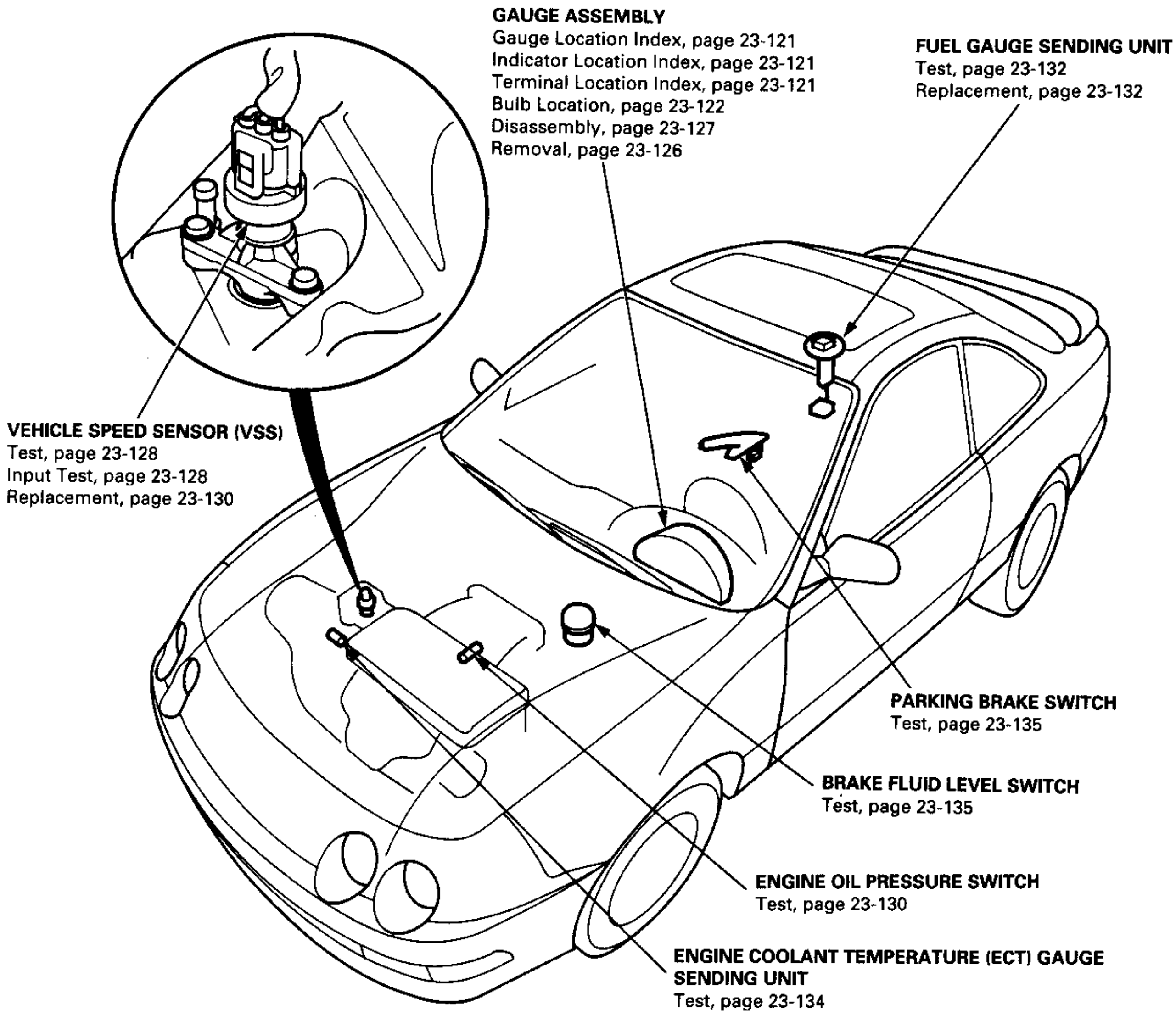


3. Heat the coolant and check engine coolant temperature with a thermometer.
4. Check the continuity between the A and B terminals according to the table:

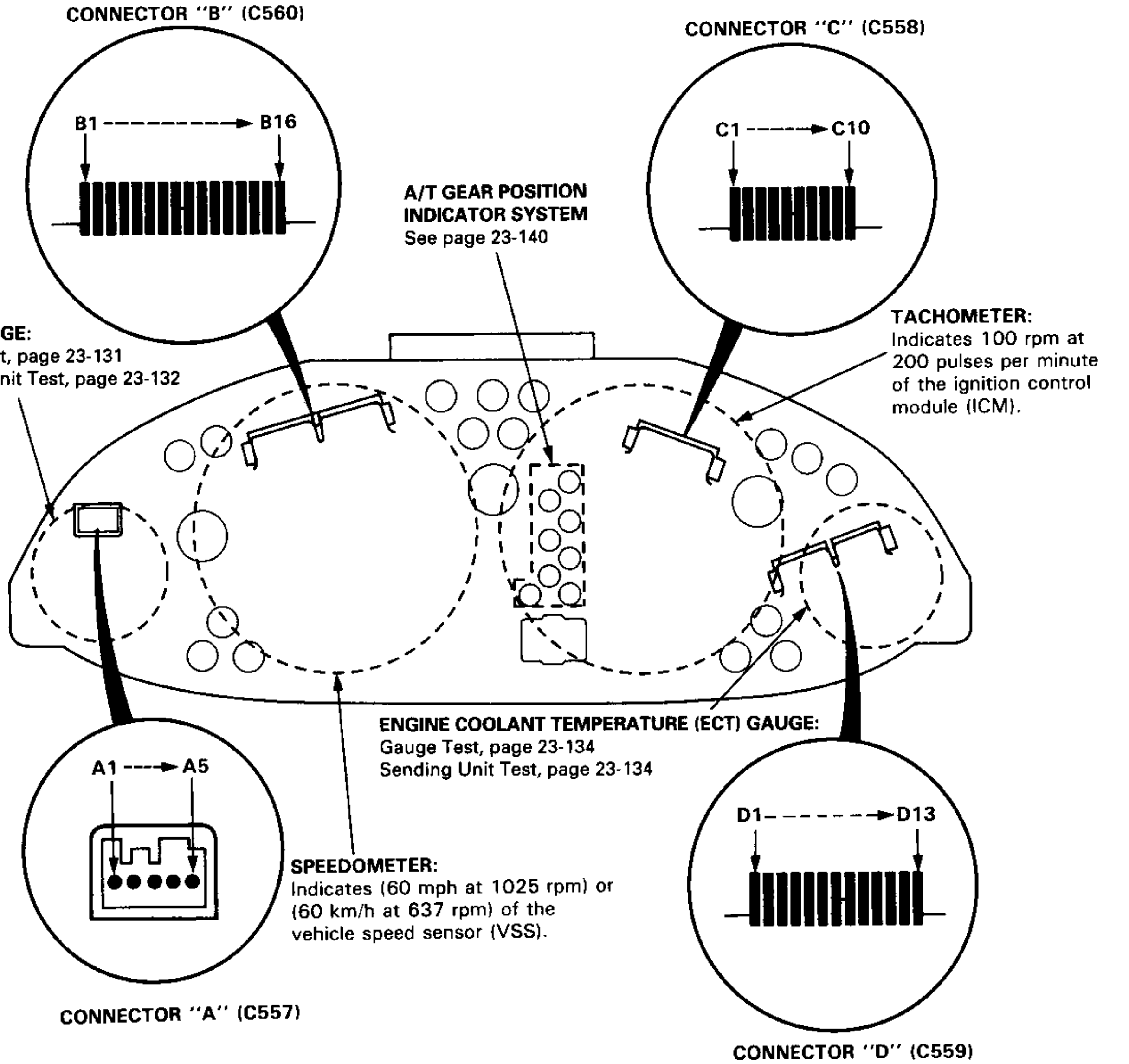
Operation		Terminal / Temperature	A	B
SWITCH	ON	196° – 203°F (91° – 95°C)	O—	—O
	OFF	5° – 14°F (3° – 8°C) lower than the temperature when it goes on.		

Gauge Assembly

Component Location Index

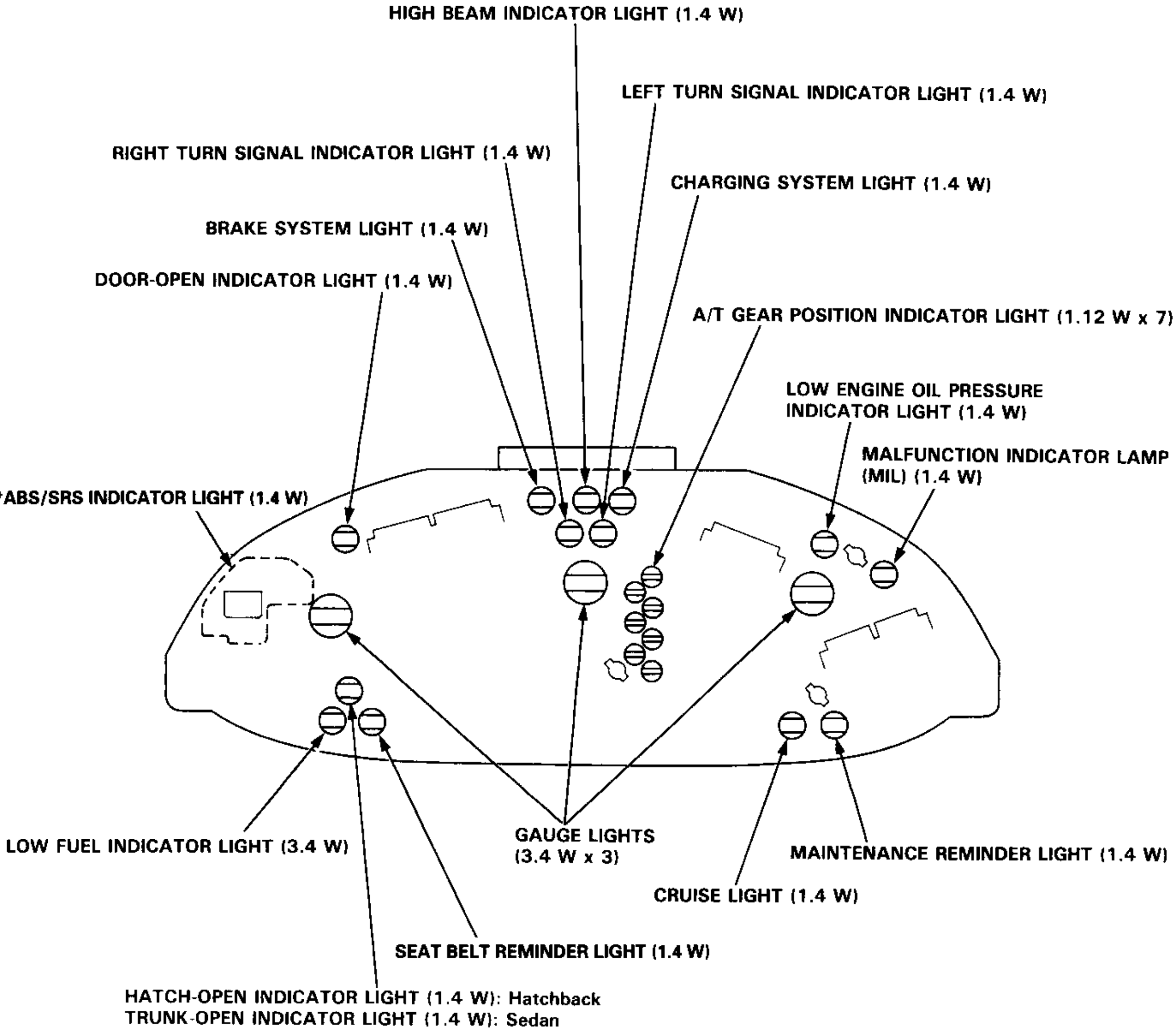


Gauge/Indicator/Terminal Location Index



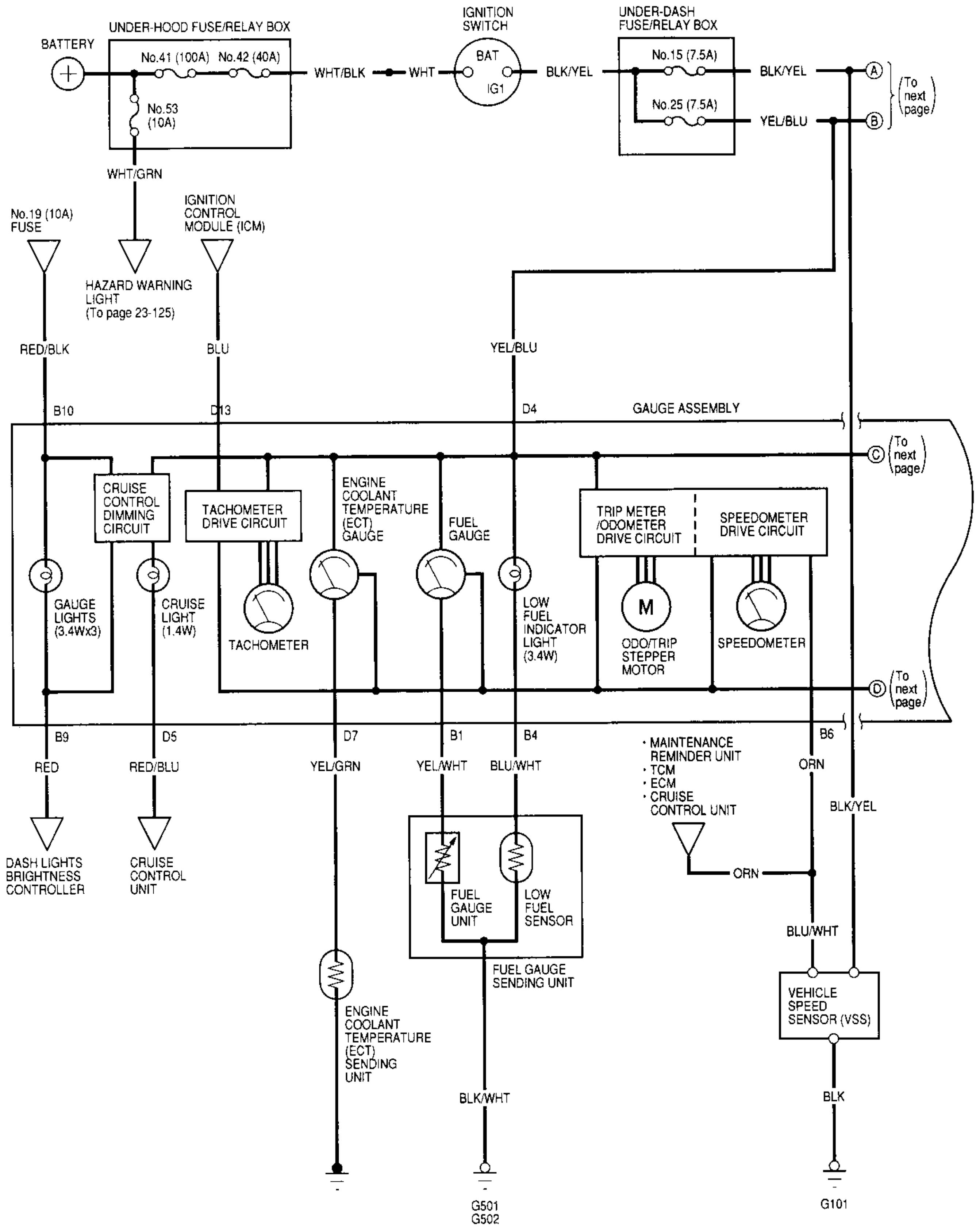
Gauge Assembly

Bulb Locations



*: On the ABS/SRS printed circuit board

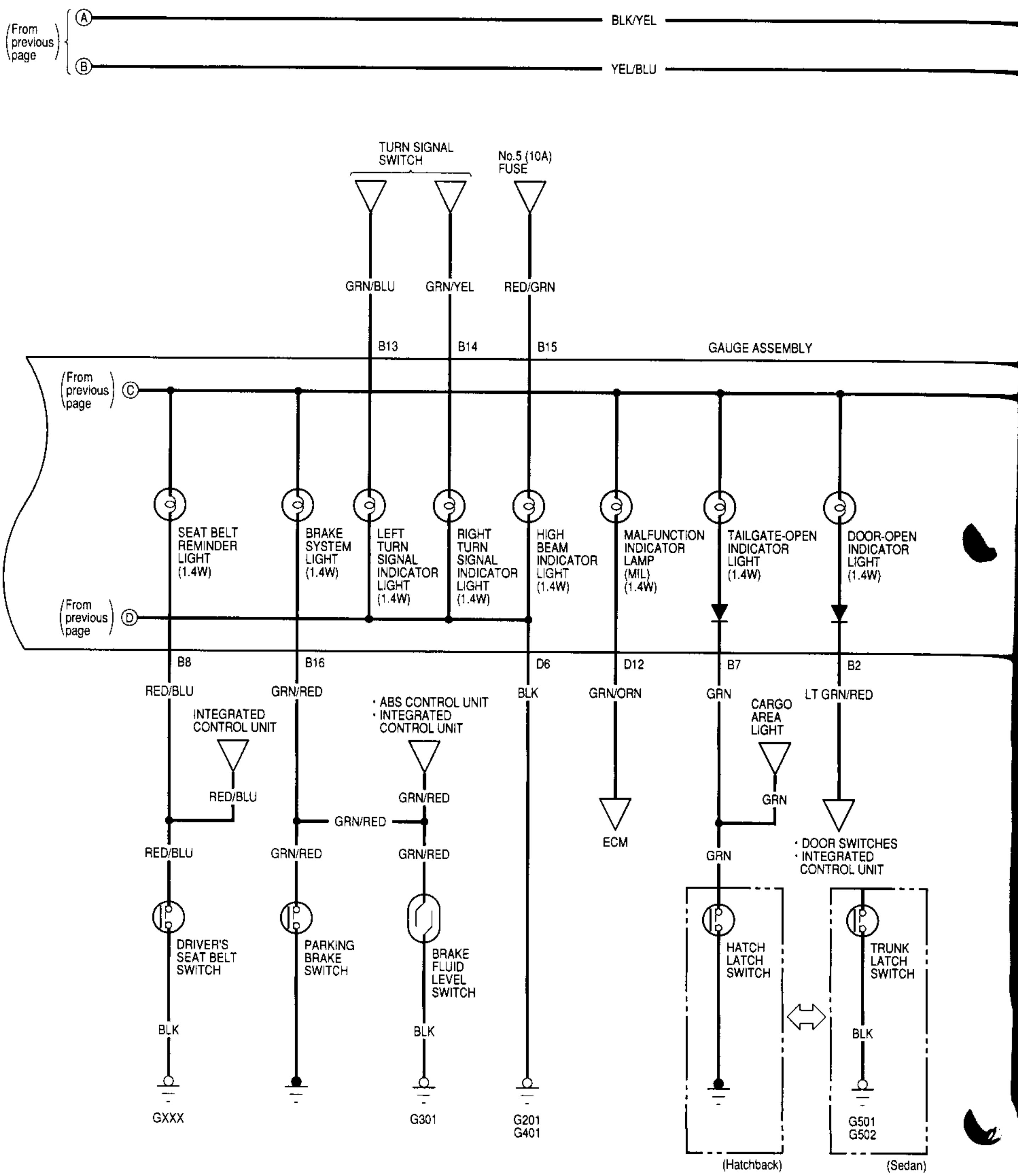
Circuit Diagram

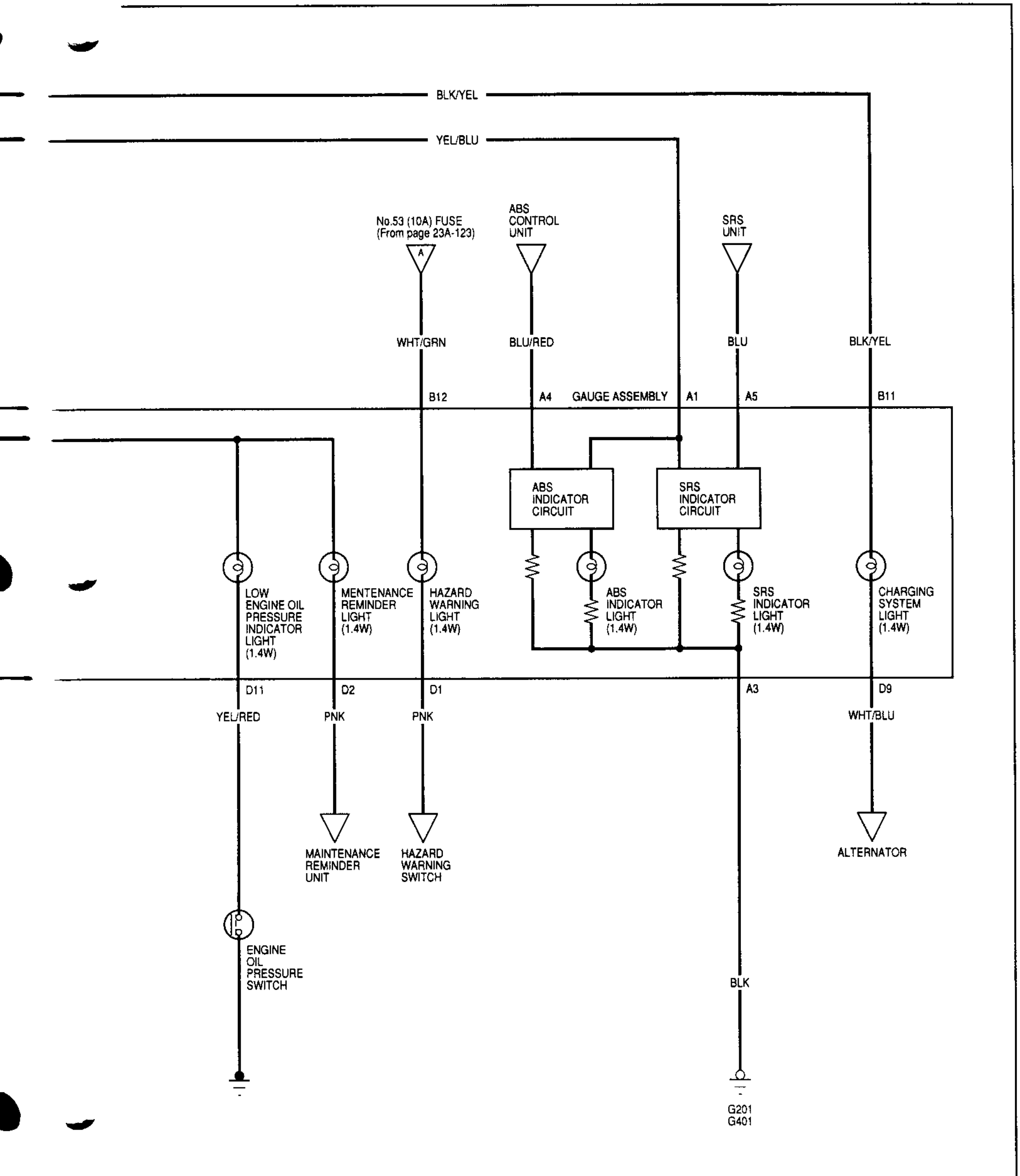


(cont'd)

Gauge Assembly

Circuit Diagram (cont'd)



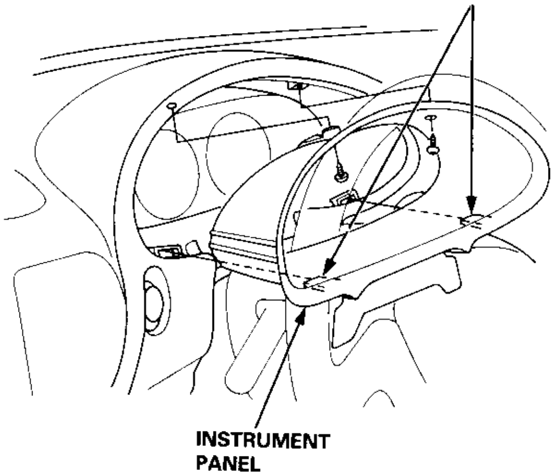

BLK/YEL
YEL/BLU
No.53 (10A) FUSE
(From page 23A-123)
A
ABS
CONTROL
UNIT
SRS
UNIT
WHT/GRN
BLU/RED
BLU
BLK/YEL
B12
A4
GAUGE ASSEMBLY
A1
A5
B11
ABS
INDICATOR
CIRCUIT
SRS
INDICATOR
CIRCUIT
LOW
ENGINE OIL
PRESSURE
INDICATOR
LIGHT
(1.4W)
MENTENANCE
REMINDER
LIGHT
(1.4W)
HAZARD
WARNING
LIGHT
(1.4W)
ABS
INDICATOR
LIGHT
(1.4W)
SRS
INDICATOR
LIGHT
(1.4W)
CHARGING
SYSTEM
LIGHT
(1.4W)
D11
D2
D1
A3
D9
YEL/RED
PNK
PNK
WHT/BLU
MAINTENANCE
REMINDER
UNIT
HAZARD
WARNING
SWITCH
ALTERNATOR
ENGINE
OIL
PRESSURE
SWITCH
BLK
G201
G401

Gauge Assembly

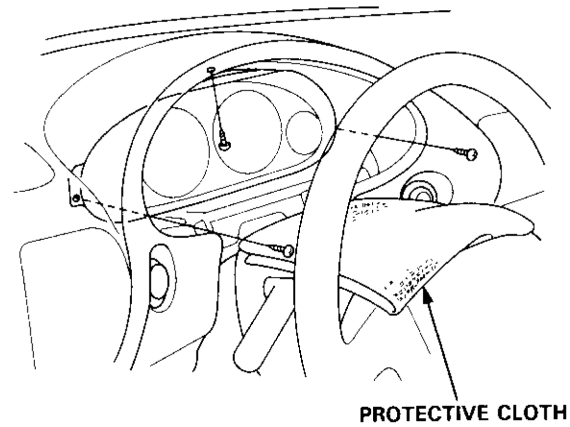
Removal

1. Remove the two screws from the instrument panel.
2. Remove the instrument panel.

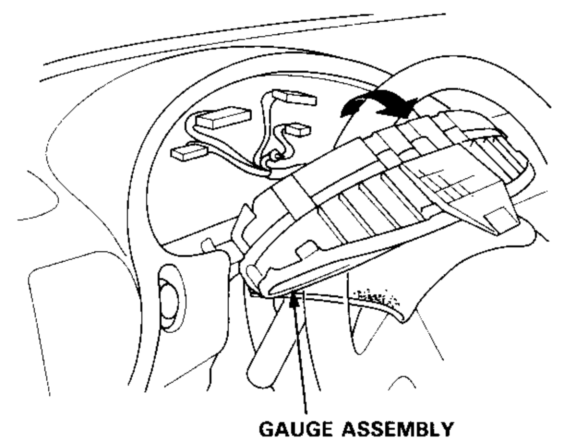
   NOTE: Remove the instrument panel carefully without damaging the clips.



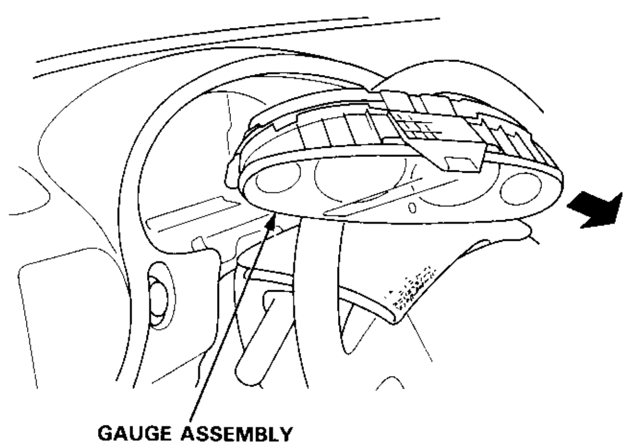
3. Tilt the steering wheel down with the tilt adjustment lever.
4. Remove the three mounting screws, and spread a protective cloth on the steering column.



5. Pry the gauge assembly out, and disconnect all connectors from it.

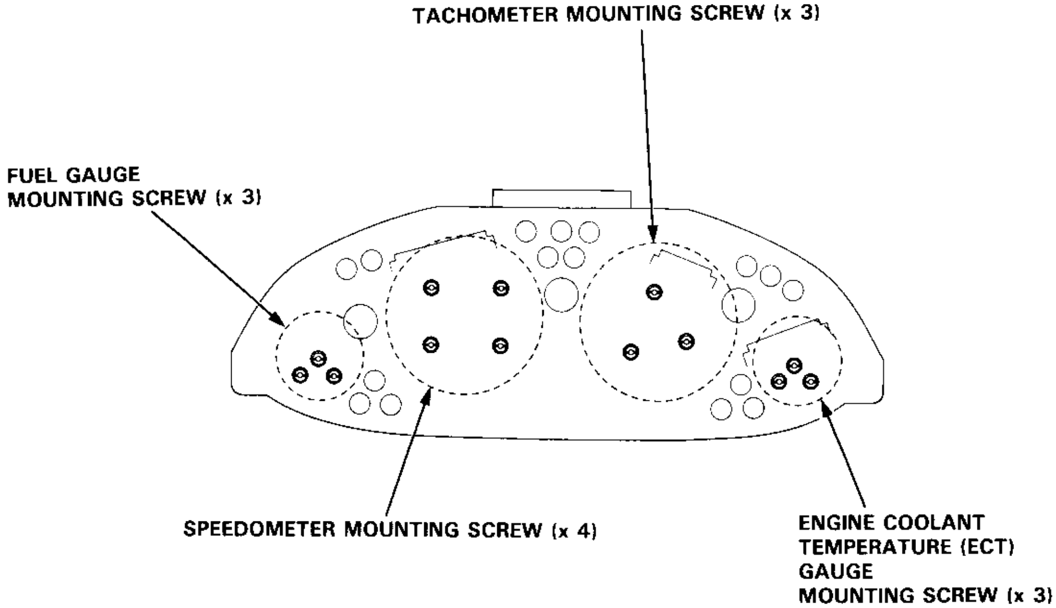


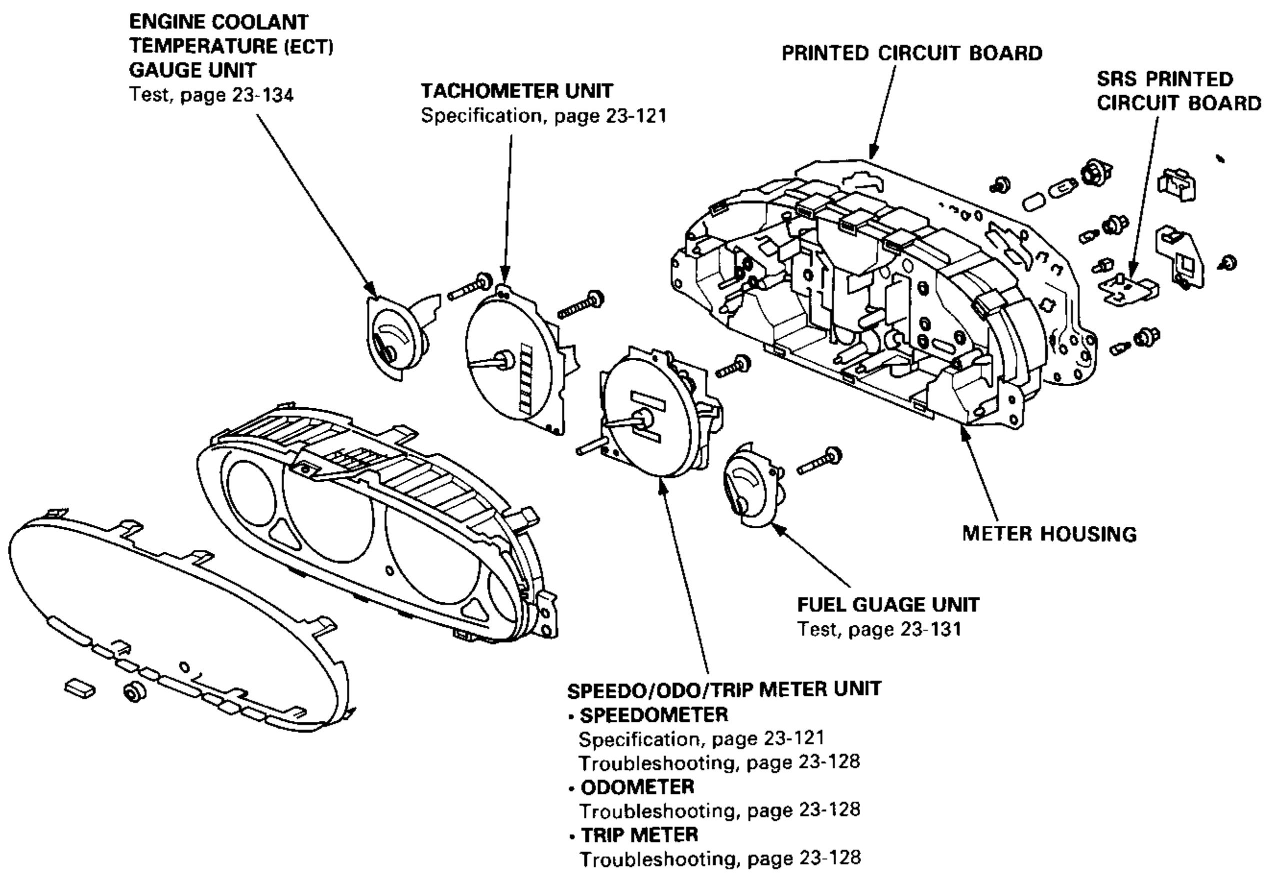
6: Take out the gauge assembly as shown.



Disassembly

NOTE: Handle the terminals and printed circuit boards carefully to avoid damaging them.



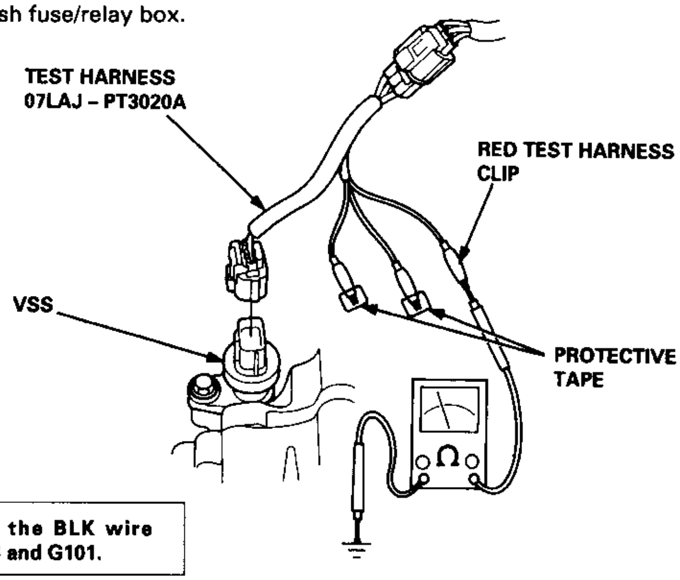


Vehicle Speed Sensor (VSS)

Troubleshooting

Before testing, inspect the No. 15 (7.5 A) fuse in the under-dash fuse/relay box.

Test the BLK wire:
1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Connect the test harness (07LAJ – PT3020A) only to the engine wire harness.
3. Connect the RED test harness clip to the positive probe of an ohmmeter.
4. Check for continuity between the RED test harness clip and body ground.

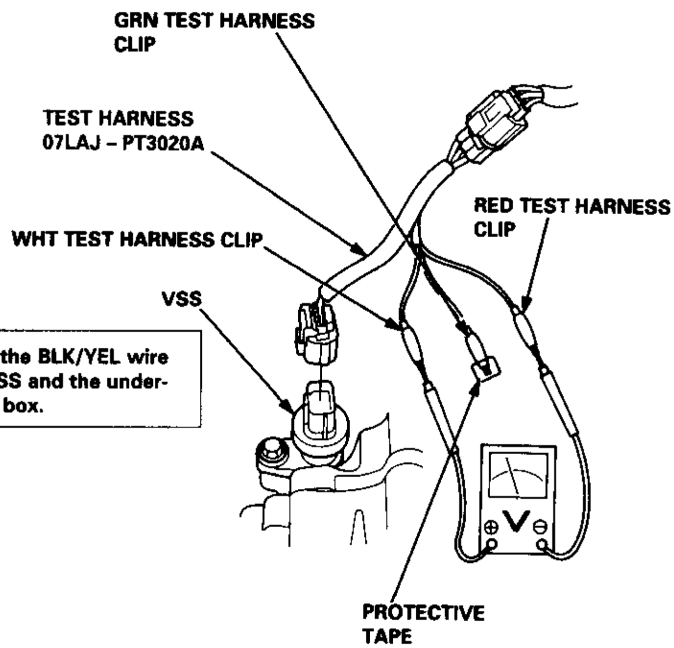


Is there continuity?

NO → **Repair open in the BLK wire between the VSS and G101.**

YES ↓

Test the BLK/YEL wire:
1. Connect the WHT test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.
2. Turn the ignition switch ON (II).



Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the VSS and the under-dash fuse/relay box.**

YES ↓

Test the BLU/WHT wire:
Connect the GRN test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.

Is there about 5 V or more?

NO → **Repair open in the BLU/WHT wire between the VSS and PCM.**

YES ↓

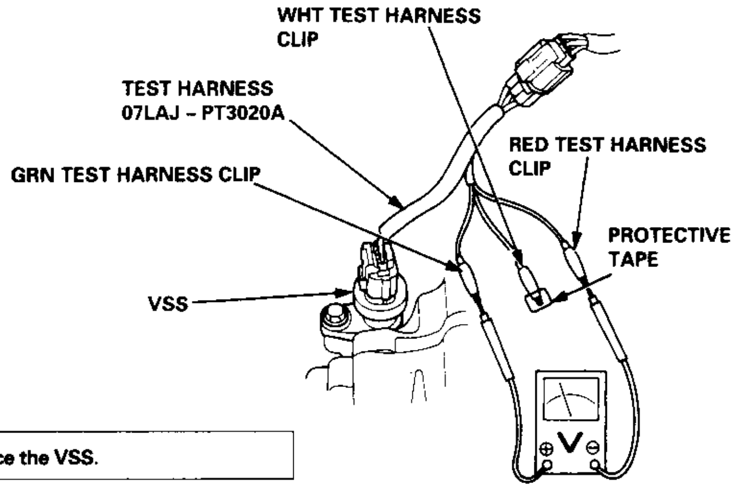
A

(To next page)

(From previous page)

A

Test the VSS:
1. Turn the ignition switch OFF.
2. Connect the other test harness connector to the VSS.
3. Raise the front and rear of the vehicle, and support it with safety stands.
4. Put the transmission in neutral with the ignition switch ON (II).
5. Slowly rotate one wheel with the other wheel blocked.



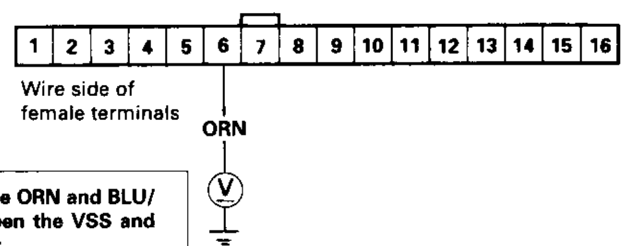
Does voltage pulse from 0 to approx. 5 V or more?

NO → **Replace the VSS.**

YES ↓

Speedometer Test:
1. Disconnect the 16P connector "B" from the gauge assembly.
2. Touch a probe to the ORN wire, and connect it to body ground through a voltmeter.
3. Slowly rotate one wheel with the other wheel blocked.

GAUGE ASSEMBLY 16P CONNECTOR "B"



Does the meter indicate pulsing voltage?

NO → **Repair open in the ORN and BLU/WHT wire between the VSS and the speedo-meter.**

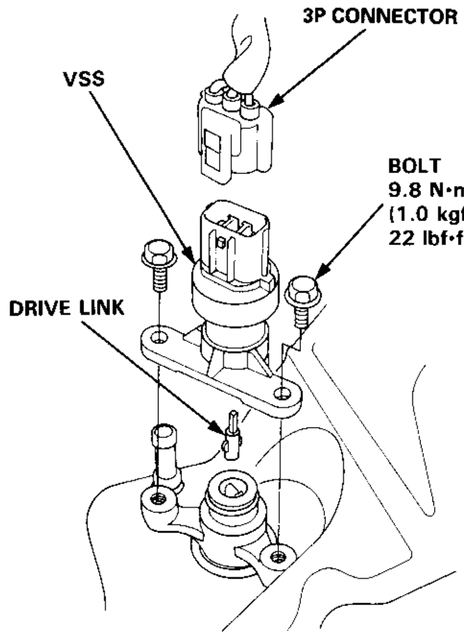
YES ↓

Replace the speedometer.

Vehicle Speed Sensor (VSS)

Replacement

1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Remove the two mounting bolts, then remove the VSS.



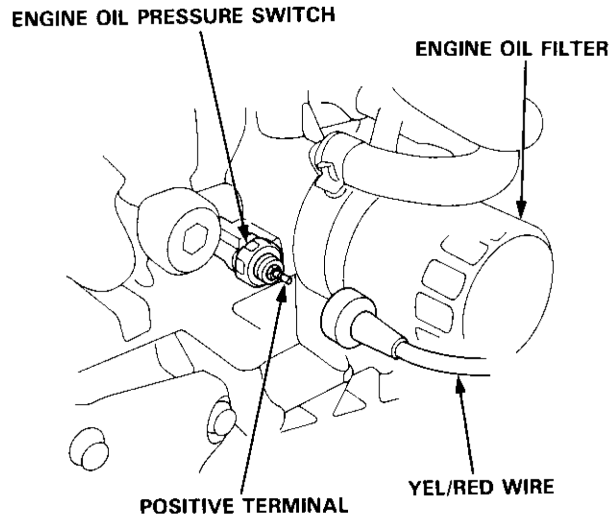
3. Install in the reverse order of removal.

   NOTE: The VSS drive link is a very small part; be careful not to lose it.

Engine Oil Pressure Indicator System

Engine Oil Pressure Switch Test

1. Remove the YEL/RED wire from the engine oil pressure switch.



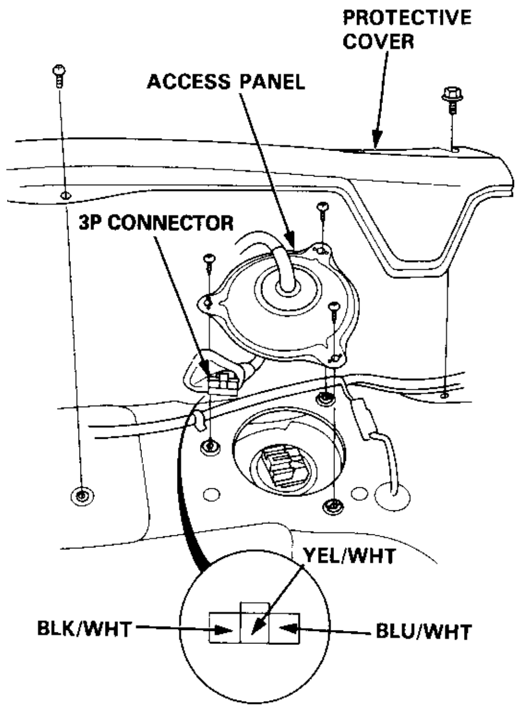
2. Check for continuity between the positive terminal and the engine (ground) with the ignition switch OFF.
   - If there is continuity, go to step 3.
   - If there is no continuity, replace the switch.
3. Check for continuity again, this time with the engine running.
   - If there is continuity, go to step 4.
   - If there is no continuity, the switch is OK.
4. Make sure engine oil level is OK, then check engine oil pressure (see section 8).
   - If engine oil pressure is OK, replace the switch.
   - If engine oil pressure is low, check the engine oil pump (see section 8) and, if necessary, replace it.

Fuel Gauge

Gauge Test

NOTE: Refer to page 23-123 for the fuel gauge system circuit.

1. Check the No. 25 (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Remove the rear seat (see section 20).
3. Remove the protective cover and access panel from the floor.
4. With the ignition switch OFF, disconnect the 3P connector from the fuel gauge sending unit.



View from wire side

5. Connect the voltmeter positive probe to the YEL/WHT terminal and the negative probe to the BLK/WHT terminal, then turn the ignition switch ON (II). There should be between 5 and 8 V.

- If the voltage is as specified, go to step 6.
- If the voltage is not as specified, check for
  - an open in the YEL/WHT, BLU/WHT or BLK/WHT wire.
  - poor ground (G501, G502).

6. Turn the ignition switch OFF. Attach a jumper wire between the BLK/WHT and YEL/WHT terminals, then turn the ignition switch ON (II).
Check that the pointer of the fuel gauge starts moving toward the "F" mark.

CAUTION: Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.

NOTE: The fuel gauge is a bobbin (cross-coil) type gauge, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves more slowly than that of a bimetal type gauge.

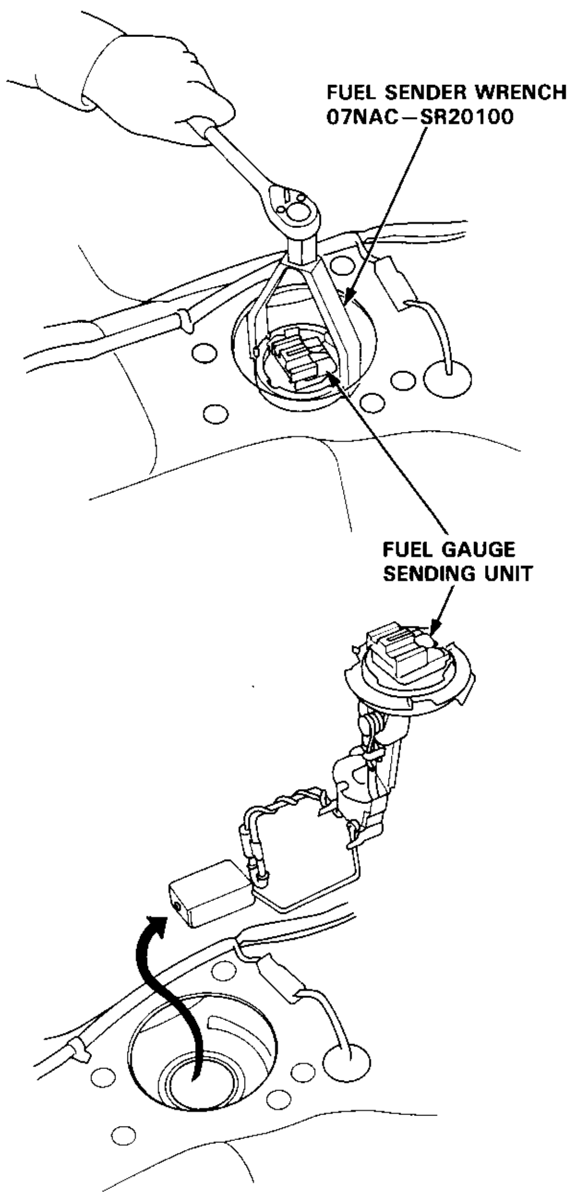
- If the pointer of the fuel gauge does not move at all, replace the gauge.
- If the gauge is OK, inspect the fuel gauge sending unit.

Fuel Gauge

Sending Unit Test/Replacement

⚠ WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

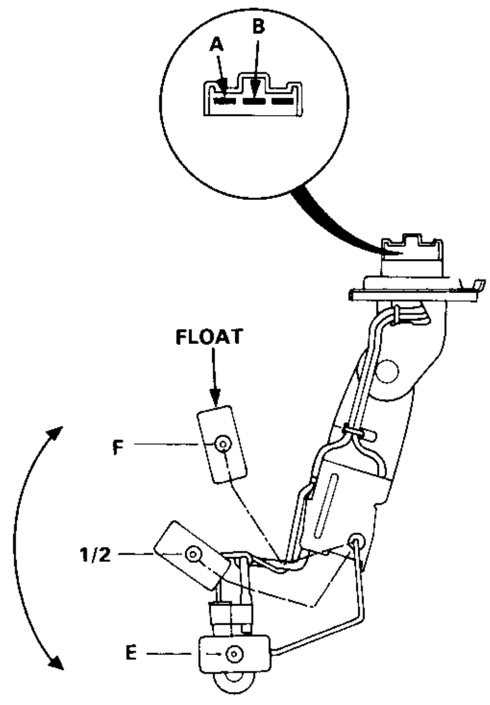
1. Remove the rear seat (see section 20).
2. Remove the protective cover and access panel from the floor.
3. With the ignition switch OFF, disconnect the 3P connector from the fuel gauge sending unit.
4. Remove the fuel gauge sending unit.



5. Measure the resistance between the A and B terminals at E (empty), 1/2 (half full) and F (full) by moving the float.

Float Position	E	1/2	F
Resistance (Ω)	105–110	25.5–39.5	2–5

6. Check the change in resistance by moving the float up and down.



7. If unable to obtain the above readings or if resistance does not change, replace the fuel gauge sending unit.

NOTE: Use new O-rings or packings when reassembling. For details, refer to section 11.

Low Fuel Indicator

Indicator Light Test

NOTE: Refer to page 23-123 for the wiring description of the low fuel indicator circuit.

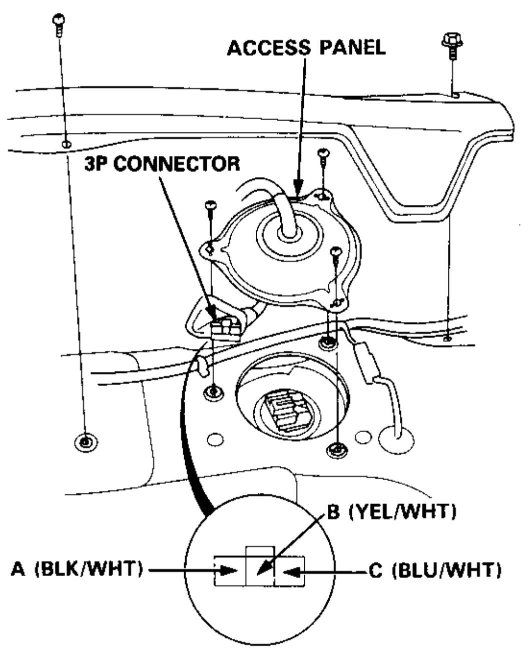
1. Park car on level ground.

   ⚠ WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area. Drain fuel only into an approved container.

2. Drain fuel into an approved container. Then install the drain bolt with a new washer.

3. Add less than 8.2 ℓ (2.2 U.S.Gal, 1.8 Imp.Gal) of fuel and turn the ignition switch ON (II). The low fuel indicator light should come on within four minutes.

   - If the light does not come on, remove the access panel and disconnect the 3P connector from the fuel gauge sending unit. Connect the A (BLK/WHT) terminal to the C (BLU/WHT) terminal with a jumper wire.
     - If the light comes on, the problem is either the sending unit or its ground.
     - If the light does not come on, the problem is an open in the BLU/WHT wire to the gauge assembly, no power to the gauge, or a blown bulb.
   - If the light comes on, add approx. 4 ℓ (1.1 U.S.Gal, 0.9 Imp.Gal) of fuel, the light should go off within four minutes.



View from wire side

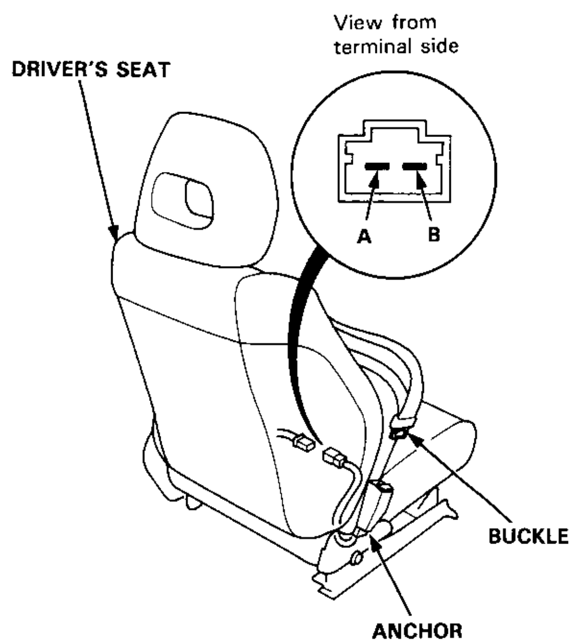
Seat Belt Reminder System

Seat Belt Switch Test

1. Slide the driver's seat to the middle position, then disconnect the 2P connector from the back of the seat.

2. Check for continuity between the A and B terminals in each condition according to the table.

Condition \ Terminal	A	B
UNBUCKLED	O	O
BUCKLED		



NOTE: Refer to page 23-156 for the seat belt reminder input test.

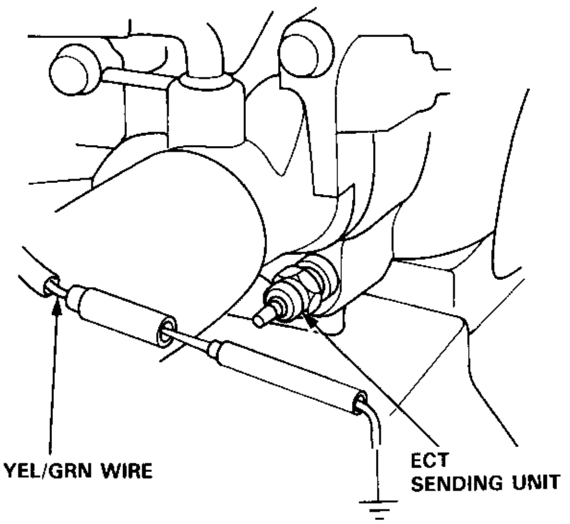
3. If necessary, replace the seat belt switch.

Engine Coolant Temperature (ECT) Gauge

Gauge Test

NOTE: Refer to page 23-123 for the wiring description of the engine coolant temperature (ECT) gauge circuit diagram.

1. Check the No. 25 (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Make sure the ignition switch is OFF, then disconnect the YEL/GRN wire from the ECT gauge sending unit and ground it with a jumper wire.



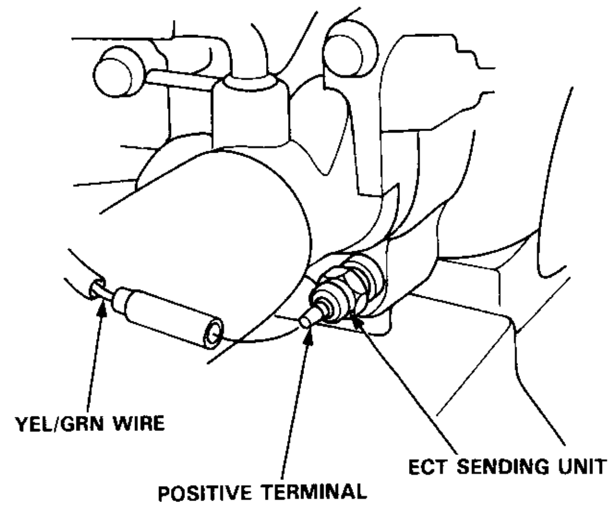
3. Turn the ignition switch ON (II).
   Check that the pointer of the ECT gauge starts moving toward the "H" mark.

   CAUTION: Turn the ignition switch OFF before the pointer reaches "H" on the gauge dial. Failure to do so may damage the gauge.

   - If the pointer of the gauge does not move at all, check for an open in the YEL or YEL/GRN wire. If the wires are OK, replace the ECT gauge.
   - If the ECT gauge works, test the ECT sending unit.

ECT Sending Unit Test

1. Disconnect the YEL/GRN wire from the ECT sending unit.
2. With the engine cold, use an ohmmeter to measure resistance between the positive terminal and the engine (ground).



3. Check the temperature of the coolant.
4. Run the engine and measure the change in resistance with the engine at operating temperature (the radiator fan comes on).

Temperature	133°F (56°C)	185°F (85°C)–212°F (100°C)
Resistance (Ω)	137	46–30

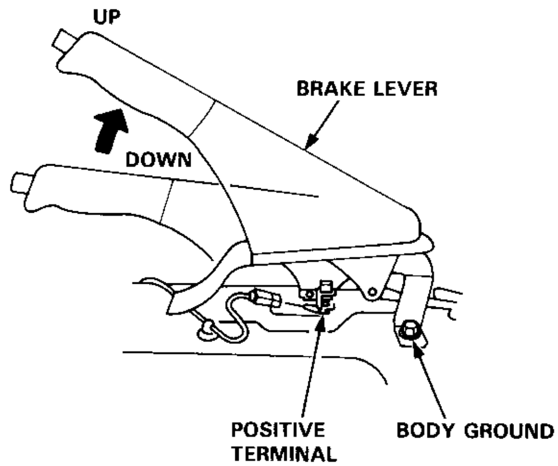
5. If the obtained readings are substantially different from the specifications above, replace the ECT sending unit.

Brake System Indicator

Parking Brake Switch Test

1. Remove the floor console, and disconnect the connector from the switch.
2. Check for continuity between the positive terminal and body ground in each lever position according to the table.

Lever position \ Terminal	POSITIVE	BODY
UP	O—	—O
DOWN		

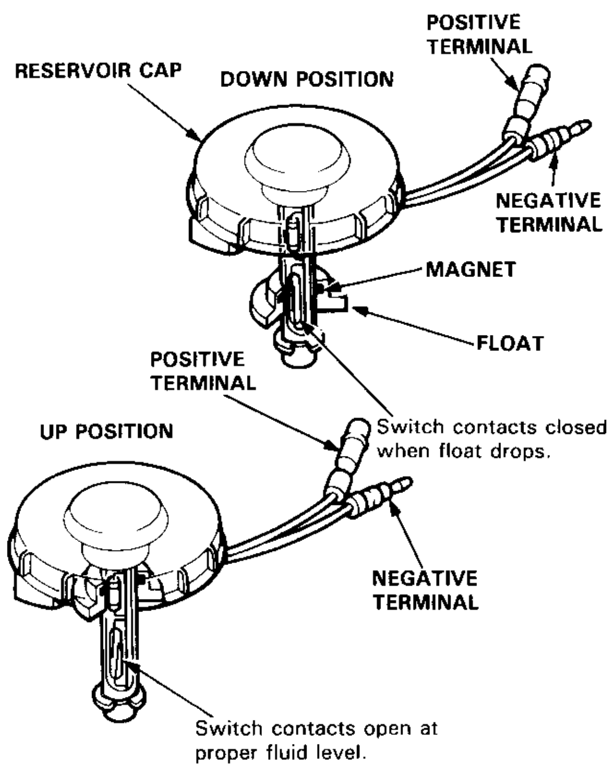


Canada:
If the parking brake switch is OK, but the brake system indicator does not function, perform the input test for the daytime running lights control unit (see page 23-164).

Brake Fluid Level Switch Test

1. Remove the reservoir cap.
2. Check that the float moves up and down freely; if it does not, replace the reservoir cap assembly.
3. Check for continuity between the terminals in each float position according to the table.

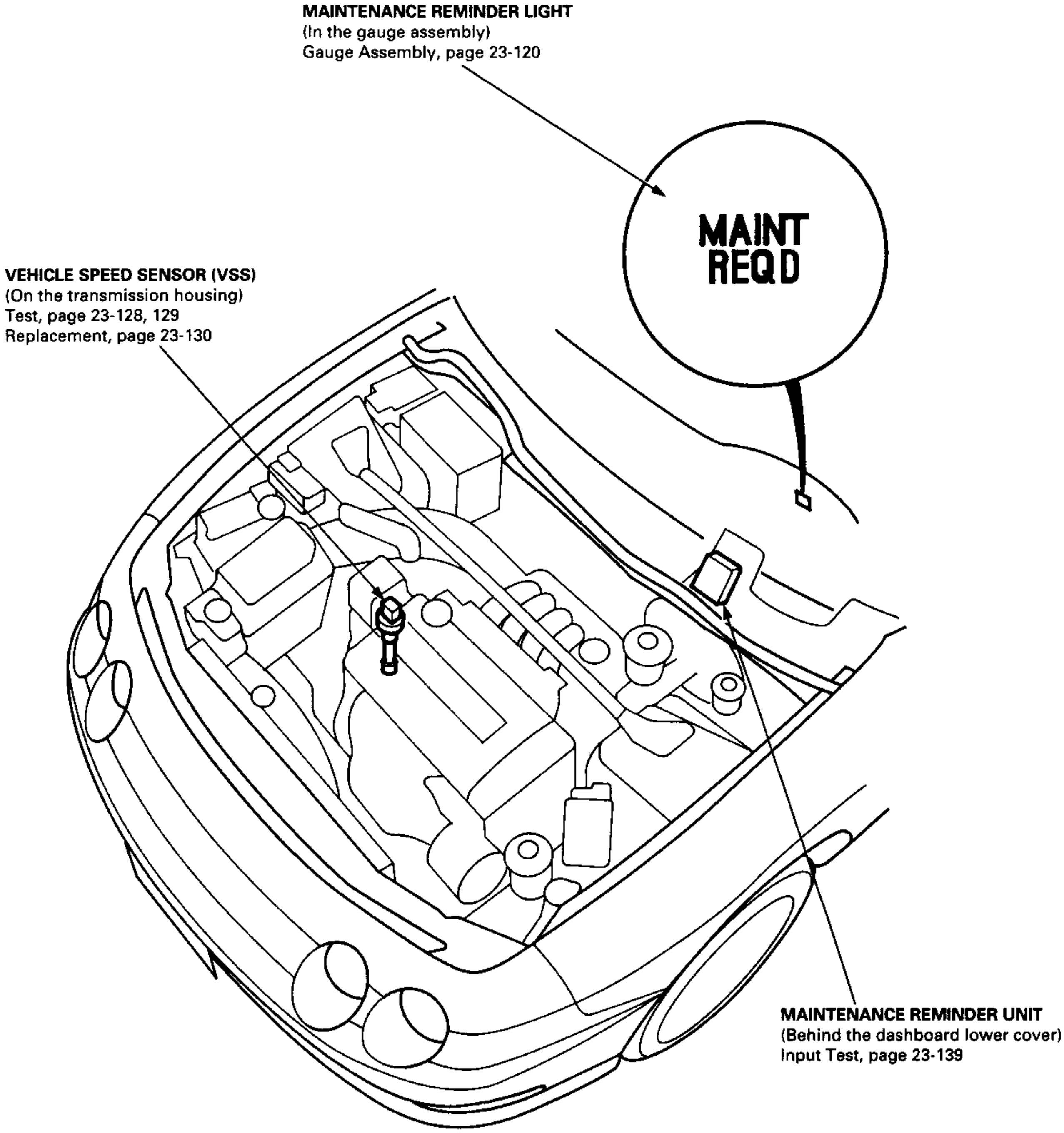
Float position \ Terminal	POSITIVE	NEGATIVE
UP		
DOWN	O—	—O



4. If necessary, replace the reservoir cap assembly.

Maintenance Reminder System

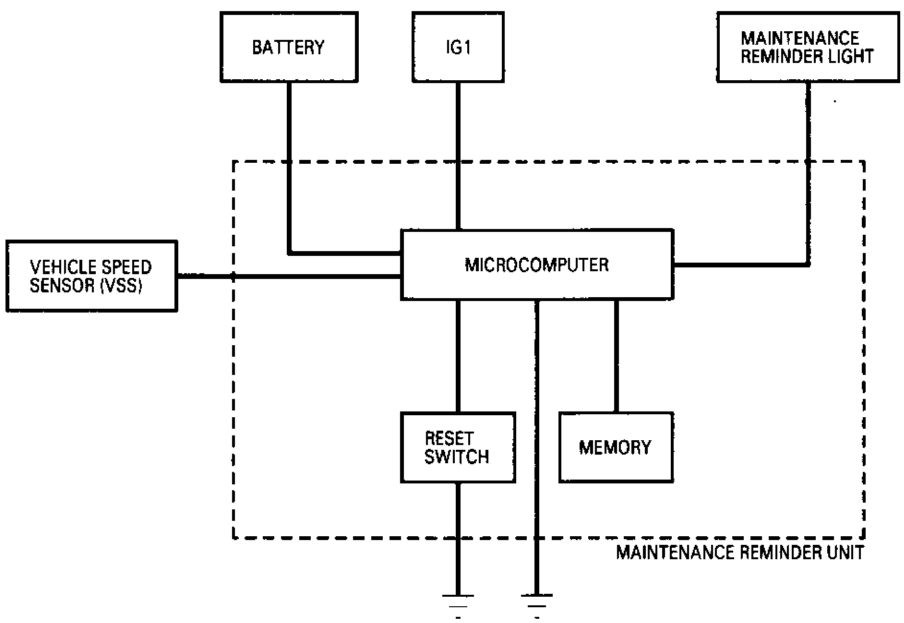
Component Location Index



Description

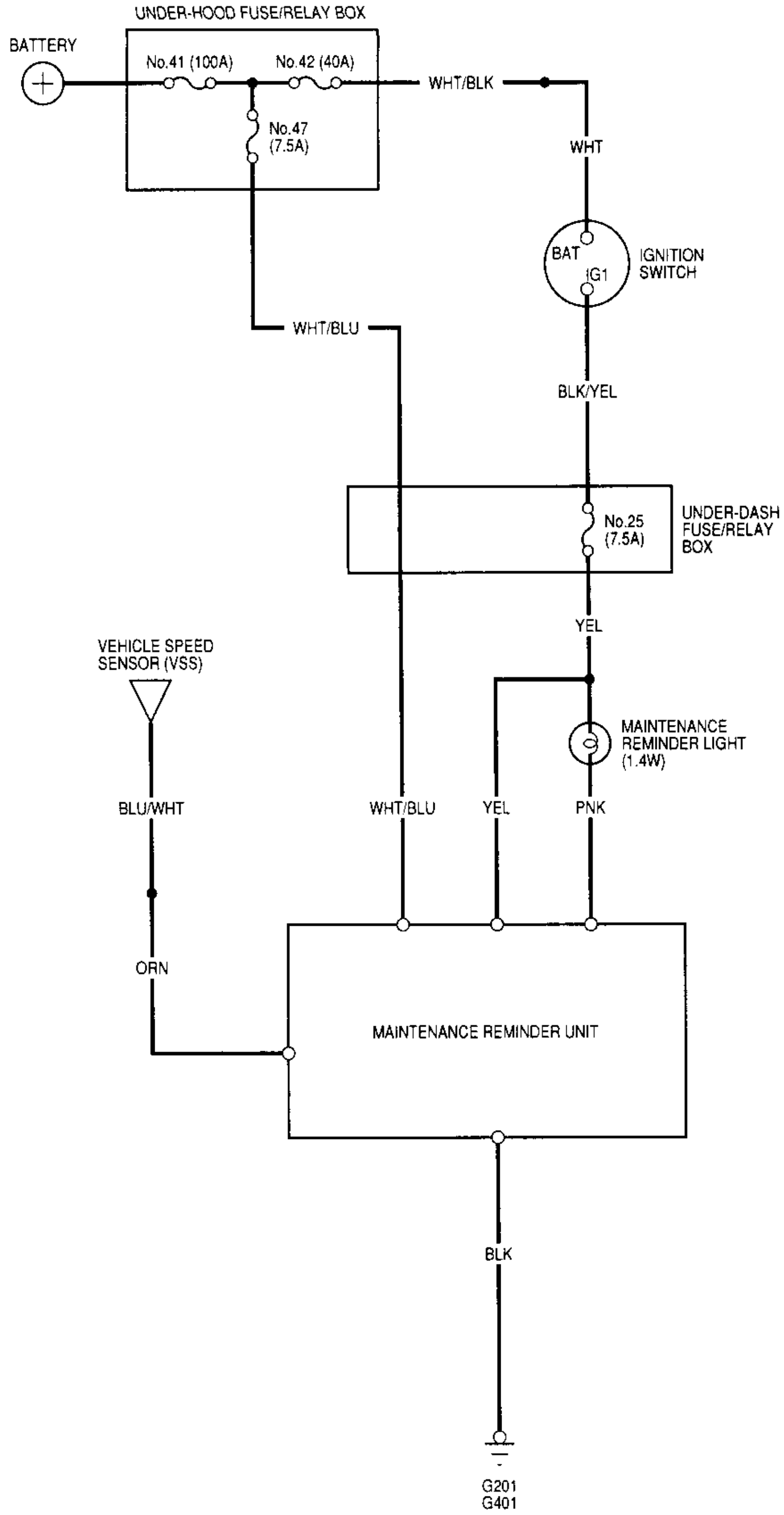
Based on signals received from the vehicle speed sensor (VSS), the microcomputer in the maintenance reminder unit, which is located behind the dashboard lower cover, computes the distances traveled. When you turn the ignition switch ON (II), the reminder light in the gauge assembly will come on for two seconds (bulb check function). At 9,650 ± 160 km (6,000 ± 100 miles) intervals, the reminder light will glow for two seconds and then blink ten seconds after you turn the ignition switch ON (II). This will repeat every time you turn the ignition switch ON (II) until the car reaches 12,070 ± 160 km (7,500 ± 100 miles).
Beyond the 12,070 ± 160 km (7,500 ± 100 mile) interval, the light will continue to glow after the bulb check until you turn the ignition switch off or reset the unit.
To reset the unit, the car must be parked and the ignition switch must be ON (II). Press the reset button on the unit for more than three seconds, and the reminder light will go off.

NOTE:
- Turn the ignition switch OFF before you remove the 5P connector from the maintenance reminder unit, otherwise you will cancel all data in the memory.
- The data will remain in the memory even when the ignition switch is turned off, or if the unit is disconnected. When the ignition switch is turned ON (II), and the car is driven, additional data will be stored.



Maintenance Reminder System

Circuit Diagram

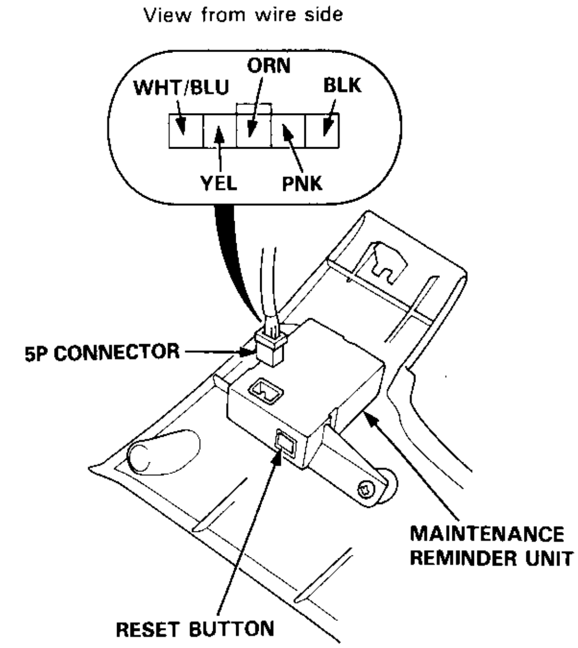


Maintenance Reminder Unit Input Test

1. With the ignition switch OFF, disconnect the 5P connector from the reminder unit.

2. Inspect the connector and socket terminals to be sure they are all making good contact.

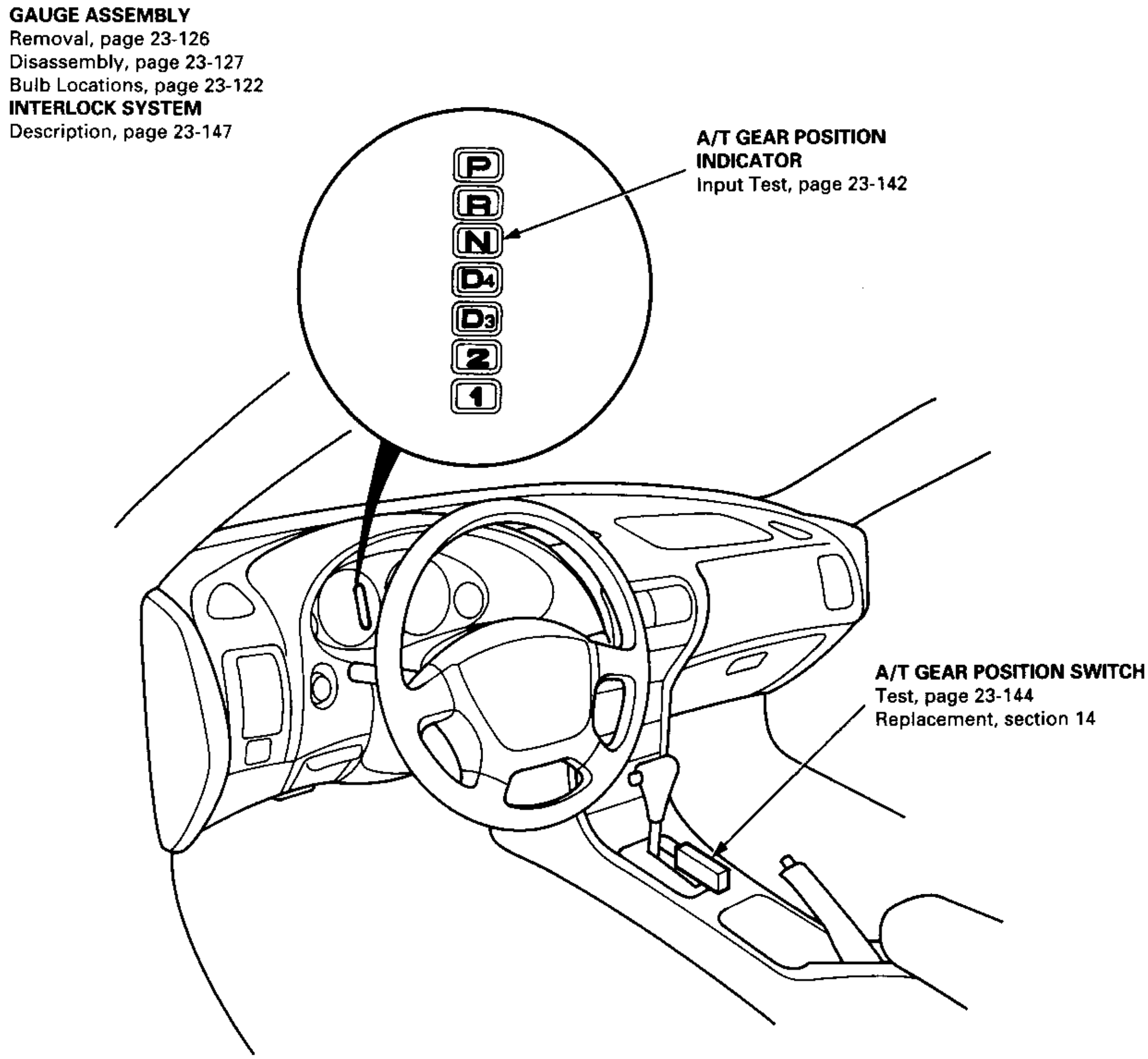
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If a test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the reminder unit must be faulty; replace it.



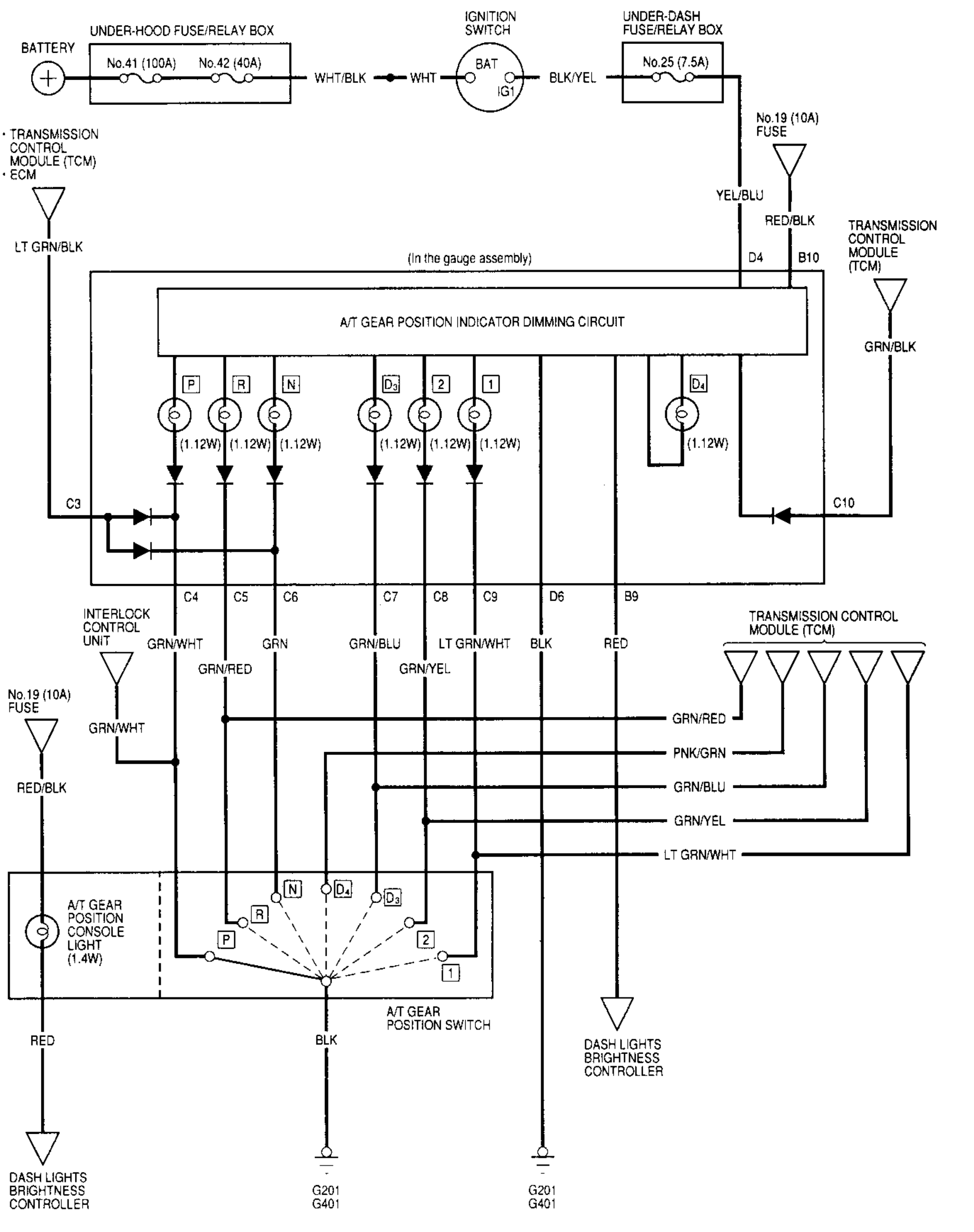
No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 47 (7.5 A) fuse in the under-hood fuse/relay box • An open in the wire
3	YEL	Ignition ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
4	PNK	Ignition ON (II)	Connect to body ground: The reminder light should go on.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Blown bulb • An open in the wire
5	ORN	Ignition ON (II), car in neutral with front of car raised, one wheel rotated with other wheel blocked	Check for voltage to ground: Meter should indicate pulsing voltage.	• Faulty vehicle speed sensor (VSS) • An open in the wire

A/T Gear Position Indicator

Component Location Index



Circuit Diagram

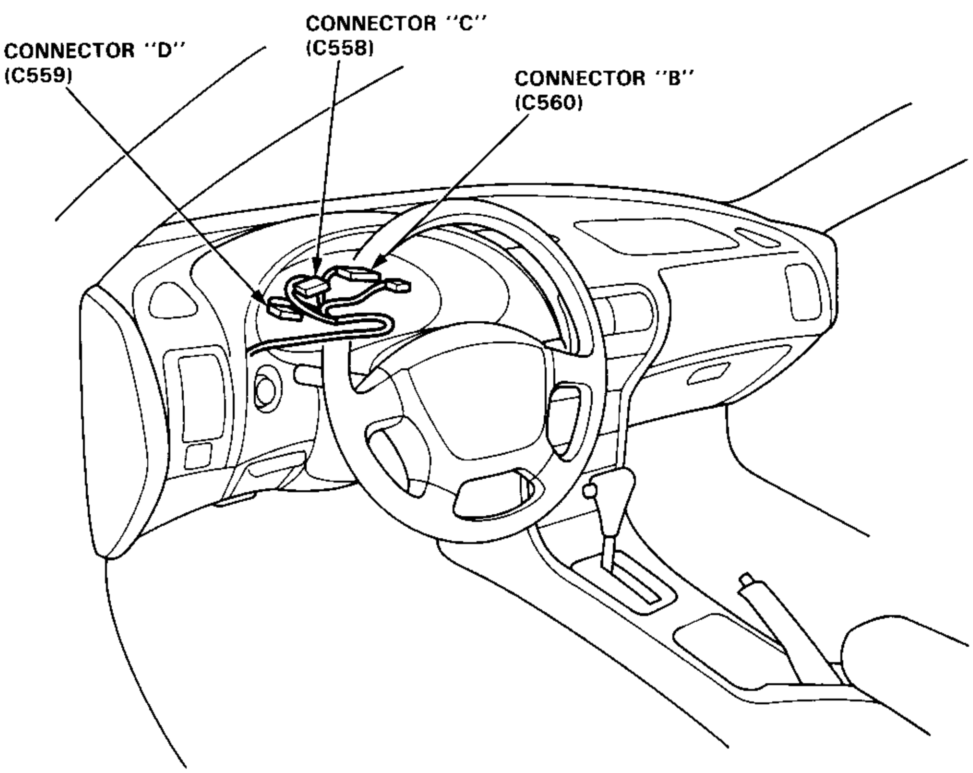


A/T Gear Position Indicator

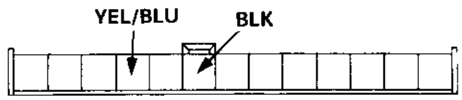
Indicator Input Test

Remove the gauge assembly from the dashboard (see page 23-126), and disconnect connectors "B", "C" and "D" from it. Inspect the connector terminals to be sure they are all making good contact.

- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the gauge assembly must be faulty; replace it.

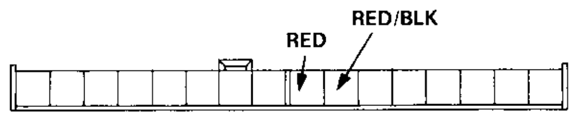


CONNECTOR "D": View from wire side of female terminals



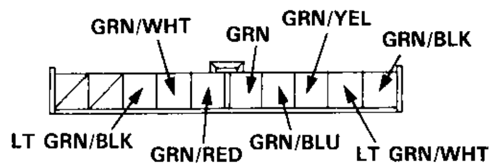
No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

CONNECTOR "B": View from wire side of female terminals



No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	RED/BLK and RED	Combination light switch ON and dash lights brightness control dial on full bright	Check for voltage between RED/BLK and RED terminals: There should be battery voltage.	• Faulty dash lights brightness control system • An open in the wire

CONNECTOR "C": View from wire side of female terminals

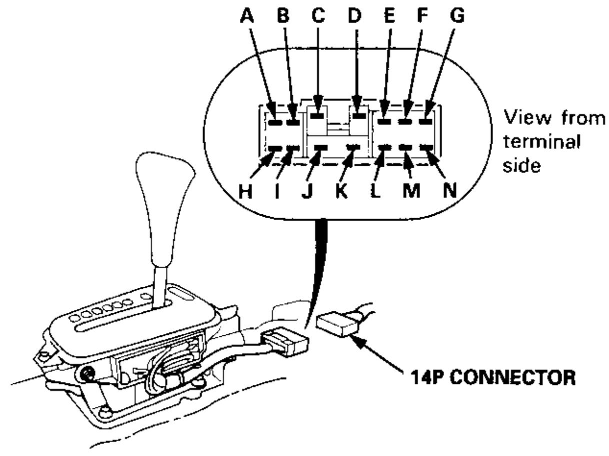


No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	GRN/WHT	Shift lever in position [P] NOTE: Don't push the brake pedal.	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity in any other position.	• Faulty A/T gear position switch • Poor ground (G201, G401) • An open in the wire
	GRN/RED	Shift lever in position [R]		
	GRN	Shift lever in position [N]		
	GRN/BLU	Shift lever in position [D_3]		
	GRN/YEL	Shift lever in position [2]		
	LT-GRN/WHT	Shift lever in position [1]		
2	GRN/BLK	Ignition switch ON (II) and shift lever in any position except [D_4]	Check for voltage to ground: There should be battery voltage for two seconds after the ignition switch is turned ON (II), and less than 1 V two seconds later.	• Faulty transmission control module (TCM) • An open in the wire
3	LT-GRN/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Faulty transmission control module (TCM) or ECM • An open in the wire

A/T Gear Position Indicator

A/T Gear Position Switch Test

1. Remove the console, then disconnect the 14P connector from the switch.
2. Check for continuity between the terminals in each position according to the table.
   - Move the lever back and forth at each position without touching the push button, and check for continuity within the range of free play.
   - If there is no continuity within the range of free play, adjust the installing position of the switch as described on the next page.



A/T Gear Position Switch (Without cruise control)

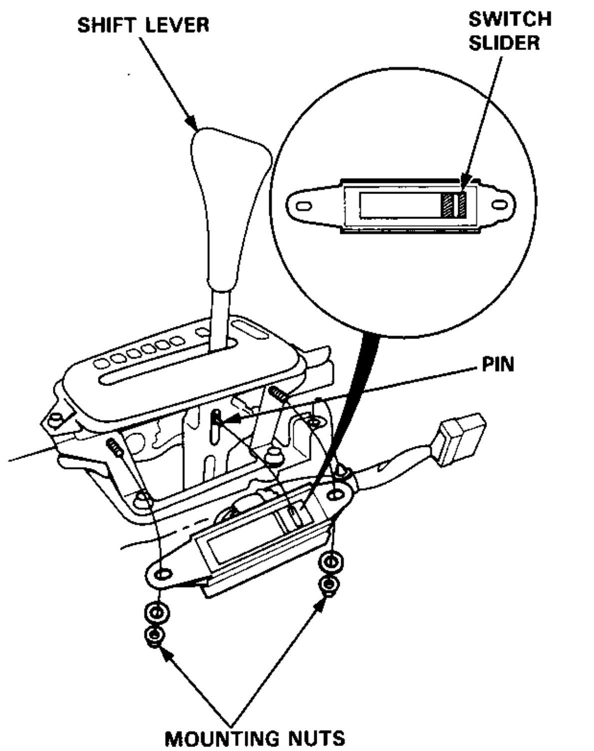
Terminal / Position	A	B	E	F	G	N	M	L	C	D	J	K
									Back – up Light Switch		Neutral Position Switch	
$\boxed{1}$	O	O										
$\boxed{2}$	O		O									
$\boxed{D_3}$	O			O								
$\boxed{D_4}$	O				O							
$\boxed{N}$	O					O					O	O
$\boxed{R}$	O						O		O	O		
$\boxed{P}$	O							O			O	O

A/T Gear Position Switch (With cruise control)

Terminal / Position	I	A	B	E	F	G	N	M	L	C	D	J	K
										Back – up Light Switch		Neutral Position Switch	
$\boxed{1}$		O	O										
$\boxed{2}$	O	O		O									
$\boxed{D_3}$	O	O			O								
$\boxed{D_4}$	O	O				O							
$\boxed{N}$		O					O					O	O
$\boxed{R}$		O						O		O	O		
$\boxed{P}$		O							O			O	O

A/T Gear Position Switch Replacement

1. Remove the console, then disconnect the 14P connector from the switch.
2. Remove the two console switch mounting nuts.

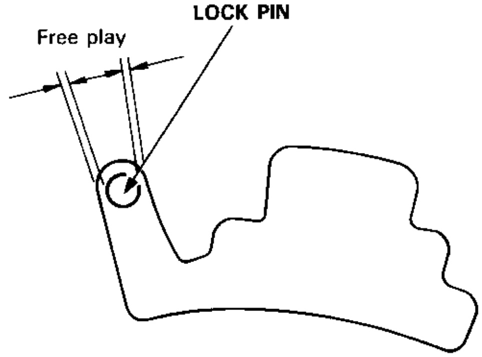


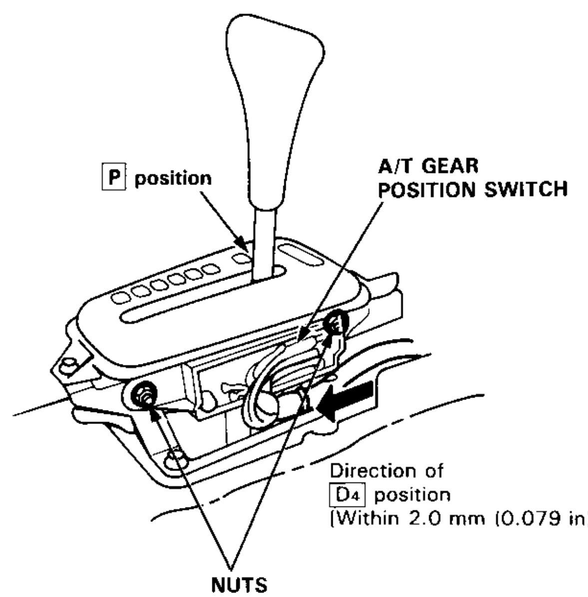
3. Position the switch slider to "Neutral" as shown above.
4. Move the shift lever to "Neutral", then slip the switch into position.
5. Attach the switch with the two nuts.
6. Test the switch in the [P] and [N] position of the shift lever. The engine should start when the shift lever is in position [P] anywhere in the range of free play.
7. Connect the 14P connector, clamp the harness and install the console.

A/T Gear Position Switch Adjustment

1. Shift to the [P] position, and loosen the nuts.
2. Slide the switch in the direction of [D4] position [within 2.0 mm (0.079 in.)] so that there is continuity between the "A" and "L" terminals in the range of free play of the shift lever.
3. Recheck for continuity between each of the terminals.

NOTE:
- If adjustment is not possible, check for damage to the shift lever detent and/or the bracket. If there is no damage, replace the console switch.
- The engine should start when the shift lever is in position [N] in the range of free play.

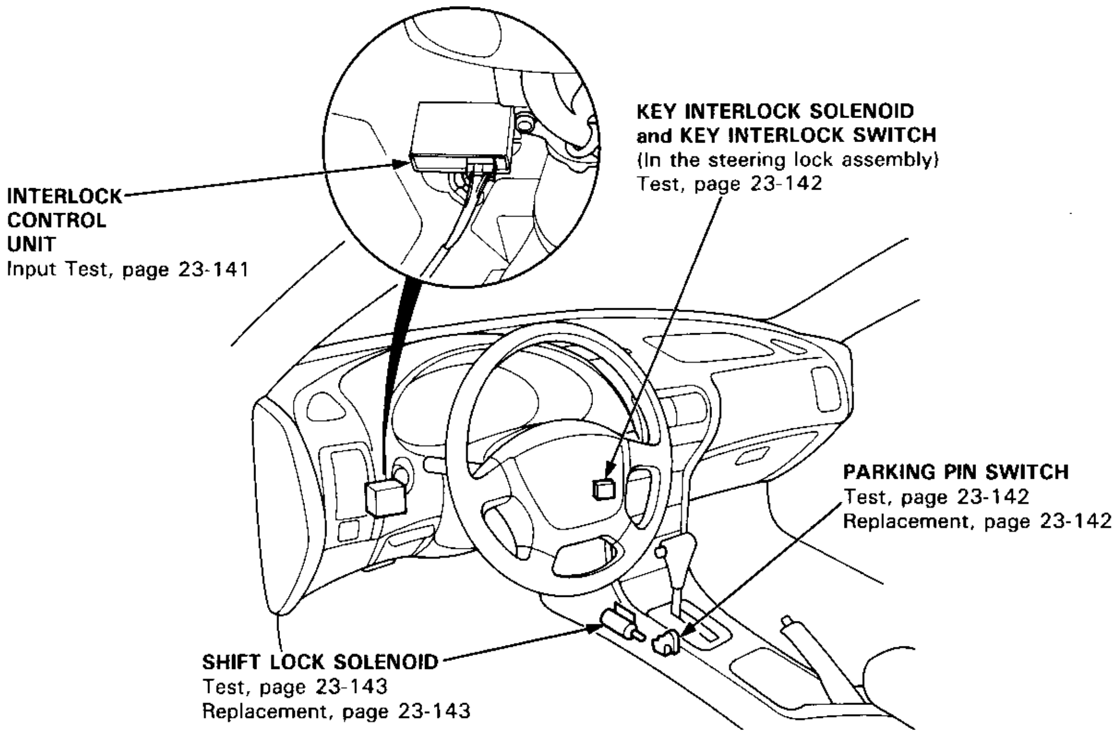




Interlock System

Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.



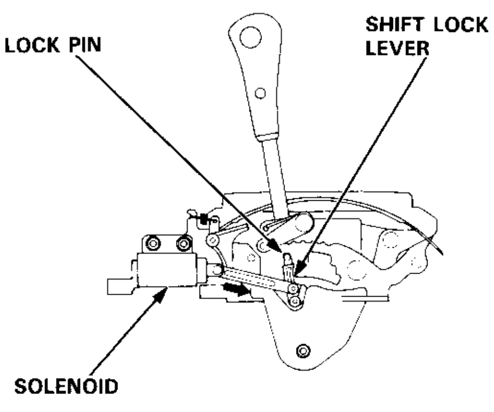
Description

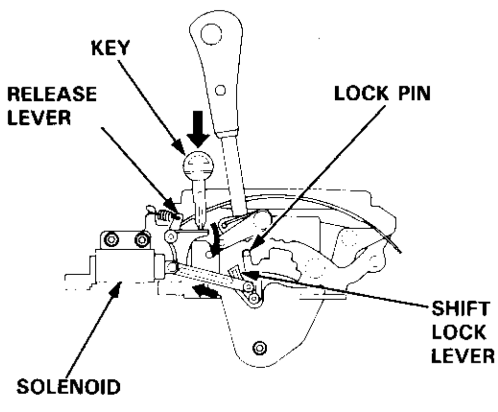
The car is equipped with the following devices to prevent inadvertent shifting:

- A/T selector with shift lock
- Key cylinder with interlocked ignition key

Shift Lock System:
The shift lock system prevents the shift lever from moving to [R] or [D4] from the [P] position unless the brake pedal is depressed and the accelerator is in its rest position.

NOTE:
- The shift lever cannot be shifted when the brake pedal and the accelerator are depressed at the same time.
- In case of system malfunction, the shift lever can be released by pushing a key into the release slot near the shift lever.



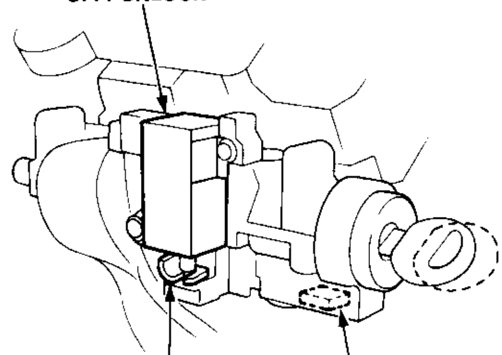


Description

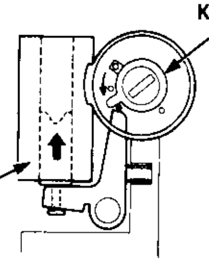
The car is equipped with the following devices to prevent inadvertent shifting:

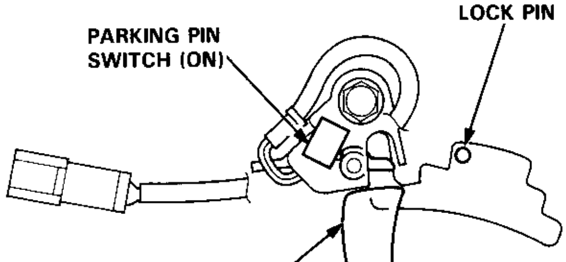
- Key cylinder with interlocked ignition key (Key Interlock System)
- Shift lever with shift lock (Shift Lock System)

Key Interlock System:
When the shift lever is in any other position than [P] or is not securely locked in [P] (parking pin switch is ON), a solenoid is activated, making it impossible to remove the ignition key from the ignition switch.
To be able to remove the key, the shift lever must be in [P] and must be securely locked in this position (parking pin switch must be turned off by the lock pin)

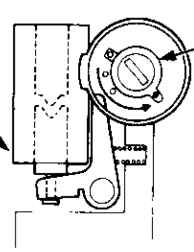


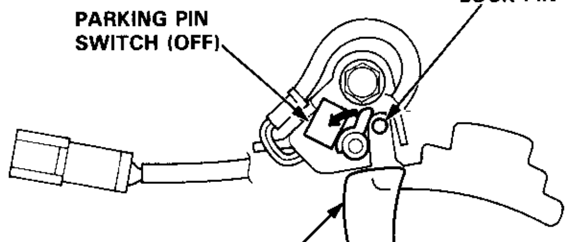
The shift lever is in any other position than [P] and the parking pin switch is ON:





The shift lever is in [P] and the parking pin switch is OFF:

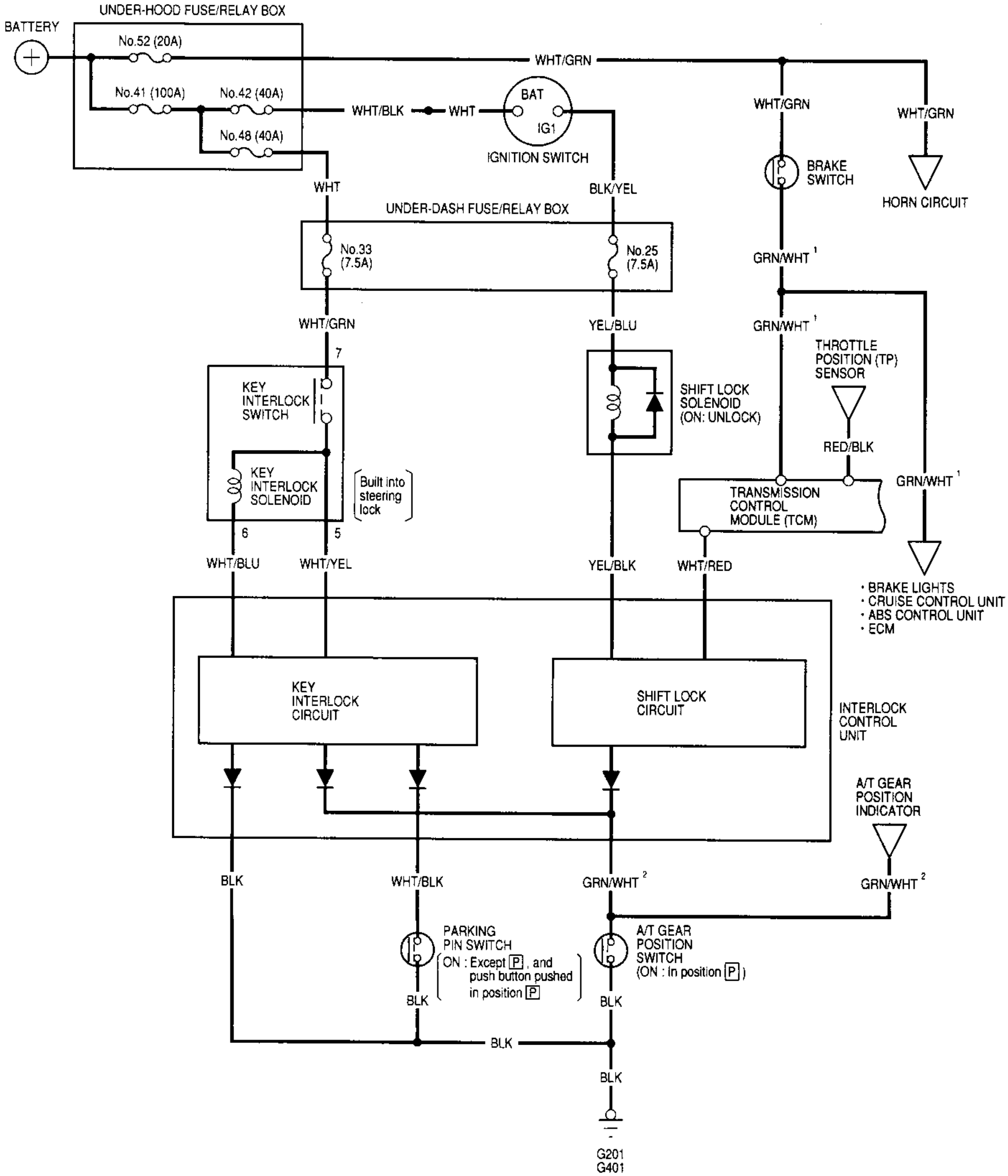




Interlock System

Circuit Diagram

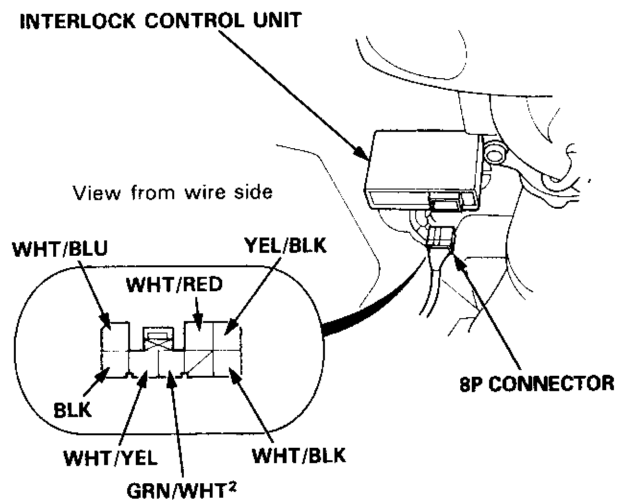
NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/WHT [1] and GRN/WHT [2] are not the same).



Control Unit Input Test

1. Disconnect the 8P connector from the interlock control unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If a test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, substitute a known-good control unit, and recheck the system. If the check is OK, the control unit must be faulty; replace it.

NOTE: If the shift lock solenoid clicks when the ignition switch is turned ON (II) and you step on the brake pedal (with the shift lever in [P]), the shift lock system is electronically normal; if the shift lever cannot be shifted from [P], test the A/T gear position switch as described on page 23-142, and see section 14.



Shift Lock System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	WHT/RED	Ignition switch ON (II) Brake pedal pushed	Check for voltage to ground: There should be battery voltage.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty transmission control module (TCM) • Faulty ECM • Faulty brake switch • Faulty throttle position (TP) sensor • An open in the wire
		Ignition switch ON (II) Brake pedal and accelerator pushed at the same time	Check for voltage to ground: There should be less than battery voltage.	
2	GRN/WHT²	Shift lever in position [P]	Check for continuity to ground: There should be continuity.	• Faulty A/T gear position switch • Poor ground (G201, G401) • An open in the wire
3	YEL/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Faulty shift lock solenoid • An open in the wire

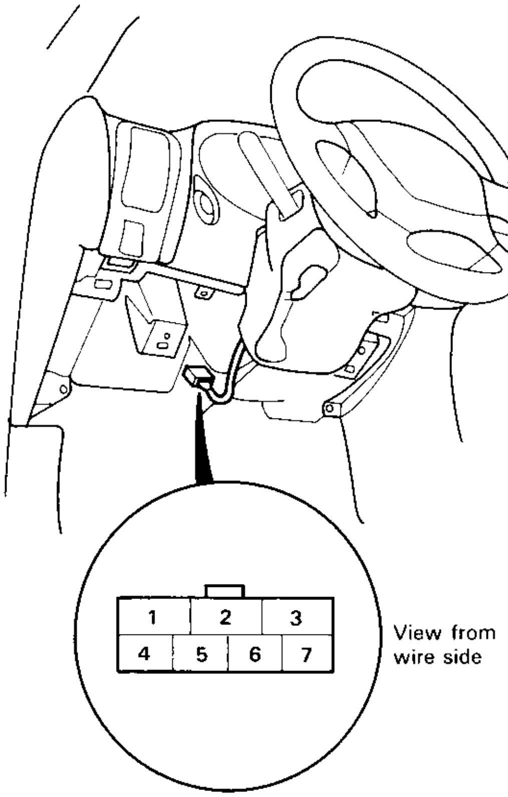
Key Interlock System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	GRN/WHT²	Shift lever in position [P]	Check for continuity to ground: There should be continuity.	• Faulty A/T gear position switch • Poor ground (G201, G401) • An open in the wire
3	WHT/YEL WHT/BLU	Ignition switch turned to ACC (I) and the key pushed in	Check for voltage to ground: There should be battery voltage.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty steering lock assembly (key interlock solenoid) • An open in the wire
4	WHT/BLK	Shift lever in position [P] and push button pressed	Check for continuity to ground: There should be continuity.	• Faulty parking pin switch • Poor ground (G201, G401) • An open in the wire
		Shift lever in position [P] and push button released	Check for continuity to ground: There should be no continuity.	• Faulty parking pin switch • Short to ground • An open in the wire

Interlock System

Key Interlock Solenoid Test

1. Remove the dashboard lower cover.
2. Remove the knee bolster.
3. Disconnect the 7P connector from the main wire harness.



4. Check for continuity between the terminals in each switch position according to the table.

Position		5	6	7
Ignition switch ACC	Key pushed in	○	○	○
	Key released *	○	○	

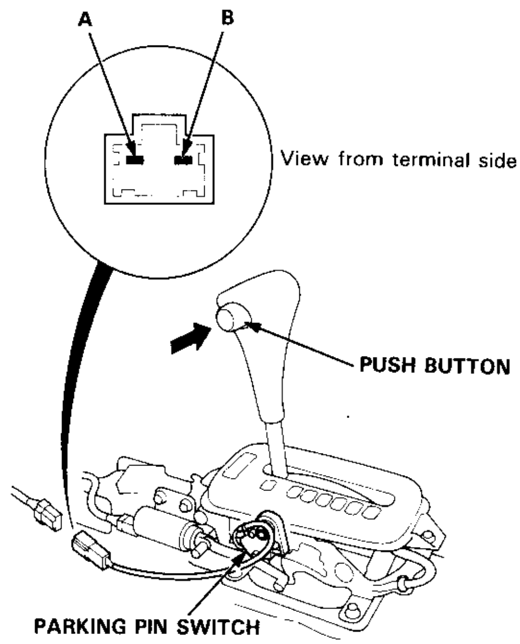
* : 15 – 20 ohms

5. Check that the key cannot be removed when the battery is connected to the No. 6 and No. 7 terminals.
   - If the key cannot be removed, the key interlock solenoid is OK.
   - If the key can be removed, replace the steering lock assembly (key interlock solenoid is not available separately).

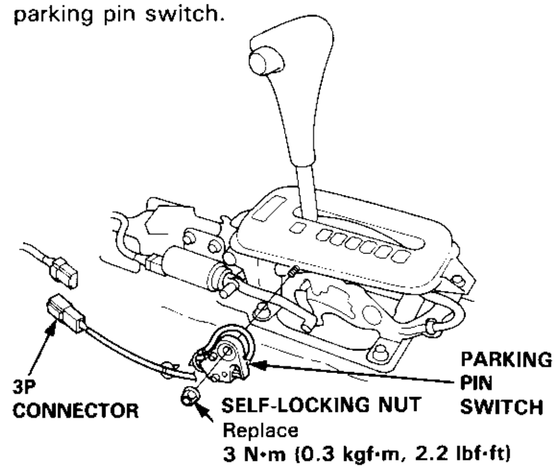
Parking Pin Switch Test/ Replacement

1. Remove the front console (see section 20).
2. Disconnect the parking pin switch 3P connector from the main wire harness.
3. Check for continuity between the terminals in each switch position according to the table.

Position		A	B
Shift lever in position [P]	Push button pushed	○	○
	Push button released		



4. If necessary, remove the self-locking nut and the parking pin switch.

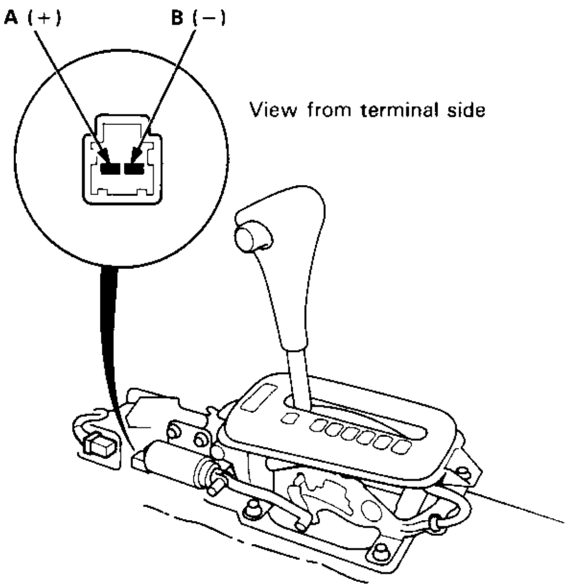


Shift Lock Solenoid Test/Replacement

1. Remove the console, then disconnect the 2P connector of the shift lock solenoid from the main wire harness.

   NOTE: Do not connect power to the B (–) terminal (reverse polarity) or you will damage the diode inside the solenoid.

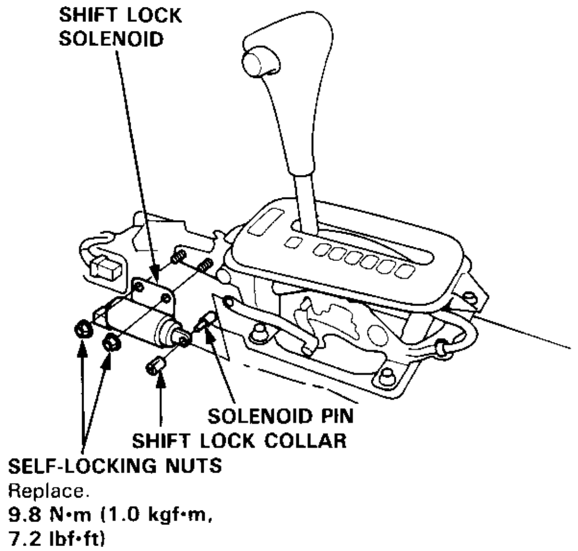
2. Connect battery power to the A terminal, ground the B terminal momentarily, and check solenoid operation.



- If the solenoid does not operate, replace it as described in steps 3,4, and 5.
- If the solenoid does operate, check and, if necessary, adjust its two positions as shown in step 5.

3. Remove the shift lock collar and the solenoid pin.

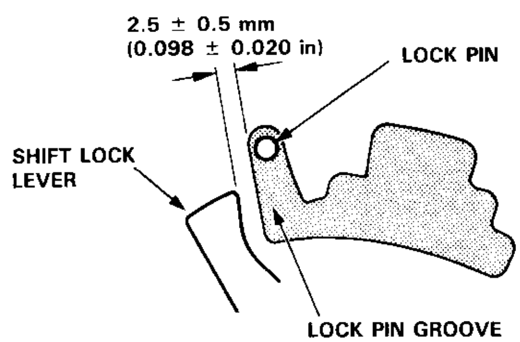
4. Remove the self-locking nuts and shift lock solenoid, then install the new solenoid in the reverse order of removal.



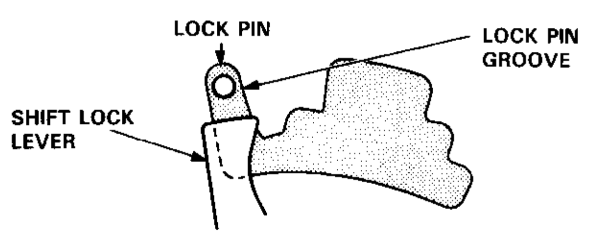
5. Check and, if necessary, adjust the solenoid's position.

   - When the shift lock solenoid is ON, check that there is a clearance of 2.5 ± 0.5 mm (0.098 ± 0.020 in) between the top rear corner of the shift lock lever and the lock pin groove, then tighten the self-locking nuts.

   NOTE: Use new self-locking nuts.



   - When the shift lock solenoid is OFF, make sure that the lock pin is blocked by the shift lock lever.



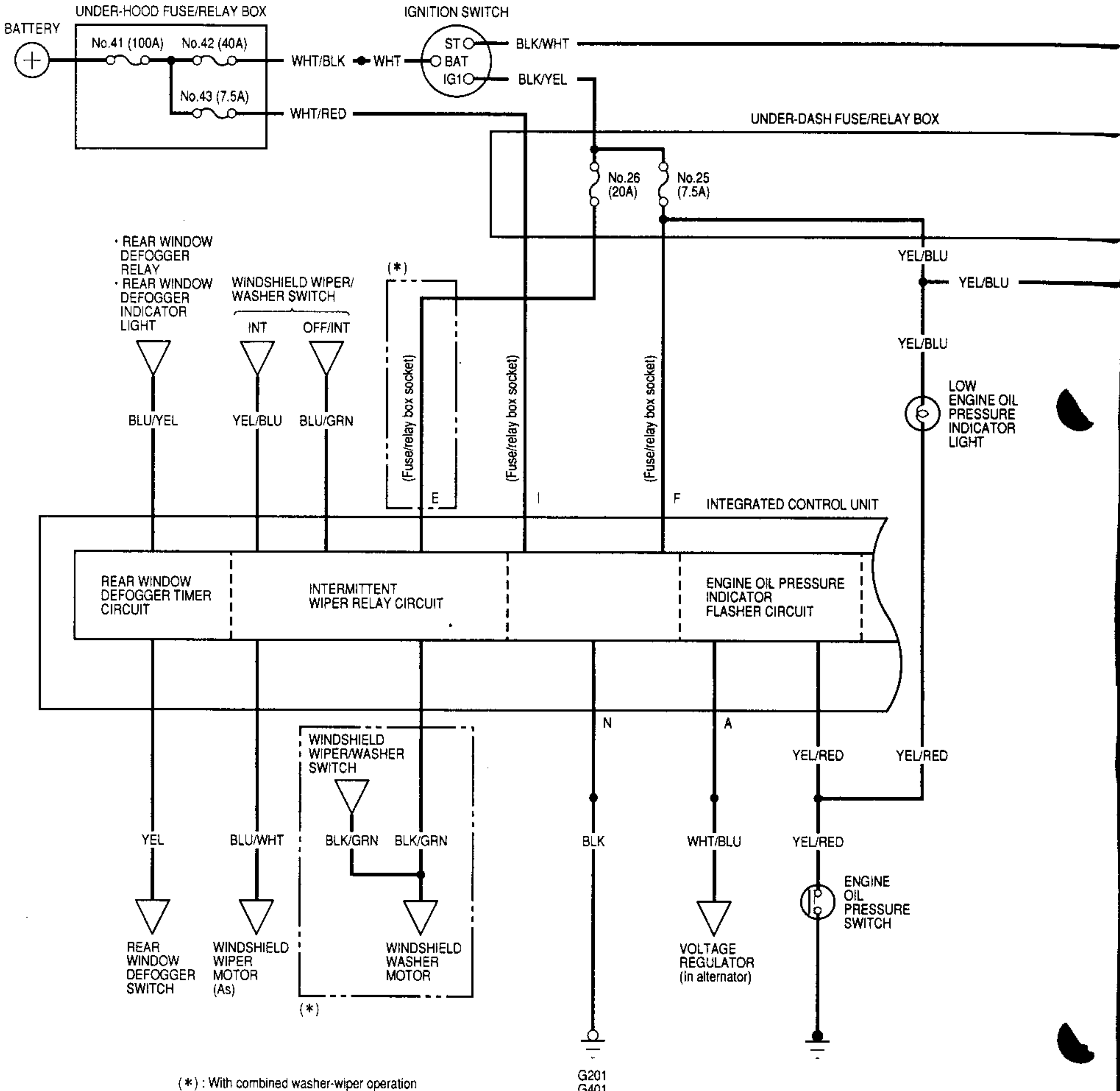
Integrated Control Unit

Circuit Diagram

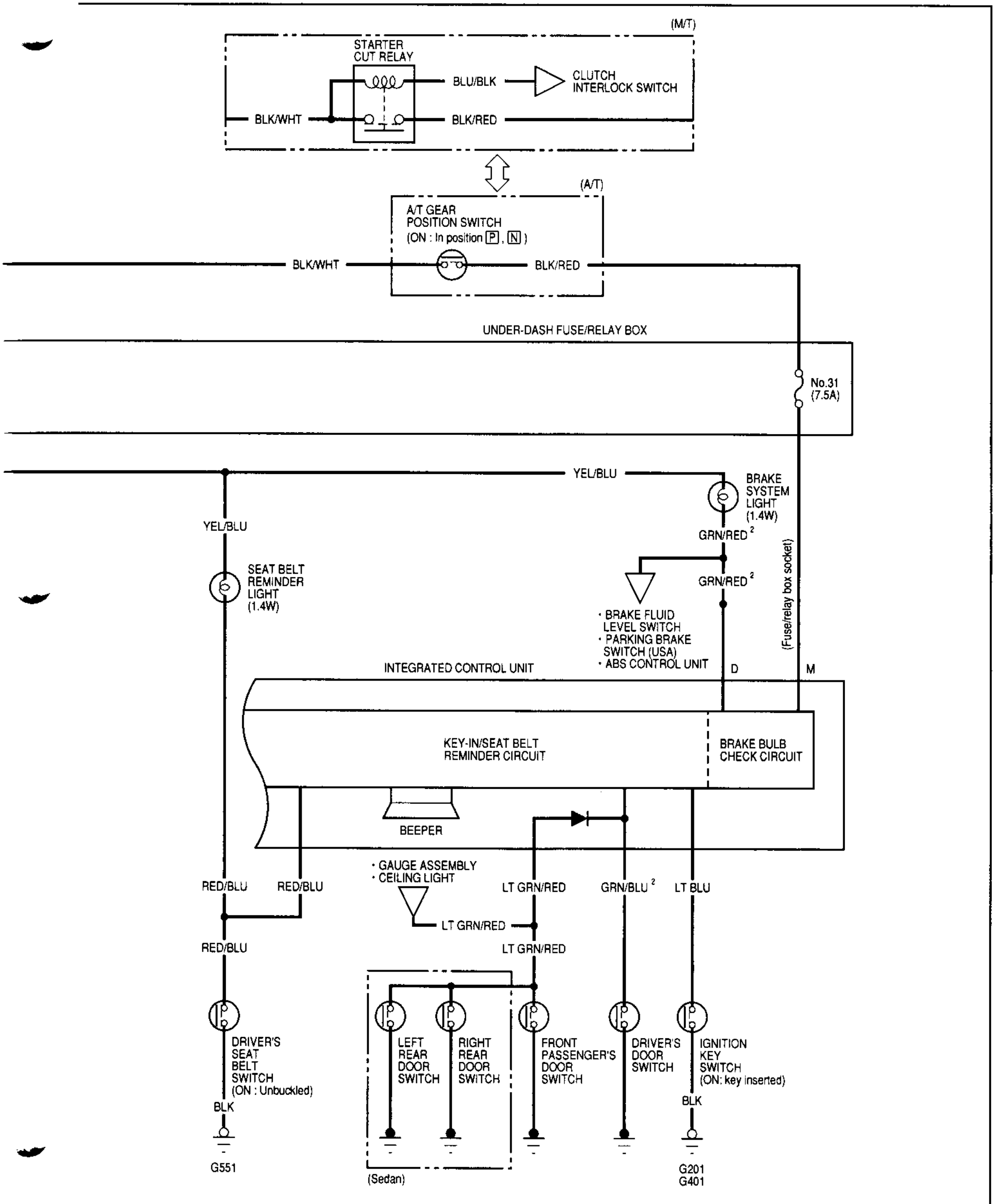
Description

An integrated control unit, located in the left kick panel, integrates the functions of the key-in/seat belt reminder , side marker light flasher, wiper/washer, lights-on reminder, rear window defogger timer, brake system light bulb check, and engine oil pressure indicator flasher circuits.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/RED[1] and GRN/RED[2] are not the same).



(*) : With combined washer-wiper operation



(M/T)
STARTER CUT RELAY
BLU/BLK
CLUTCH INTERLOCK SWITCH
BLK/WHT
BLK/RED
(A/T)
A/T GEAR POSITION SWITCH (ON : In position [P], [N])
BLK/WHT
BLK/RED
UNDER-DASH FUSE/RELAY BOX
No.31 (7.5A)
YEL/BLU
BRAKE SYSTEM LIGHT (1.4W)
GRN/RED 2
GRN/RED 2
YEL/BLU
SEAT BELT REMINDER LIGHT (1.4W)
· BRAKE FLUID LEVEL SWITCH
· PARKING BRAKE SWITCH (USA)
· ABS CONTROL UNIT
(Fuse/relay box socket)
INTEGRATED CONTROL UNIT
D
M
KEY-IN/SEAT BELT REMINDER CIRCUIT
BRAKE BULB CHECK CIRCUIT
BEEPER
· GAUGE ASSEMBLY
· CEILING LIGHT
RED/BLU
RED/BLU
LT GRN/RED
GRN/BLU 2
LT BLU
LT GRN/RED
RED/BLU
LT GRN/RED
DRIVER'S SEAT BELT SWITCH (ON : Unbuckled)
LEFT REAR DOOR SWITCH
RIGHT REAR DOOR SWITCH
FRONT PASSENGER'S DOOR SWITCH
DRIVER'S DOOR SWITCH
IGNITION KEY SWITCH (ON: key inserted)
BLK
BLK
G551
(Sedan)
G201
G401

Integrated Control Unit

Input Test

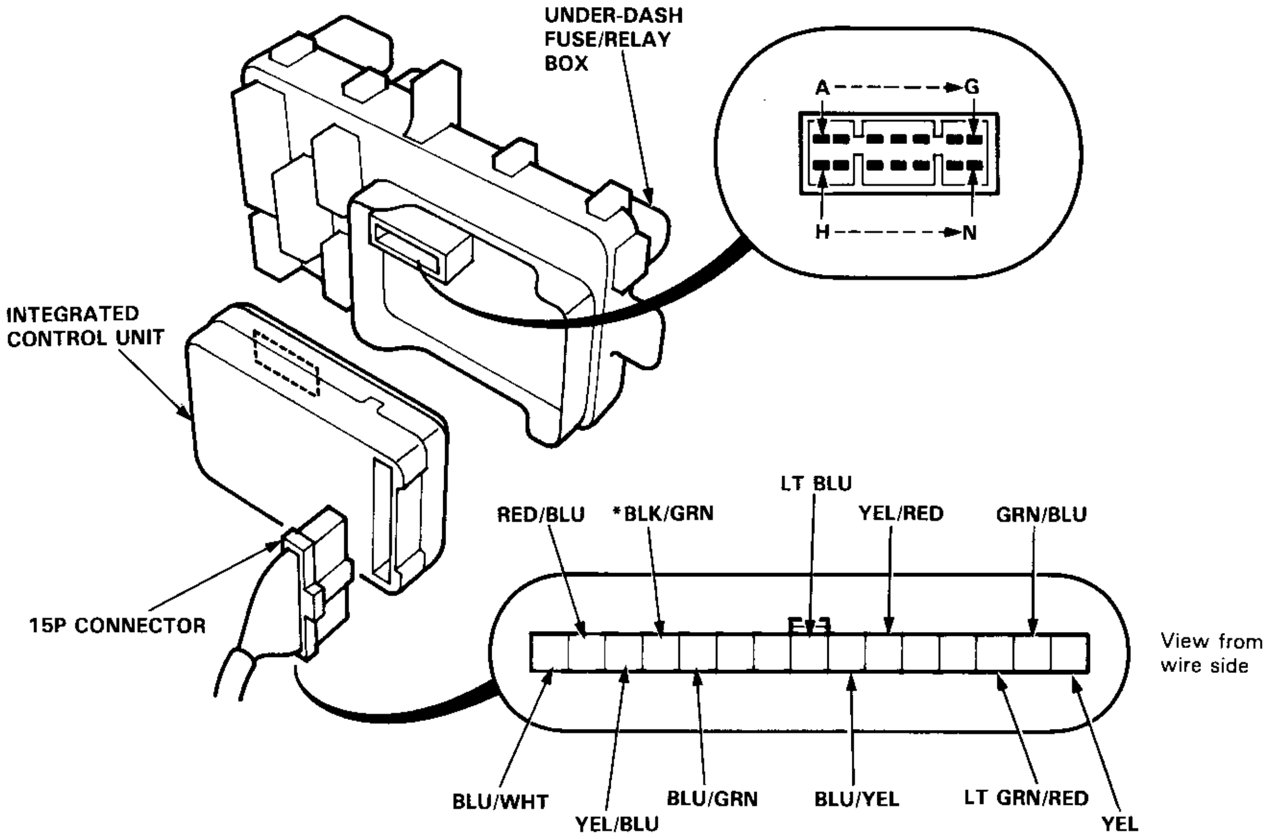
Remove the dashboard lower cover and knee bolster, then disconnect the 15P connector from the integrated control unit.
Remove the integrated control unit from the under-dach fuse/relay box.

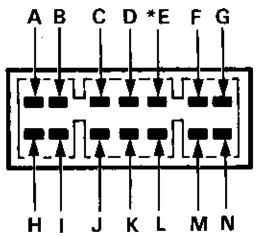
Inspect the connector and socket terminals to be sure they are all making good contact.

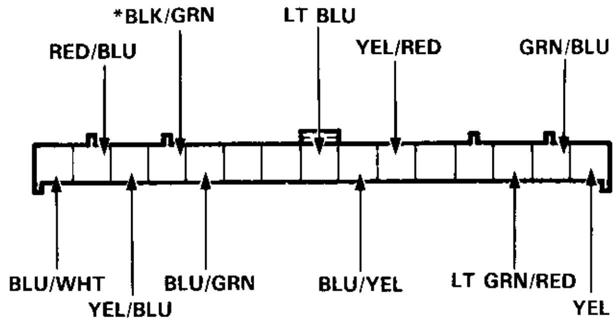
- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector and under-dash fuse/relay box.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the control unit must be faulty; replace it.

NOTE:

- Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/BLU[1] and GRN/BLU[2] are not the same).
- Do not disconnect any connectors on the under-dash fuse/relay box except the integrated control unit.







All Systems:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	N	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	I	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 43 (7.5 A) fuse in the under-hood fuse/relay box • An open in the wire
3	F	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

Rear Window Defogger Timer System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	YEL	Defogger switch pushed	Check for continuity to ground: There should be continuity as the switch is pushed.	• Faulty defogger switch • Poor ground (G201, G401) • An open in the wire
2	BLU/YEL	Ignition switch ON (II)	Connect to ground: The rear window defogger should work and the defogger switch indicator light should come on.	• Blown No. 16 (7.5 A) fuse in the under-dash fuse/relay box • Faulty defogger relay • Blown bulb • An open in the wire

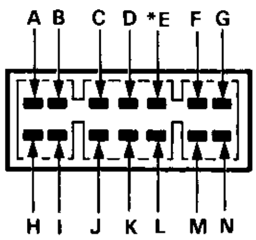
Intermittent Wiper Relay System:

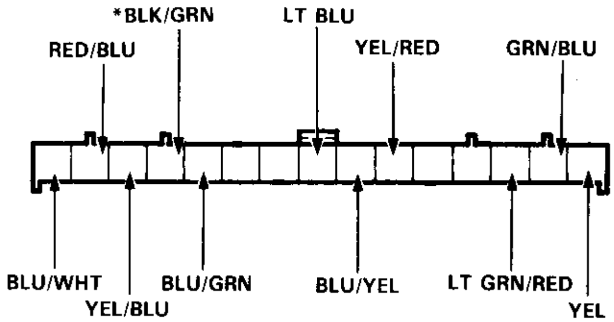
No.	Wire/ Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	YEL/BLU	Ignition switch ON (II) and windshield wiper switch INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box • Faulty windshield wiper switch • An open in the wire
2	BLU/WHT and BLU/GRN	Windshield wiper switch OFF or INT and wiper blades in park position	Check for continuity between the BLU/WHT and BLU/GRN terminals: There should be continuity.	• Faulty windshield wiper switch • Faulty windshield wiper motor • An open in the wire
3	*E	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• An open in the wire
4	*BLK/GRN	Ignition switch ON (II) and windshield washer motor switch ON	Check for voltage to ground: There should be battery voltage.	• Faulty windshield washer switch • An open in the wire

*: With combined washer-wiper operation

(cont'd)

Input Test (cont'd)





View from wire side

*With combined washer-wiper operation

Engine Oil Pressure Indicator Flasher System:

No.	Wire/ Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	A	Engine running	Check for voltage to ground: There should be battery voltage.	• Faulty charging system • An open in the wire
2	YEL/RED	Ignition switch OFF	Check for continuity to ground: There should be continuity.	• Faulty engine oil pressure switch • An open in the wire
		Ignition switch ON (II)	Check indicator light. If the light does not come on, attach the YEL/RED terminal to ground: The light should come on as the ignition switch is turned ON.	• Blown bulb • An open in the wire
		Start the engine.	Check for voltage to ground: There should be battery voltage.	• Insufficient oil • Improper lubrication • Faulty engine oil pressure switch

Key-in/Seat Belt Reminder System:

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	GRN/BLU	Driver's door open	Check for continuity to ground: There should be continuity.	• Faulty driver's door switch • An open in the wire
2	LT GRN/ RED	Front passenger's door switch open NOTE: Before testing, remove No. 43 (7.5 A) fuse from the under-hood fuse/relay box.	Check for continuity to ground: There should be continuity.	• Faulty front passenger's door switch • An open in the wire
3	LT BLU	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Faulty ignition key switch • Poor ground (G201, G401) • An open in the wire
4	RED/BLU	Ignition switch ON (II) and driver's seat belt unbuckled	Check for voltage to ground: There should be 1 V or less.	• Faulty seat belt switch • Poor ground (G551) • An open in the wire

NOTE: Refer to page 23-133 for the seat belt switch test.

Bulb Check System (brake system light)

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	M	Ignition switch at START (III)	Check for voltage to ground: There should be battery voltage.	• Blown No. 31 (7.5 A) fuse in the under-dash fuse/relay box • Faulty clutch interlock switch or starter cut relay (M/T) • Faulty neutral position switch (A/T) • An open in the wire
2	D	Ignition switch ON (II), brake fluid reservoir full, and parking brake lever down	Connect to ground: Brake system light should come on.	• Blown brake system light • An open in the wire

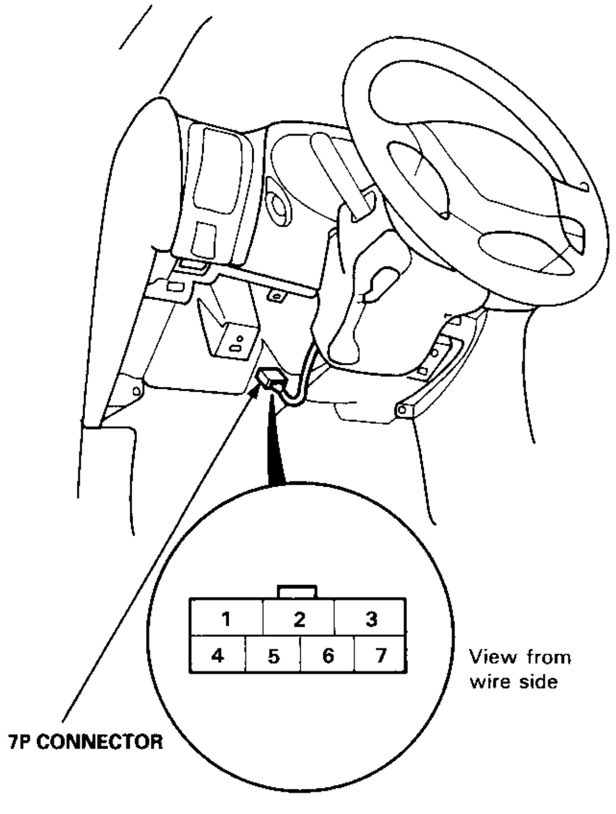
Key-in Reminder System

Ignition Key Switch Test

NOTE: Refer to page 23-153 for a diagram of the key-in reminder circuit, and to page 23-148 for the input test of the beeper circuit.

When the ignition key is not removed, the key-in reminder in the integrated control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch. With ground at the "LT BLU" and "GRN/BLU" terminals, the beeper sounds.

1. Remove the dashboard lower cover and knee bolster (see page 23-71).
2. Disconnect the 7P connector from the main wire harness.

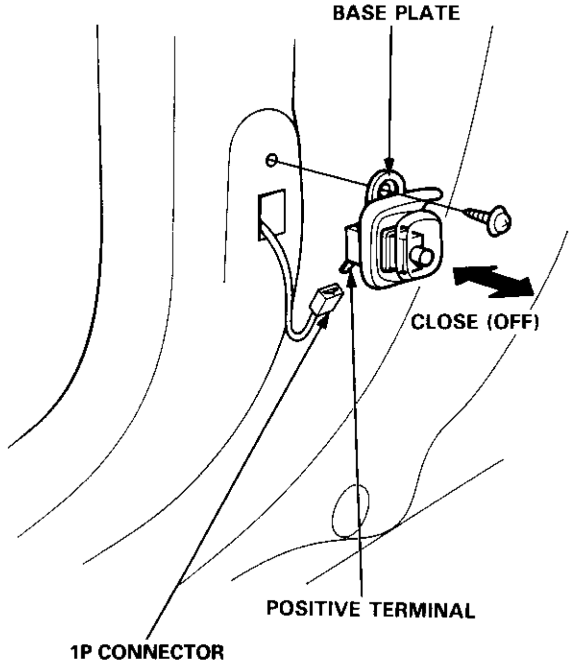


3. Check for continuity between the No. 2 and No. 4 terminals in each condition according to the table.

Condition \ Terminal	2	4
KEY INSERTED	○	○
KEY REMOVED		

Door Switch Test

1. Open the door.
2. Remove the screw, then pull out the door switch.
3. Disconnect the 1P connector from the switch.



4. Check for continuity between the positive terminal and the base plate (ground) in each switch position according to the table.

Position \ Terminal	POSITIVE	BASE PLATE
PUSHED (door closed)		
RELEASED (door open)	○	○

Engine Oil Pressure Indicator System

Description

NOTE: Refer to page 23-152 for the circuit diagram of the engine oil pressure indicator flasher, and to page 23-156 for the input test of the flasher circuit.

The low engine oil pressure indicator light works in two ways. It will flash continuously following a momentary loss of oil pressure, or it will go on and stay on with a complete loss of oil pressure.

When the engine first starts, before oil pressure rises above 29.4 kPa (0.3 kgf/cm^2, 4.3 psi), current flows through the low engine oil pressure indicator light and the oil pressure switch to ground. This tests the circuit.

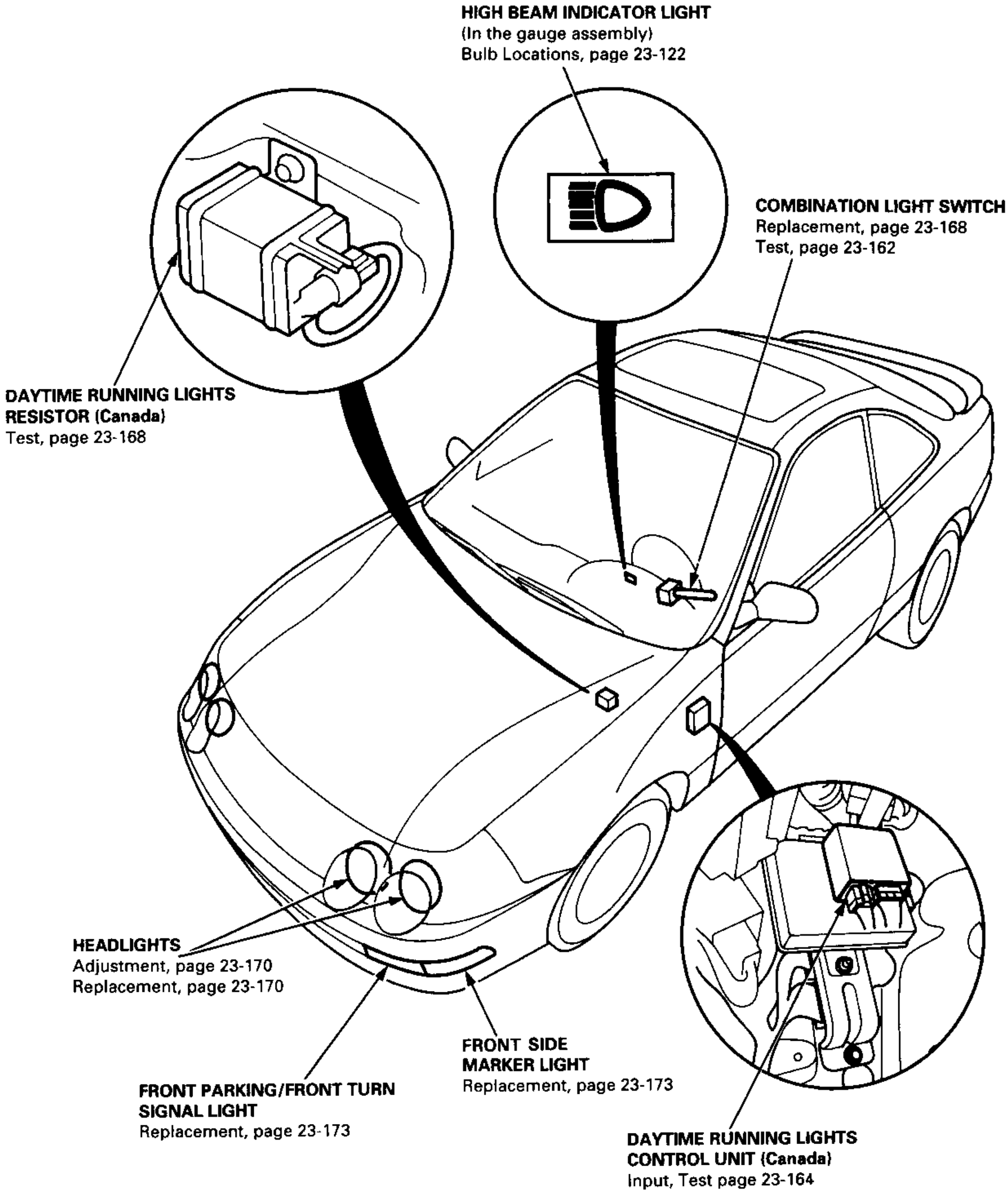
With the engine running, voltage is applied to the flasher circuit of the integrated control unit. With normal oil pressure, the oil pressure switch is open and the low engine oil pressure indicator light does not operate. If the oil pressure switch closes momentarily (more than 0.5 seconds), but then opens again, terminal "YEL/RED" will sense ground through the switch. The integrated control unit will then provide and remove ground for the low engine oil pressure indicator light through terminal "YEL/RED". The light will flash on and off until the ignition switch is turned to "OFF".

If engine oil pressure falls below 29.4 kPa (0.3 kgf/cm^2, 4.3 psi) and does not increase, the oil pressure switch will stay closed. The low engine oil pressure indicator light will go on and stay on.

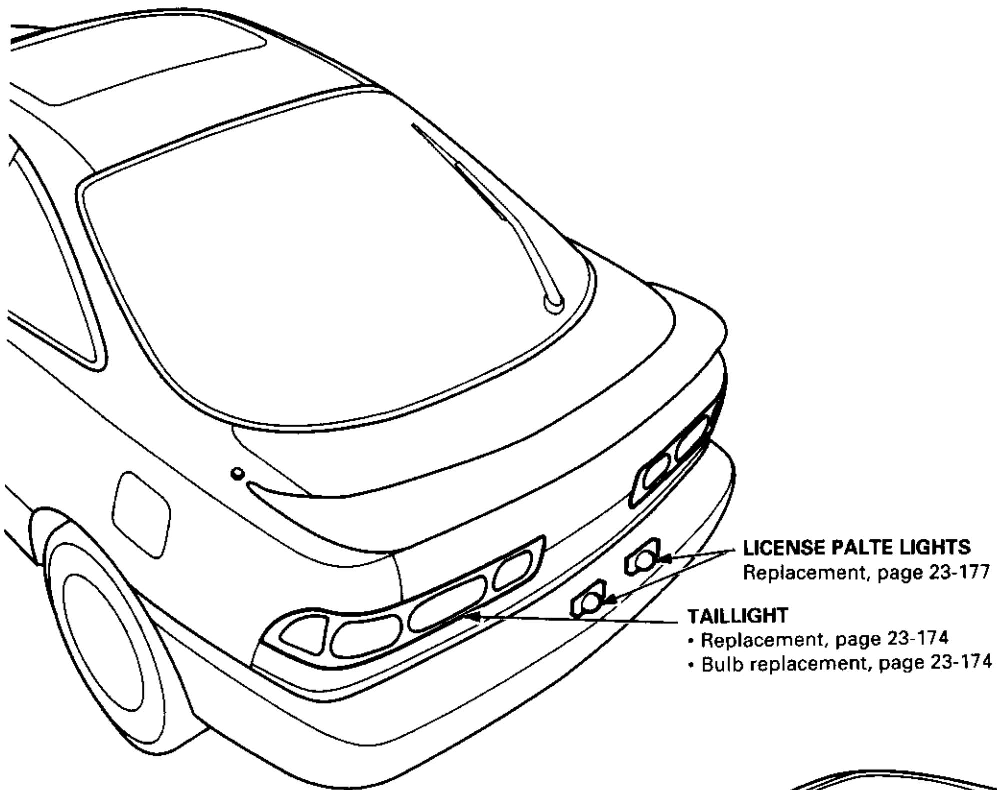
NOTE: Refer to page 23-130 for the engine oil pressure switch test.

Lighting System

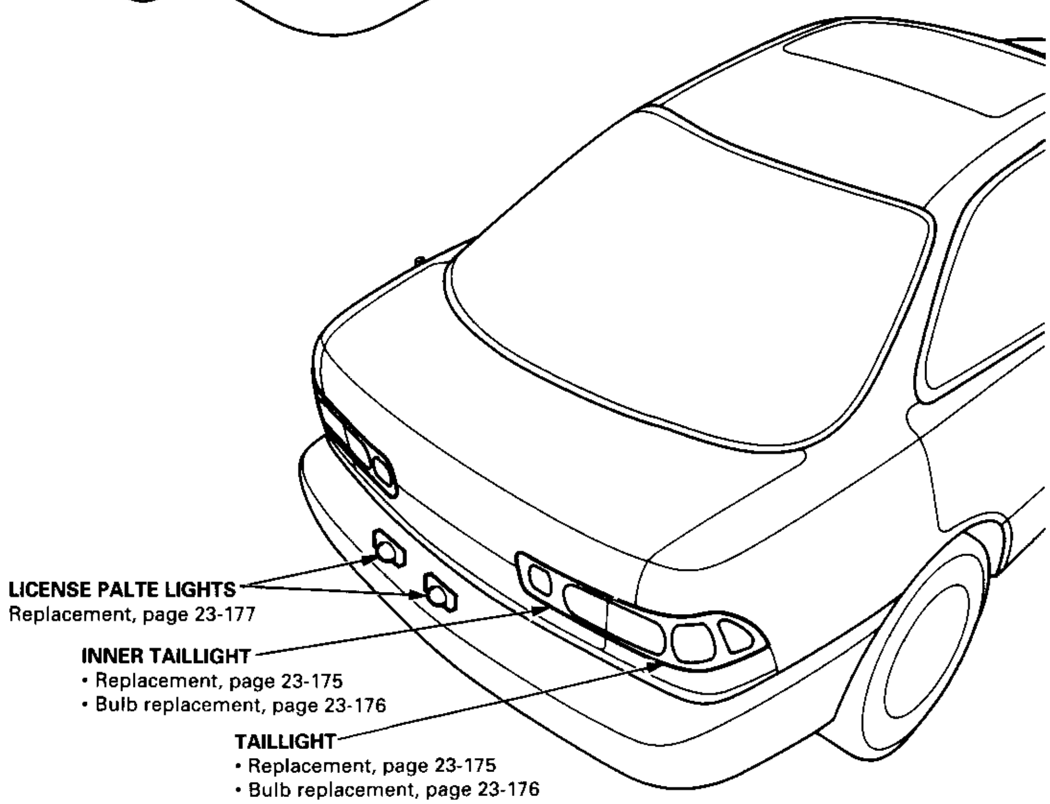
Component Locations Index



Hatchback:

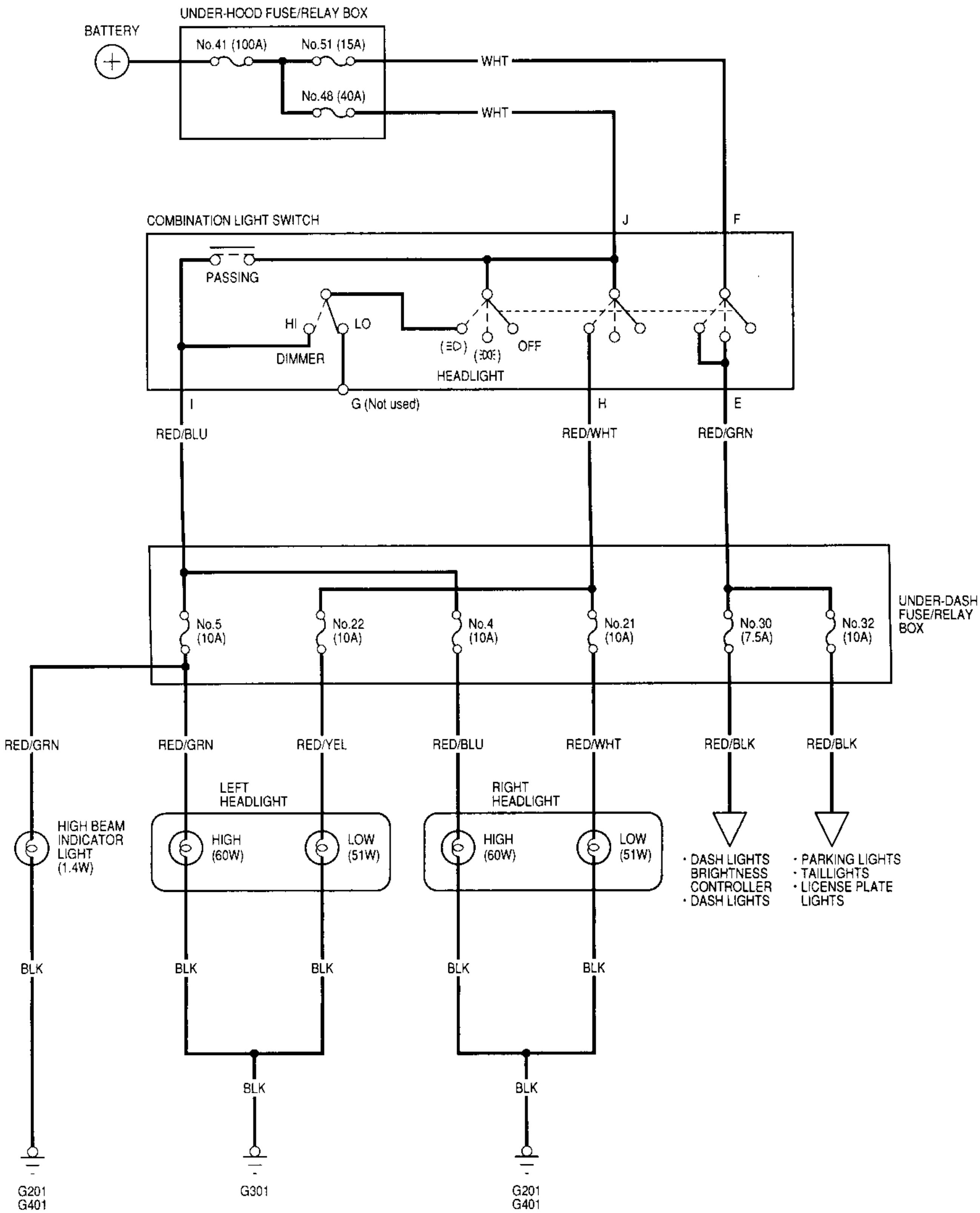


Sedan:

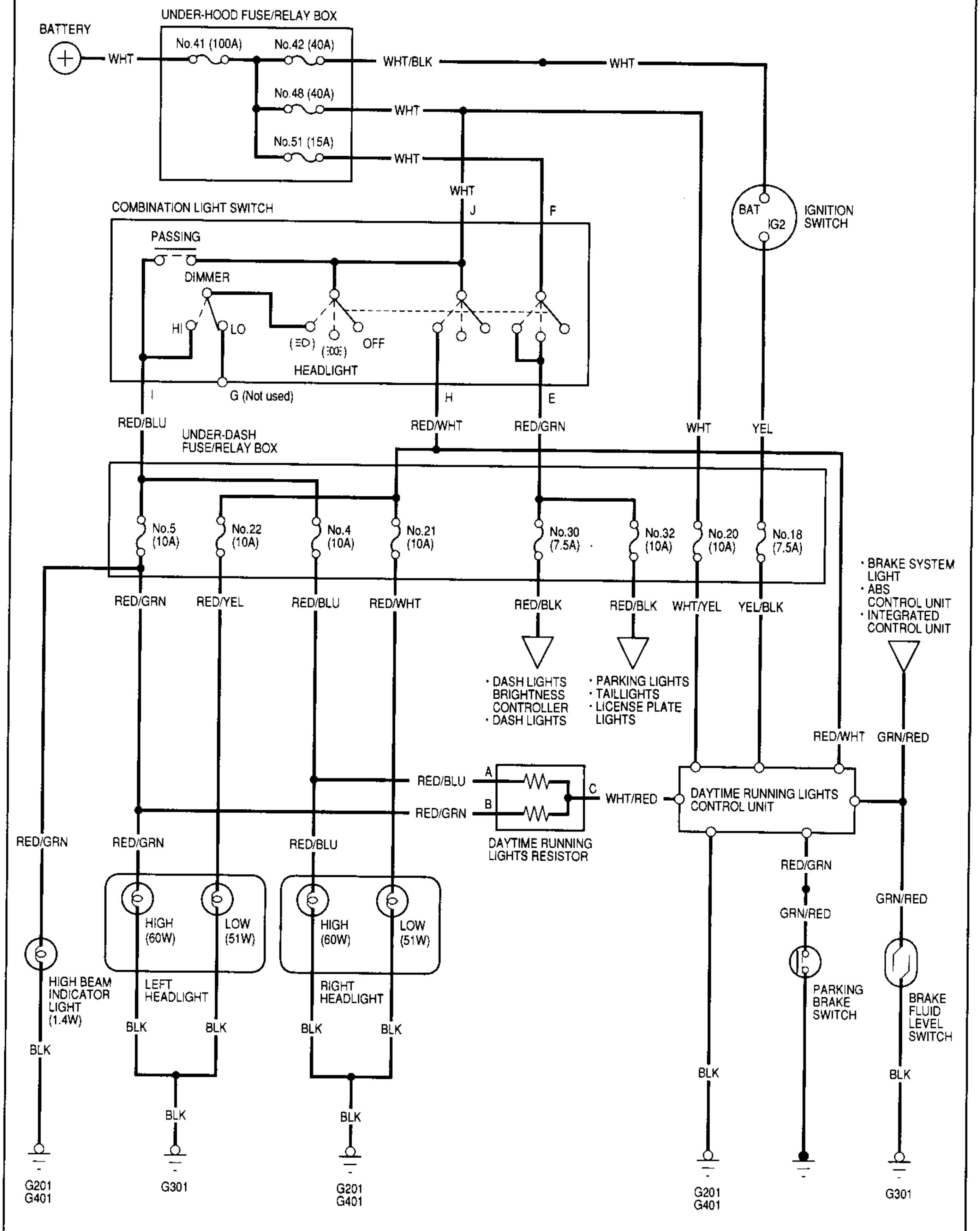


Lighting System

Circuit Diagram (USA)



Circuit Diagram (Canada)

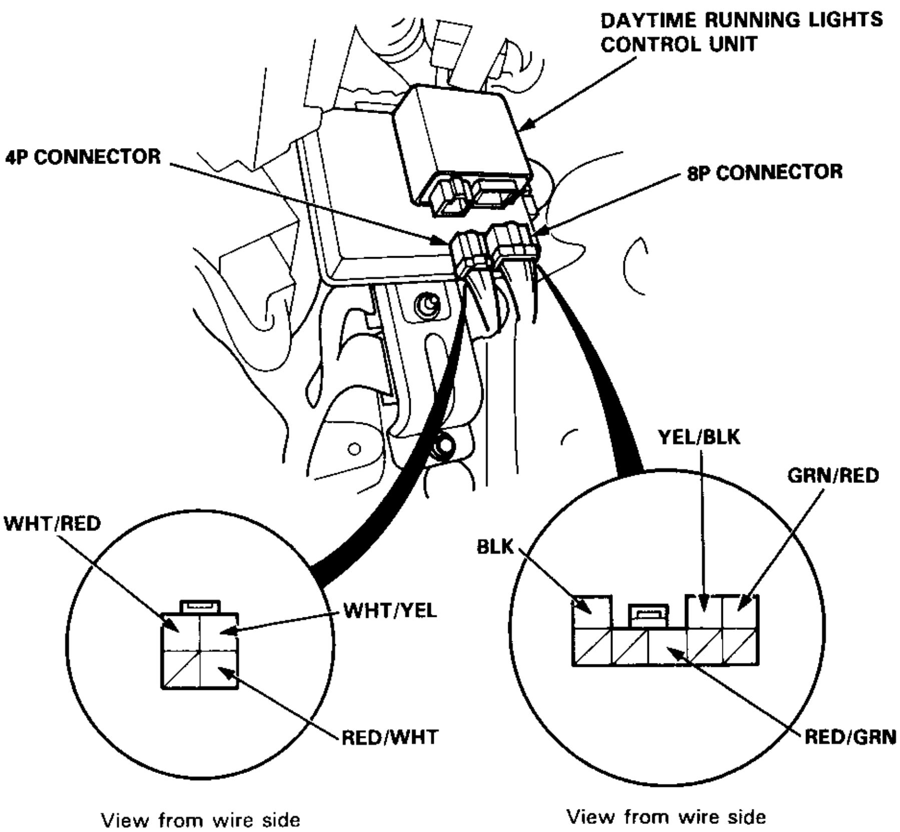


Lighting System

Daytime Running Lights Control Unit Input Test (Canada)

1. Remove the dashboard lower cover and knee bolster.
2. Disconnect the connectors from the daytime running lights control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.

- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the control unit must be faulty; replace it.

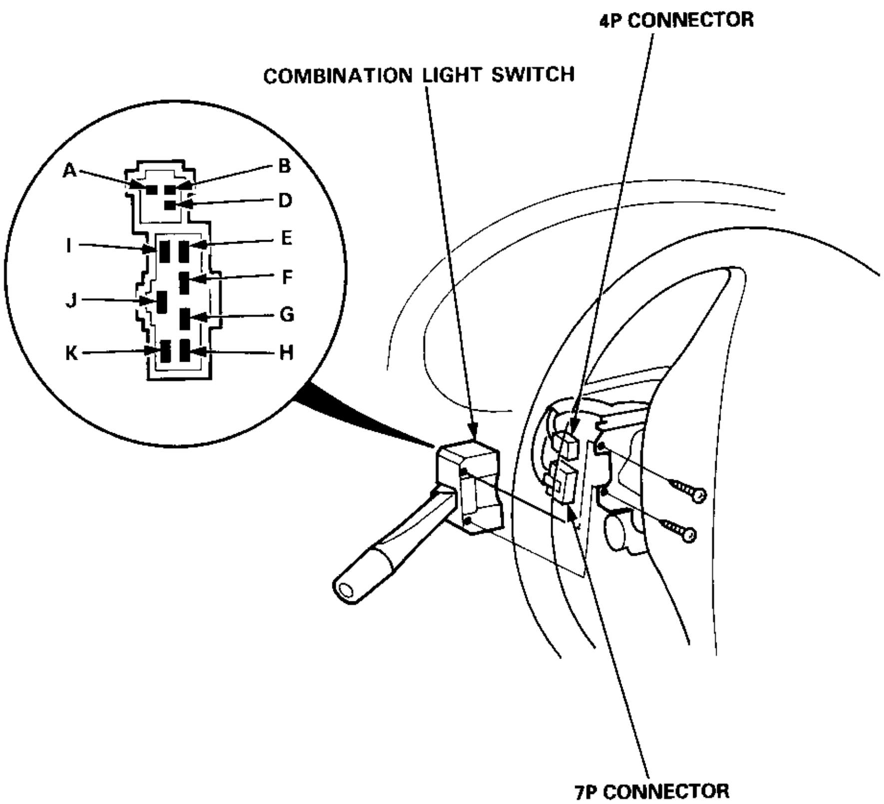


No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
3	YEL/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 18 (7.5 A) fuse in the under-dash fuse/relay box • Faulty ignition switch • An open in the wire
4	RED/WHT	Combination light switch in "≡D" position	Check for voltage to ground: There should be battery voltage.	• Blown No. 48 (40 A) fuse in the he under-hood fuse/relay box • Faulty combination light switch • An open in the wire
5	WHT/RED	Combination light switch is OFF; connect a jumper wire between the YEL/BLK and WHT/RED terminals, then turn the ignition switch ON (II).	Left and right headlight (high beam) should be on but dim, and high beam indicator light should come on.	• Poor ground (G201, G401, G301) • Blown bulbs • Faulty daytime running lights resistor • An open in the wire
6	GRN/RED	Ignition switch ON (II), brake fluid reservoir full, and parking brake lever down	Connect to ground: The brake system light should come on.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Blown brake system light • An open in the wire
7	RED/GRN	Parking brake lever up	Check for continuity to ground: There should be continuity.	• Faulty brake lever switch • An open in the wire

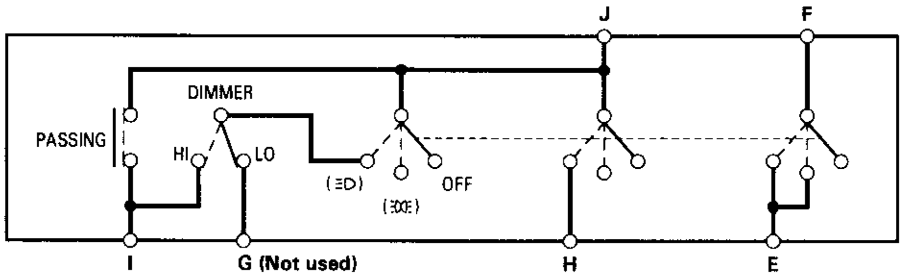
Lighting System

Combination Light/Turn Signal Switch Test

1. Remove the dashboard lower cover and steering column covers (see page 23-72).
2. Disconnect the 4P and 7P connectors from the switch.
3. Check the connector and socket terminals to be sure they are all making good contact. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
4. Check for continuity between the terminals in each switch position according to the table.

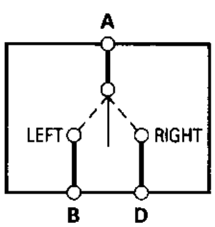


Combination Light Switch :



Position \ Terminal			E	F	H	I	J
Headlight switch	OFF						
	≡00≡		○	○			
	≡D	LOW	○	○	○	—	○
		HIGH	○	○	○	○	○
Passing switch	OFF						
	ON					○	○

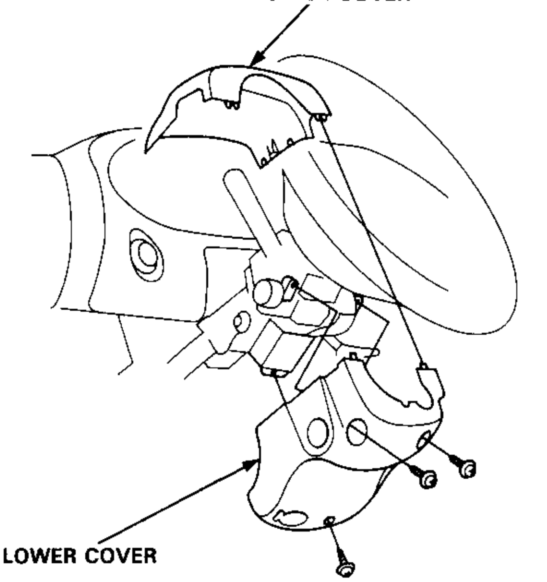
Turn Signal Switch :



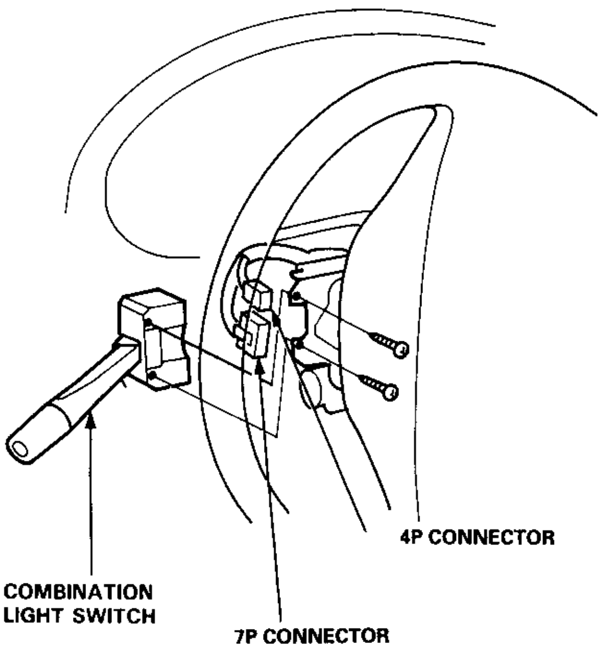
Position \ Terminal	A	B	D
RIGHT	○	—	○
NEUTRAL			
LEFT	○	○	

Combination Light Switch Replacement

1. Remove the steering column covers.



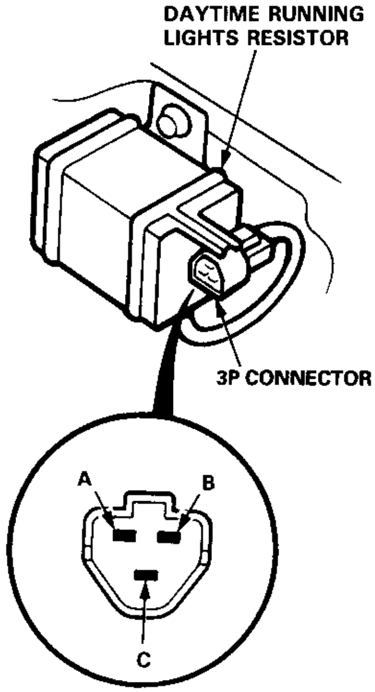
2. Disconnect the 4P and 7P connectors from the combination light switch, then remove the two screws and lift out the switch.



Daytime Running Lights Resistor Test (Canada)

CAUTION: The daytime running lights resistor becomes very hot when the daytime running lights are on; do not touch it or the attaching hardware immediately after the lights have been turned off.

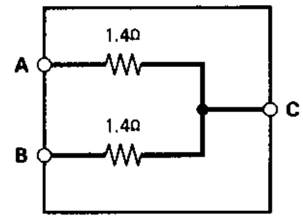
1. Disconnect the 3P connector from the resistor.



View from terminal side

2. Measure the resistance between the resistor terminals (A and B) and the power terminal C.

   Resistance: 1.4 Ω ± 0.07 Ω

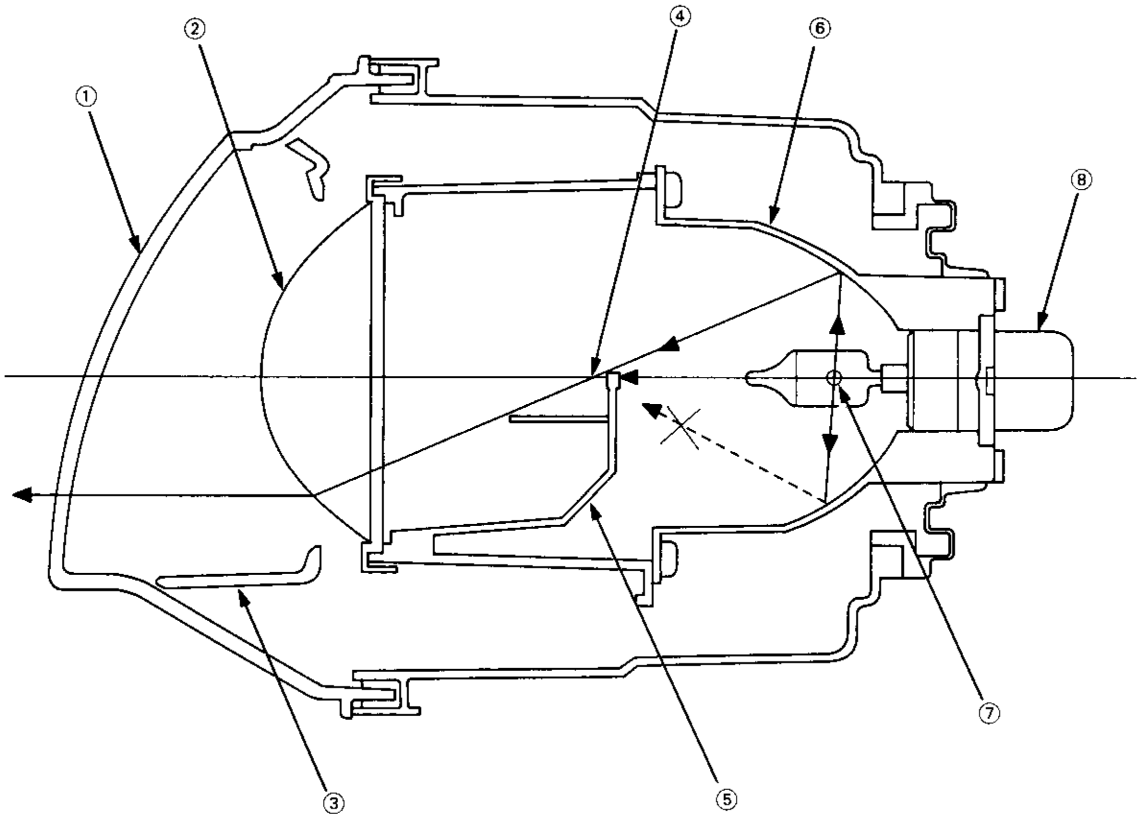


3. Replace the resistor with a new one if any of the resistances are beyond specification.

Description

The low beam lights are projector-type lights which are more compact while maintaining sufficient brightness. Bundling the light rays reduces stray light and yields a spotlight-effect which improves visibility during night or foul weather driving. For easier aiming, the headlights are equipped with vertical and horizontal gauges.

NOTE: As the outer lenses are made of a resin material, don't cover the headlights when they are turned on.



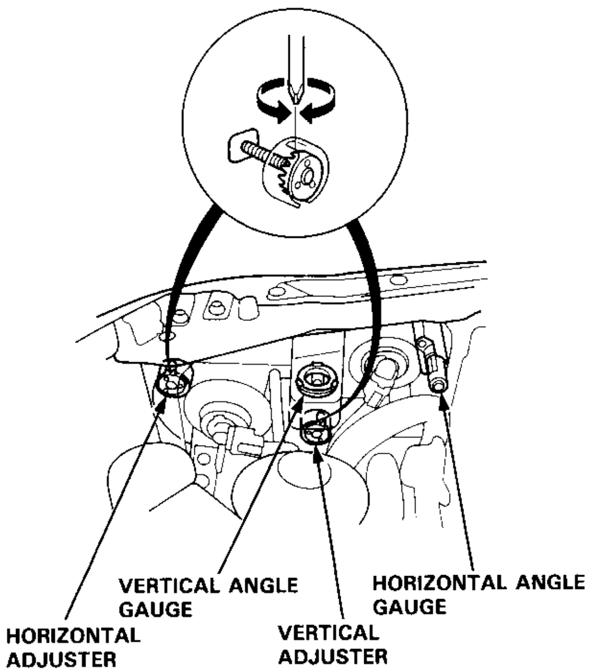
① OUTER LENS
② CONVEX LENS
③ SUB-REFLECTOR
④ SECOND FOCUS
⑤ INTERRUPTER PLATE
⑥ REFLECTOR
⑦ FIRST FOCUS
⑧ BULB

Headlight

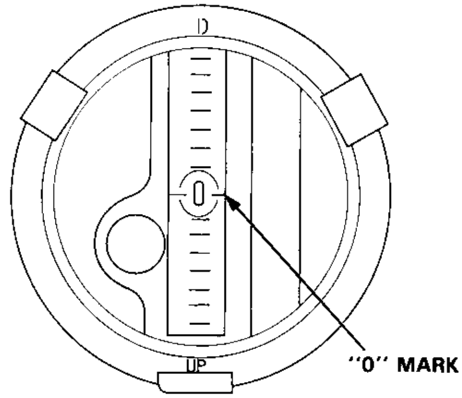
Adjustment

Before adjusting the headlights:

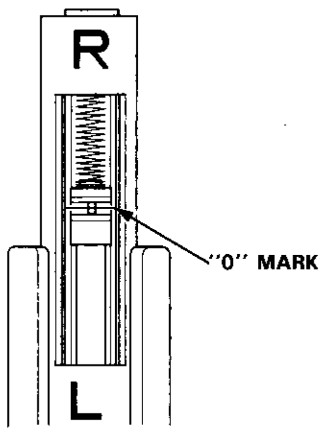
- Park the car on level ground.
- Make sure the fuel tank is full.
- The driver or someone who weighs the same should sit in the driver's seat.
- Load the trunk with the items you usually carry (if you usually pull a trailer, attach it to the car).
- Push down on the front and rear bumpers several times to make sure the car is sitting normally.
- When installing a new headlight assembly, tighten the four mounting bolts so that the indicator in the vertical gauge comes to the "0" mark.



1. Open the hood.
2. Check that both the horizontal and vertical gauge read "0".
   - If the gauges read "0", check headlight aiming with the aiming charts on page 23-171. (If aiming isn't correct, refer to the frame repair chart in section 20).
   - If one or both gauges don't read "0", go to step 3.
3. Turn the low beams on. If necessary, align the vertical indicator with its "0" mark by turning the vertical adjuster with a Phillips screwdriver, and check aiming with the chart on page 23-171.

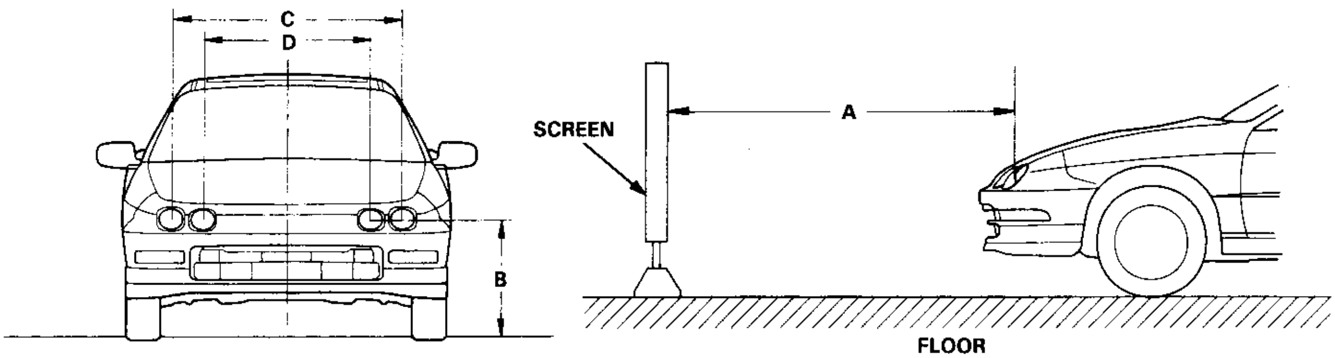


4. If necessary, align the horizontal indicator with its "0" mark by turning the horizontal adjuster with a Phillips screwdriver, and check aiming with the chart on page 23-171.



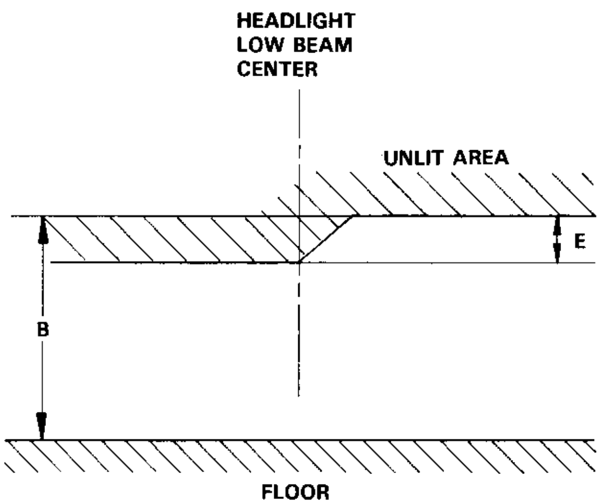
5. Recheck that the vertical indicator bubble is aligned with "0" ± 1.
   If necessary, adjust as described in step 3.
6. Turn the high beams on and check aiming with the charts on page 23-171.

Measurements (Standard):
A: 9 ft 10 in (3000 mm)
B: 23 in (585 mm)
C: 46.1 in (1170 mm)
D: 33.5 in (850 mm)
E: 1.2 in (31 mm)

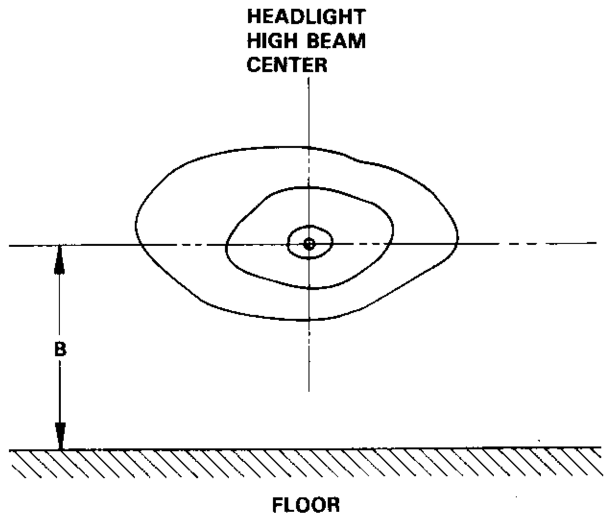


Headlight Aiming

Low beam:



High beam:

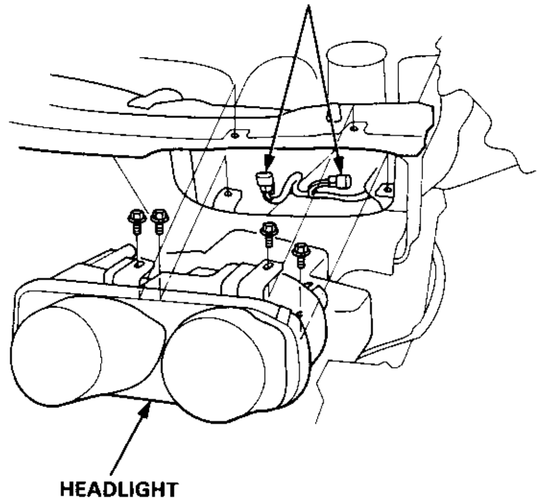


CAUTION: The outer lenses get very hot when the headlights are on; do not cover them.

Headlight

Headlight Replacement

1. Remove the front bumper (see section 20).
2. Remove the mounting bolts, then pull out the headlight, and disconnect the connectors from it.



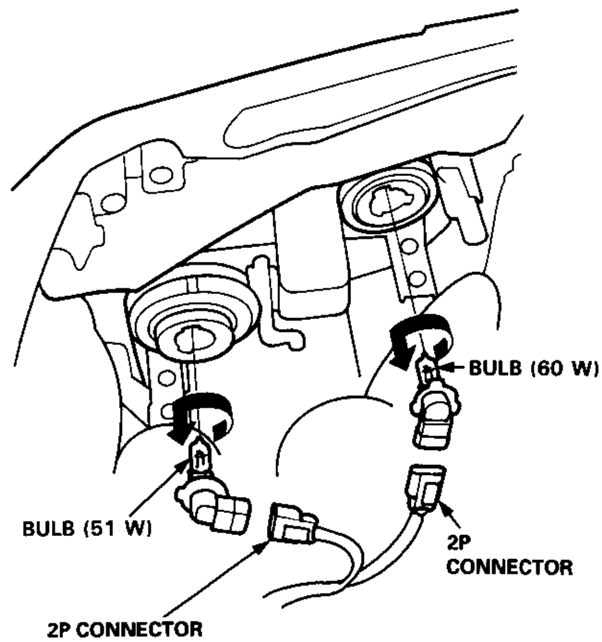
3. After replacement, the horizontal and vertical aiming must be checked using conventional methods. Use the aiming charts on page 23-171.

Bulb Replacement

CAUTION:

- **Halogen headlights can become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.**
- **Do not try to replace or clean the headlights with the lights on.**

1. Disconnect the 2P connector(s) from the headlight.

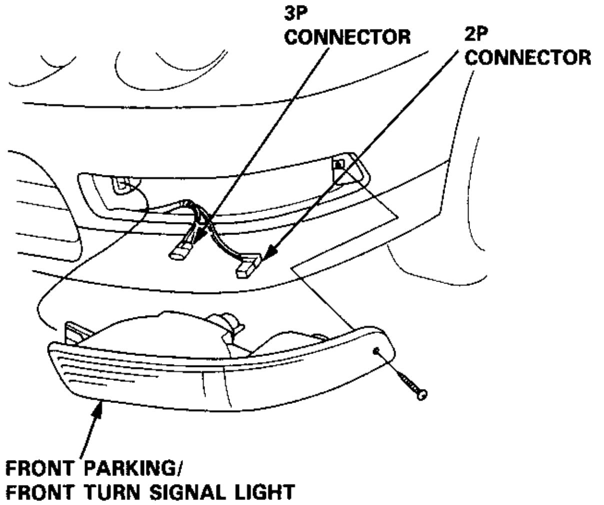


2. Turn the bulb(s) counterclockwise and remove the bulb(s).

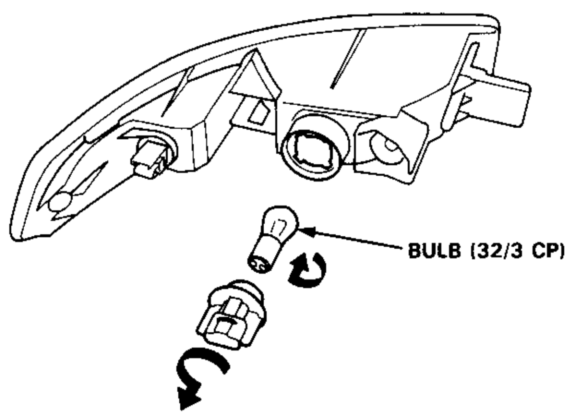
Front Parking/Front Turn Signal Lights

Replacement

1. Remove the screw, and pull the front parking/front turn signal lights out of the front bumper.



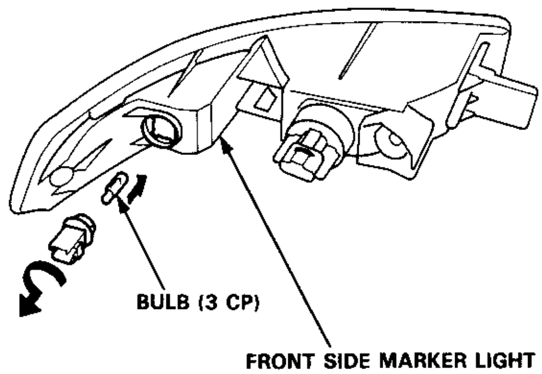
2. Disconnect the 3P and 2P connectors from the lights.
3. Turn the bulb socket 45° counterclockwise to remove it from the housing.



Front Side Marker Lights

Replacement

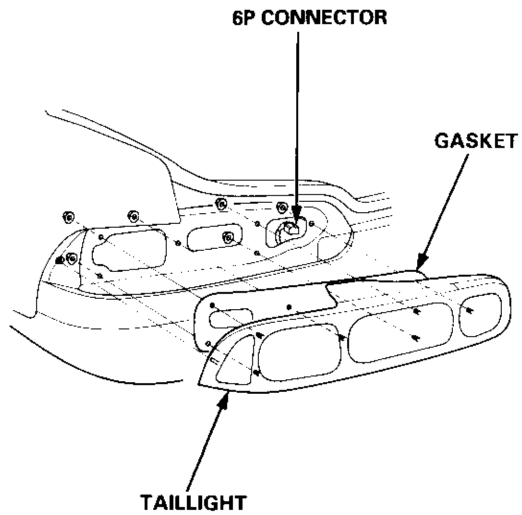
1. Remove the screw, and pull the front side marker light assembly out of the front bumper.
2. Disconnect the 3P and 2P connectors from the lights.
3. Turn the bulb socket 45° counterclockwise to remove it from the housing.



Taillights (Hatchback)

Replacement

1. Open the rear hatch.
2. Remove the rear panel lining and the side lining (see section 20).
3. Disconnect the 6P connector from the taillight.
4. Remove the six mounting nuts, then pull out the taillight.

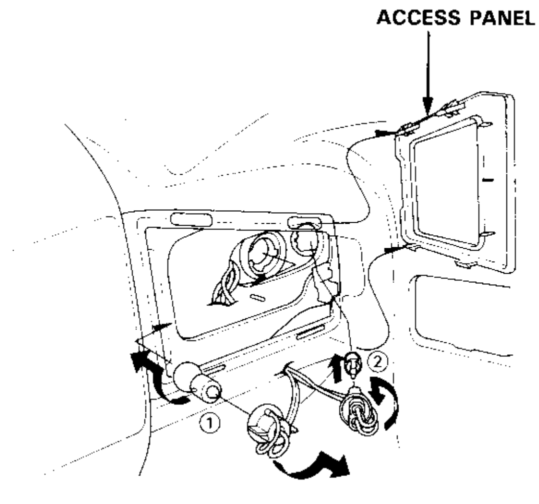


NOTE:
- Inspect the gasket. Replace it if it is distorted or stays compressed.
- After installation, run water over the lights to make sure they don't leak.

Bulb Replacement

Rear turn signal/Rear parking lights:

1. Open the rear hatch, then remove the access panel.
2. Remove the bulb from the bulb socket.

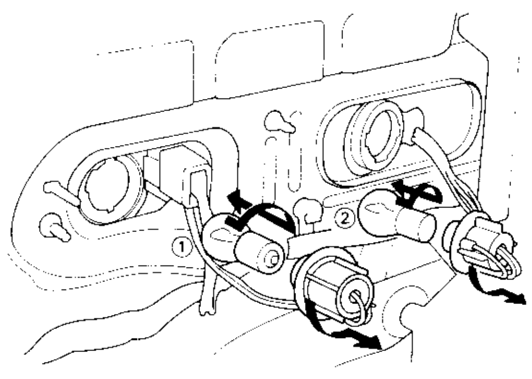


①: REAR TURN SIGNAL LIGHT BULB (32 CP)

②: REAR PARKING LIGHT BULB (3 CP)

Brake/Taillight/Back-up lights:

1. Open the rear hatch.
2. Remove the rear panel lining (see section 20).



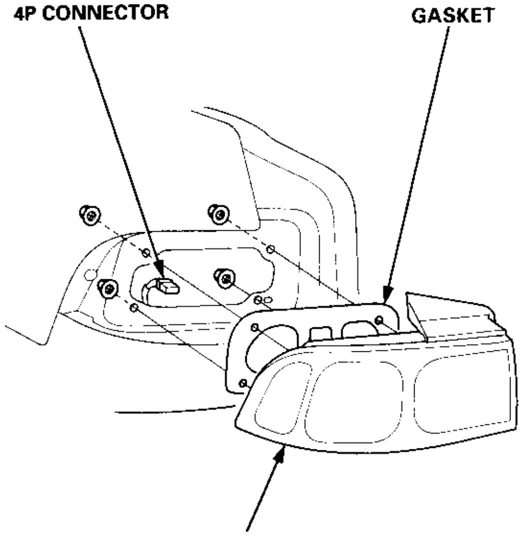
①: BACK-UP LIGHT BULB (32 CP)

②: BRAKE/TAILLIGHT BULB (32/3 CP)

Replacement

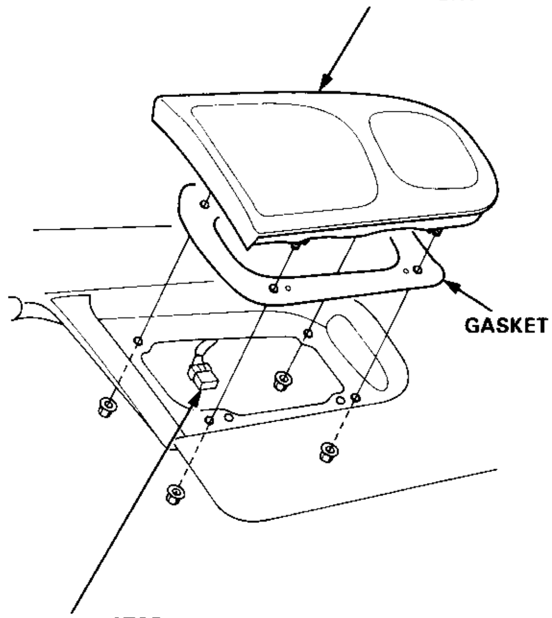
Taillight:

1. Open the trunk lid, then remove the rear panel lining and side lining (see section 20).
2. Disconnect the 4P connector from the inner taillight.
3. Remove the four mounting nuts, then pull out the taillight.



Inner Taillight:

1. Open the trunk lid.
2. Disconnect the 4P connector from the taillight.
3. Remove the four mounting nuts, then pull out the inner taillight.



NOTE:

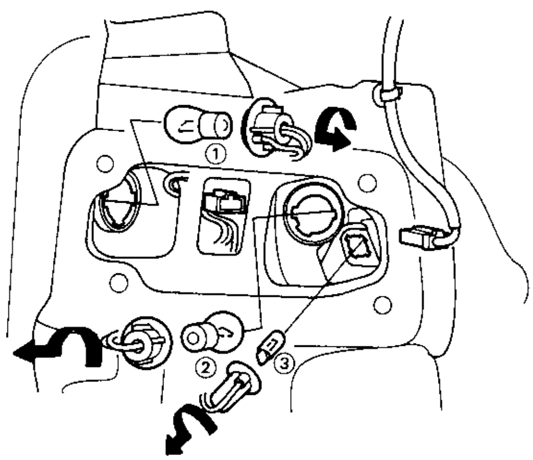
- Inspect the gasket. Replace it if it is distorted or stays compressed.
- After installation, run water over the lights to make sure they don't leak.

Taillights (Sedan)

Bulb Replacement

Taillight:

1. Open the trunk lid, then remove the rear panel lining and side lining (see section 20).
2. Remove the bulb from the bulb socket.



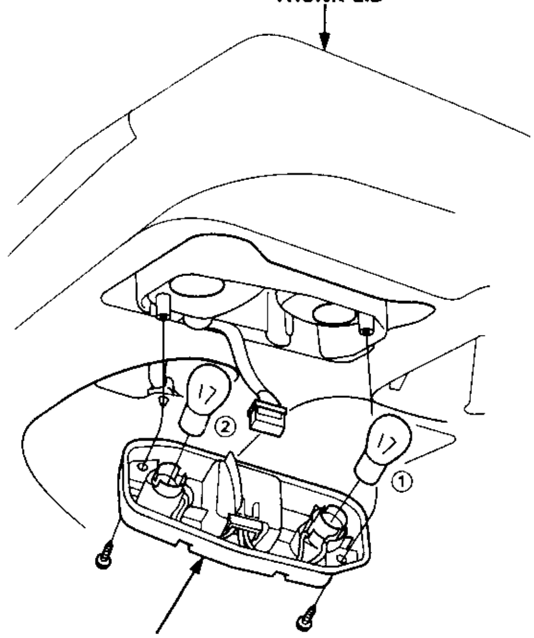
①: BRAKE/TAILLIGHT BULB (32/3 CP)

②: TURN SIGNAL LIGHT BULB (32 CP)

③: REAR PARKING LIGHT BULB (3 CP)

Inner Taillight:

1. Open the trunk lid, then remove the bulb housing.
2. Remove the bulb from the bulb housing.



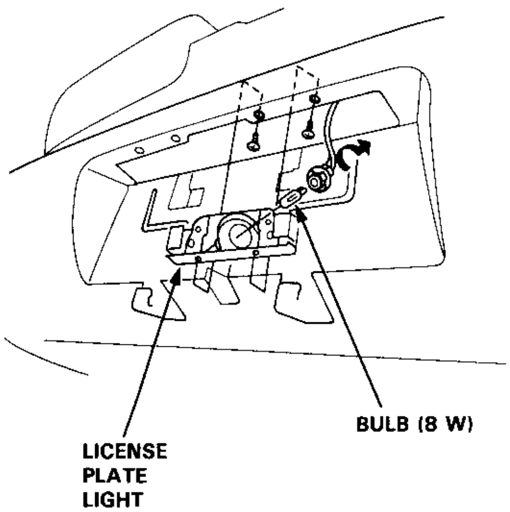
①: BACK-UP LIGHT BULB (32 CP)

②: BRAKE/TAILLIGHT BULB (32/3 CP)

License Plate Lights

Replacement

1. Remove the screws and pull out the license plate lights.
2. Turn the bulb socket 45° counterclockwise to remove it from the housing.

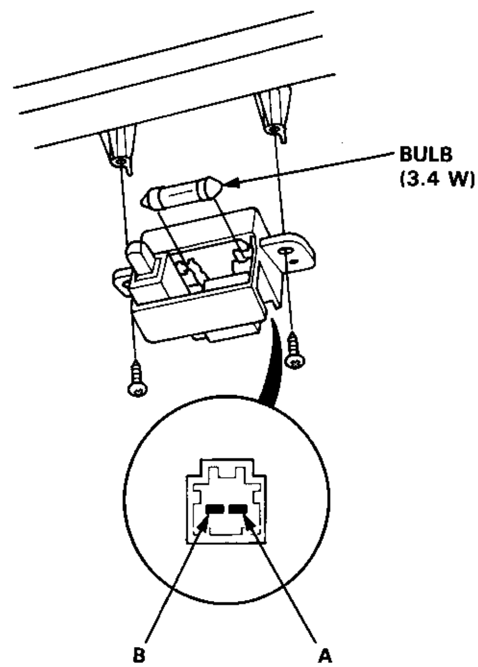


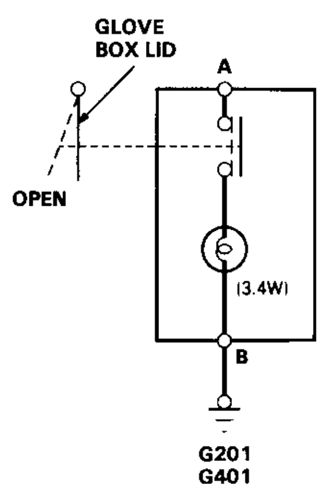
Glove Box Light

Test

1. Remove the glove box and disconnect the 2P connector.
2. Check for continuity between the A and B terminals in each condition according to the table.

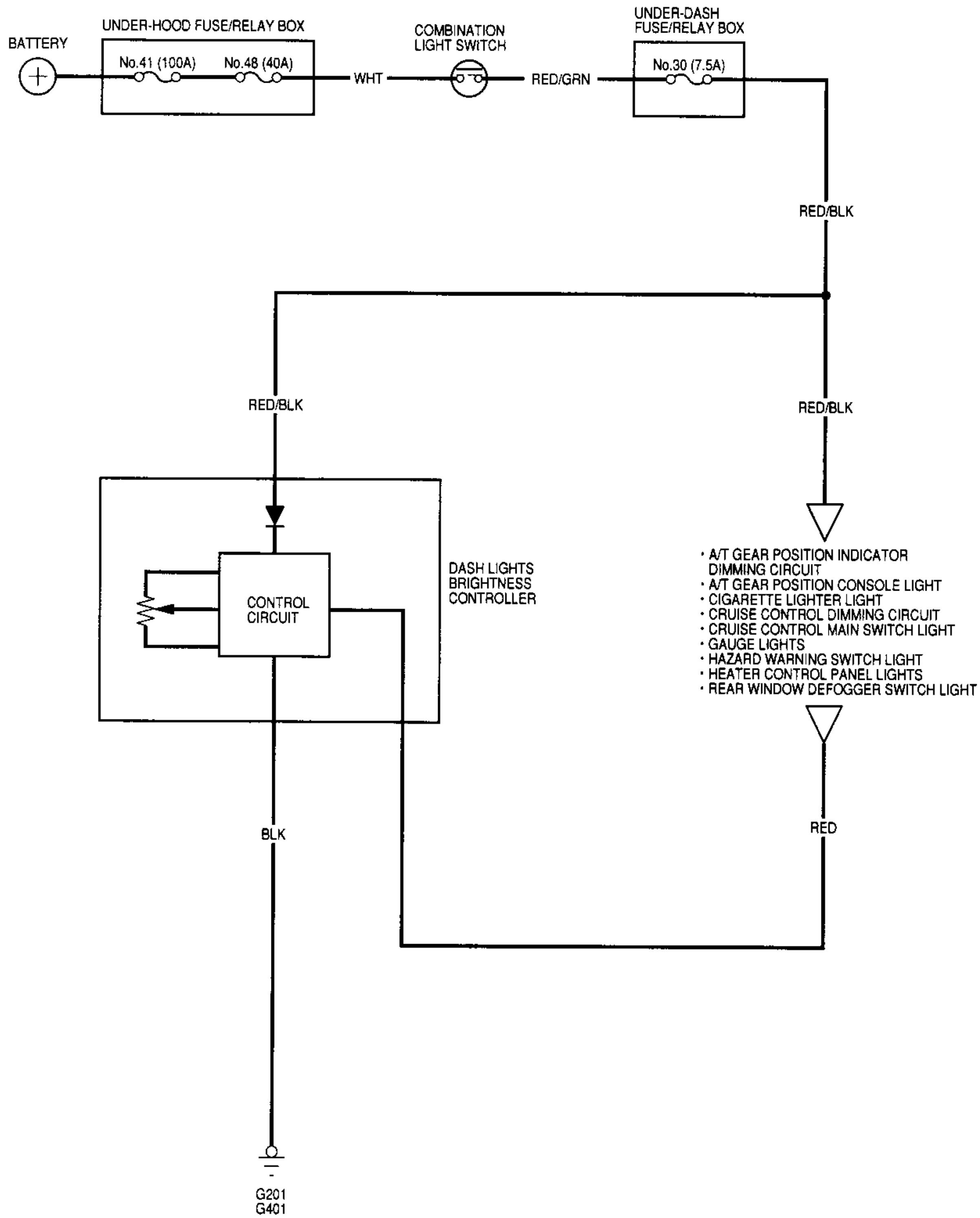
Condition \ Terminal	A		B
PUSHED (lid closed)			
RELEASED (lid open)	O	—(bulb)—	O





Dash Lights Brightness Control

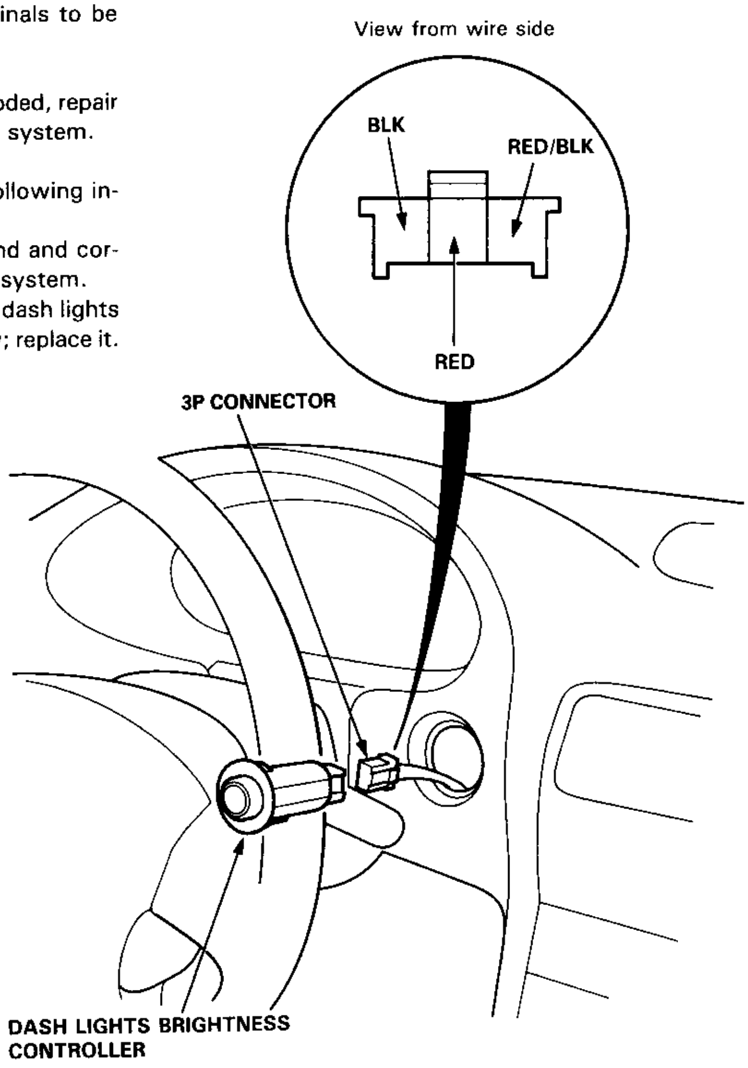
Circuit Diagram



Controller Input Test

NOTE: Be careful not to damage the controller and the instrument panel.

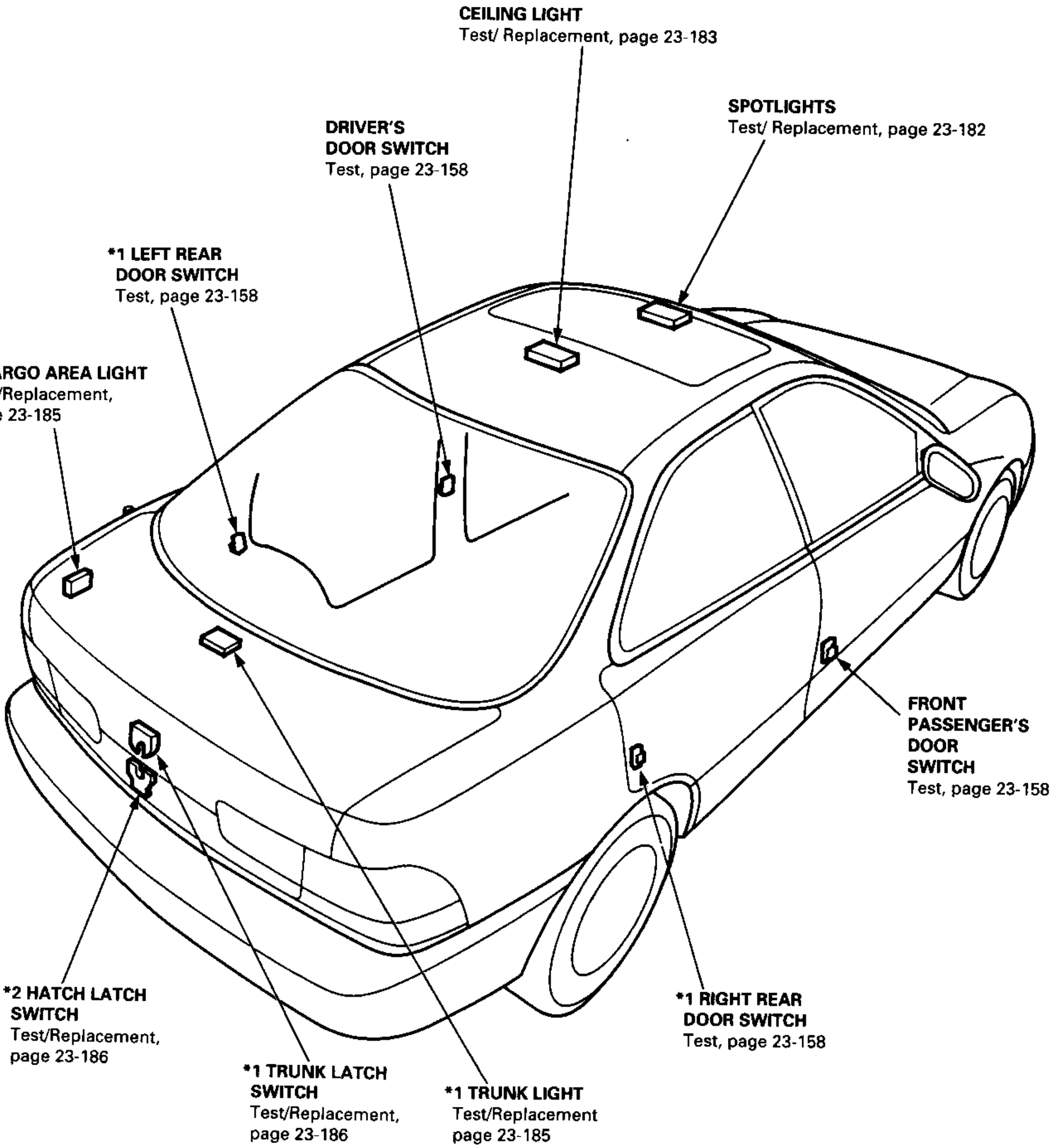
1. Remove the instrument panel from the dashboard (see page 23-126).
2. Remove the dash lights brightness controller from the dashboard, then disconnect the 3P connector.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the dash lights brightness controller must be faulty; replace it.



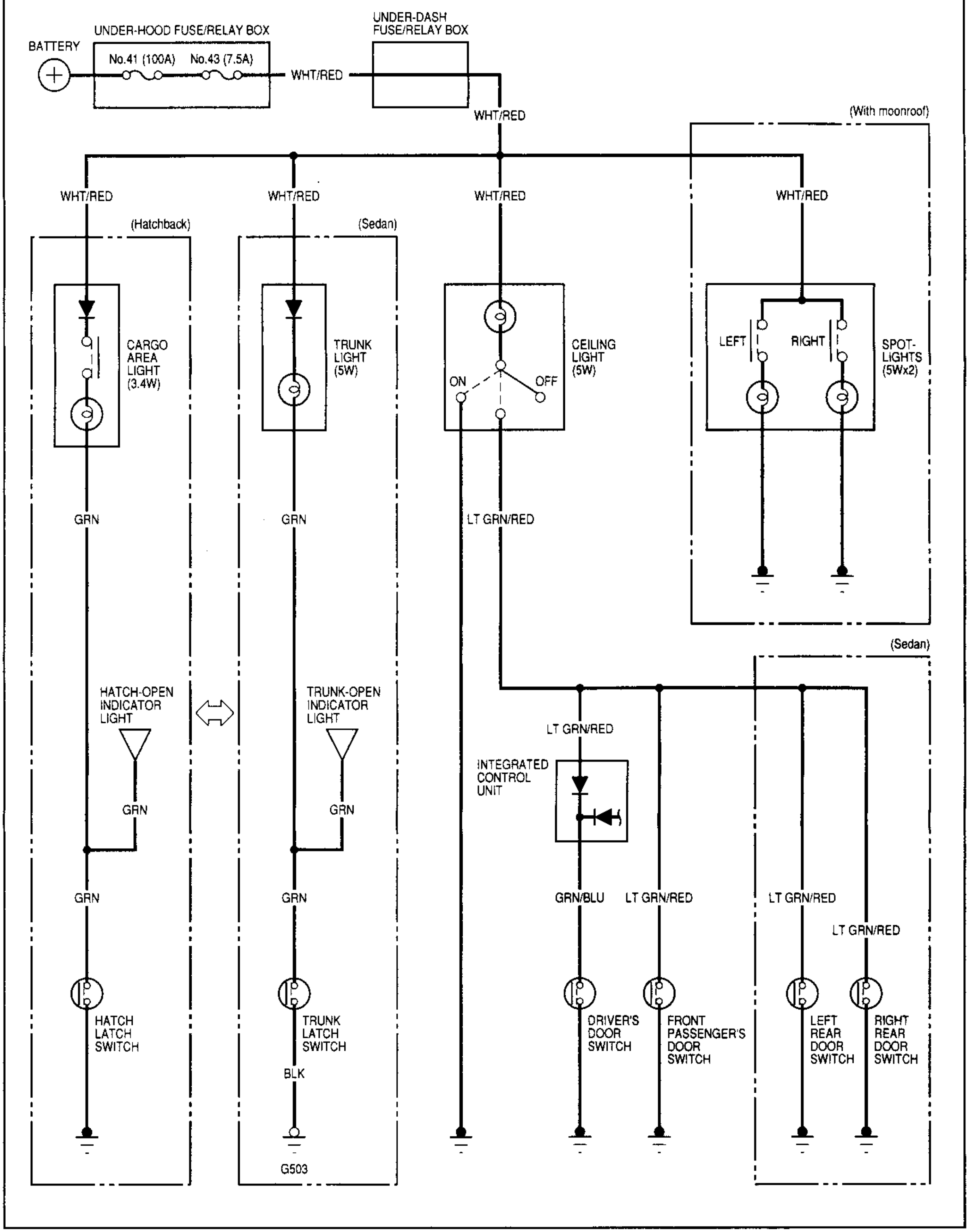
No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	RED/BLK	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 30 (7.5 A) fuse in the under-dash fuse/relay box • Faulty combination light switch • An open in the wire
3	RED	Headlight switch ON	Connect to ground: Dash lights should come on full bright.	• An open in the wire

Component Location Index

*1: Sedan
*2: Hatchback



Circuit Diagram

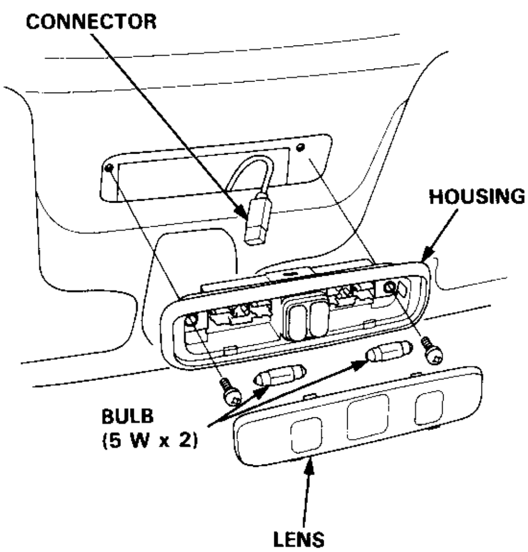


Ceiling/Trunk/Cargo Area Lights, Spotlights

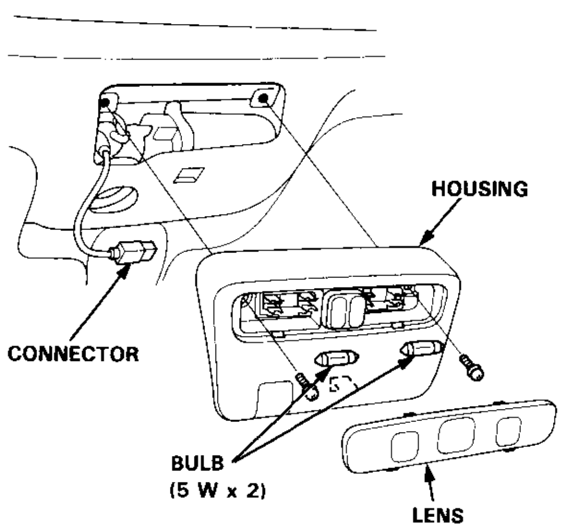
Spotlight Test/Replacement

1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the two screws, then pull out the housing.

Hatchback:

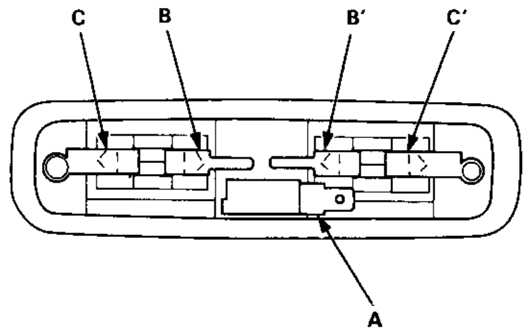


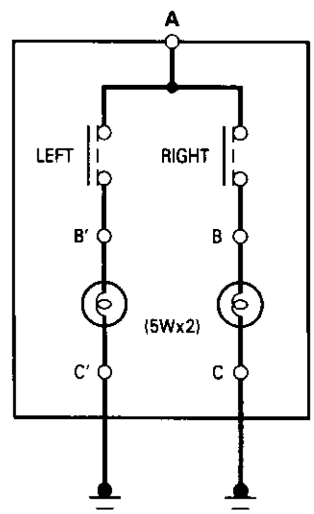
Sedan:



4. Disconnect the connector from the housing.
5. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		A	B or B′		C or C′
LEFT	ON	○	○	○	○
	OFF				
RIGHT	ON	○	○	○	○
	OFF				

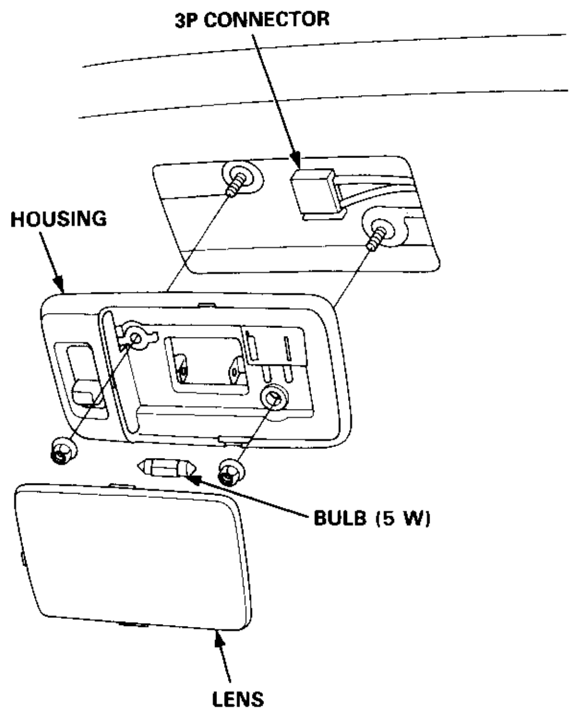




Ceiling Light Test/Replacement

With moonroof:

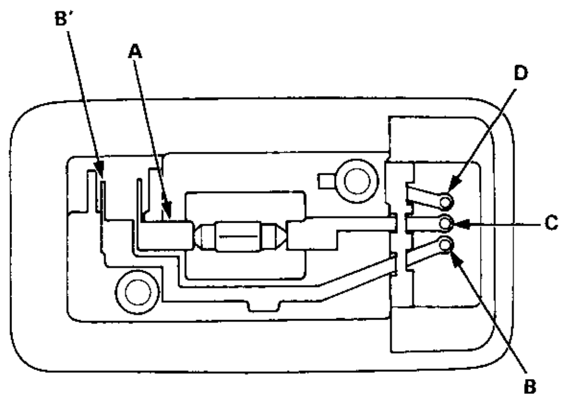
1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the two mounting nuts, then pull out the housing.

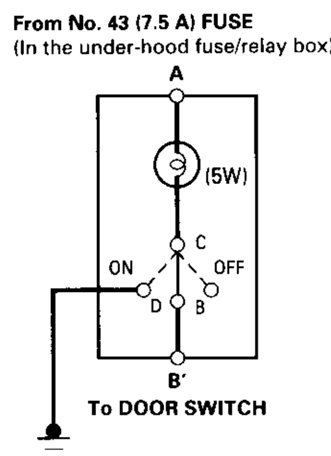


4. Disconnect the 3P connector from the housing.

5. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	A		B or B'	C	D
OFF	○	(bulb)		○	
DOOR	○	(bulb)	○	○	
ON	○	(bulb)		○	○



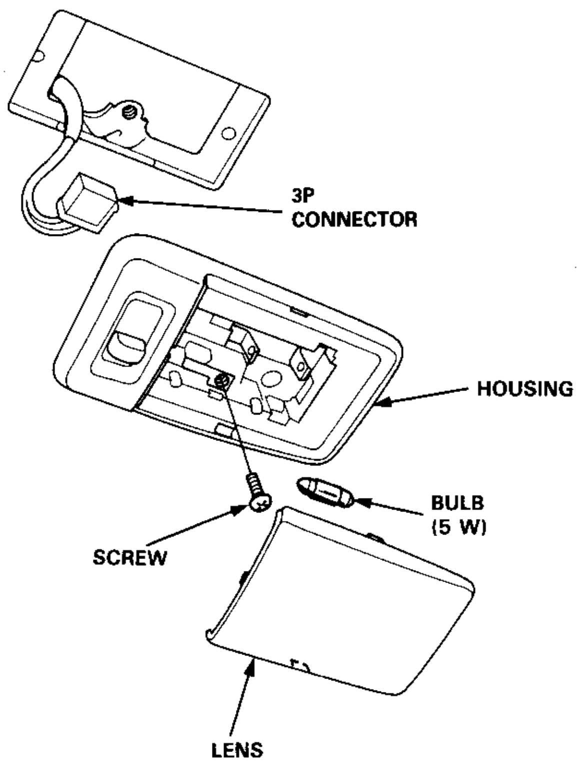


Ceiling/Trunk/Cargo Area Lights, Spotlights

Ceiling Light Test/Replacement

Without moonroof:

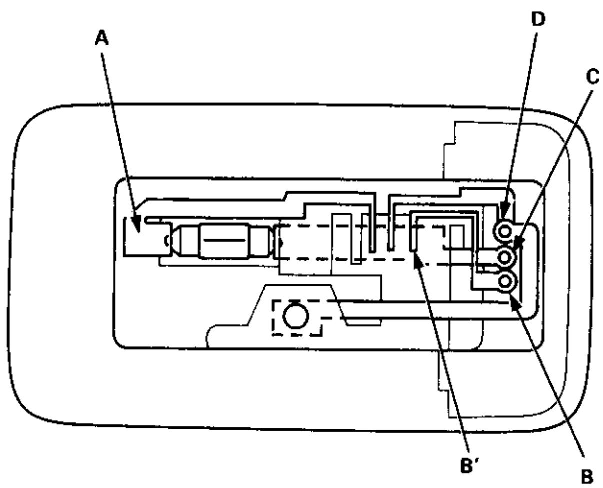
1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the screw, then pull out the housing.

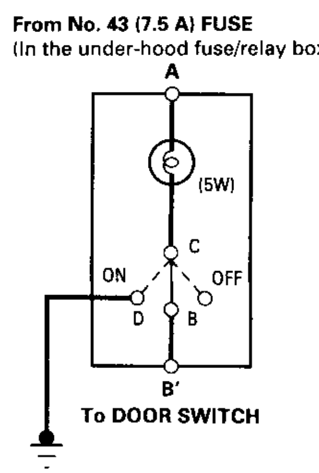


4. Disconnect the 3P connector from the housing.

5. Check for continuity between the terminals in each switch position according to the table.

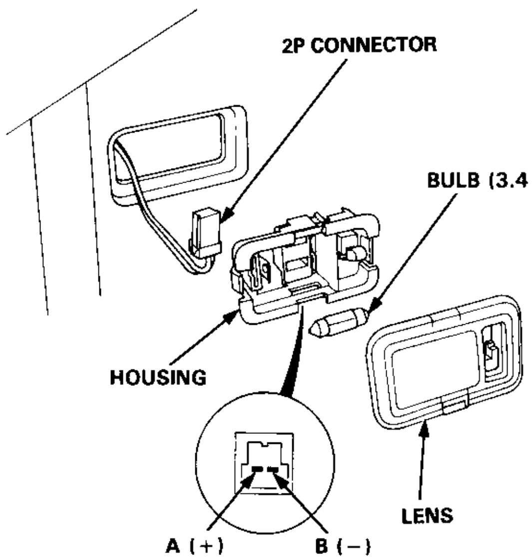
Terminal / Position	A		B or B'	C	D
OFF	○	⊗		○	
DOOR	○	⊗	○	○	
ON	○	⊗		○	○

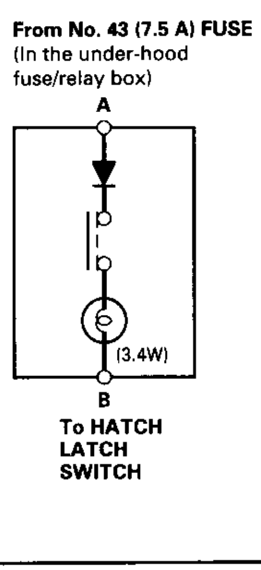




Cargo Area Light Test/ Replacement (Hatchback)

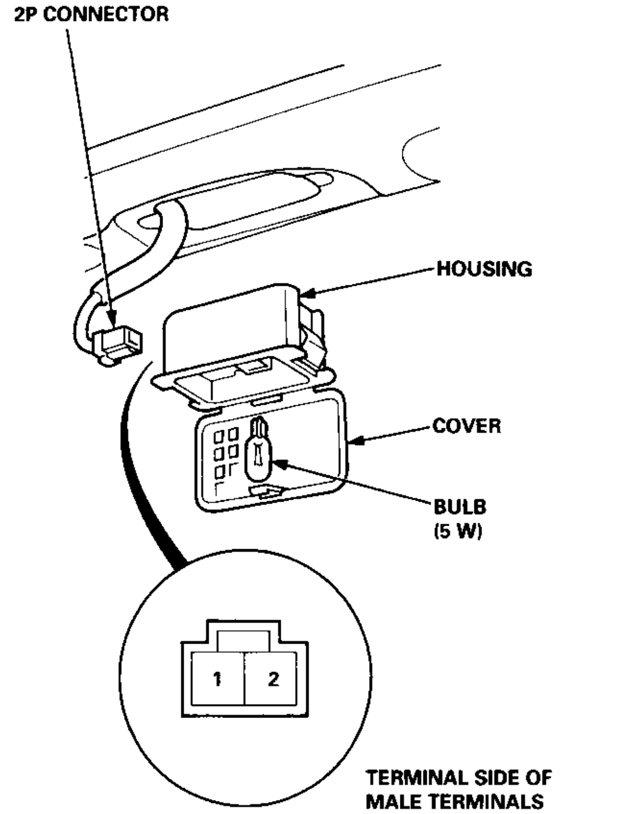
1. Pry the cargo area light lens out of its housing.
2. Pry out the light assembly.
3. Disconnect the 2P connector from the housing.
4. Make sure that the bulb is OK. Check for continuity between the A (+) and B (–) terminal with the cargo area light switch ON.

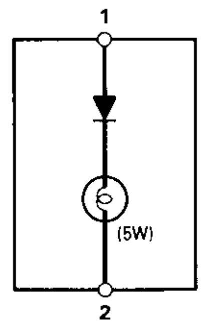




Trunk Light Test/Replacement (Sedan)

1. Open the trunk light cover.
2. Pry out the light assembly.
3. Disconnect the 2P connector from the housing.
4. Make sure that the bulb is OK. Check for continuity between the No. 1 and No. 2 terminals.



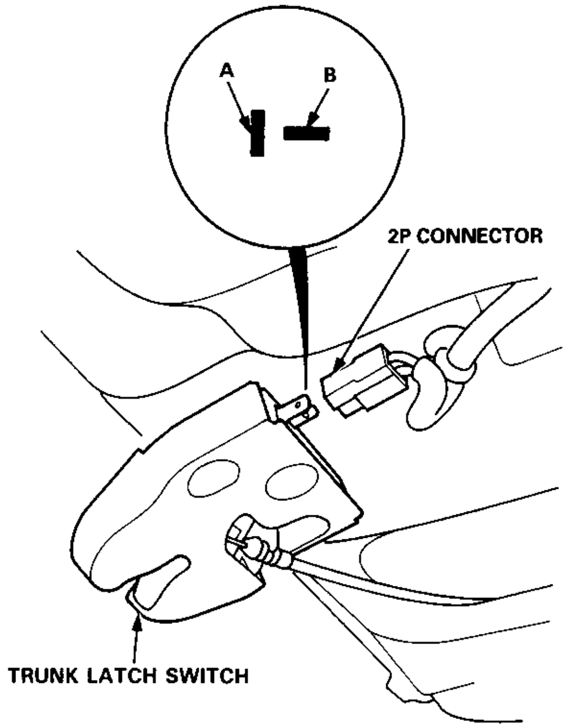


Ceiling/Trunk/Cargo Area Lights, Spotlight

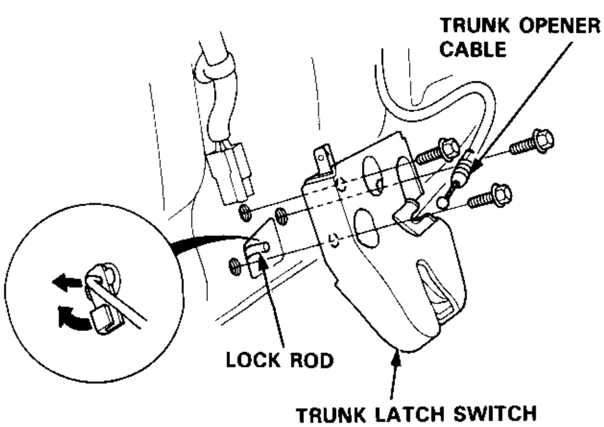
Latch Switch Test/Replacement

Sedan:

1. Open the trunk lid, and disconnect the 2P connector from the trunk latch switch.
2. There should be continuity between the A and B terminals.

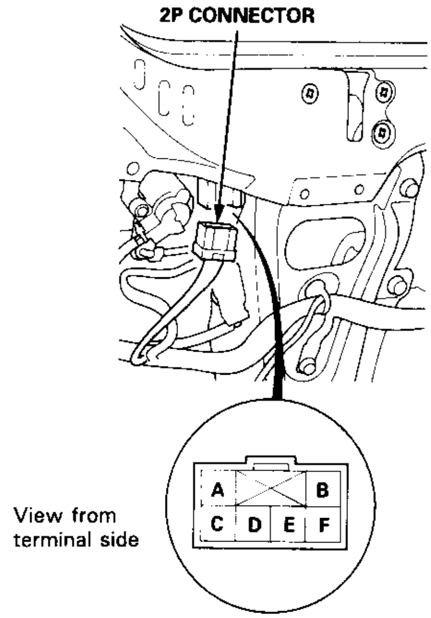


3. If necessary, remove the three mounting bolts to pull out the trunk latch switch from the trunk lid, then disconnect the lock rod from the trunk latch switch.
4. Disconnect the trunk opener cable from the trunk latch switch.

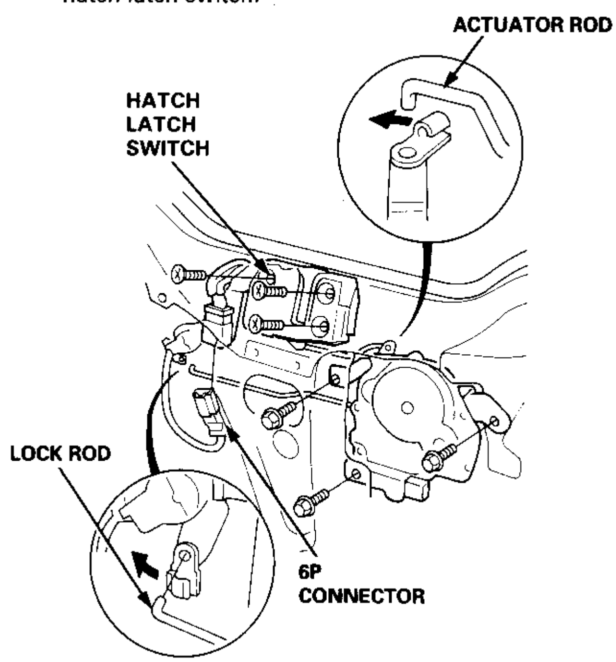


Hatchback:

1. Open the hatch, and disconnect the 6P connector from the hatch latch switch.
2. There should be continuity between the A and B terminals.

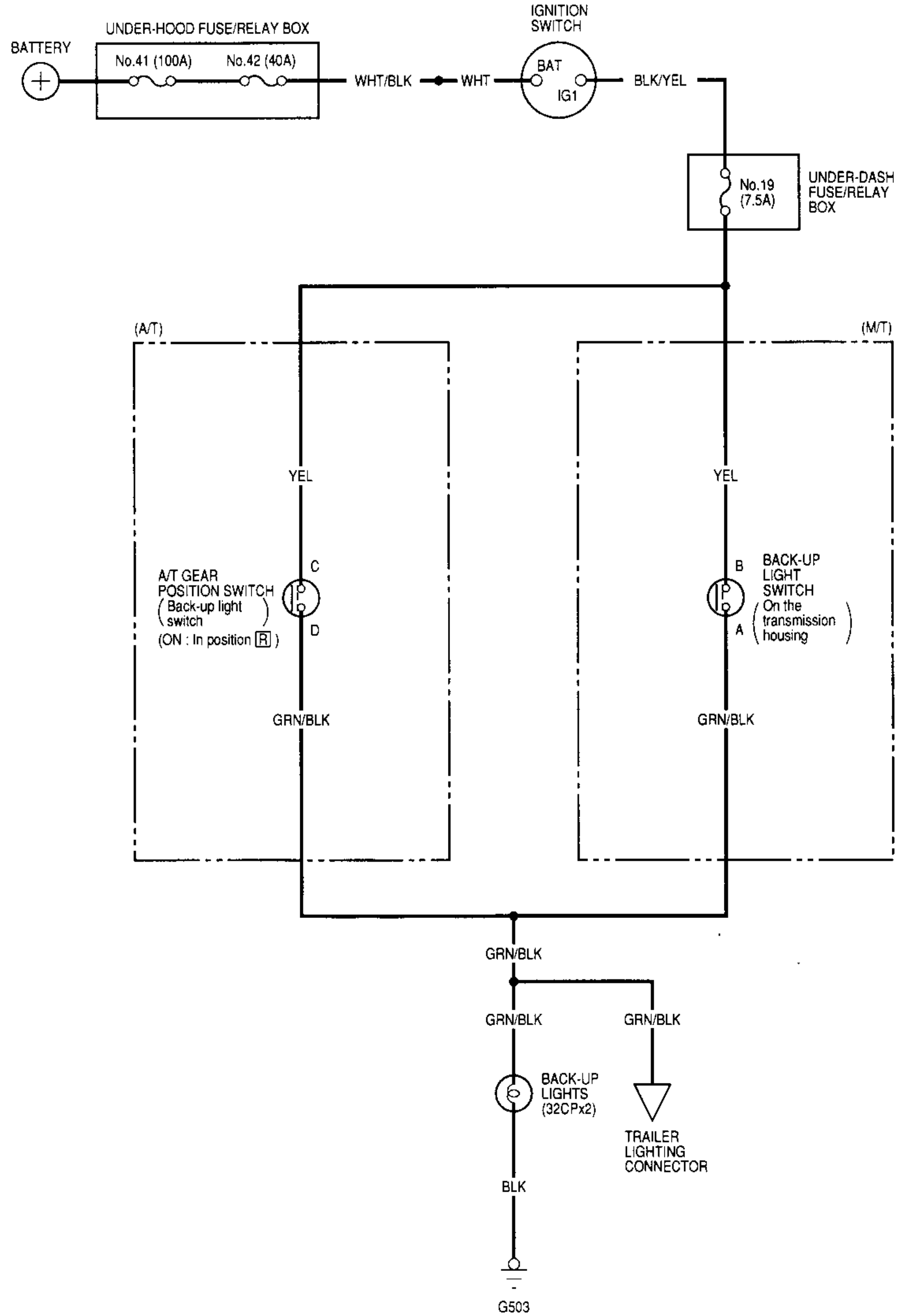


3. If necessary, remove the three mounting bolts to pull out the hatch opener actuator from the latch, then disconnect the lock rod from the hatch latch switch and the actuator rod.
4. Remove the three movting bolts to pull out the hatch latch switch.



Back-up Lights

Circuit Diagram



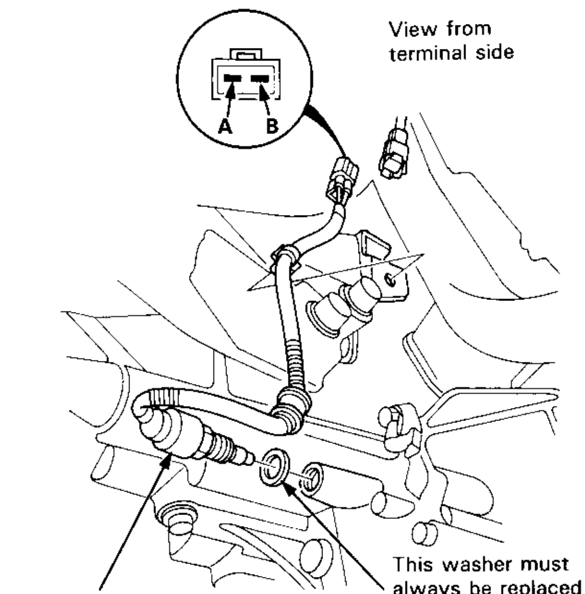
Back-up Lights

Test

Manual Transmission:

NOTE: Check the No. 19 (7.5 A) fuse in the under-dash fuse/relay box before testing.

1. Test the back-up light switch by placing the shift lever in reverse and turning the ignition switch to ON (II).
2. If the back-up lights do not go on, check the back-up light bulbs in the taillight assembly.
3. If the fuse and bulbs are OK, disconnect the connector from the back-up light switch.

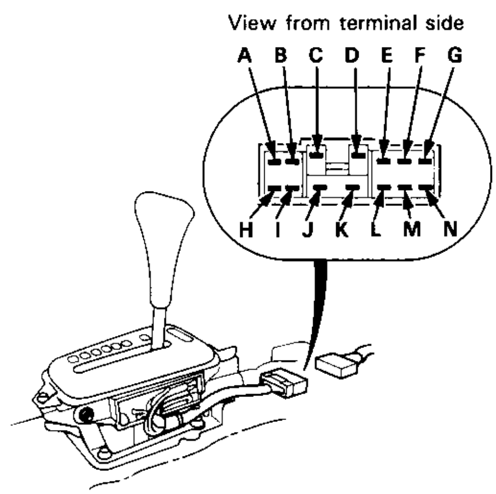


4. With the shift lever in reverse, check for continuity between the A and B terminals with the switch installed.
   There should be continuity.
   - If there is no continuity, replace the switch (see section 13).
   - If there is continuity, but the back-up lights do not go on, check for:
     - Poor ground (G503)
     - An open in the wire

Automatic Transmission:

NOTE: Check the No. 19 (7.5 A) fuse in the under-dash fuse/relay box before testing.

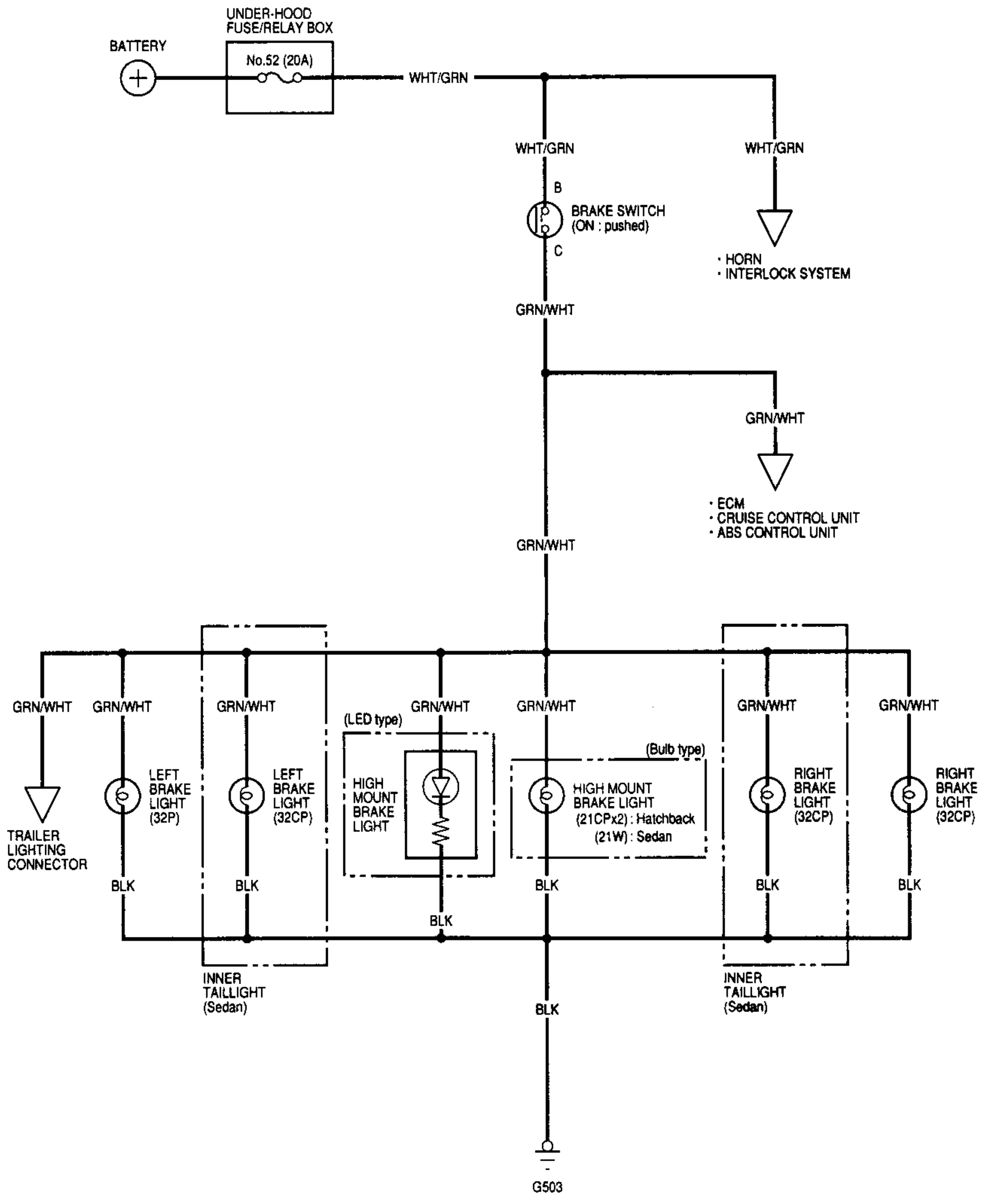
1. Test the back-up light switch by shifting the shift lever to [R] and turning the ignition switch ON (II).
2. If the back-up lights do not go on, check the back-up light bulbs in the taillight assembly.
3. If the fuse and bulbs are OK, disconnect the 14P connector from the A/T gear position switch (back-up light switch).



4. Move the lever back and forth at the [R] position without touching the push button, and check for continuity between the C and D terminals. There should be continuity within the range of free play of the shift lever.
   - If there is no continuity within the range of free play, adjust the position of the A/T gear position switch (see section 14).
   - If there is continuity, but the back-up lights do not go on,check for:
     - Poor ground (G503)
     - An open in the wire

Brake Lights

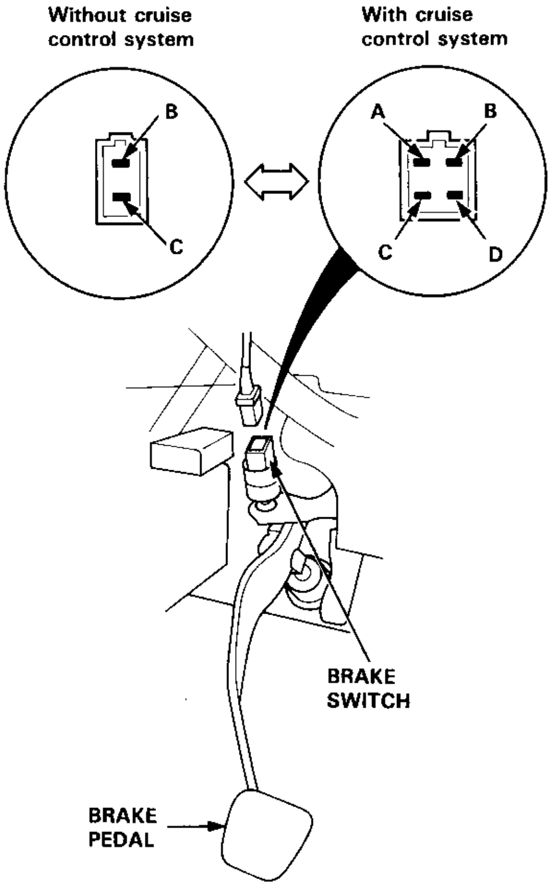
Circuit Diagram



Brake Lights

Brake Switch Test

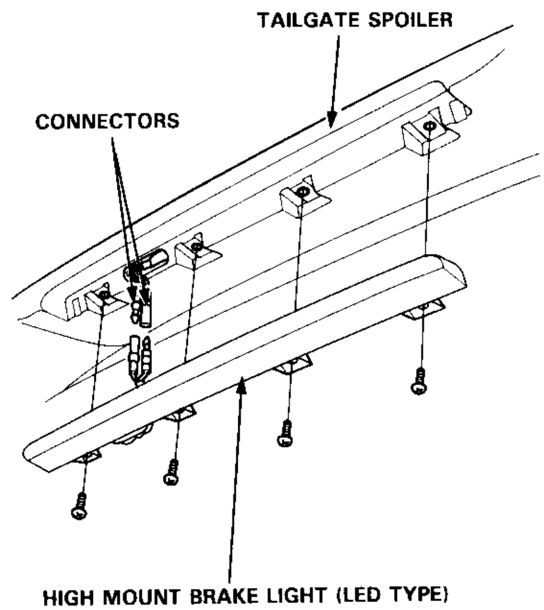
1. If the brake lights do not go on, check the No. 52 (20 A) fuse in the under-hood fuse/relay box, and the brake light bulbs in the taillight assembly and high mount brake light.
2. If the fuse and bulbs are OK, disconnect the 2P or 4P connector from the brake switch.



3. Check for continuity between the B and C terminals. There should be continuity with the brake pedal pushed.
   - If there is no continuity, replace the switch or adjust pedal height (see section 19).
   - If there is continuity, but the brake lights do not go on, inspect for:
     - Poor ground (G503)
     - An open in the wire

High Mount Brake Light Replacement (LED type)

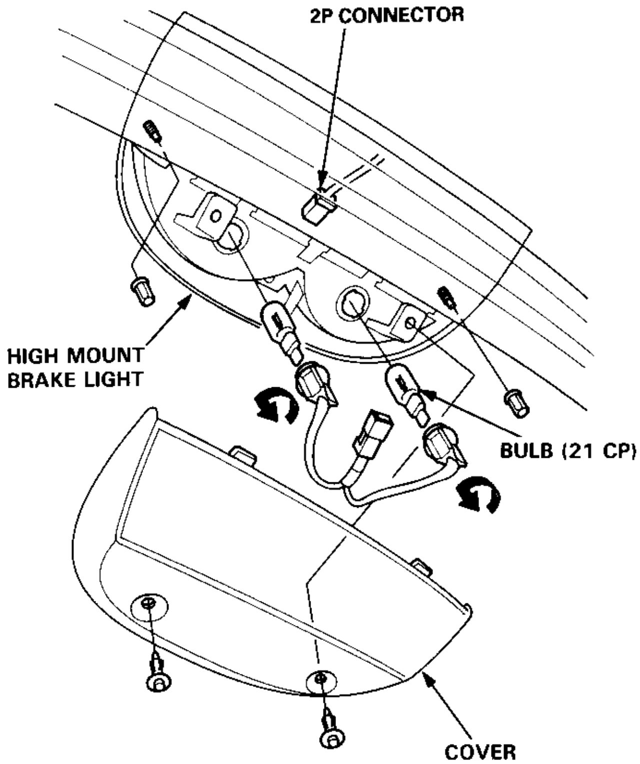
1. Remove the four screws and the high mount brake light, then disconnect the connectors.



High Mount Brake Light Replacement (Bulb type)

Hatchback:

1. Open the hatch.
2. Remove the two clips and the cover.
3. Remove the two nuts and the high mount brake light, then disconnect the 2P connector.

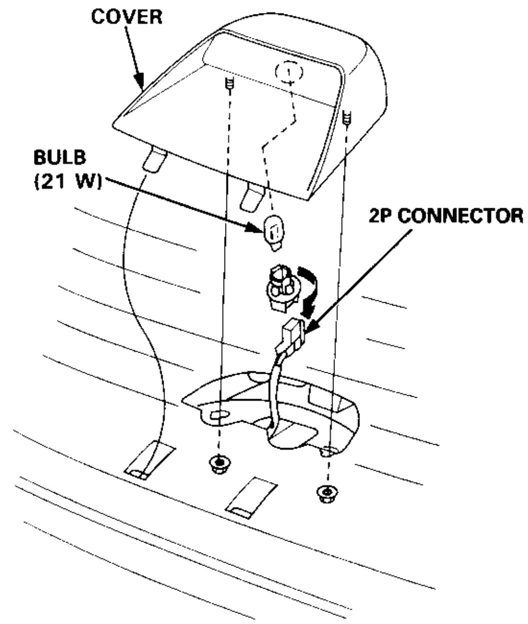


4. Turn the socket 45° counterclockwise to remove the bulb.
5. Install the high mount brake light in the reverse order of removal, and clean the rear window glass before installing.

   CAUTION: When installing the high mount brake light, make sure the rubber seal fits against the rear window evenly.

Sedan:

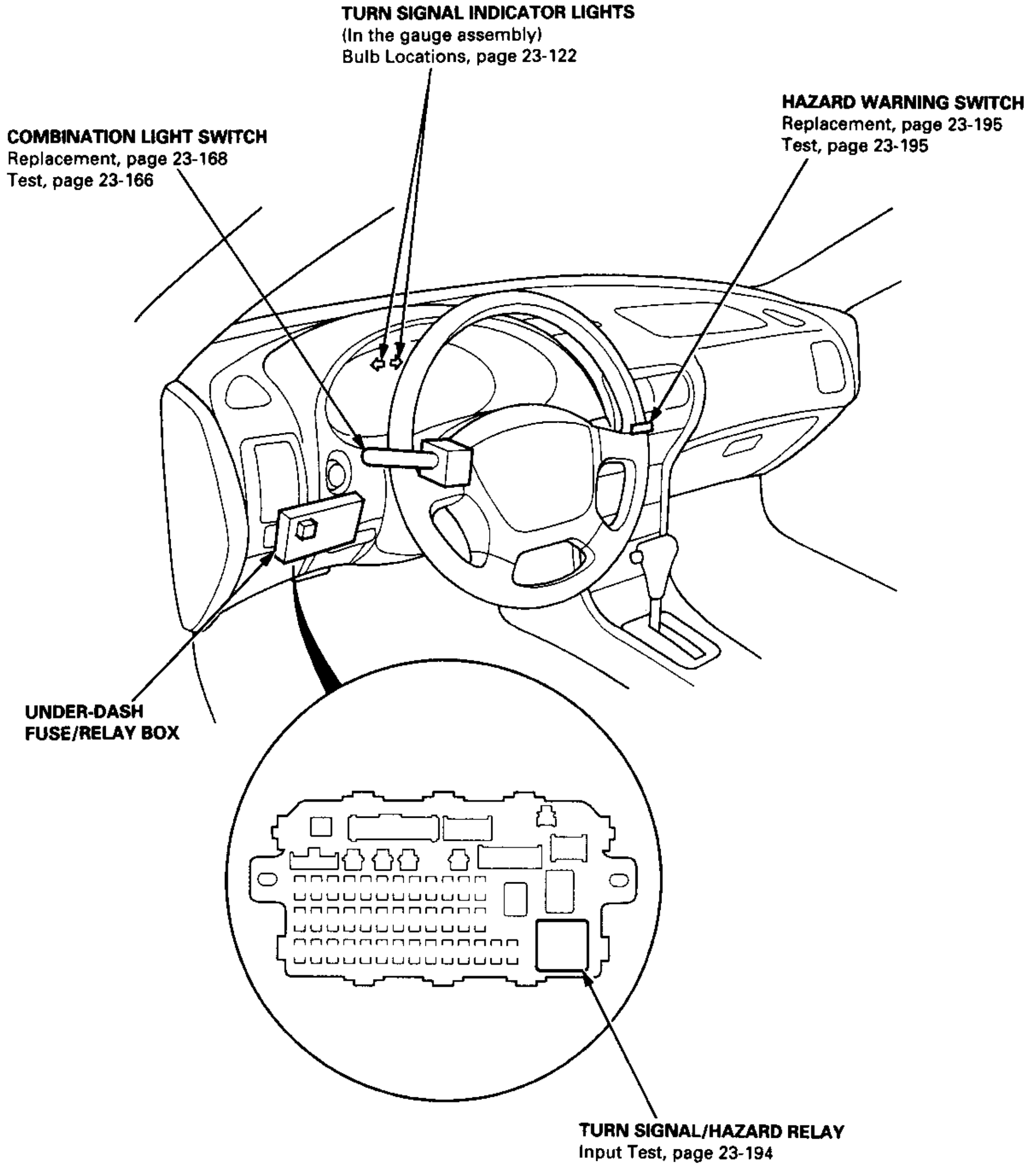
1. Open the trunk lid, and disconnect the 2P connector from the high mount brake light.
2. Remove the two nuts, then remove the high mount brake light from the rear shelf.



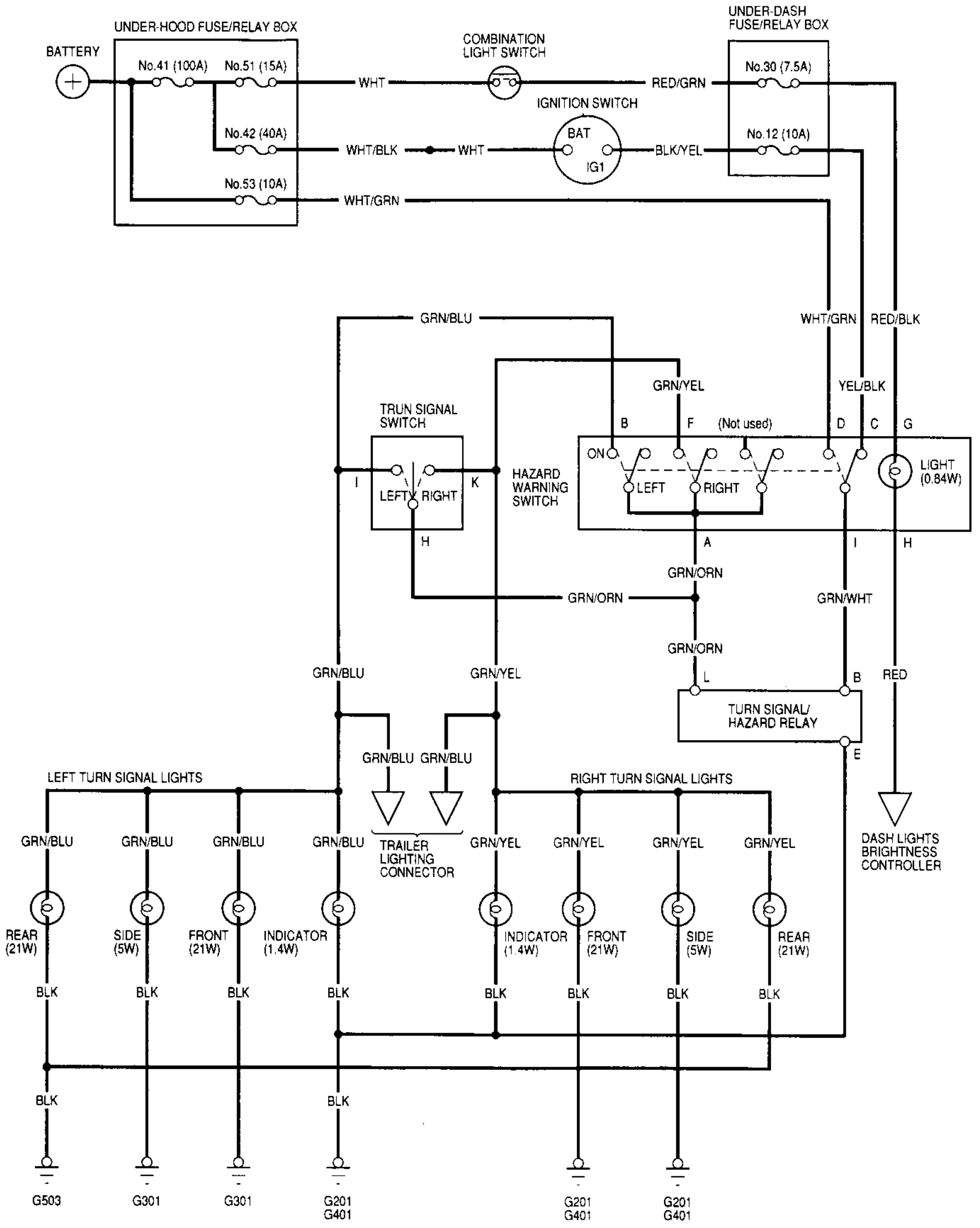
3. Install the high mount brake light in the reverse order of removal. Clean the rear window glass before installing the light.

Side Marker/Turn Signal/Hazard Flasher System

Component Location Index



Circuit Diagram

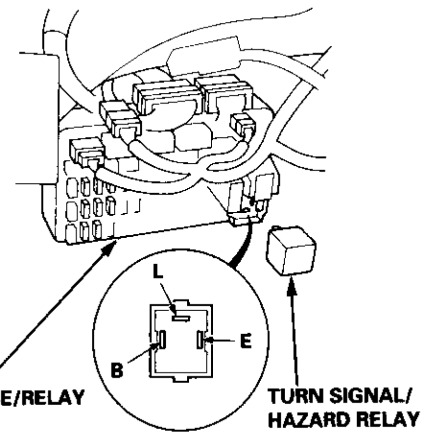


Side Marker/Turn Signal/Hazard Flasher System

Turn Signal/Hazard Relay Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

1. Remove the turn signal/hazard relay from the under-dash fuse/relay box.
2. Inspect the relay and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the socket.
     - If a test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

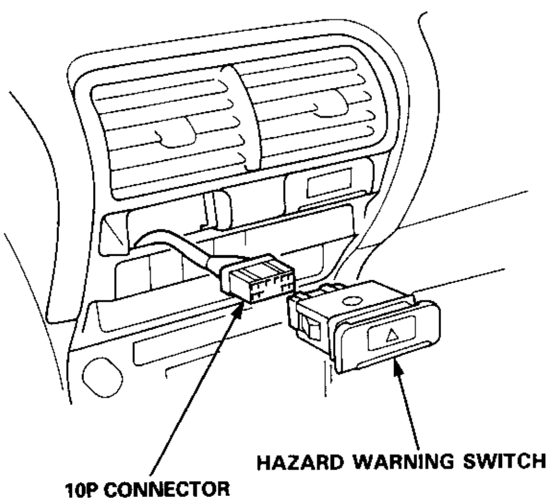


No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	E	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	B	Ignition switch ON (II) and hazard warning switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (10 A) fuse in the under-dash fuse/relay box • Faulty hazard warning switch • An open in the wire
		Ignition switch OFF and hazard warning switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 43 (10 A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
3	L	Hazard warning switch is ON; connect the B terminal to the L terminal.	Hazard lights should come on.	• Poor ground (G201, G301, G401, G503) • Faulty hazard warning switch • An open in the wire
		Ignition switch ON (II) and turn signal switch in right or left; connect the B terminal to the L terminal.	Right or left turn signal lights should come on.	• Faulty turn signal switch • An open in the wire

Hazard Warning Switch Replacement

CAUTION: Be careful not to damage the switch and console panel.

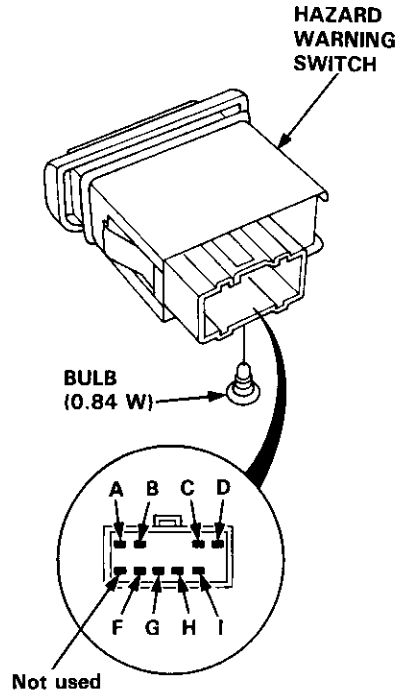
1. Pry the hazard warning switch out of the center vent.
2. Disconnect the 10P connector from the switch.

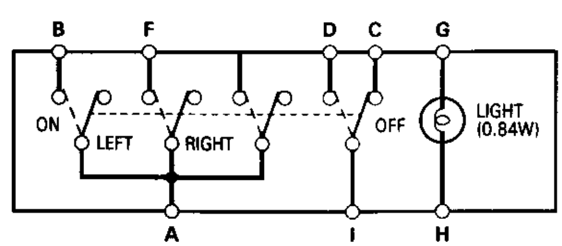


Hazard Warning Switch Test

1. Remove the hazard warning switch.
2. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	A	B	C	D	F	G		H	I
OFF			O						O
						O	(bulb)	O	
ON				O					O
	O	O			O	O	(bulb)	O	





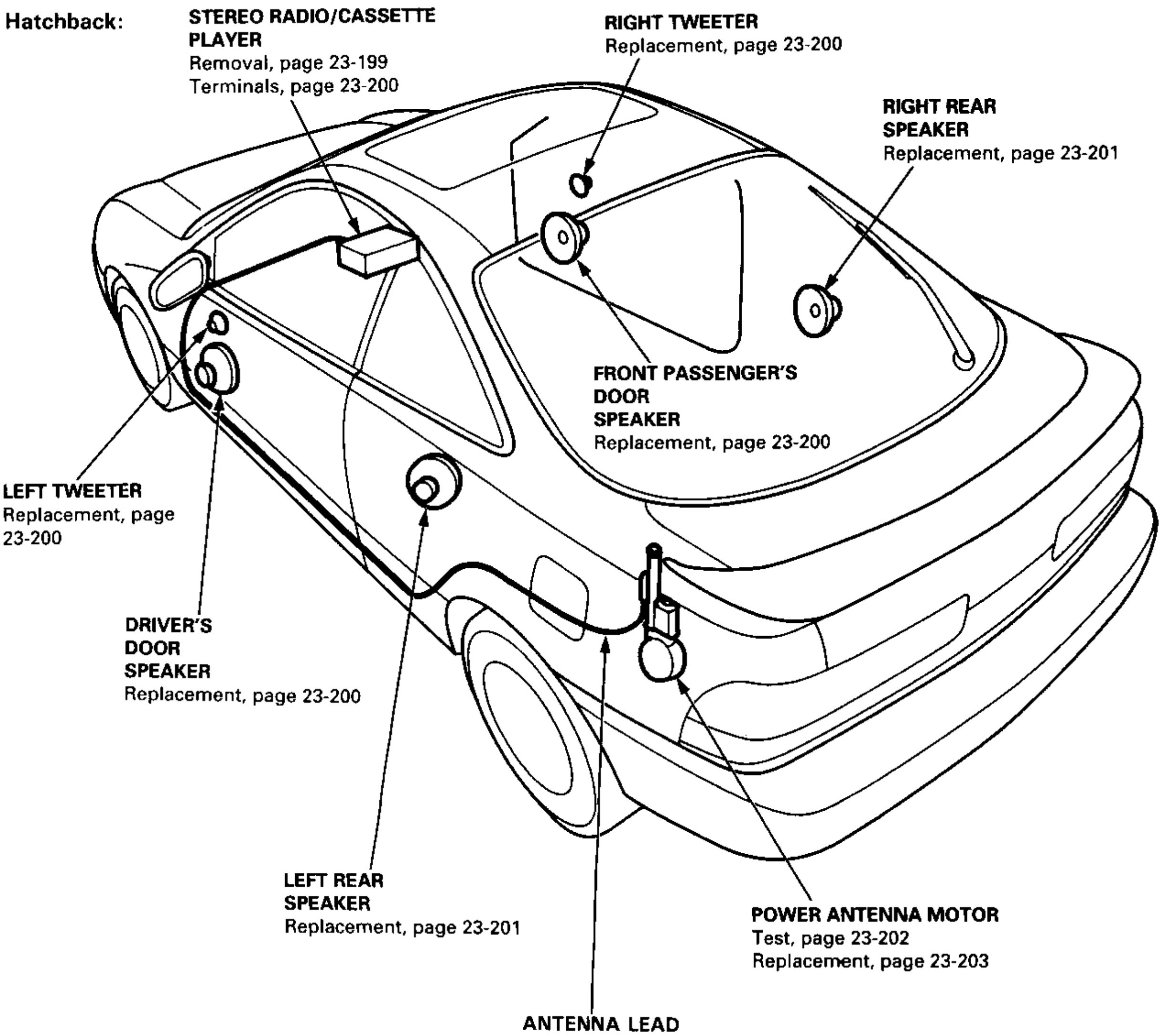
Stereo Sound System

Component Location Index

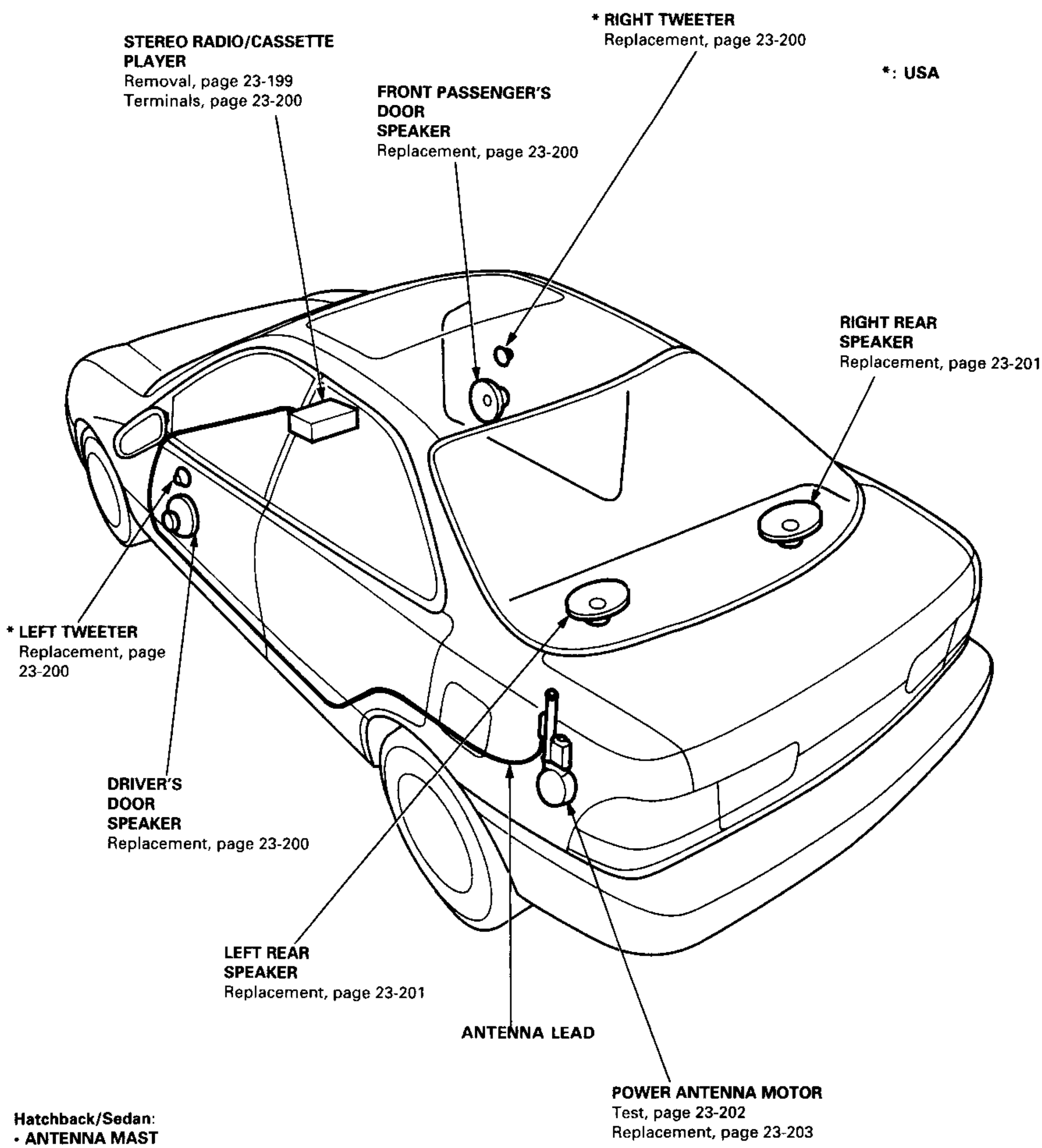
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Hatchback:



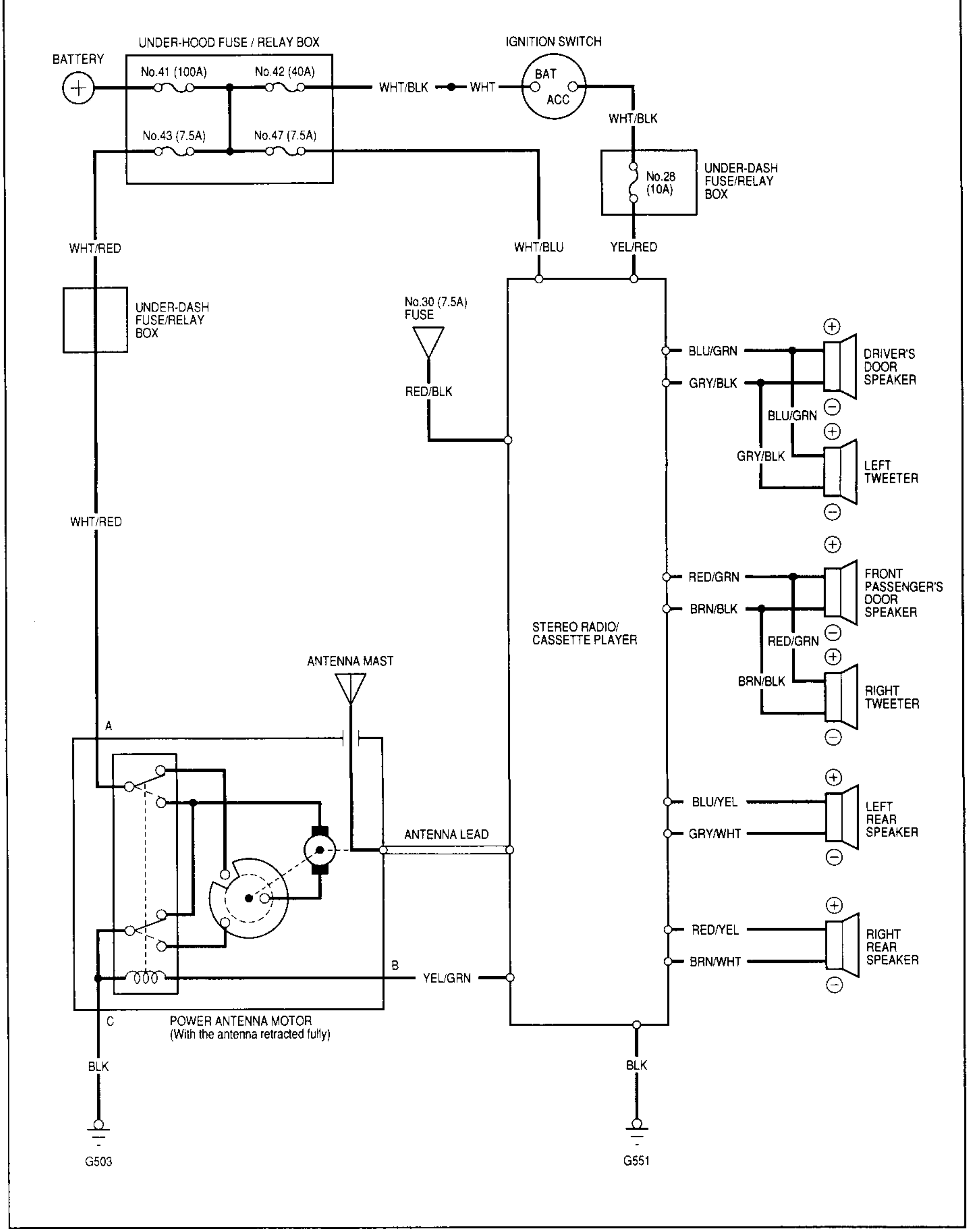
Sedan:



Hatchback/Sedan:
- **ANTENNA MAST**
  Replacement, page 23-203
  Installation, page 23-204
- **ANTENNA TUBE**
  Replacement, page 23-205

Stereo Sound System

Circuit Diagram

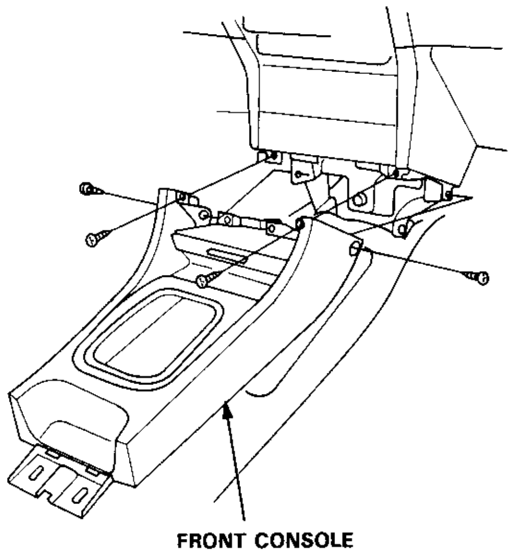


Unit Removal

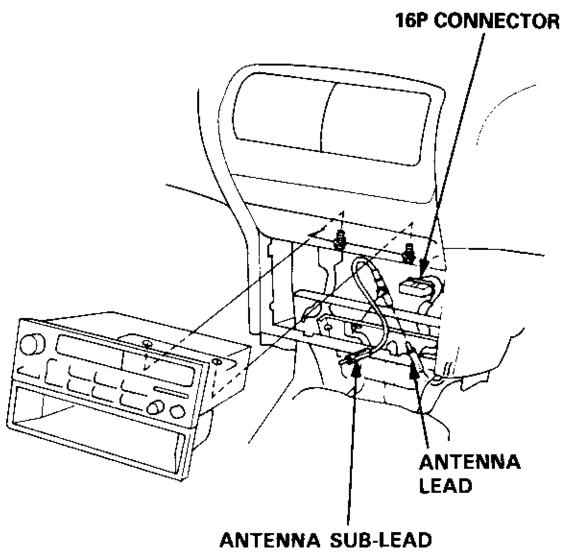
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
- disconnecting the battery.
- removing the No. 47 (7.5 A) fuse in the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Remove the center console (see section 20).
2. Remove the cigarette lighter assembly (see page 23-213).
3. Remove the four mounting screws, then remove the front console.

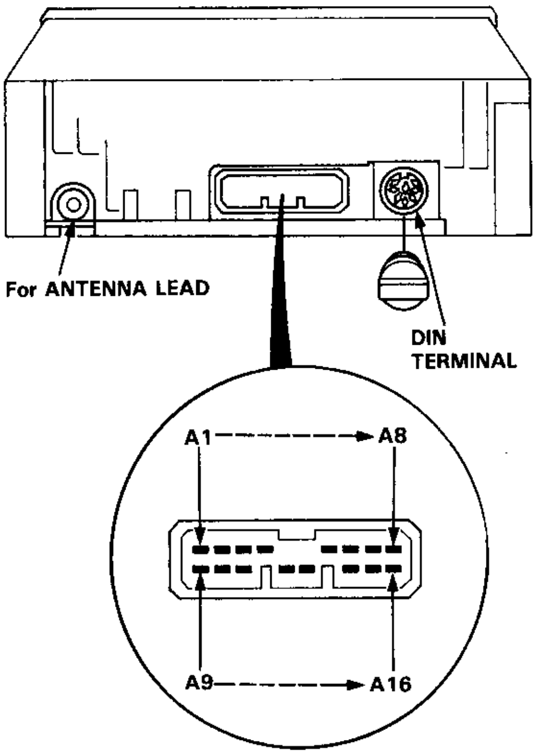


4. Loosen the two mounting screws, then disconnect the 16P connector and the antenna lead, and pull out the stereo radio/cassette player.



Stereo Sound System

Stereo Radio/Cassette Player Terminals

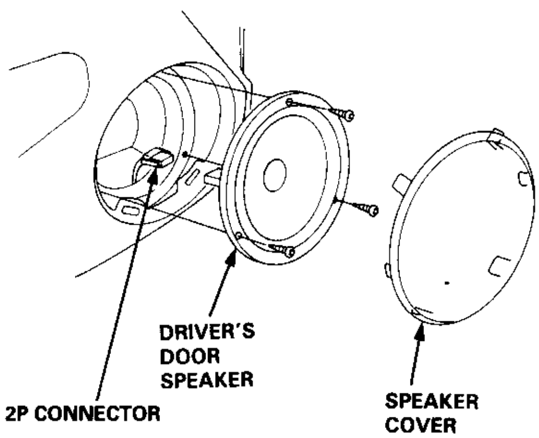


Terminal	Wire	Connects to
A1	RED/GRN	Front passenger's door speaker ⊕
A2	BLU/GRN	Driver's door speaker ⊕
A3	RED/BLK	Lights-on signal
A4	WHT/BLU	Constant power (Tuning memory)
A5	YEL/RED	ACC (Main stereo power supply)
A6	YEL/GRN	Radio switched power (To antenna)
A7	BLU/YEL	Left rear speaker ⊕
A8	RED/YEL	Right rear speaker ⊕
A9	BRN/BLK	Front passenger's door speaker ⊖
A10	GRY/BLK	Driver's door speaker ⊖
A11	—	(not used)
A12	—	(not used)
A13	—	(not used)
A14	BLK	Ground (G551)
A15	GRY/WHT	Left rear speaker ⊖
A16	BRN/WHT	Right rear speaker ⊖

Front Speaker/Tweeter Replacement

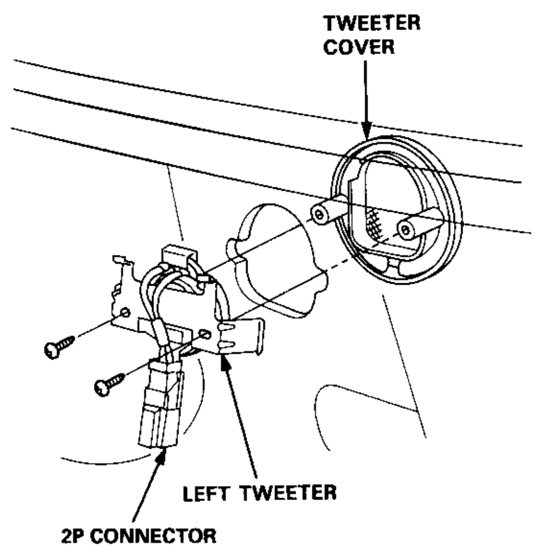
Front Speaker:

1. Carefully pry out the speaker cover.
2. Remove the three screws, then disconnect the 2P connector from the speaker, and remove the speaker.



Tweeter:

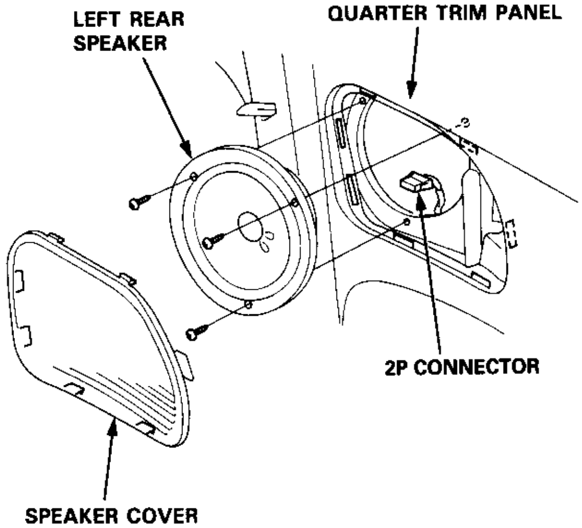
1. Remove the door panel and disconnect the tweeter 2P connector.
2. Remove the two screws, then remove the tweeter and cover.



Rear Speaker Replacement

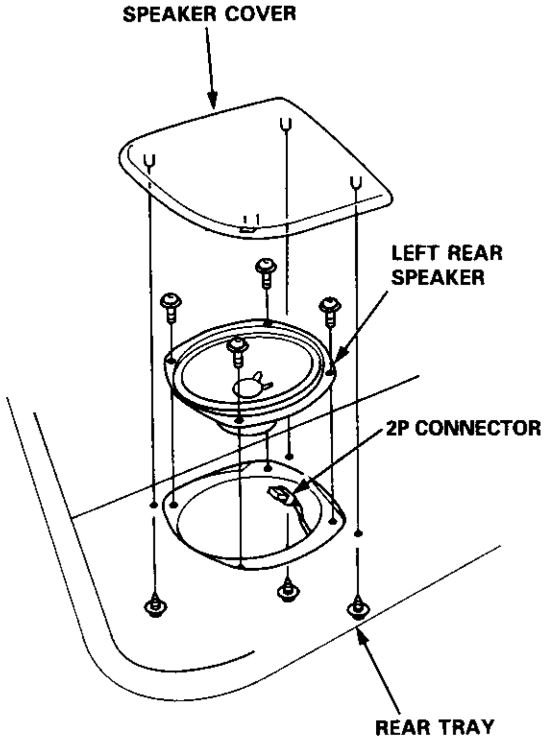
Hatchback:

1. Remove the speaker cover.
2. Remove the three screws, then disconnect the 2P connector from the rear speaker.



Sedan:

1. Remove the three screws from the trunk side, then remove the speaker cover.
2. Remove the four screws, then disconnect the 2P connector from the speaker, and remove the speaker.

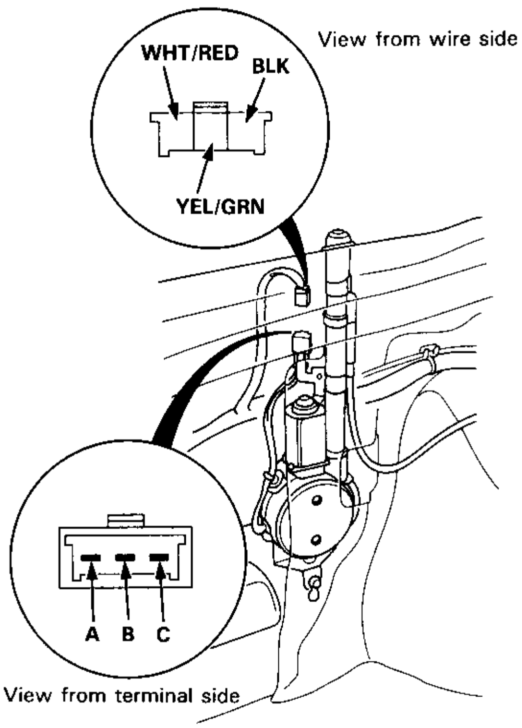


Power Antenna Motor Test

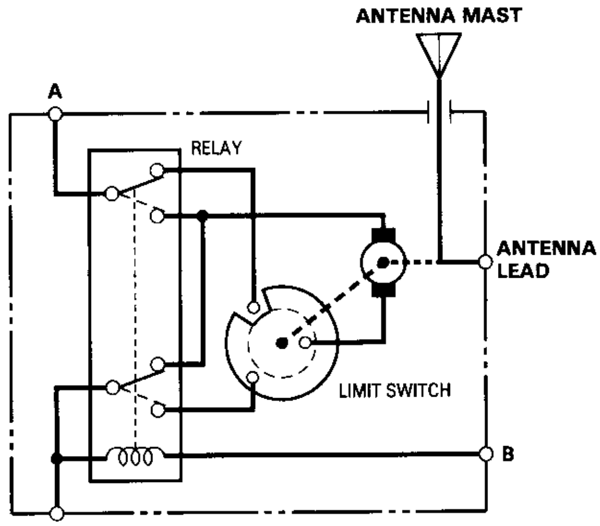
1. Remove the quarter trim panel (Hatchback) or trunk side trim panel (Sedan).
2. Disconnect there 3P connector from the motor, and remove the connector from its clamp.
3. Check for power to the motor at the connector terminals:
   - There should be battery voltage between the WHT/RED (+) and BLK (−) terminals all the time.
   - There should be battery voltage between the YEL/GRN (+) and BLK (−) terminals only with the ignition and radio switched ON.
4. Test motor operation:

   EXTEND: Connect battery power to the "A" and "B" terminals and ground the "C" terminal.

   RETRACT: Then disconnect power from the "B" terminal.



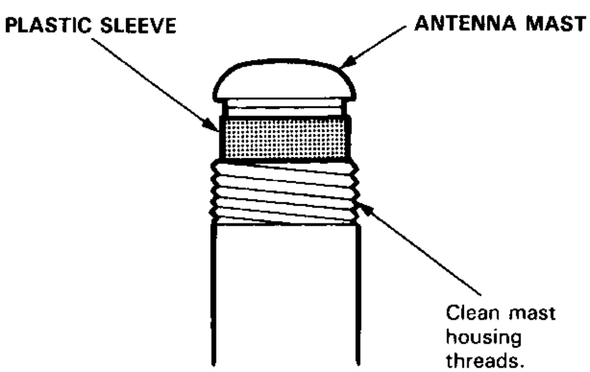
5. If the motor fails to run or does not run smoothly, replace it.



(With the antenna retracted fully)

Sticking Antenna:
The antenna sticks in either the up or down position.

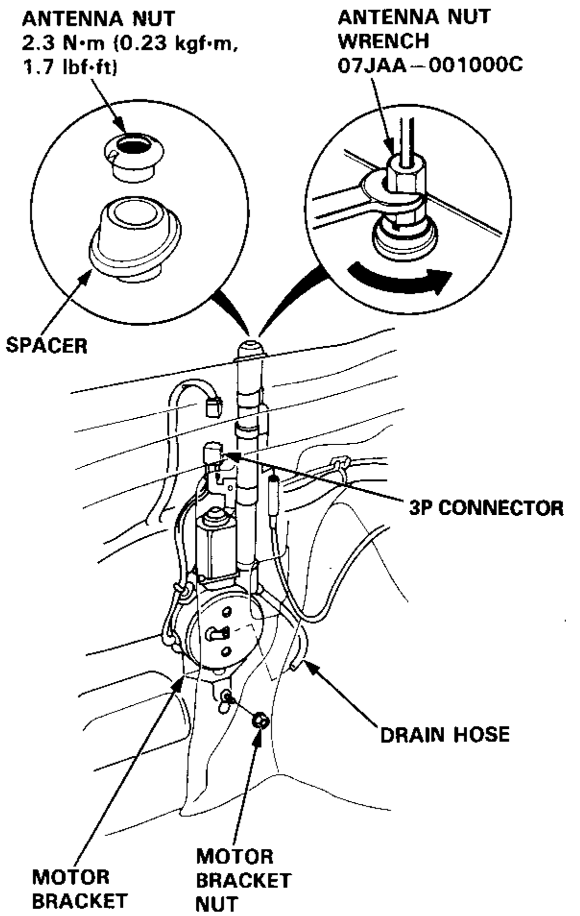
1. Using the antenna wrench, remove the antenna nut, spacer (see page 23-203).
2. Clean the antenna mast housing threads, and reinstall the spacer.



3. Tighten the antenna nut with the antenna nut wrench to 2.3 N•m (0.23 kgf•m, 1.7 lbf•ft). If you overtightened the nut, the antenna may stick. If sticking occurs, back the nut off a little, then turn the radio on and off to raise and lower the antenna again. Repeat until the antenna moves freely.

Power Antenna Motor Replacement

1. Remove the quarter trim panel (Hatchback) or trunk side trim panel (Sedan).
2. Disconnect the 3P connector and antenna lead from the motor, then remove the antenna nut and motor bracket nut.



3. Remove the motor and antenna as an assembly.

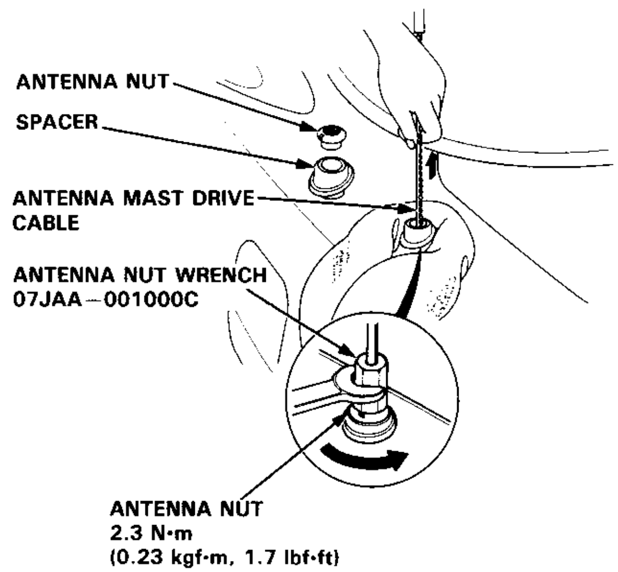
   NOTE: Tighten the antenna nut, then tighten the motor bracket nut.

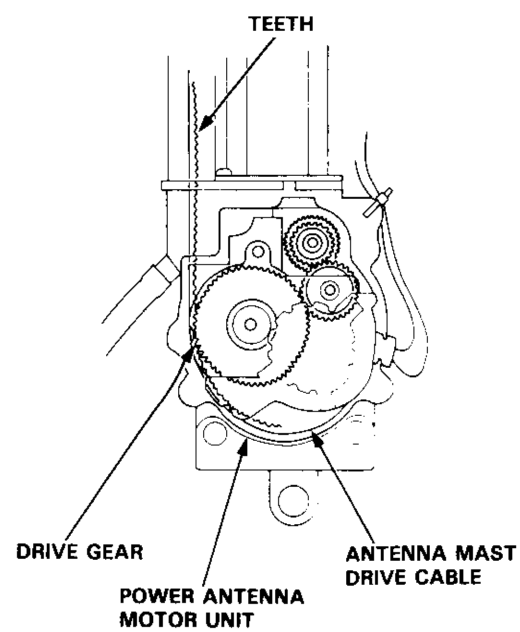
Antenna Mast Replacement

Removal:

NOTE: The antenna mast alone can be replaced without having to remove the power antenna motor.

1. Remove the antenna nut and spacer.
2. Carefully withdraw the antenna mast while extending it by turning the radio switch ON.

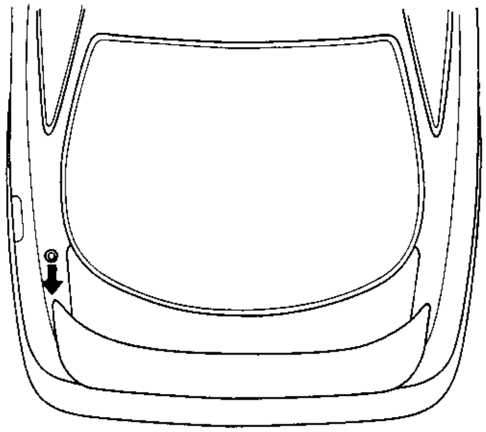




Stereo Sound System

Mast Antenna Installation

1. Carefully direct the teeth of the antenna mast drive cable as shown, and insert the drive cable into the antenna housing.

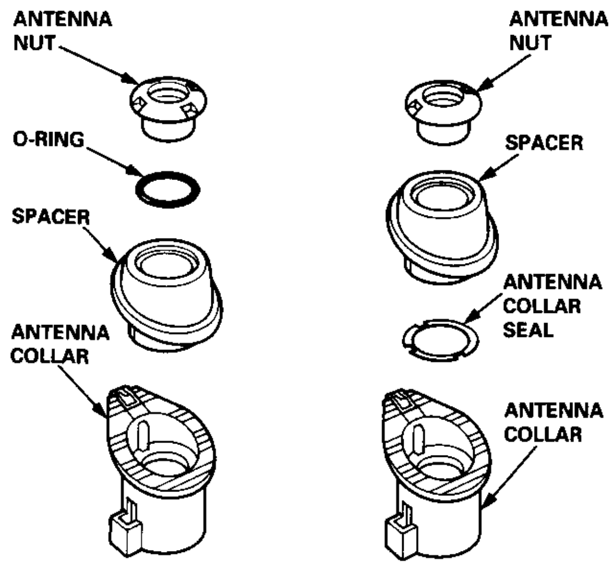


Direction of the teeth

2. Check for engagement of the cable teeth to the drive gear by carefully moving the cable up and down.
3. Clean the antenna mast housing threads.
4. Turn the radio switch "OFF", and let the motor pull the drive cable inside the antenna housing.
5. Install the bushing and spacer.
6. Tighten the antenna nut.
   2.3 N·m (0.23 kgf·m, 1.7 lbf·ft)

   NOTE: There are two types of antenna nuts – those with an O-ring (new type) and those without an O-ring (old type) – which require different spacers. To prevent a leak, make sure that
   – there is no antenna collar seal in the antenna collar when using a nut with an O-ring. If necessary, remove the seal.
   – there is an antenna collar seal in the antenna collar when using a nut without an O-ring. If necessary, install a seal.
   – the spacer matches the type of antenna nut.

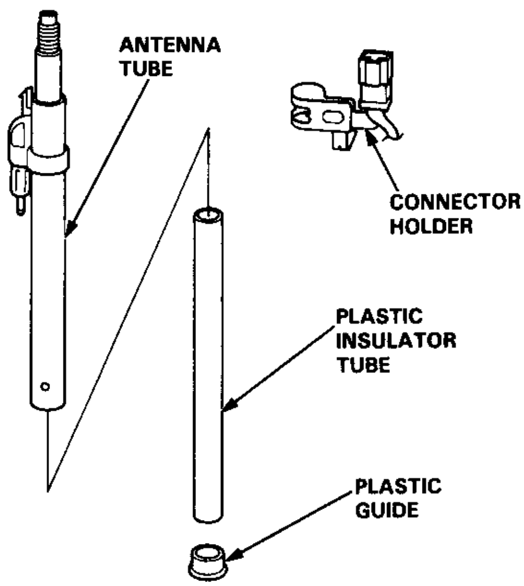
With an O-ring: **Without an O-ring:**



7. Check that the antenna mast extends and retracts fully when the radio switch is turned ON and OFF repeatedly. If you overtighten the nut, the antenna may stick. If sticking occurs, back the nut off a little, then raise and lower the antenna again. Repeat until the antenna moves freely.

Antenna Tube Replacement

1. Remove the antenna mast (see page 23-203).
2. Remove the antenna tube/motor assembly (see page 23-203).
3. Remove the tube clamping screw, and pull the antenna tube out of the motor.
4. Remove the plastic guide and plastic insulator tube, and install them in the new antenna tube.

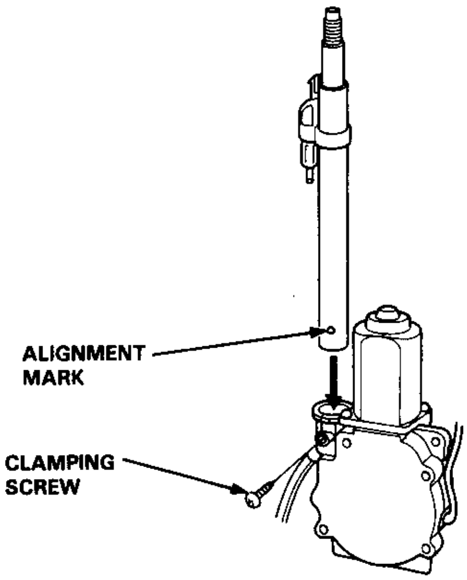


5. Insert the new antenna tube.

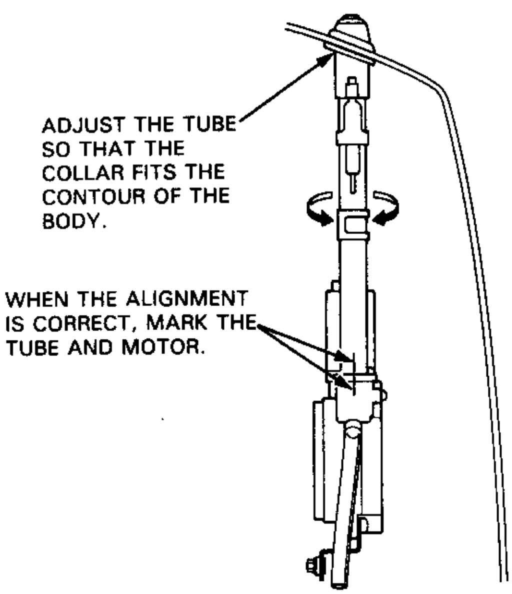
With an alignment mark:
- Insert the new antenna tube into the motor, and align the mark on the tube with the screw that is used to clamp the tube to the motor.

Without an alignment mark:
- Insert only the tube, and install the tube/motor assembly in the car.
- Adjust the tube so that the collar fits properly against the body, and mark the tube and motor.
- Remove the tube/motor assembly again.
- Align the mark on the tube with the mark on the motor, and tighten the clamping screw.

With an alignment mark:



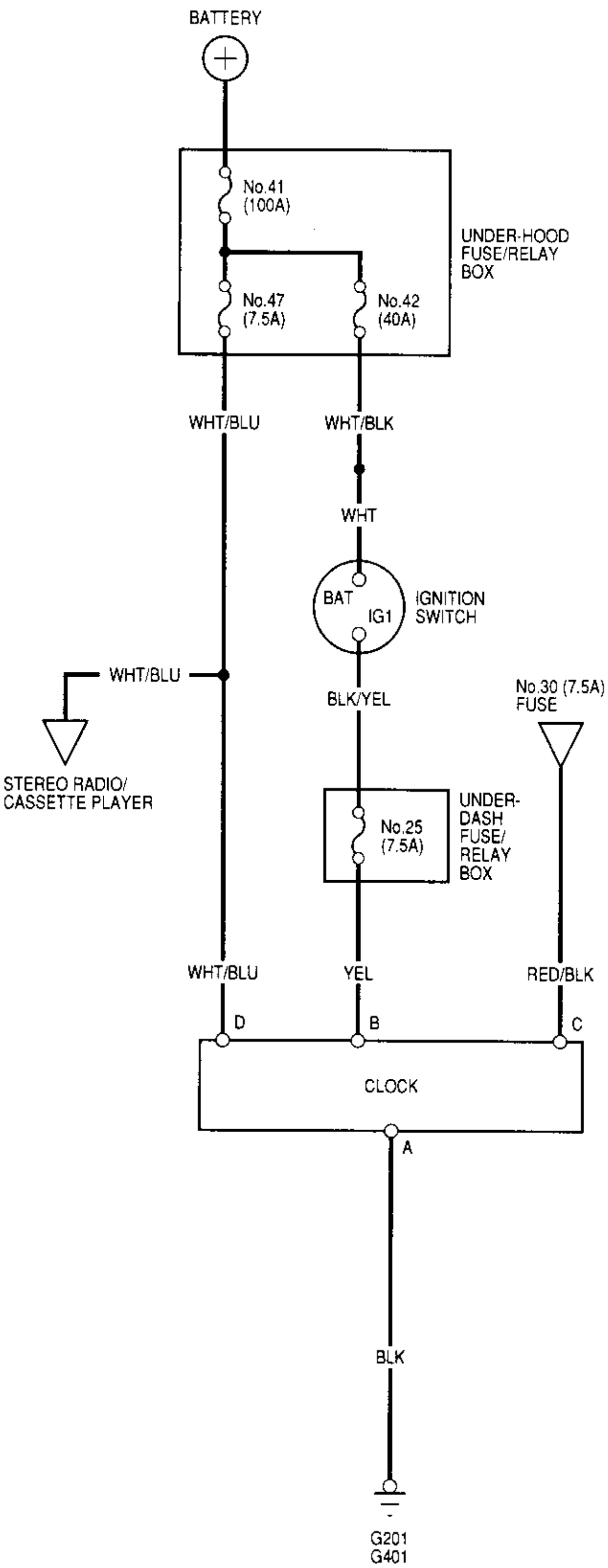
Without an alignment mark:



6. Install the tube/motor assembly in the car (see page 23-203).
7. Insert the mast into the tube (see page 23-204).

Clock

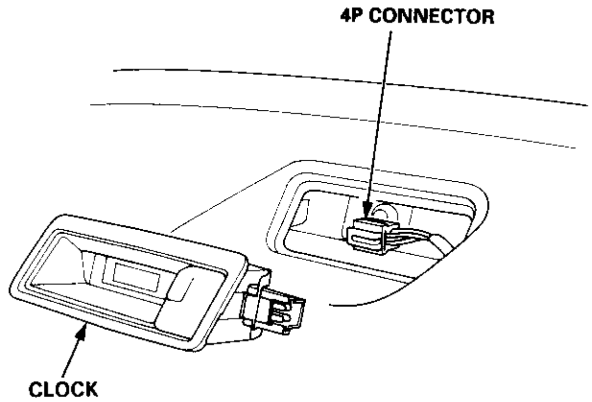
Circuit Diagram



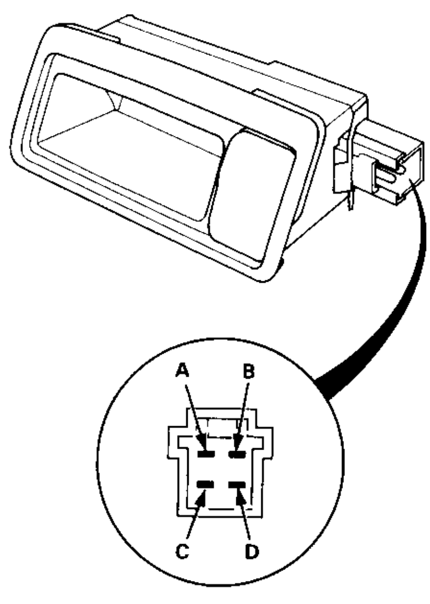
Replacement

CAUTION:
- **Pry the clock out at the left side.**
- **Be careful not to damage the clock and the dashboard when prying the clock out.**

1. Pry the clock out from the dashboard, then disconnect the 4P connector.



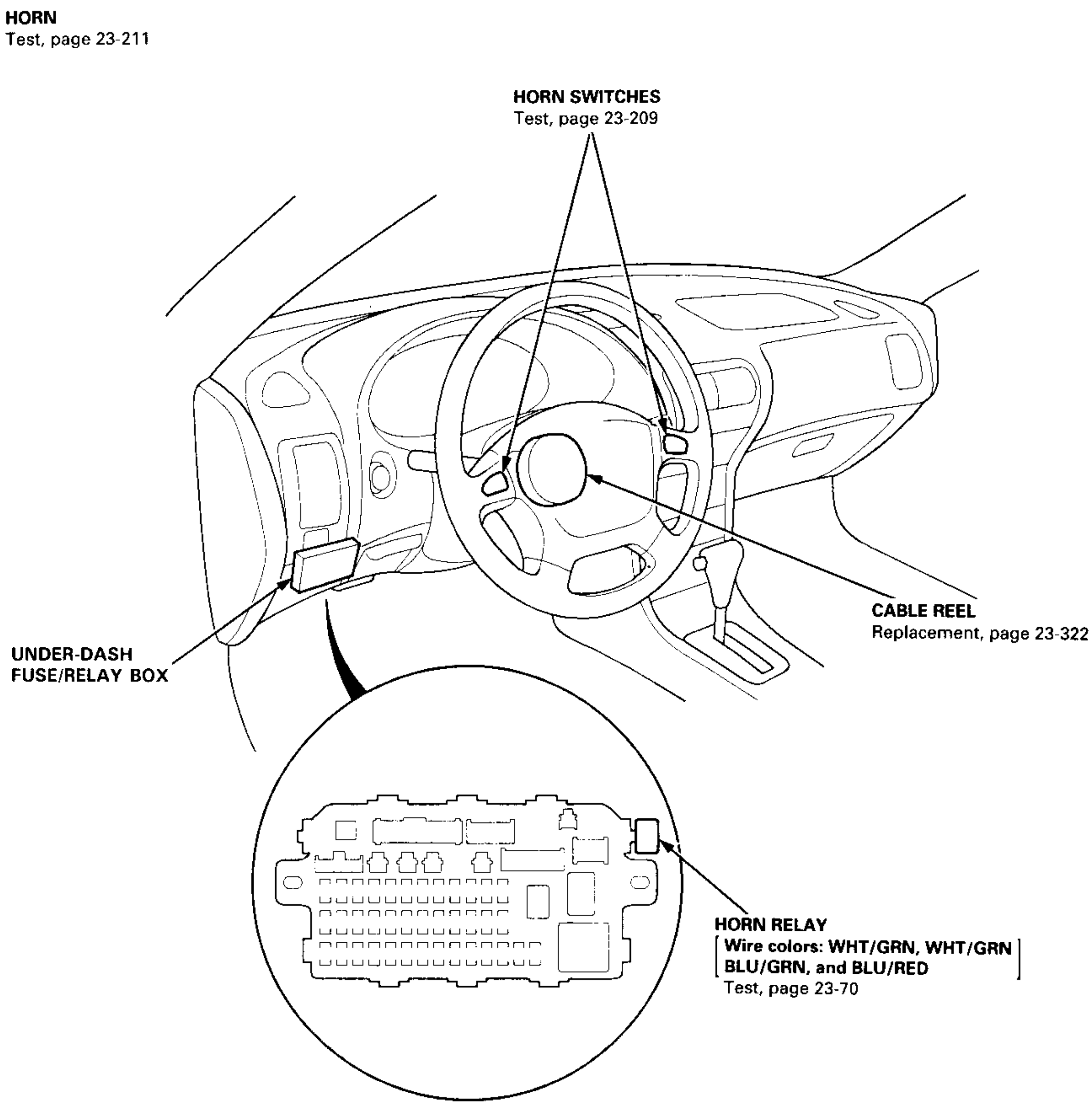
Terminals



Terminal	Wire	Connects to
A	BLK	Ground
B	YEL	IG1 (Main clock power supply)
C	RED/BLK	Lights-on signal
D	WHT/BLU	Constant power (Time memory)

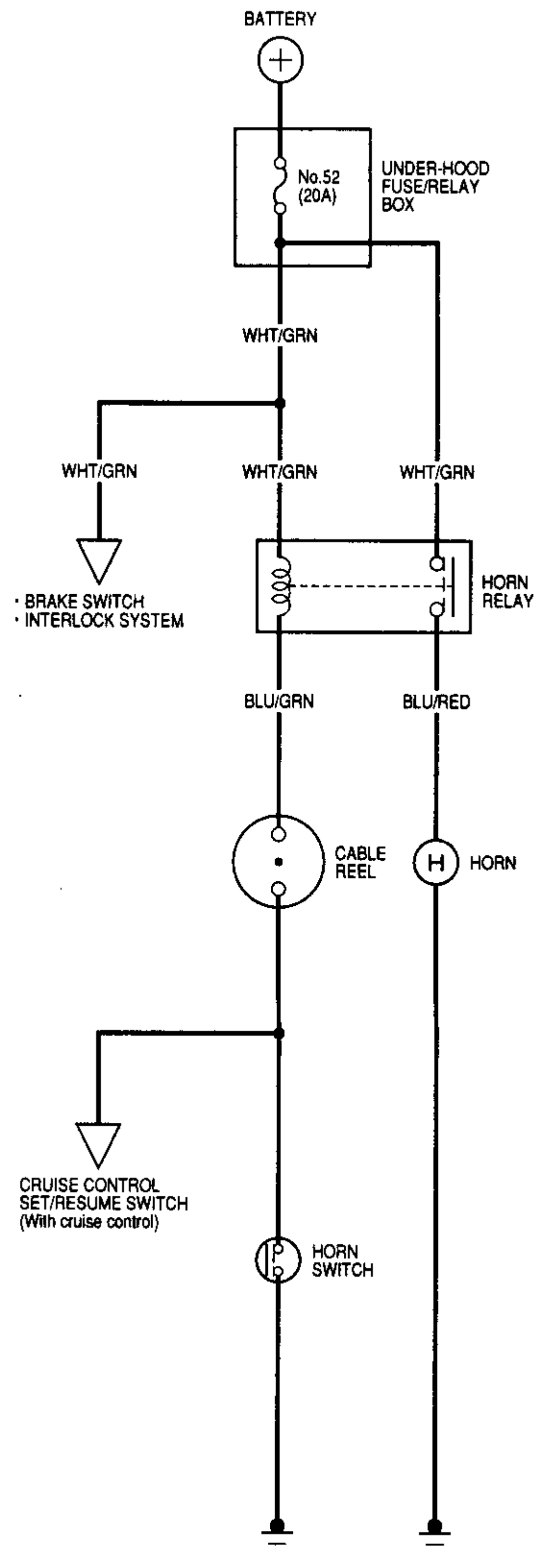
Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.



Horn

Circuit Diagram



Switch Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.

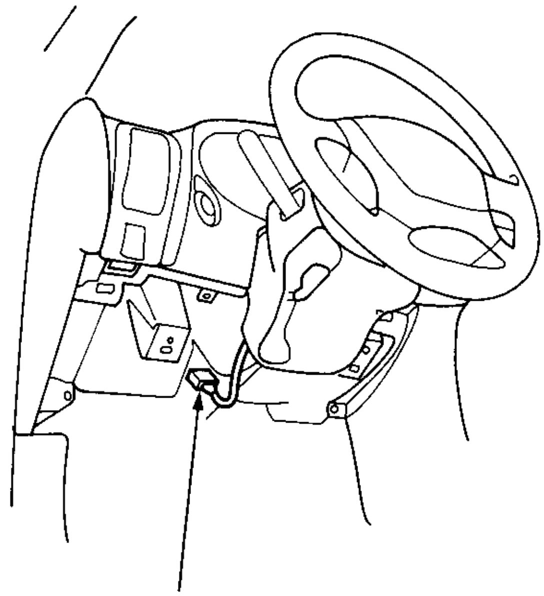
2. Disconnect each airbag connector.

   Driver's Side:
   - Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

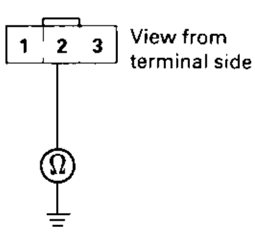
   Front Passenger's Side:
   - Remove the glove box.
   - Disconnect the 2P connector between the front passenger's airbag and SRS main harness.

3. Remove the dashboard lower cover and knee bolster (see page 23-71).

4. Disconnect the cable reel 3P connector from the main wire harness.



5. Check for continuity between the No. 2 terminal of the cable reel sub-harness and body ground with the horn switch pressed.



- If there is continuity, the horn switch is OK.
- If there is no continuity, go to step 6.

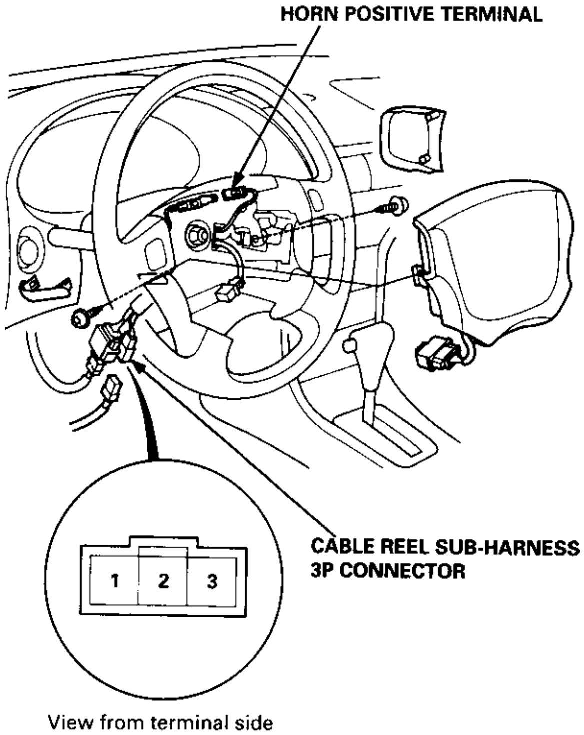
(cont'd)

Horn

Switch Test (cont'd)

6. Remove the driver's airbag assembly (refer to the SRS sub-section in section 23).

7. Check for continuity between the No. 2 terminal of the cable reel sub-harness 3P connector and horn positive terminal.



- If there is no continuity, replace the cable reel.
- If there is continuity, replace the horn switch.

8. If all tests prove OK, reinstall the driver's airbag assembly (refer to the SRS sub-section in section 23).

9. Reconnect the driver's airbag connectors, and reinstall the access panel on the steering wheel.

10. Reconnect the front passenger's airbag connector, and reinstall the glove box.

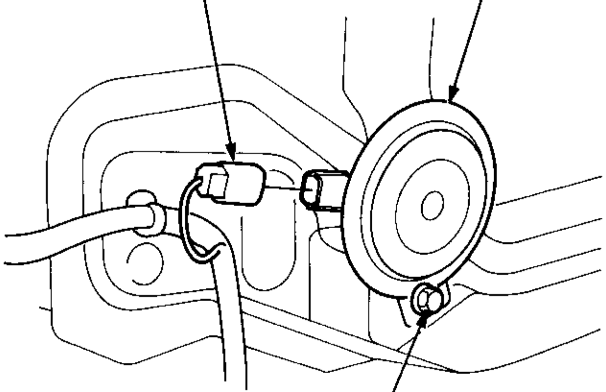
11. Connect the battery positive cable, then connect the negative cable.

12. After installing the airbag assembly, confirm that

    — the SRS indicator light should come on for about six seconds and then go off with the ignition switch ON (II).
    — the horn sounds with the horn button pressed.

Horn Test

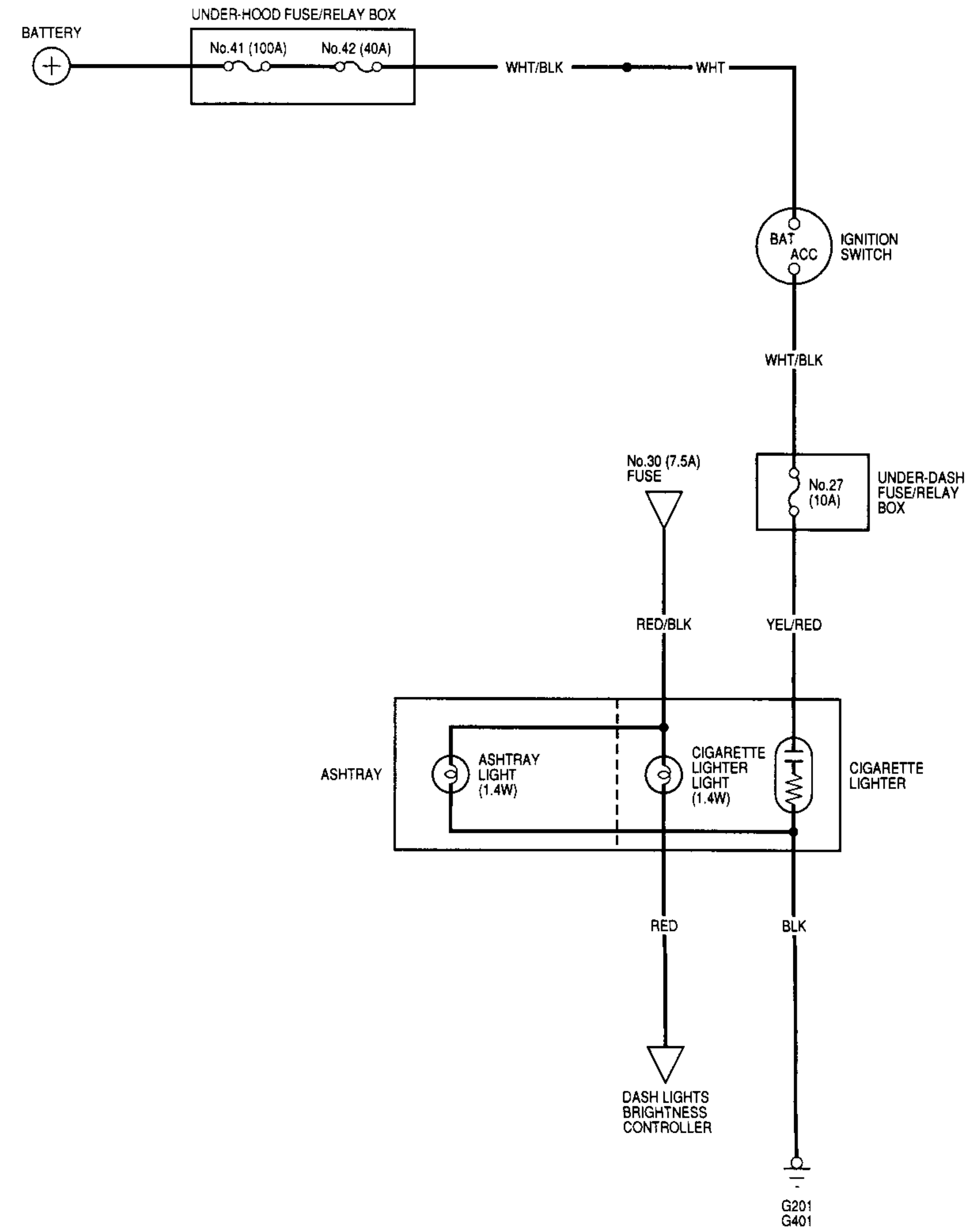
1. Remove the front bumper (see section 20).
2. Disconnect the 1P connector from the horn.



3. Test the horn by connecting battery power to one terminal and grounding the body ground. The horn should sound.
4. If the horn fails to sound, check for:
   — faulty horn assembly.
   — faulty mounting bolt.

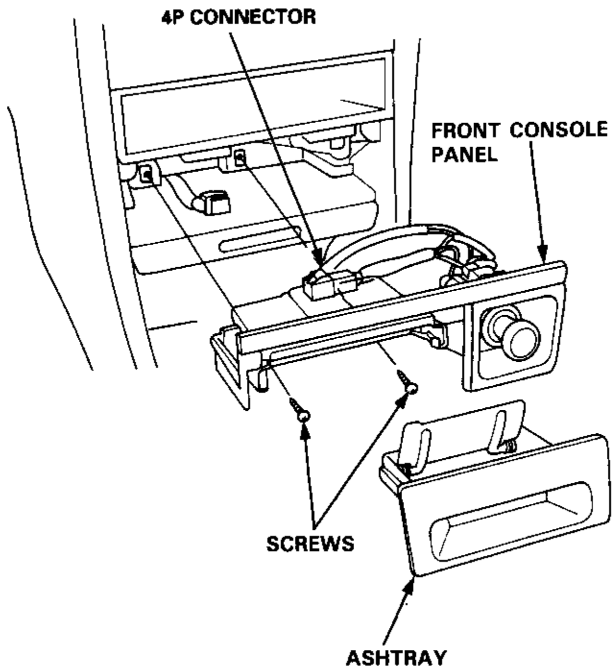
Cigarette Lighter

Circuit Diagram

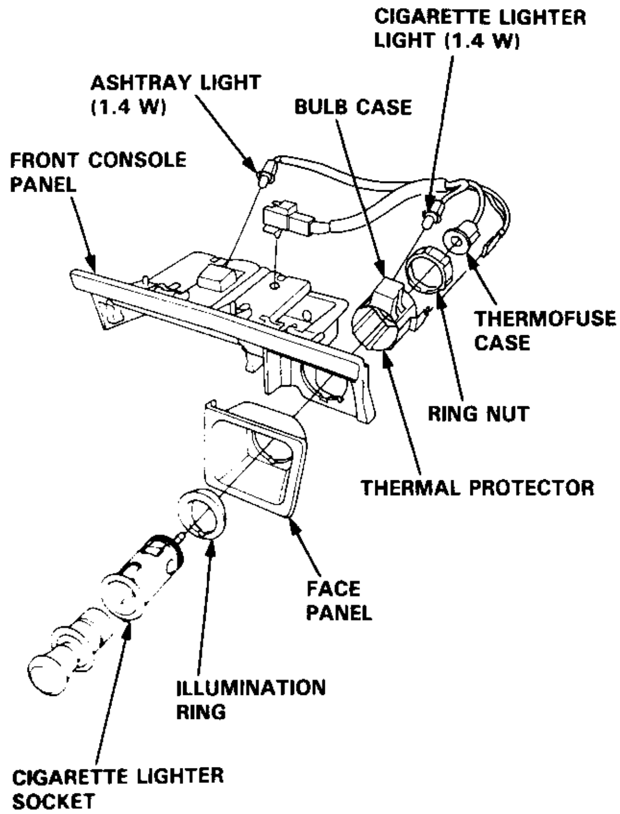


Replacement

1. Remove the two ashtray mounting screws. Then pull out the ashtray from the front console panel, and disconnect the 4P connector.



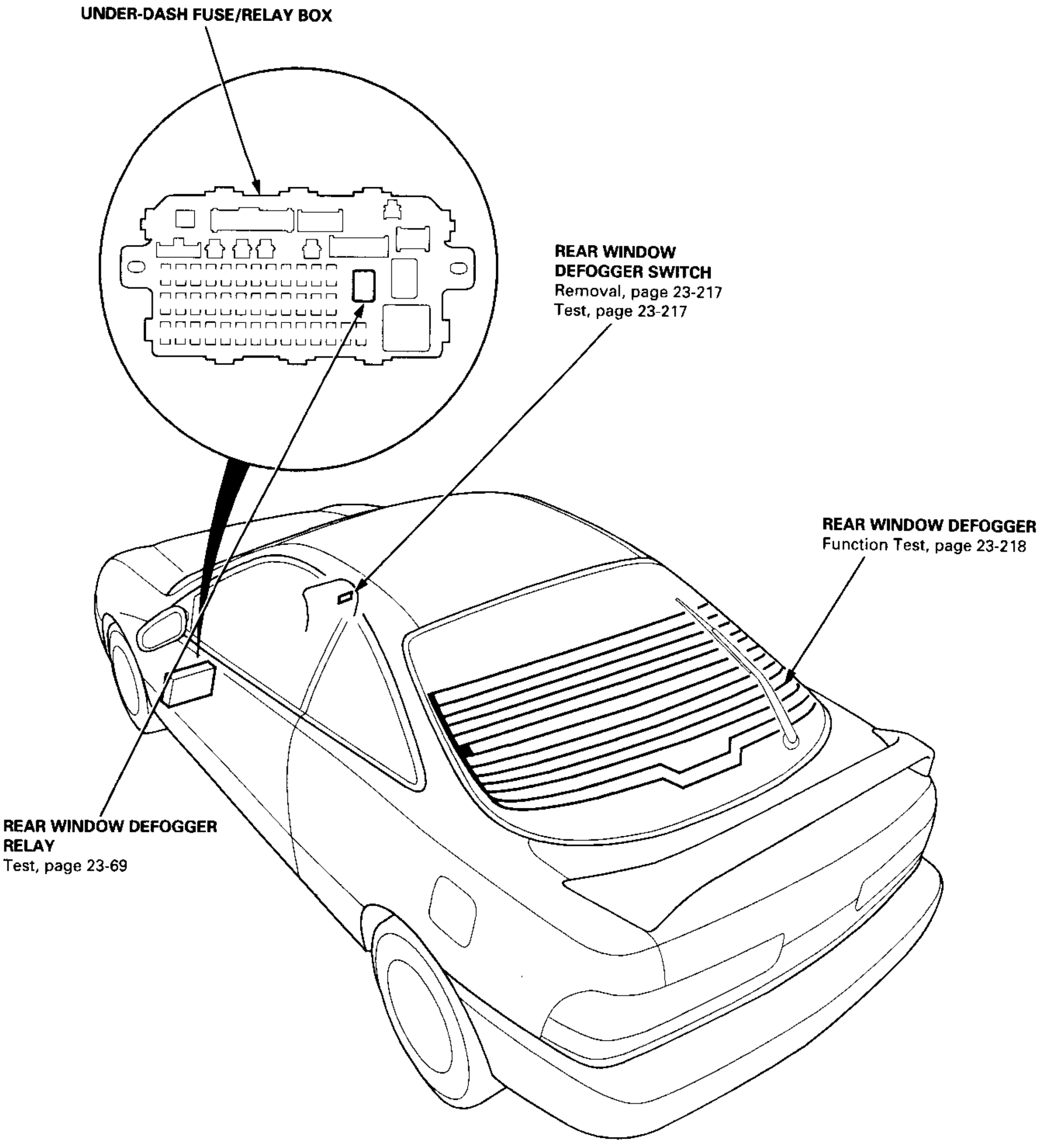
2. Disconnect the thermofuse case from the socket end.
3. Remove the thermal protector, and pull out the cigarette lighter socket.



4. When installing the cigarette lighter, align each lug on the face panel, illumination ring, and cigarette lighter socket with the groove of the hole, then position the bulb housing on the thermal protector between the stops in the console panel.
5. Make sure that the ground wire, bulb socket, and thermofuse housing are seated to the cigarette lighter assembly.

Rear Window Defogger

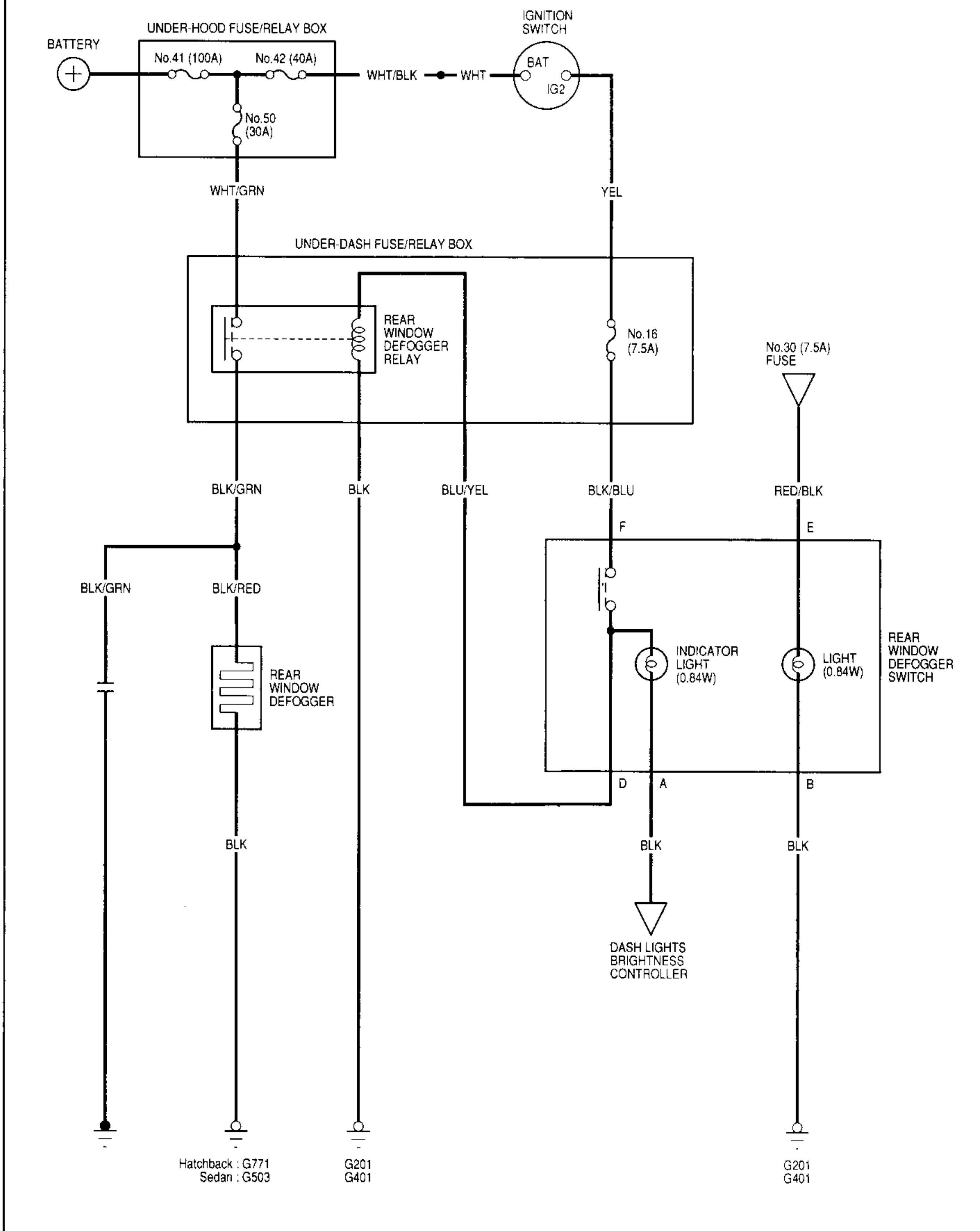
Component Location Index



Description

The rear window defogger is controlled by the integrated control unit. Pushing the defogger switch in the instrument panel sends a signal to the defogger timer in the integrated control unit, and the defogger stays on for 25 minutes or until the ignition switch is turned off. The indicator light in the switch comes on when the defogger works.

Circuit Diagram



Rear Window Defogger

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

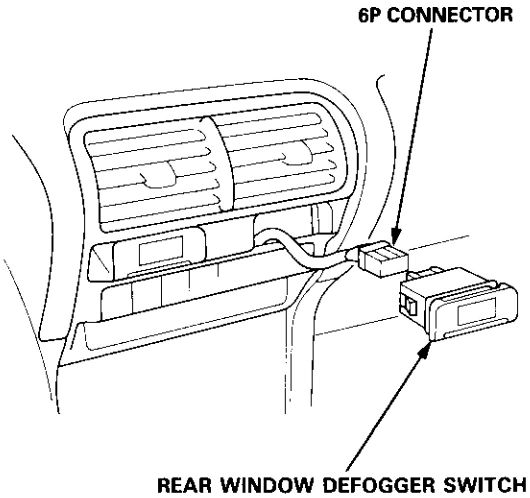
Symptom \ Item to be inspected	Blown indicator light bulb	Blown No. 16 (7.5 A) fuse (In the under-dash fuse/relay box)	Defogger timer circuit input (In the integrated control unit)	Blown No. 50 (30 A) fuse (In the under-hood fuse/relay box)	Function test	Defogger relay	Defogger switch	Poor ground	Open circuit, loose or disconnected terminals
Defogger works, but indicator light does not go on.	1								BLK/YEL or BLU/YEL
Defogger does not work and indicator light does not go on.		1	3				2	G201 G401	YEL, BLU/YEL or BLK/YEL
Defogger does not work, but indicator light goes on.				1	4	2	3	*1: G771 *2: G503	BLU/YEL or BLK/YEL BLK/GRN or BLK/WHT
Operation time is too long or too short (normal operation time is 25 minutes).			1						

*1: Hatchback
*2: Sedan

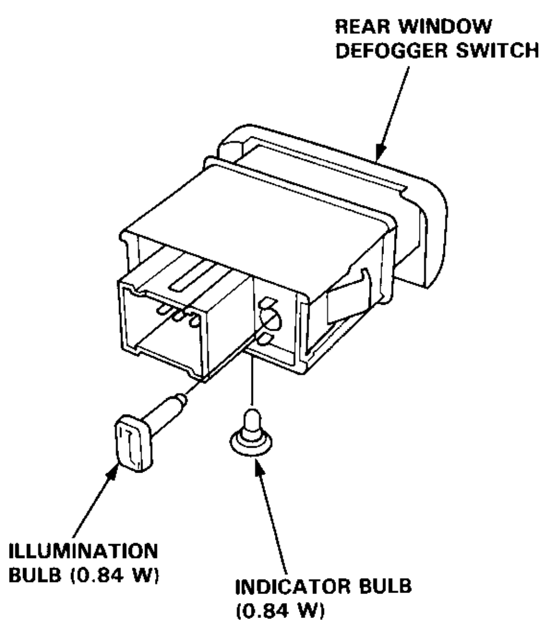
Switch Removal

CAUTION: Be careful not to damage the heater control/center air vent.

1. Carefully pry the switch out of the heater control/center air vent.
2. Disconnect the 6P connector from the switch.



3. Remove the indicator bulb (turn the socket 45° counterclockwise), and remove the illumination bulb.

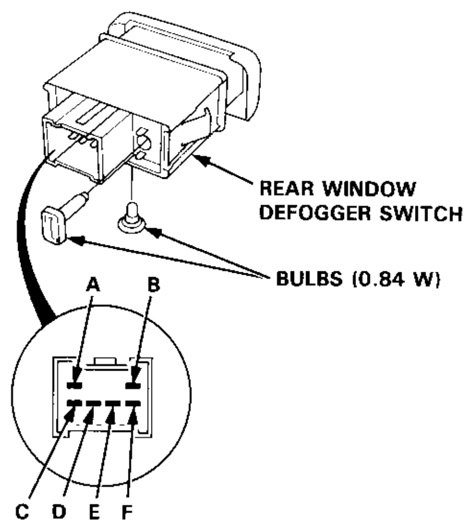


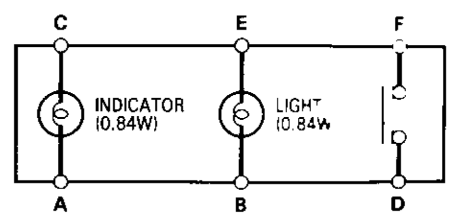
Switch Test

NOTE: Be careful not to damage the heater control/center air vent.

1. Carefully pry the switch out of the heater control/center air vent.
2. Check for continuity between the terminals according to the table.

Terminal / Position	A	B		C	D	E	F
PUSHED	○		ⓥ	○	○		○
		○	ⓥ			○	
RELEASED	○		ⓥ	○			
		○	ⓥ			○	



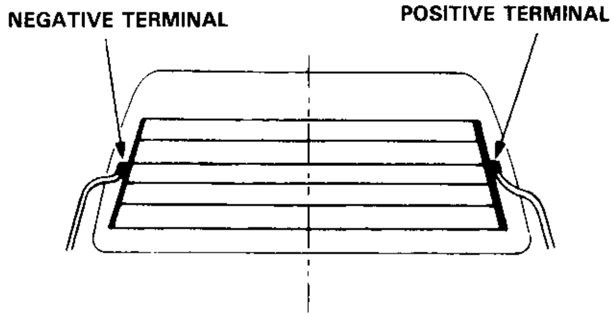


Rear Window Defogger

Function Test

CAUTION: Be careful not to scratch or damage the defogger wires with the tester probe.

1. Check for voltage between the positive terminal and body ground with the ignition switch and the defogger switch ON. There should be battery voltage.
   - If there is no voltage, check for
     - faulty defogger relay.
     - faulty defogger switch.
     - faulty integrated control unit.
     - an open in the BLK/GRN wire.
   - If there is battery voltage, go to step 2.

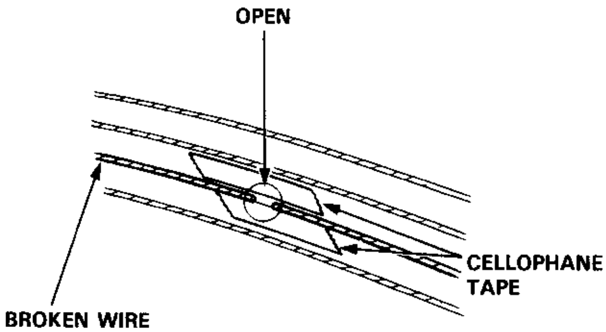


2. Turn the rear window defogger switch OFF. Check for continuity between the negative terminal and body ground.
   - If there is no continuity, check for an open in the defogger ground wire.
   - If there is continuity, go to step 3.
3. Touch the voltmeter positive lead to the halfway point of each defogger wire, and the negative lead to the negative terminal.
   There should be approximately 6 V with the ignition switch and defogger switch ON.
   - If the voltage is as specified, the defogger wire is OK.
   - If the voltage is not as specified, repair the defogger wire:
     - If it is more than 6 V, look for the damage on the negative half on the grid.
     - If it is less than 6 V, look for the damage on the positive half of the grid.

Defogger Wires Repair

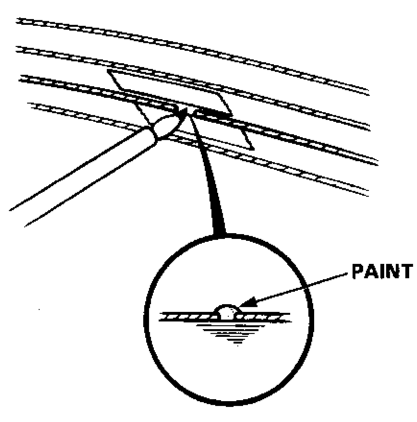
NOTE: To make an effective repair, the broken section must be no longer than one inch.

1. Lightly rub the area around the break with fine steel wool, then clean it with alcohol.
2. Carefully mask above and below the broken portion of the defogger wire with cellophane tape.



3. Using a small brush, apply a heavy coat of silver conductive paint extending about 3 mm (1/8 in) on both sides of the break. Allow 30 minutes to dry.

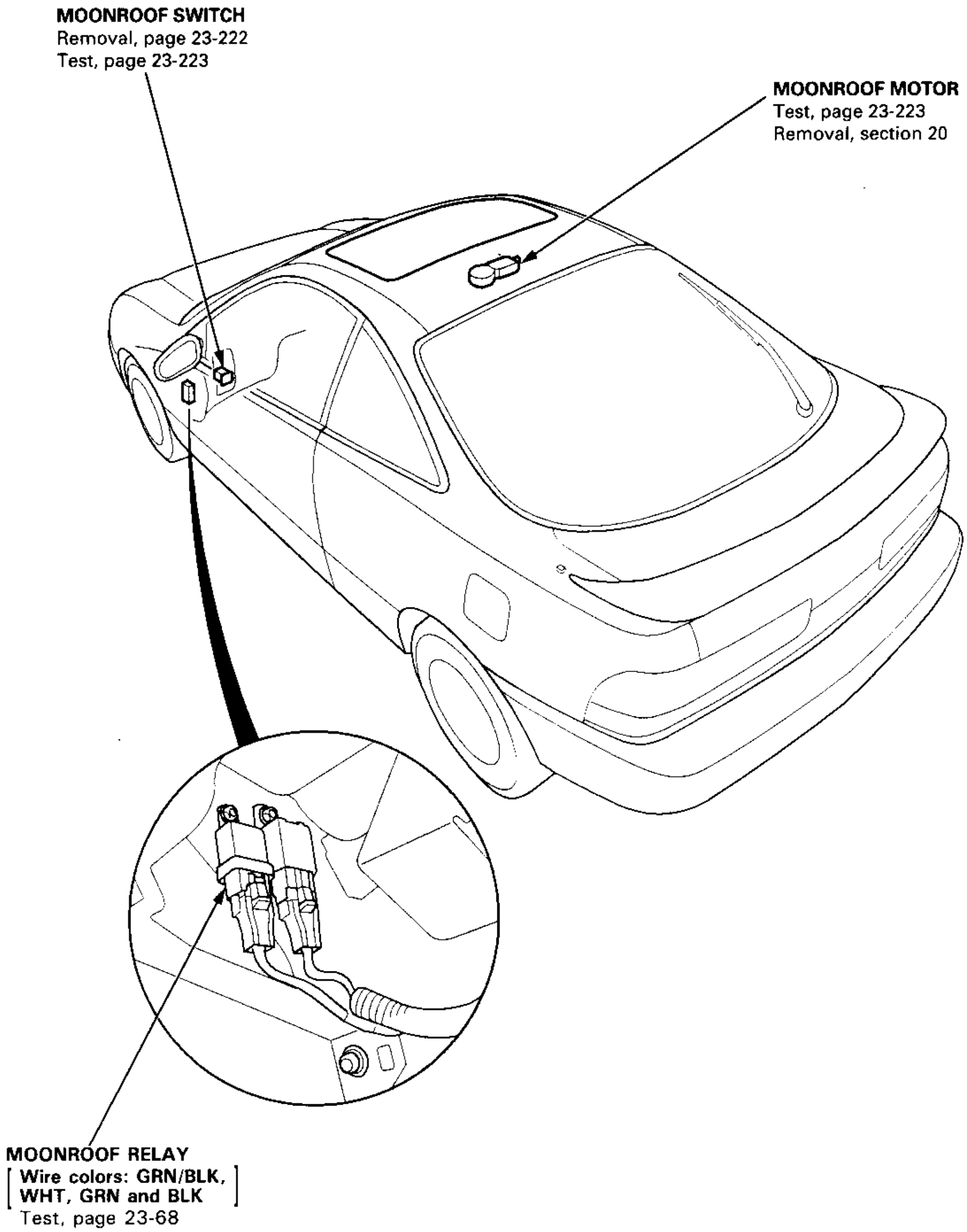
   NOTE: Thoroughly mix the paint before use.



4. Check for continuity in the repaired wire.
5. Apply a second coat of paint in the same way. Let it dry three hours before removing the tape.

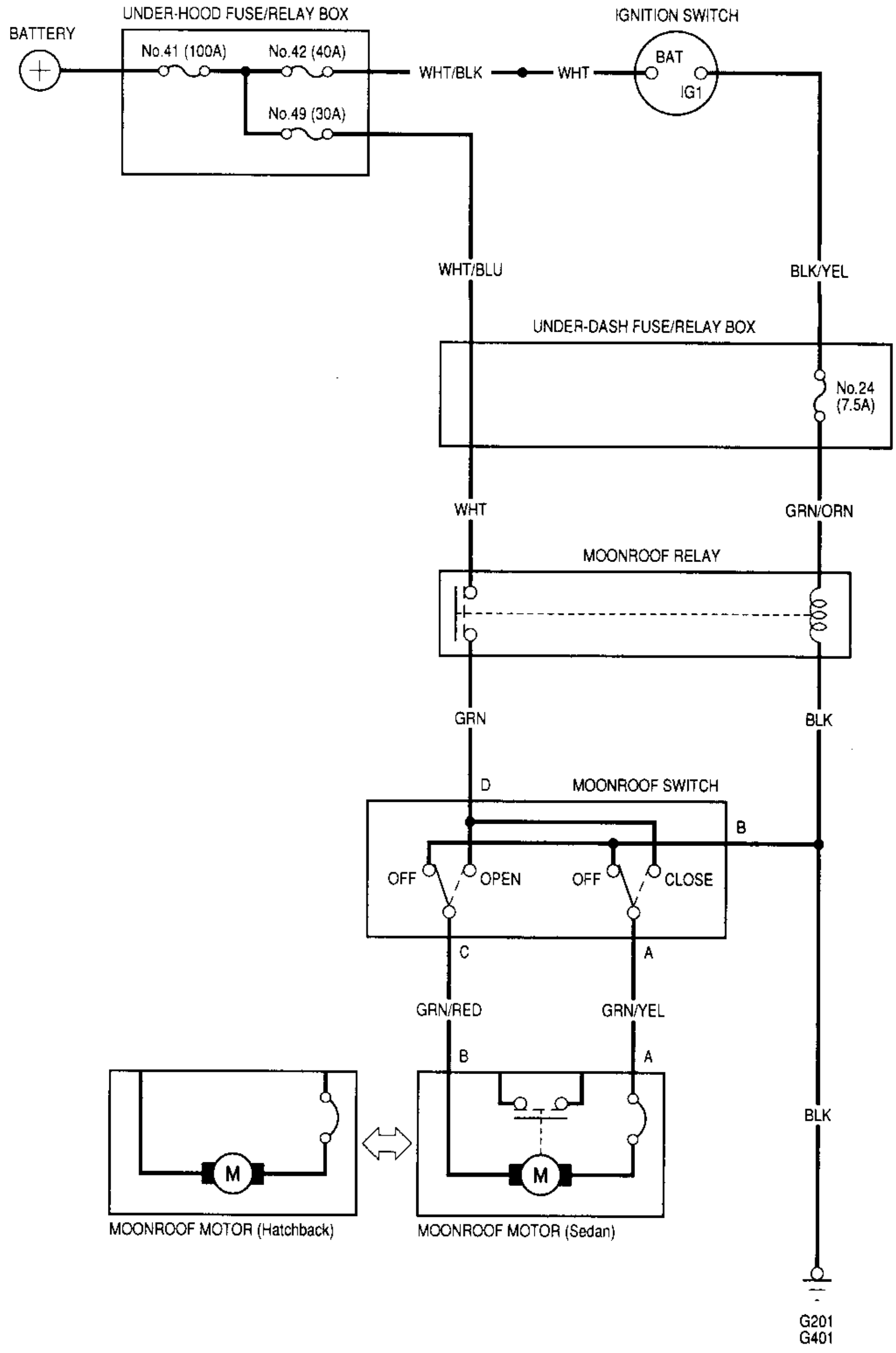
Moonroof

Component Location Index



Moonroof

Circuit Diagram



Electrical Troubleshooting

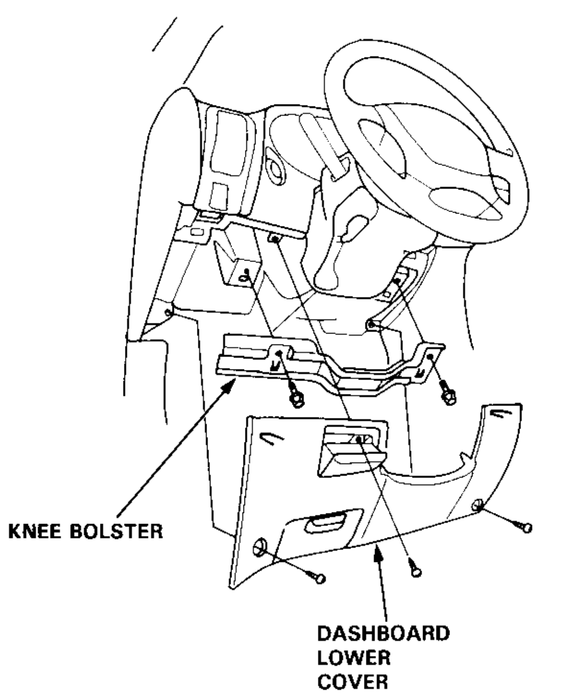
NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Clutch out of adjustment, foreign matter stuck between guide rail and moonroof, or outer cable not attached properly	Blown No. 49 (30 A) fuse (In the under-hood fuse/relay box)	Blown No. 24 (7.5 A) fuse (In the under-dash fuse/relay box)	Moonroof switch	Function test	Moonroof relay	Moonroof motor	Poor ground	Open circuit, loose or disconnected terminals
Moonroof does not move, but motor turns.		1								
Moonroof does not move and motor does not turn (moonroof can be moved with moonroof wrench).	In all switch positions		1	2		3	4	5	G201 G401	WHT, GRN/BLK, GRN,BLK
	With OPEN switch				1		2			GRN/RED
	With CLOSE switch				1		2			GRN/YEL

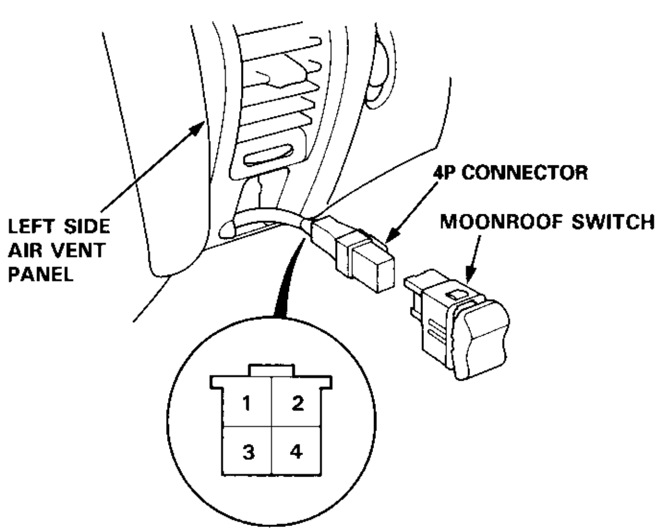
Moonroof

Function Test

1. Remove the dashboard lower cover, and if necessary, remove the knee bolster.



2. Carefully pry the switch out of the left side air vent panel, then disconnect the 4P connector to remove the switch.



View from wire side

3. Check for continuity between the No. 2 terminal and body ground.
   - If there is no continuity, check for
     — an open in the BLK wire.
     — poor ground (G201, G401).
   - If there is continuity, go to step 4.

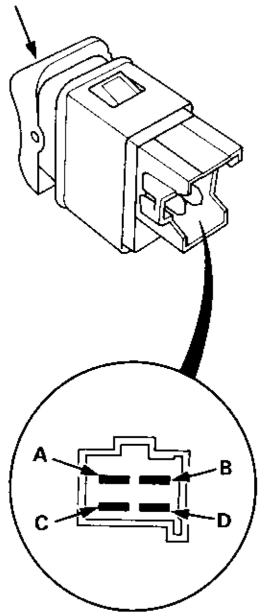
4. Check for voltage between the No. 4 terminal (+) and No. 2 terminal (−) with the ignition switch ON (II). There should be battery voltage.
   - If there is no battery voltage, check for
     — blown No. 49 (30 A) fuse in the under-hood fuse/relay box or No. 24 (7.5 A) fuse in the under-dash fuse/relay box.
     — an open in the wires (GRN/BLK, GRN, WHT) or loose terminals.
     — faulty moonroof relay.
   - If there is battery voltage, go to step 5.

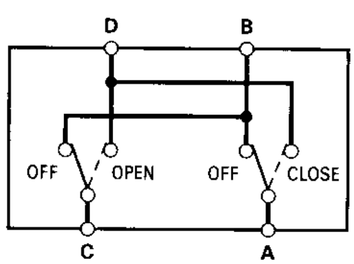
5. Connect the No. 4 terminal to the No. 3 terminal, and the No. 1 terminal to the No. 2 terminal with jumper wires. The moonroof should open when the ignition switch is turned ON (II).
   - If the moonroof opens, check the moonroof switch.
   - If it doesn't open, remove the headliner and check the motor.

Switch Test

1. Remove the dashboard lower cover.
2. Carefully pry the switch out of the left side air vent panel, then disconnect the 4P connector and remove the switch.
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	A	B	C	D
OFF	○—	—○—	—○	
OPEN	○—	—○	○—	—○
CLOSE	○—	———	———	—○
		○—	—○	



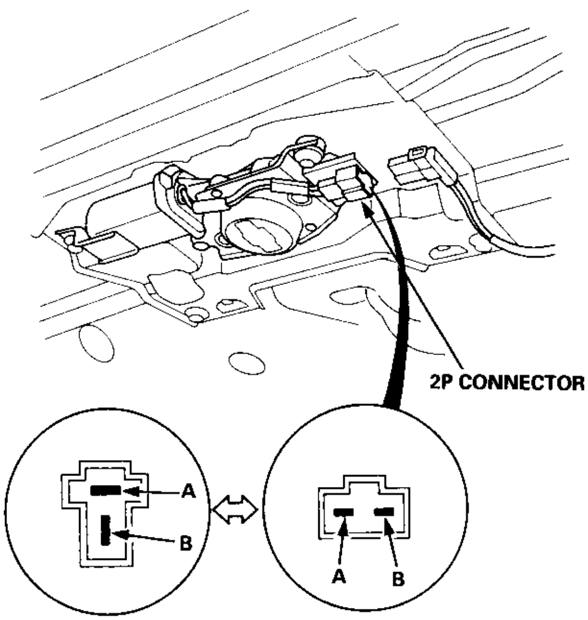


Motor Test

1. Remove the headliner (see section 20).
2. Disconnect the 2P connector from the moonroof motor.
3. Check the motor by connecting power and ground according to the table.

   NOTE: Motor clutch test is in section 20.

Condition \ Terminal	A	B
OPEN	⊖	⊕
CLOSE	⊕	⊖



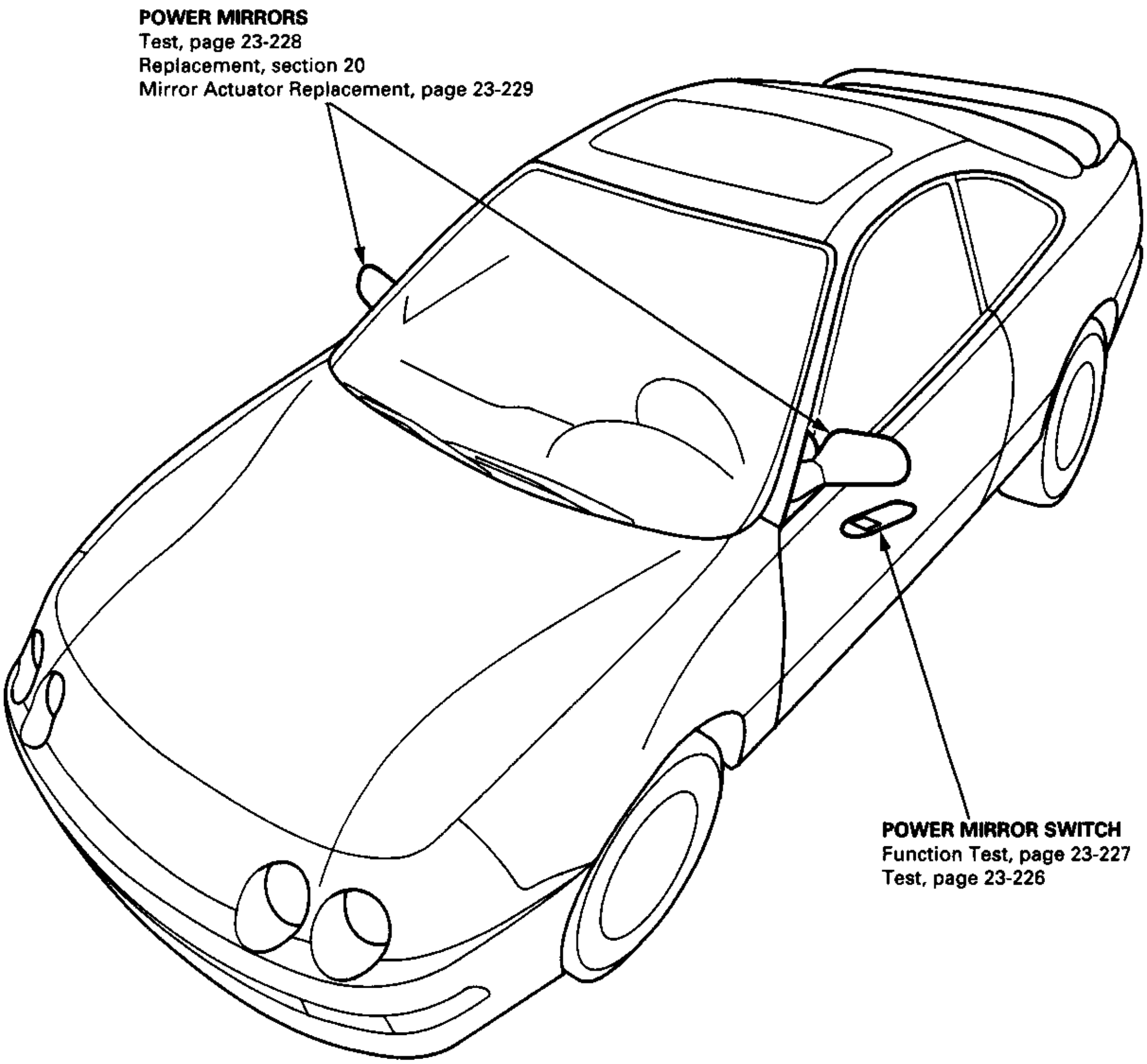
(Hatchback) (Sedan)

View from terminal side

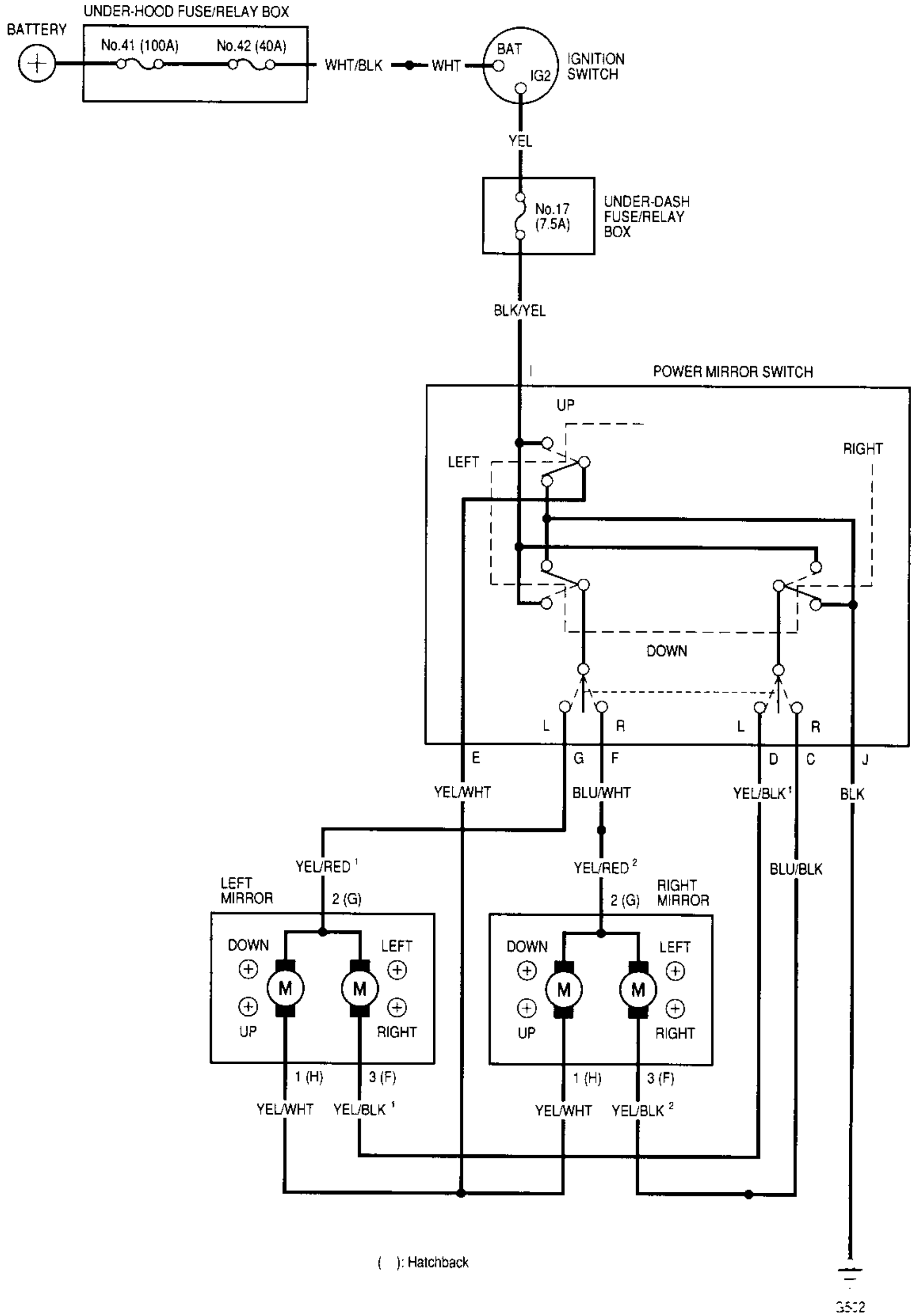
4. If the motor fails to run or doesn't run smoothly, replace it.

Power Mirrors

Component Location Index



Circuit Diagram



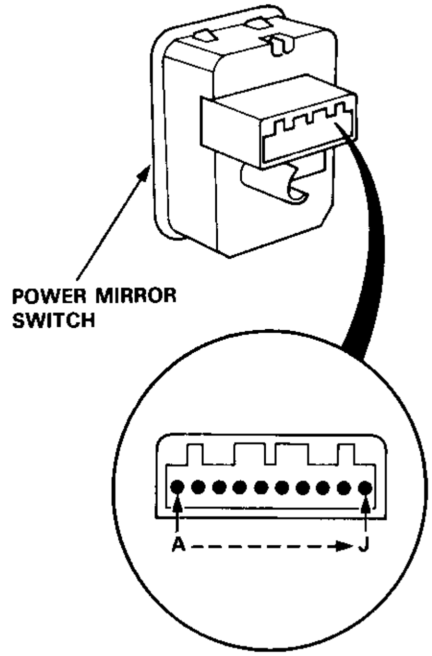
Power Mirrors

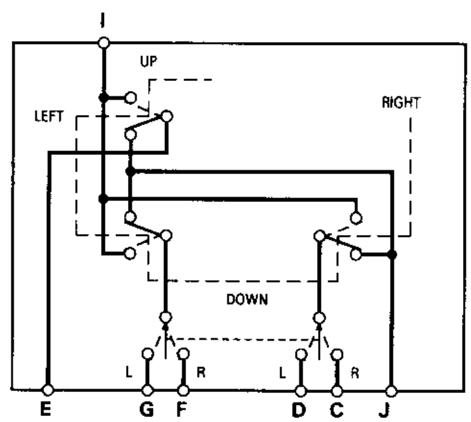
Switch Test

1. Remove the driver's door panel (see section 20).
2. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch

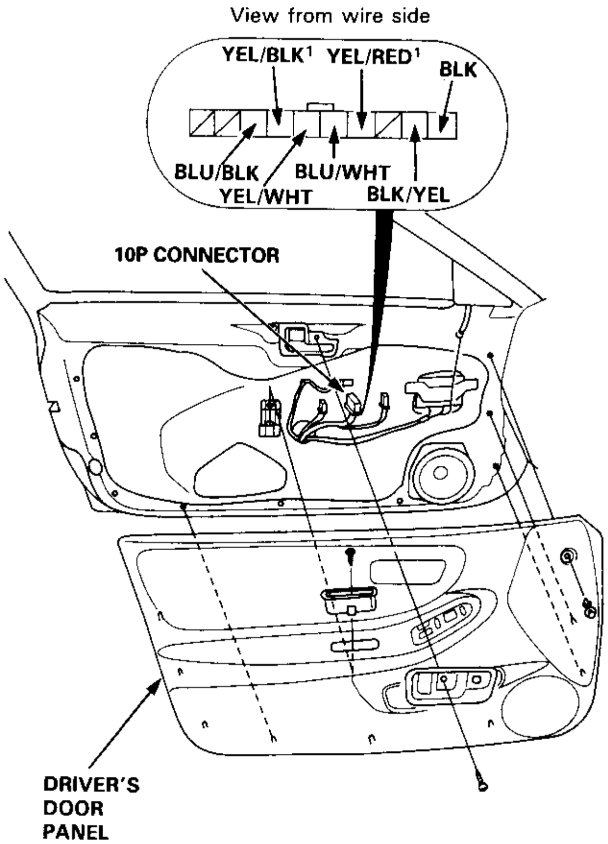
Position		I	J	E	D	G	C	F
R	OFF		○	○			○	○
	UP	○		○				
			○				○	○
	DOWN	○					○	○
			○	○				
	LEFT	○		○				○
			○				○	
	RIGHT	○					○	
			○	○				○
L	OFF		○	○	○	○		
	UP	○		○				
			○		○	○		
	DOWN	○			○	○		
			○	○				
	LEFT	○		○		○		
			○		○			
	RIGHT	○			○			
			○	○		○		





Function Test

NOTE: To test, remove the driver's door panel (see section 20), then disconnect all of the connectors from the door panel.



Mirror Test

NOTE: Check the No. 17 (7.5 A) fuse in the under-dash fuse/relay box before testing.

One or both inoperative:

1. Check for voltage between the BLK/YEL terminal and body ground with the ignition switch ON (II).
   There should be battery voltage.
   - If there is no voltage, check for:
     — Blown No. 17 (7.5 A) fuse in the under-dash fuse/relay box
     — An open in the BLK/YEL wire
   - If there is battery voltage, go to step 2.
2. Check for continuity between the BLK terminal and body ground.
   There should be continuity; check for:
   — An open in the BLK wire
   — Poor ground (G501 (sedan), G502)

Left mirror inoperative:

Connect the BLK/YEL terminal of the 10P connector to the YEL/RED[1] terminal and the YEL/WHT (or YEL/BLK[1]) terminal to body ground with jumper wires.
The left mirror should tilt down (or swing left) when you turn the ignition switch ON (II).

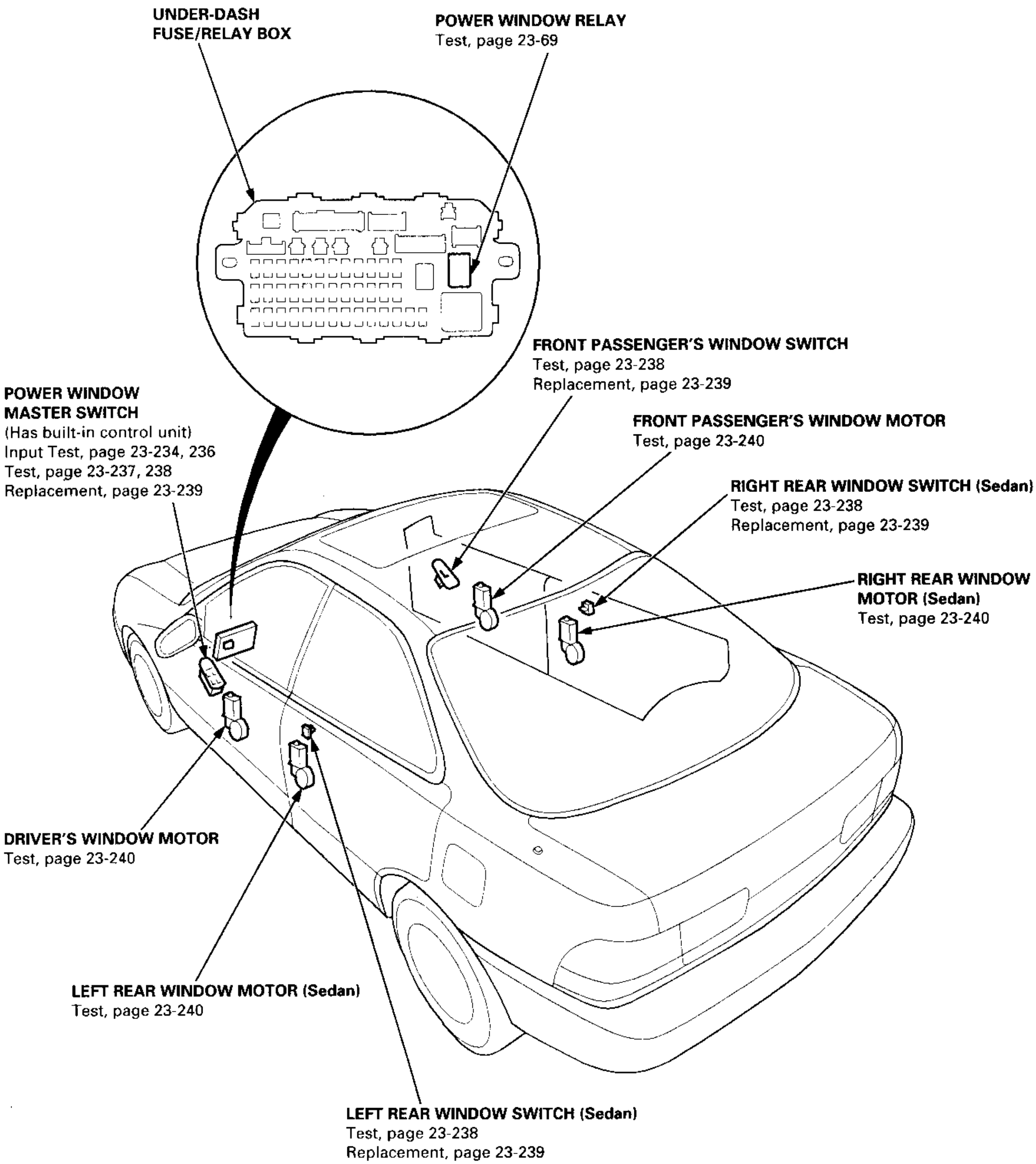
- If the mirror does not tilt down (or does not swing left), check for an open in the YEL/WHT (or YEL/BLK[1]) wire between the left mirror and the switch. If the wire is OK, check the left mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED[1] wire between the left mirror and the switch.
- If the mirror operates properly, check the mirror switch.

Right mirror inoperative:

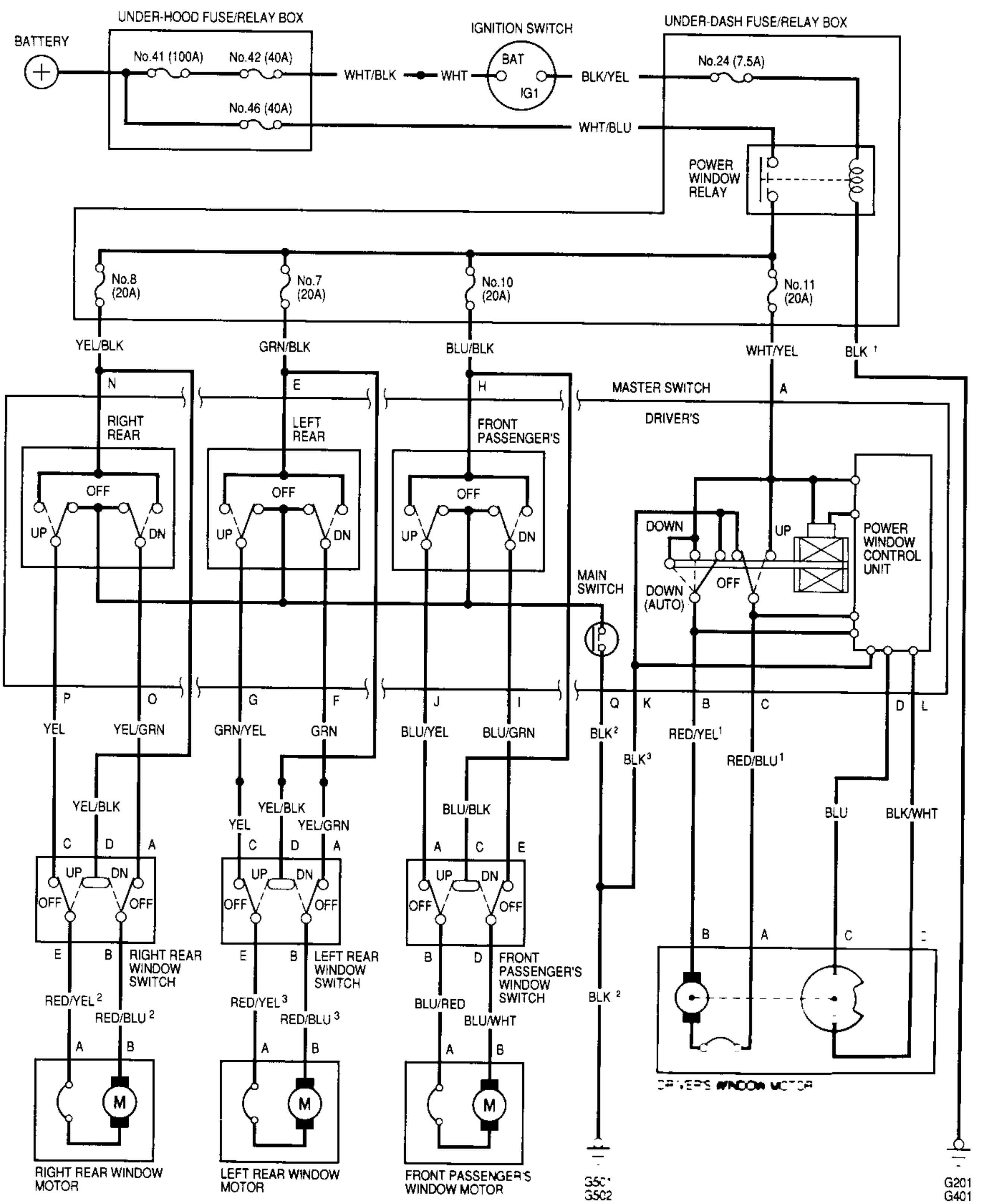
Connect the BLK/YEL terminal of the 10P connector to the BLU/WHT terminal and the YEL/WHT (or BLU/BLK) terminal to body ground with jumper wires.
The right mirror should tilt down (or swing left) when you turn the ignition switch ON (II).

- If the mirror does not tilt down (or does not swing left), remove the right door panel and check for an open in the YEL/WHT (or BLU/BLK) wire between the right mirror and the switch. If the wire is OK, check the right mirror actuator.
- If the mirror neither tilts down nor swings left, repair the BLU/WHT wire between the right mirror and the switch.
- If the mirror operates properly, check the mirror switch.

Component Location Index

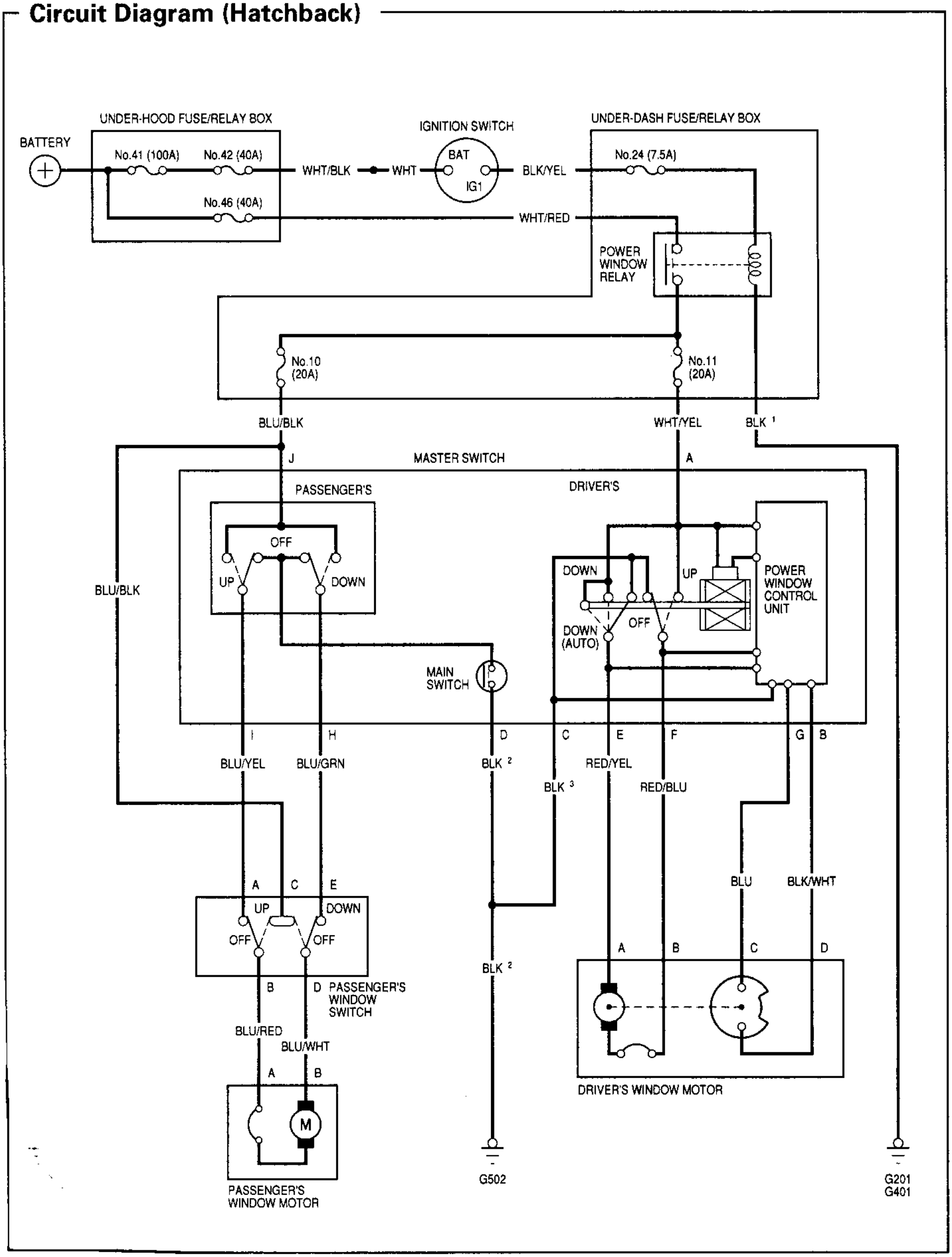


Circuit Diagram (Sedan)



Power Windows

Circuit Diagram (Hatchback)



Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom \ Item to be inspected		Blown No. 24 (7.5 A) fuse (In the under-dash fuse/relay box)	Power window relay	In the under-dash fuse/relay box: Blown No. 11 (20 A) fuse	In the under-dash fuse/relay box: Blown No. 10 (20 A) fuse	In the under-dash fuse/relay box: *Blown No. 8 (20 A) fuse	In the under-dash fuse/relay box: *Blown No. 7 (20 A) fuse	Power window master switch	Passenger's window switch	Driver's window motor	Pulser (In driver's window motor)	Passenger's window motor	Window regulator	Power window master switch input	Poor ground	Open circuit, loose or disconnected terminals
All windows do not work.		1	2												G201 G401 G501 G502	BLK/YEL WHT/RED
Driver's window does not work.				1				3		2			4	5		WHT/YEL
Driver's window does not work in AUTO.								2			1			3		BLU, BLK/WHT
Passenger's windows do not work.	Right front				1			2	3			4	5			BLU/BLK
	*Left rear						1	2	3			4	5			GRN/BLK
	*Right rear					1		2	3			4	5			YEL/BLK

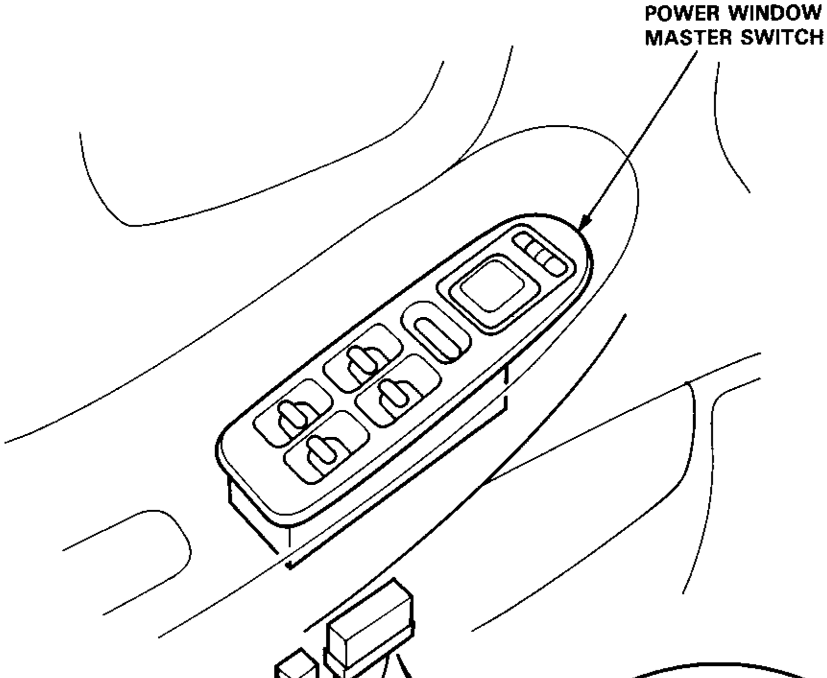
*: Sedan

Power Windows

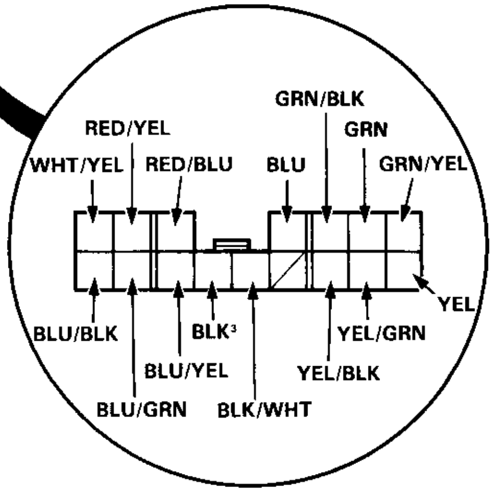
Master Switch Input Test (Sedan)

NOTE: The control unit is built into the power window master switch, and only controls driver's door window operations.

1. Remove the driver's door panel, and disconnect the 16P and 1P connectors from the master switch.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If a test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the power window master switch must be faulty; replace it.



View from wire side



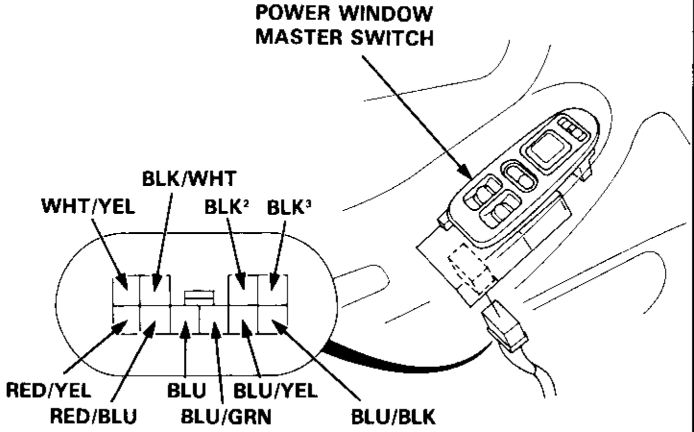
View from wire side

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK[2] and BLK[3]	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501, G502) • An open in the wire
2	WHT/YEL BLU/BLK GRN/BLK YEL/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 24 (7.5 A) fuse in the under-dash fuse/relay box • Blown No. 7, 8, 10 or 11 (20 A) fuse in the under-dash fuse/relay box • Faulty power window relay • An open in the wire
3	RED/BLU[1] and RED/YEL[1]	Connect the WHT/YEL and RED/YEL[1] terminals, and the RED/BLU[1] and BLK[3] terminals with jumper wires, then turn the ignition switch ON (II).	Check the driver's window motor: It should run (the window moves down).	• Faulty driver's window motor • An open in the wire
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK and BLU/GRN terminals, and the BLU/YEL and BLK[2] terminals with jumper wires, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run (the window moves down).	• Faulty front passenger's window motor • An open in the wire
5	GRN/YEL and GRN	Connect the GRN/BLK and GRN terminals, and the GRN/YEL and BLK[2] terminals with jumper wires, then turn the ignition switch ON (II).	Check the left rear window motor: It should run (the window moves down).	• Faulty left rear window motor • Faulty left rear window switch • An open in the wire
6	YEL/GRN and YEL	Connect the YEL/BLK and YEL/GRN terminals, and the YEL and BLK[2] terminals with jumper wires, then turn the ignition switch ON (II).	Check the right rear window motor: It should run (the window moves down).	• Faulty right rear window motor • Faulty right rear window switch • An open in the wire
7	BLU and BLK/WHT	Connect the WHT/YEL and RED/YEL[1] terminals, and the RED/BLU[1] and BLK[3] terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to terminals BLU and BLK/WHT: The meter needle should move back and forth alternately as the driver's window motor runs.	• Faulty pulser • Faulty driver's window motor • An open in the wire

Master Switch Input Test (Hatchback)

NOTE: The control unit is built into the power window master switch, and only controls driver's door window operations.

1. Remove the driver's door panel, and disconnect the 10P connector from the master switch.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector terminals.
     - If a test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the power window master switch must be faulty; replace it.

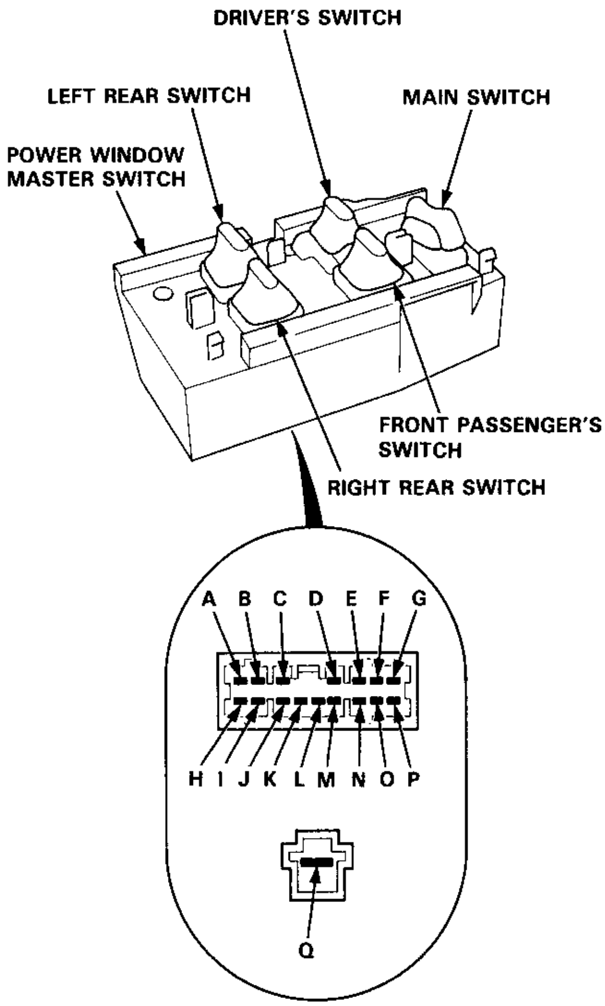


View from wire side

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK² BLK³	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G502) • An open in the wire
2	WHT/YEL BLU/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 24 (7.5 A) fuse in the under-dash fuse/relay box • Blown No. 10, or No. 11 (20 A) fuse in the under-dash fuse/relay box • Faulty power window relay • An open in the wire
3	RED/BLU¹ and RED/YEL¹	Connect the WHT/YEL and RED/YEL¹ terminals, and the RED/BLU¹ and BLK³ terminals with jumper wires, then turn the ignition switch ON (II).	Check the driver's window motor: It should run (the window moves down).	• Faulty driver's window motor • An open in the wire
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK and BLU/GRN terminals, and the BLU/YEL and BLK² terminals with jumper wires, then turn the ignition switch ON (II).	Check the passenger's window motor: It should run (the window moves down).	• Faulty passenger's window motor • An open in the wire
5	BLU and BLK/WHT	Connect the WHT/YEL and RED/YEL¹ terminals, and the RED/BLU¹ and BLK³ terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the BLU and BLK/WHT terminals: The meter needle should move back and forth alternately as the driver's window motor runs.	• Faulty pulser • Faulty driver's window motor • An open in the wire

Master Switch Test (Sedan)

1. Remove the driver's door panel (see section 20).
2. Disconnect the 16P and 1P connectors from the switch.
3. Check for continuity between the terminals in each switch position according to the tables.



Driver's Switch:
The driver's switch is combined with the control unit so you cannot isolate the switch to test it. Instead, run the master switch input test procedures No. 1, 2, 3, and 7 on page 23-234. If the tests are normal, the driver's switch must be faulty.

Front Passenger's Switch:

Position	Main Switch	H	I	J	Q
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○		○	
			○		○
	OFF	○		○	
DOWN	ON	○	○		
				○	○
	OFF	○	○		

Left Rear Switch:

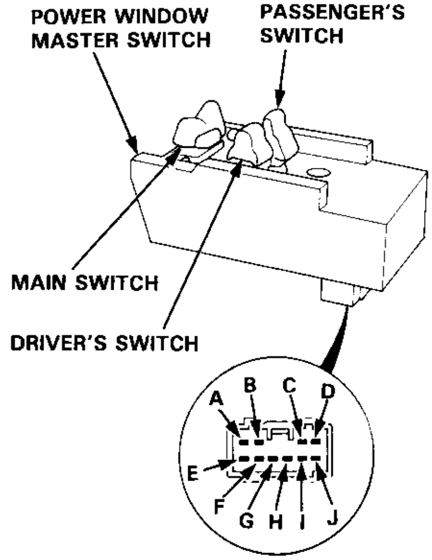
Position	Main Switch	E	F	G	Q
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○		○	
			○		○
	OFF	○		○	
DOWN	ON	○	○		
				○	○
	OFF	○	○		

Right Rear Switch:

Position	Main Switch	N	O	P	Q
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○		○	
			○		○
	OFF	○		○	
DOWN	ON	○	○		
				○	○
	OFF	○	○		

Master Switch Test (Hatchback)

1. Remove the driver's door panel (see section 20).
2. Disconnect the 10P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.



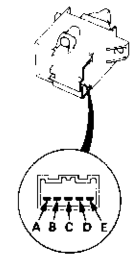
Driver's Switch:
The driver's switch is combined with the control unit so you cannot isolate the switch to test it. Instead, run the master switch input test procedures No. 1, 2, 3, and 5 on page 23-236. If the tests are normal, the driver's switch must be faulty.

Passenger's Switch:

Position	Main Switch	D	H	I	J
OFF	ON	○	○	○	
	OFF		○	○	
UP	ON			○	○
		○	○		
	OFF			○	○
DOWN	ON		○		○
		○		○	
	OFF		○		○

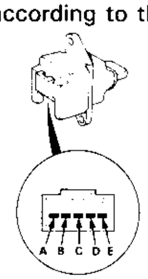
Passenger's Window Switch Test

Front:
1. Remove the passenger's door panel (see section 20).
2. Disconnect the 5P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.



Position	A	B	C	D	E
OFF	○	○			
				○	○
UP		○	○		
				○	○
DOWN			○	○	
	○	○			

Rear (Sedan):
1. Remove the inner handle (see section 20).
2. Disconnect the 5P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.

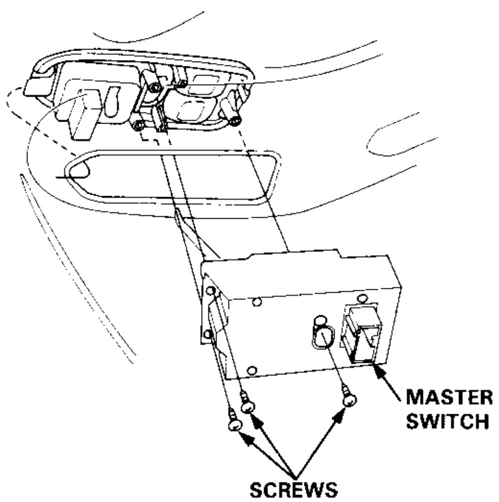


Position	A	B	C	D	E
OFF	○	○			
			○		○
UP	○	○			
				○	○
DOWN		○		○	
			○		○

Master Switch Replacement

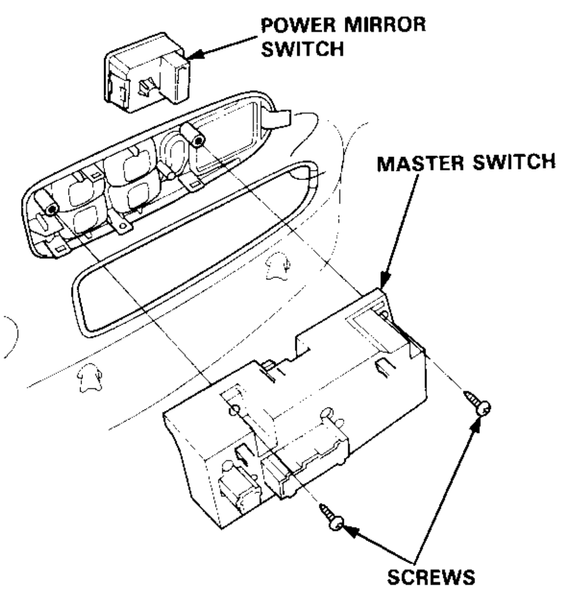
Hatchback:

1. Remove the driver's door panel (see section 20).
2. Disconnect the 10P connector from the switch.
3. Remove the three mounting screws and the switch.



Sedan:

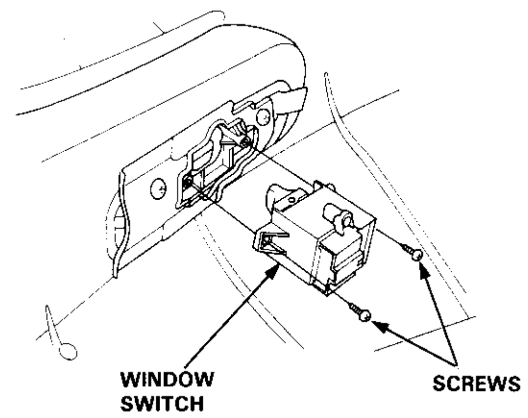
1. Remove the driver's door panel (see section 20).
2. Disconnect the 16P and 1P connectors from the switch.
3. Remove the two mounting screws and the switch.



Passenger's Window Switch Replacement

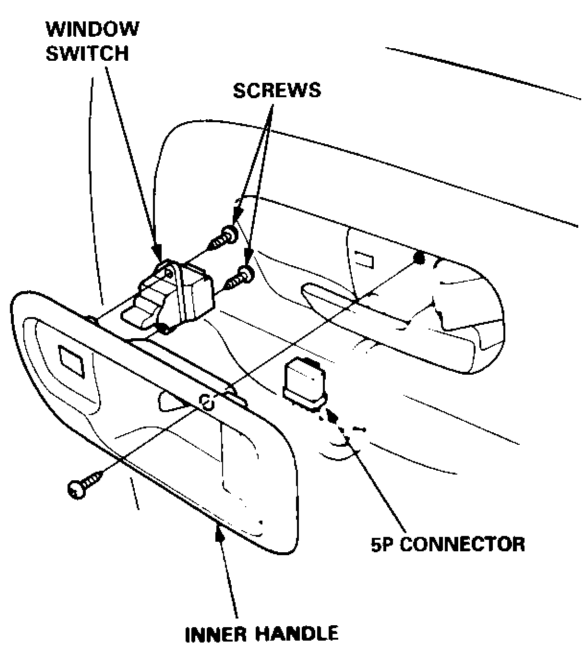
Front:

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 5P connector from the switch.
3. Remove the two mounting screws and the switch.



Rear (Sedan):

1. Remove the inner handle (see section 20).
2. Disconnect the 5P connector from the switch.
3. Remove the two mounting screws and the switch.

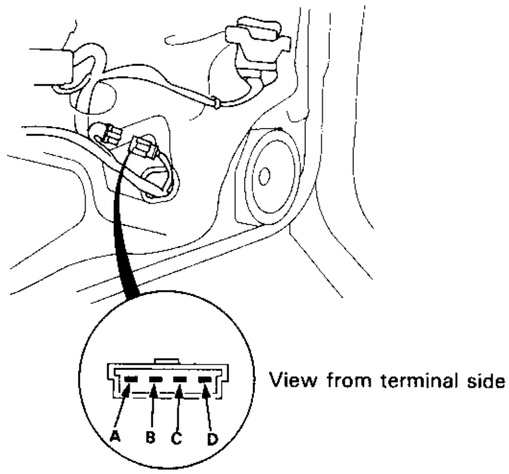


Power Windows

Driver's Window Motor Test

Motor Test:

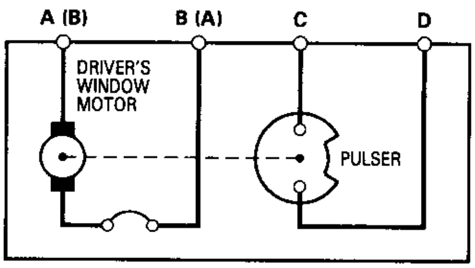
1. Remove the driver's door panel (see section 20).
2. Disconnect the 4P connector from the motor.



4P CONNECTOR

3. Test the motor in each direction by connecting battery power and ground according to the table.

Terminal / Direction	A (B)	B (A)
UP	⊖	⊕
DOWN	⊕	⊖



( ): Sedan

CAUTION: When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

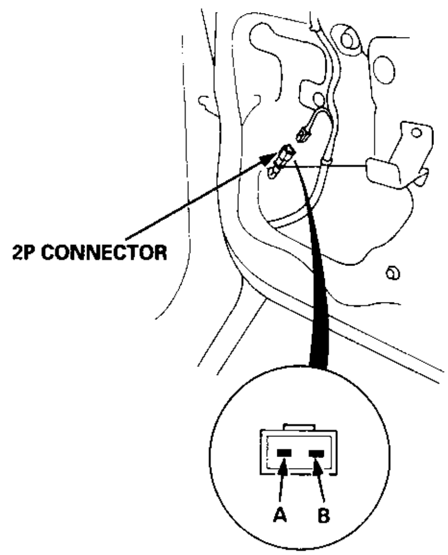
Pulser Test:

5. Connect the test leads of an analog ohmmeter to the C and D terminals.
6. Run the motor by connecting power and ground to the A and B terminals.
   The ohmmeter needle should move back and forth alternately.

Passenger's Window Motor Test

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P connector from the motor.

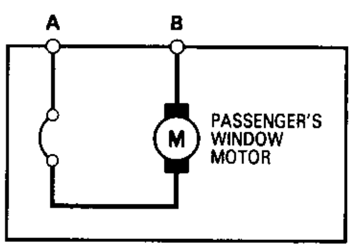
   NOTE:
   - Front passenger's door is symmetrical to driver's door.
   - The illustration shows the right rear door, left rear door is symmetrical.



View from terminal side

3. Test the motor in each direction by connecting battery power and ground according to the table.

Terminal / Direction	B	A
UP	⊖	⊕
DOWN	⊕	⊖

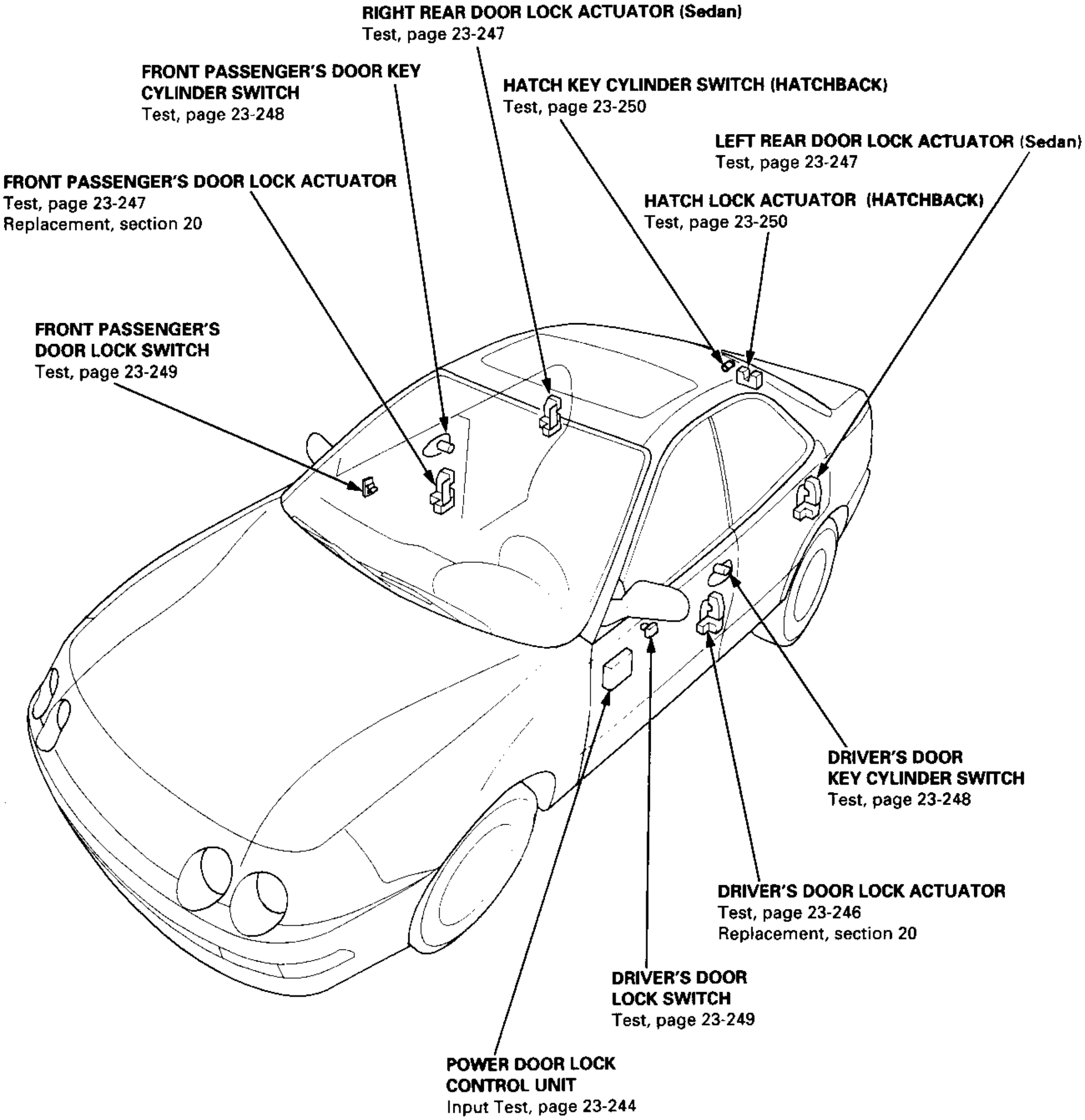


CAUTION: When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

Power Door Locks

Component Location Index

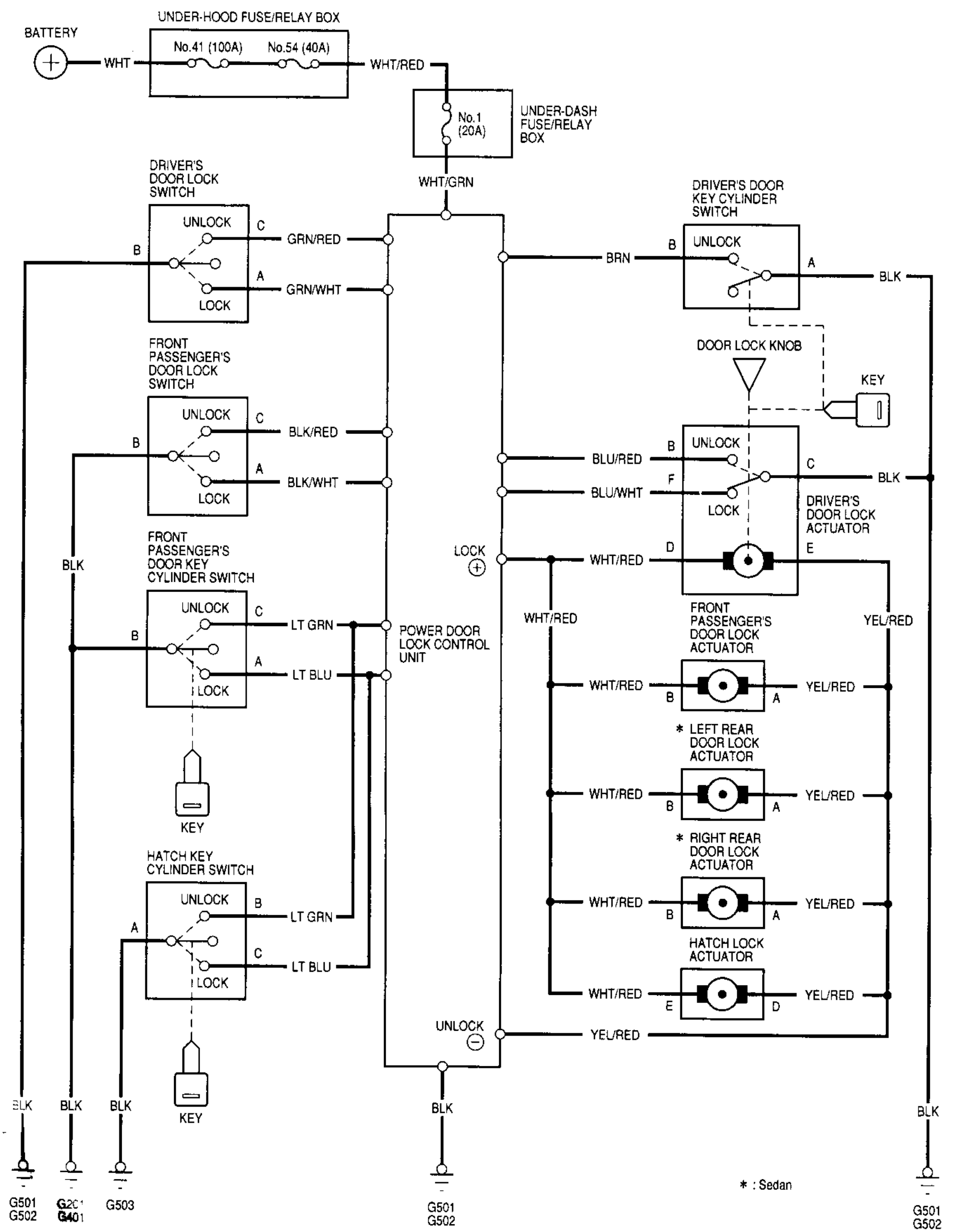


Description

For this model, a new door lock system has been adopted to improve convenience and safety. If the key is inserted into the driver's door key cylinder, turned to the unlock position, and pulled out immediately thereafter, ONLY the driver's door will unlock. However, if the key is kept in the unlock position for one second or more, ALL doors will unlock.

Power Door Locks

Circuit Diagram



Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom \ Item to be inspected		Blown No. 1 (20 A) fuse (In the under-dash fuse/relay box)	Disconnected or obstructed door lock rod/linkage	Driver's door lock knob switch (In the door lock actuator)	Driver's door key cylinder switch	Front passenger's door key cylinder switch	Driver door lock actuator	Passenger's door lock actuator	Driver's door lock switch	Passenger's door lock switch	Control unit input	Poor ground	Open circuit, loose or disconnected terminals
Power door lock system doesn't operate at all.		1									2	G501 G502	WHT/GRN
Doors don't lock or unlock with the driver's door lock switch.	All doors								1		2	G501 G502	GRN/RED or GRN/WHT
	One or more doors		1				2	3					WHT/RED or YEL/RED
Doors don't lock or unlock with the passenger's door lock switch.	All doors									1	2	G201 G401	BLK/RED or BLK/WHT
	One or more doors		1				2	3					WHT/RED or YEL/RED
Doors don't lock or unlock with the driver's door lock knob.	All doors		1	2							3	G501 G502	BLU/RED or BLU/WHT
	One or more doors		1				2	3					WHT/RED or YEL/RED
Door don't lock or unlock with the passenger's door key.	All doors					1					2	G201 G401	LT GRN or LT BLU
	One or more doors		1				2	3					WHT/RED or YEL/RED
Doors don't unlock with the driver's door key.	Driver's door		1		2		3					G501 G502	BRN, WHT RED or YEL RED
	*All doors				1						2	G501 G502	BRN, WHT/RED or YEL RED

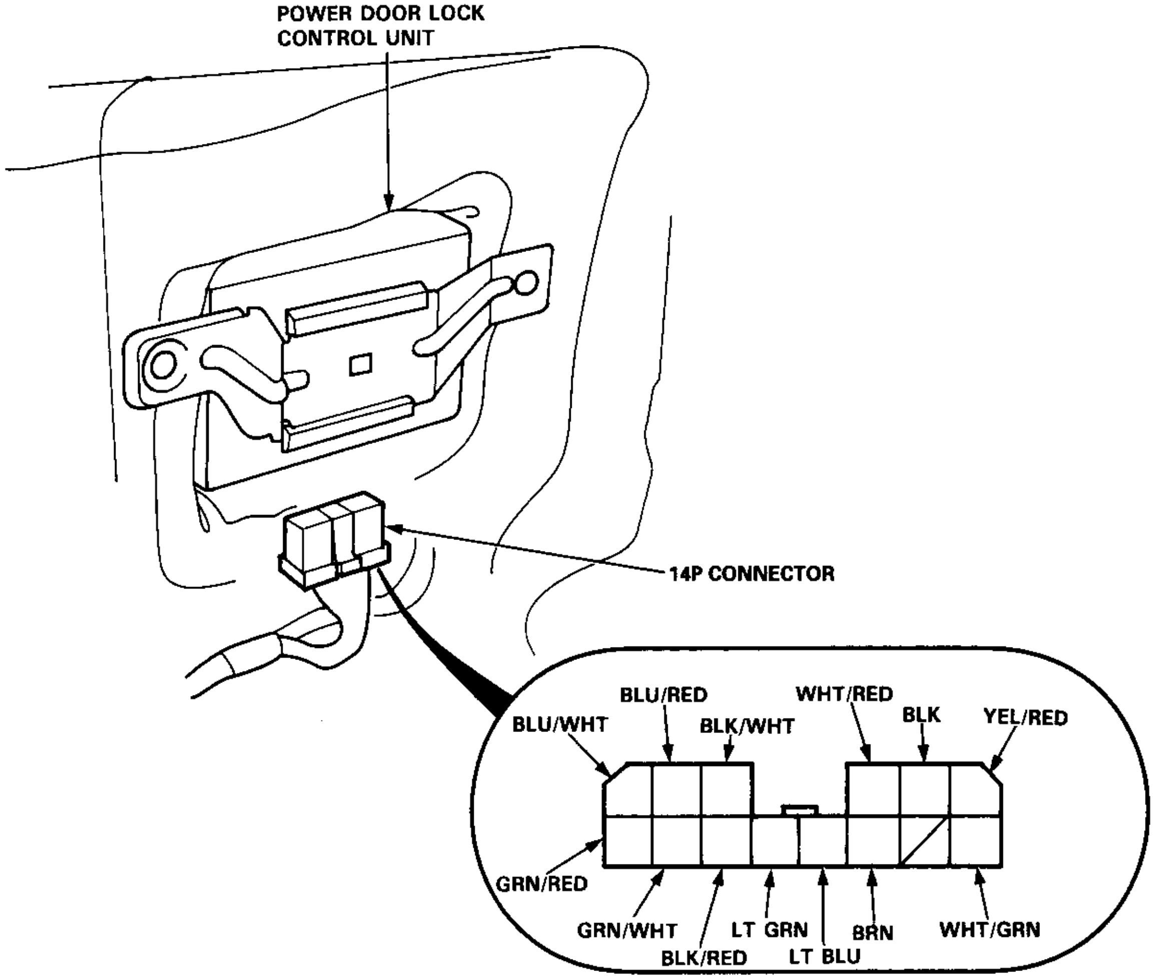
* If the system is working normally, all doors will unlock when you hold the door key in the unlock position (key cylinder switch and door lock knob switch turned ON) for one second or more.

Power Door Locks

Control Unit Input Test

1. Remove the driver's door panel (see section 20).
2. Disconnect the 14P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.

- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, make the following input tests at the connector.
  - If any test indicates a problem, find and correct the cause, then recheck the system.
  - If all the input tests prove OK, the control unit must be faulty; replace it.



View from wire side

Disconnect the 14P connector from the power door lock control unit.

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501, G502) • An open in the wire
2	WHT/RED and YEL/RED	Connect the YEL/RED terminal to the WHT/GRN terminal, and the WHT/RED terminal to the BLK terminal momentarily.	Check door lock operation: All doors should unlock.	• Faulty actuator • An open in the wire • Blown No. 1 (20 A) fuse in the under-dash fuse/relay box
		Connect the WHT/RED terminal to the WHT/GRN terminal, and the YEL/RED terminal to the BLK terminal momentarily.	Check door lock operation: All doors should lock.	

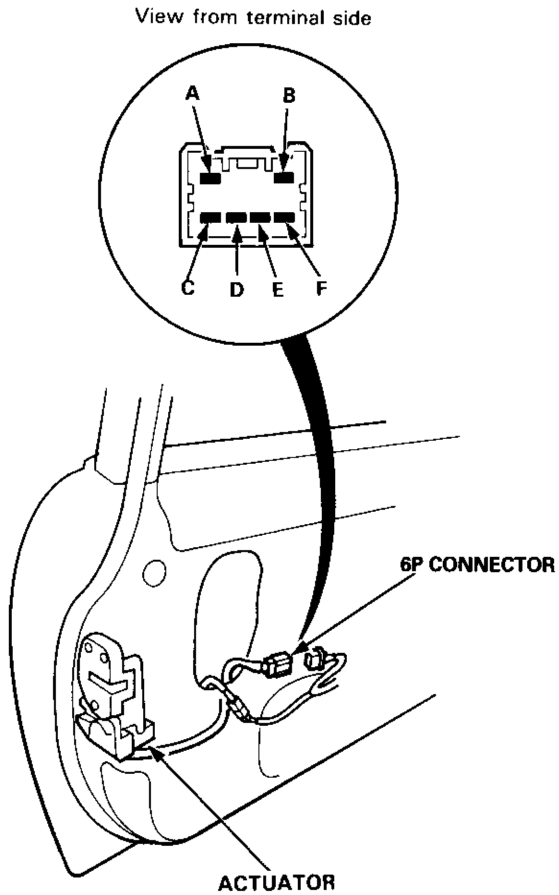
Reconnect the 14P connector to the power door lock control unit.

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
3	WHT/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 1 (20 A) fuse in the under-dash fuse/relay box • An open in the wire
4	GRN/WHT	Driver's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door lock switch • Poor ground (G501, G502) • An open in the wire
	GRN/RED	Driver's door lock switch in UNLOCK		
5	BLK/WHT	Right front door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door lock switch • Poor ground (G201, G401) • An open in the wire
	BLK/RED	Right front door lock switch in UNLOCK		
6	BLU/WHT	Driver's door lock knob in LOCK	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door lock actuator • Poor ground (G501, G502) • An open in the wire
	BLU/RED	Driver's door lock knob in UNLOCK		
7	BRN	Driver's door key cylinder in UNLOCK	Check for voltage to ground: There should be 1 V or less as the switch is turned.	• Faulty driver's door key cylinder switch • Poor ground (G501, G502 • An open in the wire
8	LT BLU	Front passenger's door key cylinder in LOCK	Check for voltage to ground: There should be 1 V or less as the switch is turned.	• Faulty front passenger's door cylinder switch • Poor ground (G201 G401) • An open in the wire
	LT GRN	Front passenger's door key cylinder in UNLOCK		

CAUTION: To prevent damage to the motor, apply battery voltage only momentarily.

Driver's Door Lock Actuator Test

1. Remove the door panel (see section 20).
2. Disconnect the 6P connector from the actuator.



3. Check actuator operation by connecting power and ground according to the table.

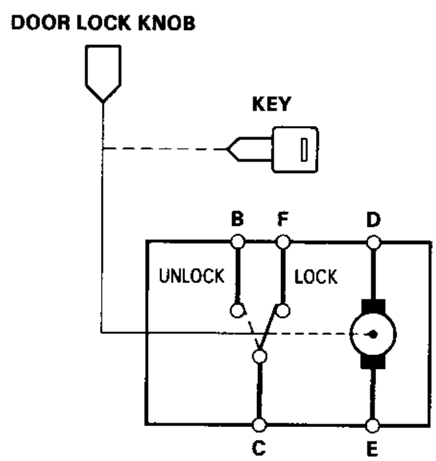
Terminal / Position	D	E
LOCK	⊕	⊖
UNLOCK	⊖	⊕

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

4. If the actuator fails to work properly, replace it.

5. Check for continuity between the terminals in each switch position according to the table.

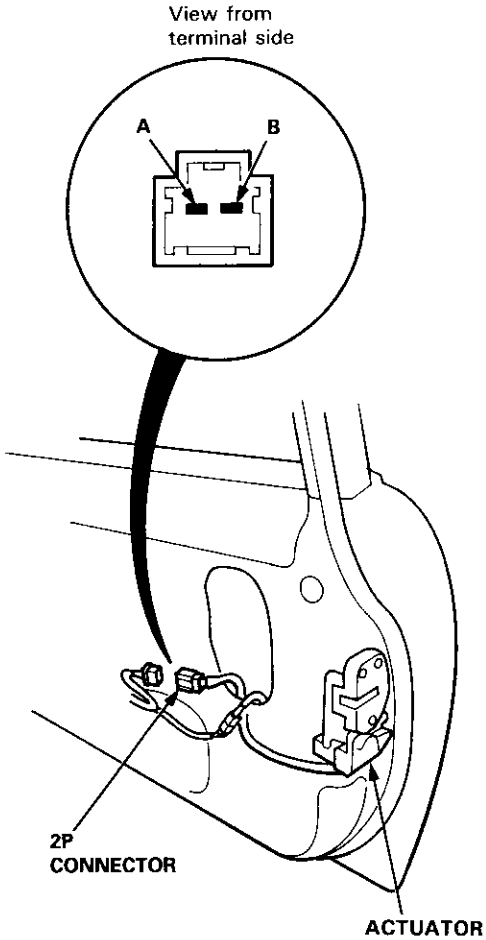
Terminal / Position	F	C	B
LOCK	O	O	
UNLOCK		O	O



Passenger's Door Lock Actuator Test

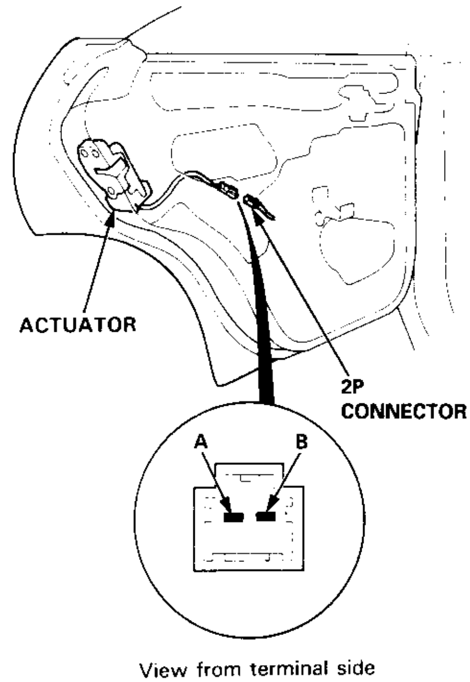
1. Remove the door panel (see section 20).
2. Disconnect the 2P connector from the actuator.

Front Passenger's Door:



Rear Passenger's Door:

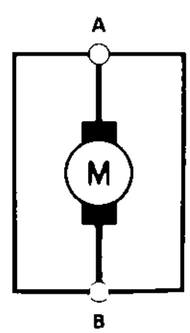
NOTE: Left rear actuator is shown, right rear actuator is similar.



3. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	A	B
LOCK	⊖	⊕
UNLOCK	⊕	⊖

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.



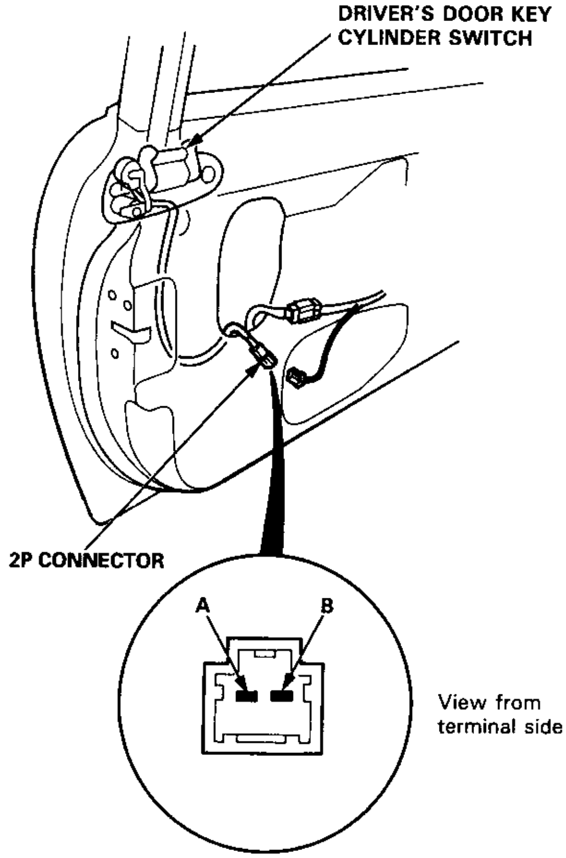
4. If the actuator fails to work properly, replace it.

Power Door Locks

Driver's Door Key Cylinder Switch Test

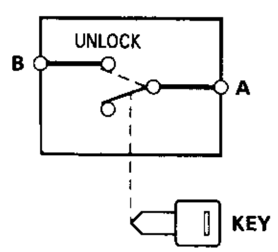
1. Remove the door panel (see section 20).

2. Disconnect the 2P connector from the switch.



3. Check for continuity between the terminals in each switch position according to the table.

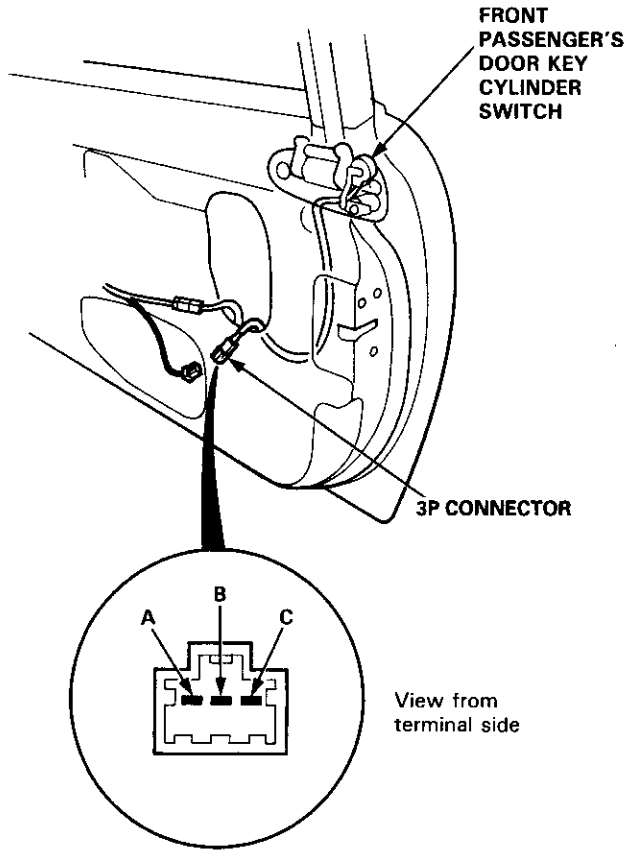
Terminal / Position	A	B
UNLOCK	O	O
OFF		



Front Passenger's Door Key Cylinder Switch Test

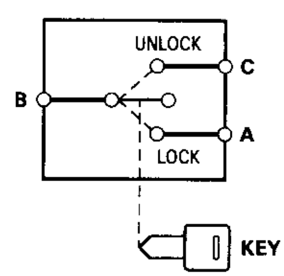
1. Remove the door panel (see section 20).

2. Disconnect the 3P connector from the switch.



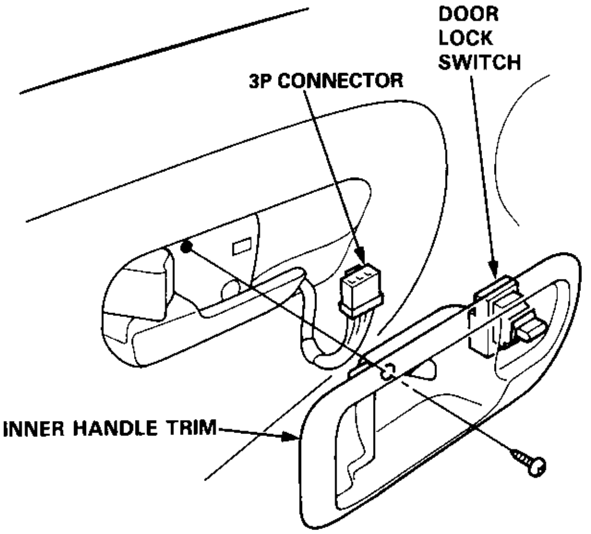
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	A	B	C
LOCK	O	O	
OFF			
UNLOCK		O	O



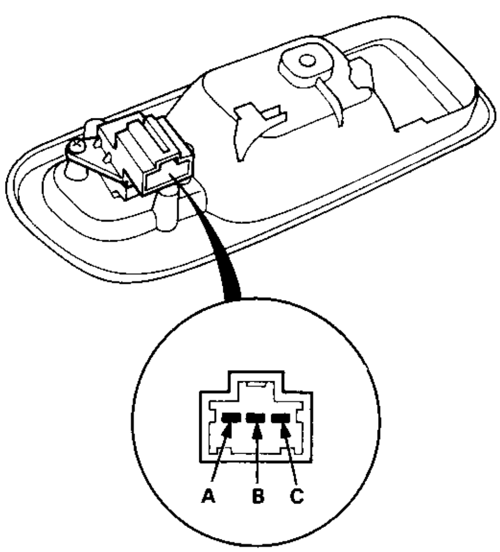
Door Lock Switch Test

1. Remove the inner handle trim.



2. Disconnect the 3P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.

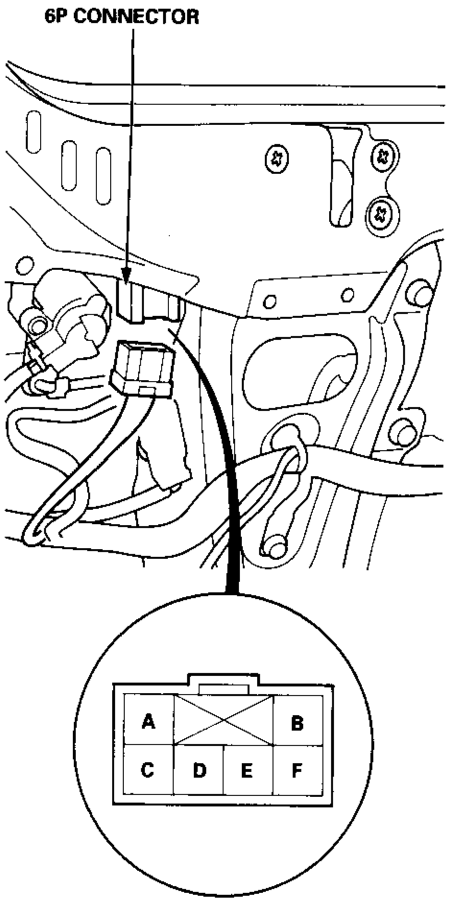
Terminal / Position	A	B	C
LOCK	○—	—○	
OFF			
UNLOCK		○—	—○



Power Door Locks

Hatch Lock Actuator Test

1. Remove the rear trim panel (see section 20).
2. Disconnect the 6P connector from the actuator.



View from terminal side

3. Check actuator operation by connecting power and ground according to the table.

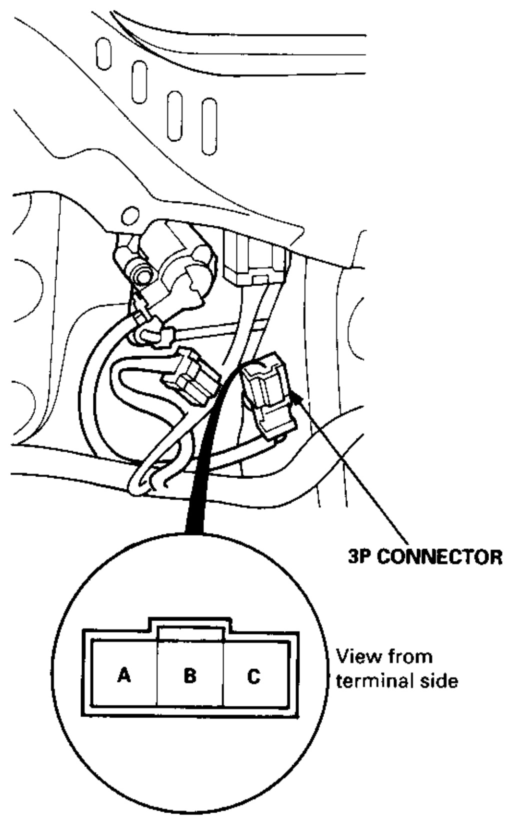
Terminal / Position	D	E
LOCK	⊕	⊖
UNLOCK	⊖	⊕

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

4. If the actuator fails to work properly, replace it.

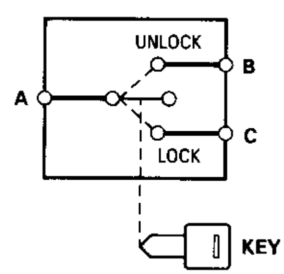
Hatch Key Cylinder Switch Test

1. Remove the rear trim panel (see section 20).
2. Disconnect the 3P connector from the switch.

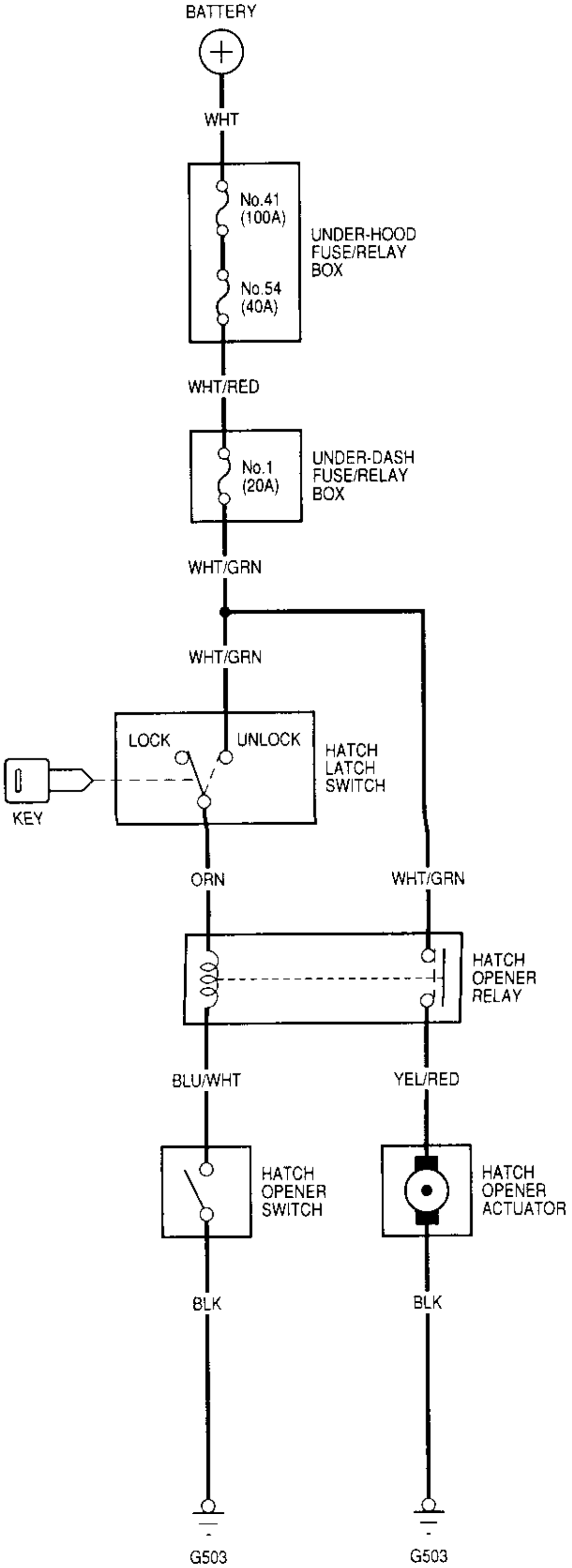


3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	A	B	C
LOCK		O—	—O
OFF			
UNLOCK	O—	—O	

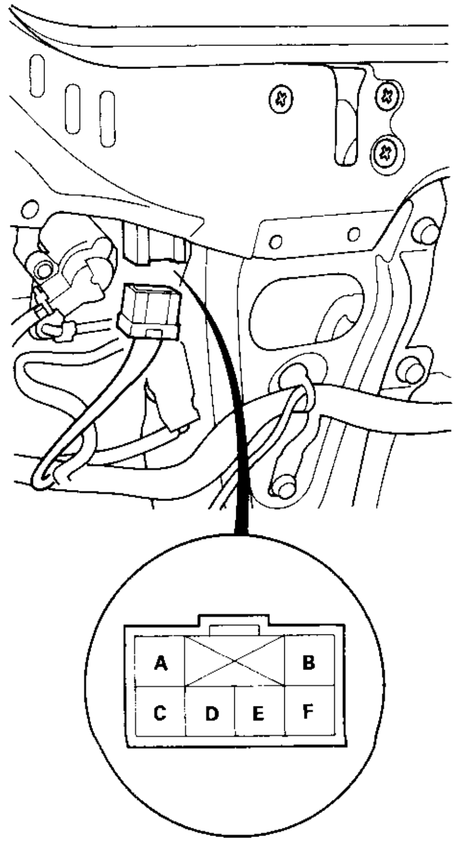


Circuit Diagram



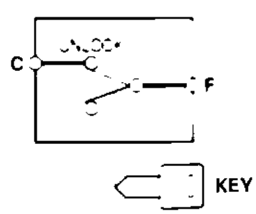
Hatch Latch Switch Test

1. Remove the rear trim panel (see section 20).
2. Disconnect the 6P connector from the switch.



3. Check for continuity between the terminals in each switch position according to the table.

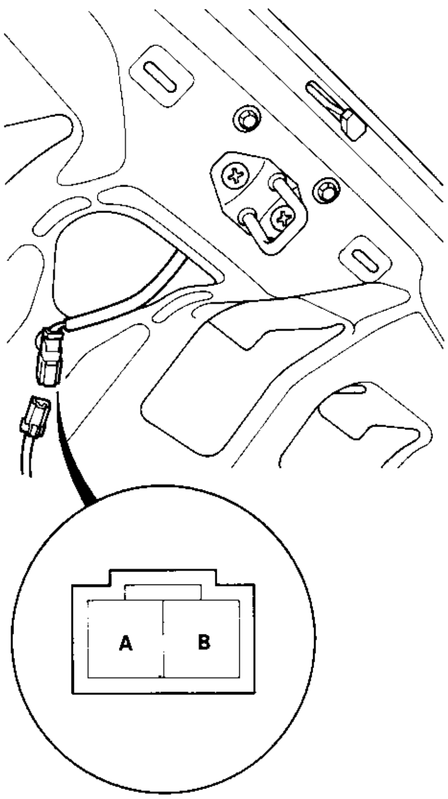
Terminal / Position	C	F
UNLOCK	○	○
LOCK		



Hatch Opener

Hatch Opener Switch Test/ Replacement

1. Remove the hatch trim panel (see section 20).
2. Disconnect the 2P connector from the switch.



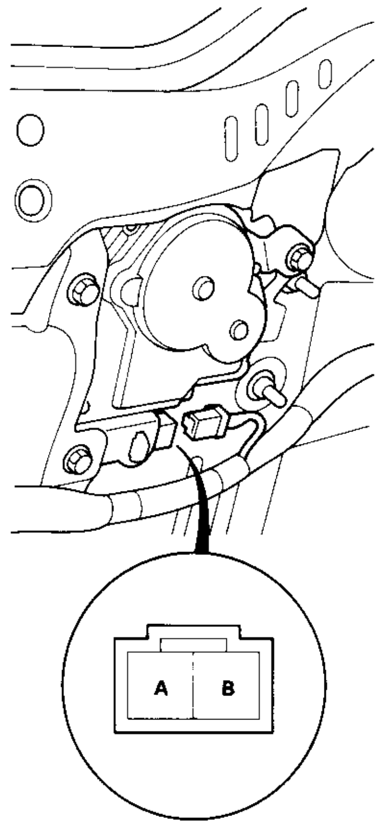
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	A	B
ON	O—	—O
OFF		

4. If necessary, remove the two mounting bolts to pull out the hatch opener switch from the hatch.

Hatch Opener Actuator Test

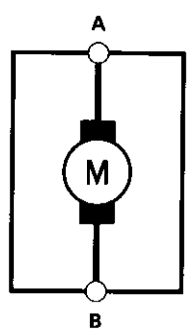
1. Remove the rear trim panel (see section 20).
2. Disconnect the 2P connector from the actuator.



3. Check actuator operation by connecting power and ground according to the table.

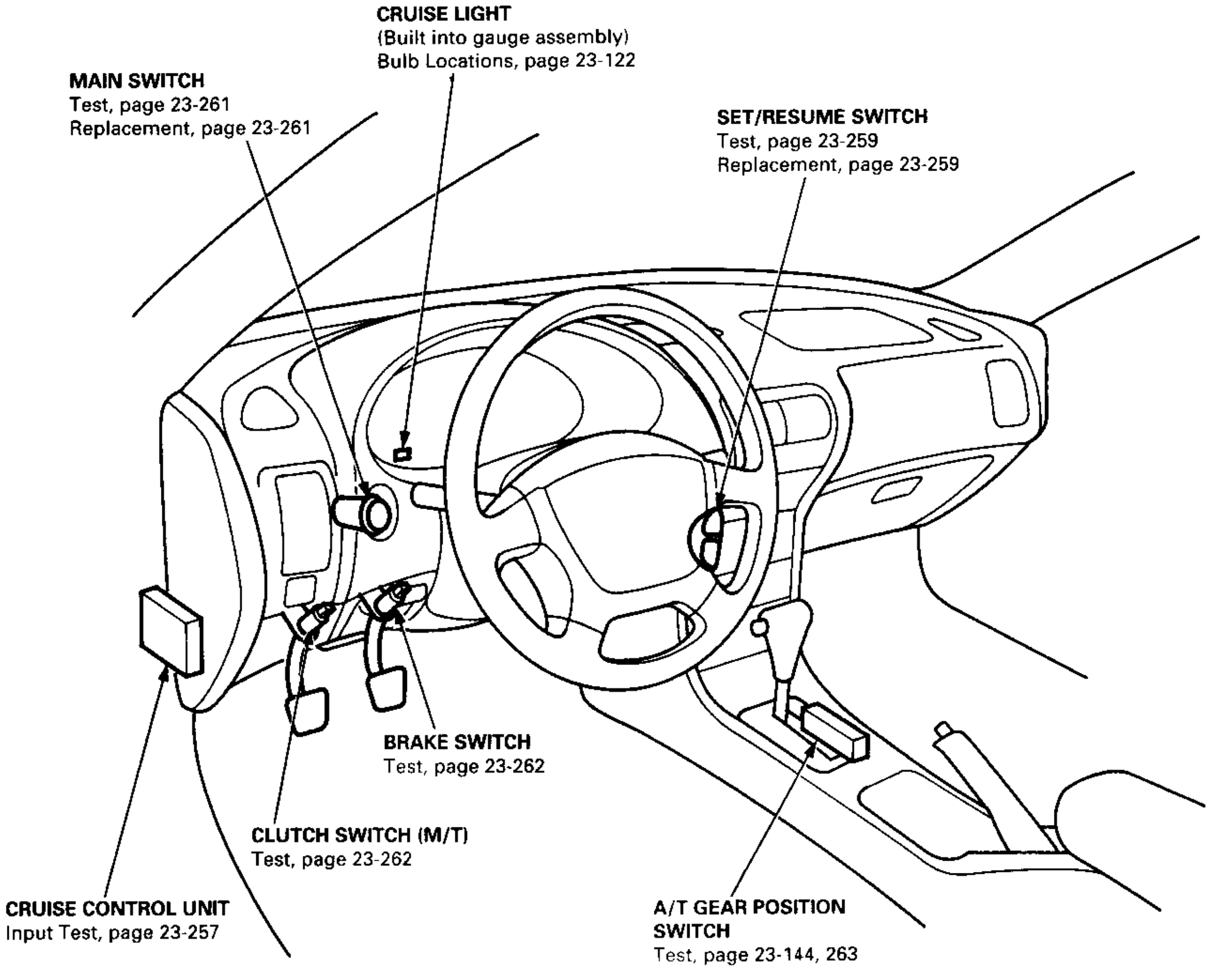
Position \ Terminal	A	B
OPEN	⊕	⊖

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.



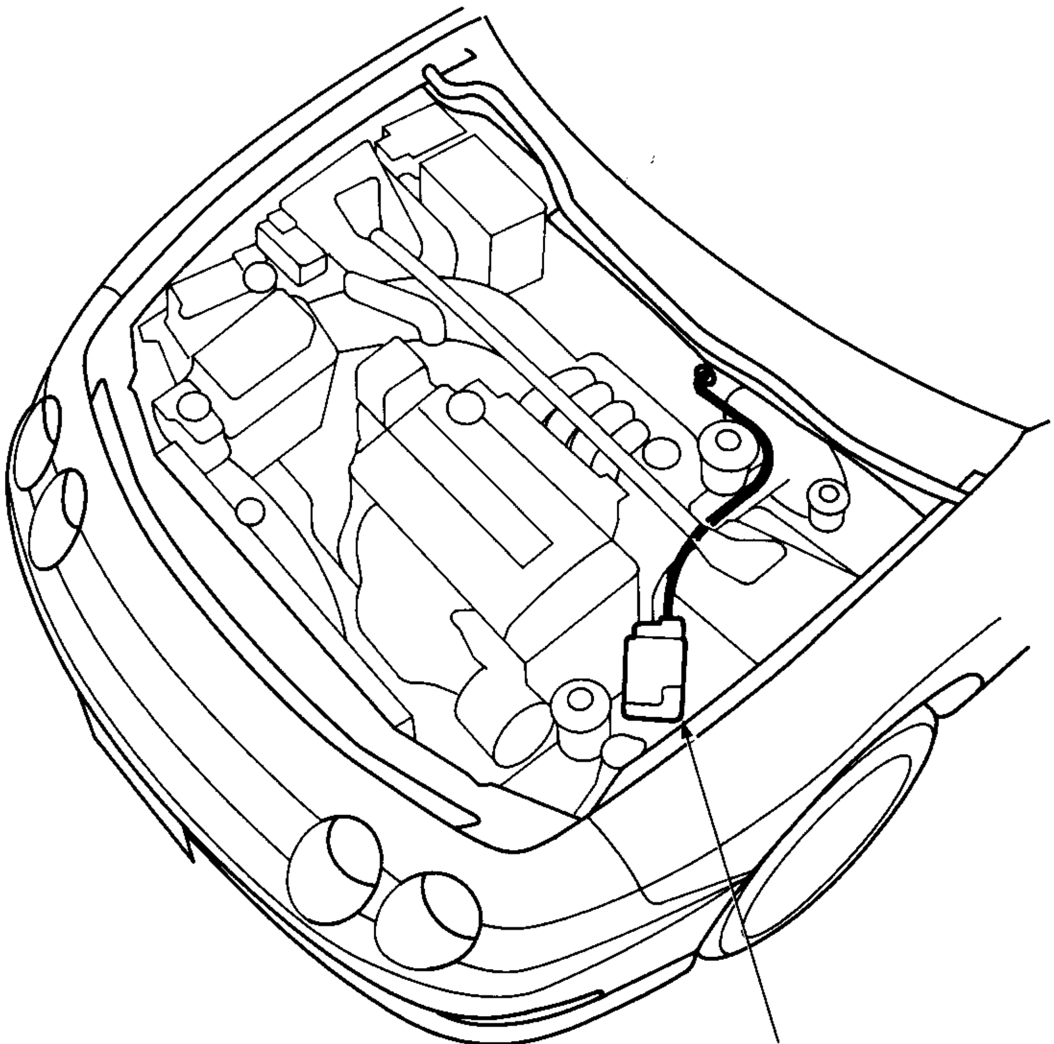
4. If the actuator fails to work properly, replace it.

Component Location Index

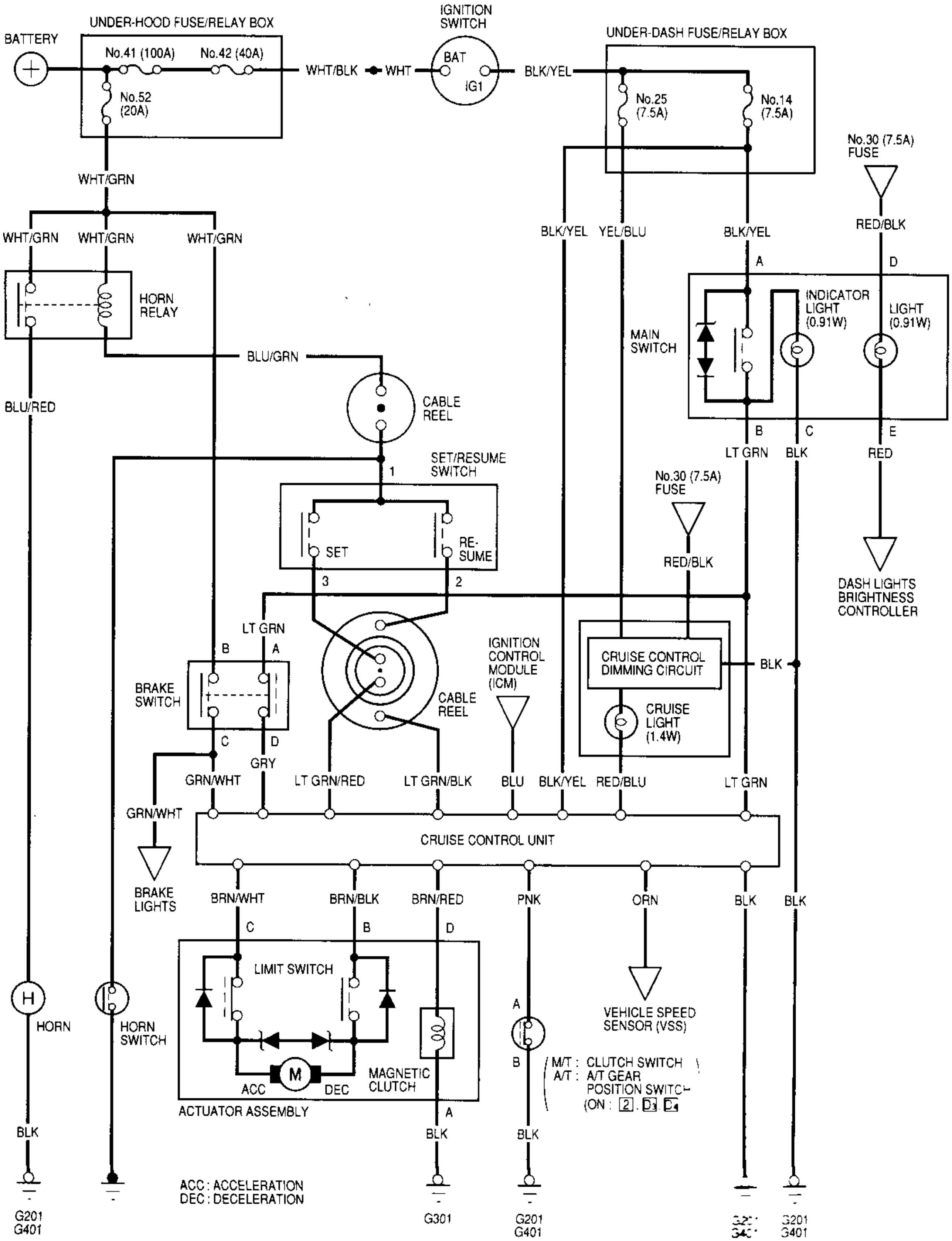


(cont'd)

Component Location Index (cont'd)



Circuit Diagram



Troubleshooting

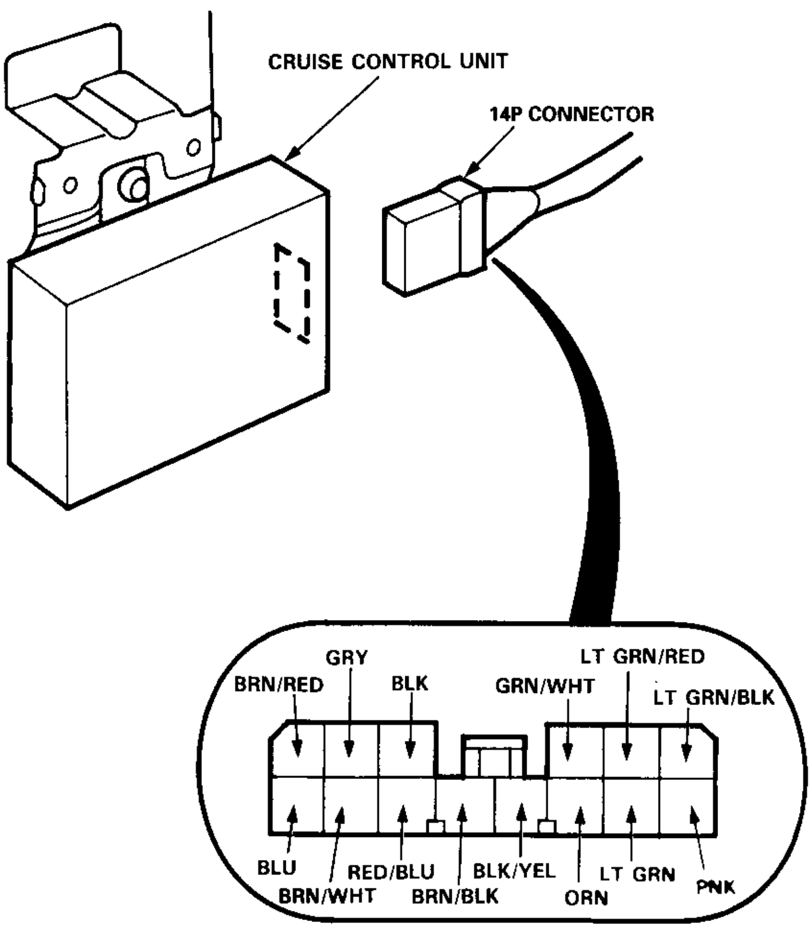
NOTE:

- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting,
  - — check the No. 25 (7.5 A) and No. 14 (7.5 A) fuses in the under-dash fuse/relay box, and the No. 41 (100 A), No. 42 (40 A), and No. 52 (20 A) fuses in the under-hood fuse/relay box.
  - — check that the horn sounds.
  - — check the tachometer to see if it works properly.

Item to be inspected / Symptom	Main switch	SET/RESUME switch	Brake switch and mounting	Clutch switch and mounting (M/T)	A/T gear position switch (A/T)	Vehicle speed sensor (VSS)	Dimming circuit in gauges	Actuator and cable deflection	Control unit	Poor ground	Open circuit, loose or disconnected terminals
Cruise control cannot be set.	1	2	3	4					5	G301, G201, G401	BLU/GRN, LT GRN/RED, BLU, BLK/YEL, LT GRN, GRY, ORN, BRN/WHT, BRN/BLK, BRN/RED or PNK
Cruise control can be set, but indicator light does not go on.							1		2	G201, G401	YEL or RED/BLU
Cruise speed is noticeably higher or lower than what was set.						2		1	3		
Excessive overshooting or undershooting when trying to set speed						2		1	3		
Steady speed is not held even on a flat road with cruise control set.						1		2	3		
Car does not decelerate or accelerate accordingly when SET or RESUME button is pushed.		1							2		LT GRN/BLK LT GRN/RED
Set speed is not cancelled when clutch pedal is pushed (M/T).				1					2		
Set speed is not cancelled when shift lever is moved to [N] (A/T).					1				2		
Set speed is not cancelled when brake pedal is pushed.			1						2		
Set speed is not cancelled when main switch is pushed OFF.	1								2		
Set speed is not resumed when RESUME button is pushed (with main switch on, but set speed temporarily cancelled).		1							2		LT GRN/BLK LT GRN/RED

Control Unit Input Test

1. Remove the dashboard lower cover and knee bolster (see page 23-71).
2. Disconnect the 14P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the control unit must be faulty; replace it.



View from wire side

(cont'd)

Control Unit Input Test (cont'd)

No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G201, G401) • An open in the wire
2	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
3	LT GRN	Ignition switch ON (II) and main switch ON	Check for voltage to ground: There should be battery voltage.	• Faulty main switch • An open in the wire
4	GRY	Ignition switch ON (II), main switch ON and brake pedal pushed, then released	Check for voltage to ground: There should be 0 V with the pedal pushed and battery voltage with the pedal released.	• Faulty brake switch • An open in the wire
5	GRN/WHT	Brake pedal pushed, then released	Check for voltage to ground: There should be battery voltage with the pedal pushed, and 0 V with the pedal released.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty brake switch • An open in the wire
6	RED/BLU	Ignition switch ON (II)	Connect to ground: Indicator light in the gauge assembly comes on.	• Blown bulb • Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Faulty dimming circuit in the gauge assembly • An open in the wire
7	LT GRN/BLK	RESUME button pushed	Check for voltage to ground: There should be battery voltage.	• Faulty SET/RESUME switch • Faulty cable reel • An open in the wire
8	LT GRN/RED	SET button pushed		
9	PNK	MT/: Clutch pedal released A/T: Shift lever in [2], [D3], or [D4]	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the clutch pedal is depressed or when the shift lever is in other positions.	• Faulty or misadjusted clutch switch (M/T) • Faulty A/T gear position switch (A/T) • Poor ground (G201,G401) • An open in the wire
10	BLU	Start the engine.	Check for voltage to ground: There should be voltage.	• Faulty ignition system or ECM • An open in the wire
11	ORN	Ignition switch ON (II) and main switch ON; raise the front of the car, rotate one wheel slowly.	Check for voltage between the ORN ⊕ and BLK ⊖ terminals: There should be 0— about 5 V—0— about 5 V repeatedly.	• Faulty vehicle speed sensor (VSS) • An open in the wire
12	BRN/WHT	Connect battery power to the BRN/WHT terminal and ground to the BRN/BLK terminal.	Check the sound of the actuator motor: You should hear the motor running smoothly.	• Faulty actuator • An open in the wire
13	BRN/BLK			
14	BRN/RED	Connect battery power to the BRN/RED terminal.	Check the operation of the magnetic clutch: Clutch should click and output link should be locked.	• Faulty actuator • An open in the wire • Poor ground (G301)

Set/Resume Switch Test/Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.

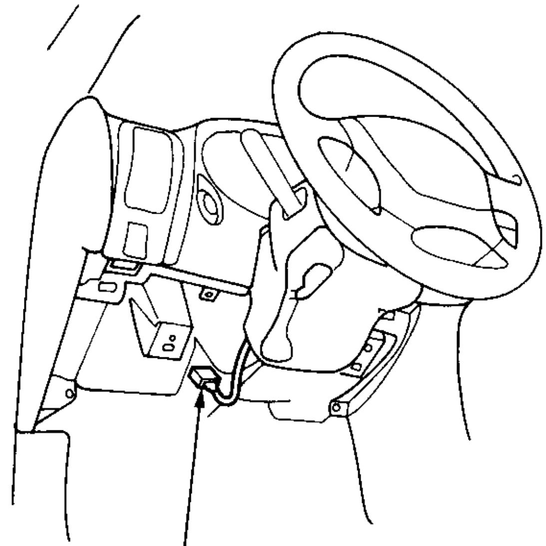
2. Disconnect each airbag connector.

   Driver's Side:
   - Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

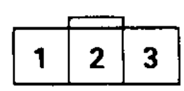
   Front Passenger's Side:
   - Remove the glove box.
   - Disconnect the 2P connector between the front passenger's airbag and SRS main harness.

3. Remove the dashboard lower cover and knee bolster (see page 23-71).

4. Disconnect the cable reel 3P connector from the main wire harness.



5. Check for continuity between the terminals of the cable reel sub-harness 3P connector in each switch position according to the table.



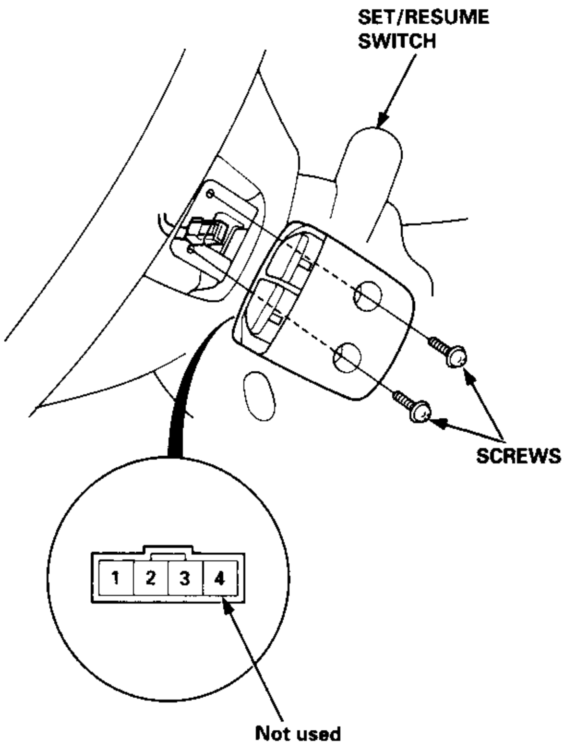
Position \ Terminal	1	2	3
SET (ON)	○	○	
RESUME (ON)		○	○

- If there is continuity, and it matches the table, the switch is OK.
- If there is no continuity in one or both positions, go to step 6.

(cont'd)

Set/Resume Switch Test/Replacement (cont'd)

6. Remove the two screws and set/resume switch.



7. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3
SET (ON)	O		O
RESUME (ON)	O	O	

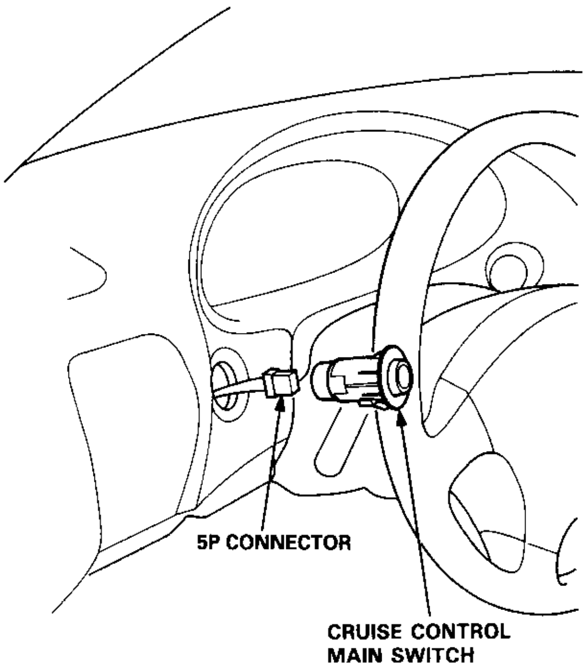
- If it matches the table, the switch is OK, replace the cable reel.
- If there is no continuity in one or both positions, replace the switch.

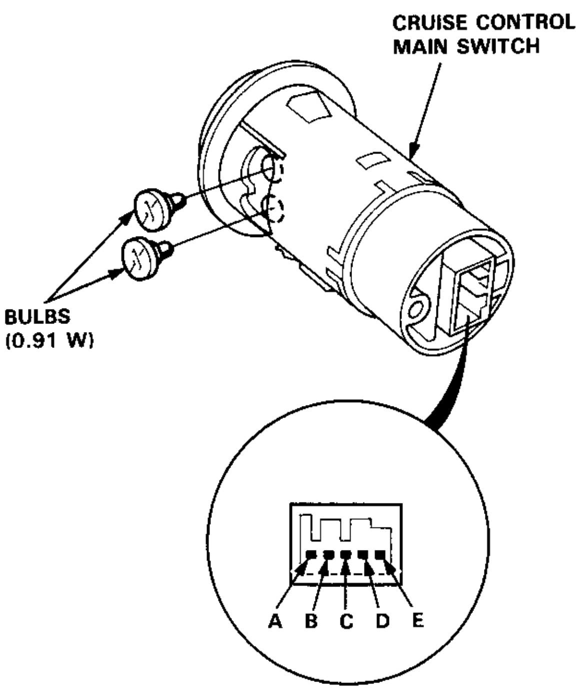
8. If all tests prove OK, reinstall the set/resume switch.
9. Reconnect the driver's airbag connectors, and reinstall the access panel on the steering wheel.
10. Reconnect the front passenger's airbag connector, and reinstall the glove box.
11. Connect the battery positive cable, then connect the negative cable.
12. After installing the airbag assembly, confirm that the SRS indicator light should come on for about six seconds and then go off with the ignition switch ON (II).

Main Switch Test/Replacement

NOTE: Be careful not to damage the switch and the instrument panel.

1. Remove the instrument panel from the dashboard (see page 23-126).
2. Remove the switch from the dashboard, then disconnect the 5P connector.

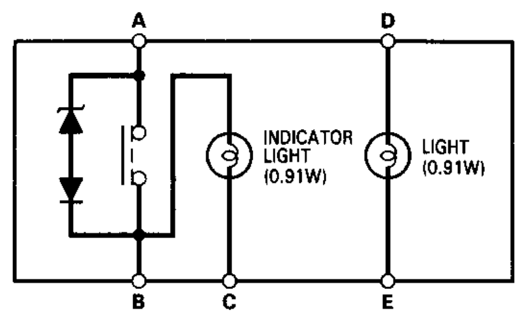




3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	A	B		C	D		E
OFF		○—	—⊚—	—○	○—	—⊚—	—○
ON	○—	—○—	—⊚—	—○	○—	—⊚—	—○

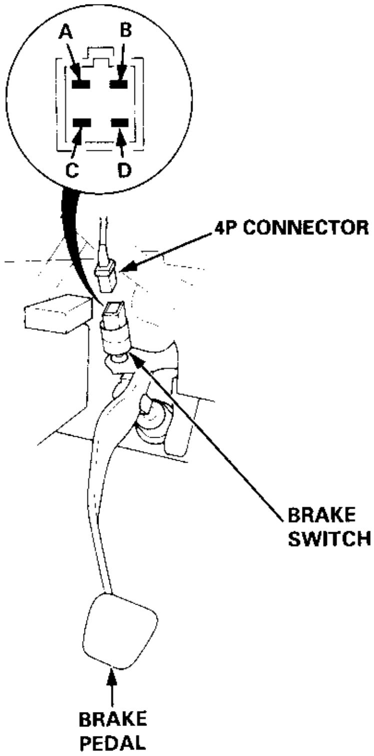
- If there is no continuity in any position, replace the switch.



Cruise Control

Brake Switch Test

1. Disconnect the 4P connector from the switch.



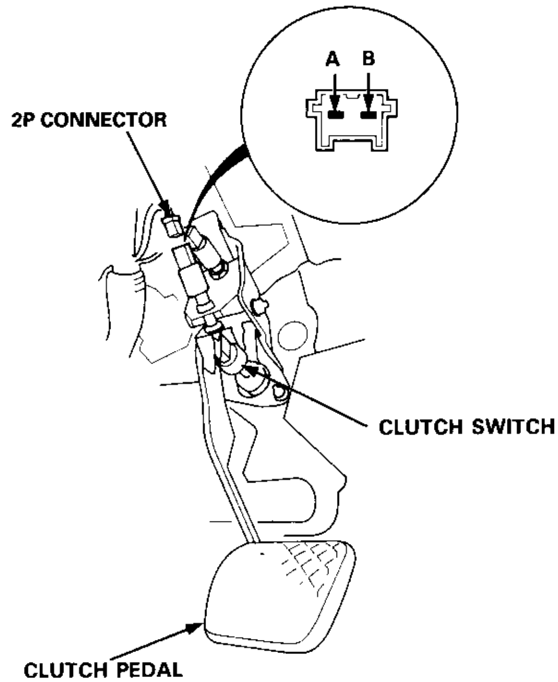
2. Check for continuity between the terminals according to the table.

Terminal / Brake pedal	A	B	C	D
RELEASED	O			O
PUSHED		O	O	

3. If necessary, replace the switch or adjust pedal height (see section 19).

Clutch Switch Test (M/T)

1. Disconnect the 2P connector from the switch.



2. Check for continuity between the terminals according to the table.

Terminal / Clutch pedal	A	B
RELEASED	O	O
PUSHED		

3. If necessary, replace the switch or adjust pedal height (see section 12).

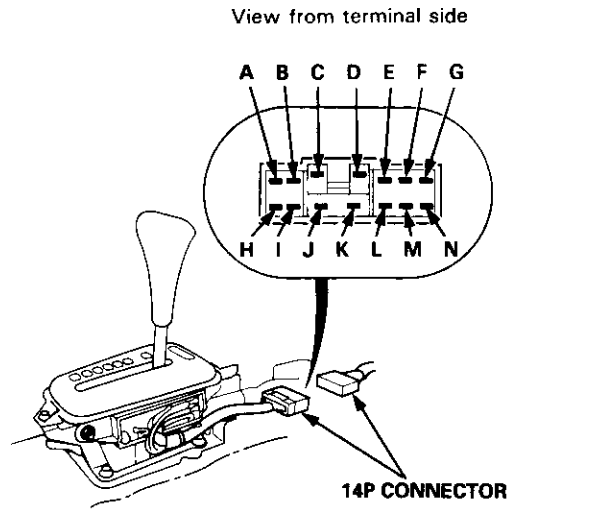
A/T Gear Position Switch Test

1. Remove the center console, then disconnect the 14P connector from the switch.
2. Check for continuity between the terminals in each switch position according to the table.

NOTE:
- Move the lever back and forth at each position without touching the button, and check for continuity within the range of free play of the shift lever.
- If there is no continuity within the range of free play, adjust the installation position of the switch.

A/T Gear Position Switch (For cruise control)

Position \ Terminal	A	I
1		
2	O	O
D3	O	O
D4	O	O
N		
R		
P		

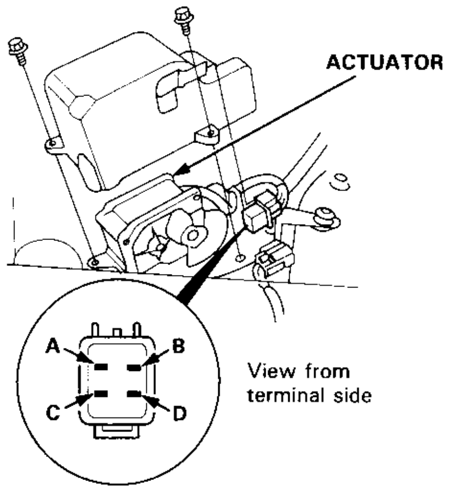


3. If necessary, replace the switch (see section 14).

Cruise Control

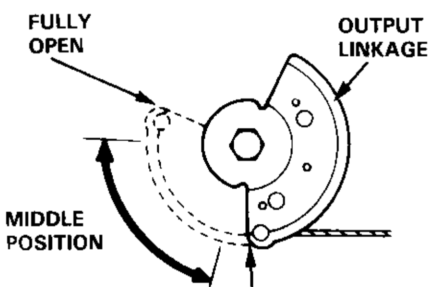
Actuator Assembly Test

1. Disconnect the 4P connector from the actuator.
2. Check that the output linkage moves smoothly.
3. Connect battery power to the D terminal and ground to the A terminal.



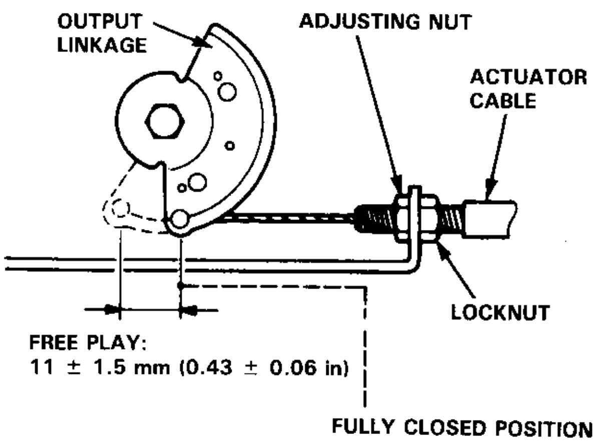
4. Check for a clicking sound from the magnetic clutch, and that the output linkage is locked. If the output linkage is not locked, replace the actuator assembly.
5. Check the operation of the actuator motor in each output linkage position according to the table (you should be able to hear the motor).

Battery polarities		Output linkage position		
⊕	⊖	FULLY CLOSED	MIDDLE POSITION	FULLY OPEN
C Terminal	B Terminal	The motor runs.	The motor runs.	The motor stops.
B Terminal	C Terminal	The motor stops.	The motor runs.	The motor runs.



Actuator Cable Adjustment

1. Check that the actuator cable operates smoothly without binding or sticking.
2. Start the engine, and warm it up to normal operating temperature (radiator fans come on twice).
3. Measure how far the output linkage moves from the fully closed position. Free play should be 11 ± 1.5 mm (0.43 ± 0.06 in).

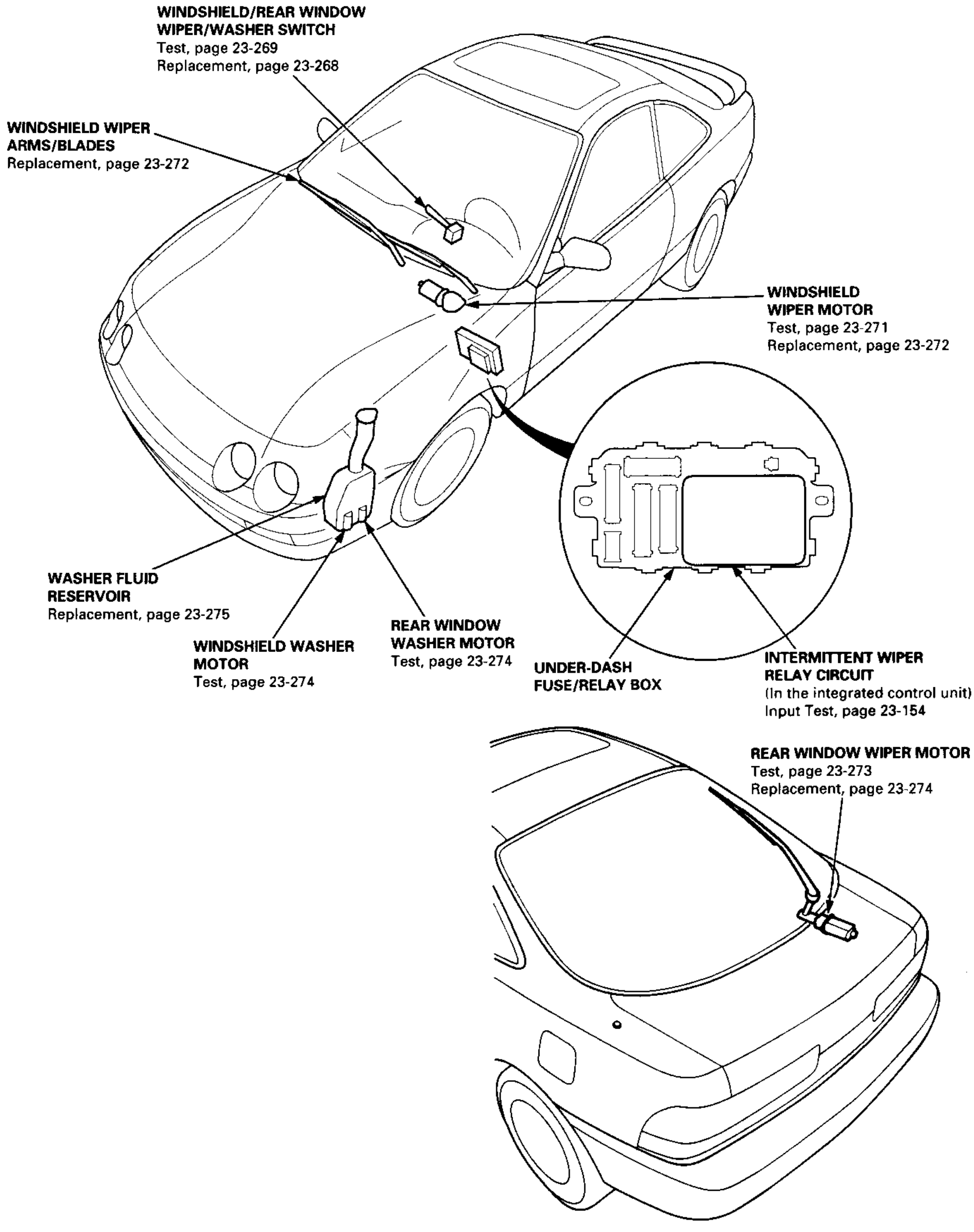


4. If the free play is not within specs, loosen the locknut, and turn the adjusting nut as required.

   NOTE: If necessary, check the throttle cable (see section 11), then recheck the output linkage free play.

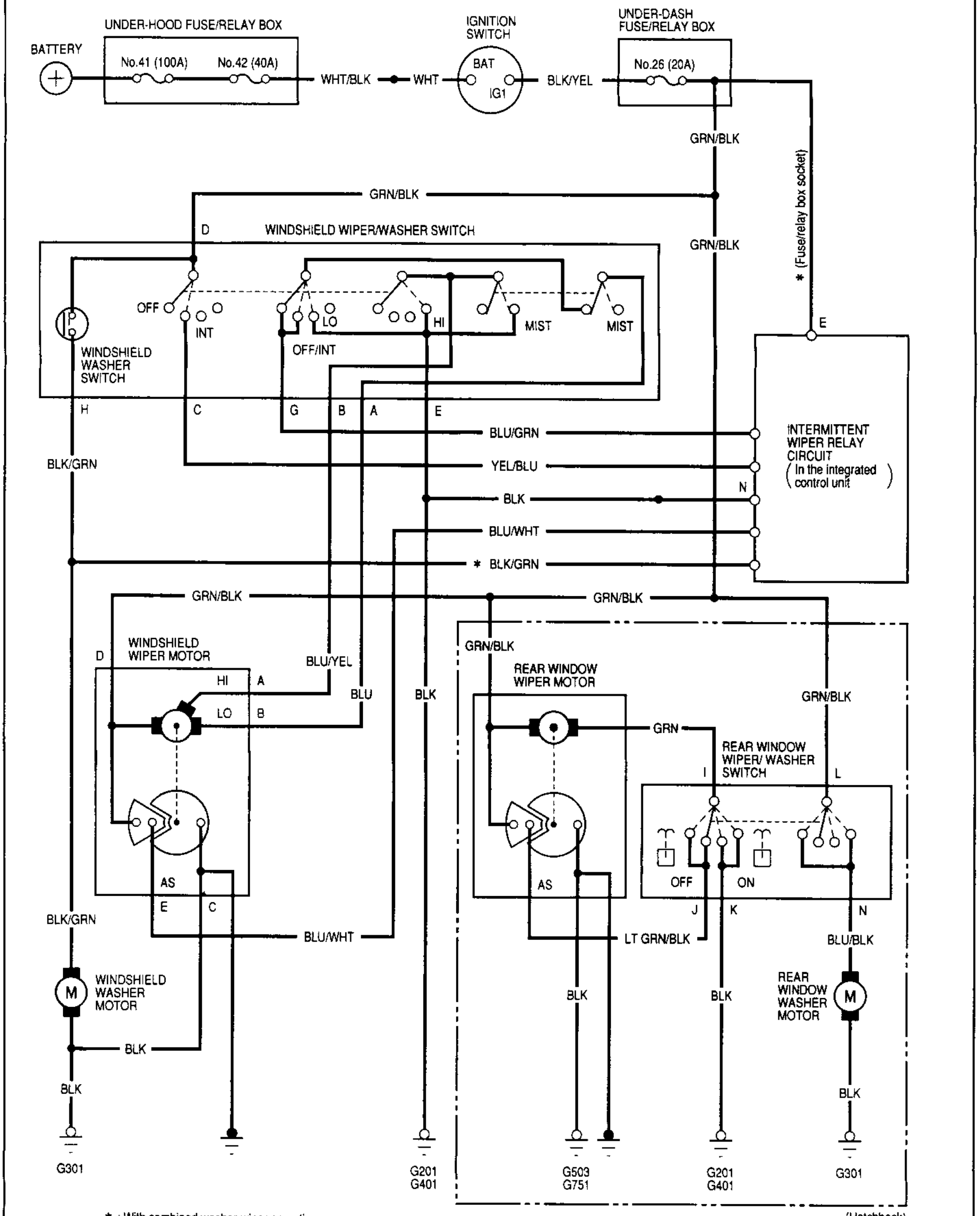
5. Retighten the locknut, and recheck the free play.

Component Location Index



Wipers/Washers

Circuit Diagram



* : With combined washer-wiper operation

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom \ Item to be inspected		Blown No. 26 (20 A) fuse (In the under-dash fuse/relay box)	Wiper switch	Wiper motor	Washer switch	Washer motor	Intermittent wiper relay circuit (In the integrated control unit)	Not enough washer fluid in reservoir	Disconnected, blocked washer hose or clogged outlet	Disconnected wiper linkages	*Combined operation of wiper/washer (In the integrated control unit)	Poor ground	Open circuit, loose or disconnected terminals
Wipers do not work.	In all positions	1	4	2						3		G201, G301, G401	GRN/BLK
	In INT		1	3			2						YEL/BLU, BLU/GRN
	In LO or HI		1	2									BLU, BLU/YEL
	In MIST		1	2									BLU/YEL
Rear window wiper does not work.		1	3	2								G503, G751	GRN/BLK, GRN LT GRN/BLK
Blades do not return to park position when the switch is turned OFF.			2	1									BLU/WHT, LT GRN/BLK
Intermittent cycle is erratic or wipers do not work intermittently.			1				2						YEL/BLU, BLU/GRN
Little or no washer fluid is pumped.					4	3		1	2			G301	BLK/GRN, BLU/BLK
Wiper and washer do not work at the same time.				3		2					1		BLK/GRN

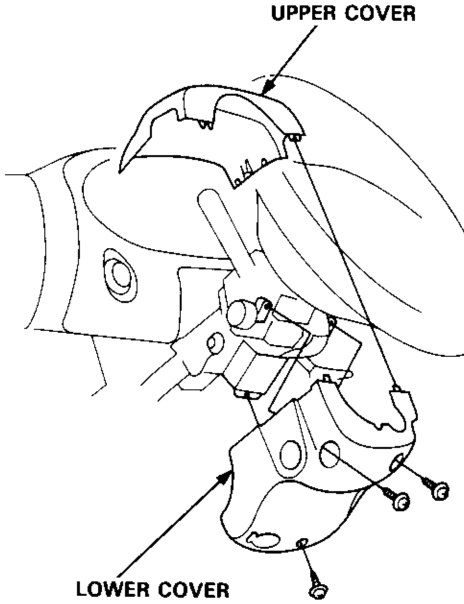
*: Canada

Wipers/Washers

Wipers/Washers Switch Replacement

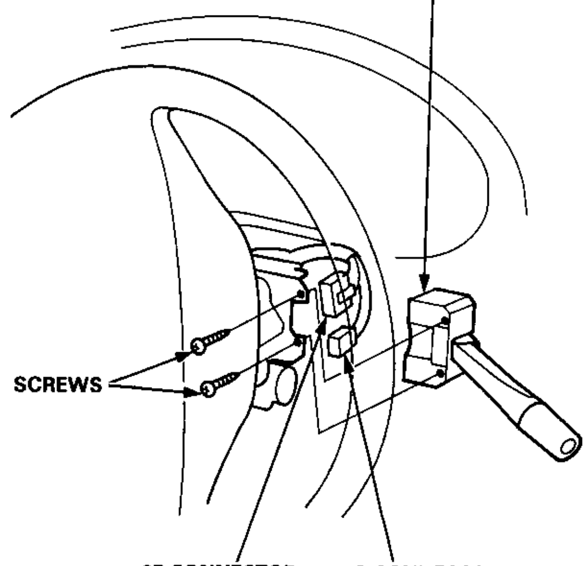
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (23) before performing repairs or service.

1. Remove the steering column covers.



2. Disconnect the 8P and 6P connectors from the switch.

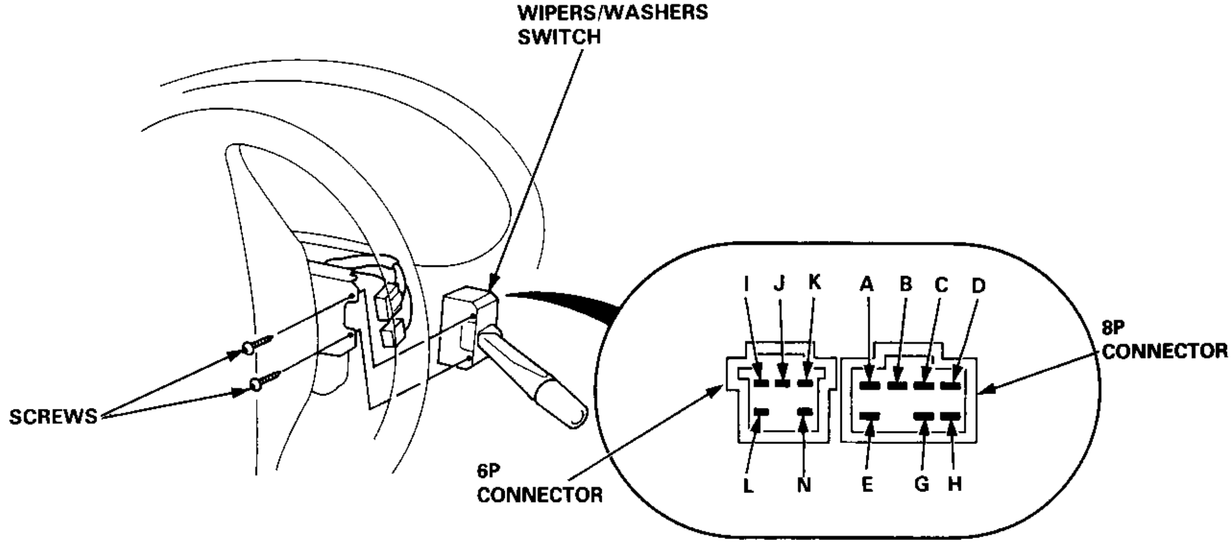
3. Remove the two screws and the switch.



4. Install in the reverse order of removal.

Wipers/Washers Switch Test

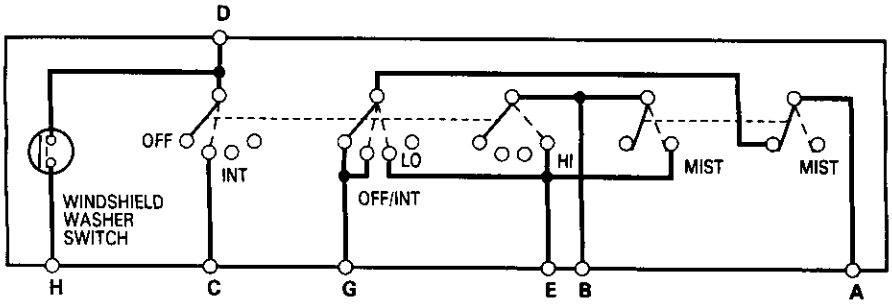
1. Remove the steering column covers.
2. Disconnect the 8P and 6P connectors from the switch.
3. If necessary, remove the two screws and the switch.
4. Check for continuity between the terminals in each switch position according to the table.



(cont'd)

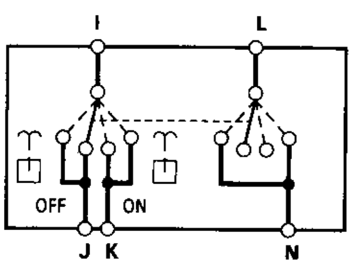
Wipers/Washers Switch Test (cont'd)

Windshield Wiper/Washer Switch



Terminal / Position	A	B	C	D	E	G	H
OFF	○					○	
INT			○	○			
	○					○	
LO	○				○		
HI		○			○		
Mist switch "ON"		○			○		
Washer switch "ON"				○			○

Rear Window Wiper/Washer Switch



Terminal / Position	I	J	K	L	N
Washer switch "ON"	○	○		○	○
OFF	○	○			
ON	○		○		
Washer switch "ON" (with wiper "ON")	○		○	○	○

Windshield Wiper Motor Test

1. Open the hood, and remove the cap nuts and the wiper arms (see page 23-272).

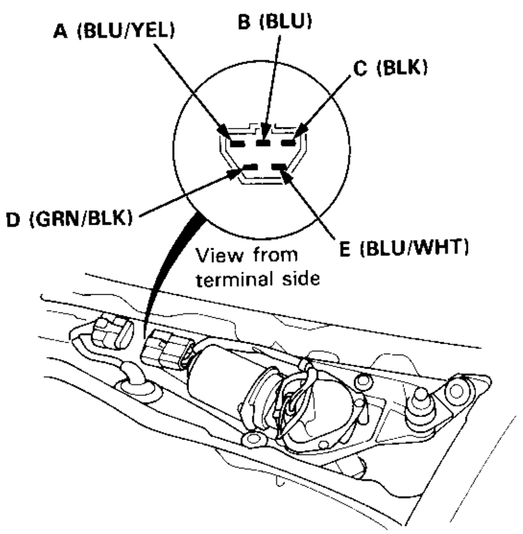
   NOTE: Remove the wiper arms carefully without damaging the hood.

2. Remove the hood seal and air scoop by prying out their trim clips.

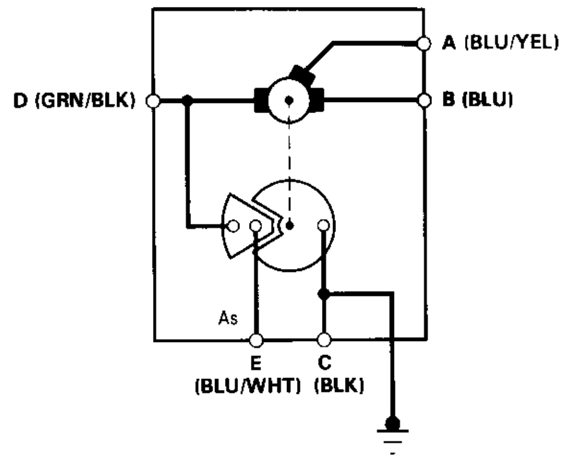
3. Disconnect the 5P connector from the windshield wiper motor.

4. Test the motor by connecting battery power and ground according to the table.

Position \ Terminal	D (GRN/BLK)	B (BLU)	A (BLU/YEL)
LOW SPEED	⊕	⊖	
HIGH SPEED	⊕		⊖



5. If the motor does not run or fails to run smoothly, replace it.



6. Reconnect the 5P connector to the wiper motor assembly.

7. Connect an analog voltmeter between the E (BLU/WHT) and the C (BLK) terminals. Run the motor by turning the wiper switch ON (LO or HI position).
   The voltmeter should alternately indicate 0 V and more than 4 V.

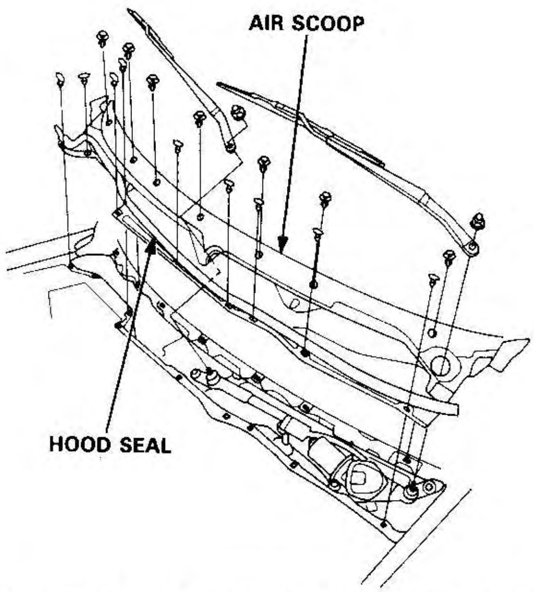
   NOTE: Use an analog tester.

Windshield Wiper Motor Replacement

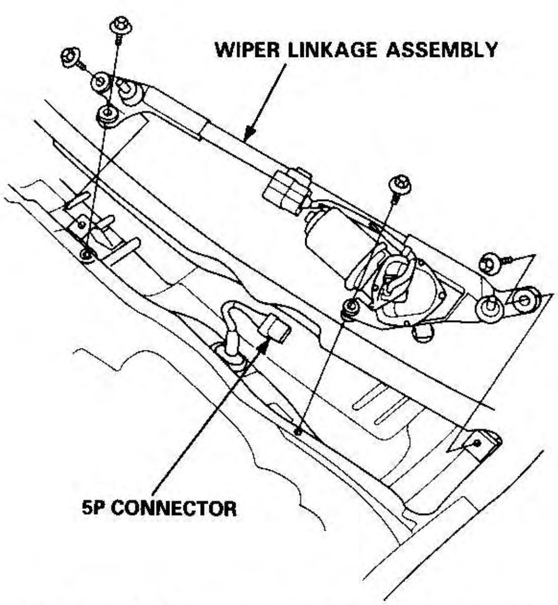
1. Open the hood, and remove the cap nuts and wiper arms.

   NOTE: Remove the wiper arms carefully without damaging the hood.

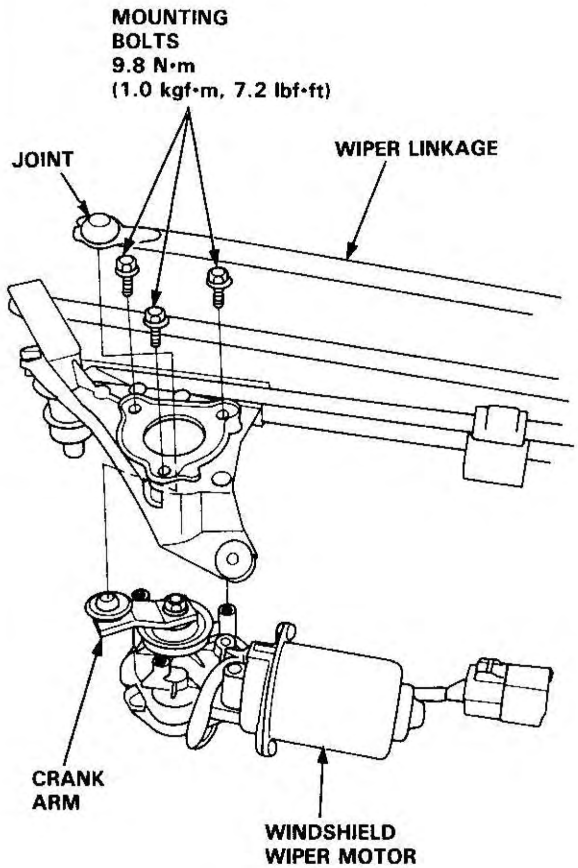
2. Remove the hood seal and air scoop by prying out their trim clips.



3. Disconnect the 5P connector from the windshield wiper motor.



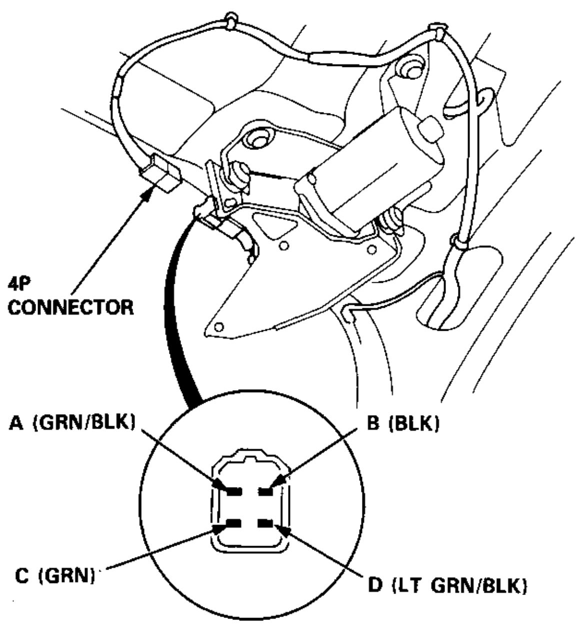
4. Remove the four mounting bolts and wiper linkage ASSEMBLY.
5. Remove the wiper harness from the wiper linkage.
6. Separate the wiper linkage and crank arm at the joint.
7. Remove the three mounting bolts and wiper motor.



8. Install in the reverse order of removal.

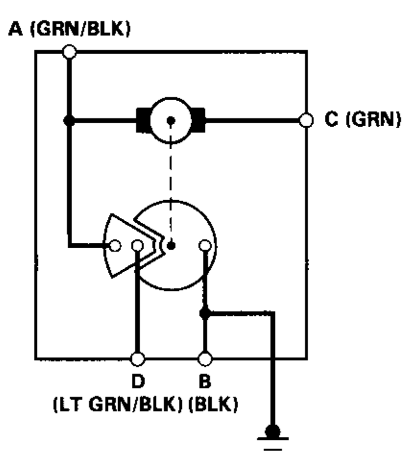
Rear Window Wiper Motor Test

1. Disconnect the 4P connector from the wiper motor.



View from terminal side

2. Test the motor by connecting battery power to the A (GRN/BLK) and ground to the C (GRN) terminals. The motor should run smoothly.

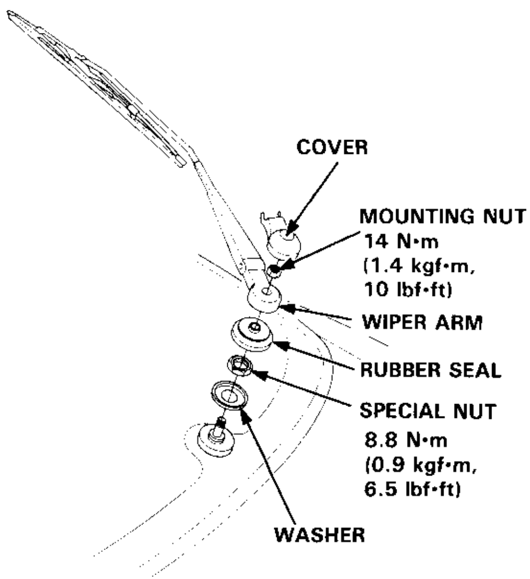


3. If the motor does not run or fails to run smoothly, replace it.
4. Reconnect the 4P connector to the wiper motor assembly.
5. Connect an analog voltmeter between the D (LT GRN/BLK) and B (BLK) terminals. Run the motor by turning the wiper switch ON.
   The voltmeter should alternately indicate 0 V and more than 4 V.

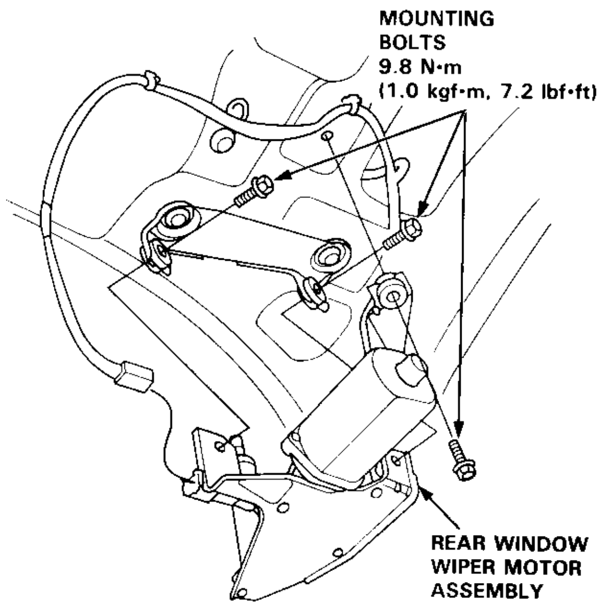
   NOTE: Use an analog tester.

Rear Window Wiper Motor Replacement

1. Remove the cover, mounting nut, and wiper arm.
2. Remove the rubber seal, special nut, and washer.



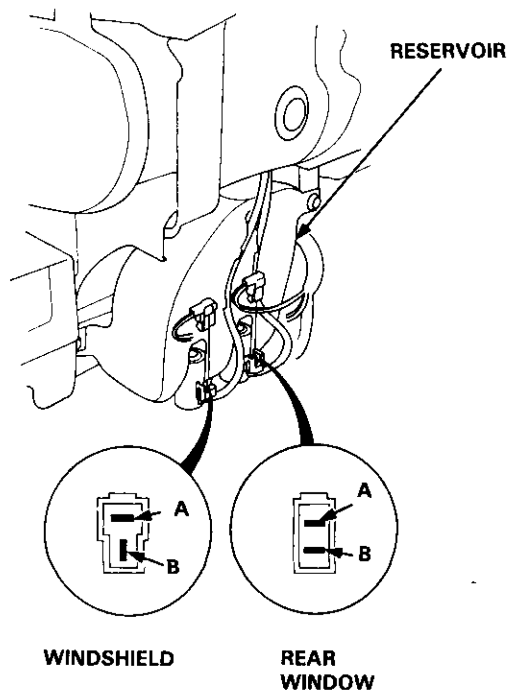
3. Open the tailgate and remove the tailgate trim panels (see section 20).
4. Disconnect the 4P connector from the wiper motor.
5. Remove the three mounting bolts and the wiper motor assembly.



6. Install in the reverse order of removal.

Washer Motor Test

1. Remove the front bumper (see section 20).
2. Disconnect the 2P connector from the washer motor.

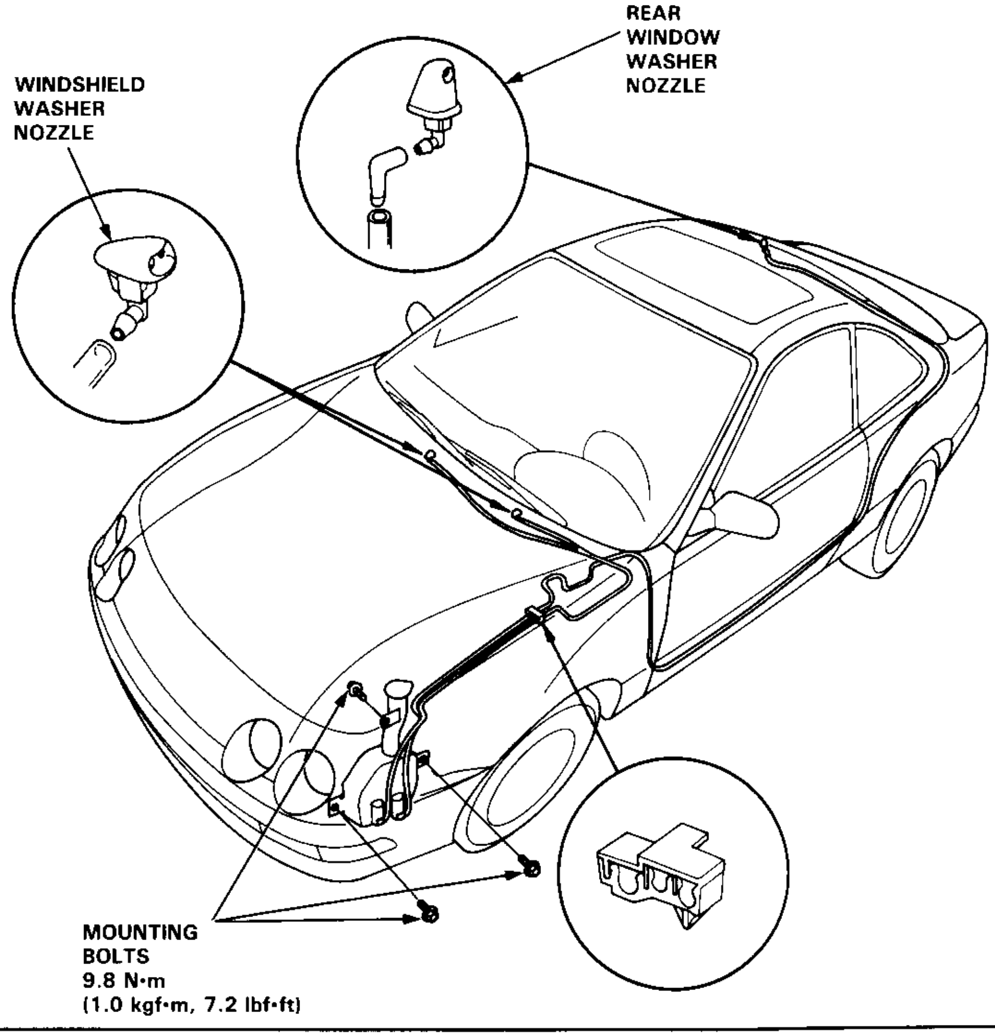


3. Test the motor by connecting battery power to the A (+) terminal and ground to the B (−) terminal.
   - If the motor does not run or fails to run smoothly, replace it.
   - If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

Washer Replacement

1. Remove the front bumper (see section 20).
2. Remove the left front inner fender.
3. Disconnect the 2P connector and hose from the washer motor.
4. Remove the three mounting bolts and the washer reservoir.
5. Remove the washer motor from the reservoir.
6. Remove the windshield wiper arms and air scoop (see page 23-272). Then remove the washer nozzles and hoses.
7. Install in the reverse order of removal.

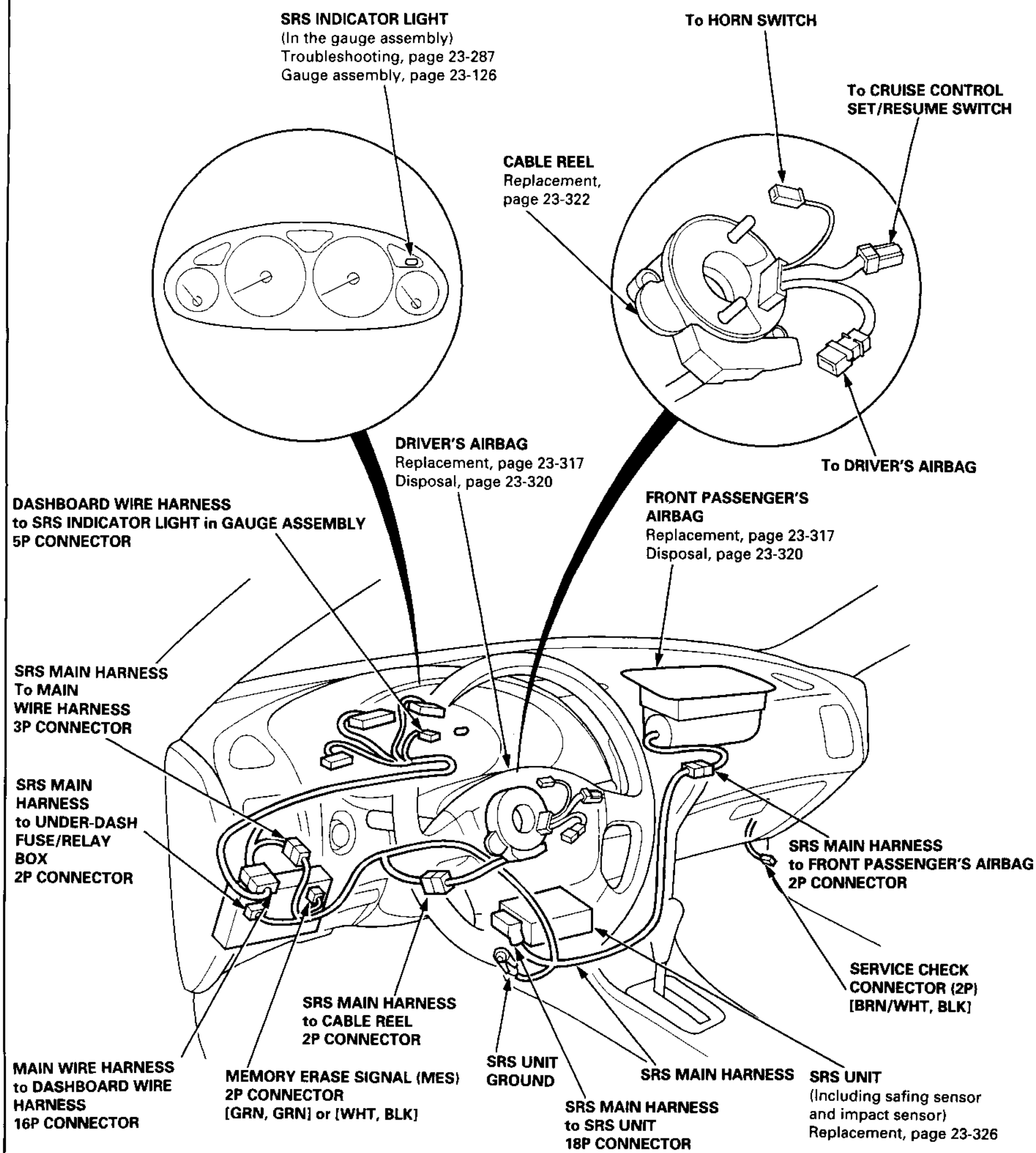
NOTE:
- Take care not to pinch the hoses during installation.
- Install the clips firmly.
- After installing, adjust the aim of the washer nozzles.



Supplemental Restraint System (SRS)

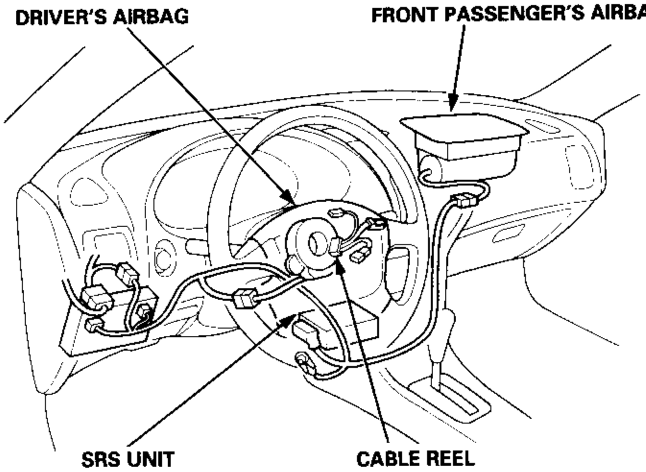
SRS

Component/Wiring Locations Index



Description

The SRS is a safety device which, when used in conjunction with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit (including safing sensor and impact sensor), the cable reel, the driver's airbag, and front passenger's airbag.



Operation

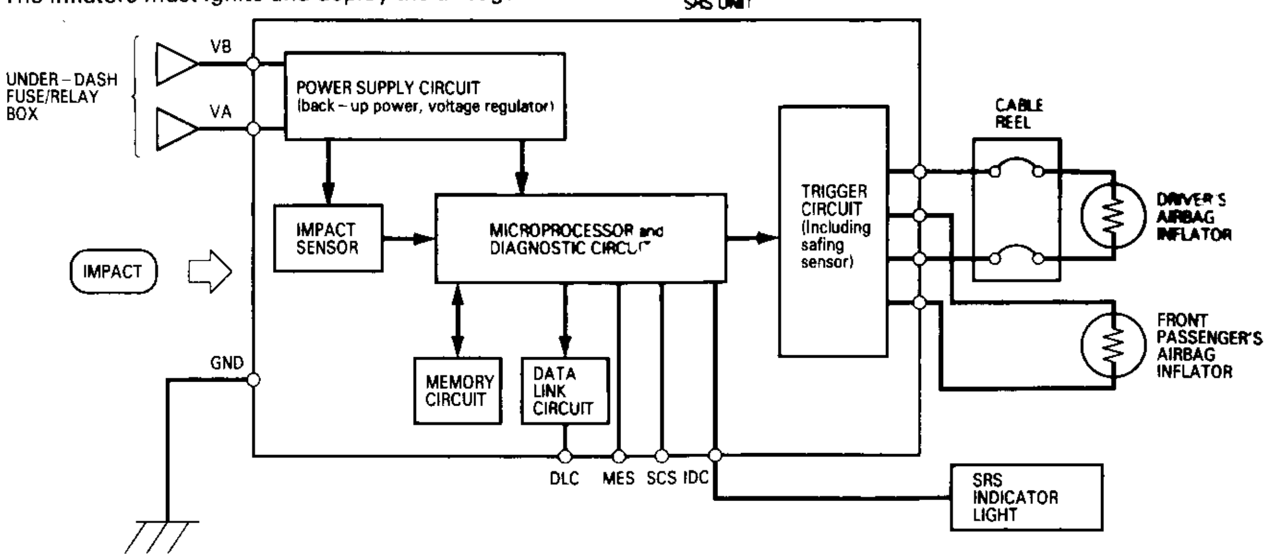
The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the back-up power circuit will keep voltage at a constant level.

For the SRS to operate:

(1) The impact sensor and safing sensor must activate and send electric signals to the microprocessor

(2) The microprocessor must compute the signals and send signals to the airbag inflators.

(3) The inflators must ignite and deploy the airbags.



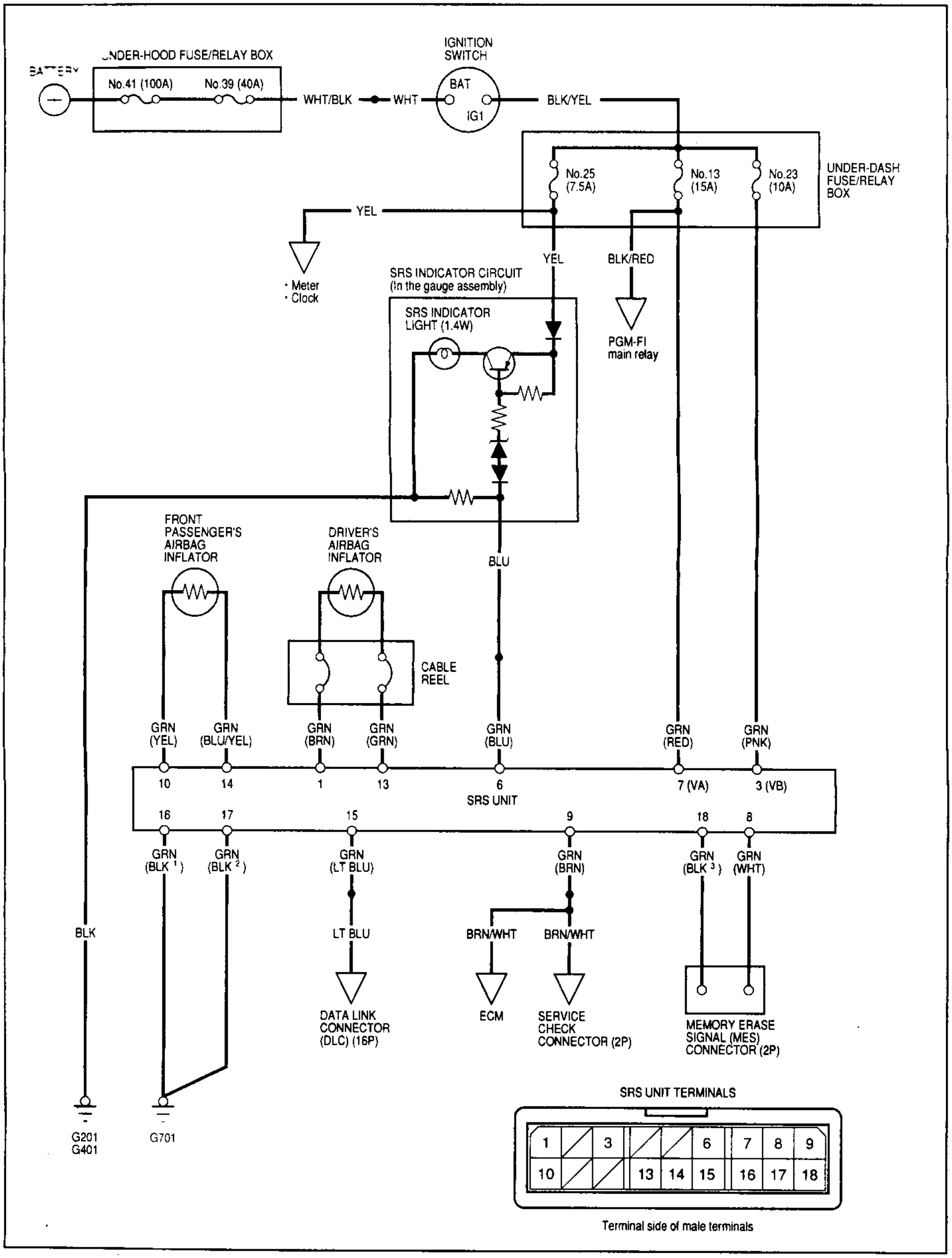
Self-diagnosis System

A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about six seconds if the system is operating normally.

If the light does not come on, or does not go off after six seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the memory will store the cause of the malfunction, and the data link circuit passes on the information from the memory to the data link connector (DLC). This information can be read with the Honda PGM Tester connected to the DLC (16P).

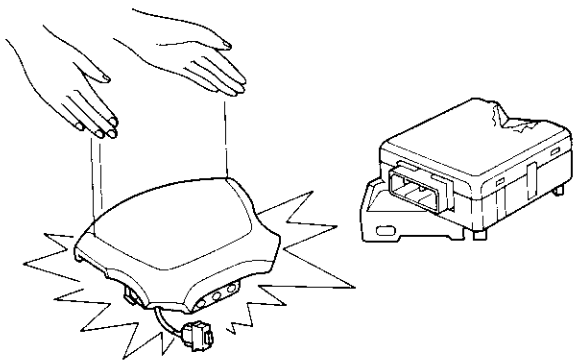
Circuit Diagram



Precautions/Procedures

General Precautions

- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation:
  - Airbags
  - Cable reel
  - SRS unit



- Use only a digital multimeter to check the system. If it's not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental deployment and possible injury.
- Do not install used SRS parts from another car. When making SRS repairs, use only new parts.
- Except when performing electrical inspections, always disconnect both the negative cable and positive cable from the battery, and wait at least three minutes before beginning work.
- Replacement of the combination light and wiper/washer switches and cruise control switch can be done without removing the steering wheel:
  - Combination light and wiper/washer switch replacement (see page 23-268).
  - Cruise control set/resume switch replacement (see page 23-259).
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Whenever the airbag has been activated, replace the SRS unit.
- The original radio has a coded theft protection circuit. Be sure to get the customer's code number before disconnecting the battery cables.

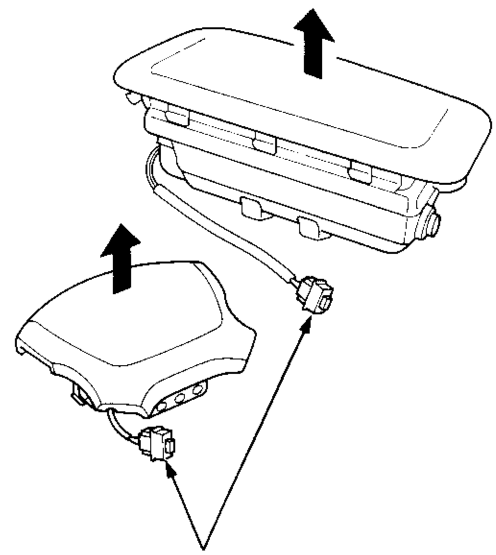
Airbag Handling and Storage

Do not try to disassemble the airbag. It has no serviceable parts. Once an airbag has been operated (deployed), it cannot be repaired or reused.

For temporary storage of the airbag during service, please observe the following precautions:

- Store the removed airbag with the pad surface up. The driver's and front passenger's airbag connectors have a built-in short contact (see page 23-284).

⚠WARNING If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

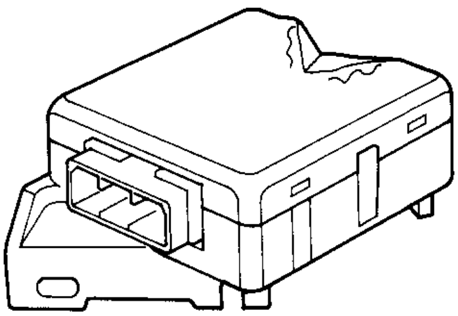


- Store the removed airbag on a secure flat surface away from any high heat source (exceeding 212°F/100°C) and free of any oil, grease, detergent or water.

CAUTION: Improper handling or storage can internally damage the airbag, making it inoperative.
If you suspect the airbag has been damaged, install a new unit and refer to the Deployment/Disposal Procedures for disposing of the damaged airbag.

SRS Unit Precautions

- Take extra care when painting or doing body work in the area below the dashboard. Avoid direct exposure of the SRS unit or wiring to heat guns, welding, or spraying equipment.
- Disconnect the airbag connector(s) before disconnecting SRS harness connectors (see page 23-285).
- After any degree of frontal body damage, or after a collision without airbag deployment, inspect the SRS unit for physical damage. If it is dented, cracked, or deformed, replace it.



- Be sure the SRS unit is installed securely.
- Do not disassemble the SRS unit.
- Store the SRS unit in a cool (less than about 104°F/40°C) and dry (less than 80% humidity, no moisture) place. Do not spill water or oil on the SRS unit, and keep it away from dust.
- During installation or replacement, be careful not to bump (impact wrench, hammer, etc.) the area around the SRS unit. The airbags could accidentally deploy and cause damage or injuries.

Inspection After Deployment

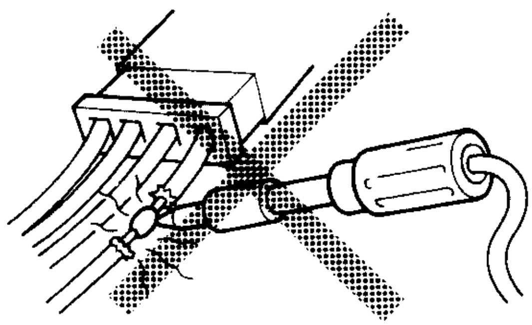
After a collision in which the airbags were deployed, replace the SRS unit, and inspect the following:

1. Inspect all the SRS wire harnesses. Replace, don't repair, any damaged harnesses.
2. Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.
3. After the vehicle is completely repaired, turn the ignition switch ON (II). If the SRS indicator light comes on for about six seconds and then goes off, the SRS system is OK. If the indicator light does not function properly, go to SRS Troubleshooting.

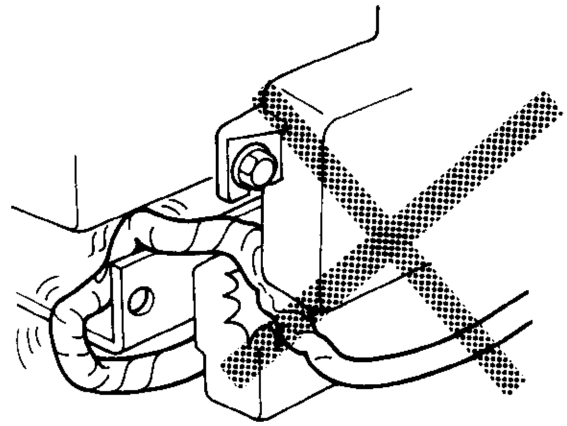
Wiring Precautions

- Never attempt to modify, splice or repair SRS wiring.

  NOTE: SRS wiring can be identified by special yellow outer protective covering.



- Be sure to install the harness wires so that they are not pinched or interfering with other car parts.

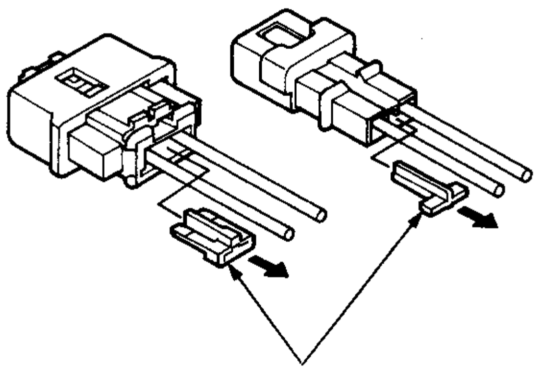


- Make sure all SRS ground locations are clean and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Backprobing Spring-loaded Lock Connectors

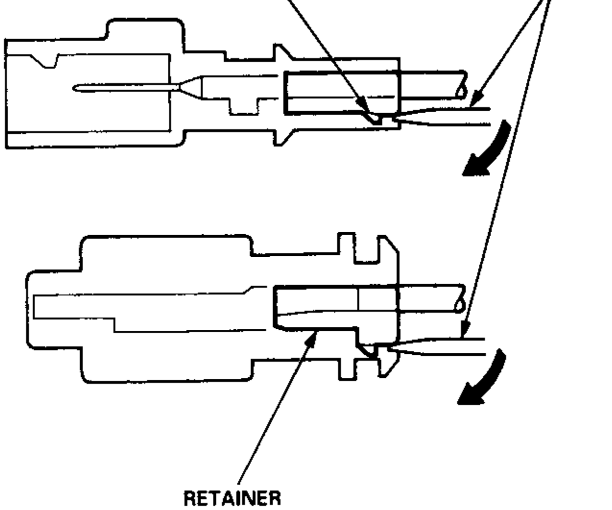
- When checking voltage or resistance on this type of connector the first time, it is necessary to remove the retainer to insert tester probes from the wire side.

  NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.



- To remove the retainer, insert a flat tip screwdriver between connector body and retainer, and carefully pry out the retainer.

  NOTE: Take care not to break the connector.



Precautions/Procedures

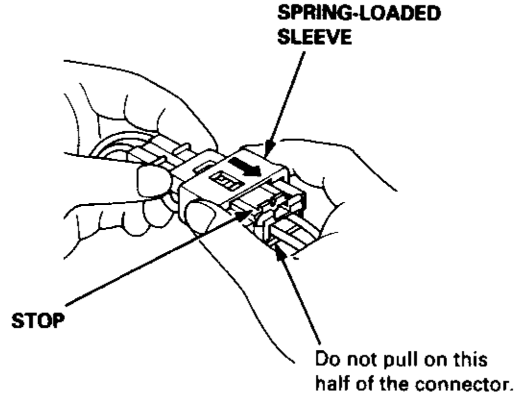
Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

Disconnecting

To release the lock, pull the spring-loaded sleeve toward the stop while holding the opposite half of the connector. Then pull the connector halves apart.

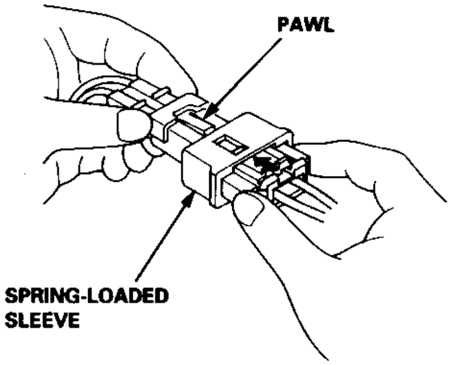
NOTE: Be sure to pull on the sleeve and not on the connector half.



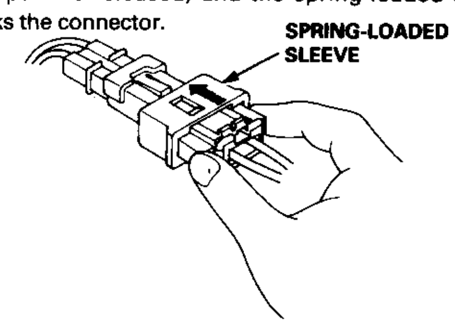
Connecting

1. Hold the pawl-side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve is pushed back by the pawl.

   NOTE: Do not touch the sleeve.



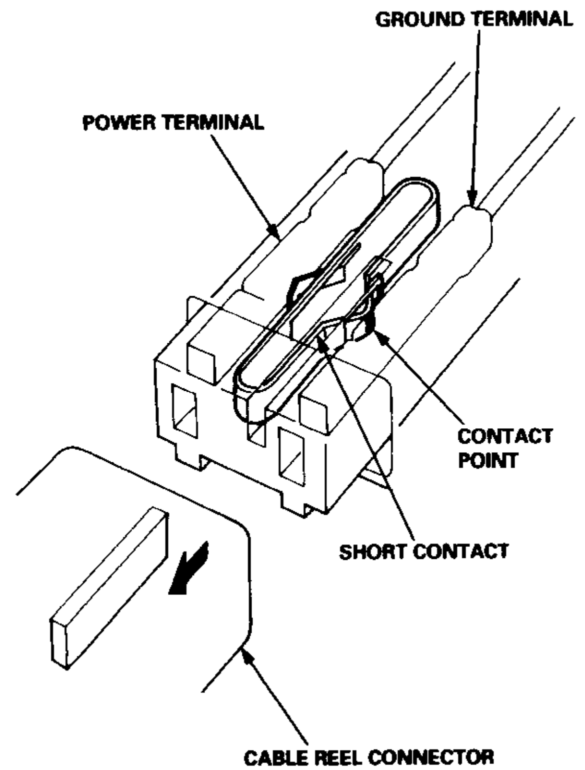
2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.



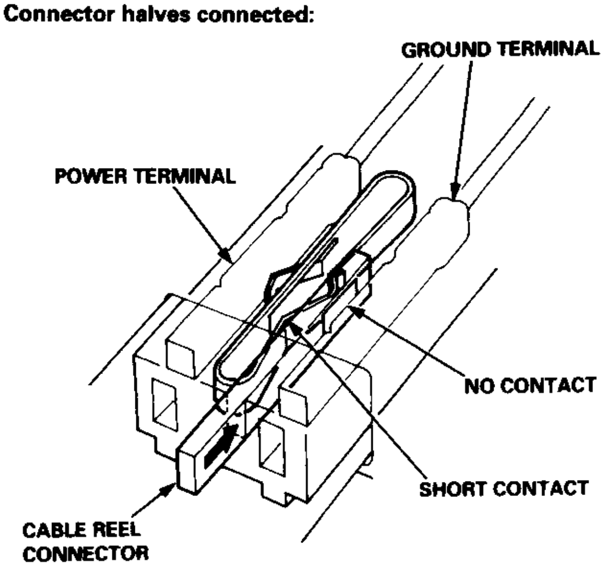
Spring-loaded Lock Connector with Built-in Short Contact

The driver's and front passenger's airbag have a spring-loaded lock connector with a built-in short contact. When this connector is disconnected, the power terminal and the ground terminal in the airbag connector are automatically shorted.

Connector halves disconnected:



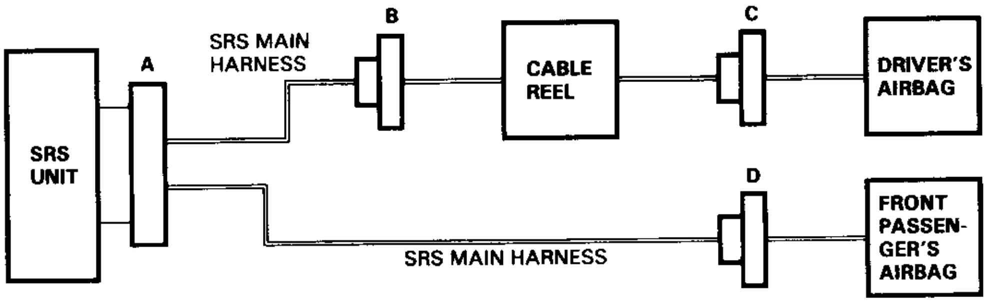
Connector halves connected:



Disconnecting the Airbag Connector(s)

WARNING To prevent accidental airbag deployment, turn the ignition switch OFF, disconnect the negative battery cable, and wait three minutes before disconnecting any SRS connectors.

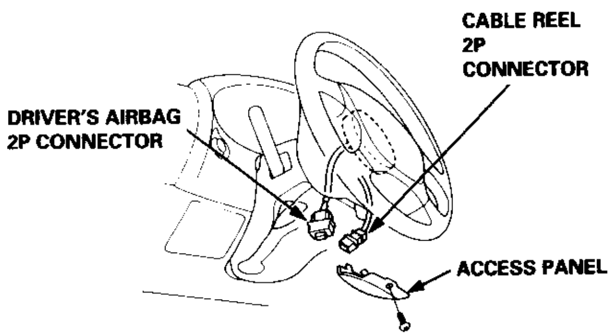
- Before disconnecting the SRS main harness (A) from the SRS unit, disconnect both airbags (C, D).
- Before disconnecting the cable reel 2P connector (B), disconnect the driver's airbag 2P connector (C).



1. Disconnect the negative battery cable, and wait at least three minutes.
2. Disconnect the airbag connector(s).

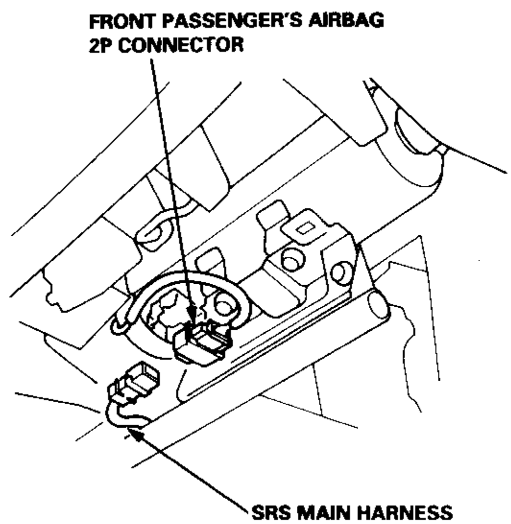
Driver's Side:

- Remove the access panel from the steering wheel, then disconnect the driver's airbag 2P connector and cable reel 2P connector.



Front Passenger's Side:

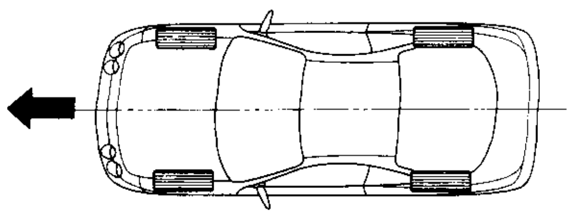
- Remove the glove box, then disconnect the front passenger's airbag 2P connector and SRS main harness 2P connector.



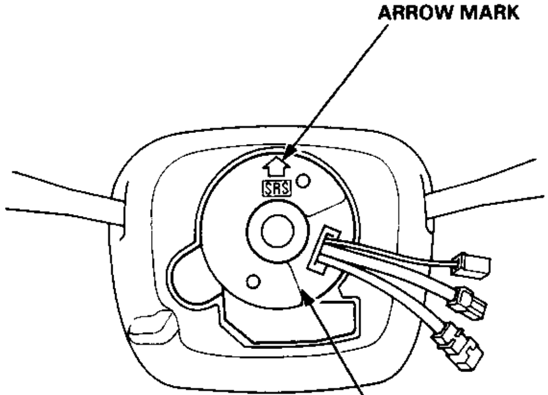
Steering-related Precautions

Steering Wheel and Cable Reel Alignment

NOTE: To avoid misalignment of the steering wheel or airbag on reassembly, make sure the wheels are turned straight ahead before removing the steering wheel.



Rotate the cable reel clockwise unit it stops.
Then rotate it counterclockwise (approximately two and a half turns) until the arrow mark on the cable reel label points straight up.



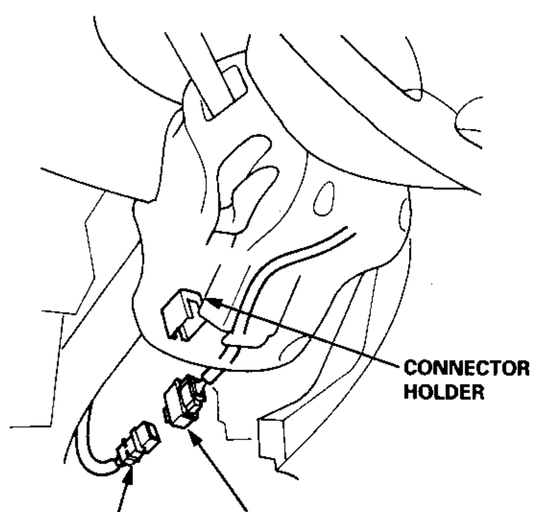
Steering Column Removal

CAUTION:

- **Before removing the steering column, first disconnect the connector between the cable reel and the SRS main harness.**
- **If the steering column is going to be removed without dismounting the steering wheel, lock the steering by turning the ignition key to 0-LOCK position, or remove the key from the ignition so that the steering wheel will not turn.**

NOTE:

- When the airbag and cable reel are disconnected, and the battery is reconnected and the ignition switch is turned ON (II), the SRS unit will store this as an open in the driver's airbag inflator, and the SRS indicator light will come on. In such a case, make sure to confirm the DTC, then clear the SRS unit memory.
- For disconnecting the spring-loaded lock type connector, refer to page 23-284.



Do not replace the original steering wheel with any other design since it will make it impossible to properly install the airbag (only use genuine Honda replacement parts).

After reassembly, confirm that the wheels are still turned straight ahead and that the steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjusting the tie-rods, not by removing and repositioning the steering wheel.

Troubleshooting

Self-diagnostic Procedures

The self-diagnostic function of the SRS system allows it to locate the causes of system problems and to store this information in memory. For easier troubleshooting, this data can be retrieved via a data link circuit.

- When you turn the ignition switch ON (II), the SRS indicator will come on. If it goes off after six seconds, the system is normal.
- If there is an abnormality, the system locates and defines the problem, stores this information in memory, and turns the SRS indicator light on. The data will remain in the memory even when the ignition switch is turned off or if the battery is disconnected.
- When you connect the SCS service connector to the service check connector (2P), and turn the ignition switch ON (II), the SRS indicator light will indicate the diagnostic trouble code (DTC) by the number of blinks.
- After reading and recording the DTC, proceed with the troubleshooting for this code.

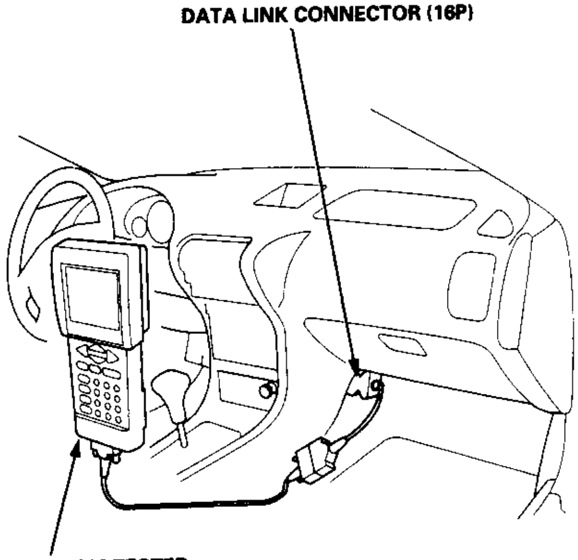
Precautions

- Use only a digital multimeter to check the system. If it's not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental airbag deployment and possible injury.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Before you remove the SRS main harness, disconnect the driver's airbag connector and the front passenger's airbag connector.
- Make sure the battery is sufficiently charged (see page 23-67). If the battery is dead or low, measuring values won't be correct.
- Do not touch a tester probe to the terminals in the SRS unit or harness connectors, and do not connect the terminals with a jumper wire. Use only the backprobe set and the SCS service connector.
  For backprobing spring-loaded lock type connectors, refer to page 23-283.

Reading the DTC

When the SRS indicator light is on, read the DTC using one of these methods:

A. Connect the Honda PGM Tester to the 16P Data Link Connector (DLC), and follow the tester's prompts. If the tester indicates no DTC, or it indicates DTC 9-1 or DTC 9-2, double-check by jumping the service check connector and watching the SRS indicator light (see next page).

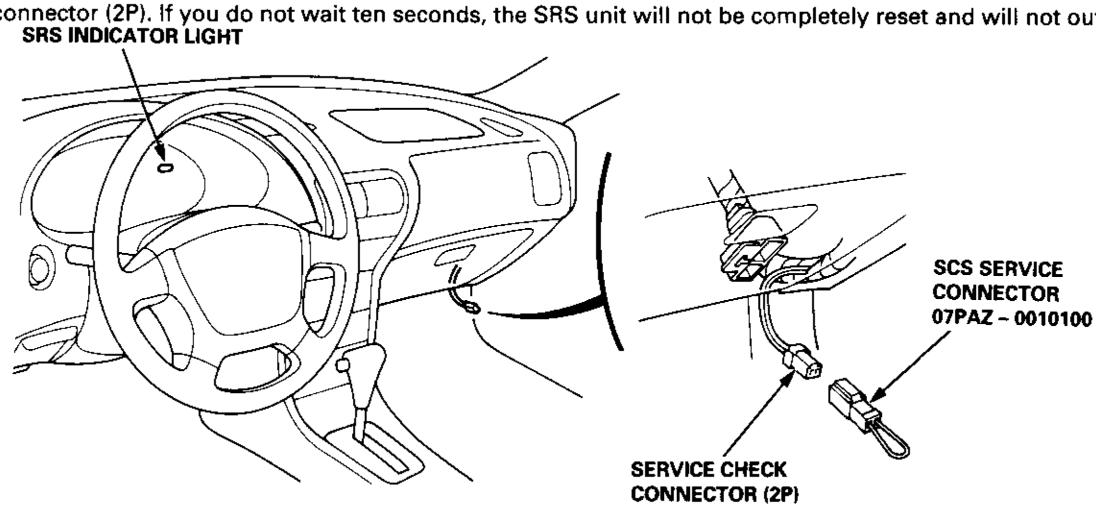


(cont'd)

Reading the DTC (cont'd)

B. The SRS indicator light can also indicate the DTC by the number of blinks when the SCS service connector is connected to the service check connector (2P).

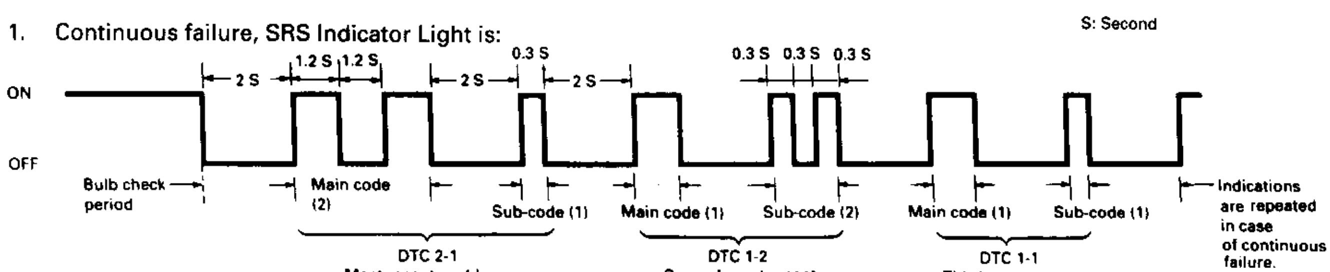
1. Turn the ignition switch OFF, and wait for ten seconds. Then connect the SCS service connector to the service check connector (2P). If you do not wait ten seconds, the SRS unit will not be completely reset and will not output DTCs.



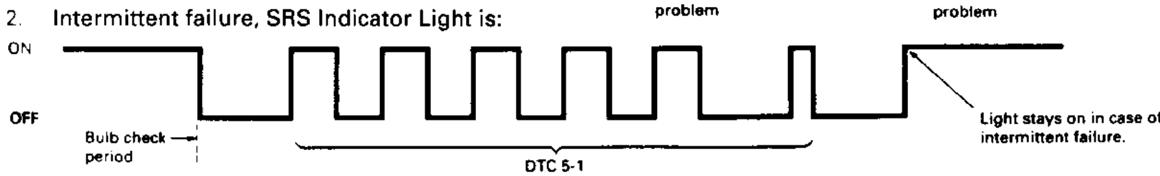
2. Turn the ignition switch ON (II). The SRS indicator light comes on for about six seconds and then goes off. Then it will indicate the DTC:
   — The DTC consists of a main code and a sub-code.
   — Including the most recent problem, up to three different malfunctions can be indicated.
   — In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
   — In case of an intermittent failure, the SRS indicator light will indicate the DTC one time, then it will stay on (see example 2 below).
   — If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
   — In case the system is normal (no DTC), the SRS indicator light will stay on (see example 3).
3. Read the DTC.
4. Turn the ignition switch OFF, and wait for ten seconds. Then disconnect the SCS service connector from the service check connector (2P).

Examples of DTC Indications:

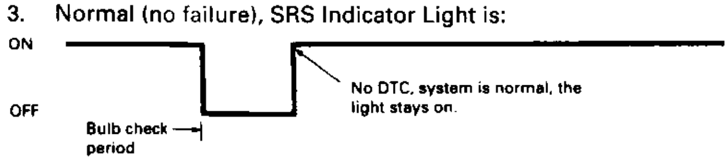
1. Continuous failure, SRS Indicator Light is:



2. Intermittent failure, SRS Indicator Light is:



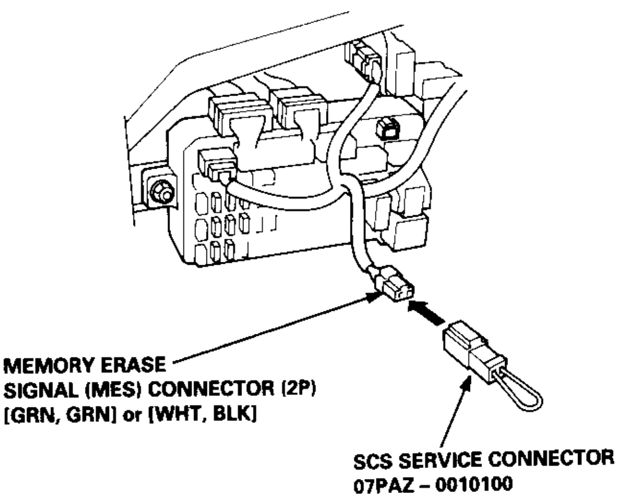
3. Normal (no failure), SRS Indicator Light is:



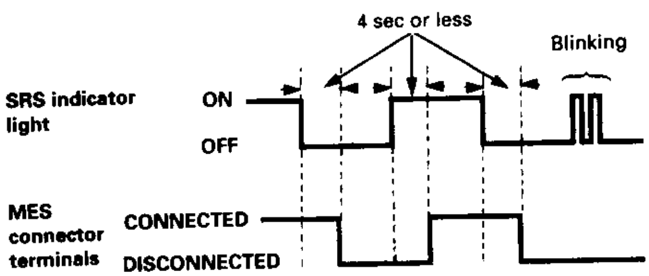
Erasing the DTC Memory

To erase the DTC(s) from the SRS unit, use a Honda PGM tester (see the Honda PGM Tester SRS vehicle System Supplement) or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS service connector to the MES connector (2P). Do not use a jumper wire.



3. Turn the ignition switch ON (II).
4. The SRS indicator light comes on for about six seconds and goes off. Remove the SCS service connector from the MES connector (2P) within four seconds after the SRS indicator light went off.
5. The SRS indicator light comes on again. Reconnect the SCS service connector to the MES connector (2P) within the four seconds after the SRS indicator light comes on.
6. The SRS indicator light goes off. Remove the SCS service connector from the MES connector (2P) within four seconds.
7. The SRS indicator light indicates that the memory is erased by blinking two times.
8. Turn the ignition switch OFF, and wait for ten seconds.

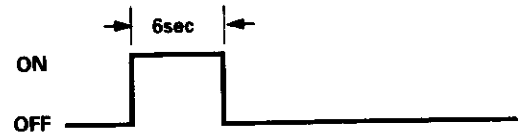


Troubleshooting Intermittent Failures

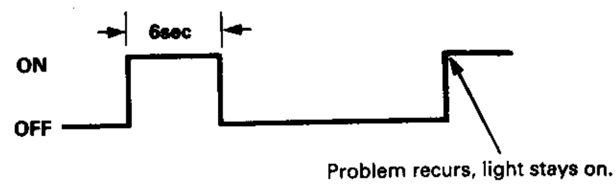
If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator light comes on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see "Reading the DTC").
2. Erase the DTC memory (see "Erasing the DTC Memory").
3. With the shift lever in neutral, turn the ignition switch ON (II), and let the engine idle.
4. The SRS indicator light comes on for about six seconds and then goes off.



5. Shake the wire harness and the connector, take a test drive (quick acceleration, quick braking, cornering), and turn the steering wheel fully left and right, and hold it there for five to ten seconds to find the cause of the intermittent failure.
   If the problem recurs, the SRS indicator light will stay on.



6. If you can't duplicate the intermittent failure, the system is OK at this time.

Troubleshooting

Diagnostic Trouble Code (DTC) Chart

SRS indicator light	DTC	Possible cause	Corrective action	See page
doesn't come on	none (doesn't come on)	Faulty SRS indicator light circuit	Troubleshooting	23-293
comes on	none*3 (doesn't go off)	Faulty SRS indicator light circuit, internal failure of SRS unit, faulty SRS power supply (VB line)	Troubleshooting	23-296
	1-1	Open in the driver's airbag inflator	Troubleshooting	23-301
	1-2	Increased resistance in the driver's airbag inflator		23-301
	1-3	Short to another wire in the driver's airbag inflator or decreased resistance		23-303
	1-4	Short to power in the driver's airbag inflator		23-305
	1-5	Short to ground in the driver's airbag inflator		23-307
	2-1	Open in the passenger's airbag inflator	Troubleshooting	23-309
	2-2	Increased resistance in the passenger's airbag inflator		23-309
	2-3	Short to another wire in the passenger's airbag inflator or decreased resistance		23-311
	2-4	Short to power in the passenger's airbag inflator		23-313
	2-5	Short to ground in the passenger's airbag inflator		23-315

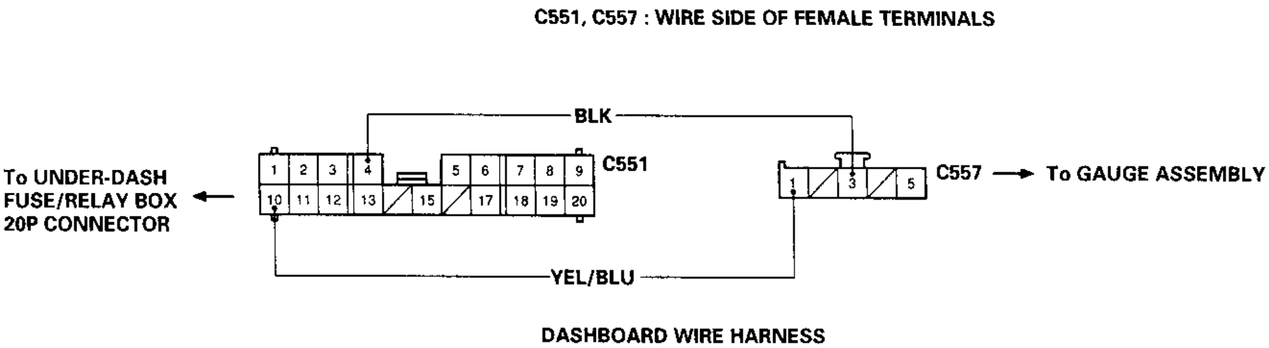
SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	5-1	Internal failure of the SRS unit	SRS unit replacement	23-326
	5-2			
	5-3			
	5-4			
	6-1	Internal failure of the SRS unit	SRS unit replacement	23-326
	6-2			
	6-3			
	6-4			
	7-1	Internal failure of the SRS unit	SRS unit replacement	23-326
	7-2			
	7-3			
	8-1	Internal failure of the SRS unit	SRS unit replacement	23-326
	8-2			
	8-6			
	9-1*1*3	Internal failure of the SRS unit	SRS unit replacement	23-326
	9-2*2*3	Internal failure of the SRS unit	SRS unit replacement	23-326
	10-1	SRS airbags deployed (SRS unit must be replaced)	SRS unit replacement	23-326

*1: In case of an intermittent failure DTC 9-1, it means there was an internal failure of the SRS unit or a faulty SRS indicator light circuit. Do the troubleshooting for intermittent failures (see page 23-289).
*2: In case of an intermittent failure DTC 9-2, it means there was an internal failure of the power supply (VB line). Do the troubleshooting for intermittent failures (see page 23-289).
*3: DTC cannot be read with a Honda PGM Tester; check by jumping the SCS service connector.

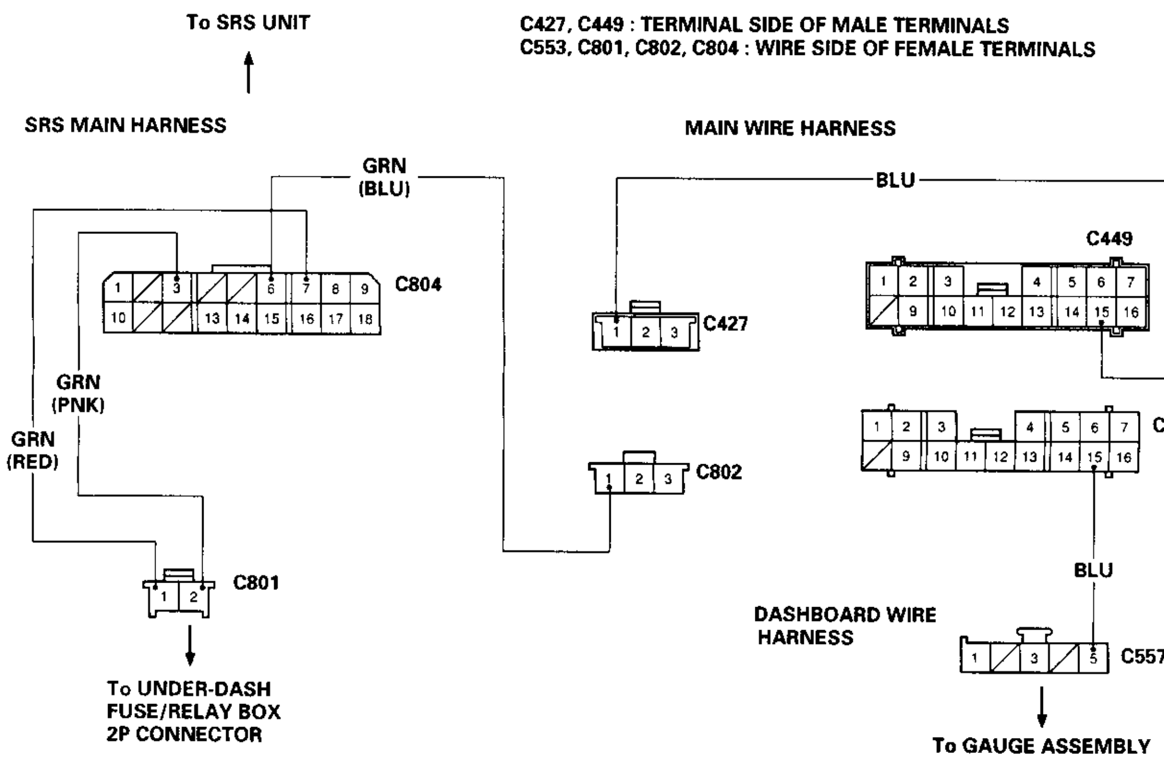
Troubleshooting

SRS Indicator Light Wire Connections

SRS Indicator Light Power Circuit



SRS Indicator Light Control Circuit



C427 : MAIN WIRE HARNESS 3P CONNECTOR
C449 : MAIN WIRE HARNESS 16P CONNECTOR
C551 : DASHBOARD WIRE HARNESS 20P CONNECTOR
C553 : DASHBOARD WIRE HARNESS 16P CONNECTOR
C557 : DASHBOARD WIRE HARNESS 5P CONNECTOR

C801 : SRS MAIN HARNESS 2P CONNECTOR
C802 : SRS MAIN HARNESS 3P CONNECTOR
C804 : SRS MAIN HARNESS 18P CONNECTOR

The SRS Indicator Light Doesn't Come On

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Check the power supply (fuse):
Turn the ignition switch ON (II), and check whether the other indicator lights come on or not (brake system, etc.).

Do the other indicator lights come on?

YES / NO

Check the fuse:
Check the No. 25 (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES / NO

Check the bulb:
Replace the No. 25 (7.5 A) fuse, and check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES / NO

END

Check the wire harness between fuse and gauge assembly:
Check for an open in the wire harness between fuse No. 25 (7.5 A) and the gauge assembly, and repair. Check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES / NO

END

Check the SRS indicator light bulb:
1. Turn the ignition switch OFF.
2. Remove the gauge assembly.
3. Check for blown SRS indicator light bulb.

Is the SRS indicator light bulb OK?

YES / NO

Check the SRS indicator light circuit:
Replace the bulb, and reconnect the gauge assembly connectors. Then turn the ignition switch ON (II).

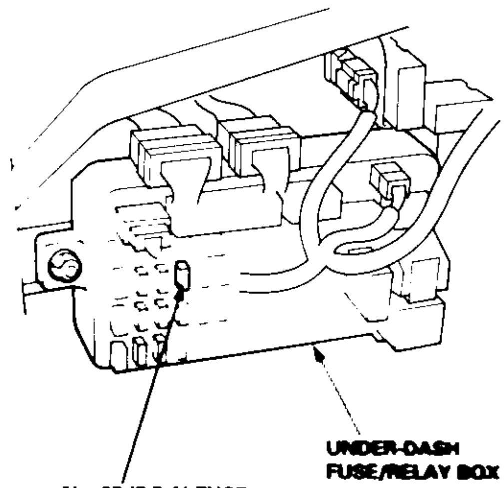
Does the SRS indicator light come on?

YES / NO

END

(A)
To page 23-294

(B)
To page 23-294



(cont'd)

The SRS Indicator Light Doesn't Come On (cont'd)

From page 23-293 (A)

From page 23-293 (B)

Check the SRS indicator light circuit:
1. Disconnect the dashboard wire harness 5P connector from the gauge assembly.
2. Connect a voltmeter between the No. 5 terminal (+) of the 5P connector and ground.
3. Turn the ignition switch ON (II), and measure voltage.

Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

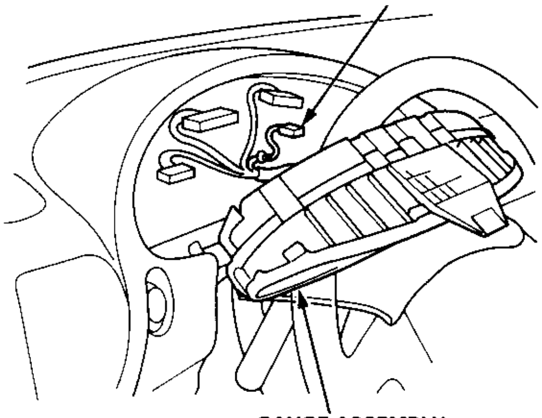
YES — **Faulty SRS indicator light circuit in the gauge assembly; replace the SRS printed circuit board in the gauge assembly.**

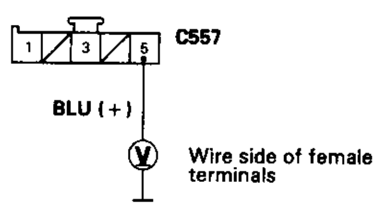
NO — **Check the wire harness of the SRS indicator light circuit (1):**
1. Turn the ignition switch OFF.
2. Disconnect the main wire harness 16P connector from the dashboard wire harness.
3. Connect a voltmeter between the No. 15 terminal (+) of the main wire harness 16P connector and ground.
4. Turn the ignition ON (II), and measure voltage.

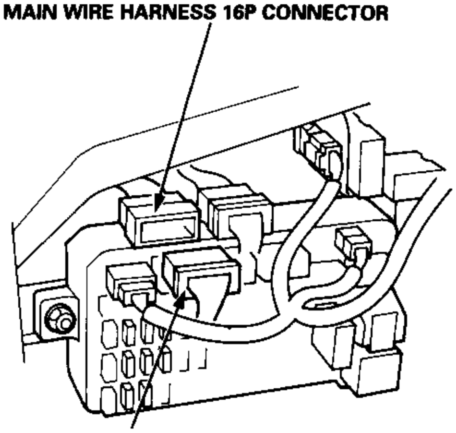
Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

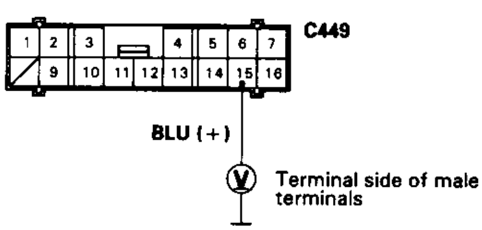
YES — **Short to power in the BLU wire of the dashboard wire harness; repair the harness.**

NO — To page 23-295









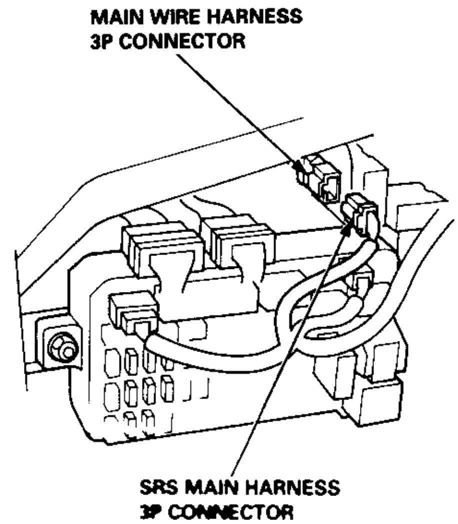
From page 23-294

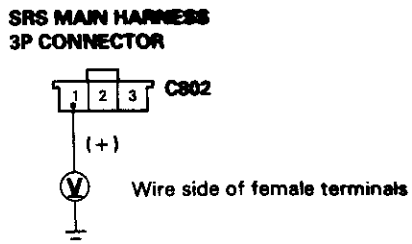
Check the wire harness of the SRS indicator light circuit (2):
1. Turn the ignition switch OFF.
2. Disconnect the SRS main harness 3P connector from the main wire harness.
3. Connect a voltmeter between the No. 1 terminal (+) of the SRS main harness 3P connector and ground.
4. Turn the ignition switch ON (II), and measure voltage.

Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

YES — **Short to power in the BLU wire of the main wire harness; repair the harness.**

NO — go to the next check.



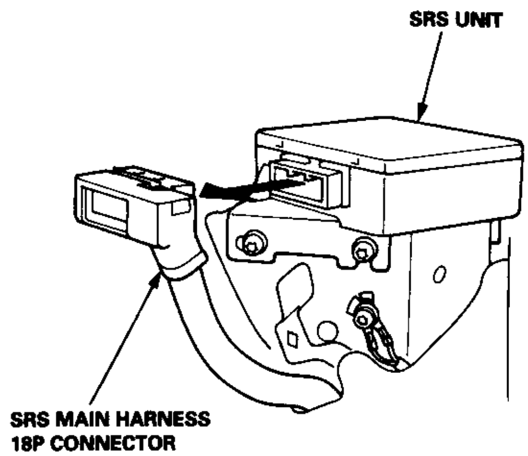


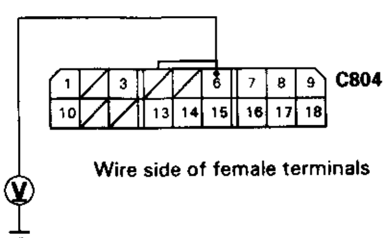
Check the wire harness of the SRS indicator circuit (3):
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then the positive cable, and wait three minutes.
3. Disconnect the driver's airbag and front passenger's airbag connectors (see page 23-285).
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Connect a voltmeter between the No. 6 terminal (+) of the SRS main harness 18P connector and ground.
7. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

Is voltage as specified?

YES — **Faulty SRS unit; replace the unit (see page 23-326).**

NO — **Short to power in the SRS main harness; replace the harness.**





The SRS Indicator Light Doesn't Go Off

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES / NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.

YES ↓

Check the No. 23 (10 A) fuse:
1. Turn the ignition switch OFF.
2. Check for blown No. 23 (10 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES / NO

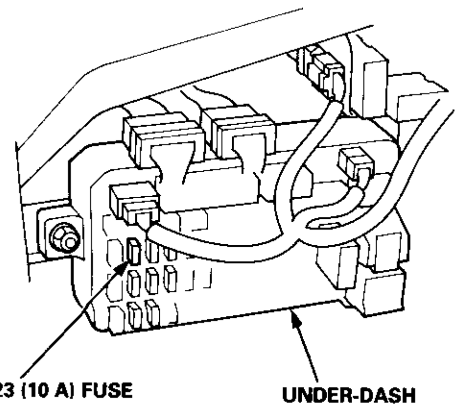
NO → **Replace the fuse, and erase the memory**
1. Replace the No. 23 (10 A) fuse.
2. Erase the DTC memory (see page 23-289).
3. Turn the ignition switch ON (II).

Does the SRS indicator light go off after six seconds?

YES → END

NO → **Confirm the DTC, and continue troubleshooting.**

YES ↓



Check for an open in the SRS main harness (VB line):
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's and front passenger's airbag connector (see page 23-285).
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Reconnect the battery positive cable, then reconnect the negative cable.
5. Connect a voltmeter between the No. 3 terminal (+) of the SRS main harness 18P connector and ground.
6. Turn the ignition switch ON (II).

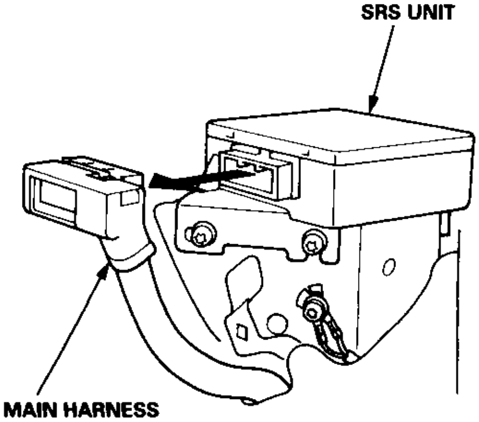
Is there battery voltage?

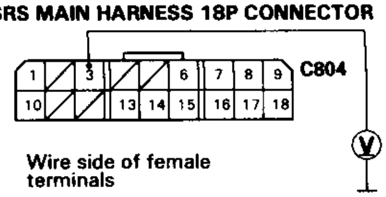
YES / NO

Open in the SRS main harness (VB line); replace the harness.

YES ↓

(A)
To page 23-297





From page 23-296
(A)

Check the SRS unit:
Connect the SRS main harness 18P connector terminals No. 6 and No. 3 with a jumper wire and backprobe adapters.

Does the SRS indicator light go off?

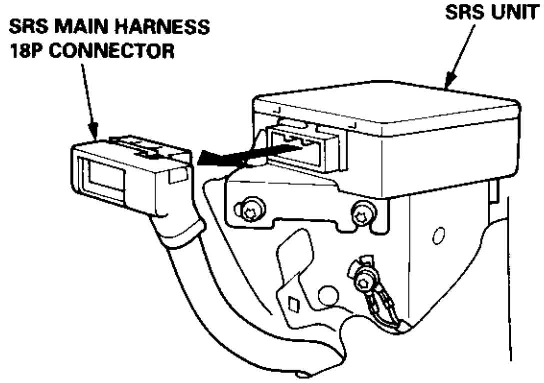
YES — **Faulty SRS unit or poor contact at the SRS main harness 18P connector; check the connector.**
If the connector is OK, replace the SRS unit.

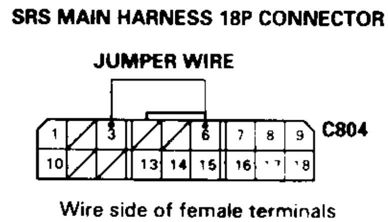
NO — **Did fuse No. 23 (10 A) blow?**

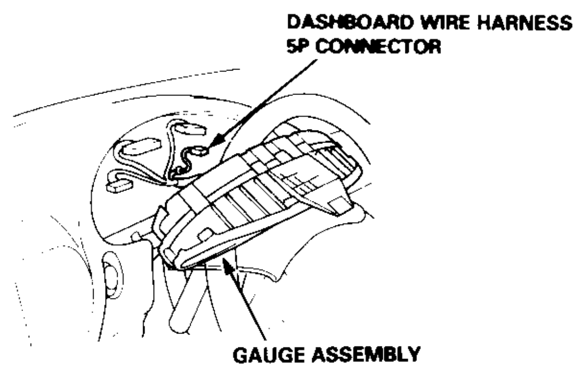
- **YES** — (B) To page 23-298
- **NO** — **Check for a short to ground in the SRS indicator light circuit:**
  1. Turn the ignition switch OFF.
  2. Disconnect the dashboard wire harness 5P connector from the gauge assembly.
  3. Check resistance between the No. 5 terminal of the dashboard wire harness 5P connector and ground. There should be 1 MΩ or more.

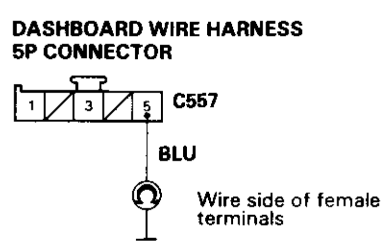
  Is the resistance as specified?

  - **YES** — **Short to ground in the gauge assembly; replace the gauge assembly.**
  - **NO** — (C) To page 23-299









(cont'd)

The SRS Indicator Light Doesn't Go Off (cont'd)

From page 23-297
(B)

Check the SRS indicator circuit:
1. Turn the ignition switch OFF.
2. Remove the gauge assembly. Do not disconnect the dashboard wire harness 5P connector from the gauge assembly.
3. Turn the ignition switch ON (II).
4. Connect the dashboard wire harness 5P connector terminals No. 1 and No. 5 with a jumper wire.

Does the SRS indicator light go off?

YES NO

Faulty SRS indicator light circuit in the gauge assembly; replace the SRS printed circuit board in the gauge assembly.

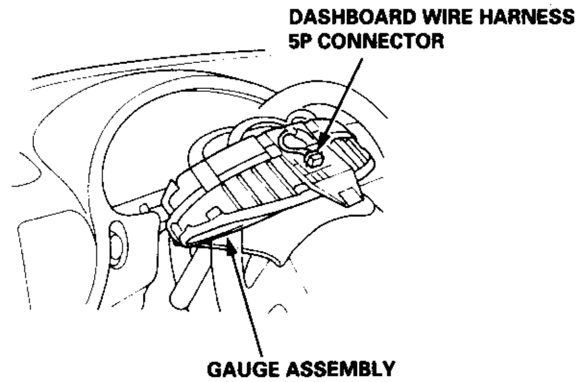
Check for an open in the SRS indicator light circuit:
1. Turn the ignition switch OFF.
2. Disconnect the dashboard wire harness 5P connector from the gauge assembly.
3. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 5 terminal of the dashboard wire harness 5P connector; there should be 0 – 1.0 Ω.

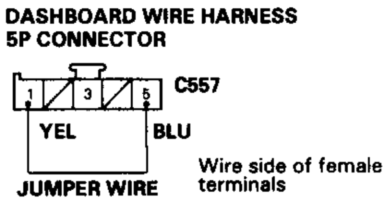
Is the resistance as specified?

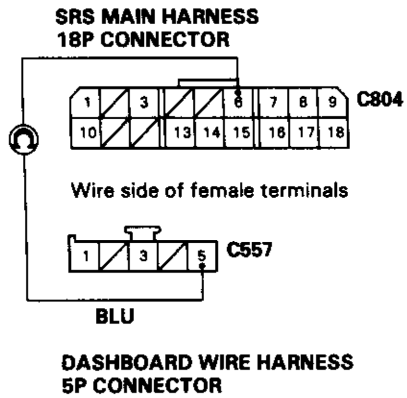
YES NO

(D)
To page 23-300

(E)
To page 23-300







From page 23-297
(C)

Check for a short to ground in the main wire harness:
1. Disconnect the dashboard wire harness 16P connector from the main wire harness.
2. Check for continuity between the No. 15 terminal of the main wire harness 16P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — **NO**

NO: **Short to ground in the dashboard wire harness; repair the dashboard wire harness.**

YES:

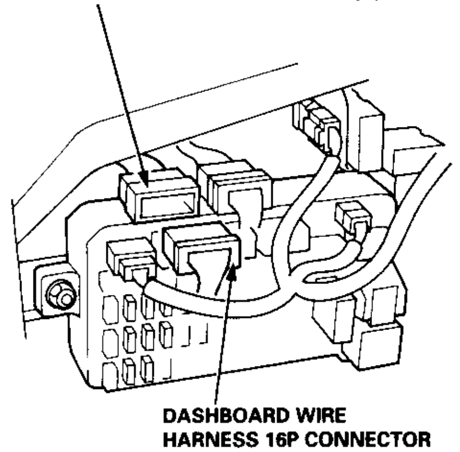
Check for a short to ground in the SRS main harness:
1. Disconnect the SRS main harness 3P connector from the main wire harness.
2. Check resistance between the No. 1 terminal of the SRS main harness 3P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

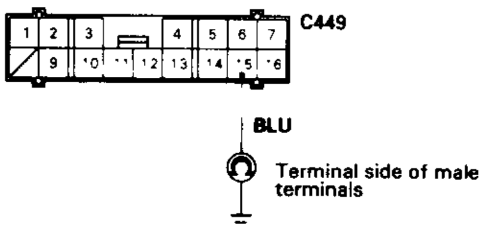
YES — **NO**

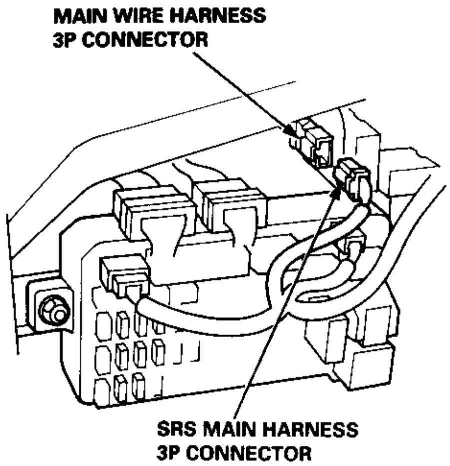
NO: **Short to ground in the main wire harness; repair the main wire harness.**

YES: **Short to ground in the SRS main wire harness; replace the SRS main harness.**

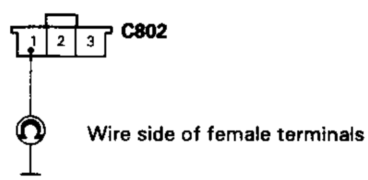


MAIN WIRE HARNESS
16P CONNECTOR





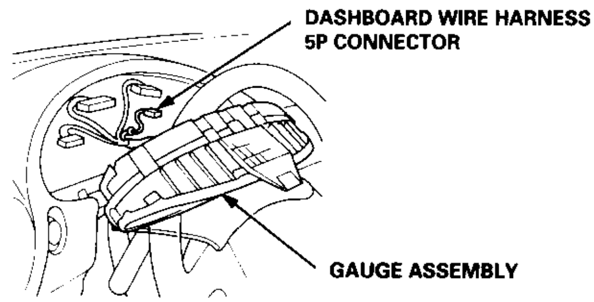
SRS MAIN HARNESS
3P CONNECTOR



(cont'd)

The SRS Indicator Light Doesn't Go Off (cont'd)

From page 23-298
D



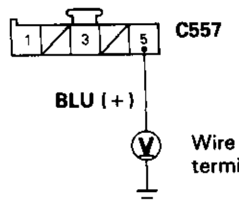
Check the SRS indicator circuit input voltage:
1. Reconnect the SRS main harness 18P connector to the SRS unit.
2. Connect a voltmeter between the No. 5 terminal (+) of the dashboard 5P connector and ground.
3. Turn the ignition switch ON (II), wait for six seconds, then measure voltage.

Is there 8.5 V or more?

YES — **The problem has disappeared due to disconnecting and connecting the connectors. Be sure all terminals make good contact, and recheck the system (see Troubleshooting Intermittent Failures on page 23-289).**

NO — **Poor contact at the SRS main harness 18P connector; check the connector.**
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

DASHBOARD WIRE HARNESS
5P CONNECTOR



From page 23-298
(E)

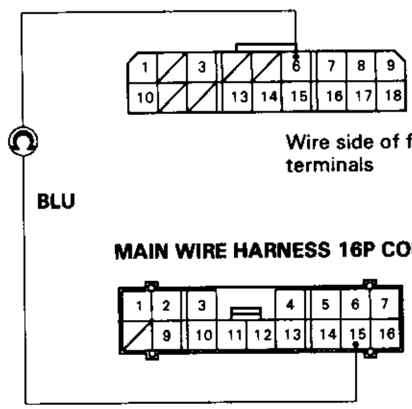
Check for an open in the dashboard wire harness:
1. Disconnect the dashboard wire harness 16P connector from the main wire harness.
2. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and the No. 15 terminal of the main wire harness 16P connector; resistance should be approx. 0 – 1.0 Ω.

Is the resistance as specified?

YES — (continue below)

NO — **Open in the BLU wire of the dashboard wire harness; repair the dashboard wire harness.**

SRS MAIN HARNESS 18P CONNECTOR



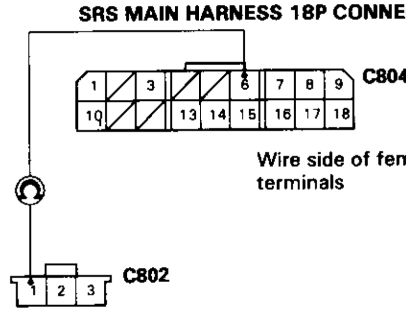
Check for an open in the main wire harness:
1. Disconnect the SRS main harness 3P connector from the main wire harness.
2. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and the No. 1 terminal of the SRS main harness 3P connector; resistance should be approx. 0 – 1.0 Ω.

Is the resistance as specified?

YES — **Open in the SRS main harness; replace the SRS main harness.**

NO — **Open in the BLU wire of the main wire harness; repair the main wire harness.**

SRS MAIN HARNESS 18P CONNECTOR



SRS MAIN HARNESS
3P CONNECTOR

DTC 1-1 and DTC 1-2

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES / NO

NO → **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES ↓

Check for an open in the driver's airbag inflator:

1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the passenger's airbag connector.
4. Connect the special tool (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-1 or DTC 1-2 indicated?

YES / NO

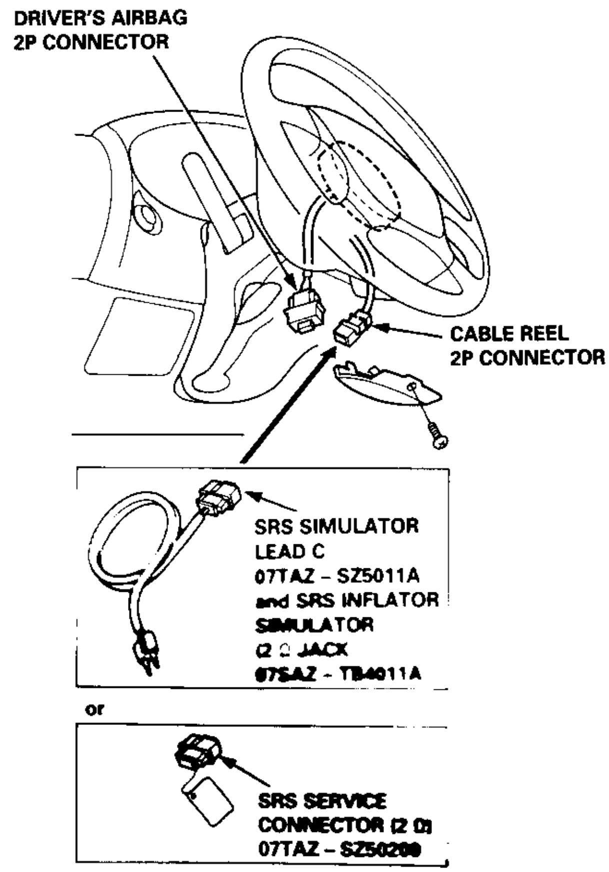
NO → **Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-317).**

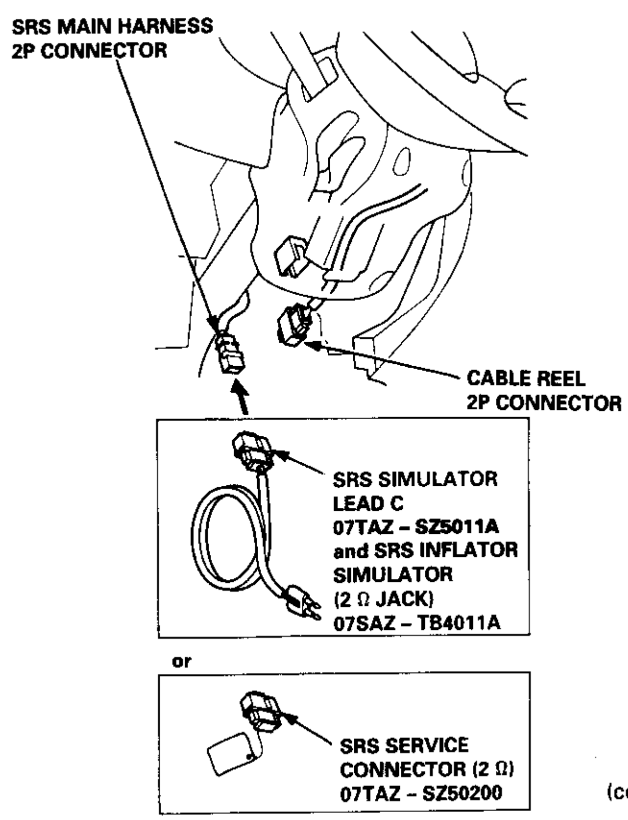
YES ↓

Check for an open in the cable reel:

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the special tool (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 23-302





(cont'd)

From page 23-301

Check for an open in the cable reel (cont'd)

5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-1 or DTC 1-2 indicated?

YES — **Open or increased resistance in the cable reel; replace the cable reel (see page 23-322).**

NO

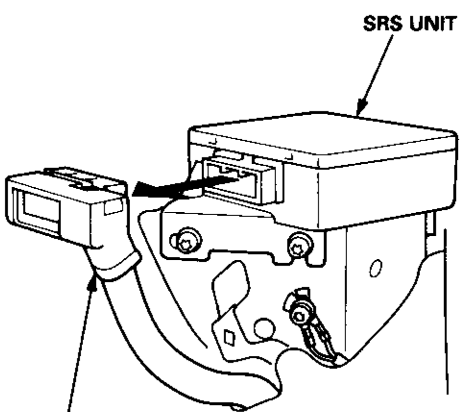
Check for an open in the SRS main harness:

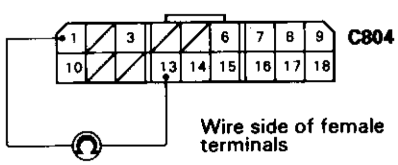
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Disconnect the SRS main harness 18P connector from the SRS unit. Do not disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between terminals No. 1 and No. 13 of the SRS main harness 18P connector.
   There should be approx. 2.0 – 3.0 Ω.

Is the resistance as specified?

YES — **Poor contact at the SRS main harness 18P connector; check the connector.**
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

NO — **Open or increased resistance in the SRS main harness; replace the harness.**





DTC 1-3

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES | NO

NO → **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES ↓

Check for a short to another wire in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the passenger's airbag connector.
4. Connect the special tool (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-3 indicated?

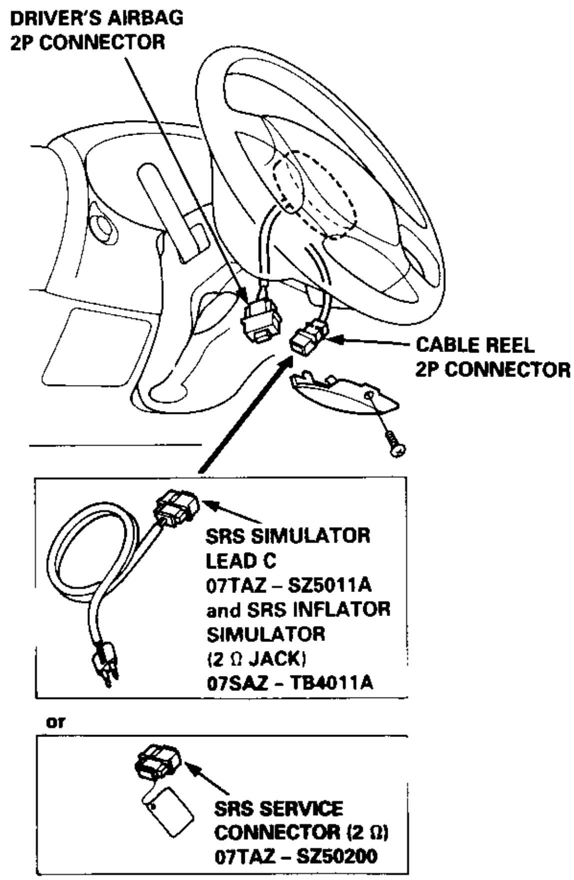
YES | NO

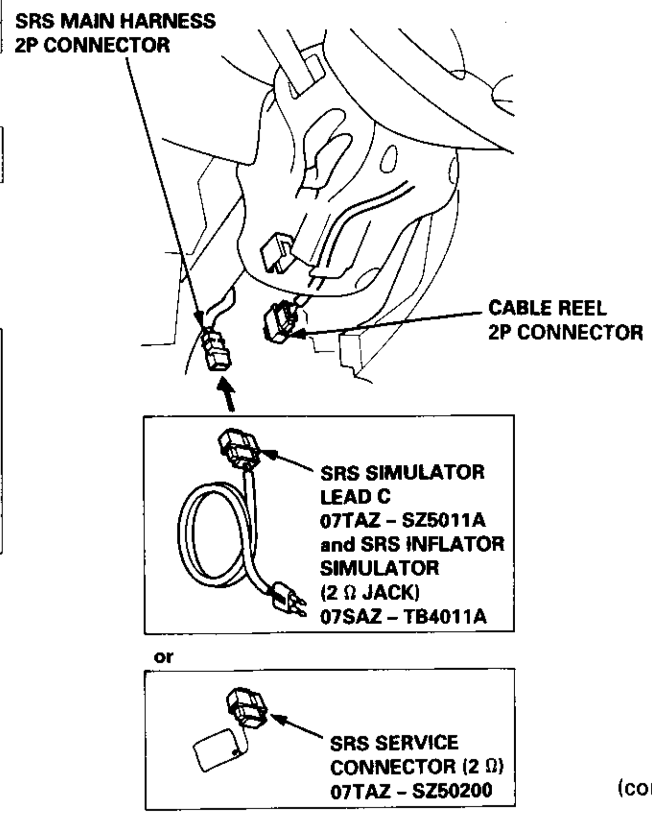
NO → **Short in the driver's airbag inflator; replace the driver's airbag (see page 23-317).**

YES ↓

Check for a short in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the special tool (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 23-304





(cont'd)

Troubleshooting

DTC 1-3 (cont'd)

From page 23-303

Check for a short in the cable reel (cont'd):

5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-3 indicated?

YES — NO

Short in the cable reel; replace the cable reel (see page 23-322).

Check for a short in the SRS main harness:

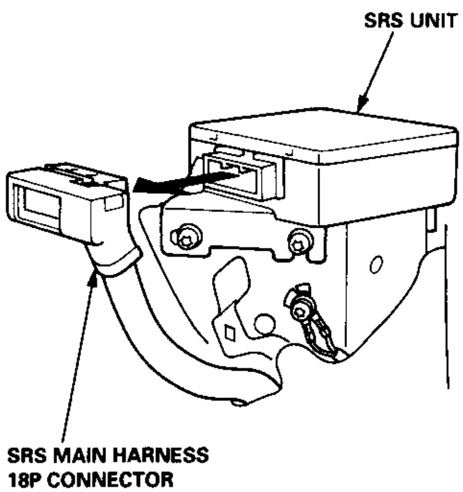
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Disconnect the SRS main harness 18P connector from the SRS unit. Do not disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between terminals No. 1 and No. 13 of the SRS main harness 18P connector.
   There should be approx. 2.0 – 3.0 Ω.

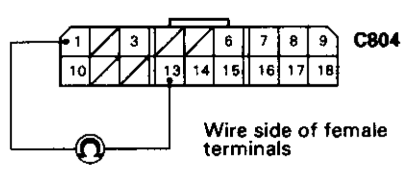
Is the resistance as specified?

YES — NO

Faulty SRS unit; replace the SRS unit (see page 23-326).

Short in the SRS main harness; replace the SRS main harness.





DTC 1-4

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES — NO

NO: **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES:

Check for a short to power in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the passenger's airbag connector.
4. Connect the SRS service connector (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-4 indicated?

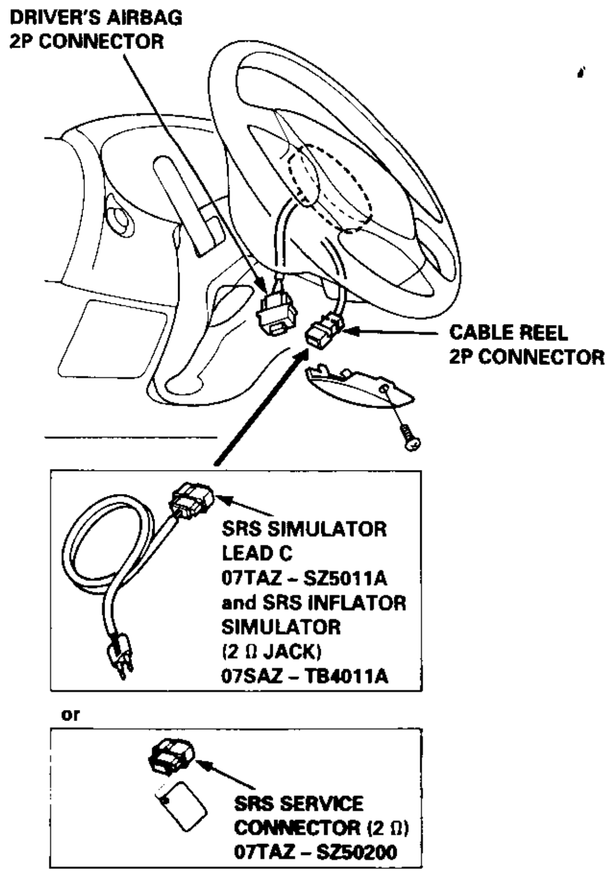
YES — NO

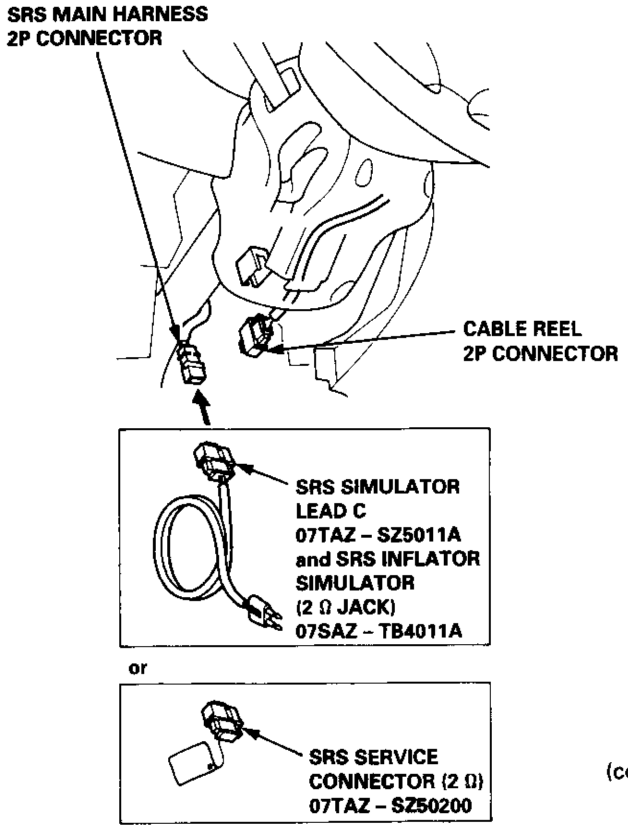
YES: **Short to power in the driver's airbag inflator; replace the driver's airbag (see page 23-317).**

NO:

Check for a short to power in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the special tool (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 23-306





(cont'd)

DTC 1-4 (cont'd)

From page 23-305

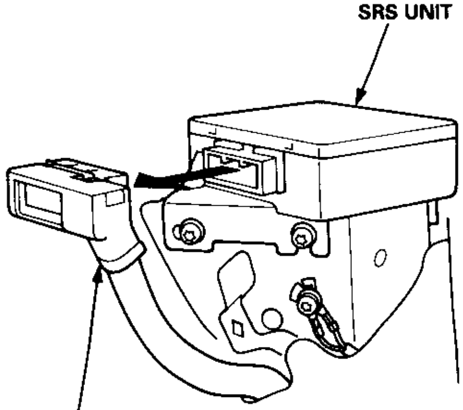
Check for a short to power in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

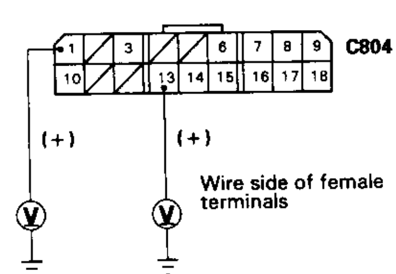
Is DTC 1-4 indicated?

YES — **Short to power in the cable reel; replace the cable reel (see page 23-322).**

NO

Check for a short to power in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Remove the special tool (2 Ω) from the SRS main harness 2P connector.
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Connect a voltmeter between the No. 1 (+) terminal of the SRS main harness 18P connector and body ground.
7. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.
8. Turn the ignition switch OFF.
9. Connect a voltmeter between the No. 13 (+) terminal of the SRS main harness 18P connector and body ground.
10. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.





Are voltages as specified?

YES — **Faulty SRS unit; replace the SRS unit (see page 23-326).**

NO — **Short to power in the SRS main harness; replace the SRS main harness.**

DTC 1-5

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (See page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES / NO

NO → **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES ↓

Check for a short to ground in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the passenger's airbag connector.
4. Connect the special tool (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-5 indicated?

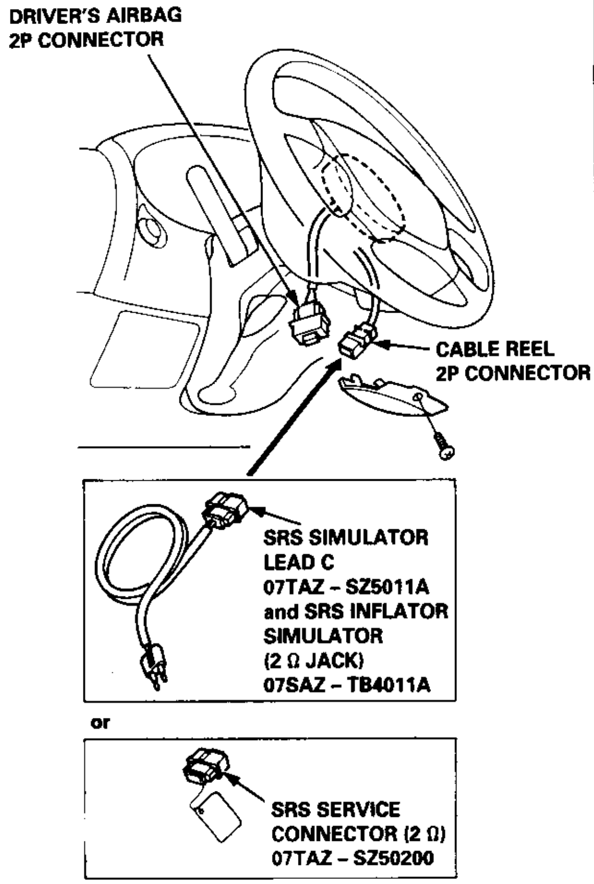
YES / NO

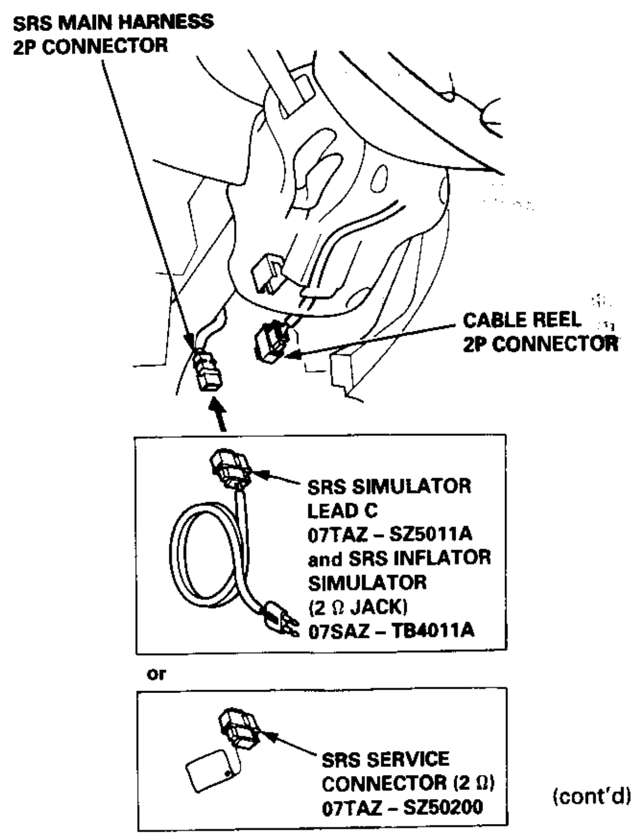
NO → **Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-317).**

YES ↓

Check for a short to ground in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the special tool (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the Special tool (2 Ω) to the SRS main harness 2P connector (cont'd).

To page 23-308





(cont'd)

DTC 1-5 (cont'd)

From page 23-307

Check for a short to ground in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 1-5 indicated?

YES — **Short to ground in the cable reel; replace the cable reel (see page 23-322).**

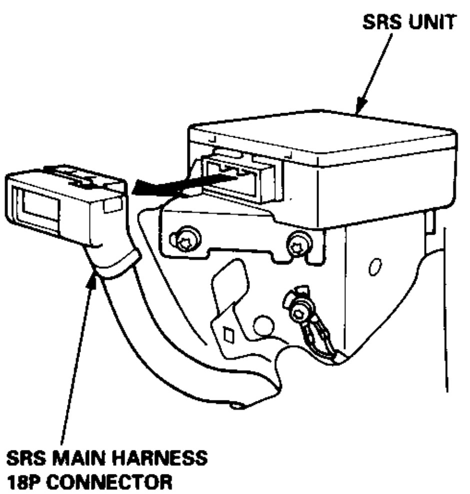
NO

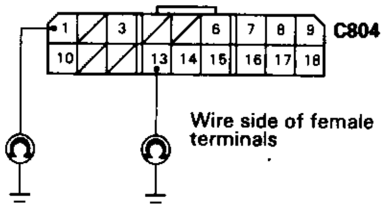
Check for a short to ground in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag 2P connector from the SRS main harness.
3. Remove the special tool (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between the No. 1 terminal of the SRS main harness 18P connector and ground, and between the No. 13 terminal of the SRS main harness 18P connector and ground.
   There should be 1 MΩ or more.

Is the resistance as specified?

YES — **Faulty SRS unit; replace the SRS unit (see page 23-326).**

NO — **Short to ground in the SRS main harness; replace the SRS main harness.**





DTC 2-1 and DTC 2-2

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES / NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.

YES ↓

Check for an open in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag connector from the SRS main harness (see page 23-285).
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
   CAUTION: Do not disconnect the driver's airbag connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

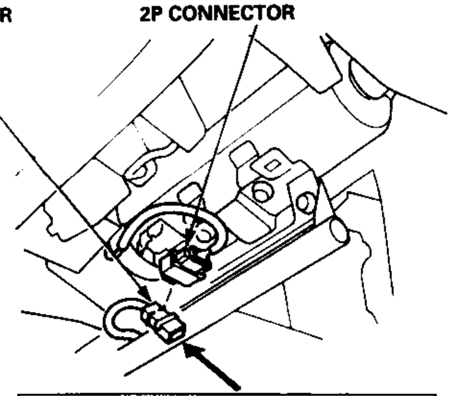
Is DTC 2-1 or DTC 2-2 indicated?

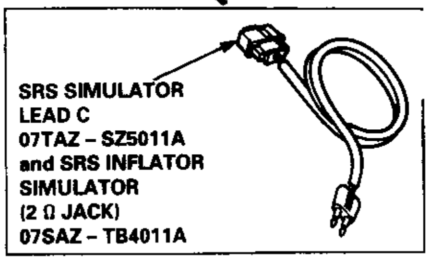
YES / NO

Open or increased resistance in the passenger's airbag inflator; replace the passenger's airbag (see page 23-317).

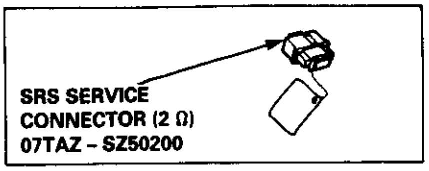
YES ↓

To page 23-310





or



(cont'd)

DTC 2-1 and DTC 2-2 (cont'd)

From page 23-309

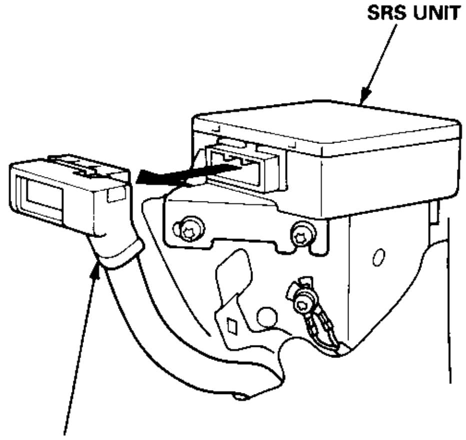
Check for an open in the SRS main harness:

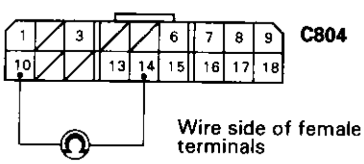
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (see page 23-285).
3. Disconnect the SRS main harness 18P connector from the SRS unit. Do not disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between the No. 10 terminal and No. 14 terminal of the SRS main harness 18P connector. There should be approx. 2.0 – 3.0 Ω.

Is the resistance as specified?

YES — **Poor contact at the SRS main harness 18P connector; check the connector.**
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

NO — **Open or increased resistance in the SRS main harness; replace the harness.**





DTC 2-3

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES — NO

NO: **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES:

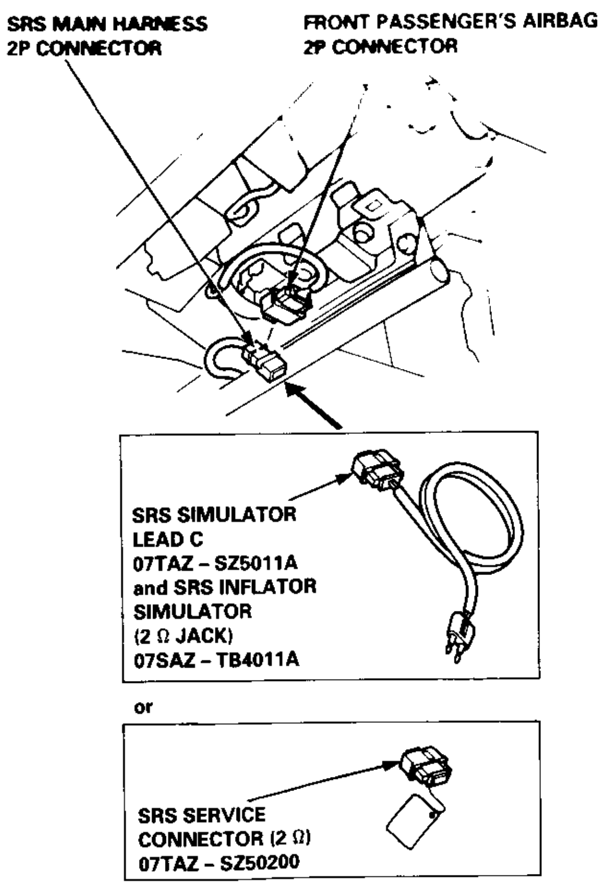
Check for a short to another wire or decreased resistance in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness (see page 23-285).
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
   CAUTION: Do not disconnect the driver's airbag connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

Is DTC 2-3 indicated?

YES — NO

YES: **Short to another wire or decreased resistance in the passenger's airbag inflator; replace the passenger's airbag (see page 23-317).**

NO: To page 23-312



(cont'd)

DTC 2-3 (cont'd)

From page 23-311

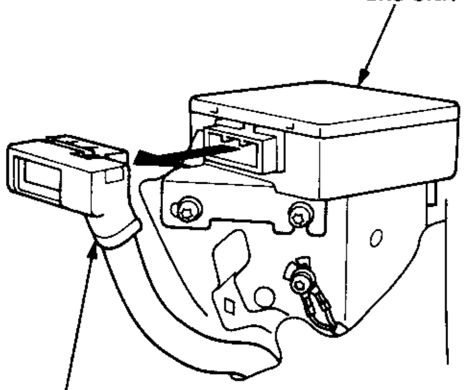
Check for a short to another wire or decreased resistance in the SRS main harness:

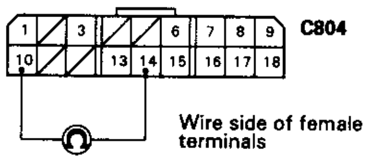
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit. Do not disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between the No. 10 terminal and No. 14 terminal of the SRS main harness 18P connector. There should be approx. 2.0 – 3.0 Ω.

Is the resistance as specified?

YES — **Faulty SRS unit; replace the SRS unit (see page 23-326).**

NO — **Short to another wire or decreased resistance in the SRS main harness; replace the SRS main harness.**





DTC 2-4

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES / NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.

YES ↓

Check for a short to power in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness (see page 23-285).
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
   CAUTION: Do not disconnect the driver's airbag connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-286).

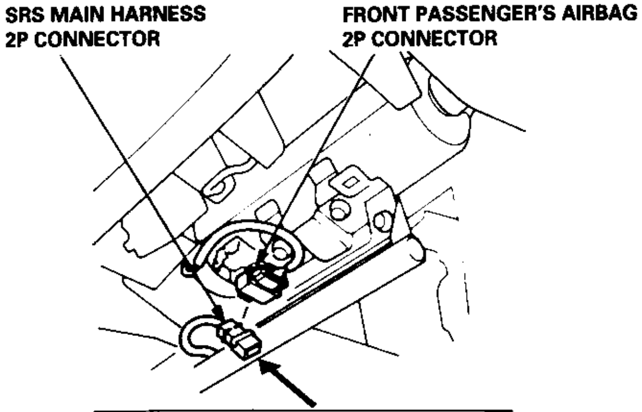
Is DTC 2-4 indicated?

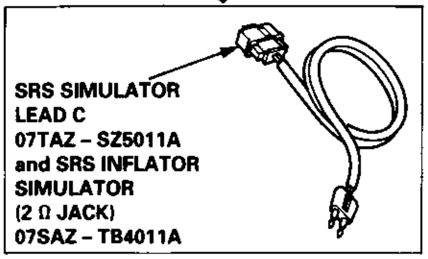
YES / NO

Short to power in the passenger's airbag inflator; replace the passenger's airbag (see page 23-317).

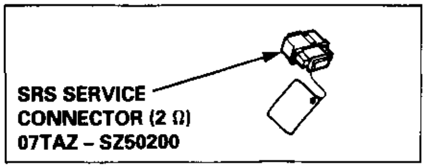
YES ↓

To page 23-314





or



(cont'd)

DTC 2-4 (cont'd)

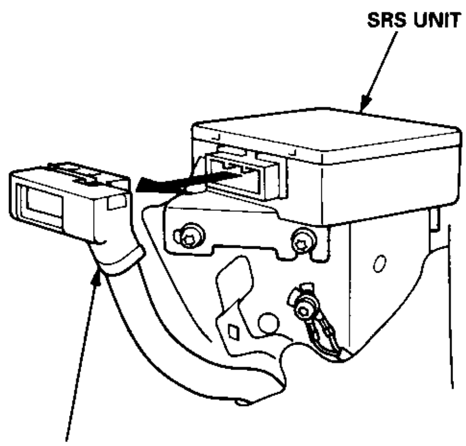
From page 23-313

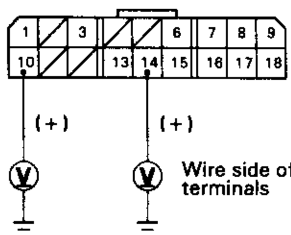
Check for a short to power in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Remove the special tool (2 Ω) from the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Connect a voltmeter between the No. 10 (+) terminal of SRS main harness 18P connector and ground.
7. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.
8. Connect a voltmeter between the No. 14 (+) terminal of the SRS main harness 18P connector and ground, and measure voltage. There should be 0.5 V or less.

Are voltages as specified?

YES — **Faulty SRS unit; replace the SRS unit (see page 23-326).**

NO — **Short to power in the SRS main harness; replace the SRS main harness.**





DTC 2-5

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 23-289).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and then goes off.

Does the SRS indicator light stay on?

YES — NO

NO: **Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 23-289.**

YES:

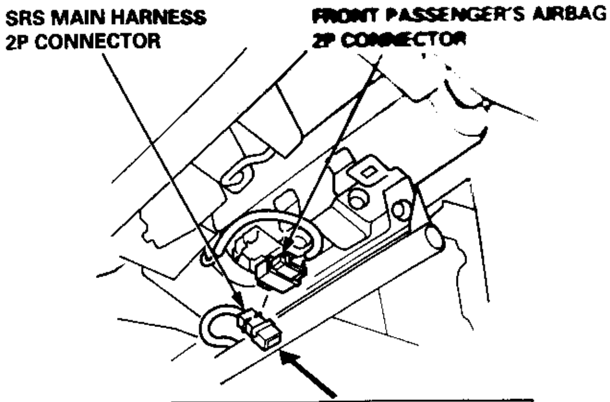
Check for a short to ground in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness (see page 23-285).
4. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
   CAUTION: Do not disconnect the driver's airbag connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 23-289).
7. Read the DTC (see page 23-287).

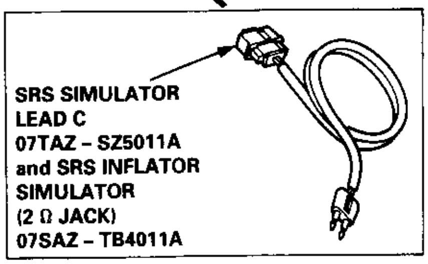
Is DTC 2-5 indicated?

YES — NO

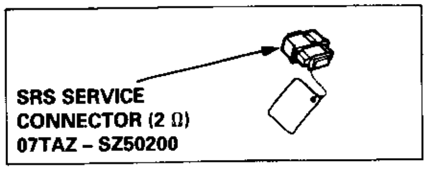
YES: **Short to ground in the passenger's airbag inflator; replace the passenger's airbag (see page 23-317).**

NO: To page 23-316





or



(cont'd)

DTC 2-5 (cont'd)

From page 23-315

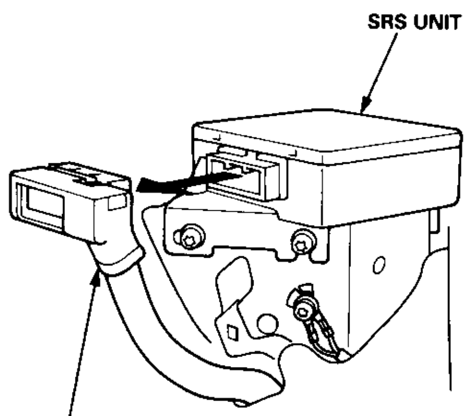
Check for a short to ground in the SRS main harness:

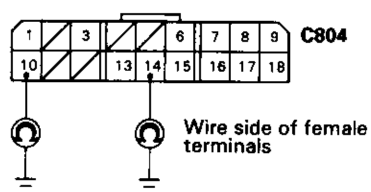
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Remove the special tool (2 Ω) from the SRS main harness 2P connector.
5. Check resistance between the No. 10 terminal of the SRS main harness 18P connector and ground, and between the No. 14 terminal of the SRS main harness 18P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — **Faulty SRS unit; replace the SRS unit (see page 23-326).**

NO — **Short to ground in the SRS main harness; replace the SRS main harness.**





Airbag

Replacement

After a collision in which the airbags were deployed, the airbag assemblies and the SRS unit must be replaced.

WARNING Store a removed airbag with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

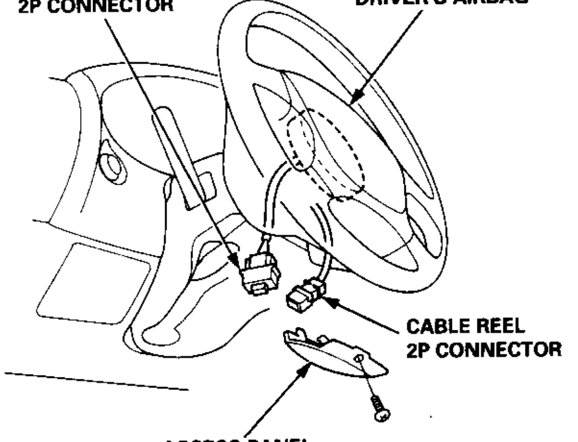
CAUTION:
- **Do not install used SRS parts from another vehicle. When repairing, use only new SRS parts.**
- **Carefully inspect the airbag before you install it. Do not install an airbag that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Always disconnect the airbag connector(s) when the harness is disconnected.**
- **Do not disassemble or tamper with the airbag.**

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.
3. Disconnecting the airbag connector(s):

Driver's Side:

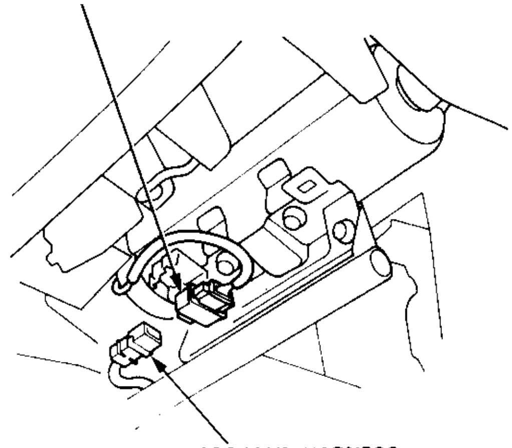
- Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

  NOTE: When disconnected, the airbag connector is automatically shorted.



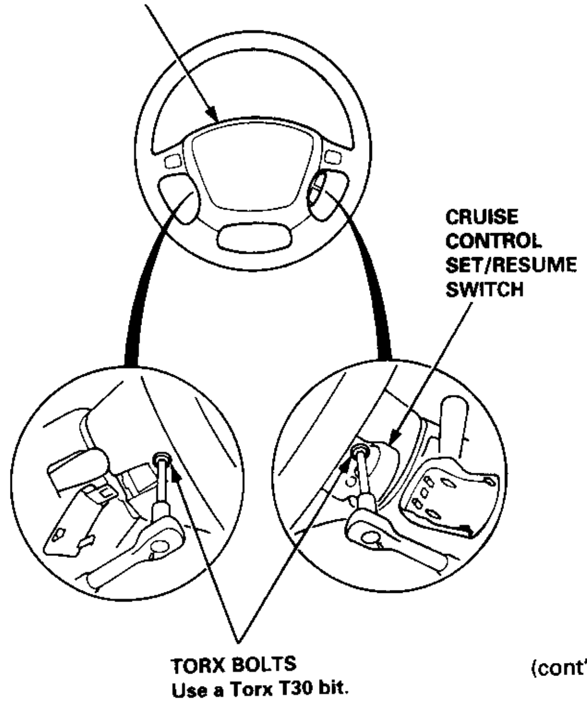
Front Passenger's Side:
- Remove the glove box (see section 20).
- Disconnect the 2P connector between the front passenger's airbag and SRS main harness.

  NOTE: When disconnected, the airbag connector is automatically shorted.



4. **Remove the airbag(s):**

Driver's Side:
- Remove the two Torx bolts using a Torx T30 bit, then remove the driver's airbag.



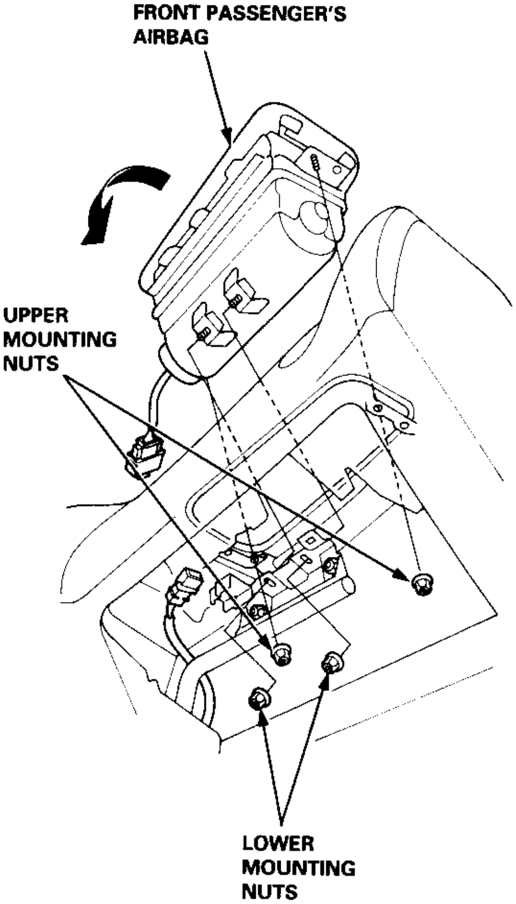
(cont'd)

Replacement (cont'd)

Front Passenger's Side:

- Remove the four mounting nuts from the bracket.
- Lift the front passenger's airbag out of the dashboard by covering the lid and dashboard with a cloth, and prying carefully with a flat-tip screwdriver.

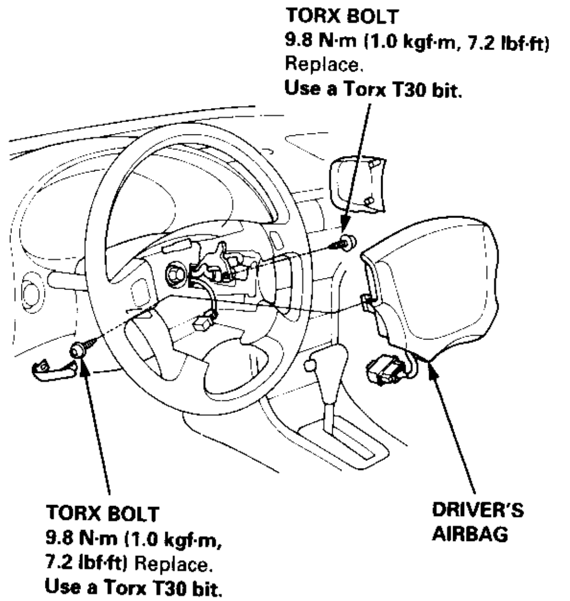
NOTE: The lid of the airbag has pawls on its side which attach it to the dashboard.



CAUTION: Be sure to install the SRS wiring so that it is not pinched or interfering with other parts.

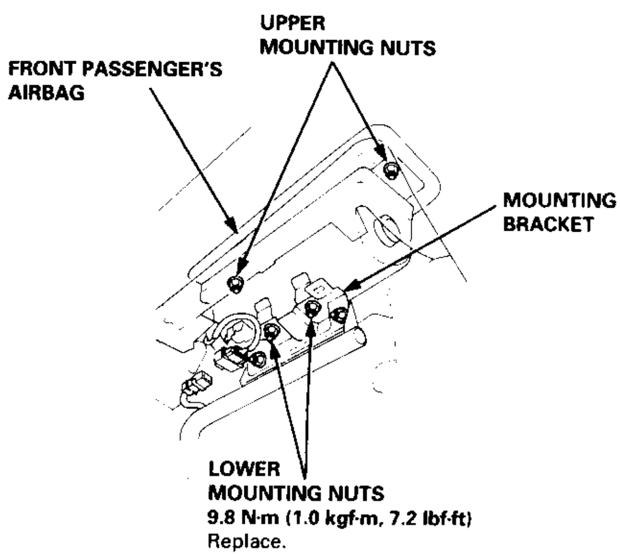
5. Install the new airbag(s):

Driver's Side: Place the driver's airbag into the steering wheel, and secure it with new Torx bolts.



Front Passenger's Side:

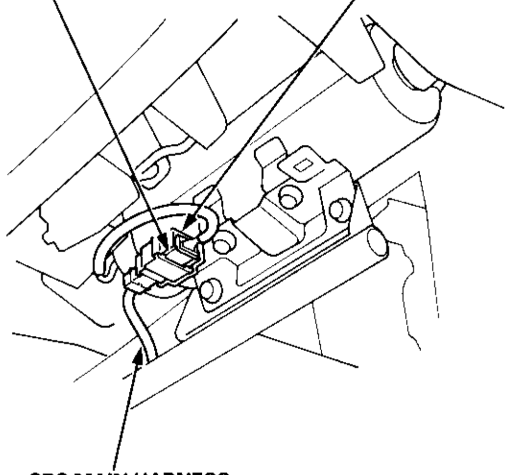
- Place the front passenger's airbag into the dashboard.
- Loosely install all four mounting nuts.
- Tighten the upper two nuts first, then tighten the lower two nuts. Adjust the lower mounting bracket if necessary.



6. Reconnect the airbag connector(s).

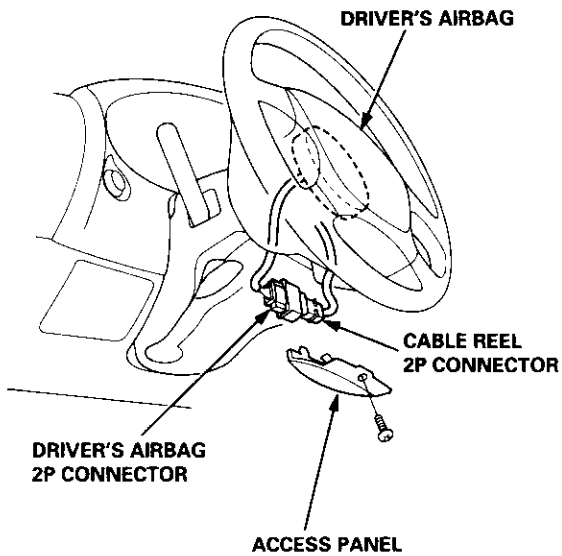
Front Passenger's Side:

- Attach the airbag connector to the connector holder, then reinstall the glove box.



Driver's Side:

- Connect the driver's airbag 2P connector to the cable reel 2P connector, then install the access panel on the steering wheel.



7. Connect the battery positive cable, then connect the negative cable.

8. After installing the airbag, confirm proper system operation:

   - Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
   - Make sure both horn buttons work.
   - Take a test drive, and make sure the cruise control switches work.

9. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Airbag Disposal

Before scrapping any airbags (including those in a whole car to be scrapped), the airbags must be deployed. If the car is still within the warranty period, before you deploy the airbags, the Acura District Technical Manager must give approval and/or special instructions. Only after the airbags have been deployed (as the result of vehicle collision, for example), can they be scrapped.
If the airbags appear intact (not deployed), treat them with extreme caution.
Follow this procedure:

Deploying the Airbags: In-vehicle

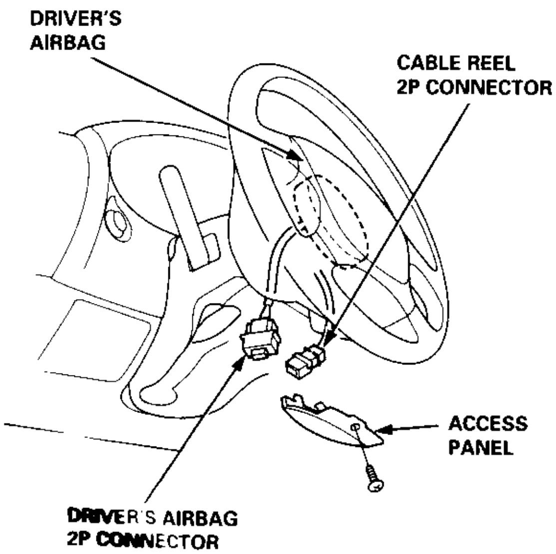
NOTE: If an SRS vehicle is to be entirely scrapped, its airbags should be deployed while still in the vehicle. The airbags should not be considered as salvageable parts and should never be installed in another vehicle.

⚠ WARNING Confirm that each airbag is securely mounted; otherwise, severe personal injury could result from deployment.

1. Disconnect the battery negative cable, then disconnect the positive cable.
2. Confirm that the special tool is functioning properly by following the check procedure on the label on the tool or on page 23-321.

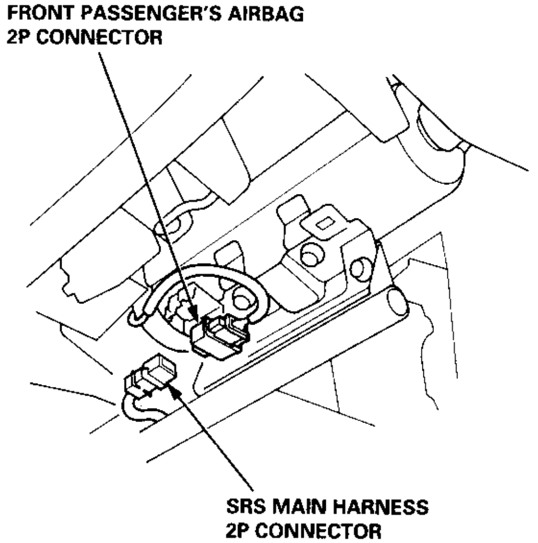
Driver's Airbag:

3. Remove the access panel, then disconnect the 2P connector between the driver's airbag and the cable reel.

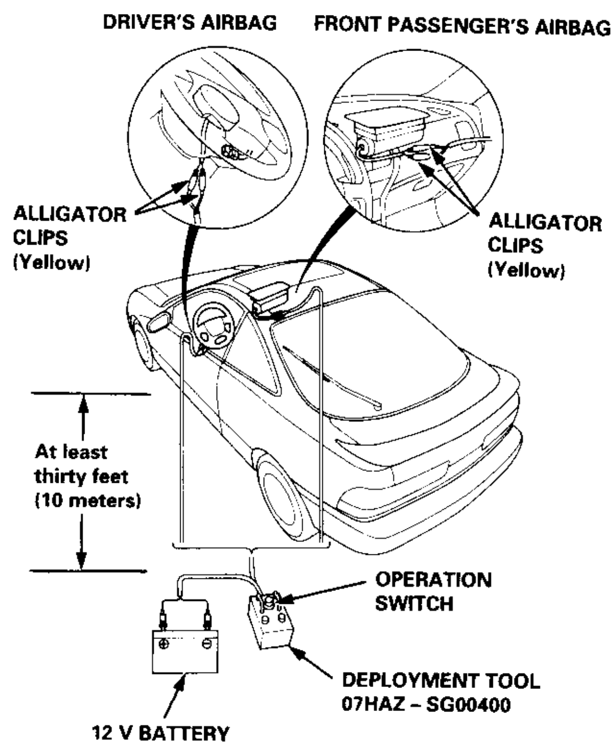


Front Passenger's Airbag:

4. Remove the glove box, then disconnect the 2P connector between the front passenger's airbag and SRS main harness.



5. Cut off the airbag connector, strip the ends of the airbag wires, and connect the special tool alligator clips to the airbag. Place the special tool approximately thirty feet (10 meters) away from the airbag.

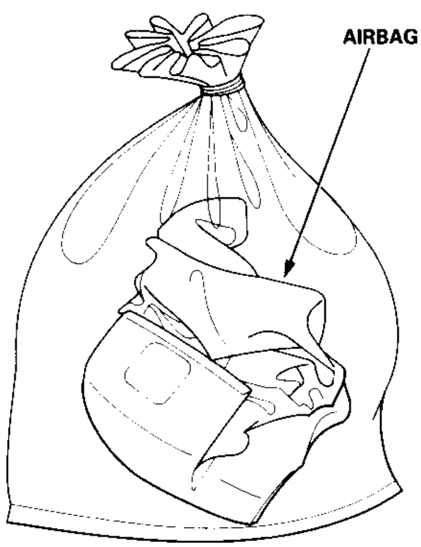


6. Connect a 12 volt battery to the tool:
   - If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Damaged Airbag Special Procedure.
   - If the red light on the tool comes on, the airbag is ready to be deployed.
7. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible; a loud noise and rapid inflation of the bag, followed by slow deflation).
   - If the airbags deploy and the green light on the tool comes on, continue with this procedure.
   - If an airbag doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Damaged Airbag Special Procedure.

WARNING During deployment, the airbag can become hot enough to burn you. Wait thirty minutes after deployment before touching the assembly.

8. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag, and seal it securely.

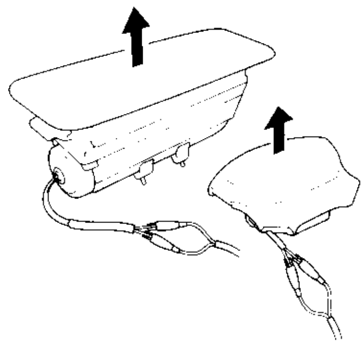
CAUTION:
- **Wear a face shield and gloves when handling a deployed airbag.**
- **Wash your hands and rinse them well with water after handling a deployed airbag.**



Deploying the Airbag: Out-of-vehicle

NOTE: If an intact airbag has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage or service, it should be deployed as follows:

WARNING Position the airbag face up, outdoors on flat ground at least thirty feet (10 m) from any obstacles or people.



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.
2. Follow steps 5, 6, 7, and 8 of the in-vehicle deployment procedure.

Damaged Airbag Special Procedure

WARNING If an airbag cannot be deployed, it should not be treated as normal scrap; it should still be considered a potentially explosive device that can cause serious injury.

1. If installed in a vehicle, follow the removal procedure on page 23-317.
2. In all cases, make sure a short connector is properly installed on the airbag connector.
3. Package the airbag in exactly the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Acura District Technical Manager for how and where to return it for disposal.

Deployment Tool: Check Procedure

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. Disconnect the battery and the yellow clips.

Cable Reel

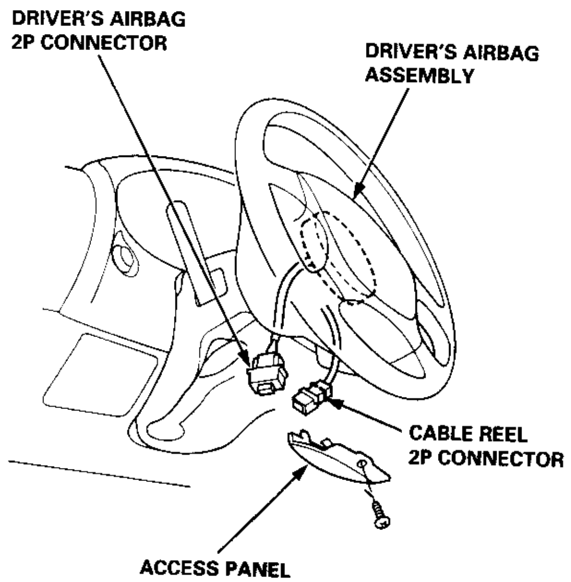
Replacement

⚠WARNING Store a removed airbag with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

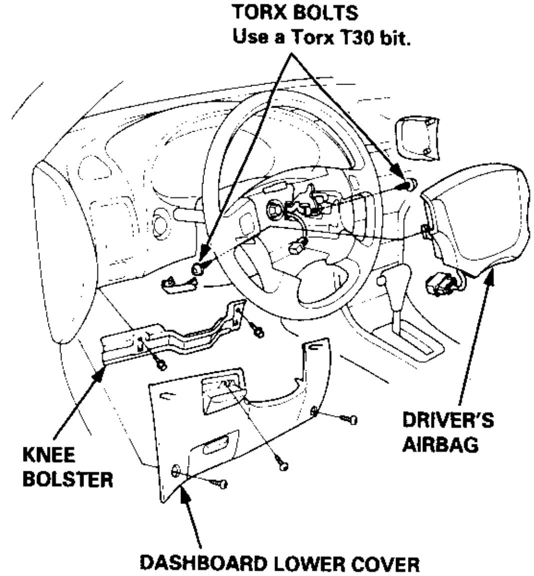
CAUTION:
- **Carefully inspect the airbag before installing it. Do not install an airbag that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Always disconnect the airbag connector(s) when the harness is disconnected.**
- **Do not disassemble or tamper with the airbag.**

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset button.
2. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.
3. Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

   NOTE: When disconnected, the airbag connector is automatically shorted.

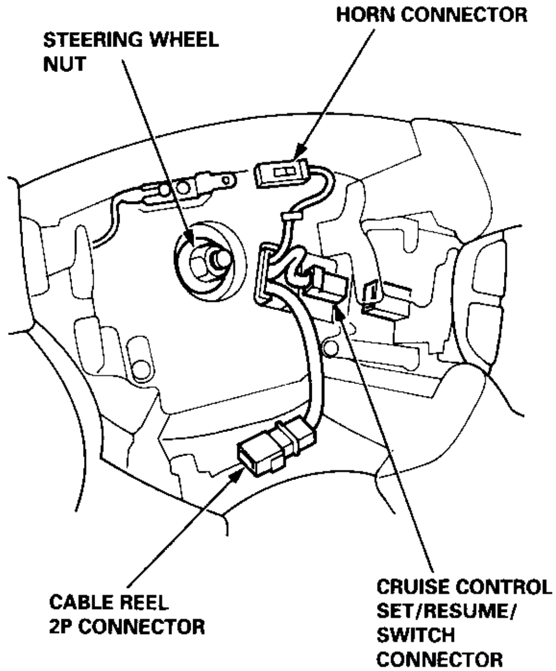


4. Make sure the wheels are aligned straight ahead.
5. Remove the dashboard lower cover and knee bolster.



6. Remove the two Torx bolts from the steering wheel, then remove the driver's airbag.

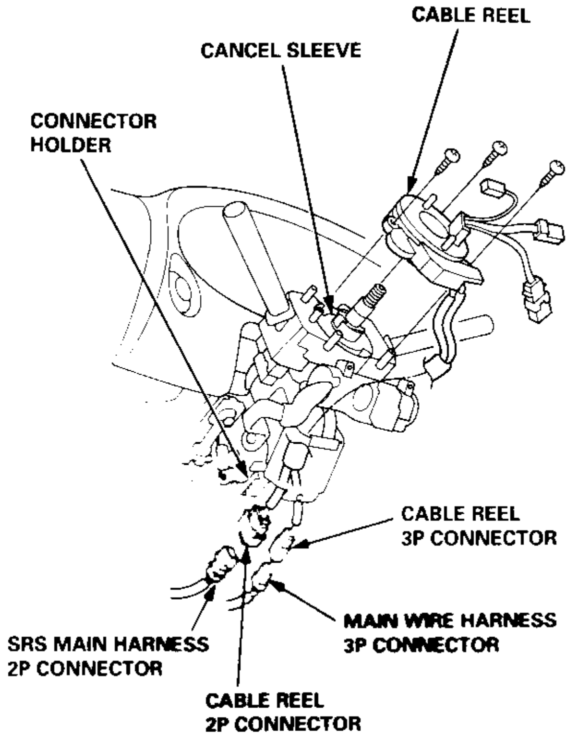
7. Disconnect the connectors from the horn and cruise control set/resume switches, then remove the steering wheel nut.



8. Remove the steering wheel from the column.

9. Remove the steering column covers.

10. Disconnect the 3P connector between the cable reel and main wire harness, and remove the 2P connector between the cable reel and SRS main harness.



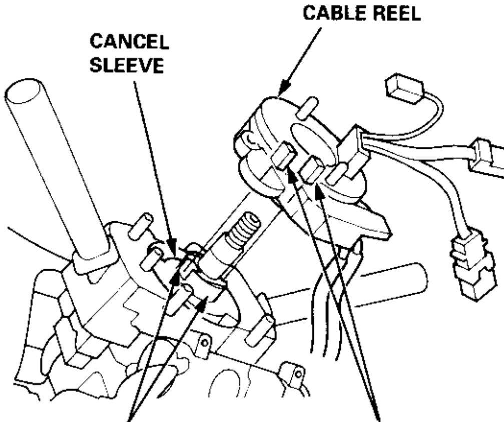
11. Remove the cable reel from the column.

(cont'd)

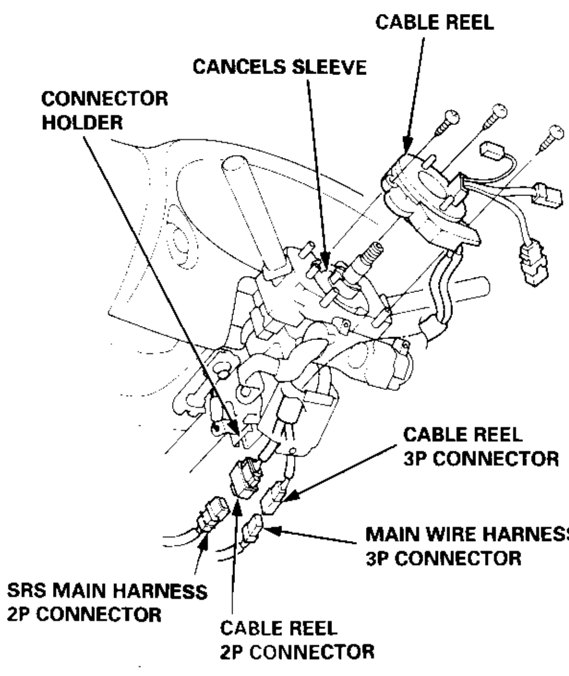
Replacement (cont'd)

CAUTION:
- **Before installing the steering wheel, the front wheels should be aligned straight ahead.**
- **Be sure to install the harness wires so that they are not pinched or interfering with other parts.**
- **After reassembly, confirm that the wheels are still turned straight ahead and that the steering wheel spoke angle is correct (road test). If minor spoke angle adjustment is necessary, do so only by adjusting the tie-rods, not by removing and repositioning the steering wheel.**

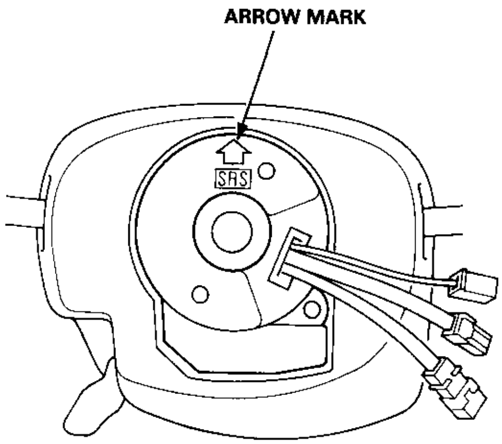
12. Align the cancel sleeve grooves with the cable reel projections.



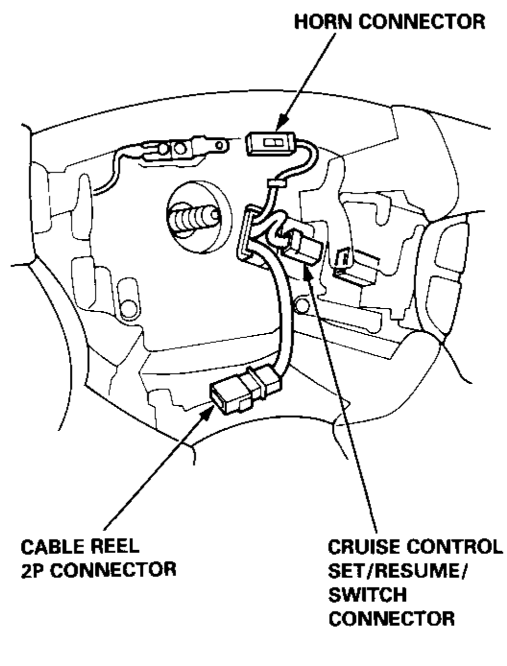
13. Carefully install the cable reel on the steering column shaft. Then connect the 2P connector to the SRS main harness, and connect the 3P connector to the main wire harness.



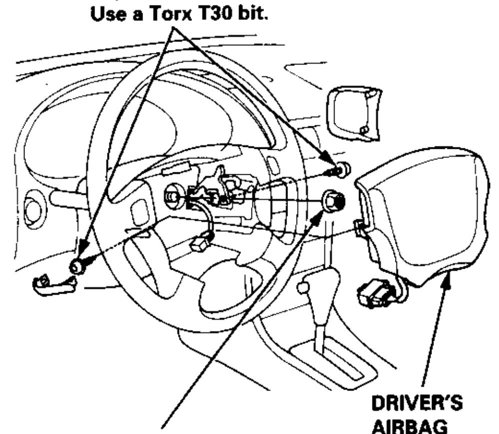
14. Install the steering column covers.
15. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (approximately two and a half turns) until the arrow mark on the cable reel label points straight up.



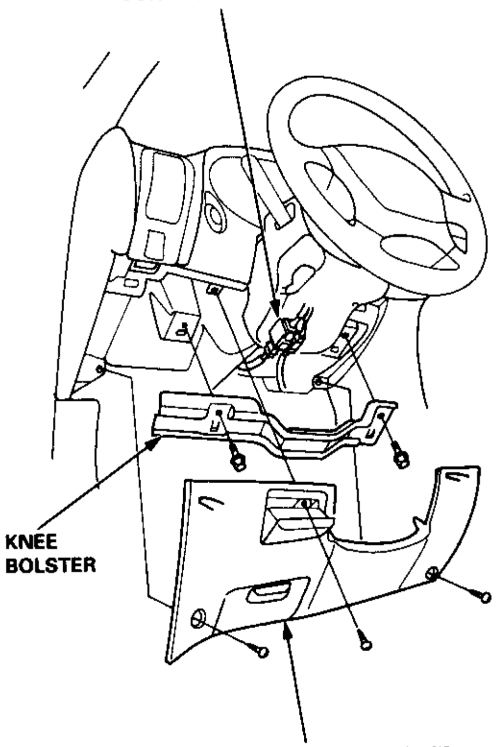
16. Install the steering wheel, then connect the horn connector and cruise control set/resume switch connector.



17 Install the steering wheel bolt, then install the driver's airbag.



18. Attach the 2P and 3P connectors to the connector holder, then install the knee bolster and dashboard lower cover.



19. Reconnect the driver's airbag 2P connector to the cable reel 2P connector, and reinstall the access panel on the steering wheel.

20. Reconnect the battery positive cable, then the negative cable.

21. After installing the cable reel, confirm proper system operation:

- Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
- Make sure both horn buttons work.
- Make sure the headlight and wiper switches work.
- Go for a test drive, and make sure the cruise control switches work.

22. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

SRS Unit

Replacement

CAUTION:

- **Before disconnecting the SRS main harness 18P connector, disconnect the airbag connectors.**
- **During installation or replacement, do not bump (impact wrench, hammer etc.) the area near the SRS unit.**
- **Do not damage the SRS unit terminals or connectors.**
- **Do not disassemble the SRS unit; it has no serviceable parts.**
- **Store the SRS unit in a clean, dry area.**
- **Do not use any SRS unit which has been subjected to water damage or shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**

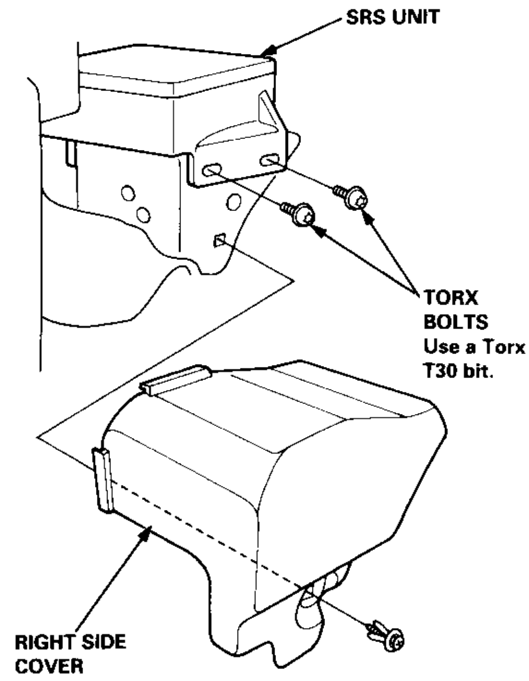
1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.

2. Disconnect the airbag connectors. (When disconnected, the airbag connectors are automatically shorted.)

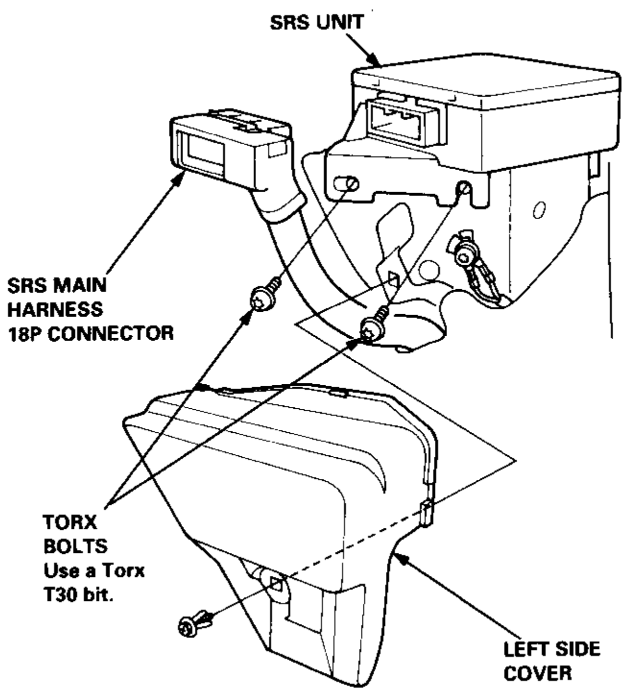
   Driver's Side:
   - Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel (see page 23-285).

   Front Passenger's Side:
   - Disconnect the 2P connector between the front passenger's airbag and SRS main harness (see page 23-285).

3. Remove the right side cover from the SRS unit.

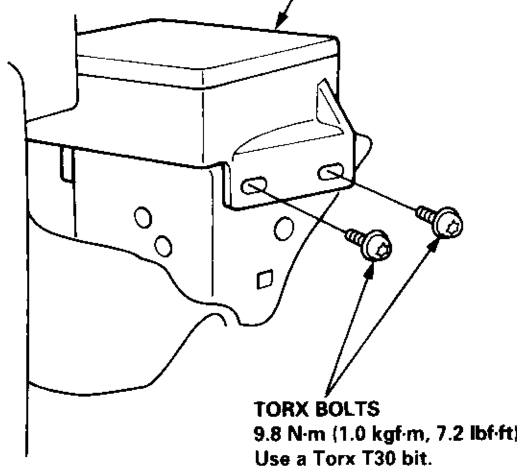


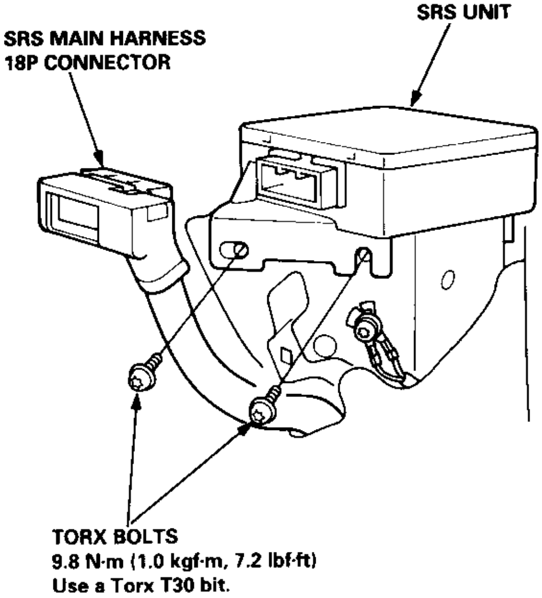
4. Remove the left side cover from the SRS unit, then disconnect the SRS main harness 18P connector from the SRS unit.



5. Remove the four Torx bolts from the SRS unit, then pull out the SRS unit from the driver's side.

6. Install the new SRS unit.





7. Connect the SRS main harness 18P connector to the SRS unit; push it into position until it clicks.

8. Install the SRS unit covers (right and left). Make sure the covers snap together in the middle.

9. Reconnect the driver's airbag 2P connector to the cable reel 2P connector, then reinstall the access panel on the steering wheel.

10. Reconnect the front passenger's airbag connector to the SRS main harness.

11. Reconnect the battery positive cable, then the negative cable.

12. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.

ACURA

INTEGRA

Electrical Troubleshooting 98-00

Contents

Circuit Index

How To Use This Manual

The next few pages describe how this manual is organized. They also explain what kind of information the manual contains, what that information means, and how to use it to troubleshoot electrical problems.

Circuit schematics break the entire electrical system into individual systems, like the Low Fuel Indicator Light on the next page.
Only electrical components that work together are shown together, so you won't be distracted by unrelated wires.

Explanations of the abbreviations and symbols used in the schematics begin on page [8]. You'll need to know what they mean before you can use a schematic effectively.

Circuit Schematics

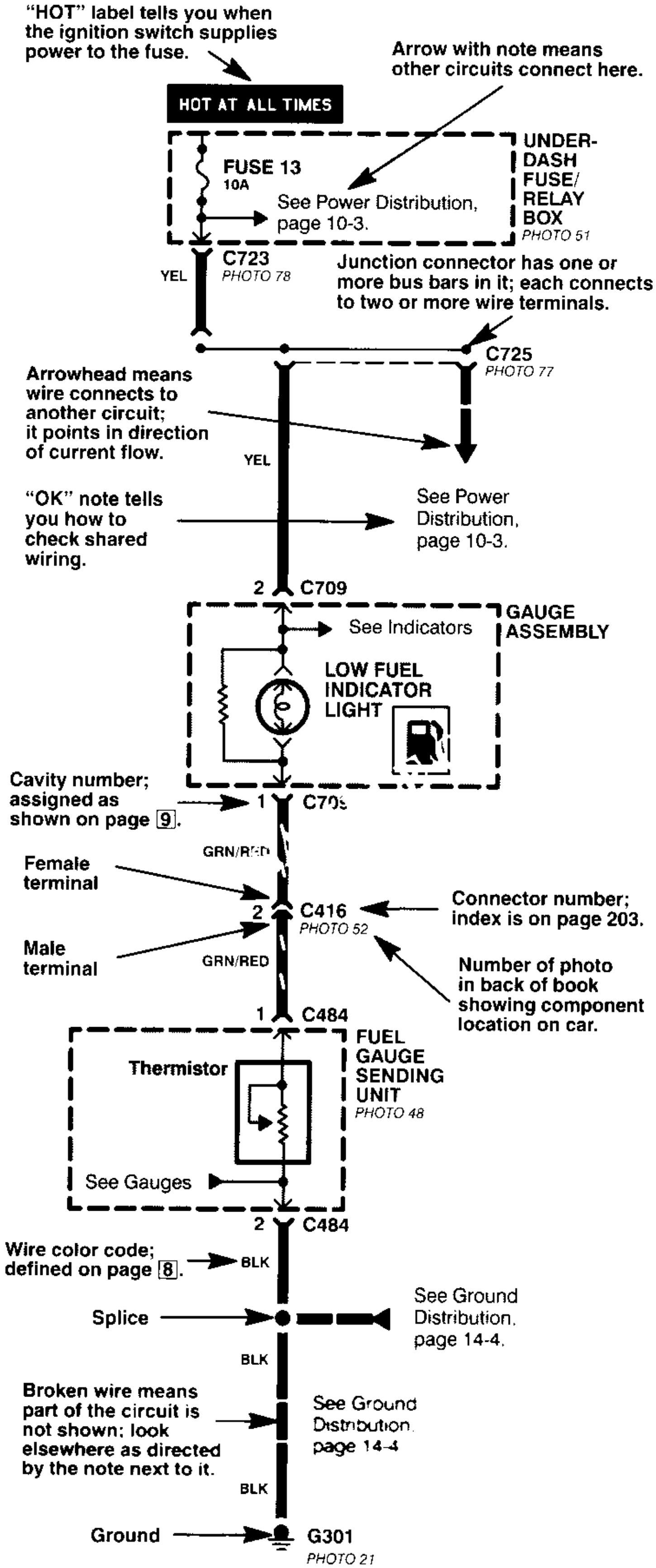
Each schematic represents one circuit. A circuit's wires and components are arranged to show current flow, from power at the top of the page, to ground, at the bottom.

Other circuits may share power or ground terminals or wiring with the circuit shown. A wire that connects one circuit to another, for example, is cut short and has an arrowhead at the end of it pointing in the direction of current flow. Next to the arrowhead is the name of the circuit or component which shares that wiring. To quickly check shared wiring, check the operation of a component it serves. If that component works, you know the shared wiring is OK.

All connectors are numbered (C709, C416, etc.). Below each connector number (except those for components) is the number of a photo in the back of the book showing the connector's location on the car. Connector cavities are also numbered. The numbering sequence begins at the top left corner of the connector as seen from either of the viewpoints shown on page [9]. Disregard any numbers molded into the connector housing.

Wires are identified by the abbreviated names of their colors; the second color is the color of the stripe. Wires are also identified by their location in a connector. The number "2" next to the male and female wire terminals at C416, for example, means those terminals join in cavity 2 of connector C416.

A complete description of schematic symbols begins on page [8].

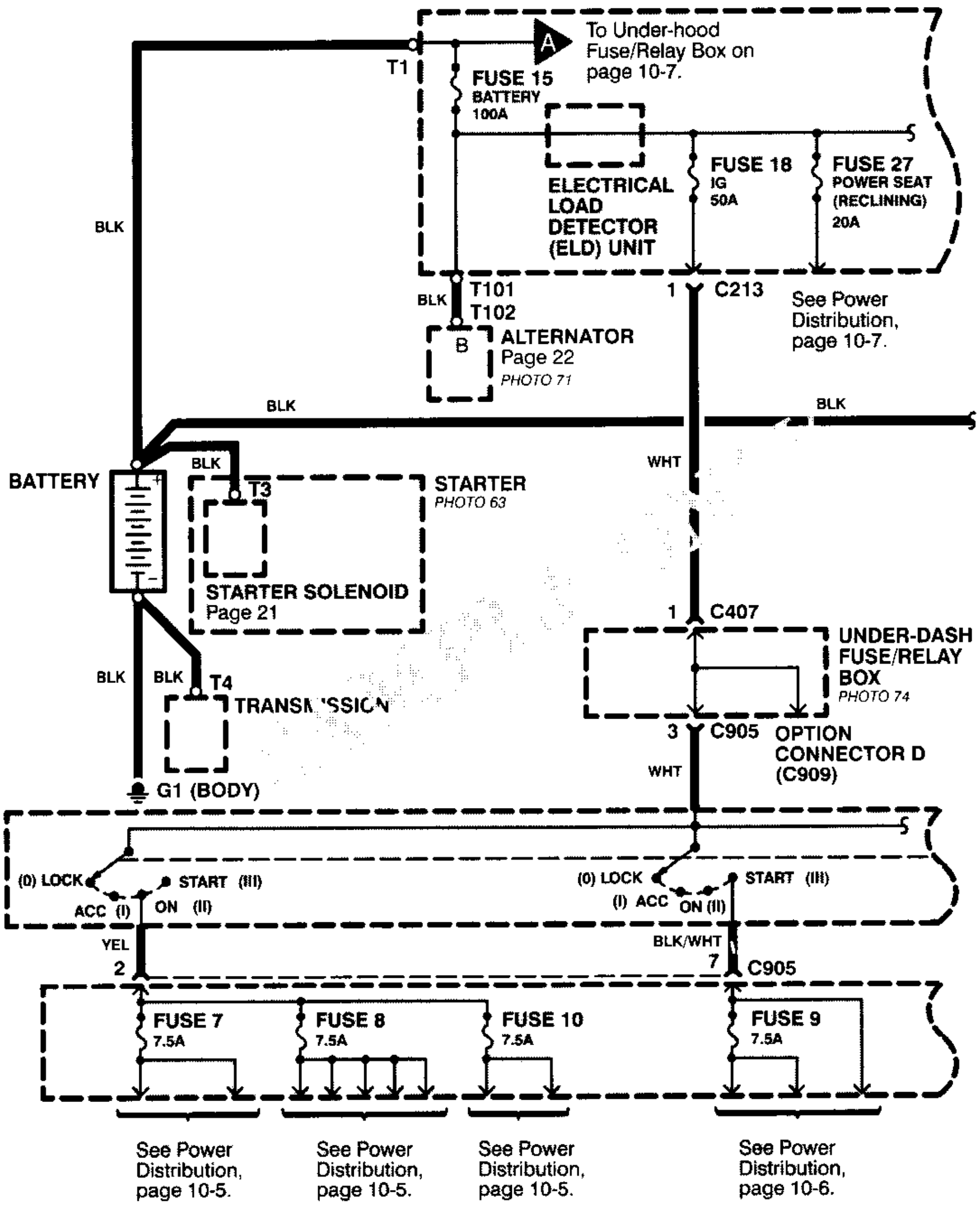


Power Distribution Schematics

Power Distribution schematics show how power is supplied from the positive battery terminal to various circuits in the car. Refer to the Power Distribution section to get a more detailed picture of how power is supplied to the circuit you're working on.

From Battery to Ignition Switch, Fuses, and Relays

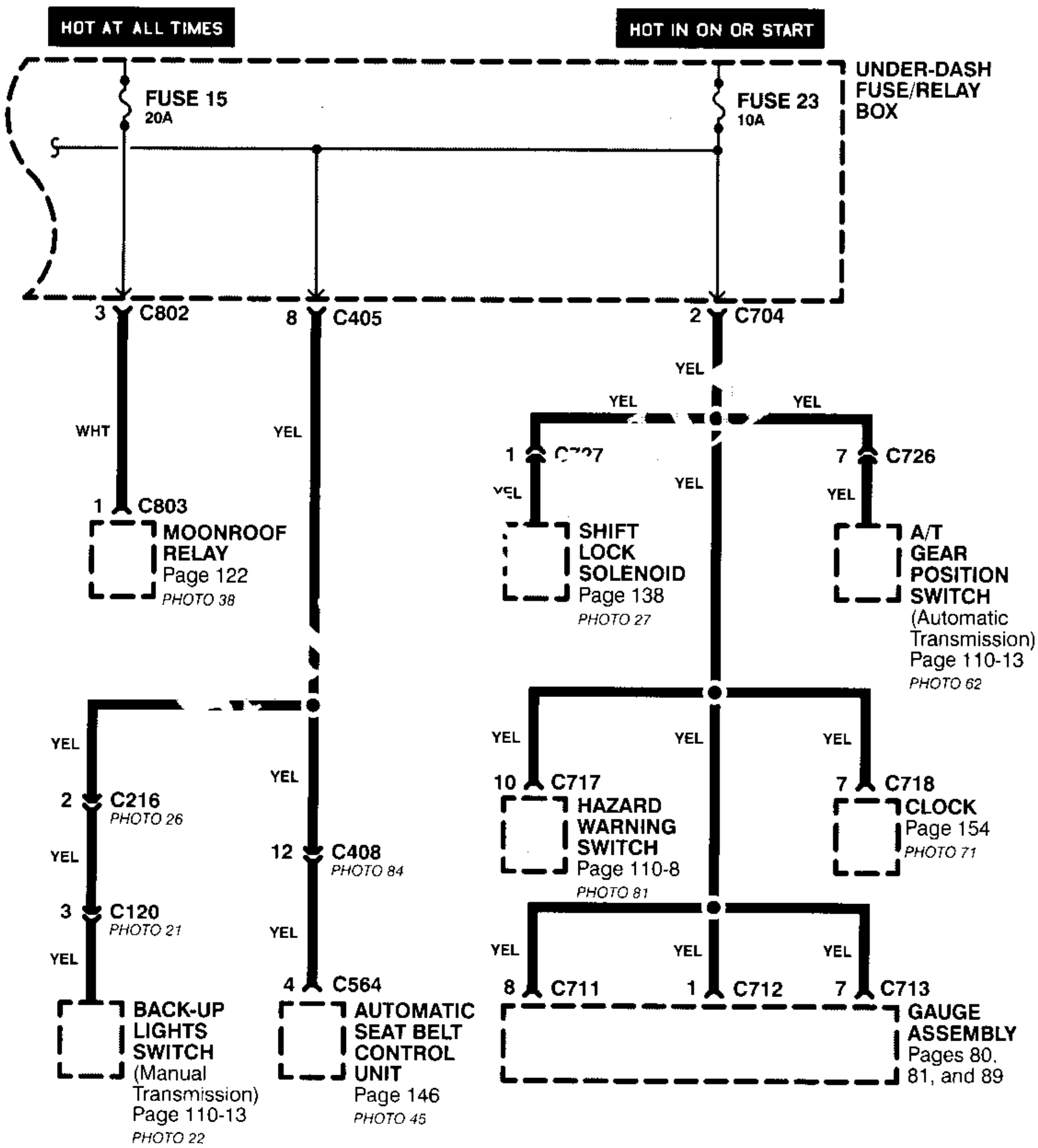
Individual circuit schematics begin with a fuse. The first half of Power Distribution, however, shows the wiring "upstream" between the battery and the fuses.



Power Distribution Schematics

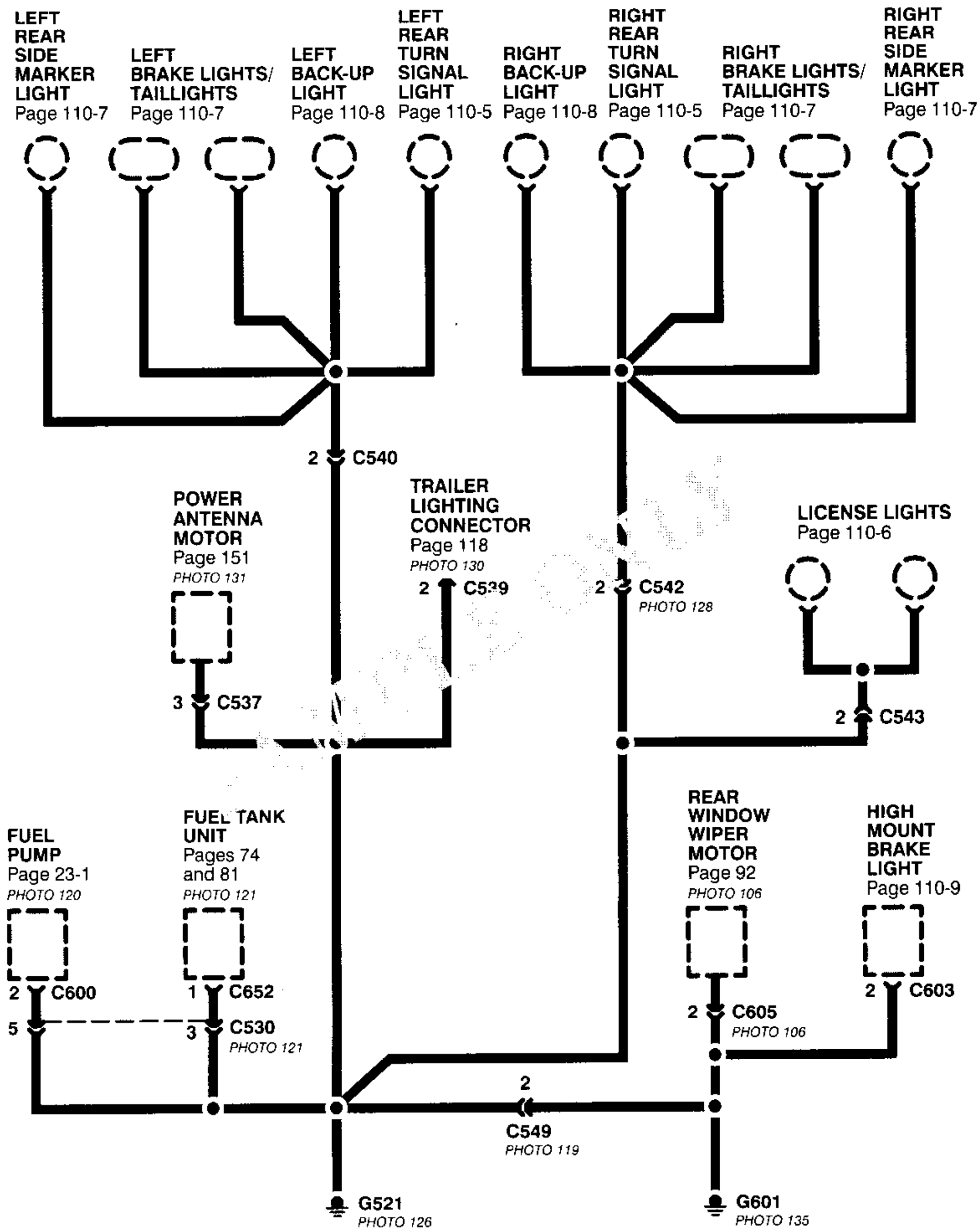
From Fuses to Relays and Components

The second half of Power Distribution shows the wiring "From Fuses to Relays and Components." This can speed your troubleshooting by showing which circuits share fuses. If Power Distribution shows that an inoperative circuit and another circuit share a fuse, check a component in the other circuit. If it works, you know the fuse is good and power is available to the inoperative circuit.



Ground Distribution Schematics

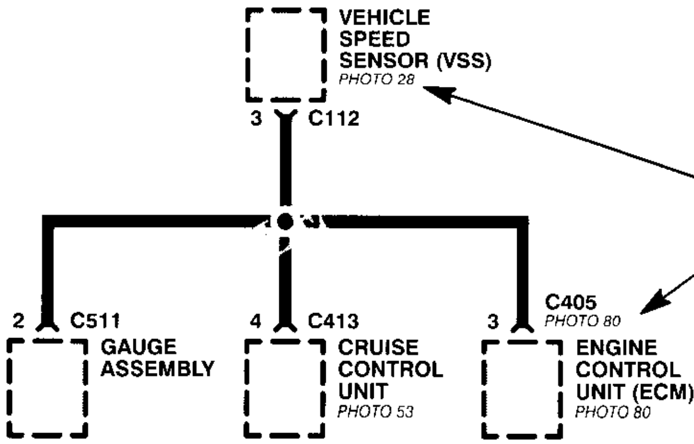
This sample Ground Distribution schematic shows all of the components that share two ground points.



How To Use This Manual

Component Locations

To see where a component or connector is located on the car, look up its photo number in the Component Location section in the back of the book. The photo will also tell you the color of the connector, and how many cavities it has.



To see where connectors and parts are located, look up their photos in the Component Location section.

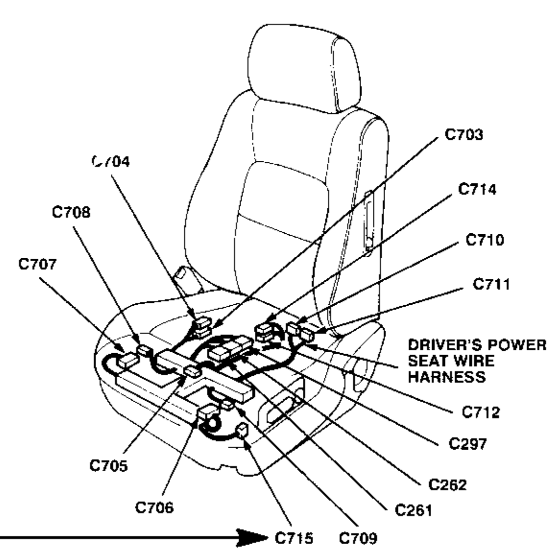
If there is no photo number below or beside a connector, ground, or terminal number, look up that connector, ground, or terminal number in the appropriate Connector Identification Chart. The chart will tell you the color of a connector, how many cavities it has, where it's located, and what component or harness it connects to. On the page opposite that chart you'll find an illustration of the related harness.

Connector Identification and Wire Harness Routing (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
Driver's Door Wire Harness				
C261	10-GRY	Under driver's seat	Left side wire harness	
C262	5-BRN	Under driver's seat	Left side wire harness	
C297	14-GRY	Under driver's seat	Left side wire harness	
C703	2-BLU	Under driver's seat	Front up-down memory sensor	
C704	2-GRY	Under driver's seat	Rear up-down memory sensor	
C705	10-GRY	Under driver's seat	Power seat control unit	
C706	7-BRN	Under driver's seat	Power seat control unit	
C707	7-BRN	Under driver's seat	Power seat control unit	
C708	2-GRY/BRN	Under driver's seat	Slide sensor	
C709	2-GRY	Under driver's seat	Slide motor	
C710	2-BRN	Under driver's seat	Rear up-down motor	
C711	2-GRN	Under driver's seat	Front up-down motor	
C712	4-GRY	Under driver's seat	Recline motor	
C714	2-GRY	Under driver's seat	Recline limit switch	
C715	10-GRY	Left side of driver's seat	Power seat switch	

If a connector on a schematic has no photo number, look it up in the Connector Identification chart.

203-14



(cont'd)

203-15

Circuit Identification for In-Line and Fuse Box Connectors

Use the chart (on page 204, sample below) to help diagnose multiple symptoms in separate circuits which could be caused by a single problem in a connector shared by those circuits. Here's how that chart could help you find such a problem:

1. Pick one of the multiple symptoms and look up the schematic for that circuit.
2. Make a list of all in-line and fuse box connectors in that schematic (include page numbers).
3. Then, in the chart, look up each connector on your list to see if circuits related to the other symptoms run through one of them. If they do, inspect that connector for the problem.

Example: The horn, A/C, and the right headlight don't work. List all in-line and fuse box connectors in the horn circuit and then check the chart (sample below). You find that C211 is common to the A/C circuit and the headlight circuit, so you inspect C211 and find the problem: bent terminals.

Connector (6 or more cavities)	Number of Cavities – Color	Wire Harnesses	Circuits
C201	10-GRY	Main/ Dashboard	Anti-lock brake system (ABS), Cruise control, Programmed fuel injection system (PGM-FI)
C204	6-BLK	Main/ Dashboard	Compressor controls, Ignition system
C207	12-GRY	Main/ Dashboard	Anti-lock brake system (ABS), Blower controls, Fans, Wiper/washer
C208	8-WHT	Engine/ Main	Ignition system, Starting system
C211	14-GRY	Engine/ Main	Blower controls, Compressor controls, Headlights, Horns, Vehicle speed sensor (VSS), Wiper/washer
C212	9-BRN	Engine/ Main	Programmed fuel injection system (PGM-FI), Starting system

How To Use This Manual

Symbols

Wire Color Abbreviations

The following abbreviations are used to identify wire colors in the circuit schematics:

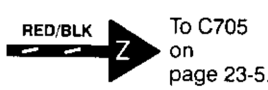
BLK	black
BLU	blue
BRN	brown
GRN	green
GRY	gray
LT BLU	light blue
LT GRN	light green
ORN	orange
PNK	pink
PUR	purple
RED	red
WHT	white
YEL	yellow

Wires

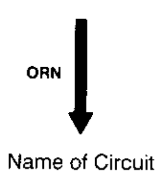
A wavy line at the end of a wire means the wire is broken by the binding of the book or by a "choice" bracket but continues on the next page.

Wire insulation can be one color, or one color with another color stripe. (The second color is the stripe.)

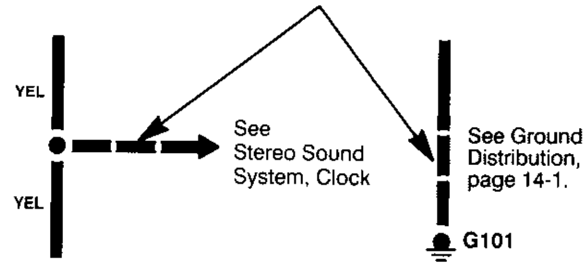
This circuit continues on another page. (The arrow shows direction of current flow.) To follow the RED/BLK wire in this example, you would turn to page 23-5 and look for the "Z" arrow.



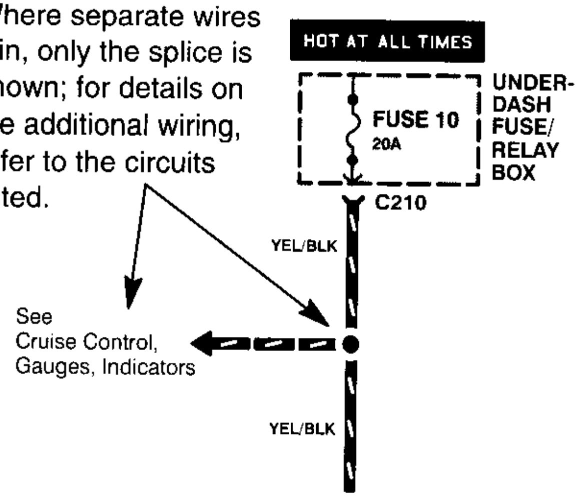
This means the branch of the wire connects to another circuit. The arrow points to the name of the circuit branch where the wire continues.



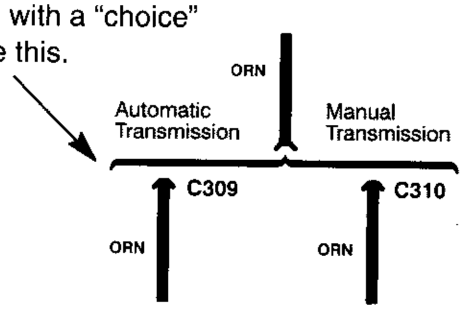
A broken line means this part of the circuit is not shown; refer to the circuit listed for the complete schematic.



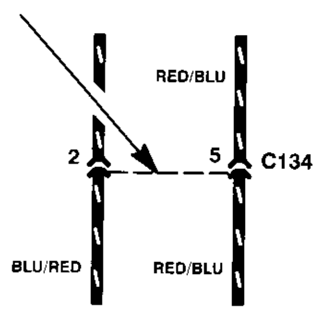
Where separate wires join, only the splice is shown; for details on the additional wiring, refer to the circuits listed.



Wire choices for options or different models are labeled and shown with a "choice" bracket like this.

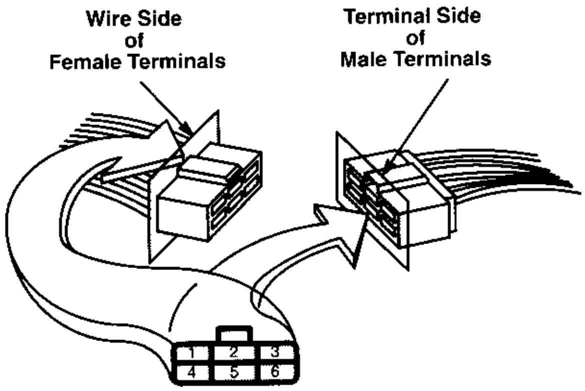


This broken line means both terminals are in connector C134.

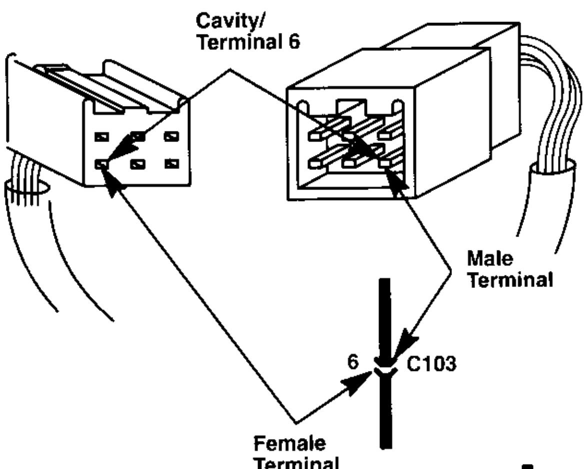


Connectors – "C"

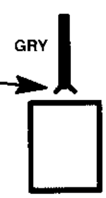
The cavities (and wire terminals) in each connector are numbered starting from the upper left, looking at the male terminals from the terminal side (or looking at the female terminals from the wire side. Both views are in the same direction so the numbers are the same.) All actual cavities are numbered, even if they have no wire terminals in them.



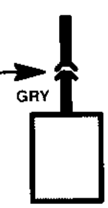
The connector cavity number is listed next to each terminal on the circuit schematic. The cavity/terminal shown below is #6.



This means the connector connects directly to the component.

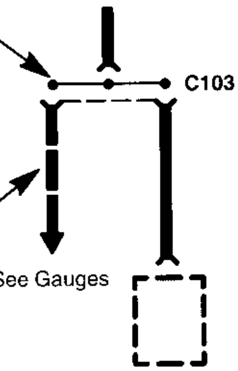


This means the connector connects to a lead (pigtail) wired directly to the component.



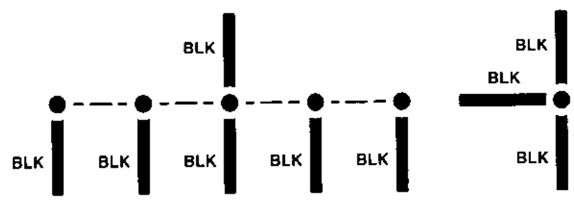
This symbol represents one bus bar inside the cap of a junction connector. A junction connector cap contains several bus bars, but only the one affecting that circuit will be shown. The dots represent tabs on the bus that the wire terminals connect to.

Remaining wires to the same bus bars are represented by a broken line.



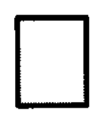
Splices

Splices are shown as a dot. Their location and the number of wires may vary depending on the harness manufacturer.



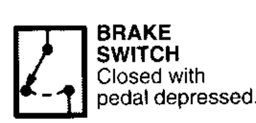
Components

A solid border line means the entire component is shown.



A broken border line indicates that only part of the component is shown.

The name of the component appears next to its upper right corner followed by notes about its function.



How To Use This Manual

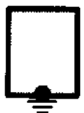
Symbols

Ground – "G"

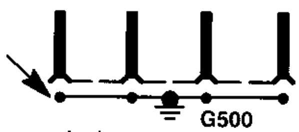
This symbol means the end of the wire is attached (grounded) to the car frame or to a metal part connected to the frame.

Each wire ground (G) is numbered for reference.

This ground symbol (dot and 3 lines) overlapping the component means the housing of the component is grounded to the car frame or to a metal part connected to the frame.

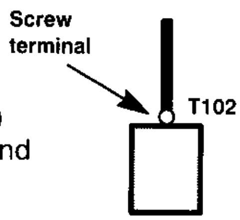


This symbol represents the bus bar inside a ground connector. The dots represent tabs on the bus bar that the wire terminals connect to. The ground symbol (large dot) is the connection between the bus bar and metal (grounded) part of the car.



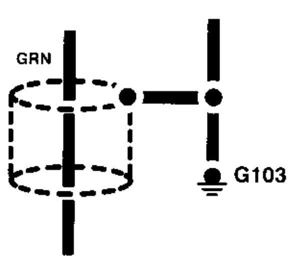
Terminals – "T"

Each "T" terminal (ring type) is numbered for reference and location. A "T" terminal is secured with a screw or bolt.



Shielding

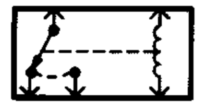
This represents RFI (Radio Frequency Interference) shielding around a wire. The shielding is always connected to ground.

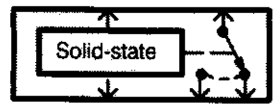


Switches

These switches move together; the broken straight line between them means they are mechanically connected.

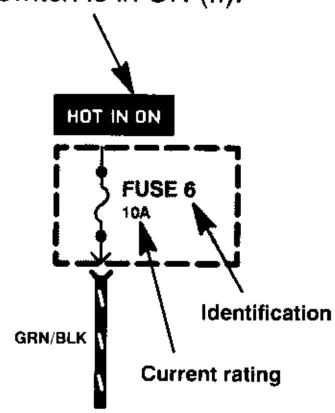
Other types of switches are controlled by a coil or a solid state circuit. Unless otherwise noted, all switches are shown in their normal (rest) position, with power off.





Fuses

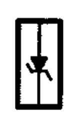
This means power is supplied when the ignition switch is in ON (II).



Diodes

A rectifier diode works like a one way valve. It allows current to flow only in the direction of the arrow.

A Zener diode blocks reverse current at normal voltages just like a rectifier diode. At high voltages, however, a Zener diode allows current to flow in reverse.



Five-Step Troubleshooting

1. **Verify The Complaint**

   Turn on all the components in the problem circuit to check the accuracy of the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. **Analyze The Schematic**

   Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power source through the circuit components to ground. Also, trace circuits that share wiring with the problem circuit. The names of circuits that share the same fuse, ground, or switch, and so on, are referred to in each circuit schematic. Try to operate any shared circuits you didn't check in step 1. If the shared circuits work, the shared wiring is OK, and the cause must be in the wiring used only by the problem circuit. If several circuits fail at the same time, the fuse or ground is a likely cause.

   Based on the symptoms and your understanding of the circuit's operation, identify one or more possible causes.

3. **Isolate The Problem By Testing The Circuit**

   Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. **Fix The Problem**

   Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. **Make Sure The Circuit Works**

   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on that fuse. Make sure no new problems turn up and the original problem does not recur.

Test Equipment

CAUTION:

Most circuits include solid-state devices. Test the voltages in these circuits only with a 10-megaohm or higher impedance digital multimeter. Never use a test light or analog meter on circuits that contain solid-state devices. Damage to the devices may result.

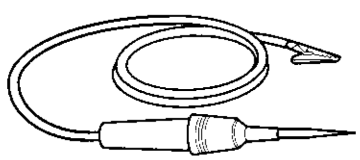
Test Light and DVOM

On circuits without solid-state devices, use a test light to check for voltage. A test light is made up of a 12 volt bulb with a pair of leads attached. After grounding one lead, touch the other lead to various points along the circuit where voltage should be present. The bulb will go on if there is voltage at the point being tested. If you need to know how much voltage is present, use a digital volt/ohmmeter (DVOM).

Self-Powered Test Light and DVOM

Use a self-powered test light to check for continuity. This tool is made up of a light bulb, battery, and two leads. To test it, touch the leads together: the light should go on.

Use a self-powered test light only on an unpowered circuit. First, disconnect the battery, or remove the fuse that feeds the circuit you are working on. Select two points in the circuit between which you want to check continuity. Connect one lead of the self-powered test light to each point. If there is continuity, the test light's circuit will be completed, and the light will go on.



SELF-POWERED TEST LIGHT

How To Use This Manual

Test Equipment

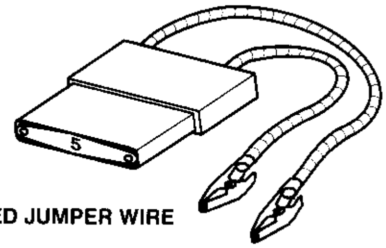
If, in addition, you need to know exactly how much resistance there is between two points, use a digital volt/ohmmeter (DVOM).

In the "OHMS" range, the DVOM will show resistance between two points along a circuit. Low resistance means good continuity.

Diodes and solid-state devices in a circuit can make a DVOM give a false reading. To check a reading, reverse the leads, and take a second reading. If the readings differ, the component is affecting the measurement.

Jumper Wire

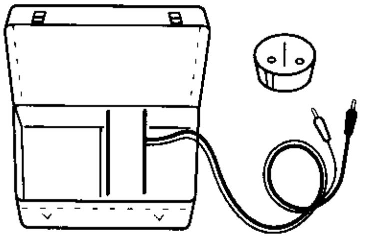
Use a jumper wire to bypass an open circuit. A jumper wire is made up of an in-line fuse holder connected to a set of test leads. It should have a five ampere fuse. Never connect a jumper wire across a short circuit. The direct battery short will blow the fuse.



FUSED JUMPER WIRE

Short Finder (Short Circuit Locater)

Short finders are available to locate shorts to ground. The short finder creates a pulsing magnetic field in the shorted circuit which you can follow to the location of the short. Its use is explained on page 15.



SHORT FINDER

To order any test equipment shown above, contact your local tool supplier. For a list of suppliers and tool numbers, refer to Acura Required Special Tools and Equipment Service Bulletin.

Troubleshooting Precautions

Before Troubleshooting

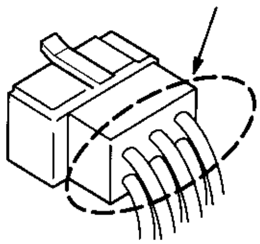
1. Check the main fuse and the fuse box.
2. Check the battery for damage, state of charge, and clean and tight connections.

   CAUTION:

   - **Do not quick-charge a battery unless the battery ground cable has been disconnected, or you will damage the alternator diodes.**
   - **Do not attempt to crank the engine with the ground cable disconnected or you will severely damage the wiring.**

While You're Working

1. Make sure connectors are clean, and have no loose terminals or receptacles.
2. Make sure multiple terminal connectors are packed with dielectric (silicone) grease. Part Number: 08798-9001.



3. When connecting a connector, push it until it clicks into place.

   CAUTION:

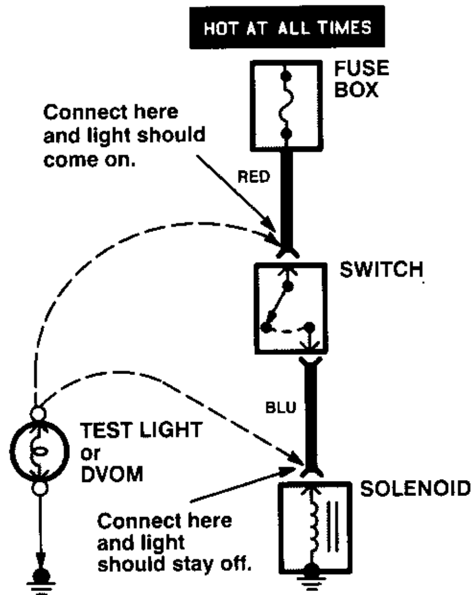
   - **Do not pull on the wires when disconnecting a connector. Pull only on the connector housings.**
   - **Most circuits include solid-state devices. Test the voltages in these circuits only with a 10-megaohm or higher impedance digital multimeter. Never use a test light or analog meter on circuits that contain solid-state devices. Damage to the devices may result.**

Troubleshooting Tests

Testing for Voltage

When testing for voltage at a connector without wire seals, you do not have to separate the two halves of the connector. Instead, probe the connector from the back. Always check both sides of the connector because dirty, corroded, and bent terminals can cause problems (no electrical contact = an open).

1. Connect one lead of the test light to a known good ground, or, if you're using a digital volt ohmmeter (DVOM), place it in the appropriate DC volts range, and connect its negative lead to ground.



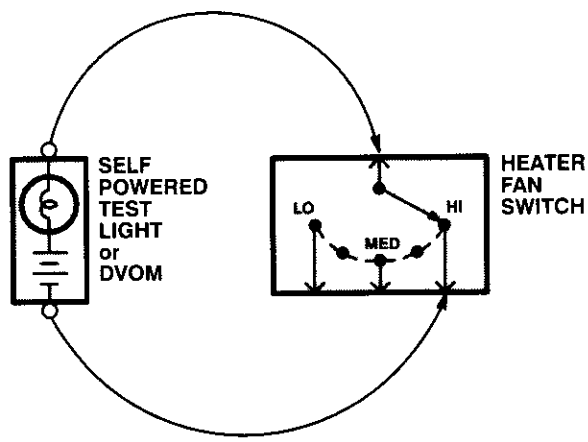
2. Connect the other lead of the test light or DVOM to the point you want to check.
3. If the test light glows, there is voltage present. If you're using a DVOM, note the voltage reading. It should be within one volt of measured battery voltage.
   A loss of more than one volt indicates a problem.

   NOTE: Always use a DVOM on high impedance circuits. A test light may not glow (even with battery voltage present).

Testing for Continuity

When testing for continuity at a connector without wire seals, you do not have to separate the two halves of the connector. Instead, probe the connector from the back. Always check both sides of the connector because dirty, corroded, and bent terminals can cause problems (no electrical contact = an open).

1. Disconnect the negative cable from the car battery. If you're using a DVOM, place it in the lowest "OHMS" range.
2. Connect one lead of a self-powered test light or DVOM to one end of the part of the circuit you want to test.



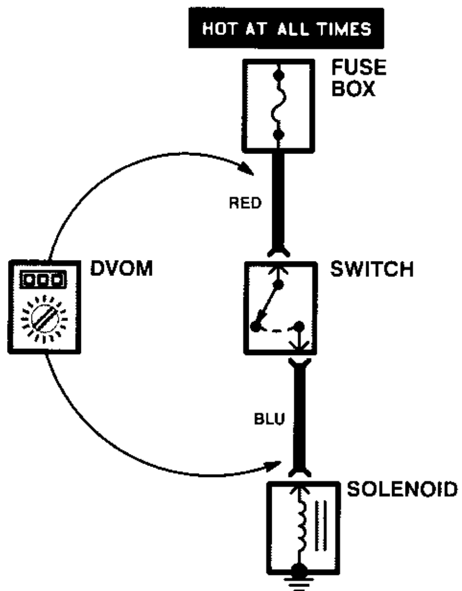
3. Connect the other lead to the other end.
4. If the self-powered test light glows, there is continuity. If you're using a DVOM, a low reading or no reading (zero), means good continuity.

Troubleshooting Tests

Testing for Voltage Drop

Wires, connectors, and switches are designed to conduct current with a minimum loss of voltage. A voltage drop of more than one volt indicates a problem.

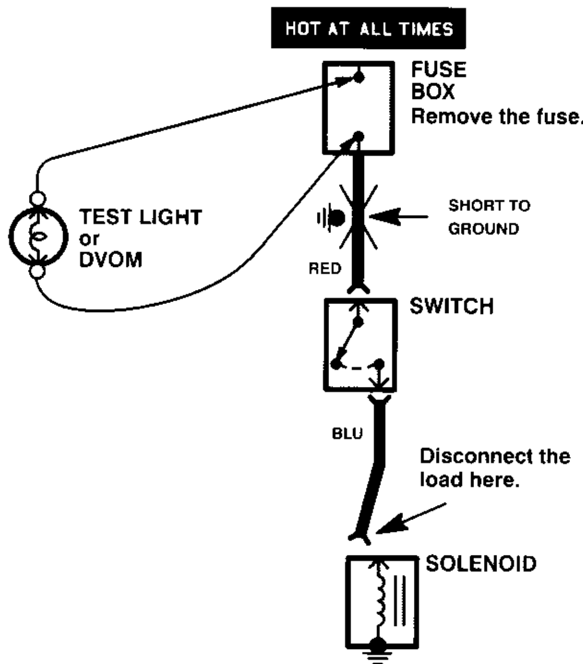
1. Place the digital volt/ohmmeter (DVOM) in the appropriate DC volts range. Connect the positive lead to the end of the wire (or to the connector or switch) closest to the battery.



2. Connect the negative lead to the other end of the wire (or the other side of the connector or switch).
3. Turn on the components in the circuit.
4. The DVOM will show the difference in voltage between the two points. A difference, or drop, of more than one volt indicates a problem. Check the circuit for loose, dirty, or bent terminals.

Testing for a Short to Ground with a Test Light or DVOM

1. Remove the blown fuse and disconnect the load.
2. Connect a test light or digital volt/ohmmeter (DVOM), switched to the appropriate DC volts range, across the fuse terminals to make sure voltage is present. You might have to turn the ignition switch to ON; check the schematic to see.



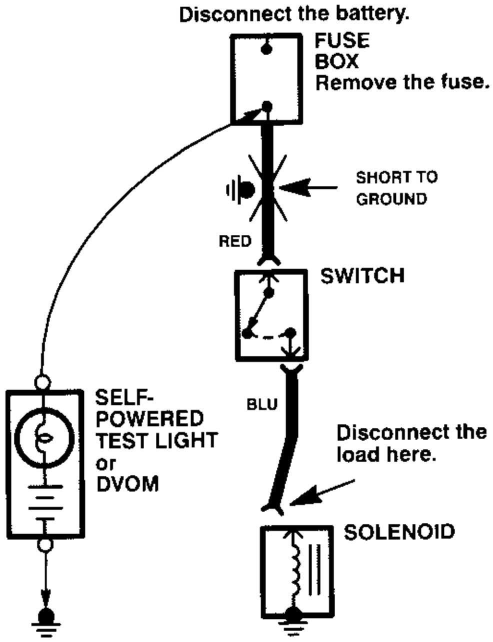
3. Beginning near the fuse box, wiggle the harness. Continue this at convenient points about six inches apart while watching the test light or DVOM.
4. Where the test light goes off, or the DVOM voltage drops to zero, there is a short to ground in the wiring near that point.

   NOTE: Always use a DVOM on high impedance circuits. A test light may not glow (even with battery voltage present).

Testing for a Short to Ground with a Self-Powered Test Light or DVOM

1. Remove the blown fuse and disconnect the battery and load.

2. Connect one lead of a self-powered test light or digital volt/ohmmeter (DVOM) (switched to the lowest "OHMS" range) to the fuse terminal on the load side.



3. Connect the other lead to a known good ground.

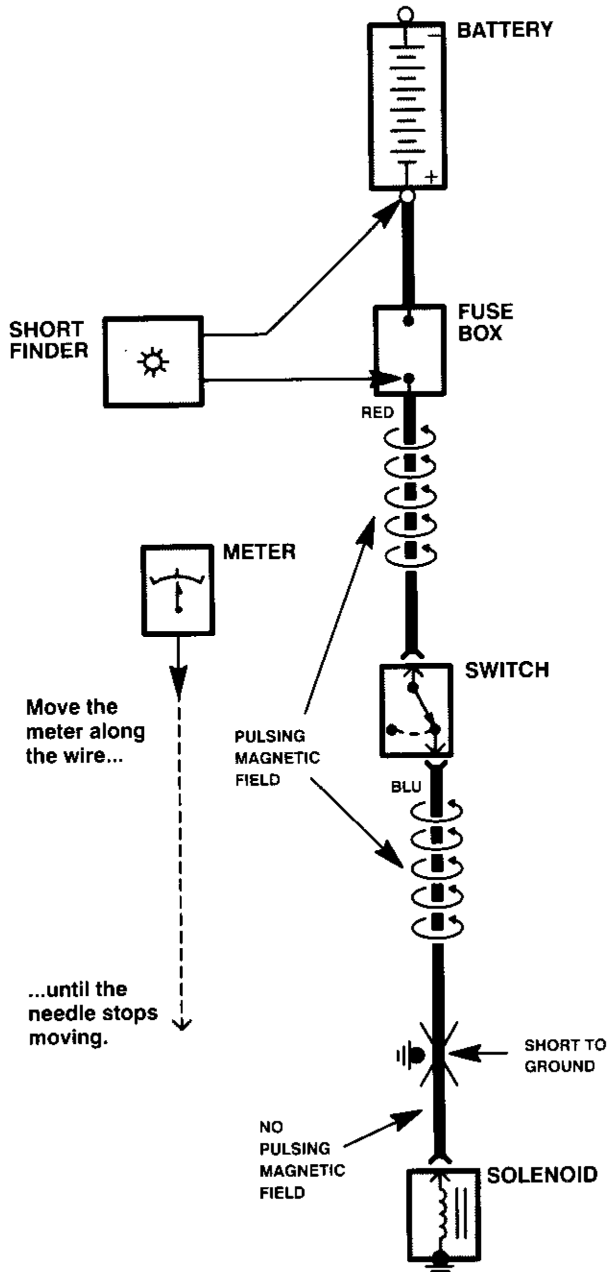
4. Beginning near the fuse box, wiggle the harness. Continue this at convenient points about six inches apart while watching the test light or DVOM.

5. If the self-powered test light goes on or the DVOM displays a low reading or no reading (zero), there is a short to ground in the wiring near that point.

Testing for a Short with a Short Circuit Locator (Short Finder)

1. Remove the blown fuse. Leave the battery connected.

2. Connect the short finder across the battery terminals and the load (component) side of the fuse terminal.



3. Close all switches in the circuit you're testing.

Troubleshooting Tests (cont'd)

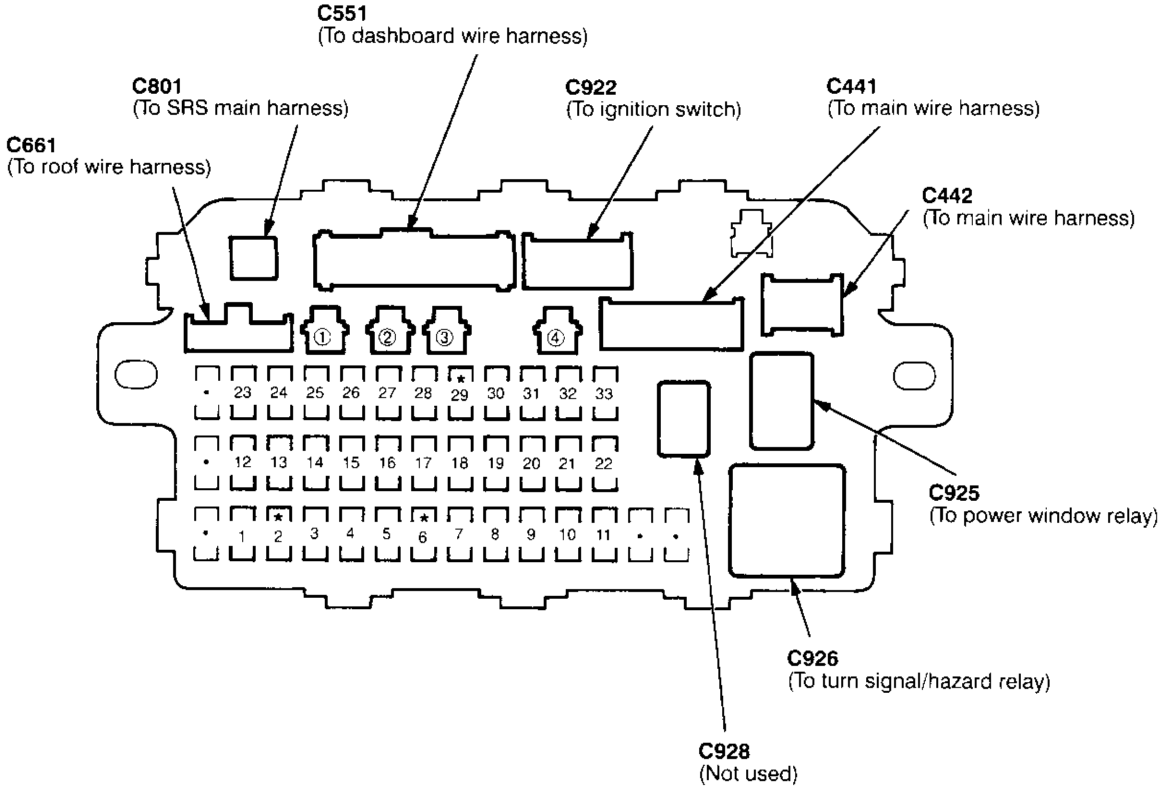
4. Turn on the short finder. This creates a pulsing magnetic field around the wiring between the fuse box and the short.

5. Beginning at the fuse box, slowly move the short finder along the circuit wiring. The meter will show current pulses through sheet metal and body trim. As long as the meter is between the fuse and the short, the needle will move with each current pulse. Once you move the meter past the point of the short, the needle will stop moving. Check the wiring and connectors in this area to locate the cause of the short.

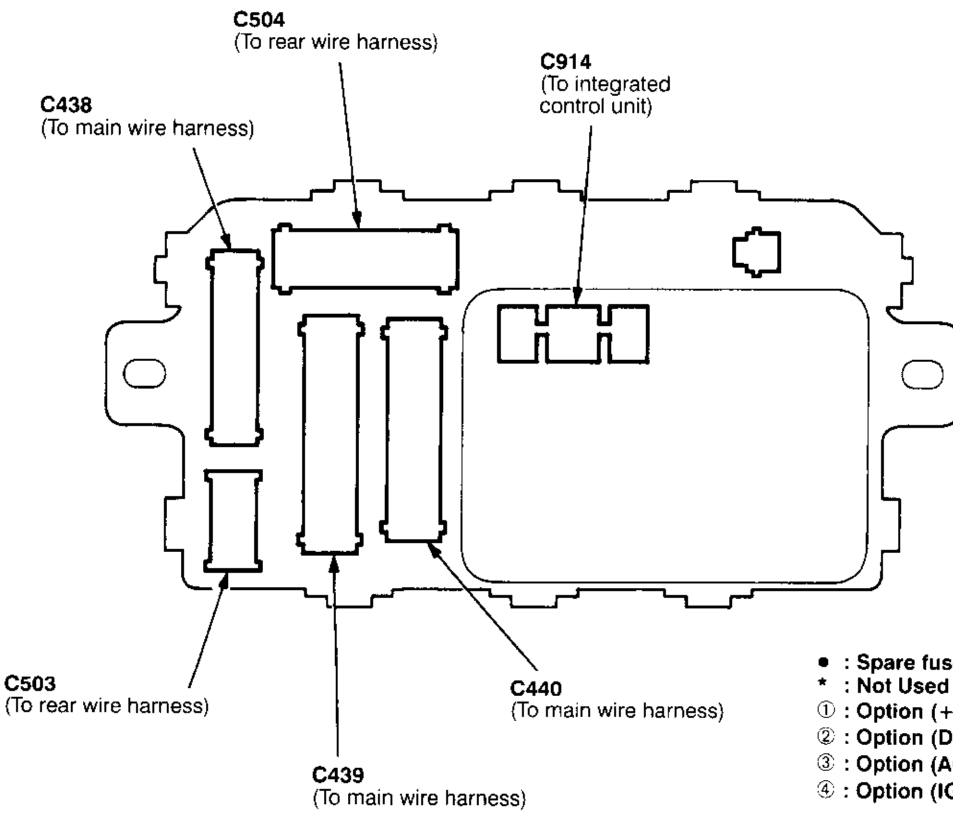
Fuse/Relay Information

– Under-dash Fuse/Relay Box

Front View



Rear View



- • : Spare fuse
- * : Not Used
- ① : Option (+B)
- ② : Option (Dash lights)
- ③ : Option (ACC)
- ④ : Option (IG2)

Fuse Number	Fuse Name	Amps	Page	Component or Circuit Protected
1	(POWER DOOR LOCK)	20	10-2	Power door lock control unit
2	—	—	10-1	Not used
3	(RR WIPER RR WASHER)	10	10-2	Rear wiper
4	R – HEAD LIGHT HIGH BEAM	10	110-8	DRL control unit (Canada), Right headlight
5	L – HEAD LIGHT HIGH BEAM	10	110-8	DRL control unit (Canada), High beam indicator light, Left headlight
6	—	—	10-1	Not used
7	(POWER WINDOW RR-L)	20	120-2	Left rear window motor
8	(POWER WINDOW RR-R)	20	120-2	Right rear window motor
9	(IGN COIL)	15	10-2	Ignition system
10	(POWER WINDOW FR-R)	20	120 (H/B) or 120-2 (Sedan)	Front passenger's window motor
11	(POWER WINDOW FR-L)	20	120 (H/B) or 120-2 (Sedan)	Driver's window motor
12	TURN LIGHTS	10	10-2	Hazard warning switch
13	FUEL PUMP (SRS UNIT)	15	10-2	PGM-FI main relay, SRS unit
14	(CRUISE CONTROL)	7.5	10-3	Cruise control
15	ALTERNATOR SP SENSOR	7.5	10-3	Alternator, ECM or PCM ('00 Model), ELD unit, Gauge assembly, PGM-FI, TCM ('98-'99 Model with A/T), Vehicle speed sensor
16	REAR DEFROSTER RELAY	7.5	10-6	ABS control unit, Rear window defogger
17	HEATER A/C RELAY	7.5	10-6	A/C compressor controls, Air delivery, Blower controls, Fans, Power mirrors
18	(RUNNING LIGHT RELAY)	7.5	10-6	DRL control unit (Canada)
19	BACK UP LIGHTS	7.5	10-4	Back-up lights
20	(RUNNING LIGHTS)	10	10-8	DRL control unit (Canada)

(cont'd)

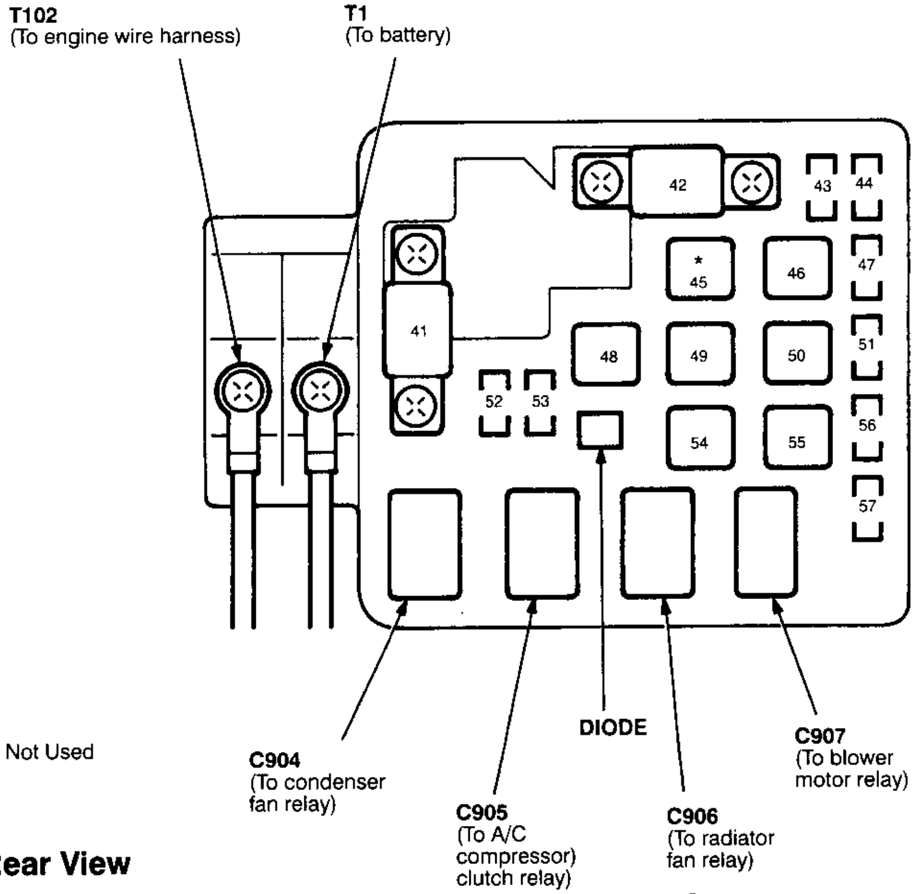
Fuse/Relay Information

– Under-dash Fuse/Relay Box (cont'd)

Fuse Number	Fuse Name	Amps	Page	Component or Circuit Protected
21	R – HEAD LIGHT LOW BEAM	10	110-8	Right headlight
22	L – HEAD LIGHT LOW BEAM	10	110-8	Left headlight
23	(SRS)	10	10-4	SRS unit
24	P/W RELAY (SUNROOF RELAY)	7.5	10-4	Power window relay, Moonroof
25	METER	7.5	10-5	Clock, Gauge assembly, Integrated control unit, Interlock system, Maintenance reminder unit
26	FR WIPER FR WASHER	20	10-5	Front wiper/washer
27	CIGARETTE LIGHTER	10	10-5	Cigarette lighter
28	RADIO	10	10-5	Stereo radio/cassette player
29	(RR FOG LIGHT)	7.5	—	Not used
30	INSTRUMENT LIGHTS	7.5	114	Dash & console lights, Integrated control unit
31	STARTER SIGNAL	7.5	21, 21-1	ECM or PCM, Integrated control unit, PGM-FI main relay
32	LICENSE LIGHTS TAIL LIGHTS	10	100-1	License plate lights, Parking lights, Taillights
33	(INTER LOCK UNIT)	7.5	10-8	Interlock system

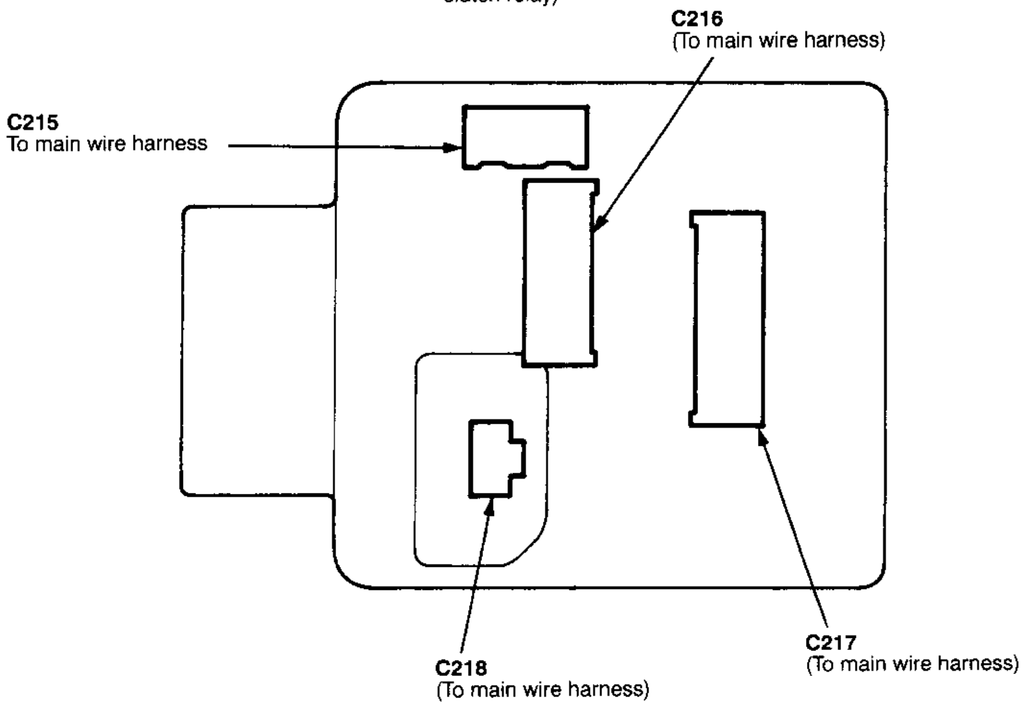
Under-hood Fuse/Relay Box

Front View



*: Not Used

Rear View



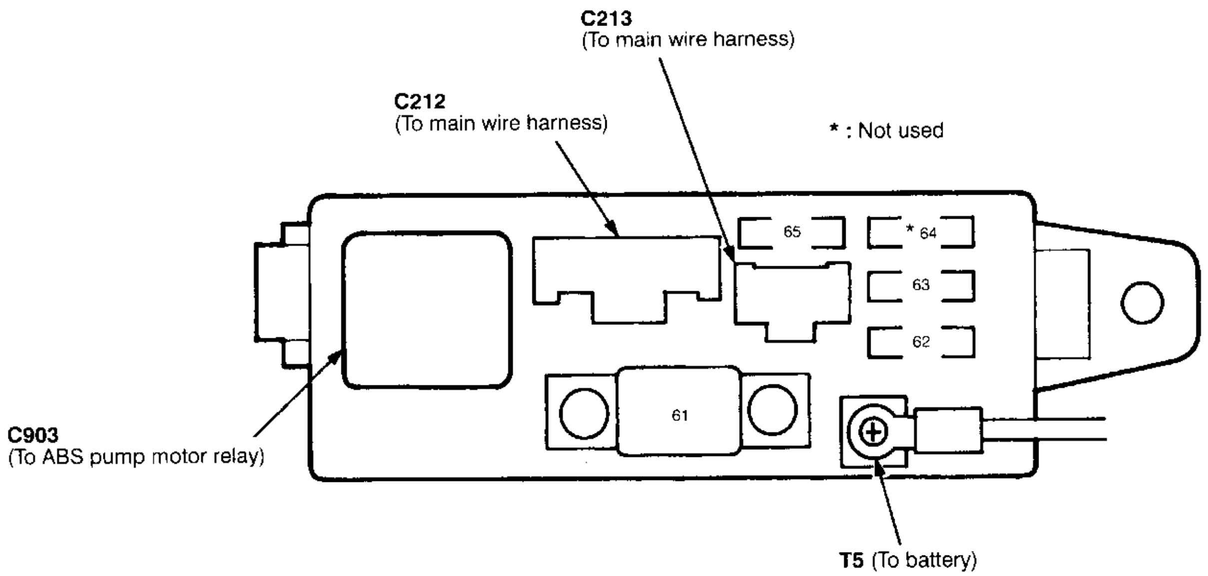
(cont'd)

Fuse/Relay Information

– Under-hood Fuse/Relay Box (cont'd)

Fuse Number	Fuse Name	Amps	Page	Component or Circuit Protected
41	BATTERY	100	10	Power distribution
42	IG 1	40	10	Ignition switch
43	INTERIOR LIGHT	7.5	10-7	DLC, Ceiling light, Power antenna motor (Hatchback), Trunk/cargo area light
44	FI E/M	15	10-7	PGM-FI main relay
45	—	—	—	Not used
46	POWER WINDOW	40	10-7	Power window relay
47	BACK UP, (RADIO)	7.5	10-8	Clock, ECM or PCM, Maintenance reminder unit, Stereo radio cassette player, TCM ('98-'99 Models with A/T)
48	HEADLIGHT	40	10-8	Headlights, Interlock system (A/T)
49	DR LOCK, SUNROOF	30	10-9	Moonroof
50	RR DEFROSTER	40	10-9	Rear window defogger relay
51	+B SMALL	15	10-9	Dash and console lights, License plate lights, Rear parking lights, Taillights
52	HORN, STOP	20	10-9	Brake switch, Horn relay
53	HAZARD	10	10-9	Gauge assembly ('00 Model), Hazard warning switch
54	(OPTION)	40	10-1	Power door locks, Security system (option)
55	HEATER MOTOR	40	10-1	Blower motor relay
56	(CONDENSER FAN)	20	10-1	A/C compressor clutch relay, Condenser fan relay
57	COOLING FAN	20	10-1	Radiator fan relay

– Under-hood ABS Fuse/Relay Box



Fuse Number	Fuse Name	Amps	Page	Component or Circuit Protected
61	ABS MOTOR FUSE	40	10-10	ABS pump motor relay
62	ABS B1	20	10-10	ABS fail-safe relay
63	ABS B2	15	10-10	Not used
64	—	—	—	Not used
65	ABS UNIT	10	44-3	ABS control unit

Ground-to-Components Index

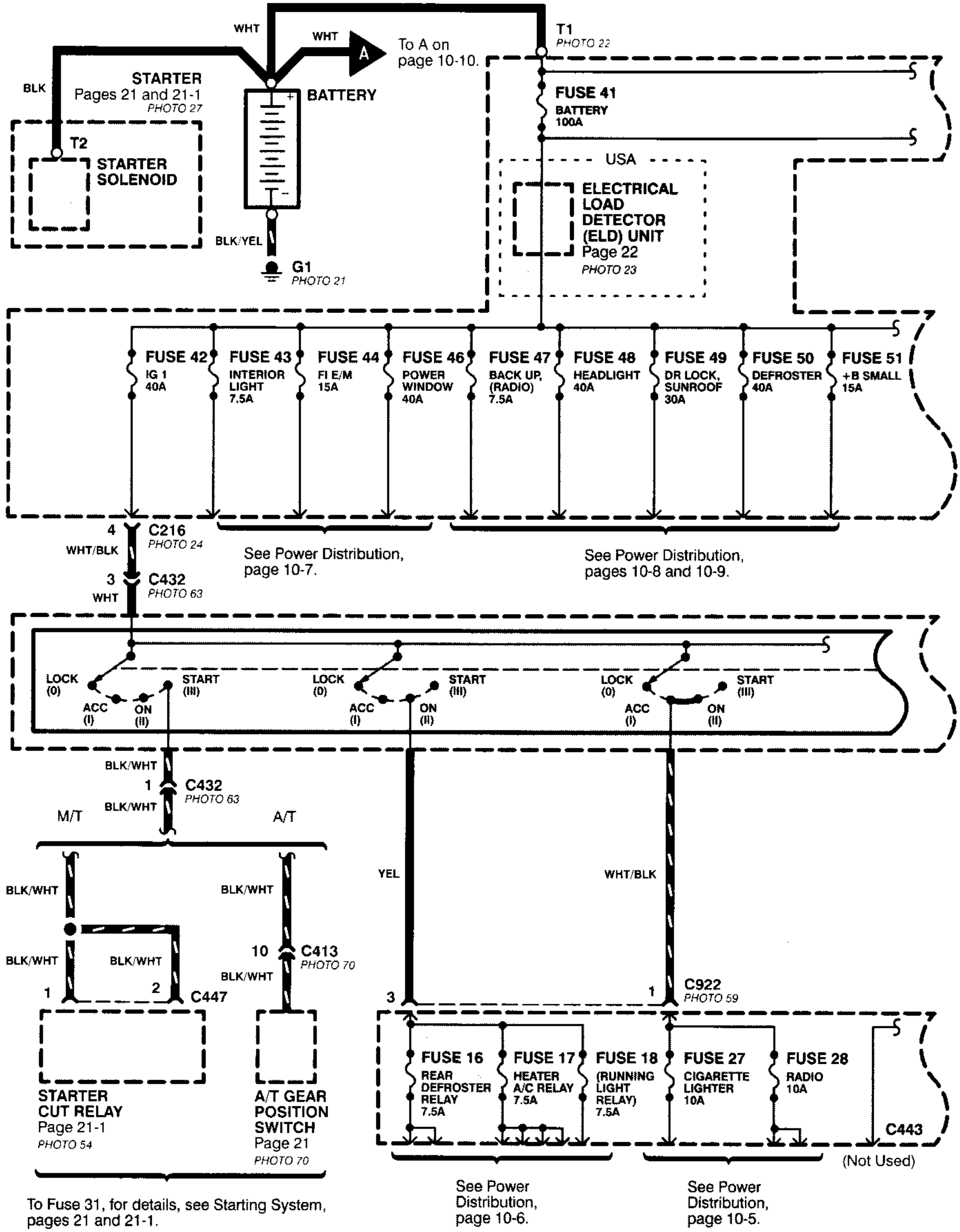
NOTE: All ground wires are BLK unless otherwise noted.

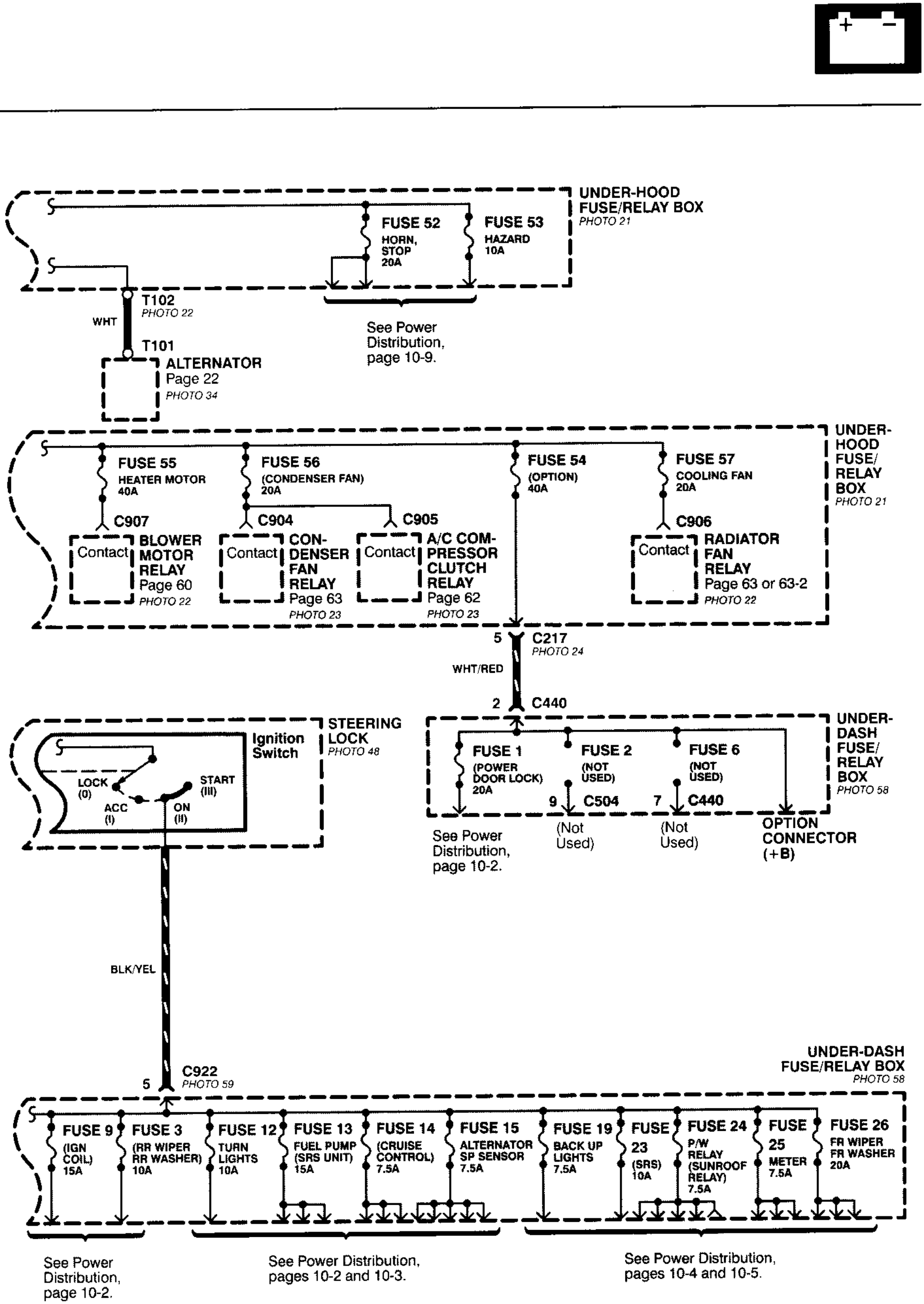
Ground	Page	Components or Circuit Grounded
G1	14	Battery (BLK/YEL)
G2	14	Valve cover (BRN)
G101	14 and 14-1	Data link connector (BRN/BLK), Engine or powertrain control module (PG1 and PG2 are BLK ; LG1 and LG2 are BRN/BLK), IAB control solenoid valve (GS-R), Immobilizer receiver unit ('00 Model) (BRN/BLK), PGM-FI main relay, Radiator fan switch, Transmission control module ('98-'99 Models with A/T) (2 BRN/BLK wires), Vehicle speed sensor, VTEC pressure switch (GS-R, Type-R)
		Shielding between the ECM or PCM and these components (all have BRAIDED wires): CKF sensor, Primary and secondary heated oxygen sensors, Knock sensor (GS-R, Type-R), TDC/CKP/CYP sensor
		Shielding between the TCM ('98-'99 Models) or PCM ('00 Model) and these components (all have BRAIDED wires): Countershaft speed sensor, Mainshaft speed sensor
G151	14-9	Condenser fan motor
G201	14-2	Blower motor relay, ELD unit, Radiator fan motor, Right front parking/turn signal light, Right front side marker light, Right headlight.....plus everything grounded through G401
G202	14-2	ABS fail-safe relay, ABS pump motor
G301	14-3	Brake fluid level switch, Cruise control actuator, Left front parking/turn signal light, Left front side marker light, Left headlight, Power steering pressure switch (USA), Rear window washer motor (Hatchback), Windshield washer motor, Windshield wiper motor
G401	14-4 and 14-5	A/T gear position switch, Cigarette lighter, Clutch switch (M/T), Clock, Clutch interlock switch (M/T), Combination wiper switch (2 wires), Cruise control main switch, Cruise control unit, Dash lights brightness controller, Data link connector, Daytime running lights control unit (Canada), Front passenger's door key cylinder switch, Front passenger's door lock switch, Gauge assembly (2 wires), Glove box light, Heater control panel, Heater fan switch, Ignition key switch, Integrated control unit, Interlock control unit (A/T), Maintenance reminder unit, Mode control motor, Moonroof relay, Moonroof switch, Parking pin switch (A/T), Power window relay, Rear window defogger switch, Service check connector, Turn signal/hazard relay.....plus everything grounded through G201
G502	14-6	Driver's door key cylinder switch, Driver's door lock actuator, Driver's door lock switch, Driver's seat belt switch, Fuel pump (BLK/WHT), Fuel tank unit (BLK/WHT), Power door lock control unit, Power mirror switch, Power window master switch (2 wires)
G503 (H/B)	14-7	Hatch key cylinder switch, Hatch latch switch, Hatch opener actuator, Hatch opener switch, Left and right back-up lights, Left and right brake light/taillights, Left and right rear parking lights, Left and right rear turn signal lights, License plate lights, Power antenna motor, Trailer lighting connector..... plus everything grounded through G751
G503 (Sedan)	14-8	High mount brake light, Left and right back-up lights, Left and right inner brake light/ taillights, Left and right outer brake light/taillights, Left and right rear parking lights, Left and right rear turn signal lights, License plate lights, Rear window defogger, Trailer lighting connector, Trunk latch switch

Ground	Page	Components or Circuit Grounded
G551	14-9	Stereo radio/cassette player
G702	14-9	ABS control unit (GND1 and GND2 are BLK ; GND3 and GND4 are BLK/WHT)
G751	14-7	High mount brake light, Rear window wiper motor..... plus everything grounded through G503
G771	14-9	Rear window defogger
G801	14-9	SRS unit (2 GRN wires)

Power Distribution

– From Battery to Ignition Switch, Fuses, and Relays

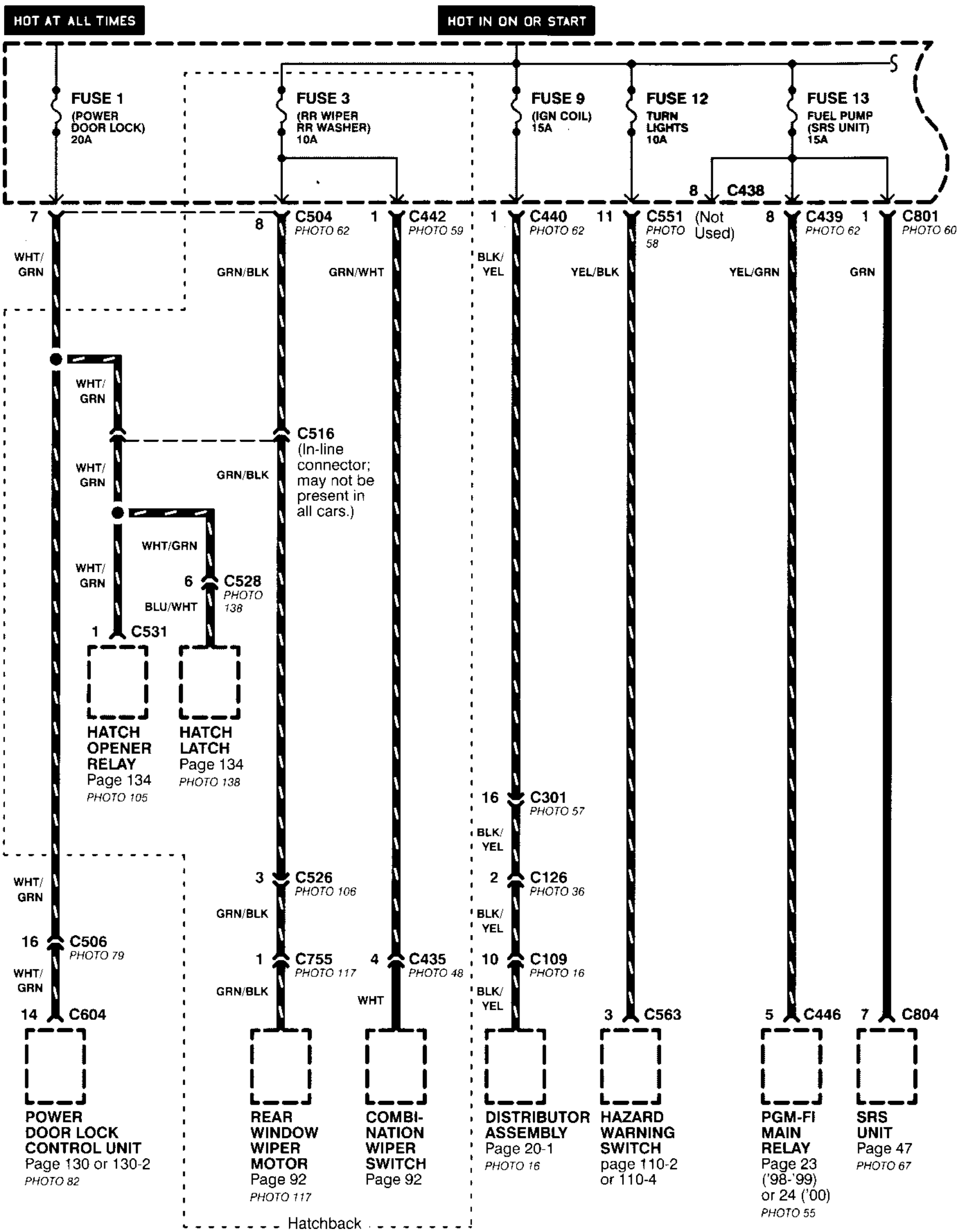


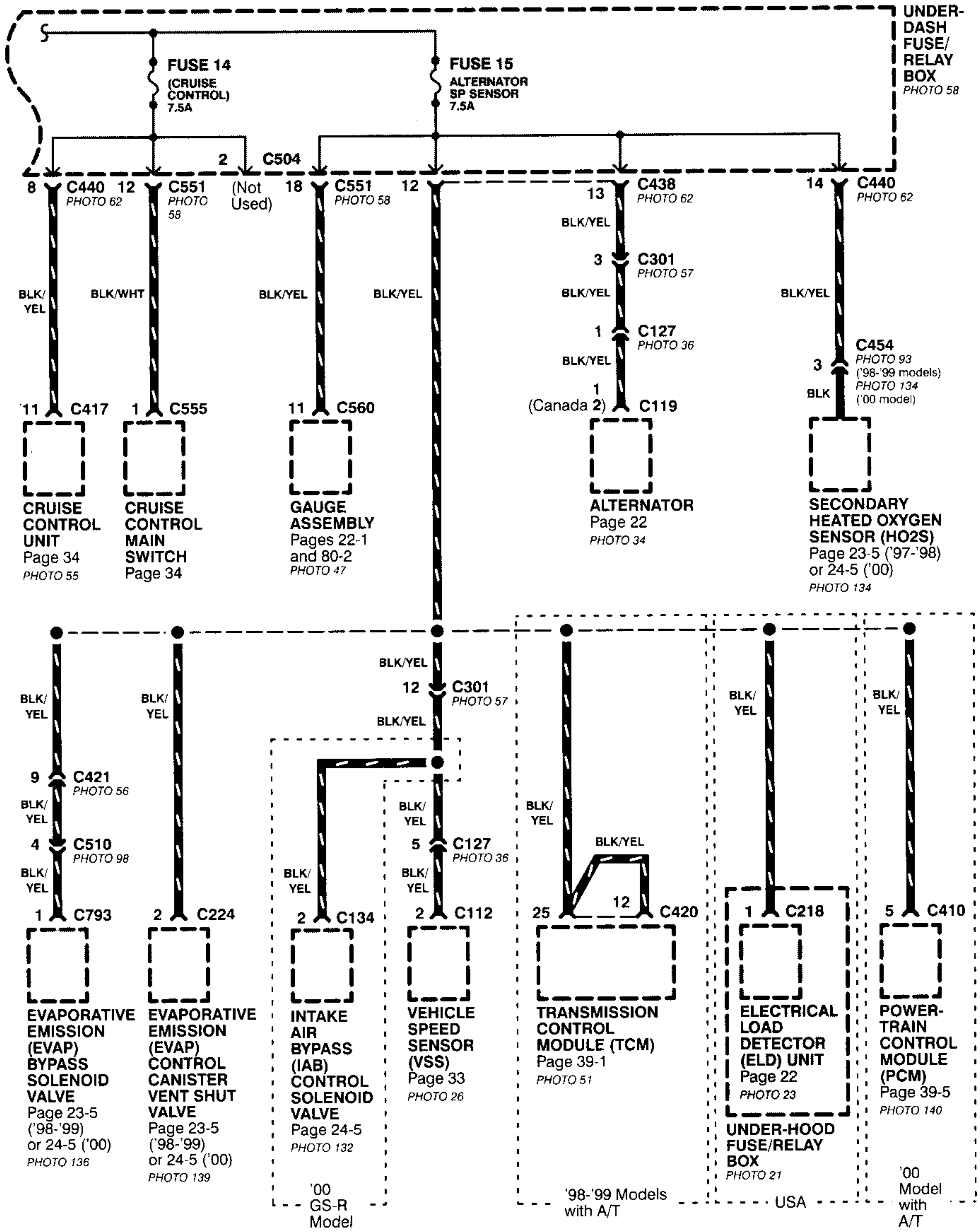


UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 52
HORN, STOP 20A
FUSE 53
HAZARD 10A
T102
PHOTO 22
WHT
T101
ALTERNATOR
Page 22
PHOTO 34
See Power Distribution, page 10-9.
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 55
HEATER MOTOR 40A
FUSE 56
(CONDENSER FAN) 20A
FUSE 54
(OPTION) 40A
FUSE 57
COOLING FAN 20A
C907
C904
C905
C906
Contact
BLOWER MOTOR RELAY
Page 60
PHOTO 22
CON-DENSER FAN RELAY
Page 63
PHOTO 23
A/C COM-PRESSOR CLUTCH RELAY
Page 62
PHOTO 23
RADIATOR FAN RELAY
Page 63 or 63-2
PHOTO 22
5
C217
PHOTO 24
WHT/RED
2
C440
STEERING LOCK
PHOTO 48
Ignition Switch
LOCK (0)
ACC (I)
ON (II)
START (III)
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 1
(POWER DOOR LOCK) 20A
FUSE 2
(NOT USED)
FUSE 6
(NOT USED)
9
C504
7
C440
See Power Distribution, page 10-2.
(Not Used)
(Not Used)
OPTION CONNECTOR (+B)
BLK/YEL
C922
PHOTO 59
5
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 9
(IGN COIL) 15A
FUSE 3
(RR WIPER RR WASHER) 10A
FUSE 12
TURN LIGHTS 10A
FUSE 13
FUEL PUMP (SRS UNIT) 15A
FUSE 14
(CRUISE CONTROL) 7.5A
FUSE 15
ALTERNATOR SP SENSOR 7.5A
FUSE 19
BACK UP LIGHTS 7.5A
FUSE 23
(SRS) 10A
FUSE 24
P/W RELAY (SUNROOF RELAY) 7.5A
FUSE 25
METER 7.5A
FUSE 26
FR WIPER FR WASHER 20A
See Power Distribution, page 10-2.
See Power Distribution, pages 10-2 and 10-3.
See Power Distribution, pages 10-4 and 10-5.

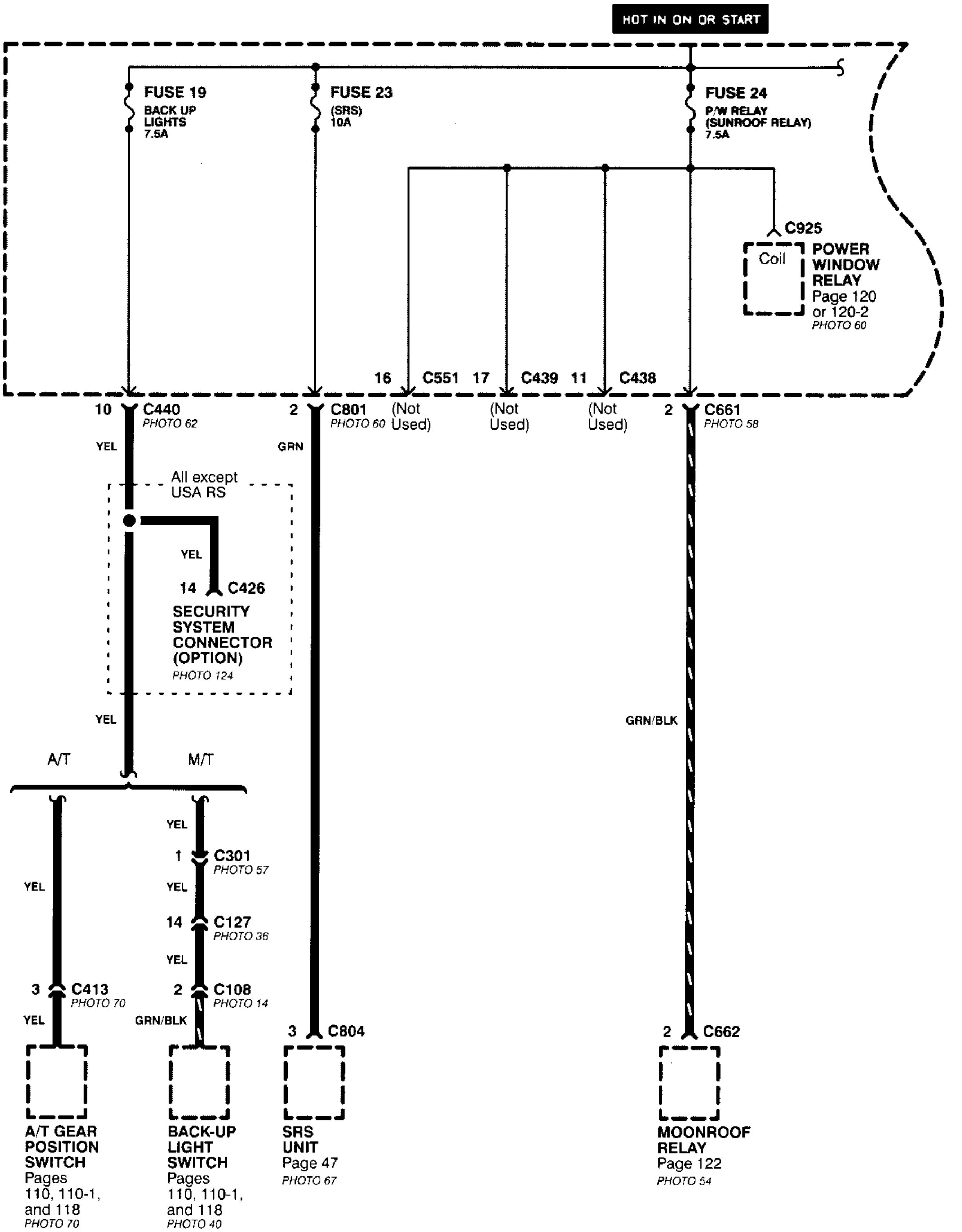
Power Distribution (cont'd)

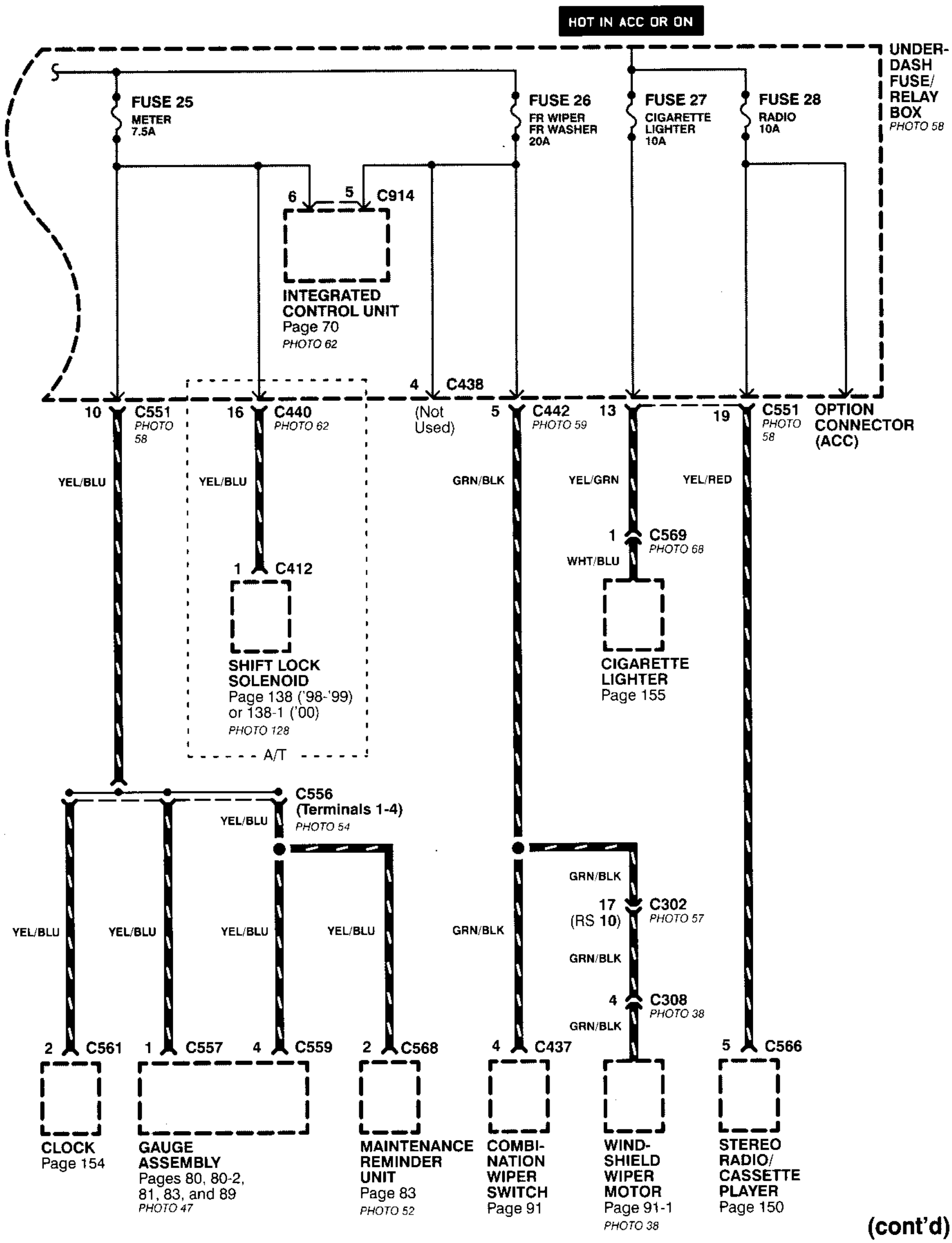
– From Fuses to Relays and Components




UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 14 (CRUISE CONTROL) 7.5A
FUSE 15 ALTERNATOR SP SENSOR 7.5A
2 C504
8 C440 PHOTO 62
12 C551 PHOTO 58
(Not Used)
18 C551 PHOTO 58
12
13 C438 PHOTO 62
14 C440 PHOTO 62
BLK/YEL
BLK/WHT
3 C301 PHOTO 57
1 C127 PHOTO 36
C454 PHOTO 93 ('98-'99 models) PHOTO 134 ('00 model)
3
BLK
11 C417
1 C555
11 C560
1 (Canada 2) C119
CRUISE CONTROL UNIT Page 34 PHOTO 55
CRUISE CONTROL MAIN SWITCH Page 34
GAUGE ASSEMBLY Pages 22-1 and 80-2 PHOTO 47
ALTERNATOR Page 22 PHOTO 34
SECONDARY HEATED OXYGEN SENSOR (HO2S) Page 23-5 ('97-'98) or 24-5 ('00) PHOTO 134
12 C301 PHOTO 57
9 C421 PHOTO 56
4 C510 PHOTO 98
5 C127 PHOTO 36
1 C793
2 C224
2 C134
2 C112
25 12 C420
1 C218
5 C410
EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE Page 23-5 ('98-'99) or 24-5 ('00) PHOTO 136
EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE Page 23-5 ('98-'99) or 24-5 ('00) PHOTO 139
INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE Page 24-5 PHOTO 132
VEHICLE SPEED SENSOR (VSS) Page 33 PHOTO 26
TRANSMISSION CONTROL MODULE (TCM) Page 39-1 PHOTO 51
ELECTRICAL LOAD DETECTOR (ELD) UNIT Page 22 PHOTO 23
UNDER-HOOD FUSE/RELAY BOX PHOTO 21
POWER-TRAIN CONTROL MODULE (PCM) Page 39-5 PHOTO 140
'00 GS-R Model
'98-'99 Models with A/T
USA
'00 Model with A/T

- From Fuses to Relays and Components (cont'd)

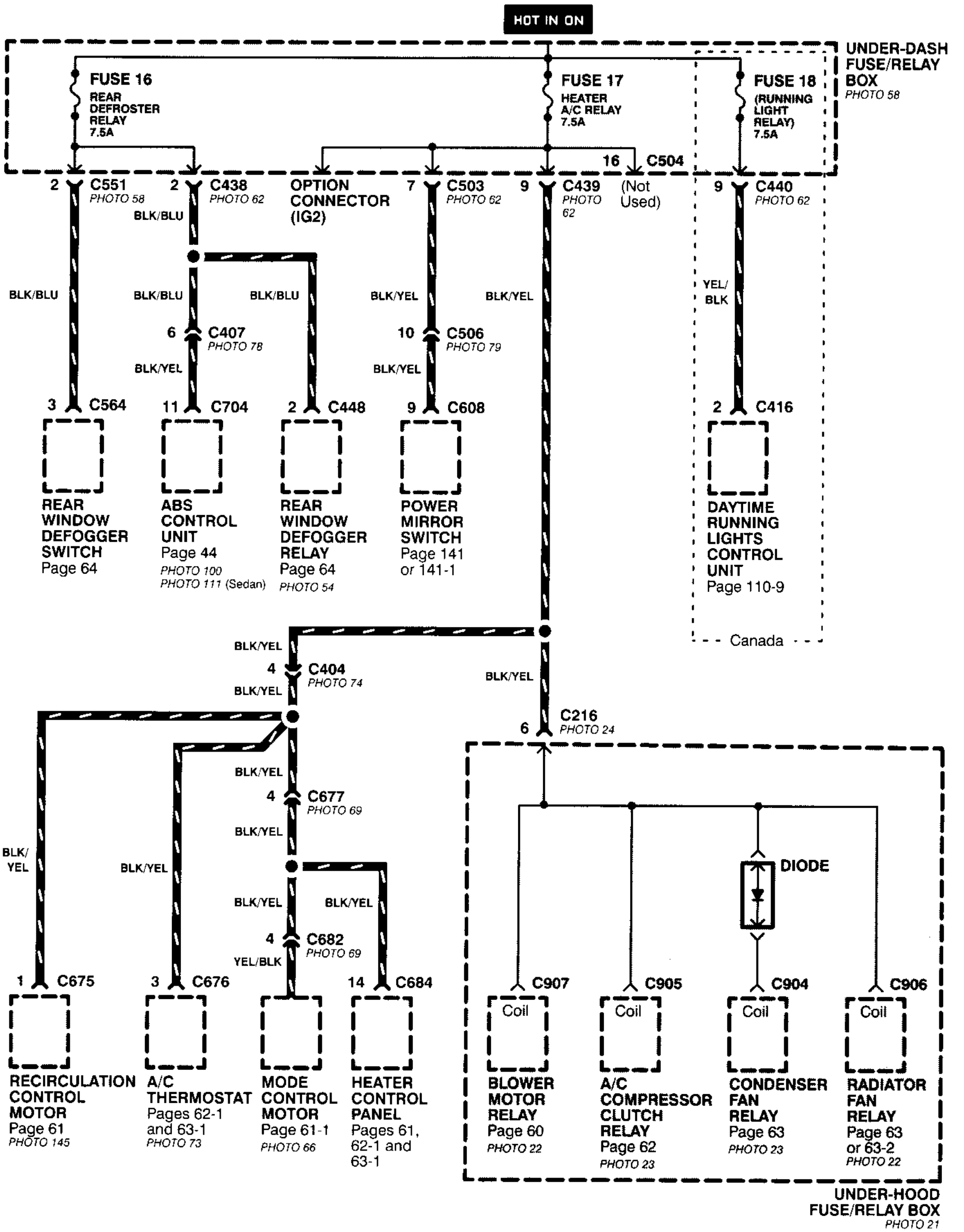


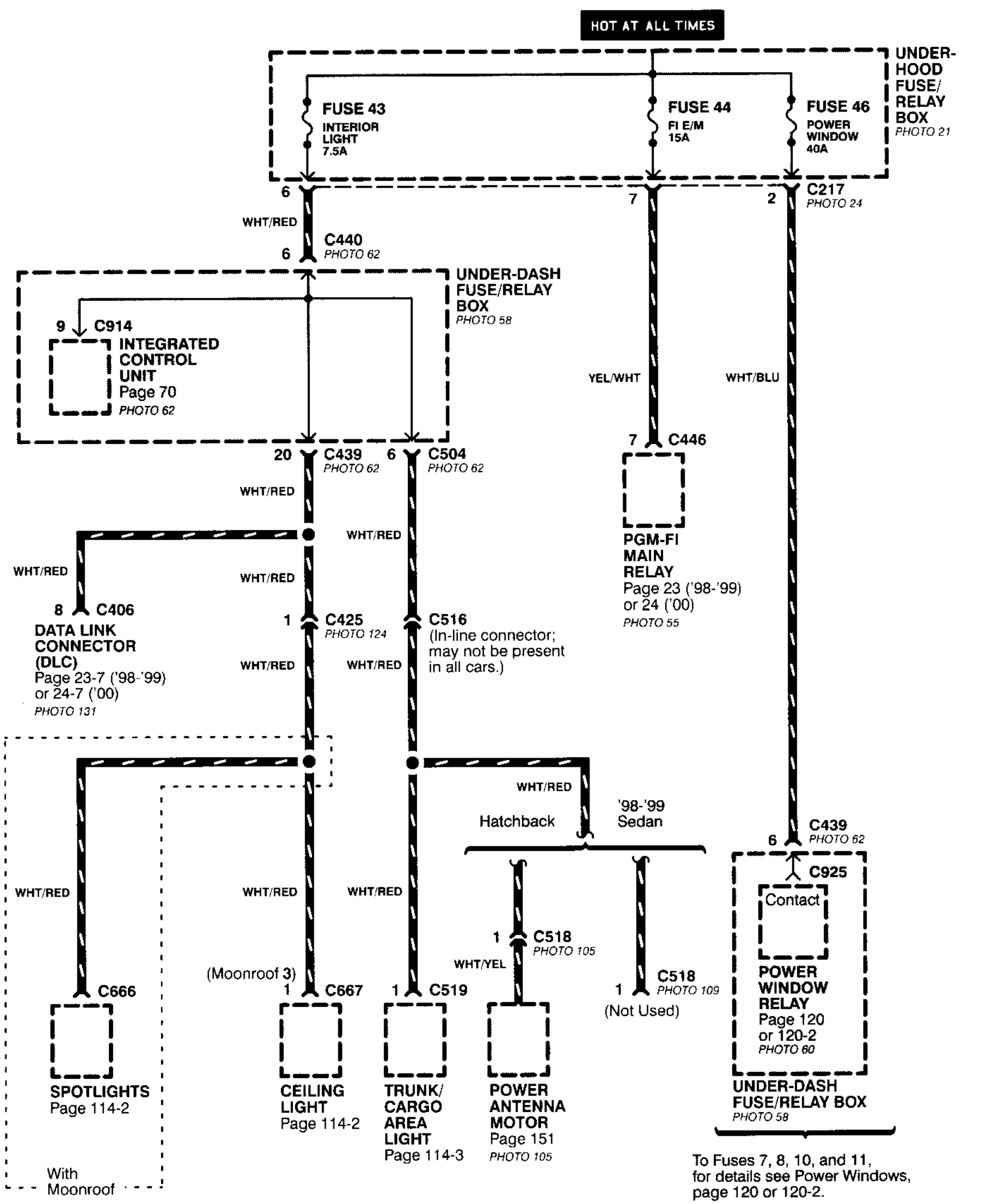

HOT IN ACC OR ON
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 25
METER 7.5A
FUSE 26
FR WIPER FR WASHER 20A
FUSE 27
CIGARETTE LIGHTER 10A
FUSE 28
RADIO 10A
6
5
C914
INTEGRATED CONTROL UNIT
Page 70
PHOTO 62
4
C438
(Not Used)
10
C551
PHOTO 58
16
C440
PHOTO 62
5
C442
PHOTO 59
13
19
C551
PHOTO 58
OPTION CONNECTOR (ACC)
YEL/BLU
YEL/BLU
GRN/BLK
YEL/GRN
YEL/RED
1
C569
PHOTO 68
WHT/BLU
1
C412
SHIFT LOCK SOLENOID
Page 138 ('98-'99) or 138-1 ('00)
PHOTO 128
A/T
CIGARETTE LIGHTER
Page 155
C556
(Terminals 1-4)
PHOTO 54
YEL/BLU
GRN/BLK
17
(RS 10)
C302
PHOTO 57
GRN/BLK
4
C308
PHOTO 38
GRN/BLK
YEL/BLU
YEL/BLU
YEL/BLU
YEL/BLU
GRN/BLK
2
C561
1
C557
4
C559
2
C568
4
C437
5
C566
CLOCK
Page 154
GAUGE ASSEMBLY
Pages 80, 80-2, 81, 83, and 89
PHOTO 47
MAINTENANCE REMINDER UNIT
Page 83
PHOTO 52
COMBI-NATION WIPER SWITCH
Page 91
WIND-SHIELD WIPER MOTOR
Page 91-1
PHOTO 38
STEREO RADIO/ CASSETTE PLAYER
Page 150

(cont'd)

Power Distribution

– From Fuses to Relays and Components (cont'd)



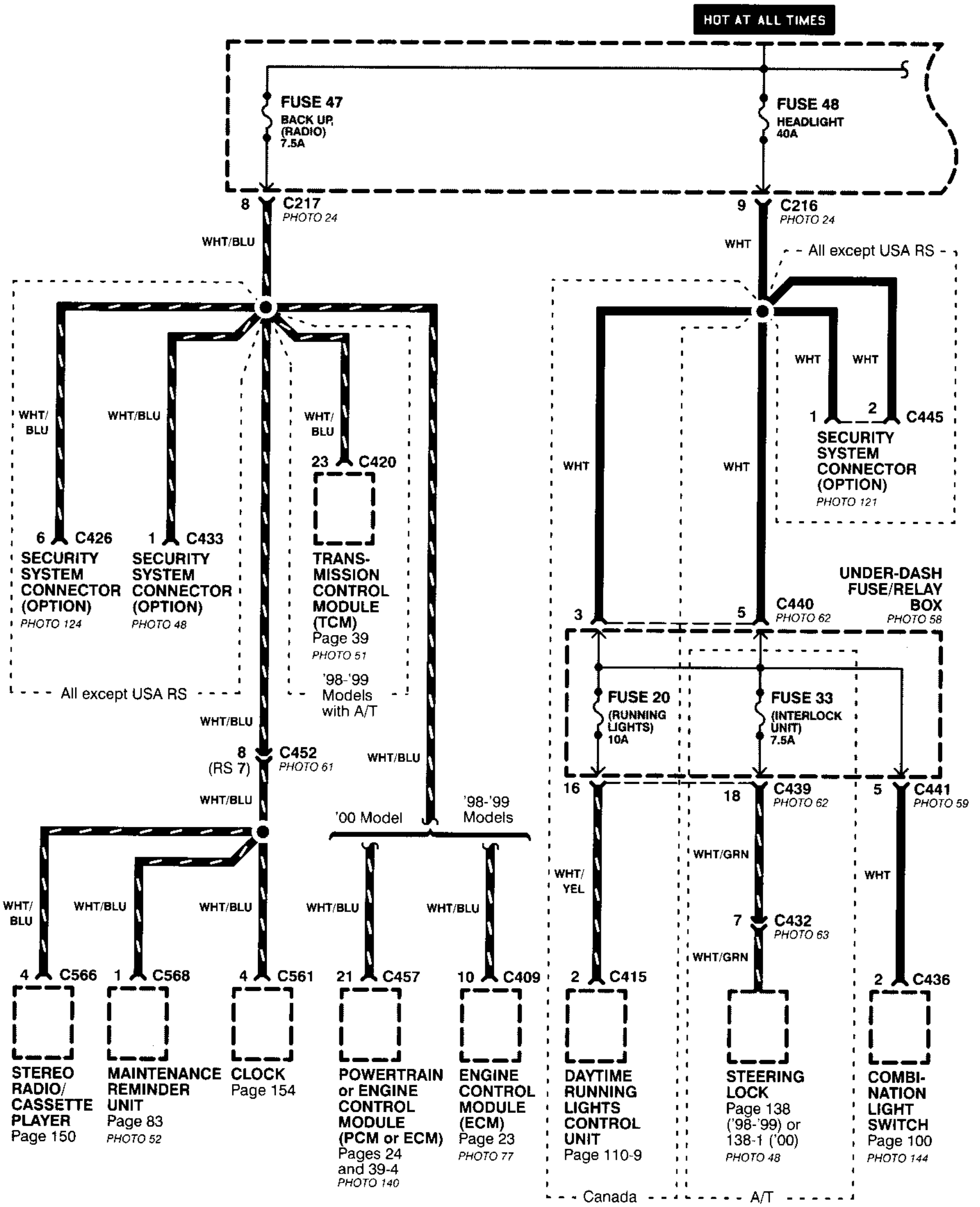


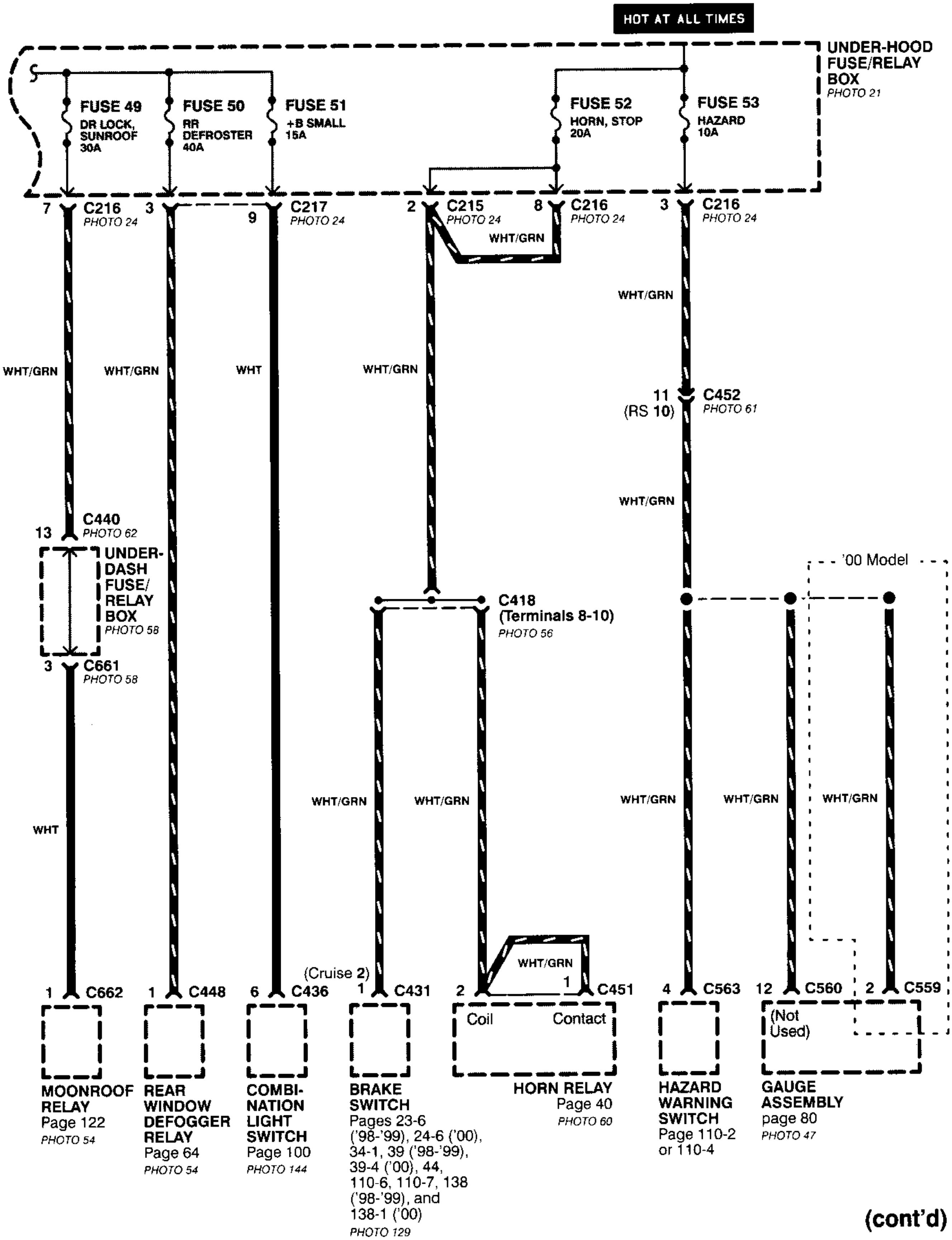
HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 43
INTERIOR LIGHT 7.5A
FUSE 44
FI E/M 15A
FUSE 46
POWER WINDOW 40A
C217
PHOTO 24
WHT/RED
C440
PHOTO 62
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C914
INTEGRATED CONTROL UNIT
Page 70
PHOTO 62
YEL/WHT
WHT/BLU
C446
PGM-FI MAIN RELAY
Page 23 ('98-'99) or 24 ('00)
PHOTO 55
C439
PHOTO 62
C504
PHOTO 62
C406
DATA LINK CONNECTOR (DLC)
Page 23-7 ('98-'99) or 24-7 ('00)
PHOTO 131
C425
PHOTO 124
C516
(In-line connector; may not be present in all cars.)
Hatchback
'98-'99 Sedan
C439
PHOTO 62
C925
Contact
C518
PHOTO 105
WHT/YEL
C518
PHOTO 109
(Not Used)
(Moonroof 3)
C666
C667
C519
SPOTLIGHTS
Page 114-2
CEILING LIGHT
Page 114-2
TRUNK/ CARGO AREA LIGHT
Page 114-3
POWER ANTENNA MOTOR
Page 151
PHOTO 105
POWER WINDOW RELAY
Page 120 or 120-2
PHOTO 60
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
With Moonroof
To Fuses 7, 8, 10, and 11, for details see Power Windows, page 120 or 120-2.

(cont'd)

Power Distribution

– From Fuses to Relays and Components (cont'd)

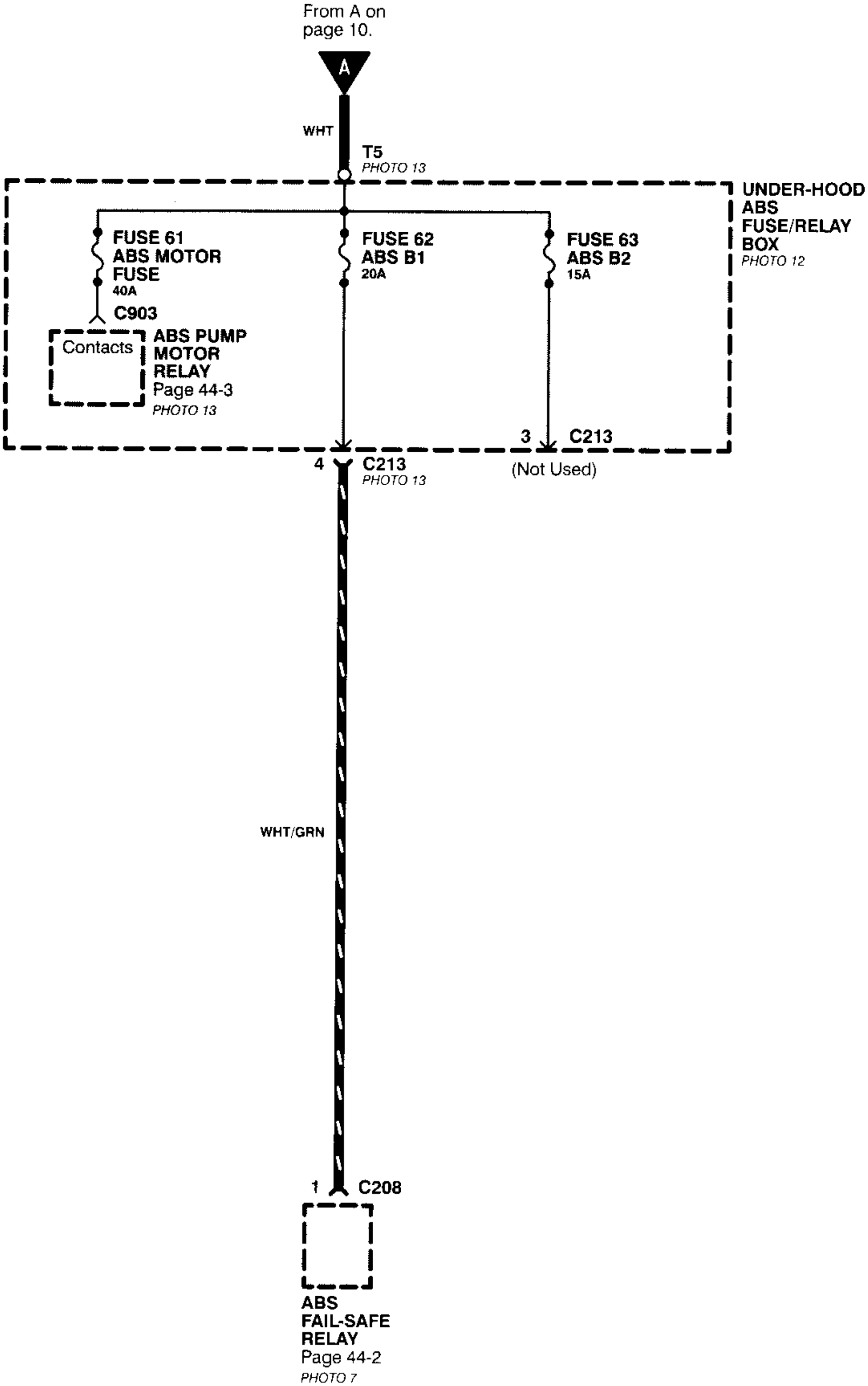



HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 49
DR LOCK, SUNROOF 30A
FUSE 50
RR DEFROSTER 40A
FUSE 51
+B SMALL 15A
FUSE 52
HORN, STOP 20A
FUSE 53
HAZARD 10A
C216
PHOTO 24
C217
PHOTO 24
C215
PHOTO 24
WHT/GRN
WHT
C452
PHOTO 61
11 (RS 10)
C440
PHOTO 62
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C661
PHOTO 58
C418 (Terminals 8-10)
PHOTO 56
'00 Model
(Cruise 2)
C662
C448
C436
C431
C451
C563
C560
C559
Coil
Contact
(Not Used)
MOONROOF RELAY
Page 122
PHOTO 54
REAR WINDOW DEFOGGER RELAY
Page 64
PHOTO 54
COMBI-NATION LIGHT SWITCH
Page 100
PHOTO 144
BRAKE SWITCH
Pages 23-6 ('98-'99), 24-6 ('00), 34-1, 39 ('98-'99), 39-4 ('00), 44, 110-6, 110-7, 138 ('98-'99), and 138-1 ('00)
PHOTO 129
HORN RELAY
Page 40
PHOTO 60
HAZARD WARNING SWITCH
Page 110-2 or 110-4
GAUGE ASSEMBLY
page 80
PHOTO 47

(cont'd)

Power Distribution

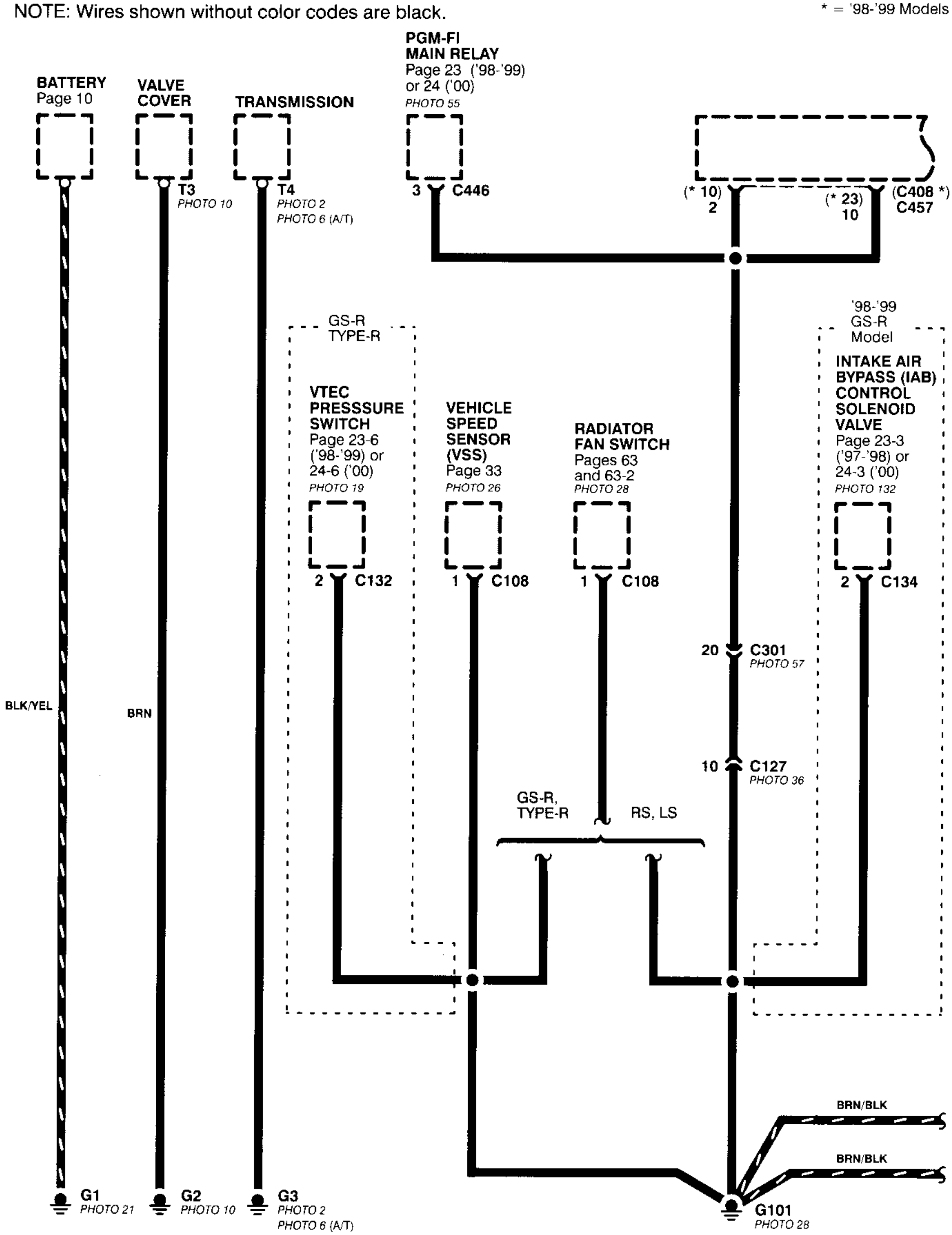
– From Fuses to Relays and Components (cont'd)

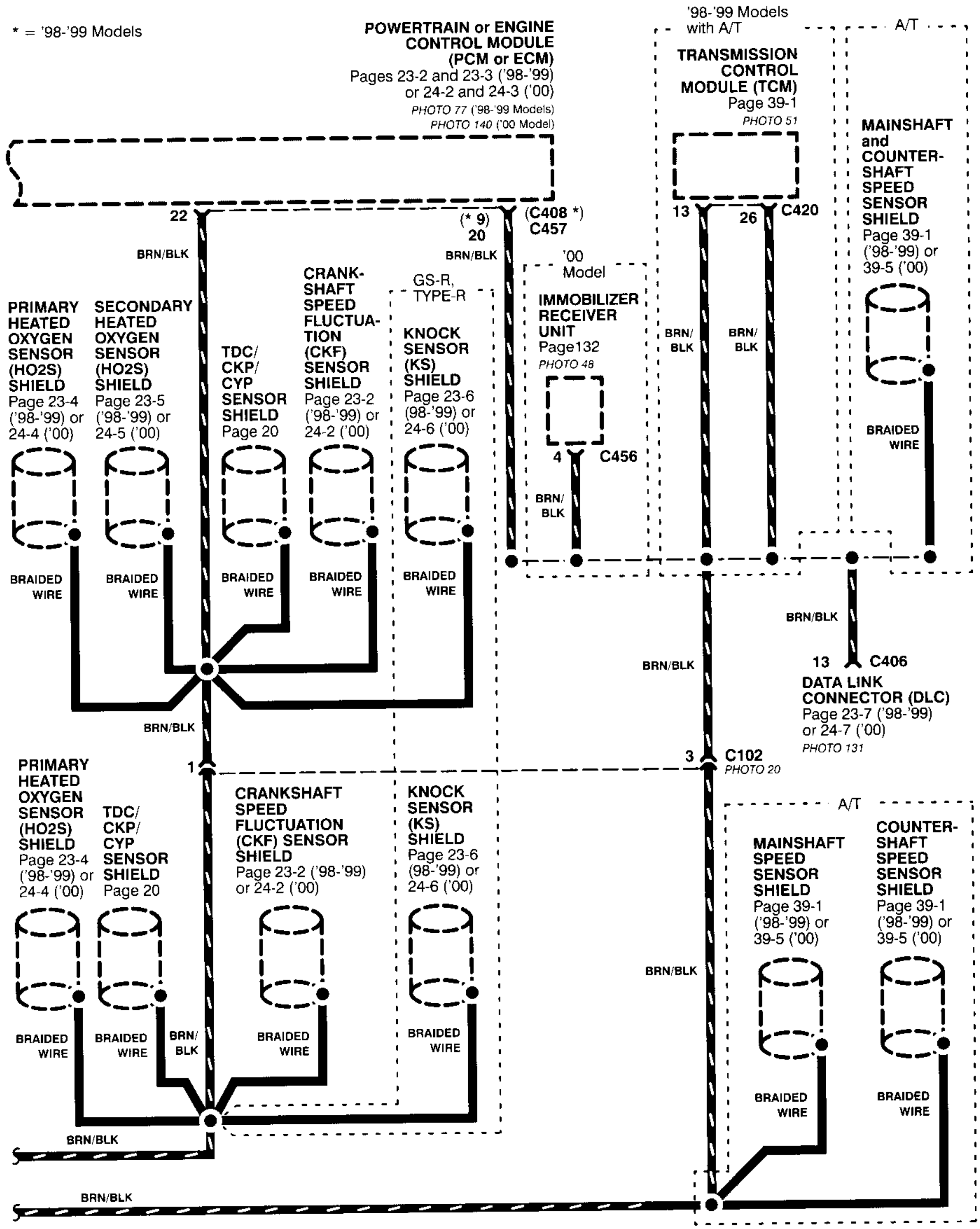


Ground Distribution

– G1, G2, G3, and G101

NOTE: Wires shown without color codes are black.



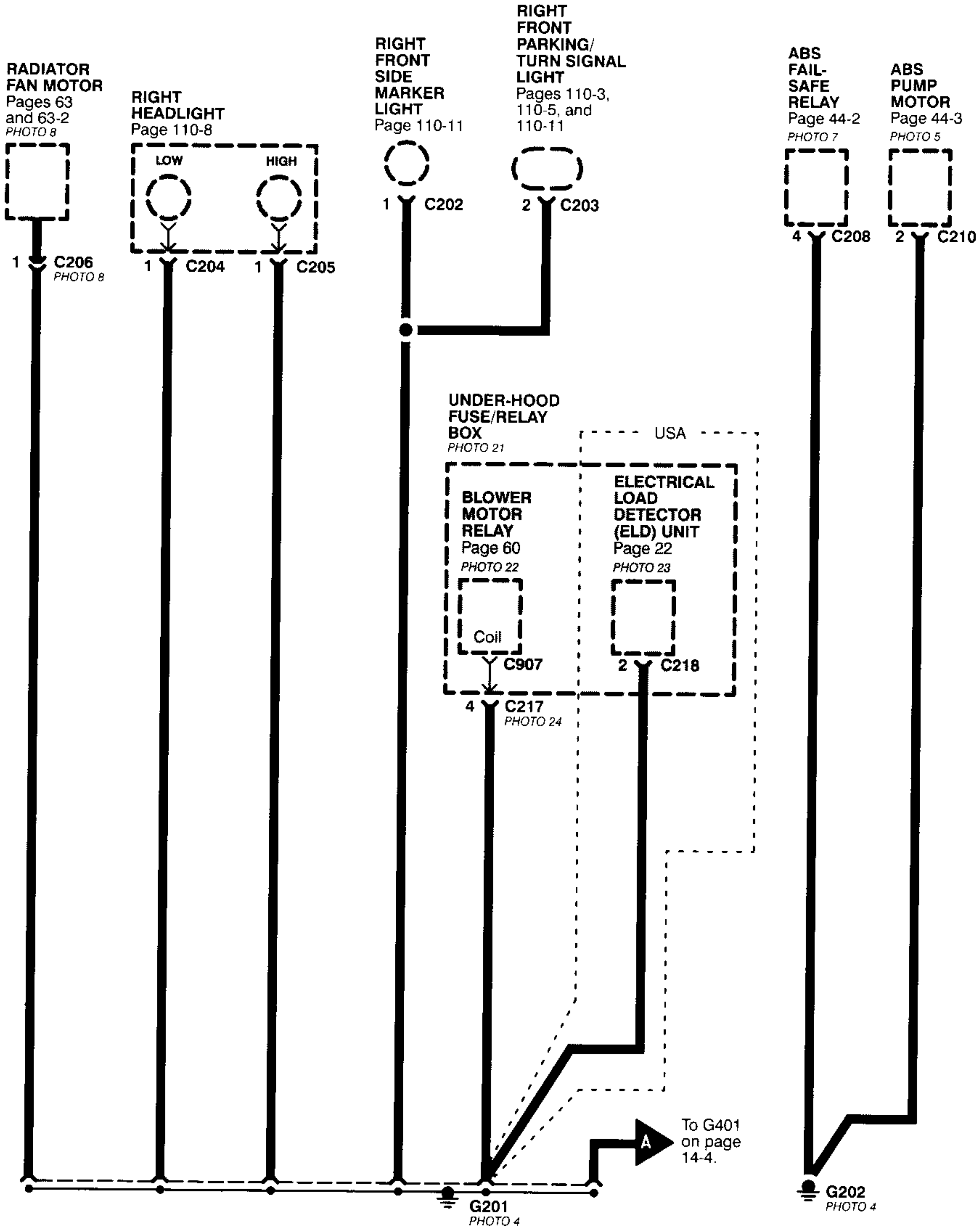


* = '98-'99 Models
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
Pages 23-2 and 23-3 ('98-'99) or 24-2 and 24-3 ('00)
PHOTO 77 ('98-'99 Models)
PHOTO 140 ('00 Model)
'98-'99 Models with A/T
TRANSMISSION CONTROL MODULE (TCM)
Page 39-1
PHOTO 51
A/T
MAINSHAFT and COUNTER-SHAFT SPEED SENSOR SHIELD
Page 39-1 ('98-'99) or 39-5 ('00)
22
(* 9) 20
(C408 *) C457
13
26
C420
BRN/BLK
'00 Model
IMMOBILIZER RECEIVER UNIT
Page132
PHOTO 48
4
C456
GS-R, TYPE-R
PRIMARY HEATED OXYGEN SENSOR (HO2S) SHIELD
Page 23-4 ('98-'99) or 24-4 ('00)
SECONDARY HEATED OXYGEN SENSOR (HO2S) SHIELD
Page 23-5 ('98-'99) or 24-5 ('00)
TDC/ CKP/ CYP SENSOR SHIELD
Page 20
CRANK-SHAFT SPEED FLUCTUA-TION (CKF) SENSOR SHIELD
Page 23-2 ('98-'99) or 24-2 ('00)
KNOCK SENSOR (KS) SHIELD
Page 23-6 (98-'99) or 24-6 ('00)
BRAIDED WIRE
13
C406
DATA LINK CONNECTOR (DLC)
Page 23-7 ('98-'99) or 24-7 ('00)
PHOTO 131
1
3
C102
PHOTO 20
PRIMARY HEATED OXYGEN SENSOR (HO2S) SHIELD
Page 23-4 ('98-'99) or 24-4 ('00)
TDC/ CKP/ CYP SENSOR SHIELD
Page 20
CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR SHIELD
Page 23-2 ('98-'99) or 24-2 ('00)
KNOCK SENSOR (KS) SHIELD
Page 23-6 (98-'99) or 24-6 ('00)
MAINSHAFT SPEED SENSOR SHIELD
Page 39-1 ('98-'99) or 39-5 ('00)
COUNTER-SHAFT SPEED SENSOR SHIELD
Page 39-1 ('98-'99) or 39-5 ('00)

Ground Distribution (cont'd)

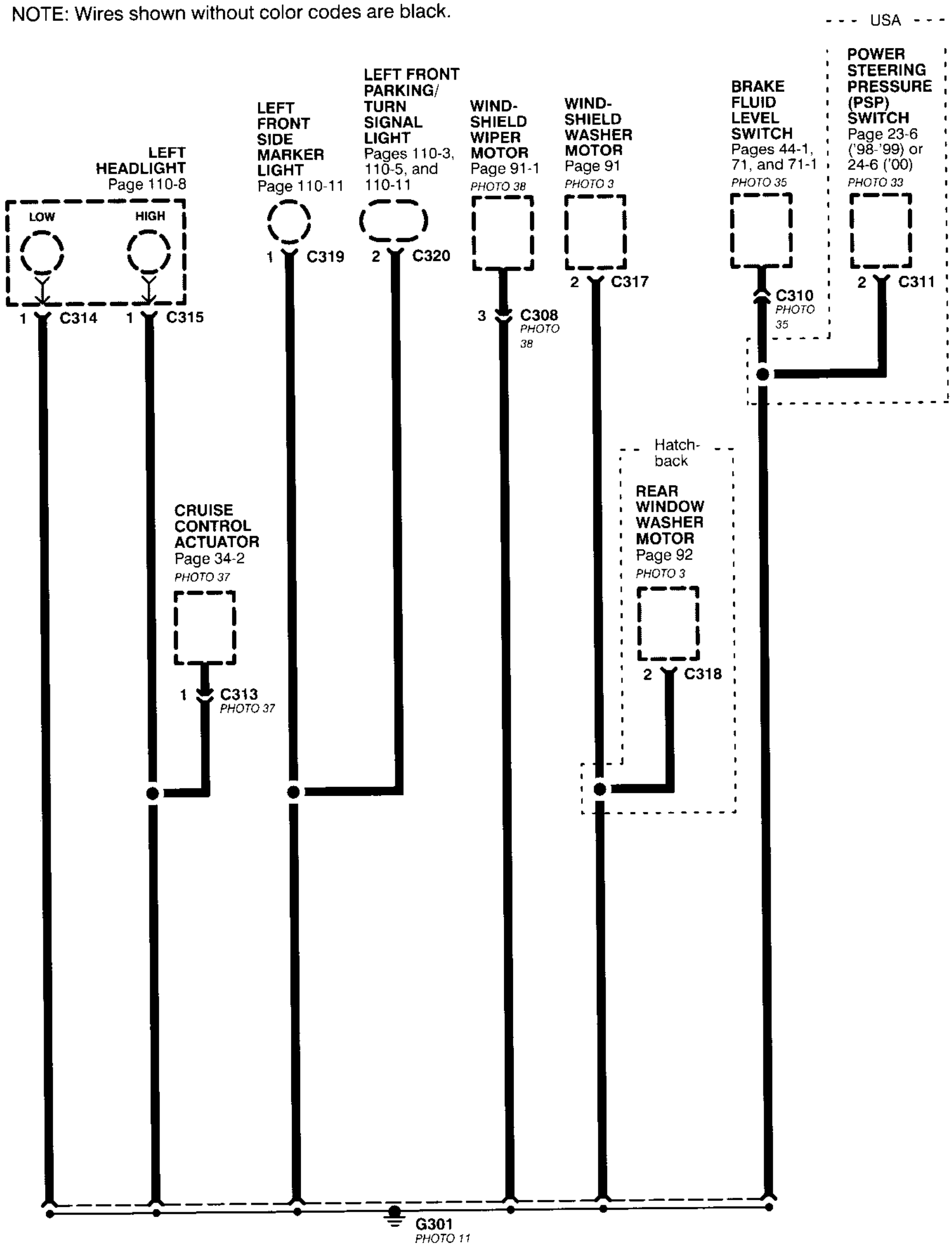
– G201 and G202

NOTE: Wires shown without color codes are black.



G301

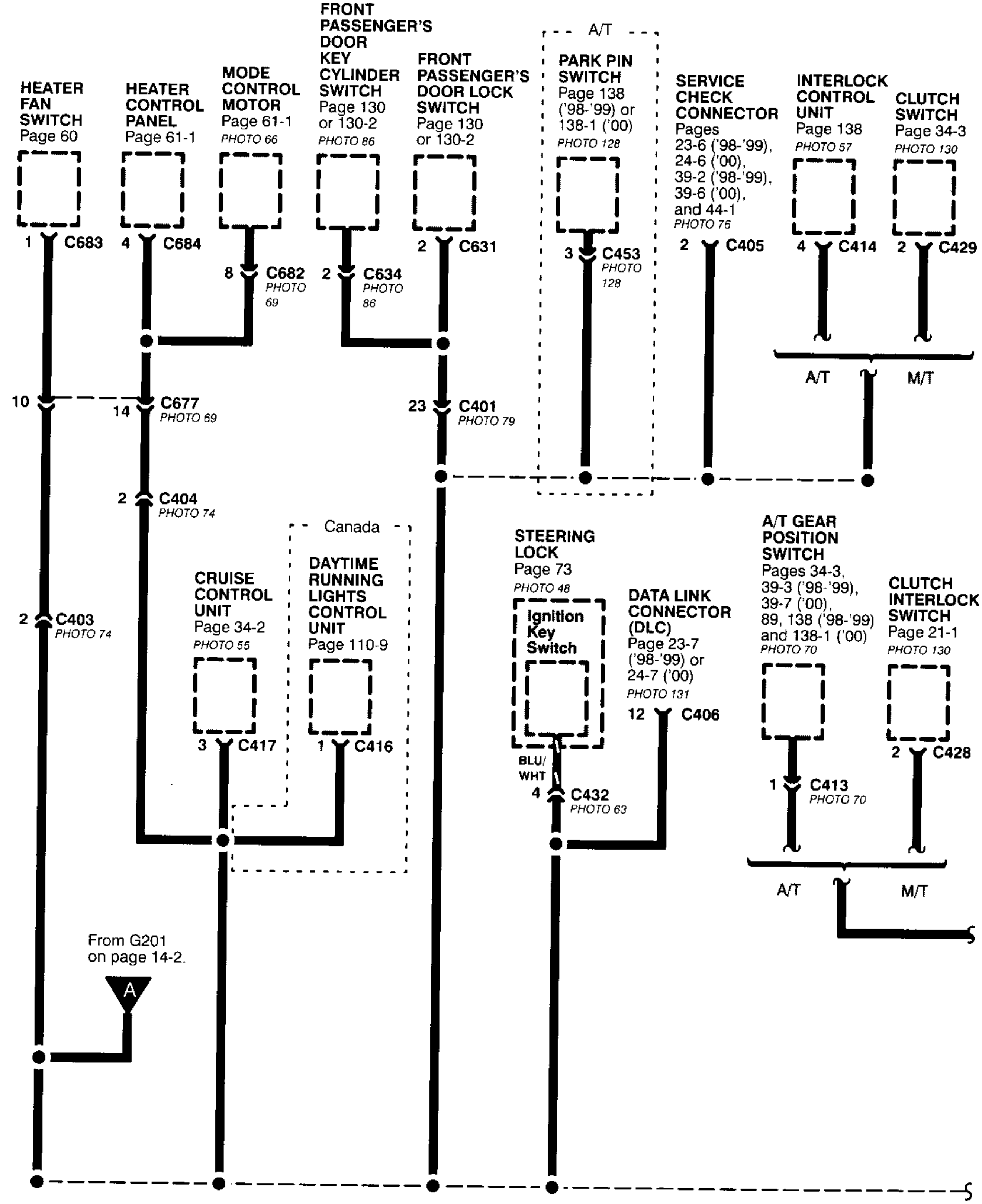
NOTE: Wires shown without color codes are black.

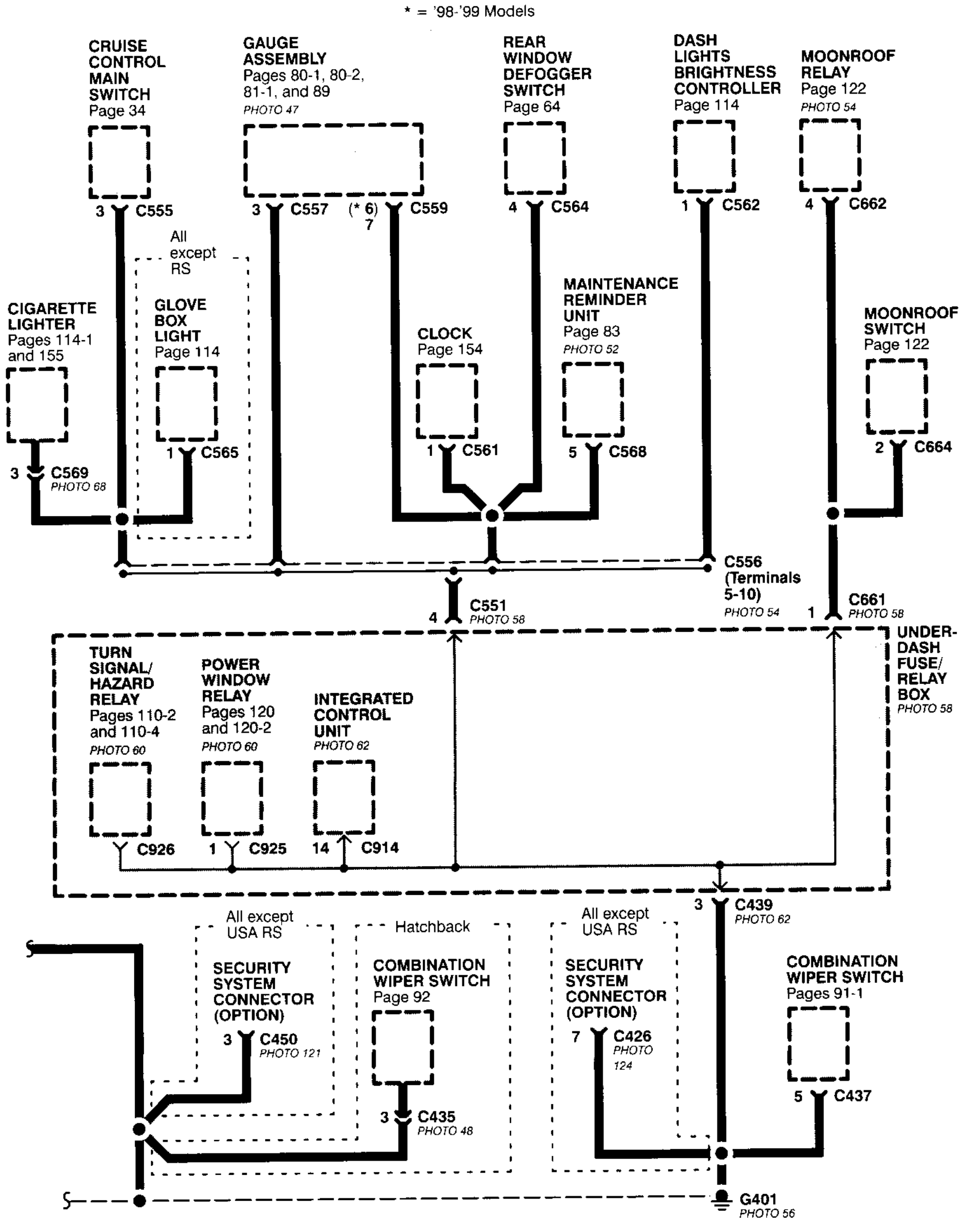


Ground Distribution (cont'd)

– G401

NOTE: Wires shown without color codes are black.

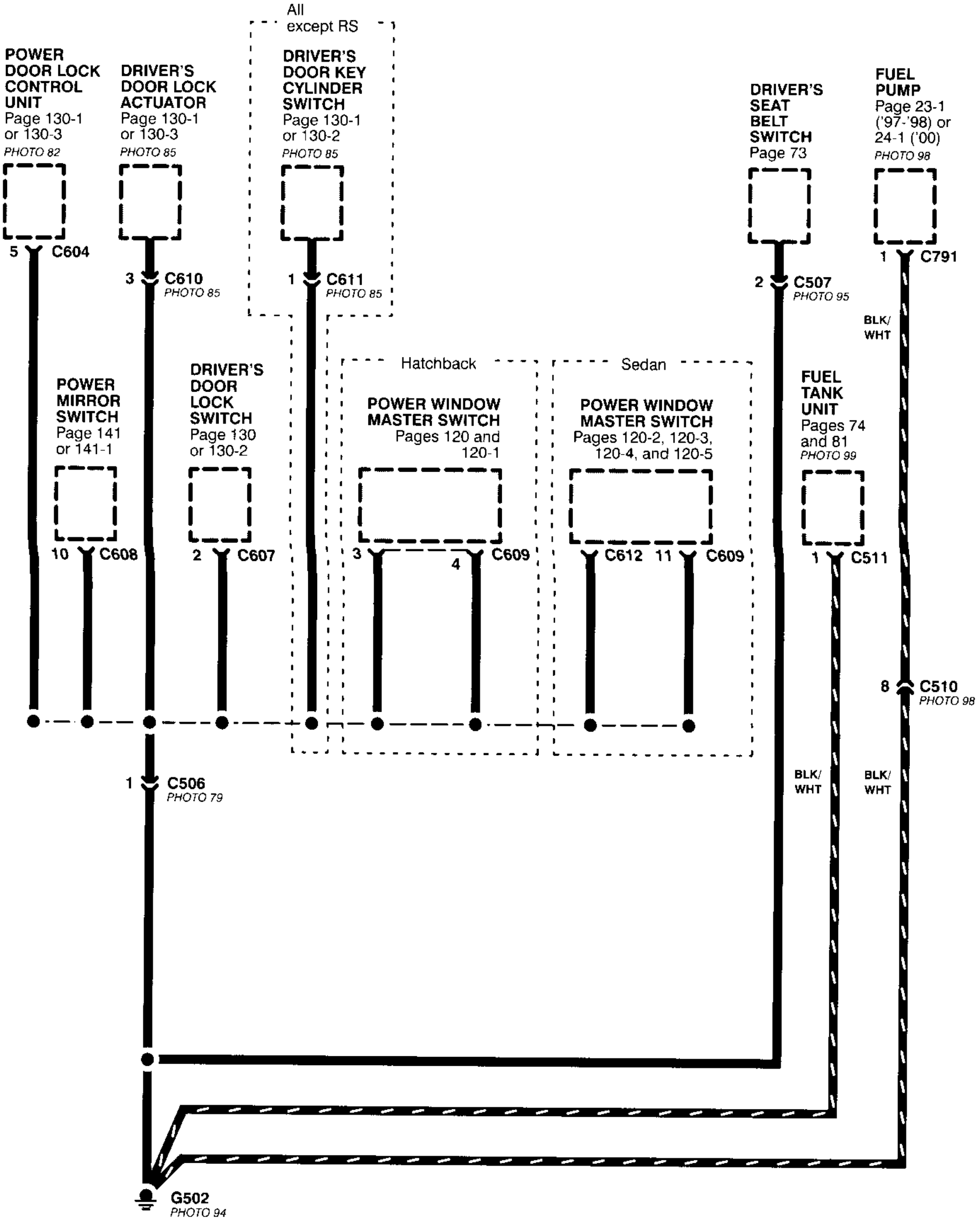



* = '98-'99 Models
CRUISE CONTROL MAIN SWITCH Page 34
GAUGE ASSEMBLY Pages 80-1, 80-2, 81-1, and 89 PHOTO 47
REAR WINDOW DEFOGGER SWITCH Page 64
DASH LIGHTS BRIGHTNESS CONTROLLER Page 114
MOONROOF RELAY Page 122 PHOTO 54
3 C555
3 C557
(* 6) 7 C559
4 C564
1 C562
4 C662
All except RS
CIGARETTE LIGHTER Pages 114-1 and 155
GLOVE BOX LIGHT Page 114
CLOCK Page 154
MAINTENANCE REMINDER UNIT Page 83 PHOTO 52
MOONROOF SWITCH Page 122
3 C569 PHOTO 68
1 C565
1 C561
5 C568
2 C664
C556 (Terminals 5-10) PHOTO 54
4 C551 PHOTO 58
1 C661 PHOTO 58
UNDER-DASH FUSE/RELAY BOX PHOTO 58
TURN SIGNAL/HAZARD RELAY Pages 110-2 and 110-4 PHOTO 60
POWER WINDOW RELAY Pages 120 and 120-2 PHOTO 60
INTEGRATED CONTROL UNIT PHOTO 62
C926
1 C925
14 C914
3 C439 PHOTO 62
All except USA RS
SECURITY SYSTEM CONNECTOR (OPTION)
3 C450 PHOTO 121
Hatchback
COMBINATION WIPER SWITCH Page 92
3 C435 PHOTO 48
All except USA RS
SECURITY SYSTEM CONNECTOR (OPTION)
7 C426 PHOTO 124
COMBINATION WIPER SWITCH Pages 91-1
5 C437
G401 PHOTO 56

Ground Distribution (cont'd)

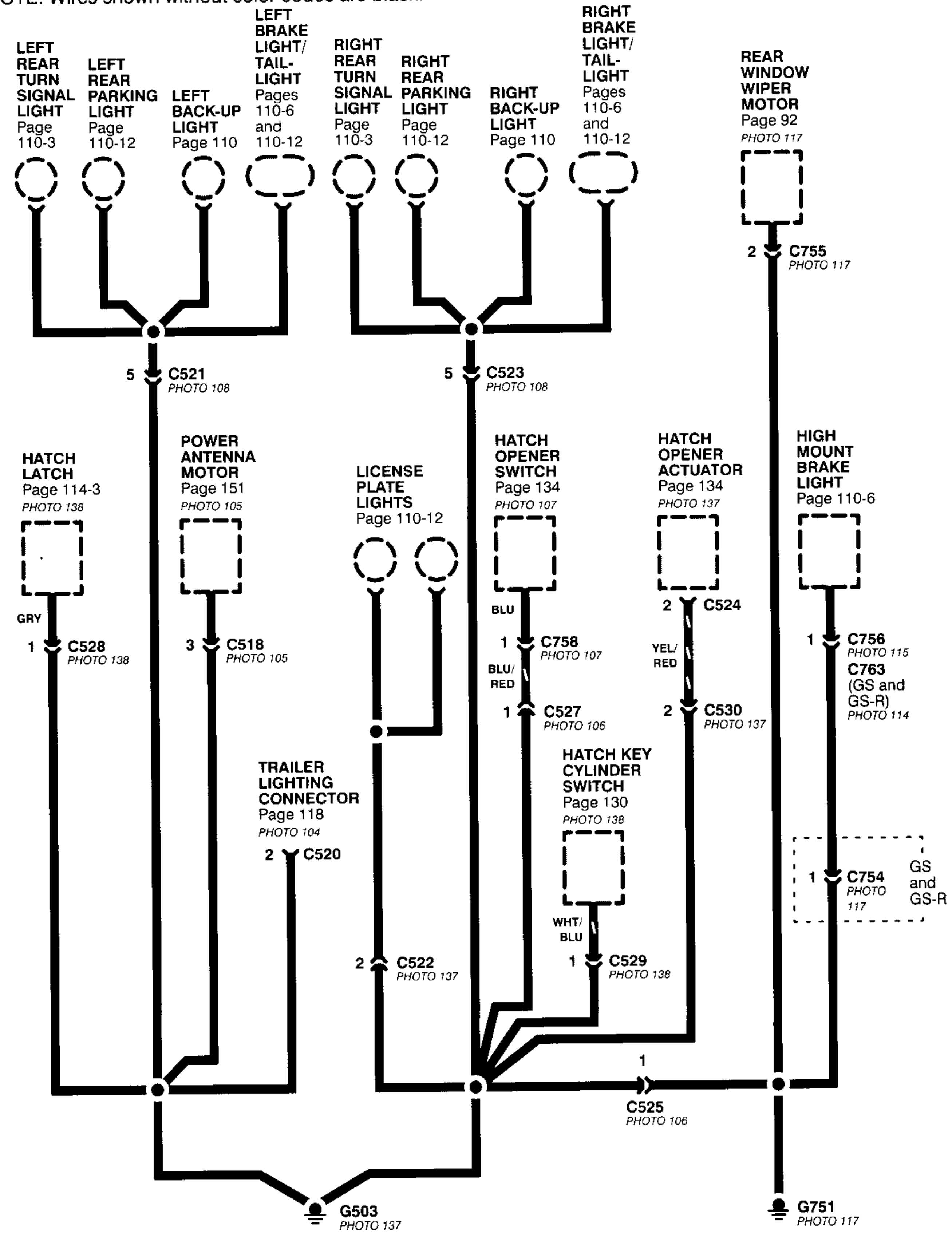
– G502

NOTE: Wires shown without color codes are black.



G503 (Hatchback), G751

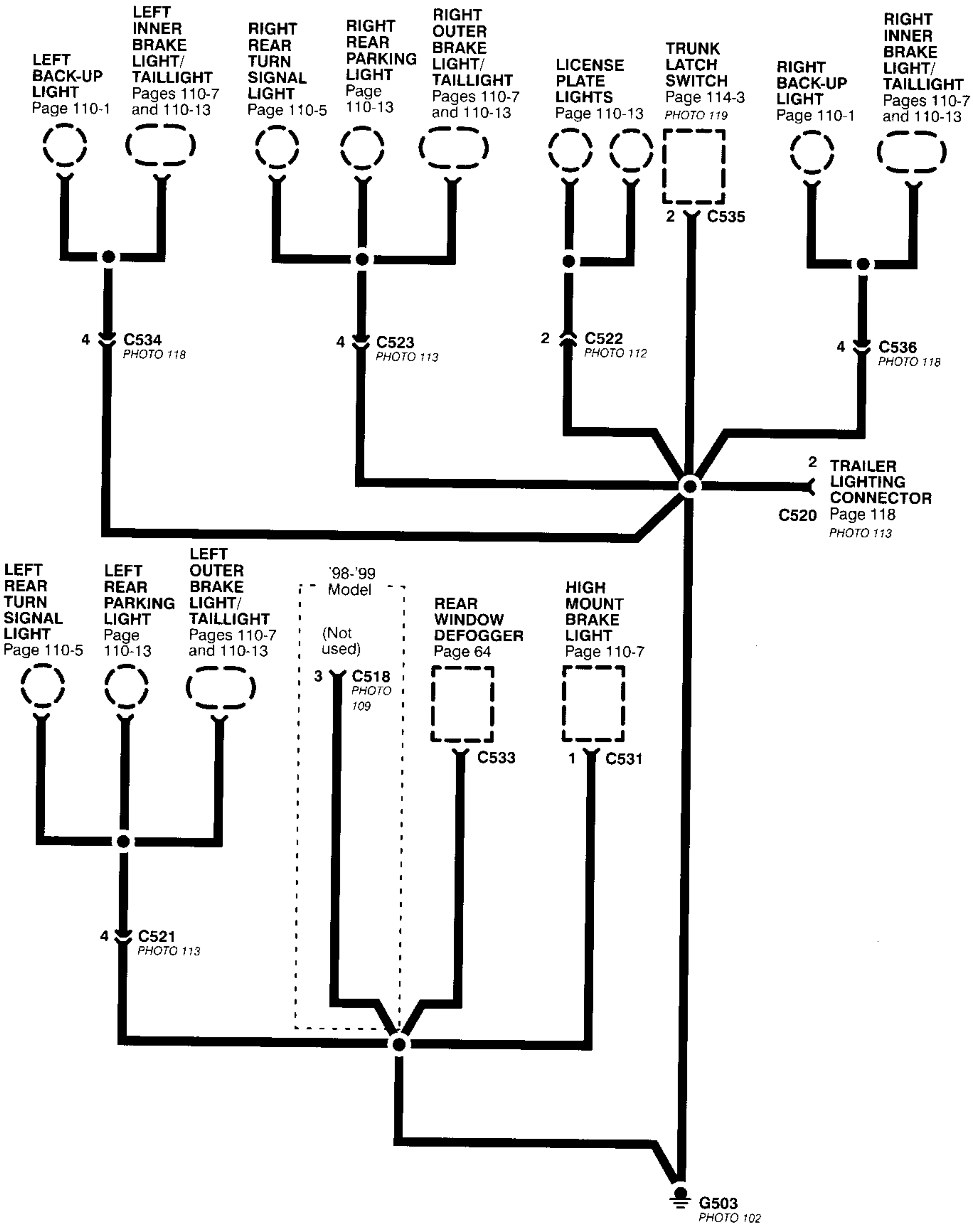
NOTE: Wires shown without color codes are black.



Ground Distribution (cont'd)

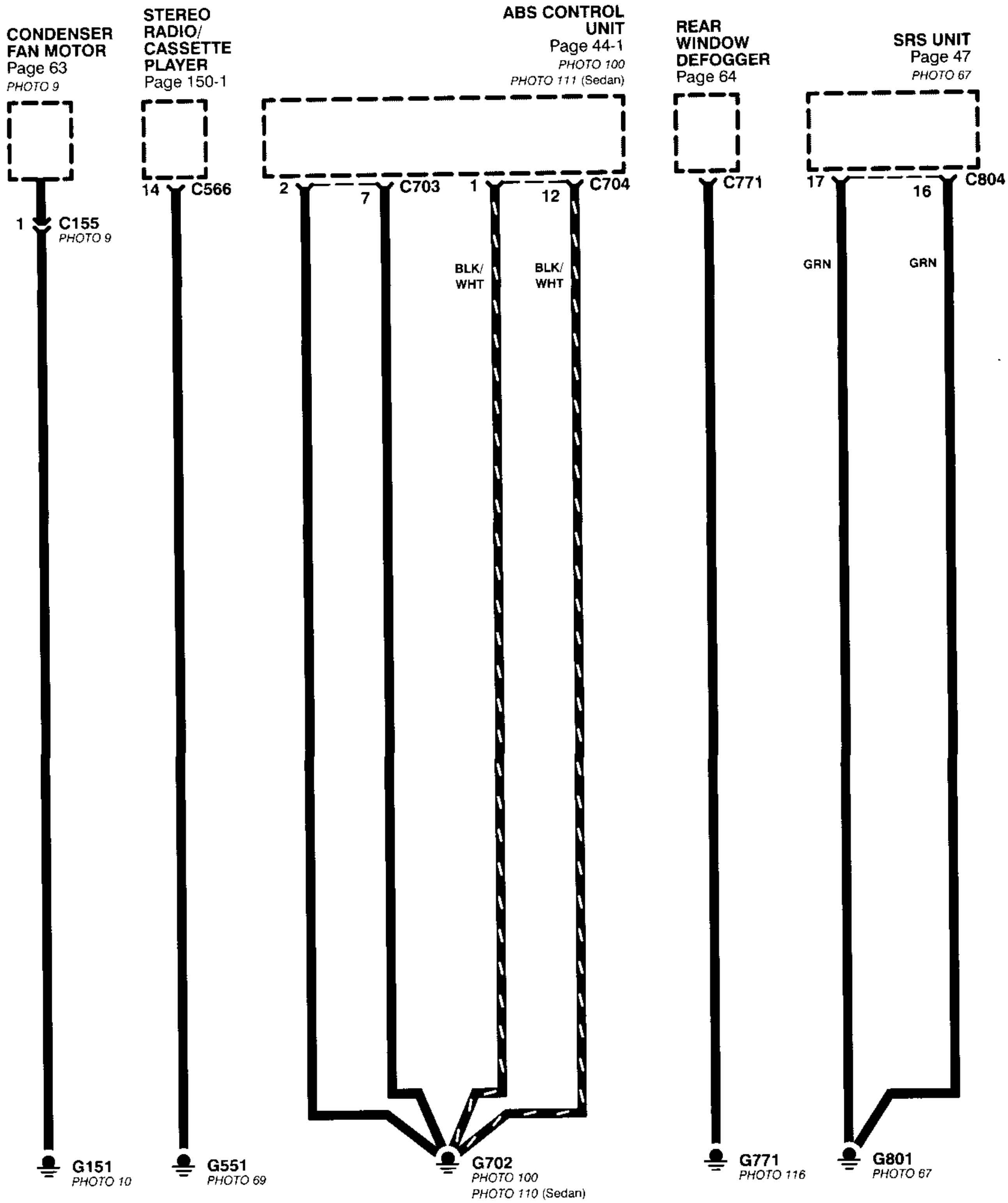
– G503 (Sedan)

NOTE: Wires shown without color codes are black.

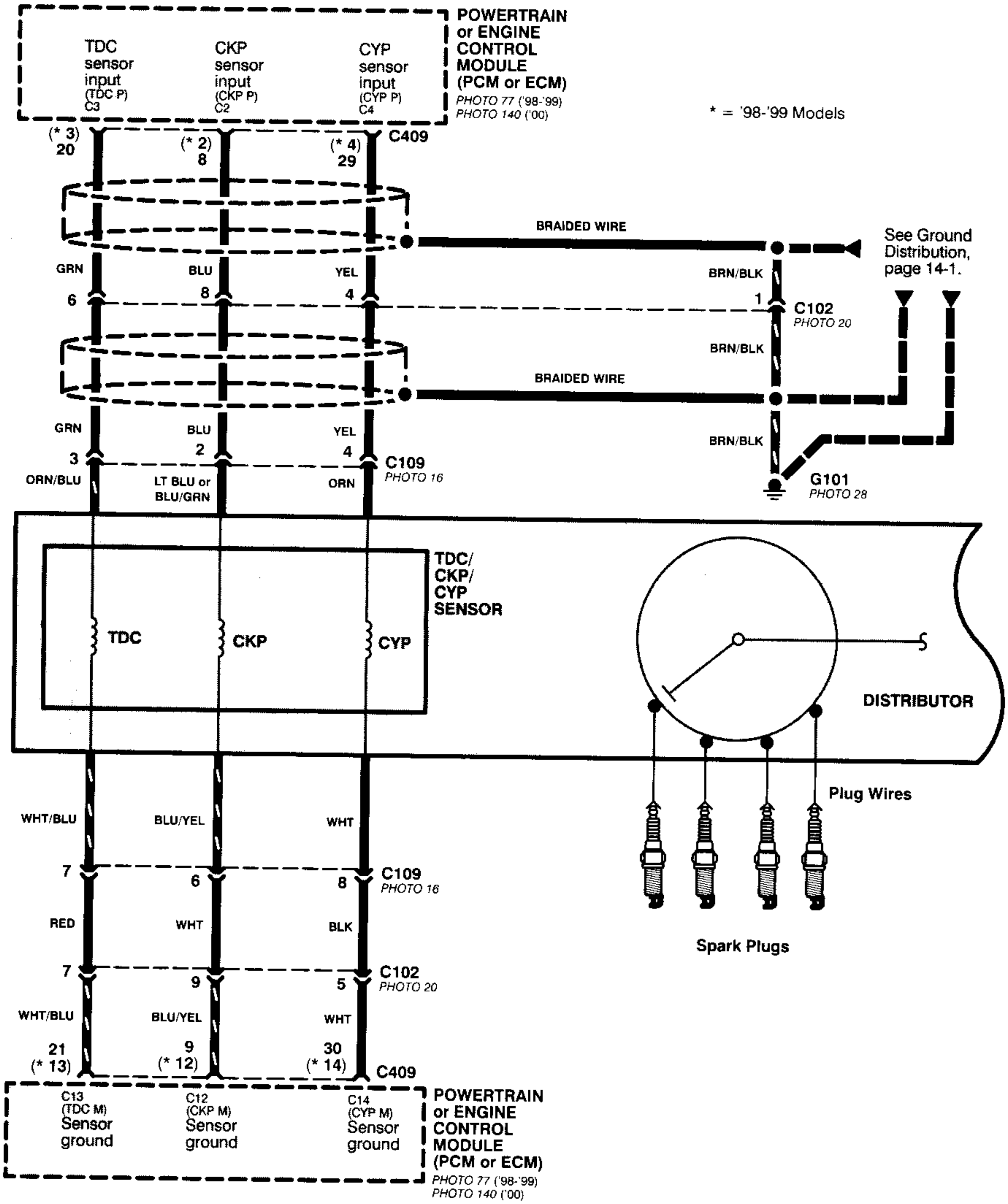


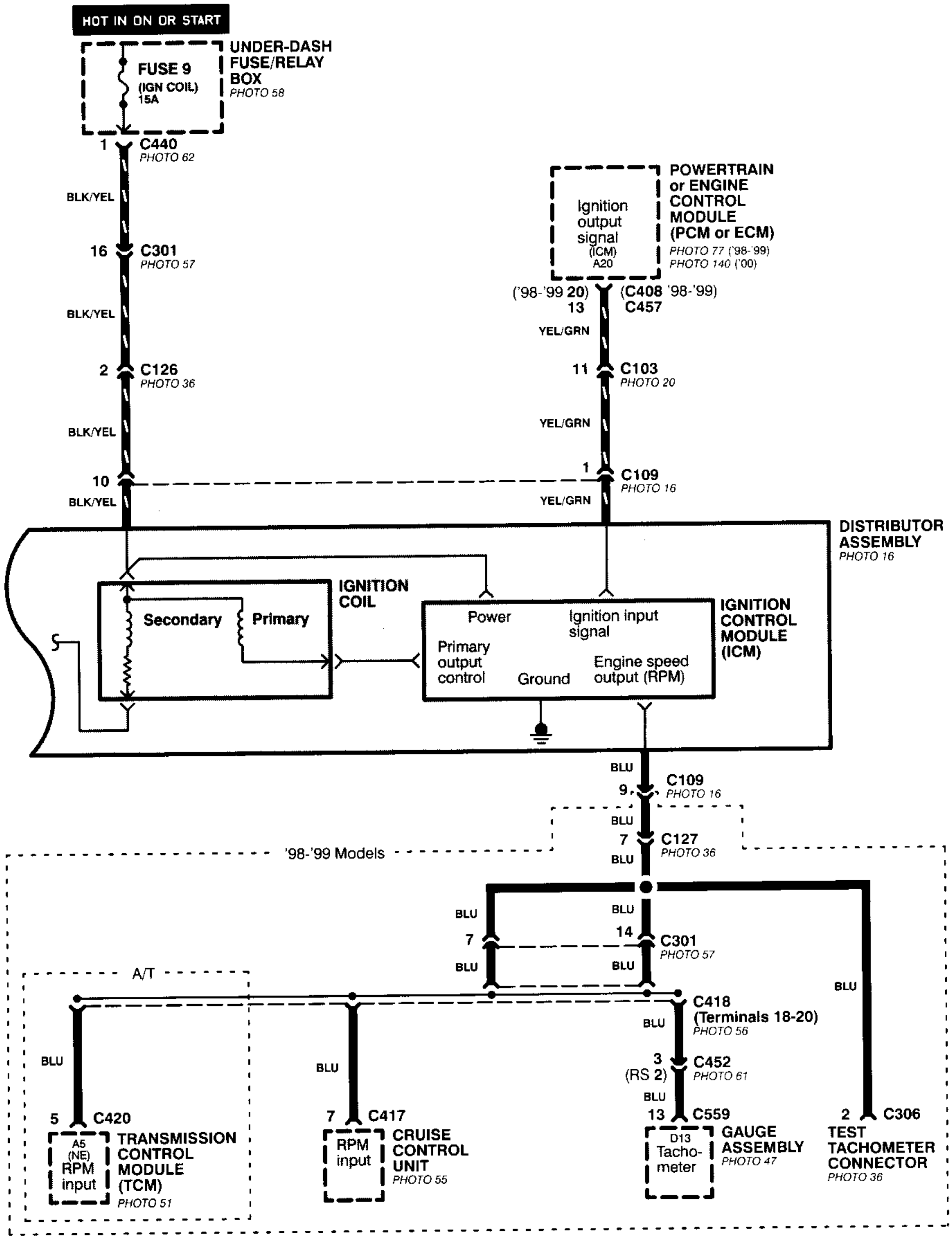
G151, G551, G702, G771, and G801

NOTE: Wires shown without color codes are black.



NOTE: For Service Check Connector details, see page 23-6 ('98-'99 Models) or 24-6 ('00 Model).

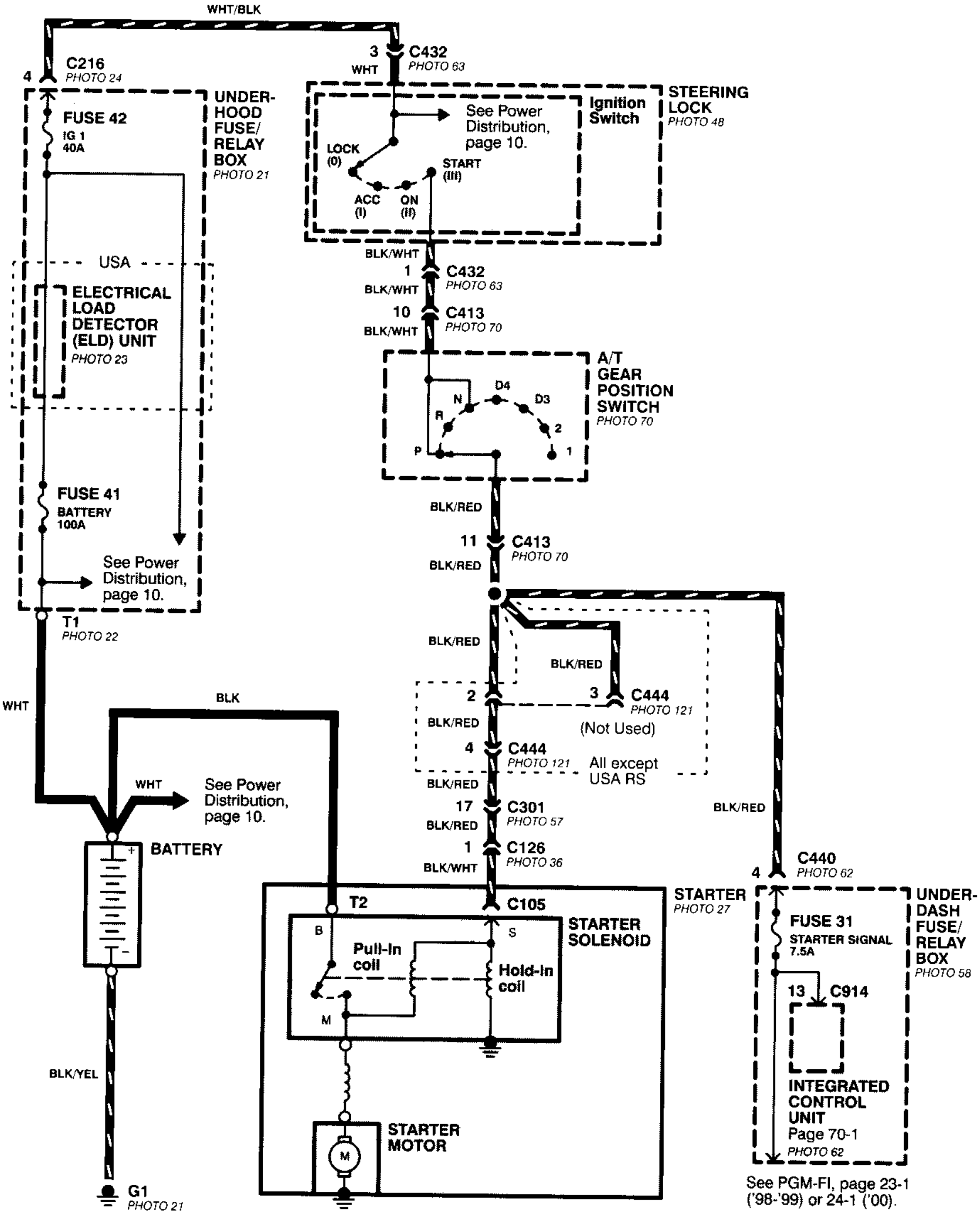



HOT IN ON OR START
FUSE 9
(IGN COIL)
15A
UNDER-DASH
FUSE/RELAY
BOX
PHOTO 58
1
C440
PHOTO 62
BLK/YEL
16
C301
PHOTO 57
BLK/YEL
2
C126
PHOTO 36
BLK/YEL
10
BLK/YEL
Ignition
output
signal
(ICM)
A20
POWERTRAIN
or ENGINE
CONTROL
MODULE
(PCM or ECM)
PHOTO 77 ('98-'99)
PHOTO 140 ('00)
('98-'99 20)
13
(C408 '98-'99)
C457
YEL/GRN
11
C103
PHOTO 20
YEL/GRN
1
C109
PHOTO 16
YEL/GRN
DISTRIBUTOR
ASSEMBLY
PHOTO 16
IGNITION
COIL
Secondary
Primary
Power
Ignition input
signal
Primary
output
control
Ground
Engine speed
output (RPM)
IGNITION
CONTROL
MODULE
(ICM)
BLU
9
C109
PHOTO 16
BLU
7
C127
PHOTO 36
BLU
'98-'99 Models
BLU
BLU
7
14
C301
PHOTO 57
BLU
BLU
A/T
C418
(Terminals 18-20)
PHOTO 56
BLU
BLU
BLU
BLU
3
(RS 2)
C452
PHOTO 61
BLU
5
C420
A5
(NE)
RPM
input
TRANSMISSION
CONTROL
MODULE
(TCM)
PHOTO 51
7
C417
RPM
input
CRUISE
CONTROL
UNIT
PHOTO 55
13
C559
D13
Tacho-
meter
GAUGE
ASSEMBLY
PHOTO 47
2
C306
TEST
TACHOMETER
CONNECTOR
PHOTO 36

Starting System

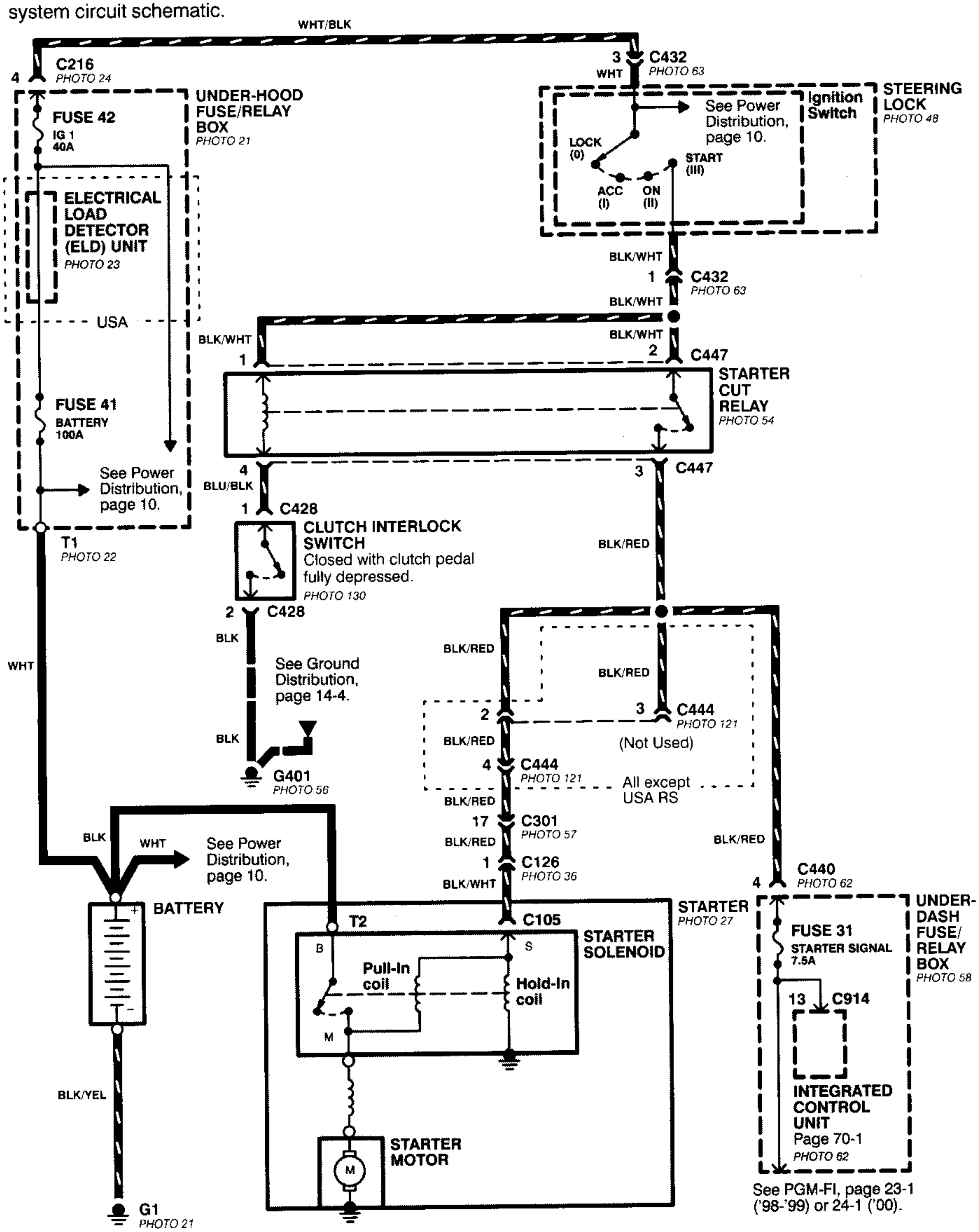
– Automatic Transmission

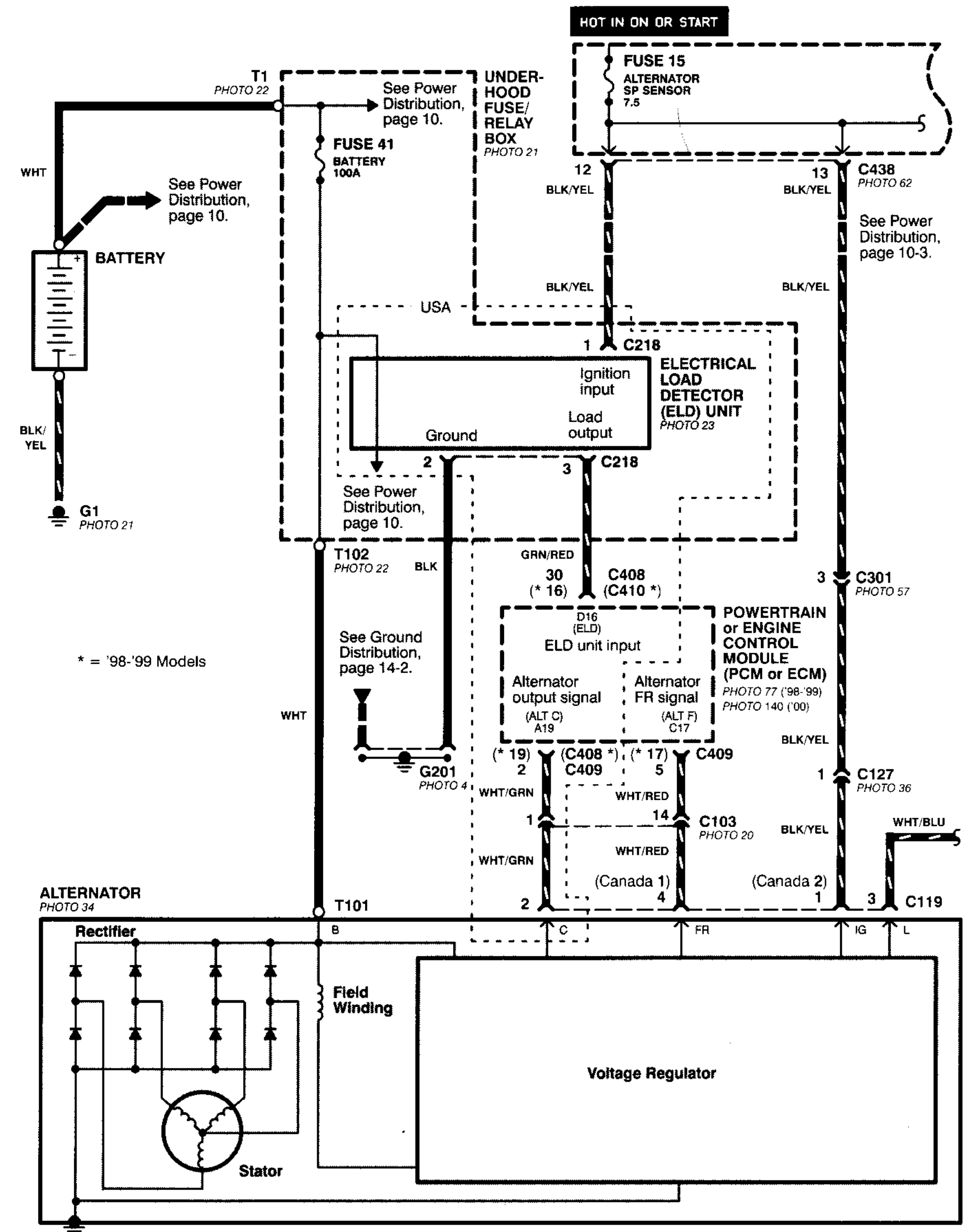
NOTE: For cars equipped with optional security system, see Security System, page 133-3 for starting system circuit schematic.



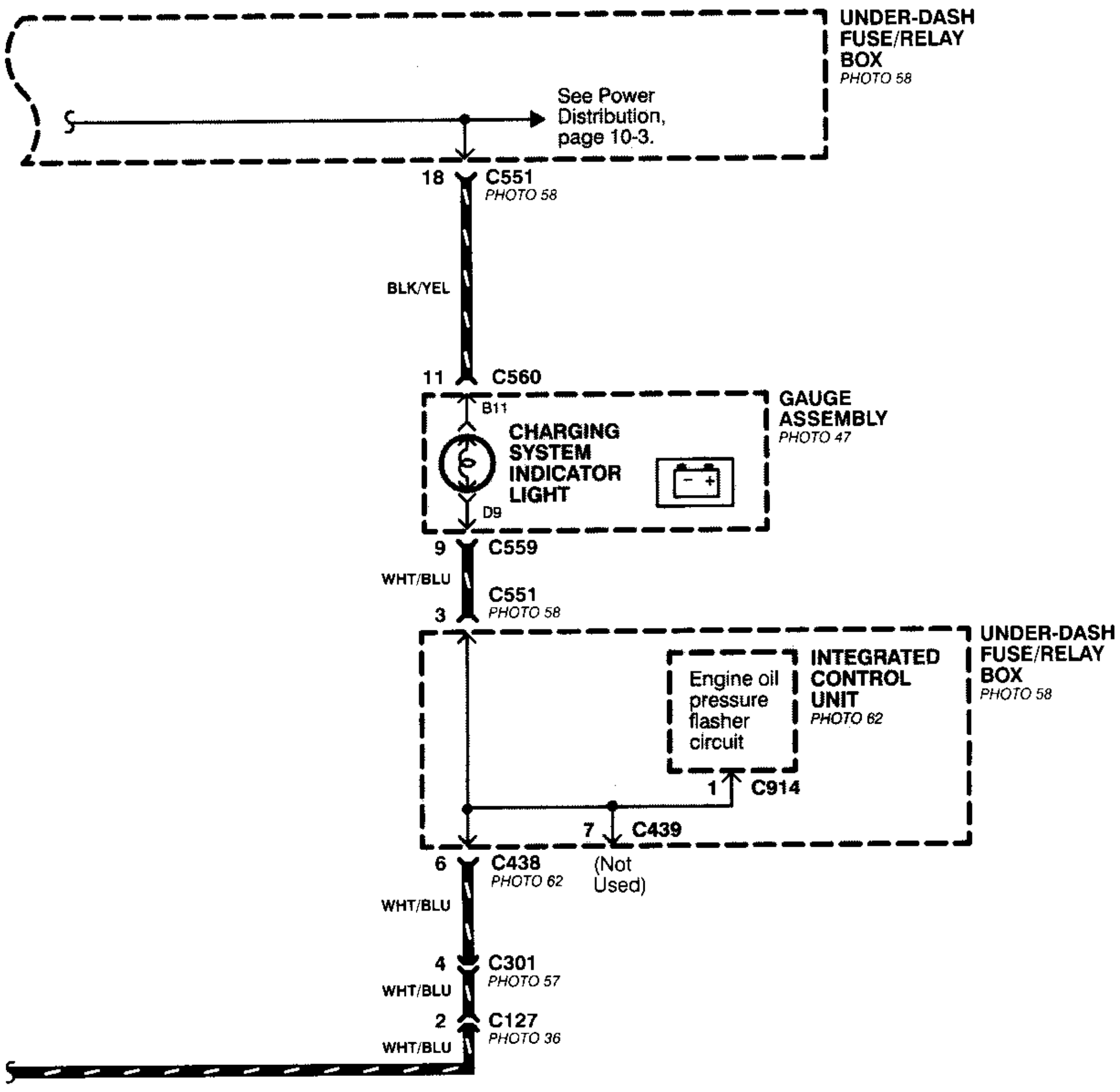
– Manual Transmission

NOTE: For cars equipped with optional security system, see Security System, page 133-3 for starting system circuit schematic.



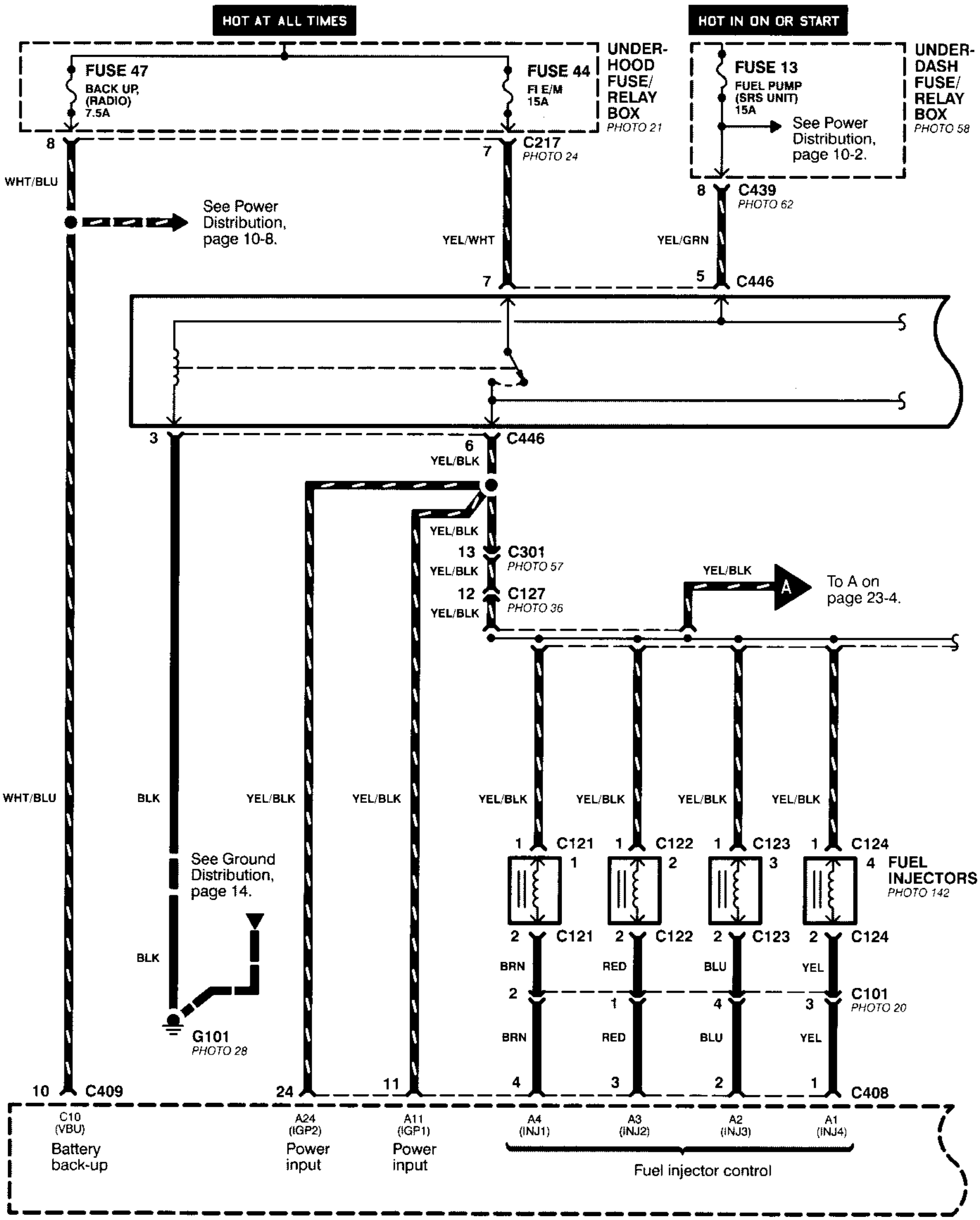


HOT IN ON OR START
FUSE 15
ALTERNATOR SP SENSOR 7.5
T1
PHOTO 22
See Power Distribution, page 10.
UNDER-HOOD FUSE/ RELAY BOX
PHOTO 21
FUSE 41
BATTERY 100A
WHT
See Power Distribution, page 10.
BATTERY
12
BLK/YEL
13
BLK/YEL
C438
PHOTO 62
See Power Distribution, page 10-3.
BLK/YEL
BLK/YEL
USA
1
C218
Ignition input
Load output
Ground
ELECTRICAL LOAD DETECTOR (ELD) UNIT
PHOTO 23
BLK/ YEL
2
3
C218
G1
PHOTO 21
See Power Distribution, page 10.
T102
PHOTO 22
BLK
GRN/RED
30 (* 16)
C408 (C410 *)
3
C301
PHOTO 57
D16 (ELD)
ELD unit input
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 77 ('98-'99)
PHOTO 140 ('00)
See Ground Distribution, page 14-2.
* = '98-'99 Models
Alternator output signal
(ALT C) A19
Alternator FR signal
(ALT F) C17
WHT
BLK/YEL
(* 19) 2
(C408 *) C409
(* 17) 5
C409
G201
PHOTO 4
1
C127
PHOTO 36
WHT/GRN
WHT/RED
1
14
C103
PHOTO 20
BLK/YEL
WHT/BLU
WHT/GRN
WHT/RED
(Canada 1)
(Canada 2)
ALTERNATOR
PHOTO 34
T101
2
4
1
3
C119
Rectifier
B
C
FR
IG
L
Field Winding
Voltage Regulator
Stator

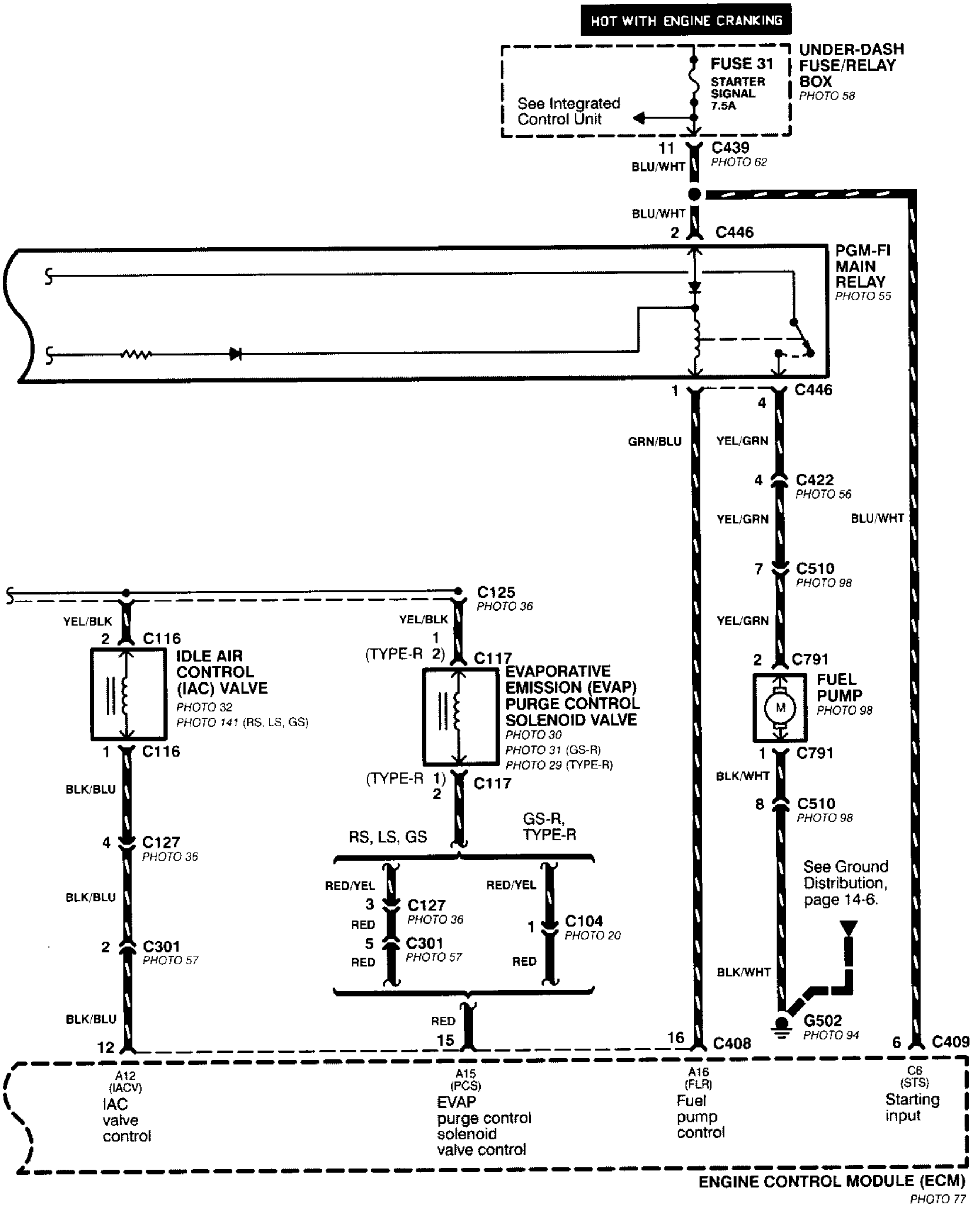


UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-3.
18
C551
PHOTO 58
BLK/YEL
11
C560
B11
CHARGING SYSTEM INDICATOR LIGHT
D9
GAUGE ASSEMBLY
PHOTO 47
9
C559
WHT/BLU
C551
PHOTO 58
3
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
Engine oil pressure flasher circuit
INTEGRATED CONTROL UNIT
PHOTO 62
1
C914
7
C439
6
C438
PHOTO 62
(Not Used)
WHT/BLU
4
C301
PHOTO 57
WHT/BLU
2
C127
PHOTO 36
WHT/BLU

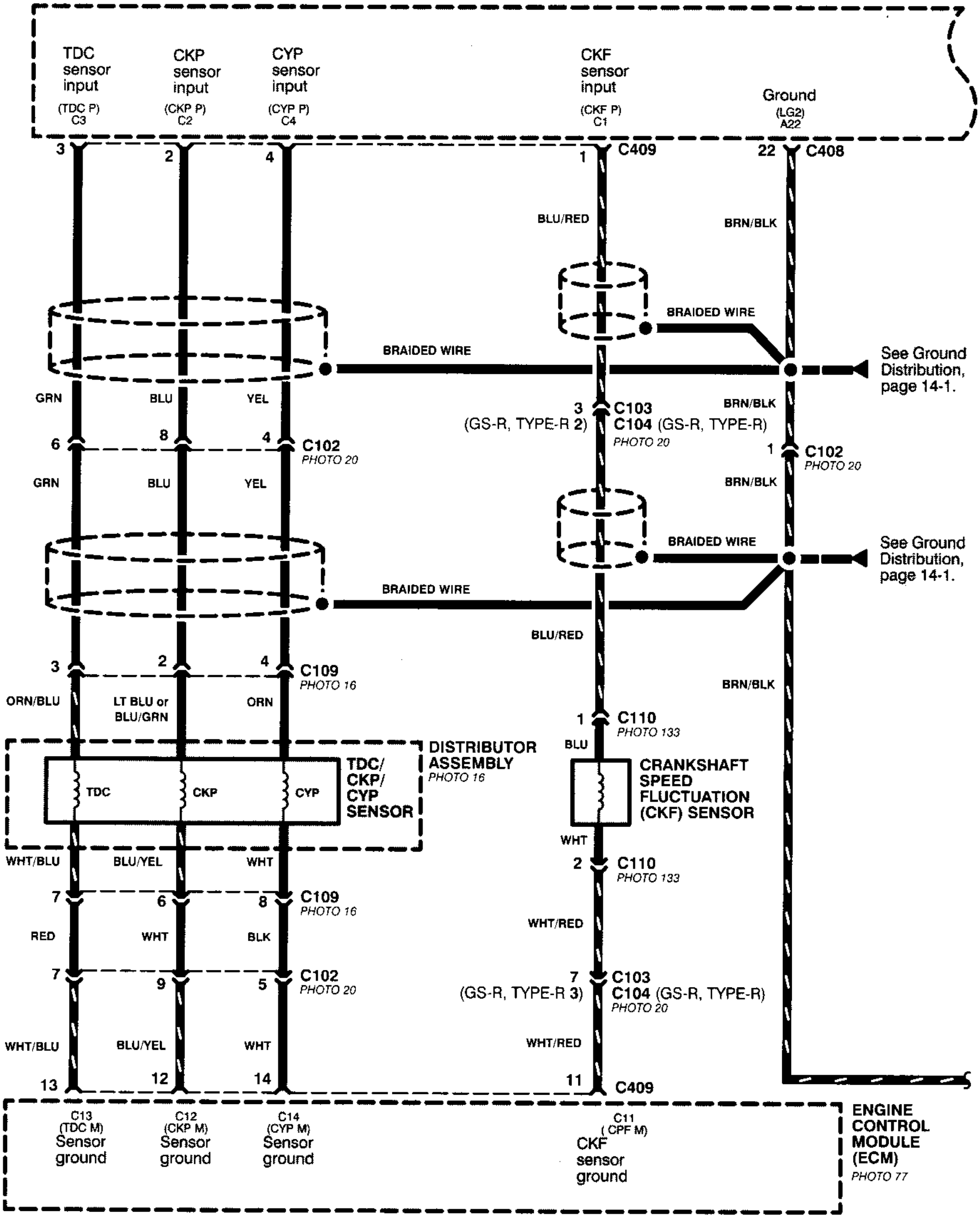
PGM-FI ('98-'99 Models)

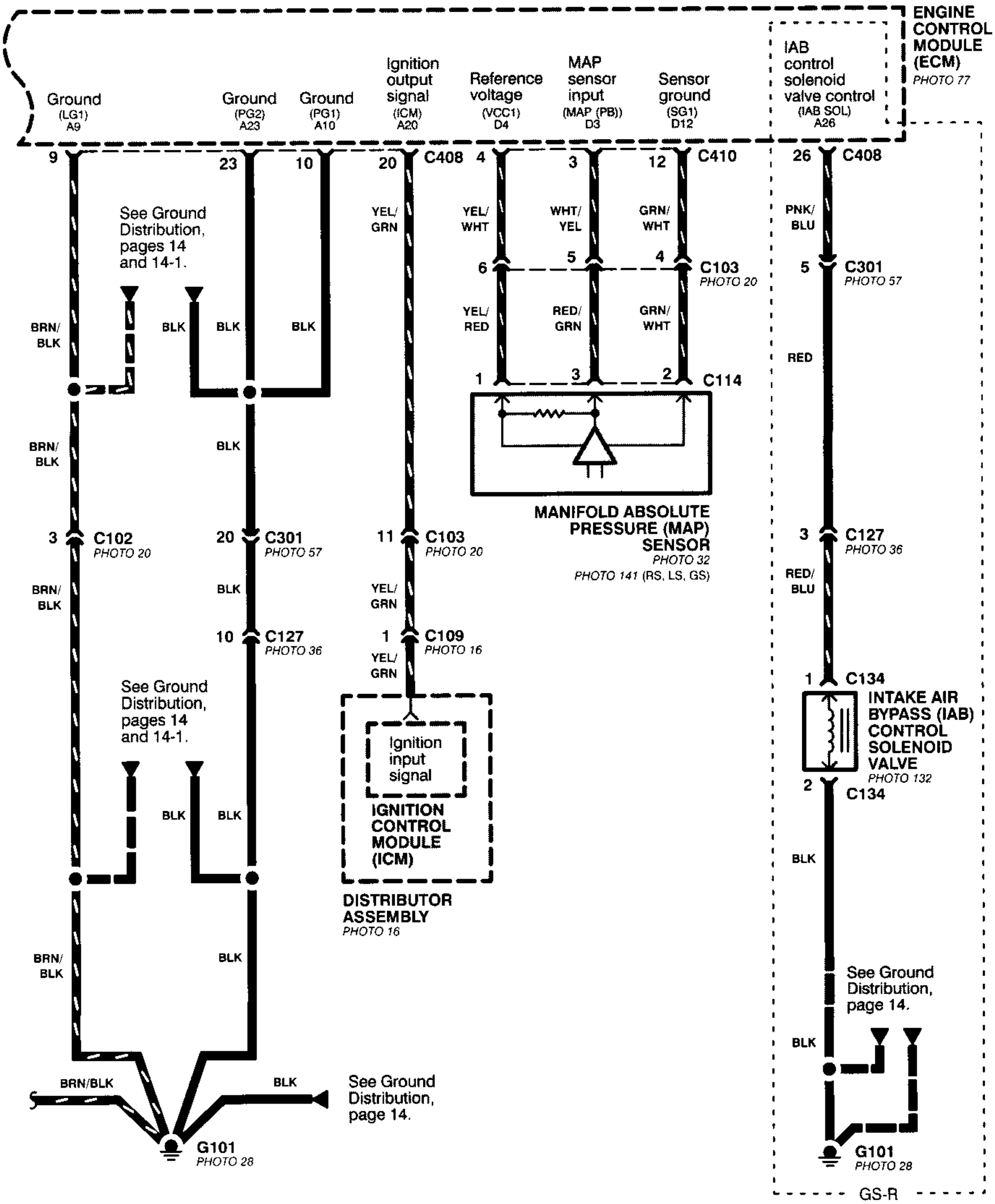


NOTE: Fuse 31 is HOT with Ignition Switch in START (III) and clutch pedal depressed or A/T Gear Selector in PARK (P) or NEUTRAL (N), see Starting System, pages 21 and 21-1.



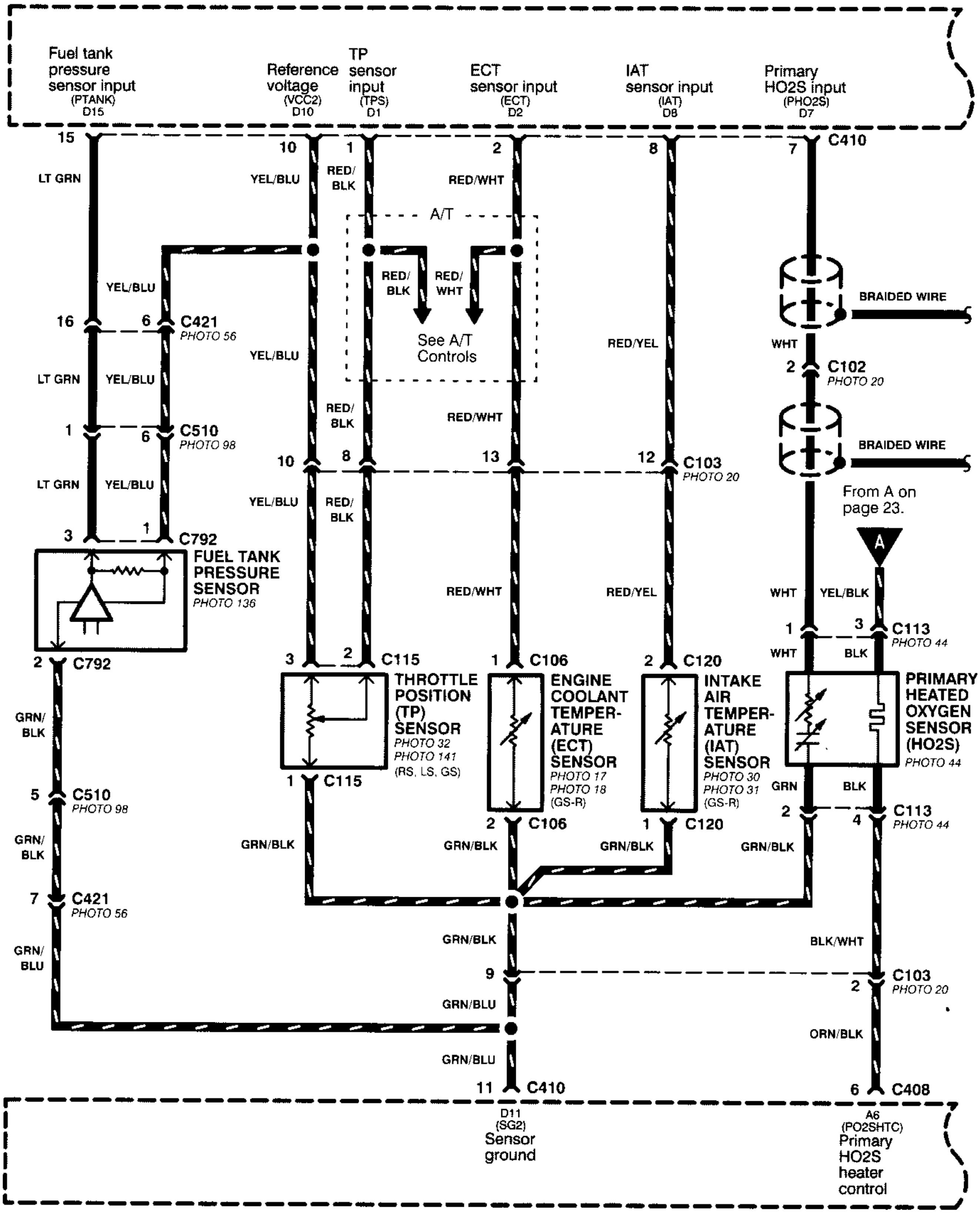
(cont'd)

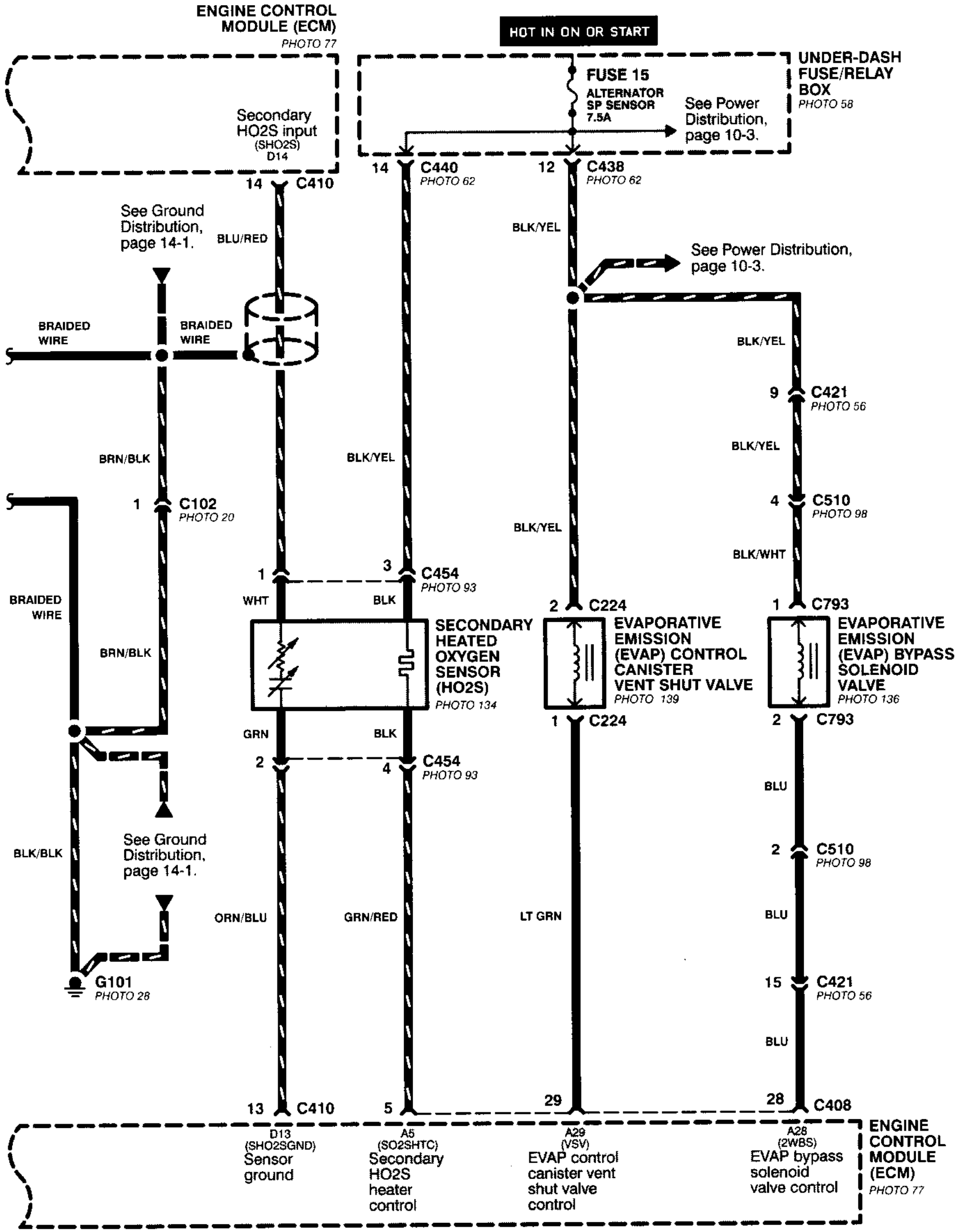

TDC sensor input (TDC P) C3
CKP sensor input (CKP P) C2
CYP sensor input (CYP P) C4
CKF sensor input (CKF P) C1
Ground (LG2) A22
C409
C408
BLU/RED
BRN/BLK
BRAIDED WIRE
See Ground Distribution, page 14-1.
GRN
BLU
YEL
C102 PHOTO 20
C103
(GS-R, TYPE-R 2)
C104 (GS-R, TYPE-R) PHOTO 20
C109 PHOTO 16
ORN/BLU
LT BLU or BLU/GRN
ORN
C110 PHOTO 133
BLU
DISTRIBUTOR ASSEMBLY PHOTO 16
TDC/ CKP/ CYP SENSOR
TDC
CKP
CYP
CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
WHT
WHT/BLU
BLU/YEL
RED
BLK
WHT/RED
(GS-R, TYPE-R 3)
ENGINE CONTROL MODULE (ECM) PHOTO 77
C13 (TDC M) Sensor ground
C12 (CKP M) Sensor ground
C14 (CYP M) Sensor ground
C11 (CPF M) CKF sensor ground



ENGINE CONTROL MODULE (ECM)
PHOTO 77
Ground (LG1) A9
Ground (PG2) A23
Ground (PG1) A10
Ignition output signal (ICM) A20
Reference voltage (VCC1) D4
MAP sensor input (MAP (PB)) D3
Sensor ground (SG1) D12
IAB control solenoid valve control (IAB SOL) A26
C408
C410
YEL/GRN
YEL/WHT
WHT/YEL
GRN/WHT
PNK/BLU
See Ground Distribution, pages 14 and 14-1.
C103
PHOTO 20
C301
PHOTO 57
BRN/BLK
BLK
YEL/RED
RED/GRN
RED
C114
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
PHOTO 32
PHOTO 141 (RS, LS, GS)
C102
PHOTO 20
C127
PHOTO 36
RED/BLU
C109
PHOTO 16
C134
Ignition input signal
IGNITION CONTROL MODULE (ICM)
DISTRIBUTOR ASSEMBLY
PHOTO 16
INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE
PHOTO 132
See Ground Distribution, page 14.
G101
PHOTO 28
GS-R

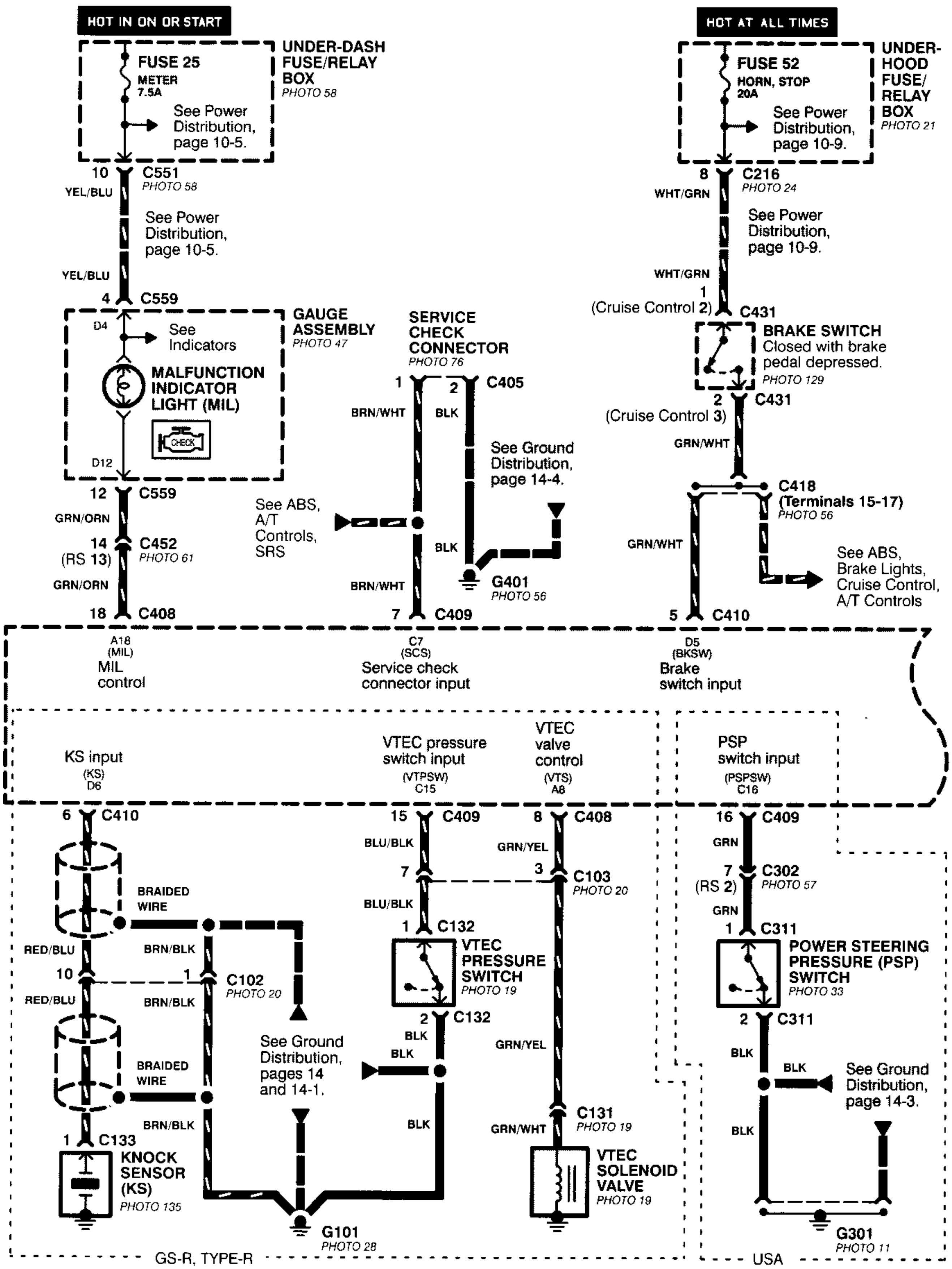
(cont'd)


Fuel tank pressure sensor input (PTANK) D15
Reference voltage (VCC2) D10
TP sensor input (TPS) D1
ECT sensor input (ECT) D2
IAT sensor input (IAT) D8
Primary HO2S input (PHO2S) D7
C410
LT GRN
YEL/BLU
RED/BLK
RED/WHT
A/T
See A/T Controls
RED/YEL
BRAIDED WIRE
WHT
C421 PHOTO 56
C102 PHOTO 20
C510 PHOTO 98
C103 PHOTO 20
From A on page 23.
C792
FUEL TANK PRESSURE SENSOR PHOTO 136
YEL/BLK
C113 PHOTO 44
BLK
C115
C106
C120
THROTTLE POSITION (TP) SENSOR PHOTO 32 PHOTO 141 (RS, LS, GS)
ENGINE COOLANT TEMPER-ATURE (ECT) SENSOR PHOTO 17 PHOTO 18 (GS-R)
INTAKE AIR TEMPER-ATURE (IAT) SENSOR PHOTO 30 PHOTO 31 (GS-R)
PRIMARY HEATED OXYGEN SENSOR (HO2S) PHOTO 44
GRN
GRN/BLK
GRN/BLU
BLK/WHT
ORN/BLK
C408
D11 (SG2) Sensor ground
A6 (PO2SHTC) Primary HO2S heater control

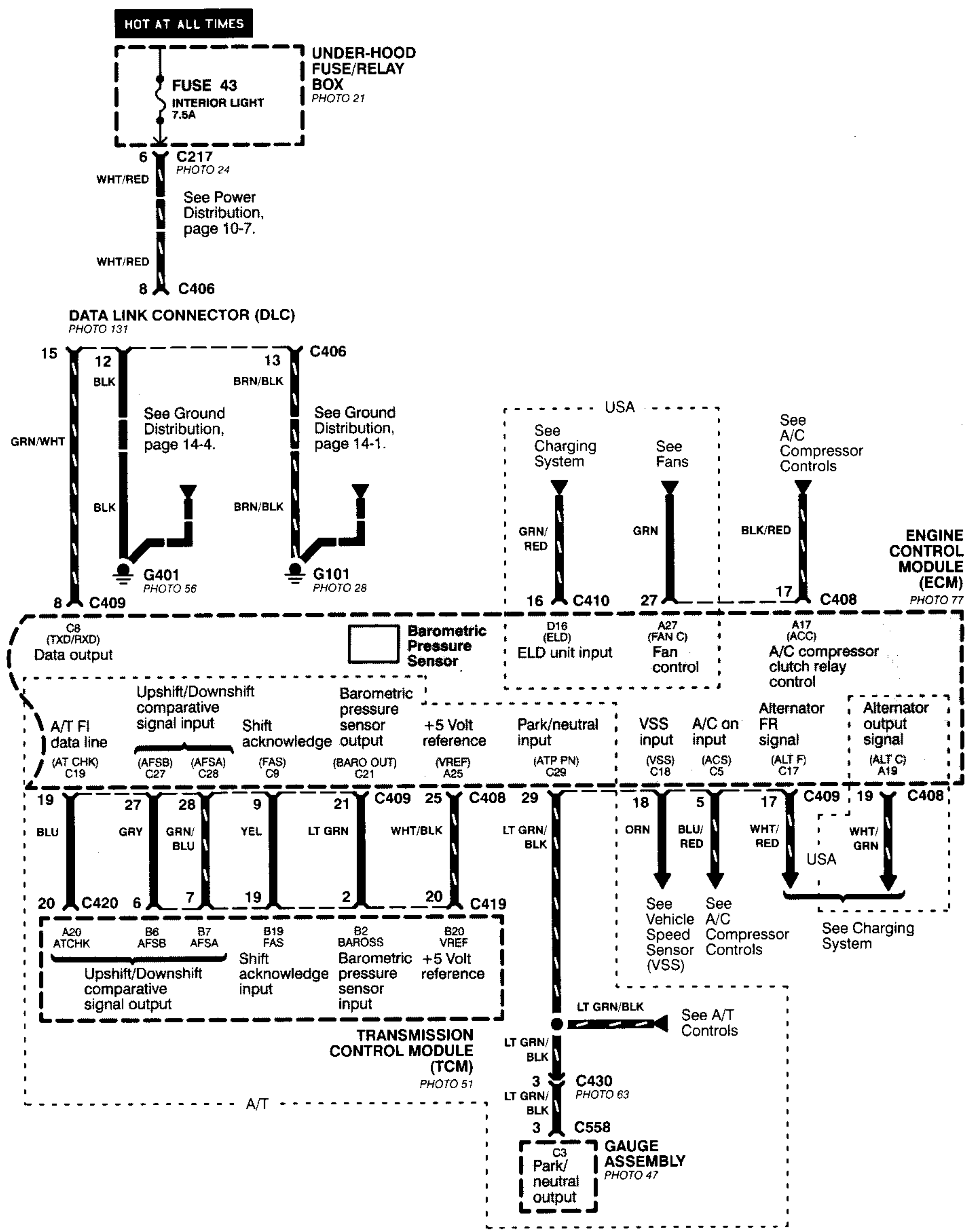


ENGINE CONTROL MODULE (ECM)
PHOTO 77
Secondary HO2S input
(SHO2S)
D14
14 C410
HOT IN ON OR START
FUSE 15
ALTERNATOR SP SENSOR 7.5A
See Power Distribution, page 10-3.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
14 C440
PHOTO 62
12 C438
PHOTO 62
See Ground Distribution, page 14-1.
BLU/RED
BLK/YEL
See Power Distribution, page 10-3.
BRAIDED WIRE
BRAIDED WIRE
BLK/YEL
9 C421
PHOTO 56
BRN/BLK
BLK/YEL
BLK/YEL
1 C102
PHOTO 20
4 C510
PHOTO 98
BLK/YEL
BLK/WHT
1
3 C454
PHOTO 93
BRAIDED WIRE
WHT
BLK
2 C224
1 C793
SECONDARY HEATED OXYGEN SENSOR (HO2S)
PHOTO 134
EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
PHOTO 139
EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
PHOTO 136
BRN/BLK
1 C224
2 C793
GRN
BLK
2
4 C454
PHOTO 93
BLU
See Ground Distribution, page 14-1.
BLK/BLK
2 C510
PHOTO 98
ORN/BLU
GRN/RED
LT GRN
BLU
G101
PHOTO 28
15 C421
PHOTO 56
BLU
13 C410
5
29
28 C408
D13
(SHO2SGND)
Sensor ground
A5
(SO2SHTC)
Secondary HO2S heater control
A29
(VSV)
EVAP control canister vent shut valve control
A28
(2WBS)
EVAP bypass solenoid valve control
ENGINE CONTROL MODULE (ECM)
PHOTO 77

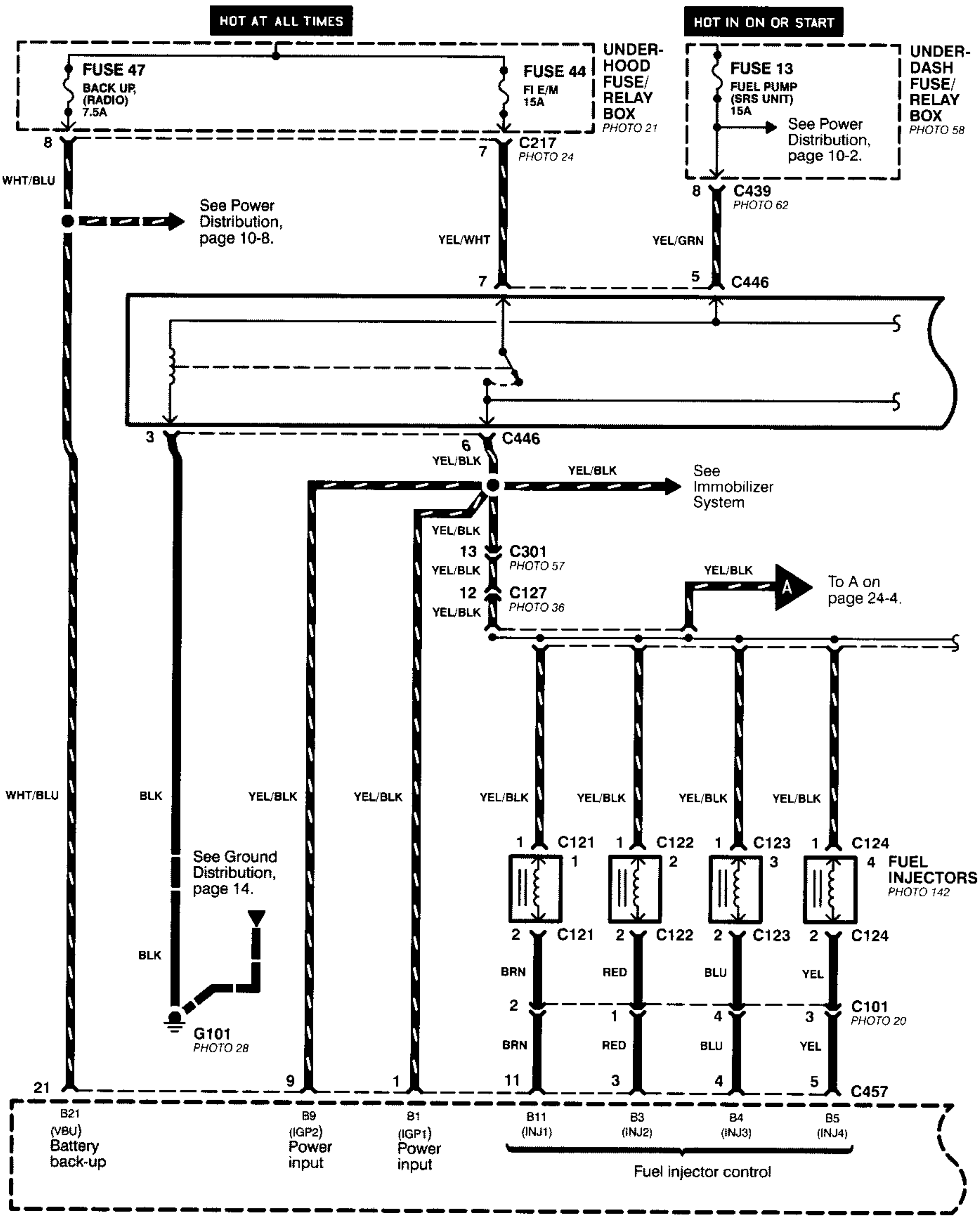
(cont'd)



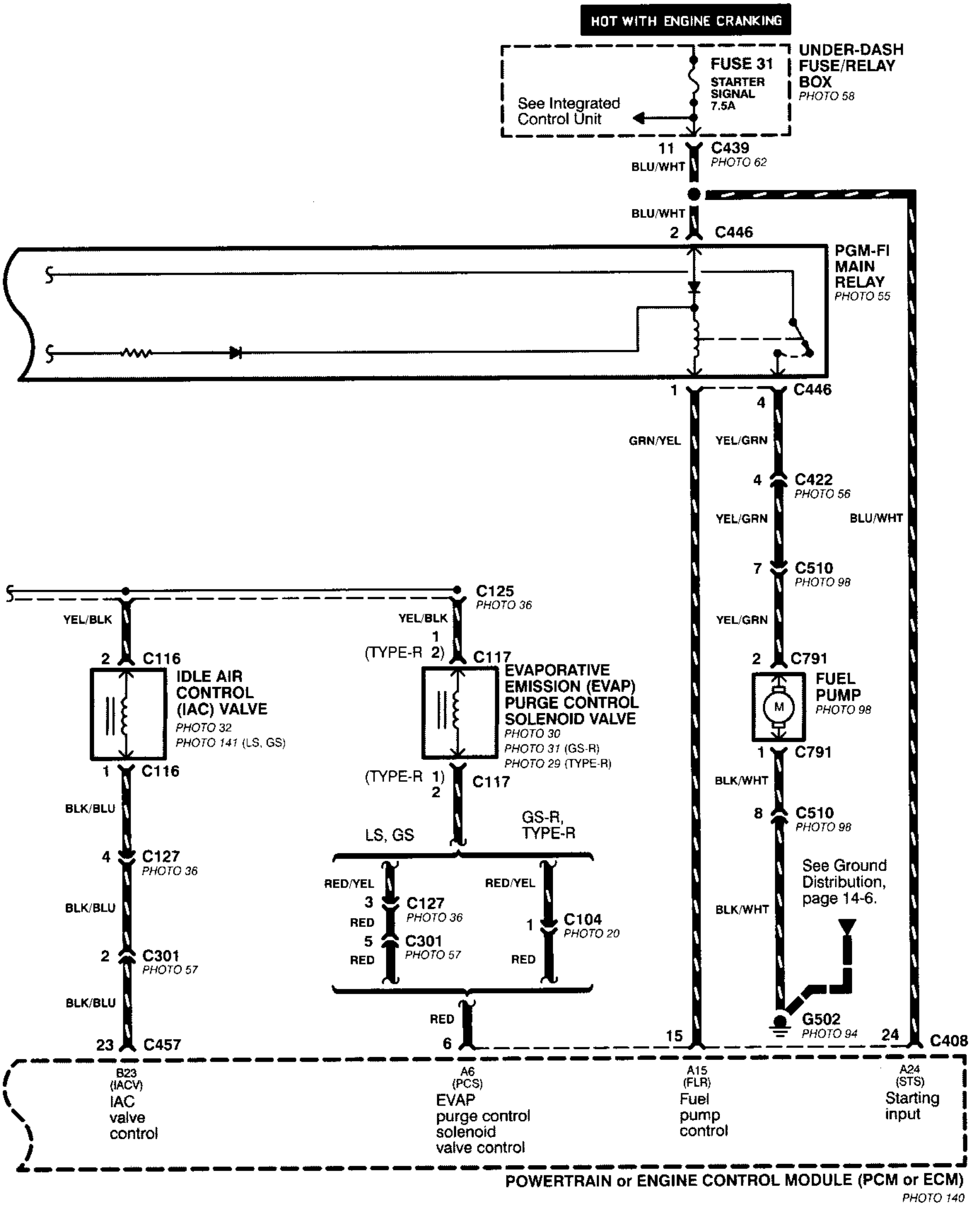
HOT IN ON OR START
FUSE 25 METER 7.5A
UNDER-DASH FUSE/RELAY BOX PHOTO 58
See Power Distribution, page 10-5.
HOT AT ALL TIMES
FUSE 52 HORN, STOP 20A
UNDER-HOOD FUSE/ RELAY BOX PHOTO 21
See Power Distribution, page 10-9.
10 C551 PHOTO 58
YEL/BLU
See Power Distribution, page 10-5.
YEL/BLU
4 C559
8 C216 PHOTO 24
WHT/GRN
See Power Distribution, page 10-9.
WHT/GRN
1 (Cruise Control 2) C431
GAUGE ASSEMBLY PHOTO 47
D4
See Indicators
MALFUNCTION INDICATOR LIGHT (MIL)
CHECK
D12
SERVICE CHECK CONNECTOR PHOTO 76
1 2 C405
BRN/WHT BLK
See Ground Distribution, page 14-4.
BRAKE SWITCH Closed with brake pedal depressed. PHOTO 129
2 C431 (Cruise Control 3)
GRN/WHT
C418 (Terminals 15-17) PHOTO 56
12 C559
GRN/ORN
14 C452 (RS 13) PHOTO 61
GRN/ORN
18 C408
See ABS, A/T Controls, SRS
BLK
G401 PHOTO 56
BRN/WHT
7 C409
GRN/WHT
See ABS, Brake Lights, Cruise Control, A/T Controls
5 C410
A18 (MIL) MIL control
C7 (SCS) Service check connector input
D5 (BKSW) Brake switch input
KS input (KS) D6
VTEC pressure switch input (VTPSW) C15
VTEC valve control (VTS) A8
PSP switch input (PSPSW) C16
6 C410
BRAIDED WIRE
RED/BLU
BRN/BLK
10 1 C102 PHOTO 20
RED/BLU
BRN/BLK
BRAIDED WIRE
BRN/BLK
1 C133
KNOCK SENSOR (KS) PHOTO 135
15 C409
BLU/BLK
7
BLU/BLK
1 C132
VTEC PRESSURE SWITCH PHOTO 19
2 C132
BLK
BLK
See Ground Distribution, pages 14 and 14-1.
BLK
G101 PHOTO 28
8 C408
GRN/YEL
3 C103 PHOTO 20
GRN/YEL
C131 PHOTO 19
GRN/WHT
VTEC SOLENOID VALVE PHOTO 19
16 C409
GRN
7 C302 (RS 2) PHOTO 57
GRN
1 C311
POWER STEERING PRESSURE (PSP) SWITCH PHOTO 33
2 C311
BLK
BLK
See Ground Distribution, page 14-3.
BLK
G301 PHOTO 11
GS-R, TYPE-R
USA


HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 43
INTERIOR LIGHT 7.5A
6 C217
PHOTO 24
WHT/RED
See Power Distribution, page 10-7.
WHT/RED
8 C406
DATA LINK CONNECTOR (DLC)
PHOTO 131
15
12
BLK
13
BRN/BLK
C406
GRN/WHT
See Ground Distribution, page 14-4.
See Ground Distribution, page 14-1.
BLK
BRN/BLK
G401
PHOTO 56
G101
PHOTO 28
8 C409
USA
See Charging System
See Fans
See A/C Compressor Controls
GRN/RED
GRN
BLK/RED
ENGINE CONTROL MODULE (ECM)
PHOTO 77
16 C410
27
17 C408
C8 (TXD/RXD)
Data output
Barometric Pressure Sensor
D16 (ELD)
ELD unit input
A27 (FAN C)
Fan control
A17 (ACC)
A/C compressor clutch relay control
A/T FI data line
(AT CHK) C19
Upshift/Downshift comparative signal input
(AFSB) C27
(AFSA) C28
Shift acknowledge
(FAS) C9
Barometric pressure sensor output
(BARO OUT) C21
+5 Volt reference
(VREF) A25
Park/neutral input
(ATP PN) C29
VSS input
(VSS) C18
A/C on input
(ACS) C5
Alternator FR signal
(ALT F) C17
Alternator output signal
(ALT C) A19
19
BLU
27
GRY
28
GRN/BLU
9
YEL
21
LT GRN
C409
25
WHT/BLK
C408
29
LT GRN/BLK
18
ORN
5
BLU/RED
17
WHT/RED
C409
19
WHT/GRN
C408
USA
20 C420
6
7
19
2
20 C419
See Vehicle Speed Sensor (VSS)
See A/C Compressor Controls
See Charging System
A20 ATCHK
B6 AFSB
B7 AFSA
Upshift/Downshift comparative signal output
B19 FAS
Shift acknowledge input
B2 BAROSS
Barometric pressure sensor input
B20 VREF
+5 Volt reference
TRANSMISSION CONTROL MODULE (TCM)
PHOTO 51
A/T
LT GRN/BLK
See A/T Controls
LT GRN/BLK
3 C430
PHOTO 63
LT GRN/BLK
3 C558
GAUGE ASSEMBLY
PHOTO 47
C3
Park/neutral output

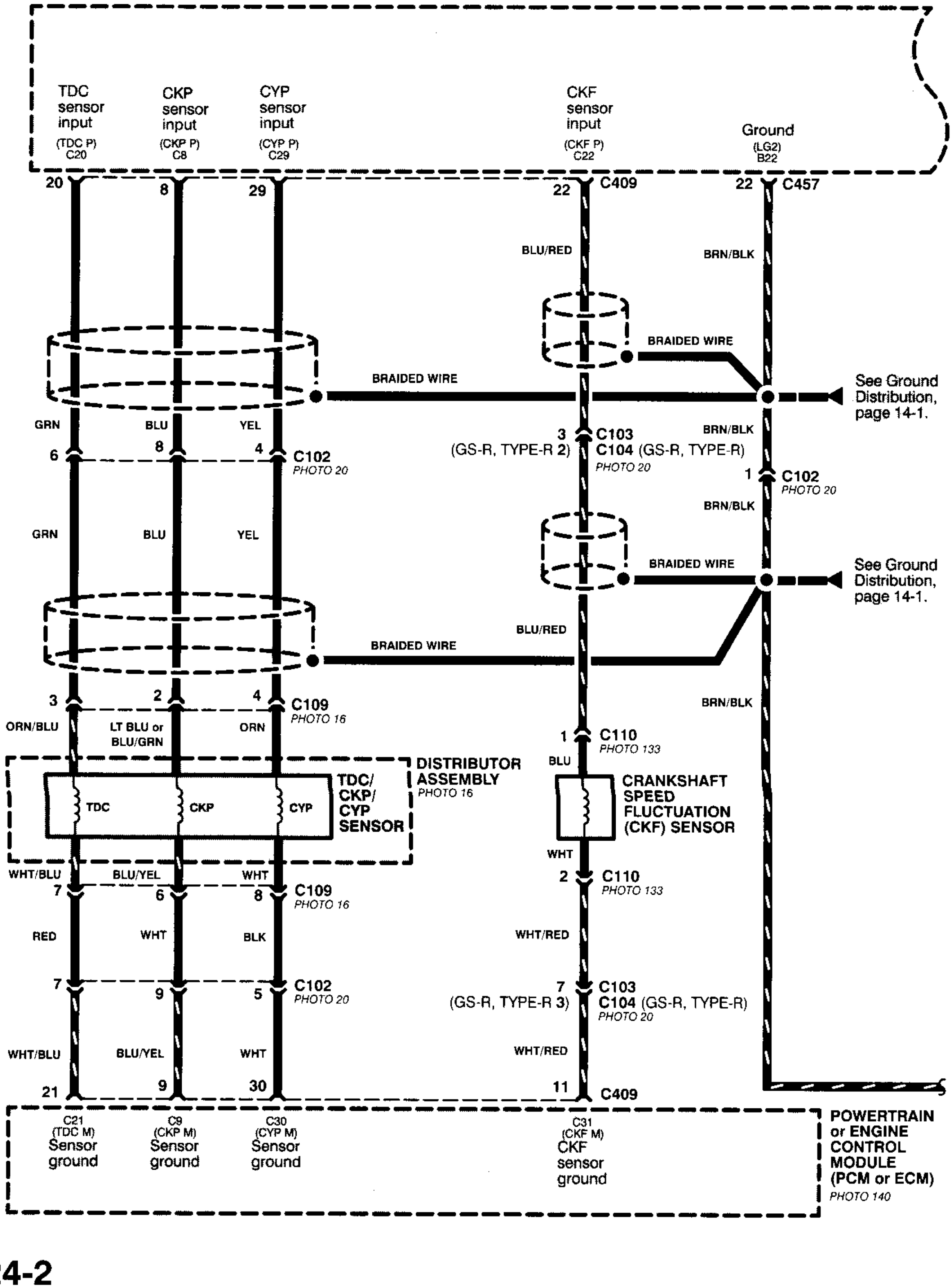
PGM-FI ('00 Model)

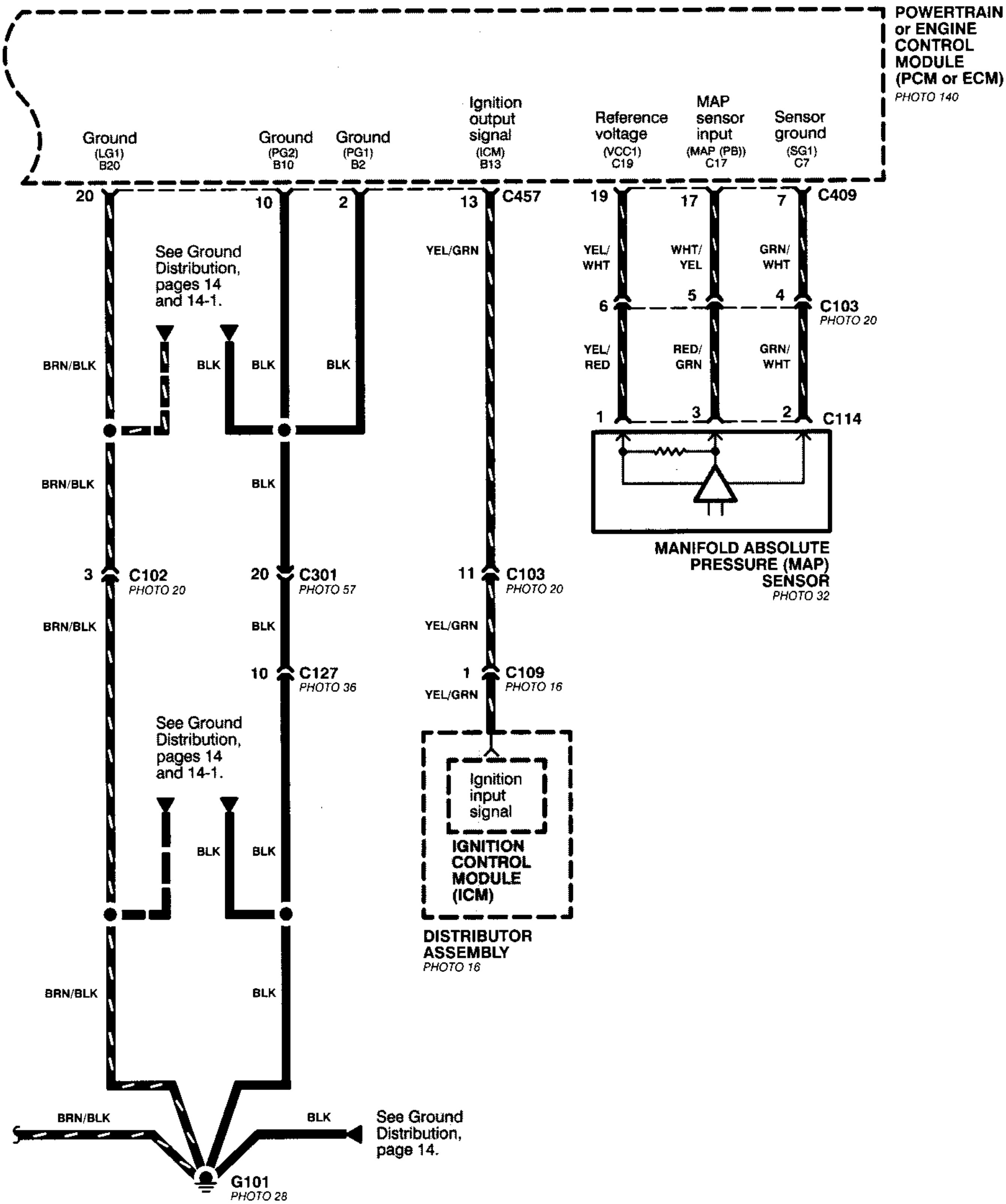


NOTE: Fuse 31 is HOT with Ignition Switch in START (III) and clutch pedal depressed or A/T Gear Selector in PARK (P) or NEUTRAL (N), see Starting System, pages 21 and 21-1.

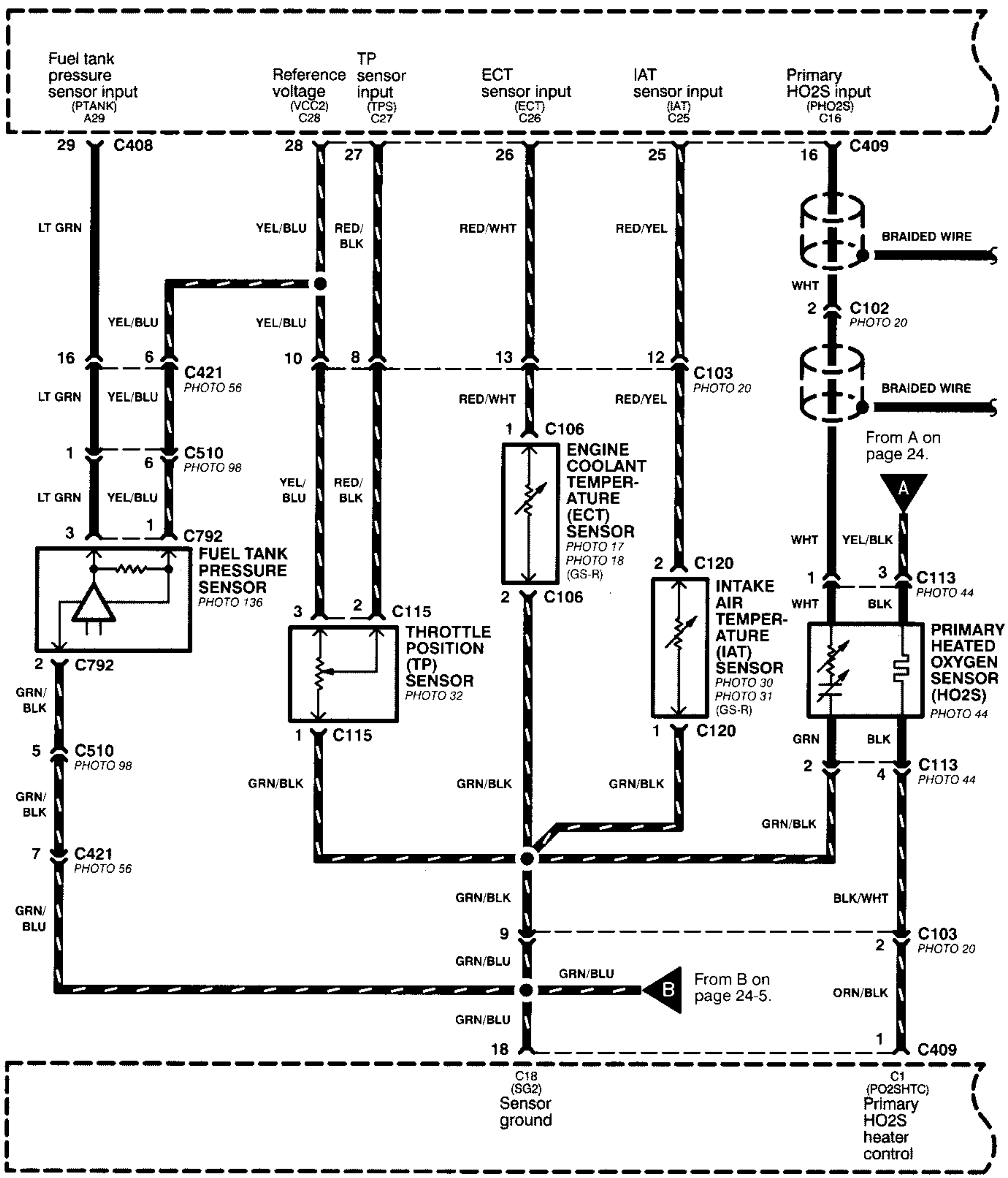


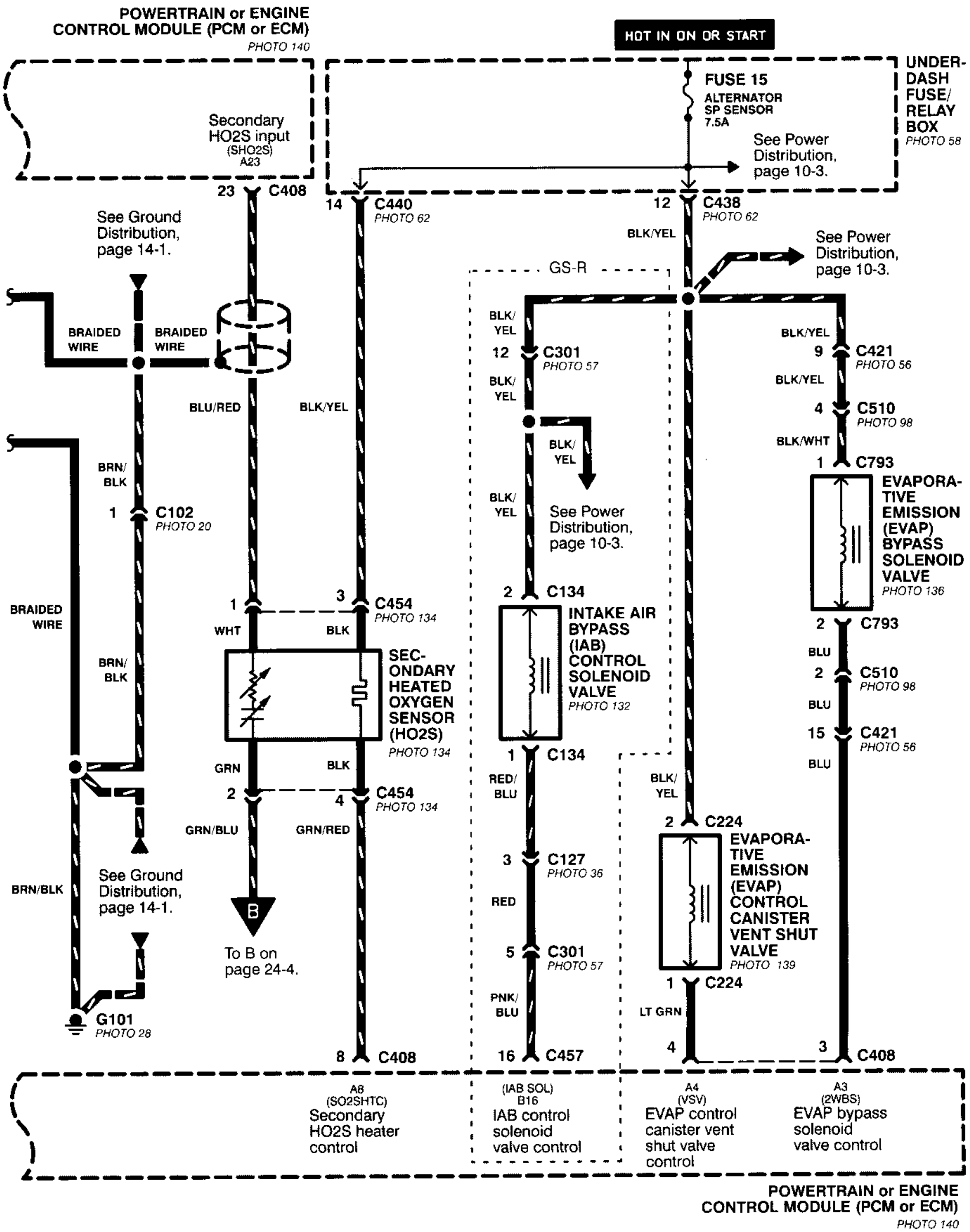
(cont'd)


TDC sensor input
(TDC P) C20
CKP sensor input
(CKP P) C8
CYP sensor input
(CYP P) C29
CKF sensor input
(CKF P) C22
Ground
(LG2) B22
20
8
29
22
C409
22
C457
BLU/RED
BRN/BLK
BRAIDED WIRE
BRAIDED WIRE
See Ground Distribution, page 14-1.
GRN
BLU
YEL
6
8
4
C102
PHOTO 20
3
C103
(GS-R, TYPE-R 2)
C104 (GS-R, TYPE-R)
PHOTO 20
BRN/BLK
1
C102
PHOTO 20
BRN/BLK
GRN
BLU
YEL
BRAIDED WIRE
See Ground Distribution, page 14-1.
BLU/RED
BRAIDED WIRE
3
2
4
C109
PHOTO 16
BRN/BLK
ORN/BLU
LT BLU or BLU/GRN
ORN
1
C110
PHOTO 133
DISTRIBUTOR ASSEMBLY
PHOTO 16
BLU
TDC
CKP
CYP
TDC/ CKP/ CYP SENSOR
CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
WHT
WHT/BLU
BLU/YEL
WHT
7
6
8
C109
PHOTO 16
2
C110
PHOTO 133
RED
WHT
BLK
WHT/RED
7
9
5
C102
PHOTO 20
7
C103
(GS-R, TYPE-R 3)
C104 (GS-R, TYPE-R)
PHOTO 20
WHT/BLU
BLU/YEL
WHT
WHT/RED
21
9
30
11
C409
C21 (TDC M) Sensor ground
C9 (CKP M) Sensor ground
C30 (CYP M) Sensor ground
C31 (CKF M) CKF sensor ground
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140

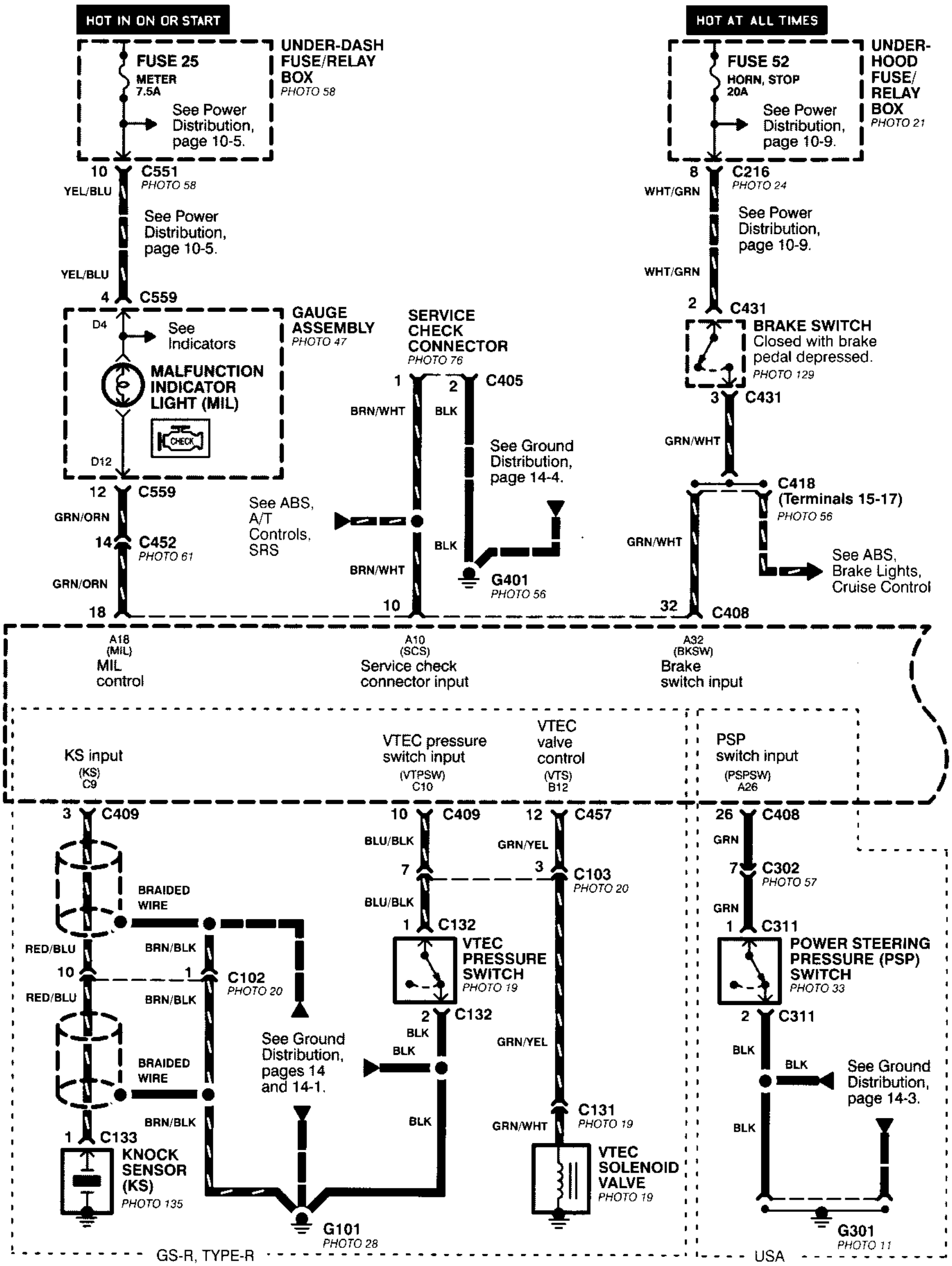

POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140
Ground (LG1) B20
Ground (PG2) B10
Ground (PG1) B2
Ignition output signal (ICM) B13
Reference voltage (VCC1) C19
MAP sensor input (MAP (PB)) C17
Sensor ground (SG1) C7
20
10
2
13
C457
19
17
7
C409
See Ground Distribution, pages 14 and 14-1.
YEL/GRN
YEL/WHT
WHT/YEL
GRN/WHT
6
5
4
C103
PHOTO 20
BRN/BLK
BLK
BLK
BLK
YEL/RED
RED/GRN
GRN/WHT
1
3
2
C114
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
PHOTO 32
BRN/BLK
BLK
3
C102
PHOTO 20
20
C301
PHOTO 57
11
C103
PHOTO 20
BRN/BLK
BLK
YEL/GRN
10
C127
PHOTO 36
1
C109
PHOTO 16
YEL/GRN
See Ground Distribution, pages 14 and 14-1.
Ignition input signal
IGNITION CONTROL MODULE (ICM)
BLK
BLK
DISTRIBUTOR ASSEMBLY
PHOTO 16
BRN/BLK
BLK
BRN/BLK
BLK
See Ground Distribution, page 14.
G101
PHOTO 28

(cont'd)

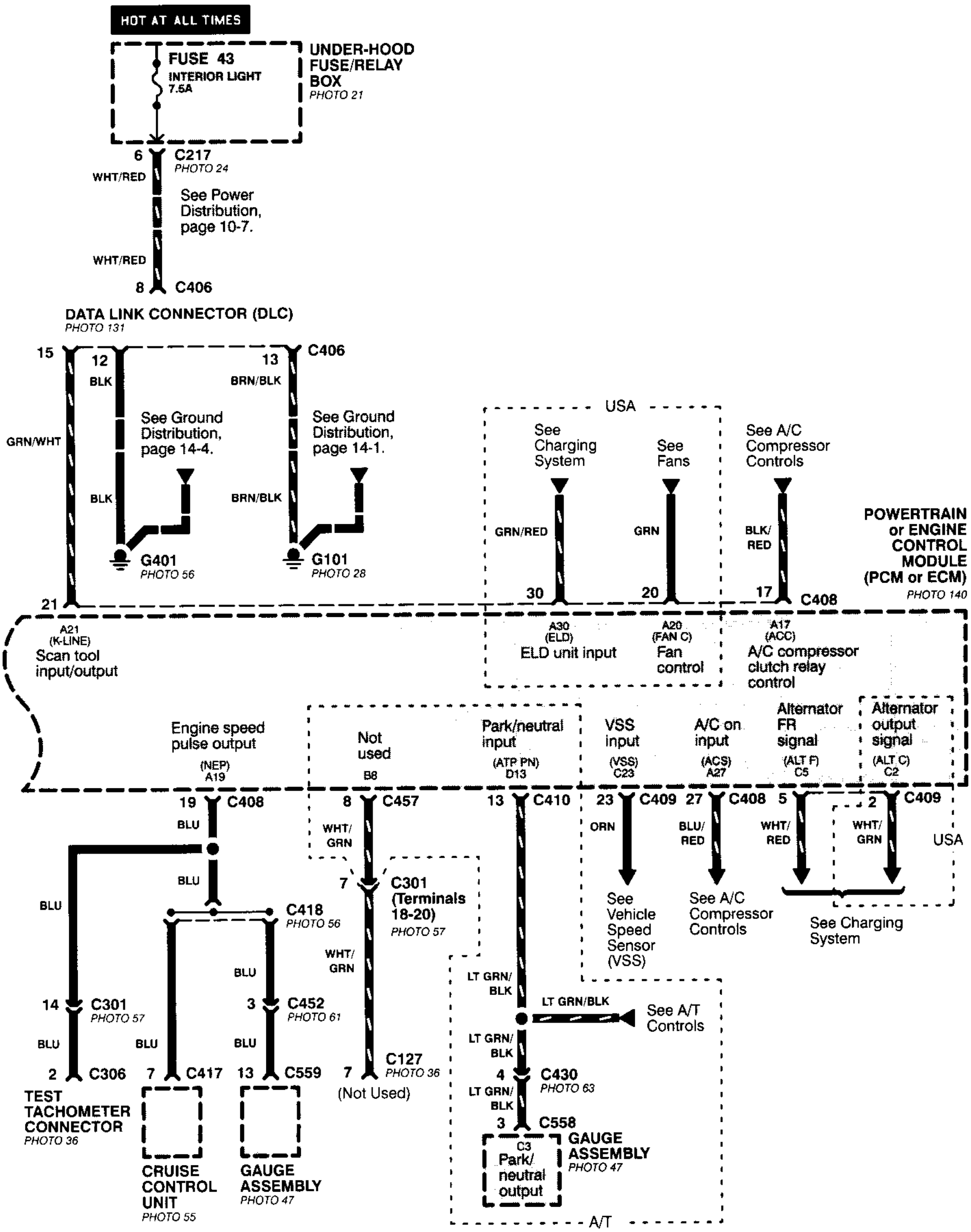

Fuel tank pressure sensor input (PTANK) A29
Reference voltage (VCC2) C28
TP sensor input (TPS) C27
ECT sensor input (ECT) C26
IAT sensor input (IAT) C25
Primary HO2S input (PHO2S) C16
C408
C409
LT GRN
YEL/BLU
RED/BLK
RED/WHT
RED/YEL
BRAIDED WIRE
WHT
C102 PHOTO 20
C421 PHOTO 56
C103 PHOTO 20
C106
C510 PHOTO 98
ENGINE COOLANT TEMPERATURE (ECT) SENSOR PHOTO 17 PHOTO 18 (GS-R)
From A on page 24.
C792
FUEL TANK PRESSURE SENSOR PHOTO 136
C120
C113 PHOTO 44
INTAKE AIR TEMPERATURE (IAT) SENSOR PHOTO 30 PHOTO 31 (GS-R)
C115
THROTTLE POSITION (TP) SENSOR PHOTO 32
PRIMARY HEATED OXYGEN SENSOR (HO2S) PHOTO 44
GRN/BLK
GRN
BLK
BLK/WHT
GRN/BLU
From B on page 24-5.
ORN/BLK
C18 (SG2) Sensor ground
C1 (PO2SHTC) Primary HO2S heater control


POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140
Secondary HO2S input
(SHO2S)
A23
HOT IN ON OR START
FUSE 15
ALTERNATOR SP SENSOR
7.5A
See Power Distribution, page 10-3.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
23
C408
14
C440
PHOTO 62
12
C438
PHOTO 62
BLK/YEL
See Ground Distribution, page 14-1.
See Power Distribution, page 10-3.
GS-R
BRAIDED WIRE
BRAIDED WIRE
BLK/YEL
12
C301
PHOTO 57
BLK/YEL
9
C421
PHOTO 56
BLK/YEL
4
C510
PHOTO 98
BLK/WHT
1
C793
BLU/RED
BLK/YEL
BLK/YEL
BLK/YEL
EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
PHOTO 136
BRN/BLK
1
C102
PHOTO 20
BLK/YEL
See Power Distribution, page 10-3.
BRAIDED WIRE
1
3
C454
PHOTO 134
2
C134
INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE
PHOTO 132
2
C793
BLU
WHT
BLK
SECONDARY HEATED OXYGEN SENSOR (HO2S)
PHOTO 134
2
C510
PHOTO 98
BRN/BLK
BLU
15
C421
PHOTO 56
BLU
1
C134
GRN
BLK
RED/BLU
BLK/YEL
2
4
C454
PHOTO 134
2
C224
GRN/BLU
GRN/RED
EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
PHOTO 139
3
C127
PHOTO 36
BRN/BLK
See Ground Distribution, page 14-1.
RED
B
To B on page 24-4.
5
C301
PHOTO 57
1
C224
PNK/BLU
LT GRN
G101
PHOTO 28
8
C408
16
C457
4
3
C408
A8
(SO2SHTC)
Secondary HO2S heater control
(IAB SOL)
B16
IAB control solenoid valve control
A4
(VSV)
EVAP control canister vent shut valve control
A3
(2WBS)
EVAP bypass solenoid valve control
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140

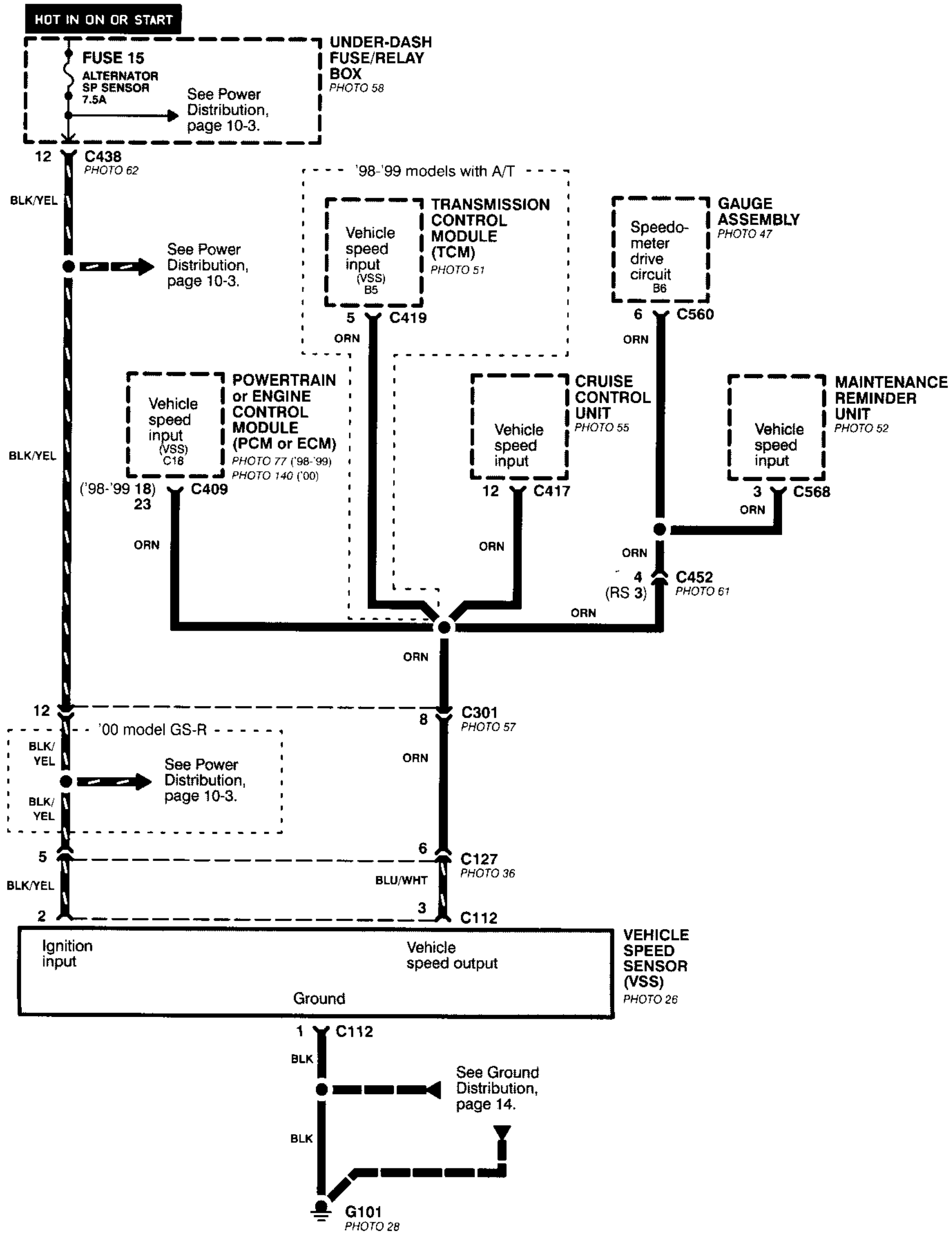
(cont'd)



HOT IN ON OR START
FUSE 25
METER
7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-5.
10
C551
PHOTO 58
YEL/BLU
See Power Distribution, page 10-5.
YEL/BLU
4
C559
D4
See Indicators
GAUGE ASSEMBLY
PHOTO 47
MALFUNCTION INDICATOR LIGHT (MIL)
CHECK
D12
12
C559
GRN/ORN
14
C452
PHOTO 61
GRN/ORN
18
SERVICE CHECK CONNECTOR
PHOTO 76
1
2
C405
BRN/WHT
BLK
See Ground Distribution, page 14-4.
See ABS, A/T Controls, SRS
BLK
BRN/WHT
G401
PHOTO 56
10
HOT AT ALL TIMES
FUSE 52
HORN, STOP
20A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
See Power Distribution, page 10-9.
8
C216
PHOTO 24
WHT/GRN
See Power Distribution, page 10-9.
WHT/GRN
2
C431
BRAKE SWITCH
Closed with brake pedal depressed.
PHOTO 129
3
C431
GRN/WHT
C418
(Terminals 15-17)
PHOTO 56
GRN/WHT
See ABS, Brake Lights, Cruise Control
32
C408
A18
(MIL)
MIL control
A10
(SCS)
Service check connector input
A32
(BKSW)
Brake switch input
KS input
(KS)
C9
VTEC pressure switch input
(VTPSW)
C10
VTEC valve control
(VTS)
B12
PSP switch input
(PSPSW)
A26
3
C409
BRAIDED WIRE
RED/BLU
BRN/BLK
10
1
C102
PHOTO 20
RED/BLU
BRN/BLK
BRAIDED WIRE
BRN/BLK
1
C133
KNOCK SENSOR (KS)
PHOTO 135
See Ground Distribution, pages 14 and 14-1.
G101
PHOTO 28
10
C409
BLU/BLK
7
BLU/BLK
1
C132
VTEC PRESSURE SWITCH
PHOTO 19
2
C132
BLK
BLK
BLK
12
C457
GRN/YEL
3
C103
PHOTO 20
GRN/YEL
GRN/WHT
C131
PHOTO 19
VTEC SOLENOID VALVE
PHOTO 19
26
C408
GRN
7
C302
PHOTO 57
GRN
1
C311
POWER STEERING PRESSURE (PSP) SWITCH
PHOTO 33
2
C311
BLK
BLK
See Ground Distribution, page 14-3.
BLK
G301
PHOTO 11
GS-R, TYPE-R
USA


HOT AT ALL TIMES
FUSE 43
INTERIOR LIGHT
7.5A
UNDER-HOOD
FUSE/RELAY
BOX
PHOTO 21
6
C217
PHOTO 24
WHT/RED
See Power
Distribution,
page 10-7.
WHT/RED
8
C406
DATA LINK CONNECTOR (DLC)
PHOTO 131
15
12
BLK
13
BRN/BLK
C406
GRN/WHT
See Ground
Distribution,
page 14-4.
See Ground
Distribution,
page 14-1.
BLK
BRN/BLK
G401
PHOTO 56
G101
PHOTO 28
USA
See
Charging
System
See
Fans
See A/C
Compressor
Controls
GRN/RED
GRN
BLK/
RED
30
20
17
C408
POWERTRAIN
or ENGINE
CONTROL
MODULE
(PCM or ECM)
PHOTO 140
21
A21
(K-LINE)
Scan tool
input/output
A30
(ELD)
ELD unit input
A20
(FAN C)
Fan
control
A17
(ACC)
A/C compressor
clutch relay
control
Engine speed
pulse output
(NEP)
A19
Not
used
B8
Park/neutral
input
(ATP PN)
D13
VSS
input
(VSS)
C23
A/C on
input
(ACS)
A27
Alternator
FR
signal
(ALT F)
C5
Alternator
output
signal
(ALT C)
C2
19
C408
8
C457
13
C410
23
C409
27
C408
5
2
C409
BLU
WHT/
GRN
ORN
BLU/
RED
WHT/
RED
WHT/
GRN
USA
7
C301
(Terminals
18-20)
PHOTO 57
See
Vehicle
Speed
Sensor
(VSS)
See A/C
Compressor
Controls
See Charging
System
BLU
C418
PHOTO 56
BLU
WHT/
GRN
BLU
LT GRN/
BLK
LT GRN/BLK
See A/T
Controls
14
C301
PHOTO 57
3
C452
PHOTO 61
LT GRN/
BLK
BLU
BLU
BLU
2
C306
7
C417
13
C559
7
C127
PHOTO 36
4
C430
PHOTO 63
LT GRN/
BLK
TEST
TACHOMETER
CONNECTOR
PHOTO 36
(Not Used)
3
C558
C3
Park/
neutral
output
GAUGE
ASSEMBLY
PHOTO 47
CRUISE
CONTROL
UNIT
PHOTO 55
GAUGE
ASSEMBLY
PHOTO 47
A/T

Vehicle Speed Sensor (VSS)

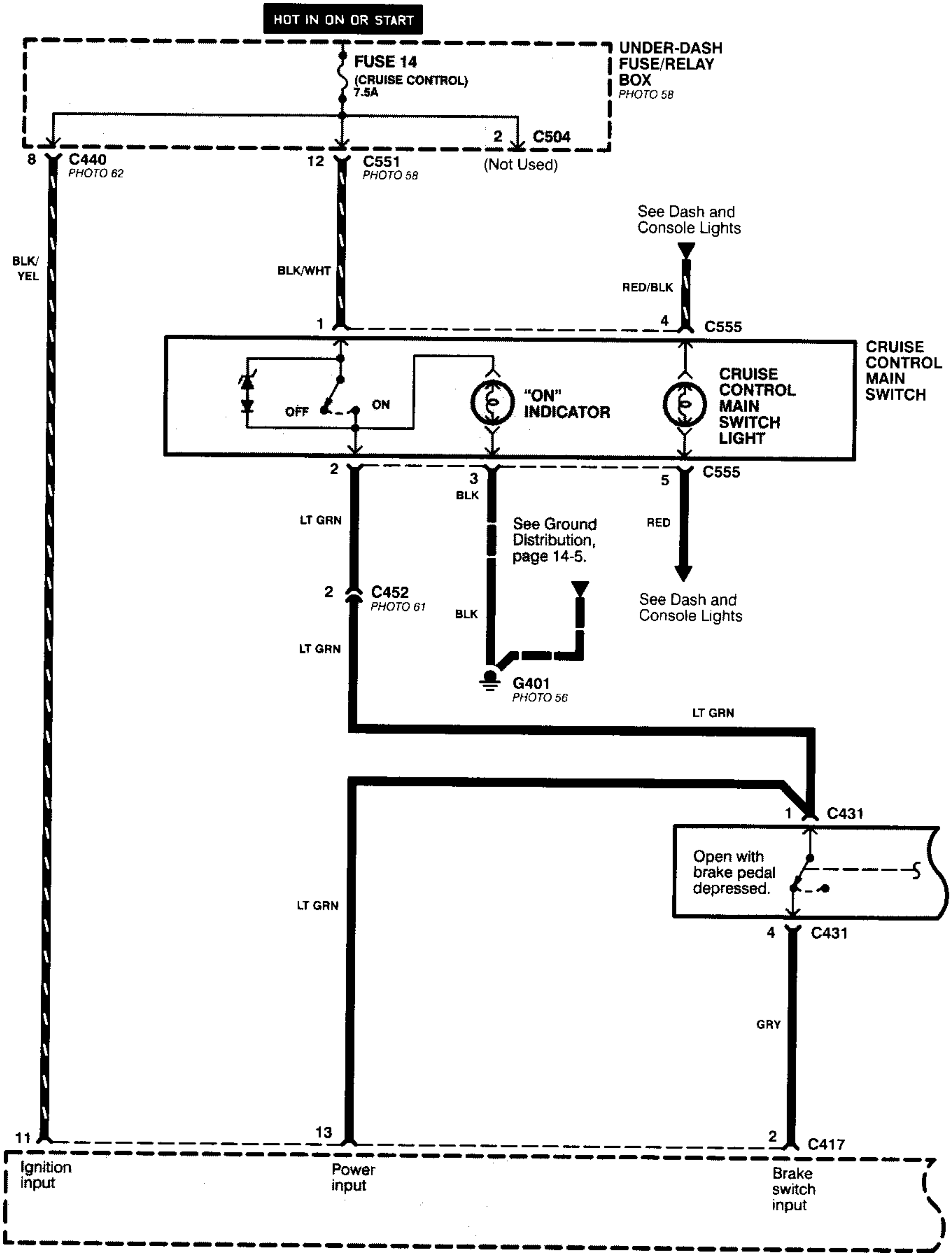


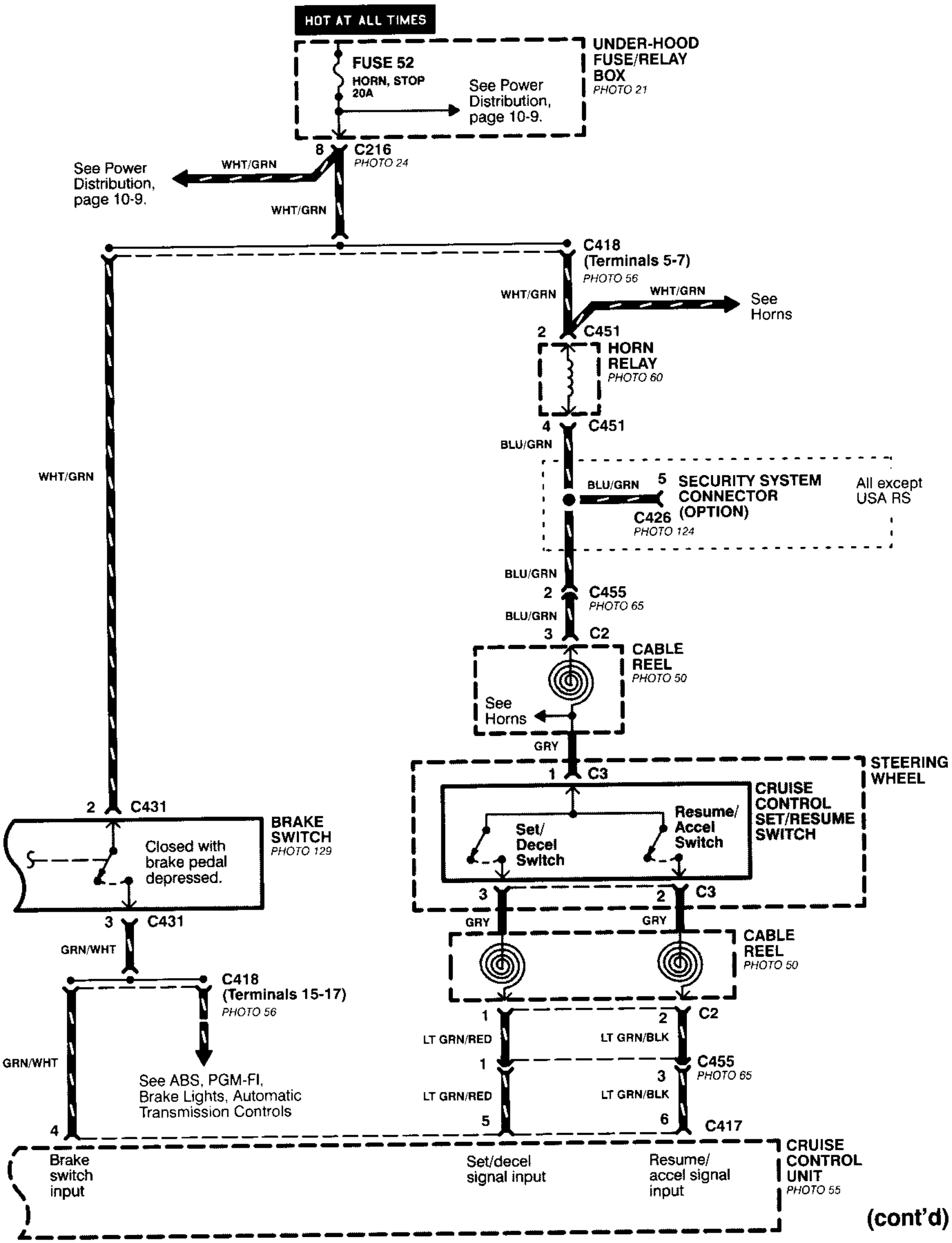
How the Circuit Works

With the ignition switch in ON (II) or START (III), battery voltage is supplied through fuse 15 and the BLK/YEL wire to the vehicle speed sensor (VSS). The sensor is grounded by the BLK wire to G101. The speedometer and other control units in the circuit supply about 5 volts to the ORN wire. The vehicle speed sensor (VSS) intermittently grounds the ORN wire which generates a pulsed signal in it. The number of pulses per minute increases/ decreases with the speed of the car.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

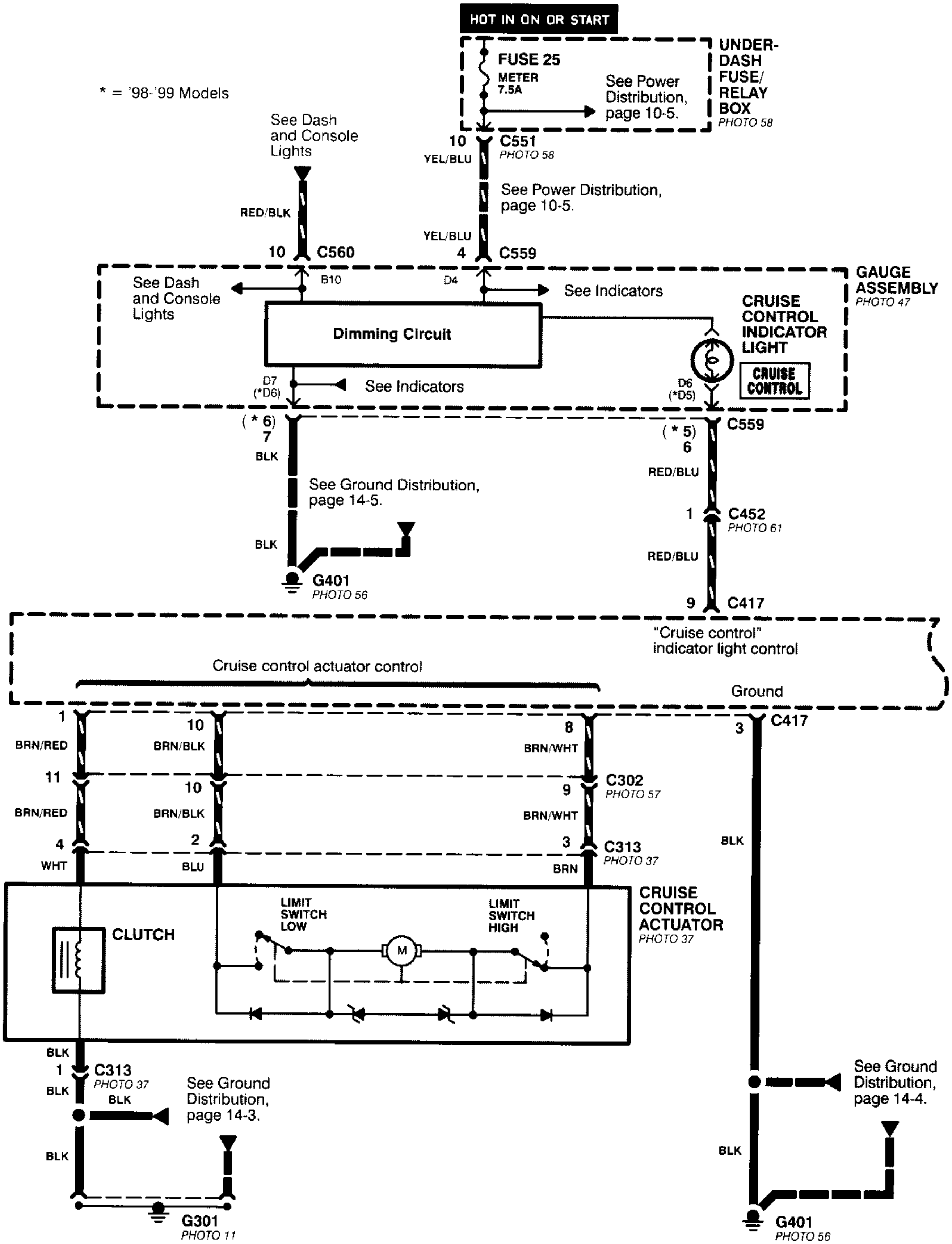
Cruise Control

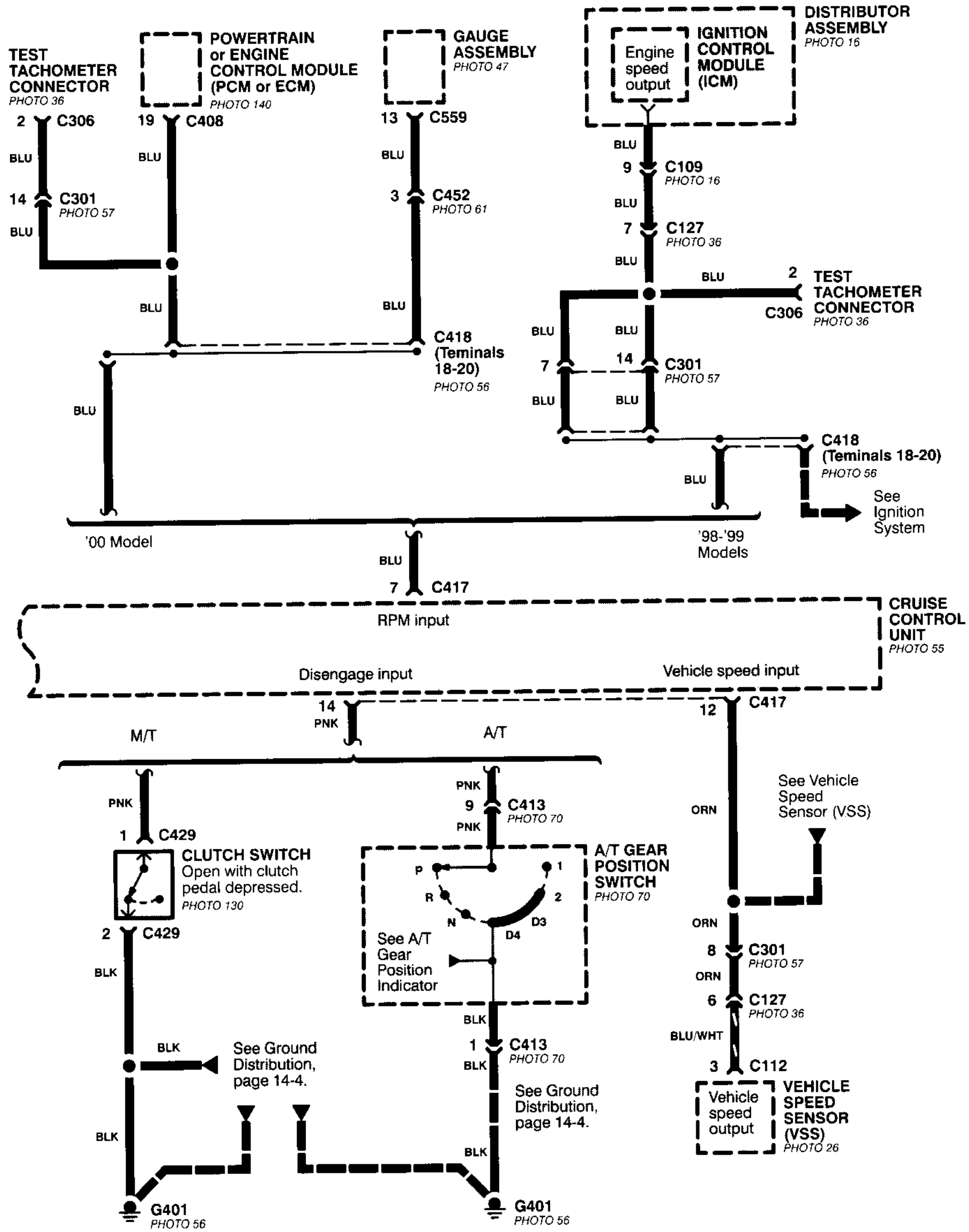




HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 52
HORN, STOP 20A
See Power Distribution, page 10-9.
C216
PHOTO 24
WHT/GRN
See Power Distribution, page 10-9.
WHT/GRN
C418 (Terminals 5-7)
PHOTO 56
WHT/GRN
WHT/GRN
See Horns
C451
HORN RELAY
PHOTO 60
C451
BLU/GRN
BLU/GRN
SECURITY SYSTEM CONNECTOR (OPTION)
All except USA RS
C426
PHOTO 124
BLU/GRN
C455
PHOTO 65
BLU/GRN
C2
CABLE REEL
PHOTO 50
See Horns
GRY
STEERING WHEEL
C3
CRUISE CONTROL SET/RESUME SWITCH
Set/ Decel Switch
Resume/ Accel Switch
C3
GRY
GRY
CABLE REEL
PHOTO 50
C2
LT GRN/RED
LT GRN/BLK
C455
PHOTO 65
LT GRN/RED
LT GRN/BLK
C417
WHT/GRN
C431
BRAKE SWITCH
PHOTO 129
Closed with brake pedal depressed.
C431
GRN/WHT
C418 (Terminals 15-17)
PHOTO 56
GRN/WHT
See ABS, PGM-FI, Brake Lights, Automatic Transmission Controls
CRUISE CONTROL UNIT
PHOTO 55
Brake switch input
Set/decel signal input
Resume/ accel signal input

(cont'd)


HOT IN ON OR START
FUSE 25
METER 7.5A
See Power Distribution, page 10-5.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
* = '98-'99 Models
See Dash and Console Lights
10 C551
PHOTO 58
YEL/BLU
See Power Distribution, page 10-5.
RED/BLK
YEL/BLU
10 C560
4 C559
GAUGE ASSEMBLY
PHOTO 47
See Dash and Console Lights
B10
D4
See Indicators
Dimming Circuit
CRUISE CONTROL INDICATOR LIGHT
CRUISE CONTROL
D7 (*D6)
See Indicators
D6 (*D5)
(*6) 7
BLK
(*5) 6
C559
RED/BLU
See Ground Distribution, page 14-5.
1 C452
PHOTO 61
BLK
RED/BLU
G401
PHOTO 56
9 C417
"Cruise control" indicator light control
Cruise control actuator control
Ground
1
BRN/RED
10
BRN/BLK
8
BRN/WHT
3 C417
11
10
9 C302
PHOTO 57
BRN/RED
BRN/BLK
BRN/WHT
4
2
3 C313
PHOTO 37
BLK
WHT
BLU
BRN
CLUTCH
LIMIT SWITCH LOW
LIMIT SWITCH HIGH
M
CRUISE CONTROL ACTUATOR
PHOTO 37
BLK
1 C313
PHOTO 37
BLK
BLK
See Ground Distribution, page 14-3.
See Ground Distribution, page 14-4.
BLK
BLK
G301
PHOTO 11
G401
PHOTO 56



TEST TACHOMETER CONNECTOR
PHOTO 36
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140
GAUGE ASSEMBLY
PHOTO 47
DISTRIBUTOR ASSEMBLY
PHOTO 16
IGNITION CONTROL MODULE (ICM)
Engine speed output
C306
C408
C559
BLU
C301
PHOTO 57
C452
PHOTO 61
C109
PHOTO 16
C127
PHOTO 36
TEST TACHOMETER CONNECTOR
C306
PHOTO 36
C418 (Teminals 18-20)
PHOTO 56
C301
PHOTO 57
C418 (Teminals 18-20)
PHOTO 56
See Ignition System
'00 Model
'98-'99 Models
C417
CRUISE CONTROL UNIT
PHOTO 55
RPM input
Disengage input
Vehicle speed input
C417
PNK
M/T
A/T
ORN
C429
CLUTCH SWITCH
Open with clutch pedal depressed.
PHOTO 130
C413
PHOTO 70
A/T GEAR POSITION SWITCH
PHOTO 70
See A/T Gear Position Indicator
See Vehicle Speed Sensor (VSS)
C301
PHOTO 57
C127
PHOTO 36
BLU/WHT
C112
VEHICLE SPEED SENSOR (VSS)
PHOTO 26
Vehicle speed output
BLK
See Ground Distribution, page 14-4.
C413
PHOTO 70
See Ground Distribution, page 14-4.
G401
PHOTO 56
G401
PHOTO 56

– How the Circuit Works

The cruise control system uses mechanical and electrical devices to maintain the car's speed at a setting selected by the driver.

System Description

The cruise control unit receives command signals from the cruise control main switch and the cruise control Set/Resume switch. With the ignition switch in ON (II) or START (III), voltage is provided to the cruise control main switch. When you push the switch to on, power is provided to the cruise control unit and the brake switch.

The cruise control unit receives information about operating conditions from the brake switch, the ignition control module (ICM), the vehicle speed sensor (VSS), and the clutch switch (manual transmission) or the A/T gear position switch (automatic transmission). The cruise control unit then sends signals to the cruise control actuator which regulates the throttle position to maintain the selected speed. The control unit compares the actual speed of the car to the selected speed. The control unit then uses the result of that comparison to open or close the throttle.

The brake switch releases the system's control of the throttle at the instant you press on the brake pedal. The switch sends a signal to the control unit by removing power from the normally closed brake input (GRY wire), and providing power at the normally open brake input (GRN/WHT wire). The control unit responds by allowing the throttle to close. The clutch switch or the A/T gear position switch sends a "disengage" signal to the control unit that also allows the throttle to close.

The cruise control system will set and automatically maintain any speed above 25 mph (40 km/h). To set it, make sure the main switch is on and the switch indicator is on. Then, after reaching the desired speed, press the set switch. This sends a "set" signal to the cruise control unit which, in turn, controls the cruise control actuator to maintain the set speed.

When you push the SET switch and the cruise control system is on, the "cruise control" ON indicator lights up.

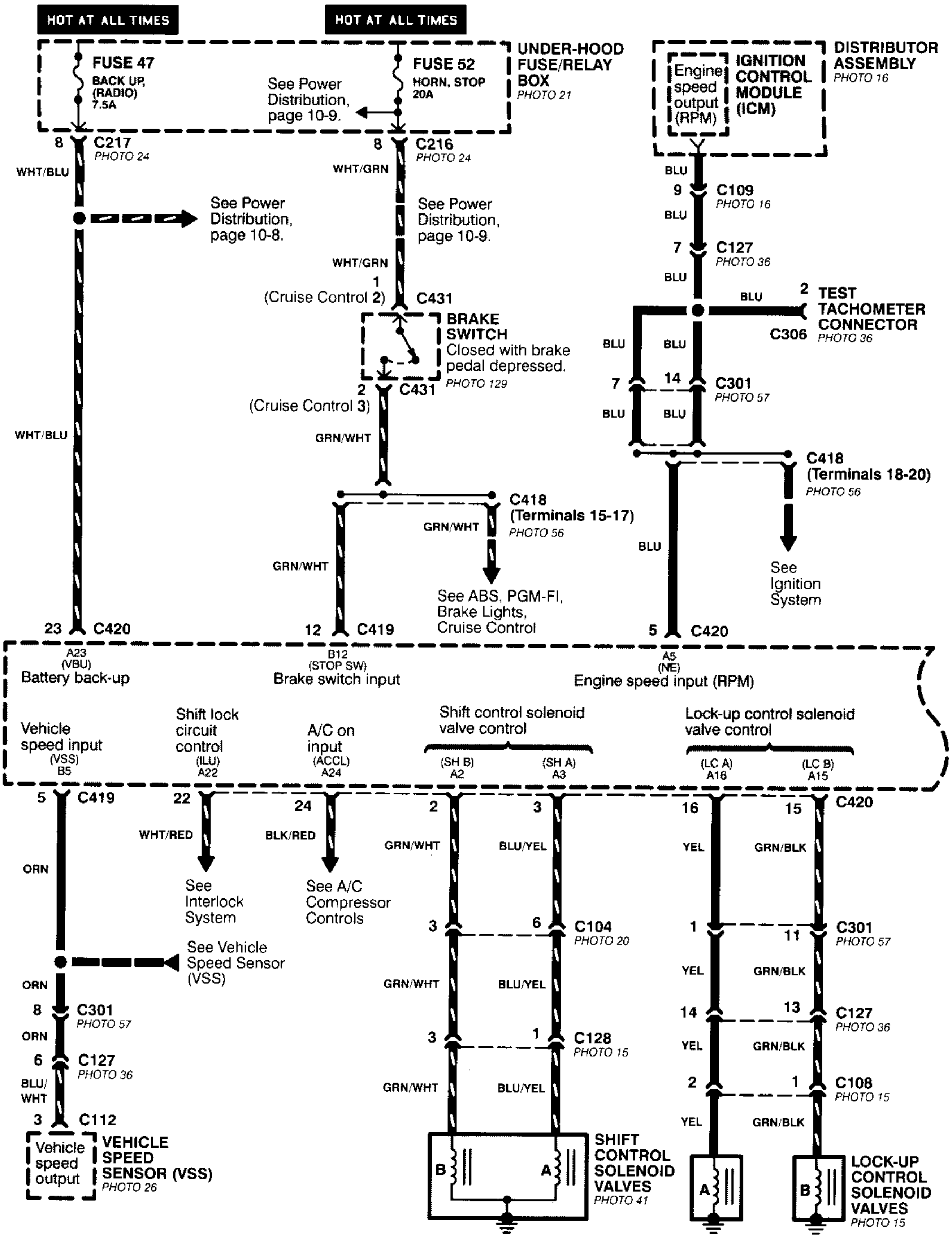
You can cancel the cruise control system by turning the main switch off. This removes power to the control unit and erases the set speed from memory. If the system is disengaged temporarily by the brake switch, or clutch switch, and the car's speed is still above 25 mph, press the RESUME switch: the car will automatically return to the previously set speed.

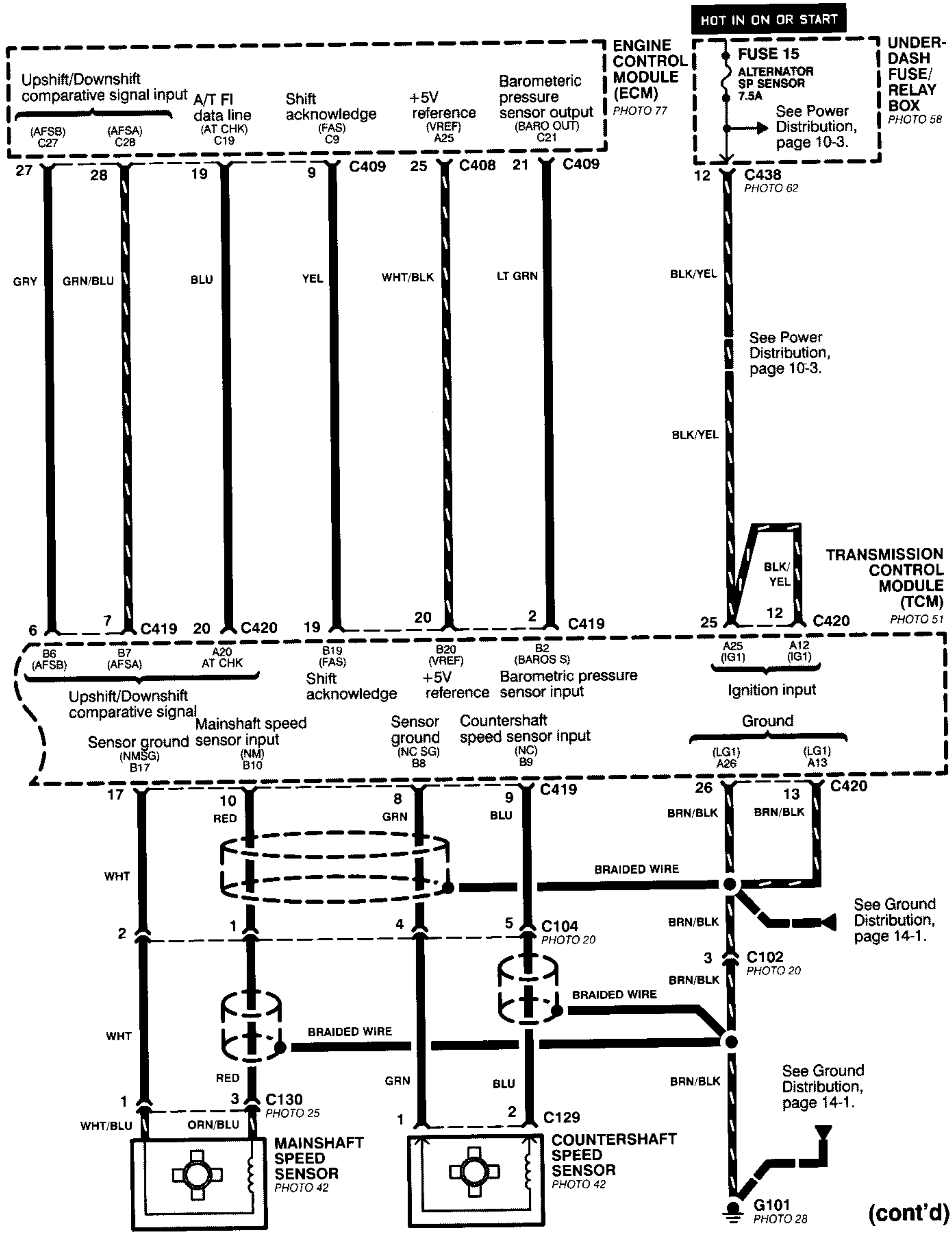
For gradual acceleration without pressing the accelerator pedal, push the RESUME switch and hold it there. This will send an "acceleration" signal to the control unit. When you release the switch, the system will be reprogrammed for the new speed. To slow the car down, push the SET switch in and hold it there. This sends a "deceleration" signal to the control unit, causing the car to coast. When the desired speed is reached, release the SET switch. This reprograms the system for the new speed.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Automatic Transmission Controls

– '98-'99 Models



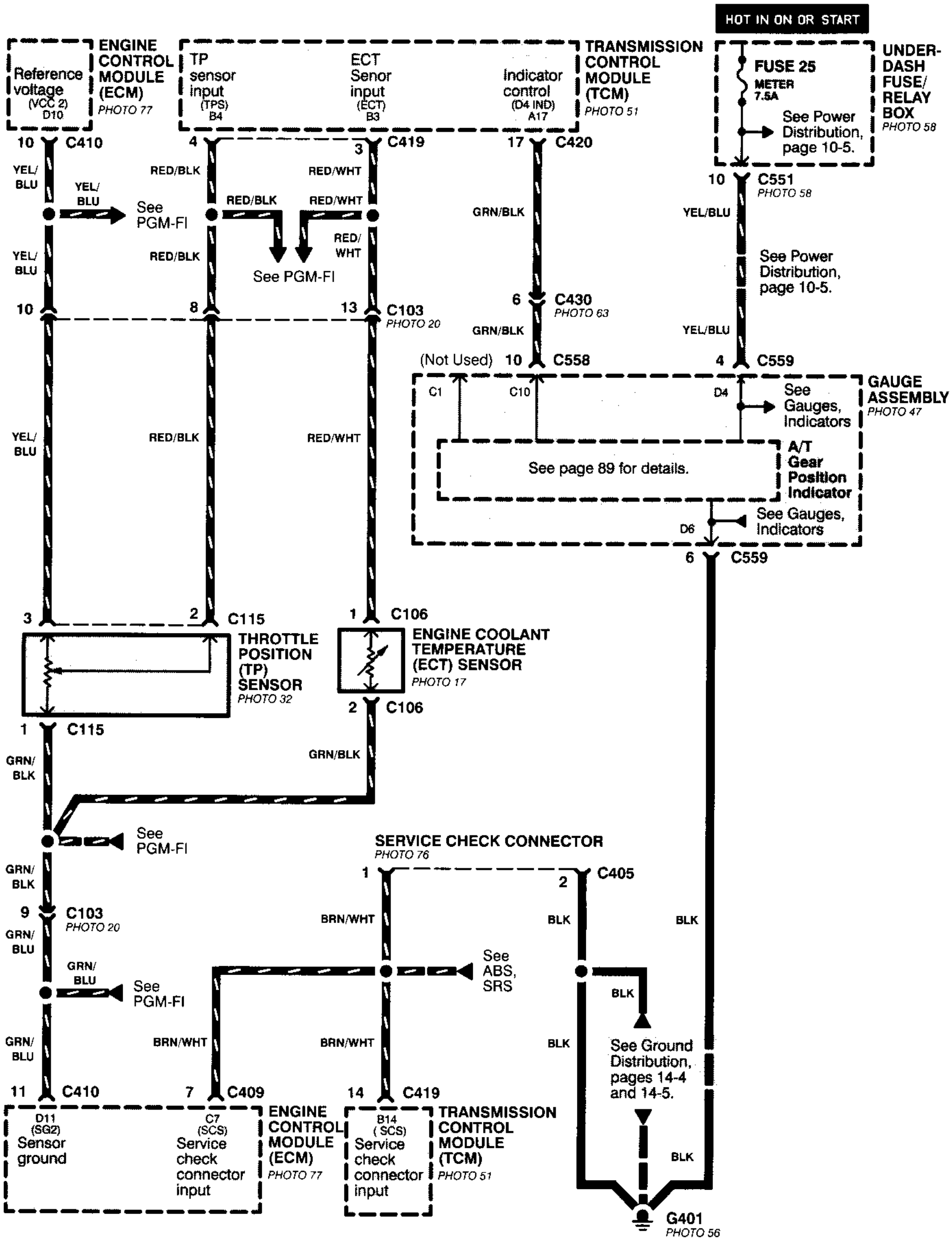


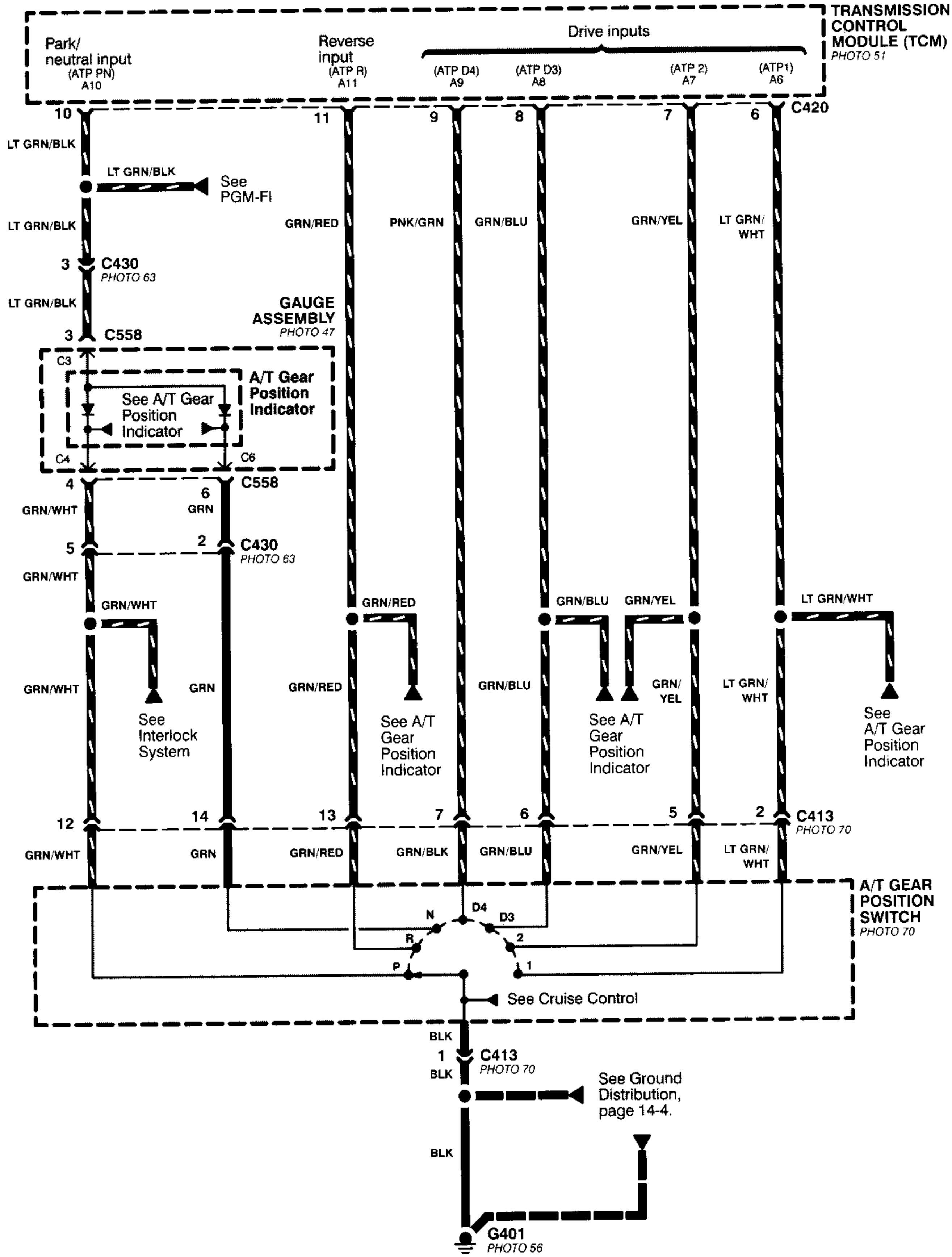
HOT IN ON OR START
ENGINE CONTROL MODULE (ECM)
PHOTO 77
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 15
ALTERNATOR SP SENSOR 7.5A
See Power Distribution, page 10-3.
Upshift/Downshift comparative signal input
(AFSB) C27
(AFSA) C28
A/T FI data line
(AT CHK) C19
Shift acknowledge
(FAS) C9
+5V reference
(VREF) A25
Barometeric pressure sensor output
(BARO OUT) C21
C409
C408
C438
PHOTO 62
GRY
GRN/BLU
BLU
YEL
WHT/BLK
LT GRN
BLK/YEL
See Power Distribution, page 10-3.
BLK/YEL
BLK/YEL
TRANSMISSION CONTROL MODULE (TCM)
PHOTO 51
C419
C420
B6 (AFSB)
B7 (AFSA)
A20 AT CHK
B19 (FAS)
B20 (VREF)
B2 (BAROS S)
A25 (IG1)
A12 (IG1)
Upshift/Downshift comparative signal
Shift acknowledge
+5V reference
Barometric pressure sensor input
Ignition input
Sensor ground
(NMSG) B17
Mainshaft speed sensor input
(NM) B10
Sensor ground
(NC SG) B8
Countershaft speed sensor input
(NC) B9
Ground
(LG1) A26
(LG1) A13
RED
GRN
BLU
BRN/BLK
WHT
BRAIDED WIRE
See Ground Distribution, page 14-1.
C104
PHOTO 20
C102
PHOTO 20
WHT
RED
GRN
BLU
BRAIDED WIRE
See Ground Distribution, page 14-1.
C130
PHOTO 25
C129
WHT/BLU
ORN/BLU
MAINSHAFT SPEED SENSOR
PHOTO 42
COUNTERSHAFT SPEED SENSOR
PHOTO 42
G101
PHOTO 28

(cont'd)

Automatic Transmission Controls

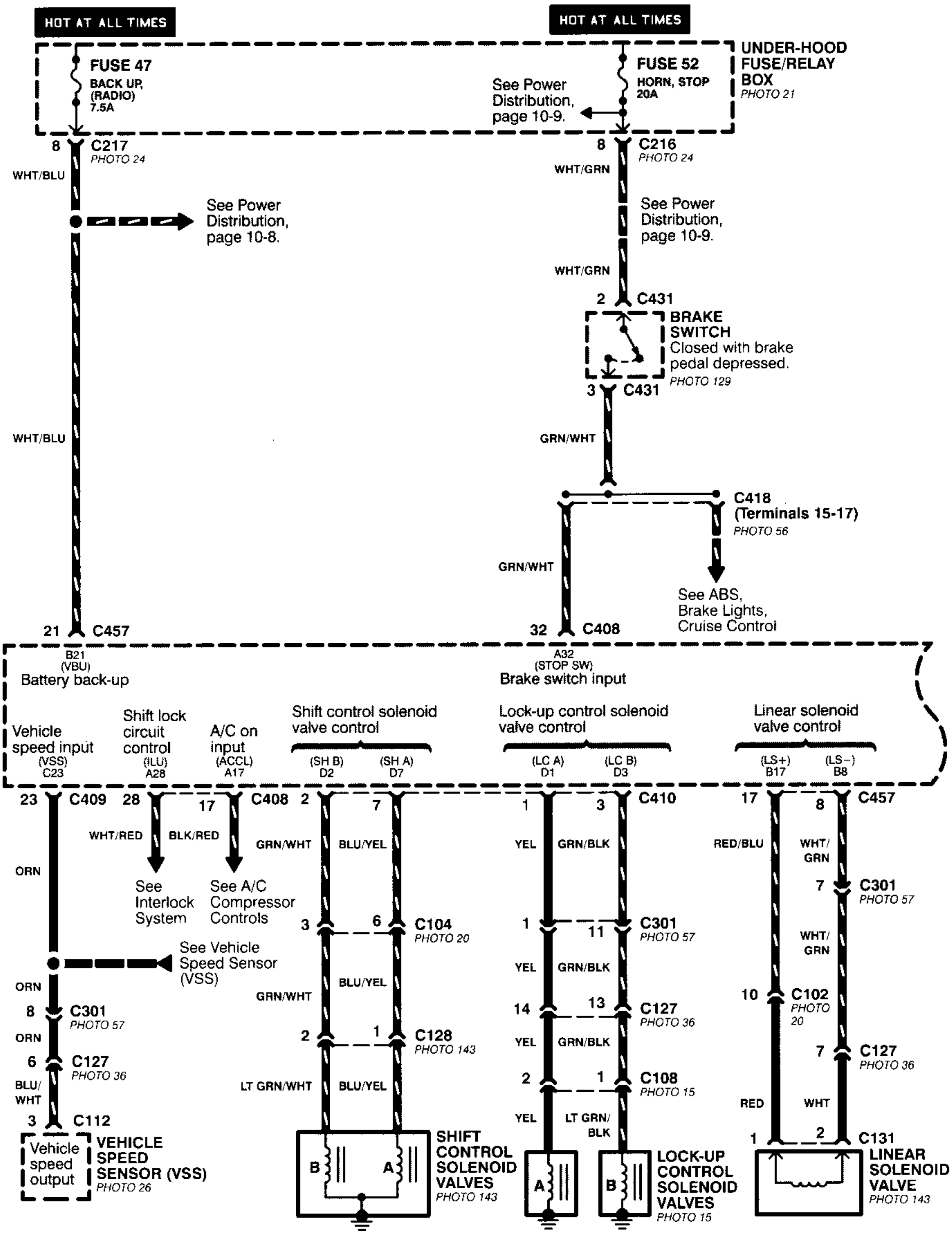
– '98-'99 Models (cont'd)

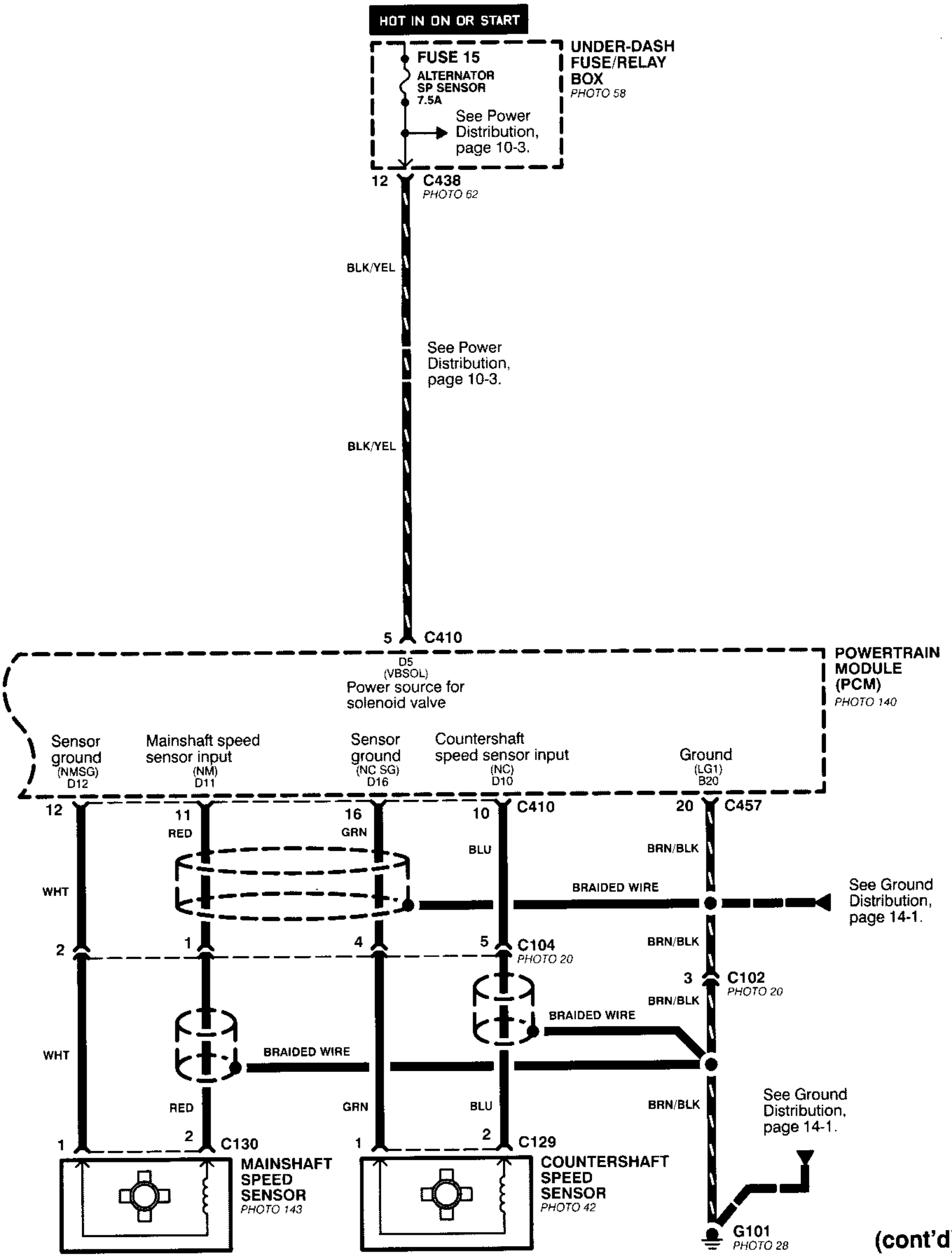



TRANSMISSION CONTROL MODULE (TCM)
PHOTO 51
Park/ neutral input
(ATP PN)
A10
Reverse input
(ATP R)
A11
Drive inputs
(ATP D4)
A9
(ATP D3)
A8
(ATP 2)
A7
(ATP1)
A6
C420
LT GRN/BLK
See PGM-FI
C430
PHOTO 63
C558
GAUGE ASSEMBLY
PHOTO 47
A/T Gear Position Indicator
See A/T Gear Position Indicator
GRN/WHT
GRN
GRN/RED
PNK/GRN
GRN/BLU
GRN/YEL
LT GRN/WHT
See Interlock System
See A/T Gear Position Indicator
C413
PHOTO 70
GRN/BLK
A/T GEAR POSITION SWITCH
PHOTO 70
See Cruise Control
BLK
See Ground Distribution, page 14-4.
G401
PHOTO 56

Automatic Transmission Controls

– '00 Model

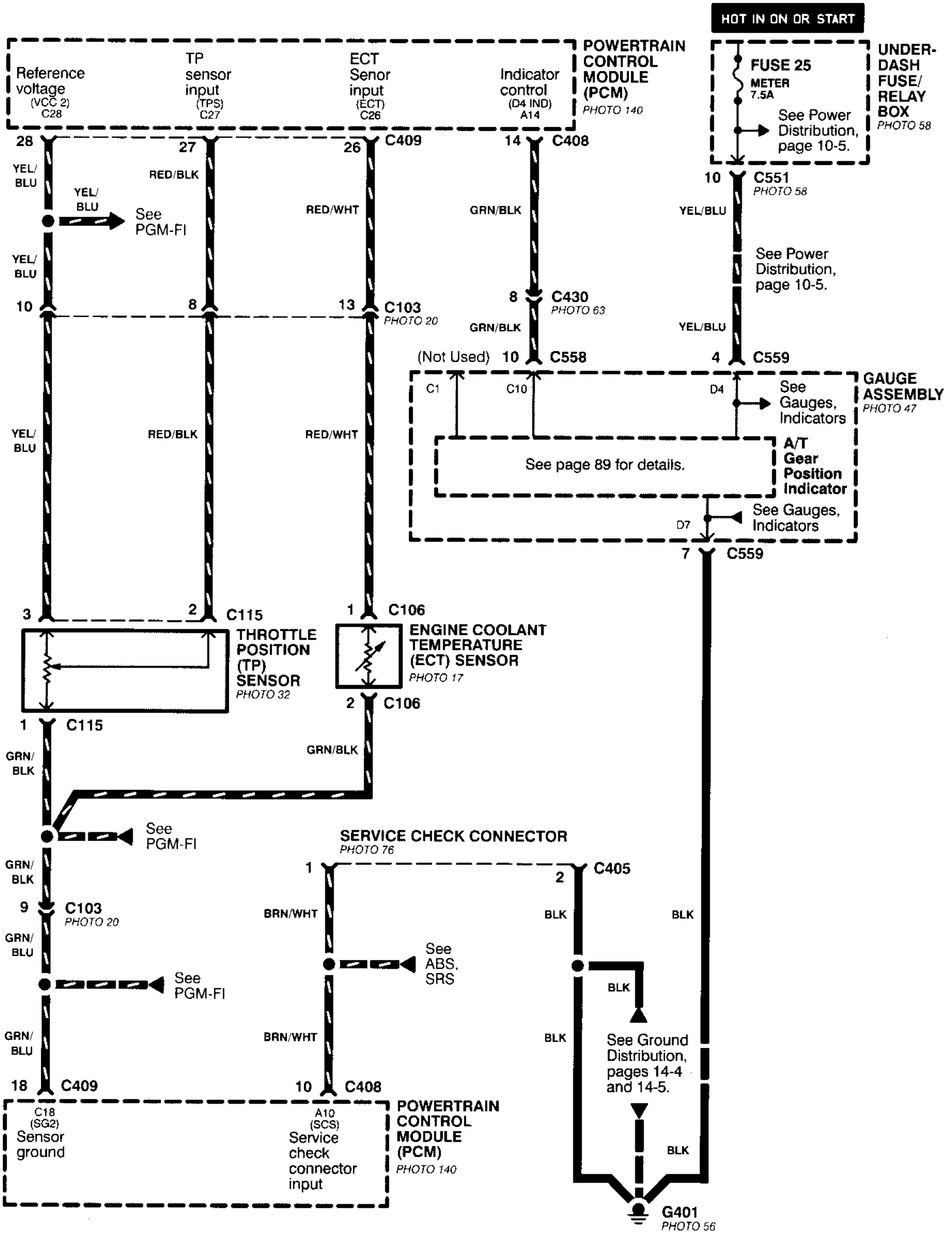


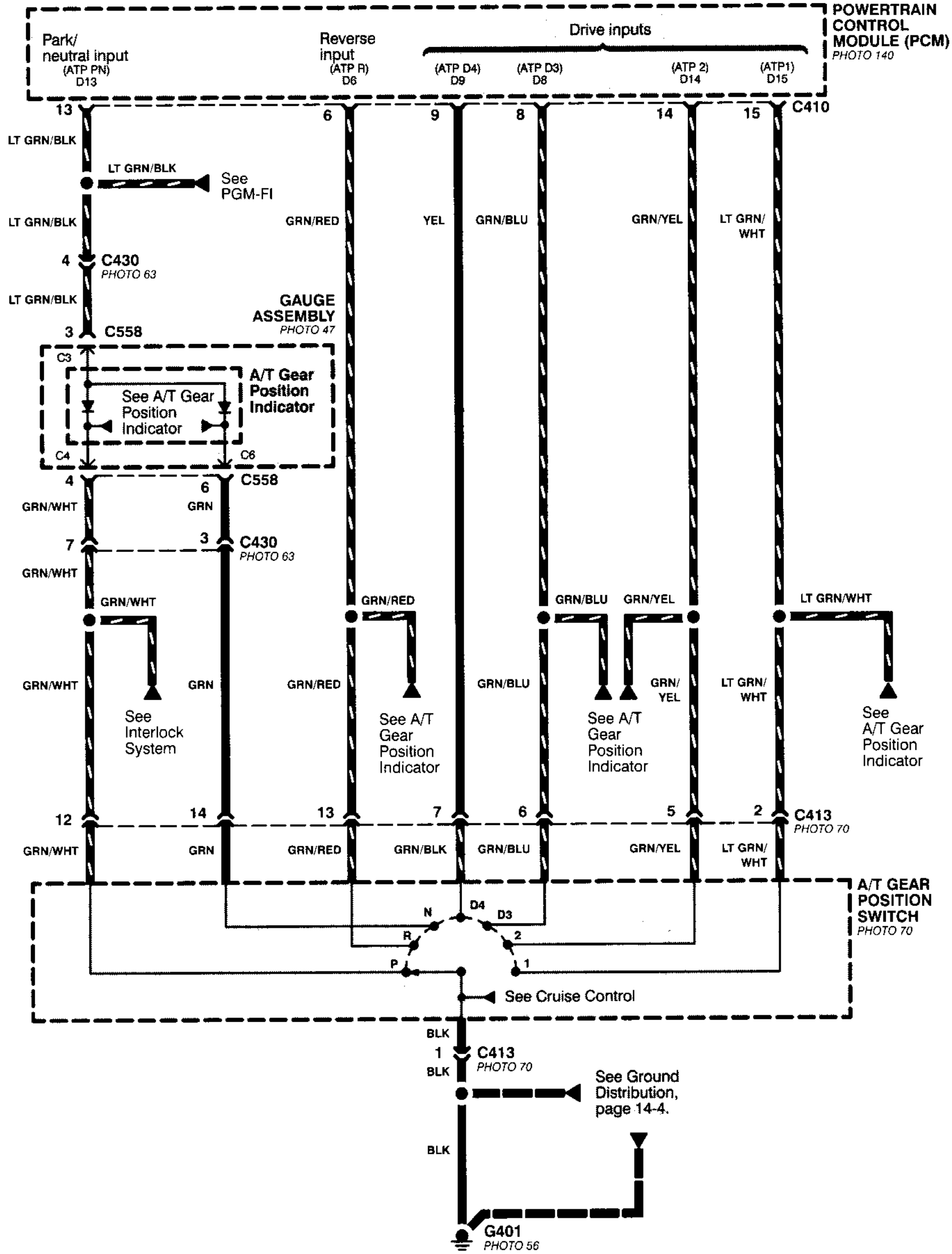

HOT IN ON OR START
FUSE 15
ALTERNATOR SP SENSOR 7.5A
See Power Distribution, page 10-3.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
12 C438
PHOTO 62
BLK/YEL
See Power Distribution, page 10-3.
BLK/YEL
5 C410
D5 (VBSOL)
Power source for solenoid valve
POWERTRAIN MODULE (PCM)
PHOTO 140
Sensor ground (NMSG) D12
Mainshaft speed sensor input (NM) D11
Sensor ground (NC SG) D16
Countershaft speed sensor input (NC) D10
Ground (LG1) B20
12
11
RED
16
GRN
10 C410
BLU
20 C457
BRN/BLK
WHT
BRAIDED WIRE
See Ground Distribution, page 14-1.
2
1
4
5 C104
PHOTO 20
BRN/BLK
3 C102
PHOTO 20
BRN/BLK
BRAIDED WIRE
WHT
BRAIDED WIRE
RED
GRN
BLU
BRN/BLK
See Ground Distribution, page 14-1.
1
2 C130
1
2 C129
MAINSHAFT SPEED SENSOR
PHOTO 143
COUNTERSHAFT SPEED SENSOR
PHOTO 42
G101
PHOTO 28

(cont'd)

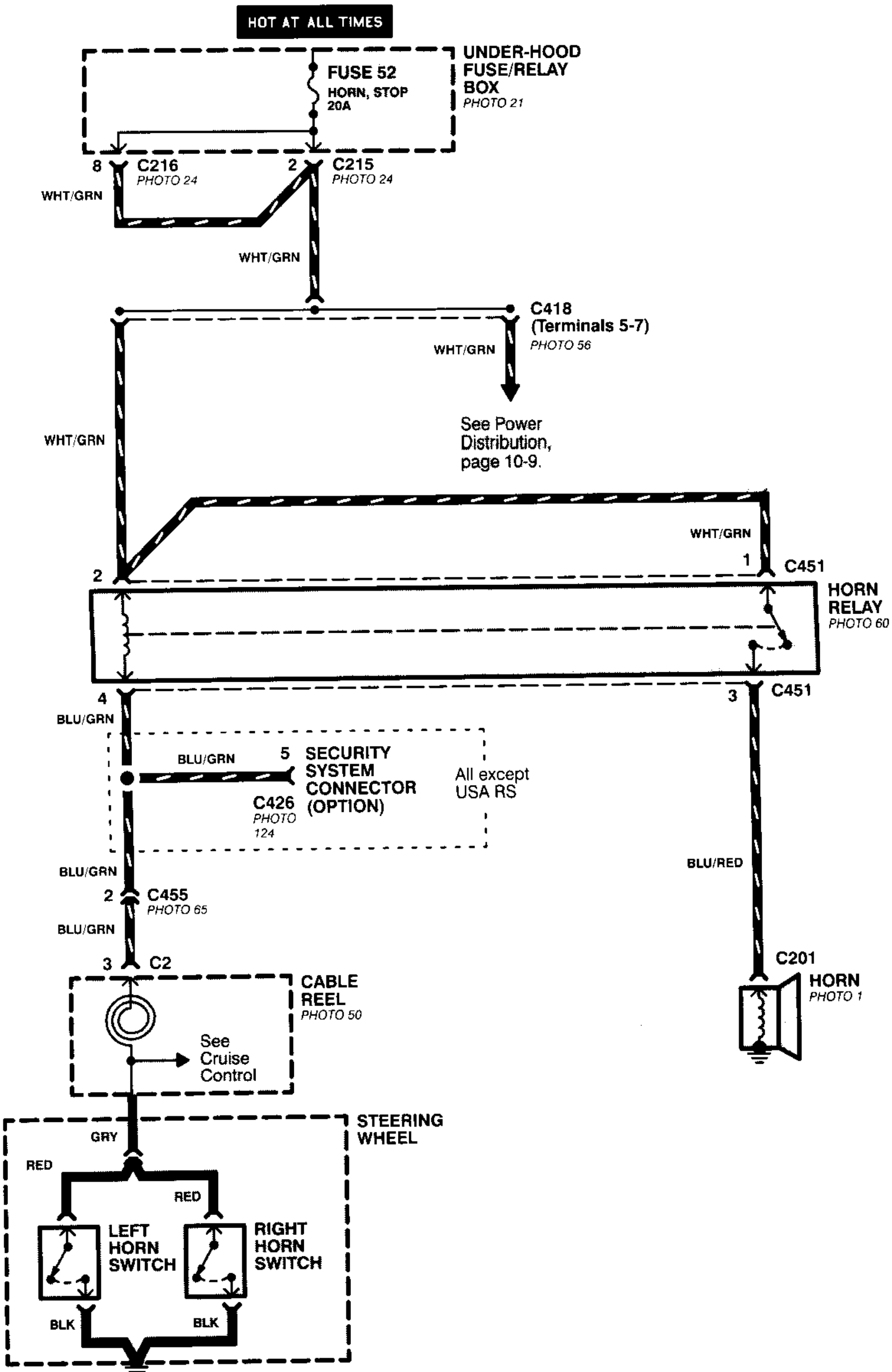
Automatic Transmission Controls

– '00 Model (cont'd)



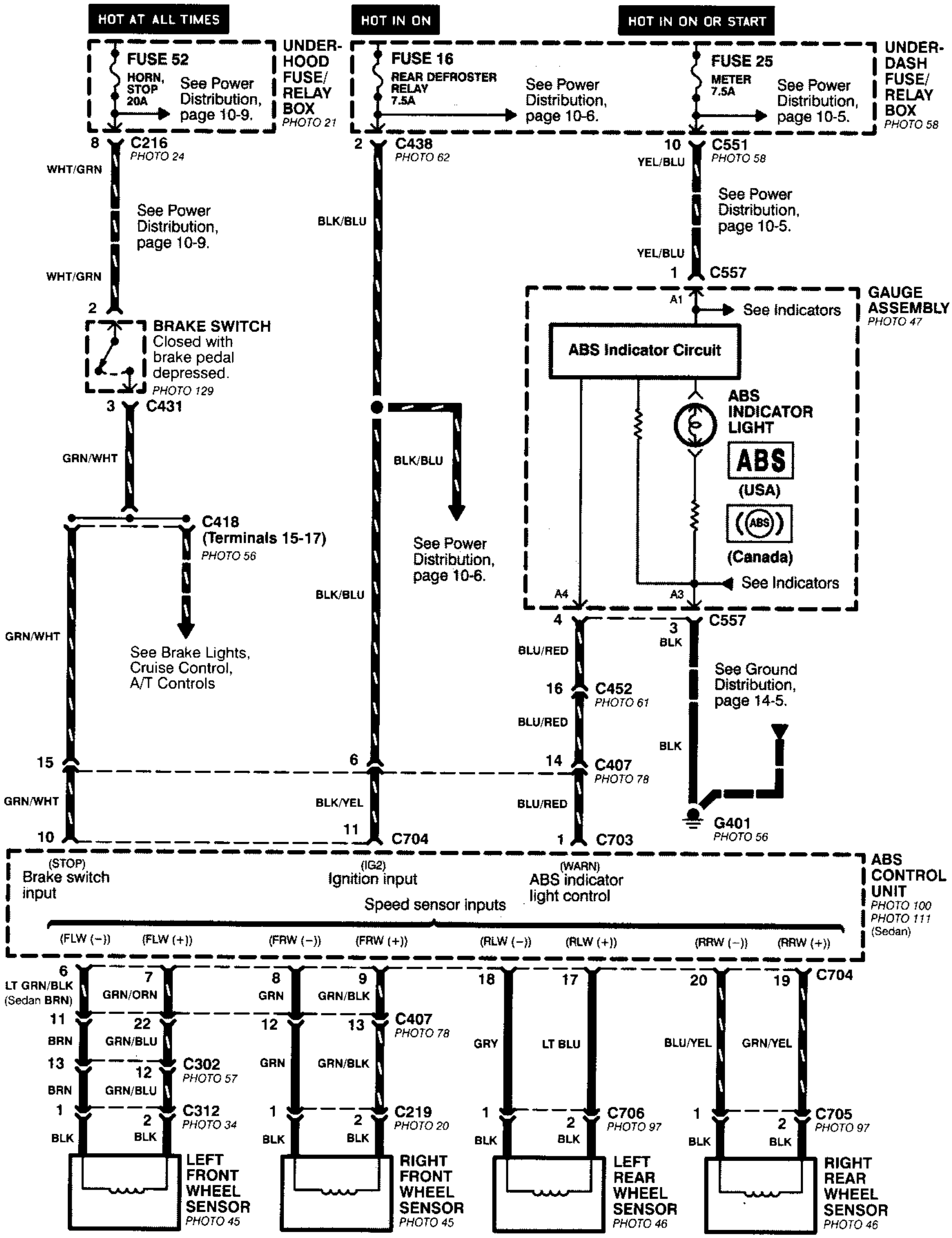

POWERTRAIN CONTROL MODULE (PCM)
PHOTO 140
Park/ neutral input (ATP PN) D13
Reverse input (ATP R) D6
Drive inputs
(ATP D4) D9
(ATP D3) D8
(ATP 2) D14
(ATP1) D15
C410
LT GRN/BLK
See PGM-FI
GRN/RED
YEL
GRN/BLU
GRN/YEL
LT GRN/WHT
C430
PHOTO 63
GAUGE ASSEMBLY
PHOTO 47
C558
A/T Gear Position Indicator
See A/T Gear Position Indicator
GRN/WHT
GRN
See Interlock System
See A/T Gear Position Indicator
C413
PHOTO 70
GRN/BLK
A/T GEAR POSITION SWITCH
PHOTO 70
See Cruise Control
BLK
See Ground Distribution, page 14-4.
G401
PHOTO 56

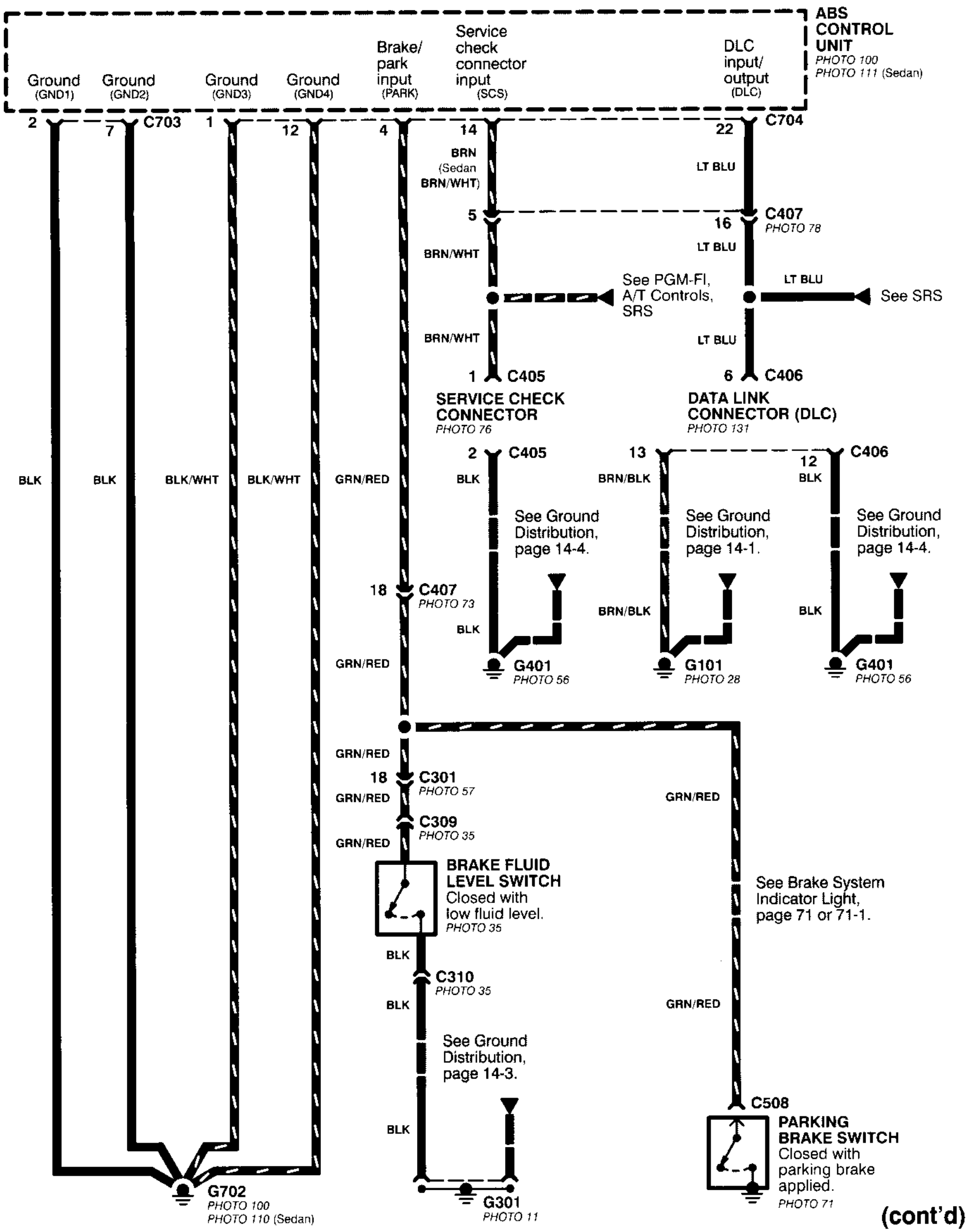
Horns



HOT AT ALL TIMES
FUSE 52
HORN, STOP
20A
UNDER-HOOD
FUSE/RELAY
BOX
PHOTO 21
8
C216
PHOTO 24
2
C215
PHOTO 24
WHT/GRN
WHT/GRN
C418
(Terminals 5-7)
PHOTO 56
WHT/GRN
See Power
Distribution,
page 10-9.
WHT/GRN
WHT/GRN
2
1
C451
HORN
RELAY
PHOTO 60
4
BLU/GRN
3
C451
BLU/GRN
5
SECURITY
SYSTEM
CONNECTOR
(OPTION)
C426
PHOTO
124
All except
USA RS
BLU/RED
BLU/GRN
2
C455
PHOTO 65
BLU/GRN
3
C2
C201
HORN
PHOTO 1
CABLE
REEL
PHOTO 50
See
Cruise
Control
STEERING
WHEEL
GRY
RED
RED
LEFT
HORN
SWITCH
RIGHT
HORN
SWITCH
BLK
BLK

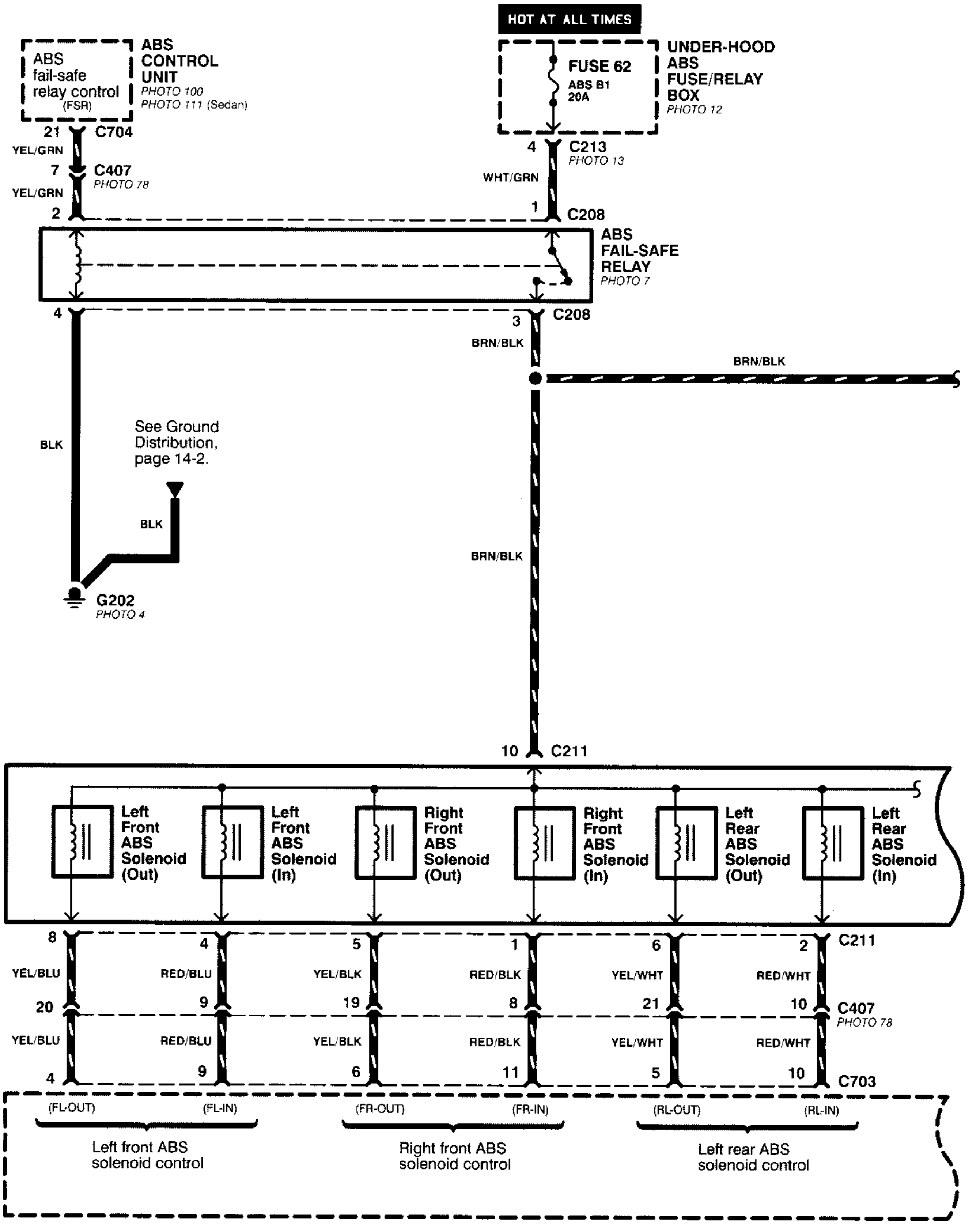
Anti-Lock Brake System (ABS)



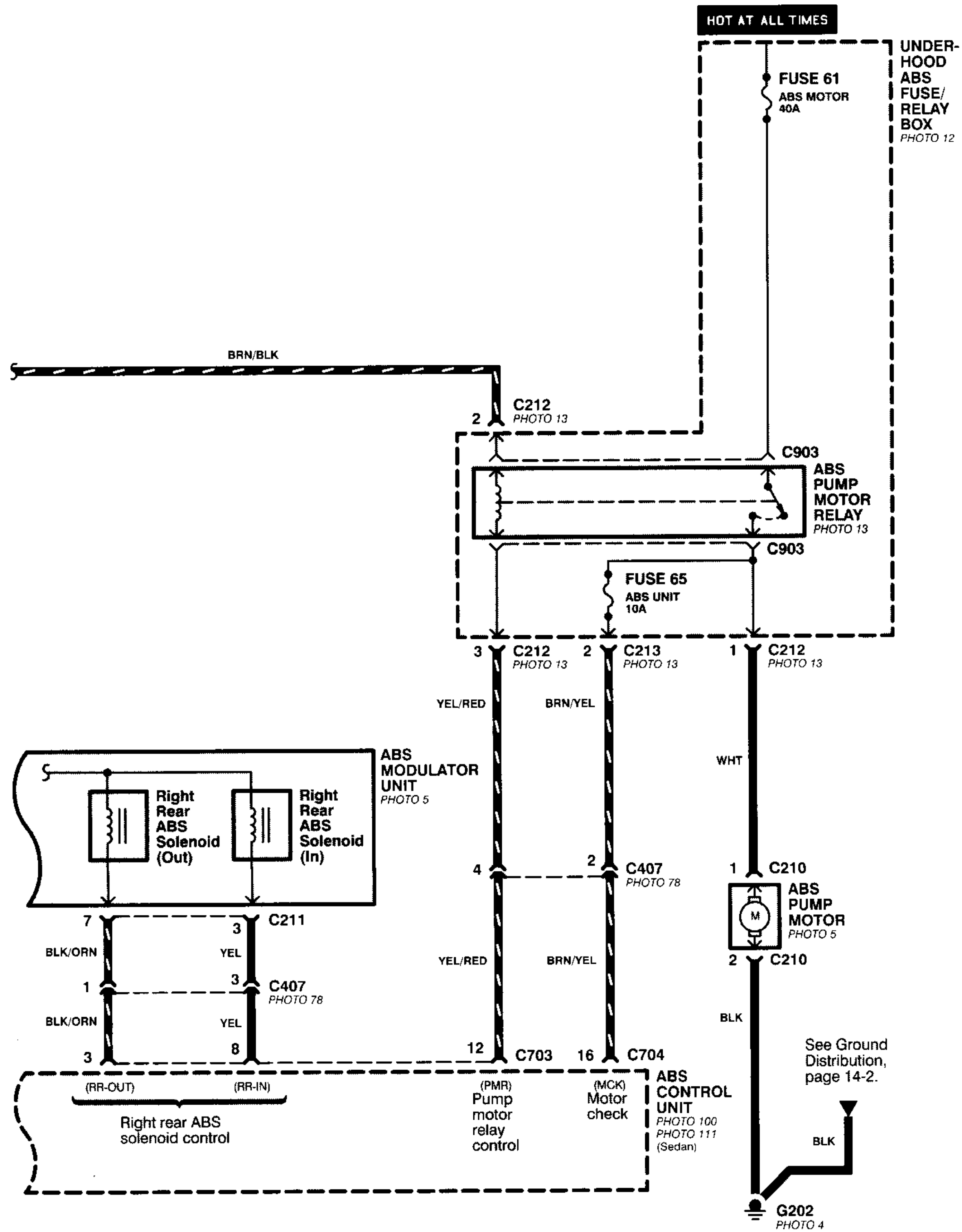


ABS CONTROL UNIT
PHOTO 100
PHOTO 111 (Sedan)
Ground (GND1)
Ground (GND2)
Ground (GND3)
Ground (GND4)
Brake/ park input (PARK)
Service check connector input (SCS)
DLC input/ output (DLC)
C703
C704
BLK
BLK
BLK/WHT
BLK/WHT
GRN/RED
BRN (Sedan BRN/WHT)
LT BLU
C407
PHOTO 78
BRN/WHT
See PGM-FI, A/T Controls, SRS
See SRS
1 C405
6 C406
SERVICE CHECK CONNECTOR
PHOTO 76
DATA LINK CONNECTOR (DLC)
PHOTO 131
2 C405
C406
BRN/BLK
See Ground Distribution, page 14-4.
See Ground Distribution, page 14-1.
See Ground Distribution, page 14-4.
18 C407
PHOTO 73
G401
PHOTO 56
G101
PHOTO 28
G401
PHOTO 56
18 C301
PHOTO 57
C309
PHOTO 35
BRAKE FLUID LEVEL SWITCH
Closed with low fluid level.
PHOTO 35
C310
PHOTO 35
See Ground Distribution, page 14-3.
See Brake System Indicator Light, page 71 or 71-1.
C508
PARKING BRAKE SWITCH
Closed with parking brake applied.
PHOTO 71
G702
PHOTO 100
PHOTO 110 (Sedan)
G301
PHOTO 11

(cont'd)



HOT AT ALL TIMES
ABS fail-safe relay control (FSR)
ABS CONTROL UNIT
PHOTO 100
PHOTO 111 (Sedan)
FUSE 62
ABS B1 20A
UNDER-HOOD ABS FUSE/RELAY BOX
PHOTO 12
21 C704
YEL/GRN
7 C407
PHOTO 78
YEL/GRN
2
4 C213
PHOTO 13
WHT/GRN
1 C208
ABS FAIL-SAFE RELAY
PHOTO 7
4
3 C208
BRN/BLK
BRN/BLK
BLK
See Ground Distribution, page 14-2.
BLK
G202
PHOTO 4
BRN/BLK
10 C211
Left Front ABS Solenoid (Out)
Left Front ABS Solenoid (In)
Right Front ABS Solenoid (Out)
Right Front ABS Solenoid (In)
Left Rear ABS Solenoid (Out)
Left Rear ABS Solenoid (In)
8
4
5
1
6
2 C211
YEL/BLU
RED/BLU
YEL/BLK
RED/BLK
YEL/WHT
RED/WHT
20
9
19
8
21
10 C407
PHOTO 78
YEL/BLU
RED/BLU
YEL/BLK
RED/BLK
YEL/WHT
RED/WHT
4
9
6
11
5
10 C703
(FL-OUT)
(FL-IN)
(FR-OUT)
(FR-IN)
(RL-OUT)
(RL-IN)
Left front ABS solenoid control
Right front ABS solenoid control
Left rear ABS solenoid control



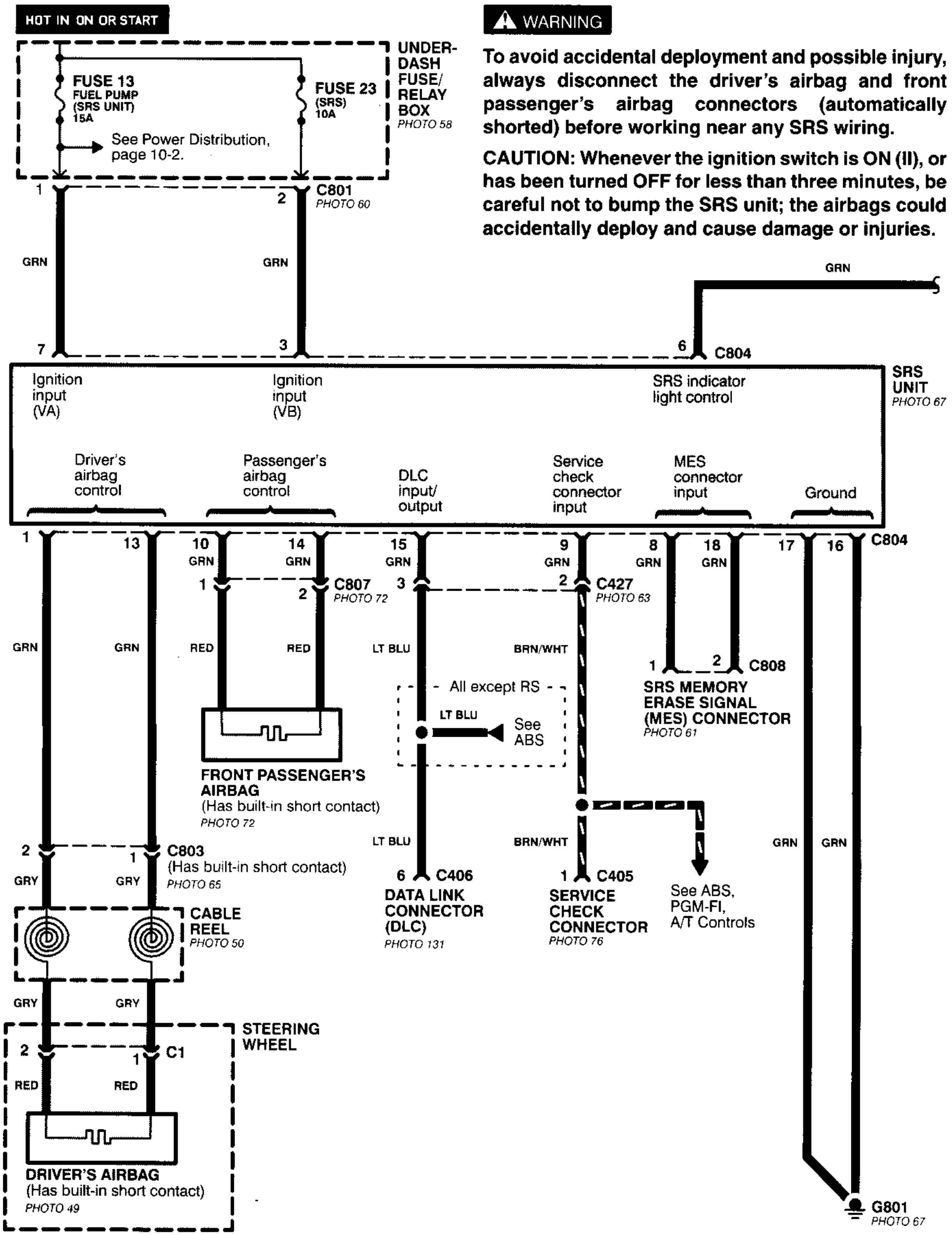
HOT AT ALL TIMES
UNDER-HOOD ABS FUSE/RELAY BOX
PHOTO 12
FUSE 61
ABS MOTOR 40A
BRN/BLK
C212
PHOTO 13
C903
ABS PUMP MOTOR RELAY
PHOTO 13
C903
FUSE 65
ABS UNIT 10A
C212
PHOTO 13
C213
PHOTO 13
C212
PHOTO 13
YEL/RED
BRN/YEL
WHT
ABS MODULATOR UNIT
PHOTO 5
Right Rear ABS Solenoid (Out)
Right Rear ABS Solenoid (In)
C407
PHOTO 78
C210
ABS PUMP MOTOR
PHOTO 5
C210
C211
BLK/ORN
YEL
C407
PHOTO 78
BLK/ORN
YEL
YEL/RED
BRN/YEL
BLK
C703
C704
(RR-OUT)
(RR-IN)
Right rear ABS solenoid control
(PMR)
Pump motor relay control
(MCK)
Motor check
ABS CONTROL UNIT
PHOTO 100
PHOTO 111
(Sedan)
See Ground Distribution, page 14-2.
BLK
G202
PHOTO 4

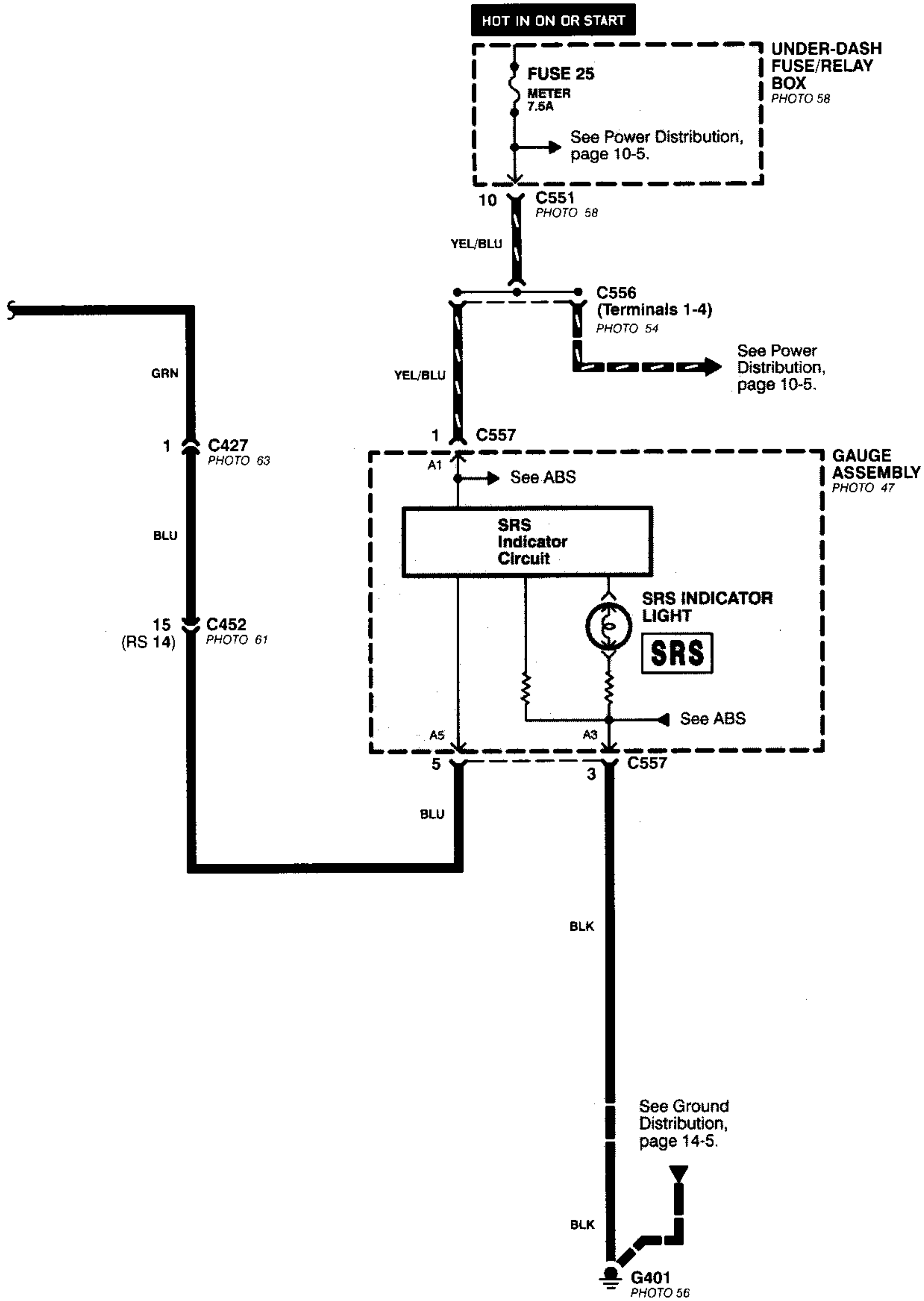
Supplemental Restraint System (SRS)

WARNING

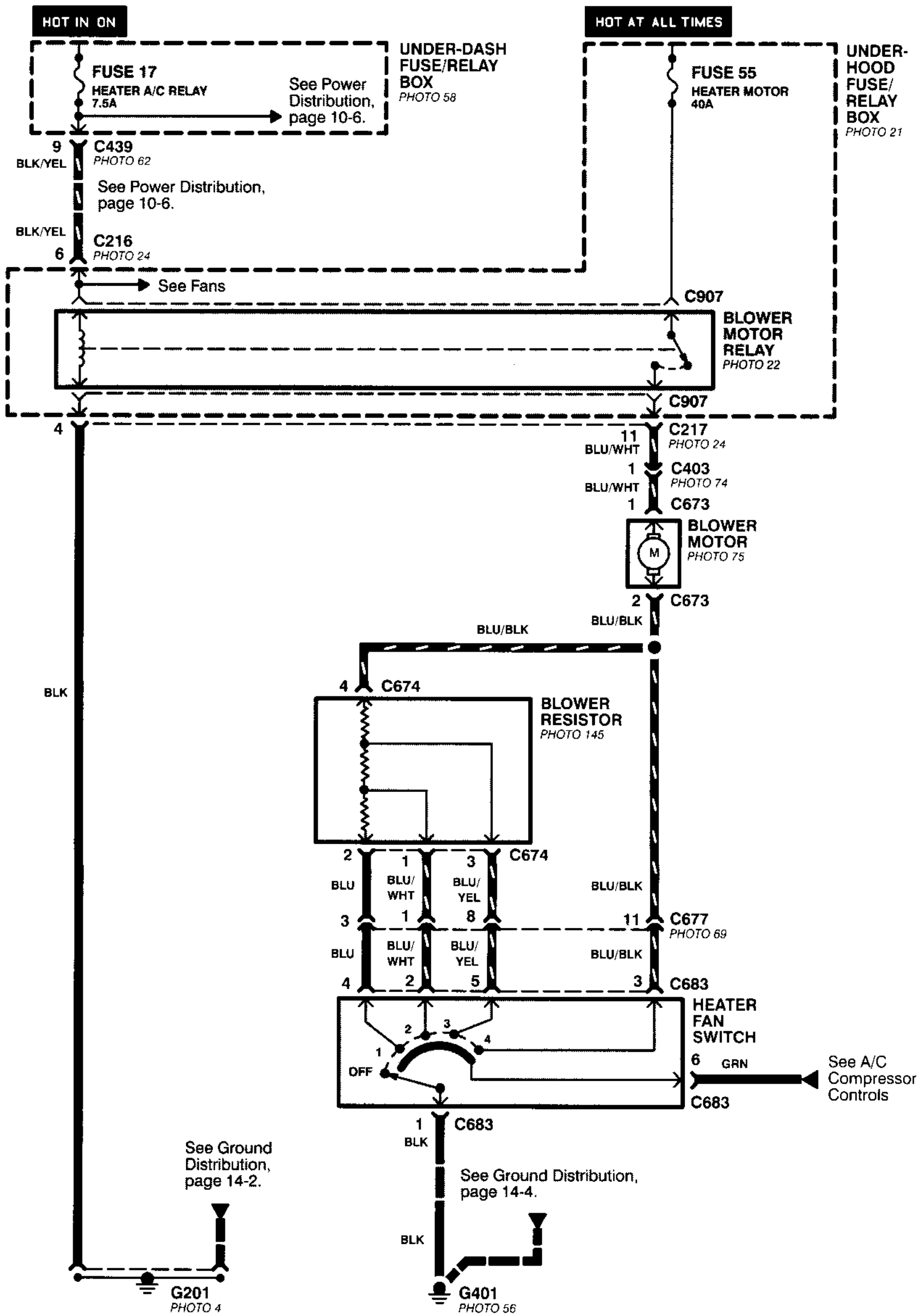
To avoid accidental deployment and possible injury, always disconnect the driver's airbag and front passenger's airbag connectors (automatically shorted) before working near any SRS wiring.

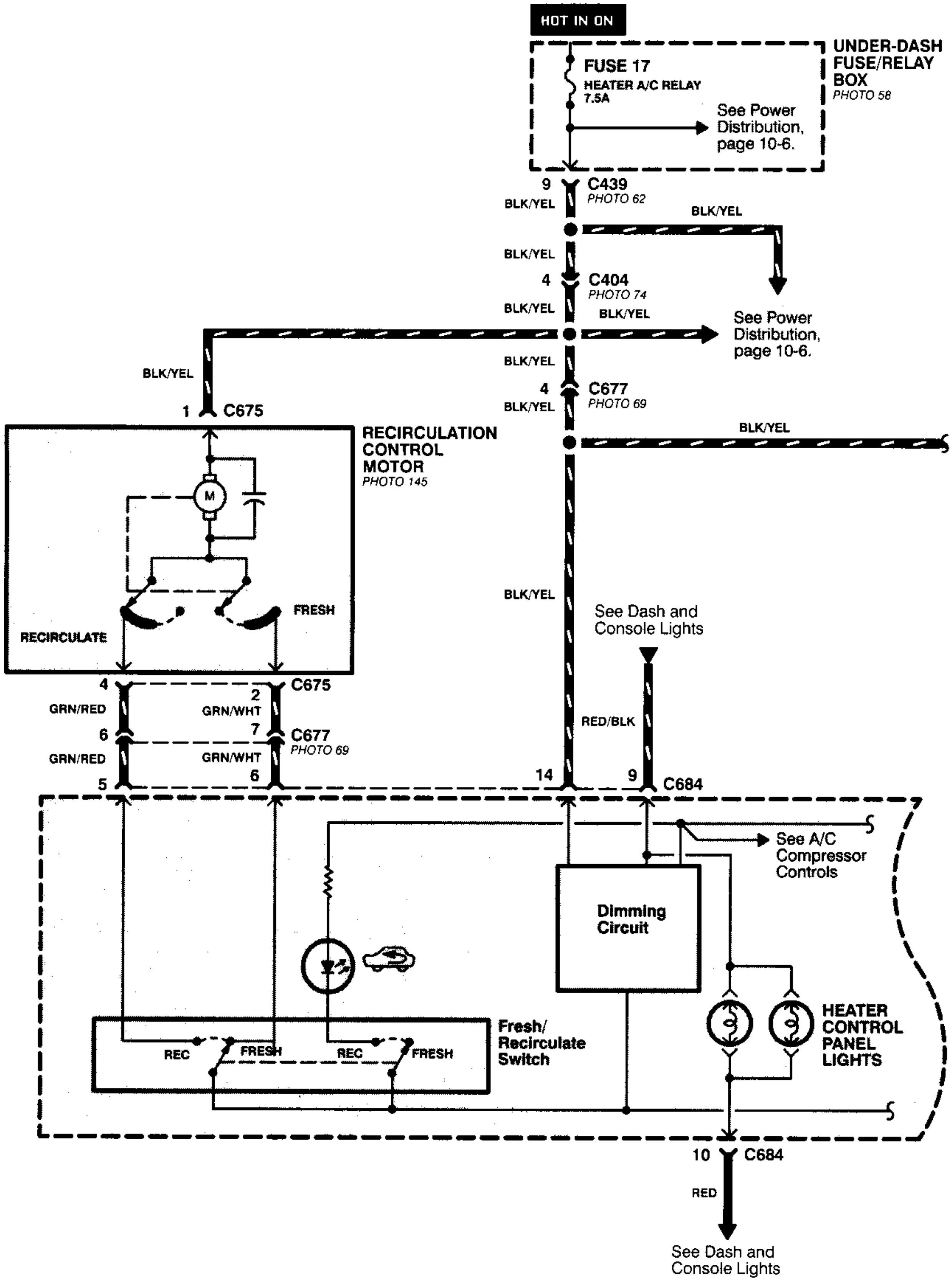
CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.



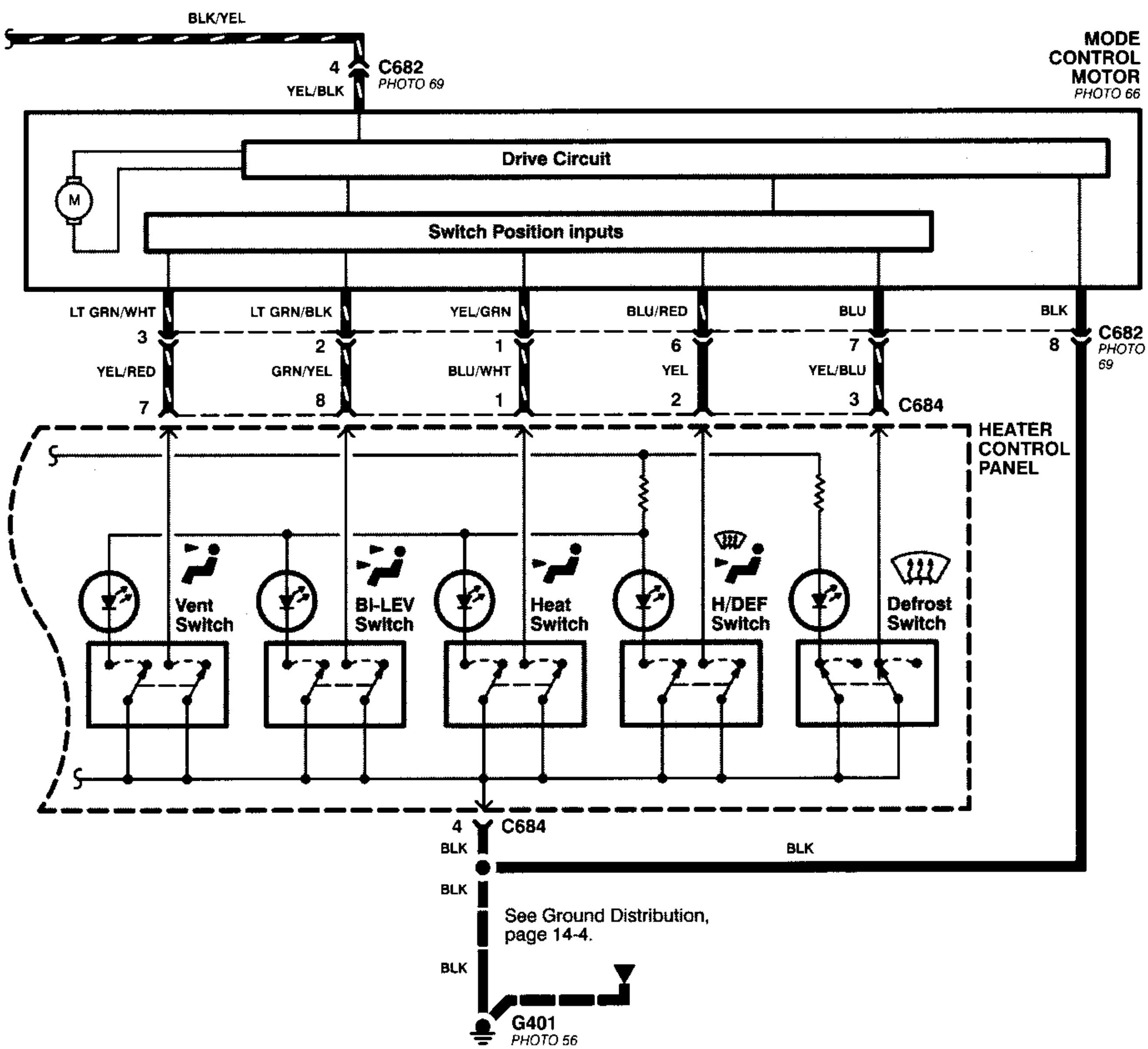

HOT IN ON OR START
FUSE 25
METER
7.5A
See Power Distribution, page 10-5.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
10
C551
PHOTO 58
YEL/BLU
C556
(Terminals 1-4)
PHOTO 54
See Power Distribution, page 10-5.
YEL/BLU
GRN
1
C427
PHOTO 63
BLU
15
(RS 14)
C452
PHOTO 61
1
C557
A1
See ABS
GAUGE ASSEMBLY
PHOTO 47
SRS Indicator Circuit
SRS INDICATOR LIGHT
SRS
See ABS
A5
A3
5
3
C557
BLU
BLK
See Ground Distribution, page 14-5.
BLK
G401
PHOTO 56

Blower Controls





HOT IN ON
FUSE 17
HEATER A/C RELAY
7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-6.
9 C439
PHOTO 62
BLK/YEL
BLK/YEL
BLK/YEL
4 C404
PHOTO 74
BLK/YEL
BLK/YEL
See Power Distribution, page 10-6.
BLK/YEL
BLK/YEL
4 C677
PHOTO 69
BLK/YEL
1 C675
BLK/YEL
RECIRCULATION CONTROL MOTOR
PHOTO 145
M
FRESH
RECIRCULATE
BLK/YEL
See Dash and Console Lights
4 C675
2
GRN/RED
GRN/WHT
6
7 C677
PHOTO 69
GRN/RED
GRN/WHT
5
6
RED/BLK
14
9 C684
See A/C Compressor Controls
Dimming Circuit
HEATER CONTROL PANEL LIGHTS
REC
FRESH
REC
FRESH
Fresh/ Recirculate Switch
10 C684
RED
See Dash and Console Lights


BLK/YEL
4
C682
PHOTO 69
YEL/BLK
MODE
CONTROL
MOTOR
PHOTO 66
Drive Circuit
M
Switch Position inputs
LT GRN/WHT
LT GRN/BLK
YEL/GRN
BLU/RED
BLU
BLK
3
2
1
6
7
8
C682
PHOTO
69
YEL/RED
GRN/YEL
BLU/WHT
YEL
YEL/BLU
7
8
1
2
3
C684
HEATER
CONTROL
PANEL
Vent
Switch
BI-LEV
Switch
Heat
Switch
H/DEF
Switch
Defrost
Switch
4
C684
BLK
BLK
BLK
See Ground Distribution,
page 14-4.
BLK
G401
PHOTO 56

Air Delivery (cont'd)

– How the Circuit Works

The air delivery system directs the flow of air used by the heater and air conditioner systems.

Mode Selection

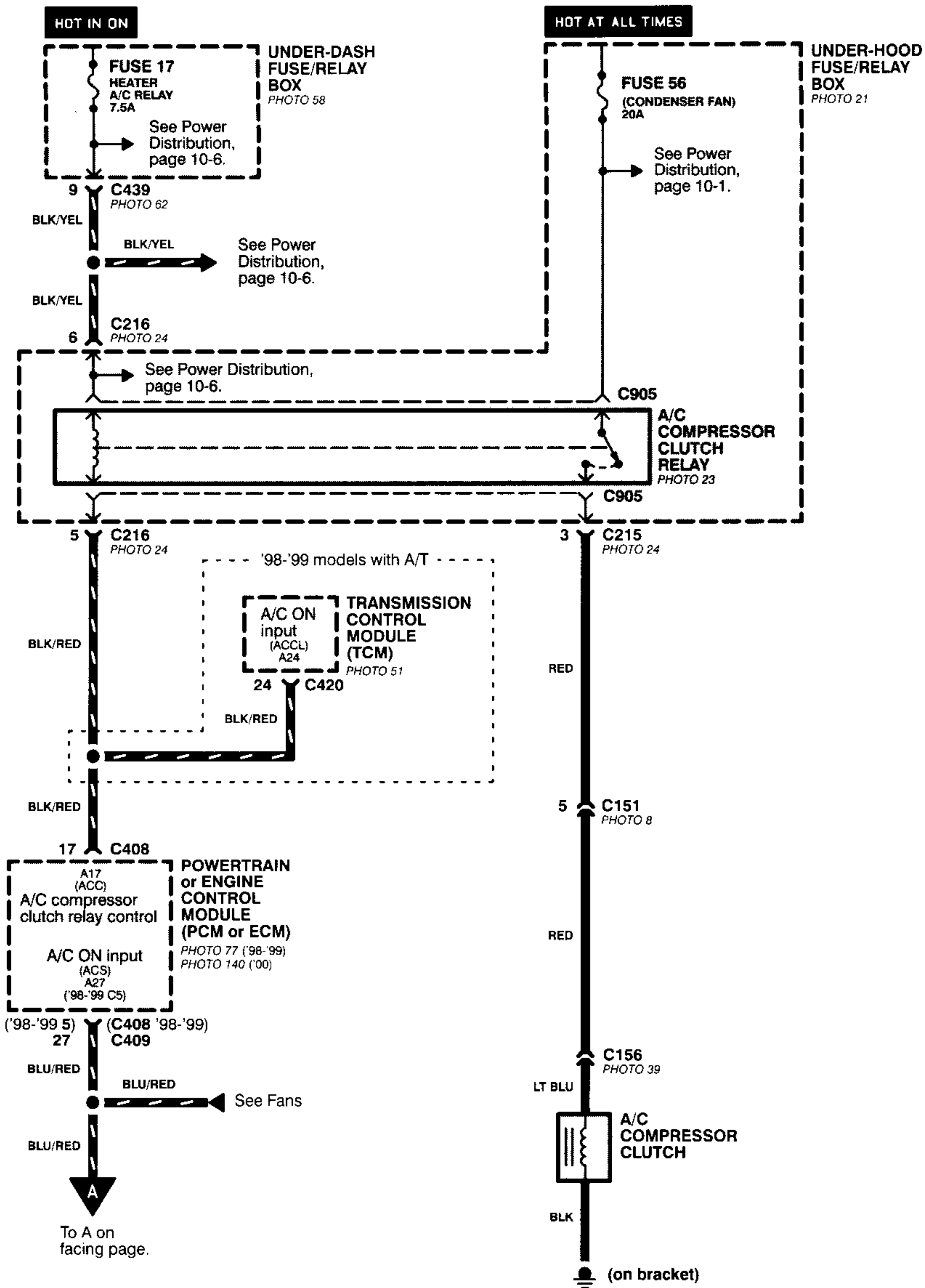
Mode selection is controlled by the mode switches in the heater control panel and the mode control motor. When you select a specific mode, voltage is applied through the dimming control circuit to the LED, which comes on, indicating the mode selected. Ground is provided to the mode control motor though that mode switch. The motor then runs until the air control door reaches the proper position.

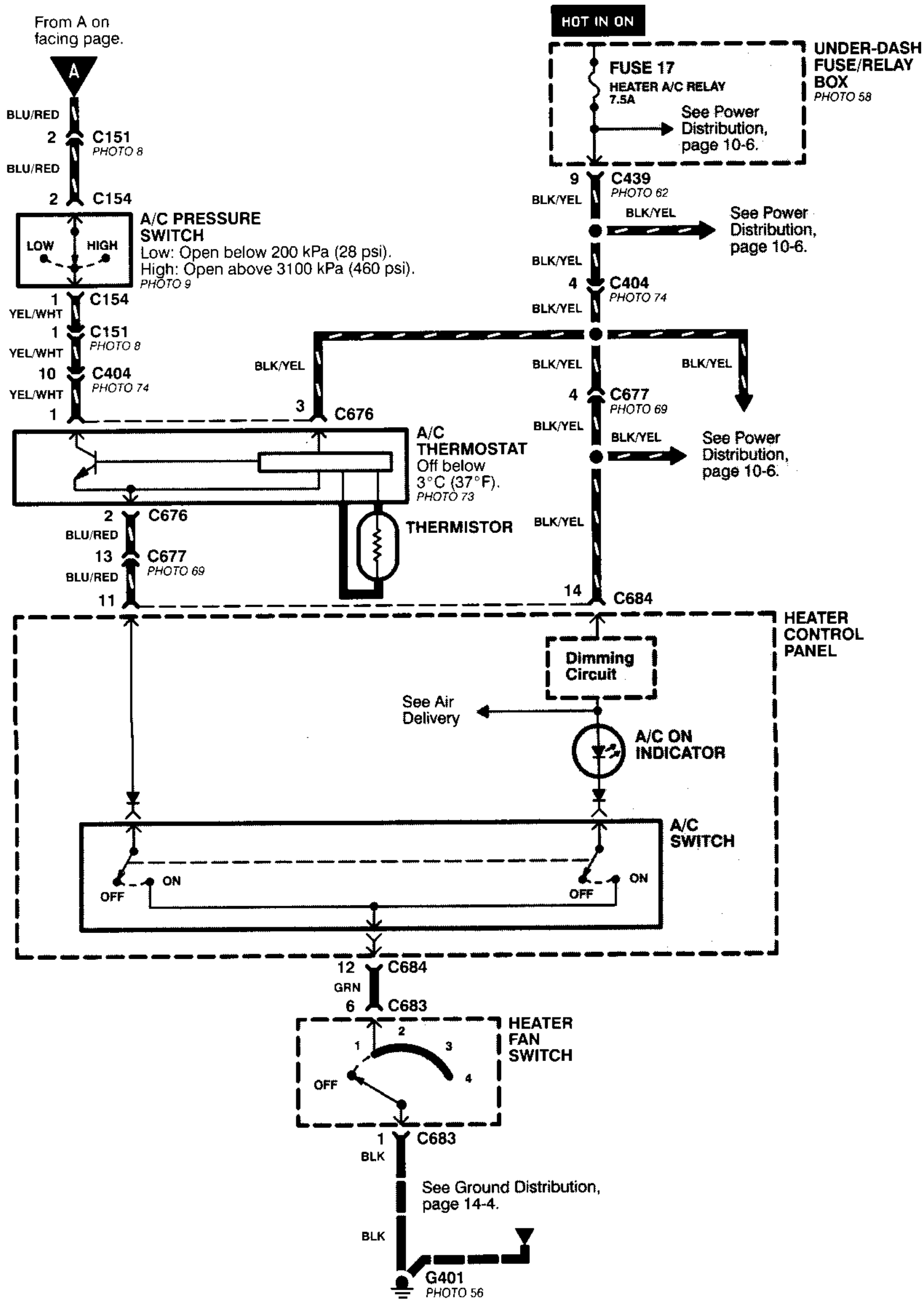
Fresh/Recirculation Selection

When you press the recirculation button, a ground signal is sent from the heater control panel to the recirculation control motor. The motor then runs until the recirculation door reaches the opposite position. When the recirculation button is in the REC position, battery voltage is applied through the dimming control circuit to the recirculate LED, and the LED comes on.

Refer to the Service Manual (Section 21, Heater) for specific tests or troubleshooting procedures.

A/C Compressor Controls




From A on facing page.
A
BLU/RED
2 C151 PHOTO 8
BLU/RED
2 C154
A/C PRESSURE SWITCH
Low: Open below 200 kPa (28 psi).
High: Open above 3100 kPa (460 psi).
PHOTO 9
LOW
HIGH
1 C154
YEL/WHT
1 C151 PHOTO 8
YEL/WHT
10 C404 PHOTO 74
YEL/WHT
1
BLK/YEL
3 C676
A/C THERMOSTAT
Off below 3°C (37°F).
PHOTO 73
THERMISTOR
2 C676
BLU/RED
13 C677 PHOTO 69
BLU/RED
11
HOT IN ON
FUSE 17
HEATER A/C RELAY 7.5A
See Power Distribution, page 10-6.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
9 C439 PHOTO 62
BLK/YEL
BLK/YEL
See Power Distribution, page 10-6.
BLK/YEL
4 C404 PHOTO 74
BLK/YEL
BLK/YEL
BLK/YEL
4 C677 PHOTO 69
BLK/YEL
BLK/YEL
See Power Distribution, page 10-6.
BLK/YEL
14 C684
HEATER CONTROL PANEL
Dimming Circuit
See Air Delivery
A/C ON INDICATOR
A/C SWITCH
ON
OFF
ON
OFF
12 C684
GRN
6 C683
HEATER FAN SWITCH
1
2
3
4
OFF
1 C683
BLK
See Ground Distribution, page 14-4.
BLK
G401
PHOTO 56

A/C Compressor Controls (cont'd)

How the Circuit Works

Battery voltage is supplied through fuse 56 to the A/C compressor clutch relay contacts at all times.

With the ignition switch in ON (II), voltage is applied to the coil of the A/C compressor clutch relay through fuse 17. When you push the A/C switch ON, and the heater fan switch is in position 1, 2, 3, or 4, a "ground" input is provided to the engine or powertrain control module (ECM or PCM) through the A/C thermostat and the A/C pressure switch.

The A/C compressor clutch relay is grounded by the engine or powertrain control module (ECM or PCM). When energized, the A/C compressor clutch relay allows battery voltage to turn on the A/C compressor clutch.

The A/C ON indicator light comes on when the A/C system is requested.

A/C Thermostat

The A/C thermostat is located on the evaporator housing. The A/C thermostat turns off the A/C compressor clutch if the temperature at the evaporator goes below 3°C (37°F). This prevents condensation from freezing on the evaporator fins and blocking the air delivery into the passenger compartment. The blower motor will keep running when the sensor turns off the compressor.

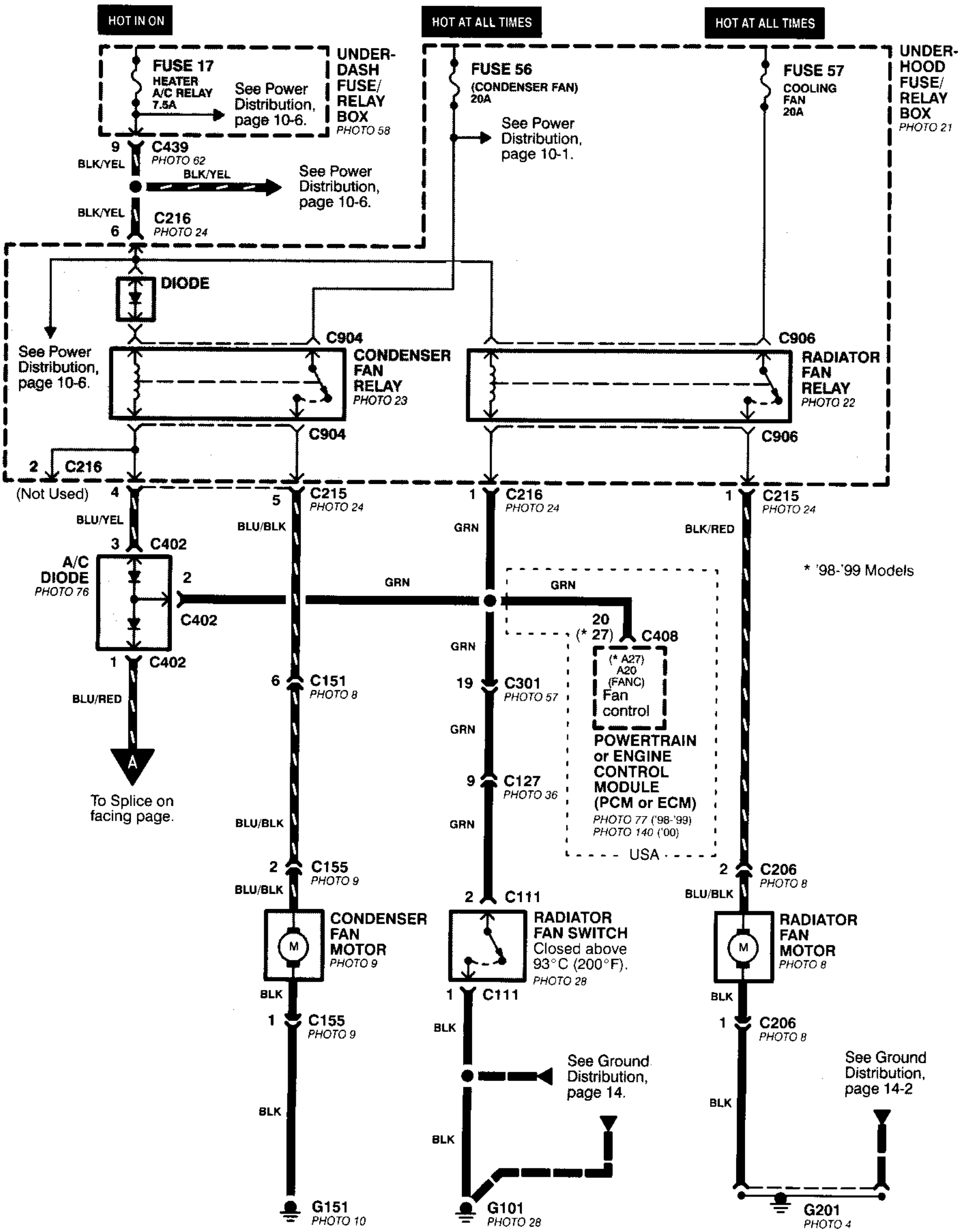
A/C Pressure Switch

The A/C pressure switch is located in the condenser outlet line where refrigerant is in a high temperature/high pressure liquid state. The switch will sense abnormally high or low pressure, and open the circuit. This removes ground, and the compressor will stop running.

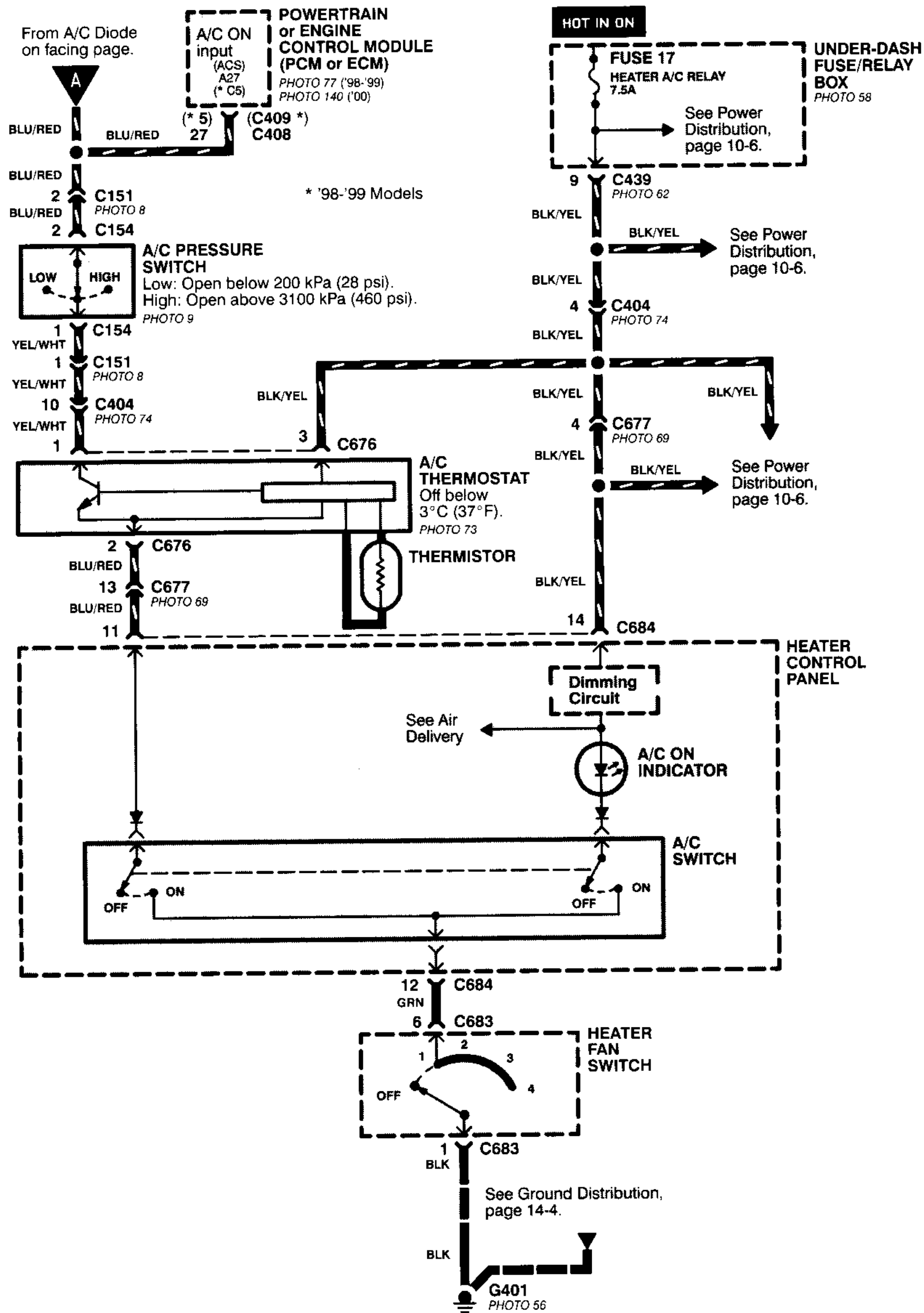
Refer to the Service Manual (Section 22, Air Conditioning) for specific tests or troubleshooting procedures.

Fans

- With A/C

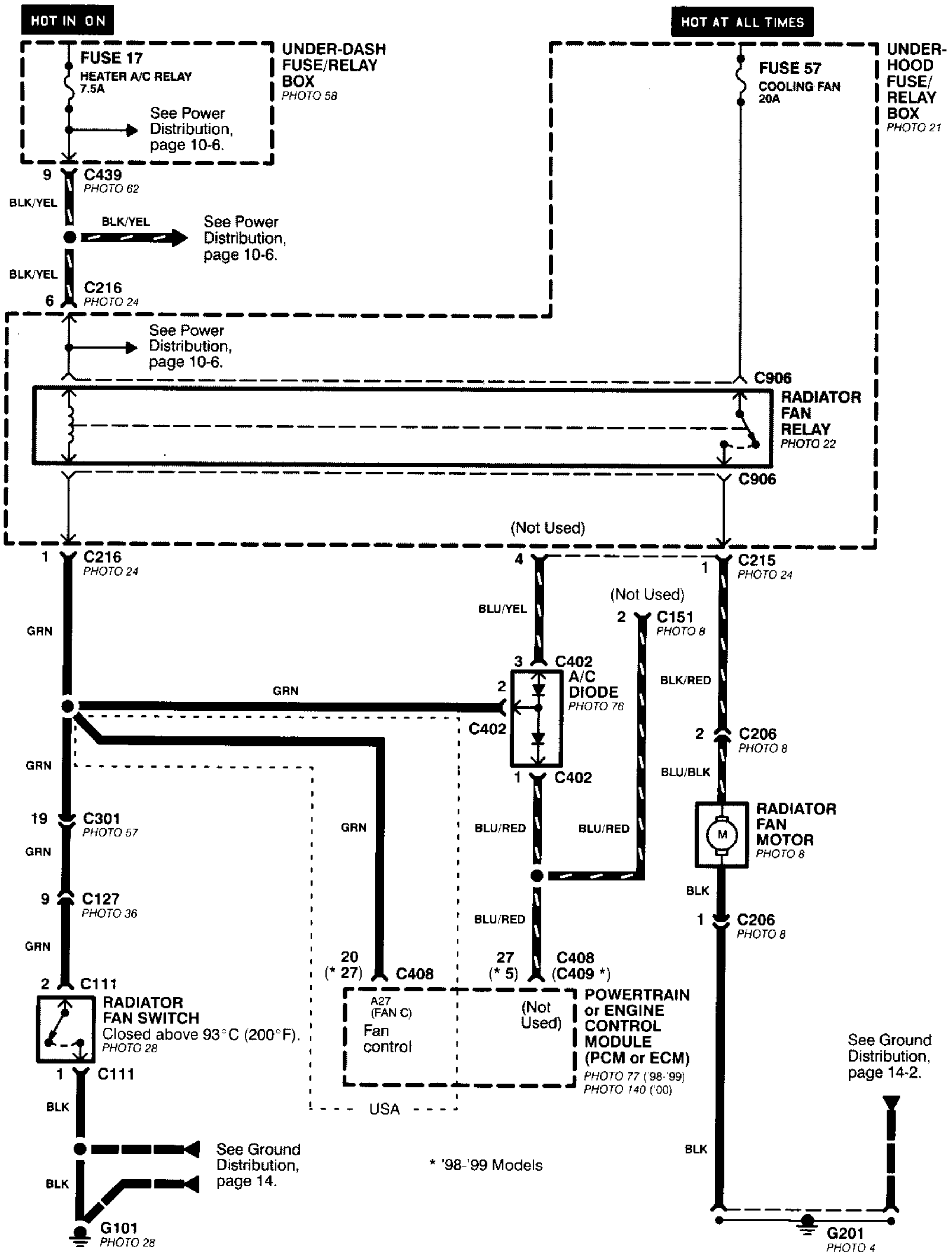


HOT IN ON
HOT AT ALL TIMES
HOT AT ALL TIMES
FUSE 17
HEATER A/C RELAY 7.5A
See Power Distribution, page 10-6.
UNDER-DASH FUSE/ RELAY BOX
PHOTO 58
FUSE 56
(CONDENSER FAN) 20A
See Power Distribution, page 10-1.
FUSE 57
COOLING FAN 20A
UNDER-HOOD FUSE/ RELAY BOX
PHOTO 21
9
C439
PHOTO 62
BLK/YEL
BLK/YEL
See Power Distribution, page 10-6.
BLK/YEL
C216
6
PHOTO 24
DIODE
See Power Distribution, page 10-6.
C904
CONDENSER FAN RELAY
PHOTO 23
C906
RADIATOR FAN RELAY
PHOTO 22
C904
C906
2
C216
(Not Used)
4
C215
5
PHOTO 24
1
C216
PHOTO 24
1
C215
PHOTO 24
BLU/YEL
BLU/BLK
GRN
BLK/RED
3
C402
A/C DIODE
PHOTO 76
2
GRN
GRN
* '98-'99 Models
C402
20
(* 27)
C408
1
C402
(* A27) A20 (FANC)
Fan control
BLU/RED
6
C151
PHOTO 8
GRN
19
C301
PHOTO 57
GRN
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 77 ('98-'99)
PHOTO 140 ('00)
A
To Splice on facing page.
9
C127
PHOTO 36
BLU/BLK
GRN
USA
2
C155
PHOTO 9
BLU/BLK
2
C111
2
C206
PHOTO 8
BLU/BLK
CONDENSER FAN MOTOR
PHOTO 9
M
RADIATOR FAN SWITCH
Closed above 93°C (200°F).
PHOTO 28
RADIATOR FAN MOTOR
PHOTO 8
M
BLK
1
C155
PHOTO 9
1
C111
BLK
BLK
1
C206
PHOTO 8
See Ground Distribution, page 14.
See Ground Distribution, page 14-2
BLK
BLK
BLK
G151
PHOTO 10
G101
PHOTO 28
G201
PHOTO 4


From A/C Diode on facing page.
A
A/C ON input (ACS) A27 (* C5)
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 77 ('98-'99)
PHOTO 140 ('00)
BLU/RED
(* 5) 27
(C409 *) C408
C151
PHOTO 8
C154
* '98-'99 Models
A/C PRESSURE SWITCH
LOW
HIGH
Low: Open below 200 kPa (28 psi).
High: Open above 3100 kPa (460 psi).
PHOTO 9
YEL/WHT
C404
PHOTO 74
C676
A/C THERMOSTAT
Off below 3°C (37°F).
PHOTO 73
THERMISTOR
C677
PHOTO 69
HOT IN ON
FUSE 17
HEATER A/C RELAY 7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-6.
C439
PHOTO 62
BLK/YEL
C684
HEATER CONTROL PANEL
Dimming Circuit
See Air Delivery
A/C ON INDICATOR
A/C SWITCH
OFF
ON
GRN
C683
HEATER FAN SWITCH
BLK
See Ground Distribution, page 14-4.
G401
PHOTO 56

Fans

– Without A/C



How the Circuit Works

When the ignition switch is in ON (II), voltage is applied to the coils of the radiator fan relay and the condenser fan relay (with A/C) through fuse 17. Whenever a ground is provided to the radiator fan relay and condenser fan relay, the relays are energized, turning on the radiator fan motor and condenser fan motor. The relays can be grounded by the radiator fan switch, engine or powertrain control module (ECM or PCM) (USA), or the A/C and heater fan switches via the A/C pressure switch and the A/C thermostat.

A/C Thermostat

The A/C thermostat is located on the evaporator housing. The A/C thermostat turns off the A/C compressor clutch if the temperature at the evaporator goes below 3°C (37°F). This prevents condensation from freezing on the evaporator fins and blocking the air delivery into the passenger compartment. If the temperature goes below 3°C (37°F) turning off the A/C thermostat, and the BLU/RED wire at the A/C diode was the only wire providing ground to the condenser and radiator fan relays (A/C switch on, heater fans switch on, radiator fan switch open, and ECM or PCM fan control output not grounded), the relay will deenergize removing voltage from the condenser and radiator fan motors causing them to stop running.

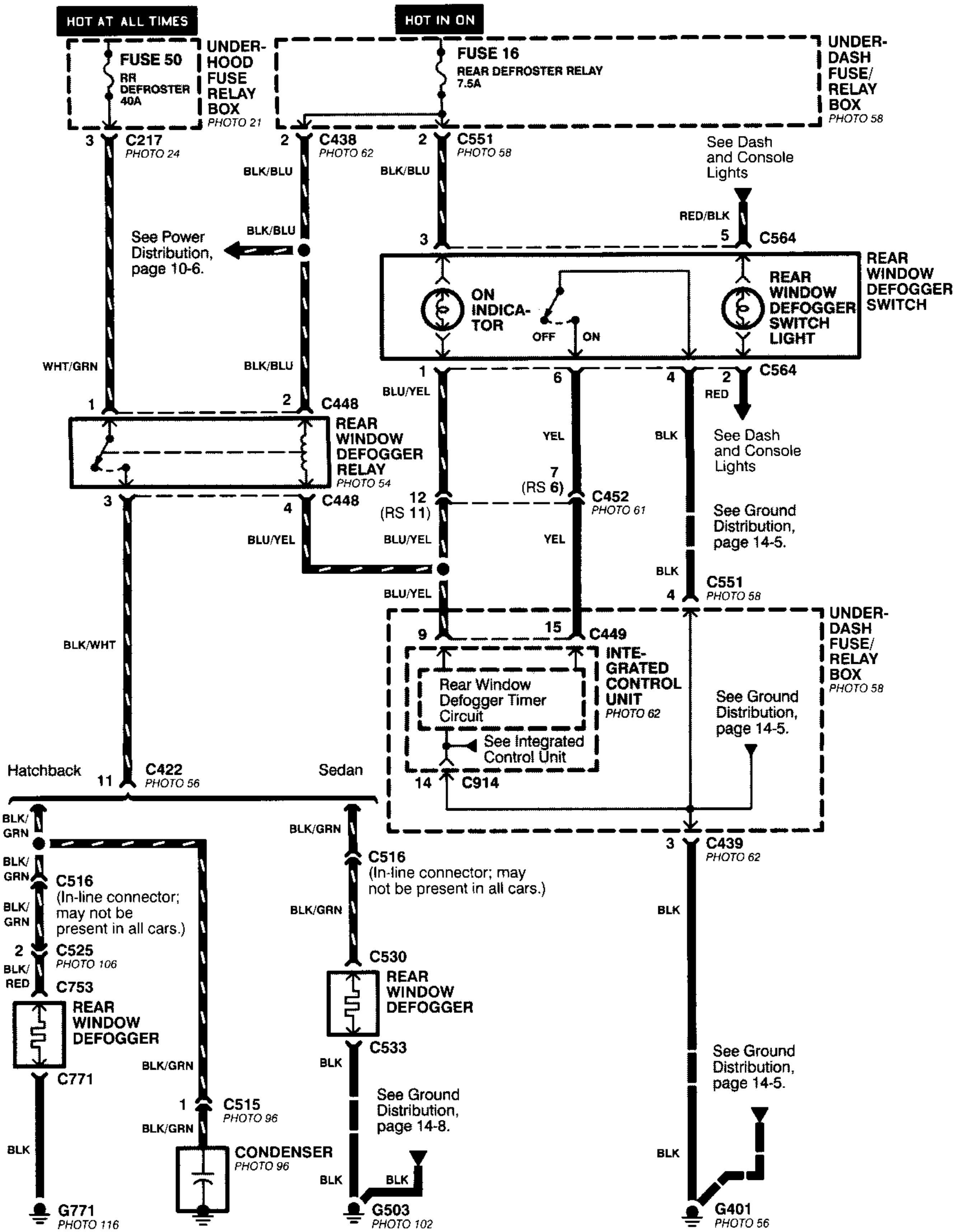
A/C Pressure Switch

The A/C pressure switch is located in the condenser outlet line where refrigerant is in a high temperature/high pressure liquid state. The A/C switch turns off the A/C compressor clutch if it senses abnormally high or low pressure. If the A/C pressure switch opens, and the BLU/RED wire at the A/C diode was the only wire providing ground to the condenser and radiator fan relays (A/C switch on, heater fans switch on, radiator fan switch open, and ECM or PCM fan control output not grounded), the relay will deenergize removing voltage from the condenser and radiator fan motors causing them to stop running.

A/C Diode

This diode prevents the radiator fan switch from grounding the "A/C ON" input to the engine or powertrain control module (ECM or PCM).

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.


HOT AT ALL TIMES
FUSE 50
RR DEFROSTER 40A
UNDER-HOOD FUSE RELAY BOX
PHOTO 21
HOT IN ON
FUSE 16
REAR DEFROSTER RELAY 7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C217
PHOTO 24
C438
PHOTO 62
C551
PHOTO 58
BLK/BLU
See Dash and Console Lights
RED/BLK
C564
See Power Distribution, page 10-6.
ON INDICATOR
OFF
ON
REAR WINDOW DEFOGGER SWITCH LIGHT
REAR WINDOW DEFOGGER SWITCH
WHT/GRN
C448
BLU/YEL
YEL
BLK
RED
REAR WINDOW DEFOGGER RELAY
PHOTO 54
(RS 6)
(RS 11)
C452
PHOTO 61
See Ground Distribution, page 14-5.
C449
INTEGRATED CONTROL UNIT
PHOTO 62
Rear Window Defogger Timer Circuit
See Integrated Control Unit
C914
BLK/WHT
Hatchback
C422
PHOTO 56
Sedan
BLK/GRN
C516
(In-line connector; may not be present in all cars.)
C525
PHOTO 106
BLK/RED
C753
REAR WINDOW DEFOGGER
C771
C515
PHOTO 96
CONDENSER
PHOTO 96
C530
C533
See Ground Distribution, page 14-8.
C439
PHOTO 62
G771
PHOTO 116
G503
PHOTO 102
G401
PHOTO 56

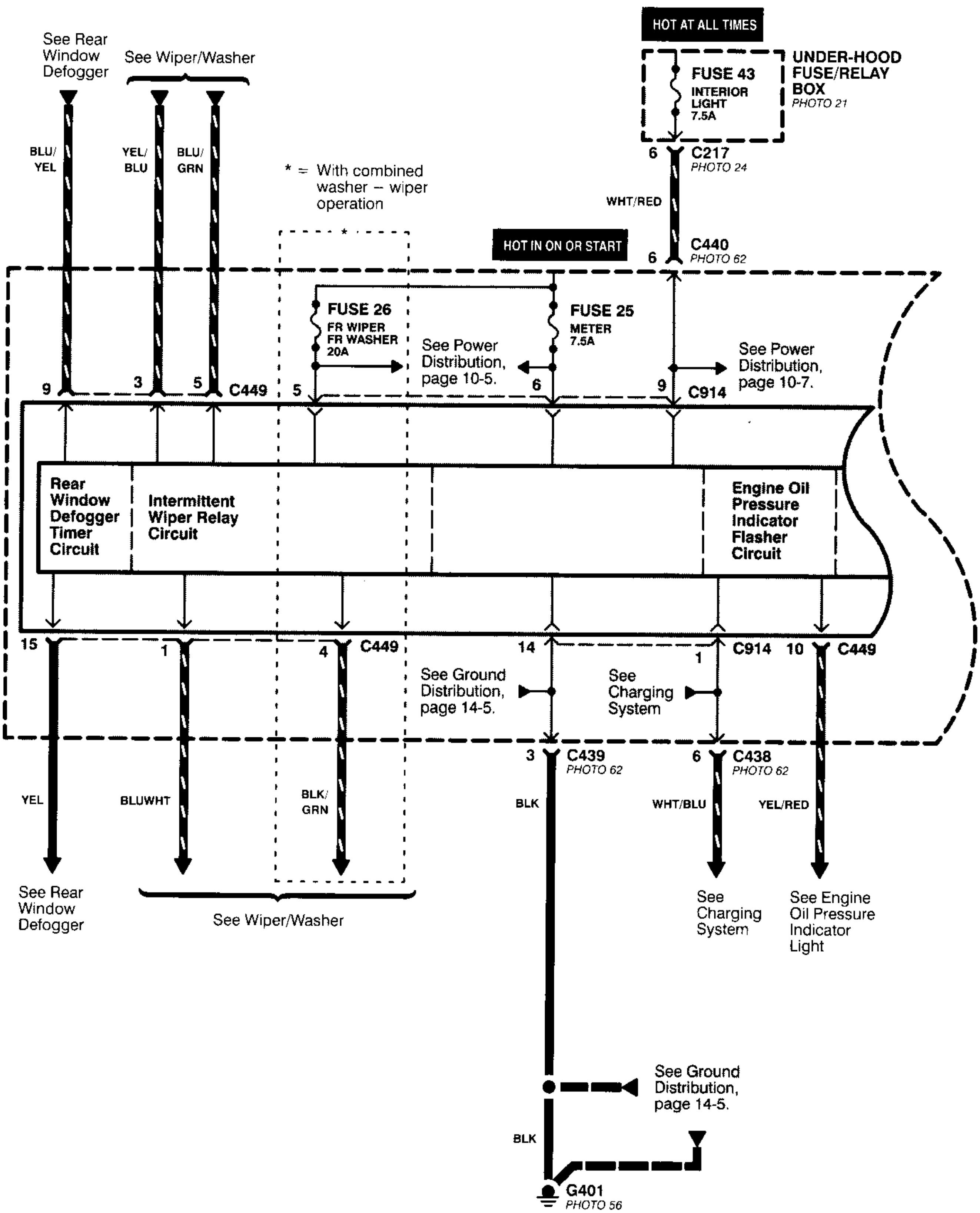
How the Circuit Works

Voltage is applied at all times through fuse 50 to the rear window defogger relay. With the ignition switch in ON (II), voltage is applied through fuse 16 to the rear window defogger relay and the defogger ON indicator.

When you turn the rear window defogger switch to ON, a path to ground is provided for the rear window defogger relay and the defogger ON indicator through the integrated control unit. The defogger ON indicator light comes on and the rear window defogger relay contacts close. Voltage is applied to the defogger grid on the surface of the rear window and the grid heats the rear window to remove any fog from the glass.

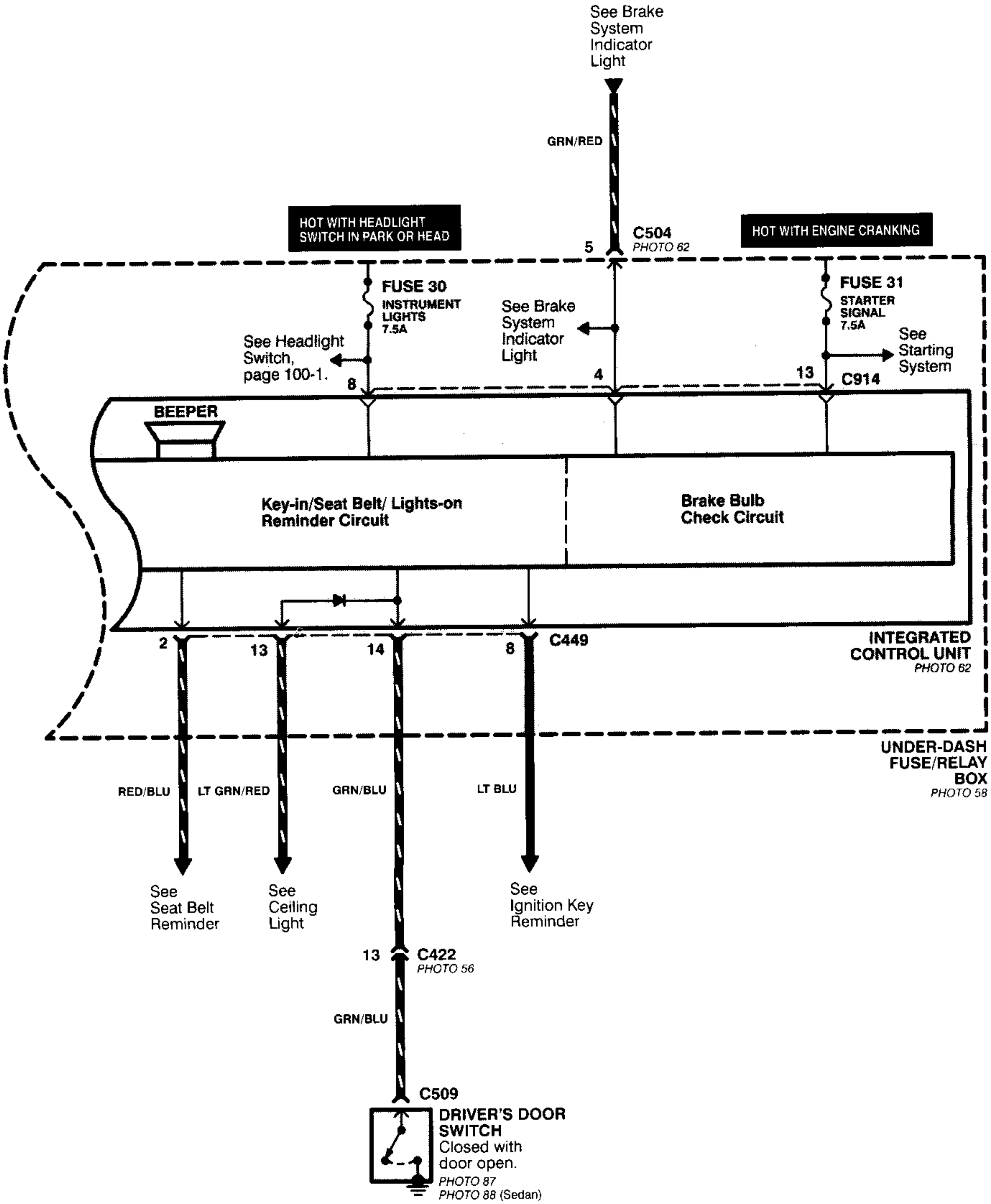
A timer in the integrated control unit will automatically turn off the defogger after 20 to 30 minutes.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.



HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 43
INTERIOR LIGHT 7.5A
6 C217
PHOTO 24
WHT/RED
C440
PHOTO 62
6
HOT IN ON OR START
See Rear Window Defogger
See Wiper/Washer
BLU/YEL
YEL/BLU
BLU/GRN
* = With combined washer – wiper operation
FUSE 26
FR WIPER FR WASHER 20A
FUSE 25
METER 7.5A
See Power Distribution, page 10-5.
See Power Distribution, page 10-7.
9
3
5
C449
5
6
9
C914
Rear Window Defogger Timer Circuit
Intermittent Wiper Relay Circuit
Engine Oil Pressure Indicator Flasher Circuit
15
1
4
C449
14
1
C914
10
C449
See Ground Distribution, page 14-5.
See Charging System
3 C439
PHOTO 62
6 C438
PHOTO 62
YEL
BLUWHT
BLK/GRN
BLK
WHT/BLU
YEL/RED
See Rear Window Defogger
See Wiper/Washer
See Charging System
See Engine Oil Pressure Indicator Light
See Ground Distribution, page 14-5.
BLK
G401
PHOTO 56

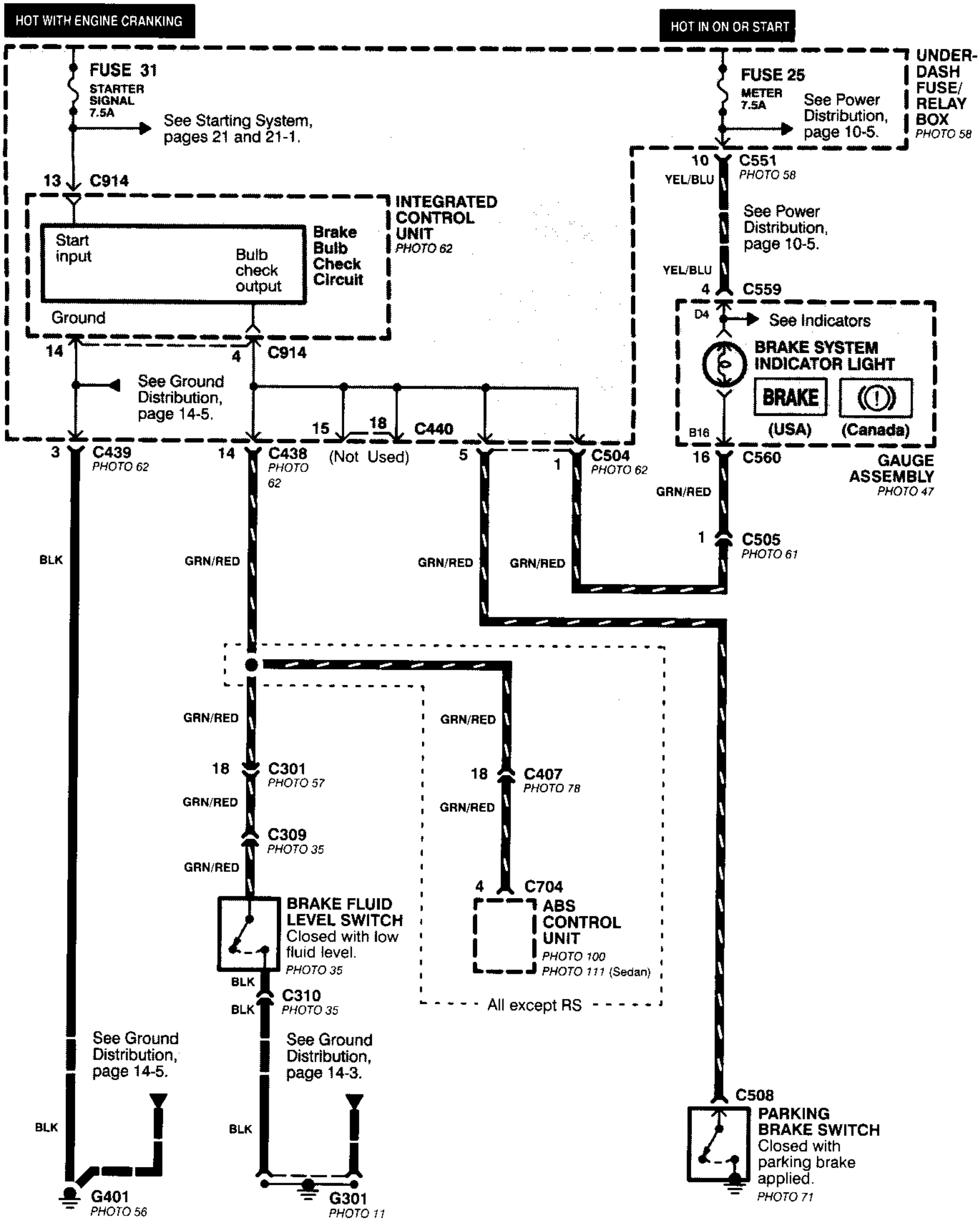
NOTE: Fuse 31 is HOT with Ignition Switch in START (III) and clutch pedal depressed or A/T Gear Selector in PARK (P) or NEUTRAL (N), see Starting System, pages 21 and 21-1.



Brake System Indicator Light

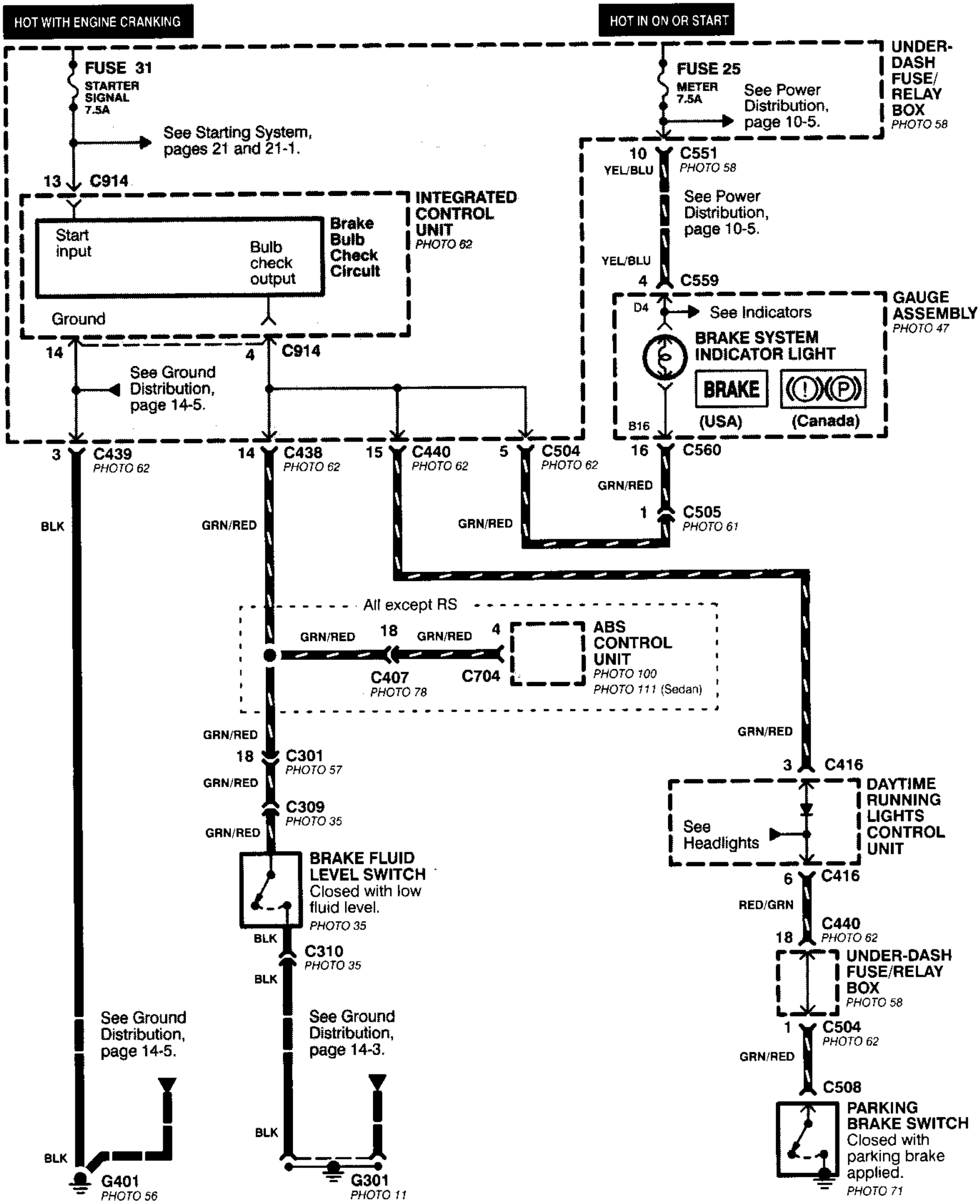
- USA

NOTE: Fuse 31 is HOT with Ignition Switch in START (III) and clutch pedal depressed or A/T gear selector in PARK (P) or NEUTRAL (N), see Starting System, pages 21 and 21-1.

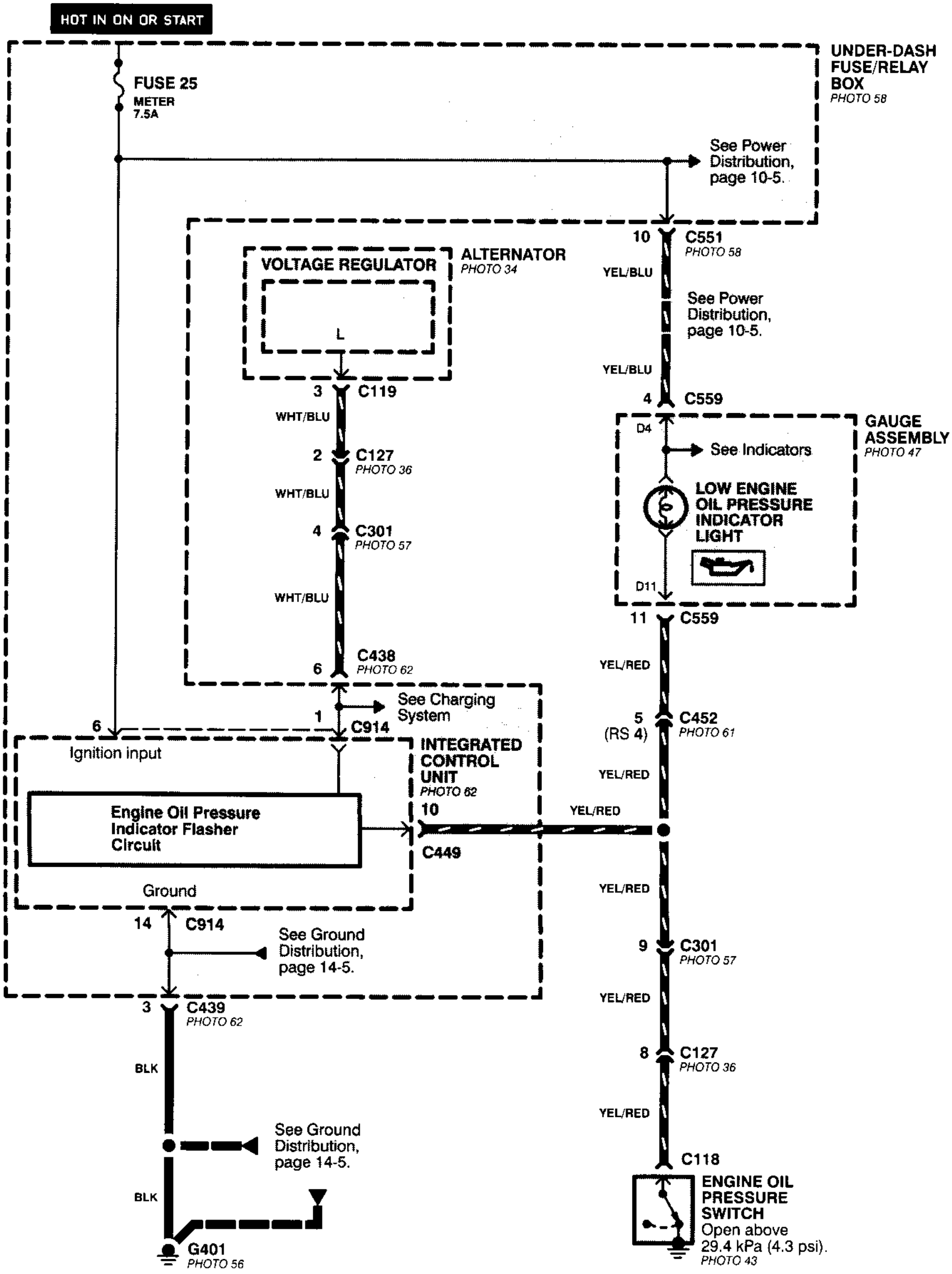


– Canada

NOTE: Fuse 31 is HOT with Ignition Switch in START (III) and clutch pedal depressed or A/T gear selector in PARK (P) or NEUTRAL (N), see Starting System, pages 21 and 21-1.



Engine Oil Pressure Indicator Light



How the Circuit Works

The low engine oil pressure indicator light works in two ways: it flashes continuously following a momentary loss of engine oil pressure, or it comes on and stays on with a complete loss of engine oil pressure.

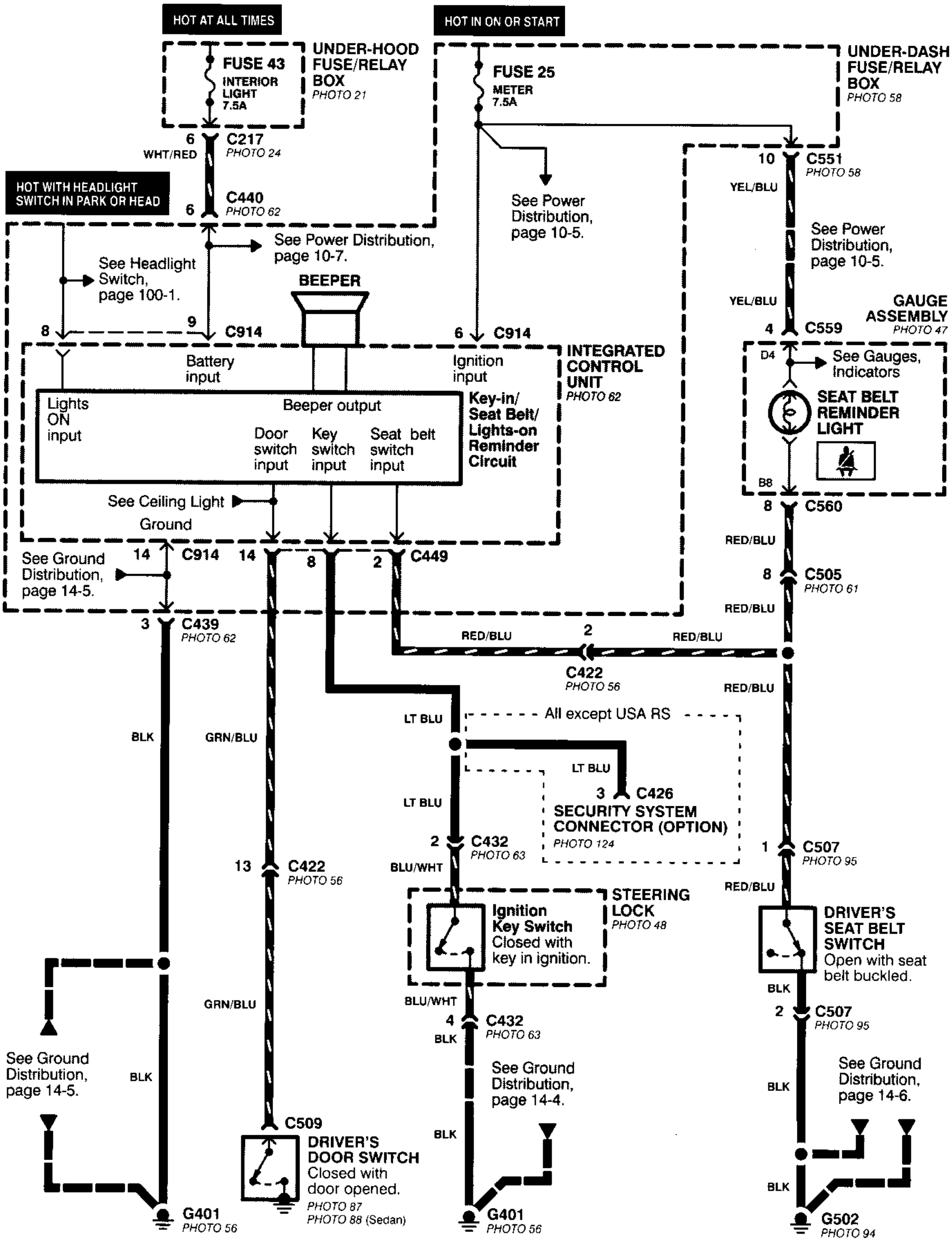
When the engine first starts, before its oil pressure rises above 4.3 psi, voltage is applied to the closed and grounded engine oil pressure switch and the light comes on to test the bulb.

With the engine running, voltage is applied at the WHT/BLU wire of the integrated control unit. With normal engine oil pressure, the engine oil pressure switch is open and the low oil pressure indicator light does not come on. If the engine oil pressure switch closes momentarily (more than 0.5 seconds) but then opens again, the YEL/RED wire at the integrated control unit will sense ground through the switch. The integrated control unit will then provide and remove ground for the low oil pressure indicator light through the YEL/RED wire. The light will flash on and off until you turn the ignition switch off. The flashing feature will not work until 30 seconds after initial voltage is applied to the WHT/BLU wire of the oil pressure indicator flasher circuit. This delay keeps the low oil pressure indicator light from coming on during engine warm-up.

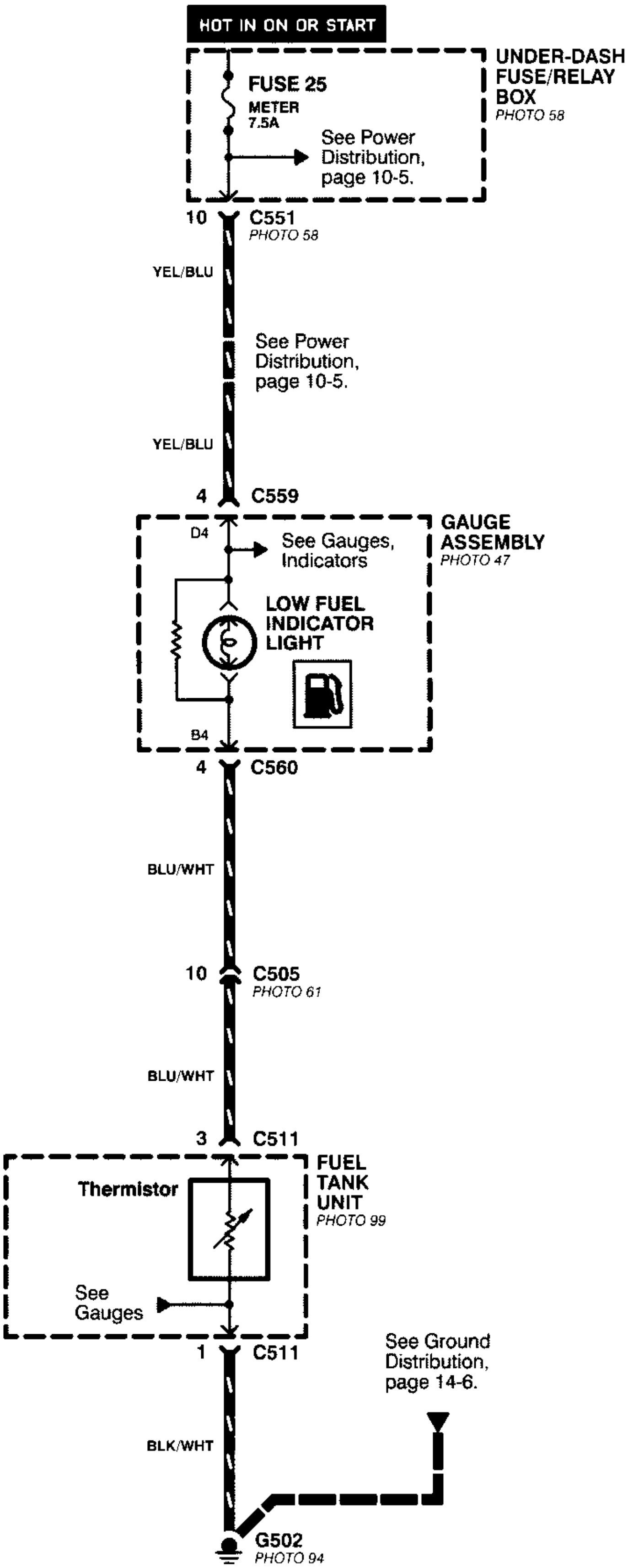
If engine oil pressure falls below 4.3 psi and does not increase, the engine oil pressure switch will stay closed. The low oil pressure indicator light will then come on and stay on.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Seat Belt, Lights-on, and Ignition Key Reminders



Low Fuel Indicator Light



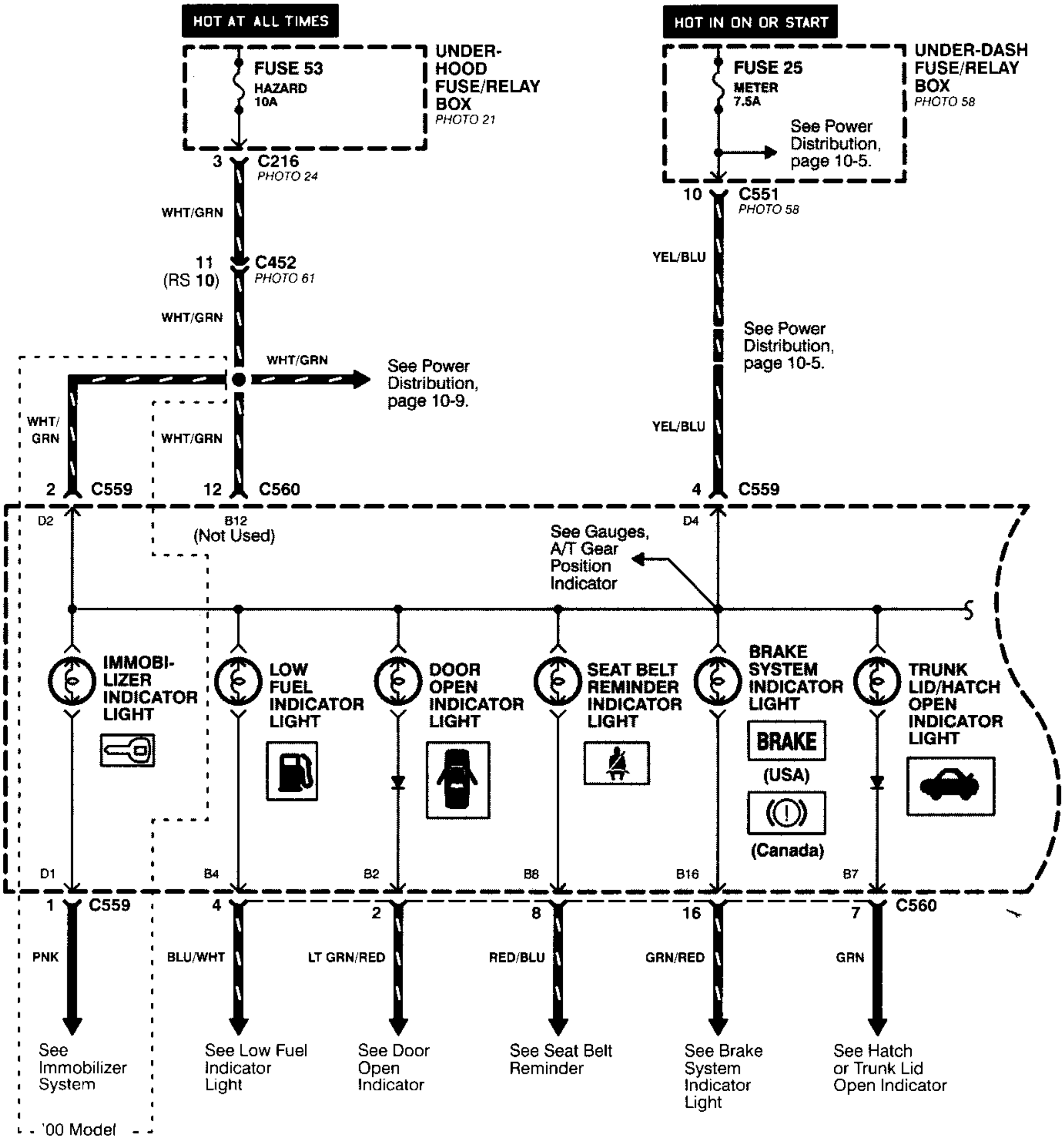
How the Circuit Works

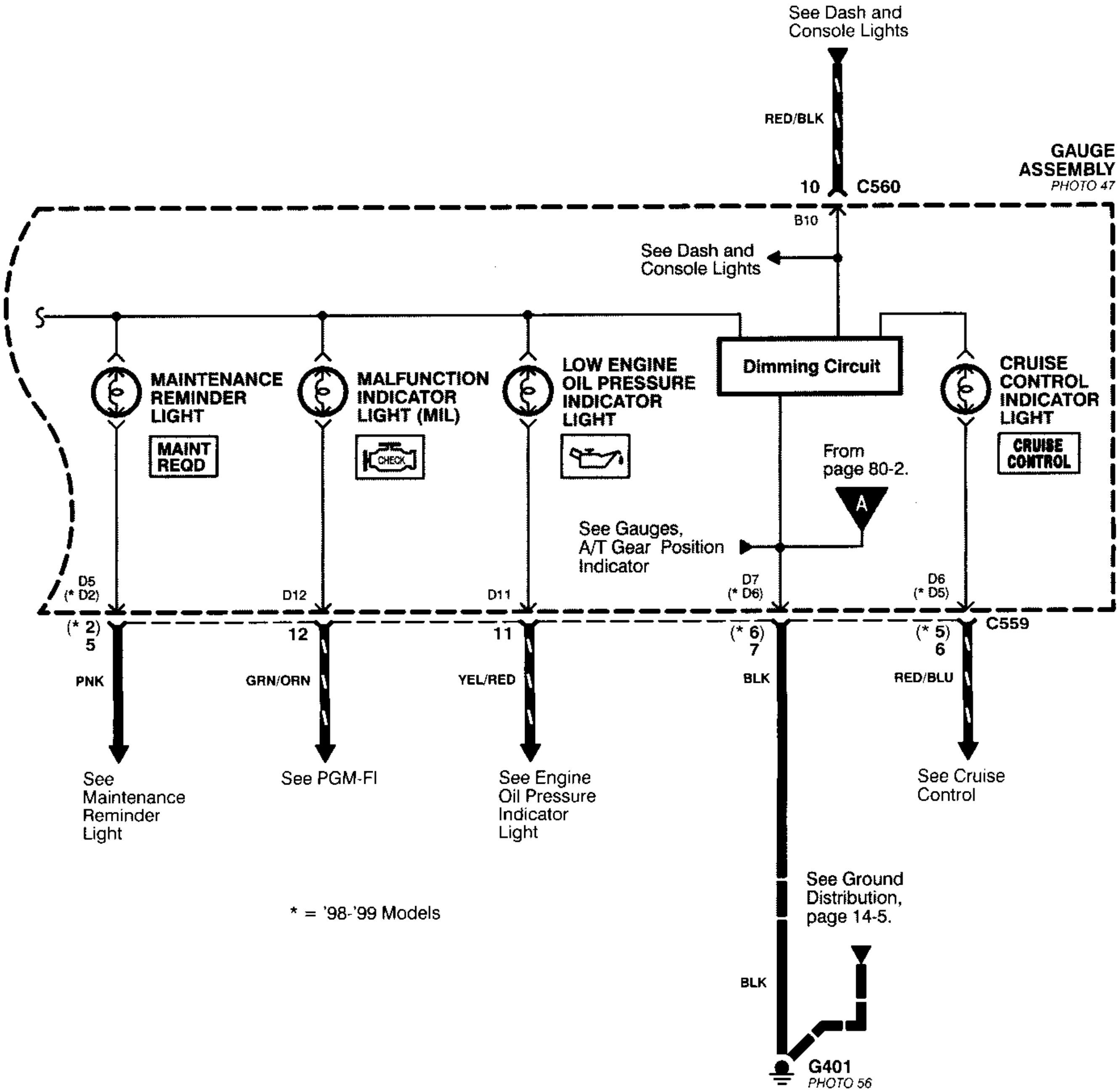
⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame away from the work area. Drain fuel only into an approved container.

A thermistor is mounted in the fuel tank unit. When the thermistor is cool, its resistance is very high. When the thermistor is warm, its resistance decreases. Fuel in the fuel tank transfers heat away from the thermistor fast enough to keep it cool so the thermistor's resistance stays high and the low fuel indicator light does not come on. When the fuel level drops below about 2.2 gallons, the thermistor is no longer immersed in fuel. Without the fuel to cool it, the thermistor's resistance decreases, allowing current to flow through the low fuel indicator light and the thermistor to ground, and the low fuel indicator light comes on.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

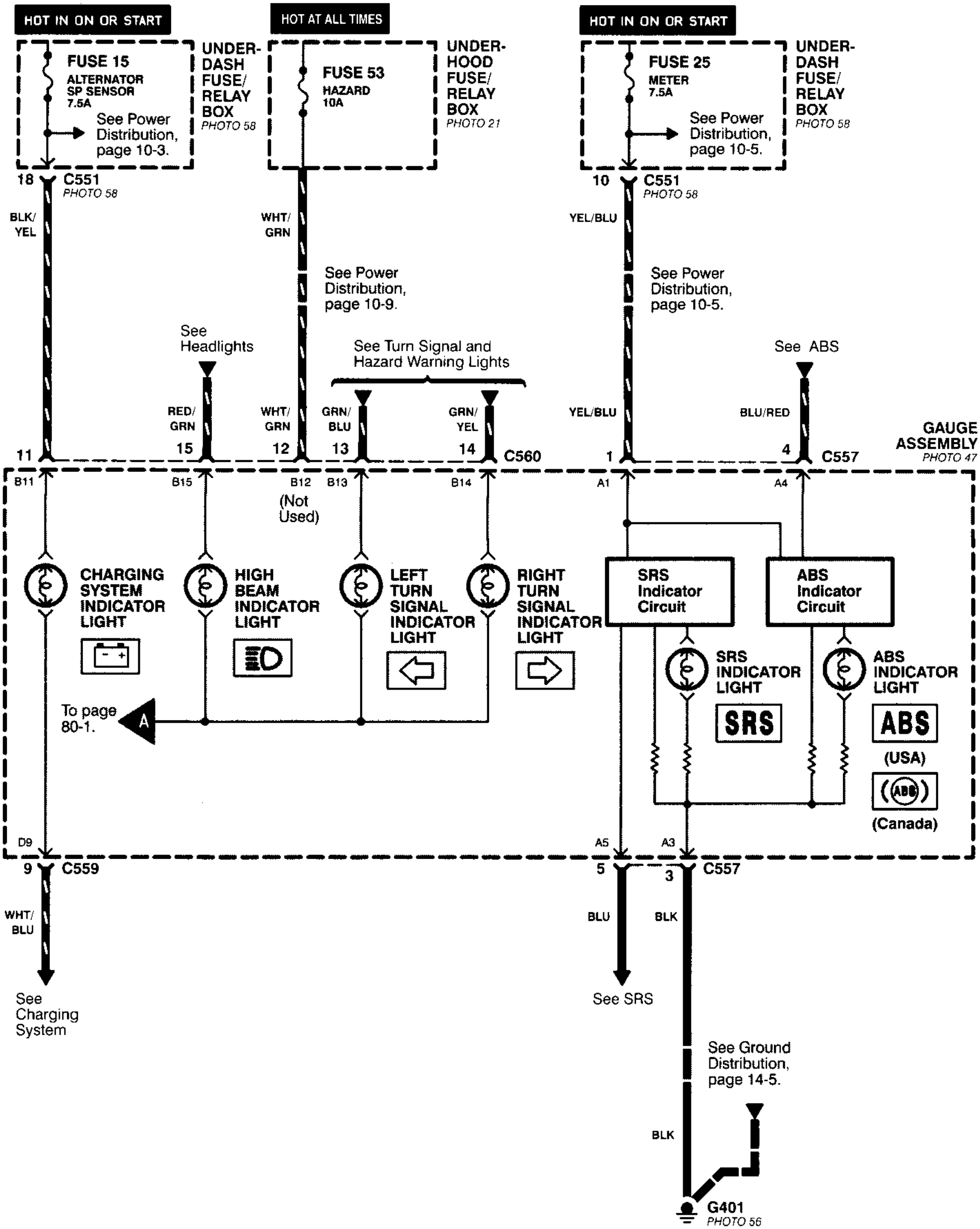

HOT AT ALL TIMES
FUSE 53
HAZARD
10A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
3 C216
PHOTO 24
WHT/GRN
11 (RS 10) C452
PHOTO 61
WHT/GRN
WHT/GRN
See Power Distribution, page 10-9.
WHT/GRN
WHT/GRN
2 C559
12 C560
HOT IN ON OR START
FUSE 25
METER
7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-5.
10 C551
PHOTO 58
YEL/BLU
See Power Distribution, page 10-5.
YEL/BLU
4 C559
D2
B12
(Not Used)
See Gauges, A/T Gear Position Indicator
D4
IMMOBILIZER INDICATOR LIGHT
LOW FUEL INDICATOR LIGHT
DOOR OPEN INDICATOR LIGHT
SEAT BELT REMINDER INDICATOR LIGHT
BRAKE SYSTEM INDICATOR LIGHT
BRAKE
(USA)
(Canada)
TRUNK LID/HATCH OPEN INDICATOR LIGHT
D1
B4
B2
B8
B16
B7
1 C559
4
2
8
16
7 C560
PNK
BLU/WHT
LT GRN/RED
RED/BLU
GRN/RED
GRN
See Immobilizer System
'00 Model
See Low Fuel Indicator Light
See Door Open Indicator
See Seat Belt Reminder
See Brake System Indicator Light
See Hatch or Trunk Lid Open Indicator

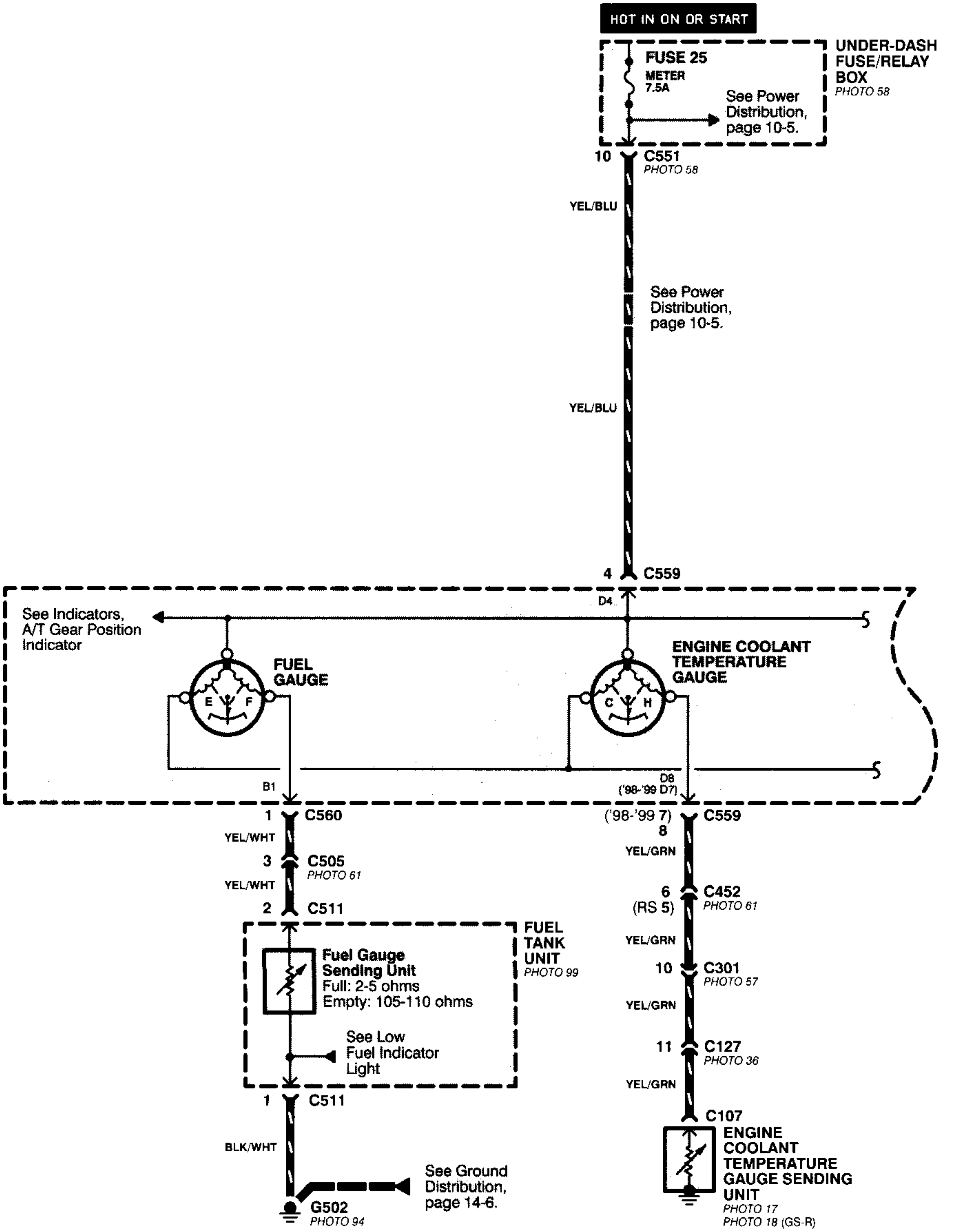


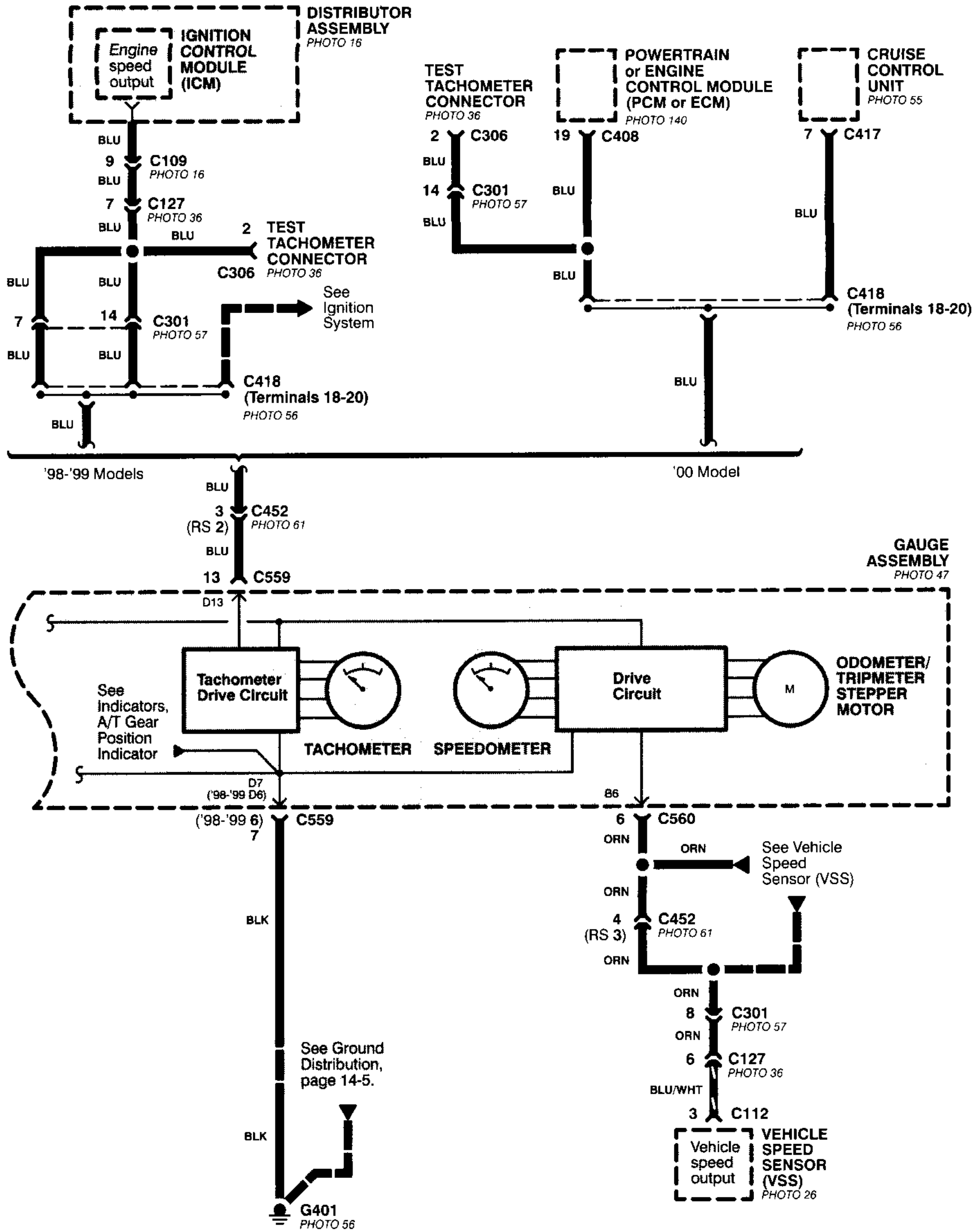
* = '98-'99 Models

(cont'd)

Indicators (cont'd)




HOT IN ON OR START
FUSE 25
METER
7.5A
See Power Distribution, page 10-5.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
10
C551
PHOTO 58
YEL/BLU
See Power Distribution, page 10-5.
YEL/BLU
4
C559
D4
See Indicators, A/T Gear Position Indicator
FUEL GAUGE
E
F
ENGINE COOLANT TEMPERATURE GAUGE
C
H
B1
D8
('98-'99 D7)
1
C560
('98-'99 7)
8
C559
YEL/WHT
3
C505
PHOTO 61
YEL/WHT
2
C511
YEL/GRN
6
(RS 5)
C452
PHOTO 61
FUEL TANK UNIT
PHOTO 99
Fuel Gauge Sending Unit
Full: 2-5 ohms
Empty: 105-110 ohms
YEL/GRN
10
C301
PHOTO 57
YEL/GRN
See Low Fuel Indicator Light
11
C127
PHOTO 36
YEL/GRN
1
C511
C107
ENGINE COOLANT TEMPERATURE GAUGE SENDING UNIT
PHOTO 17
PHOTO 18 (GS-R)
BLK/WHT
See Ground Distribution, page 14-6.
G502
PHOTO 94



DISTRIBUTOR ASSEMBLY
PHOTO 16
Engine speed output
IGNITION CONTROL MODULE (ICM)
BLU
9 C109
PHOTO 16
7 C127
PHOTO 36
2 TEST TACHOMETER CONNECTOR
C306 PHOTO 36
7
14 C301
PHOTO 57
See Ignition System
C418 (Terminals 18-20)
PHOTO 56
'98-'99 Models
TEST TACHOMETER CONNECTOR
PHOTO 36
2 C306
14 C301
PHOTO 57
POWERTRAIN or ENGINE CONTROL MODULE (PCM or ECM)
PHOTO 140
19 C408
CRUISE CONTROL UNIT
PHOTO 55
7 C417
C418 (Terminals 18-20)
PHOTO 56
'00 Model
3 (RS 2) C452
PHOTO 61
13 C559
GAUGE ASSEMBLY
PHOTO 47
D13
Tachometer Drive Circuit
Drive Circuit
M
ODOMETER/ TRIPMETER STEPPER MOTOR
See Indicators, A/T Gear Position Indicator
TACHOMETER
SPEEDOMETER
D7 ('98-'99 D6)
B6
('98-'99 6) 7 C559
BLK
See Ground Distribution, page 14-5.
G401
PHOTO 56
6 C560
ORN
See Vehicle Speed Sensor (VSS)
4 (RS 3) C452
PHOTO 61
8 C301
PHOTO 57
6 C127
PHOTO 36
BLU/WHT
3 C112
Vehicle speed output
VEHICLE SPEED SENSOR (VSS)
PHOTO 26

How the Circuit Works

When the ignition switch is in ON (II) or START (III), battery voltage is supplied through fuse 25 to the gauges in the gauge assembly.

Speedometer and Odometer

The odometer and speedometer drive circuits receive pulses from the vehicle speed sensor (VSS). The pulse rate increases as the car accelerates. The frequency and duration of these input pulses are measured and displayed by the speedometer, odometer and tripmeter.

Tachometer ('98-'99 Models)

The tachometer drive circuit receives pulses from the ignition control module (ICM) in the distributor assembly. The solid-state tachometer then displays these pulses as engine speed. For each 200 pulses per minute from the ignition control module (ICM), the tachometer displays 100 RPM.

Tachometer ('00 Model)

The tachometer drive circuit receives pulses from the PCM or ECM. The solid-state tachometer then displays these pulses as engine speed. For each 200 pulses per minute from the PCM or ECM the tachometer displays 100 RPM.

Engine Coolant Temperature Gauge and Fuel Gauge

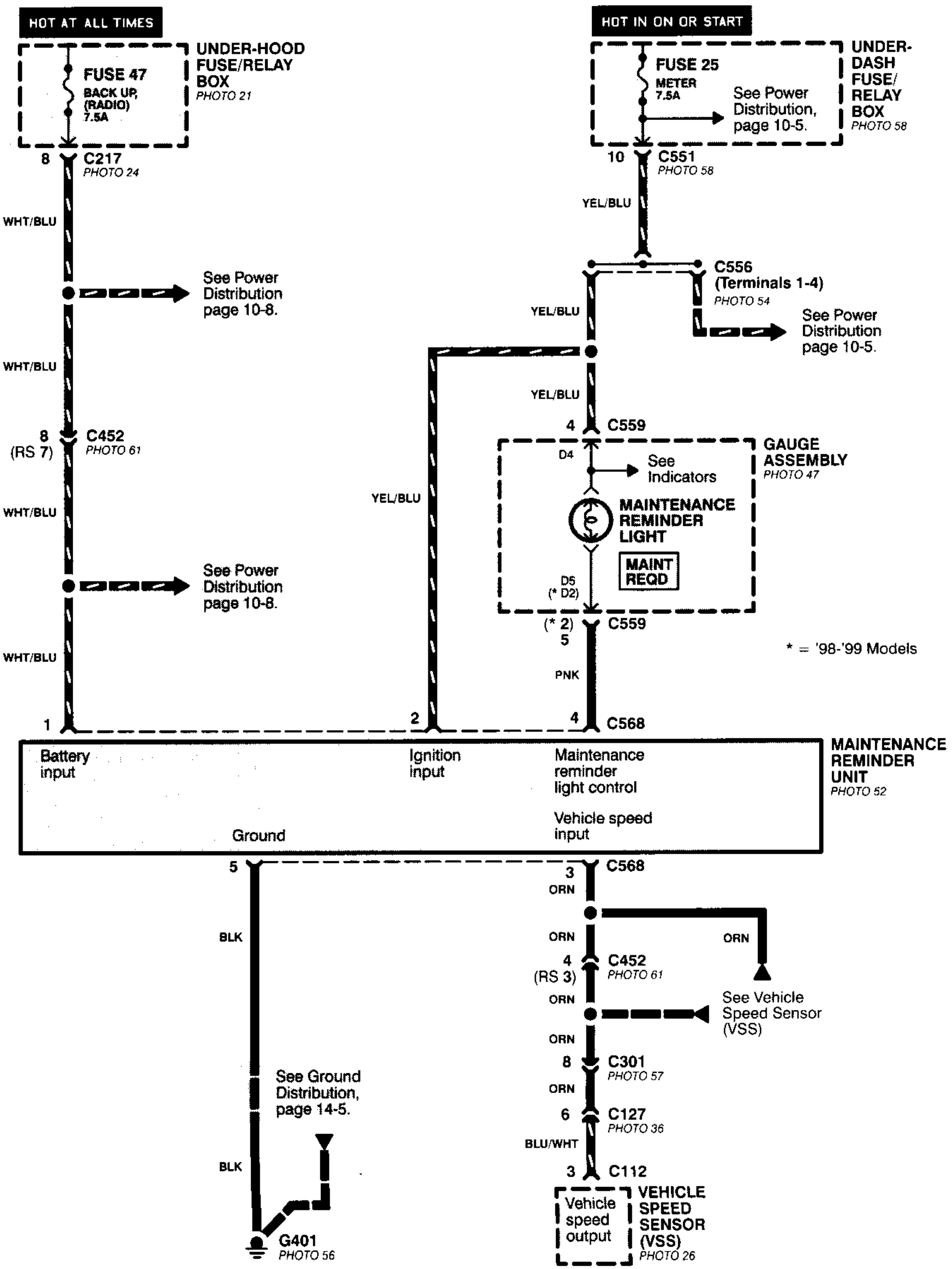
The engine coolant temperature gauge has two intersecting coils wound around a permanent magnet rotor. Voltage applied to the coils, through fuse 25, generates a magnetic field. The magnetic field, controlled by the engine coolant temperature gauge sending unit, causes the rotor to rotate and the gauge needle to move. As the resistance in the sending unit varies, current through the gauge coils changes. The gauge needle moves toward the coil with the strongest magnetic field. The fuel gauge works the same way.

The engine coolant temperature gauge sending unit's resistance varies from about 137 ohms at low engine temperature to between 30–46 ohms at high temperature (radiator fan running).

The fuel gauge sending unit's resistance varies from about 2–5 ohms at full, to about 110 ohms at empty. When you turn the ignition switch to LOCK (0), the gauge remains at the last reading until you turn the ignition switch to ON (II) or START (III) again.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Maintenance Reminder Light



How the Circuit Works

The maintenance reminder light comes on to remind the driver that the car is due for scheduled maintenance.

The maintenance reminder unit receives a vehicle speed input from the vehicle speed sensor (VSS) and uses this information to compute the distance traveled. For the first 6000 ± 100 miles (9650 ± 160 km) after the maintenance reminder light is reset, it will come on for two seconds when you turn the ignition switch to ON (II) as a bulb check.

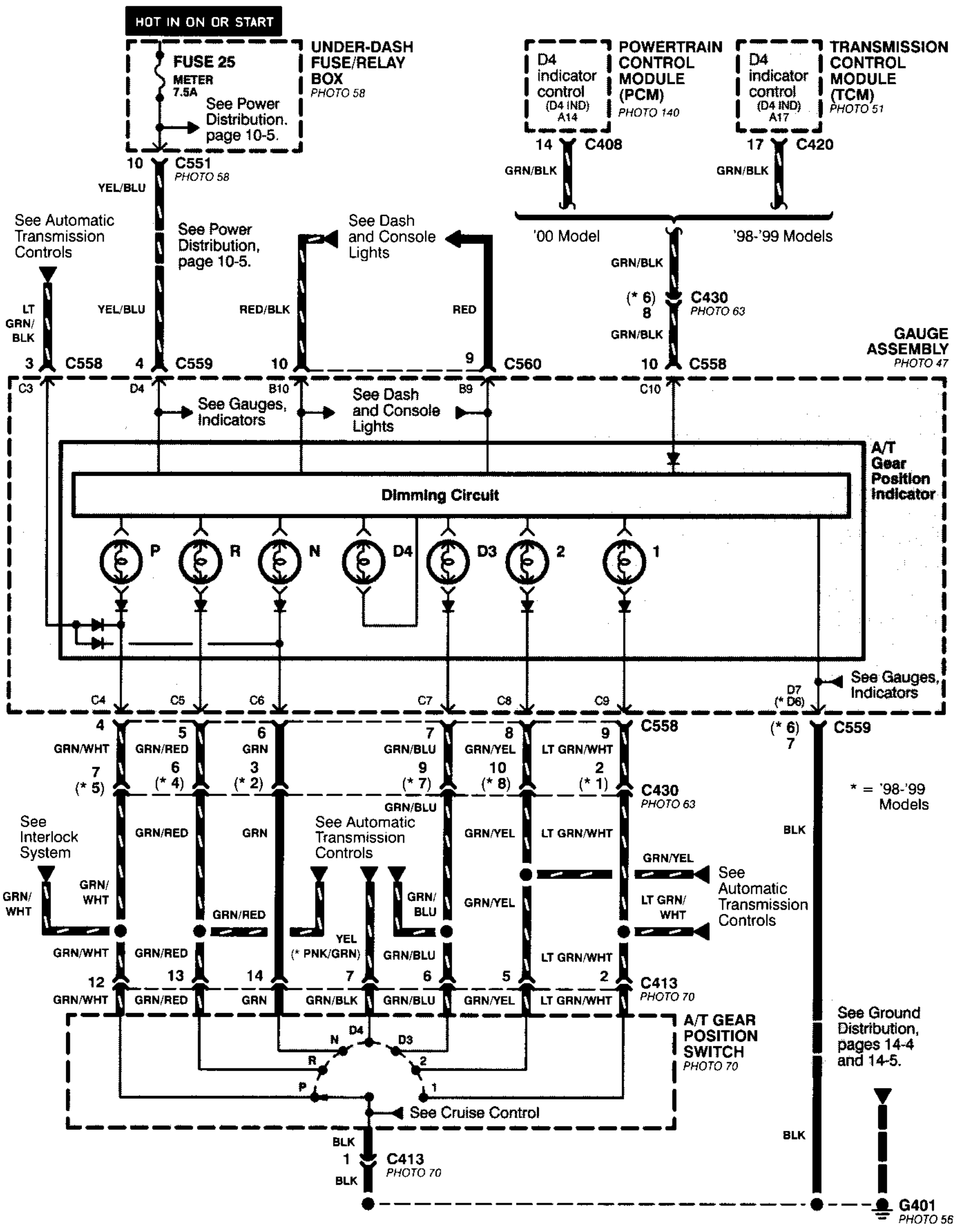
Between 6000 ± 100 miles (9650 ± 160 km) and 7500 ± 100 miles (12070 ± 160 km) the reminder light will come on for two seconds when you turn the ignition switch to ON (II), and then flash for eight seconds more.

Beyond 7500 ± 100 miles (12070 ± 160 km) the reminder light will stay on when the ignition switch is in the ON (II) position until the unit is reset.

To reset the unit, the car must be parked and the ignition switch in the ON (II) position. Press the reset button on the unit and hold it there for more than three seconds, and the reminder light will go off.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

A/T Gear Position Indicator



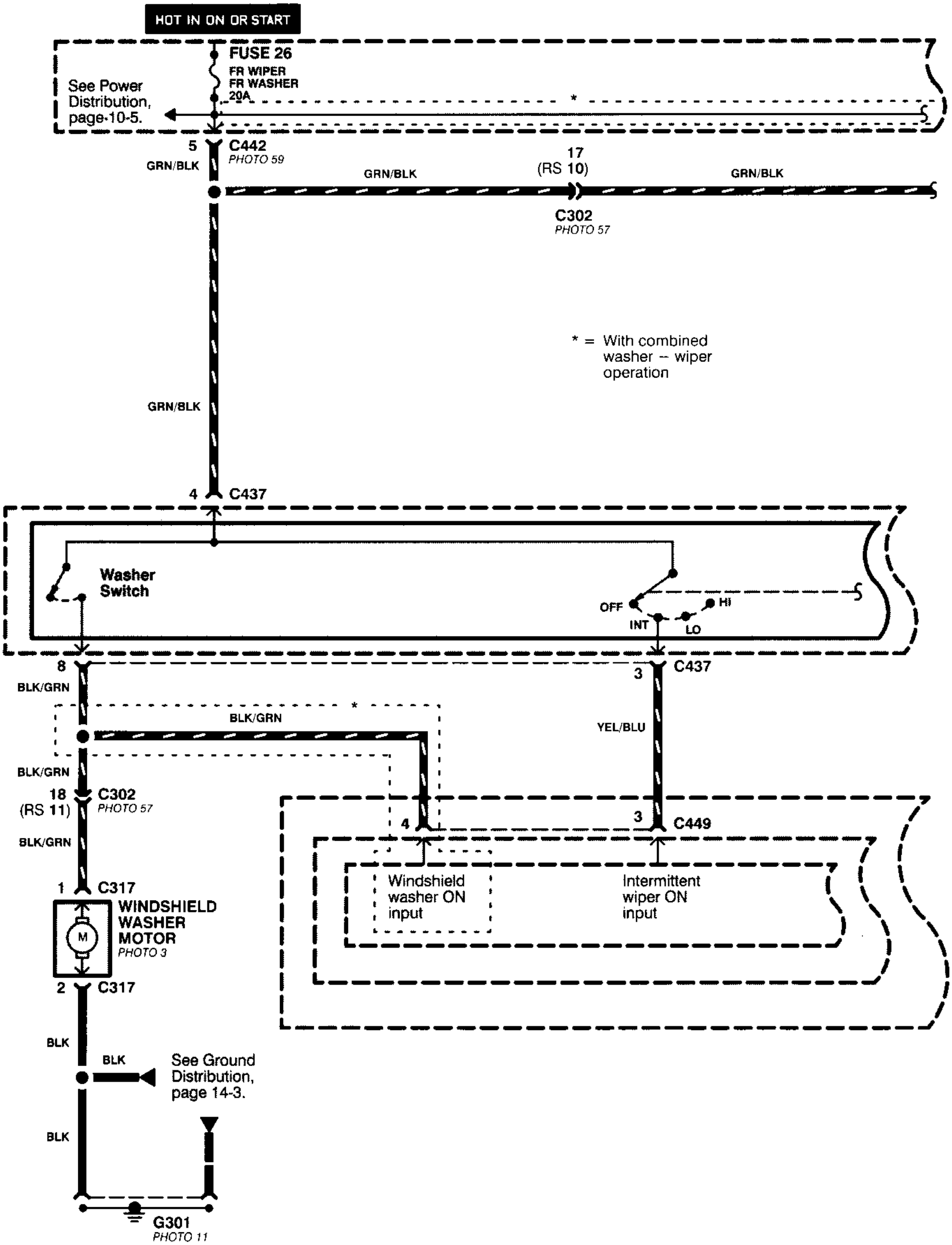
How the Circuit Works

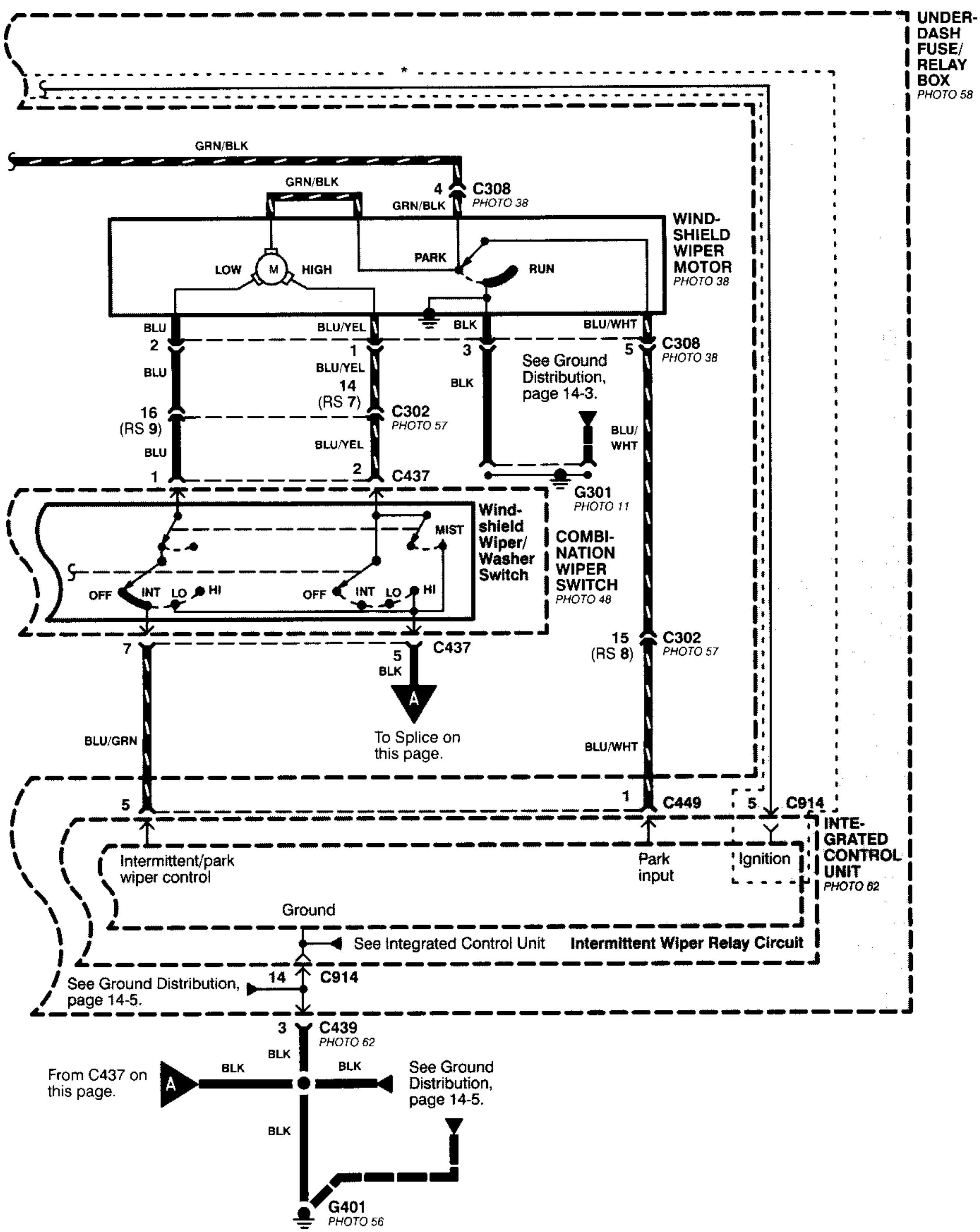
With the ignition switch in ON (II) or START (III), voltage is applied to the A/T gear position indicator. The A/T gear position switch provides a ground for each position. As an input is grounded, its indicator light comes on. If you select R, for example, ground will be applied to the input of the A/T gear position indicator, and the R indicator bulb will come on.

With the headlight switch in PARK or HEAD, voltage is applied to the RED/BLK wire terminal. this changes the indicator panel illumination from fixed to controlled by the dash lights dimmer input through the RED wire.

When the transmission ('98-'99 models) or powertrain ('00 model) control module (TCM or PCM) detects an abnormality in the automatic transmission control system, or when you request diagnostic trouble codes through the service check connector, the TCM or PCM will make the D4 indicator light blink.

Refer to the Service Manual (Section 14, Automatic Transmission) for specific tests or troubleshooting procedures.


HOT IN ON OR START
FUSE 26
FR WIPER
FR WASHER
20A
See Power Distribution, page 10-5.
*
5
C442
PHOTO 59
GRN/BLK
GRN/BLK
17
(RS 10)
GRN/BLK
C302
PHOTO 57
* = With combined washer – wiper operation
GRN/BLK
4
C437
Washer Switch
OFF
HI
INT
LO
8
3
C437
BLK/GRN
*
BLK/GRN
YEL/BLU
BLK/GRN
18
(RS 11)
C302
PHOTO 57
BLK/GRN
4
3
C449
1
C317
WINDSHIELD WASHER MOTOR
PHOTO 3
M
Windshield washer ON input
Intermittent wiper ON input
2
C317
BLK
BLK
See Ground Distribution, page 14-3.
BLK
G301
PHOTO 11


UNDER-DASH FUSE/RELAY BOX
PHOTO 58
GRN/BLK
4
C308
PHOTO 38
WIND-SHIELD WIPER MOTOR
PHOTO 38
LOW
M
HIGH
PARK
RUN
BLU
BLU/YEL
BLK
BLU/WHT
2
1
3
5
C308
PHOTO 38
See Ground Distribution, page 14-3.
14
(RS 7)
16
(RS 9)
C302
PHOTO 57
BLU/WHT
C437
G301
PHOTO 11
Wind-shield Wiper/ Washer Switch
COMBI-NATION WIPER SWITCH
PHOTO 48
MIST
OFF
INT
LO
HI
7
5
C437
15
(RS 8)
C302
PHOTO 57
BLU/GRN
A
To Splice on this page.
C449
C914
INTE-GRATED CONTROL UNIT
PHOTO 62
Intermittent/park wiper control
Park input
Ignition
Ground
See Integrated Control Unit Intermittent Wiper Relay Circuit
See Ground Distribution, page 14-5.
14
C914
3
C439
PHOTO 62
From C437 on this page.
See Ground Distribution, page 14-5.
G401
PHOTO 56

Wiper/Washer (cont'd)

How the Circuit Works

When the ignition switch is in ON (II) or START (III), battery voltage is applied to the windshield wiper/washer switch, and the windshield wiper motor.

Low Speed

When you turn the wiper switch to LO, the wiper motor's low speed winding is grounded through the BLU wire and the LO speed contacts of the wiper switch at G401, and the wipers run at low speed.

Park/Off

When you turn the wiper switch OFF, the integrated control unit (PARK input) grounds the wiper motor through the BLU/WHT wire. The cam switch on the motor signals the integrated control unit that the wipers are in the PARK position; the control unit then removes ground from the motor, and the wipers stop in the PARK position.

High Speed

When the wiper switch is in HI, the high speed windings of the windshield wiper motor are grounded through the BLU/YEL wire and the HI contacts of the wiper switch at G401, and the wipers run at high speed.

Intermittent

When the wiper switch is in INT, battery voltage is applied through the YEL/BLU wire to the integrated control unit (Intermittent wiper ON input). The integrated control unit (Intermittent/Park Wiper Control) grounds the low speed windings of the wiper motor and the wipers make a single sweep every few seconds (See Low Speed above). When the wiper returns to the PARK position, the park switch applies battery voltage through the BLU/WHT wire to the integrated control unit (PARK input), and the wipers stop in the PARK position.

Mist

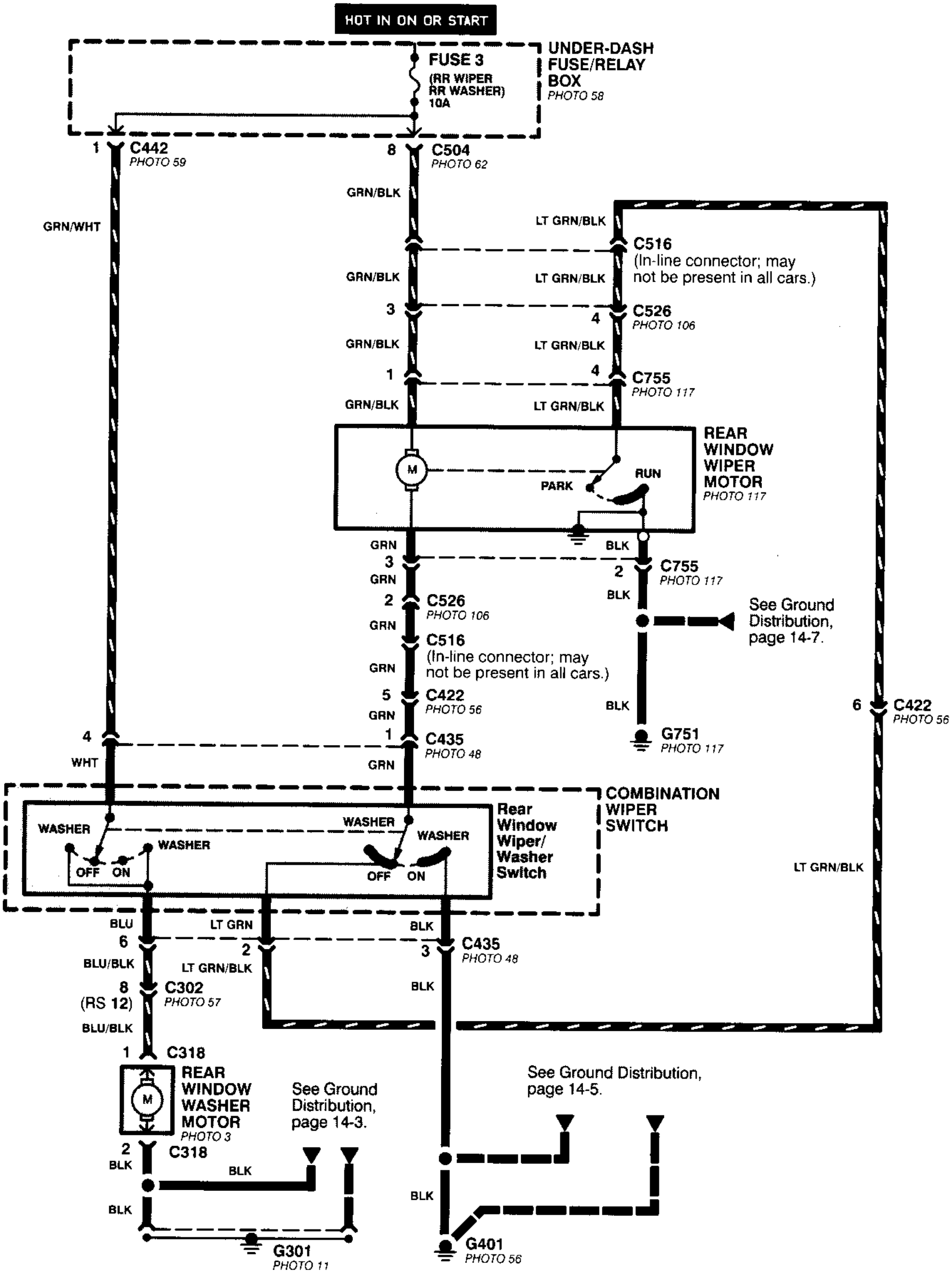
When you pull the wiper switch down to MIST position, the high speed windings of the wiper motor are grounded through the BLU/YEL wire and the closed contacts of the mist switch at G401, and the wipers make one pass across the windshield at high speed. The PARK/OFF function then takes over and the wipers stop in the PARK position.

Washer

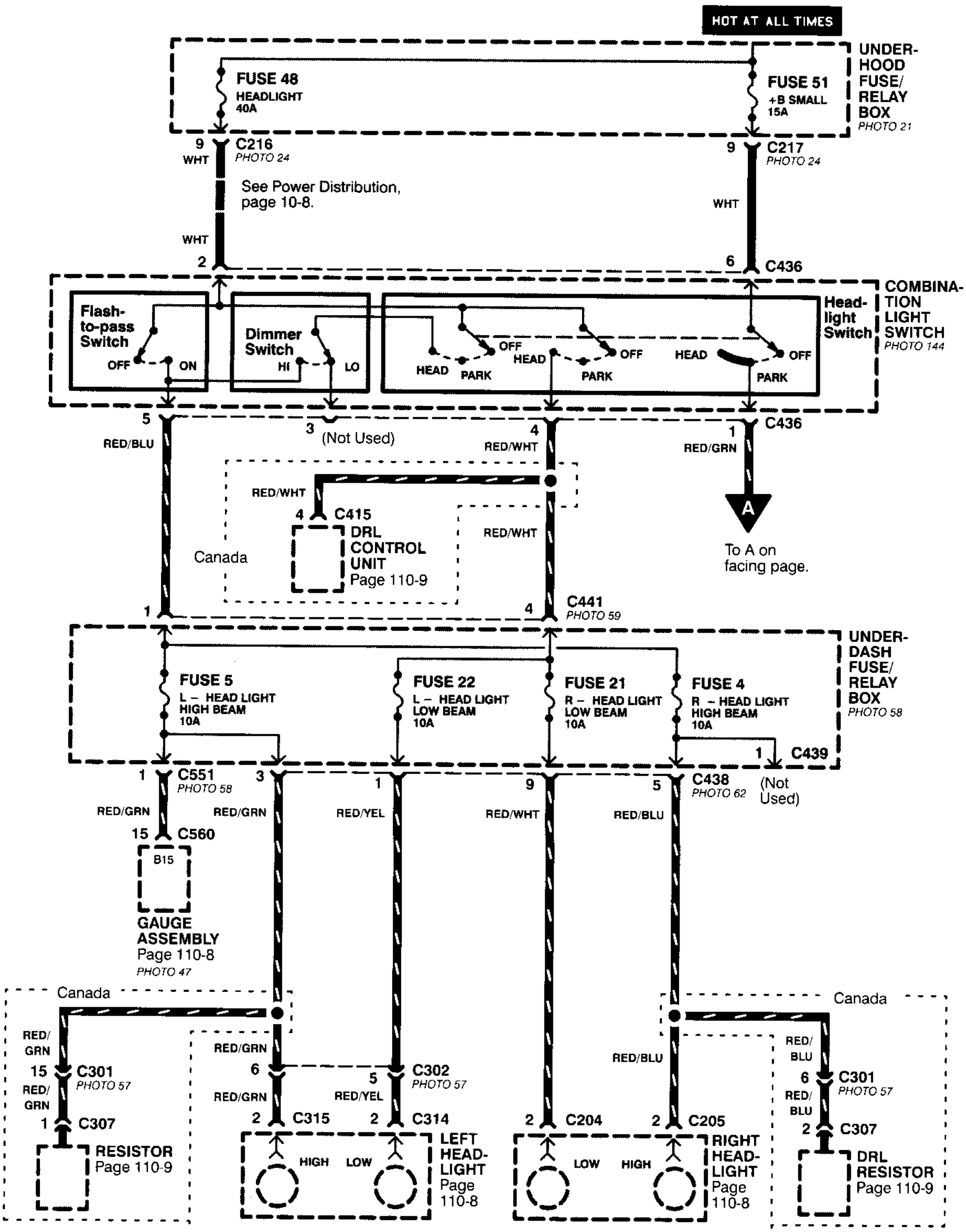
When you pull the wiper switch toward you to turn on the washer switch, battery voltage is applied to the washer motor. The motor pumps fluid onto the windshield until you release the lever. On models with combined wiper/washer operation (Canada), the integrated control unit (windshield washer ON input) senses power at the BLK/GRN wire terminal and runs the washer motor whenever the wipers run.

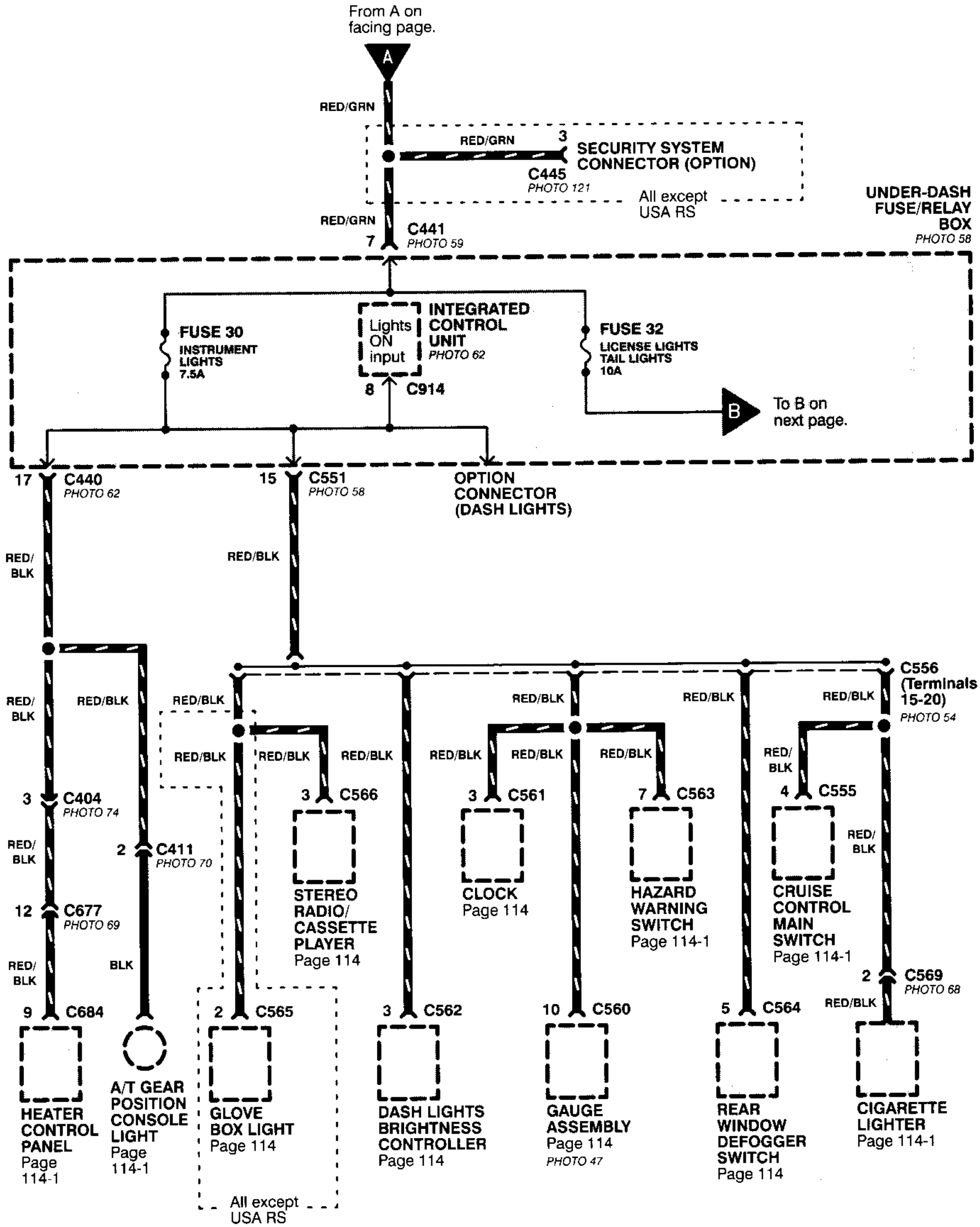
Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Rear Wiper/Washer



Headlight Switch

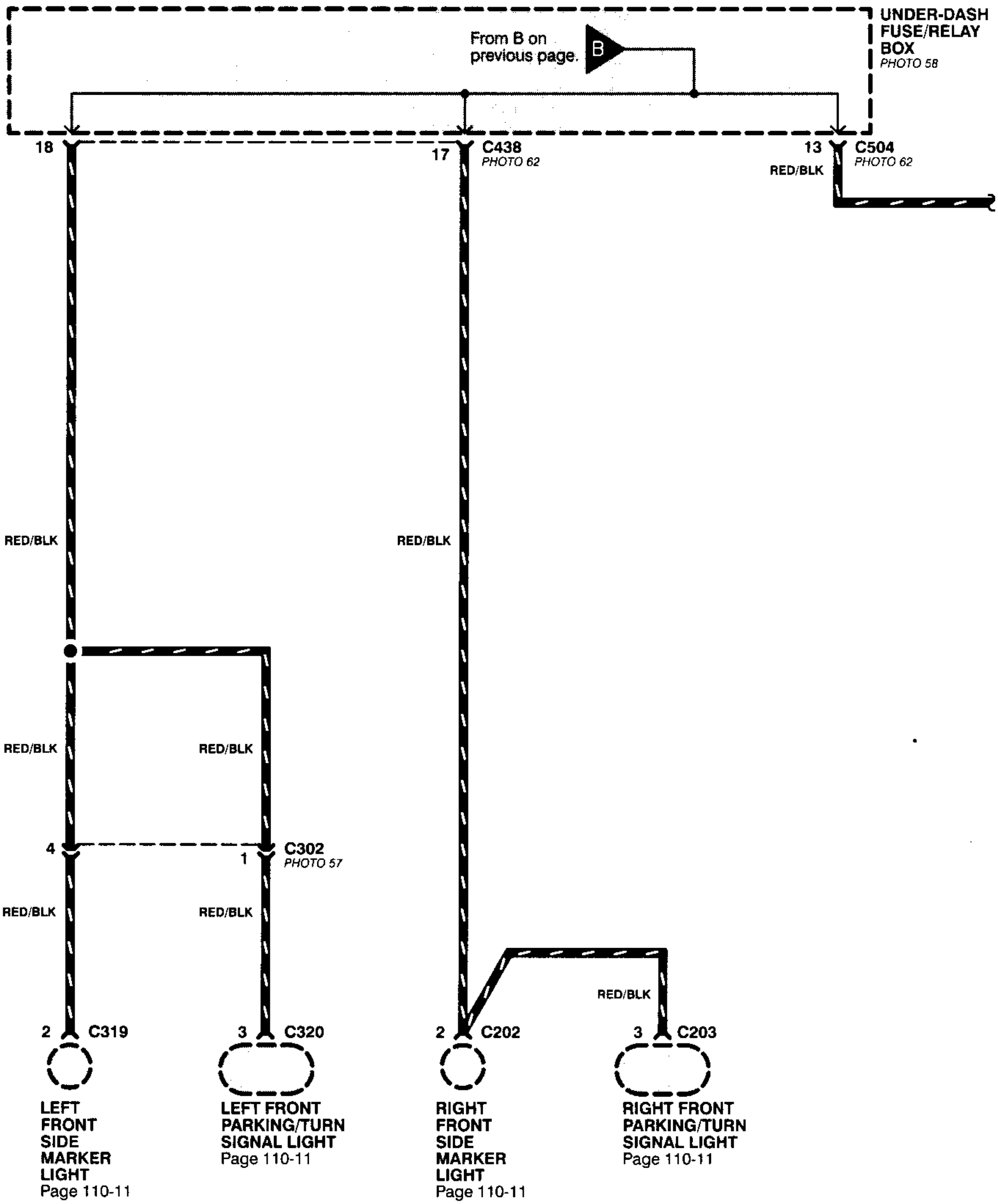


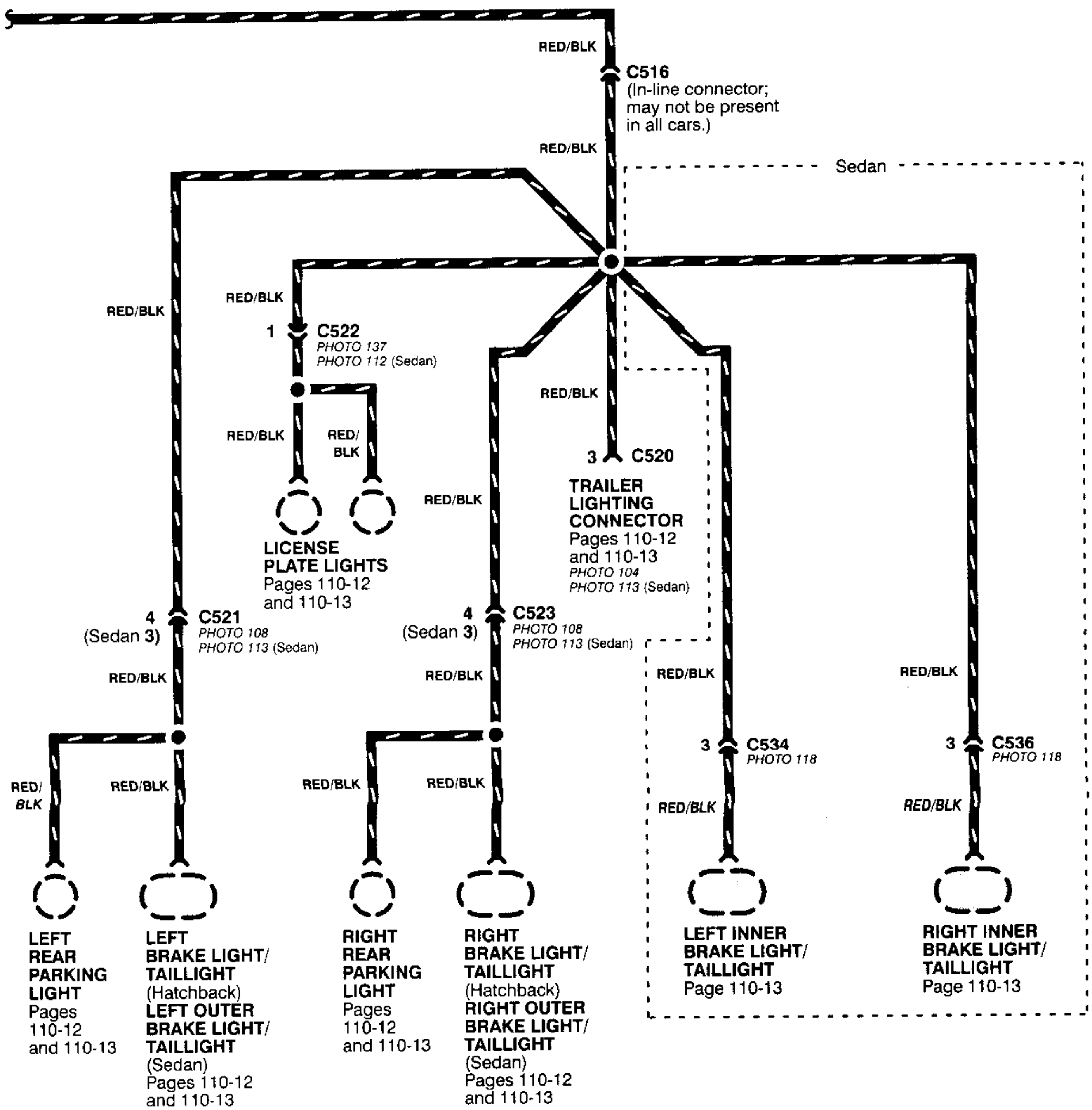


From A on facing page.
A
RED/GRN
RED/GRN
3
SECURITY SYSTEM CONNECTOR (OPTION)
C445
PHOTO 121
All except USA RS
RED/GRN
C441
PHOTO 59
7
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 30
INSTRUMENT LIGHTS
7.5A
Lights ON input
INTEGRATED CONTROL UNIT
PHOTO 62
8
C914
FUSE 32
LICENSE LIGHTS
TAIL LIGHTS
10A
B
To B on next page.
17
C440
PHOTO 62
15
C551
PHOTO 58
OPTION CONNECTOR (DASH LIGHTS)
RED/BLK
RED/BLK
C556 (Terminals 15-20)
PHOTO 54
3
C404
PHOTO 74
2
C411
PHOTO 70
12
C677
PHOTO 69
BLK
9
C684
HEATER CONTROL PANEL
Page 114-1
A/T GEAR POSITION CONSOLE LIGHT
Page 114-1
3
C566
STEREO RADIO/ CASSETTE PLAYER
Page 114
2
C565
GLOVE BOX LIGHT
Page 114
All except USA RS
3
C562
DASH LIGHTS BRIGHTNESS CONTROLLER
Page 114
3
C561
CLOCK
Page 114
10
C560
GAUGE ASSEMBLY
Page 114
PHOTO 47
7
C563
HAZARD WARNING SWITCH
Page 114-1
5
C564
REAR WINDOW DEFOGGER SWITCH
Page 114
4
C555
CRUISE CONTROL MAIN SWITCH
Page 114-1
2
C569
PHOTO 68
CIGARETTE LIGHTER
Page 114-1

(cont'd)

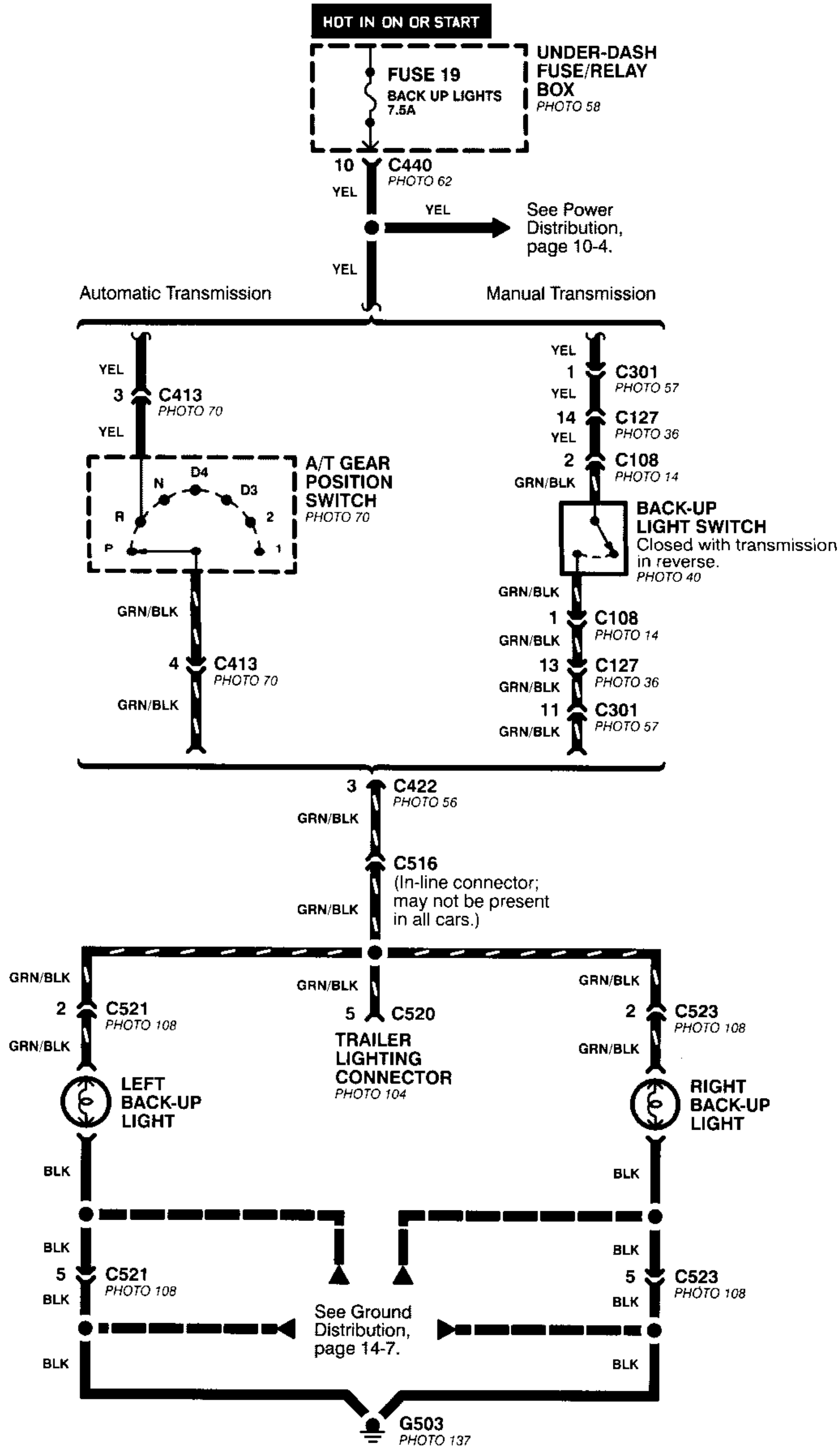
Headlight Switch (cont'd)



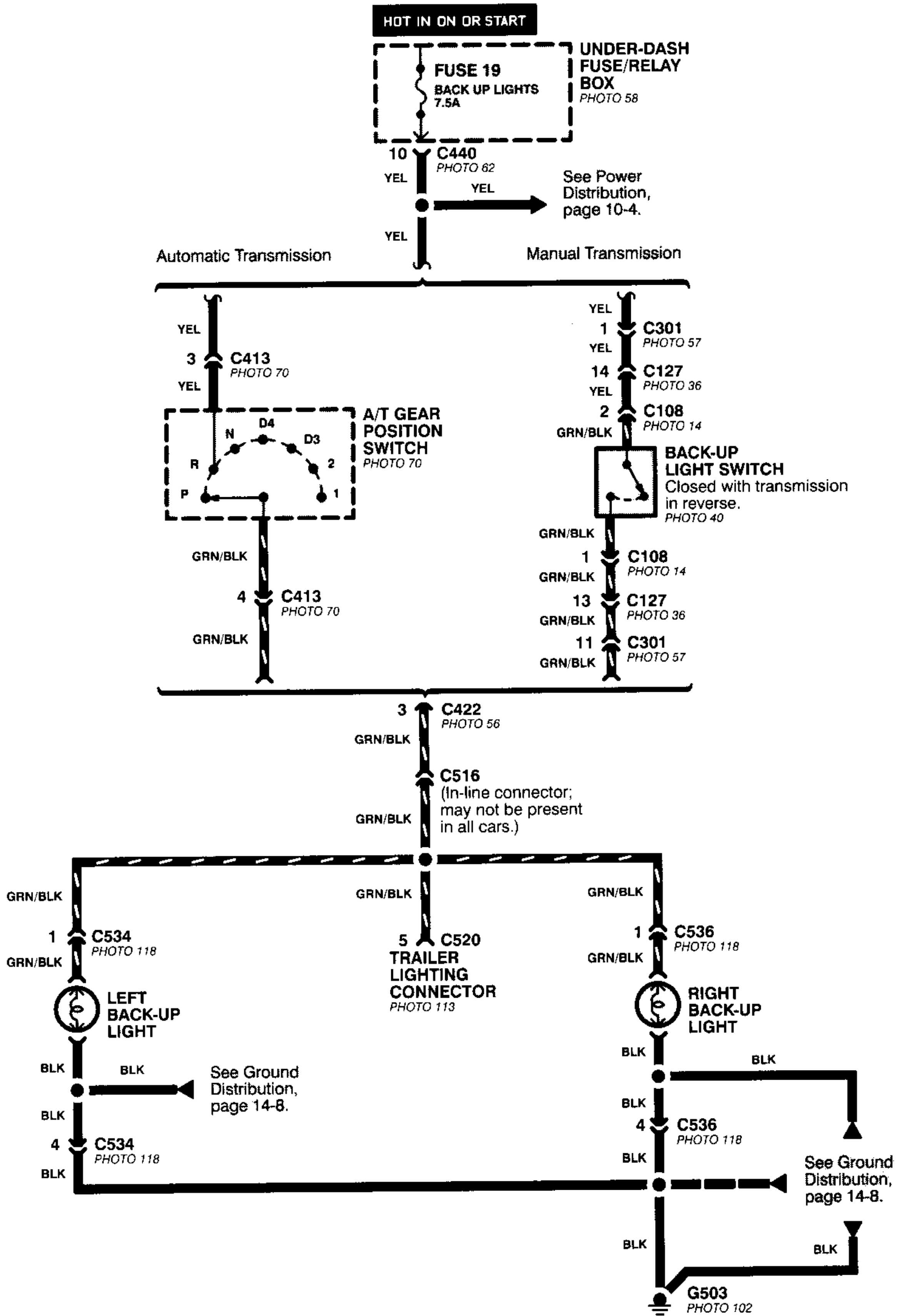

RED/BLK
C516
(In-line connector; may not be present in all cars.)
RED/BLK
Sedan
RED/BLK
1 C522
PHOTO 137
PHOTO 112 (Sedan)
RED/BLK
RED/BLK
RED/BLK
3 C520
TRAILER LIGHTING CONNECTOR
Pages 110-12 and 110-13
PHOTO 104
PHOTO 113 (Sedan)
LICENSE PLATE LIGHTS
Pages 110-12 and 110-13
4 (Sedan 3) C521
PHOTO 108
PHOTO 113 (Sedan)
4 (Sedan 3) C523
PHOTO 108
PHOTO 113 (Sedan)
3 C534
PHOTO 118
3 C536
PHOTO 118
LEFT REAR PARKING LIGHT
Pages 110-12 and 110-13
LEFT BRAKE LIGHT/ TAILLIGHT (Hatchback)
LEFT OUTER BRAKE LIGHT/ TAILLIGHT (Sedan)
Pages 110-12 and 110-13
RIGHT REAR PARKING LIGHT
Pages 110-12 and 110-13
RIGHT BRAKE LIGHT/ TAILLIGHT (Hatchback)
RIGHT OUTER BRAKE LIGHT/ TAILLIGHT (Sedan)
Pages 110-12 and 110-13
LEFT INNER BRAKE LIGHT/ TAILLIGHT
Page 110-13
RIGHT INNER BRAKE LIGHT/ TAILLIGHT
Page 110-13

Back-up Lights

- Hatchback

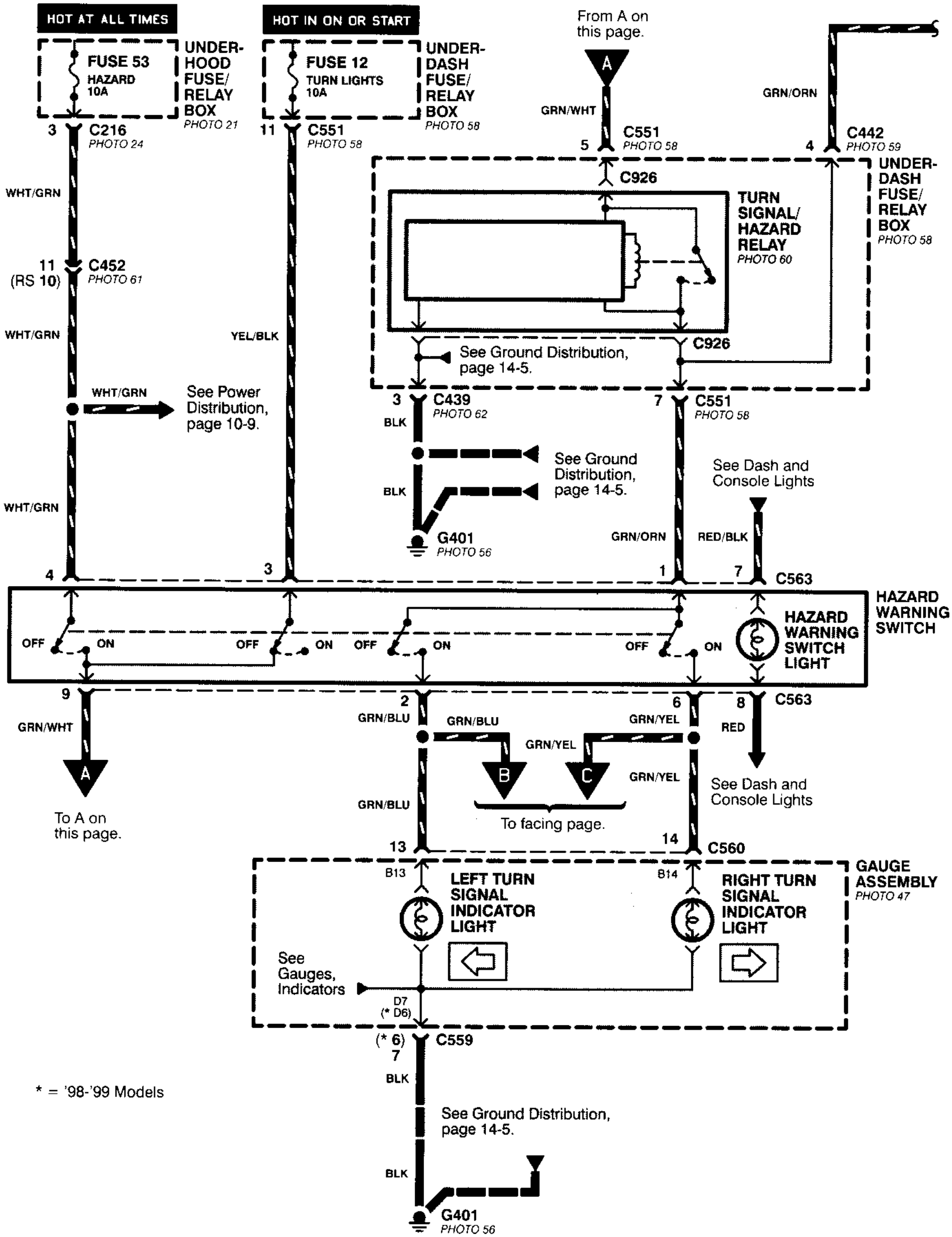


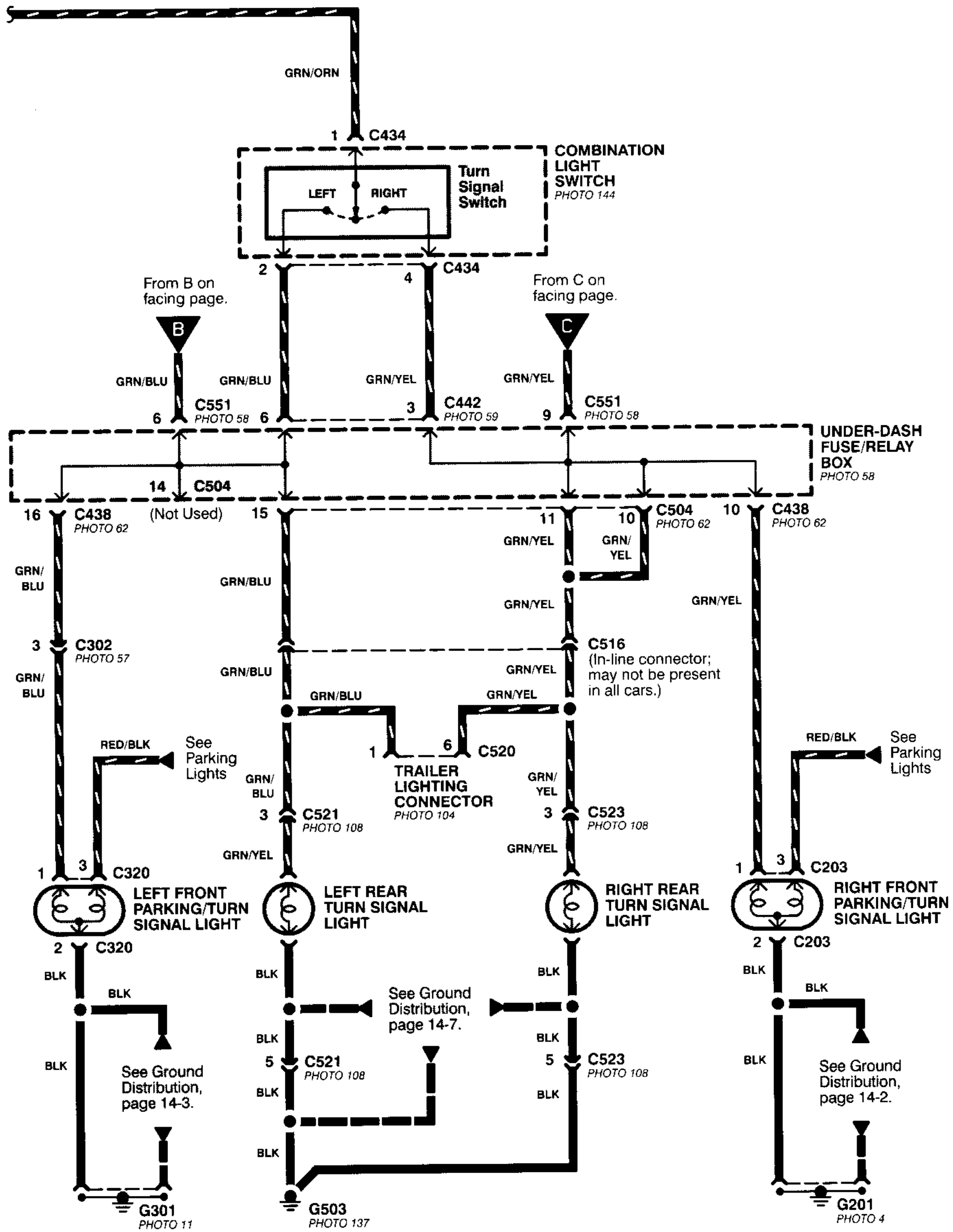
- Sedan


HOT IN ON OR START
FUSE 19
BACK UP LIGHTS 7.5A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
10
C440
PHOTO 62
YEL
YEL
See Power Distribution, page 10-4.
YEL
Automatic Transmission
Manual Transmission
YEL
3
C413
PHOTO 70
YEL
A/T GEAR POSITION SWITCH
PHOTO 70
D4
N
D3
R
2
P
1
GRN/BLK
4
C413
PHOTO 70
GRN/BLK
YEL
1
C301
PHOTO 57
YEL
14
C127
PHOTO 36
YEL
2
C108
PHOTO 14
GRN/BLK
BACK-UP LIGHT SWITCH
Closed with transmission in reverse.
PHOTO 40
GRN/BLK
1
C108
PHOTO 14
GRN/BLK
13
C127
PHOTO 36
GRN/BLK
11
C301
PHOTO 57
GRN/BLK
3
C422
PHOTO 56
GRN/BLK
C516
(In-line connector; may not be present in all cars.)
GRN/BLK
GRN/BLK
1
C534
PHOTO 118
GRN/BLK
LEFT BACK-UP LIGHT
GRN/BLK
5
C520
TRAILER LIGHTING CONNECTOR
PHOTO 113
GRN/BLK
1
C536
PHOTO 118
GRN/BLK
RIGHT BACK-UP LIGHT
BLK
BLK
See Ground Distribution, page 14-8.
BLK
4
C534
PHOTO 118
BLK
BLK
BLK
BLK
4
C536
PHOTO 118
BLK
See Ground Distribution, page 14-8.
BLK
BLK
G503
PHOTO 102

Turn Signal and Hazard Warning Lights

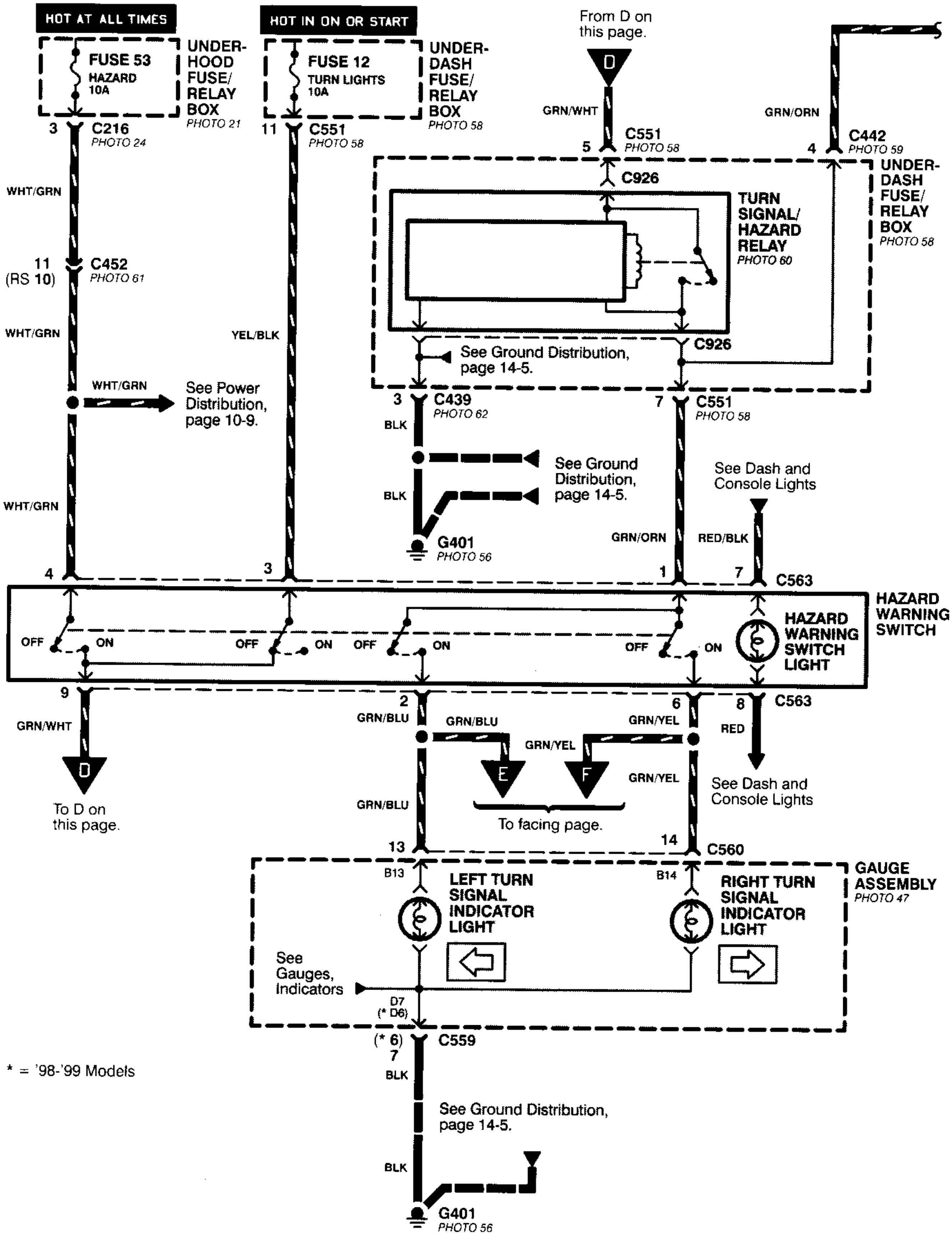
– Hatchback



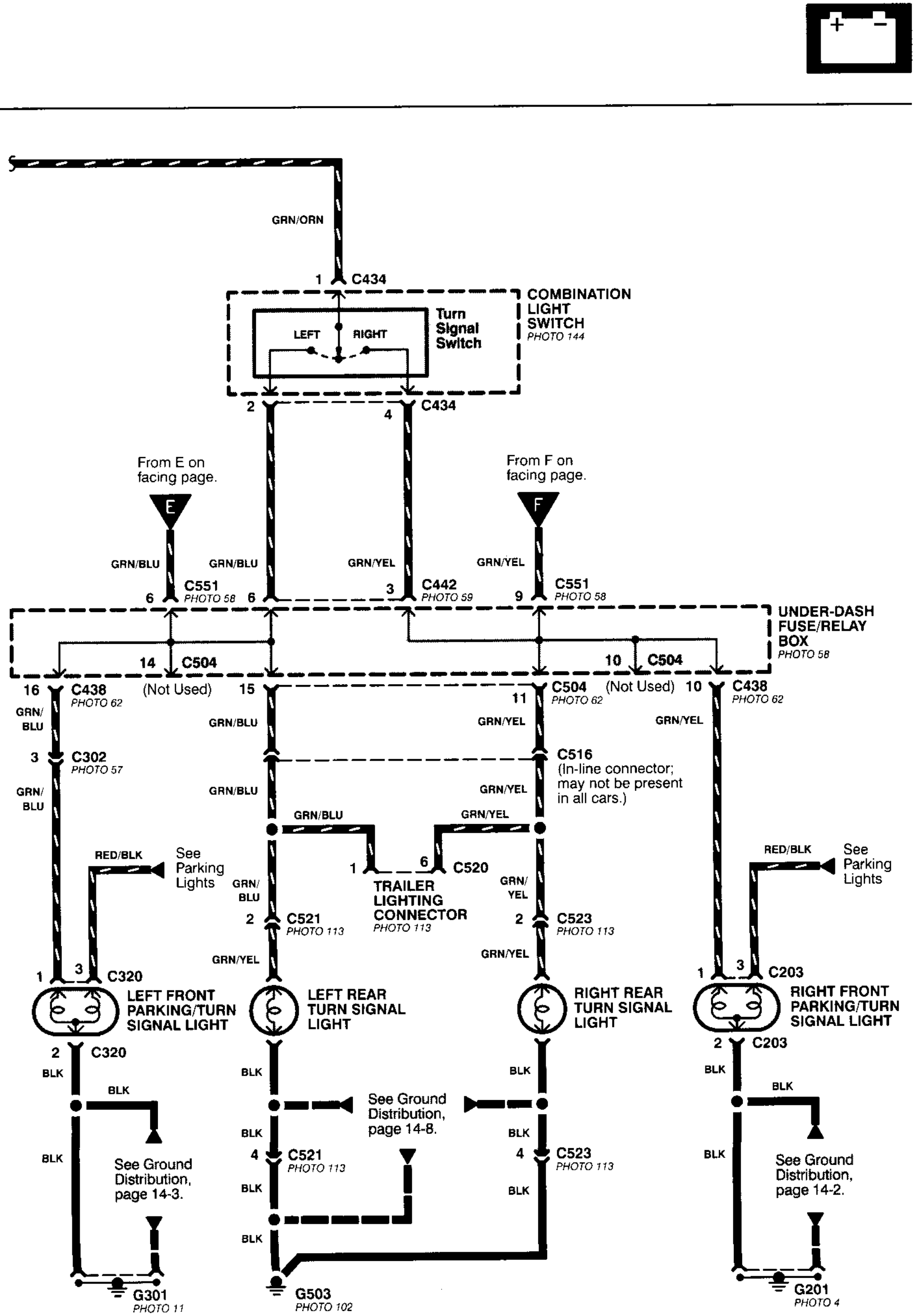

GRN/ORN
C434
COMBINATION LIGHT SWITCH
PHOTO 144
Turn Signal Switch
LEFT
RIGHT
From B on facing page.
From C on facing page.
GRN/BLU
GRN/YEL
C551
PHOTO 58
C442
PHOTO 59
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C504
(Not Used)
C438
PHOTO 62
C302
PHOTO 57
C516
(In-line connector; may not be present in all cars.)
RED/BLK
See Parking Lights
TRAILER LIGHTING CONNECTOR
PHOTO 104
C520
C521
PHOTO 108
C523
PHOTO 108
C320
LEFT FRONT PARKING/TURN SIGNAL LIGHT
LEFT REAR TURN SIGNAL LIGHT
RIGHT REAR TURN SIGNAL LIGHT
C203
RIGHT FRONT PARKING/TURN SIGNAL LIGHT
BLK
See Ground Distribution, page 14-3.
See Ground Distribution, page 14-7.
See Ground Distribution, page 14-2.
G301
PHOTO 11
G503
PHOTO 137
G201
PHOTO 4

Turn Signal and Hazard Warning Lights

- Sedan



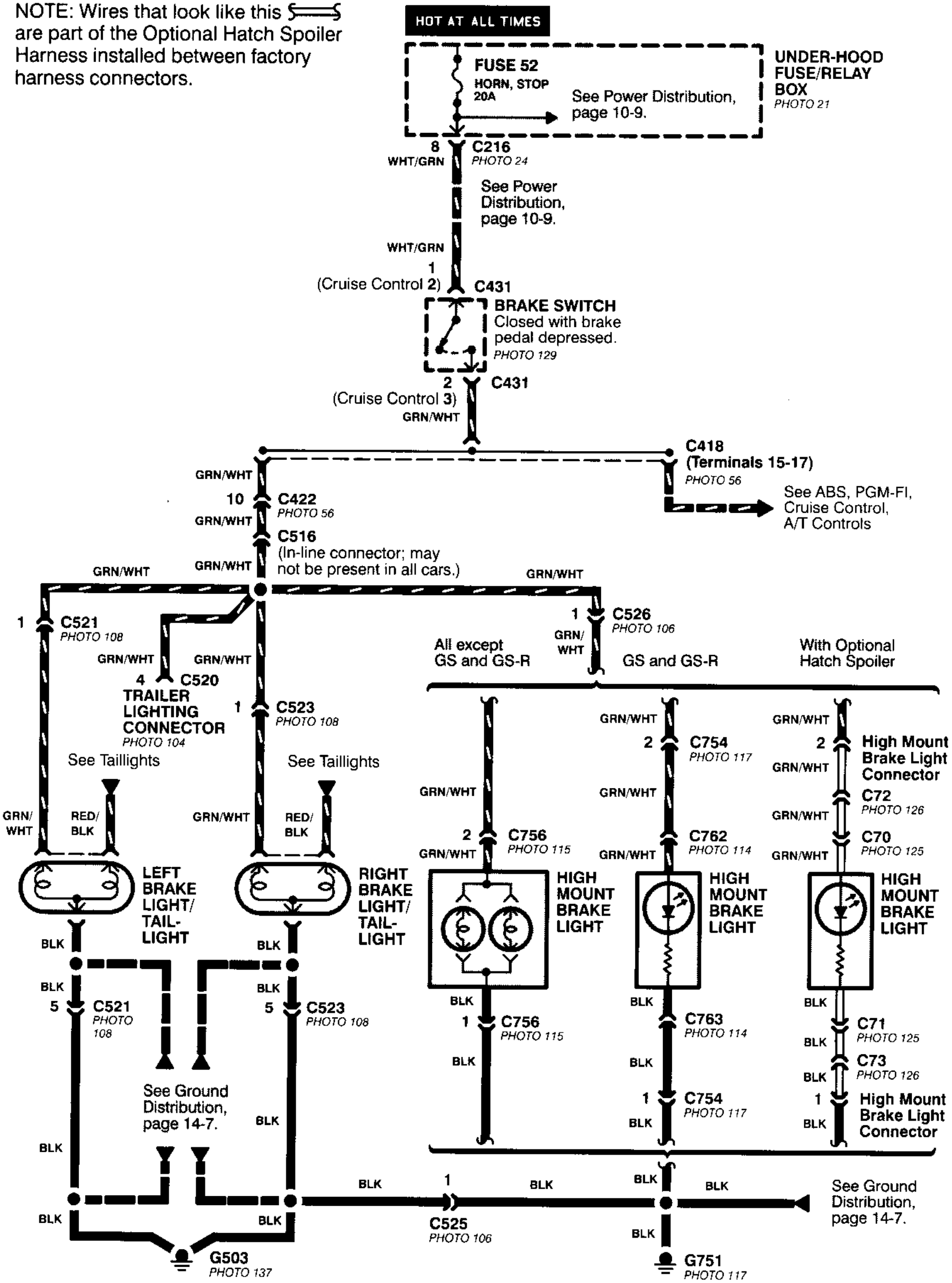
* = '98-'99 Models


GRN/ORN
1 C434
COMBINATION LIGHT SWITCH
PHOTO 144
Turn Signal Switch
LEFT
RIGHT
2
4 C434
From E on facing page.
From F on facing page.
GRN/BLU
GRN/BLU
GRN/YEL
GRN/YEL
6 C551 PHOTO 58
6
3 C442 PHOTO 59
9 C551 PHOTO 58
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
14 C504
10 C504
16 C438 PHOTO 62
(Not Used)
15
11 C504 PHOTO 62
(Not Used)
10 C438 PHOTO 62
3 C302 PHOTO 57
C516
(In-line connector; may not be present in all cars.)
RED/BLK
See Parking Lights
1
6 C520
TRAILER LIGHTING CONNECTOR
PHOTO 113
2 C521 PHOTO 113
2 C523 PHOTO 113
1 3 C320
LEFT FRONT PARKING/TURN SIGNAL LIGHT
LEFT REAR TURN SIGNAL LIGHT
RIGHT REAR TURN SIGNAL LIGHT
1 3 C203
RIGHT FRONT PARKING/TURN SIGNAL LIGHT
2 C320
2 C203
BLK
See Ground Distribution, page 14-3.
See Ground Distribution, page 14-8.
See Ground Distribution, page 14-2.
4 C521 PHOTO 113
4 C523 PHOTO 113
G301 PHOTO 11
G503 PHOTO 102
G201 PHOTO 4

Brake Lights

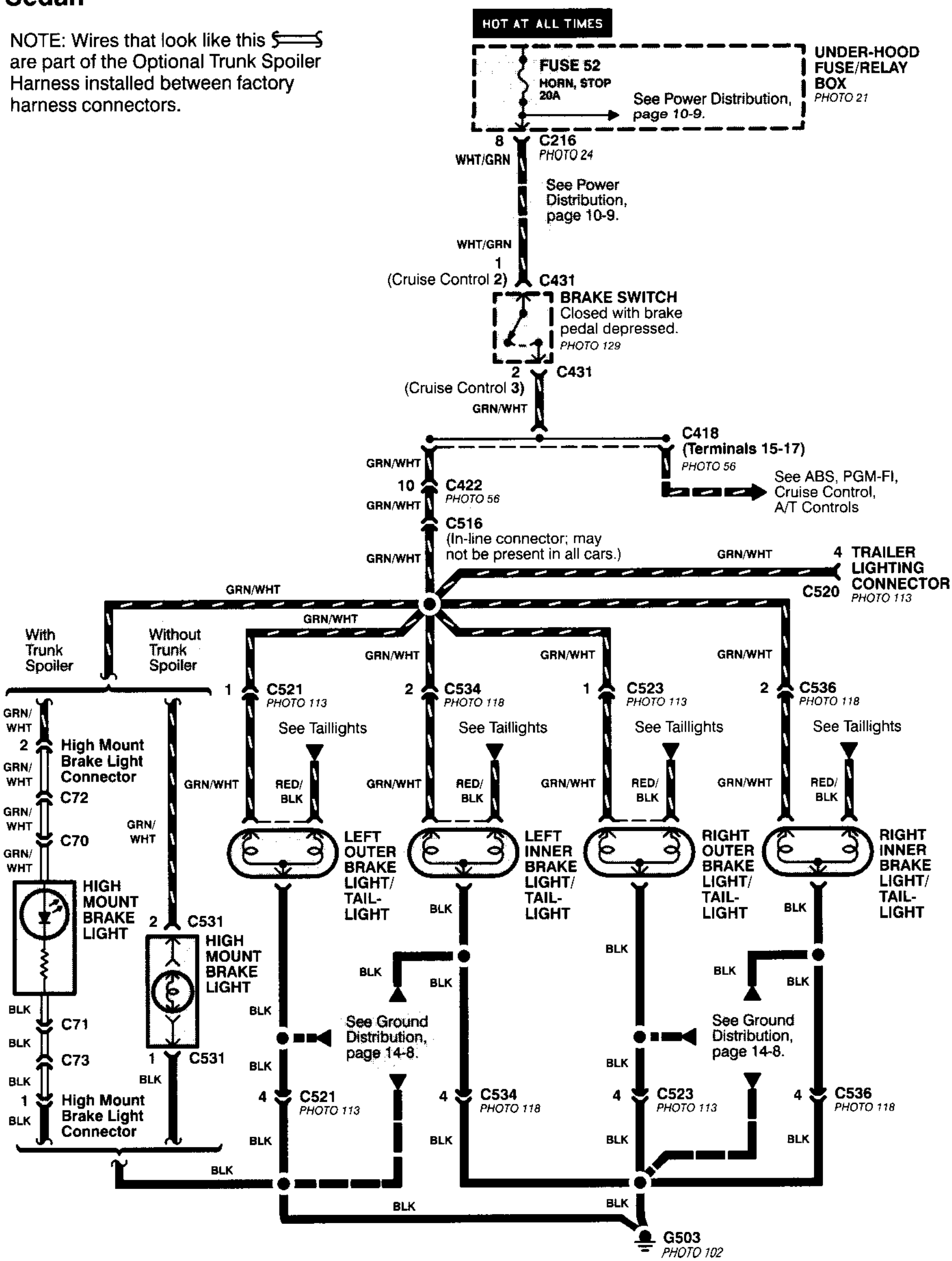
– Hatchback

NOTE: Wires that look like this are part of the Optional Hatch Spoiler Harness installed between factory harness connectors.



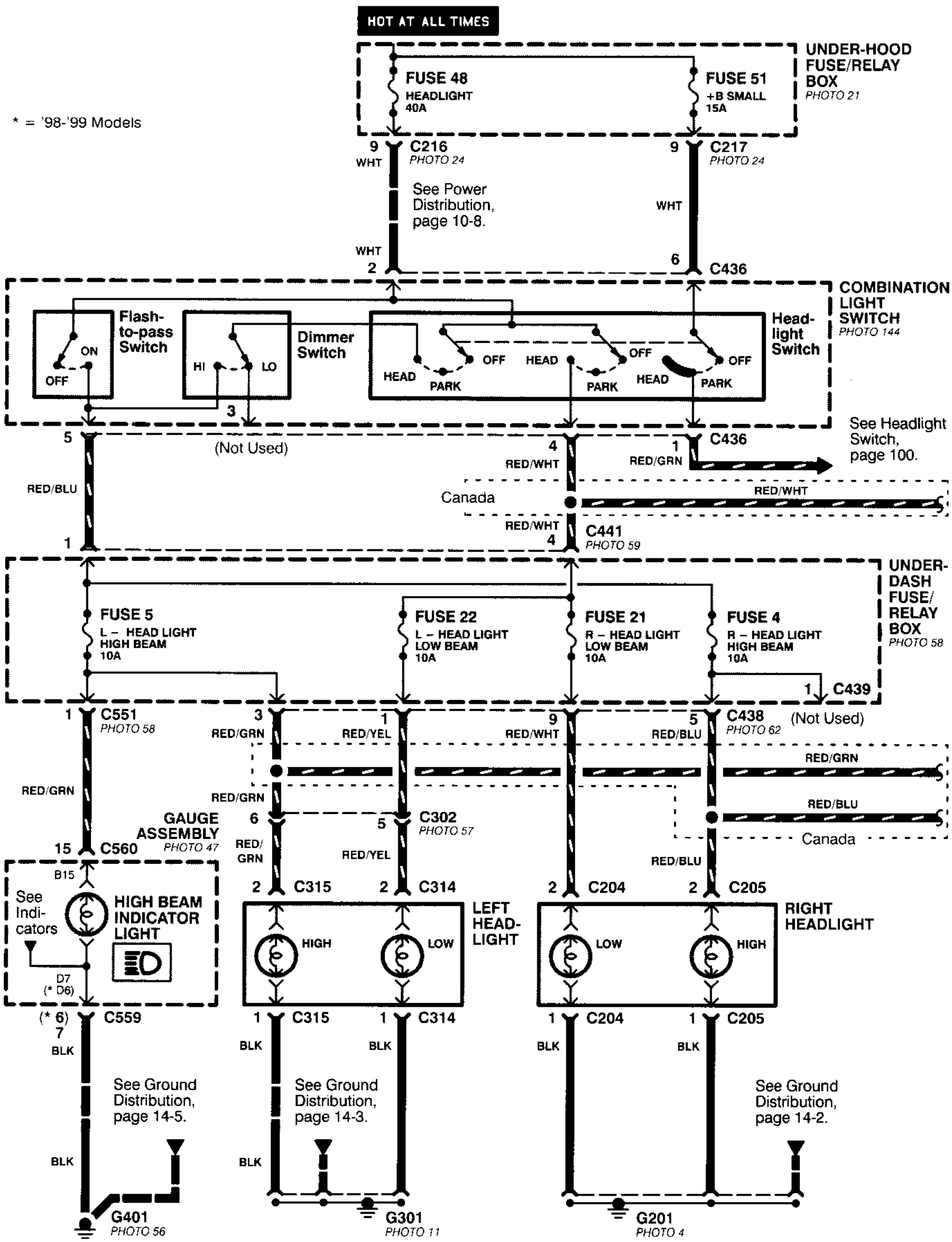
Sedan

NOTE: Wires that look like this are part of the Optional Trunk Spoiler Harness installed between factory harness connectors.

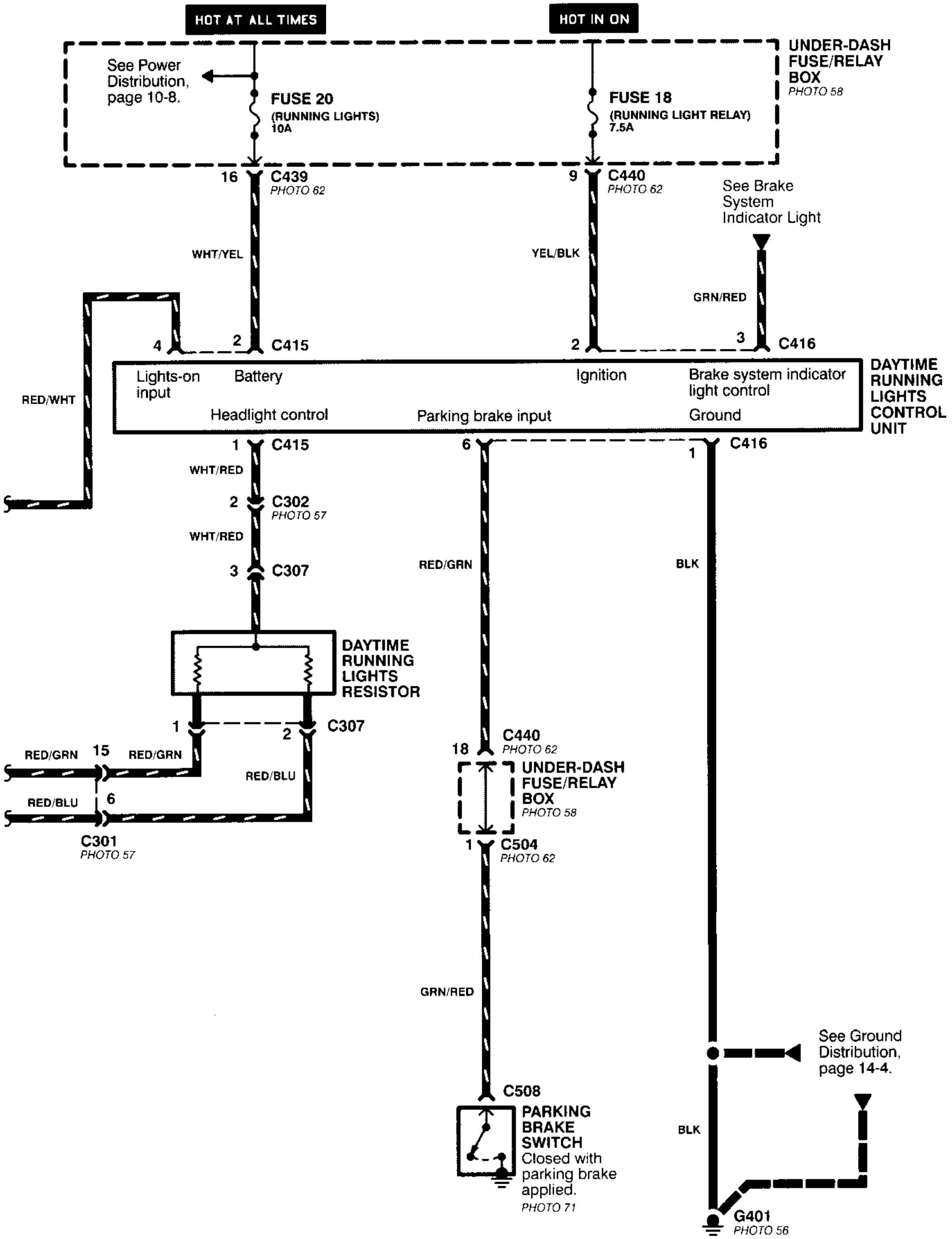


Headlights

– USA and Canada



– Canada Only



HOT AT ALL TIMES
HOT IN ON
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
See Power Distribution, page 10-8.
FUSE 20
(RUNNING LIGHTS) 10A
FUSE 18
(RUNNING LIGHT RELAY) 7.5A
16
C439
PHOTO 62
9
C440
PHOTO 62
See Brake System Indicator Light
WHT/YEL
YEL/BLK
GRN/RED
4
2
C415
2
3
C416
RED/WHT
Lights-on input
Battery
Ignition
Brake system indicator light control
Headlight control
Parking brake input
Ground
DAYTIME RUNNING LIGHTS CONTROL UNIT
1
C415
6
1
C416
WHT/RED
2
C302
PHOTO 57
WHT/RED
3
C307
RED/GRN
BLK
DAYTIME RUNNING LIGHTS RESISTOR
1
2
C307
RED/GRN
15
RED/GRN
RED/BLU
RED/BLU
6
C301
PHOTO 57
18
C440
PHOTO 62
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
1
C504
PHOTO 62
GRN/RED
See Ground Distribution, page 14-4.
C508
PARKING BRAKE SWITCH
Closed with parking brake applied.
PHOTO 71
BLK
G401
PHOTO 56

– How the Circuit Works

Low Beam Operation

With the headlight switch in HEAD and the dimmer switch in LO, current flows through the headlight switch, fuse 21, fuse 22, and the low beam filaments to ground, and the low beams come on.

High Beam Operation

With the headlight switch in HEAD and the dimmer switch in HI, current flows through the headlight switch, dimmer/passing switch, fuses 4, 5, 21, and 22, and the low and high beam filaments to ground, and the low and high beams come on.

Current also flows through the high beam indicator light to ground. The high beam indicator comes on to remind the driver that the high beams are on.

Flash operation

The flash feature works with the headlight switch in OFF, PARK, or HEAD (low beams). When you move the flash-to-pass switch to ON, current flows through the switch, fuses 4 and 5, and the high beam filaments to ground, and the high beams flash. The high beam indicator also flashes during the flash operation. The flash function has no effect if the high beams are already on.

Daytime Running Lights Day Operation

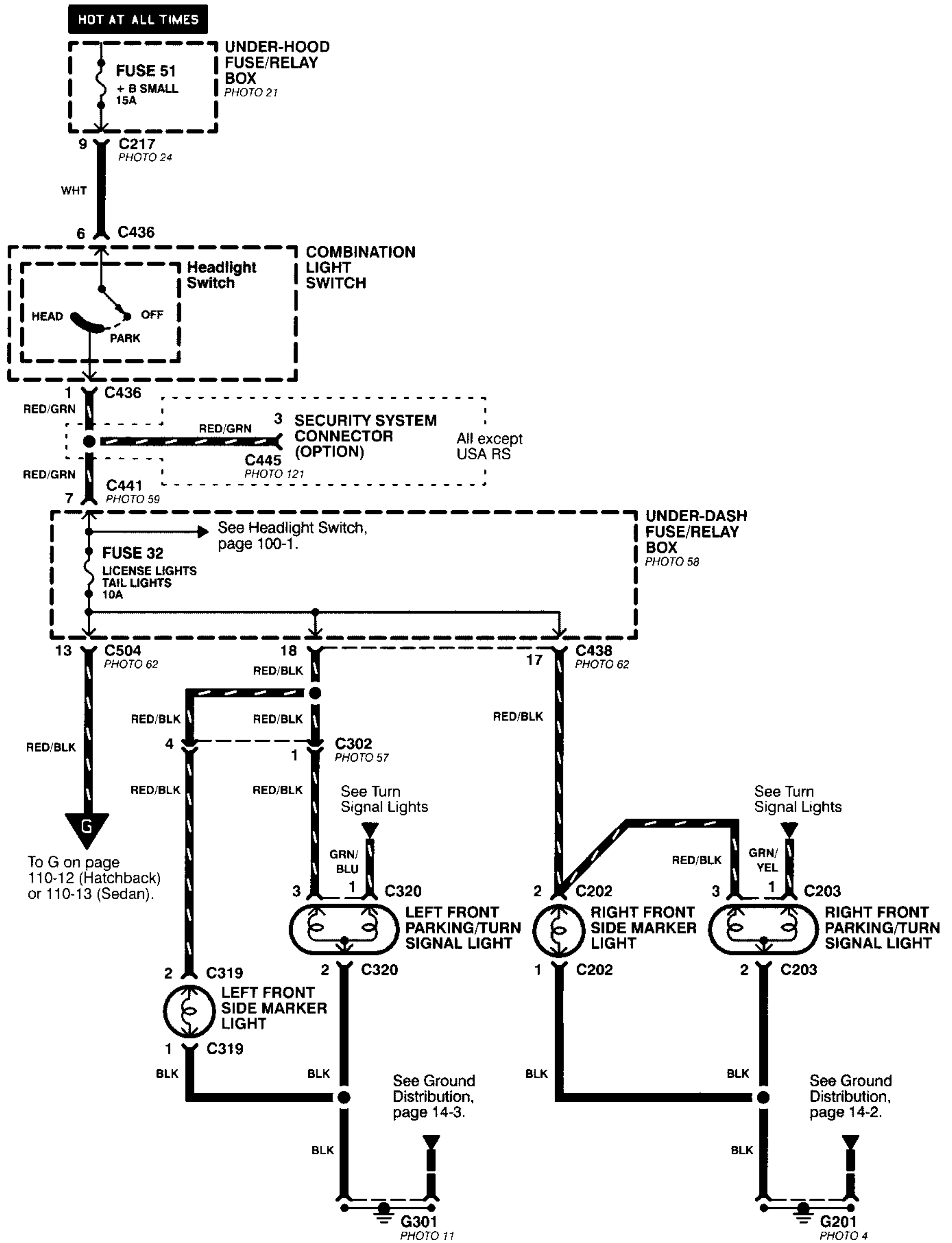
When you turn the ignition to ON (II) with the parking brake released, the daytime running lights control unit supplies battery voltage at the WHT/RED wire. This voltage is applied to the high beam headlights through the daytime running lights resistor. Each high beam headlight receives less than battery voltage causing them to come on at reduced brightness.

If the parking brake is set, a ground signal is applied to the daytime running lights control unit at the RED/GRN wire. If the parking brake is set when you first turn the ignition switch to ON (II), the high beam headlights will remain off until you release the parking brake. Once the high beam headlights are in day mode, setting the parking brake will not cause the headlights to turn off. When low or high beam operation is requested, battery voltage from the headlight switch is applied to the daytime running light control unit via the RED/WHT wire. The daytime running light control unit then discontinues the daytime running light mode.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

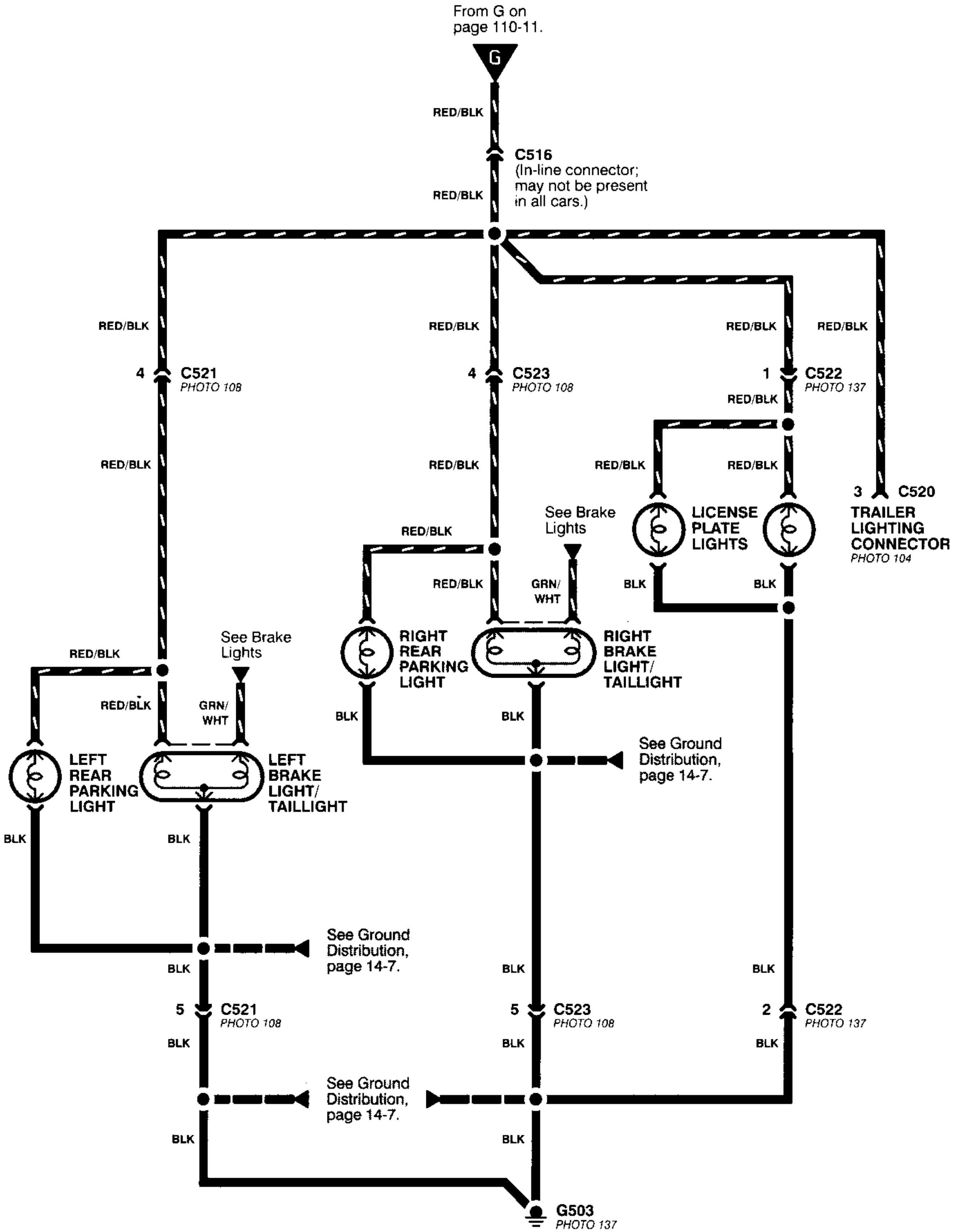
License Lights, Parking Lights, and Taillights

– Hatchback and Sedan

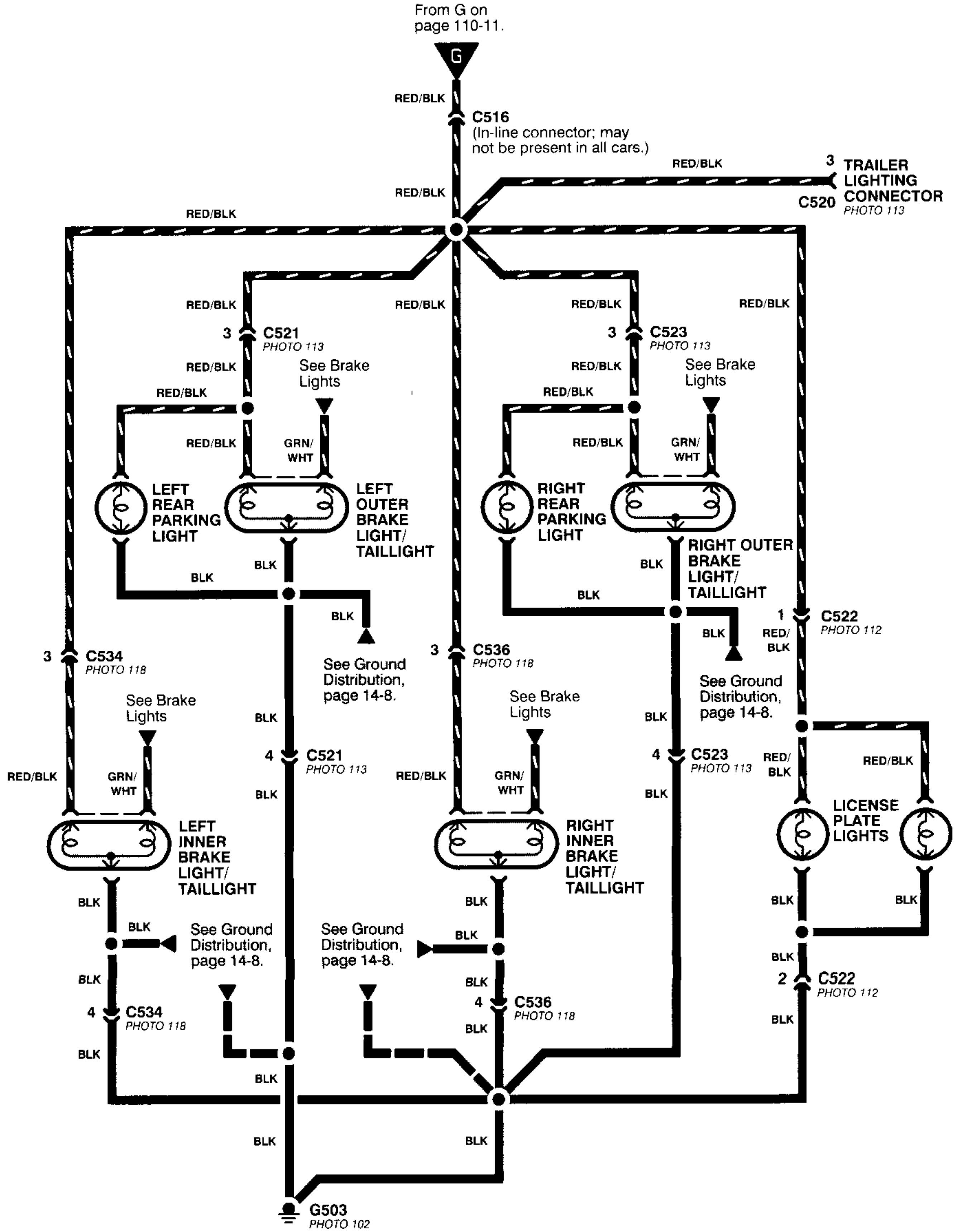


License Lights, Parking Lights, and Taillights (cont'd)

– Hatchback

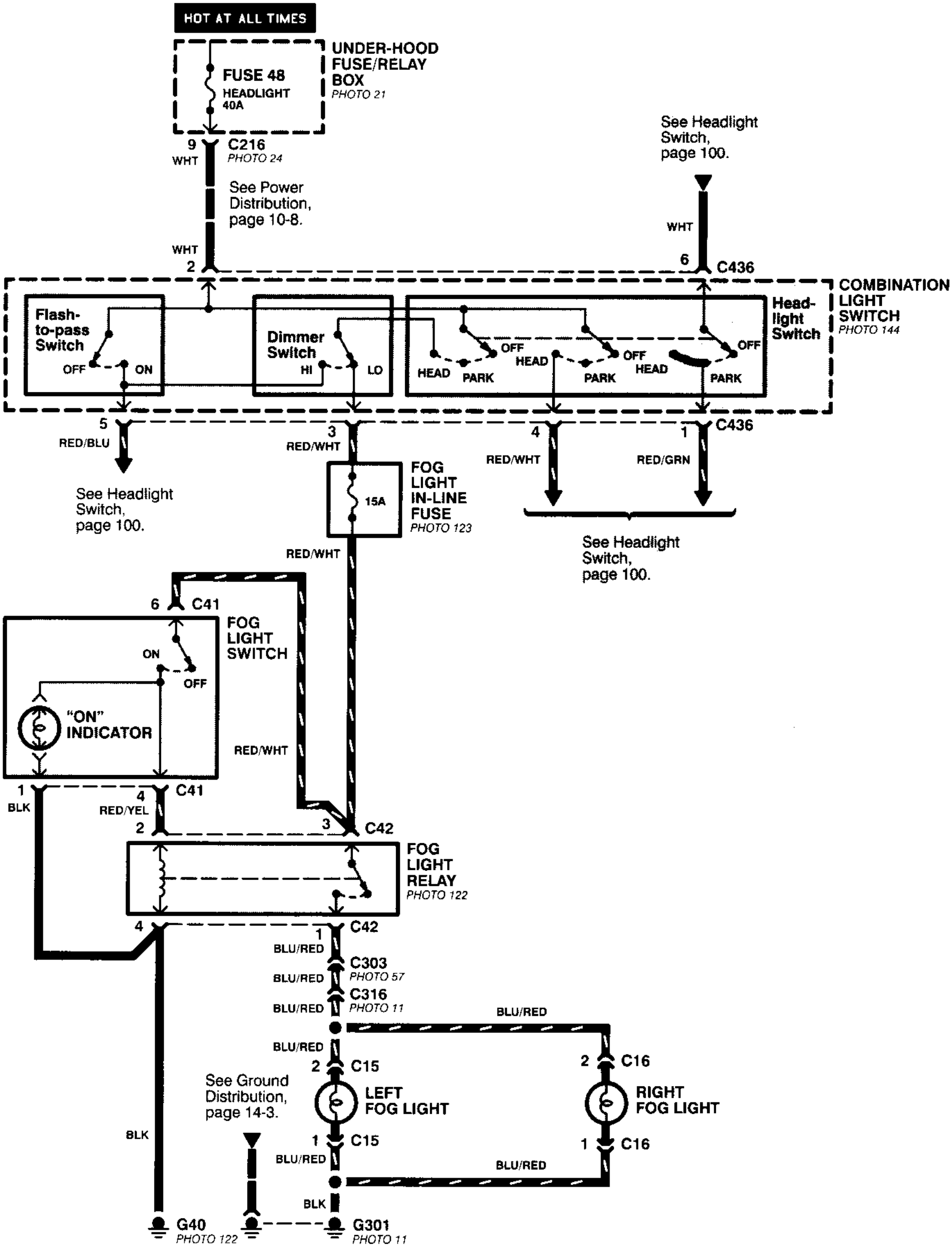


- Sedan

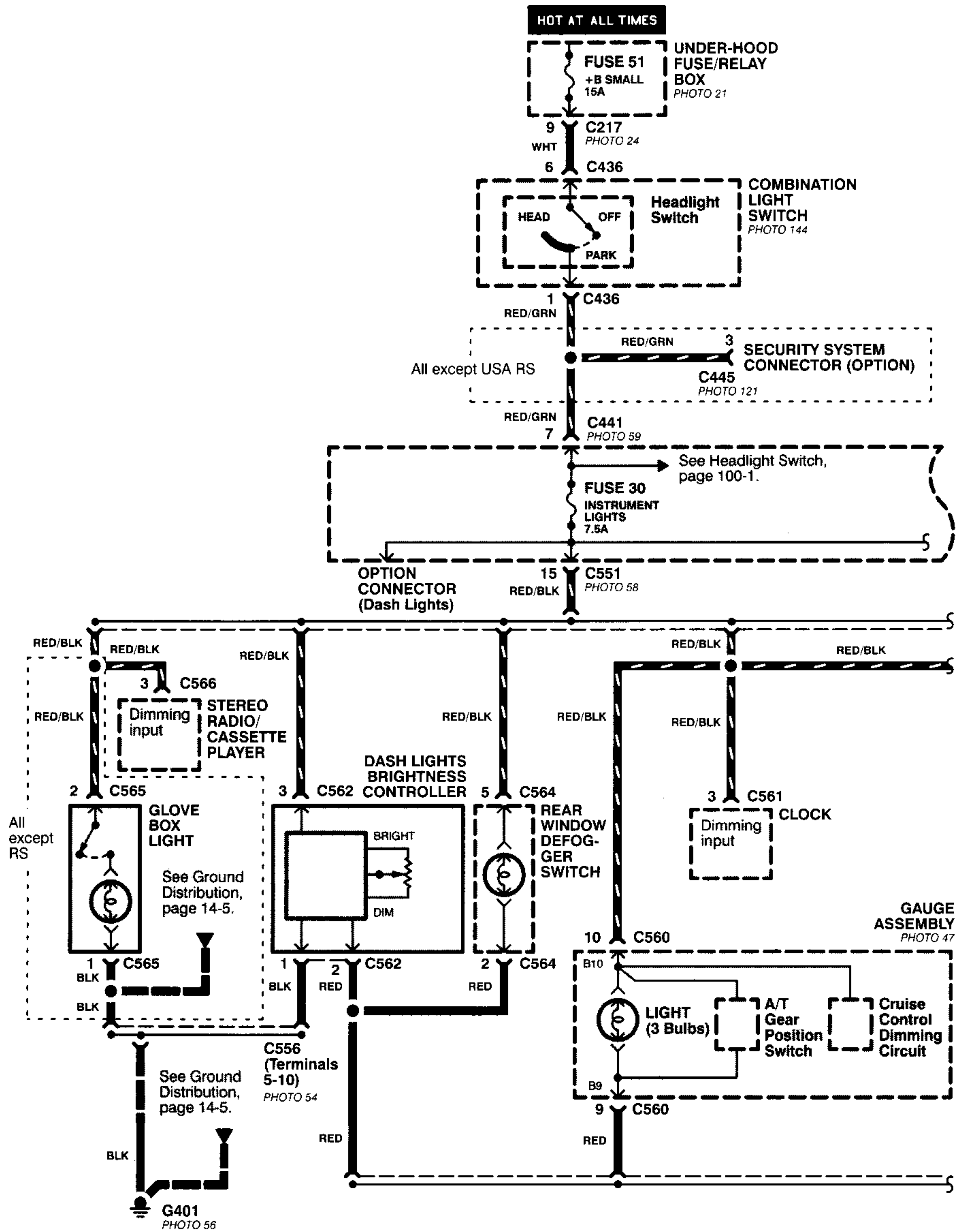


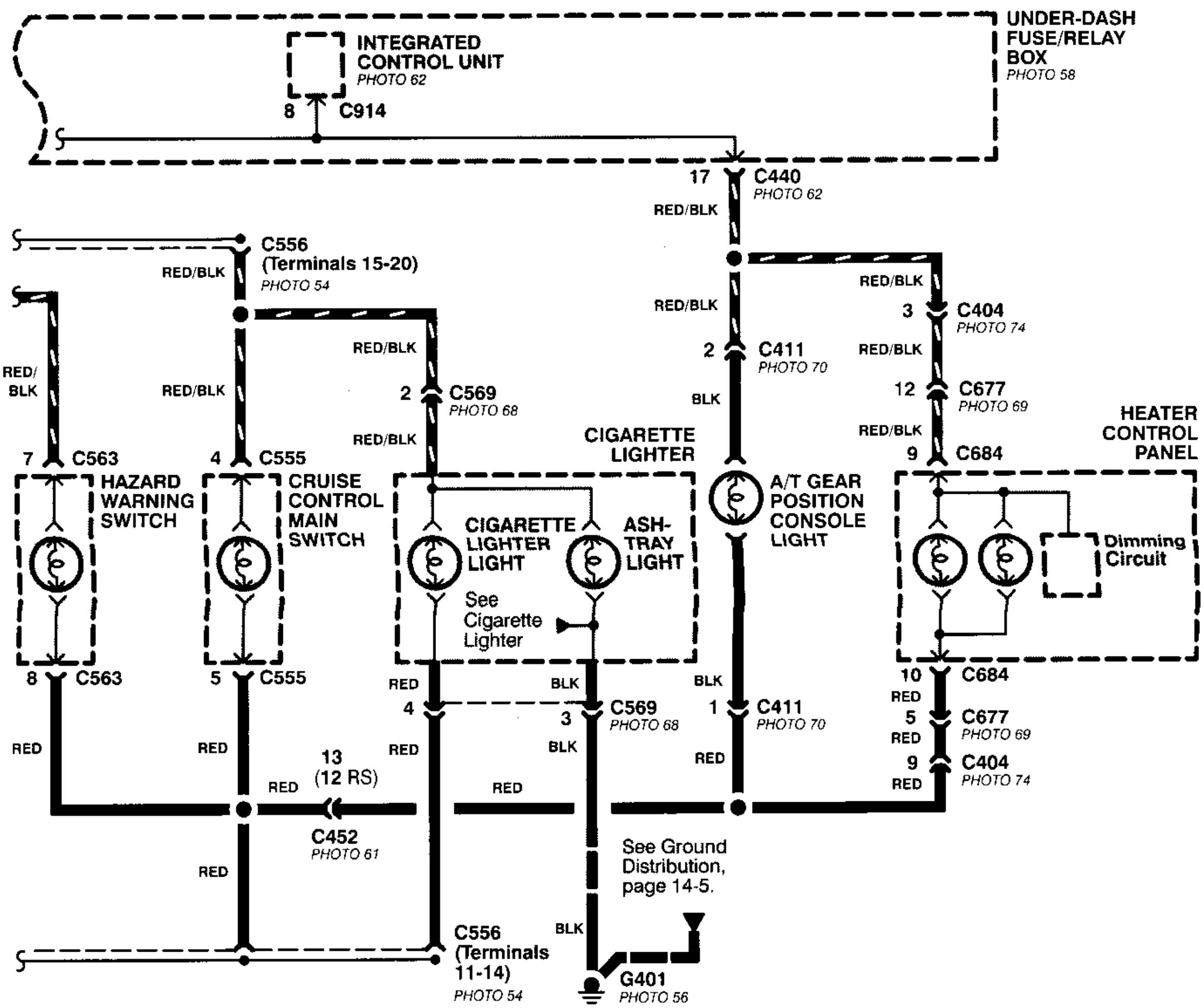
From G on page 110-11.
G
RED/BLK
C516
(In-line connector; may not be present in all cars.)
RED/BLK
3 TRAILER LIGHTING CONNECTOR
C520
PHOTO 113
RED/BLK
C521
PHOTO 113
See Brake Lights
GRN/WHT
LEFT REAR PARKING LIGHT
LEFT OUTER BRAKE LIGHT/ TAILLIGHT
C523
PHOTO 113
RIGHT REAR PARKING LIGHT
RIGHT OUTER BRAKE LIGHT/ TAILLIGHT
BLK
See Ground Distribution, page 14-8.
C522
PHOTO 112
C534
PHOTO 118
C536
PHOTO 118
LEFT INNER BRAKE LIGHT/ TAILLIGHT
RIGHT INNER BRAKE LIGHT/ TAILLIGHT
LICENSE PLATE LIGHTS
G503
PHOTO 102

Fog Lights


HOT AT ALL TIMES
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
FUSE 48
HEADLIGHT 40A
C216
PHOTO 24
WHT
See Power Distribution, page 10-8.
See Headlight Switch, page 100.
C436
COMBINATION LIGHT SWITCH
PHOTO 144
Flash-to-pass Switch
OFF
ON
Dimmer Switch
HI
LO
HEAD
PARK
OFF
Head-light Switch
RED/BLU
RED/WHT
RED/GRN
FOG LIGHT IN-LINE FUSE
PHOTO 123
15A
C41
FOG LIGHT SWITCH
"ON" INDICATOR
BLK
RED/YEL
C42
FOG LIGHT RELAY
PHOTO 122
BLU/RED
C303
PHOTO 57
C316
PHOTO 11
C15
LEFT FOG LIGHT
C16
RIGHT FOG LIGHT
See Ground Distribution, page 14-3.
G40
PHOTO 122
G301
PHOTO 11

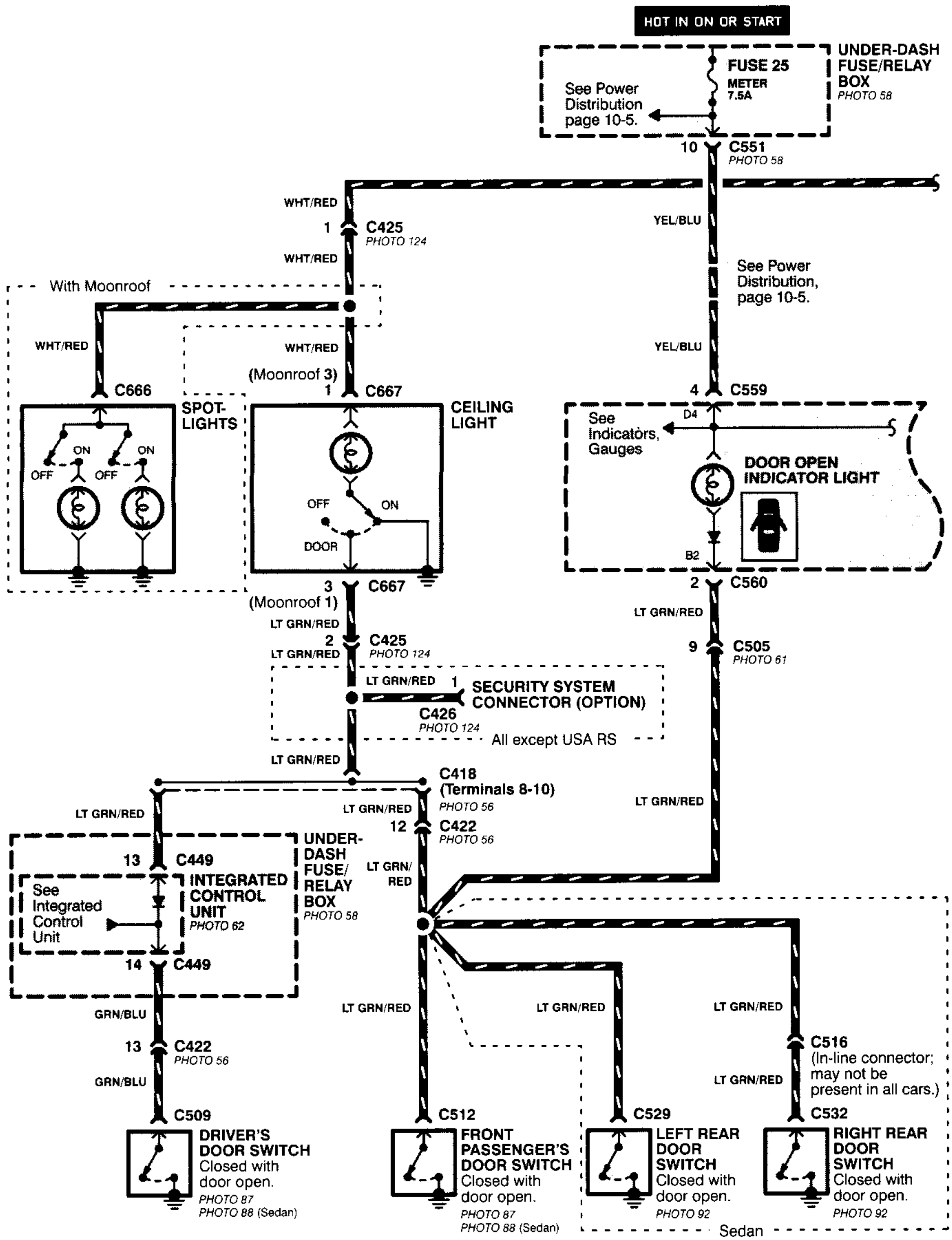
Dash and Console Lights

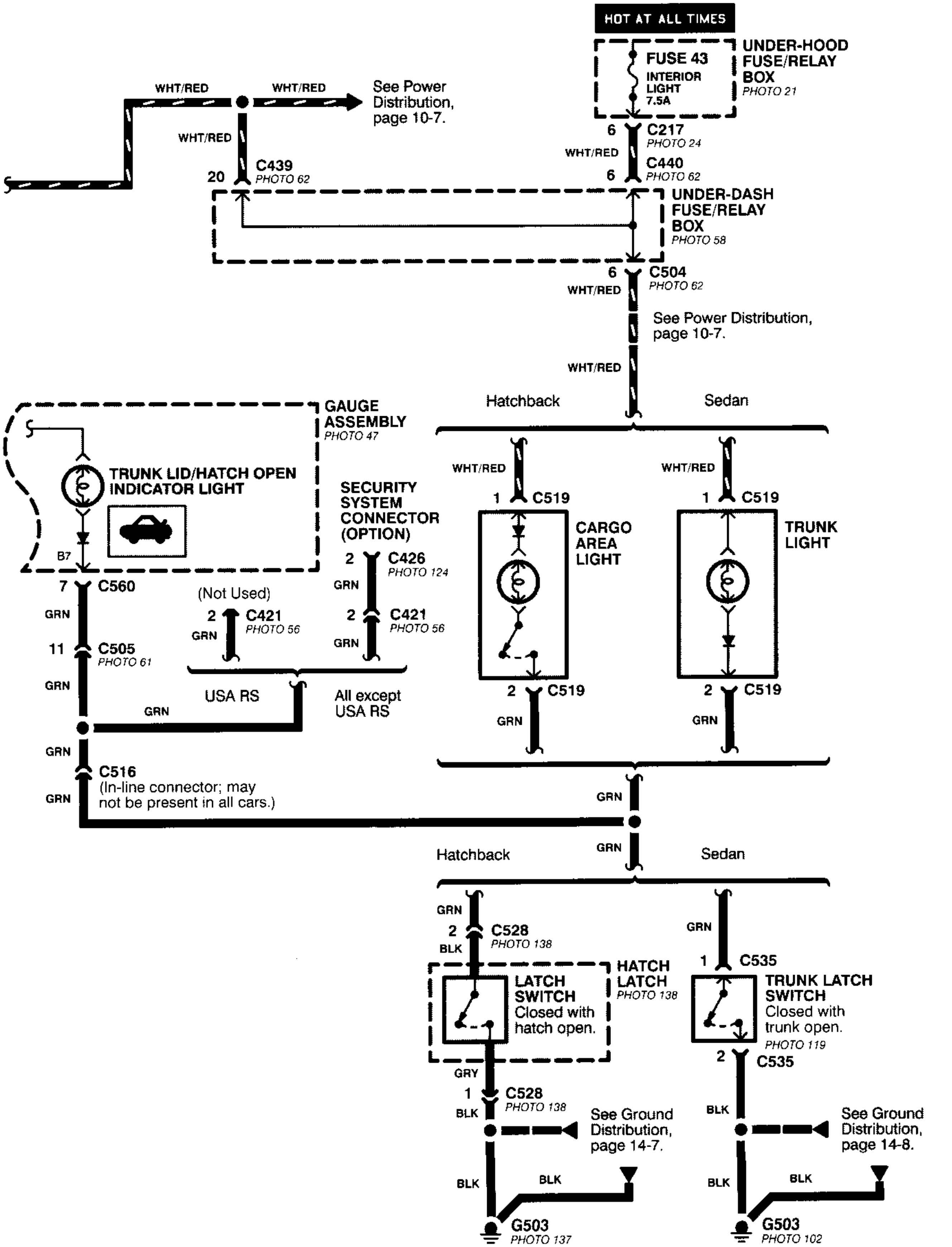




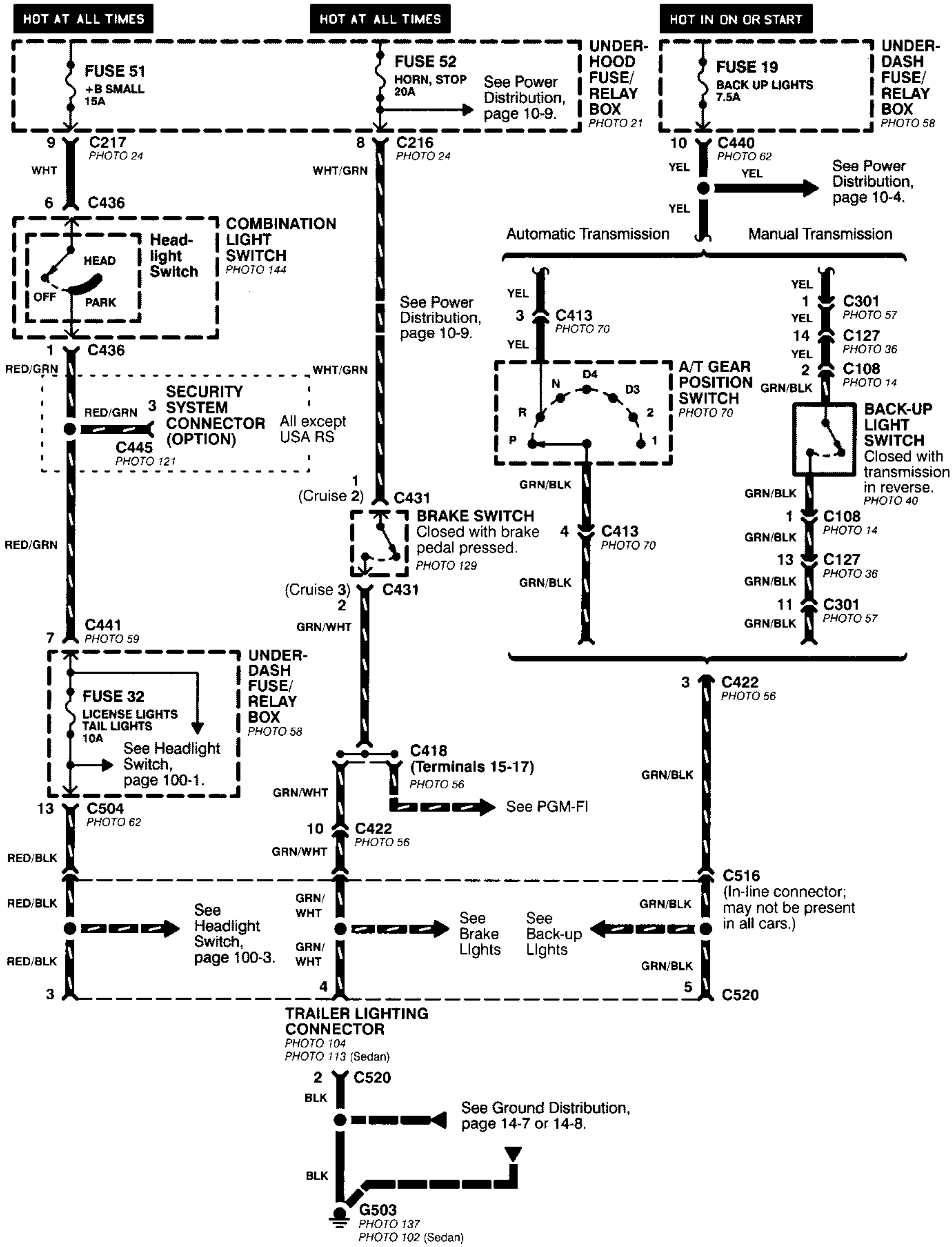
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
INTEGRATED CONTROL UNIT
PHOTO 62
8
C914
17
C440
PHOTO 62
RED/BLK
C556 (Terminals 15-20)
PHOTO 54
RED/BLK
RED/BLK
RED/BLK
RED/BLK
RED/BLK
RED/BLK
RED/BLK
RED/BLK
RED/ BLK
3
C404
PHOTO 74
2
C411
PHOTO 70
12
C677
PHOTO 69
2
C569
PHOTO 68
BLK
9
C684
HEATER CONTROL PANEL
CIGARETTE LIGHTER
7
C563
HAZARD WARNING SWITCH
4
C555
CRUISE CONTROL MAIN SWITCH
CIGARETTE LIGHTER LIGHT
ASH-TRAY LIGHT
See Cigarette Lighter
A/T GEAR POSITION CONSOLE LIGHT
Dimming Circuit
8
C563
5
C555
RED
BLK
BLK
10
C684
RED
4
3
C569
PHOTO 68
1
C411
PHOTO 70
5
C677
PHOTO 69
RED
BLK
RED
RED
RED
9
C404
PHOTO 74
RED
RED
13 (12 RS)
RED
RED
C452
PHOTO 61
See Ground Distribution, page 14-5.
RED
BLK
C556 (Terminals 11-14)
PHOTO 54
G401
PHOTO 56

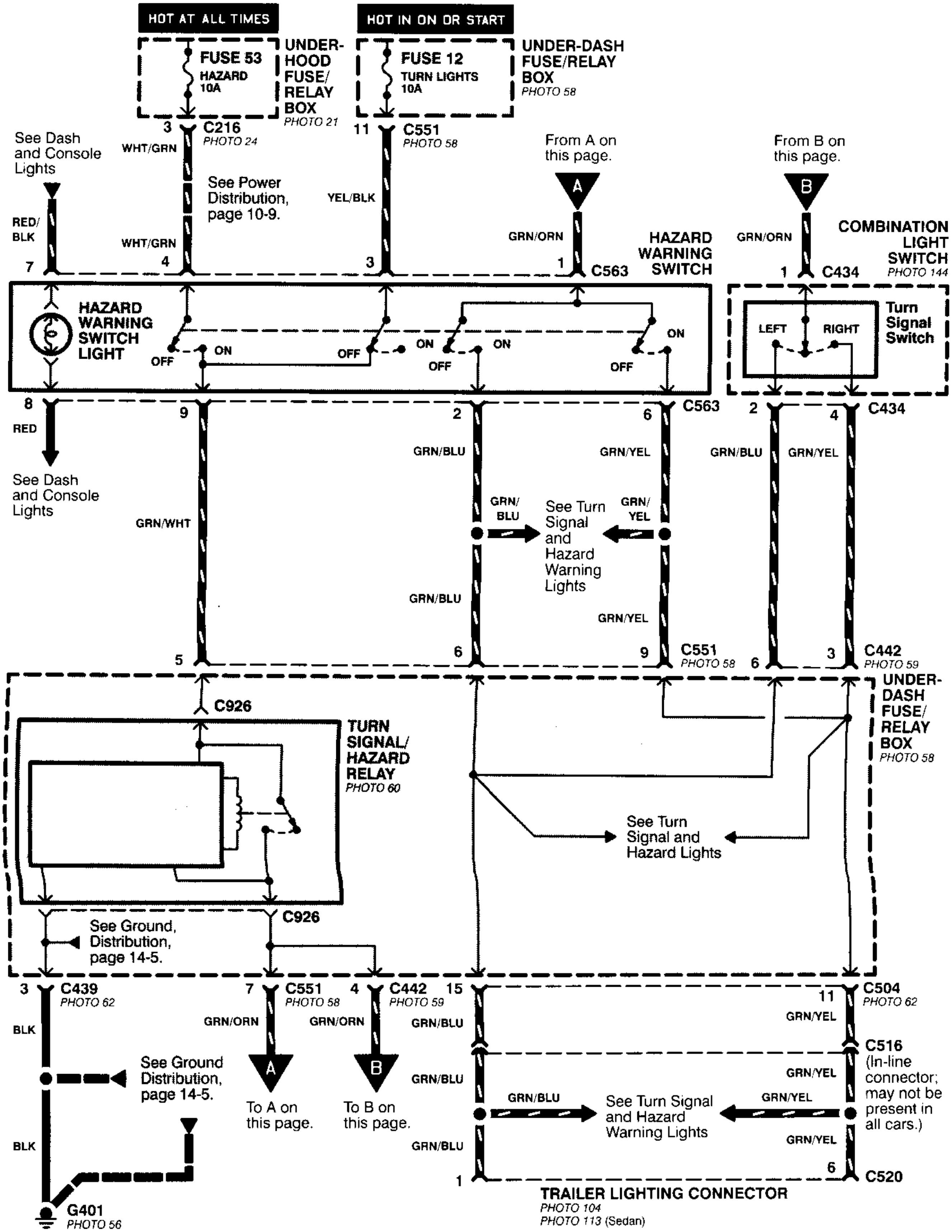
Ceiling, Spot, Cargo Area, and Trunk Lights; Door, Hatch,




HOT AT ALL TIMES
FUSE 43
INTERIOR LIGHT 7.5A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
WHT/RED
See Power Distribution, page 10-7.
6 C217 PHOTO 24
6 C440 PHOTO 62
20 C439 PHOTO 62
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
6 C504 PHOTO 62
See Power Distribution, page 10-7.
Hatchback
Sedan
GAUGE ASSEMBLY
PHOTO 47
TRUNK LID/HATCH OPEN INDICATOR LIGHT
B7
SECURITY SYSTEM CONNECTOR (OPTION)
1 C519
CARGO AREA LIGHT
TRUNK LIGHT
7 C560
GRN
2 C426 PHOTO 124
(Not Used)
2 C421 PHOTO 56
11 C505 PHOTO 61
USA RS
All except USA RS
2 C519
C516
(In-line connector; may not be present in all cars.)
2 C528 PHOTO 138
BLK
HATCH LATCH
PHOTO 138
LATCH SWITCH
Closed with hatch open.
GRY
1 C528 PHOTO 138
1 C535
TRUNK LATCH SWITCH
Closed with trunk open.
PHOTO 119
2 C535
See Ground Distribution, page 14-7.
See Ground Distribution, page 14-8.
G503 PHOTO 137
G503 PHOTO 102

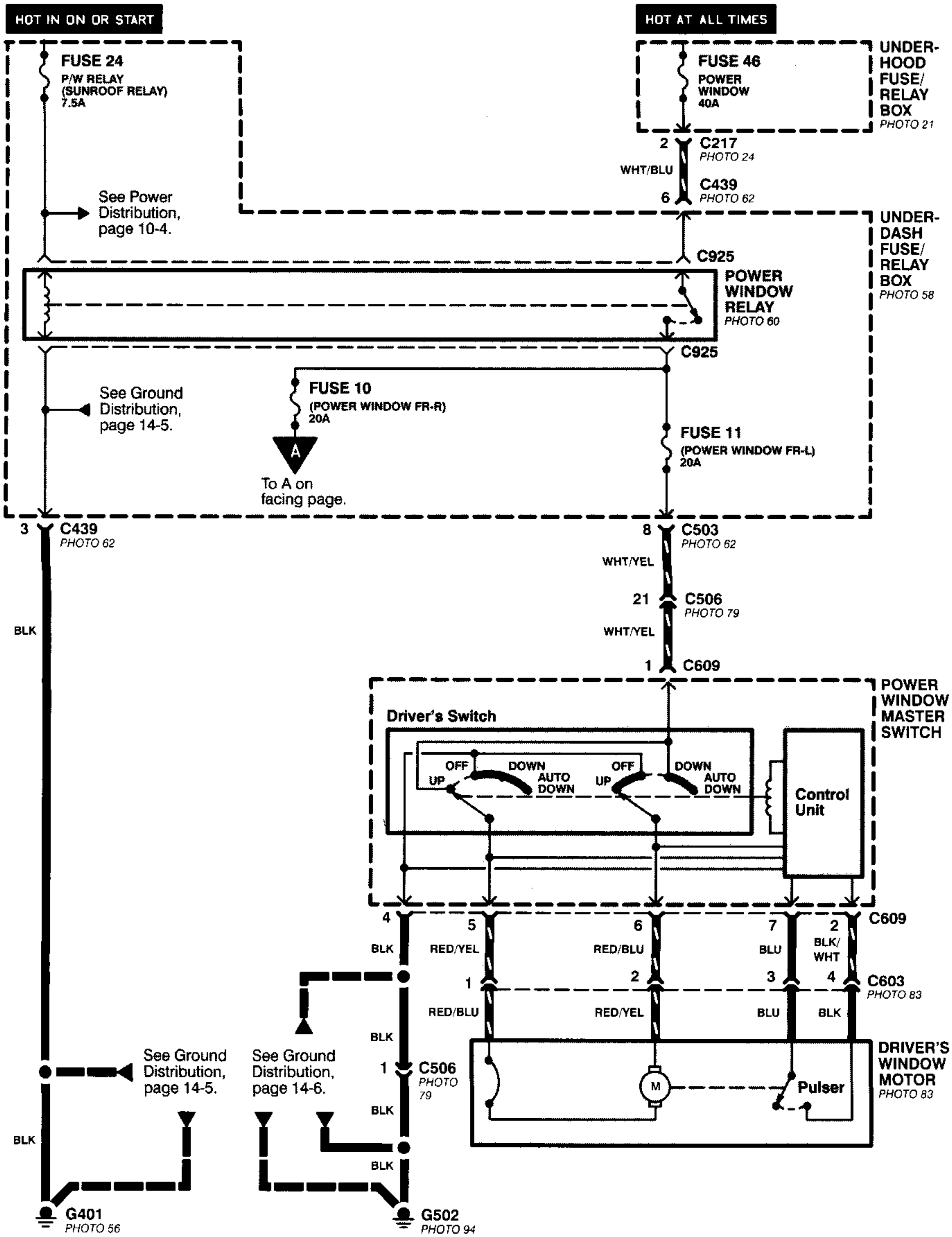
Trailer Lighting Connector



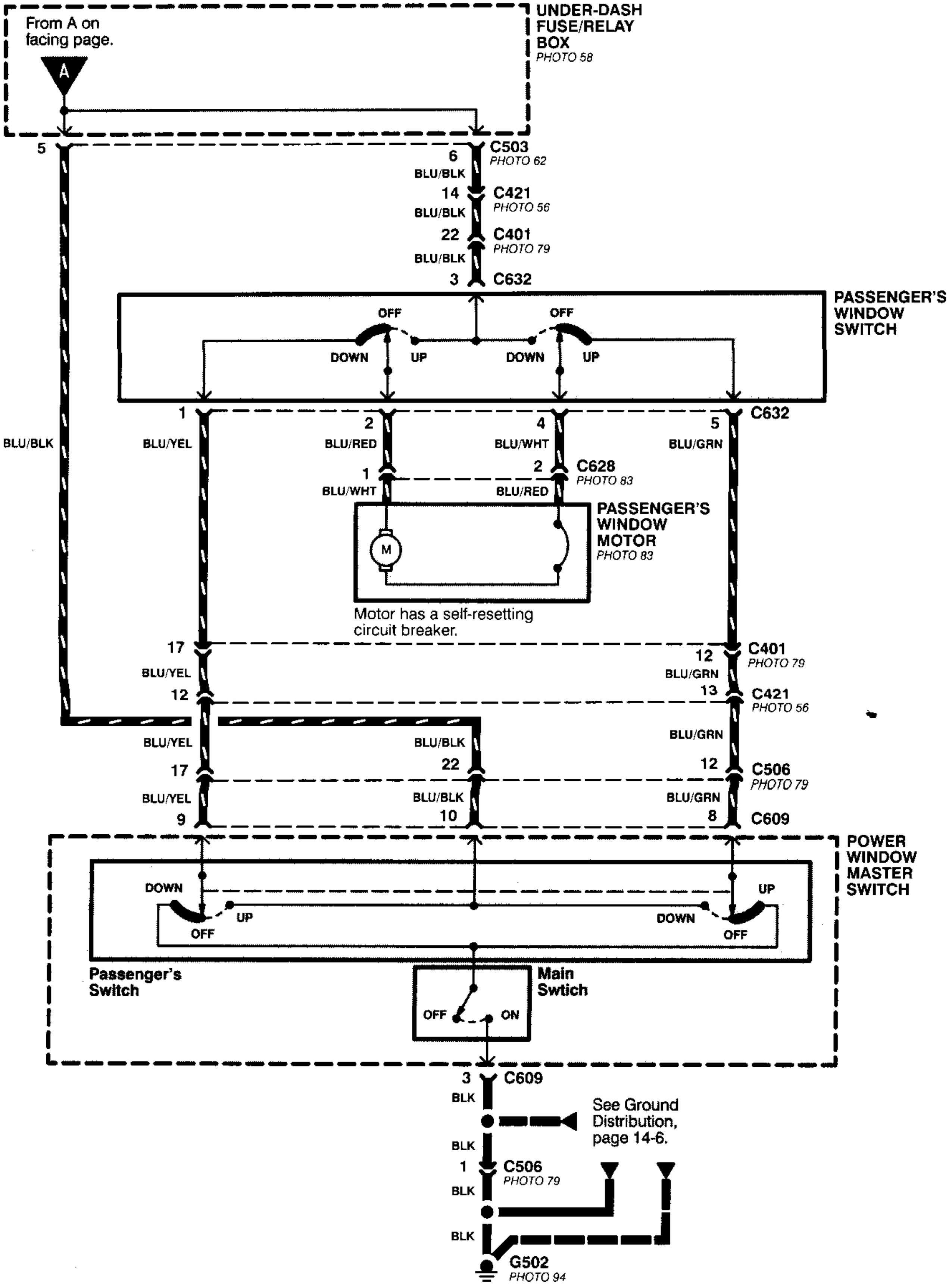

HOT AT ALL TIMES
HOT IN ON OR START
FUSE 53 HAZARD 10A
UNDER-HOOD FUSE/RELAY BOX PHOTO 21
FUSE 12 TURN LIGHTS 10A
UNDER-DASH FUSE/RELAY BOX PHOTO 58
See Dash and Console Lights
C216 PHOTO 24
C551 PHOTO 58
WHT/GRN
See Power Distribution, page 10-9.
YEL/BLK
From A on this page.
From B on this page.
RED/BLK
GRN/ORN
HAZARD WARNING SWITCH
COMBINATION LIGHT SWITCH PHOTO 144
C563
C434
HAZARD WARNING SWITCH LIGHT
ON
OFF
LEFT
RIGHT
Turn Signal Switch
RED
GRN/BLU
GRN/YEL
GRN/WHT
See Dash and Console Lights
See Turn Signal and Hazard Warning Lights
C551 PHOTO 58
C442 PHOTO 59
UNDER-DASH FUSE/RELAY BOX PHOTO 58
C926
TURN SIGNAL/HAZARD RELAY PHOTO 60
See Turn Signal and Hazard Lights
See Ground, Distribution, page 14-5.
C439 PHOTO 62
C551 PHOTO 58
C442 PHOTO 59
C504 PHOTO 62
BLK
See Ground Distribution, page 14-5.
To A on this page.
To B on this page.
C516 (In-line connector; may not be present in all cars.)
See Turn Signal and Hazard Warning Lights
C520
G401 PHOTO 56
TRAILER LIGHTING CONNECTOR PHOTO 104 PHOTO 113 (Sedan)

Power Windows

– Driver's Door (Hatchback)

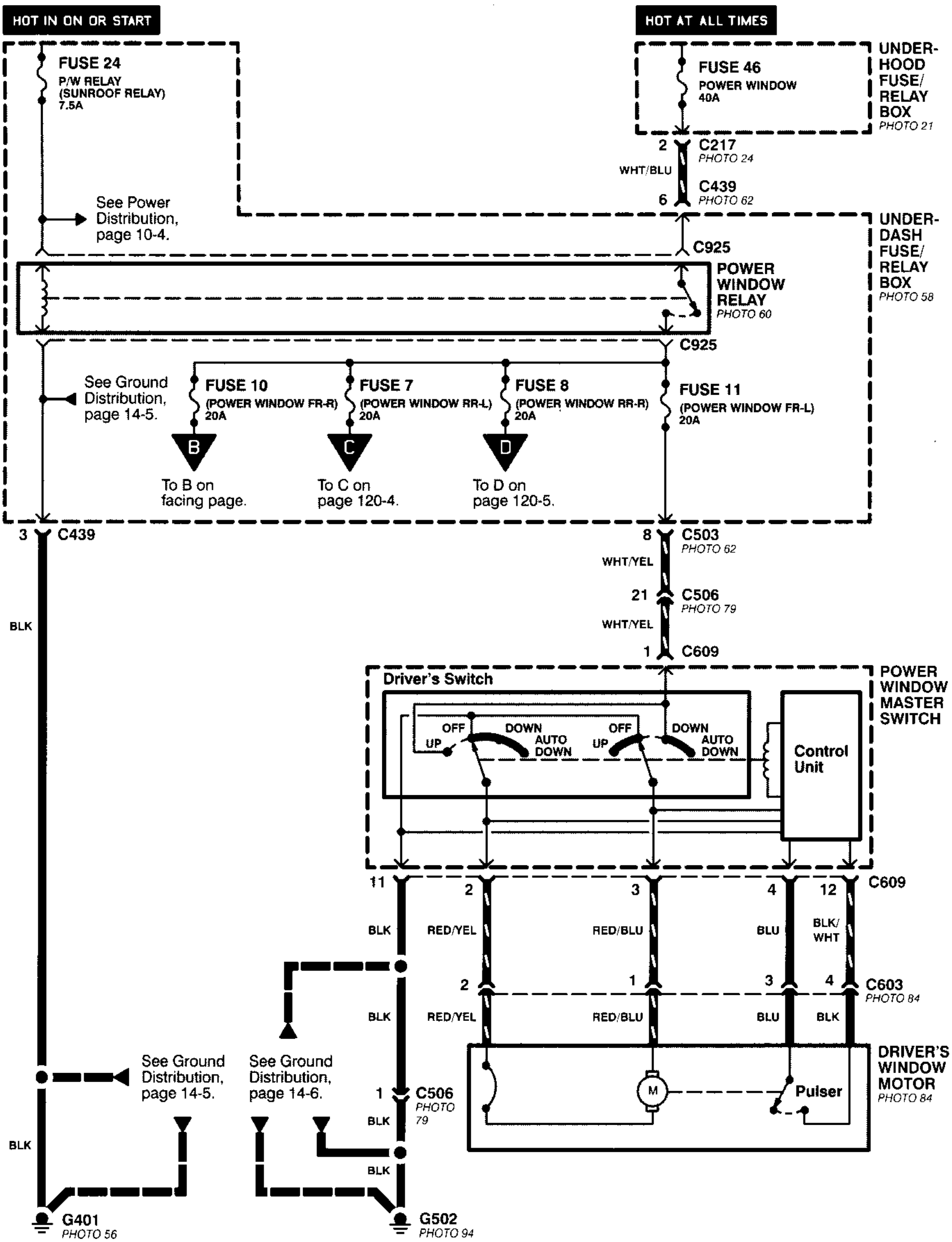


– Passenger's Door (Hatchback)

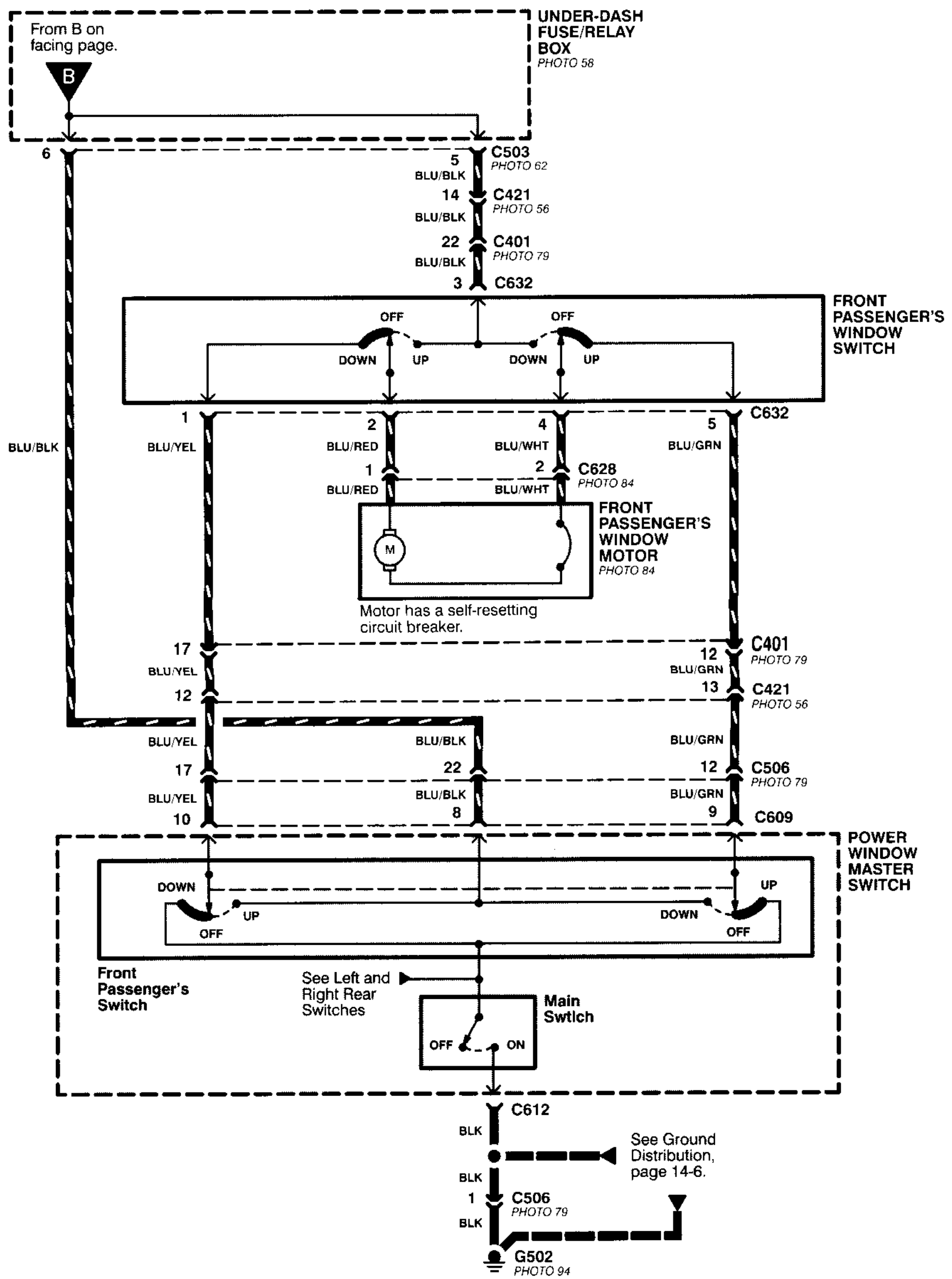


Power Windows (cont'd)

– Driver's Door (Sedan)

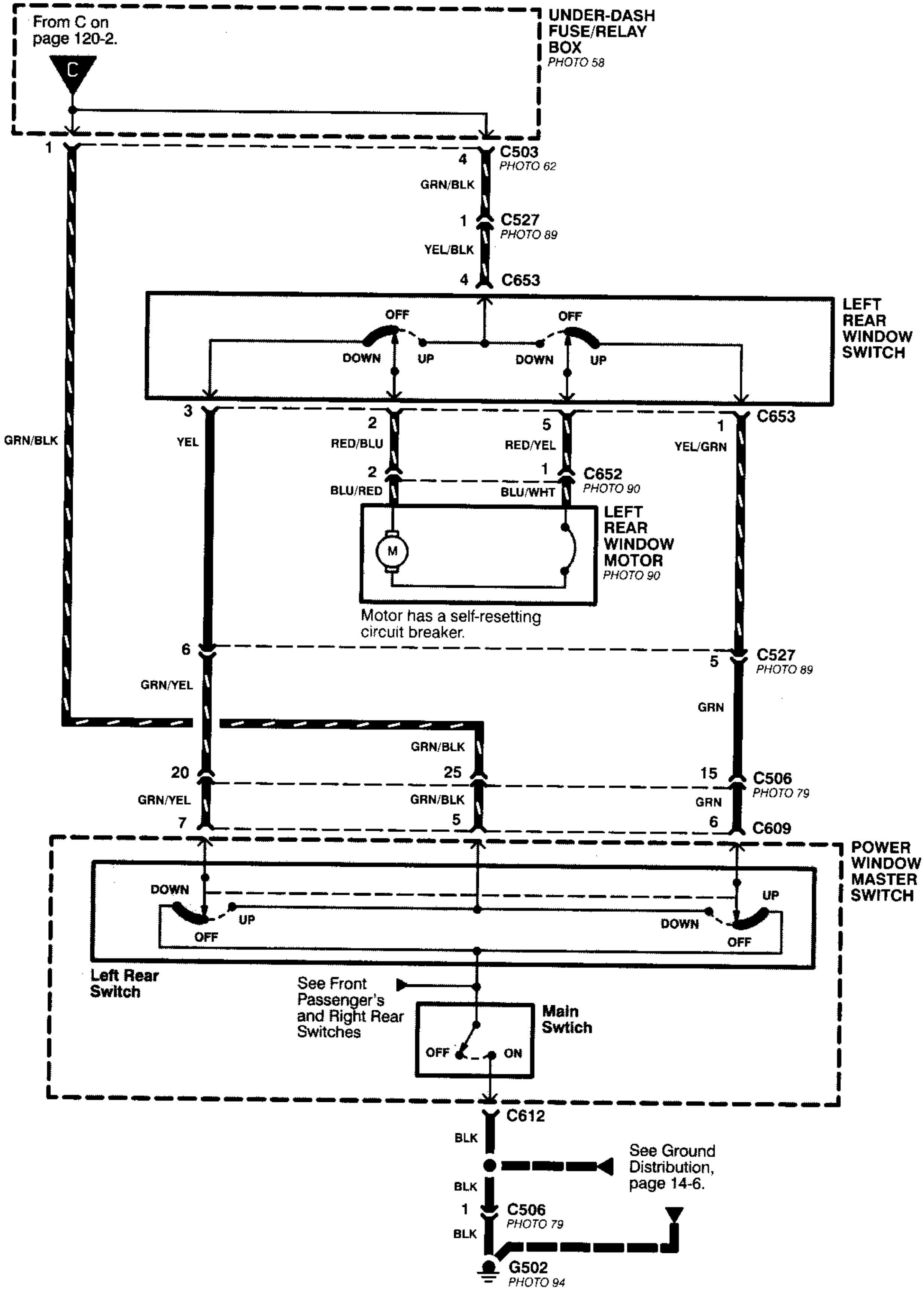


– Front Passenger's Door (Sedan)

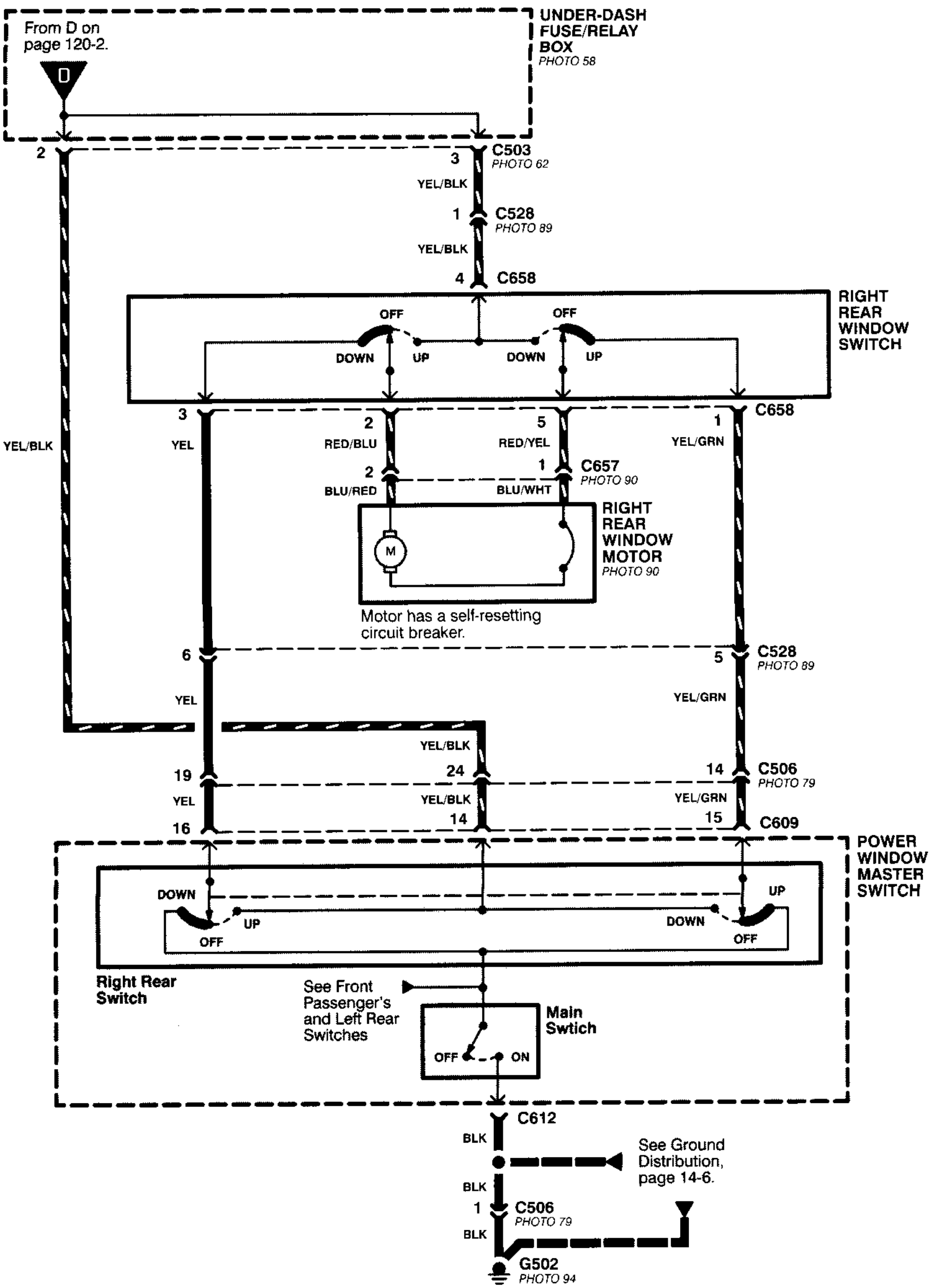


Power Windows (cont'd)

– Left Rear Door



- Right Rear Door



Power Windows (cont'd)

– How the Circuit Works

CAUTION: You could injure your arms, hands, or fingers if you unintentionally switch the driver's window to "automatic down" while working in that door with the power on. Disconnect the window switch connector or the battery when working in the driver's door.

System Description

The operation of the power windows is controlled by the main switch in the power window master switch. When the main switch is in OFF, only the driver's door window can be opened or closed. With the main switch ON, all windows can be opened or closed either by switches in the master panel, or switches in the doors. The driver's window switch also has an automatic down mode which is turned on by pushing the switch down to its second position.

The power windows are driven by reversible motors. Each motor is protected by a built-in circuit breaker. If the window switch is held on too long (with the window obstructed, or after the window is fully up or down), the circuit breaker opens the circuit. The circuit breaker resets automatically as it cools.

Driver's Window

With the ignition switch in ON (II), voltage is provided to the coil of the power window relay through fuse 24. The contacts of the power window relay close, and voltage is applied to the driver's switch. When you push the power window master switch to UP, voltage is applied to the driver's power window motor. (The motor's ground path is back through the power window master switch.) The driver's window motor then drives the window up. When you push the switch to DOWN, voltage is applied in the opposite direction and the motor drives the window down.

Automatic Down (Driver's Window)

With the ignition switch in ON (II), voltage is applied to the coil of the power window relay. The contacts of the power window relay close and voltage is applied to the power window master switch. When you push the driver's switch to the AUTO DOWN position, voltage is applied through the driver's switch to the driver's window motor. The control unit receives pulses at the pulser input while the motor is running. When the window is fully down, the motor stops, and pulses are no longer generated by the pulser. This is sensed by the control unit at the pulser input, and voltage is no longer applied to the driver's window motor.

Passenger Windows

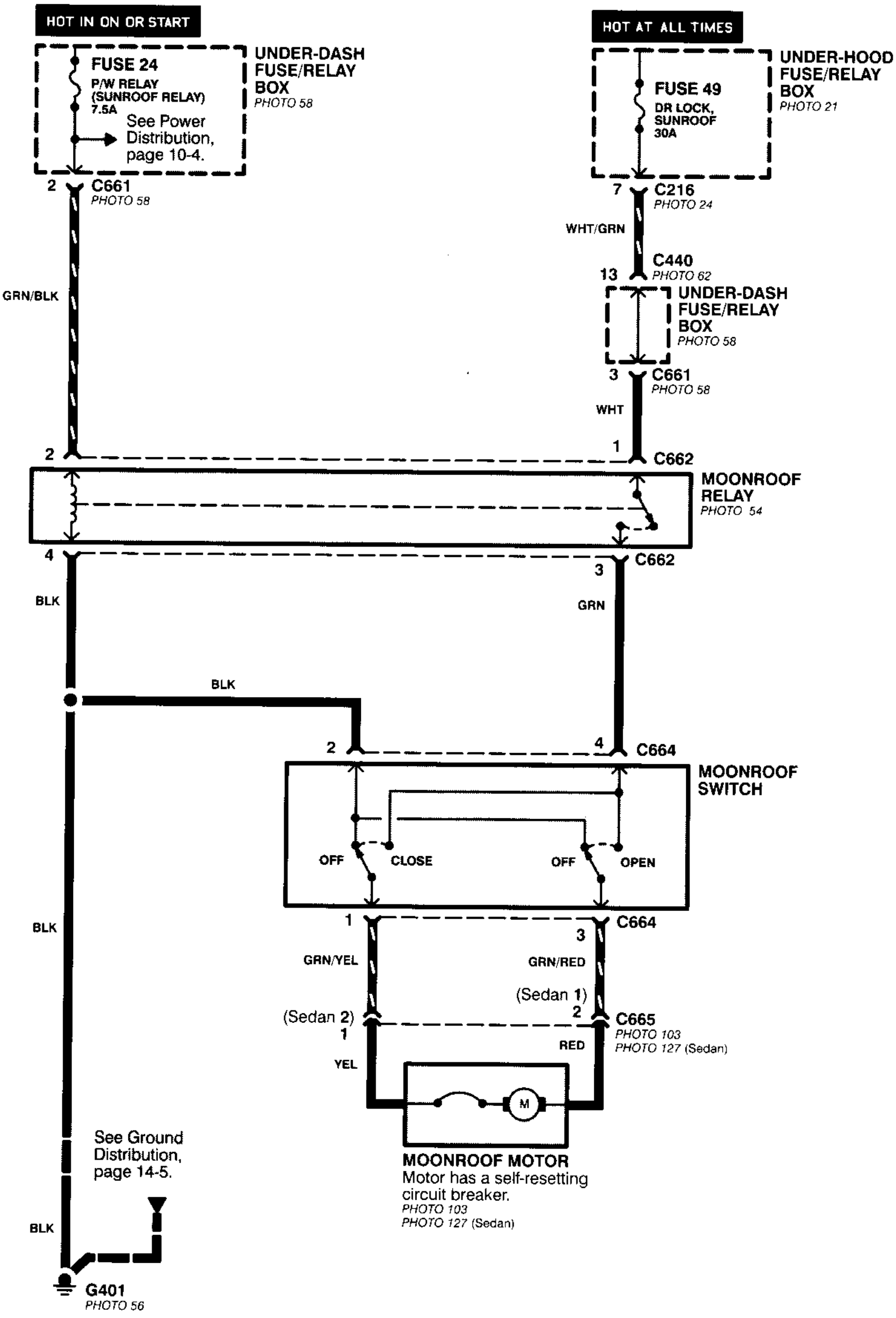
With the ignition switch in ON (II), voltage is applied to the coil of the power window relay through fuse 24. The contacts of the power window relay then close, applying voltage to the individual window switches and the power window master switch. With the master panel main switch ON, the passenger windows can be operated from the individual window switches or from the master panel switches.

When you push the front passenger's window switch to UP, voltage is applied to the front passenger's window motor. (The motor is grounded through the contacts in the front passenger's window switch and the power window master switch.) The window moves up as long as you hold the switch in the UP position. If you push the switch to DOWN, voltage is applied in the opposite direction to the front passenger's window motor, and the window moves down as long as you hold the switch in the DOWN position. The window switches in the other doors operate similarly.

When you push the front passenger's switch in the master panel to UP, voltage is applied through the front passenger's window switch contacts to the front passenger's window motor. (The motor is grounded through the contacts in the front passenger's window switch and the power window master switch.) The window moves up as long as you hold the switch in the UP position. If you push the switch to DOWN, voltage is applied in the opposite direction to the front passenger's window motor, and the window moves down as long as you hold the switch in the DOWN position. The other passenger window switches in the master panel operate similarly.

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Moonroof



HOT IN ON OR START
FUSE 24
P/W RELAY (SUNROOF RELAY) 7.5A
See Power Distribution, page 10-4.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C661
PHOTO 58
GRN/BLK
HOT AT ALL TIMES
FUSE 49
DR LOCK, SUNROOF 30A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
C216
PHOTO 24
WHT/GRN
C440
PHOTO 62
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C661
PHOTO 58
WHT
C662
MOONROOF RELAY
PHOTO 54
C662
BLK
GRN
BLK
C664
MOONROOF SWITCH
OFF
CLOSE
OFF
OPEN
C664
BLK
GRN/YEL
GRN/RED
(Sedan 1)
(Sedan 2)
C665
PHOTO 103
PHOTO 127 (Sedan)
RED
YEL
M
MOONROOF MOTOR
Motor has a self-resetting circuit breaker.
PHOTO 103
PHOTO 127 (Sedan)
See Ground Distribution, page 14-5.
BLK
G401
PHOTO 56

How The Circuit Works

With the ignition switch ON (II), voltage is applied through fuse 24 to the coil of the moonroof relay. The moonroof relay energizes and voltage is applied from fuse 49 through the closed contacts of the moonroof relay to the moonroof switch.

Open Operation

When you push the moonroof switch to the OPEN position, voltage is applied to the moonroof motor. The moonroof motor is grounded through the CLOSE contacts of the moonroof switch, and the motor runs to open the moonroof.

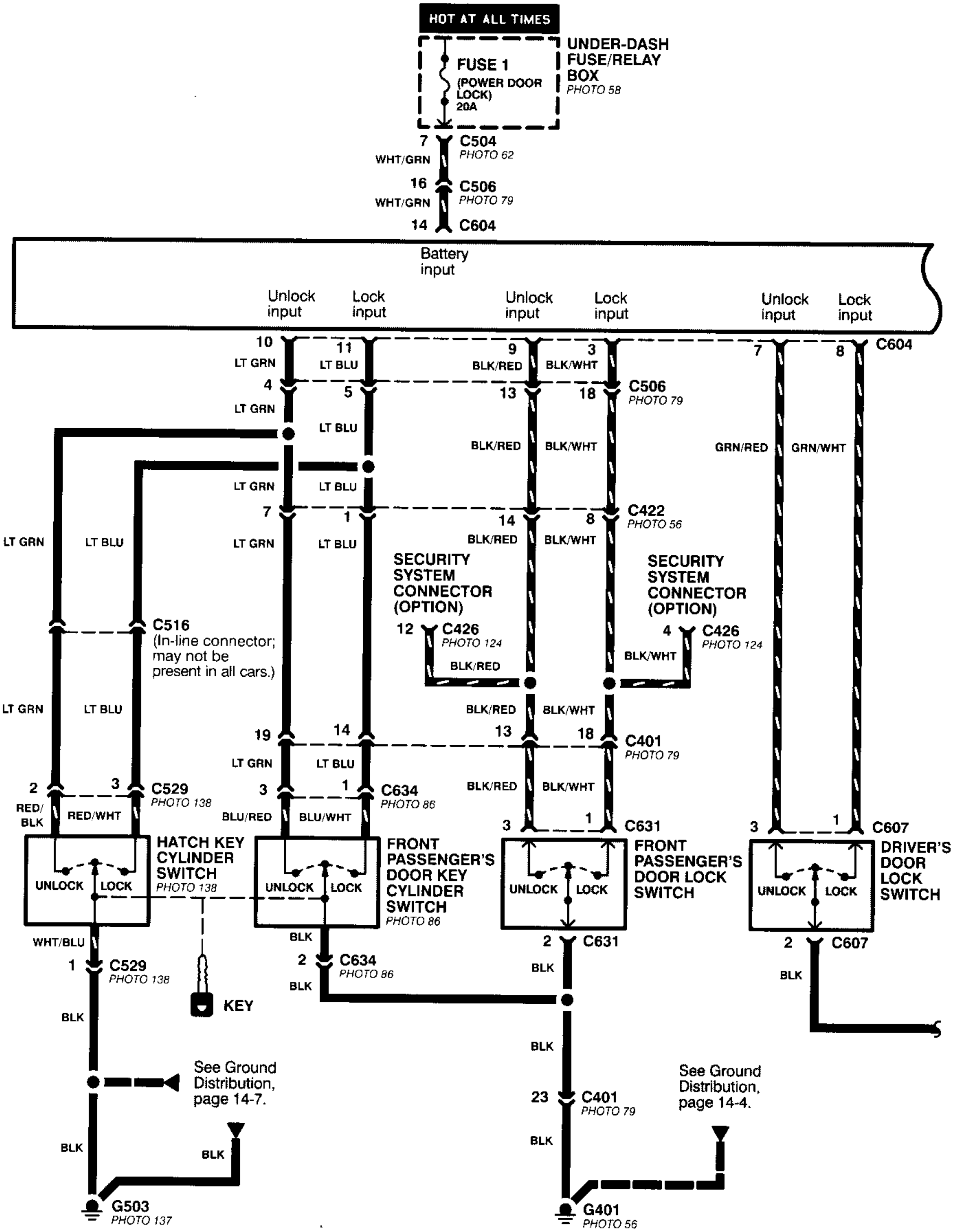
Close Operation

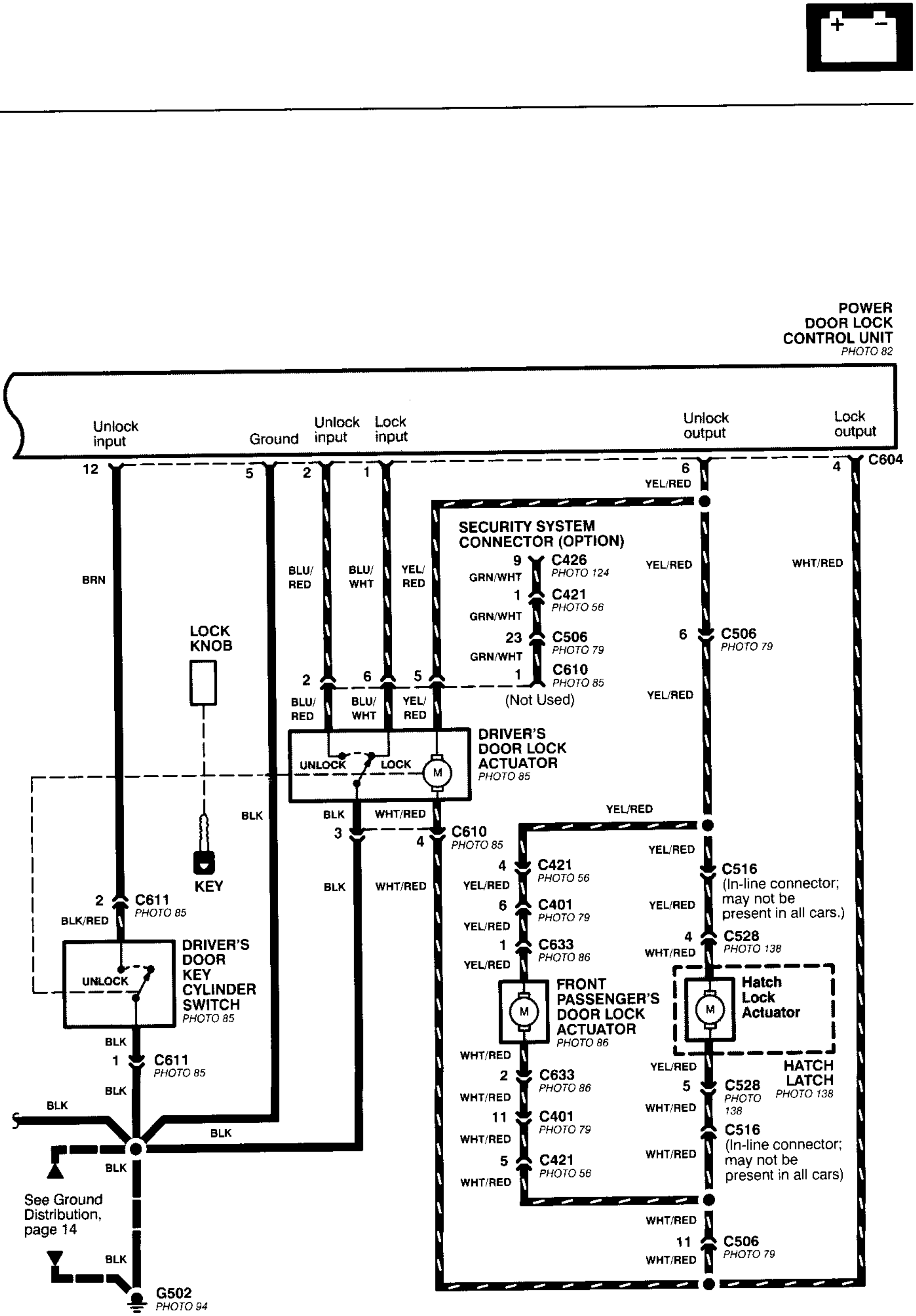
When you push moonroof switch to the CLOSE position, voltage is applied to the moonroof motor. The moonroof motor is grounded through the OPEN contacts of the moonroof switch, and the motor runs to close the moonroof.

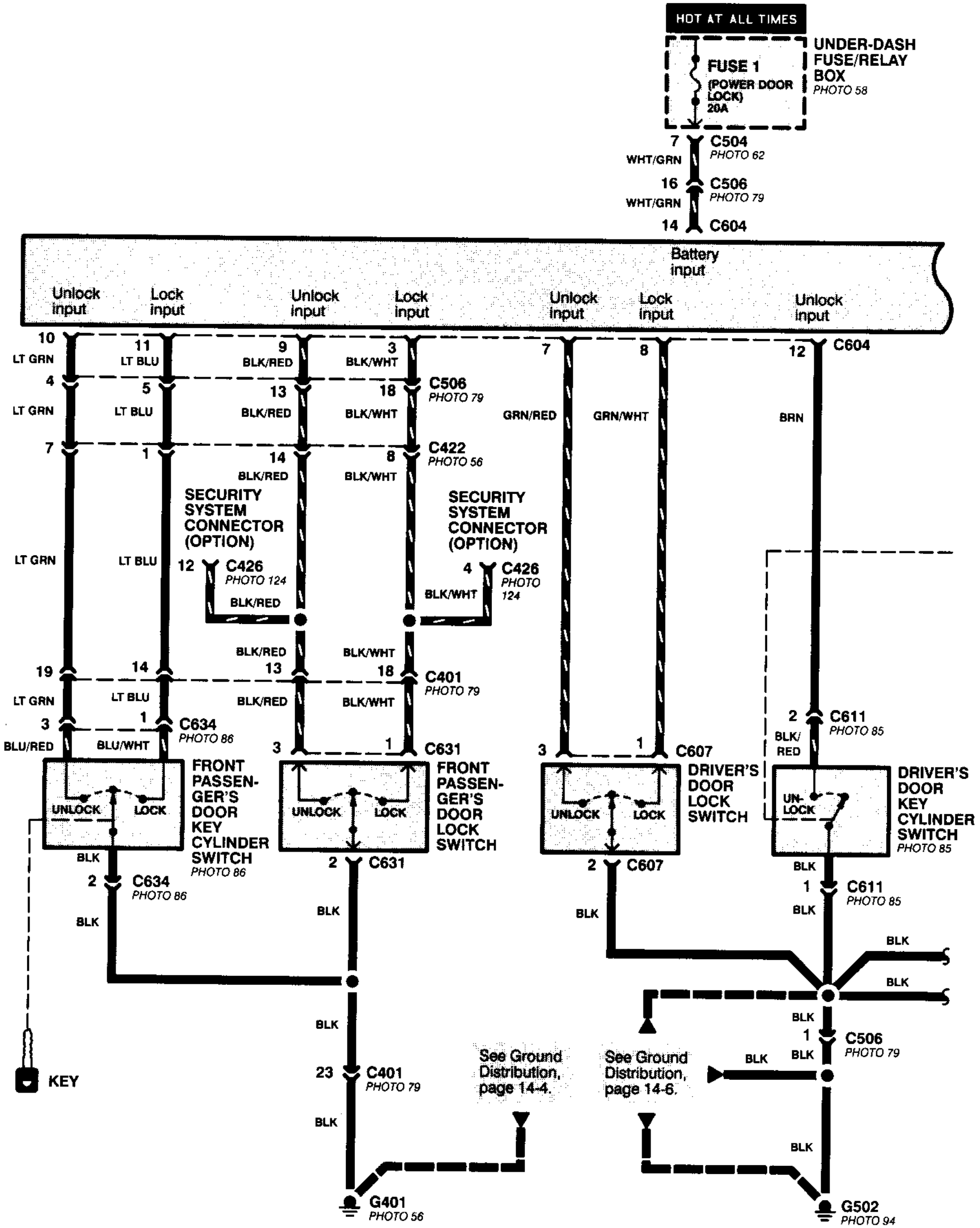
Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Power Door Locks

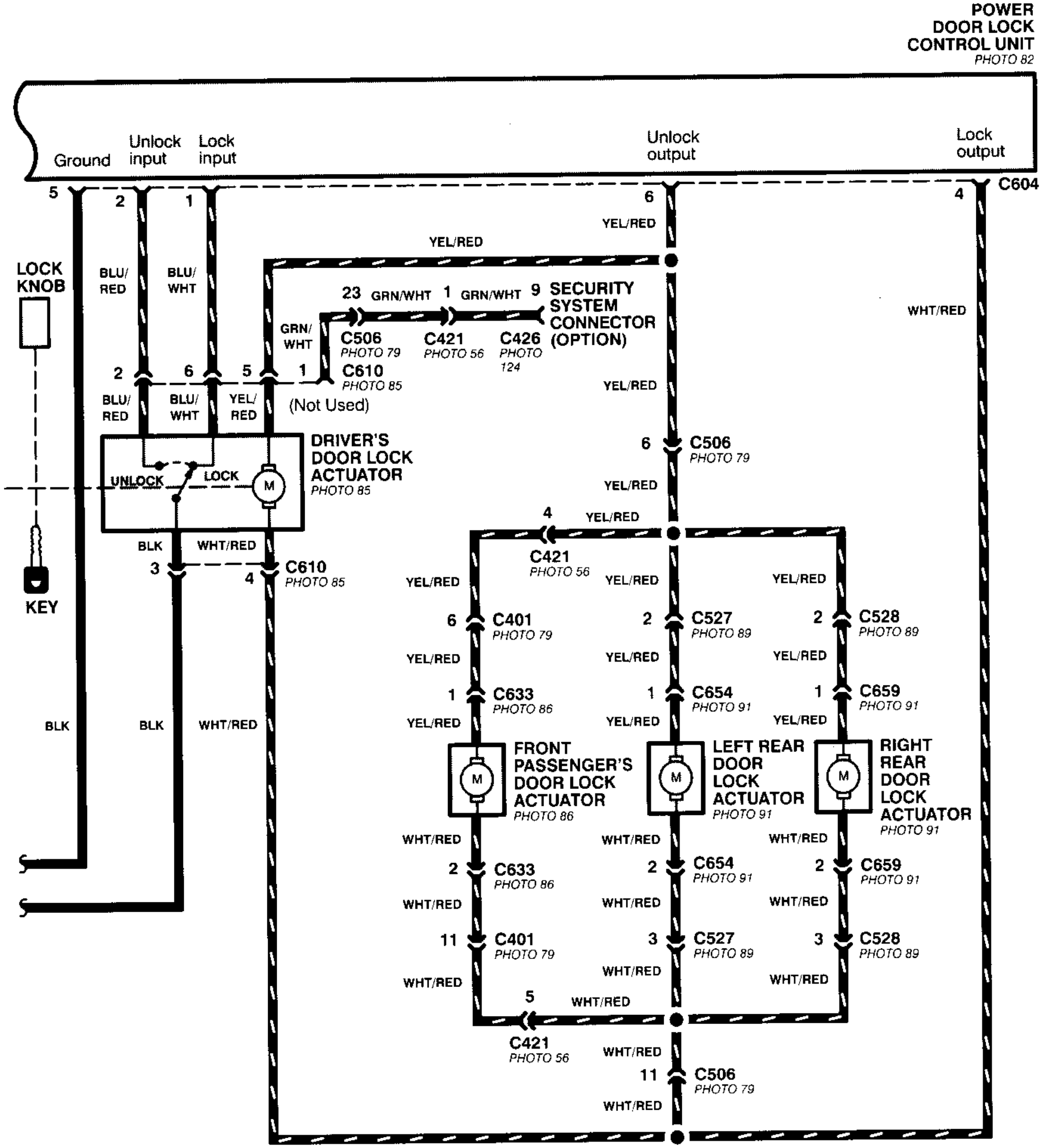
– Hatchback




POWER DOOR LOCK CONTROL UNIT
PHOTO 82
Unlock input
Ground
Unlock input
Lock input
Unlock output
Lock output
C604
BRN
BLU/RED
BLU/WHT
YEL/RED
WHT/RED
SECURITY SYSTEM CONNECTOR (OPTION)
C426
PHOTO 124
GRN/WHT
C421
PHOTO 56
C506
PHOTO 79
C610
PHOTO 85
(Not Used)
LOCK KNOB
DRIVER'S DOOR LOCK ACTUATOR
PHOTO 85
UNLOCK
LOCK
KEY
BLK
C611
PHOTO 85
BLK/RED
DRIVER'S DOOR KEY CYLINDER SWITCH
PHOTO 85
C401
C633
PHOTO 86
FRONT PASSENGER'S DOOR LOCK ACTUATOR
C516
(In-line connector; may not be present in all cars.)
C528
PHOTO 138
Hatch Lock Actuator
HATCH LATCH
See Ground Distribution, page 14
G502
PHOTO 94

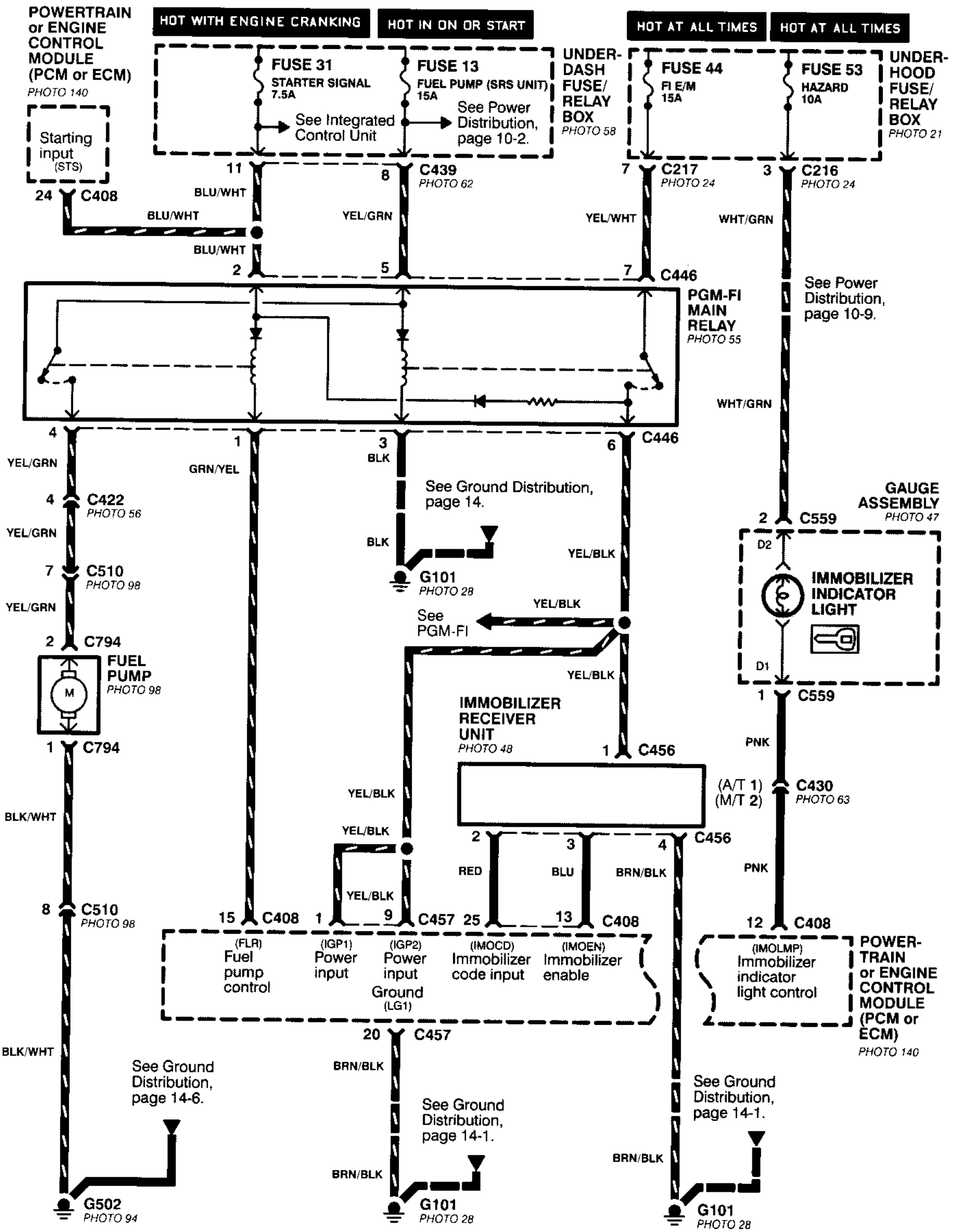


HOT AT ALL TIMES
FUSE 1 (POWER DOOR LOCK) 20A
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
C504
PHOTO 62
WHT/GRN
C506
PHOTO 79
C604
Battery input
Unlock input
Lock input
Unlock input
Lock input
Unlock input
Lock input
Unlock input
LT GRN
LT BLU
BLK/RED
BLK/WHT
GRN/RED
GRN/WHT
BRN
C422
PHOTO 56
SECURITY SYSTEM CONNECTOR (OPTION)
C426
PHOTO 124
C401
PHOTO 79
C634
PHOTO 86
C631
C607
C611
PHOTO 85
BLU/RED
BLU/WHT
BLK/ RED
UNLOCK
LOCK
UN-LOCK
FRONT PASSENGER'S DOOR KEY CYLINDER SWITCH
FRONT PASSENGER'S DOOR LOCK SWITCH
DRIVER'S DOOR LOCK SWITCH
DRIVER'S DOOR KEY CYLINDER SWITCH
BLK
KEY
See Ground Distribution, page 14-4.
See Ground Distribution, page 14-6.
G401
PHOTO 56
G502
PHOTO 94



POWER DOOR LOCK CONTROL UNIT
PHOTO 82
Ground
Unlock input
Lock input
Unlock output
Lock output
C604
YEL/RED
BLU/RED
BLU/WHT
LOCK KNOB
GRN/WHT
SECURITY SYSTEM CONNECTOR (OPTION)
C506 PHOTO 79
C421 PHOTO 56
C426 PHOTO 124
C610 PHOTO 85
(Not Used)
YEL/ RED
DRIVER'S DOOR LOCK ACTUATOR
PHOTO 85
UNLOCK
LOCK
BLK
WHT/RED
KEY
C401 PHOTO 79
C527 PHOTO 89
C528 PHOTO 89
C633 PHOTO 86
C654 PHOTO 91
C659 PHOTO 91
FRONT PASSENGER'S DOOR LOCK ACTUATOR
PHOTO 86
LEFT REAR DOOR LOCK ACTUATOR
PHOTO 91
RIGHT REAR DOOR LOCK ACTUATOR
PHOTO 91

Immobilizer System ('00 Model)



How the Circuit Works

The immobilizer system is designed to prevent the car from being started without the owner's ignition key. If an attempt is made to start the car without the correct key, the immobilizer system will disable the car's fuel supply.

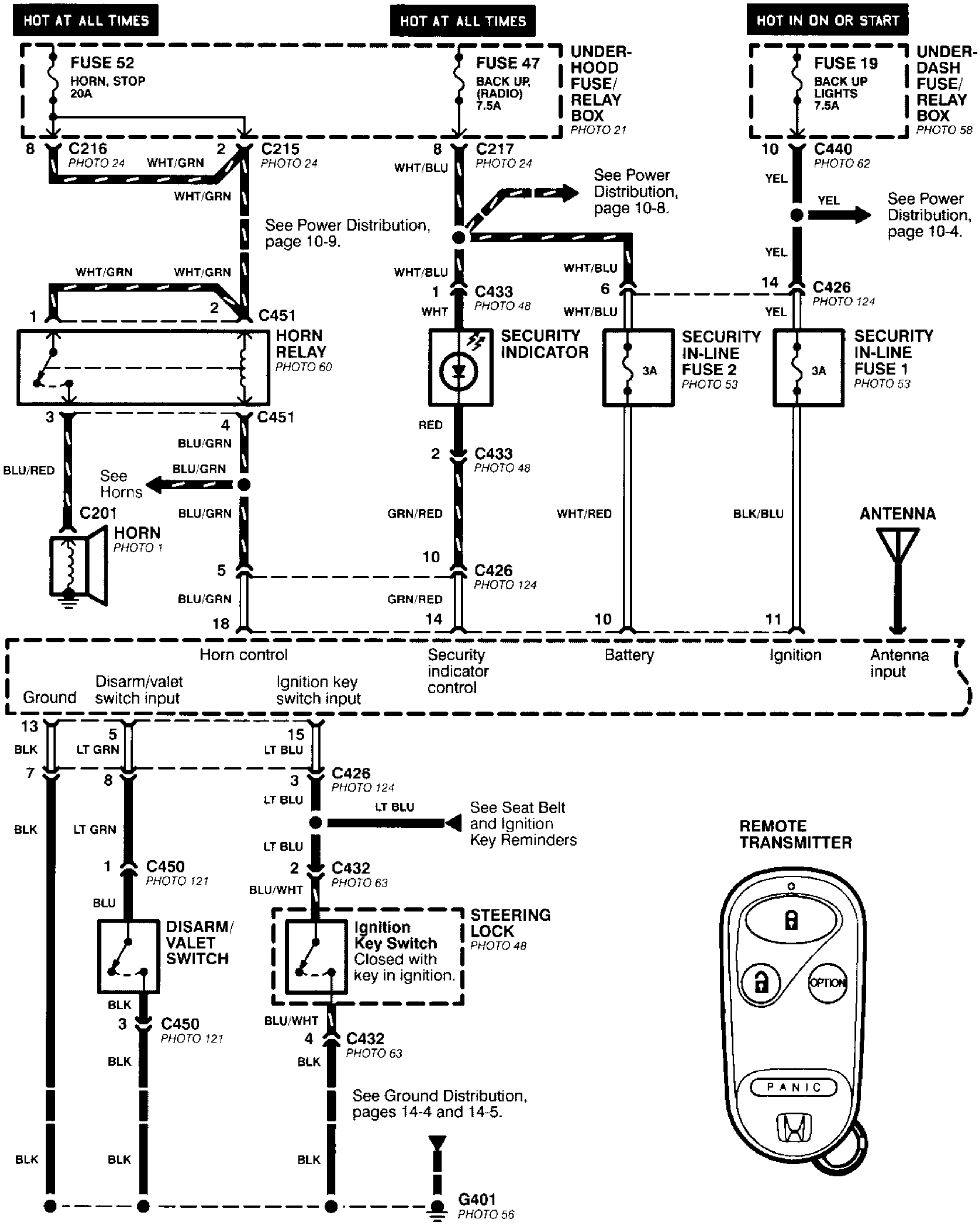
The immobilizer system consists of the ignition key, immobilizer receiver unit, immobilizer indicator light, PGM-FI main relay, fuel pump, and the PCM or ECM.

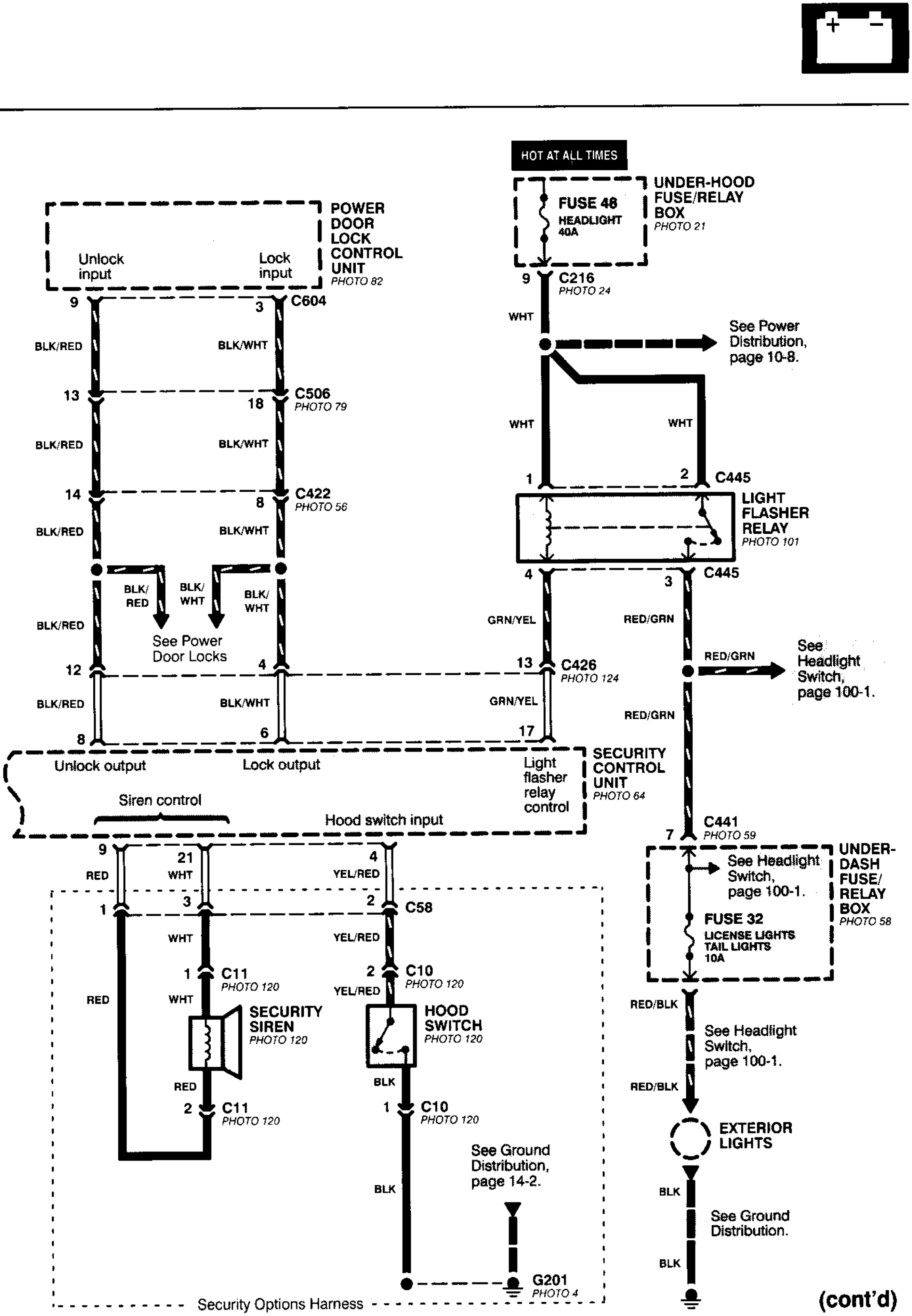
With the ignition switch in ON (II) or START (III), the immobilizer receiver unit and the PCM or ECM receive an "ignition on" signal through fuse 44 and the PGM-FI main relay. The PCM or ECM then sends power to the ignition key transponder through the immobilizer receiver unit. The transponder then sends a coded signal back to the PCM or ECM through the receiver unit. If the signal is correct, the PCM or ECM will energize the car's fuel supply system by grounding the PGM-FI main relay. The immobilizer indicator light flashes a code to indicate that the correct key has been inserted. If the ignition key signal is not correct, the PCM or ECM will not energize the car's fuel supply system by not grounding the PGM-FI main relay. The immobilizer indicator light then flashes a code to indicate that an incorrect key has been inserted.

Refer to the Service Manual (Section 23, Body Electrical) for specific tests and troubleshooting procedures.

Security System

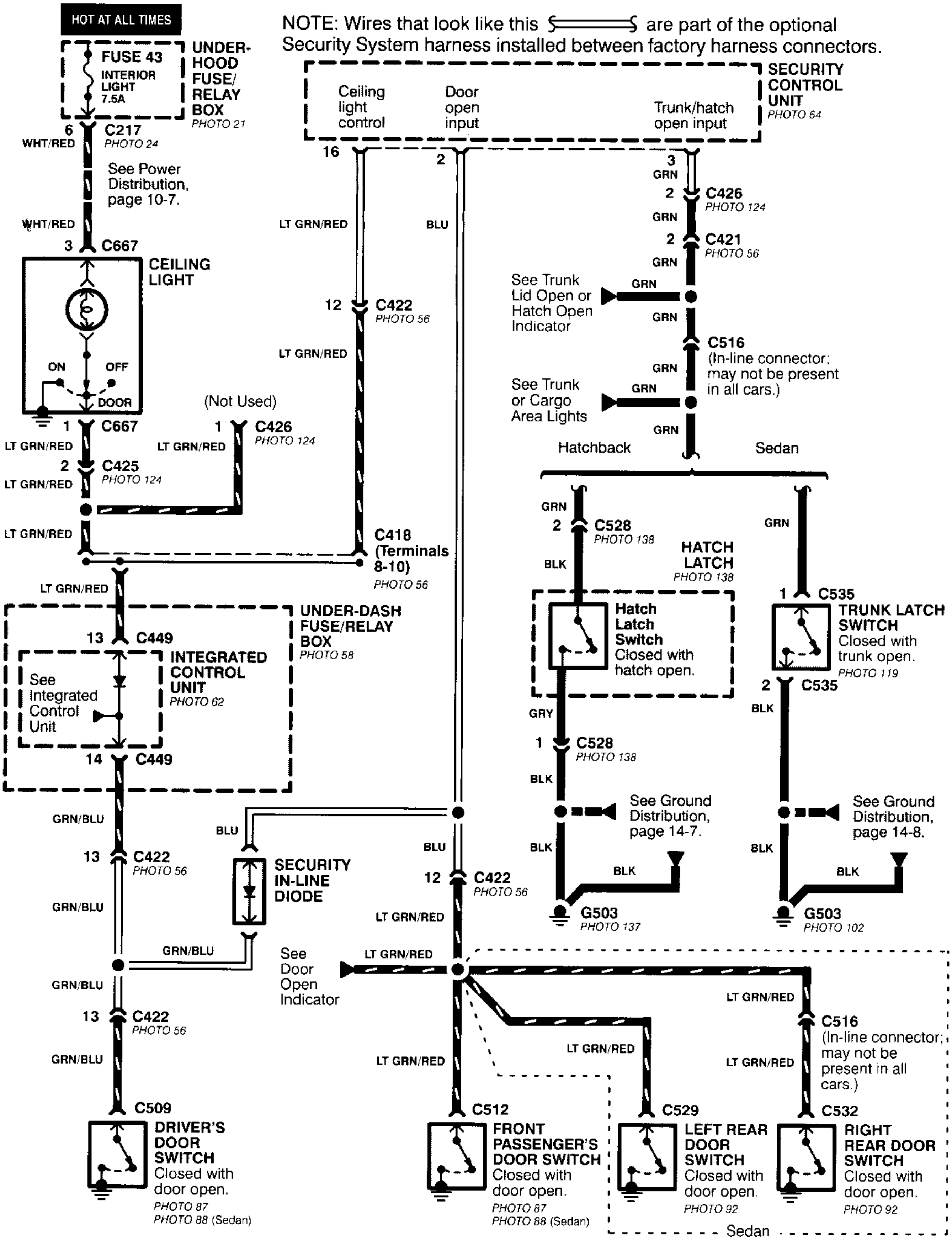
NOTE: Wires that look like this are part of the optional Security System harness installed between factory harness connectors.



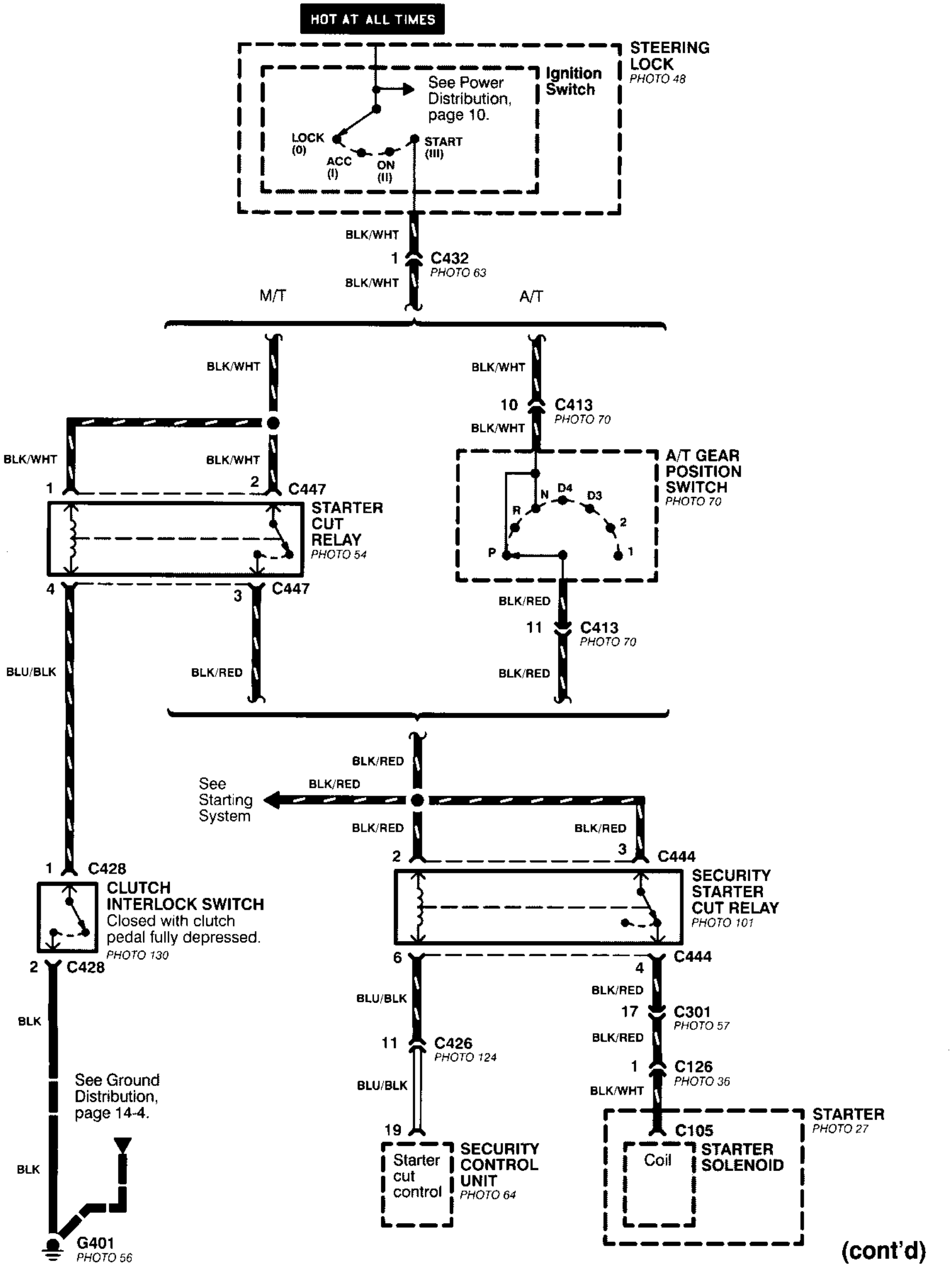


HOT AT ALL TIMES
FUSE 48
HEADLIGHT 40A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
POWER DOOR LOCK CONTROL UNIT
PHOTO 82
Unlock input
Lock input
C604
C216
PHOTO 24
WHT
BLK/RED
BLK/WHT
See Power Distribution, page 10-8.
C506
PHOTO 79
C422
PHOTO 56
C445
LIGHT FLASHER RELAY
PHOTO 101
GRN/YEL
RED/GRN
See Power Door Locks
C426
PHOTO 124
See Headlight Switch, page 100-1.
SECURITY CONTROL UNIT
PHOTO 64
Unlock output
Lock output
Light flasher relay control
Siren control
Hood switch input
C441
PHOTO 59
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
FUSE 32
LICENSE LIGHTS TAIL LIGHTS 10A
RED
YEL/RED
C58
C11
PHOTO 120
C10
PHOTO 120
SECURITY SIREN
PHOTO 120
HOOD SWITCH
PHOTO 120
RED/BLK
BLK
EXTERIOR LIGHTS
See Ground Distribution, page 14-2.
See Ground Distribution.
G201
PHOTO 4
Security Options Harness

(cont'd)



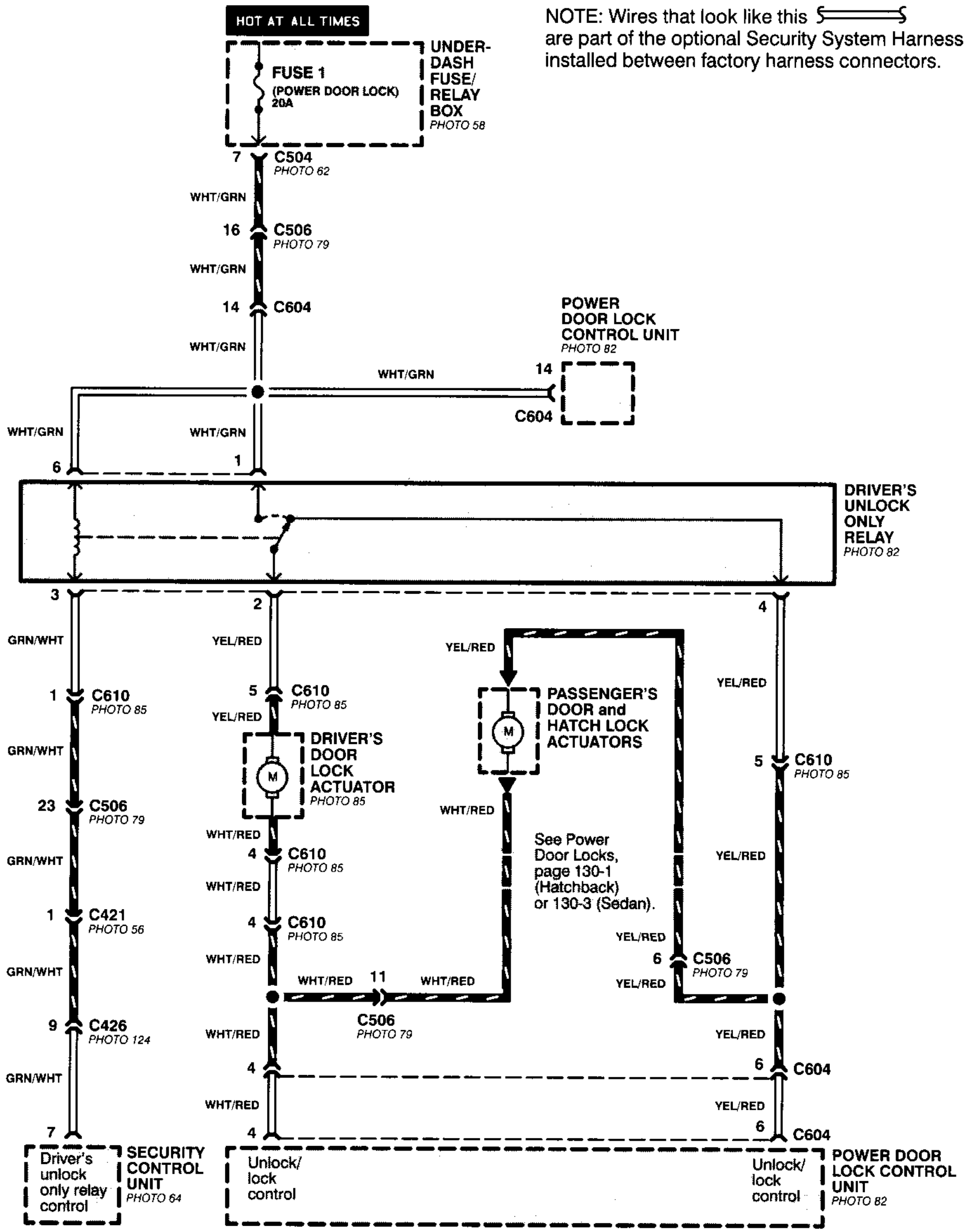
HOT AT ALL TIMES
FUSE 43
INTERIOR LIGHT 7.5A
UNDER-HOOD FUSE/ RELAY BOX
PHOTO 21
6
C217
PHOTO 24
WHT/RED
See Power Distribution, page 10-7.
WHT/RED
3
C667
CEILING LIGHT
ON
OFF
DOOR
1
C667
LT GRN/RED
2
C425
PHOTO 124
LT GRN/RED
(Not Used)
1
C426
PHOTO 124
LT GRN/RED
LT GRN/RED
NOTE: Wires that look like this are part of the optional Security System harness installed between factory harness connectors.
Ceiling light control
Door open input
Trunk/hatch open input
SECURITY CONTROL UNIT
PHOTO 64
16
2
3
GRN
LT GRN/RED
BLU
2
C426
PHOTO 124
GRN
2
C421
PHOTO 56
GRN
See Trunk Lid Open or Hatch Open Indicator
GRN
GRN
C516
(In-line connector; may not be present in all cars.)
GRN
See Trunk or Cargo Area Lights
GRN
GRN
12
C422
PHOTO 56
LT GRN/RED
C418 (Terminals 8-10)
PHOTO 56
Hatchback
Sedan
GRN
2
C528
PHOTO 138
BLK
HATCH LATCH
PHOTO 138
Hatch Latch Switch
Closed with hatch open.
GRY
1
C528
PHOTO 138
BLK
See Ground Distribution, page 14-7.
BLK
BLK
G503
PHOTO 137
GRN
1
C535
TRUNK LATCH SWITCH
Closed with trunk open.
PHOTO 119
2
C535
BLK
See Ground Distribution, page 14-8.
BLK
BLK
G503
PHOTO 102
LT GRN/RED
13
C449
INTEGRATED CONTROL UNIT
PHOTO 62
See Integrated Control Unit
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
14
C449
GRN/BLU
BLU
SECURITY IN-LINE DIODE
13
C422
PHOTO 56
GRN/BLU
GRN/BLU
GRN/BLU
13
C422
PHOTO 56
GRN/BLU
C509
DRIVER'S DOOR SWITCH
Closed with door open.
PHOTO 87
PHOTO 88 (Sedan)
BLU
12
C422
PHOTO 56
LT GRN/RED
See Door Open Indicator
LT GRN/RED
LT GRN/RED
C512
FRONT PASSENGER'S DOOR SWITCH
Closed with door open.
PHOTO 87
PHOTO 88 (Sedan)
LT GRN/RED
C529
LEFT REAR DOOR SWITCH
Closed with door open.
PHOTO 92
LT GRN/RED
C516
(In-line connector; may not be present in all cars.)
LT GRN/RED
C532
RIGHT REAR DOOR SWITCH
Closed with door open.
PHOTO 92
Sedan



HOT AT ALL TIMES
STEERING LOCK
PHOTO 48
Ignition Switch
See Power Distribution, page 10.
LOCK (0)
ACC (I)
ON (II)
START (III)
BLK/WHT
1
C432
PHOTO 63
M/T
A/T
BLK/WHT
10
C413
PHOTO 70
A/T GEAR POSITION SWITCH
PHOTO 70
N
D4
D3
R
2
P
1
BLK/RED
11
C413
PHOTO 70
1
2
C447
STARTER CUT RELAY
PHOTO 54
4
3
C447
BLU/BLK
BLK/RED
See Starting System
2
3
C444
SECURITY STARTER CUT RELAY
PHOTO 101
1
C428
CLUTCH INTERLOCK SWITCH
Closed with clutch pedal fully depressed.
PHOTO 130
2
C428
BLK
See Ground Distribution, page 14-4.
G401
PHOTO 56
6
C444
4
17
C301
PHOTO 57
11
C426
PHOTO 124
1
C126
PHOTO 36
19
Starter cut control
SECURITY CONTROL UNIT
PHOTO 64
STARTER
PHOTO 27
C105
Coil
STARTER SOLENOID

(cont'd)

NOTE: Wires that look like this [symbol] are part of the optional Security System Harness installed between factory harness connectors.



How the Circuit Works

The security system control unit has a 3 position switch: Manual, Auto, and Auto Lock. Here's what happens when you arm the system, regardless of the switch position:

- The parking lights will flash once.
- The security indicator will flash once per second after the system is armed.

With the switch in the Manual position, the security system can only be armed by using the remote control transmitter. After you remove the key from the ignition and close all doors, the hood (if equipped with the optional hood switch), the hatch or trunk, press the lock button on the transmitter and the system will arm (if the system is in the beep sound mode, the horn will sound once). The doors will automatically lock when the system is armed.

With the switch in the Auto position, the security system will arm itself within about 20 seconds after you turn the engine off, remove the key from the ignition, and close the hatch or trunk, the hood (if equipped with the optional hood switch), or last door. If a door is opened during the 20-second exit delay time, the timer will reset itself. The remote control transmitter can still be used to arm the system with the switch in Auto position (see manual for details).

With the switch in Auto Lock position, the security system will arm itself and lock the doors about 20 seconds after you turn the engine off, remove the key from the ignition, and close the hatch or trunk, the hood (if equipped with the optional hood switch), or last door. If a door is opened during the 20-second exit delay time, the timer will reset. The remote control transmitter can still be used to arm the system in the Auto Lock position.

Triggering the Alarm

After the security system is armed, the sound of breaking glass or the opening of a door, hood, hatch or trunk will trigger the alarm, and cause the following:

- The horn will sound for 30 seconds.
  The optional siren will sound for 60 seconds.
- The parking lights will flash.
- The security indicator LED will flash twice per second.
- The starter will be disabled.

At the end of the alarm cycle, the system will automatically rearm.

Disarming the Security System

There are two ways to disarm the security system:

- With the transmitter
- With the disarm/valet switch

When the system is disarmed, regardless of the method used, the parking lights will flash two times if the alarm has not been triggered and three times if the alarm has been triggered. To disarm the system with the transmitter, press the unlock button (if the system is in the beep sound mode, the horn will sound two times if the alarm has not been triggered, however, will sound three times if the alarm has been triggered). The driver's door will unlock (pressing the unlock button twice will unlock all doors).

To disarm the security system using the disarm/valet switch, enter the car and turn the ignition switch to ON (II) then press the disarm/valet switch button. If you open the door when the control unit switch is in Auto or Auto Lock, a 20-second entry delay will give you time to disarm the system. However, when the system is armed by the transmitter, the entry delay time is changed to zero seconds, and the alarm is triggered as soon as you open the door.

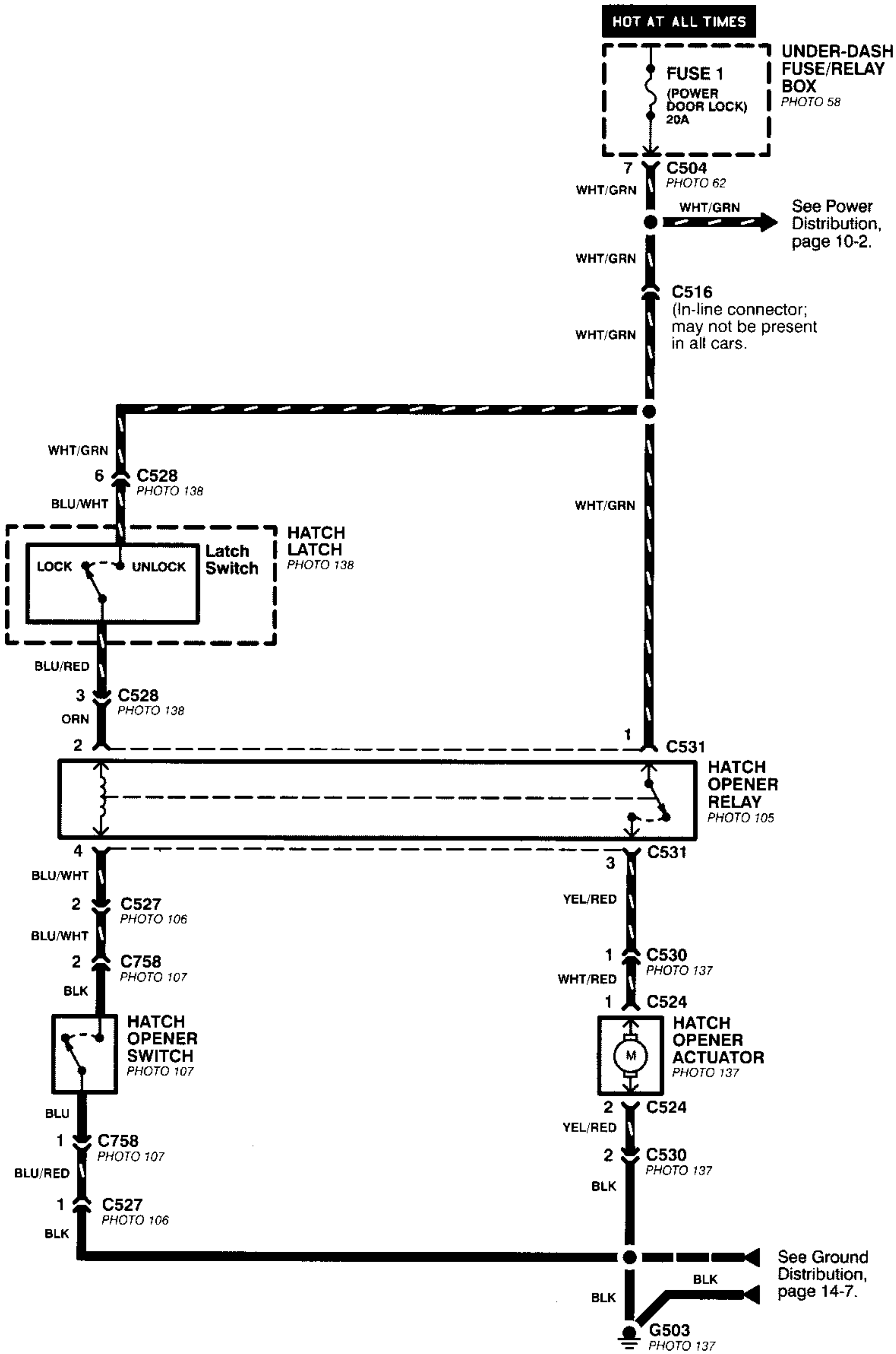
Identifying Tripped Sensors

The system will indicate the sensor which triggered the alarm through the security indicator LED. While sitting inside the vehicle with the key out of the ignition switch, all doors, the hood (if equipped with the optional hood switch), the hatch or trunk must be closed. Press and hold the disarm/valet switch. Press the lock button and then the unlock button of the transmitter. Release the disarm/valet switch. The status LED will blink according to the following code:

Sensors	Number of Flashes
Door	1 blink, pause, repeat
Trunk/Hatch	2 blinks, pause, repeat
System Switches	3 blinks, pause, repeat
Glass Breakage	4 blinks, pause, repeat
Hood (Optional)	5 blinks, pause, repeat

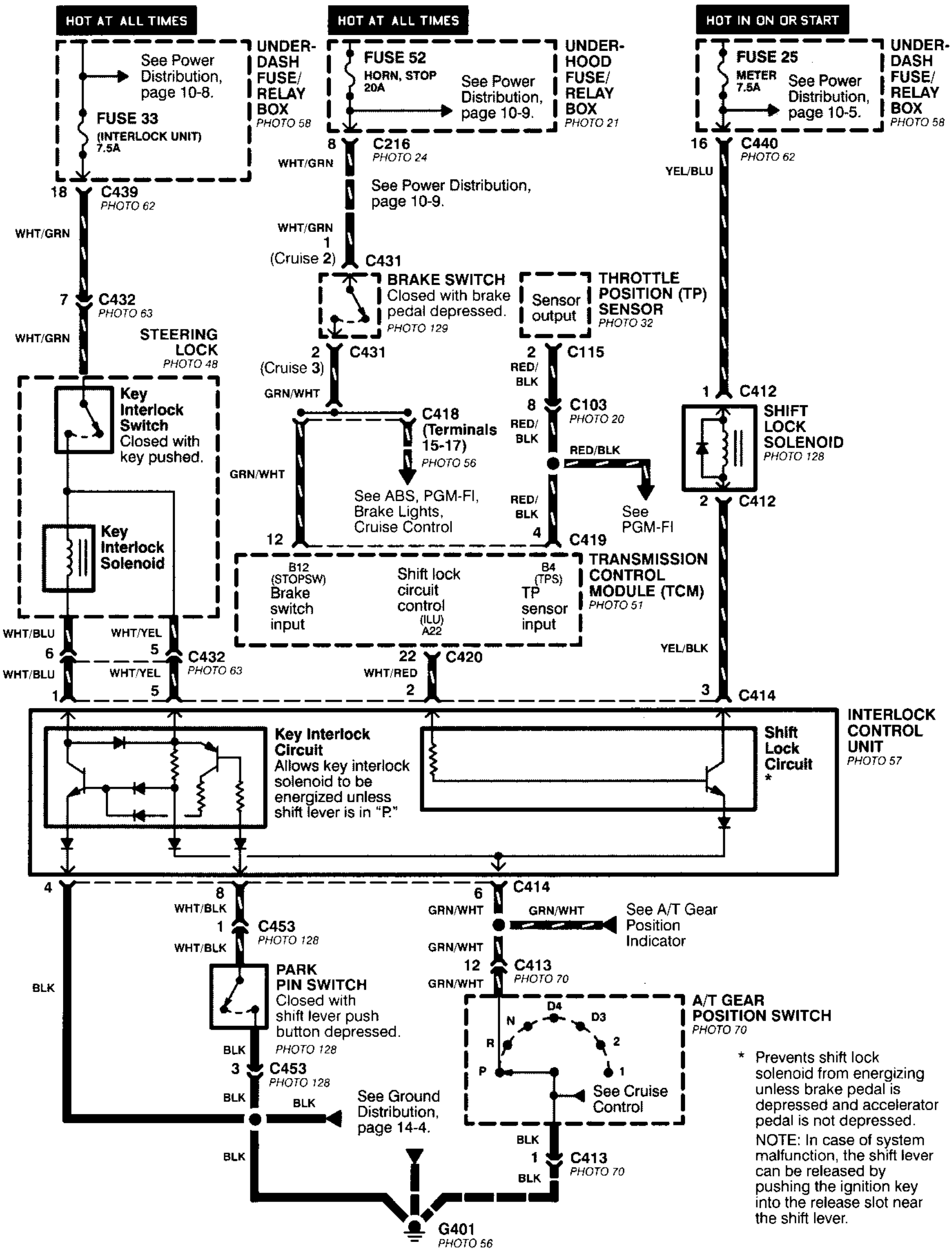
For further operating instructions and troubleshooting, see the security system owner's manual.

Hatch Opener



Interlock System

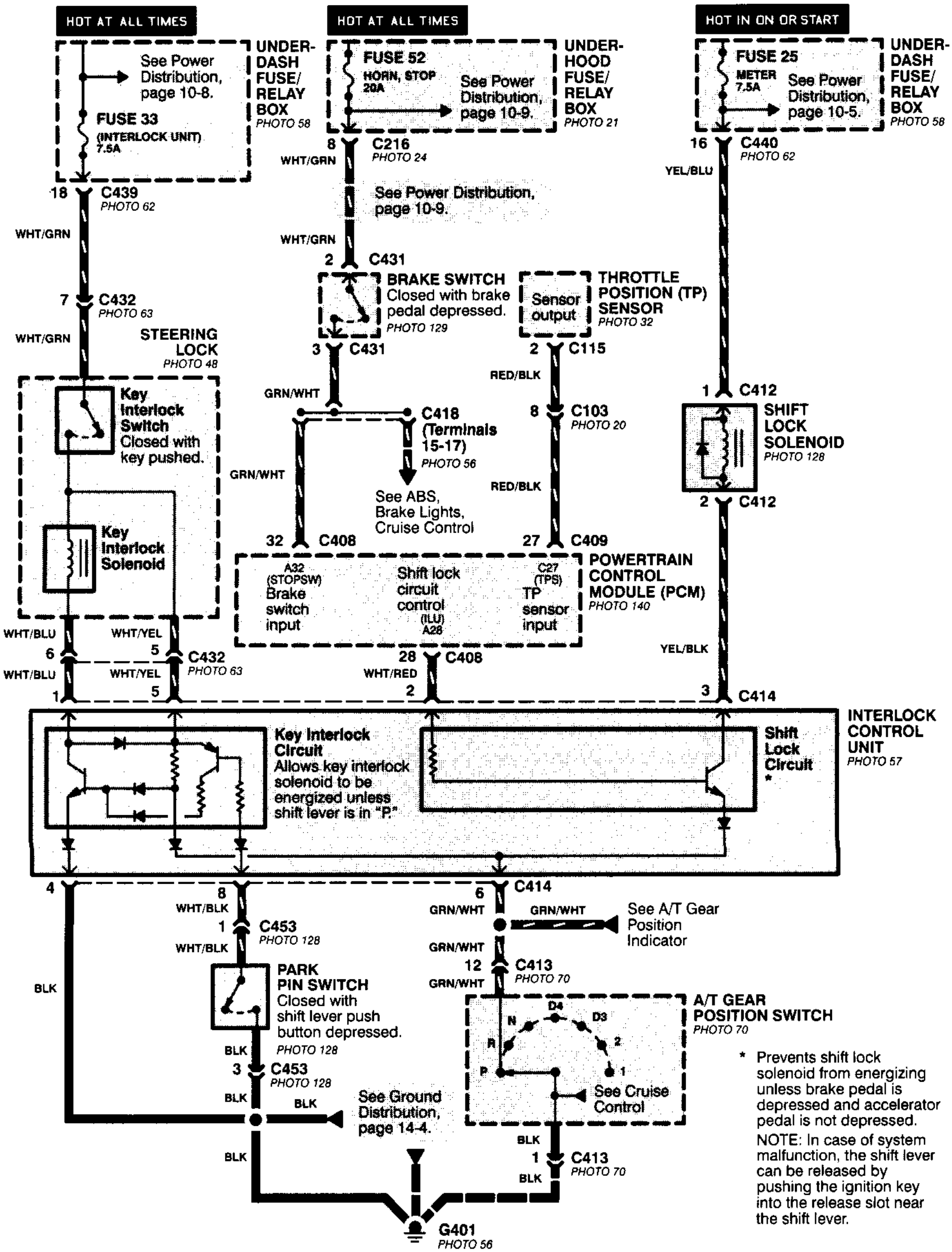
– '98-'99 Models



* Prevents shift lock solenoid from energizing unless brake pedal is depressed and accelerator pedal is not depressed.

NOTE: In case of system malfunction, the shift lever can be released by pushing the ignition key into the release slot near the shift lever.

– '00 Model



* Prevents shift lock solenoid from energizing unless brake pedal is depressed and accelerator pedal is not depressed.

NOTE: In case of system malfunction, the shift lever can be released by pushing the ignition key into the release slot near the shift lever.

Interlock System

– How the Circuit Works

Key Interlock

Battery voltage is supplied at all times through fuse 33 to the key interlock switch. When the key is in the ignition, battery voltage is supplied to the key interlock solenoid and the key interlock circuit in the interlock control unit. When the A/T gear position switch is in PARK, ground is provided to the key interlock circuit. This removes ground from the interlock solenoid, the solenoid is deenergized, and the key can be removed from the ignition.

Shift Position Interlock

Battery voltage is supplied at all times from fuse 52 to the brake switch. With the ignition in ON (II) or START (III), battery voltage is supplied through fuse 25 to the shift lock solenoid. When you push the brake pedal, battery voltage is applied through the GRN/WHT wire to the transmission ('98-'99 models) or powertrain ('00 model) control module (TCM or PCM). If, at the same time, you do not push the accelerator pedal, a low voltage signal is sent through the RED/BLK wire to the TCM or PCM. The TCM or PCM then applies voltage through the WHT/RED wire to the shift lock circuit in the interlock control unit. If the A/T gear position switch is in the PARK position, the shift lock circuit provides ground to the shift lock solenoid. The solenoid is then energized, and the shift lever can be moved from the PARK position.

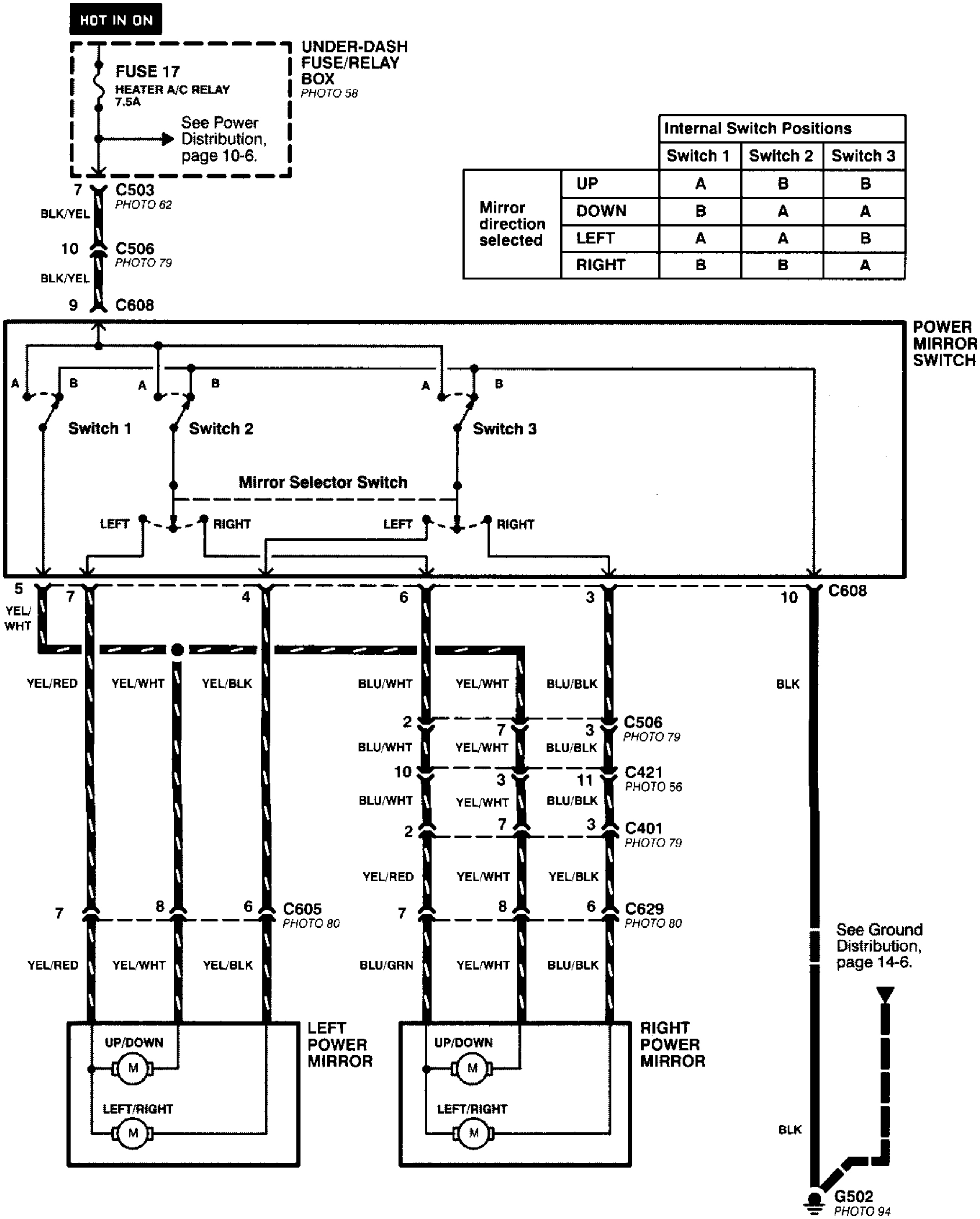
Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

Power Mirrors

– Hatchback

NOTE: The power mirror switch contains three switches (designated 1, 2, and 3). The three switches are not mechanically connected, but operate independently or together depending on the mirror direction selected (up, down, left, right). Refer to the table below for internal switch positions according to the mirrror direction selected.

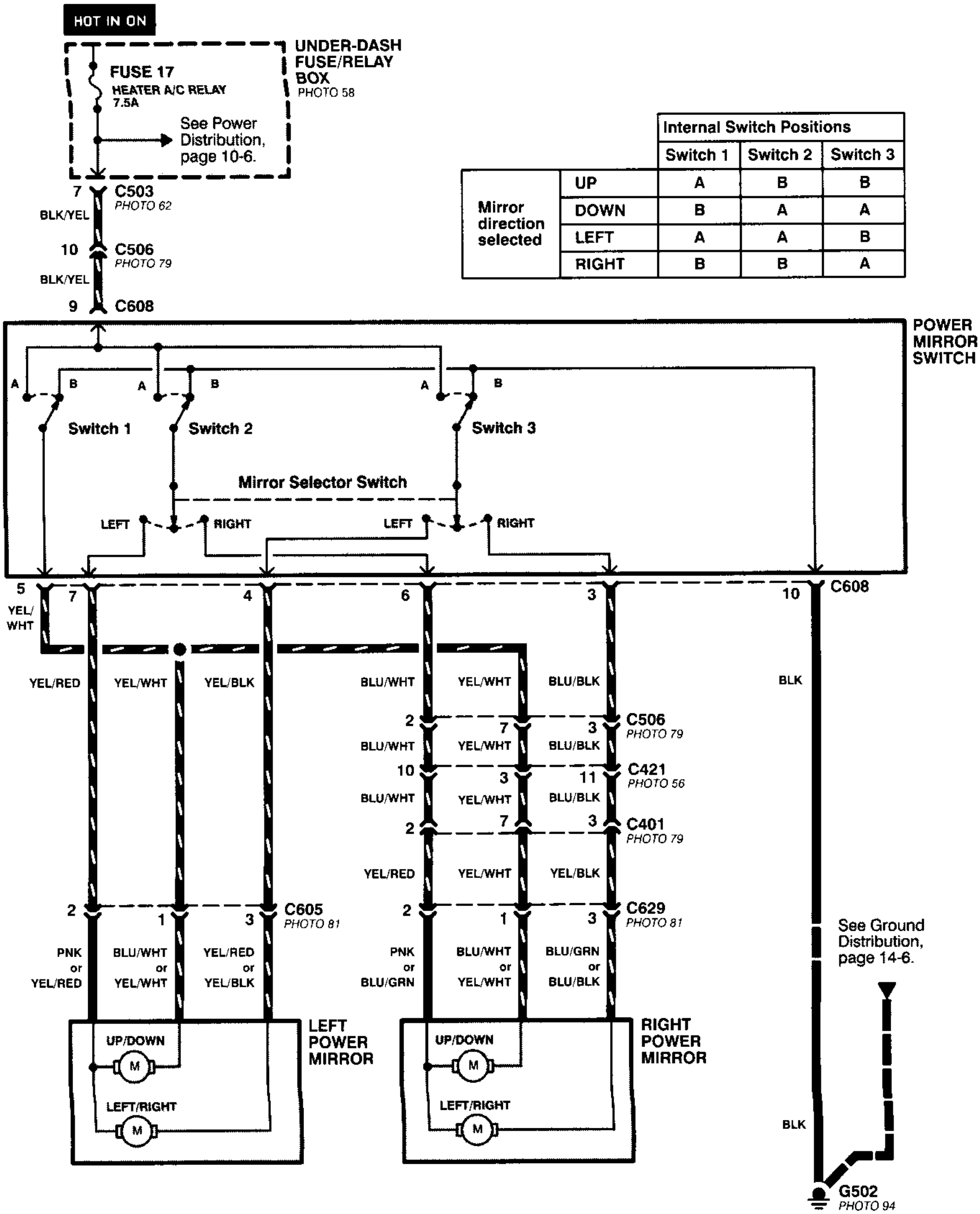
		Internal Switch Positions		
		Switch 1	Switch 2	Switch 3
Mirror direction selected	UP	A	B	B
	DOWN	B	A	A
	LEFT	A	A	B
	RIGHT	B	B	A



- Sedan

NOTE: The power mirror switch contains three switches (designated 1, 2, and 3). The three switches are not mechanically connected, but operate independently or together depending on the mirror direction selected (up, down, left, right). Refer to the table below for internal switch positions according to the mirrror direction selected.

		Internal Switch Positions		
		Switch 1	Switch 2	Switch 3
Mirror direction selected	UP	A	B	B
	DOWN	B	A	A
	LEFT	A	A	B
	RIGHT	B	B	A



Power Mirrors

– How the Circuit Works

The two outside mirrors are controlled by the power mirror switch. Each mirror has two reversible motors: one motor moves the mirror up and down and the other motor moves the mirror left and right.

The power mirror switch contains three switches to control mirror direction, and two switches to select the left or right mirror. With the ignition in ON (II), battery voltage is supplied to the power mirror switch. The mirror selector switch directs voltage from two of the direction switches to either the left or the right mirror. Each direction switch is used for more than one function.

Mirror Up Operation

With the power mirror switch in the up position, switch 1 is moved to the A position. Switch 1 applies battery voltage to both the left and right power mirror up/down motors. If the mirror selector switch is in the left position, the left up/down motor is grounded through the mirror selector switch and switch 2 in the B position to G501 (Sedan) or G502 (Hatchback). If the right mirror up/down motor is selected it is also grounded through switch 2 in the B position.

Mirror Down Operation

With the power mirror switch in the down position, switches 2 and 3 are moved to the A position. Switch 2 applies battery voltage to the left or right power mirror up/down motor as determined by the mirror selector switch. The selected mirror motor is grounded through switch 1 in the B position to G501 (Sedan) or G502 (Hatchback). When switch 2 is moved to position A, it also applies battery voltage to the selected mirror left/right motor. With switch 3 in the A position, battery voltage is supplied to both sides of the left/right motor so it does not move.

Mirror Left Operation

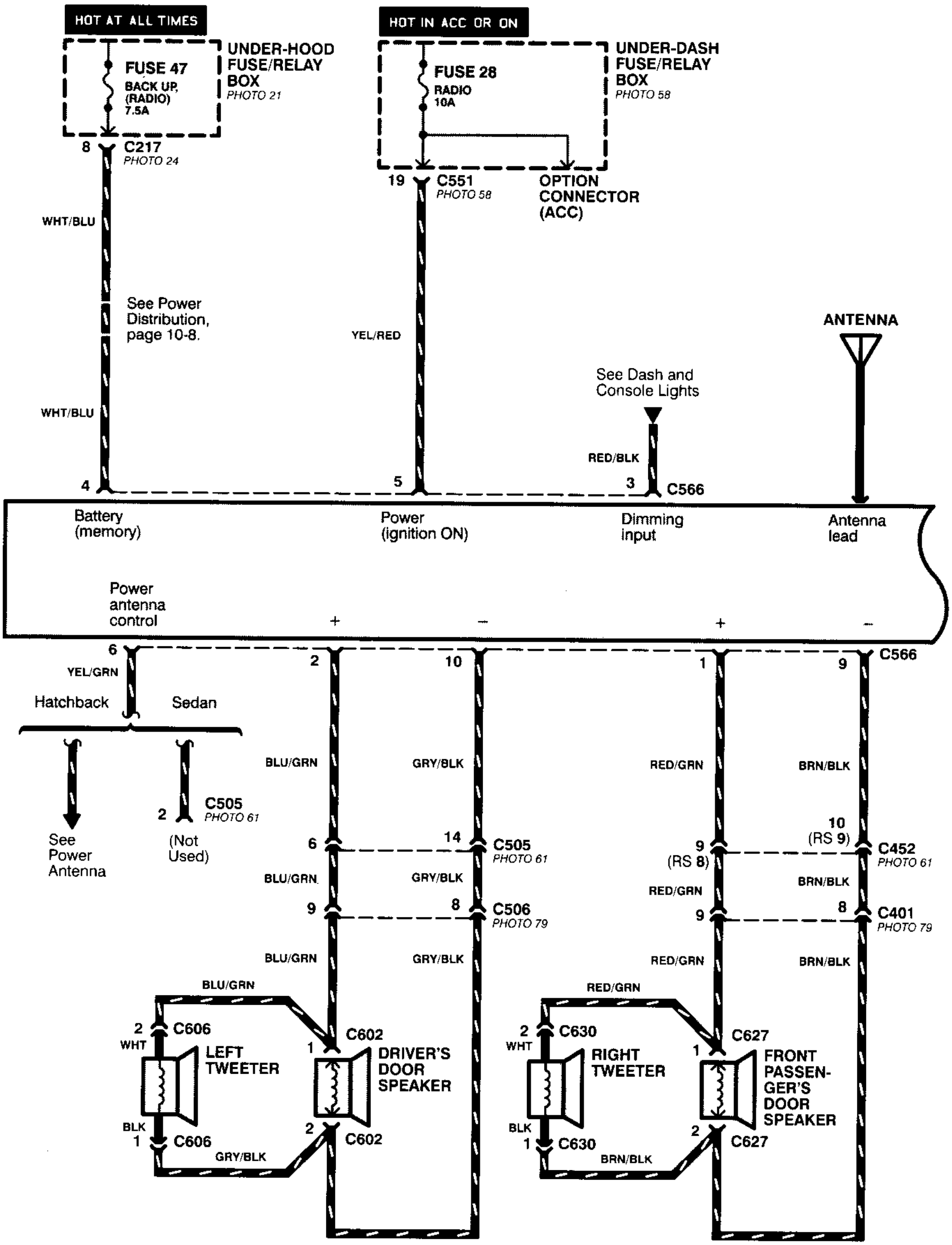
With the power mirror switch in the left position, switches 1 and 2 are moved to the A position. Switch 2 applies battery voltage to the left or right power mirror left/right motor as determined by the mirror selector switch. The selected mirror motor is grounded through switch 3 in the B position to G501 (Sedan) or G502 (Hatchback). When switch 2 is moved to position A, it also applies battery voltage to the selected mirror up/down motor. With switch 1 in the A position, battery voltage is supplied to both sides of the up/down motor so it does not move.

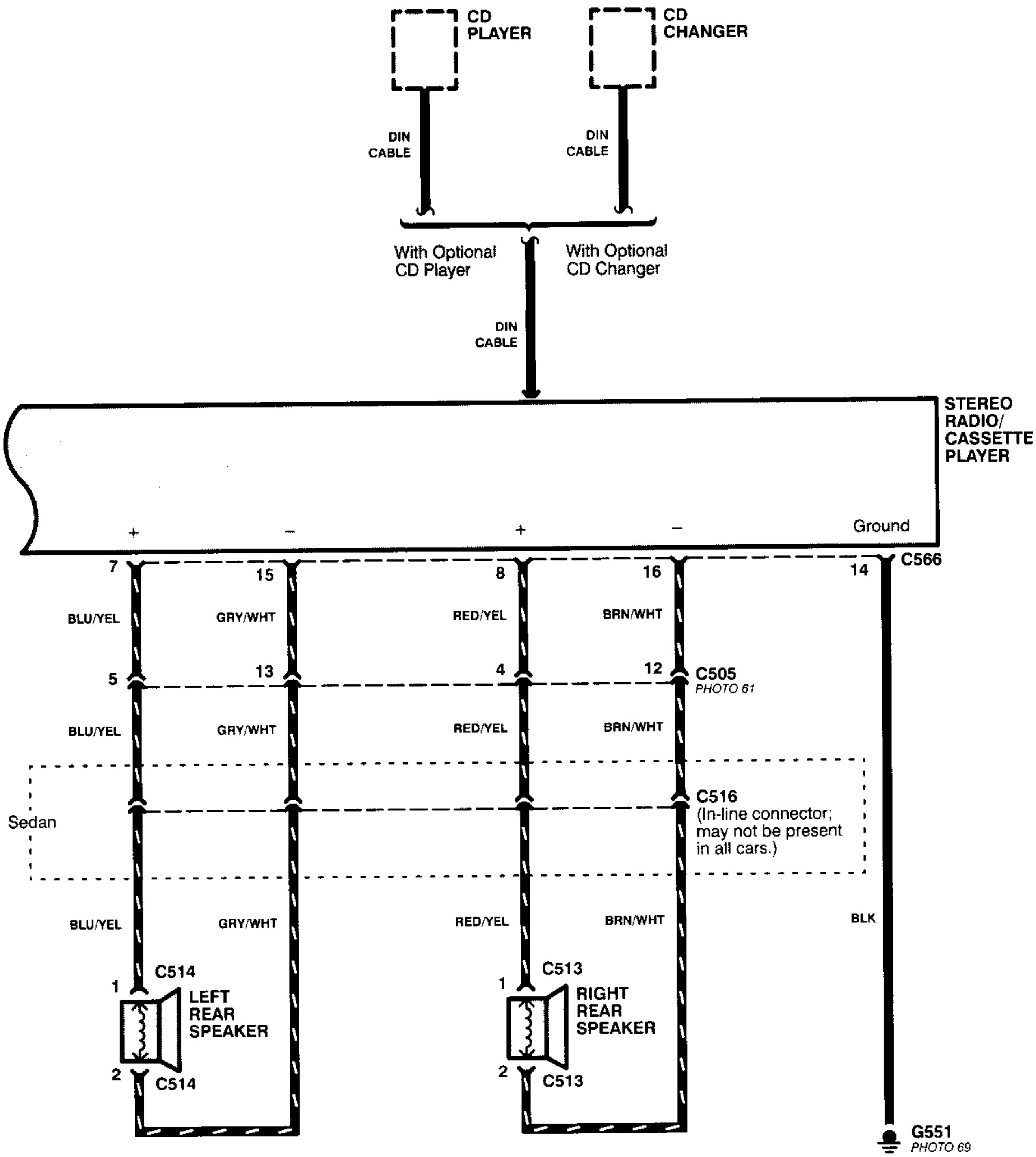
Mirror Right Operation

With the power mirror switch in the right position, switch 3 is moved to the A position. Switch 3 applies battery voltage through the mirror selector switch to the left or right left/right motor. The motor is grounded through the mirror selector switch and switch 2 in the B position to G501 (Sedan) or G502 (Hatchback).

Refer to the Service Manual (Section 23, Electrical) for specific tests or troubleshooting procedures.

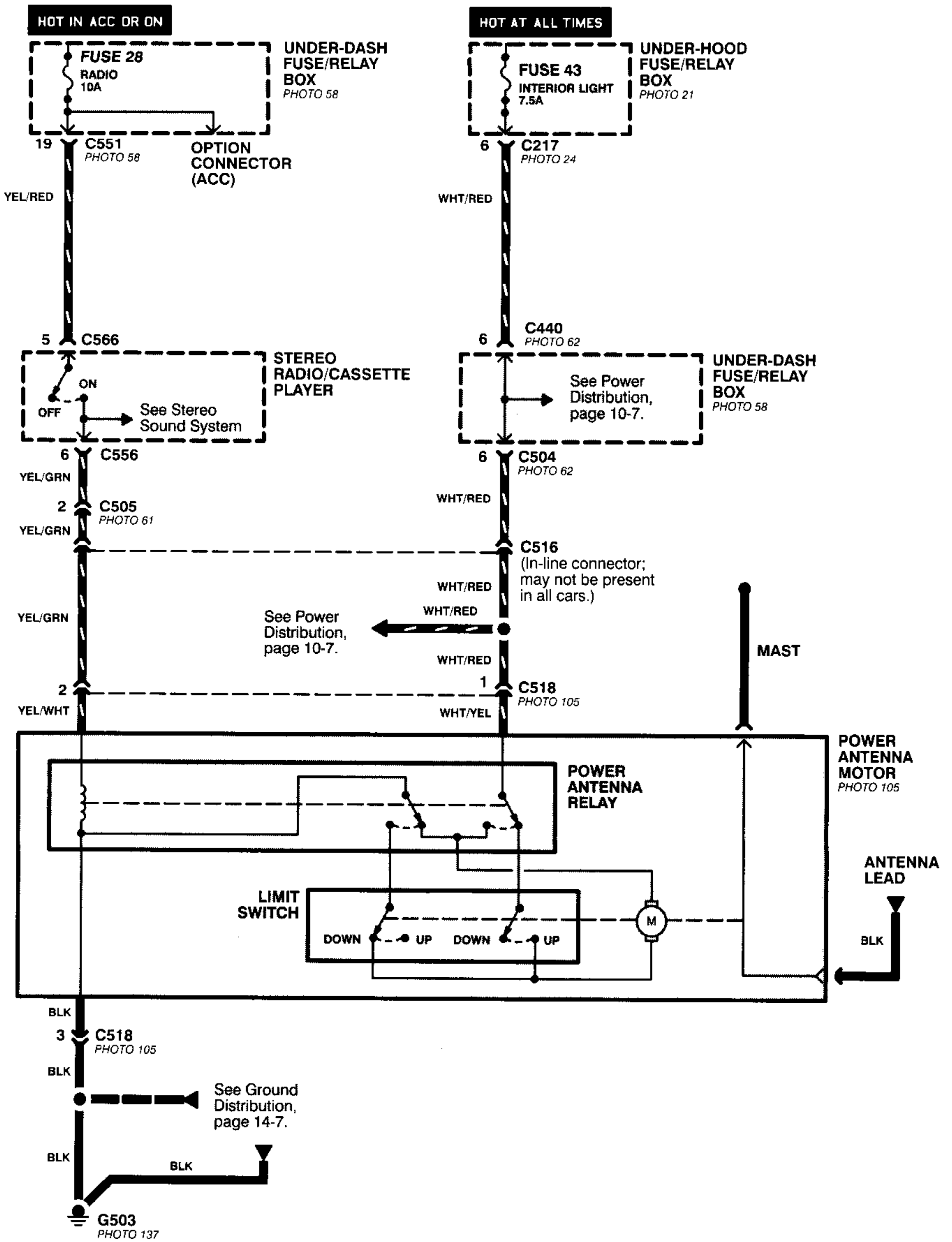
Stereo Sound System



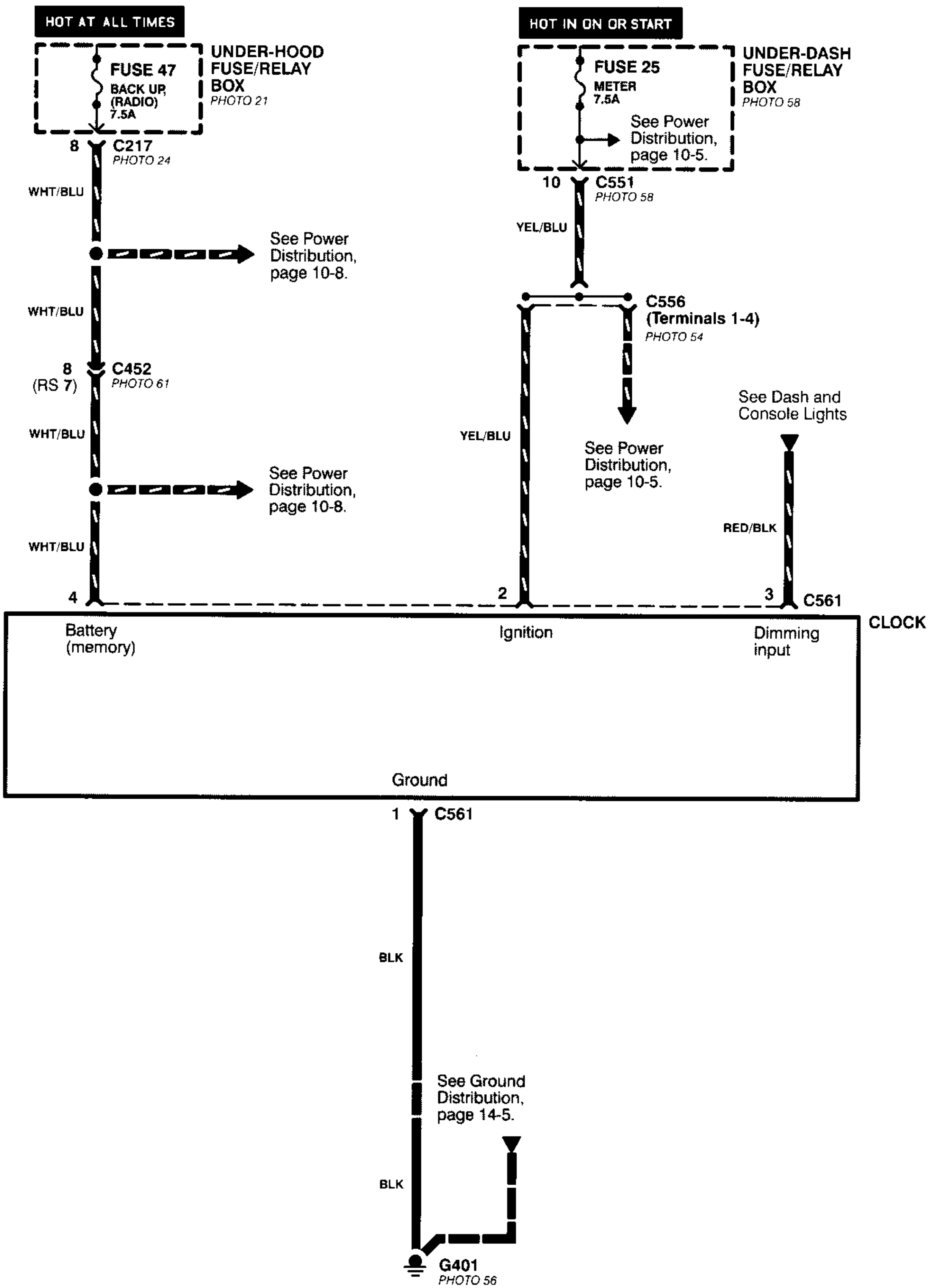


CD PLAYER
CD CHANGER
DIN CABLE
DIN CABLE
With Optional CD Player
With Optional CD Changer
DIN CABLE
STEREO RADIO/ CASSETTE PLAYER
+
−
+
−
Ground
C566
7
15
8
16
14
BLU/YEL
GRY/WHT
RED/YEL
BRN/WHT
5
13
4
12
C505
PHOTO 61
BLU/YEL
GRY/WHT
RED/YEL
BRN/WHT
Sedan
C516
(In-line connector; may not be present in all cars.)
BLU/YEL
GRY/WHT
RED/YEL
BRN/WHT
BLK
C514
1
LEFT REAR SPEAKER
2
C514
C513
1
RIGHT REAR SPEAKER
2
C513
G551
PHOTO 69

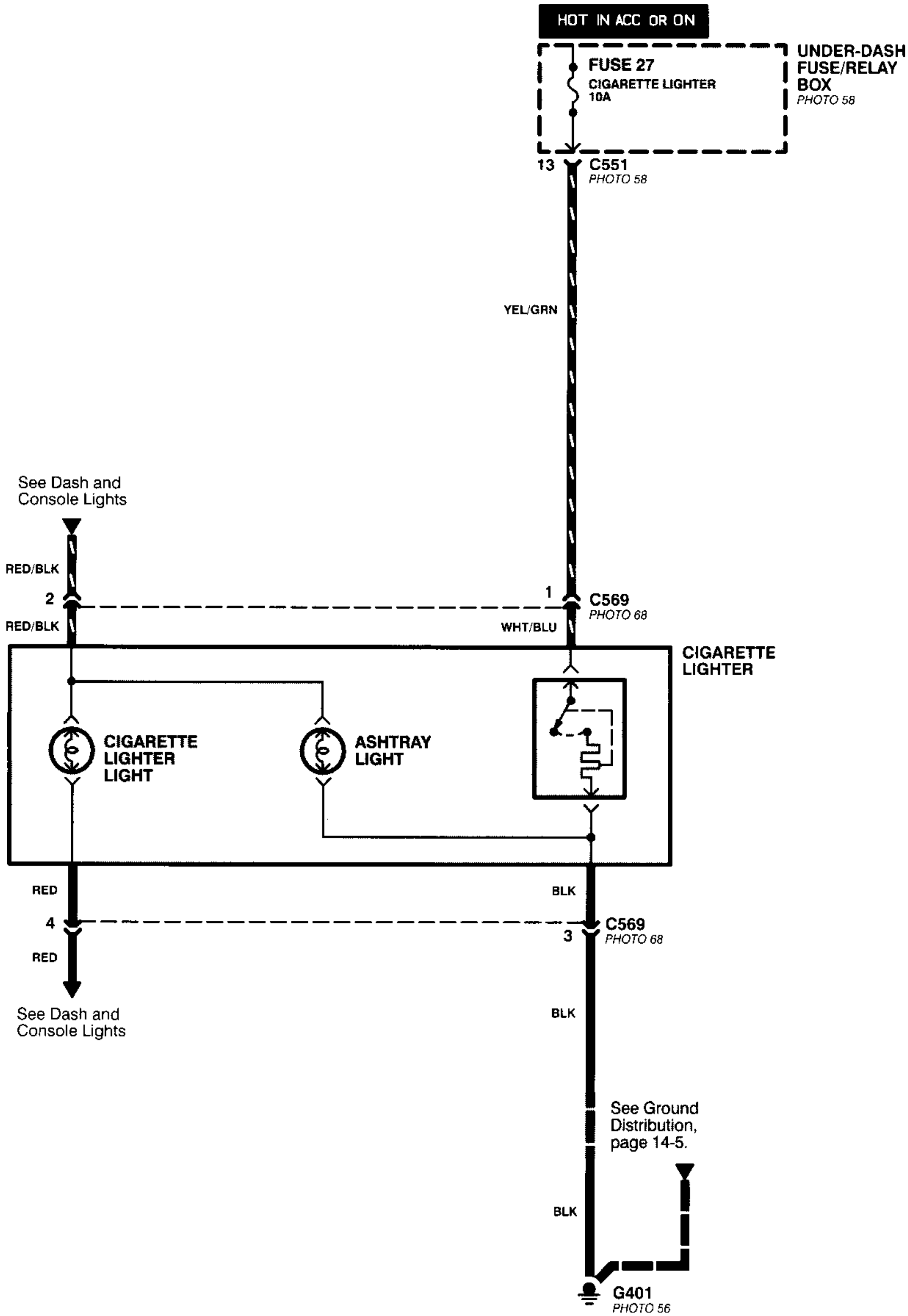
Power Antenna



Clock

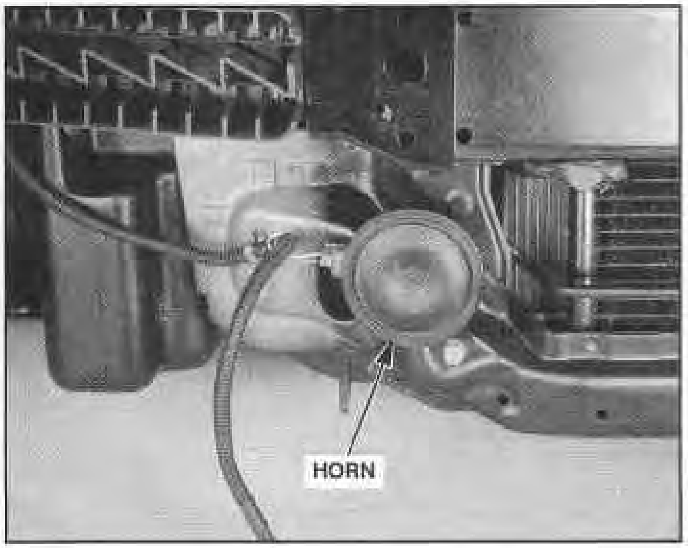

HOT AT ALL TIMES
FUSE 47
BACK UP, (RADIO) 7.5A
UNDER-HOOD FUSE/RELAY BOX
PHOTO 21
8
C217
PHOTO 24
WHT/BLU
See Power Distribution, page 10-8.
WHT/BLU
8
(RS 7)
C452
PHOTO 61
WHT/BLU
See Power Distribution, page 10-8.
WHT/BLU
4
HOT IN ON OR START
FUSE 25
METER 7.5A
See Power Distribution, page 10-5.
UNDER-DASH FUSE/RELAY BOX
PHOTO 58
10
C551
PHOTO 58
YEL/BLU
C556
(Terminals 1-4)
PHOTO 54
YEL/BLU
See Power Distribution, page 10-5.
2
See Dash and Console Lights
RED/BLK
3
C561
CLOCK
Battery (memory)
Ignition
Dimming input
Ground
1
C561
BLK
See Ground Distribution, page 14-5.
BLK
G401
PHOTO 56

Cigarette Lighter

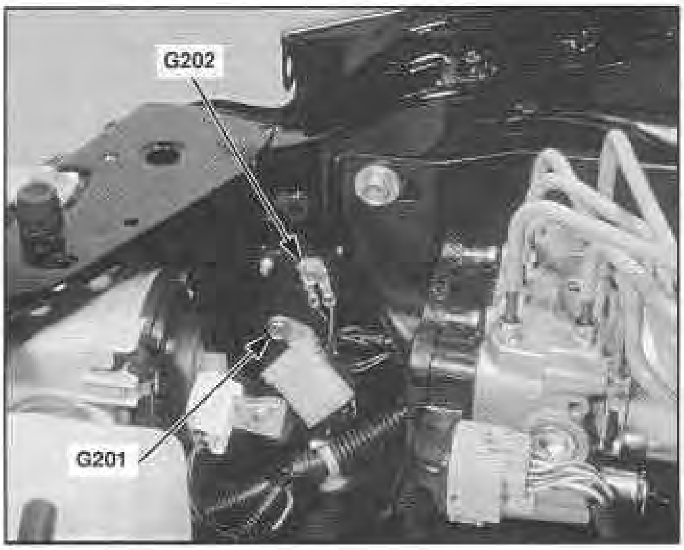


Component Location

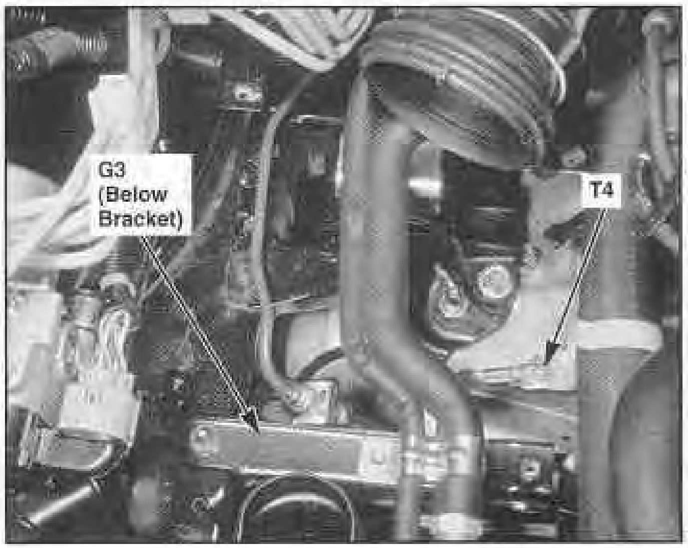
1. Behind Right Side of Front Bumper



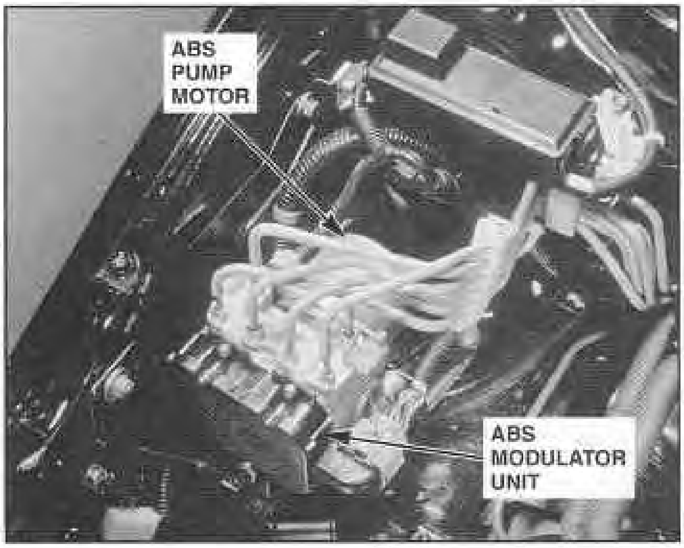
4. Right Front Corner of Engine Compartment



2. Right Side of Engine Compartment (M/T)

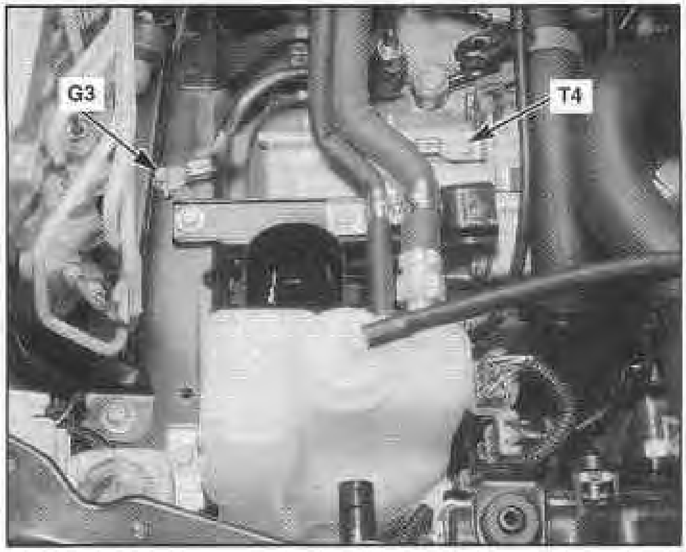


5. Right Front Corner of Engine Compartment



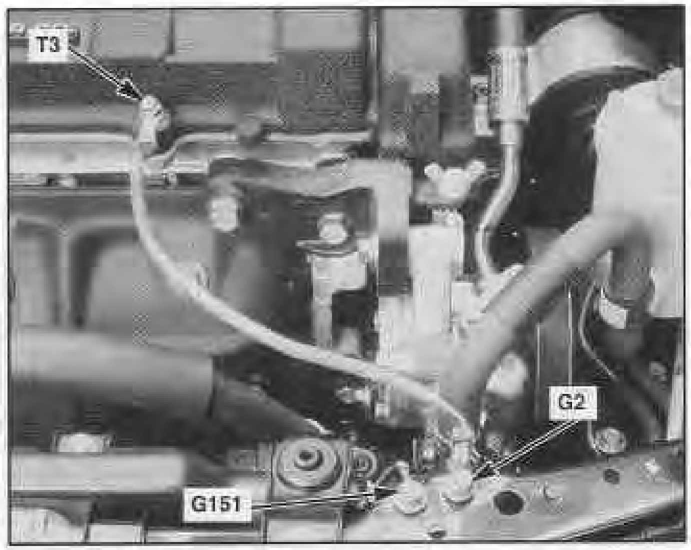
3. Behind Left Side of Front Bumper

6. Right Front of Engine Compartment (A/T)

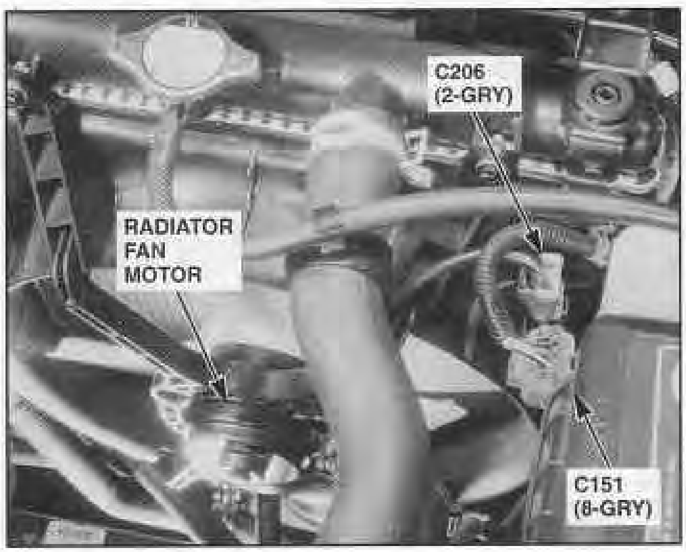


7. Right Front of Engine Compartment

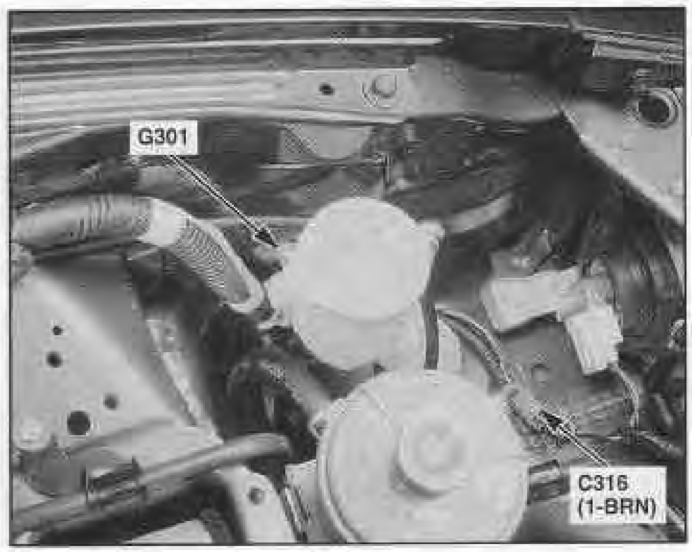
10. Left Front of Engine Compartment



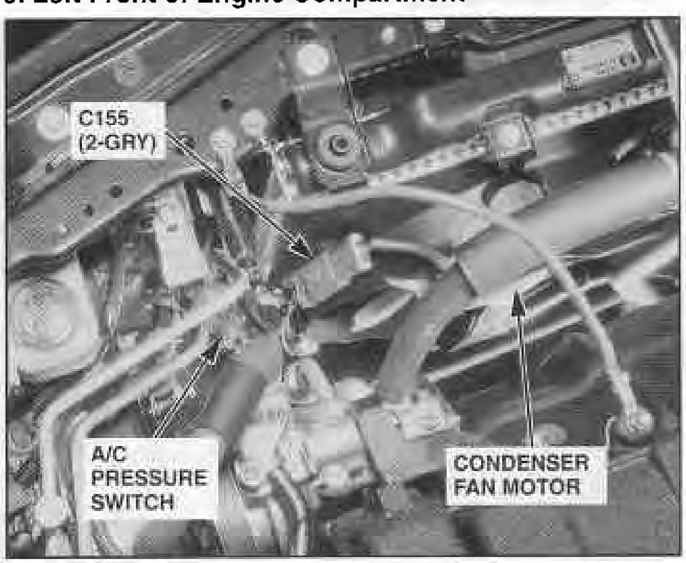
8. Center Front of Engine Compartment



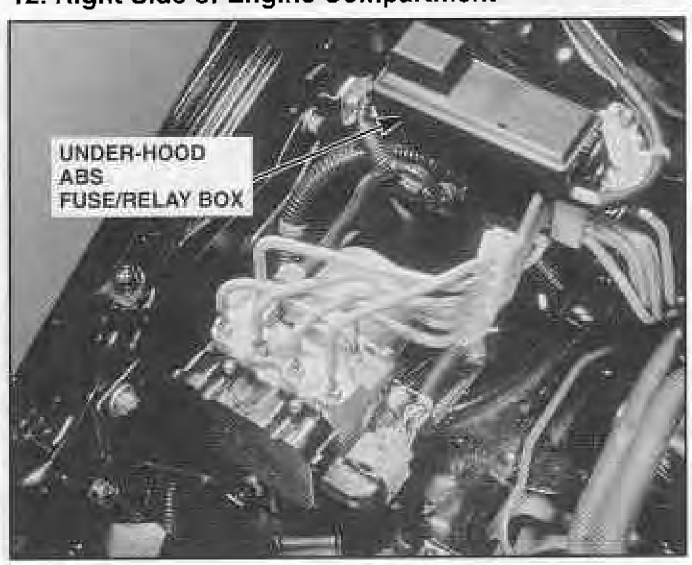
11. Left Front Corner of Engine Compartment



9. Left Front of Engine Compartment

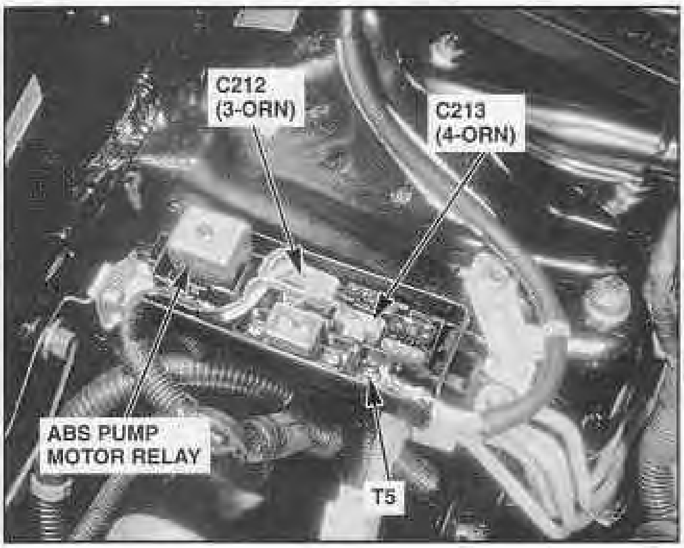


12. Right Side of Engine Compartment

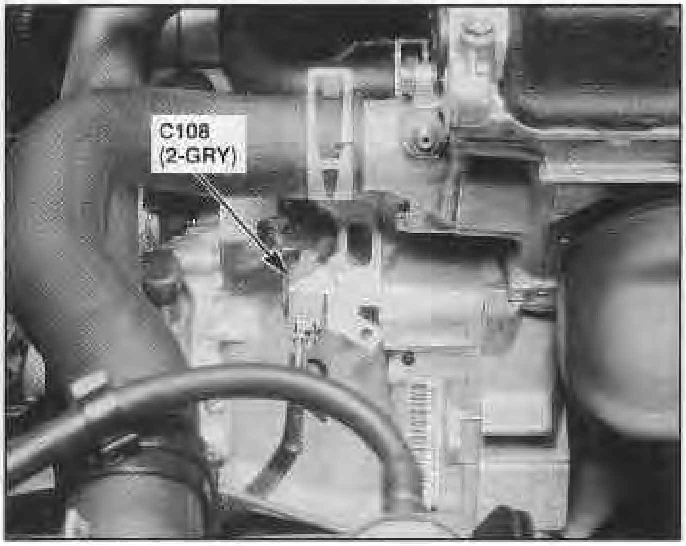


Component Location

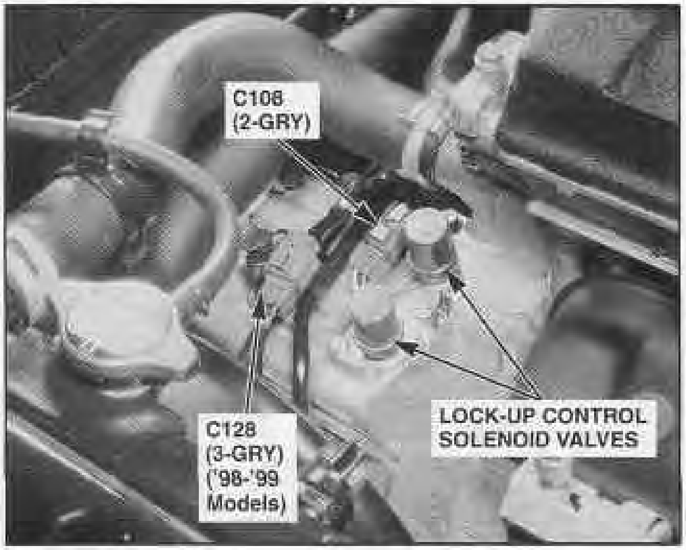
13. Right Front Corner of Engine Compartment



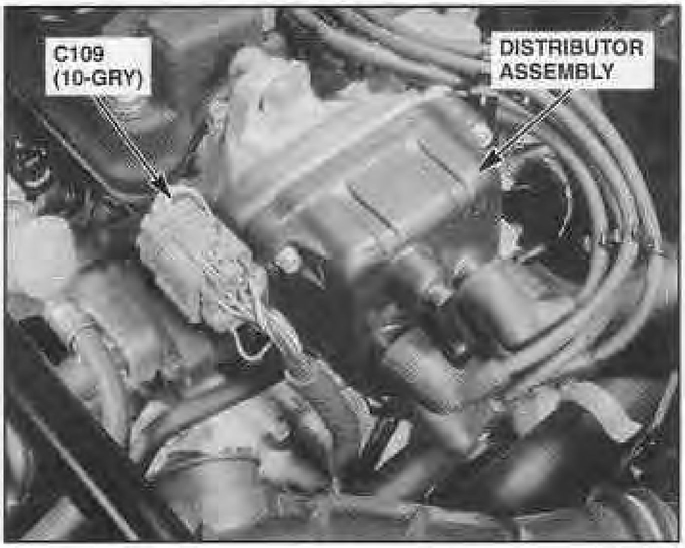
14. Top Front of Manual Transmission



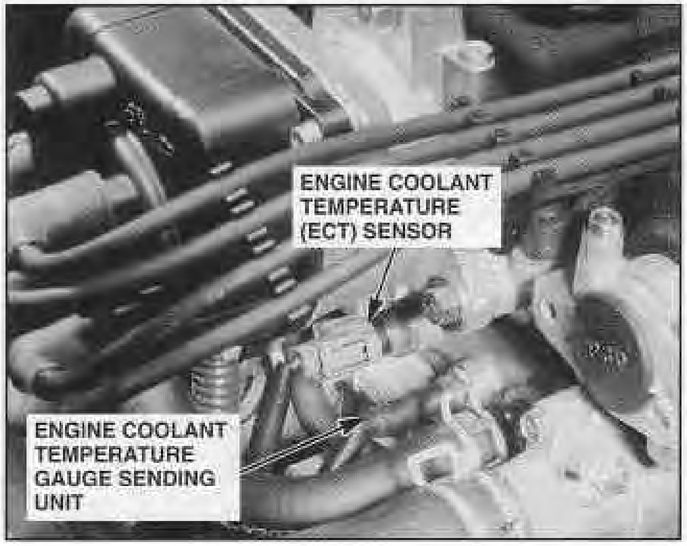
15. Top Front of Automatic Transmission



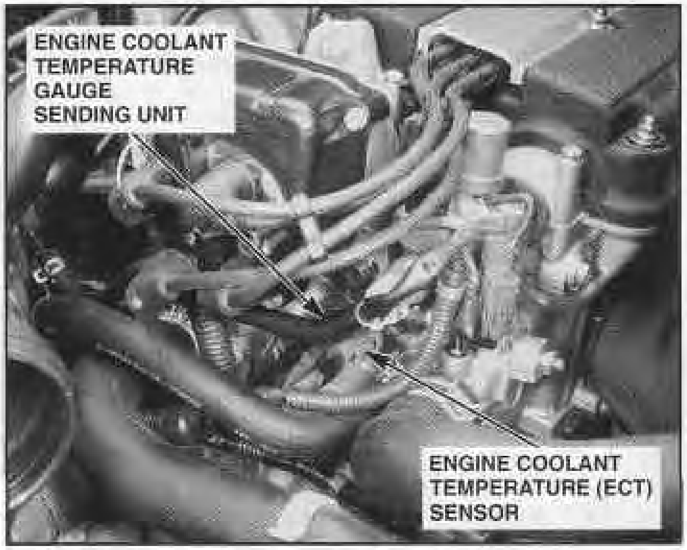
16. Right Side of Engine (GS-R Shown, Others Similar)



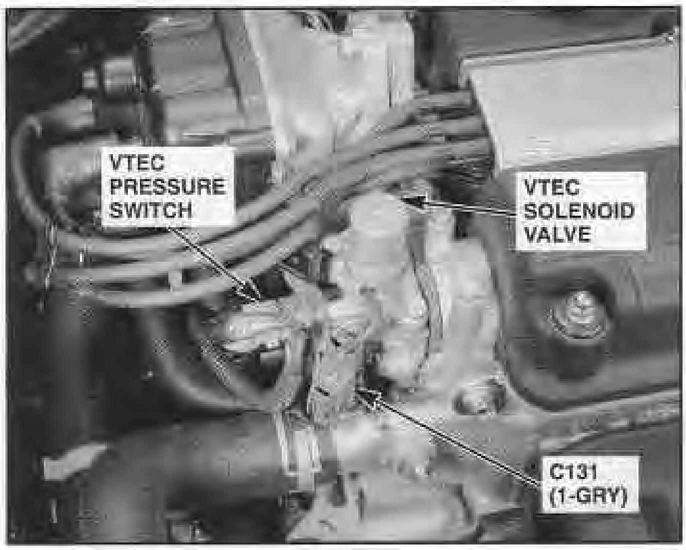
17. Right Side of Engine (All Except GS-R)



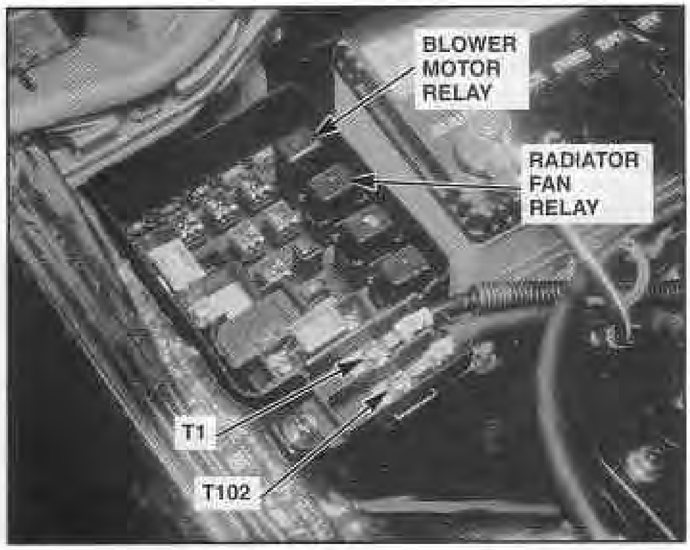
18. Right Side of Engine (GS-R)



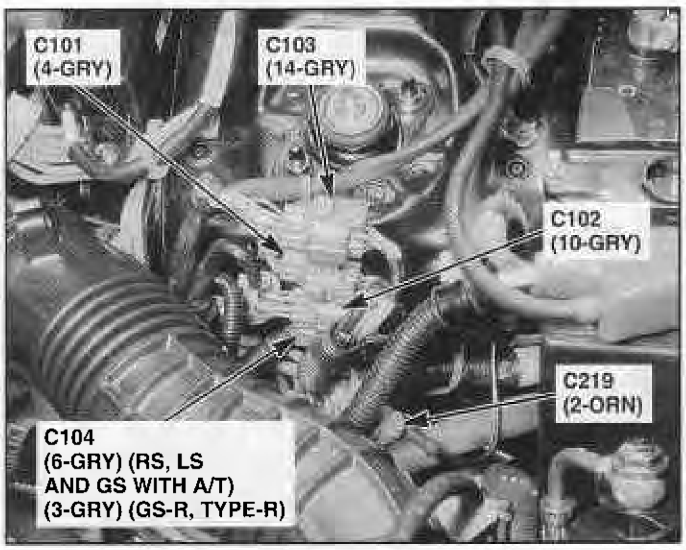
19. Right Side of Engine



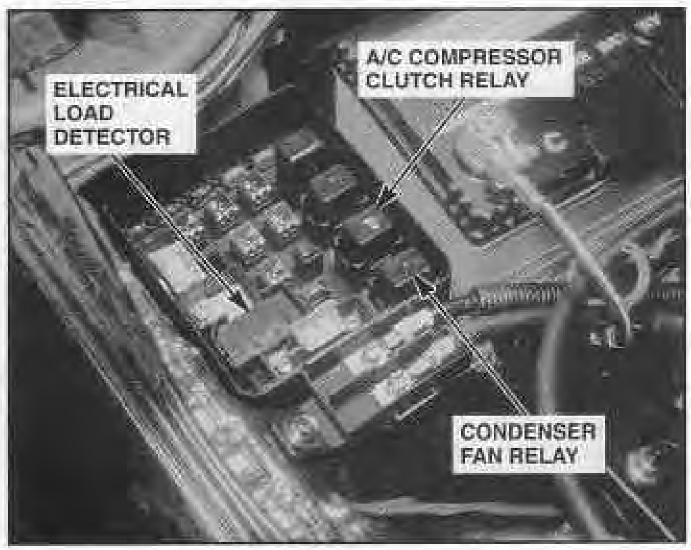
22. Right Rear Corner of Engine Compartment



20. Right Side of Eng. Comp. (A/T Shown, M/T Similar)

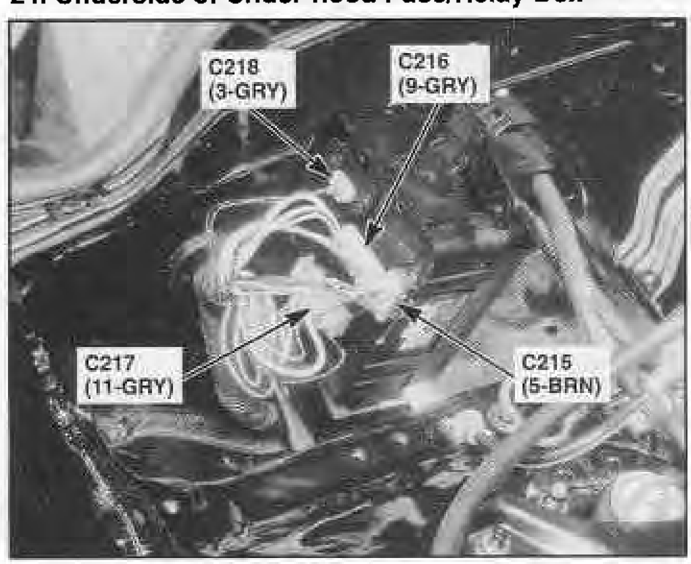


23. Right Rear Corner of Engine Compartment



21. Right Rear Corner of Engine Compartment

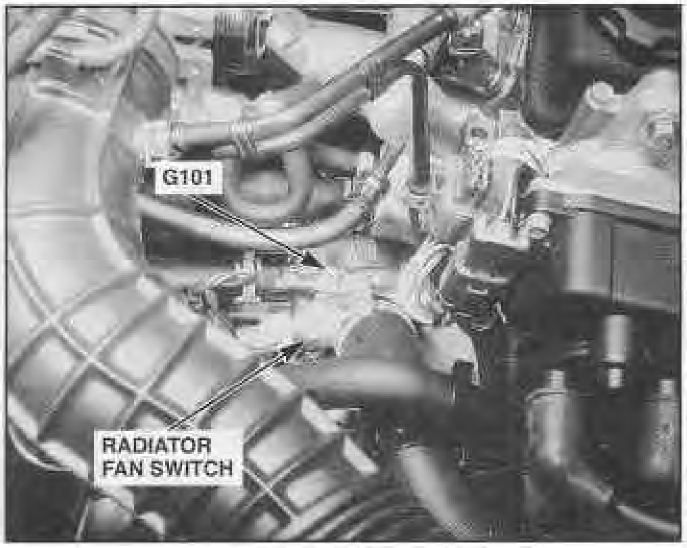
24. Underside of Under-hood Fuse/Relay Box



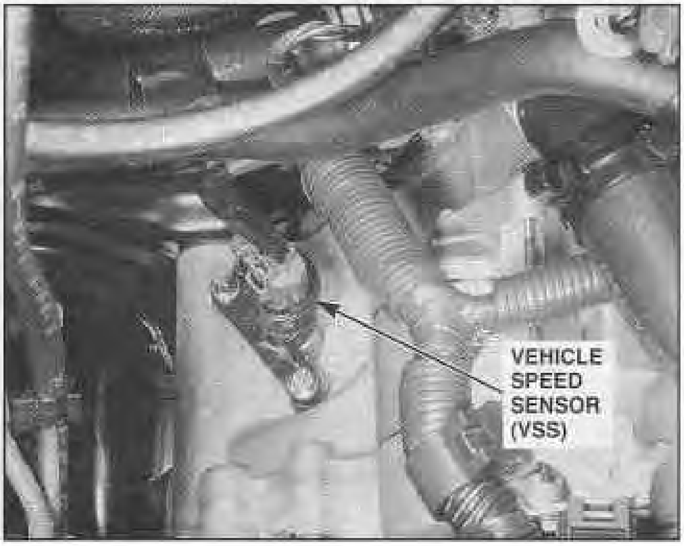
Component Location

25. Top Rear of Automatic Transmission ('98-'99 Mod.)

28. Right Side of Engine

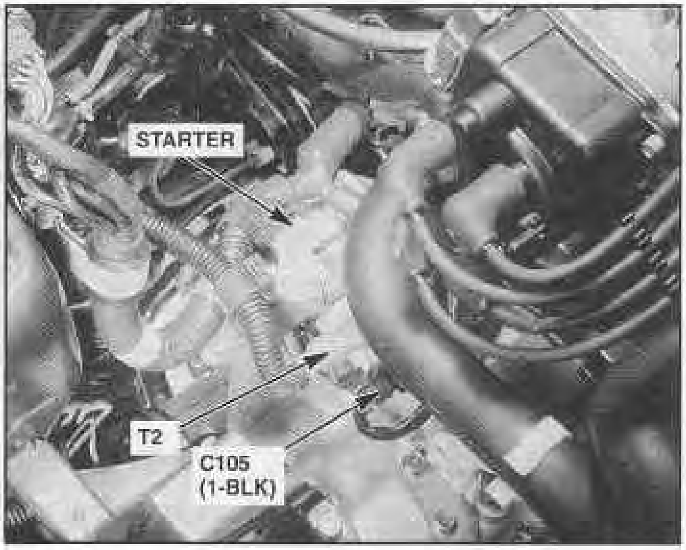


26. Top Rear of Transmission

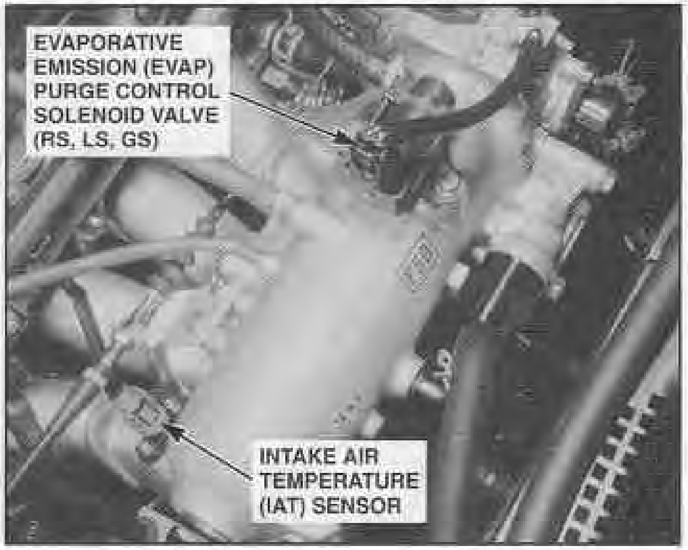


29. Center Rear of Engine (Type-R)

27. Lower Right Side of Engine Compartment

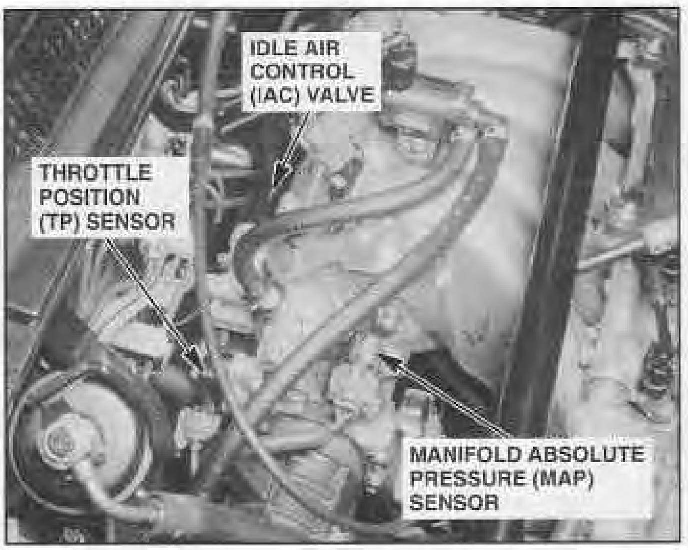


30. Center Rear of Engine (All Except GS-R)

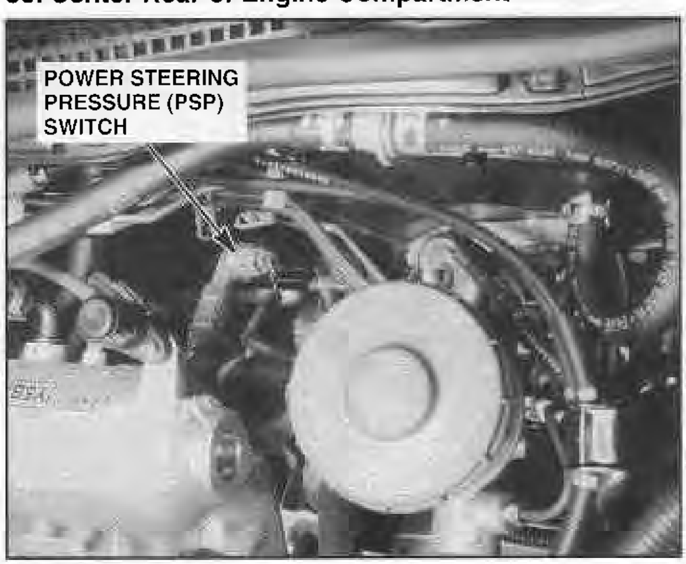


31. Center Rear of Engine (GS-R)

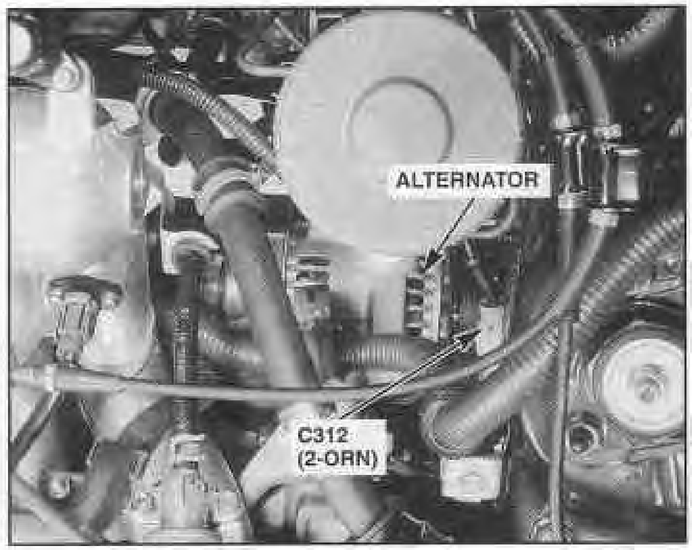
32. Center Rear of Engine (GS-R Shown, Type-R Similar)



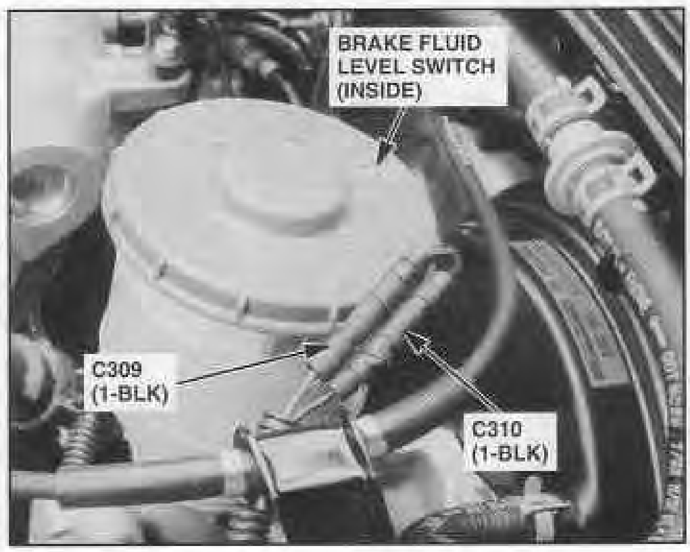
33. Center Rear of Engine Compartment



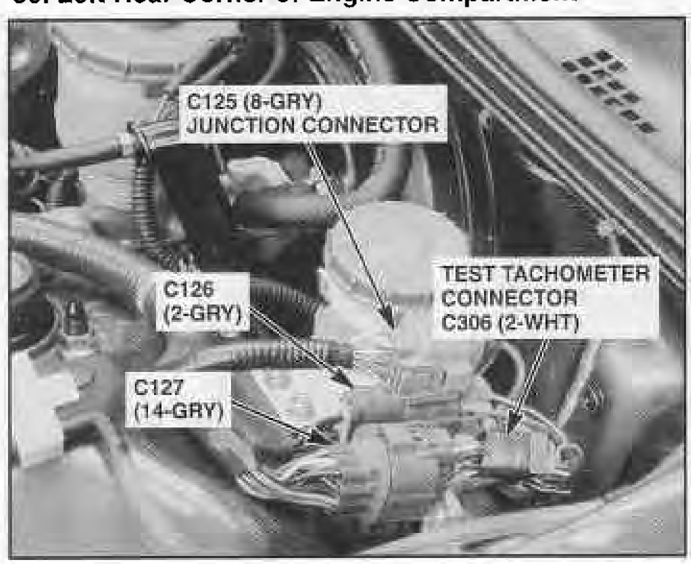
34. Left Rear of Engine Compartment



35. Left Rear of Engine Compartment

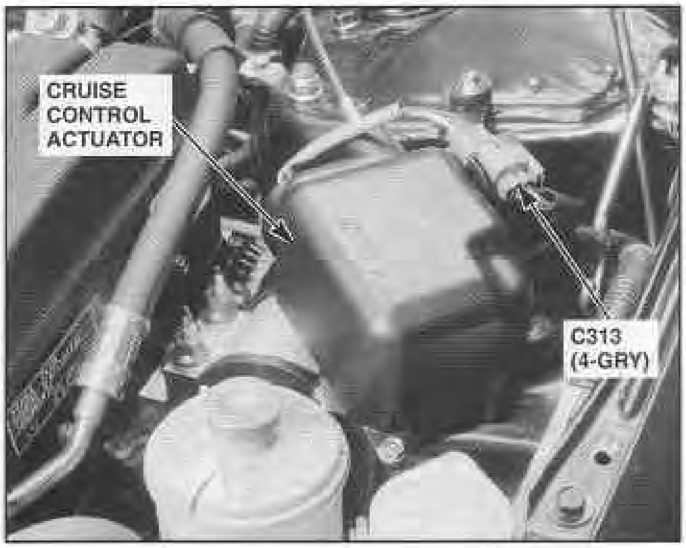


36. Left Rear Corner of Engine Compartment

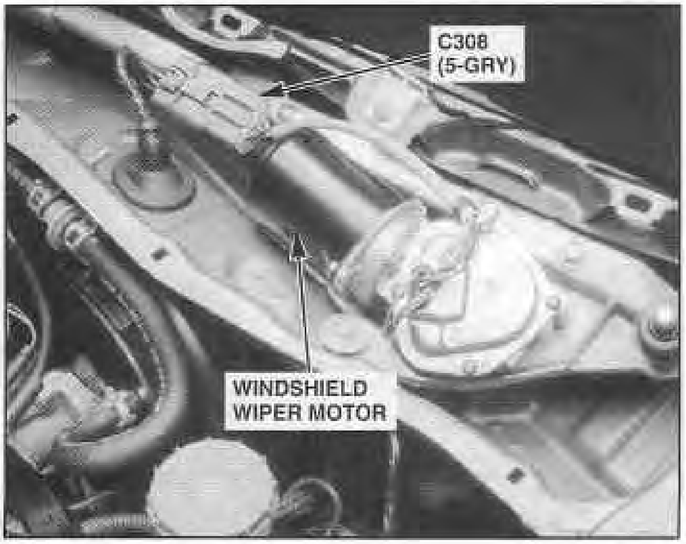


Component Location

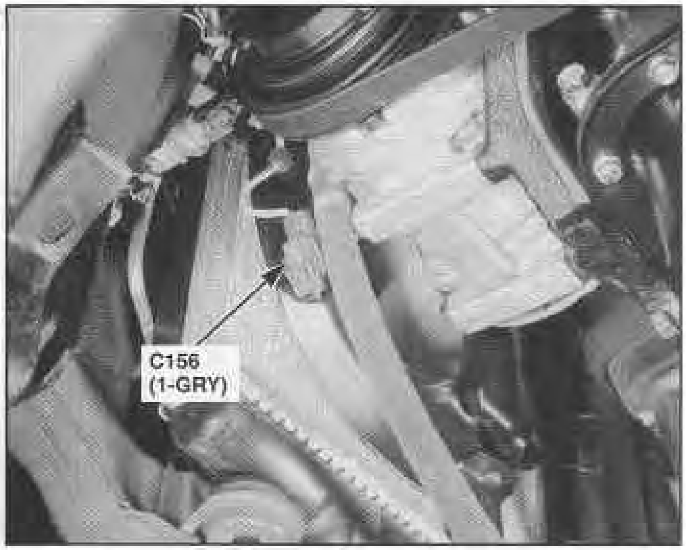
37. Left Side of Engine Compartment



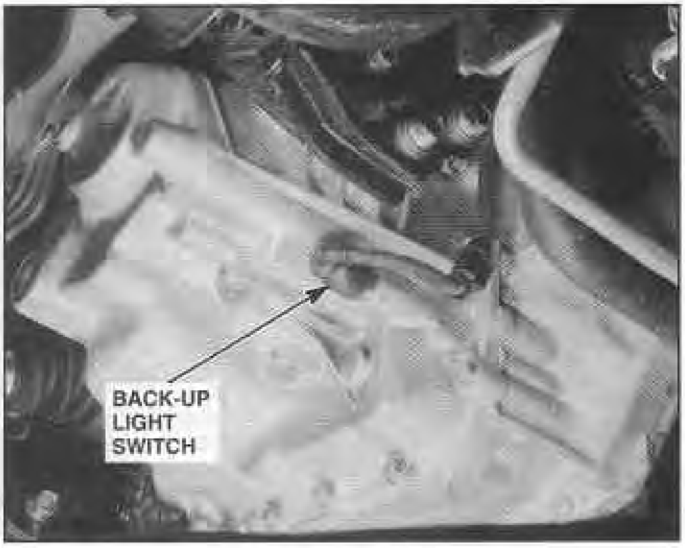
38. Behind Left Side of Air Scoop



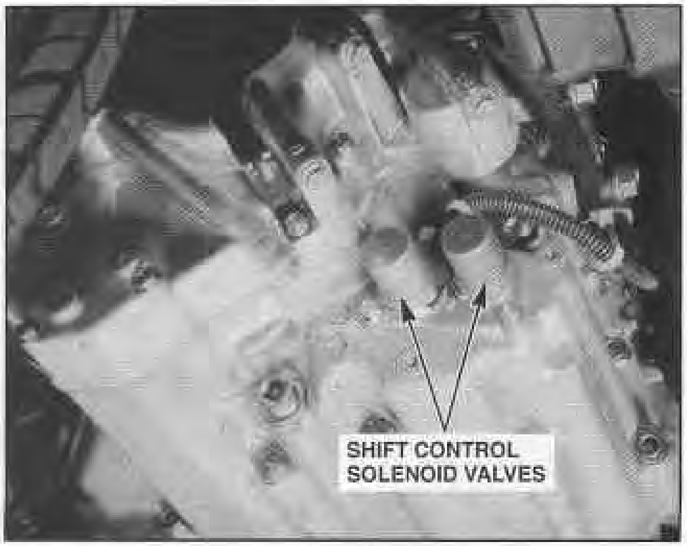
39. Underside of Car, Left Front Corner of Engine



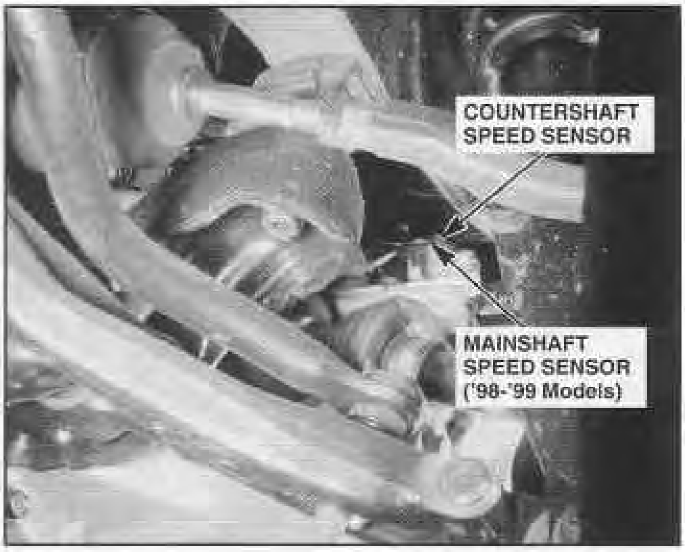
40. Underside of Car, Front of Manual Transmission



41. Underside of Car, Front of Transmission ('98-'99)

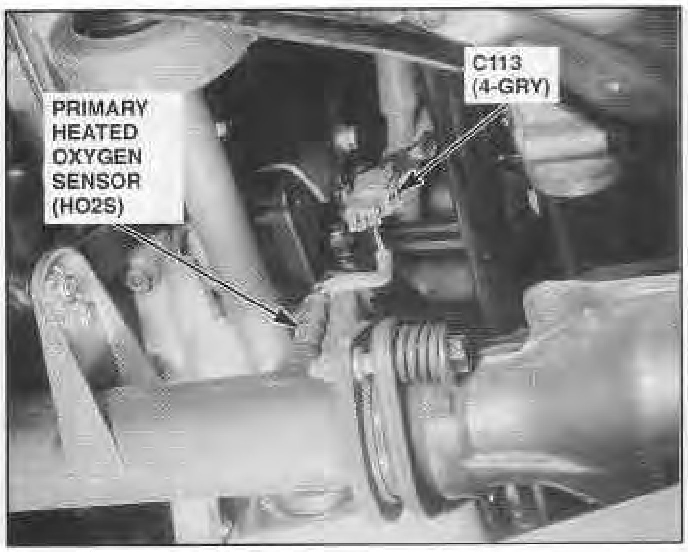


42. Underside of Car, Right Rear of Transmission



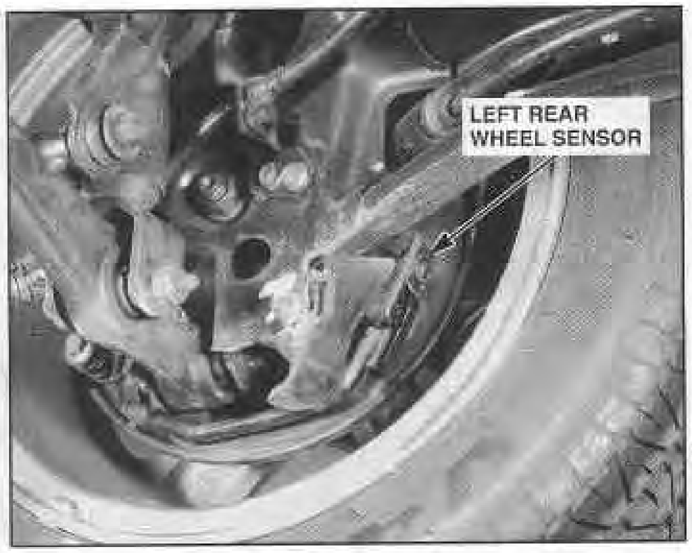
43. Underside of Car, Center Rear of Engine

44. Underside of Car, Behind Center of Engine

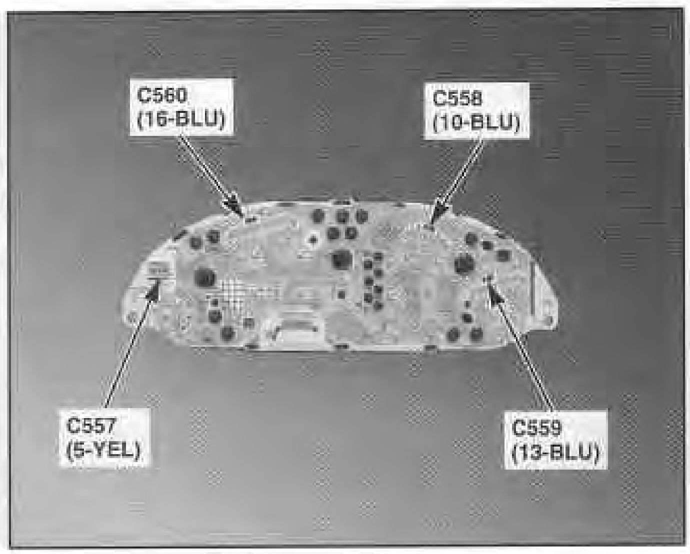


45. Behind Left Front Wheel (Right Front Similar)

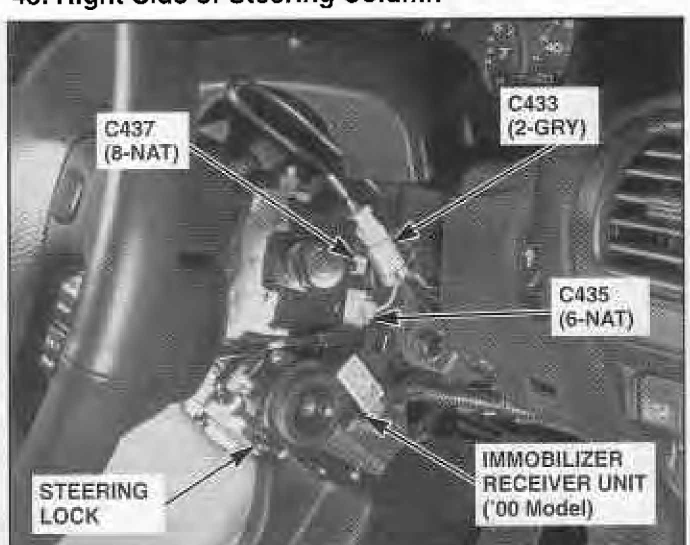
46. Behind Left Rear Wheel (Right Rear Similar)



47. Rear of Gauge Assembly



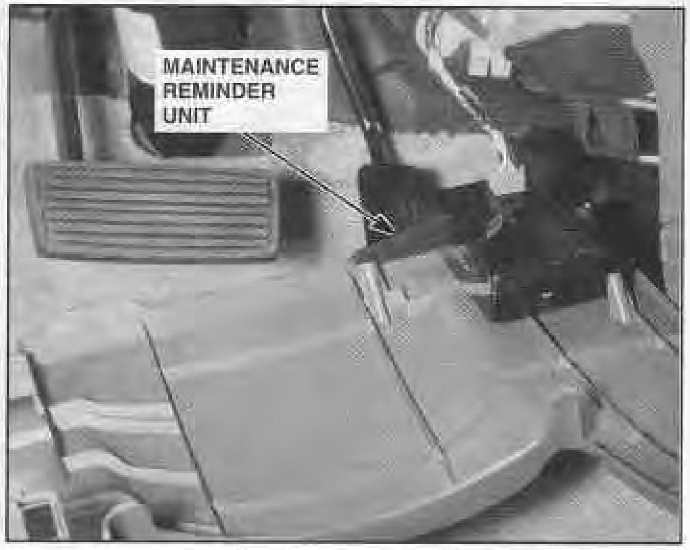
48. Right Side of Steering Column



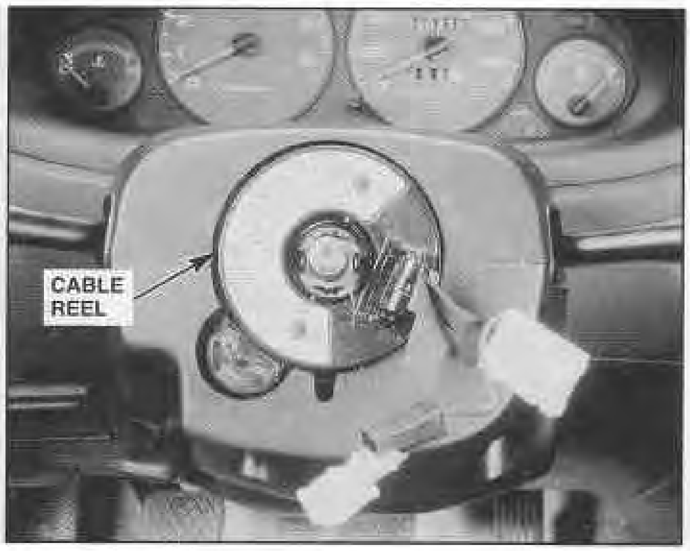
Component Location

49. Center of Steering Wheel

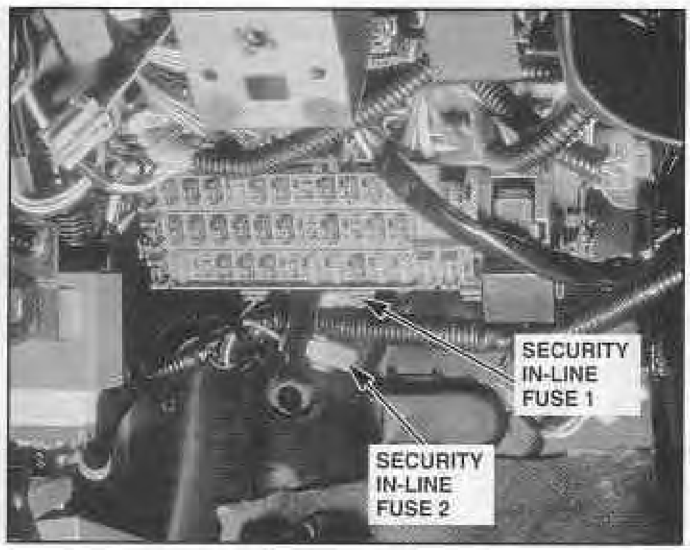
52. Rear of Dashboard Lower Cover



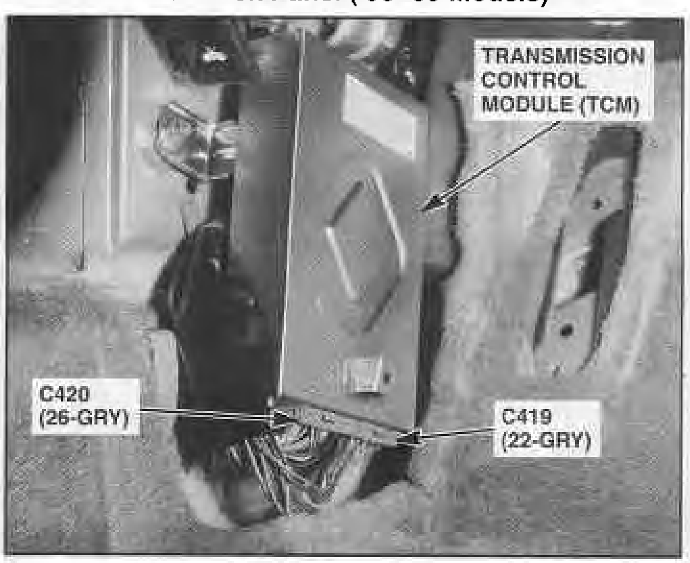
50. Top of Steering Column



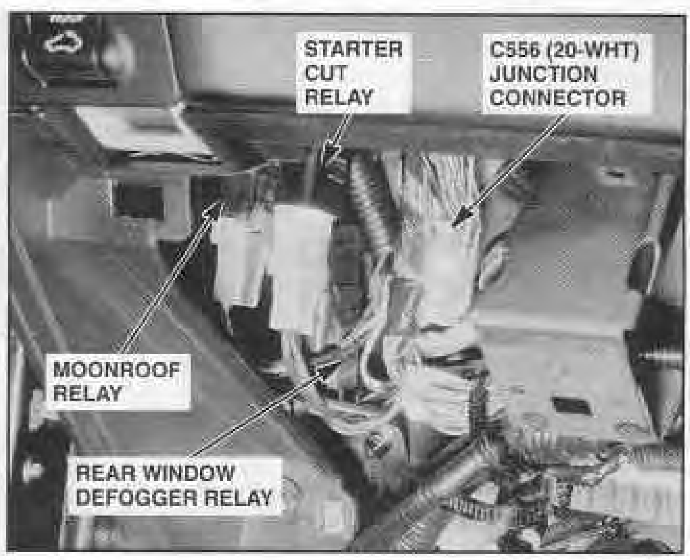
53. Behind Dashboard Lower Cover



51. Behind Left Kick Panel ('98-'99 Models)

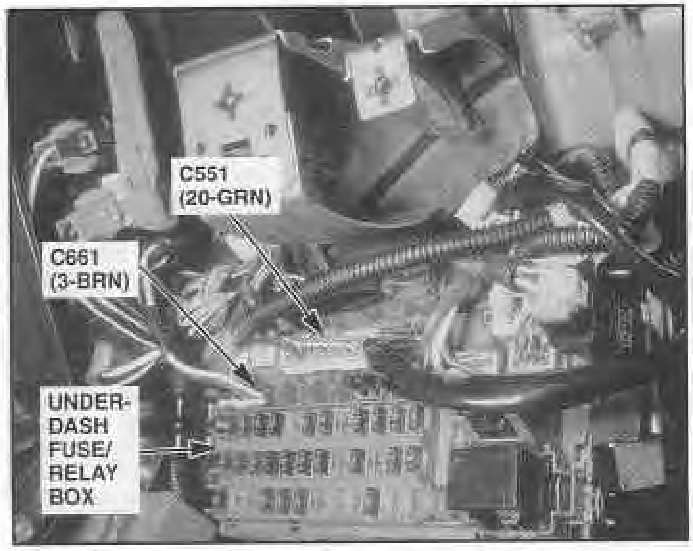


54. Above Left Kick Panel

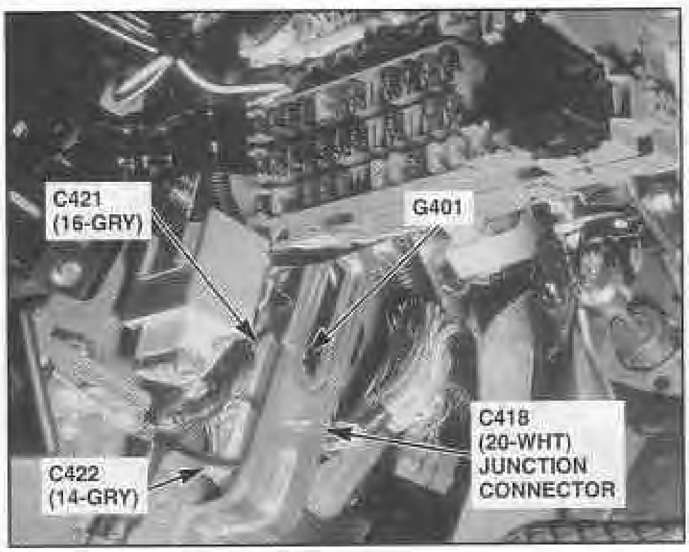


55. Above Left Kick Panel

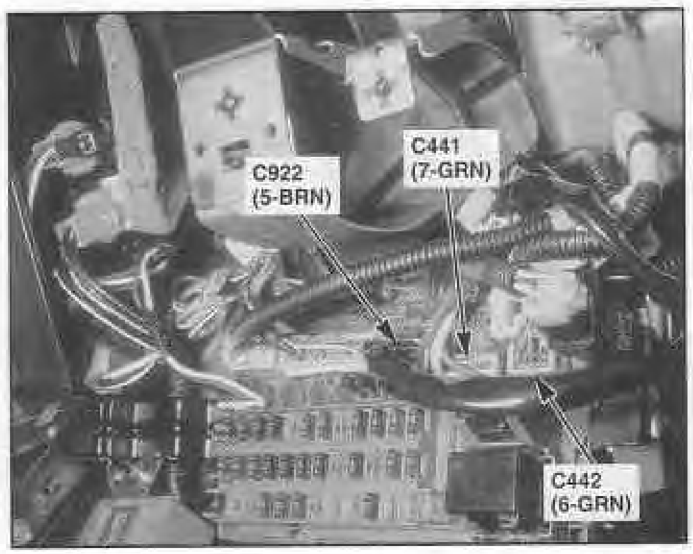
58. Behind Dashboard Lower Cover



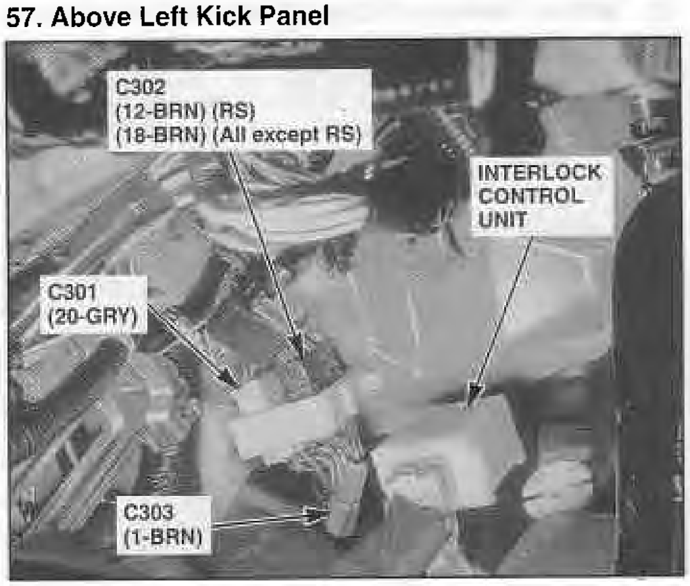
56. Above Left Kick Panel



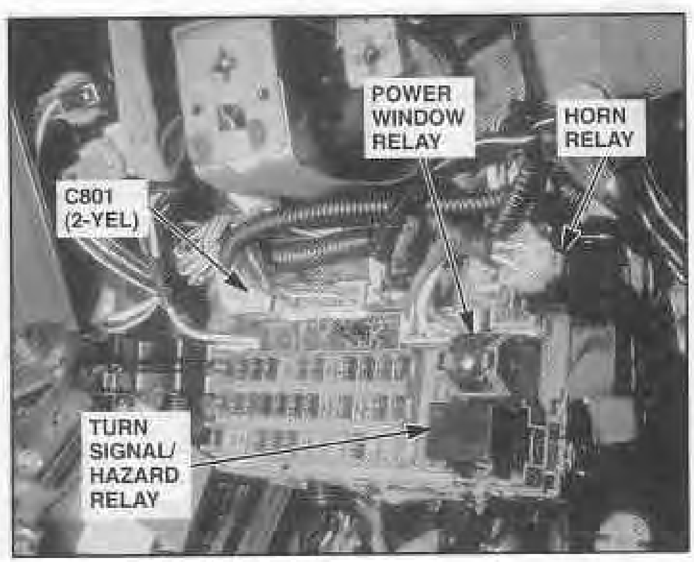
59. Behind Dashboard Lower Cover



57. Above Left Kick Panel

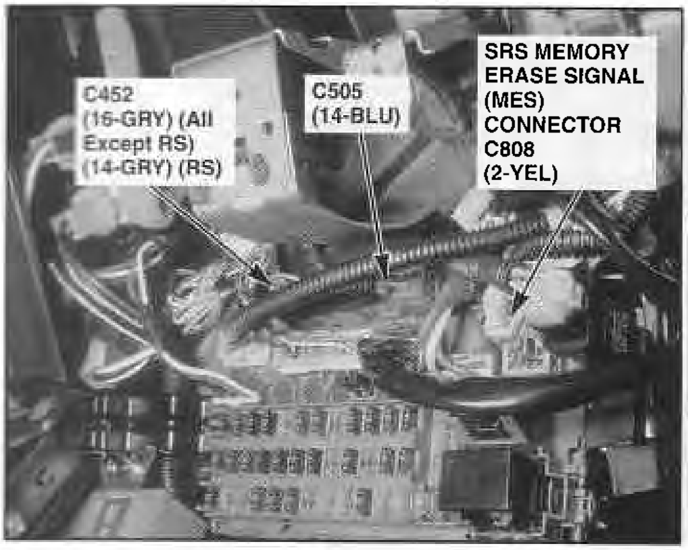


60. Behind Dashboard Lower Cover

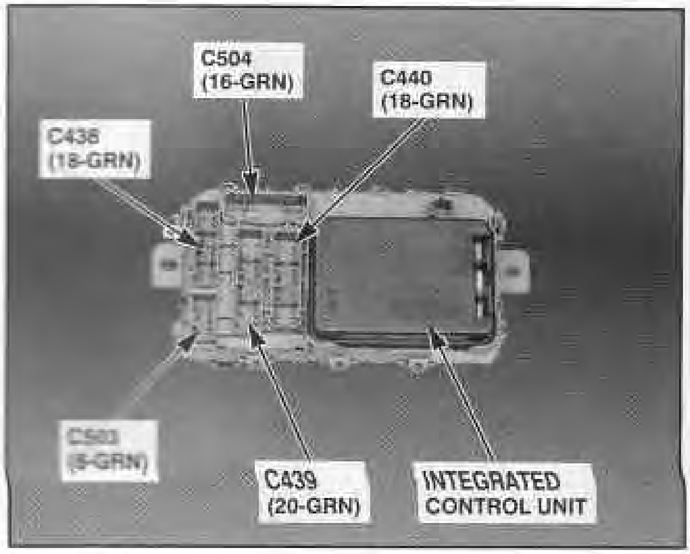


Component Location

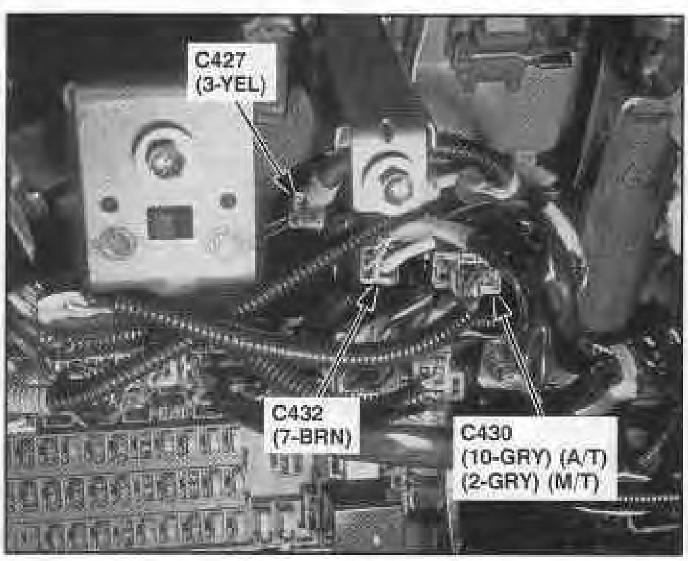
61. Behind **Dashboard Lower Cover**



62. Rear of **Under-dash Fuse/Relay Box**

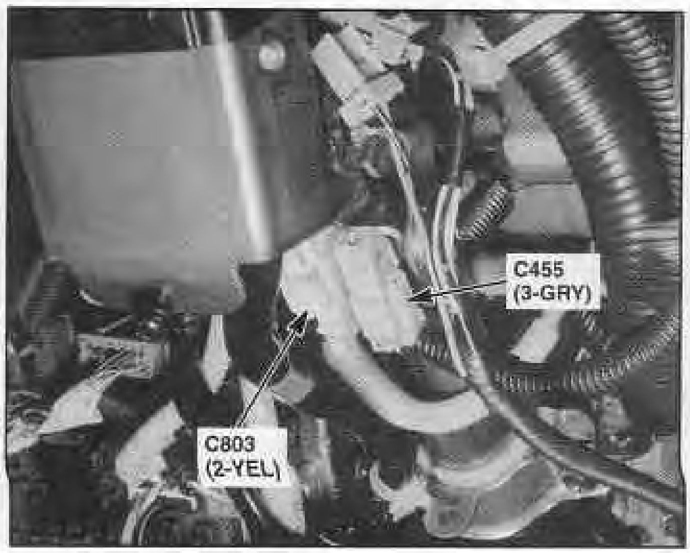


63. Behind Dashboard Lower Cover

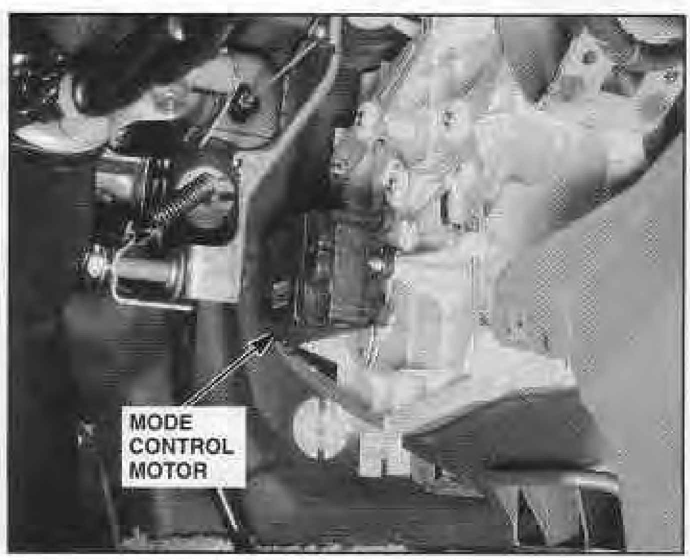


64. Behind Dashboard Lower Cover

65. Behind Dashboard Lower Cover

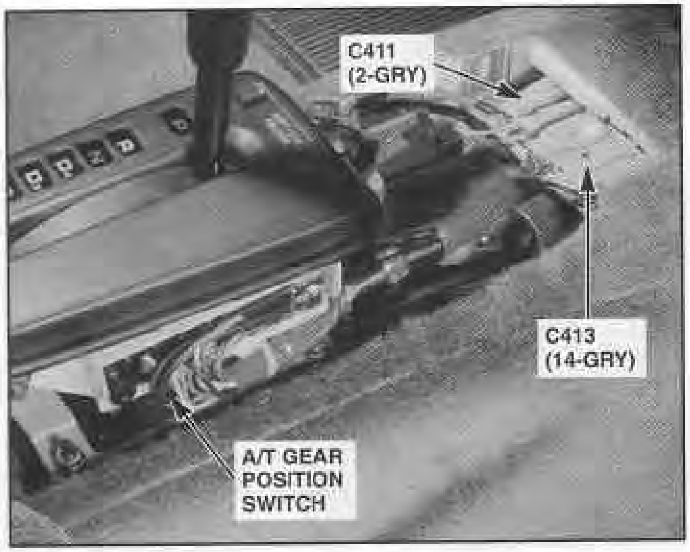


66. Behind Dashboard Lower Cover

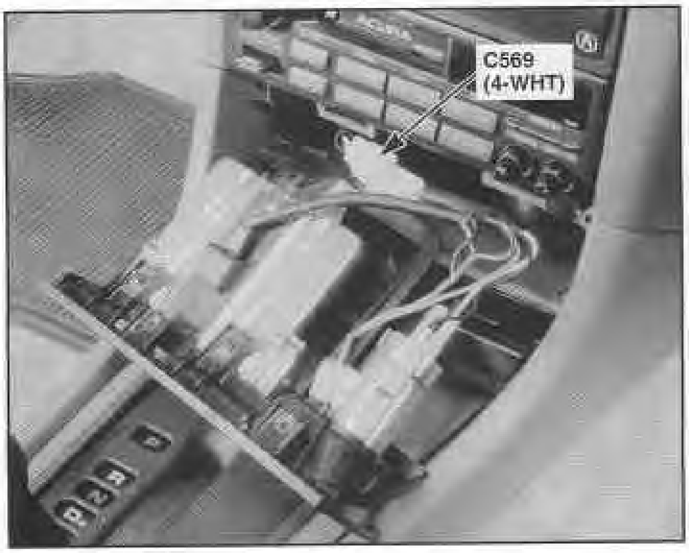


67. Below Center of Dash, Left of Heater Unit

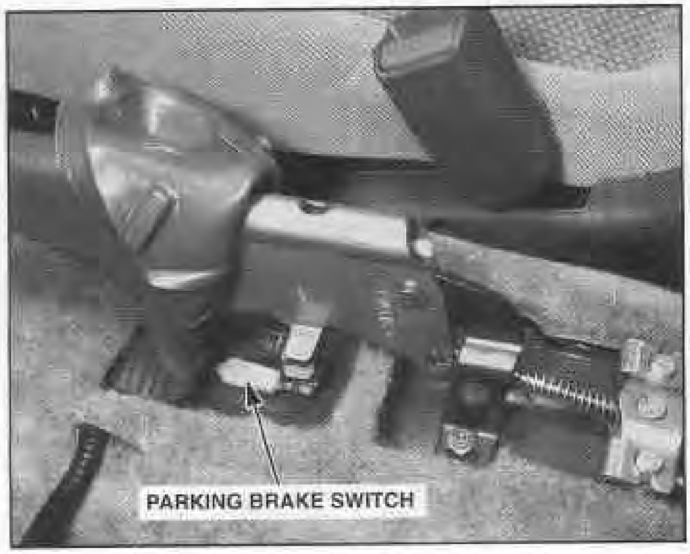
70. Below Right Side of Front Console



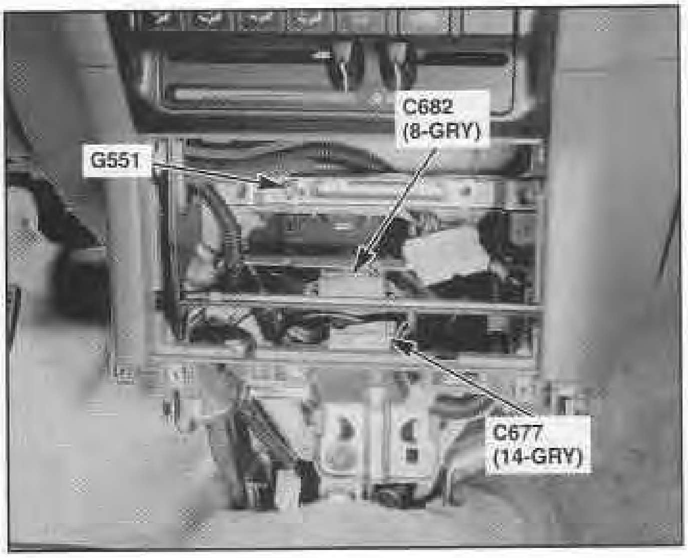
68. Behind Front Console Panel



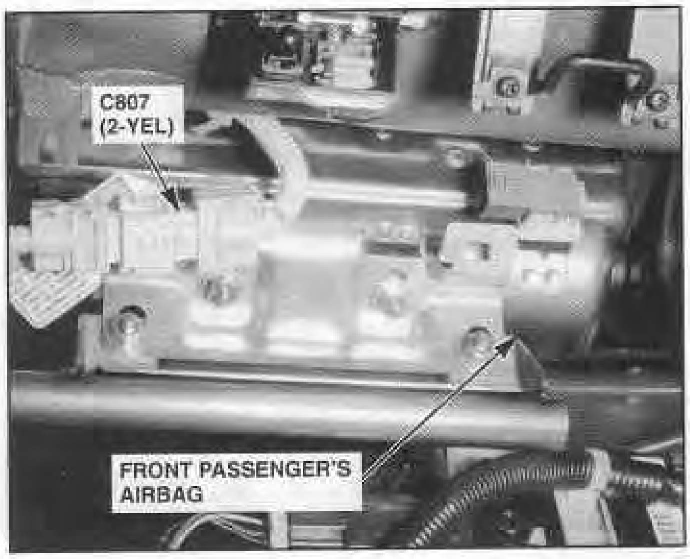
71. Below Rear Console



69. Behind Center of Dash



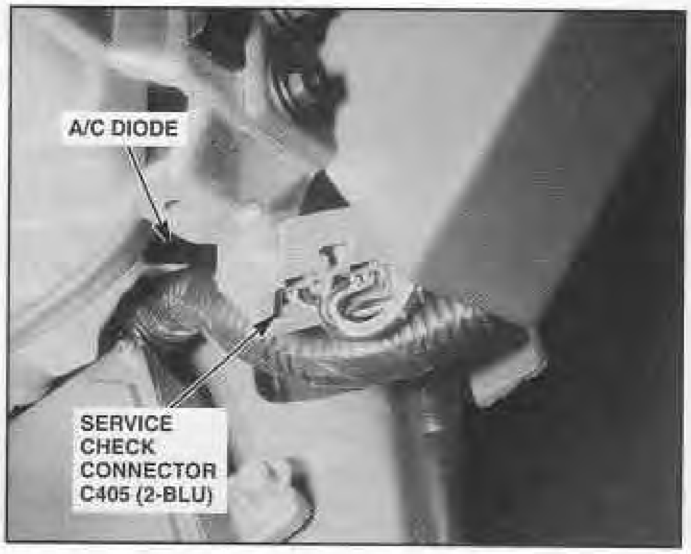
72. Below Glove Box



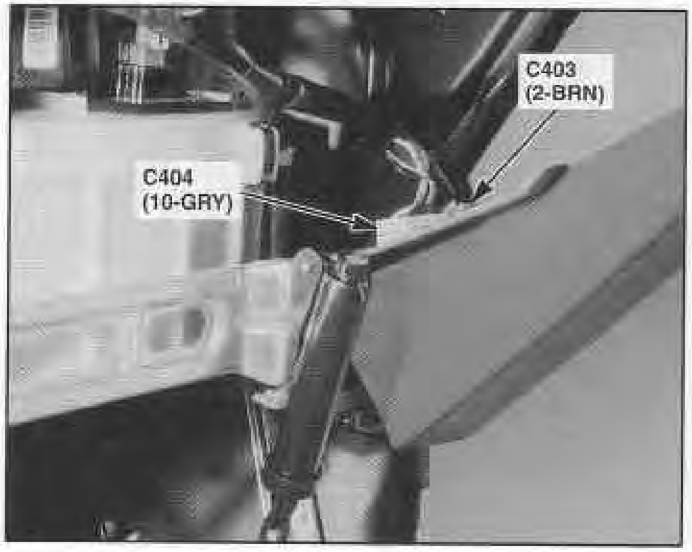
Component Location

73. Behind Glove Box

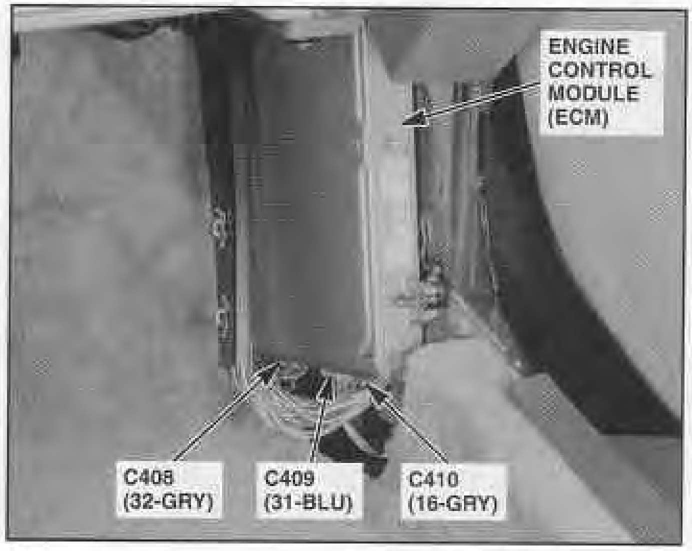
76. Above Right Kick Panel



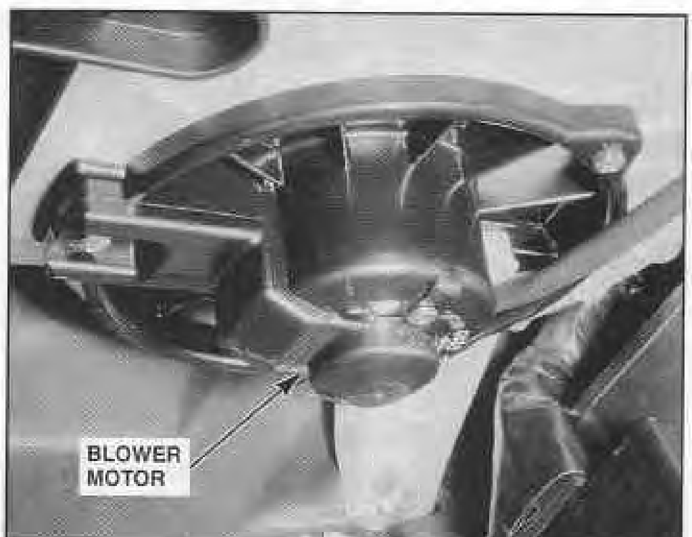
74. Behind Right Side Glove Box



77. Behind Right Kick Panel ('98-'99 Models)

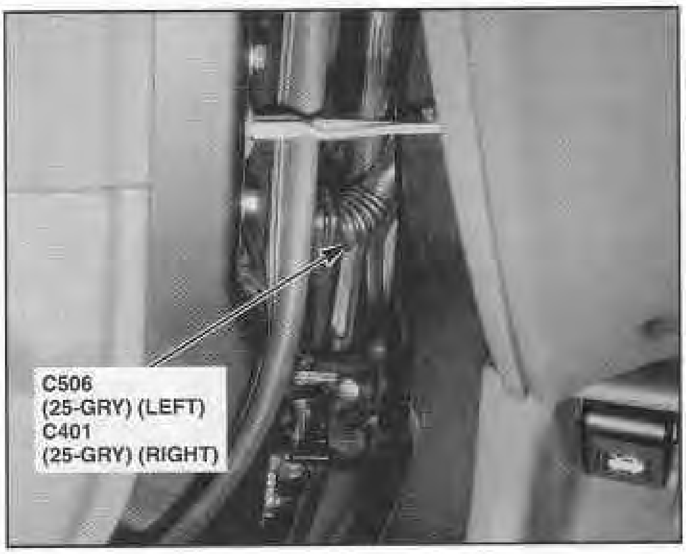


75. Below Right Side of Dash

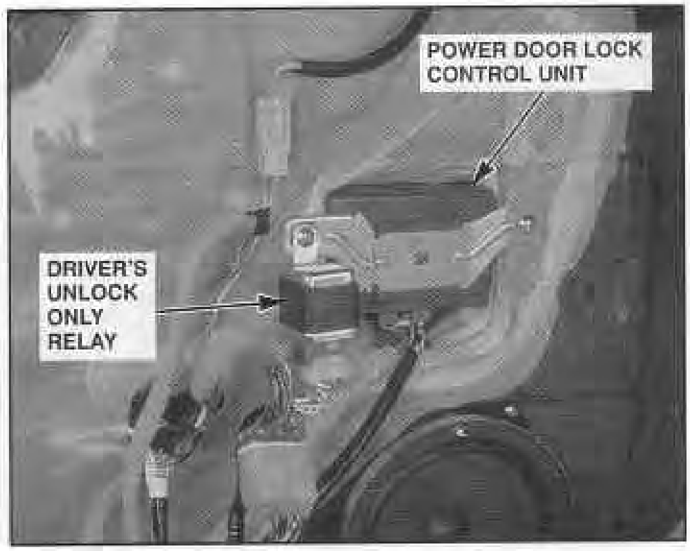


78. Behind Right Kick Panel (ECM or PCM Removed)

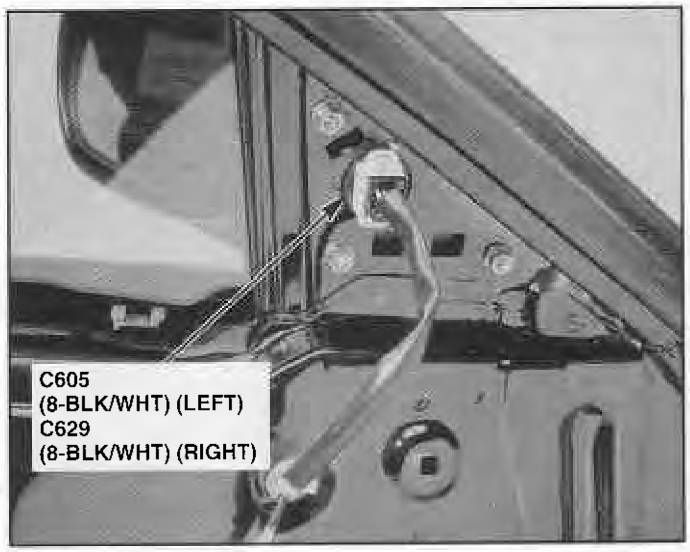
79. Driver's Door Jamb (Front Passenger's Similar)



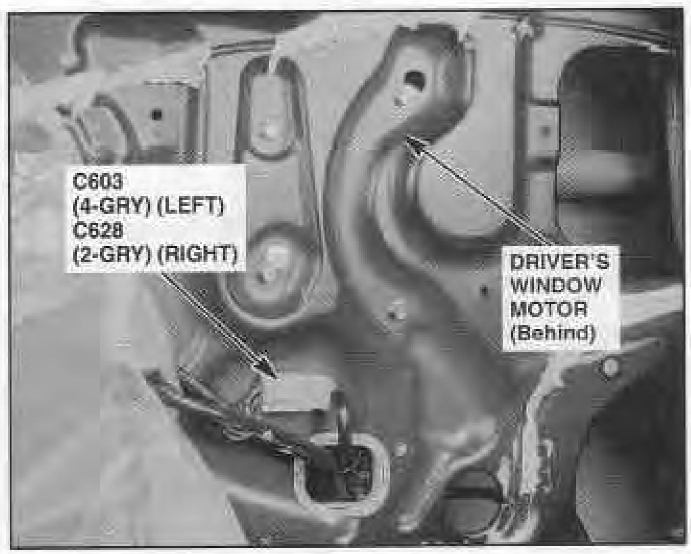
82. Front of Driver's Door



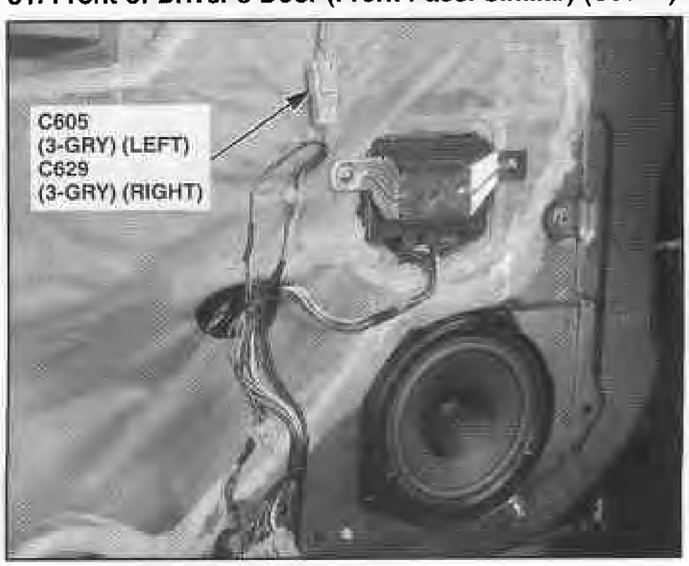
80. Front of Driver's Door (Pass. Similar) (Hatchback)



83. Center of Driver's Door (Pass. Similar) (Hatchback)



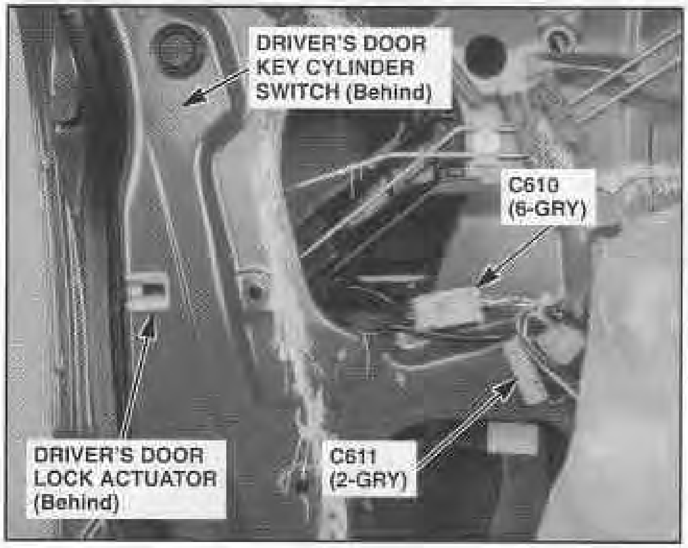
81. Front of Driver's Door (Front Pass. Similar) (Sedan)



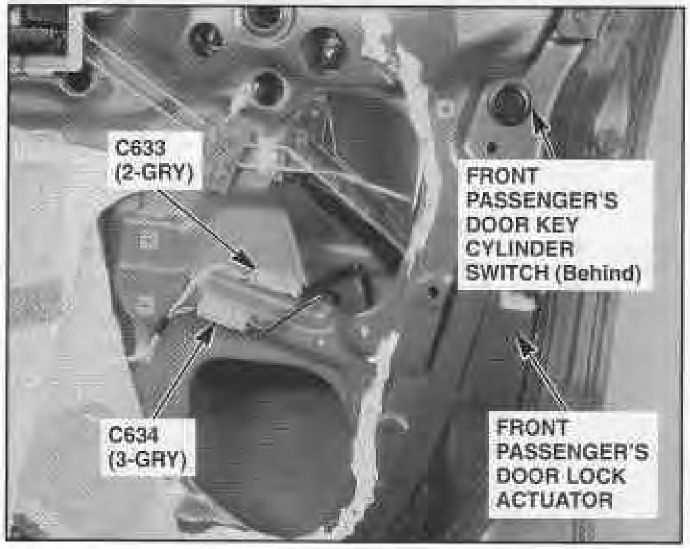
84. Center of Driver's Door (Pass. Similar) (Sedan)

Component Location

85. Rear of Driver's Door



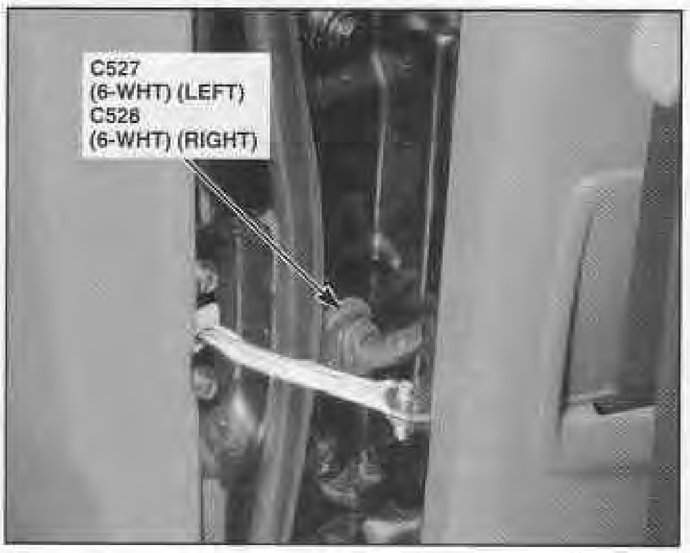
86. Rear of Front Passenger's Door



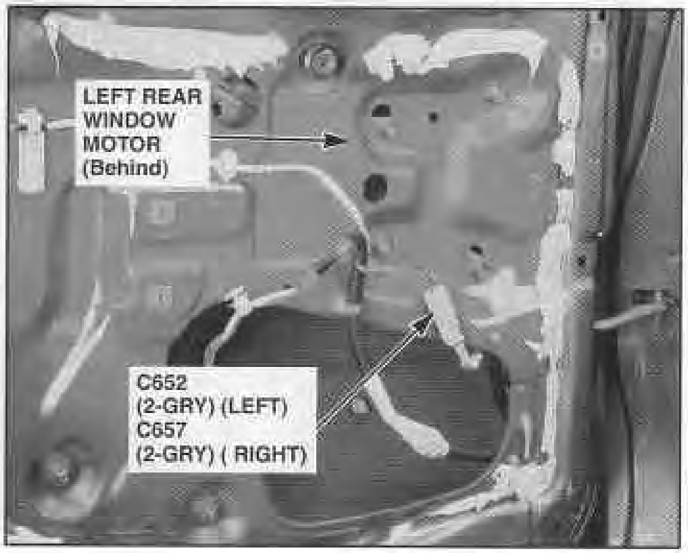
87. Front of Left Quarter Panel (Right Sim.) (Hatchback)

88. Left B-pillar (Right Similar) (Sedan)

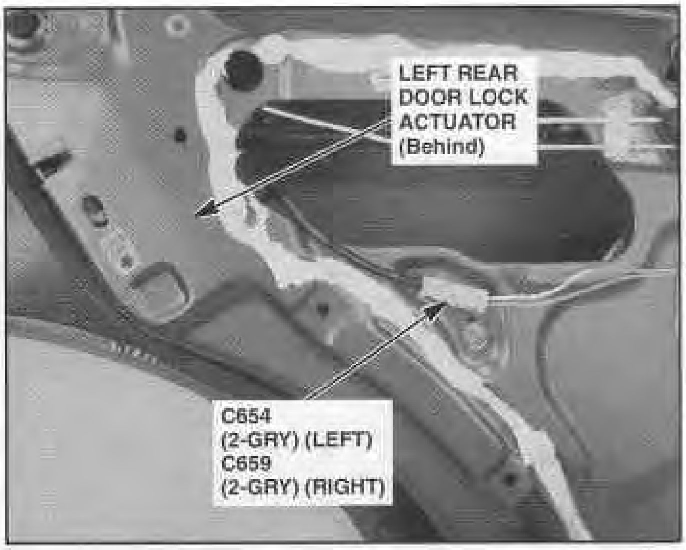
89. Left Rear Door Jamb (Right Similar)



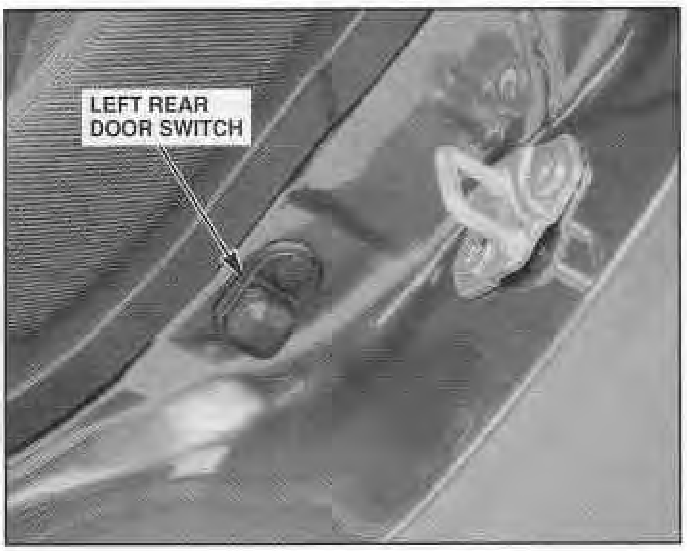
90. Front of Left Rear Door (Right Similar)



91. Rear of Left Rear Door (Right Similar)

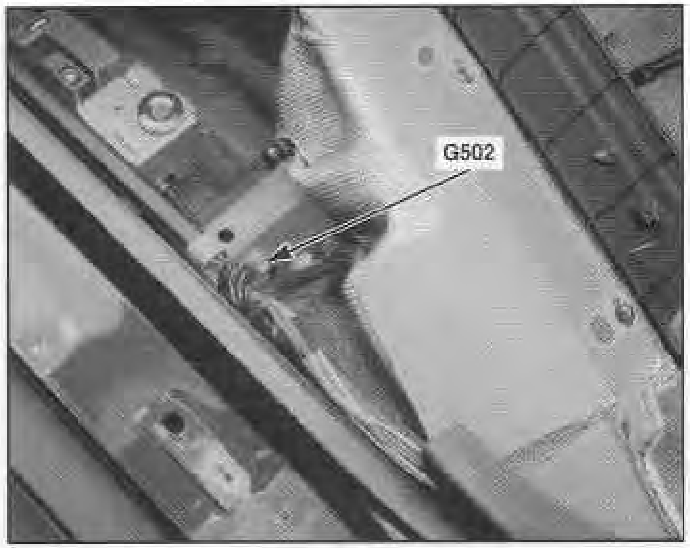


92. Front of Left Quarter Panel (Right Similar)



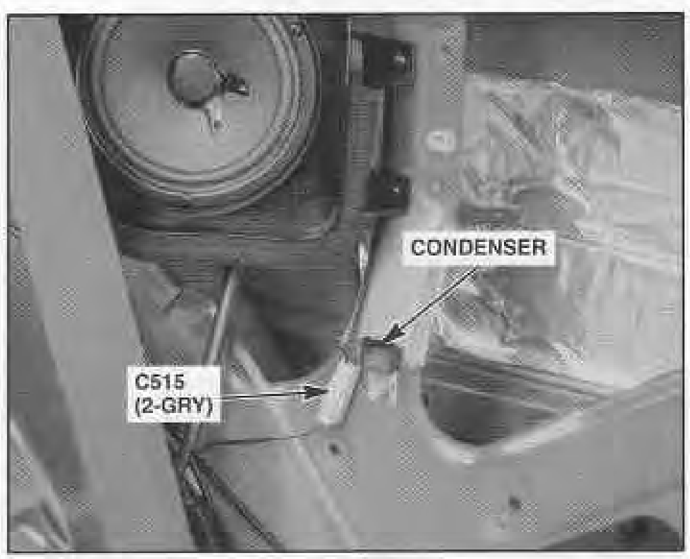
93. Behind Right Side of Front Console ('98-'99 Models)

94. Below Driver's Door Side Trim



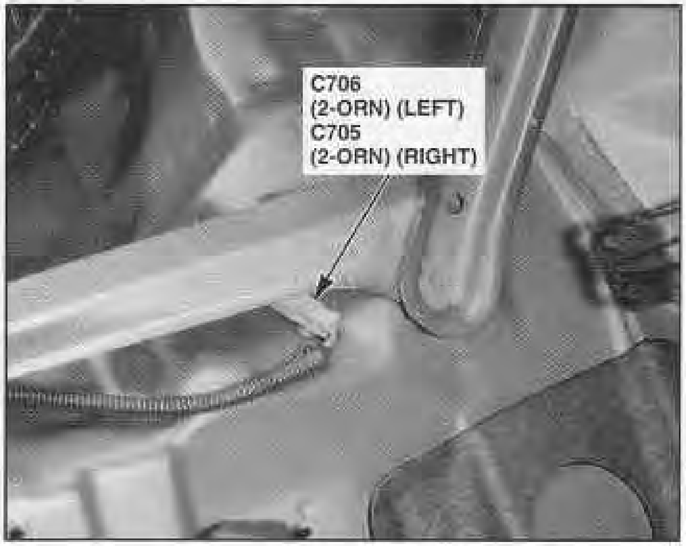
95. Below Driver's Seat

96. Behind Left Quarter Panel Trim

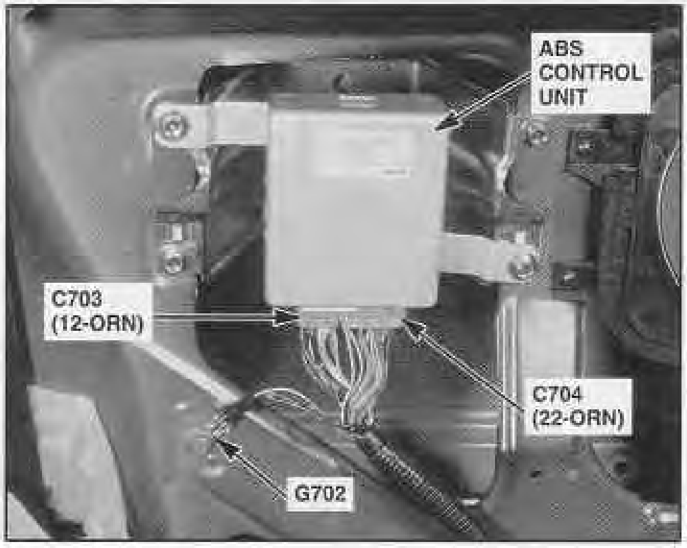


Component Location

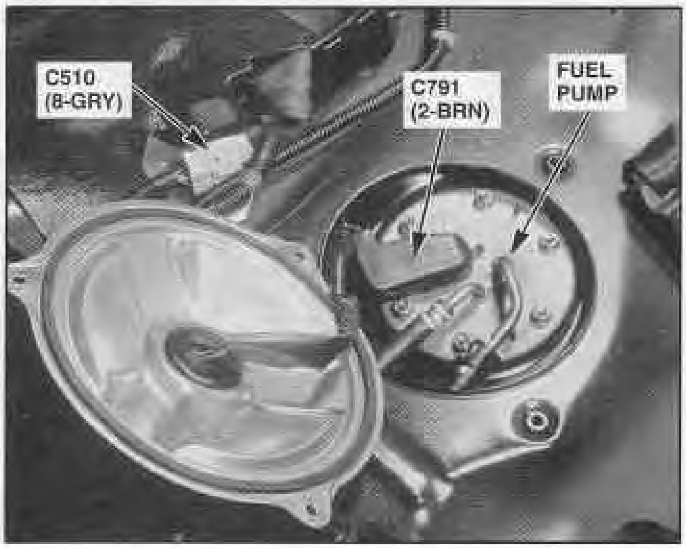
97. Behind Left Side of Rear Seat (Right Similar)



100. Behind Right Quarter Panel Trim (Hatchback)



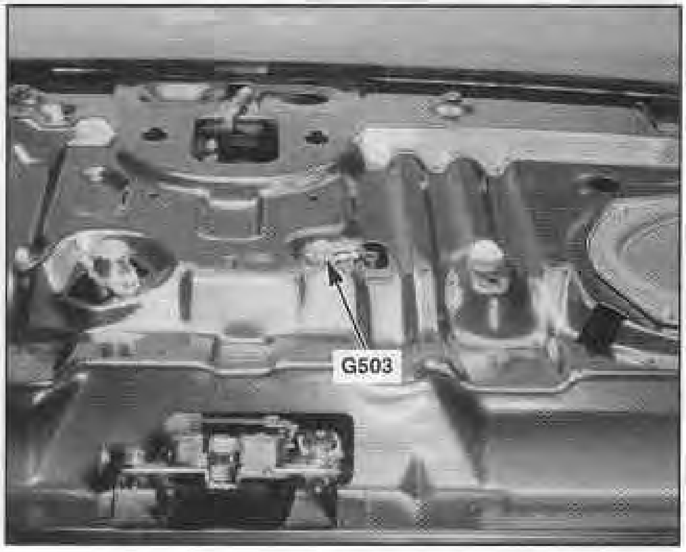
98. Below Center of Rear Seat



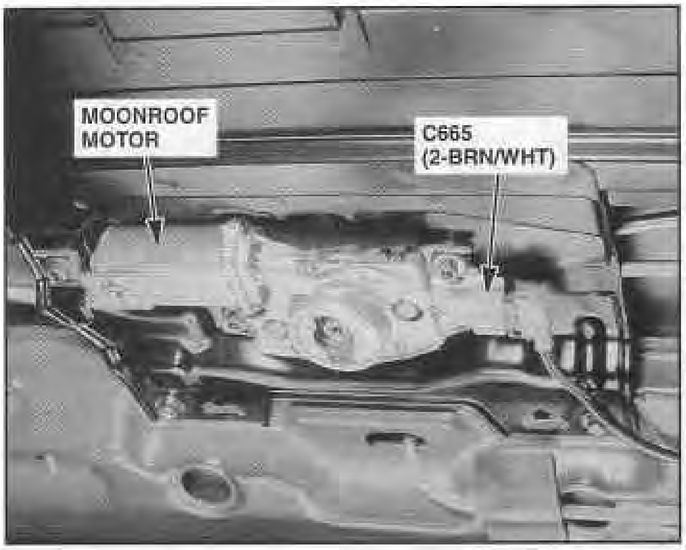
101. Below Left Side of Dash (with Security)

99. Behind Right Side of Rear Seat

102. Center of Rear Shelf

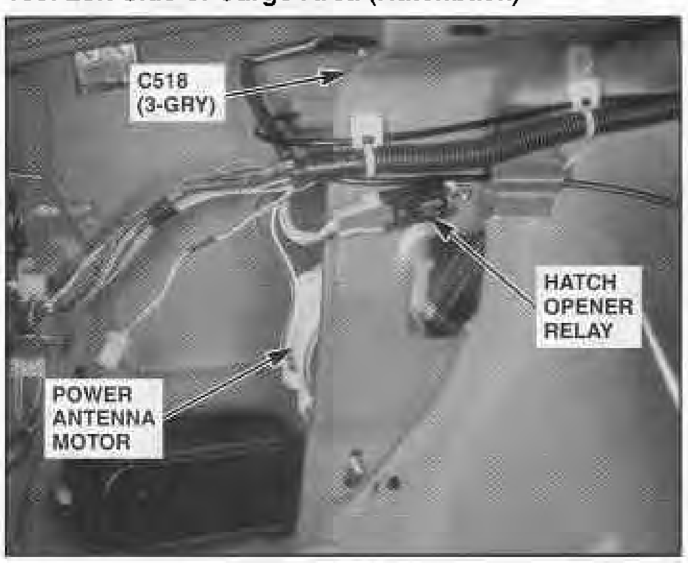


103. Center Rear of Roof (Hatchback)

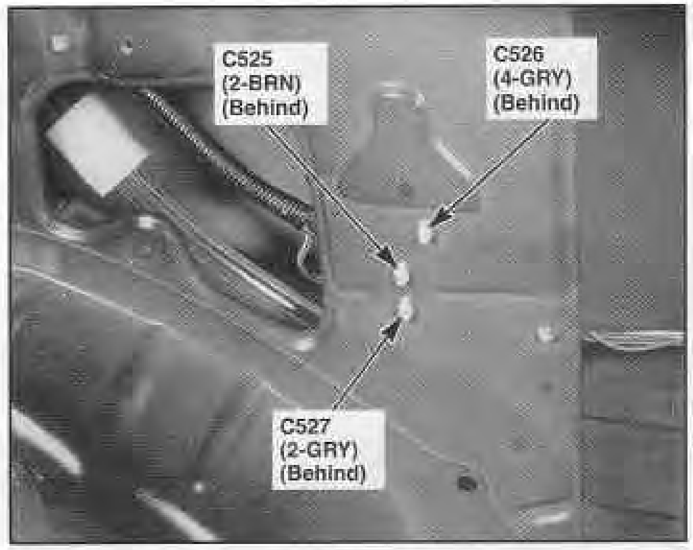


104. Left Rear of Cargo Area (Hatchback)

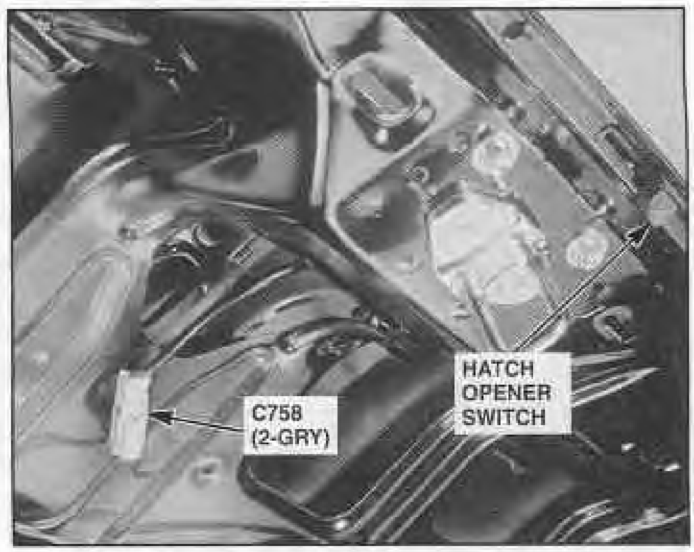
105. Left Side of Cargo Area (Hatchback)



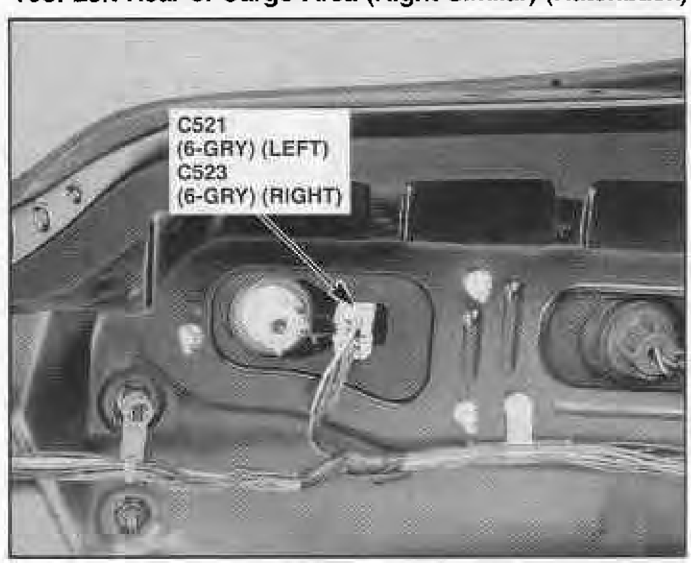
106. Right Side of Cargo Area



107. Center Rear of Cargo Area (Hatchback)

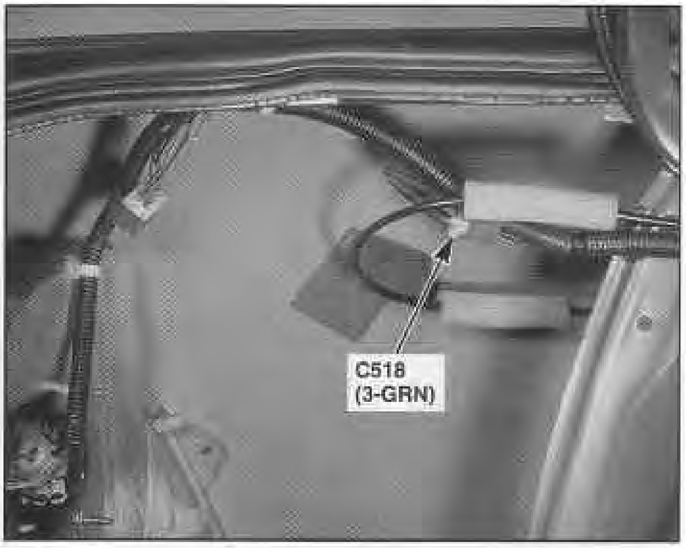


108. Left Rear of Cargo Area (Right Similar) (Hatchback)

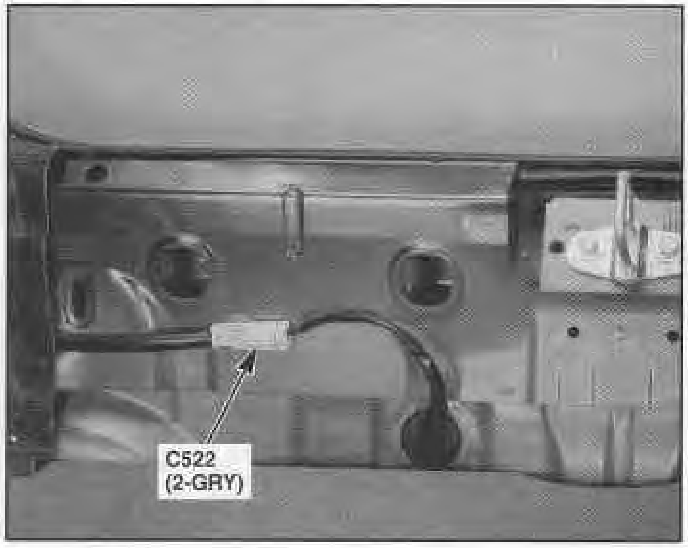


Component Location

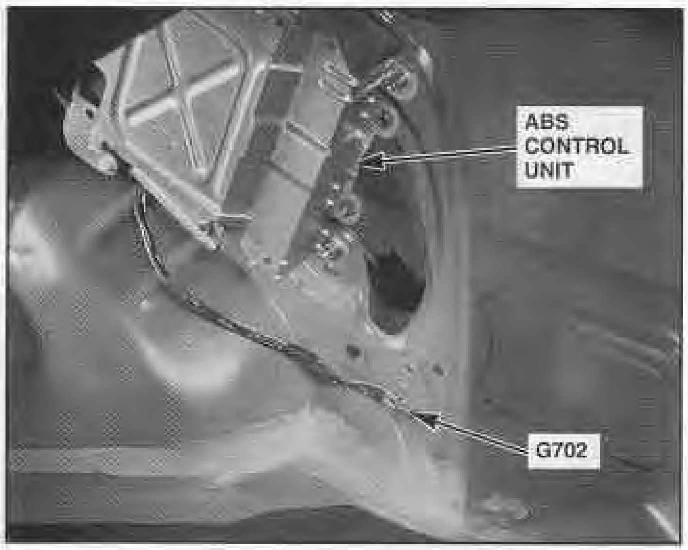
109. Left Side of Trunk ('98-'99 Models) (Sedan)



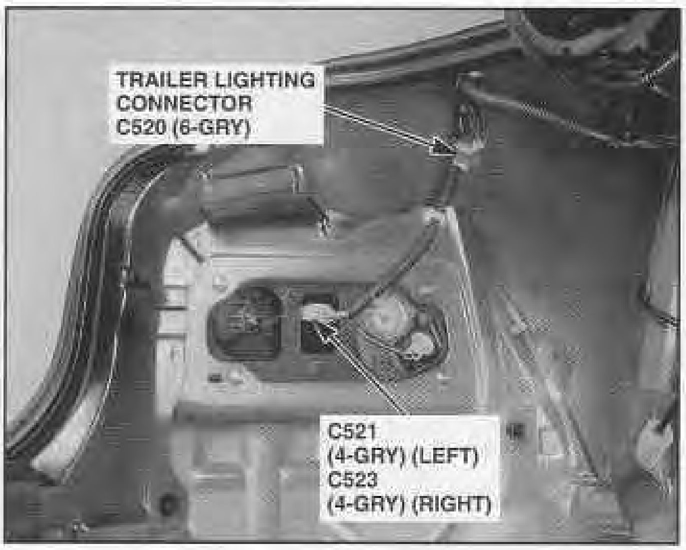
112. Right Rear of Trunk



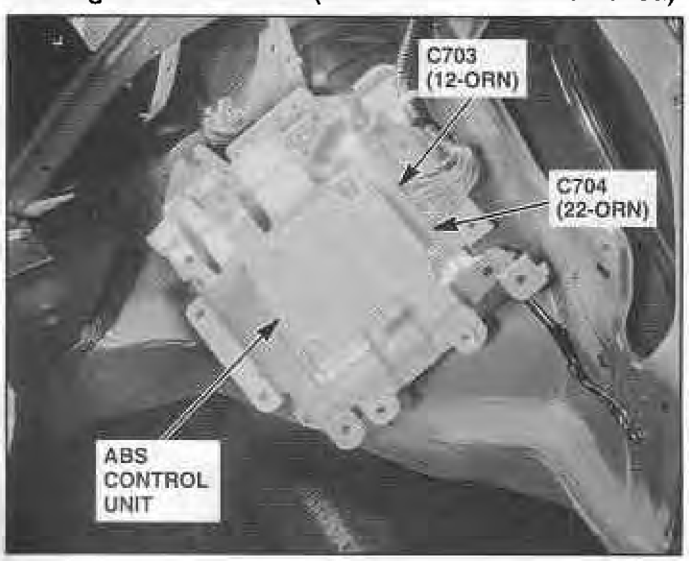
110. Right Side of Trunk (Sedan)



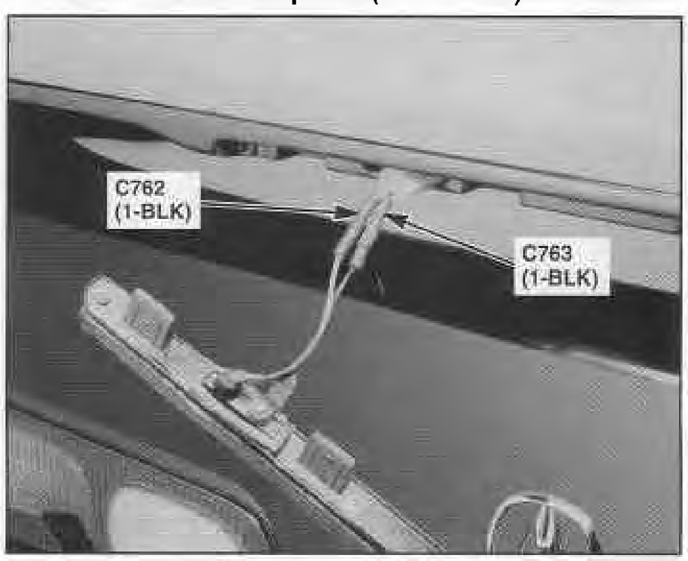
113. Left Rear of Trunk (Right Similar) (Sedan)



111. Right Side of Trunk (ABS Control Unit Removed)

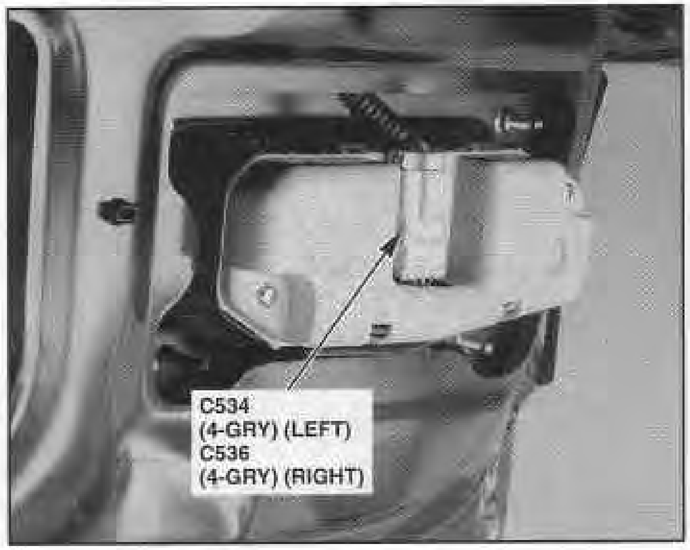


114. Center of Hatch Spoiler (Hatchback)

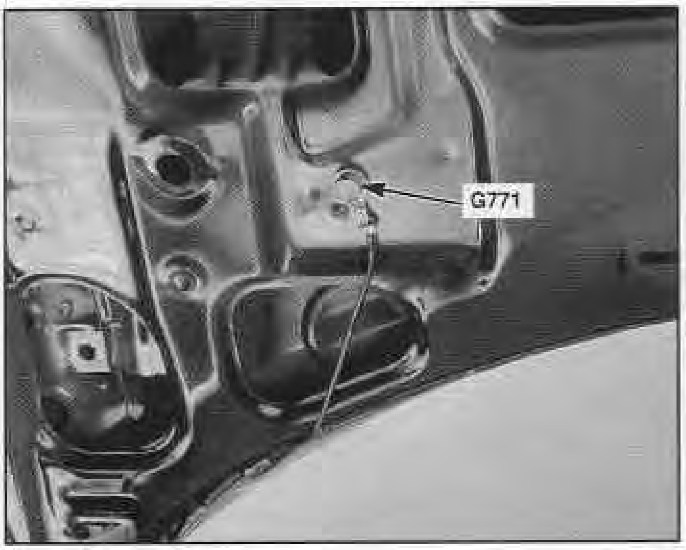


115. Center of Hatch (All except GS and GS-R)

118. Left Side of Trunk Lid (Right Similar) (Sedan)

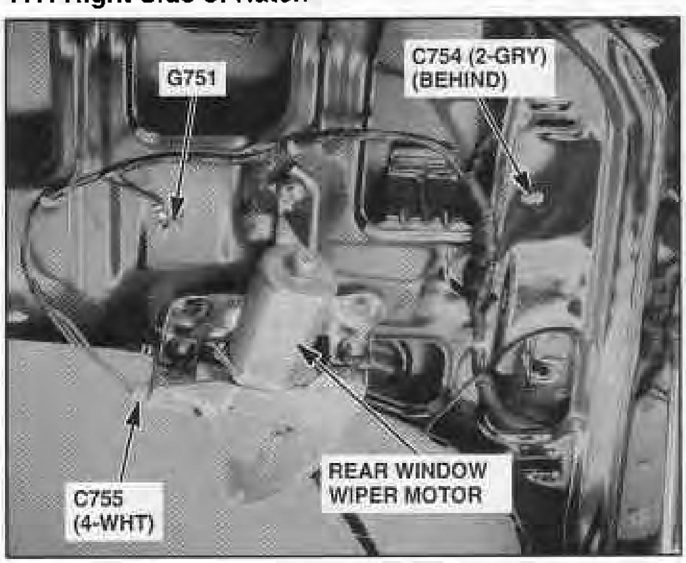


116. Left Side of Hatch

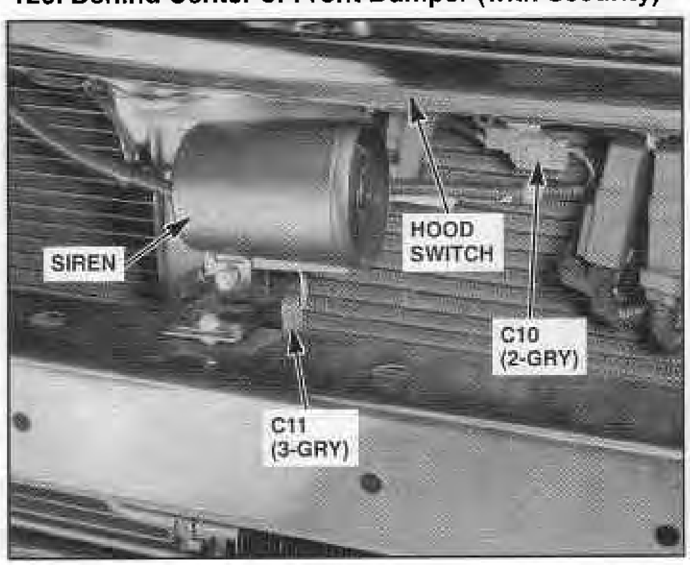


119. Center of Trunk Lid (Sedan)

117. Right Side of Hatch

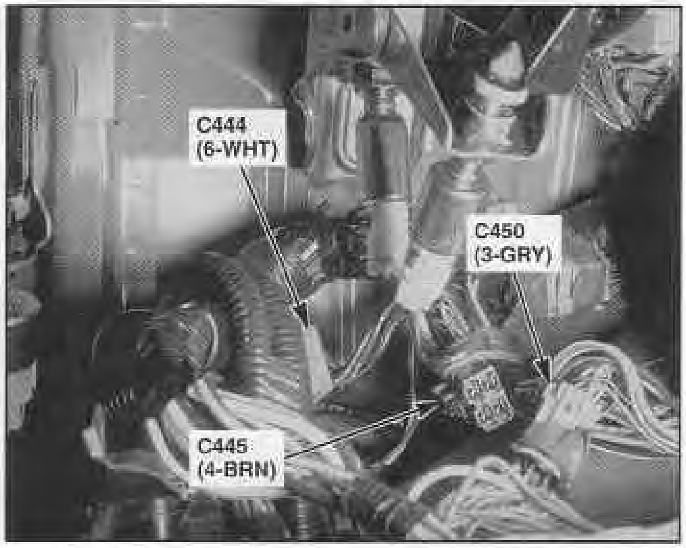


120. Behind Center of Front Bumper (with Security)

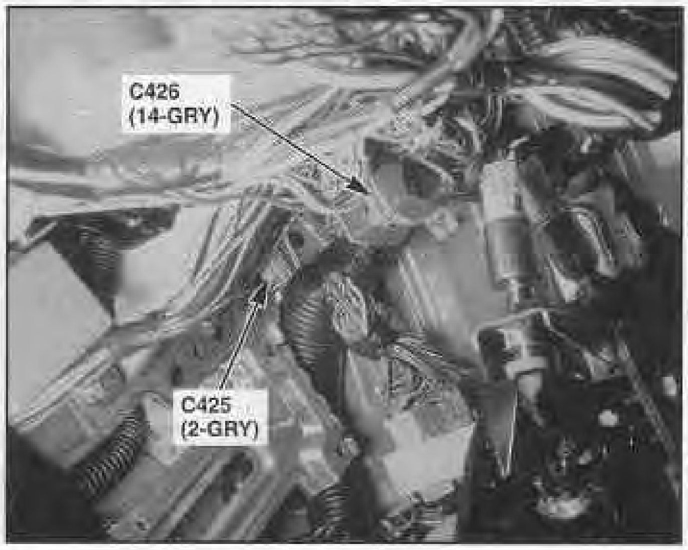


Component Location

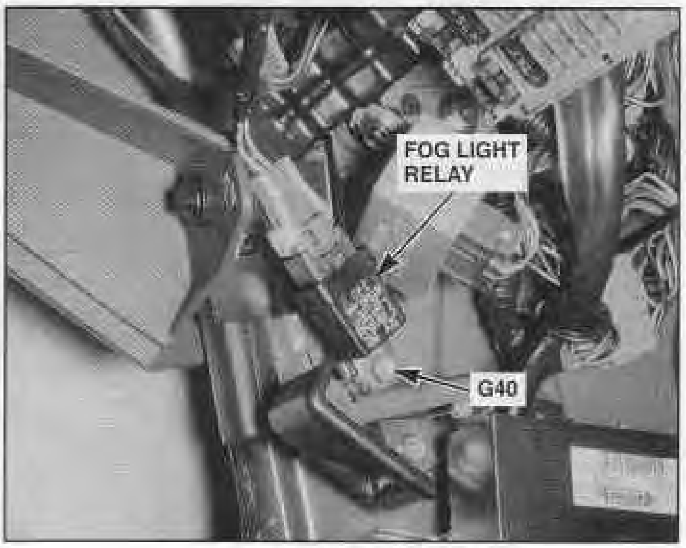
121. Below Left Side of Dash



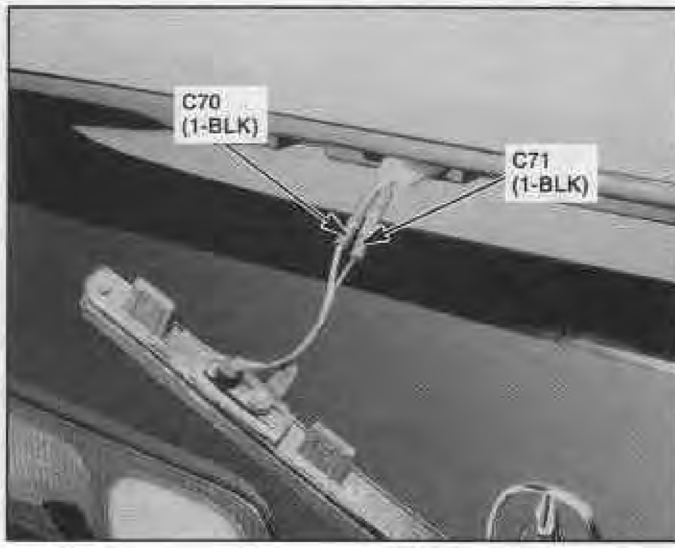
124. Below Left Side of Dash



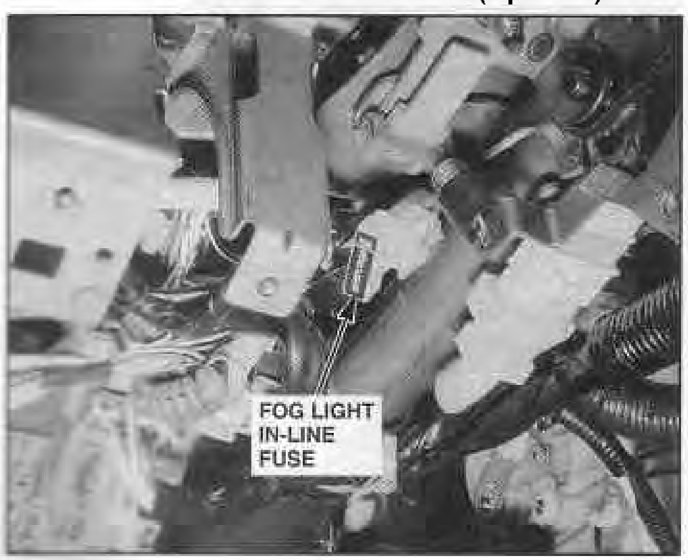
122. Above Left Kick Panel (Optional)



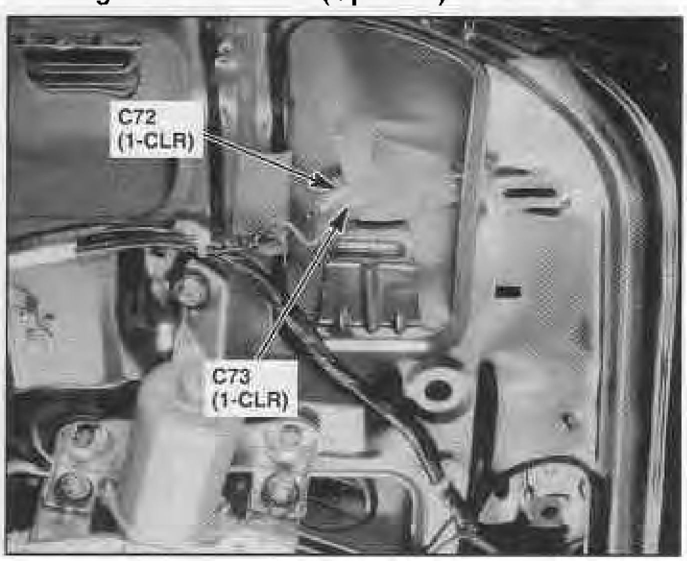
125. Center of Hatch Spoiler (Optional)



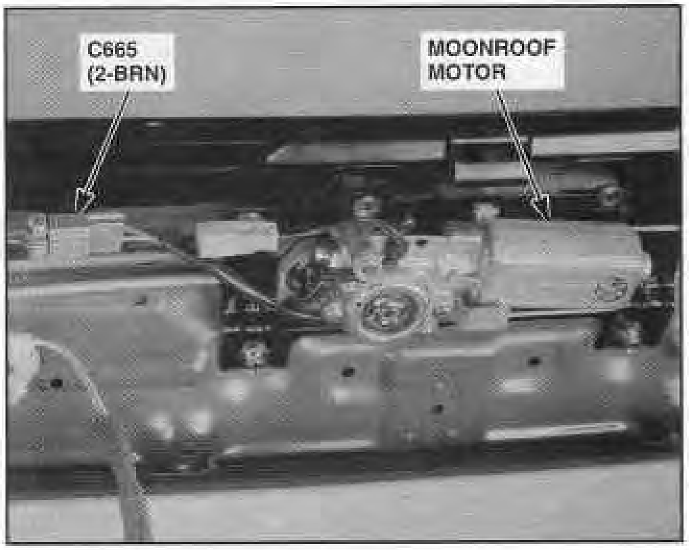
123. Behind Dashboard Lower Cover (Optional)



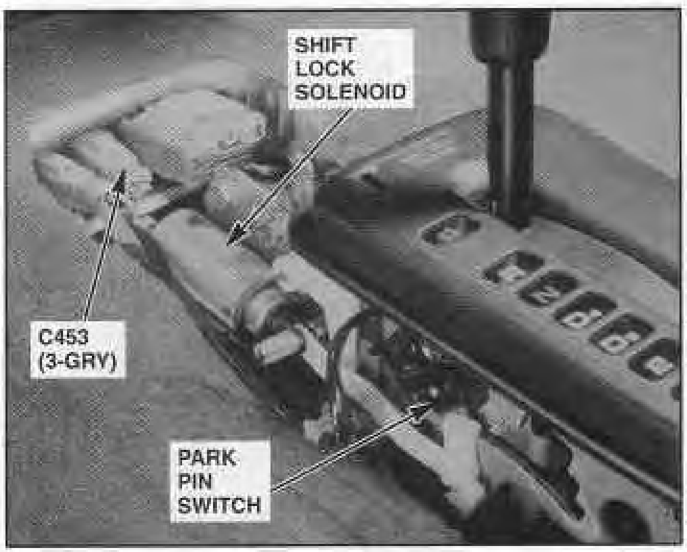
126. Right Side of Hatch (Optional)



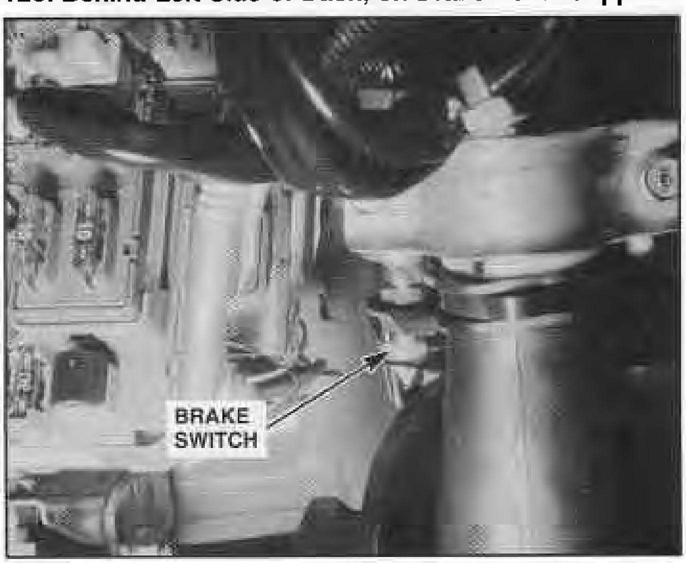
127. Center Front of Roof (Sedan)



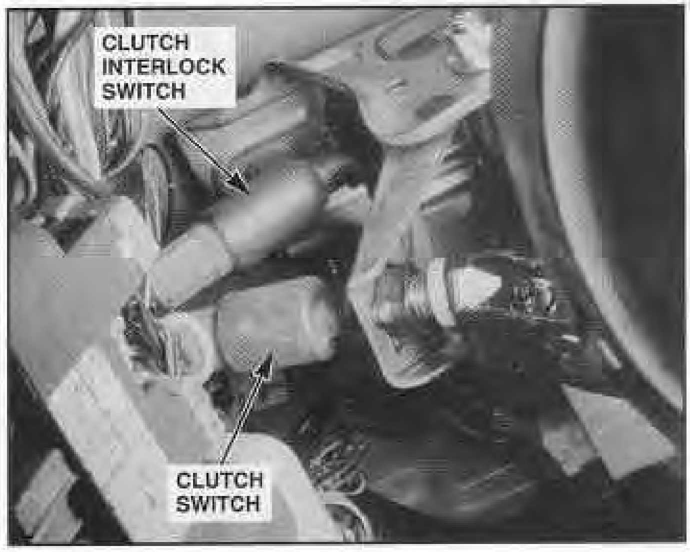
128. Below Left Side of Front Console



129. Behind Left Side of Dash, on Brake Pedal Support

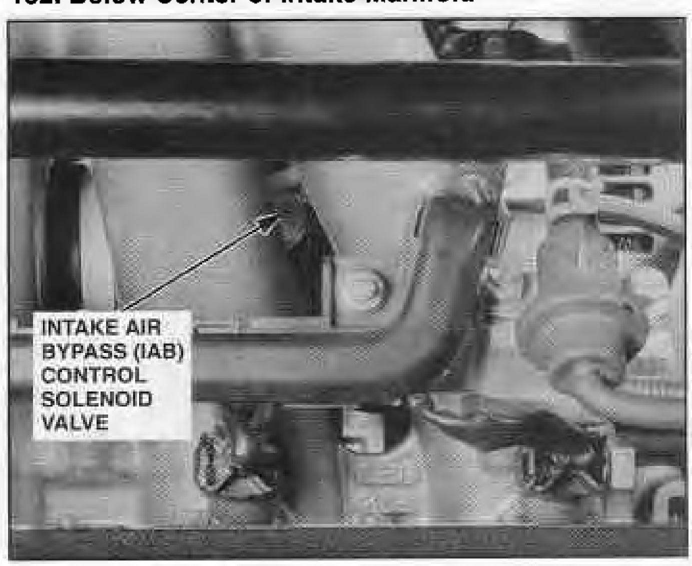


130. Behind Left Side of Dash, on Clutch Pedal Support



131. Right Side of Front Console

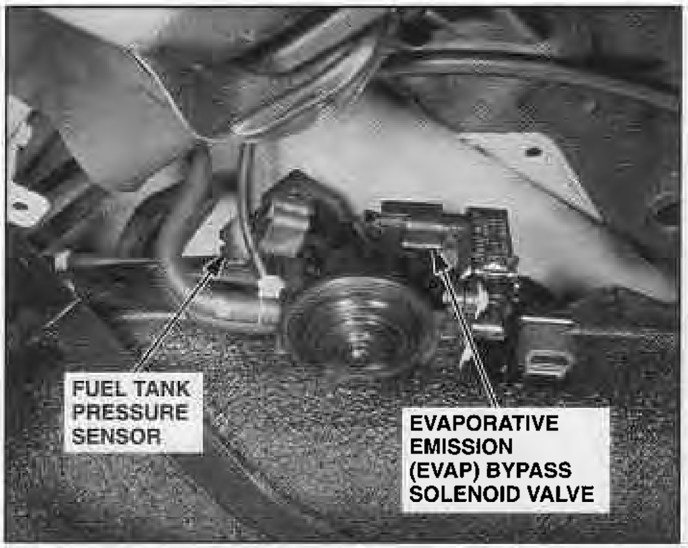
132. Below Center of Intake Manifold



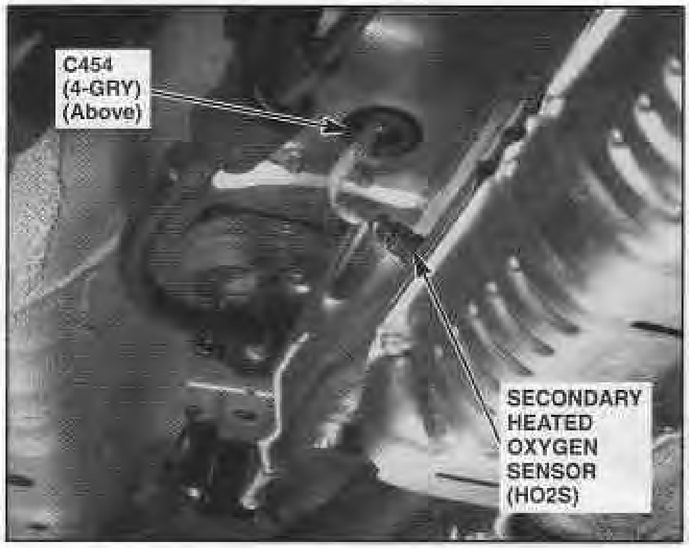
Component Location

133. Left Rear Underside of Engine

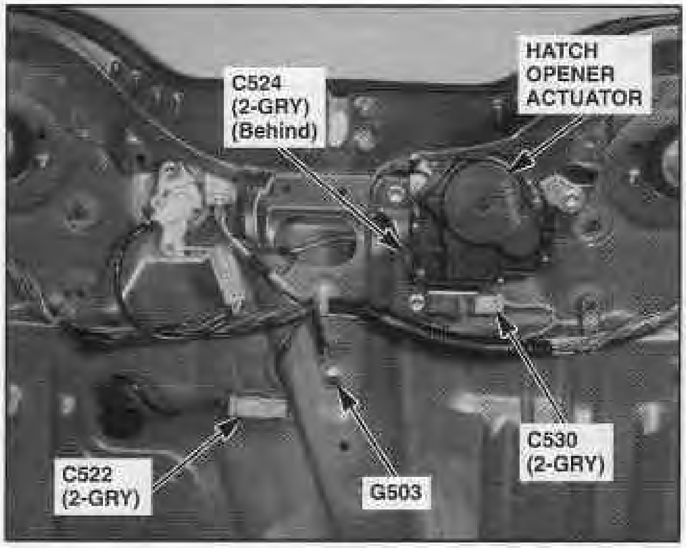
136. Underside of Vehicle, Forward of Fuel Tank



134. Underside of Vehicle, Top of Catalytic Converter

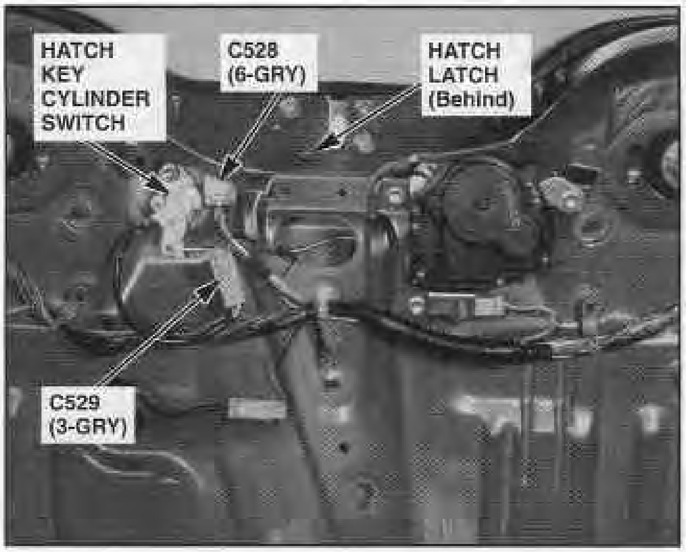


137. Center Rear of Cargo Area (Hatchback)



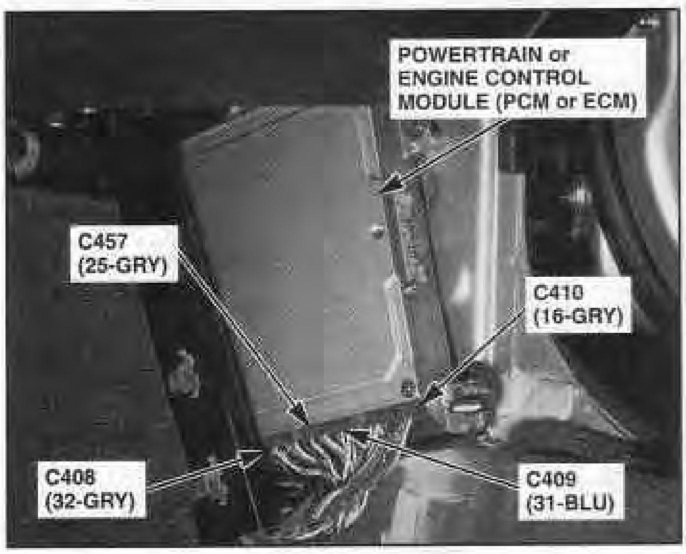
135. Lower Center of Engine

138. Center Rear of Cargo Area (Hatchback)

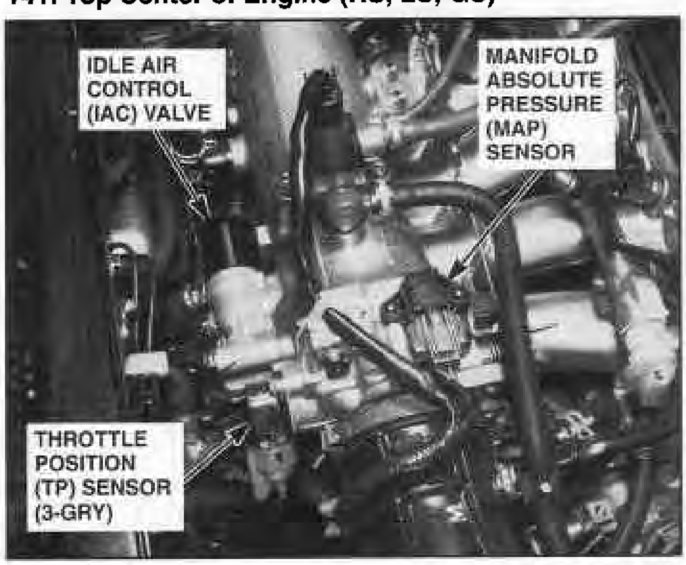


139. Right Side of Engine Compartment

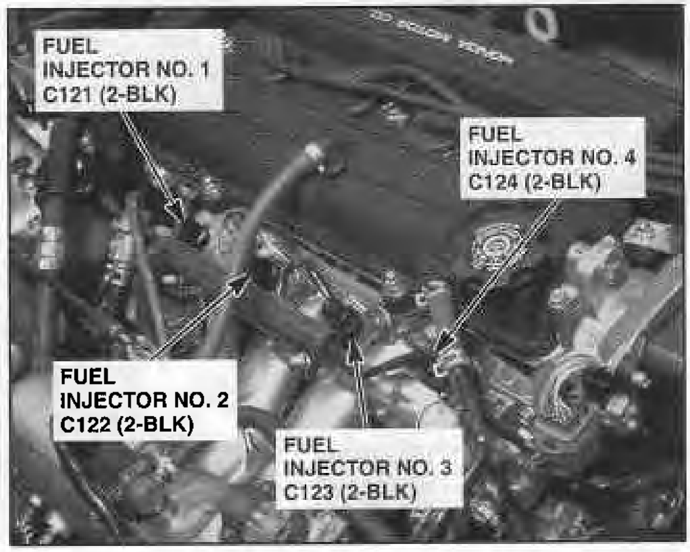
140. Behind Right Kick Panel ('00 Model)



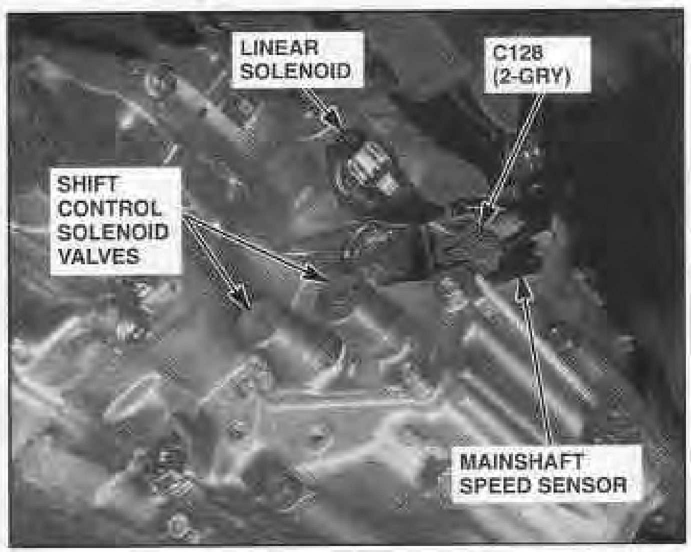
141. Top Center of Engine (RS, LS, GS)



142. Top Center of Engine



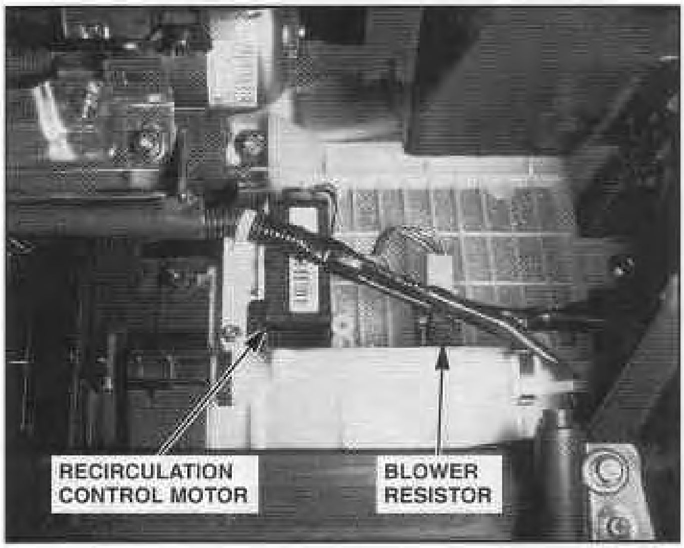
143. Underside of Car, Front of Trans. ('00 Model)



144. Left Side of Steering Column

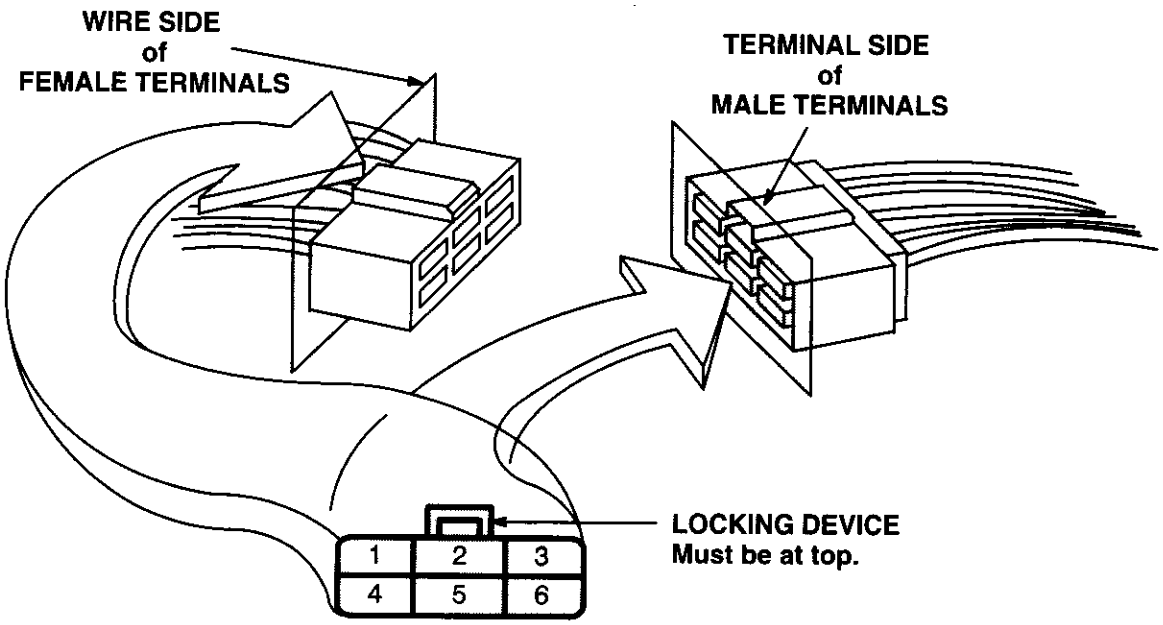
Component Location

145. Behind Glove Box



Connector Cavity Numbers

Cavity Numbering System

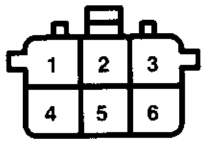


Connector View Index (Views are shown on the following pages)

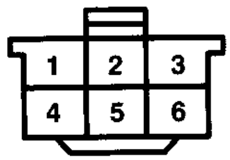
Connector	View
C102	13
C103	24
C104 (A/T)	1
C109	16
C125	9
C127	24
C151	9
C211	16
C216	12
C217	17
C301	38
C302 (RS)	19
C302 (All except RS)	36
C401	43
C404	14
C406	32
C407	41
C408	47
C409	46
C410 (A/T)	20
C413	25
C414	10
C416	10
C417	26
C418	40
C419	42
C420	45
C421	30
C422	25
C426	22
C430 (A/T) ('98-'99)	8
C430 (A/T) ('00)	14
C432	7
C435	2
C436	5
C437	11
C438	36
C439	37
C440	35
C441	6
C442	4
C444	3
C446	6
C449	27
C452 (RS)	22
C452 (All except RS)	30
C457	44
C503	8
C504	33
C505	22
C506	43
C510	8
C516	38
C520	4
C521	4
C523	4
C527 (Sedan)	2
C528 (Hatchback)	4
C528 (Sedan)	2
C551	39
C556	40
C558 (A/T)	15
C559	21
C560	31
C563	14
C564	4
C566	28
C604	26
C605	11
C608	15
C609 (Hatchback)	14
C609 (Sedan)	29
C610	4
C629	11
C677	25
C682	8
C683	3
C684	23
C703	18
C704	42
C804	34

Connector Views

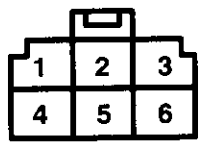
1



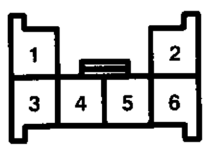
2



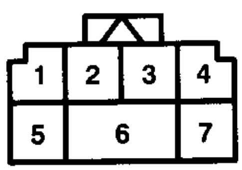
3



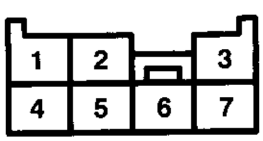
4



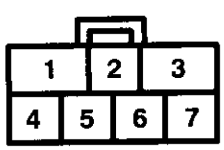
5



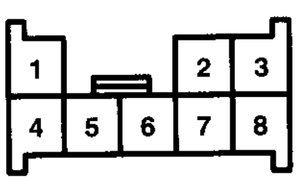
6



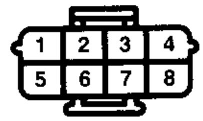
7



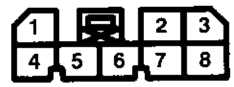
8



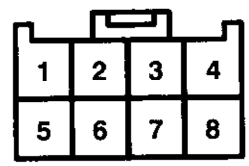
9



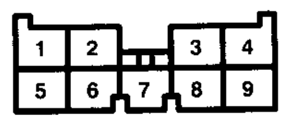
10



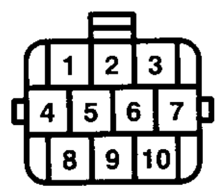
11



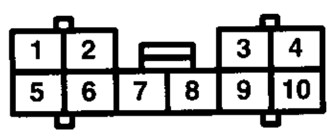
12



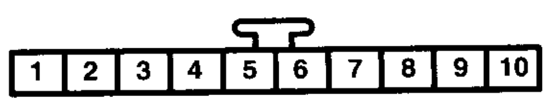
13



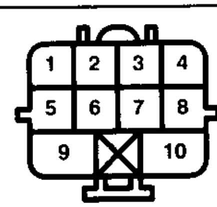
14



15



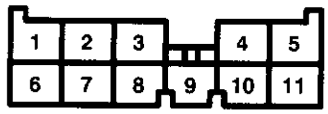
16



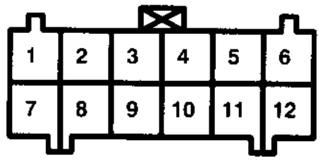
Connector Cavity Numbers

Connector Views

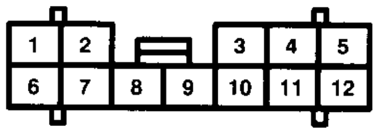
17



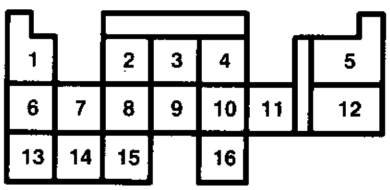
18



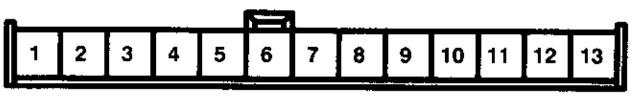
19



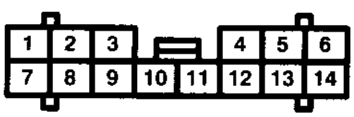
20



21

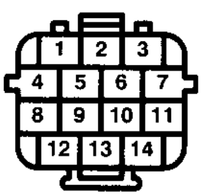


22

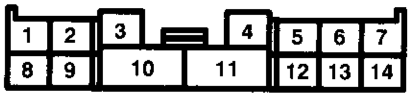


23

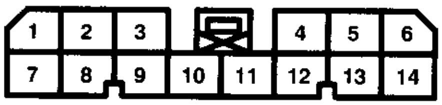
24



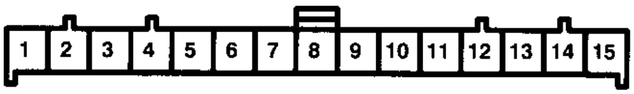
25



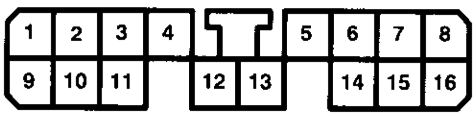
26



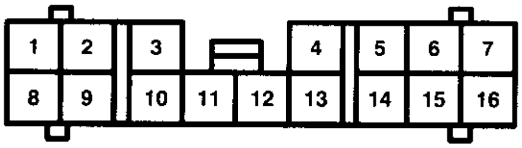
27



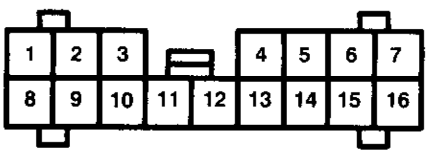
28



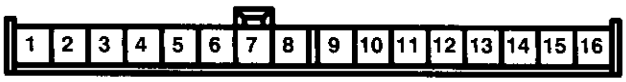
29



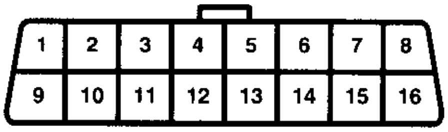
30



31

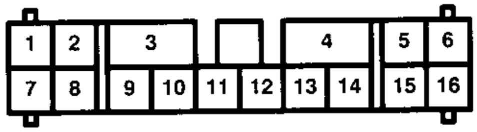


32

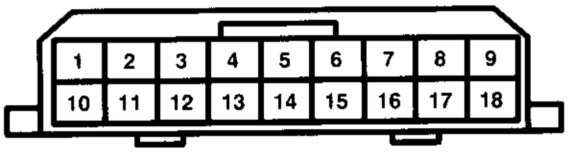


Connector Views

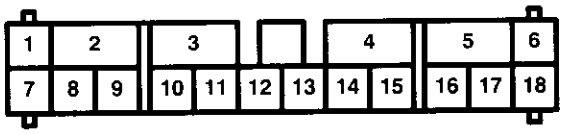
33



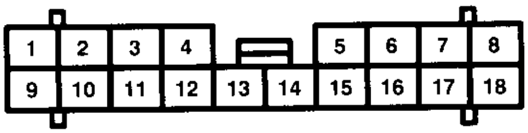
34



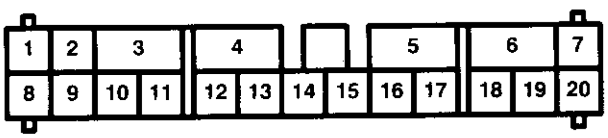
35



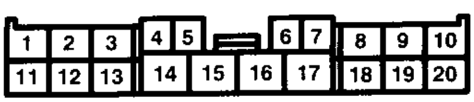
36



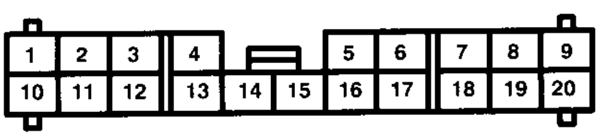
37



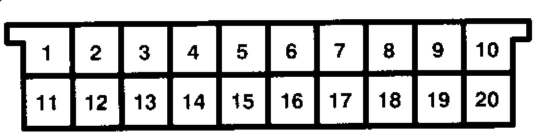
38



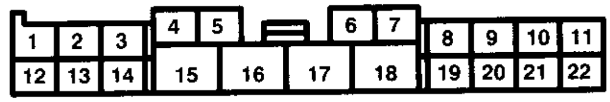
39



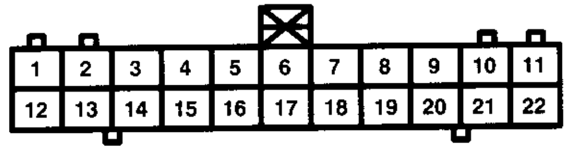
40



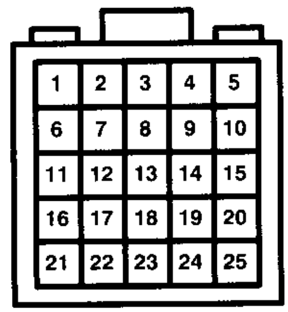
41



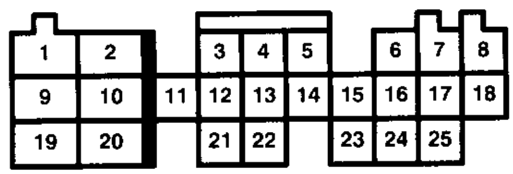
42



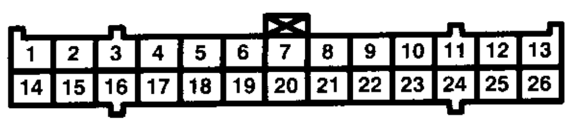
43



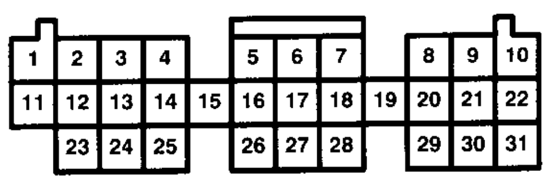
44



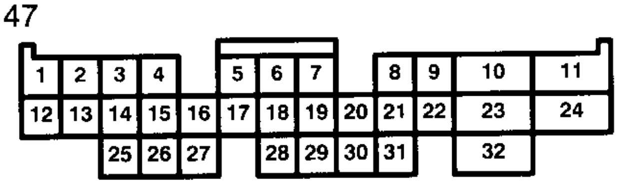
45



46



47



Connector Identification and Wire Harness Routing

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Starter Cables

T1 T2		Right side of engine compartment Right end of engine	Under-hood fuse/relay box Starter motor	
⊕		Battery	Battery positive terminal	

Battery Ground Cable

G1		Right front shock tower	Body ground, via battery ground cable	
⊖		Battery	Battery negative terminal	

Engine Ground Cable A

T3		Left end of engine	Valve cover	
G2		Top left side of bulkhead	Body ground, via engine ground wire A	

Engine Ground Cable B

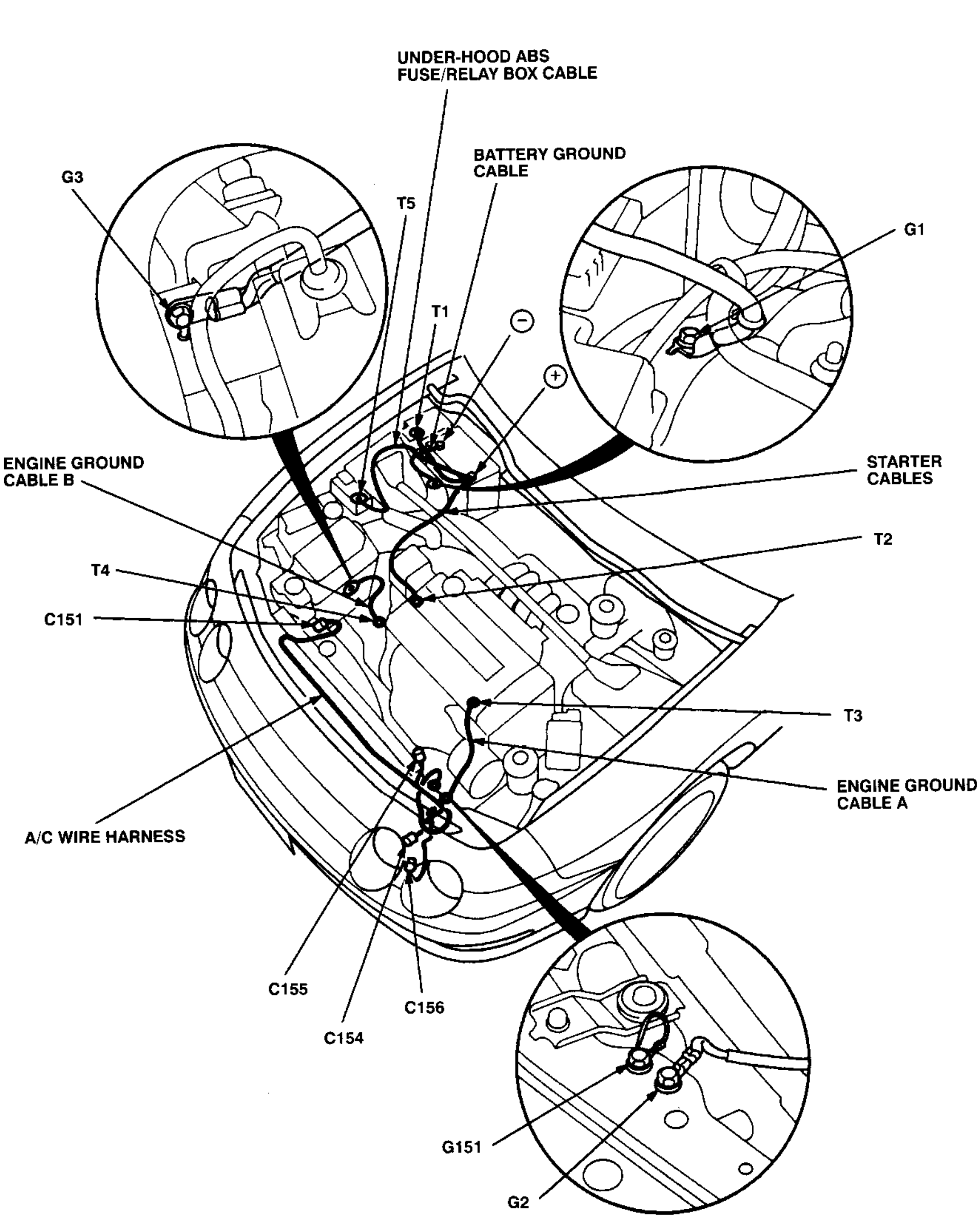
T4		Right side of engine compartment	Transmission housing	
G3		Right front side of frame	Body ground, via engine ground wire B	

A/C Wire Harness

C151 C154 C155 C156	8-GRY 2-GRY 2-GRY 1-GRY	Right side of engine compartment Left side of engine compartment Left side of engine compartment Left side of engine compartment	Main wire harness A/C pressure switch Condenser fan motor A/C compressor clutch	
G151		Top right side of front bulkhead		

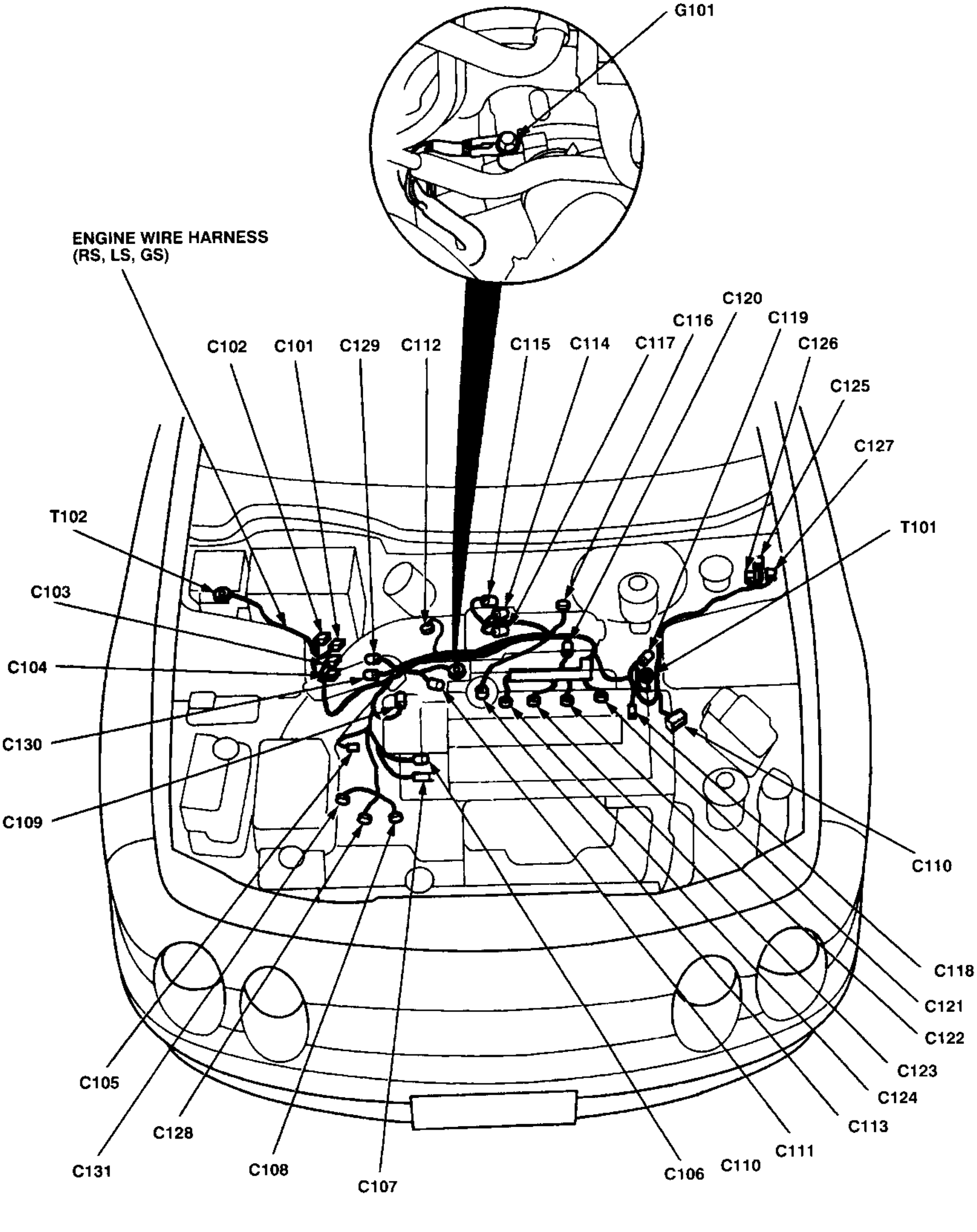
Under-hood ABS Fuse/Relay Box Cable

T5		Right side of engine compartment	Under-hood ABS fuse/relay box	
⊕		Battery	Battery positive terminal	


UNDER-HOOD ABS
FUSE/RELAY BOX CABLE
BATTERY GROUND
CABLE
G3
T5
G1
T1
⊖
⊕
ENGINE GROUND
CABLE B
STARTER
CABLES
T2
T4
C151
T3
ENGINE GROUND
CABLE A
A/C WIRE HARNESS
C155
C156
C154
G151
G2

Engine Wire Harness (RS, LS, GS)

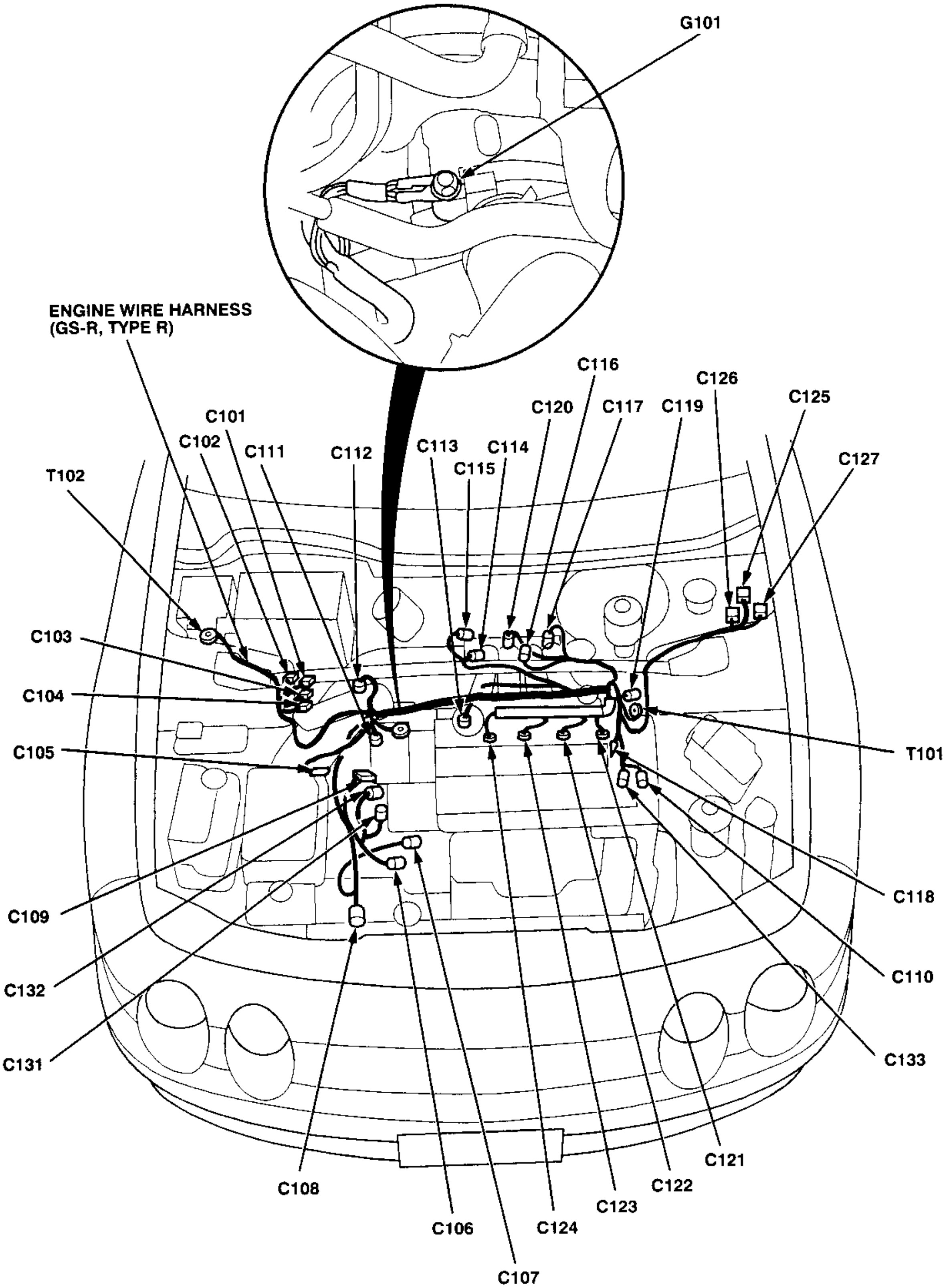
Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C101	4-GRY	Right side of engine compartment	Main wire harness	
C102	10-GRY	Right side of engine compartment	Main wire harness	
C103	14-GRY	Right side of engine compartment	Main wire harness	
C104	6-GRY	Right side of engine compartment	Main wire harness	A/T
C105	1-BLK	Right end of engine	Starter solenoid	
C106	2-GRY	Right end of engine	Engine coolant temperature (ECT) sensor	
C107	1-BLK	Right end of engine	Engine coolant temperature gauge sending unit	
C108	2-GRY	Transmission	Back-up light switch	M/T
C108	2-GRY	Transmission	Lock-up control solenoid valve A and B	A/T
C109	10-GRY	Middle of engine	Distributor	
C110	2-GRY	Left rear underside of engine	Crankshaft speed fluctuation (CKF) sensor	
C111	2-GRY	Right side of engine	Radiator fan switch	
C112	3-GRY	Rear of engine compartment	Vehicle speed sensor (VSS)	
C113	4-GRY	Middle rear of engine compartment	Primary heated oxygen sensor (HO2S)	
C114	3-GRY	Middle of engine	MAP sensor	
C115	3-GRY	Middle of engine	Throttle position (TP) sensor	
C116	2-GRY	Middle of engine	Idle air control (IAC) valve	
C117	2-BLK	Middle of engine	Evaporative emission (EVAP) purge control solenoid valve	
C118	1-BLK	Middle of engine	Engine oil pressure switch	
C119	4-GRN	Left end of engine	Alternator	USA
C119	3-GRN	Left end of engine	Alternator	Canada
C120	2-GRY	Middle of engine	Intake air temperature (IAT) sensor	
C121	2-BLK	Middle of engine	No. 1 fuel injector	
C122	2-BLK	Middle of engine	No. 2 fuel injector	
C123	2-BLK	Middle of engine	No. 3 fuel injector	
C124	2-BLK	Middle of engine	No. 4 fuel injector	
C125	8-GRY	Left rear corner of engine compt.	Junction connector	
C126	2-GRY	Left rear corner of engine compt.	Engine compartment wire harness	
C127	14-GRY	Left rear corner of engine compt.	Engine compartment wire harness	
C128	3-GRY	Transmission	Shift control solenoid valve A and B	A/T ('98-'99 models)
C128	2-GRY	Transmission	Shift control solenoid valve A and B	A/T ('00 model)
C129	2-GRY	Transmission	Countershaft speed sensor	A/T ('98-'99 models)
C129	2-BLK	Transmission	Countershaft speed sensor	A/T ('00 model)
C130	3-GRY	Transmission	Mainshaft speed sensor	A/T ('98-'99 models)
C130	2-BLK	Transmission	Mainshaft speed sensor	A/T ('00 model)
C131	2-BLK	Transmission	Linear solenoid valve	A/T ('00 model)
T101		Left end of engine	Alternator	
T102		Right rear corner of engine compt.	Under-hood fuse/relay box	
G101		Right end of engine	Engine ground, via engine wire harness	


G101
ENGINE WIRE HARNESS
(RS, LS, GS)
C120
C116
C119
C102
C101
C129
C112
C115
C114
C117
C126
C125
C127
T102
T101
C103
C104
C130
C109
C110
C118
C121
C122
C123
C124
C113
C111
C110
C106
C105
C128
C131
C108
C107

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Engine Wire Harness (GS-R, Type R)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C101	4-GRY	Right side of engine compartment	Main wire harness	
C102	10-GRY	Right side of engine compartment	Main wire harness	
C103	14-GRY	Right side of engine compartment	Main wire harness	
C104	3-GRY	Right side of engine compartment	Main wire harness	
C105	1-BLK	Right side of engine compartment	Starter solenoid	
C106	2-GRY	Right end of engine	Engine coolant temperature (ECT) sensor	
C107	1-BLK	Right end of engine	Engine coolant temperature gauge sending unit	
C108	2-GRY	Transmission	Back-up light switch	
C109	10-GRY	Middle end of engine	Distributor	
C110	2-GRY	Left rear underside of engine	Crankshaft speed fluctuation (CKF) sensor	
C111	2-GRY	Right end of engine	Radiator fan switch	
C112	3-GRY	Right end of engine compartment	Vehicle speed sensor (VSS)	
C113	4-GRY	Middle rear of engine compartment	Primary heated oxygen sensor (HO2S)	
C114	3-GRY	Middle of engine	MAP sensor	
C115	3-GRY or BLU	Middle of engine	Throttle position (TP) sensor	
C116	2-GRY	Middle of engine	Idle air control (IAC) valve	
C117	2-BLK	Middle of engine	Evaporative emission (EVAP) purge control solenoid valve	
C118	1-BLK	Middle of engine	Engine oil pressure switch	
C119	4-GRN	Left end of engine	Alternator	USA
C119	3-GRN	Left end of engine	Alternator	Canada
C120	2-GRY	Middle of engine	Intake air temperature (IAT) sensor	
C121	2-BLK	Middle of engine	No. 1 fuel injector	
C122	2-BLK	Middle of engine	No. 2 fuel injector	
C123	2-BLK	Middle of engine	No. 3 fuel injector	
C124	2-BLK	Middle of engine	No. 4 fuel injector	
C125	8-GRY	Left rear corner of engine compt.	Junction connector	
C126	2-GRY	Left rear corner of engine compt.	Engine compartment wire harness	
C127	14-GRY	Left rear corner of engine compt.	Engine compartment wire harness	
C131	1-GRY	Right side of engine	VTEC solenoid valve	
C132	2-GRN	Right side of engine	VTEC pressure switch	
C133	2-GRN	Left end of engine	Knock sensor (KS)	
C134	2-GRY	Left end of engine	Intake air bypass (IAB) control solenoid valve	GS-R
T101		Left end of engine	Alternator	
T102		Right rear corner of engine compt.	Under-hood fuse/relay box	
G101		Right end of engine	Engine ground, via engine wire harness	

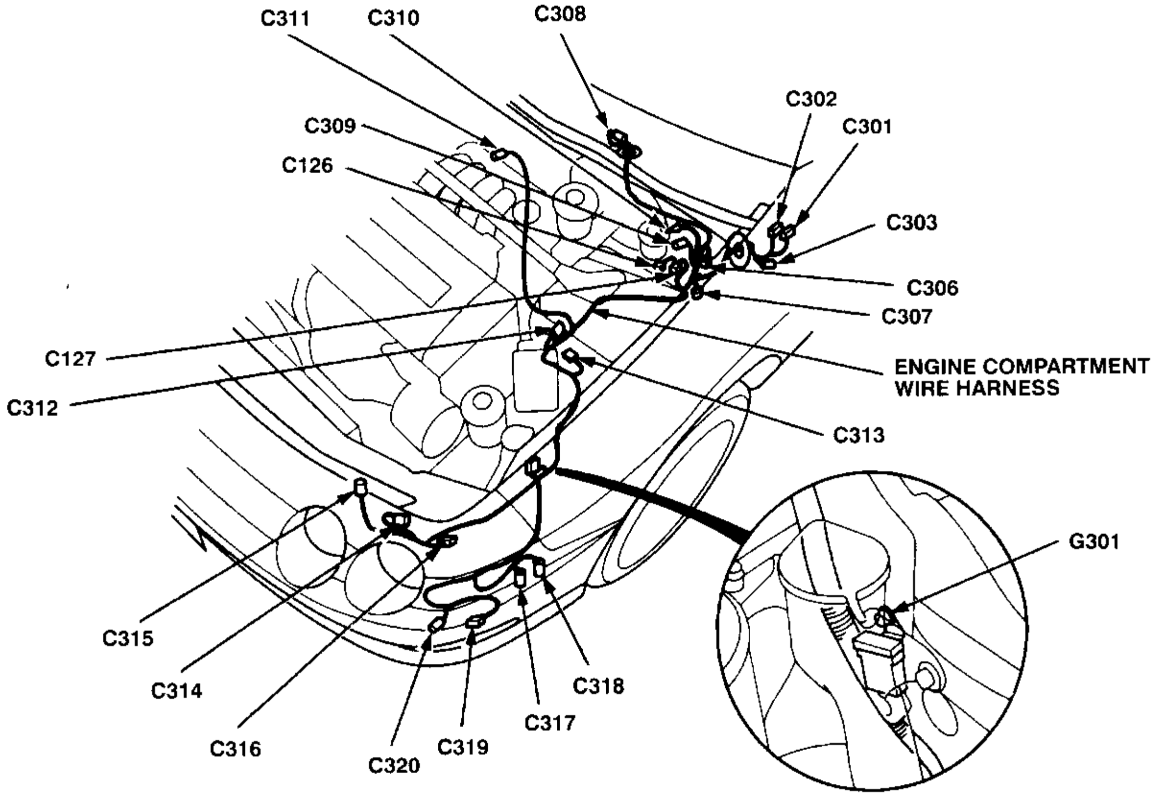


G101
ENGINE WIRE HARNESS
(GS-R, TYPE R)
C116
C126
C125
C120
C117
C119
C101
C102
C111
C112
C113
C114
C115
C127
T102
C103
C104
C105
T101
C109
C118
C132
C110
C131
C133
C121
C122
C108
C123
C106
C124
C107

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Engine Compartment Wire Harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C126	2-GRY	Left rear corner of engine compt.	Engine wire harness	
C127	14-GRY	Left rear corner of engine compt.	Engine wire harness	
C301	20-GRY	Behind left kick panel	Main wire harness	
C302	18-BRN	Behind left kick panel	Main wire harness	All except RS
C302	12-BRN	Behind left kick panel	Main wire harness	RS
C303	1-BRN	Behind left kick panel	Front fog light system	Option
C306	2-NAT	Left rear corner of engine compt.	Test tachometer connector	
C307	3-CAVITY	Left rear corner of engine compt.	Daytime running lights resistor	Canada
C308	5-GRY	Left rear corner of engine compt.	Windshield wiper motor	
C309	1-BLK	Left rear corner of engine compt.	Brake fluid level sensor (+)	
C310	1-BLK	Left rear corner of engine compt.	Brake fluid level sensor (-)	
C311	2-GRY	Middle of engine compartment	Power steering pressure (PSP) switch	USA
C312	2-ORN	Left side of engine compartment	Left front wheel sensor	ABS
C313	4-GRY	Left side of engine compartment	Cruise control actuator	
C314	2-WHT	Behind left headlight	Left headlight (Low beam)	
C315	2-BLU	Behind left headlight	Left headlight (High beam)	
C316	1-BRN	Behind left headlight	Front fog light system	Option
C317	2-GRN	Behind left corner of front bumper	Windshield washer motor	
C318	2-BRN	Behind left corner of front bumper	Rear window washer motor	Hatchback
C319	2-BRN	Behind left corner of front bumper	Left front side marker light	
C320	3-WHT	Behind left corner of front bumper	Left front turn signal/parking lights	
G301		Left side of engine compartment	Body ground, via engine compartment wire harness	

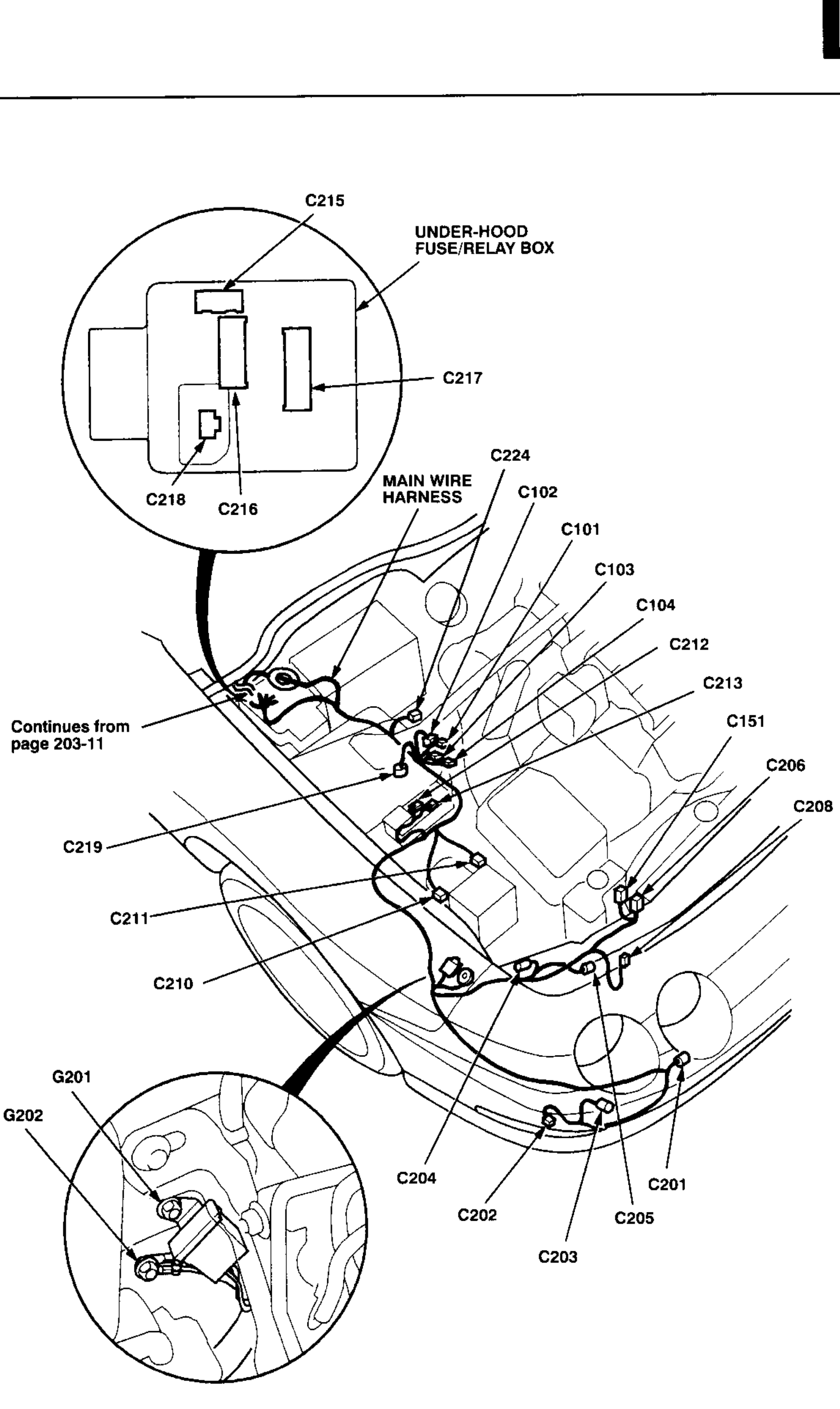

C311
C310
C308
C302
C301
C309
C126
C303
C306
C307
C127
ENGINE COMPARTMENT WIRE HARNESS
C312
C313
G301
C315
C314
C318
C317
C316
C319
C320

Connector Identification and Wire Harness Routing (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Main Wire Harness (Under-hood branch)

C101	4-GRY	Right side of engine compartment	Engine wire harness	
C102	10-GRY	Right side of engine compartment	Engine wire harness	
C103	14-GRY	Right side of engine compartment	Engine wire harness	
C104	3-GRY	Right side of engine compartment	Engine wire harness	GS-R, TYPE-R
C104	6-GRY	Right side of engine compartment	Engine wire harness	RS, LS, GS
C151	8-GRY	Right side of engine compartment	A/C wire harness	
C201	1-BLK	Behind right side of front bumper	Horn	
C202	2-BRN	Behind right corner of front bumper	Right front side marker light	
C203	3-WHT	Behind right corner of front bumper	Right front turn signal/parking light	
C204	2-WHT	Behind right headlight	Right headlight (Low beam)	
C205	2-BLU	Behind right headlight	Right headlight (High beam)	
C206	2-GRY	Right side of engine compartment	Radiator fan motor	
C208	4-ORN	Right side of engine compartment	ABS fail-safe relay	
C210	2-ORN	Right side of engine compartment	ABS pump motor	
C211	10-ORN	Right side of engine compartment	ABS modulator unit	
C212	3-ORN	Right side of engine compartment	Under-hood ABS fuse/relay box	
C213	4-ORN	Right side of engine compartment	Under-hood ABS fuse/relay box	
C215	5-BRN	Right side of engine compartment	Under-hood fuse/relay box	
C216	9-GRY	Right side of engine compartment	Under-hood fuse/relay box	
C217	11-GRY	Right side of engine compartment	Under-hood fuse/relay box	
C218	3-GRY	Right side of engine compartment	ELD unit	USA
C219	2-ORN	Right side of engine compartment	Right front wheel sensor	ABS
C224	2-BRN	Right side of engine compartment	EVAP control canister vent shut valve	
G201		Right side of engine compartment	Body ground, via main wire harness	
G202		Right side of engine compartment	Body ground, via main wire harness	ABS

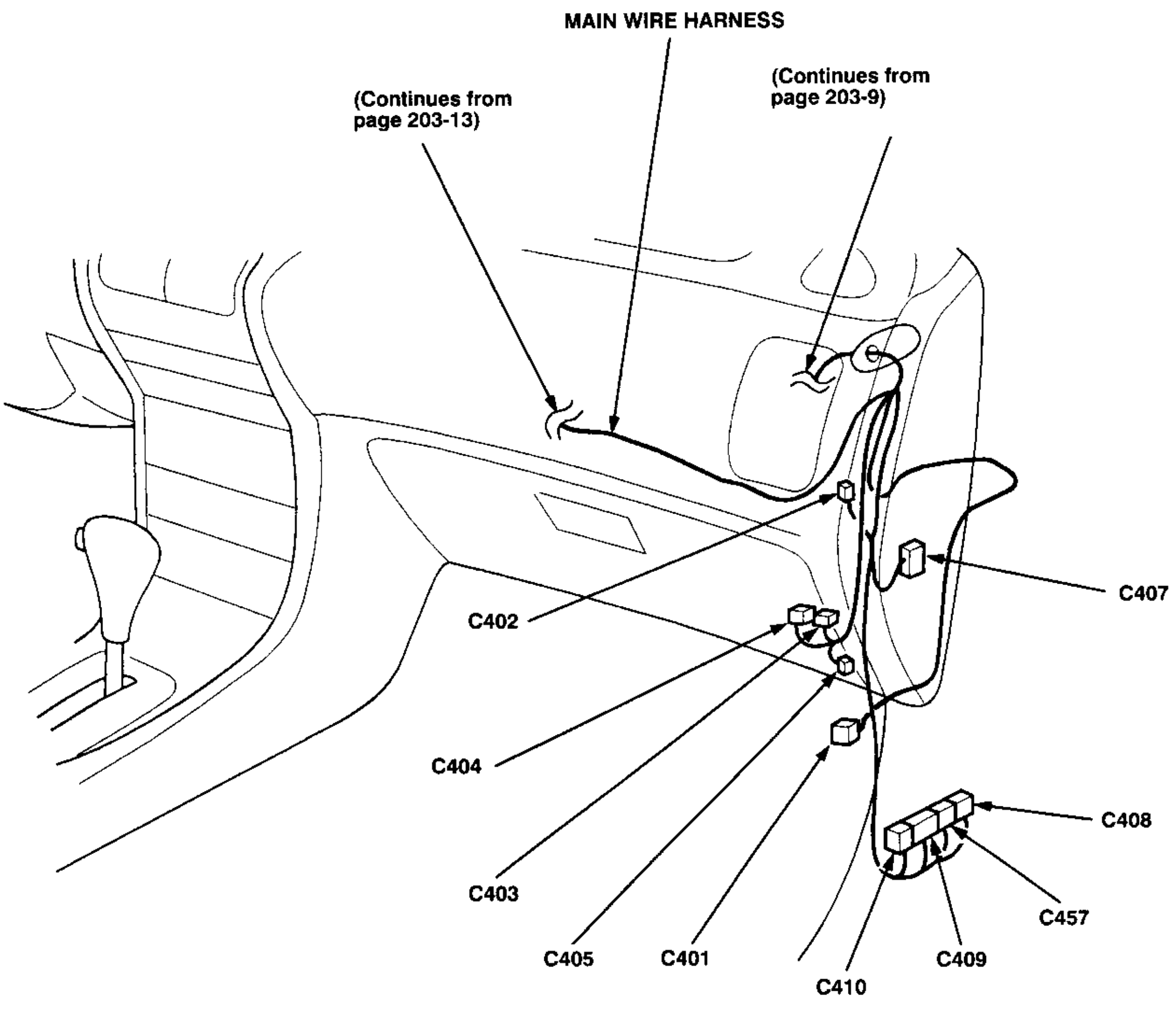

C215
UNDER-HOOD
FUSE/RELAY BOX
C217
C224
MAIN WIRE
HARNESS
C218
C216
C102
C101
C103
C104
C212
C213
C151
Continues from
page 203-11
C206
C208
C219
C211
C210
G201
G202
C204
C202
C205
C201
C203

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Main Wire Harness (Right branch)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C401	25-GRY	Front passenger's door	Front passenger's door wire harness	
C402	3-WHT	Under right side of dash	A/C diode	
C403	2-BRN	Under right side of dash	Heater sub-harness A	
C404	10-GRY	Under right side of dash	Heater sub-harness A	
C405	2-BLU	Under right side of dash	Service check connector	
C407	22-ORN	Behind right kick panel	ABS sub-harness	
C408	32-GRY	Behind right kick panel	Engine control module (ECM/PCM)	
C409	31-BLU	Behind right kick panel	Engine control module (ECM/PCM)	
C410	16-GRY	Behind right kick panel	Engine control module (ECM/PCM)	
C457	25-GRY	Behind right kick panel	Engine control module (ECM/PCM)	*

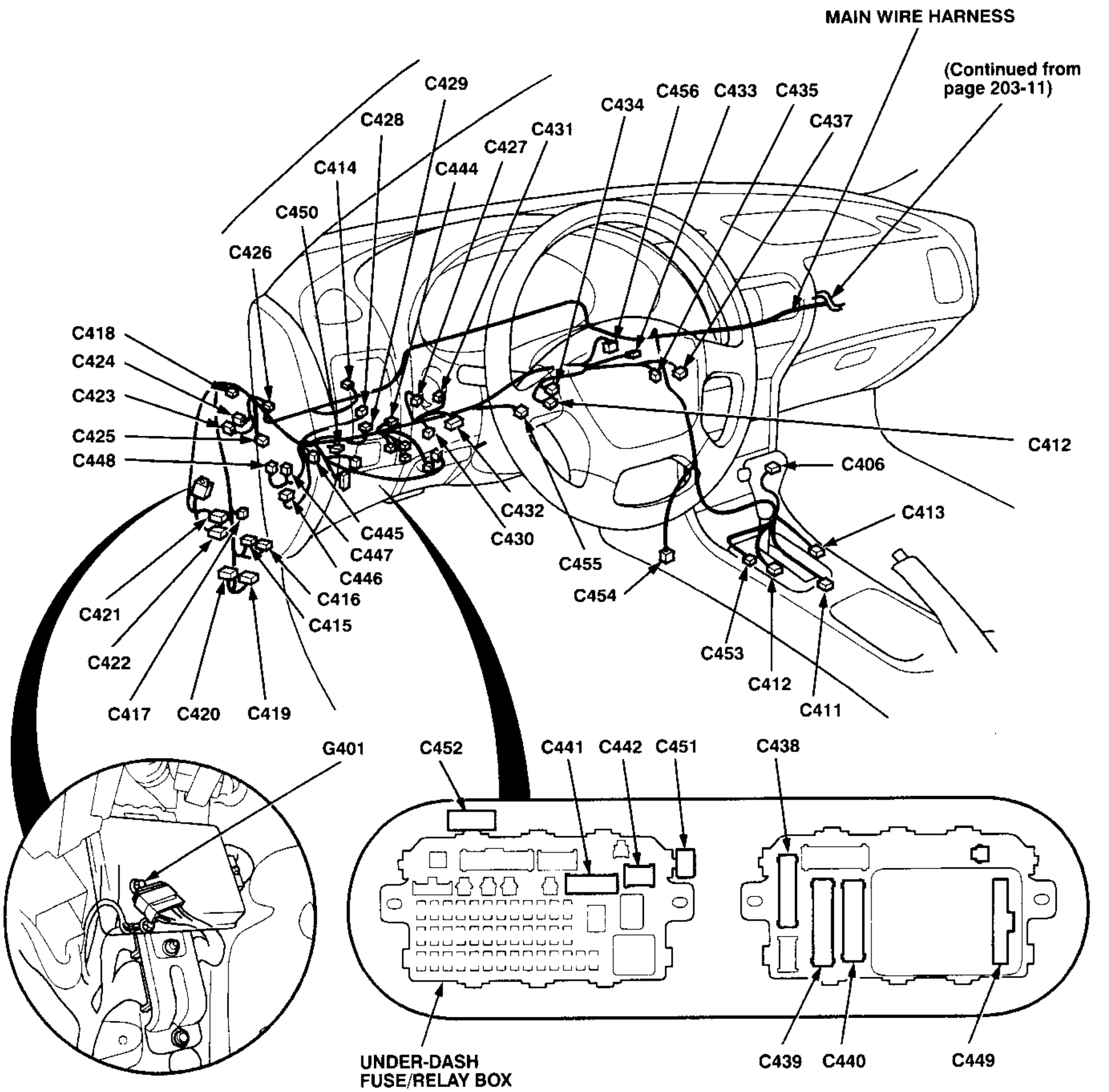
* = All except '00 model w/ M/T


MAIN WIRE HARNESS
(Continues from page 203-13)
(Continues from page 203-9)
C402
C407
C404
C408
C403
C457
C405
C401
C410
C409

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
Main Wire Harness (Left branch)				
C301	20-GRY	Under left side of dash	Engine compartment wire harness	
C302	12-BRN	Under left side of dash	Engine compartment wire harness	RS
C302	18-BRN	Under left side of dash	Engine compartment wire harness	All except RS
C406	16-GRY	Right side of center console	Data link connector (DLC)	
C411	2-GRY	Center console	A/T gear position console light	A/T
C412	2-BLU	Center console	Shift lock solenoid	A/T
C413	14-GRY	Center console	A/T gear position switch	A/T
C414	8-GRY	Under left side of dash	Interlock control unit	A/T
C415	4-CAVITY	Behind left kick panel	Daytime running lights control unit	Canada
C416	8-CAVITY	Behind left kick panel	Daytime running lights control unit	Canada
C417	14-GRY	Behind left kick panel	Cruise control unit	
C418	20-WHT	Behind left kick panel	Junction connector	
C419	22-GRY	Behind left kick panel	Transmission control module (TCM)	A/T ('98-'99 models)
C420	26-GRY	Behind left kick panel	Transmission control module (TCM)	A/T ('98-'99 models)
C421	16-GRY	Behind left kick panel	Rear wire harness	
C422	14-GRY	Behind left kick panel	Rear wire harness	
C425	2-GRY	Under left side of dash	Roof wire harness	
C426	14-GRY	Under left side of dash	Security system (Option)	All except RS
C427	3-YEL	Under left side of dash	SRS main harness	
C428	2-YEL	Under left side of dash	Clutch interlock switch	M/T
C429	2-WHT	Under left side of dash	Clutch switch (Cruise control)	M/T
C430	2-GRY	Under left side of dash	Dashboard wire harness	M/T
C430	8-GRY	Under left side of dash	Dashboard wire harness	A/T ('98-'99 models)
C430	10-GRY	Under left side of dash	Dashboard wire harness	A/T ('00 model)
C431	2-WHT	Under left side of dash	Brake switch (Without cruise control)	
C431	4-BLU	Under left side of dash	Brake switch (With cruise control)	
C432	7-BRN	Under left side of dash	Steering lock	
C433	2-GRY	Right side of steering column	Security system (Option)	All except RS
C434	4-NAT	Left side of steering column	Combination light switch	
C435	6-NAT	Right side of steering column	Combination wiper switch	
C436	7-NAT	Left side of steering column	Combination light switch	
C437	8-NAT	Right side of steering column	Combination wiper switch	
C438	18-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C439	20-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C440	18-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C441	7-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C442	6-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C444	6-WHT	Under left side of dash	Security system (Option)	All except RS
C445	4-BRN	Under left side of dash	Security system (Option)	All except RS
C446	7-BRN	Under left side of dash	PGM-FI main relay	
C447	4-GRN	Under left side of dash	Starter cut relay	M/T
C448	4-BRN	Under left side of dash	Rear window defogger relay	
C449	15-GRY	Behind under-dash fuse/relay box	Integrated control unit	
C450	3-GRY	Under left side of dash	Security system (Option)	All except RS

Main Wire Harness (Left branch) (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C451	4-NAT	Behind dashboard lower cover	Horn relay	
C452	14-GRY	Behind dashboard lower cover	Dashboard wire harness	RS
C452	16-GRY	Behind dashboard lower cover	Dashboard wire harness	All except RS
C453	3-GRY	Center console	Park pin switch	A/T
C454	4-GRY	Under middle of dash	Secondary HO2S	
C455	3-GRY	Under left side of dash	Cable reel	
C456	5-GRN	Right side of steering column	Immobilizer receiver unit	'00 model
G401		Behind left kick panel	Body ground, via main wire harness	



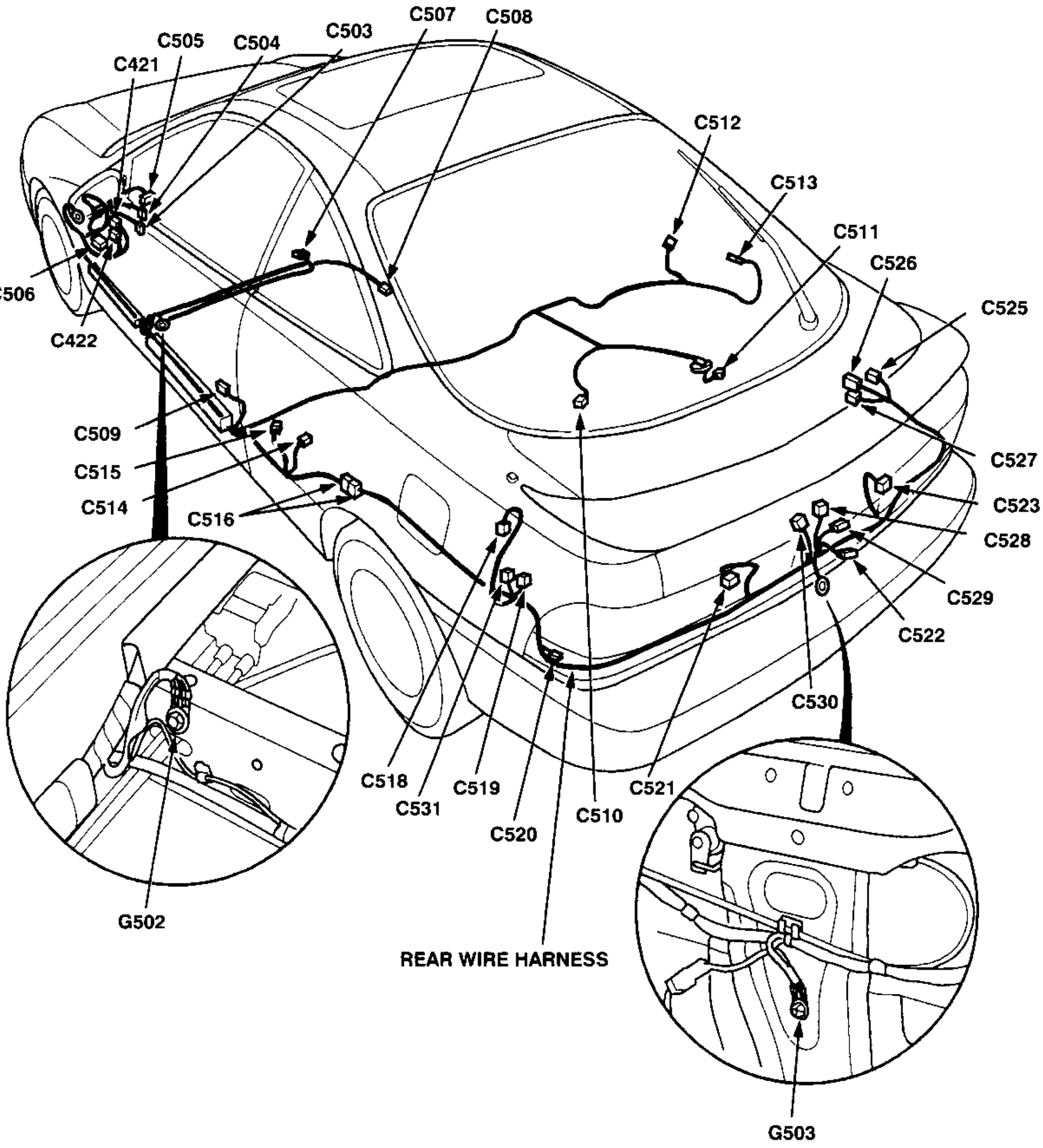
Connector Identification and Wire Harness Routing (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Rear Wire Harness (Hatchback)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C421	16-GRY	Behind left kick panel	Main wire harness	
C422	14-GRY	Behind left kick panel	Main wire harness	
C503	8-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C504	16-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C505	14-BLU	Behind dashboard lower cover	Dashboard wire harness	
C506	25-GRY	Driver's door	Driver's door wire harness	
C507	2-GRY/BRN	Center floor	Driver's seat belt switch	
C508	1-WHT	Center floor	Parking brake switch	
C509	1-WHT	Left quarter panel	Driver's door switch	
C510	8-GRY	Top of fuel tank	Fuel pump sub-harness	
C511	3-BRN	Top of fuel tank	Fuel tank unit	
C512	1-WHT	Right quarter panel	Passenger's door switch	
C513	2-GRY	Right quarter panel	Right rear speaker	
C514	2-GRY	Left quarter panel	Left rear speaker	
C515	2-GRY	Left quarter panel	Noise condenser	
C516	20-CAVITY	Left quarter panel	Rear wire harness	*
C518	3-GRY	Left side corner of cargo area	Power antenna motor	
C519	2-GRY	Left side corner of cargo area	Cargo area light	
C520	6-GRY	Left side corner of cargo area	Trailer lighting connector	
C521	6-GRY	Left side corner of cargo area	Left taillight	
C522	2-GRY	Center of cargo area bulkhead	License plate lights	
C523	6-GRY	Right rear corner of cargo area	Right taillight	
C525	2-BRN	Right side of cargo area	Hatch wire harness	
C526	4-GRY	Right side of cargo area	Hatch wire harness	
C527	2-GRY	Right side of cargo area	Hatch wire harness	
C528	6-GRY	Center of cargo area bulkhead	Hatch latch	
C529	3-GRY	Center of cargo area bulkhead	Hatch key cylinder switch	
C530	2-GRY	Center of cargo area bulkhead	Hatch opener actuator	
C531	4-BRN	Left side corner of cargo area	Hatch opener relay	
G502		Left side of floor	Body ground, via rear wire harness	
G503		Center of cargo area bulkhead	Body ground, via rear wire harness	

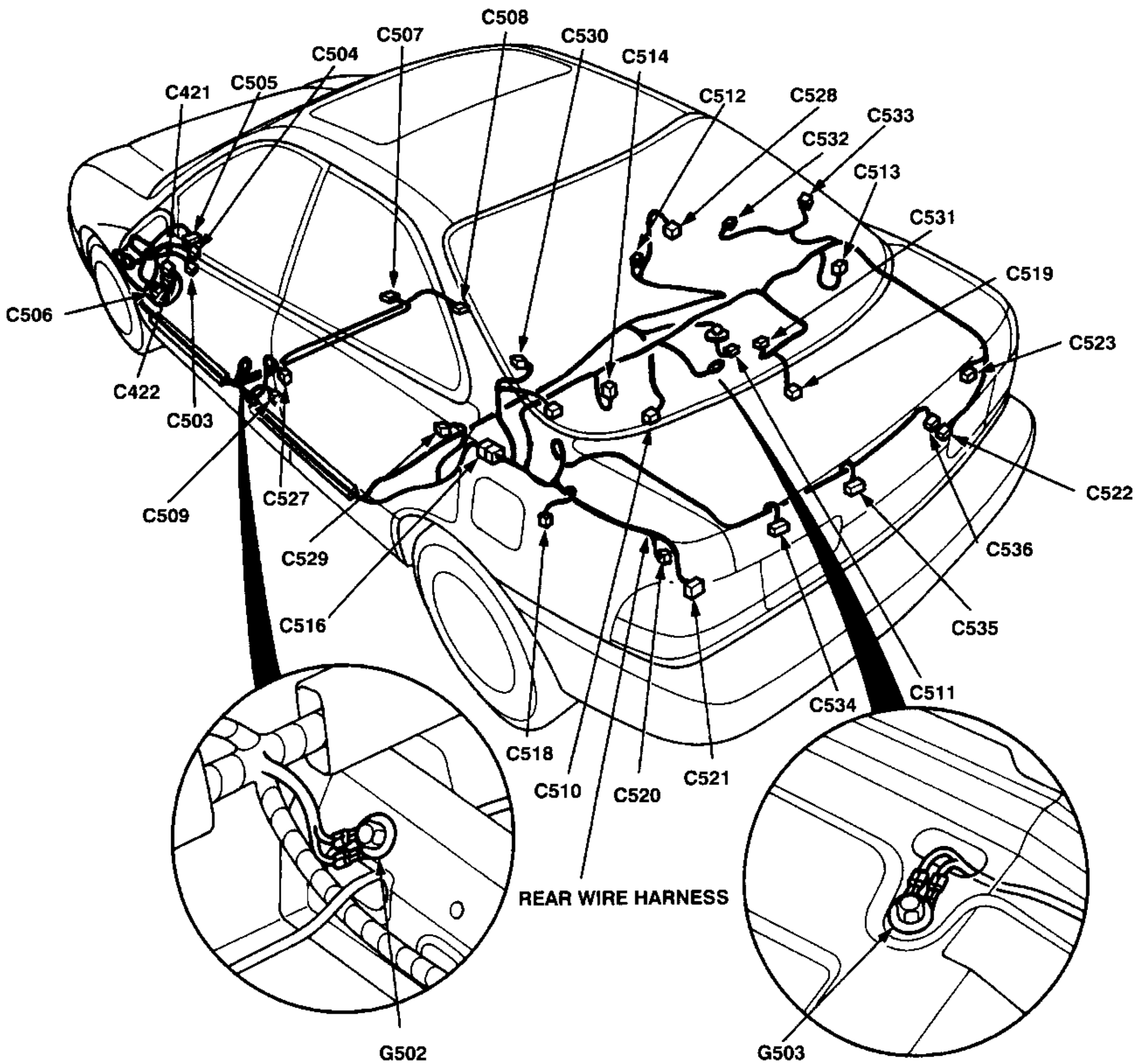
* = In-line connector; may not be present in all cars.


C507
C508
C505
C504
C503
C421
C512
C513
C511
C526
C525
C506
C422
C509
C515
C514
C516
C527
C523
C528
C529
C522
C530
C518
C531
C519
C520
C510
C521
G502
REAR WIRE HARNESS
G503

Rear Wire Harness (Sedan)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C421	16-GRY	Behind left kick panel	Main wire harness	
C422	14-GRY	Behind left kick panel	Main wire harness	
C503	8-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C504	16-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C505	14-BLU	Behind dashboard lower cover	Dashboard wire harness	
C506	25-GRY	Driver's door	Driver's door wire harness	
C507	2-GRY/BRN	Center floor	Driver's seat belt switch	
C508	1-WHT	Center floor	Parking brake switch	
C509	1-WHT	Left B-pillar	Driver's door switch	
C510	8-GRY	Top of fuel tank	Fuel pump sub-harness	
C511	3-BRN	Top of fuel tank	Fuel tank unit	
C512	1-WHT	Right B-pillar	Front passenger's door switch	
C513	2-GRY	Above right side of trunk	Right rear speaker	
C514	2-GRY	Above left side of trunk	Left rear speaker	
C516	20-CAVITY	Left quarter panel	Rear wire harness	*
C518	3-GRY	Left side corner of trunk	Power antenna motor	'98-'99 models
C519	2-GRY	Above center of trunk	Trunk light	
C520	6-GRY	Left side corner of trunk	Trailer lighting connector	
C521	4-GRY	Left rear corner of trunk	Left outer taillight	
C522	2-GRY	Right rear corner of trunk	License plate lights	
C523	4-GRY	Right rear corner of trunk	Right outer taillight	
C527	6-NAT	Left rear door	Left rear door wire harness	
C528	6-NAT	Right rear door	Right rear door wire harness	
C529	1-WHT	Left quarter panel	Left rear door switch	
C530	1-BLK	Left edge of rear window	Rear window defogger (+)	
C531	2-BRN	Above right side of trunk	High mount brake light	
C532	1-WHT	Right quarter panel	Right rear door switch	
C533	1-BLK	Right edge of rear window	Rear window defogger (–)	
C534	4-GRY	Left side of trunk lid	Left inner taillight	
C535	2-BLK	Center of trunk lid	Trunk latch switch	
C536	4-GRY	Right side of trunk lid	Right inner taillight	
G502		Left side of floor	Body ground, via rear wire harness	
G503		Above center of trunk	Body ground, via rear wire harness	

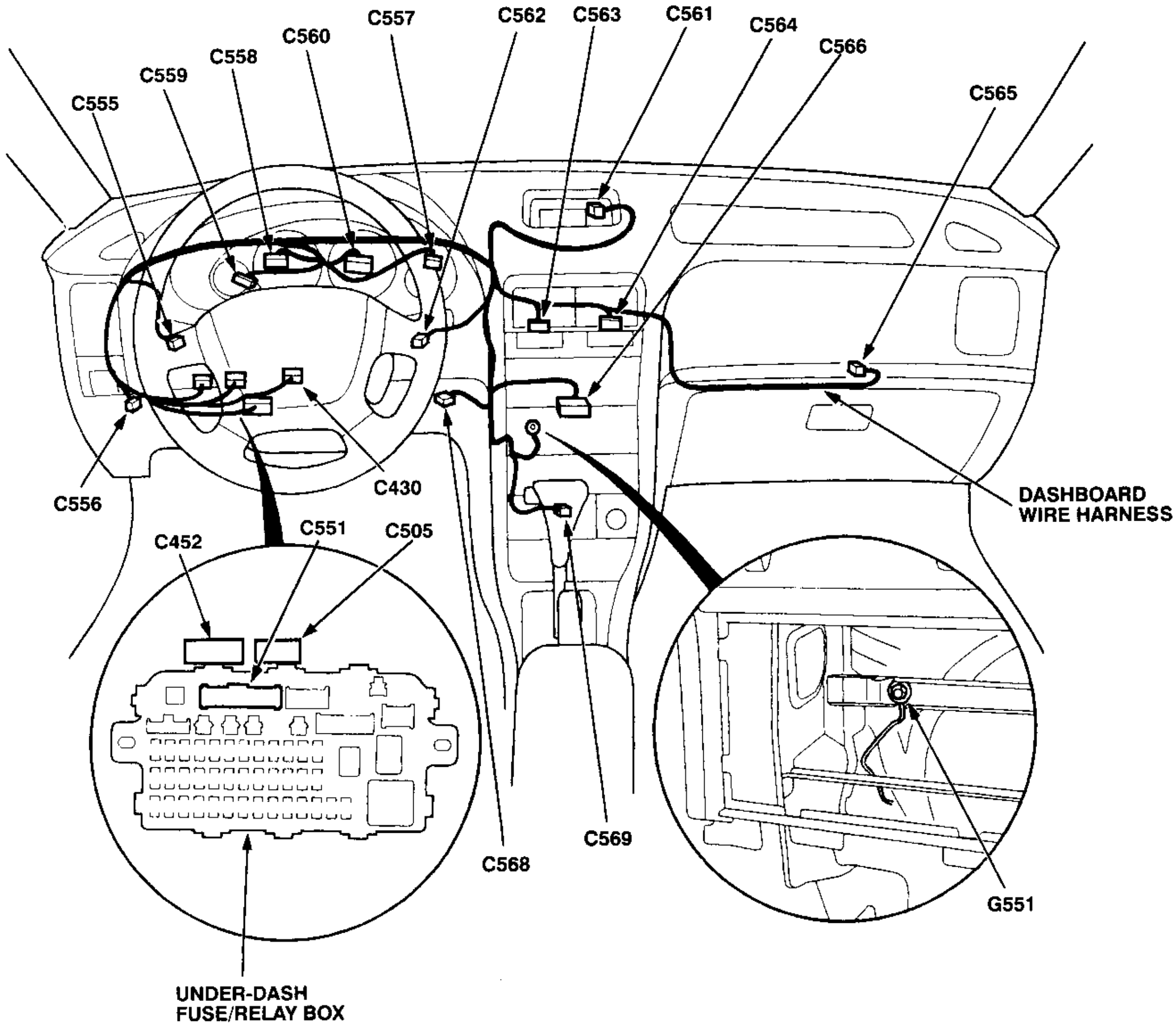
* = In-line connector; may not be present in all cars.


C508
C507
C530
C504
C514
C421
C505
C512
C528
C533
C532
C513
C531
C519
C506
C523
C422
C503
C522
C509
C527
C529
C536
C516
C535
C534
C511
C518
C510
C520
C521
REAR WIRE HARNESS
G502
G503

Connector Identification and Wire Harness Routing (cont'd)

Dashboard Wire Harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C430	2-GRY	Behind dashboard lower cover	Main wire harness	M/T
C430	8-GRY	Behind dashboard lower cover	Main wire harness	A/T ('98-'99 models)
C430	10-GRY	Behind dashboard lower cover	Main wire harness	A/T ('00 model)
C452	14-GRY	Behind dashboard lower cover	Main wire harness	RS
C452	16-GRY	Behind dashboard lower cover	Main wire harness	All except RS
C505	14-BLU	Behind dashboard lower cover	Rear wire harness	
C551	20-GRN	Behind dashboard lower cover	Under-dash fuse/relay box	
C555	5-BLU	Under left side of dash	Cruise control main switch	
C556	20-WHT	Under left side of dash	Junction connector	
C557	5-YEL	Behind gauges	Gauge assembly	
C558	10-BLU	Behind gauges	Gauge assembly	A/T
C559	13-BLU	Behind gauges	Gauge assembly	
C560	16-BLU	Behind gauges	Gauge assembly	
C561	4-WHT	Behind middle of dash	Clock	
C562	3-GRY	Left side of dash	Dash lights brightness controller	
C563	10-GRY	Behind middle of dash	Hazard warning switch	
C564	6-GRY	Behind middle of dash	Rear window defogger switch	
C565	2-GRY	Right side of dash	Glove box light	
C566	16-GRY	Under middle of dash	Stereo radio/cassette player	
C568	5-GRN	Behind dashboard lower cover	Maintenance reminder unit	
C569	4-WHT	Under middle of dash	Cigarette lighter	
G551		Under middle of dash	Body ground, via dashboard wire harness	



C557
C562
C563
C561
C564
C560
C566
C558
C559
C565
C555
C430
DASHBOARD
WIRE HARNESS
C556
C551
C505
C452
C569
C568
G551
UNDER-DASH
FUSE/RELAY BOX

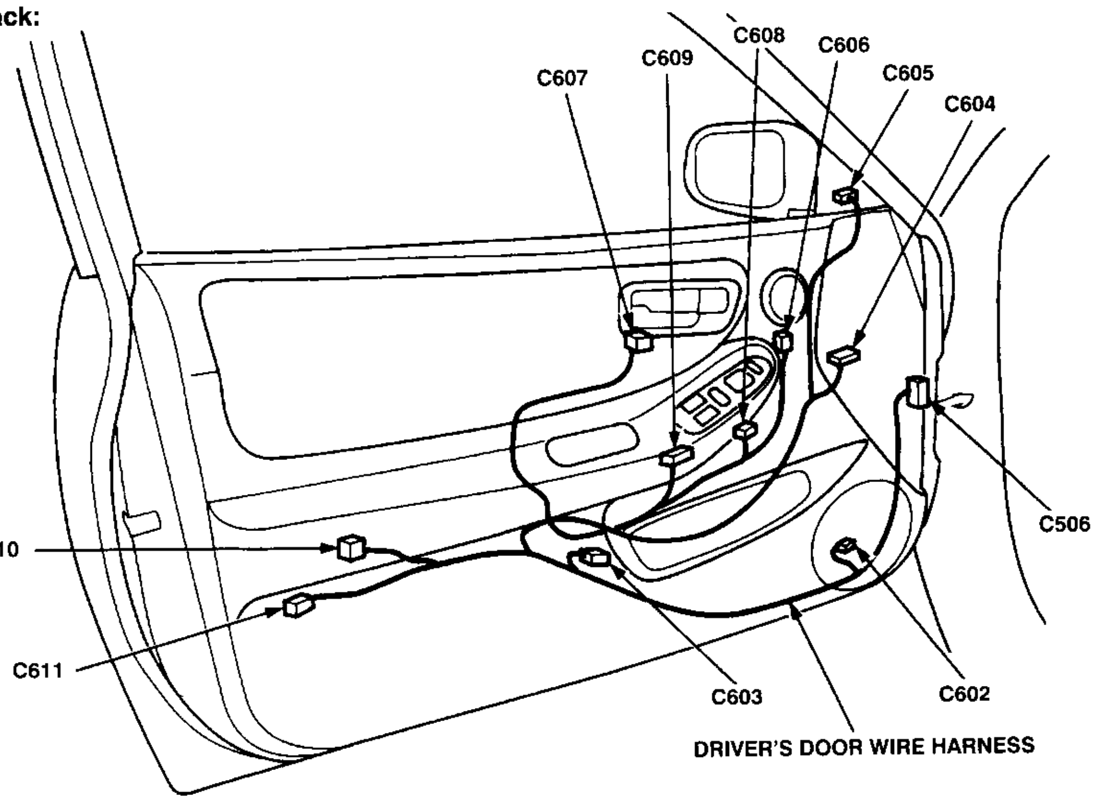
Connector Identification and Wire Harness Routing (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

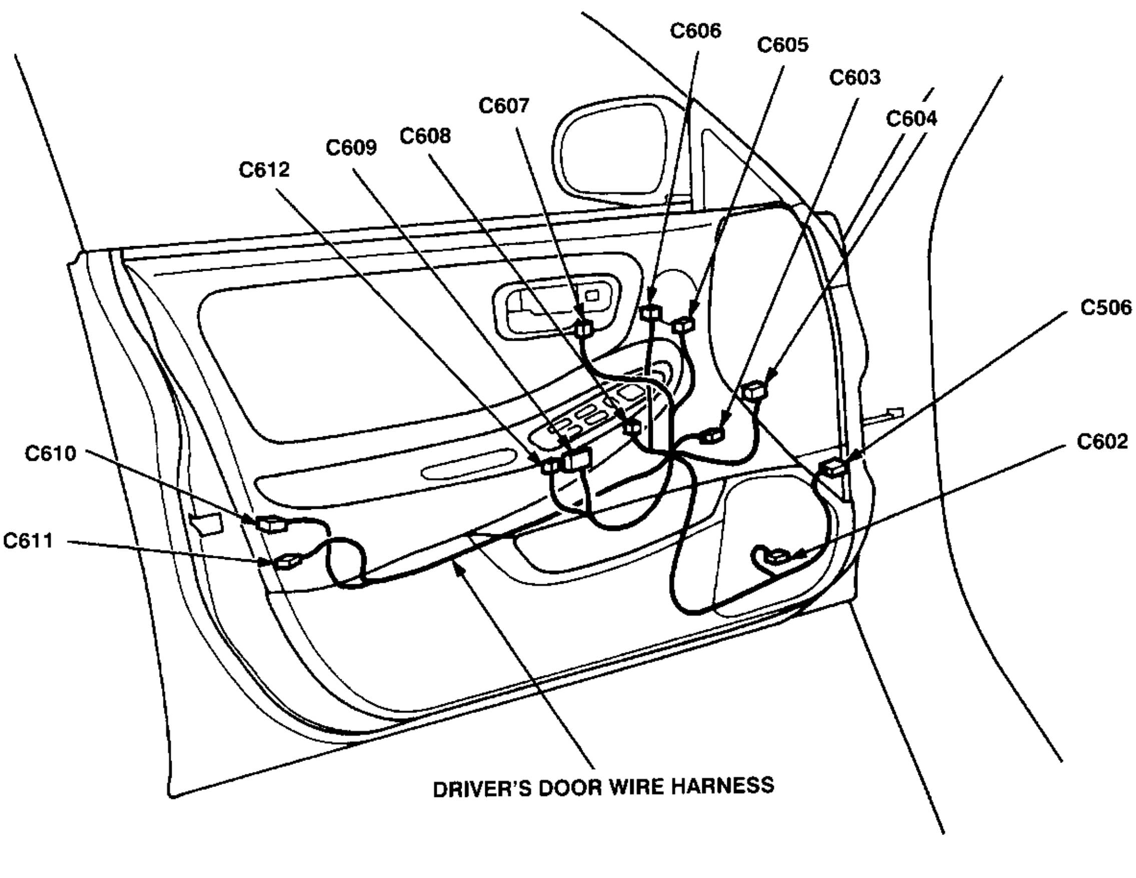
Driver's Door Wire Harness

C506	25-BLK	Driver's door	Rear door wire harness	
C602	2-GRY	Driver's door	Driver's door speaker	
C603	4-GRY	Driver's door	Driver's power window motor	
C604	14-GRY	Driver's door	Power door lock control unit	
C605	8-BLK/WHT	Behind mirror control panel	Left power mirror	Hatchback
C605	3-GRY	Driver's door	Left power mirror	Sedan
C606	2-GRY	Driver's door	Left tweeter	
C607	3-GRY	Driver's door	Driver's door lock switch	
C608	10-GRN	Driver's door	Power mirror switch	
C609	10-GRY	Driver's door	Power window master switch	Hatchback
C609	16-GRY	Driver's door	Power window master switch	Sedan
C610	6-GRY	Driver's door	Driver's door lock actuator assembly	
C611	2-GRY	Driver's door	Driver's key cylinder switch	
C612	1-BRN	Driver's door	Power window master switch	Sedan

Hatchback:



Sedan:

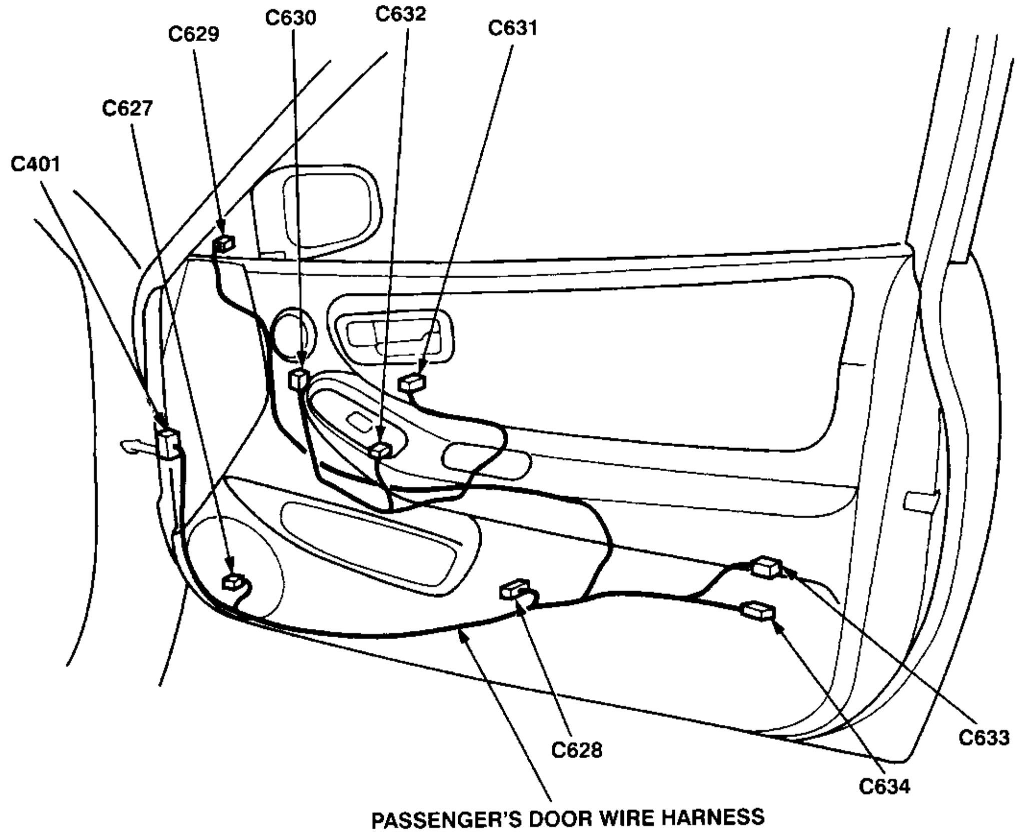


Connector Identification and Wire Harness Routing (cont'd)

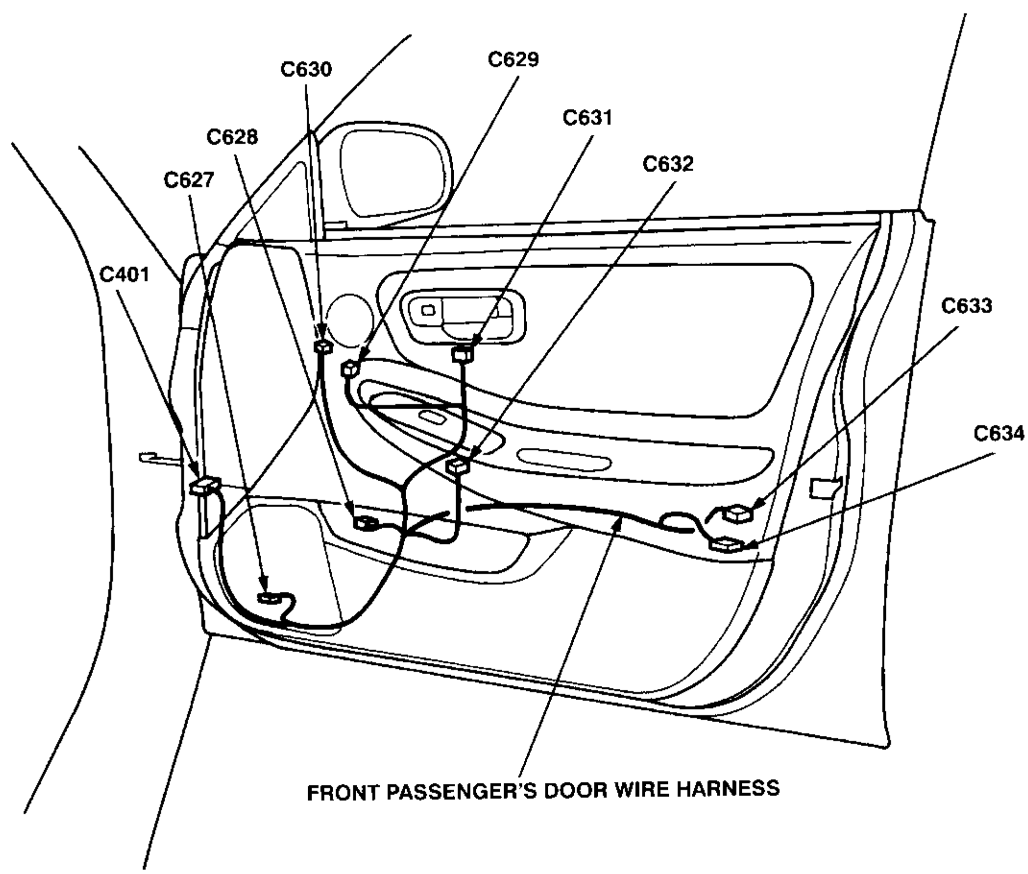
Front Passenger's Door Wire Harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C401	25-BLK	Front passenger's door	Main wire harness	
C627	2-GRY	Front passenger's door	Front passenger's door speaker	
C628	2-GRY	Front passenger's door	Front passenger's power window motor	
C629	8-BLK/WHT	Behind cover panel	Right power mirror	Hatchback
C629	3-GRY	Front passenger's door	Right power mirror	Sedan
C630	2-GRY	Front passenger's door	Right tweeter	
C631	3-GRY	Front passenger's door	Front passenger's door lock switch	
C632	5-GRY	Front passenger's door	Front passenger's power window switch	
C633	2-GRY	Front passenger's door	Front passenger's door lock actuator	
C634	3-GRY	Front passenger's door	Front passenger's door key cylinder switch	

Hatchback:



Sedan:



Connector Identification and Wire Harness Routing (cont'd)

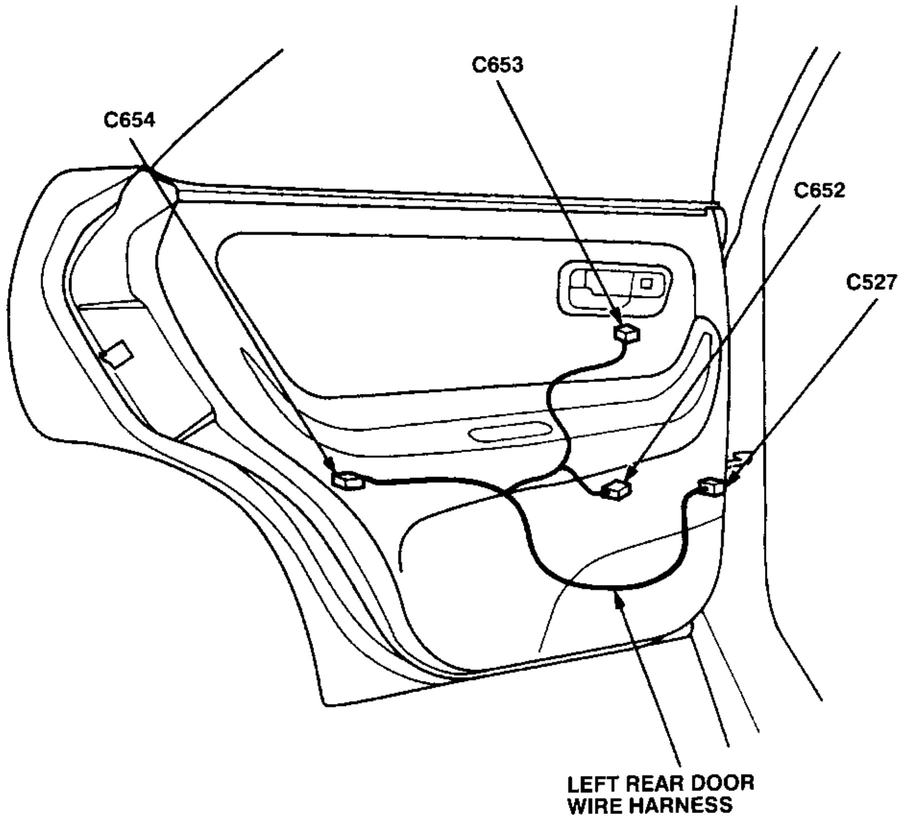
Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

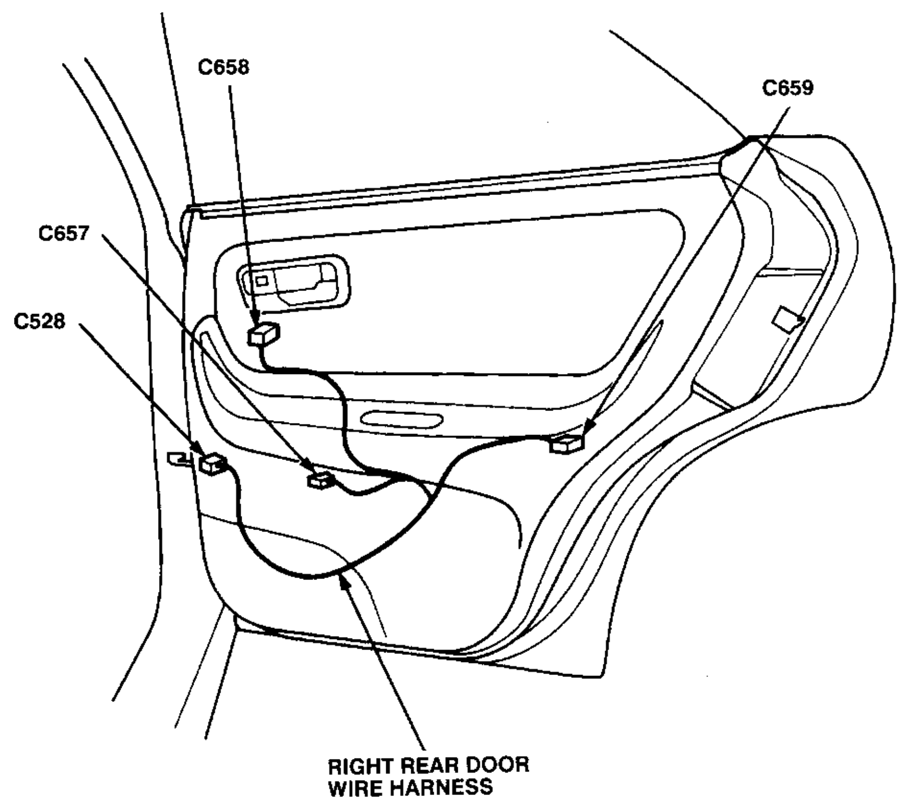
Left Rear Door Wire Harness (Sedan)

C527	6-NAT	Left rear door	Rear wire harness	
C652	2-GRY	Left rear door	Left rear power window motor	
C653	5-NAT	Left rear door	Left rear power window switch	
C654	2-GRY	Left rear door	Left rear door lock actuator	

Right Rear Door Wire Harness (Sedan)

C528	6-NAT	Right rear door	Rear wire harness	
C657	2-GRY	Right rear door	Right rear power window motor	
C658	5-NAT	Right rear door	Right rear power window switch	
C659	2-GRY	Right rear door	Right rear door lock actuator	


C653
C654
C652
C527
LEFT REAR DOOR
WIRE HARNESS

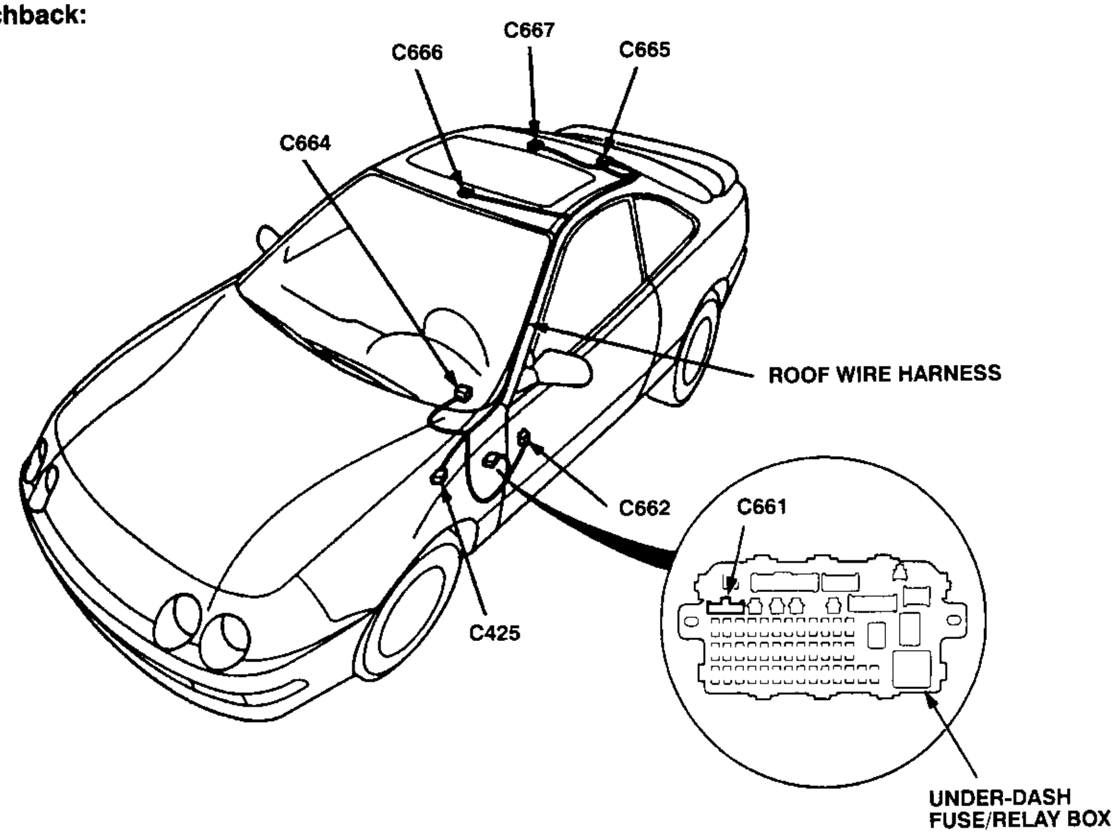

C658
C659
C657
C528
RIGHT REAR DOOR
WIRE HARNESS

Connector Identification and Wire Harness Routing (cont'd)

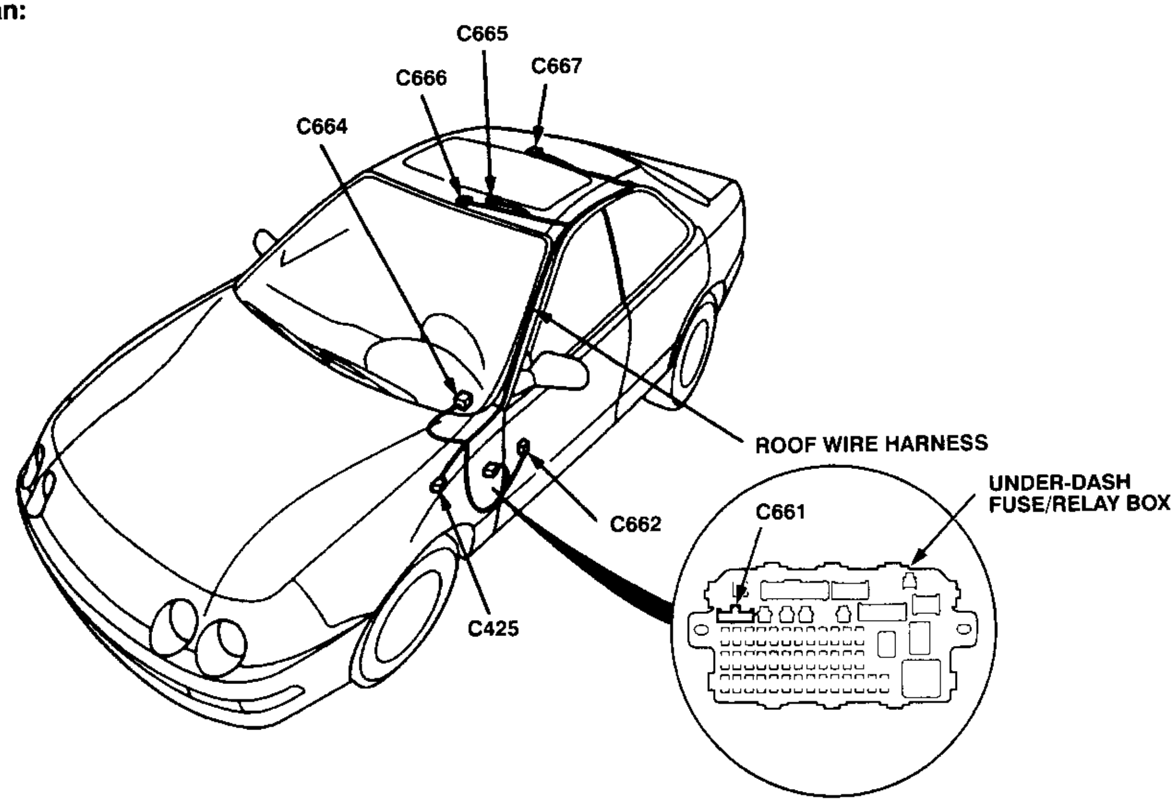
Roof Wire Harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C425	2-GRY	Behind left kick panel	Main wire harness	
C661	3-BRN	Behind left kick panel	Under-dash fuse/relay box	With moonroof
C662	4-BRN	Behind left kick panel	Moonroof relay	With moonroof
C664	4-BLU	Left side of dashboard	Moonroof switch	With moonroof
C665	2-BRN/WHT	Roof	Moonroof motor	With moonroof
C666	1-WHT	Roof	Spotlight	With moonroof
C667	3-NAT	Roof	Ceiling light	

Hatchback:



Sedan:

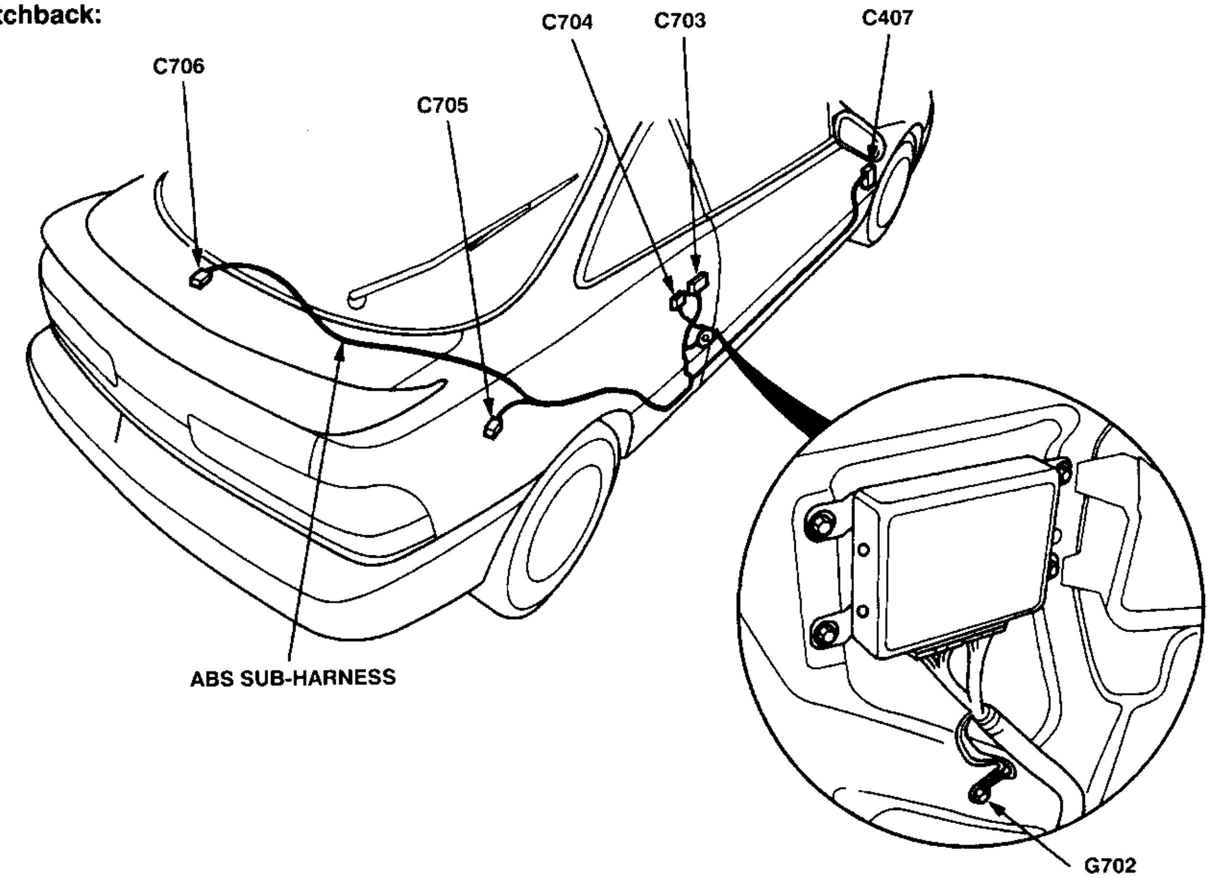


Connector Identification and Wire Harness Routing (cont'd)

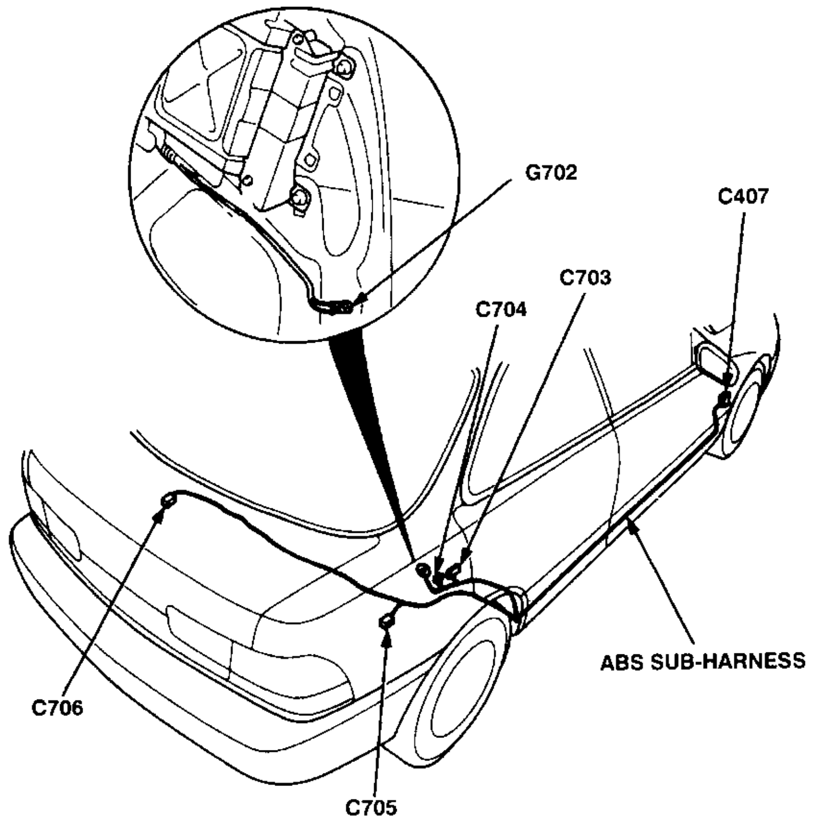
ABS Sub-harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C407	22-ORN	Behind right kick panel	Main wire harness	
C703	12-ORN	Right quarter panel	ABS control unit	
C704	22-ORN	Right quarter panel	ABS control unit	
C705	2-ORN	Right side of cargo area	ABS right wheel sensor	Hatchback
C705	2-ORN	Right side of trunk	ABS right wheel sensor	Sedan
C706	2-ORN	Left side of cargo area	ABS left wheel sensor	Hatchback
C706	2-ORN	Left side of trunk	ABS left wheel sensor	Sedan
G702		Right quarter panel	Body ground, via ABS sub-harness	

Hatchback:



Sedan:



Hatch Wire Harness (Hatchback)

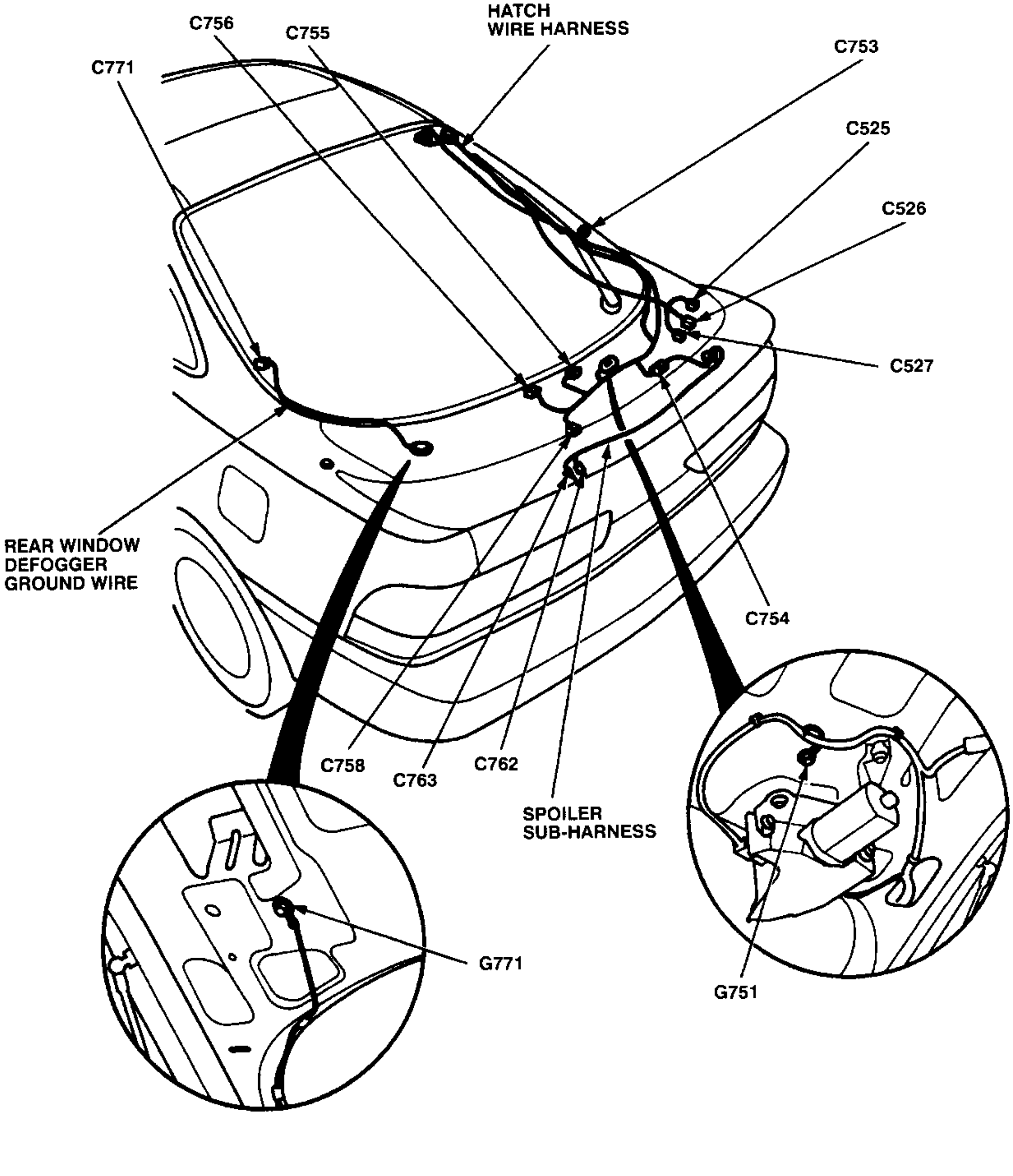
Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C525	2-BRN	Right side of cargo area	Rear wire harness	
C526	4-GRY	Right side of cargo area	Rear wire harness	
C527	2-GRY	Right side of carge area	Rear wire harness	
C753	1-BLK	Right side of rear window	Rear window defogger (+)	
C754	2-GRY	Right side of hatch	Spoiler sub-harness	GS, GS-R
C755	4-NAT	Middle of hatch	Rear window wiper motor	
C756	2-GRY	Middle of hatch	High mount brake light	RS, LS, GS
C758	2-GRY	Middle of hatch	Hatch opener switch	
G751		Right side of hatch	Body ground, via hatch wire harness	

Spoiler Sub-harness (Hatchback GS and GS-R)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C754	2-GRY	Right side of hatch	Hatch wire harness	
C762	1-BLK	Middle of hatch	High mount brake light (+)	
C763	1-BLK	Middle of hatch	High mount brake light (–)	

Rear Window Defogger Ground Wire (Hatchback)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C771	1-BLK	Left rear side of window	Rear window defogger (–)	
G771		Left rear side of window	Body ground, via rear window defogger ground wire	


C756
C755
HATCH
WIRE HARNESS
C753
C771
C525
C526
C527
REAR WINDOW
DEFOGGER
GROUND WIRE
C754
C758
C763
C762
SPOILER
SUB-HARNESS
G771
G751

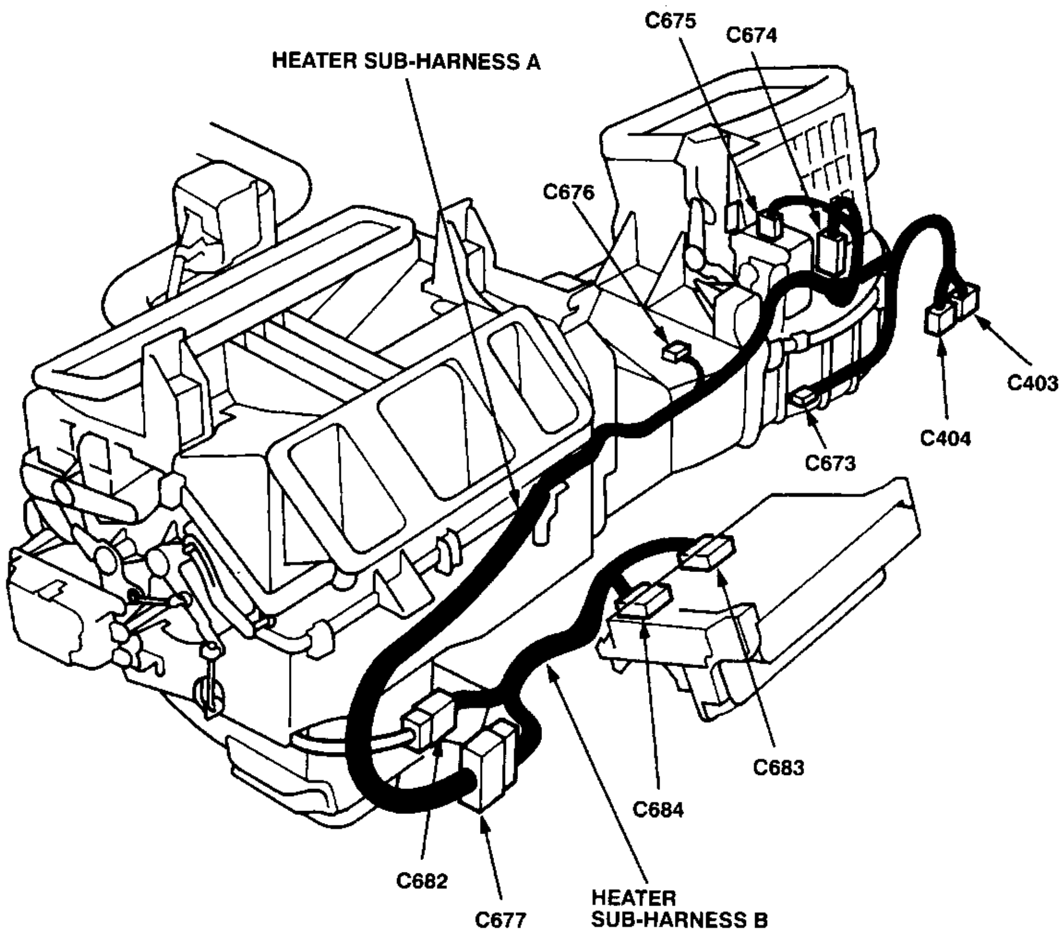
Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Heater Sub-harness A

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C403	2-BRN	Under right side of dash	Main wire harness	
C404	10-GRY	Under right side of dash	Main wire harness	
C673	2-NAT	Under right side of dash	Blower motor	
C674	4-BRN	Behind glove box	Blower resistor	
C675	4-GRN	Behind glove box	Recirculation control motor	
C676	3-GRY	Behind glove box	A/C thermostat	
C677	14-GRY	Behind middle of dash	Heater sub-harness B	

Heater Sub-harness B

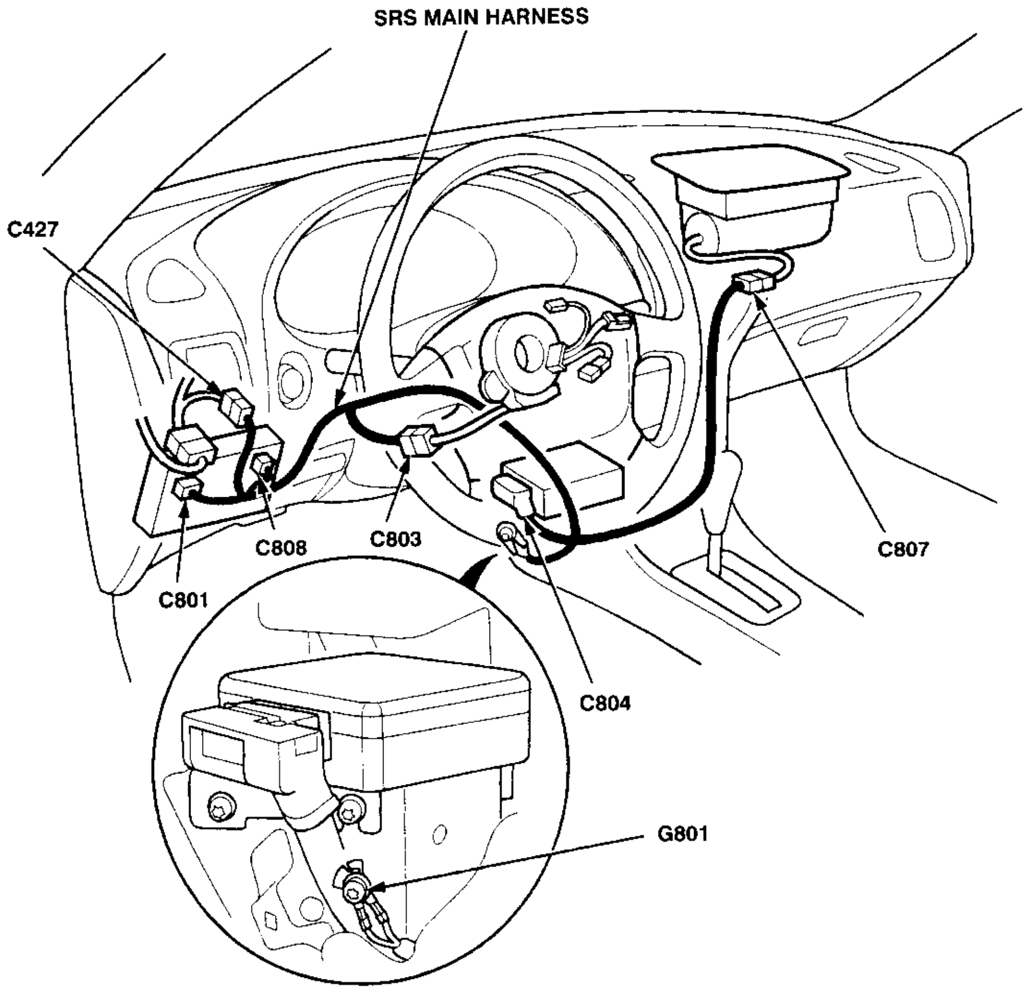
Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C677	14-GRY	Behind middle of dash	Heater sub-harness B	
C682	8-GRY	Middle of floor	Mode control motor	
C683	6-NAT	Behind middle of dash	Heater fan switch	
C684	14-GRN	Behind middle of dash	Heater control panel	



Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

SRS Main Harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C427	3-YEL	Under left side of dash	Main wire harness	
C801	2-YEL	Behind dashboard lower cover	Under-dash fuse/relay box	
C803	2-YEL	Under left side of dash	Cable reel	
C804	18-YEL	Middle of floor	SRS unit	
C807	2-YEL	Behind glove box	Passenger's airbag assembly	
C808	2-YEL	Under left side of dash	Memory erase signal (MES) connector	
G801		Middle of floor	Body ground, via SRS main harness	

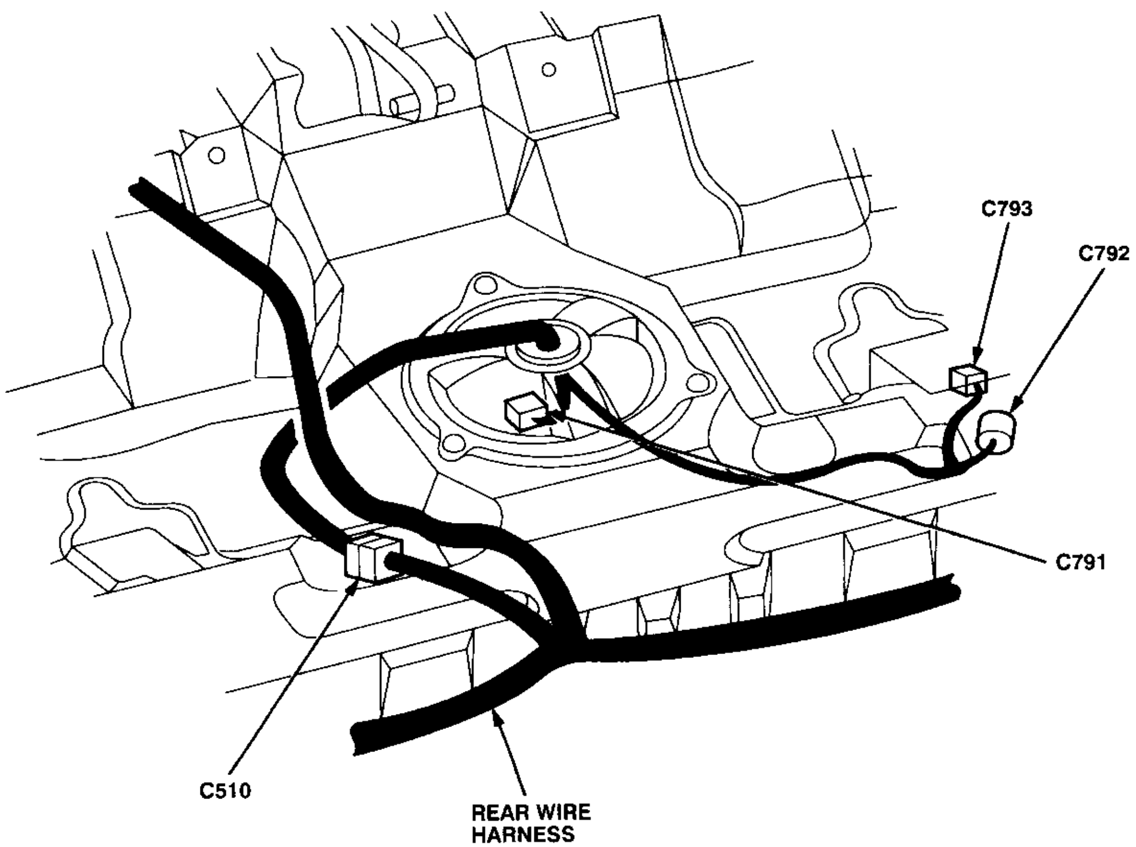


Connector Identification and Wire Harness Routing (cont'd)

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes

Fuel Sub-harness

Connector or Terminal	Number of Cavities/ Color	Location	Connects to	Notes
C510	8-GRY	Top of fuel tank	Rear wire harness	
C791	2-BRN	Below center of rear seat	Fuel pump connector	
C792	3-GRY	Underside of vehicle, forward of fuel tank	Fuel tank pressure sensor	
C793	2-BLK	Underside of vehicle, forward of fuel tank	EVAP bypass solenoid valve	


C793
C792
C791
C510
REAR WIRE
HARNESS

Circuit Identification for In-Line and Fuse Box Connectors

Use this chart to help diagnose multiple symptoms in separate circuits which could be caused by a single problem in a connector shared by those circuits (see example on page 7).

Connector (6 or more cavities)	Number of Cavities-Color	Wire Harnesses	Circuits
C102	10-GRY	Engine/ Main	Automatic transmission controls, Ignition system, Programmed fuel injection system (PGM-FI)
C103	14-GRY	Engine/ Main	Automatic transmission controls, Charging system, Ignition system, Programmed fuel injection system (PGM-FI)
C127	14-GRY	Engine/ Engine Compartment	Automatic transmission controls, Back-up lights, Charging system, Cruise control, Fans, Gauges, Ignition system, Maintenance reminder system, Engine oil pressure indicator light, Programmed fuel injection system (PGM-FI), Vehicle speed sensor (VSS)
C151	8-GRY	A/C/Main	A/C compressor controls, Fans
C216	9-GRY	Under-hood fuse/relay box/Main	Automatic transmission controls, Blower controls, Cargo area light, Ceiling light, Clock, Console lights, Dash lights, Immobilizer system ('00 model), Integrated control unit, License plate lights, Maintenance reminder light, Parking lights, Power antenna, Power door locks, Power windows, Programmed fuel injection system (PGM–FI), Rear window defogger, Stereo sound system, Taillights, Trunk light
C217	11-GRY	Under-hood fuse/relay box/Main	A/C compressor controls, Automatic transmission controls, Blower controls, Brake lights, Ceiling light, Clock, Fans, Hazard warning lights, Horn, Interlock system, Maintenance reminder light, Moonroof, PGM-FI, Power door locks, Power windows, Rear window defogger, Stereo sound system, Taillights
C301	20-GRY	Engine Compartment/ Main	Anti-lock brake system (ABS), Automatic transmission controls, Back-up lights, Brake system indicator light, Charging system, Cruise control, Daytime running lights (DRL), Fans, Gauges, Ignition system, Maintenance reminder light, Engine oil pressure indicator light, Programmed fuel injection system (PGM-FI), Starting system, Vehicle speed sensor (VSS)
C302	18-BRN (All except RS) 12-BRN (RS)	Engine Compartment/ Main	Anti-lock brake system (ABS), Cruise Control, Daytime running lights (DRL), Hazard warning lights, Headlights, Front parking lights, Programmed fuel injection system, (PGM-FI), Rear wiper/washer, Turn signal lights, Wiper/washer

Connector (6 or more cavities)	Number of Cavities-Color	Wire Harnesses	Circuits
C401	25-GRY	Front passenger's door/Main	Power door locks, Power mirrors, Power windows, Stereo sound system
C404	10-GRY	Heater sub-harness A/ Main	A/C compressor controls, Air delivery, Dash lights, Fans
C418	20-WHT	Main/ Main	Anti-lock brake system (ABS), Automatic transmission controls, Brake lights, Ceiling light, Cruise control, Door open indicator, Gauges, Horns, Ignition system, Interlock system, Programmed fuel injection system (PGM-FI)
C421	16-GRY	Main/Rear	Power mirrors, Power windows, Programmed fuel injection system (PGM-FI)
C422	14-GRY	Main/Rear	Back-up lights, Brake lights, Ceiling light, Ignition key reminder, Lights-on reminder, Power door locks, Programmed fuel injection system (PGM-FI), Rear window defogger, Rear wiper/washer
C430 (A/T)	8-GRY ('98-'99) or 10-GRY ('00)	Dashboard/ Main	A/T gear position indicator, Automatic transmission controls, Immobilizer system ('00 model), Programmed fuel injection system (PGM-FI)
C438	18-GRN	Under-dash fuse/relay box/Main	Anti-lock brake system (ABS), Automatic transmission controls, Charging system, Daytime running lights (DRL), Front parking lights, Hazard warning lights, Headlights, Interlock system, Programmed fuel injection system (PGM–FI), Rear window defogger, Turn signal lights, Vehicle speed sensor (VSS)
C439	20-GRN	Under-dash fuse/relay box/Main	A/C compressor controls, Air delivery, Blower controls, Ceiling light, Cigarette lighter, Console lights, Cruise control, Dash lights, Daytime running lights (DRL), Fans, Gauges, Hazard warning lights, Indicators, Integrated control unit, Maintenance reminder light, Power windows, Programmed fuel injection system (PGM-FI), Rear window defogger, Turn signal lights

Circuit Identification for In-Line and Fuse Box Connectors

Connector (6 or more cavities)	Number of Cavities-Color	Wire Harnesses	Circuits
C440	18-GRN	Under-dash fuse/relay box/Main	Back–up lights, Blower controls, Cargo area light, Ceiling light, Console lights, Cruise control, Dash lights, Daytime running lights (DRL), Ignition system, Integrated control unit, Interlock system, Moonroof, Power antenna, Programmed fuel injection system (PGM-FI), Trunk light
C441	7-GRN	Under-dash fuse/relay box/Main	Console lights, Dash lights, Headlights, License plate lights, Parking lights, Taillights
C442	6-GRN	Under-dash fuse/relay box/Main	Front wiper/washer, Hazard warning lights, Rear wiper/washer, Turn signal lights
C452	16-GRY (All) except RS) 14-GRY (RS)	Dashboard/ Main	Anti-lock brake system (ABS), Clock, Cruise control, Console lights, Dash lights, Gauges, Hazard warning lights, Ignition system, Maintenance reminder light, Engine oil pressure indicator light, Programmed fuel injection system (PGM-FI), Rear window defogger, Stereo sound system, Supplemental restraint system (SRS), Vehicle speed sensor (VSS)
C503	8-GRN	Under-dash fuse/relay box/Rear	Power mirrors, Power windows
C504	16-GRN	Under-dash fuse/relay box/Rear	Brake system indicator light, Cargo area light, Daytime running lights (DRL), Hatch opener, Hazard warning lights, License plate lights, Parking lights, Power antenna, Power door locks, Rear wiper/washer, Taillights, Trunk light, Turn signal lights
C505	14-BLU	Dashboard/ Rear	Brake system indicator light, Door open indicator, Gauges, Hatch open indicator, Low fuel indicator light, Power antenna, Seat belt reminder, Stereo sound system, Trunk open indicator
C506	25-GRY	Driver's door/ Rear	Power door locks, Power mirrors, Power windows, Stereo sound system
C527	6-NAT	Left rear door/Rear	Power door locks, Power windows
C528	6-NAT	Right rear door/Rear	Power door locks, Power windows

Connector (6 or more cavities)	Number of Cavities-Color	Wire Harnesses	Circuits
C551	20-GRN	Under-dash fuse/relay box/Rear	A/T gear position indicator, Charging system, Cigarette lighter, Clock, Console lights, Cruise control, Dash lights, Gauges, Hazard warning lights, Indicators, Maintenance reminder light, Power antenna, Rear window defogger, Stereo sound system, Turn signal lights
C556	20-WHT	Dashboard/ Dashboard	Cigarette lighter, Clock, Console lights, Dash lights, Gauges, Indicators, Maintenance reminder light, Rear window defogger
C677	14-GRY	Heater sub-harness A/ Heater sub-harness B	A/C compressor controls, Air delivery, Blower controls, Dash lights, Fans

ACURA

INTEGRA

Service Manual Supplement 2001

General Information

Chassis and Paint Codes

U.S. Model

Vehicle Identification Number

JH4 DB7 5 5 * 1 S 000001

Manufacturer, Make and Type of Vehicle
- JH4: HONDA MOTOR CO., LTD. ACURA Passenger vehicle

Line, Body and Engine Type
- DB7: INTEGRA 4-door/B18B1
- DB8: INTEGRA 4-door/B18C1
- DC2: INTEGRA 3-door/B18C1, B18C5
- DC4: INTEGRA 3-door/B18B1

Body Type and Transmission Type
- 3: 2-door Hatchback/5-speed Manual
- 4: 2-door Hatchback/4-speed Automatic
- 5: 4-door Sedan/5-speed Manual
- 6: 4-door Sedan/4-speed Automatic

Vehicle Grade (Series)
- 1: Type R
- 5: LS
- 6: GS
- 8: GS-R
- 9: GS-R with leather seats

Check Digit

Model Year
- 1: 2001

Factory Code
- S: Suzuka Factory in Japan

Serial Number

Engine Number

B18B1 - 8300001

Engine Type
- B18B1: 1.8 ℓ DOHC Sequential Multiport Fuel-injected engine
- B18C1, B18C5: 1.8 ℓ DOHC VTEC Sequential Multiport Fuel-injected engine

Serial Number

Transmission Number

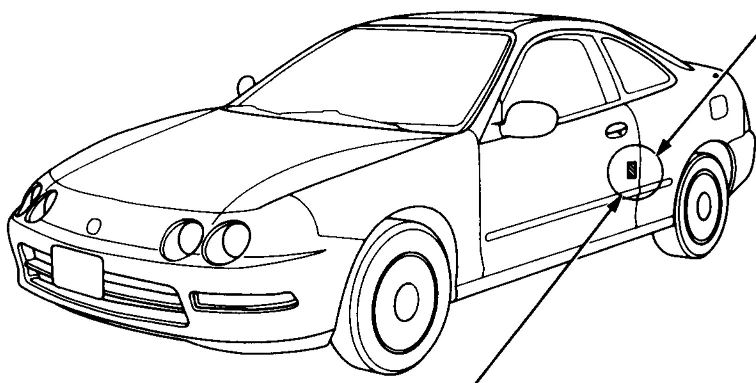
S80 - 3000001

Transmission Type
- S80: Manual
- SKWA: Automatic

Serial Number

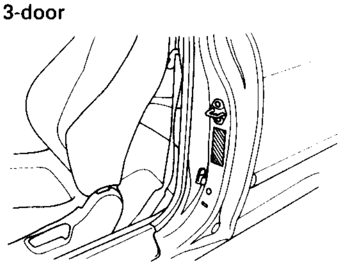
Paint Code

COLOR
G-95P

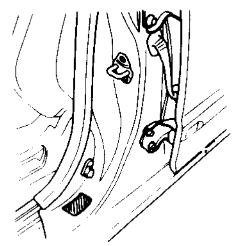


Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification

3-door



4-door



Paint Code

Code	Color
B-92P	Nighthawk Black Pearl
B-97M	Voltage Blue Metallic
G-95P	Clover Green Pearl
NH-578	Taffeta White
NH-623M	Satin Silver Metallic
R-81*3	Milano Red
R-504P	Ruby Red Pearl
Y-56	Phoenix Yellow
YR-525M*4	Titanium Metallic

*3: 3-door
*4: 4-door

Canada Model

Vehicle Identification Number

JH4 DC2 3 8 * 1 S 800001

Manufacturer, Make and Type of Vehicle
- JH4: HONDA MOTOR CO., LTD. ACURA Passenger car

Line, Body and Engine Type
- DC2: INTEGRA 3-door/B18C1, B18C5
- DC4: INTEGRA 3-door/B18B1

Body Type and Transmission Type
- 3: 2-door Hatchback/5-speed Manual
- 4: 2-door Hatchback/4-speed Automatic

Vehicle Grade (Series)
- 1: Type R
- 4: RS
- 7: GS
- 8: GS-R

Check Digit

Model Year
- 1: 2001

Factory Code
- S: Suzuka Factory in Japan

Serial Number

Engine Number

B18B1 - 8700001

Engine Type
- B18B1: 1.8 ℓ DOHC Sequential Multiport Fuel-injected engine
- B18C1, B18C5: 1.8 ℓ DOHC VTEC Sequential Multiport Fuel-injected engine

Serial Number

Transmission Number

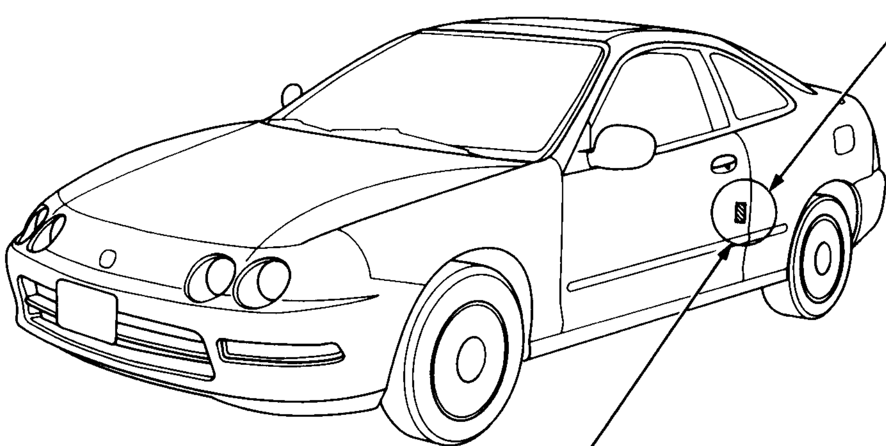
S80 - 3000001

Transmission Type
- S80: Manual
- SKWA: Automatic

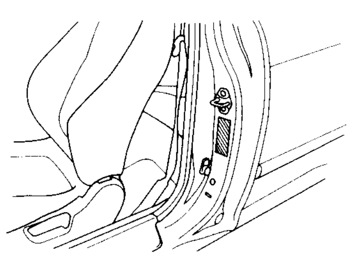
Serial Number

Paint Code

COLOR
NH-0



Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification



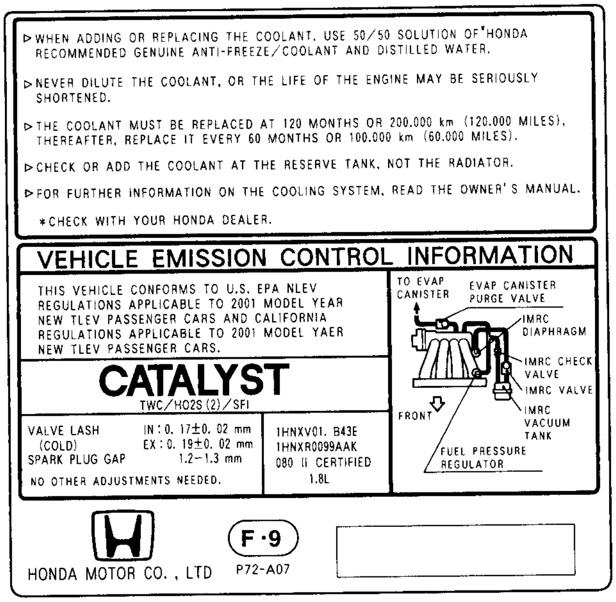
Paint Code

Code	Color
B-92P	Nighthawk Black Pearl
NH-0	Championship White
NH-623M	Satin Silver Metallic
R-81	Milano Red
YR-525M	Titanium Metallic

Under-hood Emissions Control Label

Emission Group Identification

Example:



50 STATE TIER 1
THIS VEHICLE CONFORMS TO U.S. EPA AND CALIFORNIA REGULATIONS APPLICABLE TO 2001 MODEL YEAR NEW PASSENGER CARS.

50 STATE TLEV + NLEV (UNRESTRICTED):
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2001 MODEL YEAR NEW TLEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2001 MODEL YEAR NEW TLEV PASSENGER CARS.

CANADIAN TIER 1
THIS VEHICLE CONFORMS TO CANADIAN TIER 1 STANDARDS FOR 2001 MODEL YEAR NEW PASSENGER CARS.

Engine and Evaporative Families

Engine Family: 1 HNX V 01.8 43E

Model Year
1: 2001
Manufacturer
HNX: Honda
Type
V: Light Duty Vehicle/Passenger Car
Displacement
Sequence Characters

Evaporative Family: 1 HNX R 0099 AAK

Model Year
1: 2001
Manufacturer
HNX: Honda
Type
R: ORVR
Canister Work Capacity (grams)
Sequence Characters

Revised Component Terms

Beginning with '01 models, the following component terms have been changed to conform with the standards in SAE document J1930. If you find a term or abbreviation in a '01 manual that is unfamiliar to you, check this list. If a term is not listed below, it did not change.

'00 and Earlier Models		'01 Models	
Description	**HONDA Abbreviation**	**Description**	**New Abbreviation SAE Recommendation**
Heated Oxygen Sensor (for some models)	HO2S	Air Fuel Ratio Sensor	A/F Sensor
Brake Switch		Brake Pedal Position Switch	BPP Switch
Clutch Switch		Clutch Pedal Position Switch	
Distributor Ignition Rotor	DI Rotor	Distributor Rotor	
Fluctuation Sensor		Engine Speed Fluctuation Sensor	RPM Fluctuation Sensor
Evaporative Emission Control Canister	EVAP Control Canister	Evaporative Emission Canister	EVAP Canister
Evaporative Emission Control Canister Vent Shut Valve	EVAP Control Canister Vent Shut Valve	Evaporative Emission Canister Vent Shut Valve	EVAP Canister Vent Shut Valve
Evaporative Emission Purge Control Solenoid Valve	EVAP Purge Control Solenoid Valve	Evaporative Emission Canister Purge Valve	EVAP Canister Purge Valve
Exhaust Gas Recirculation Valve Lift Sensor	EGR Valve Lift Sensor	Exhaust Gas Recirculation Valve Position Sensor	EGR Valve Position Sensor
Exhaust Gas Recirculation Control Solenoid Valve	EGR Control Solenoid Valve	Exhaust Gas Recirculation Valve Vacuum Control Solenoid Valve	EGR Valve Vacuum Control Solenoid Valve
Exhaust Gas Recirculation Vacuum Control Valve	EGR Vacuum Control Valve	Exhaust Gas Recirculation Valve Vacuum Control Solenoid Valve	EGR Valve Vacuum Control Solenoid Valve
Radiator Fan Control Module		Fan Control Module	
Fuel Tank Evaporative Emission Valve		Fuel Tank Vapor/Liquid Separation Valve	
ORVR Vent shut Valve		Fuel Tank Vapor Control Valve	
ORVR Vapor Recircuration Tube		Fuel Tank Vapor Recirculastion Tube	
First Idle Thermo Valve		Idle Air Control Thermal Valve	IAC Thermal Valve
Fuel Injector		Injector	
Fuel Injection Air Control Valve	FIA Control Valve	Intake Air Bypass Control Valve	
Fuel Injection Air Control Solenoid Valve	FIA Control Solenoid Valve	Intake Air Bypass Control Thermal Valve	
Intake Air Bypass Check Valve	IAB Check Valve	Intake Manifold Runner Control Vacuum Check Valve	IMRC Vacuum Check Valve
		Intake Manifold Runner Control Actuator	IMRC Actuator
		Intake Manifold Runner Control Actuator Wire	IMRC Actuator Wire
Intake Air Bypass Control Diaphragm	IAB Control Diaphragm	Intake Manifold Runner Control Actuator Diaphragm	IMRC Diaphragm
		Intake Manifold Runner Control Module	IMRC Module
Intake Air Bypass Control Solenoid Valve	IAB Control Solenoid Valve	Intake Manifold Runner Control Solenoid Valve	IMRC Solenoid Valve
Intake Air Bypass Vacuum Tank	IAB Vacuum Tank	Intake Manifold Runner Control Vacuum	IMRC Vacuum Reservoir
Intake Air Bypass Valve Body Assembly	IAB Valve Body Assembly	Intake Manifold Runner Control Valve	IMRC Valve
Breather Chamber		Oil/Air Separator	
Fuel Pressure Regulator Control Solenoid Valve		Pressure Regulator Vacuum Control Solenoid Valve	
Air Control Valve Check Valve		Secondary Air Injection Control Vacuum Check Valve	Air Control Vacuum Check Valve
Air Control Valve Vacuum Tank		Secondary Air Injection Control Vacuum Reservoir	Air Control Vacuum Reservoir
Air Control Solenoid Valve		Secondary Air Injection Control Valve Vacuum Control Solenoid Valve	Air Control Valve Vacuum Control Solenoid Valve
Air Pump		Secondary Air Injection Pump	Air Pump
Air Control Valve		Secondary Air Injection Pump Control Valve	Air Control Valve
Air Pump Electric Current Sensor		Secondary Air Injection Pump Electric Current Sensor	Air Pump Electric Current Sensor
Shift/Clutch Pressure Control Solenoid Valve Set		Shift Solenoid & Automatic Transaxle Clutch Pressure Control Solenoid Valve Set	SS & A/T Clutch Pressure Control Solenoid Valve Set

Revised Component Terms

'00 and Earlier Models		'01 Models	
Description	**HONDA Abbreviation**	**Description**	**New Abbreviation SAE Recommendation**
Shift Control Solenoid Valve Set		Shift Solenoid & Torque Convertor Clutch Solenoid Valve Set	SS & TCC Solenoid Valve Set
Shift/Lock-up Clutch Control Solenoid Valve Assy		Shift Solenoid & Torque Convertor Clutch Solenoid Valve	SS & TCC Solenoid Valve
Shift Control Solenoid Valve A		Shift Solenoid Valve A	SS Valve A
Shift Control Solenoid Valve B		Shift Solenoid Valve B	SS Valve B
Throttle Valve Control Module		Throttle Actuator	
Lock-up Clutch Control Solenoid Valve Set		Torque Convertor Clutch Solenoid & Automatic Transaxle Clutch Pressure Control Solenoid Valve Set	TCC Solenoid & A/T Clutch Pressure Control Solenoid Valve Set
Lock-up Clutch Control Solenoid Valve		Torque Convertor Clutch Solenoid Valve	TCC Solenoid Valve
Automatic Transaxle Position Switch	A/T Gear Position Switch	Transmission Range Switch	T/R Switch
Variable Valve Timing & Valve Lift Electronic Control Pressure Switch	VTEC Pressure Switch	Variable Valve Timing & Valve Lift Electronic Control Pressure Switch	VTEC Oil Pressure Switch

Specifications

Standards and Service Limits

Cylinder Head/Valve Train (B18B1 engine) — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm and wide open throttle kPa (kgf/cm², psi)	Minimum Maximum variation	930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height		—— 131.95 – 132.05 (5.195 – 5.199)	0.05 (0.002) ——
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	 IN EX	0.05 – 0.15 (0.002 – 0.006) 0.030 – 0.069 (0.0012 – 0.0027) 0.03 (0.001) max. 33.716 (1.3274) 33.528 (1.3200)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) —— ——
Valve	Valve clearance (Cold)* Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX	0.08 – 0.12 (0.003 – 0.005) 0.16 – 0.20 (0.006 – 0.008) 6.580 – 6.590 (0.2591 – 0.2594) 6.550 – 6.560 (0.2579 – 0.2583) 0.02 – 0.05 (0.001 – 0.002) 0.05 – 0.08 (0.002 – 0.003)	—— —— 6.55 (0.258) 6.52 (0.257) 0.08 (0.003) 0.11 (0.004)
Valve seat	Width Stem installed height	IN EX IN EX	1.25 – 1.55 (0.049 – 0.061) 1.25 – 1.55 (0.049 – 0.061) 40.765 – 41.235 (1.6049 – 1.6234) 42.765 – 43.235 (1.6837 – 1.7022)	2.0 (0.08) 2.0 (0.08) 41.485 (1.6333) 43.485 (1.7120)
Valve spring	Free length (Reference)	IN NH CH EX	41.27 (1.625) 41.28 (1.625) 44.32 (1.745)	—— —— ——
Valve guide	I.D. Installed height	IN EX IN EX	6.61 – 6.63 (0.260 – 0.261) 6.61 – 6.63 (0.260 – 0.261) 13.75 – 14.25 (0.541 – 0.561) 15.75 – 16.25 (0.620 – 0.640)	6.65 (0.262) 6.65 (0.262) —— ——

*: Measured between the camshaft and rocker arm.
NH: NIHON HATSUJO manufactured valve spring
CH: CHUO HATSUJO manufactured valve spring

Engine Block (B18B1 engine) — Section 7

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	81.00 – 81.02 (3.189 – 3.190)	81.07(3.192)
	Bore taper	——	0.05 (0.002)
	Reboring limit	——	0.25 (0.010)
Piston	Skirt O.D. at 15 mm (0.6 in) from bottom of skirt	80.98 – 80.99 (3.188 – 3.189)	80.97 (3.188)
	Clearance in cylinder	0.01 – 0.04 (0.0004 – 0.0016)	0.05 (0.002)
	Groove width (For ring) Top	1.030 – 1.040 (0.0406 – 0.0409)	1.06 (0.042)
	Second	1.230 – 1.240 (0.0484 – 0.0488)	1.26 (0.050)
	Oil	2.805 – 2.820 (0.1104 – 0.1110)	2.84 (0.112)
Piston ring	Ring-to-groove clearance Top	0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
	Second R	0.040 – 0.065 (0.0016 – 0.0026)	0.13 (0.005)
	T	0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
	Ring end gap Top R	0.20 – 0.35 (0.008 – 0.014)	0.60 (0.024)
	T	0.20 – 0.30 (0.008 – 0.012)	0.60 (0.024)
	Second	0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
	Oil R	0.20 – 0.50 (0.008 – 0.020)	0.70 (0.028)
	T	0.20 – 0.45 (0.008 – 0.018)	0.70 (0.028)
Piston Pin	O.D.	20.994 – 21.000 (0.8265 – 0.8268)	——
	Pin-to-piston clearance	0.010 – 0.022 (0.0004 – 0.0009)	——
Connecting rod	Pin-to-rod interference	0.013 – 0.032 (0.0005 – 0.0013)	——
	Small end bore diameter	20.968 – 20.981 (0.8255 – 0.8260)	——
	Large end bore diameter Nominal	48.0 (1.89)	——
	End play installed on crankshaft	0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		
	No. 1, 2, 4 and 5 journals	54.976 – 55.000 (2.1644 – 2.1654)	——
	No. 3 journal	54.970 – 54.994 (2.1642 – 2.1651)	——
	Rod journal diameter	44.976 – 45.000 (1.7707 – 1.7717)	——
	Taper	0.005 (0.0002) max.	0.010 (0.0004)
	Out-of-round	0.005 (0.0002) max.	0.010 (0.0004)
	End play	0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Runout	0.03 (0.001) max.	0.05 (0.002)
Bearing	Main bearing-to-journal oil clearance		
	No. 1, 2, 4 and 5 journals	0.024 – 0.042 (0.0009 – 0.0017)	0.050 (0.0020)
	No. 3 journal	0.030 – 0.048 (0.0012 – 0.0019)	0.060 (0.0024)
	Rod bearing-to-journal oil clearance	0.020 – 0.038 (0.0008 – 0.0015)	0.050 (0.0020)

R: RIKEN manufactured piston ring
T: TEIKOKU PISTON RING manufactured piston ring

Standards and Service Limits

Cylinder Head/Valve Train (B18C1, B18C5 engines) — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm and wide open throttle kPa (kgf/cm², psi)	Minimum	930 (9.5, 135)	
		Maximum variation	200 (2.0, 28)	
Cylinder head	Warpage		——	0.05 (0.002)
	Height		141.95 – 142.05 (5.589 – 5.593)	——
Camshaft	End play		0.05 – 0.15 (0.002 – 0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance		0.050 – 0.089 (0.0020 – 0.0035)	0.15 (0.006)
	Total runout		0.03 (0.001) max.	0.04 (0.002)
	Cam lobe height IN	Primary B18C1/B18C5 engine	33.411 (1.3154)/33.088 (1.3027)	——
		Mid B18C1/B18C5 engine	36.377 (1.4322)/36.865 (1.4138)	——
		Secondary B18C1/B18C5 engine	34.547 (1.3601)/34.732 (1.3674)	——
	EX	Primary B18C1/B18C5 engine	33.111 (1.3036)/32.785 (1.2907)	——
		Mid B18C1/B18C5 engine	35.720 (1.4063)/36.333 (1.4304)	——
		Secondary B18C1/B18C5 engine	34.381 (1.3536)/34.691 (1.3658)	——
Valve	Valve clearance (Cold)*	IN	0.15 – 0.19 (0.006 – 0.007)	——
		EX	0.17 – 0.21 (0.007 – 0.008)	——
	Valve stem O.D.	IN	5.475 – 5.485 (0.2156 – 0.2159)	5.445 (0.2144)
		EX	5.450 – 5.460 (0.2146 – 0.2150)	5.420 (0.2134)
	Stem-to-guide clearance	IN	0.025 – 0.055 (0.0010 – 0.0022)	0.08 (0.003)
		EX	0.050 – 0.080 (0.0020 – 0.0031)	0.11 (0.004)
Valve seat	Width	IN B18C1 engine	1.25 – 1.55 (0.049 – 0.061)	2.0 (0.08)
		B18C5 engine	0.85 – 1.15 (0.033 – 0.045)	2.0 (0.08)
		EX B18C1 engine	1.25 – 1.55 (0.049 – 0.061)	2.0 (0.08)
		B18C5 engine	0.85 – 1.15 (0.033 – 0.045)	2.0 (0.08)
	Stem installed height	IN	37.465 – 37.935 (1.4750 – 1.4935)	38.185 (1.5033)
		EX	37.165 – 37.635 (1.4632 – 1.4817)	37.885 (1.4915)
Valve spring	Free length (Reference) B18C1 engine:	IN Outer	41.05 (1.616)	——
		Inner NH	36.16 (1.424)	——
		CH	36.19 (1.425)	——
		EX NH	41.96 (1.652)	——
		CH	41.94 (1.651)	——
	B18C5 engine:	IN Outer	43.19 (1.700)	——
		Inner	36.84 (1.450)	——
		EX Outer	41.05 (1.616)	——
		Inner	36.16 (1.424)	——
Valve guide	I.D.	IN	5.51 – 5.53 (0.217 – 0.218)	5.55 (0.219)
		EX	5.51 – 5.53 (0.217 – 0.218)	5.55 (0.219)
	Installed height	IN	12.55 – 13.05 (0.494 – 0.514)	——
		EX	12.55 – 13.05 (0.494 – 0.514)	——
Rocker arm	Arm-to-shaft clearance	IN	0.025 – 0.052 (0.0010 – 0.0020)	0.08 (0.003)
		EX	0.025 – 0.052 (0.0010 – 0.0020)	0.08 (0.003)

*: Measured between the camshaft and rocker arm.
NH: NIHON HATSUJO manufactured valve spring
CH: CHUO HATSUJO manufactured valve spring

Unit of length: mm (in)

Engine Block (B18C1, B18C5 engines) — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface Bore diameter Bore taper Reboring limit		0.05 (0.002) max. 81.00 – 81.02 (3.189 – 3.190) ——— ———	0.08 (0.003) 81.07 (3.192) 0.05 (0.002) 0.25 (0.010)
Piston	Skirt O.D. at 15 mm (0.6 in) from bottom of skirt Clearance in cylinder Groove width (For ring)	 Top Second Oil	80.98 – 80.99 (3.188 – 3.189) 0.01 – 0.04 (0.0004 – 0.0016) 1.030 – 1.040 (0.0406 – 0.0409) 1.230 – 1.240 (0.0484 – 0.0488) 2.805 – 2.820 (0.1104 – 0.1110)	80.97 (3.188) 0.05 (0.002) 1.060 (0.0417) 1.260 (0.0496) 2.840 (0.1118)
Piston ring	Ring-to-piston groove clearance	Top Second	0.045 – 0.070 (0.0018 – 0.0028) 0.040 – 0.065 (0.0016 – 0.0026)	0.13 (0.005) 0.13 (0.005)
	Ring end gap	Top Second Oil	0.20 – 0.35 (0.008 – 0.014) 0.40 – 0.55 (0.016 – 0.022) 0.20 – 0.50 (0.008 – 0.020)	0.60 (0.024) 0.70 (0.028) 0.70 (0.028)
Piston Pin	O.D. Pin-to-piston clearance		20.994 – 21.000 (0.8265 – 0.8268) 0.010 – 0.022 (0.0004 – 0.0009)	——— ———
Connecting rod	Pin-to-rod interference Small end bore diameter Large end bore diameter End play installed on crankshaft	 Nominal 	0.017 – 0.036 (0.0007 – 0.0014) 20.964 – 20.997 (0.8254 – 0.8267) 48.0 (1.89) 0.15 – 0.30 (0.006 – 0.012)	——— ——— ——— 0.40 (0.016)
Crankshaft	Main journal diameter No. 1, 2, 4 and 5 journals No. 3 journal Rod journal diameter Taper Out-of round End play Runout		 54.976 – 55.000 (2.1644 – 2.1654) 54.974 – 54.998 (2.1643 – 2.1653) 44.976 – 45.000 (1.7707 – 1.7717) 0.005 (0.0002) max. 0.005 (0.0002) max. 0.10 – 0.35 (0.004 – 0.014) 0.03 (0.001) max.	 ——— ——— ——— 0.010 (0.0004) 0.010 (0.0004) 0.45 (0.018) 0.05 (0.002)
Bearing	Main bearing-to-journal oil clearance No. 1, 2, 4 and 5 journals No. 3 journal Rod bearing-to-journal oil clearance		 0.024 – 0.042 (0.0009 – 0.0017) 0.030 – 0.048 (0.0012 – 0.0019) 0.032 – 0.050 (0.0013 – 0.0020)	 0.050 (0.0020) 0.060 (0.0024) 0.060 (0.0024)

Engine Lubrication — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US qt, Imp qt)	B18B1 engine B18C1, B18C5 engines	4.6 (4.9, 4.0) for engine overhaul 3.8 (4.0, 3.3) for oil change, including filter 3.5 (3.7, 3.1) for oil change, without filter 4.8 (5.1, 4.2) for engine overhaul 4.0 (4.2, 3.5) for oil change, including filter 3.7 (3.9, 3.3) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance Pump housing-to-outer rotor clearance Pump housing-to-rotor axial clearance		0.04 – 0.16 (0.002 – 0.006) 0.10 – 0.19 (0.004 – 0.007) 0.02 – 0.07 (0.001 – 0.003)	0.20 (0.008) 0.20 (0.008) 0.15 (0.006)
Relief valve	Pressure setting at engine oil temp. 176°F (80°C) kPa (kgf/cm², psi)	 At idle At 3,000 rpm	 70 (0.7, 10) min. 340 (3.5, 50) min.	

Standards and Service Limits

Cooling — Section 10

	MEASUREMENT		STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) [Including engine, heater, cooling line and reservoir] Reservoir capacity: 0.6 ℓ (0.63 US qt, 0.53 Imp qt)	B18B1 engine	M/T: 6.4 (6.8, 5.6) for overhaul 4.4 (4.6, 3.9) for coolant change* A/T: 6.7 (7.1, 5.9) for overhaul 4.7 (5.0, 4.1) for coolant change*
		B18C1 engine	M/T: 6.7 (7.1, 5.9) for overhaul 4.7 (5.0, 4.1) for coolant change*
		B18C5 engine	M/T: 6.5 (6.9, 5.7) for overhaul 4.5 (4.8, 4.0) for coolant change*
Radiator cap	Opening pressure kPa (kgf/cm², psi)		93 – 123 (0.95 – 1.25, 13.5 – 17.8)
Thermostat	Start to open °F (°C) Fully open °F (°C) Valve lift at fully open		169 – 176 (76 – 80) 194 (90) 8.0 (0.31) min.
Cooling fan	Thermoswitch "ON" temperature °F (°C) Thermoswitch "OFF" temperature °F (°C)		196 – 203 (91 – 95) Subtract 5 – 14 (3 – 8) from actual "ON" temperature

*: Including the coolant in the reservoir and that remaining in the engine.

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm², psi)	B18B1 engine	270 – 320 (2.8 – 3.3, 40 – 47)	
		B18C1 engine	329 – 378 (3.35 – 3.85, 48 – 55)	
		B18C5 engine	320 – 370 (3.3 – 3.8, 47 – 54)	
Fuel tank	Capacity ℓ (US gal, Imp gal)		50 (13.2, 11.0)	
Engine	Idle speed with headlight and cooling fan off rpm		B18B1, B18C1 engines 750 ± 50 (M/T: neutral) 750 ± 50 (A/T: N or P position) B18C5 engine 800 ± 50 (M/T: neutral)	
	Fast idle rpm		B18B1, B18C1 engines 1,600 ± 200 (M/T: neutral) 1,600 ± 200 (A/T: N or P position) B18C5 engine 1,500 ± 200 (M/T: neutral)	
	Idle CO %		0.1 max.	

Clutch — Section 12

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height	to floor	164 (6 7/16)	——
	Stroke		130 – 140 (5.12 – 5.51)	——
	Pedal play		12 – 21 (1/2 – 13/16)*	——
	Disengagement height	to floor	83 (3.27) min.	——
Flywheel	Clutch surface runout		0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth		1.2 – 1.7 (0.05 – 0.07)	0.2 (0.01)
	Thickness		8.3 – 9.0 (0.33 – 0.35)	6.0 (0.24)
Pressure plate	Warpage		0.03 (0.001) max.	0.15 (0.006)
	Diaphragm spring finger alignment		0.6 (0.02) max.	0.8 (0.03)

* Including the pedal play 1 – 10 mm (0.04 – 0.39 in).

Unit of length: mm (in)

Manual Transmission — Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US qt, Imp qt)	2.2 (2.3, 1.9) for oil change 2.3 (2.4, 2.0) for overhaul	
Mainshaft	End play Diameter of ball bearing contact area (clutch housing side) Diameter of 3rd gear contact area Diameter of ball bearing contact area (transmission housing side) Runout	0.11 – 0.18 (0.004 – 0.007) 27.977 – 27.990 (1.101 – 1.102) 37.984 – 38.000 (1.495 – 1.496) 27.987 – 28.000 (1.1018 – 1.1024) 0.02 (0.0008) max.	Adjust 27.93 (1.10) 37.93 (1.493) 27.94 (1.10) 0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D. End play Thickness 3rd B18B1 engine B18C1, B18C5 engines 4th B18B1 engine B18C1, B18C5 engines	43.009 – 43.025 (1.6933 – 1.6939) 0.06 – 0.21 (0.0024 – 0.0083) 34.42 – 34.47 (1.355 – 1.357) 34.92 – 34.97 (1.375 – 1.377) 30.92 – 30.97 (1.217 – 1.219) 31.42 – 31.47 (1.237 – 1.239)	43.08 (1.696) 0.3 (0.012) 34.3 (1.350) 34.8 (1.370) 30.8 (1.213) 31.3 (1.232)
Mainshaft 5th gear	I.D. End play Thickness	43.009 – 43.025 (1.6933 – 1.6939) 0.06 – 0.21 (0.0024 – 0.0083) 31.42 – 31.47 (1.237 – 1.239)	43.08 (1.696) 0.3 (0.012) 31.3 (1.232)
Countershaft	Diameter of needle bearing contact area Diameter of ball bearing contact area Diameter of 1st gear contact area Runout	33.000 – 33.015 (1.299 – 1.300) 24.980 – 24.993 (0.9835 – 0.9840) 36.984 – 37.000 (1.4561 – 1.4567) 0.02 (0.0008) max.	32.95 (1.297) 24.94 (0.982) 36.93 (1.454) 0.05 (0.002)
Countershaft 1st gear	I.D. End play Thickness	42.009 – 42.025 (1.6539 – 1.6545) 0.045 – 0.205 (0.0018 – 0.0081) 31.45 – 31.50 (1.238 – 1.240)	42.08 (1.657) ——— ———
Countershaft 2nd gear	I.D. End play Thickness B18B1 engine B18C1, B18C5 engines	47.009 – 47.025 (1.8507 – 1.8514) 0.07 – 0.14 (0.003 – 0.006) 34.62 – 34.67 (1.3630 – 1.3650) 28.92 – 28.97 (1.1386 – 1.1405)	47.08 (1.854) 0.20 (0.008) 34.5 (1.358) 28.8 (1.134)
Spacer collar (Countershaft 2nd gear)	I.D. O.D. Length	36.48 – 36.49 (1.4362 – 1.4366) 41.989 – 42.000 (1.6531 – 1.6535) 29.07 – 29.09 (1.1445 – 1.1453)	36.5 (1.437) 41.94 (1.651) ———
Spacer collar (Mainshaft 4th and 5th gears)	I.D. O.D. Length A B	31.002 – 31.012 (1.2205 – 1.2209) 37.989 – 38.000 (1.4956 – 1.4961) 56.45 – 56.55 (2.2224 – 2.2264) 26.03 – 26.08 (1.0248 – 1.0268)	31.06 (1.223) 37.94 (1.494) ——— ———

(cont'd)

Standards and Service Limits

Manual Transmission (cont'd) — Section 13

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Reverse idler gear	I.D.	B18B1 engine	20.016 – 20.043 (0.7880 – 0.7891)	20.09 (0.7909)
		B18C1 engine	20.028 – 20.049 (0.7885 – 0.7893)	20.09 (0.7909)
		B18C5 engine	20.030 – 20.110 (0.7886 – 0.7917)	20.09 (0.7909)
	Gear-to-reverse gear shaft clearance	B18B1 engine	0.036 – 0.084 (0.0014 – 0.0033)	0.16 (0.006)
		B18C1 engine	0.028 – 0.053 (0.0011 – 0.0020)	0.16 (0.006)
		B18C5 engine	0.030 – 0.117 (0.0012 – 0.0046)	0.16 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)		0.85 – 1.10 (0.033 – 0.043)	0.4 (0.016)
Double cone synchro ring *	Clearance (ring pushed against gear)			
	Outer synchro ring-to-gear		0.95 – 1.68 (0.037 – 0.066)	0.6 (0.024)
	Inner synchro ring-to-gear		0.5 – 1.0 (0.02 – 0.04)	0.3 (0.01)
	Outer synchro ring-to-synchro cone		0.5 – 1.0 (0.02 – 0.04)	0.3 (0.01)
Shift fork	Shift fork finger thickness		7.4 – 7.6 (0.291 – 0.299)	———
	Fork-to-synchro sleeve clearance		0.35 – 0.65 (0.014 – 0.026)	1.0 (0.039)
Reverse shift fork	Shift fork pawl groove width		13.0 – 13.3 (0.512 – 0.524)	———
	Fork-to-reverse idler gear clearance		0.5 – 1.1 (0.020 – 0.043)	1.8 (0.07)
	"L" groove width	at 5th gear side	7.40 – 7.70 (0.291 – 0.303)	———
		at reverse gear side	7.05 – 7.25 (0.278 – 0.285)	———
	Fork-to-5th/reverse shift piece pin clearance			
		at 5th gear side	0.4 – 0.9 (0.016 – 0.035)	———
		at reverse gear side	0.05 – 0.45 (0.0020 – 0.018)	———
Shift arm	Groove width of change piece contact area		11.8 – 12.0 (0.46 – 0.47)	———
	Change piece-to-shift arm clearance		0.05 – 0.35 (0.002 – 0.014)	0.80 (0.031)
Shift piece	Groove width of shift arm contact area		8.1 – 8.2 (0.319 – 0.323)	———
	Shift piece-to-shift arm clearance		0.10 – 0.30 (0.004 – 0.012)	0.60 (0.024)
	I.D.		14.000 – 14.068 (0.551 – 0.554)	———
	Shift piece-to-shaft clearance		0.011 – 0.092 (0.0004 – 0.0036)	0.150 (0.0059)
	Diameter of shift fork contact area		11.90 – 12.00 (0.469 – 0.472)	———
	Shift piece-to-shift fork shaft clearance		0.20 – 0.50 (0.008 – 0.020)	0.80 (0.031)
Selector arm	Diameter of change piece contact area		11.8 – 12.0 (0.46 – 0.47)	———
	Arm-to-change piece clearance		0.05 – 0.35 (0.002 – 0.014)	0.50 (0.020)
	Groove width of interlock contact area		10.05 – 10.15 (0.3957 – 0.3996)	———
	Arm-to-interlock clearance		0.05 – 0.25 (0.002 – 0.010)	0.50 (0.020)

*: B18C1, B18C5 engines

Automatic Transmission — Section 14

Unit of length: mm (in)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)		5.9 (6.2, 5.2) for overhaul 2.7 (2.9, 2.4) for fluid change	
Hydraulic pressure kPa (kgf/cm², psi)	Line pressure at 2,000 rpm in N or P position		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	1st clutch pressure at 2,000 rpm in D4 position			
	1st-hold clutch pressure at 2,000 rpm in 1 position			
	2nd clutch pressure at 2,000 rpm in 2 position		800 – 850 (8.2 – 8.7, 120 – 124)	760 (7.7, 110)
	3rd clutch pressure at 2,000 rpm in D3 position			
	4th clutch pressure at 2,000 rpm in D4 position			
Stall speed rpm (Check with vehicle on level ground)			2,550	2,400 – 2,700
Clutch	Clutch initial clearance	1st	0.65 – 0.85 (0.026 – 0.033)	——
		2nd, 3rd, 4th	0.40 – 0.60 (0.016 – 0.024)	——
		1st-hold	0.5 – 0.8 (0.020 – 0.031)	——
	Clutch return spring free length	1st, 2nd, 3rd, 4th	31.1 (1.22)	29.1 (1.15)
		1st-hold	34.6 (1.36)	32.6 (1.28)
	Clutch disc thickness		1.88 – 2.00 (0.074 – 0.079)	Until grooves worn out
	Clutch plate thickness	2nd, 3rd, 4th	1.95 – 2.05 (0.077 – 0.081)	Discoloration
		1st, 1st-hold	1.55 – 1.65 (0.061 – 0.065)	Discoloration
	Clutch end plate thickness (1st)	Mark 1	2.05 – 2.10 (0.081 – 0.083)	Discoloration
		Mark 2	2.15 – 2.20 (0.085 – 0.087)	↑
		Mark 3	2.25 – 2.30 (0.089 – 0.091)	
		Mark 4	2.35 – 2.40 (0.093 – 0.094)	
		Mark 5	2.45 – 2.50 (0.096 – 0.098)	
		Mark 6	2.55 – 2.60 (0.100 – 0.102)	
		Mark 7	2.65 – 2.70 (0.104 – 0.106)	
		Mark 8	2.75 – 2.80 (0.108 – 0.110)	
		Mark 9	2.85 – 2.90 (0.112 – 0.114)	↓
		Mark 10	2.95 – 3.00 (0.116 – 0.118)	Discoloration
	Clutch end plate thickness (2nd, 4th)	Mark 6	2.55 – 2.60 (0.100 – 0.102)	Discoloration
		Mark 7	2.65 – 2.70 (0.104 – 0.106)	↑
		Mark 8	2.75 – 2.80 (0.108 – 0.110)	
		Mark 9	2.85 – 2.90 (0.112 – 0.114)	
		Mark 10	2.95 – 3.00 (0.116 – 0.118)	
		Mark 11	3.05 – 3.10 (0.120 – 0.122)	
		Mark 12	3.15 – 3.20 (0.124 – 0.126)	
		Mark 13	3.25 – 3.30 (0.128 – 0.130)	
		Mark 14	3.35 – 3.40 (0.132 – 0.134)	
		Mark 15	3.45 – 3.50 (0.136 – 0.138)	
		Mark 16	3.55 – 3.60 (0.140 – 0.142)	↓
		Mark 17	3.65 – 3.70 (0.144 – 0.146)	Discoloration
	Clutch end plate thickness (3rd)	Mark 8	2.75 – 2.80 (0.108 – 0.110)	Discoloration
		Mark 9	2.85 – 2.90 (0.112 – 0.114)	↑
		Mark 10	2.95 – 3.00 (0.116 – 0.118)	
		Mark 11	3.05 – 3.10 (0.120 – 0.122)	
		Mark 12	3.15 – 3.20 (0.124 – 0.126)	
		Mark 13	3.25 – 3.30 (0.128 – 0.130)	
		Mark 14	3.35 – 3.40 (0.132 – 0.134)	
		Mark 15	3.45 – 3.50 (0.136 – 0.138)	
		Mark 16	3.55 – 3.60 (0.140 – 0.142)	↓
		Mark 17	3.65 – 3.70 (0.144 – 0.146)	Discoloration
	Clutch end plate thickness (1st-hold)	Mark 1	2.05 – 2.10 (0.081 – 0.083)	Discoloration
		Mark 2	2.15 – 2.20 (0.085 – 0.087)	↑
		Mark 3	2.25 – 2.30 (0.089 – 0.091)	
		Mark 4	2.35 – 2.40 (0.093 – 0.094)	
		No mark	2.45 – 2.50 (0.096 – 0.098)	
		Mark 6	2.55 – 2.60 (0.100 – 0.102)	↓
		Mark 7	2.65 – 2.70 (0.104 – 0.106)	Discoloration

(cont'd)

Standards and Service Limits

Automatic Transmission (cont'd)— Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Diameter of needle bearing contact area		
	On mainshaft stator shaft bearing	23.980 – 23.993 (0.9441 – 0.9446)	Wear or damage
	On mainshaft 2nd gear	35.975 – 35.991 (1.4163 – 1.4169)	
	On mainshaft 4th gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On mainshaft 1st gear collar	30.975 – 30.991 (1.2195 – 1.2201)	
	On countershaft (torque converter housing side)	36.004 – 36.017 (1.4175 – 1.4180)	
	On countershaft 3rd gear	35.980 – 35.996 (1.4165 – 1.4172)	
	On countershaft 4th gear	27.980 – 27.993 (1.1016 – 1.1021)	
	On countershaft reverse gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On countershaft 1st gear collar	31.975 – 31.991 (1.2589 – 1.2595)	
	On sub-shaft (transmission housing side)	25.991 – 26.000 (1.0233 – 1.0236)	
	On sub-shaft 4th gear collar	22.9935 – 23.0065 (0.9053 – 0.9058)	
	On reverse idler gear shaft	13.990 – 14.000 (0.5508 – 0.5512)	Wear or damage
	Inside diameter of needle bearing contact area		
	On mainshaft 1st gear	35.000 – 35.016 (1.3780 – 1.3786)	Wear or damage
	On mainshaft 2nd gear	41.000 – 41.016 (1.6142 – 1.6148)	
	On mainshaft 4th gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On countershaft 1st gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On countershaft 3rd gear	41.000 – 41.016 (1.6142 – 1.6148)	
	On countershaft 4th gear	33.000 – 33.016 (1.2992 – 1.2998)	
	On countershaft reverse gear	38.000 – 38.016 (1.4961 – 1.4967)	
	On sub-shaft 4th gear	32.000 – 32.016 (1.2598 – 1.2605)	
	On reverse idler gear	18.007 – 18.020 (0.7089 – 0.7094)	
	Reverse idler gear shaft holder I.D.	14.416 – 14.434 (0.5676 – 0.5683)	Wear or damage
	End play		
	Mainshaft 1st gear	0.05 – 0.16 (0.002 – 0.006)	—
	Mainshaft 2nd gear	0.05 – 0.13 (0.002 – 0.005)	—
	Mainshaft 4th gear	0.05 – 0.16 (0.002 – 0.006)	—
	Countershaft 1st gear	0.1 – 0.5 (0.004 – 0.020)	—
	Countershaft 3rd gear	0.05 – 0.17 (0.002 – 0.007)	—
	Countershaft 4th gear	0.10 – 0.18 (0.004 – 0.007)	—
	Sub-shaft 4th gear	0.05 – 0.17 (0.002 – 0.007)	—
	Reverse idler gear	0.05 – 0.18 (0.002 – 0.007)	—
	Countershaft reverse gear	0.10 – 0.25 (0.004 – 0.010)	—
	Selector hub O.D.	51.87 – 51.90 (2.042 – 2.043)	Wear or damage
	Mainshaft 4th gear collar length	49.50 – 49.55 (1.9488 – 1.9508)	—
	Mainshaft 4th gear collar flange thickness	4.435 – 4.525 (0.1746 – 0.1781)	Wear or damage
	Mainshaft 1st gear collar length	27.00 – 27.05 (1.063 – 1.065)	—
	Countershaft distance collar length	38.97 – 39.00 (1.534 – 1.535)	—
		39.02 – 39.05 (1.536 – 1.537)	—
		39.07 – 39.10 (1.538 – 1.539)	—
		39.12 – 39.15 (1.540 – 1.541)	—
		39.17 – 39.20 (1.542 – 1.543)	—
		39.22 – 39.25 (1.544 – 1.545)	—
		39.27 – 39.30 (1.546 – 1.547)	—
		38.87 – 38.90 (1.530 – 1.531)	—
		38.92 – 38.95 (1.532 – 1.533)	—
	Countershaft 3rd gear collar length	21.15 – 21.20 (0.8327 – 0.8346)	—
	Countershaft reverse gear collar length	14.5 – 14.6 (0.571 – 0.575)	—
	Countershaft reverse gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage
	Countershaft 1st gear collar length	14.5 – 14.6 (0.571 – 0.575)	—
	Countershaft 1st gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage
	Sub-shaft 4th gear collar length	24.0 – 24.1 (0.945 – 0.949)	—
	Sub-shaft 4th gear collar flange thickness	2.95 – 3.10 (0.116 – 0.122)	Wear or damage

Automatic Transmission — Section 14

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 2nd gear thrust washer thickness	3.97 – 4.00 (0.156 – 0.157) 4.02 – 4.05 (0.158 – 0.159) 4.07 – 4.10 (0.160 – 0.161) 4.12 – 4.15 (0.162 – 0.163) 4.17 – 4.20 (0.164 – 0.165) 4.22 – 4.25 (0.166 – 0.167) 4.27 – 4.30 (0.168 – 0.169) 4.32 – 4.35 (0.170 – 0.171) 4.37 – 4.40 (0.172 – 0.173) 4.42 – 4.45 (0.174 – 0.175)	Wear or damage ↕ Wear or damage
	Thrust washer thickness Mainshaft ball bearing left side Mainshaft 1st gear Countershaft 3rd gear splined washer Sub-shaft 4th gear thrust washer	 2.95 – 3.05 (0.116 – 0.120) 2.43 – 2.50 (0.096 – 0.098) 4.45 – 4.50 (0.175 – 0.177) 2.93 – 3.00 (0.115 – 0.118)	 Wear or damage ↕ Wear or damage
	One-way clutch contact area I.D. Countershaft 1st gear Parking gear Mainshaft feed pipe A, O.D. (at 15 mm from end) Mainshaft feed pipe B, O.D. (at 30 mm from end) Countershaft feed pipe O.D. (at 15 mm from end) Sub-shaft feed pipe O.D. (at 15 mm from end) Mainshaft sealing ring thickness (29 mm and 35 mm) Mainshaft bushing I.D. Mainshaft bushing I.D. Countershaft bushing I.D. Sub-shaft bushing I.D. Mainshaft sealing ring groove width	 83.339 – 83.365 (3.2810 – 3.2821) 66.685 – 66.698 (2.6254 – 2.6259) 8.97 – 8.98 (0.353 – 0.354) 5.97 – 5.98 (0.2350 – 0.2354) 7.97 – 7.98 (0.3138 – 0.3142) 7.97 – 7.98 (0.3138 – 0.3142) 1.87 – 1.97 (0.074 – 0.078) 6.018 – 6.030 (0.2369 – 0.2374) 9.000 – 9.015 (0.3543 – 0.3549) 8.000 – 8.022 (0.3150 – 0.3158) 8.000 – 8.022 (0.3150 – 0.3158) 2.025 – 2.075 (0.0797 – 0.0811)	 Wear or damage Wear or damage 8.95 (0.352) 5.95 (0.234) 7.95 (0.313) 7.95 (0.313) 1.82 (0.072) 6.045 (0.2380) 9.03 (0.356) 8.03 (0.316) 8.03 (0.316) 2.095 (0.082)
ATF pump	ATF pump gear side clearance ATF pump gear-to-body clearance Drive Driven ATF pump driven gear I.D. ATF pump driven gear shaft O.D.	0.03 – 0.05 (0.001 – 0.002) 0.1050 – 0.1325 (0.004 – 0.005) 0.0350 – 0.0625 (0.001 – 0.002) 14.016 – 14.034 (0.5518 – 0.5525) 13.980 – 13.990 (0.5504 – 0.5508)	0.07 (0.003) —— —— Wear or damage Wear or damage
Regulator valve body	Sealing ring contact area I.D.	35.000 – 35.025 (1.3780 – 1.3782)	35.050 (1.3799)
Stator shaft	Inside of diameter of bearing contact area On torque converter side On ATF pump side	 27.000 – 27.021 (1.063 – 1.064) 29.000 – 29.013 (1.1417 – 1.1422)	 Wear or damage Wear or damage
Shifting device and parking brake control	Reverse shift fork finger thickness Parking brake pawl Parking gear	5.90 – 6.00 (0.232 – 0.236) —— ——	5.40 (0.213) } Wear or other defect
Servo body	Shift fork shaft bore I.D. Shift fork shaft valve bore I.D.	14.000 – 14.010 (0.5512 – 0.5516) 37.000 – 37.039 (1.4567 – 1.4582)	—— 37.045 (1.4585)

(cont'd)

Standards and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Springs	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	87.8 (3.457)	16.5
	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	11.0
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.9
	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	35.0 (1.378)	10.9
	Torque converter check valve spring	1.2 (0.047)	8.4 (0.331)	32.4 (1.276)	12.7
	Cooler relief valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
	Relief valve spring	1.1 (0.043)	8.6 (0.339)	37.1 (1.461)	13.4
	2nd orifice control valve spring	0.7 (0.028)	6.6 (0.260)	34.8 (1.370)	22.0
	1-2 shift valve spring	0.9 (0.035)	7.6 (0.299)	41.3 (1.626)	16.3
	2-3 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
	3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
	1st accumulator spring	2.1 (0.083)	16.0 (0.630)	89.1 (3.508)	16.2
	4th accumulator spring B	2.3 (0.091)	10.2 (0.402)	51.6 (2.031)	13.8
	4th accumulator spring A	2.6 (0.102)	17.0 (0.669)	88.4 (3.480)	14.2
	2nd accumulator spring A	2.4 (0.094)	29.0 (1.142)	39.0 (1.535)	2.9
	3rd accumulator spring A	2.8 (0.110)	17.5 (0.689)	94.3 (3.713)	15.9
	2nd accumulator spring B	1.6 (0.063)	9.0 (0.354)	20.7 (0.815)	6.1
	3rd accumulator spring B	2.1 (0.083)	31.0 (1.220)	38.2 (1.504)	2.6
	3rd sub accumulator spring	2.7 (0.106)	17.0 (0.669)	39.0 (1.535)	6.3
	2nd accumulator spring C	2.2 (0.087)	14.5 (0.571)	68.0 (2.677)	13.9
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
	Lock-up timing valve spring	0.9 (0.035)	8.1 (0.319)	81.4 (3.205)	47.8
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	14.1
	3-4 orifice control valve spring	0.6 (0.024)	6.6 (0.260)	37.9 (1.492)	31.6
	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.1 (2.051)	20.8
	CPB valve spring	0.9 (0.035)	8.1 (0.319)	47.2 (1.858)	18.3
	4th exhaust valve spring	0.9 (0.035)	6.1 (0.240)	36.4 (1.433)	19.5

Differential (Manual Transmission) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Differential carrier	Pinion shaft contact area I.D.	B18B1 engine	18.000 – 18.016 (0.7087 – 0.7093)	——
		B18C1, B18C5 engines	18.000 – 18.018 (0.7087 – 0.7094)	——
	Carrier-to-pinion clearance	B18B1 engine	0.013 – 0.045 (0.0005 – 0.0018)	0.1 (0.004)
		B18C1, B18C5 engines	0.013 – 0.047 (0.0005 – 0.0019)	0.1 (0.004)
	Driveshaft/intermediate shaft contact area I.D.	B18B1 engine	28.000 – 28.021 (1.1024 – 1.1032)	——
		B18C1, B18C5 engines	28.005 – 28.025 (1.1026 – 1.1033)	——
	Carrier-to-driveshaft clearance	B18B1 engine	0.020 – 0.062 (0.0008 – 0.0024)	——
		B18C1, B18C5 engines	0.025 – 0.066 (0.0010 – 0.0026)	——
	Carrier-to-intermediate shaft clearance	B18B1 engine	0.050 – 0.087 (0.0020 – 0.0034)	——
		B18C1, B18C5 engines	0.055 – 0.091 (0.0022 – 0.0036)	——
Differential pinion gear	Backlash		0.05 – 0.15 (0.002 – 0.006)	Adjust
	I.D.		18.042 – 18.066 (0.7103 – 0.7113)	——
	Pinion gear-to-pinion shaft clearance		0.055 – 0.095 (0.0022 – 0.0037)	0.15 (0.006)
Set ring-to-bearing outer race clearance			0 – 0.10 (0 – 0.004)	Adjust

Differential (Automatic Transmission) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Differential carrier	Pinion shaft contact area I.D.	18.010 – 18.028 (0.7091 – 0.7098)	——
	Carrier-to-pinion clearance	0.023 – 0.057 (0.0009 – 0.0022)	0.1 (0.004)
	Driveshaft/intermediate shaft contact are I.D.	26.025 – 26.045 (1.0246 – 1.0254)	——
	Carrier-to-driveshaft clearance	0.045 – 0.086 (0.0018 – 0.0034)	0.12 (0.005)
	Carrier-to-intermediate shaft clearance	0.075 – 0.111 (0.0030 – 0.0044)	0.15 (0.006)
Differential pinion gear	Backlash	0.05 – 0.15 (0.002 – 0.006)	——
	I.D.	18.042 – 18.066 (0.7103 – 0.7113)	——
	Pinion gear-to-pinion shaft clearance	0.055 – 0.095 (0.0022 – 0.0037)	0.15 (0.006)
Set ring-to-bearing outer race clearance		0 – 0.15 (0 – 0.006)	Adjust

Unit of length: mm (in)

Steering — Section 17

	MEASUREMENT		STANDARD (NEW)
Steering wheel	Rotational play at steering wheel circumference		0 – 10 (0 – 0.39)
	Starting load at steering wheel circumference N (kgf, lbf)	Engine running	34 (3.5, 7.7)
Gearbox	Angle of rack-guide-screw loosened from locked position		20° MAX
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm², psi)		6,400 – 7,400 (65 – 75, 924 – 1,067)
Power steering fluid	Recommended fluid		Honda Power Steering Fluid-V or S
	Fluid capacity ℓ (US qt, Imp qt)	GSR, Type R	1.06 (1.12, 0.93)
		GS, RS, LS	1.0 (1.06, 0.88)
		Reservoir	0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		11.5 – 13.5 (0.45 – 0.53) with used belt 8.0 – 10.0 (0.31 – 0.39) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge		390 – 540 (40 – 55, 88 – 120) with used belt 740 – 880 (75 – 90, 170 – 200) with new belt

* When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension — Section 18

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber	Front	Type R	$-0° 30' \pm 1°$	
			All except Type R	$-0° 10' \pm 1°$	
		Rear		$-0° 45'^{+0°45'}_{-1°15'}$	
	Caster	Front		$1° 10' \pm 1°$	
	Total toe	Front		0 ± 2 ($0 \pm 1/16$)	
		Rear		IN 2^{+2}_{-1} ($1/16 \pm 1/16$)	
	Front wheel turning angle		Inward wheel	$36° 00' \pm 2°$	
			Outward wheel	30° 30′	
Wheel bearing	End play	Front		0 – 0.05 (0 – 0.002)	
		Rear		0 – 0.05 (0 – 0.002)	
Wheel				STANDARD (NEW)	SERVICE LIMIT
	Rim runout (Aluminum wheel)	Axial		0 – 0.7 (0 – 0.03)	2.0 (0.08)
		Radial		0 – 0.7 (0 – 0.03)	1.5 (0.06)
	Rim runout (Steel wheel)	Axial		0 – 1.0 (0 – 0.04)	2.0 (0.08)
		Radial		0 – 1.0 (0 – 0.04)	1.5 (0.06)

Brake — Section 19

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke at 196 N (20 kgf, 44 lbf) lever force			Locks when pulled 6 –10 notches	
Foot brake pedal	Pedal height (With floor mat removed)		M/T	160 (6 5/16)	
			A/T	165 (6 1/2)	
	Free play			1 – 5 (1/16 – 3/16)	
Master cylinder	Piston-to-pushrod clearance			0 – 0.4 (0 – 0.02)	
Disc brake				STANDARD (NEW)	SERVICE LIMIT
	Disc thickness	Front	Type R	22.9 – 23.1 (0.90 – 0.91)	21.0 (0.83)
			All except Type R	20.9 – 21.1 (0.82 – 0.83)	19.0 (0.75)
		Rear		8.9 – 9.1 (0.35 – 0.36)	8.0 (0.31)
	Disc runout	Front		———	0.10 (0.004)
		Rear		———	0.10 (0.004)
	Disc parallelism	Front and rear		———	0.015 (0.0006)
	Pad thickness	Front	Type R	10.5 – 11.5 (0.41 – 0.45)	1.6 (0.06)
			All except Type R	9.5 – 10.5 (0.37 – 0.41)	1.6 (0.06)
		Rear	Type R	8.5 – 9.5 (0.33 – 0.37)	1.6 (0.06)
			All except Type R	7.0 – 8.0 (0.28 – 0.31)	1.6 (0.06)

Standards and Service Limits

Air Conditioning — Section 22

	MEASUREMENT		STANDARD (NEW)
Air conditioning system	Lubricant capacity mℓ (fl oz)	Condenser Evaporator Line or hose Receiver/Dryer	25 (5/6) 40 (1 1/3) 10 (1/3) 10 (1/3)
	Lubricant type: ND-OIL8 (P/N 38897 – PR7 – A01AH or 38899 – PR7 – A01)		
Compressor	Lubricant capacity mℓ (fl oz) Lubricant type: ND-OIL8 Stator coil resistance at 68°F (20°C) Ω Pulley-to-pressure plate clearance		140^{+15}_{0} ($4\ 2/3^{+1/2}_{0}$) 3.4 – 3.8 0.5 ± 0.15 (0.02 ± 0.006)
Compressor belt*1	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.5 – 9.5 (0.30 – 0.37) with used belt 5.0 – 7.0 (0.20 – 0.28) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge		390 – 540 (40 – 55, 88 – 120) with used belt 740 – 880 (75 – 90, 170 – 200) with new belt

*1: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off.
Readjust deflection or tension to used belt values.

Electrical — Section 23

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ignition coil	Rated voltage V Primary winding resistance at 68°F (20°C) Ω Secondary winding resistance at 68°F (20°C) kΩ	12 0.6 – 0.8 12.8 – 19.2	
Ignition wire	Resistance at 68°F (20°C) kΩ Firing order	25 max. 1 – 3 – 4 – 2	
		STANDARD (NEW)	SERVICE LIMIT
Spark plug	Type Gap B18B1, B18C5 engines B18C1 engine	See Section 23 1.0 – 1.1 (0.039 – 0.043) 1.2 – 1.3 (0.047 – 0.051)	—— 1.3 (0.051)*1 1.5 (0.059)*1
Ignition timing	At idling M/T ° BTDC (Red) – rpm A/T	Except B18C5 engine 16 ± 2 – 750 (Neutral) B18C5 engine 16 ± 2 – 800 (Neutral) 16 ± 2 –750 (N or P position)	
Alternator belt*2	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	9.0 – 11.0 (0.35 – 0.43) with used belt 6.0 – 8.0 (0.24 – 0.31) with new belt	
	Belt tension N (kgf, lbf) Measured with belt tension gauge	340 – 490 (35 – 50, 77 – 110) with used belt 690 – 880 (70 – 90, 154 – 198) with new belt	
		STANDARD (NEW)	SERVICE LIMIT
Alternator (Except B18C5 engine)	Output 13.5 V at normal operating temperature A Coil resistance (rotor) at 68°F (20°C) Ω Slip ring O.D. Brush length Brush spring tension N (kgf, lbf)	90 2.9 14.4 (0.57) 10.5 (0.41) 3.2 (0.33, 0.73)	—— —— 14.0 (0.55) 1.5 (0.06) ——
Alternator (B18C5 engine)	Output 13.5 V at normal operating temperature A Coil resistance (rotor) at 68°F (20°C) Ω Slip ring O.D. Brush length Brush spring tension N (kgf, lbf)	85 2.6 – 2.9 22.7 (0.89) 19.0 (0.75) 3.3 – 4.1 (0.34 – 0.42, 0.75 – 0.93)	—— —— 21.2 (0.83) 14.0 (0.55) ——
Starter	Output Mica depth Commutator runout Commutator O.D. Brush length Brush spring tension (new) N (kgf, lbf) M/T A/T	M/T: 1.2 kW, A/T: 1.4 kW 0.5 – 0.8 (0.02 – 0.03) 0 – 0.02 (0 – 0.0008) 29.9 – 30.0 (1.177 – 1.181) 15.0 – 15.5 (0.59 – 0.61) 12.7 – 20.6 (1.3 – 2.1, 2.9 – 4.6) 17.7 – 23.5 (1.8 – 2.4, 4.0 – 5.3)	—— 0.2 (0.008) 0.05 (0.002) 29.0 (1.142) 10.0 (0.39) —— ——

*1: Do not adjust the gap, replace spark plug if it is out of spec.
*2: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off.
Readjust deflection or tension to used belt values.

Design Specifications

	ITEM		METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length	3-door	4,380 mm	172.4 in	
		4-door	4,525 mm	178.1 in	
	Overall Width		1,710 mm	67.3 in	
	Overall Height	3-door	1,335 mm	52.6 in	
		4-door	1,370 mm	53.9 in	
	Wheelbase	3-door	2,570 mm	101.2 in	
		4-door	2,620 mm	103.1 in	
	Track F/R		1,475/1,470 mm	58.1/57.9 in	Except Type R
			1,480/1,470 mm	58.3/57.9 in	Type R
	Ground Clearance		150 mm	5.9 in	Except Type R
			140 mm	5.5 in	Type R
	Seating Capacity		Four (3-door), Five (4-door)		
Weight (USA)	Gross Vehicle Weight Rating (GVWR)		——	3,680 lbs	
Weight (CANADA)	Gross Vehicle Weight Rating (GVWR)		1,670 kg	——	
ENGINE	Type	B18B1 engine	Water-cooled, 4-stroke DOHC gasoline engine		
		B18C1, B18C5 engines	Water-cooled, 4-stroke DOHC VTEC gasoline engine		
	Cylinder Arrangement		Inline 4-cylinder, transverse		
	Bore and Stroke	B18B1 engine	81.0 x 89.0 mm	3.19 x 3.50 in	
		B18C1, B18C5 engines	81.0 x 87.2 mm	3.19 x 3.43 in	
	Displacement	B18B1 engine	1,834 cm³ (mℓ)	112 cu-in	
		B18C1, B18C5 engines	1,797 cm³ (mℓ)	110 cu-in	
	Compression Ratio	B18B1 engine	9.2		
		B18C1 engine	10.0		
		B18C5 engine	10.6		
	Valve Train	B18B1 engine	Belt driven, DOHC 4 valves per cylinder		
		B18C1, B18C5 engines	Belt driven, DOHC VTEC 4 valves per cylinder		
	Lubrication System		Forced and wet sump, trochoid pump		
	Oil Pump Displacement	B18B1 engine	50 ℓ (53 US qt, 44 Imp qt)/minute*1		
		B18C1, B18C5 engines	71 ℓ (75 US qt, 62 Imp qt)/minute*2		
	Water Pump Displacement	B18B1 engine	140 ℓ (148 US qt, 123 Imp qt)/minute*1		
		B18C1, B18C5 engines	140 ℓ (148 US qt, 123 Imp qt)/minute*2		
	Fuel Required	B18B1 engine	UNLEADED gasoline with 86 Pump Octane Number or higher		
		B18C1, B18C5 engines	Premium UNLEADED gasoline with 91 Pump Octane Number or higher		
STARTER	Type		Gear reduction		
	Normal Output		M/T: 1.2 kW, A/T: 1.4 kW		
	Nominal Voltage		12 V		
	Hour Rating		30 seconds		
	Direction of Rotation		Clockwise as viewed from gear end		
	Weight M/T		3.5 kg	7.7 lbs	
	A/T		3.7 kg	8.2 lbs	
CLUTCH	Clutch Type M/T		Single plate dry, diaphragm spring		
	A/T		Torque converter		
	Clutch Facing Area M/T	B18B1, B18C1 engines	203 cm²	31 sq-in	
		B18C5 engine	176 cm²	27 sq-in	
TRANSMISSION	Transmission Type M/T		Synchronized 5-speed forward, 1 reverse		
	A/T		Electronically controlled 4-speed automatic, 1 reverse		
	Primary Reduction		Direct 1 : 1		

*1: At 6,000 engine rpm
*2: At 7,600 engine rpm

(cont'd)

Design Specifications

(cont'd)

	ITEM		METRIC	ENGLISH	NOTES
TRANSMISSION	Type	Engine type	Manual transmission B18B1 / B18C1 / B18C5		
	Gear Ratio	1st	3.230 / 3.230 / 3.230		
		2nd	1.900 / 1.900 / 2.105		
		3rd	1.269 / 1.360 / 1.458		
		4th	0.966 / 1.034 / 1.107		
		5th	0.714 / 0.787 / 0.848		
		Reverse	3.000 / 3.000 / 3.000		
	Final Reduction	Gear type	Single helical gear		
		Gear ratio	4.266 / 4.400 / 4.400		
	Type		Automatic transmission		
	Gear Ratio	1st	2.722		
		2nd	1.516		
		3rd	1.079		
		4th	0.711		
		Reverse	1.955		
	Final Reduction	Gear type	Single helical gear		
		Gear ratio	4.357		
AIR CONDITIONING	Cooling Capacity		3,570 Kcal/h	14,200 BTU/h	
	Compressor	Type/Make	Swash-plate/DENSO		
		No. of Cylinders	10		
		Capacity	150 mℓ/rev	9.15 cu-in/rev	
		Max. Speed	7,600 rpm		
		Lubricant Capacity	140 mℓ	4-2/3 fl oz 4.73 Imp oz	
		Lubricant Type	ND-OIL8		
	Condenser	Type	Corrugated fin		
	Evaporator	Type	Corrugated fin		
	Blower	Type	Sirocco fan		
		Motor Input	200 W/12 V		
		Speed Control	4-speed		
		Max. Capacity	450 m^3/h	15,900 cu ft/h	
	Temperature Control		Air-mix type		
	Compressor Clutch	Type	Dry, single plate, poly-V-belt drive		
		Power Consumption	40 W max./12 V at 68°F (20°C)		
	Refrigerant	Type	HFC-134a (R-134a)		
		Quantity	700^{0}_{-50} g	$24.7^{0}_{-1.8}$ oz	
STEERING SYSTEM	Type		Power assisted, rack and pinion		
	Overall Ratio		16.1		
	Turns, Lock-to-Lock		2.98		
	Steering Wheel Dia.		380 mm	15.0 in	
SUSPENSION	Type	Front	Independent double wishbone, coil spring with stabilizer		
		Rear	Independent double wishbone, coil spring with stabilizer		
	Shock Absorber, Front and Rear		Telescopic, hydraulic nitrogen gas-filled		

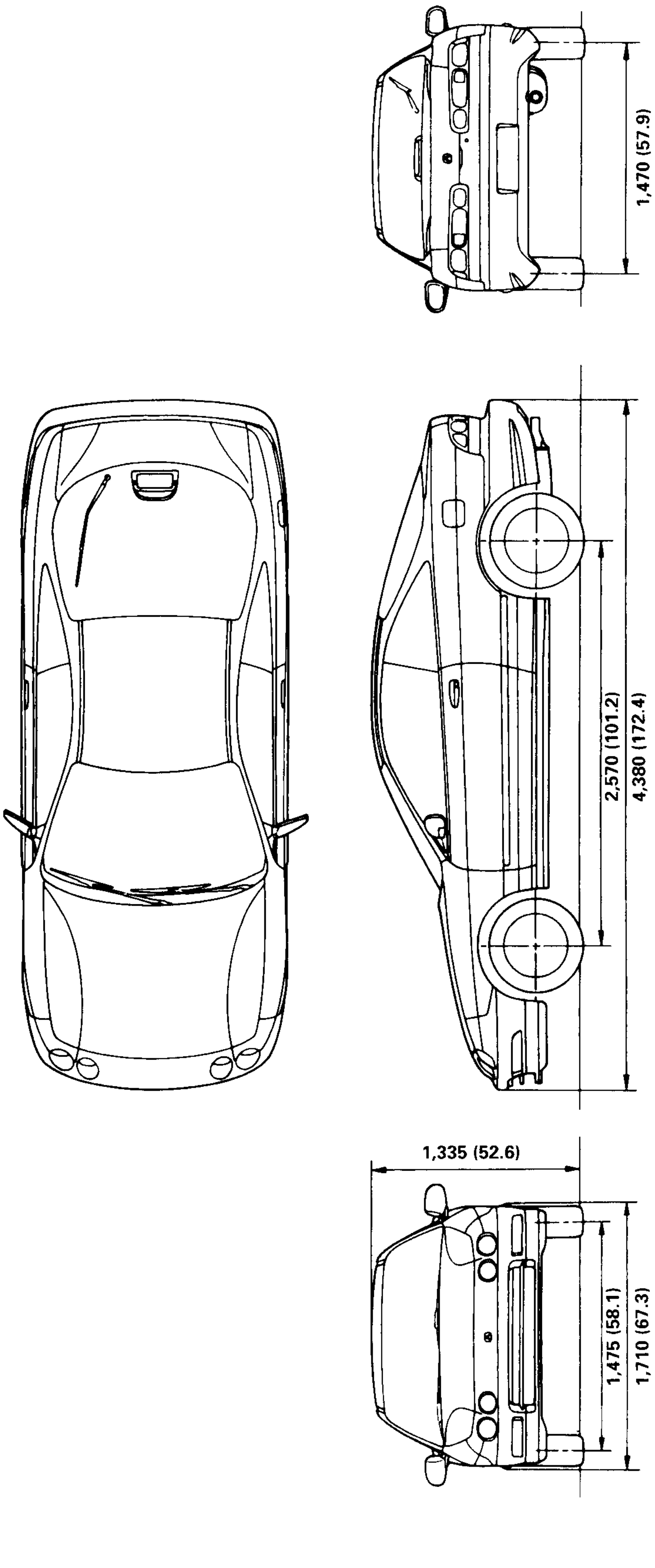
	ITEM			METRIC	ENGLISH	NOTES
WHEEL ALIGNMENT	Camber	Front	TYPE R	−0°30′		
			All Except TYPE R	−0°10′		
		Rear		−0°45′		
	Caster	Front		1°10′		
	Total Toe	Front		0 mm	0 in	
		Rear		In 2 mm	In 1/16 in	
BRAKE SYSTEM	Type	Front		Power-assisted self-adjusting ventilated disc		
		Rear		Power-assisted self-adjusting solid disc		
	Pad Surface Area	Front		50.0 cm² x 2	7.75 sq in x 2	
		Rear		21.0 cm² x 2	3.26 sq in x 2	
	Parking Brake	Type		Mechanical actuating, rear two wheel brakes		
TIRE	Size		Front and rear	P195/60R14 85H*1		
				P195/55R15 84V*2		
			Spare Tire	T115/70D14*3		
				T125/70D14*2		
				T125/70D15*4		
ELECTRICAL	Battery			12 V – 36 AH/5 HR		
	Starter			12 V – 1.2/1.4 kW		
	Alternator			12 V – 90 A/85 A		
	Fuses					
	In Under-dash Fuse/Relay Box			7.5 A, 10 A, 15 A, 20 A, 30 A		
	In Under-hood Fuse/Relay Box			7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A 50 A, 100 A		
	In Under-hood ABS Fuse/Relay Box			10 A, 15 A, 20 A, 40 A		
	Headlights		High	12 V – 60 W (HB3)		
			Low	12 V – 51 W (HB4)		
	Front Side Marker Lights			12 V – 3 CP		SAE 168
	Front Turn Signal/Parking Lights			12 V – 32/3 CP		SAE 1157
	Rear Turn Signal Lights			12 V – 32 CP		SAE 1156
	Brake/Taillights			12 V – 32/3 CP		SAE 1157
	High Mount Brake Light*5			12 V – 21 W		SAE 7440
	Rear Side Marker Lights			12 V – 3 CP		SAE 168
	Back-up Lights			12 V – 32 CP		SAE 1156
	License Plate Lights			12 V – 8 W		
	Ceiling Lights			12 V – 5 W		
	Cargo Area Lights (3-door)			12 V – 3.4 W		
	Trunk Lights (4-door)			12 V – 3.4 W		
	Spotlights			12 V – 5 W		
	Glove Box Light			12 V – 3.4 W		
	Gauge Lights			12 V – 3.4 W		
	Indicator Lights			12 V – 0.84 W, 0.91 W, 1.12 W, 1.4 W, 3 W		
	Illumination and Pilot Lights			12 V – 0.84 W, 0.91 W, 1.4 W, LED		
	Heater Illumination Lights			12 V – 1.4 W		

*1: RS
*2: LS, GS, GS-R, TYPE R
*3: RS
*4: TYPE R
*5: Except high mount brake light installed in rear spoiler.

Body Specifications

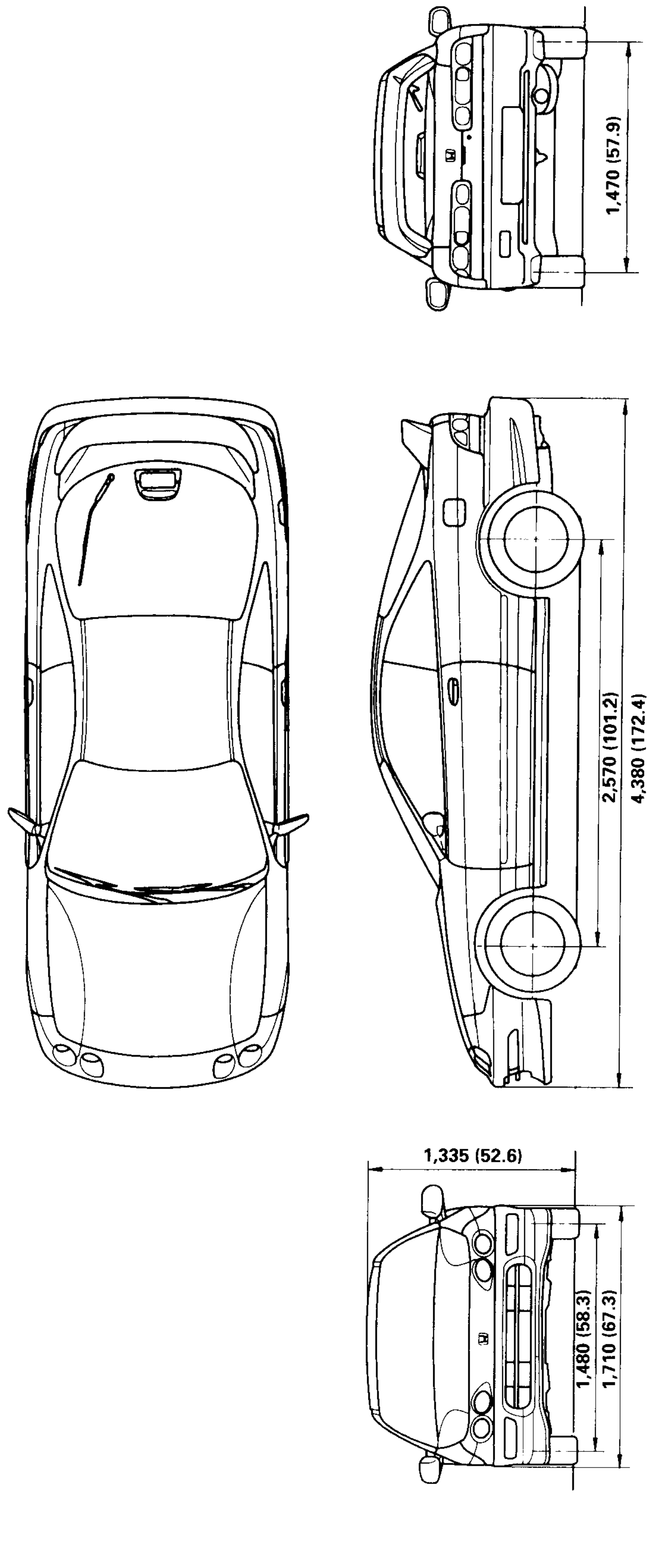
3-door (All except Type R):

Unit: mm (in)



3-door (Type R):

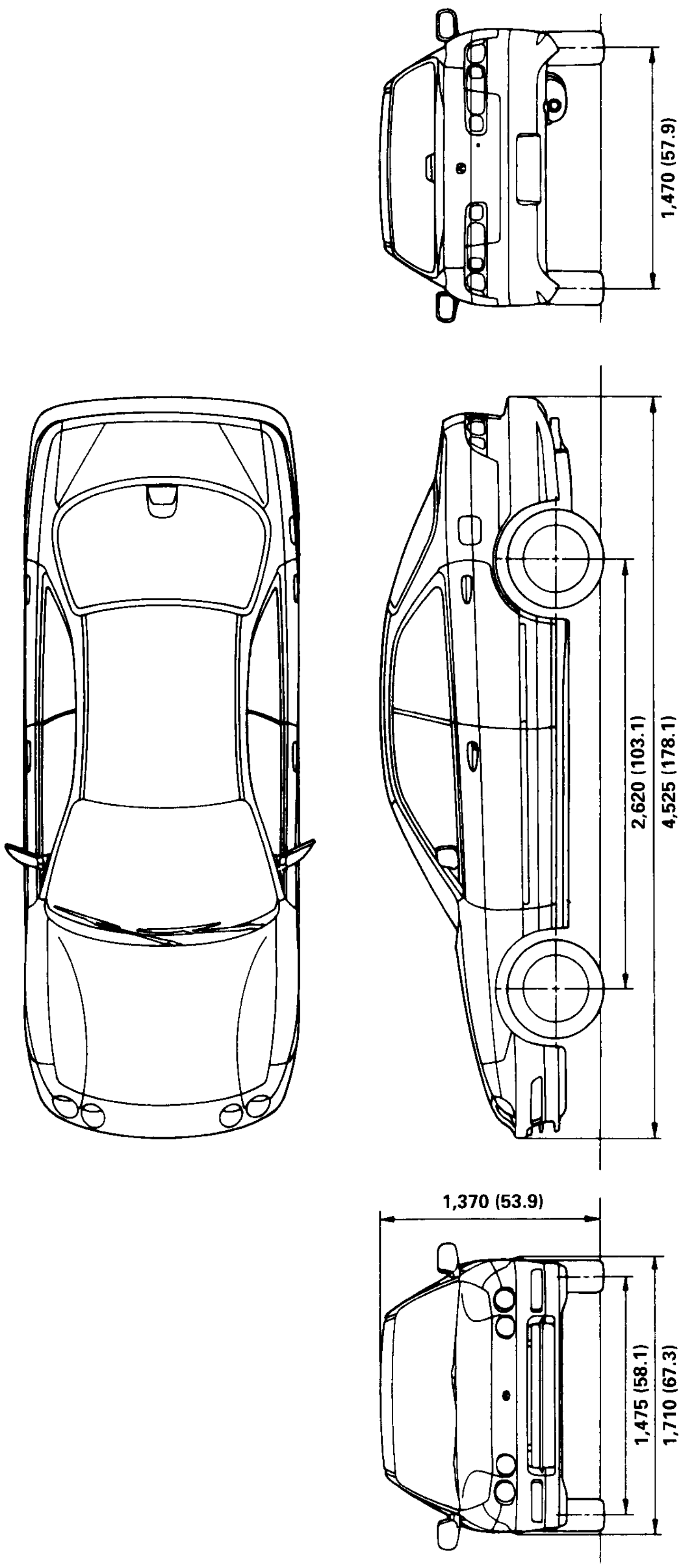
Unit: mm (in)



(cont'd)

4-door:

Unit: mm (in)



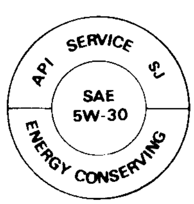
Maintenance

Lubrication Points

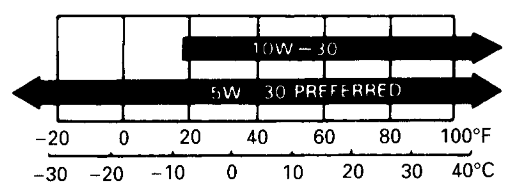
For the details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: Use SJ "Energy Conserving" grade oil. The oil container may also display the API Certification mark shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Manual	Honda Genuine MTF*2
		Automatic	Honda ATF – Z1 (ATF)*2
3	Brake line (Includes Anti-lock brake line)		Genuine Honda DOT3 Brake Fluid*3
4	Clutch line		Genuine Honda DOT3 Brake Fluid*3
5	Power steering gearbox		Steering grease P/N 08733 – B070E
6	Release fork (Manual transmission)		Super High Temp Urea Grease (P/N 08798 – 9002)
7 8	Throttle wire end (Dashboard lower panel hole) Cruise control actuator wire end (Dashboard lower panel hole)		Silicone grease
9 10 11 12 13 14	Throttle cable end (Throttle link) Cruise control actuator cable end (Actuator link) Brake master cylinder pushrod Clutch master cylinder pushrod Battery terminals Fuel fill lid		Multi-purpose grease
15 16 17 18	Engine hood hinges and engine hood latch Hatch hinges and latch or trunk hinges and latch Door hinges, upper and lower Door open detent		Honda White Lithium Grease
19	Rear brake calipers		Silicone grease
20	Power steering system		Genuine Honda Power Steering Fluid*4
21	Air conditioning compressor		Refrigerant oil ND-OIL8 (P/N38897 – PR7 – A01AH or 38899 – PR7 – A01) (For Refrigerant: HFC-134a (R-134a))

API SERVICE LABEL

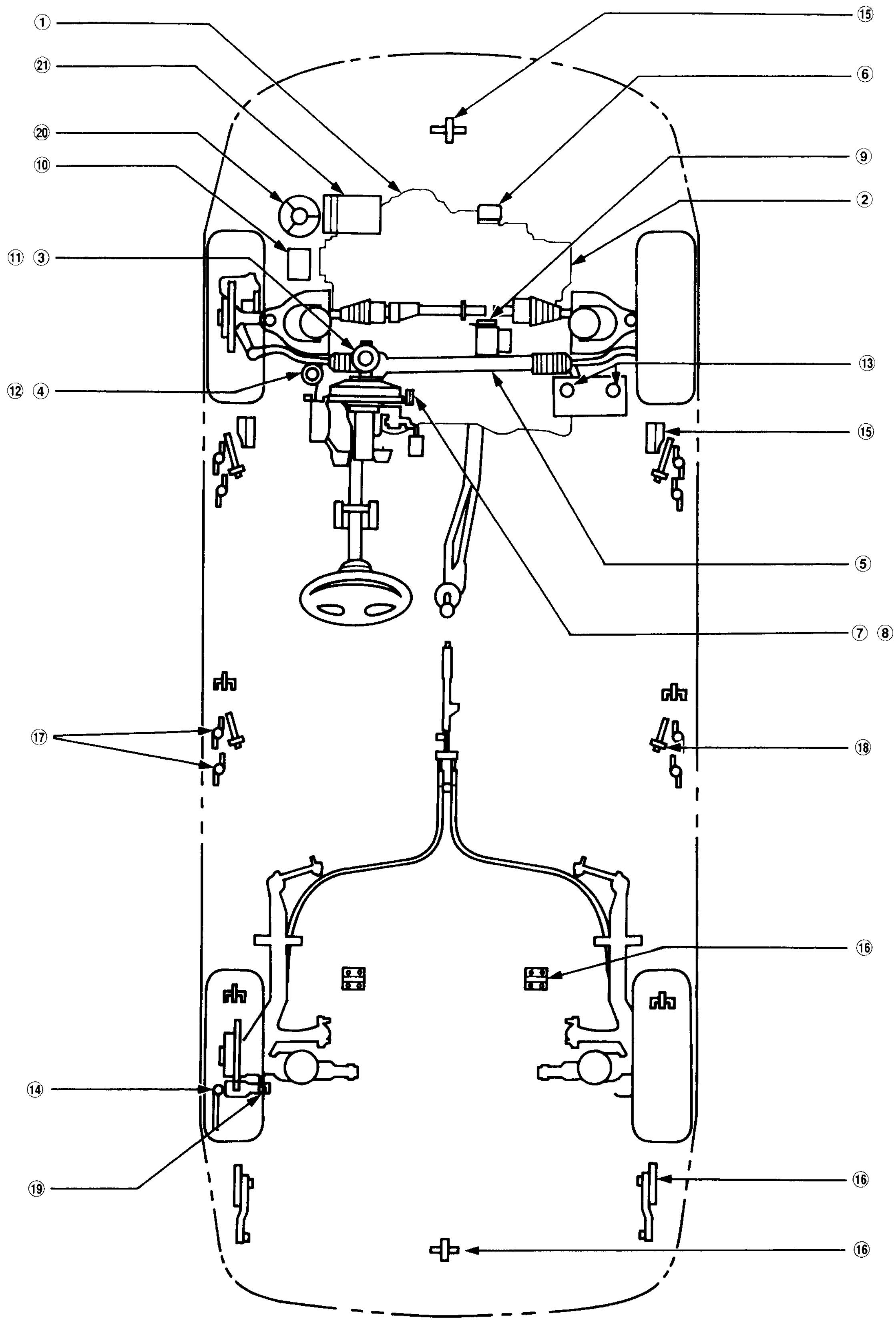


API CERTIFICATION SEAL



Recommended engine oil
Engine oil viscosity for
ambient temperature ranges

*1: Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.
*2: Always use Honda ATF-Z1 (ATF). Using a non-Honda ATF can affect shift quality.
*3: Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
*4: Always use Genuine Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increase wear and poor steering in cold weather.



NOTE: Lubricate all hinges, latches, and locks once a year.
In corrosive areas, more frequent lubrication is necessary.
We recommend Honda White Lithium Grease.

Maintenance Schedule (Normal Conditions)

Follow the Normal Conditions Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 4-6 and 4-7 do not apply.

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil		Every 7,500 miles (12,000 km) or 12 months								Capacity for change with filter: B18B1 engine: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) B18C1, B18C5 engines: 4.0 ℓ (4.2 US qt, 3.5 Imp qt)	8-6, 7*3
Replace engine oil filter		●	●	●	●	●	●	●	●		8-7, 8*3
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-6, 10-6*3
Replace air cleaner element			●		●		●		●		11-129*3
Inspect valve clearance*2		Adjust only if noisy						●		B18B1 engine: Intake 0.08 – 0.12 mm (0.003 – 0.005 in) Exhaust 0.16 – 0.20 mm (0.006 – 0.008 in) B18C1, B18C5 engines: Intake 0.15 – 0.19 mm (0.006 – 0.007 in) Exhaust 0.17 – 0.21 mm (0.007 – 0.008 in) Measured when cold.	6-3, 4, 43, 44*3
Replace spark plugs	LS, RS, GS							●		NGK: PZFR5F-11, DENSO: PKJ16CR-L11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)*1	23-98*3
	GS-R									NGK: PZFR6F-13, DENSO: PKJ20CR-L13 Gap: 1.2 – 1.3 mm (0.047 – 0.051 in)*1	
	Type R									NGK: PZFR6F-11, DENSO: PKJ20CR-L11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)*1	
Replace timing belt and inspect water pump								●			6-10, 11, 48, 49, 10-11*3
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.0 mm (0.35 – 0.43 in) P/S pump belt: 11.5 – 13.5 mm (0.45 – 0.53 in) A/C compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	17-20, 22-36*4, 23-115*3
Inspect idle speed								●		Manual transmission: B18B1, B18C1 engines 750 ± 50 rpm B18C5 engine 800 ± 50 rpm Automatic transmission: 750 ± 50 rpm (in [N] or [P] position)	11-111, 112*3
Replace engine coolant		120,000 miles (192,000 km) or 120 months, thereafter every 60,000 miles (96,000 km) or 60 months								Capacity for change: Manual transmission: B18B1 engine: 4.4 ℓ (4.6 US qt, 3.9 Imp qt) B18C1 engine: 4.7 ℓ (5.0 US qt, 4.1 Imp qt) B18C5 engine 4.5 ℓ (4.8 US qt, 4.0 Imp qt) Automatic transmission: 4.7 ℓ (5.0 US qt, 4.1 Imp qt) Check specific gravity for freezing point.	10-6*3
Replace transmission fluid	M/T	Every 120,000 miles (192,000 km) or 72 months								Manual transmission: Genuine Honda MTF 2.2 ℓ (2.3 US qt, 1.9 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with HONDA ATF – Z1 (ATF)	13-3*4, 14-98*3
	A/T	Replace 120,000 miles (192,000 km) or 72 months, thereafter 90,000 miles (144,000 km) or 60 months									
Inspect front and rear brakes		●	●	●	●	●	●	●	●	• Check the brake pad, disc thickness, and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.	19-4, 8, 10, 11, 12, 16, 18, 19, 20*3
Replace brake fluid		Every 36 months								Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7*3

*1: Do not adjust the gap, replace the spark plug if it is out of standard gap.
*2: Measured between the camshaft and rocker arm.
*3: Refer to Service Manual (98 INTEGRA, P/N 61ST705).
*4: Refer to Service Manual (2000 INTEGRA Supplement, P/N 61ST707).

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 10 clicks.	19-6*1
Rotate tires (Check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram in the Owner's Manual.	——
Visually inspect the following items:										• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	——
Tie-rod ends, steering gear box, and boots		●	●	●	●	●	●	●	●	• Check rack grease and steering linkage. • Check the boot for damage or leaking grease. • Check the fluid line for damage and leaks.	17-19*1
Suspension components											18-8, 26*1
Driveshaft boots										Check boots and boot band for cracks. Check rack grease.	16-3*1
Brake hoses and lines [including ABS]											19-20*1
All fluid levels and condition of fluid										Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, clutch fluid, windshield washer fluid, power steering fluid, and battery fluid.	10-6*2, 13-3*2, 14-98*1
Cooling system hoses and connections										Check all hoses for damage, leaks, or deterioration. Check all hose clamps. Retighten if necessary.	10-2*1
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-7, 8, 9*1
Fuel lines and connections*										Check fuel lines for loose connections, cracks, and deterioration. Retighten loose connections and replace any damaged parts.	11-7*2

*1: Refer to Service Manual (98 INTEGRA, P/N 61ST705).
*2: Refer to Service Manual (2000 INTEGRA Supplement, P/N 61ST707).
According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For Canadian models: Follow the Maintenance Schedule for Severe Conditions on pages 4-6 and 4-7.

Maintenance Schedule (Severe Conditions)

Follow the Severe Conditions Maintenance Schedule if the car is driven in Canada, or MAINLY under one or more of the Severe Driving Conditions (page 4-7):

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil and oil filter		Every 3,750 miles (6,000 km) or 6 months								Capacity for change with filter: B18B1 engine: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) B18C1, B18C5 engines: 4.0 ℓ (4.2 US qt, 3.5 Imp qt)	8-6*4
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-6, 10-6*4
Clean (○) or replace (●) air cleaner element — Use normal schedule except in dusty condition		○	●	○	●	○	●	○	●		11-129*4
Inspect valve clearance*2		Adjust only if noisy						●		B18B1 engine: Intake 0.08 – 0.12 mm (0.003 – 0.005 in) Exhaust 0.16 – 0.20 mm (0.006 – 0.008 in) B18C1, B18C5 engines: Intake 0.15 – 0.19 mm (0.006 – 0.007 in) Exhaust 0.17 – 0.21 mm (0.007 – 0.008 in) Measured when cold	6-3, 4, 43, 44*4
Replace spark plugs	LS, RS, GS							●		NGK: PZFR5F-11, DENSO: PKJ16CR-L11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)*1	23-98*4
	GS-R									NGK: PZFR6F-13, DENSO: PKJ20CR-L13 Gap: 1.2 – 1.3 mm (0.047 – 0.051 in)*1	
	Type R									NGK: PZFR6F-11, DENSO: PKJ20CR-L11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)*1	
Replace timing belt*3 and inspect water pump								●			6-10, 11, 48, 49, 10-11*4
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.0 mm (0.35 – 0.43 in) P/S pump belt: 11.5 – 13.5 mm (0.45 – 0.53 in) A/C Compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	17-20*5, 22-36*5, 23-115*4
Inspect idle speed								●		Manual transmission: B18B1, B18C1 engines 750 ± 50 rpm B18C5 engine 800 ± 50 Automatic transmission: 750 ± 50 rpm (in N or P position)	11-111, 112*4
Replace engine coolant		120,000 miles (192,000 km) or 120 months, thereafter every 60,000 miles (96,000 km) or 60 months								Capacity for change: Manual transmission: B18B1 engine 4.4 ℓ (4.6 US qt, 3.9 Imp qt) B18C1 engine 4.7 ℓ (5.0 US qt, 4.1 Imp qt) B18C5 engine 4.5 ℓ (4.8 US qt, 4.0 Imp qt) Automatic transmission: 4.7 ℓ (5.0 US qt, 4.0 Imp qt) Check specific gravity for freezing point.	10-6*4
Replace transmission fluid	M/T	Every 60,000 miles (96,000 km) or 36 months								Manual transmission: Genuine Honda MTF 2.2 ℓ (2.3 US qt, 1.9 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Honda ATF-Z1(ATF)	13-3*5, 14-98*4
	A/T	Replace 60,000 miles (96,000 km) or 36 months, thereafter 30,000 miles (48,000 km) or 24 months									
Inspect front and rear brakes		Every 7,500 miles (12,000 km) or 6 months								• Check the brake pad, disc thickness, and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.	19-4, 8, 10, 11, 12, 16, 18, 19, 20*4

*1: Do not adjust the gap, replace the spark plug if it is out of standard gap.
*2: Measured between the camshaft and rocker arm.
*3: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:
- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under −20°F, −29°C).

*4: Refer to Service Manual (98 INTEGRA, P/N 61ST705).
*5: Refer to Service Manual (2000 INTEGRA Supplement, P/N 61ST707).

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace brake fluid		Every 36 months								Use Genuine Honda DOT 3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7*1
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 10 clicks.	19-6*1
Lubricate locks and hinges		●	●	●	●	●	●	●	●	Lubricate all hinges, latches and locks	4-2, 3*1
Clean antenna mast		●	●	●	●	●	●	●	●	Clean antenna mast and check the movement	23-203*1
Rotate tires (check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram in the Owner's Manual.	——
Visually inspect the following items:										• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	——
Tie rod ends, steering gear box, and boots		Every 7,500 miles (12,000 km) or 6 months								• Check rack grease and steering linkage. • Check the boot for damage or leaking grease. • Check the fluid line for damage and leaks.	17-19*1
Suspension components											18-8, 26*1
Driveshaft boots										Check boots and boot band for cracks. Check rack grease.	16-3*1
Brake hoses and lines [including ABS]		●	●	●	●	●	●	●	●		19-20*1
All fluid levels and condition of fluid										Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, clutch fluid, windshield washer fluid, power steering fluid, and battery fluid.	10-6*2, 13-3*2, 14-98*1
Cooling system hoses and connections										Check all hoses for damage, leaks or, deterioration. Check all hose clamps. Retighten if necessary.	10-2*1
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-7, 8, 9*1
Fuel lines and connections*										Check fuel lines for loose connections, cracks, and deterioration. Retighten loose connections and replace any damaged parts.	11-7*2
Lights and controls										Check all lights functions and headlight position.	23-170*1
Vehicle underbody										Check the paint for damages, scratches, stone chipping, and dents.	——

*1: Refer to Service Manual (98 INTEGRA, P/N 61ST705).
*2: Refer to Service Manual (2000 INTEGRA Supplement, P/N 61ST707).
According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

Severe Driving Conditions:
- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule on pages 4-4 and 4-5

Cooling

Radiator

NOTE: Refer to the '98 INTEGRA Service Manual, P/N 61ST705, for the items not shown in this section.

Outline of Model Change

Engine coolant has been changed.

Radiator

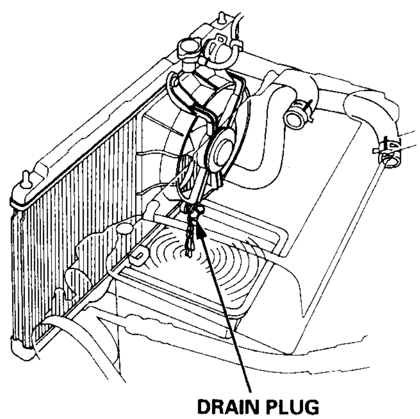
Engine Coolant Refilling and Bleeding

CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

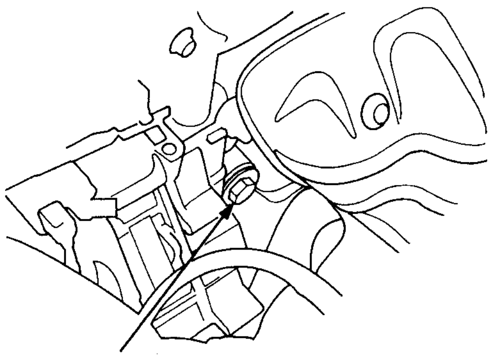
1. Slide the heater temperature control lever to maximum heat.
   Make sure the engine and radiator are cool to the touch.

2. Remove the radiator cap.

3. Loosen the drain plug, and drain the coolant.



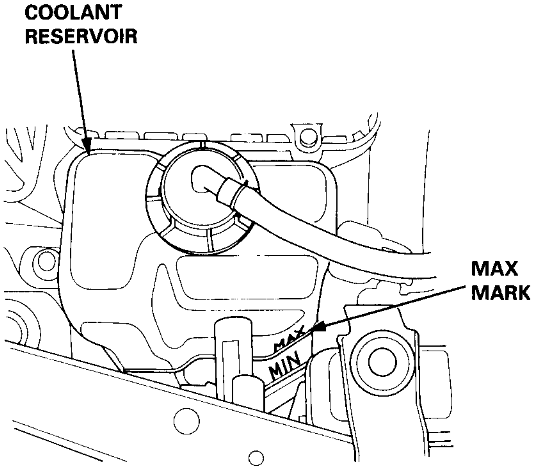
4. Remove the drain bolt from the cylinder block.



5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.

6. Tighten the radiator drain plug securely.

7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with Honda All Season Antifreeze/Coolant Type 2.



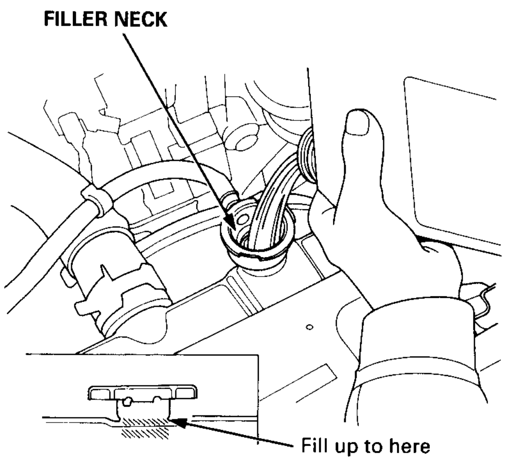
8. Pour Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

NOTE:
- Always use Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Premixing is not required.

Engine Coolant Refill Capacity [including reservoir (0.6 ℓ (0.6 US qt, 0.5 Imp qt))]:

B18B1 engine:
M/T: 4.4 ℓ (4.6 US qt, 3.9 Imp qt)
B18B1, B18C1 engines:
A/T: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)

B18C1, B18C5 engines:
M/T: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)

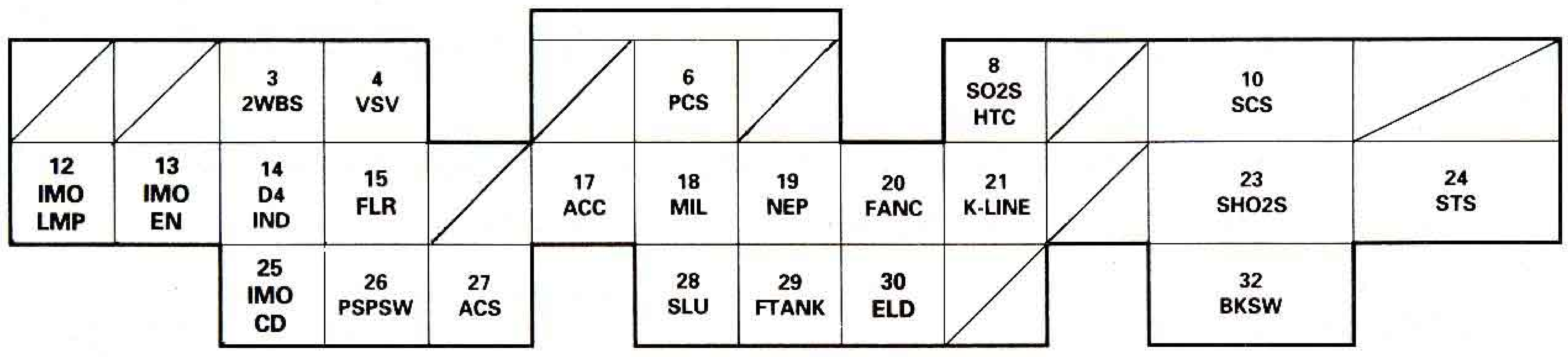


9. Install the radiator cap loosely.
10. Install the battery.
11. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).
12. Turn off the engine. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2 if needed.
13. Put the radiator cap on tightly, then run the engine again and check for leaks.

00 ITR ECU PLUG A (a-c)

Engine/Powertrain Control Module Terminal Arrangement

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

ECM/PCM CONNECTOR A (32P)

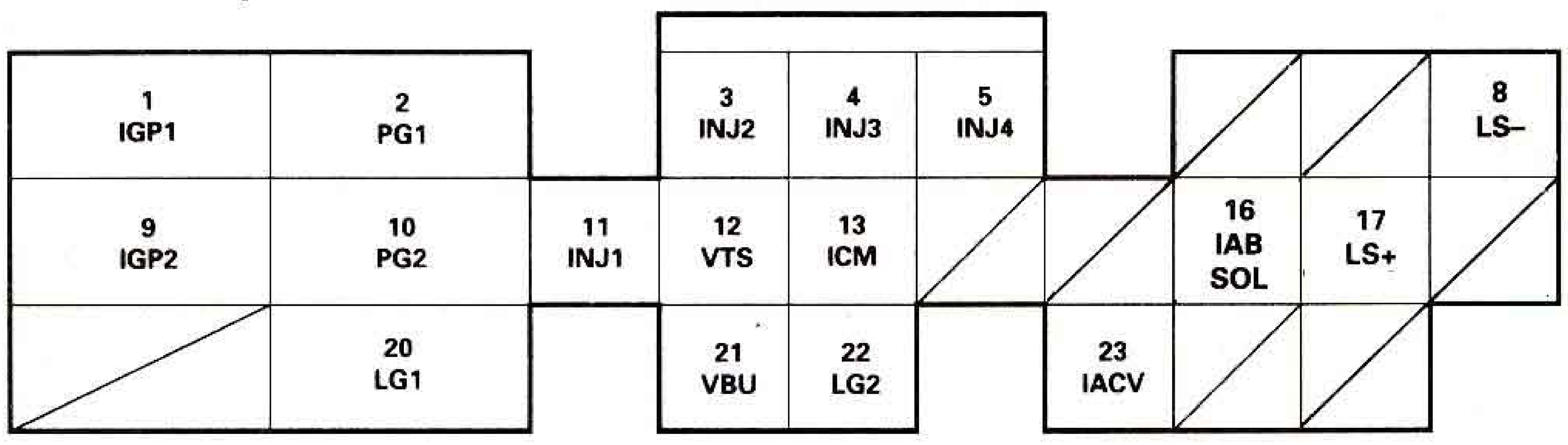
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
3	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve.	With ignition switch ON (II): battery voltage
4	LT GRN	VSV (EVAP CONTROL CANISTER VENT SHUT VALVE)	Drives EVAP control canister vent shut valve.	With ignition switch ON (II): battery voltage
6	RED	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant, below 154°F (68°C): battery voltage With engine running, engine coolant, above 154°F (68°C): duty controlled
8	GRN/RED	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
10	BRN/WHT	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0 V With the terminal disconnected: about 5 V or battery voltage
12	PNK	IMOLMP (IMMOBILIZER INDICATOR LIGHT)	Drives immobilizer indicator light.	With immobilizer indicator light turned ON: 0 V With immobilizer indicator light turned OFF: battery voltage
13	BLU	IMOEN (IMMOBILIZER ENABLE SIGNAL)	Sands immobilizer enable signal.	
14*3	GRN/BLK	D4IND (D4 INDICATOR)	Drives D4 indicator light.	With D4 indicator light turned ON: 0 V With D4 indicator light turned OFF: battery voltage
15	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	BLK/RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
20*1	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay.	With radiator fan running: 0 V With radiator fan stopped: battery voltage
21	GRN/WHT	K-LINE	Sends and receives scan tool signal.	With ignition switch ON (II): pulses
23	BLU/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
24	BLU/WHT	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: 0 V
25	RED	INOCD (IMMOBILIZER CODE)	Detects Immobilizer signal.	
26*1	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: about 5 V
28*3	WHT/RED	SLU (INTERLOCK CONTROL UNIT)	Drives interlock control unit.	With ignition switch ON (II) and brake pedal depressed: battery voltage
29	LT GRN	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor signal.	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30*1	GRN/RED	ELD (Electrical Load Detector)	Detects ELD signal.	With parking lights turned on at idle: about 2.5 – 3.5 V With low beam headlights turned on at idle: about 1.5 – 2.5 V
32	GRN/WHT	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage

*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

00 ITR ECU PLUG B (a-c)

ECM/PCM CONNECTOR B (25P)



Wire side of female terminals

PCM CONNECTOR B (25P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
3	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	With engine running: duty controlled
4	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector.	
5	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	
8*3	WHT/GRN	LS – (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE – SIDE)	A/T clutch pressure control solenoid valve power supply negative electrode.	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than at all times
11	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	With engine running: duty controlled
12*4	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: 0 V With engine at high rpm: battery voltage
13	YEL/GRN	ICM (IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): battery voltage With engine running: pulses
16*2	PNK/BLU	IAB SOL (INTAKE AIR BYPASS CONTROL SOLENOID VALVE)	Drives IAB control solenoid valve.	With engine running, engine speed below 5,750 rpm: battery voltage With engine running, engine speed above 5,750 rpm: 0 V
17*3	RED/BLU	LS + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE + SIDE)	A/T clutch pressure control solenoid valve power supply positive electrode	With ignition switch ON (II): duty controlled
20	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
21	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM/PCM control circuit. Power source for the DTC memory.	Battery voltage at this times
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
23	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: duty controlled

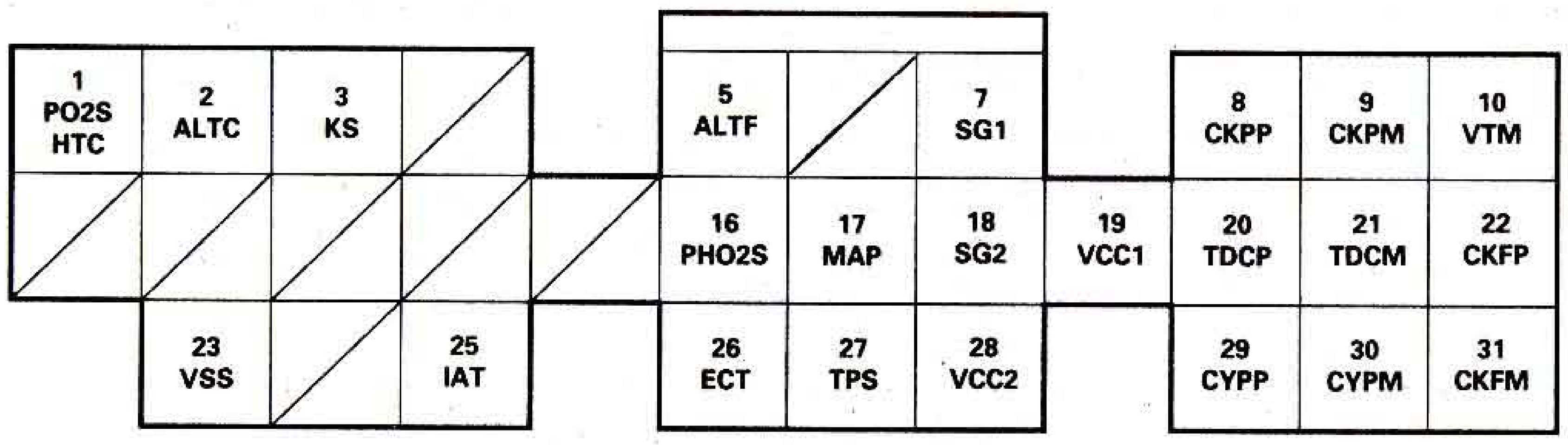
*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

(cont'd)

00 ITR ECU PLUG C (a-c)

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

ECM/PCM CONNECTOR C (31P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BRN/BLK	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2*1	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal.	With fully warmed – up engine running: battery voltage During driving with small electrical load: 0 V
3	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine knocking: pulses
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V – battery voltage (depending on electrical load)
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
9	BLU/YEL	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor.	
10*4	BLU/BLK	VTM (VTEC PRESSURE SWITCH SIGNAL)	Detects VTEC pressure switch signal.	With engine at low engine speed: 0 V With engine at high engine speed : battery voltage
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) signal.	With throttle fully opened from idle with fully, warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	WHT/YEL	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/BLU	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
20	GRN	TDCP (TDC SENSOR P SIDE)	Detects TDC sensor.	With engine running: pulses
21	WHT/BLU	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor.	
22	BLU/RED	CKFP (CKF SENSOR P SIDE)	Detects CKF sensor.	With engine running: pulses
23	ORN	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheel rotating: cycles 0 V – about 5 V or battery voltage
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
29	YEL	CYPP (CYP SENSOR P SIDE)	Detects CYP sensor.	With engine running: pluses
30	WHT	CYPM (CYP SENSOR M SIDE)	Ground for CYP sensor.	
31	WHT/RED	CKFM (CKF SENSOR M SIDE)	Ground for CKF sensor signal.	

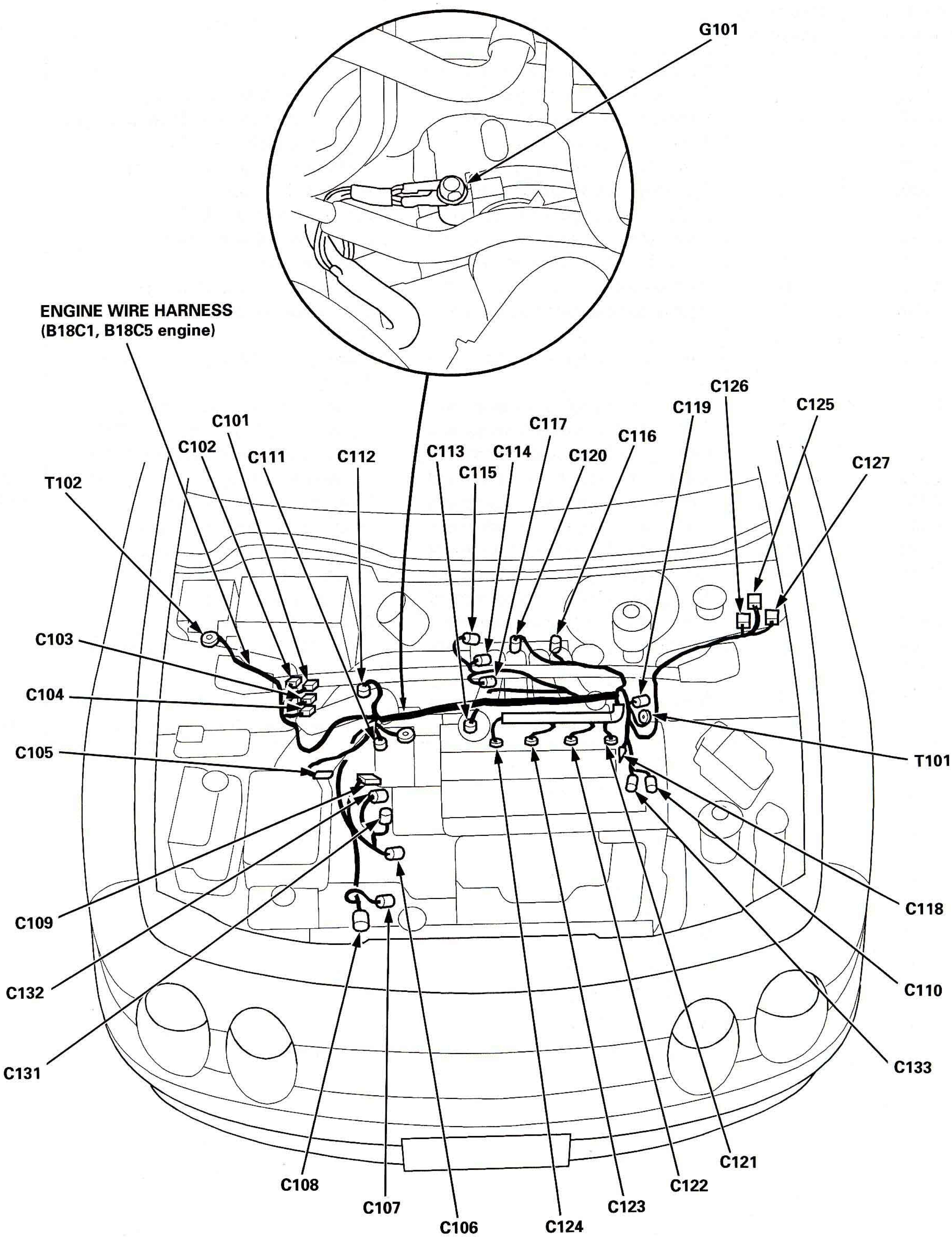
*1: USA
*2: B18C1 engine
*3: A/T
*4: B18C1, B18C5 engines

00 ITR Engine Harness 1/2

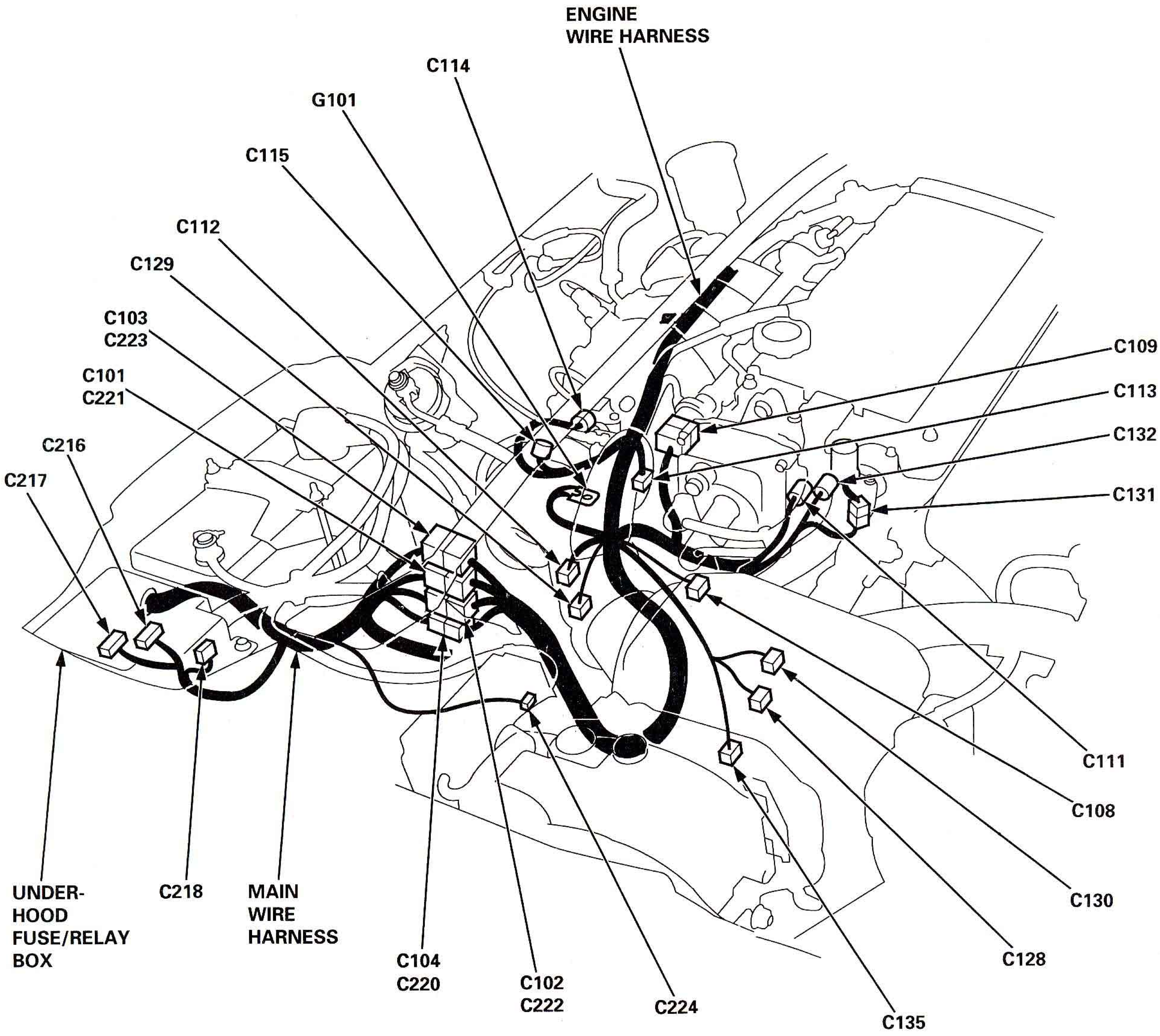
Engine Wire Harness (B18C1, B18C5 engine)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C101	4	Right side of engine compartment	Main wire harness (C221)	
C102	10	Right side of engine compartment	Main wire harness (C222)	
C103	14	Right side of engine compartment	Main wire harness (C223)	
C104	3	Right side of engine compartment	Main wire harness (C220)	
C105	1	Right side of engine compartment	Starter solenoid	
C106	2	Right side of engine	Engine coolant temperature (ECT) sensor	
C107	1	Right side of engine	Engine coolant temperature (ECT) gauge sending unit	
C108	2	Transmission	Back-up light switch	
C109	10	Middle of engine	Distributor	
C110	2	Middle of engine	Crankshaft speed fluctuation (CKF) sensor	
C111	2	Right side of engine	Engine coolant temperature (ECT) switch	
C112	3	Right side of engine compartment	Vehicle speed sensor (VSS)	
C113	4	Middle rear of engine compartment	Primary HO2S	
C114	3	Middle of engine	MAP sensor	
C115	3	Middle of engine	Throttle position (TP) sensor	
C116	2	Middle of engine	Idle air control (IAC) valve	
C117	2	Middle of engine	EVAP purge control solenoid valve	
C118	1	Middle of engine	Engine oil pressure switch	
C119	4	Left side of engine	Alternator	USA
C119	3	Left side of engine	Alternator	Canada
C120	2	Middle of engine	Intake air temperature (IAT) sensor	
C121	2	Middle of engine	No. 1 fuel injector	
C122	2	Middle of engine	No. 2 fuel injector	
C123	2	Middle of engine	No. 3 fuel injector	
C124	2	Middle of engine	No. 4 fuel injector	
C125	8	Left side of engine compartment	Junction connector	
C126	2	Left side of engine compartment	Engine compartment wire harness (C304)	
C127	14	Left side of engine compartment	Engine compartment wire harness (C305)	
C131	1	Right side of engine	VTEC solenoid valve	
C132	2	Right side of engine	VTEC oil pressure switch	
C133	2	Middle of engine	Knock sensor (KS)	
T101		Left side of engine	Alternator	
T102		Right side of engine compartment	Under-hood fuse/relay box	
G101		Right side of engine	Engine ground, via engine wire harness	

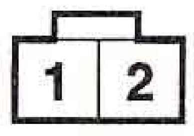
00 ITR Engine Harness 2/2



00 ITR Engine Harness Plugs 1/4

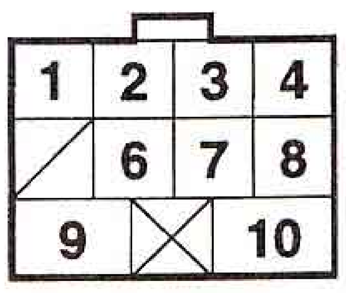


C108 (A/T)



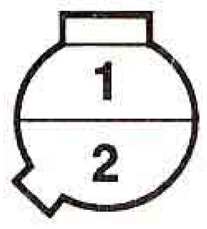
①	GRN/BLK[2]
②	YEL[3]

C109



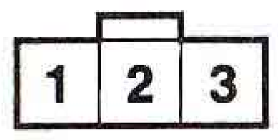
①	YEL/GRN	⑥	WHT
②	BLU[5]	⑦	RED
③	GRN[3]	⑧	BLK
④	YEL[2]	⑨	BLU
5	——	10	BLK/YEL

C111



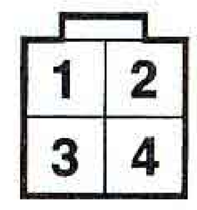
①	RED/WHT
②	GRN/BLK

C112



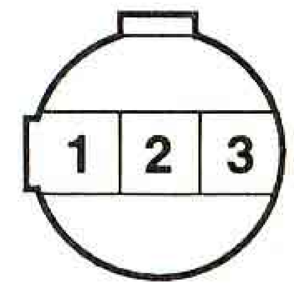
①	BLK[1]
②	BLK/YEL
③	BLU/WHT

C113



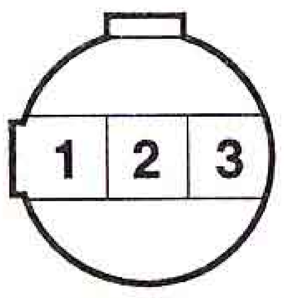
①	WHT[1]
②	GRN/BLK
③	YEL/BLK[1]
④	BLK/WHT

C114



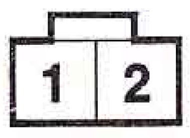
①	YEL/RED
②	GRN/WHT[3]
③	RED/GRN

C115



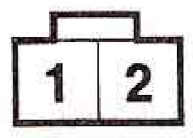
①	GRN/BLK
②	RED/BLK
③	YEL/BLU

C128 (A/T)



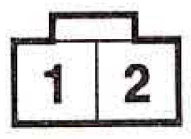
①	BLU/YEL[2]
②	GRN/WHT[4]

C129 (A/T)



①	GRN[4]
②	BLU[6]

C130 (A/T)

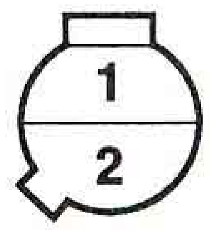


①	WHT[3]
②	RED[4]

C131

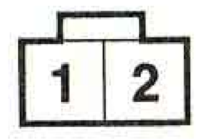
①	GRN/YEL[2]

C132



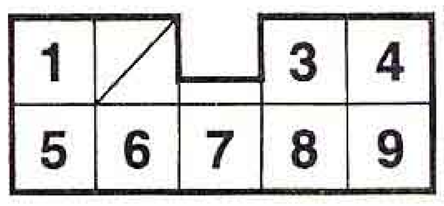
①	BLU/BLK
②	BLK[1]

C135 (A/T)



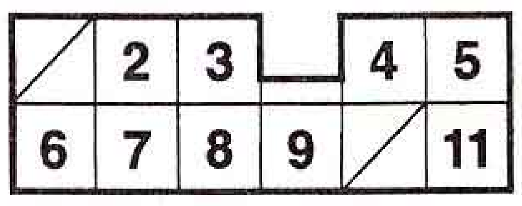
①	WHT
②	RED

C216



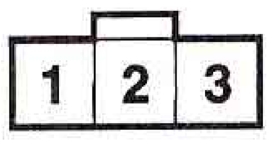
1	GRN	6	BLK/YEL
2	——	7	WHT/GRN
③	WHT/GRN	⑧	WHT/GRN
④	WHT/BLK	9	WHT
5	BLK/RED		

C217



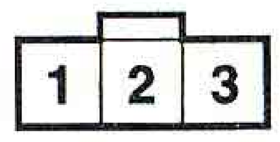
1	——	⑦	YEL/WHT
2	WHT/BLU	⑧	WHT/BLU[1]
3	WHT/GRN	9	WHT
4	BLK	10	——
5	WHT/RED	11	BLU/WHT
⑥	WHT/RED		

C218



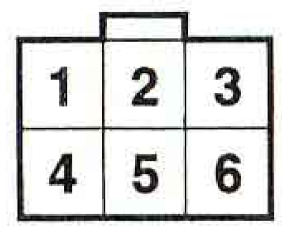
①	BLK/YEL
②	BLK
③	GRN/RED[2]

C220
(B18C1 engine)



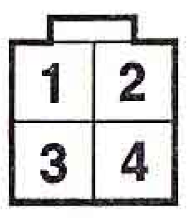
①	RED[1]
②	BLU/RED[3]
③	WHT/RED[3]

C220 (A/T)



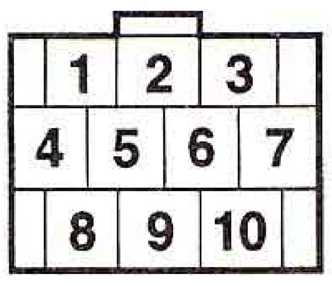
①	RED[4]
②	WHT[3]
③	GRN/WHT[4]
④	GRN[4]
⑤	BLU[6]
⑥	BLU/YEL[2]

C221



①	RED[3]
②	BRN
③	YEL[1]
④	BLU[4]

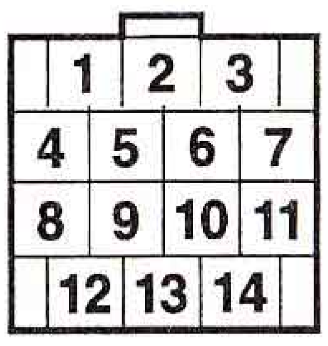
C222



①	BRN/BLK[2]	⑥	GRN[3]
②	WHT[1]	⑦	WHT/BLU[2]
③	BRN/BLK[1]	⑧	BLU[5]
④	YEL[2]	⑨	BLU/YEL[1]
⑤	WHT[2]	⑩	RED/BLU[2]* RED/BLU[1]*[1]

*: B18C1,B18C5 engines
*1: A/T

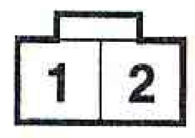
C223



①	WHT/GRN[2]	⑧	RED/BLK
②	ORN/BLK	⑨	GRN/BLU[1]
③	GRN/YEL[2] BLU/RED[3]*	⑩	YEL/BLU
④	GRN/WHT[3]	⑪	YEL/GRN
⑤	WHT/YEL	⑫	RED/YEL
⑥	YEL/WHT	⑬	RED/WHT
⑦	BLU/BLK WHT/RED[3]*	⑭	WHT/RED[2]

*: B18B1 engine

C224

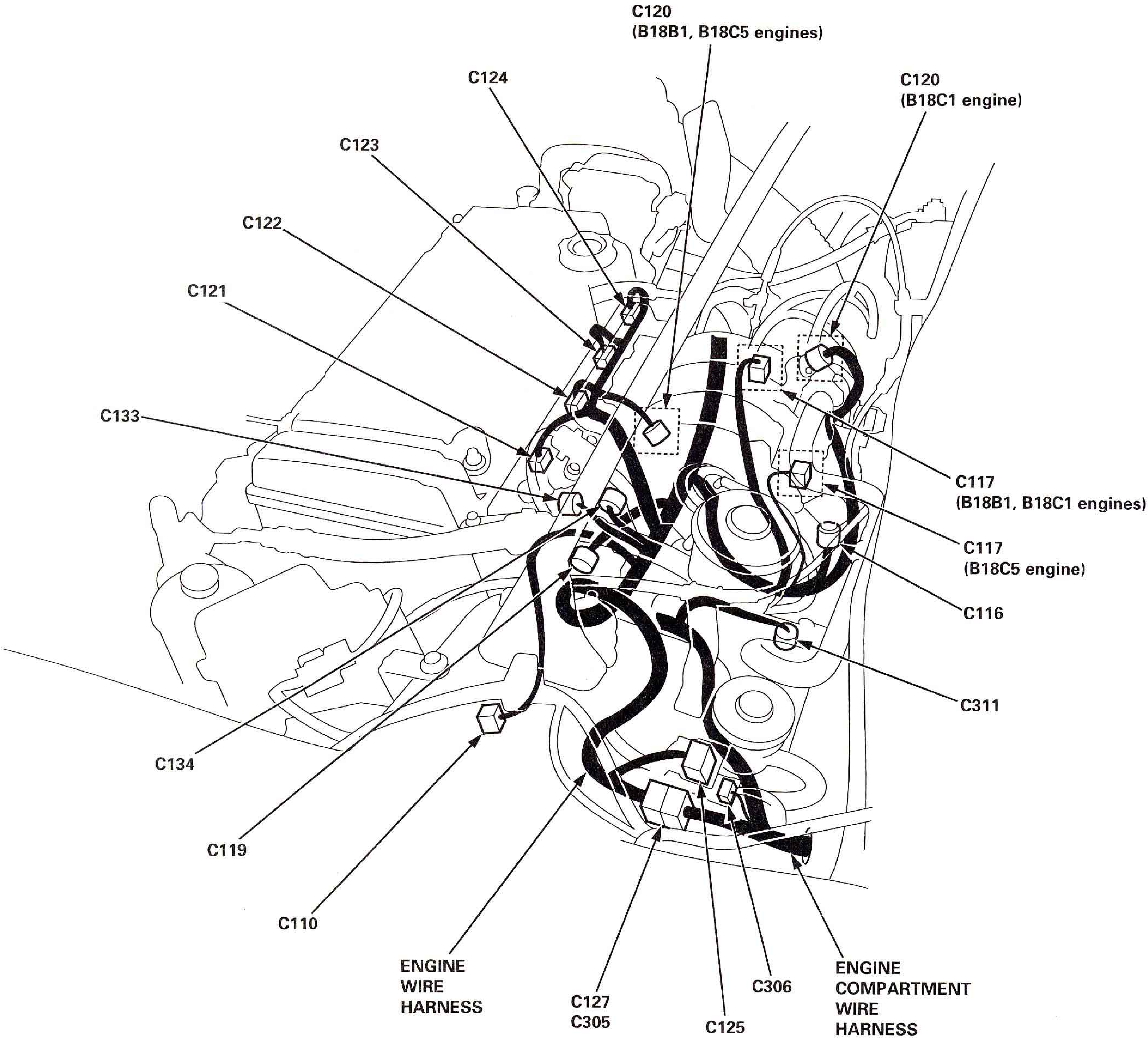


①	LT GRN[1]
②	BLK/YEL

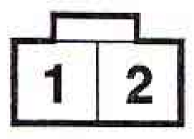
NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side

(cont'd)

00 ITR Engine Harness Plugs 3/4

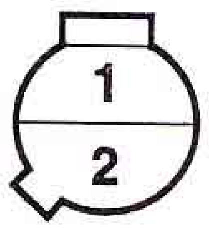


C110



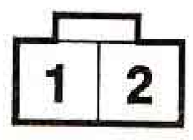
①	BLU/RED[3]
②	WHT/RED[3]

C116



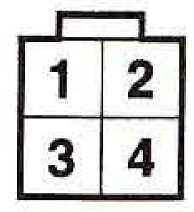
①	BLK/BLU
②	YEL/BLK[1]

C117



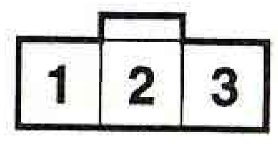
①	YEL/BLK[3]
②	RED/YEL

C119 (USA)



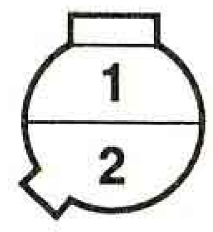
1	BLK/YEL
②	WHT/GRN[2]
3	WHT/BLU
④	WHT/RED[2]

C119 (CANADA)



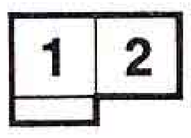
①	WHT/RED[2]
2	BLK/YEL
3	WHT/BLU

C120



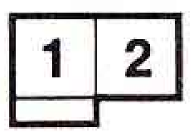
①	GRN/BLK
②	RED/YEL

C121



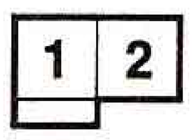
①	BRN
②	YEL/BLK[1]

C122



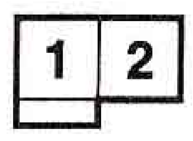
①	RED[3]
②	YEL/BLK[1]

C123



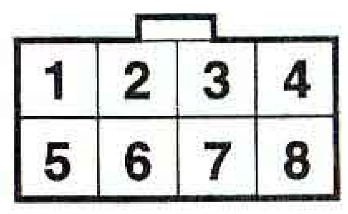
①	BLU[4]
②	YEL/BLK[1]

C124



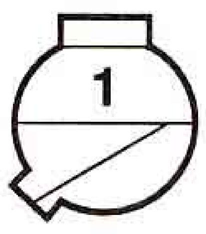
①	YEL[1]
②	YEL/BLK[1]

C125



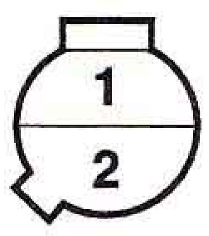
①	YEL/BLK[3]	⑤	YEL/BLK[1]
②	YEL/BLK[1]	⑥	YEL/BLK[1]
③	YEL/BLK[3]	⑦	YEL/BLK[1]
④	YEL/BLK[1]	⑧	YEL/BLK[1]

C133



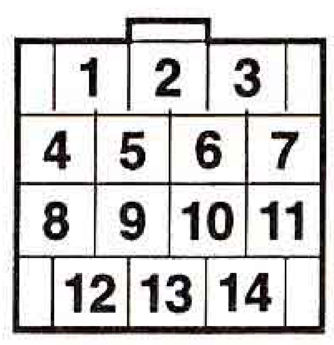
①	RED/BLU[2]
2	—

C134 (B18C1 engine)



①	RED/BLU
②	BLK/YEL

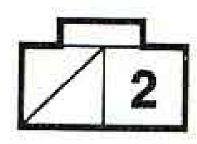
C305



1	BLK/YEL	8	YEL/RED
2	WHT/BLU	9	GRN
③	RED[1] RED*	⑩	BLK[1]
		11	YEL/GRN
④	BLK/BLU	⑫	YEL/BLK[1]
⑤	BLK/YEL	13	GRN/BLK
⑥	ORN	14	YEL
⑦	WHT/GRN[1]*1		

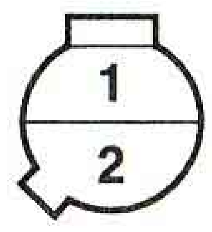
*: B18C1 engine
*1: A/T

C306



1	—
②	BLU[3]

C311



①	GRN[2]
②	BLK

NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example,YEL/BLK[1] and YEL/BLK[2] are not the same).
  ○: Related to Fuel and Emissions System.
- — Connector of male terminals: View from terminal side
  — Connector of female terminals: View from wire side