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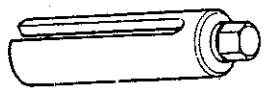
Special Tools

Ref.No.	Tool Number	Description	Q'ty	Remarks
①	07LAA–PT50100	Oxygen Sensor Socket Wrench	1	
②	07LAJ–PT30100 or 07LAJ–PT3010A	Test Harness	1	
③	07406–0040001	Fuel Pressure Gauge Set	1	
③-1	07406–0040100	Pressure Gauge	(1)	Component Tools
③-2	07406–0040201	Hose Assy	(1)	
④	07411–0020000	Digital Circuit Tester	1	



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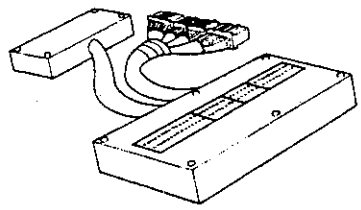

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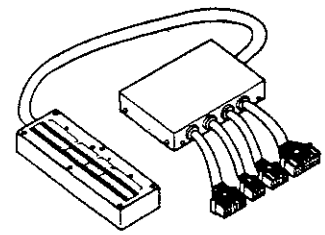

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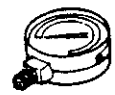
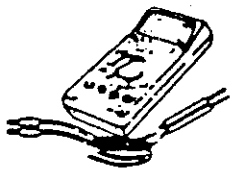


③-1

③-2



④

Component Locations

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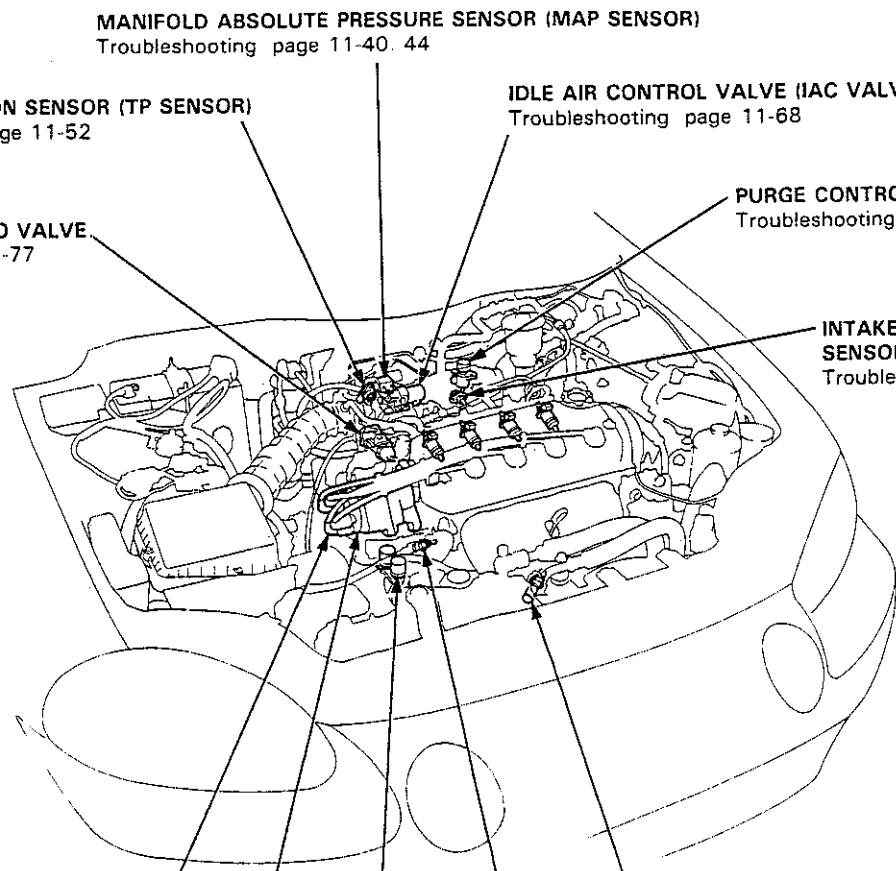
D16Z6, D16Z7 engine:



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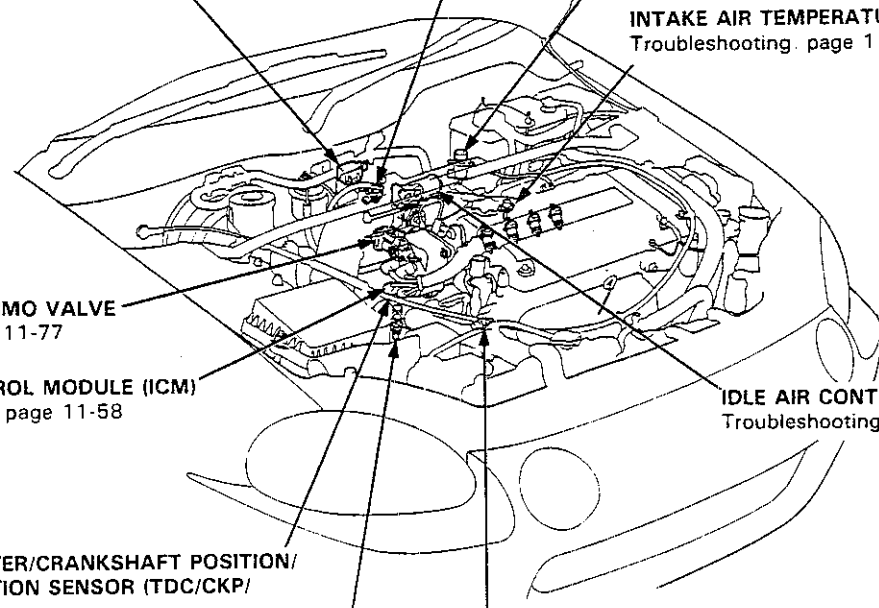
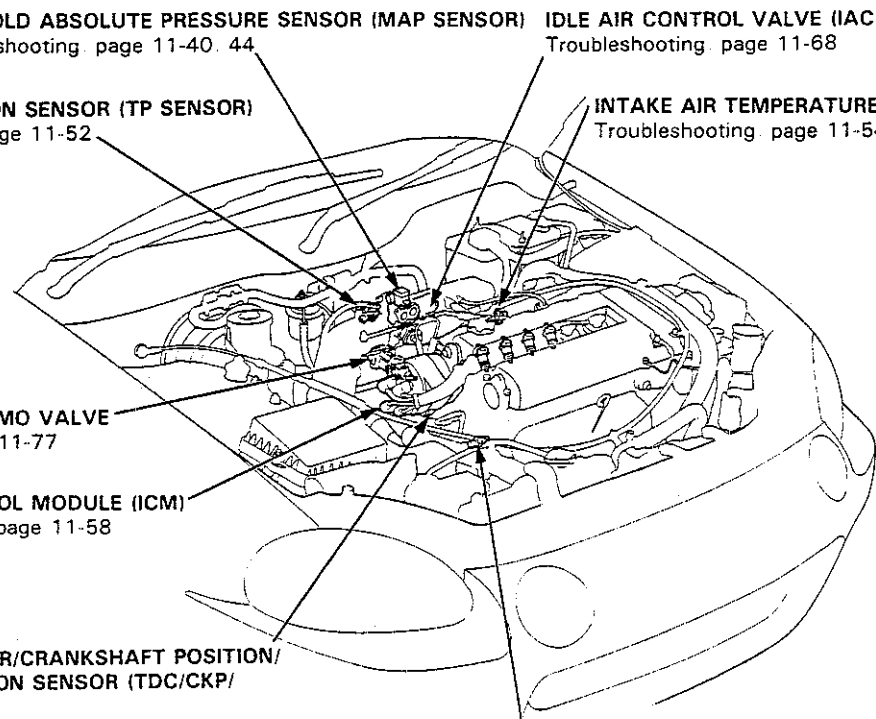
B16A2 engine:



D16A9 engine:



Component Locations

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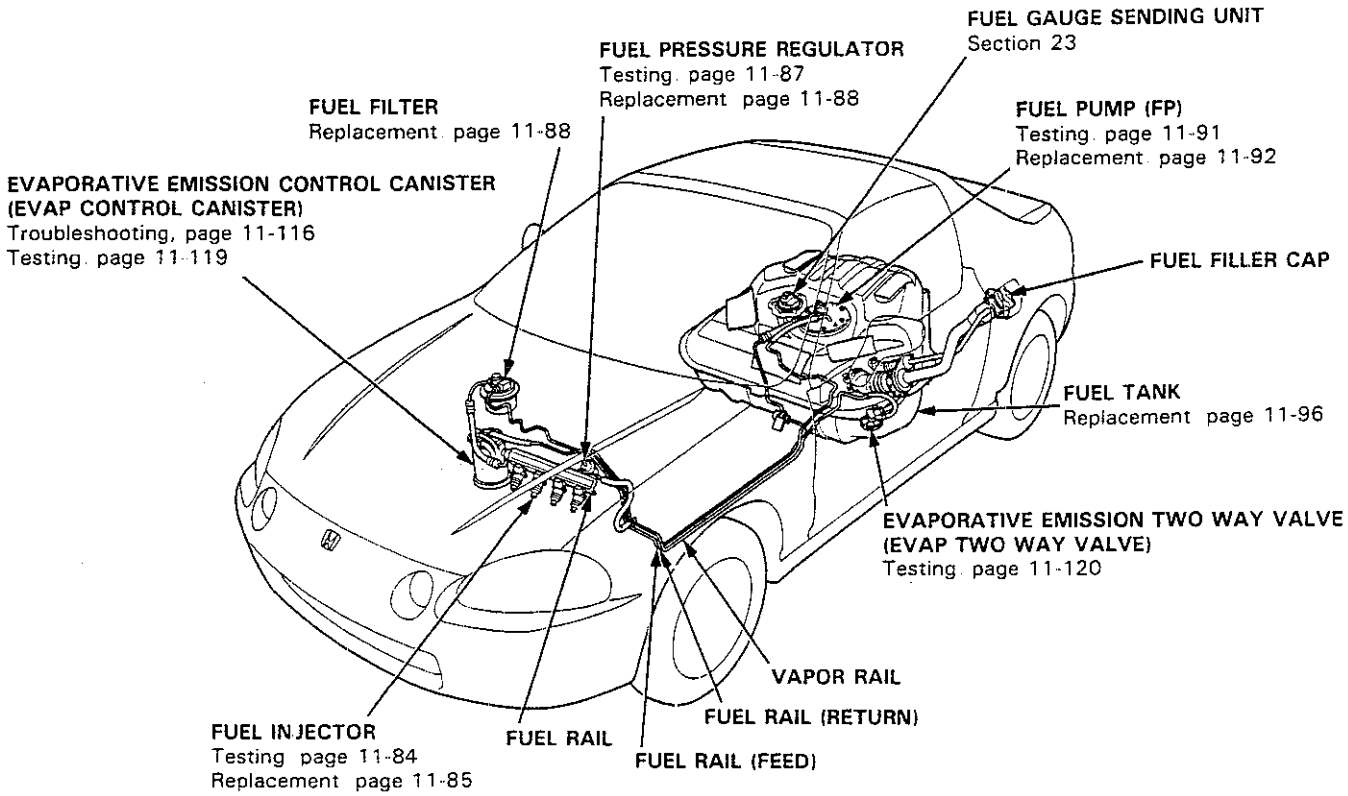

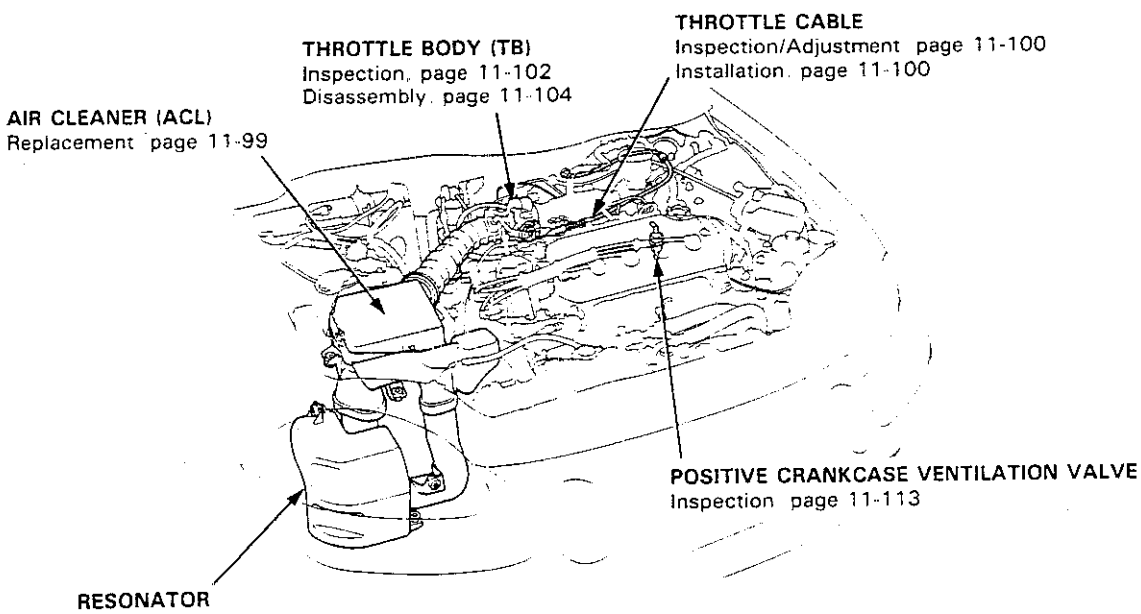

LHD:

SERVICE CHECK CONNECTOR (2P)
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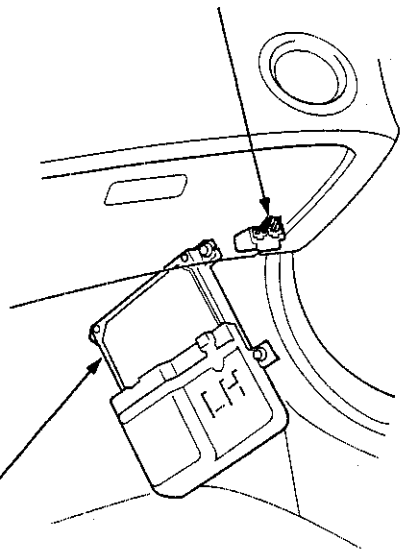

ENGINE CONTROL MODULE (ECM)
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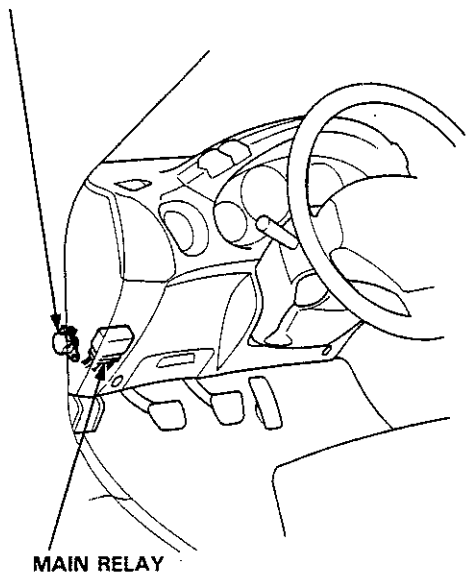
Troubleshooting page 11-29

IDLE MIXTURE ADJUSTER (IMA) [D16A9 engine]
Troubleshooting page 11-56



MAIN RELAY
Relay Testing, page 11-93
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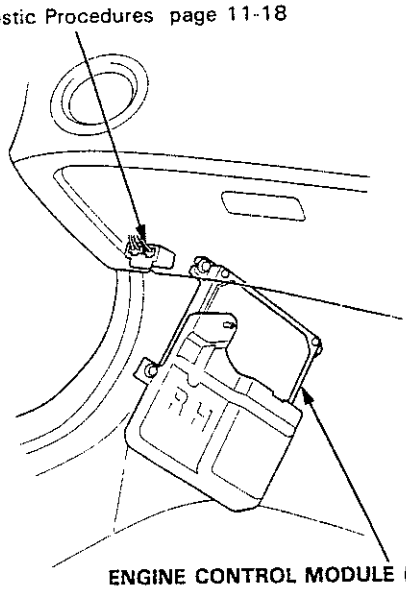
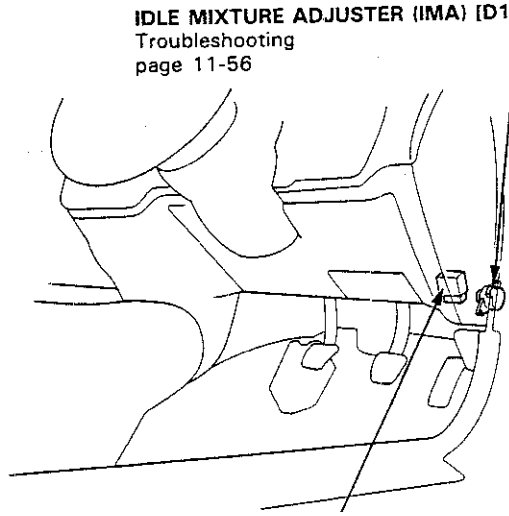
RHD:

SERVICE CHECK CONNECTOR (2P)
Self-diagnostic Procedures page 11-18



ENGINE CONTROL MODULE (ECM)
Self-diagnostic Procedures, page 11-18
Troubleshooting page 11-29

IDLE MIXTURE ADJUSTER (IMA) [D16A9 engine]
Troubleshooting
page 11-56



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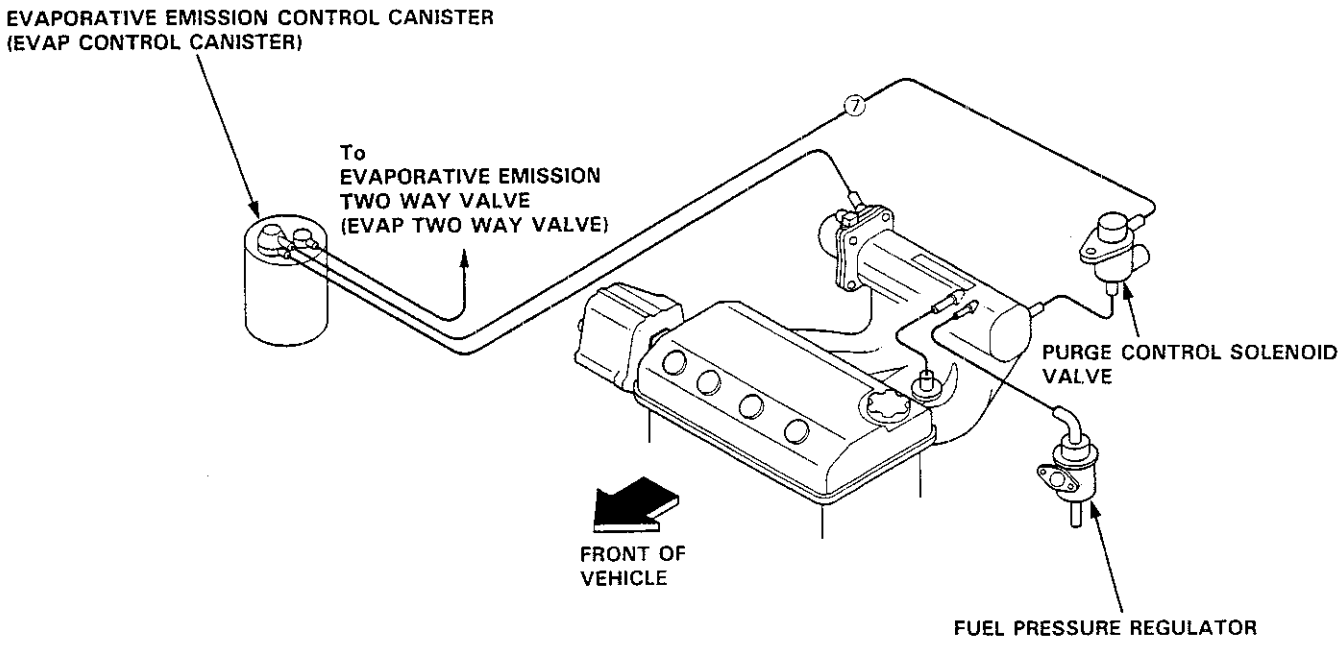
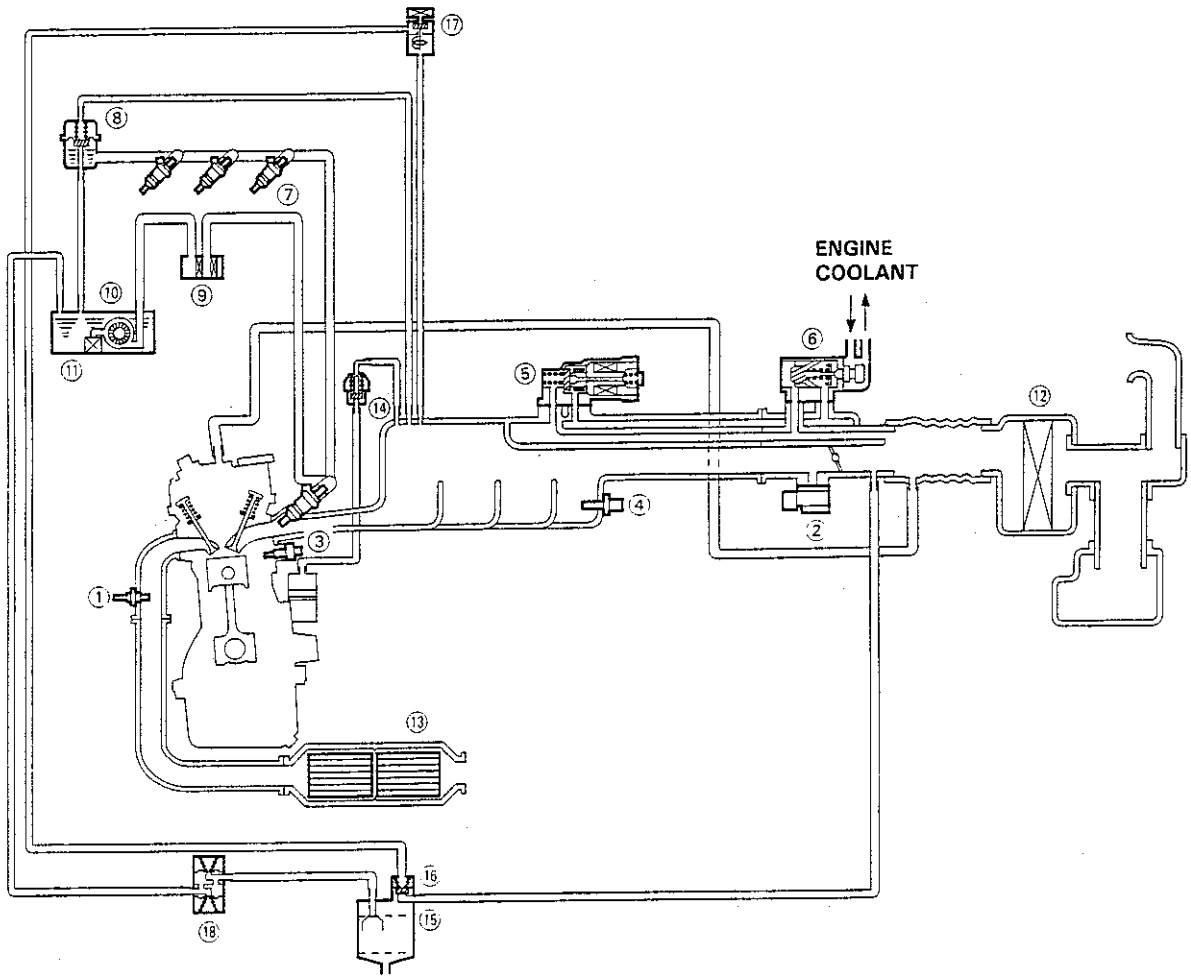
System Description

Vacuum Connections

D16Z6, D16Z7 Engine:



D16Z6, D16Z7 engine:

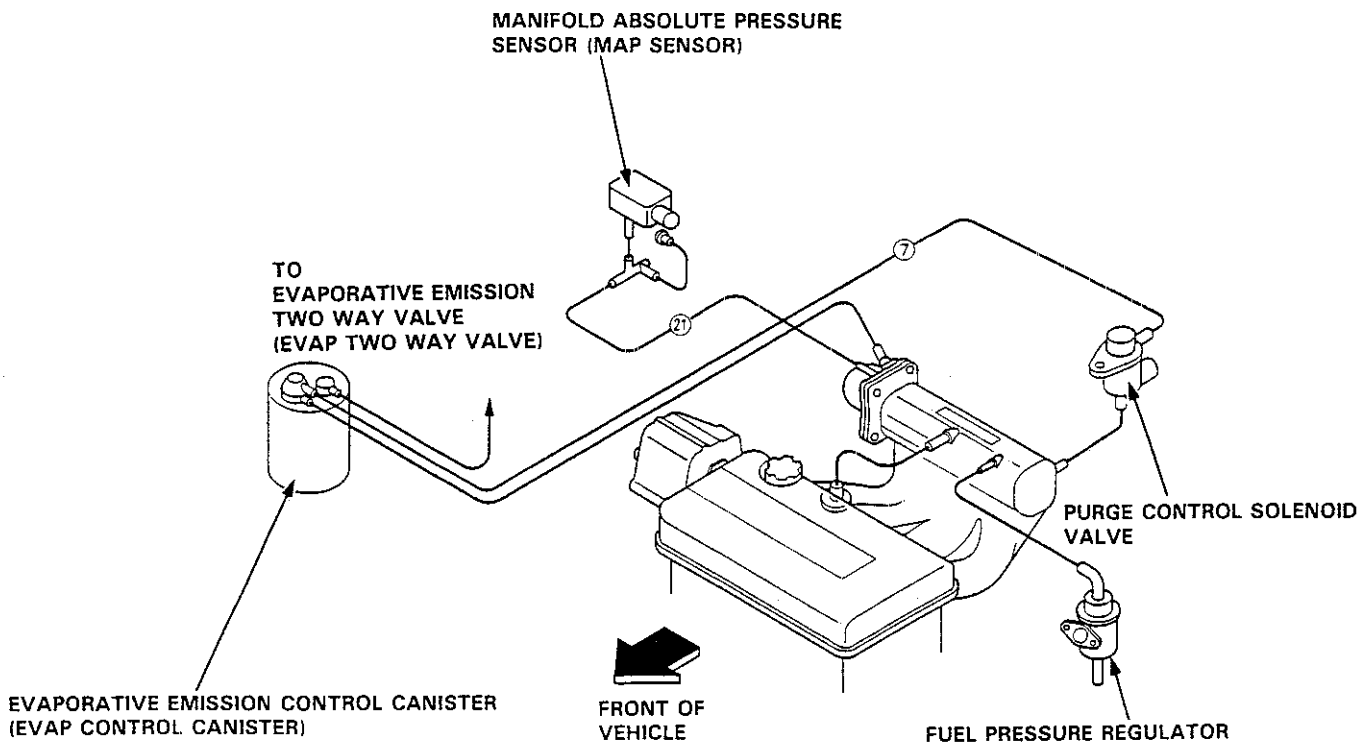


① HEATED OXYGEN SENSOR (HO2S)
② MANIFOLD ABSOLUTE PRESSURE SENSOR (MAP SENSOR)
③ ENGINE COOLANT TEMPERATURE SENSOR (ECT SENSOR)
④ INTAKE AIR TEMPERATURE SENSOR (IAT SENSOR)
⑤ IDLE AIR CONTROL VALVE (IAC VALVE)
⑥ FAST IDLE THERMO VALVE
⑦ FUEL INJECTOR
⑧ FUEL PRESSURE REGULATOR
⑨ FUEL FILTER
⑩ FUEL PUMP (FP)
⑪ FUEL TANK
⑫ AIR CLEANER (ACL)
⑬ THREE WAY CATALYTIC CONVERTER (TWC)
⑭ POSITIVE CRANKCASE VENTILATION VALVE
⑮ EVAPORATIVE EMISSION CONTROL CANISTER (EVAP CONTROL CANISTER)
⑯ PURGE CONTROL DIAPHRAGM VALVE
⑰ PURGE CONTROL SOLENOID VALVE
⑱ EVAPORATIVE EMISSION TWO WAY VALVE (EVAP TWO WAY VALVE)

(cont'd)

Vacuum Connections (cont'd)

B16A2 engine:



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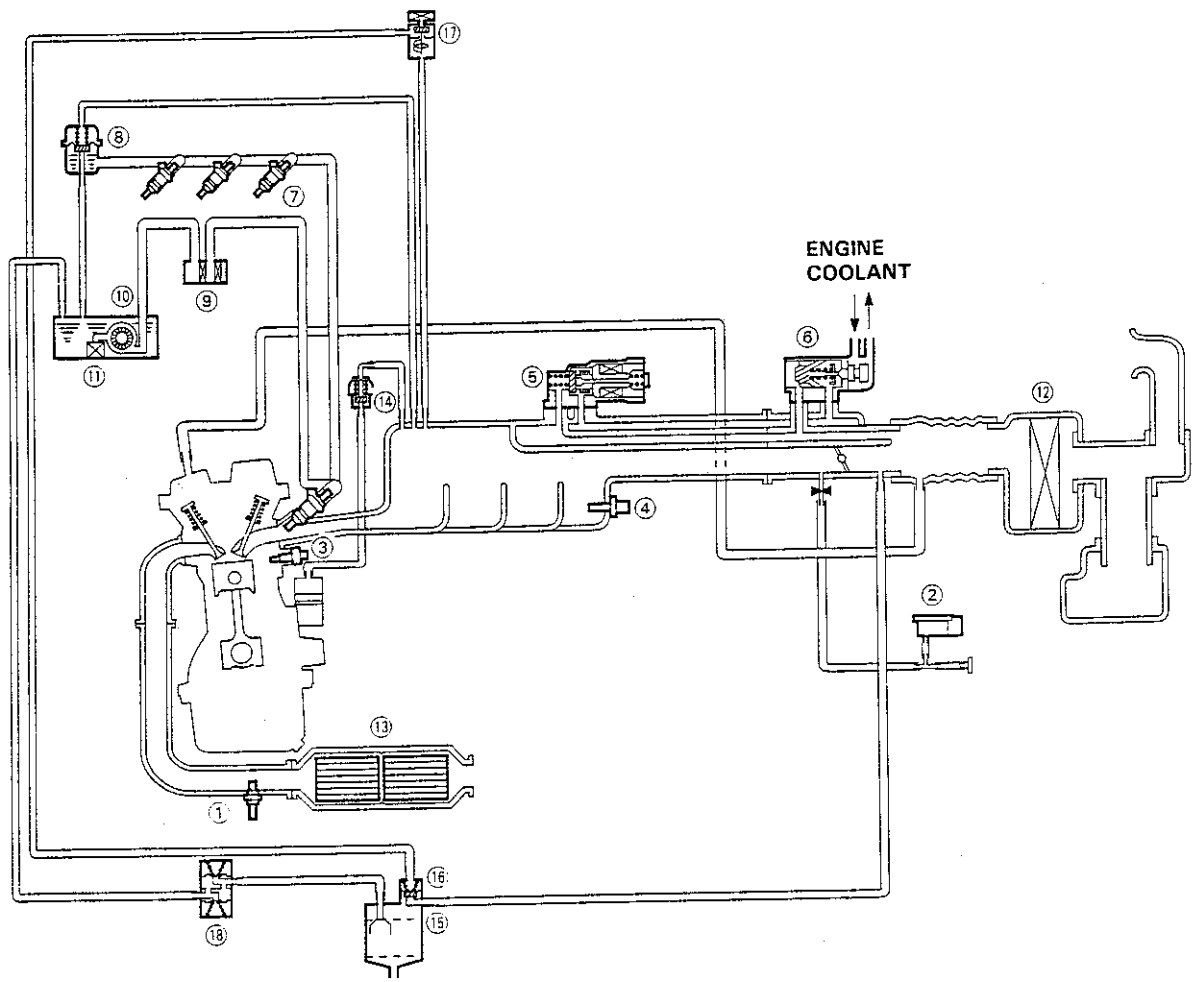

① HEATED OXYGEN SENSOR (HO2S)
② MANIFOLD ABSOLUTE PRESSURE SENSOR (MAP SENSOR)
③ ENGINE COOLANT TEMPERATURE SENSOR (ECT SENSOR)
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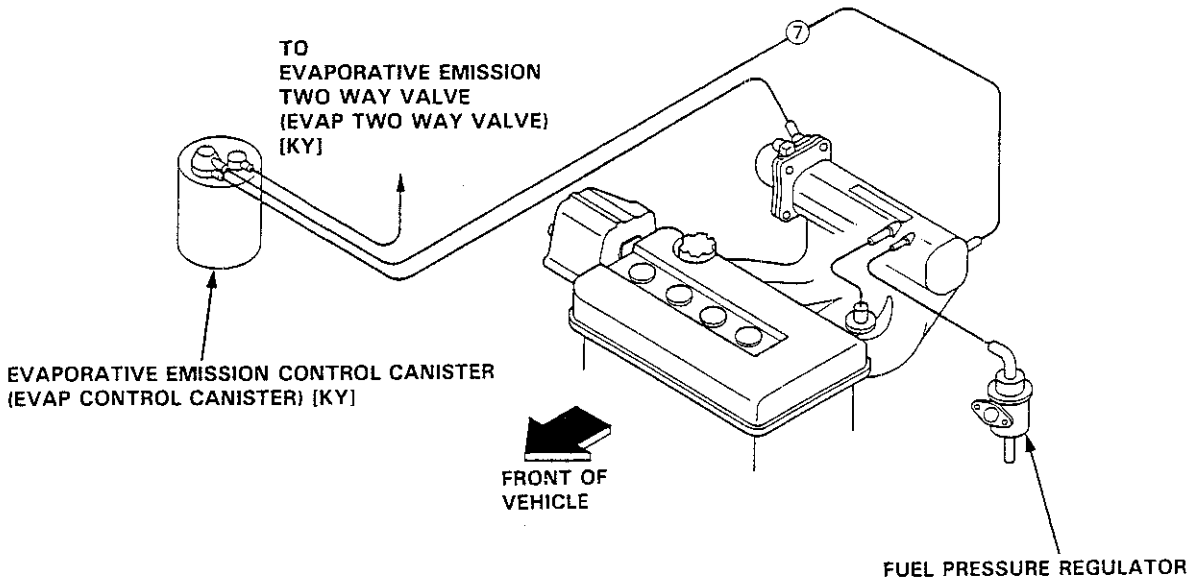
⑰ PURGE CONTROL SOLENOID VALVE
⑱ EVAPORATIVE EMISSION TWO WAY VALVE (EVAP TWO WAY VALVE)

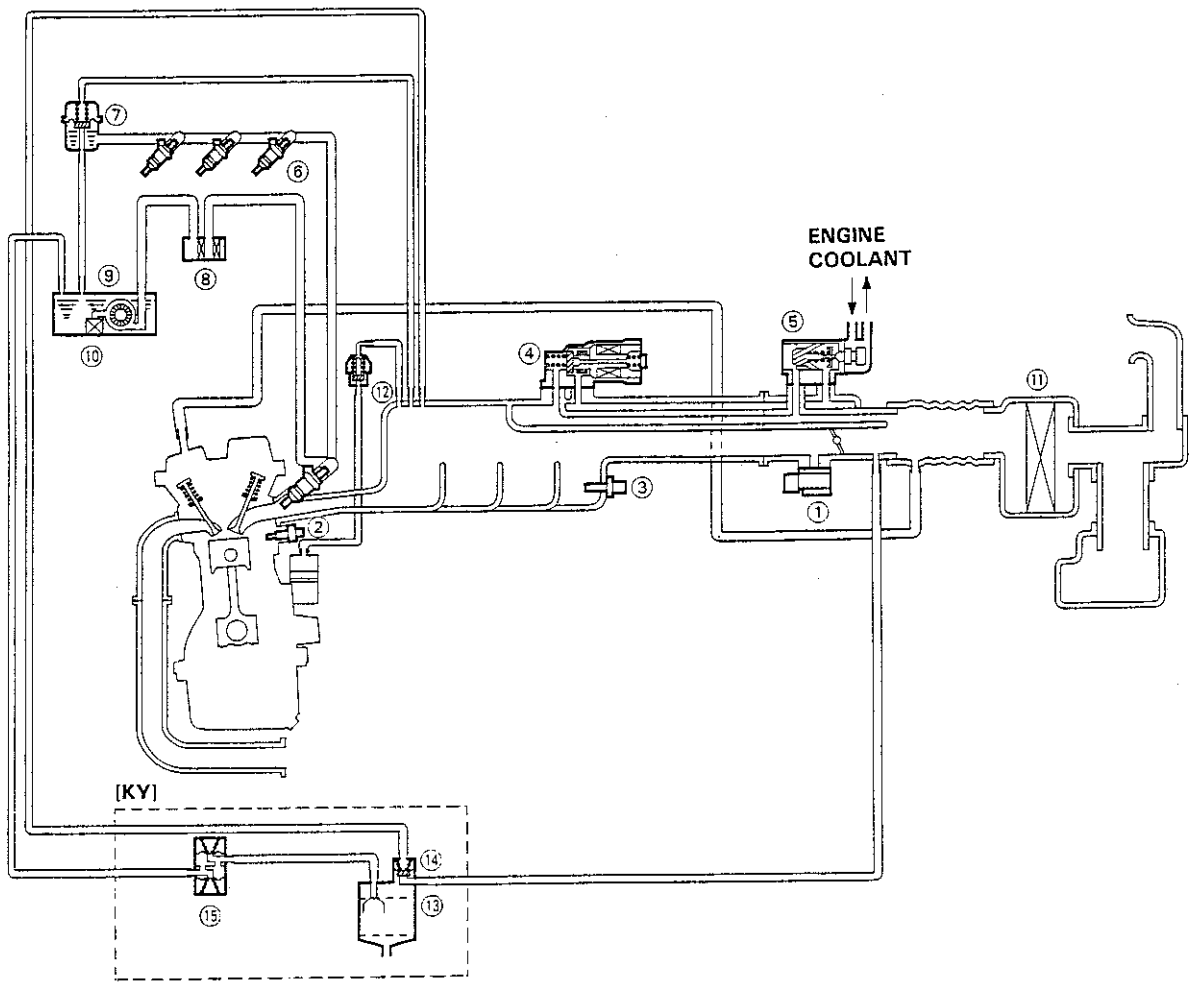
(cont d)

Vacuum Connections (cont'd)

D16A9 engine:



D16A9 engine:



① MANIFOLD ABSOLUTE PRESSURE SENSOR (MAP SENSOR)
② ENGINE COOLANT TEMPERATURE SENSOR (ECT SENSOR)
③ INTAKE AIR TEMPERATURE SENSOR (IAT SENSOR)
④ IDLE AIR CONTROL VALVE (IAC VALVE)
⑤ FAST IDLE THERMO VALVE
⑥ FUEL INJECTOR
⑦ FUEL PRESSURE REGULATOR
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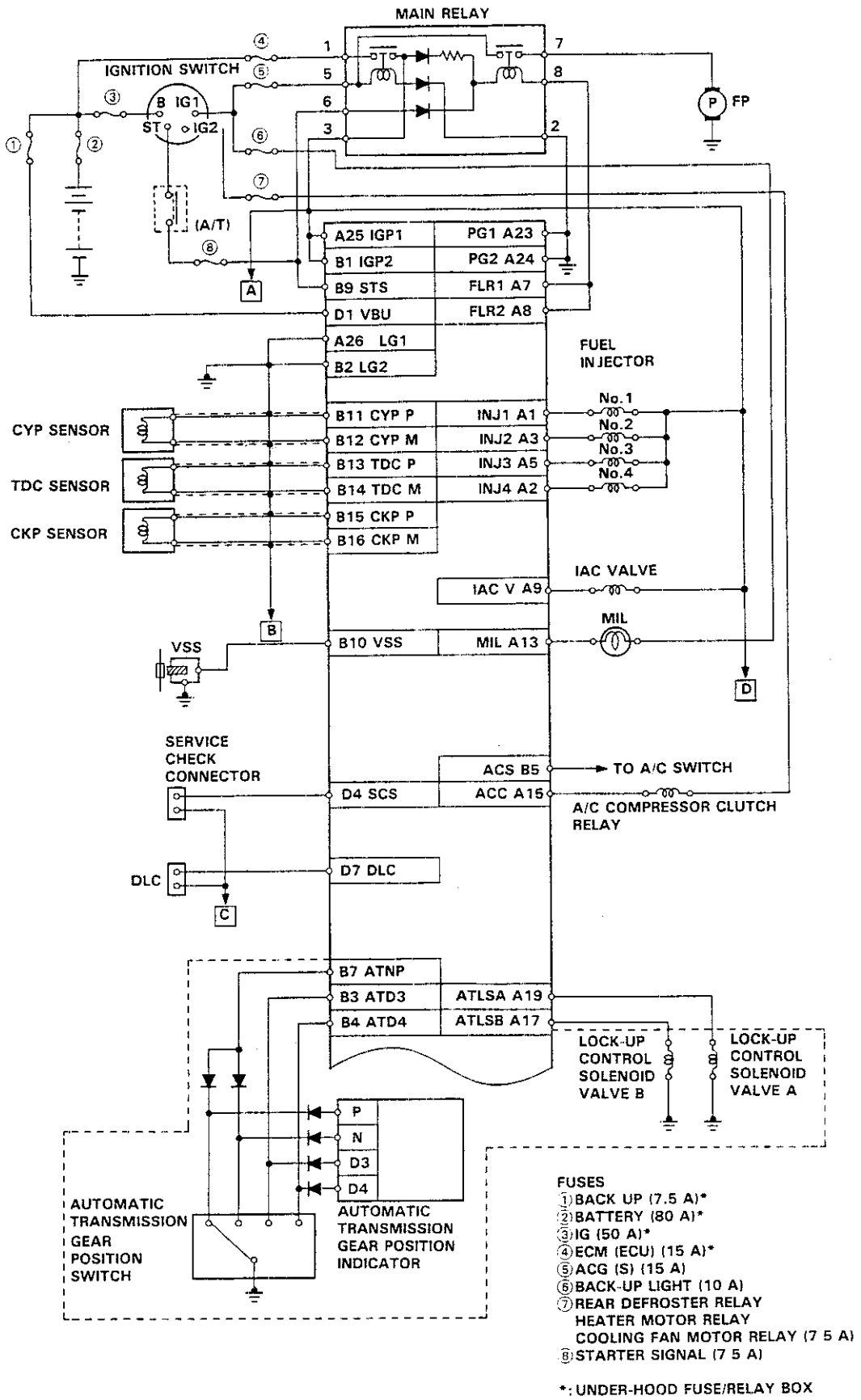
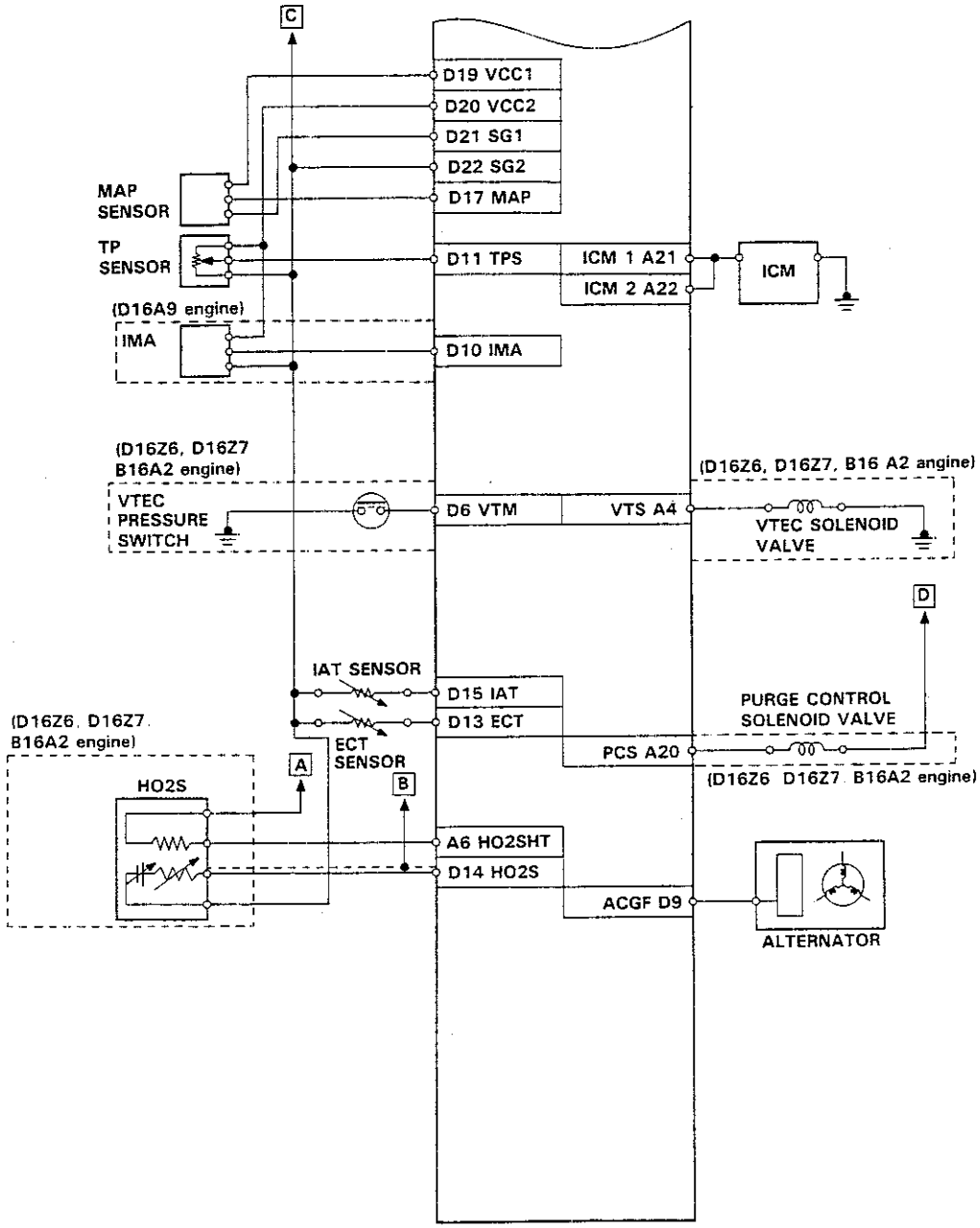
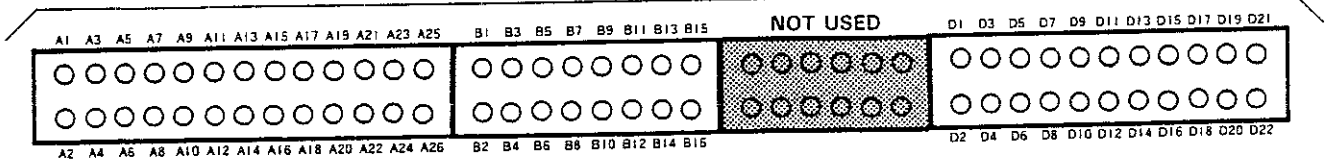
⑨ FUEL PUMP (FP)
⑩ FUEL TANK
⑪ AIR CLEANER (ACL)
⑫ POSITIVE CRANKCASE VENTILATION VALVE
⑬ EVAPORATIVE EMISSION CONTROL CANISTER (EVAP CONTROL CANISTER)
⑭ PURGE CONTROL DIAPHRAGM VALVE
⑮ EVAPORATIVE EMISSION TWO WAY VALVE (EVAP TWO WAY VALVE)

Electrical Connections





TERMINAL LOCATION



Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE / SYSTEM / SYMPTOM		PGM FI									
		ENGINE CONTROL MODULE	HEATED OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	TOP DEAD CENTER/ CRANKSHAFT POSITION/CYLINDER POSITION SENSOR	ENGINE COOLANT TEMPERATURE SENSOR	THROTTLE POSITION SENSOR	INTAKE AIR TEMPERATURE SENSOR	IDLE MIXTURE ADJUSTER (D16A9 engine)	IGNITION OUTPUT SIGNAL	VEHICLE SPEED SENSOR
		29	33, 34, 38	40, 44, 46	48	50	52	54	56	58	60
MALFUNCTION INDICATOR LIGHT TURNS ON		□ or □									
MALFUNCTION INDICATOR LIGHT BLINKS						6	7	10	11	15	17
ENGINE WON'T START		①			③					③	
DIFFICULT TO START ENGINE WHEN COLD		(BU)		③	②	①					
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	(BU)				③					
	ROUGH IDLE	(BU)		③							
	WHEN WARM ENGINE SPEED TOO HIGH	(BU)									
	WHEN WARM ENGINE SPEED TOO LOW	(BU)									
FREQUENT STALLING	WHILE WARMING UP	(BU)				③					
	AFTER WARMING UP	(BU)									
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	(BU)		②	③						
	FAILS EMISSION TEST	(BU)	③	②							
	LOSS OF POWER	(BU)		③			②				

* If codes other than those listed above are indicated, count the number of blinks again. If the Malfunction Indicator light is in fact blinking these codes, substitute a known-good ECM and recheck. If the indication goes away, replace the original ECM

(BU) If the Malfunction Indicator light is on while the engine is runnig, jump the service check connector. If no code is displayed (Malfunction Indicator light stays on steady), the back-up system is in operation
Substitute a known-good ECM and recheck. If the indication goes away, replace the original ECM

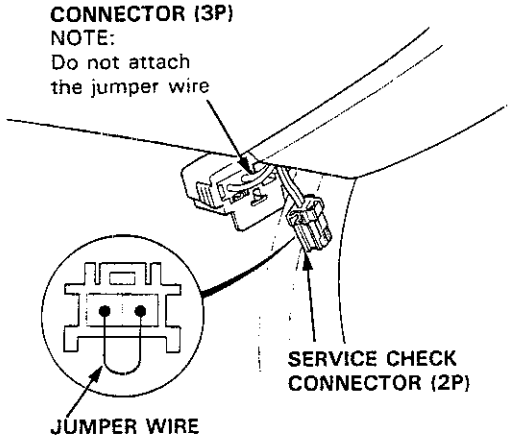
PGM-FI			IDLE CONTROL		FUEL SUPPLY			
LOCK-UP CONTROL SOLENOID VALVE	VARIABLE VALVE TIMING & VALVE LIFT ELECTRONIC CONTROL SOLENOID VALVE	VARIABLE VALVE TIMING & VALVE LIFT ELECTRONIC CONTROL PRESSURE SWITCH	IDLE AIR CONTROL VALVE	OTHER IDLE CONTROLS	FUEL INJECTOR	OTHER FUEL SUPPLY	AIR INTAKE	EMISSION CONTROL
62	65	67	68	64	83	81	97	109
								
								
						②		
			①	②				
		②	①		②			
			①	②				
③			①		②			
			①	②		③		
			②			①		
					①			
								①
	③	③			③	①	③	

Self-diagnostic Procedures

1. When the Malfunction Indicator light (MIL) has been reported on, do the following:

   1. Connect the Service Check Connector terminals with a jumper wire as shown (The 2P Service Check Connector is located under the dash on the passenger side of the car) Turn the ignition switch on.

LHD:



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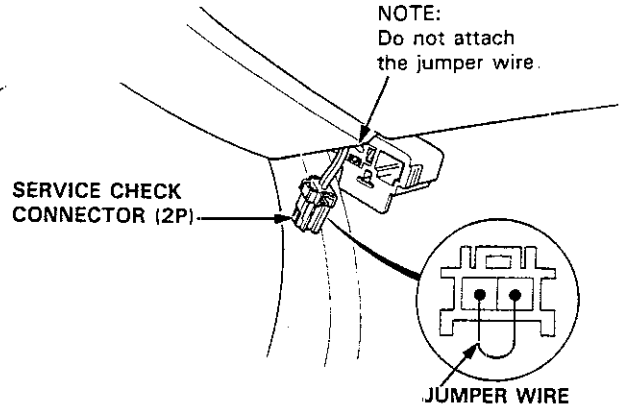
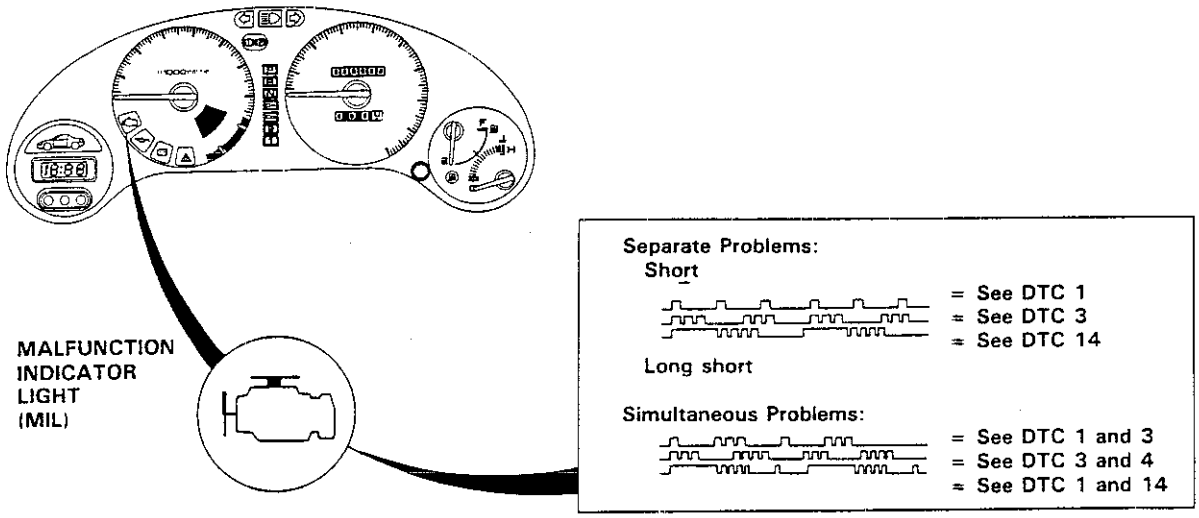


   2. Note the DIAGNOSTIC TROUBLE CODE (DTC): the Malfunction Indicater light indicates a Diagnostic Trouble Code by the length and number of blinks. The Malfunction Indicator light can indicate simultaneous component problems by blinking separate codes, one after another Diagnostic Trouble Codes 1 through 9 are indicated by individual short blinks. Diagnostic Trouble Codes 10 through 43 are indicated by a series of long and short blinks. The number of long blinks equals the first digit, the number of short blinks equals the second digit.



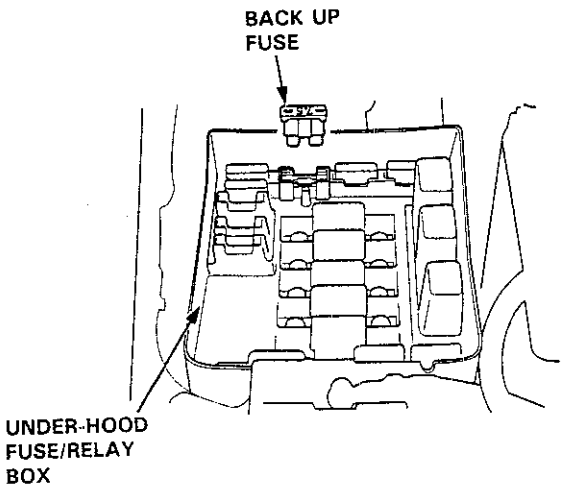
II. ENGINE CONTROL MODULE (ECM) Reset Procedure

1. Turn the ignition swtich off.

2. Remove the BACK UP fuse (7.5 A) from the under-hood fuse/relay box for 10 seconds to reset the ECM.

NOTE: Disconnecting the BACK UP fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you reset them.

LHD:



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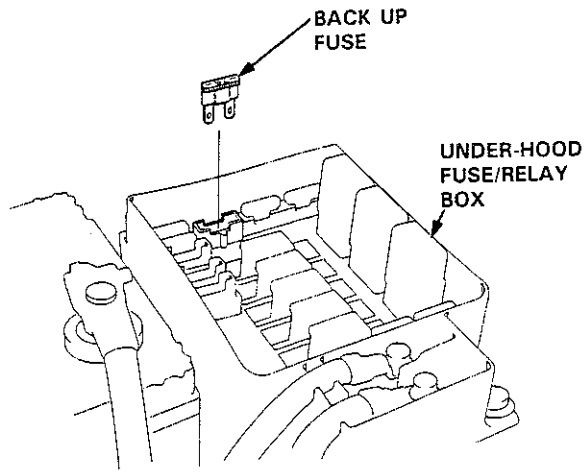


III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the Jumper Wire.

NOTE: If the Service Check Connector is jumped the Malfunction Indicator light (MIL) will stay on

2. Do the ECM Reset Procedure.

3. Set the radio preset stations and the clock setting.

(cont'd)

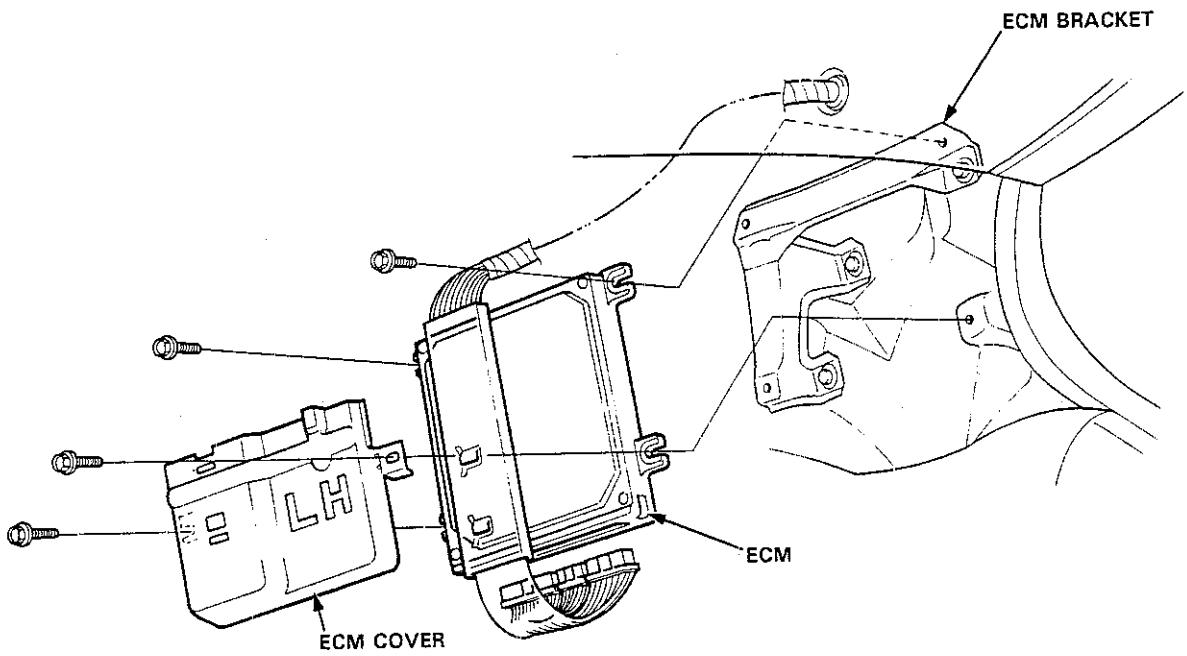
Self-diagnostic Procedures (cont'd)

DIAGNOSTIC TROUBLE CODE	SYSTEM INDICATED	PAGE
0	ENGINE CONTROL MODULE (ECM)	11-29
1	HEATED OXYGEN SENSOR (HO2S) (Except D16A9 engine)	11-33
3	MANIFOLD ABSOLUTE PRESSURE (MAP SENSOR)	11-40, 44, 46
5		
4	CRANKSHAFT POSITION (CKP SENSOR)	11-48
6	ENGINE COOLANT TEMPERATURE (ECT SENSOR)	11-50
7	THROTTLE POSITION (TP SENSOR)	11-52
8	TOP DEAD CENTER POSITION (TDC SENSOR)	11-48
9	No. 1 CYLINDER POSITION (CYP SENSOR)	11-48
10	INTAKE AIR TEMPERATURE (IAT SENSOR)	11-54
11	IDLE MIXTURE ADJUSTER (IMA) (D16A9 engine)	11-56
14	IDLE AIR CONTROL (IAC VALVE)	11-68
15	IGNITION OUTPUT SIGNAL	11-58
17	VEHICLE SPEED SENSOR (VSS)	11-60
19	LOCK-UP CONTROL SOLENOID VALVE A/B (A/T)	11-62
21	VARIABLE VALVE TIMING & VALVE LIFT ELECTRONIC CONTROL SOLENOID VALVE (VTEC SOLENOID VALVE)	6-5
22	VARIABLE VALVE TIMING & VALVE LIFT ELECTRONIC CONTROL PRESSURE SWITCH (VTEC PRESSURE SWITCH)	6-7
41	HEATED OXYGEN SENSOR HEATER (Except D16A9 engine)	11-34
43	FUEL SUPPLY SYSTEM (Except D16A9 engine)	11-38

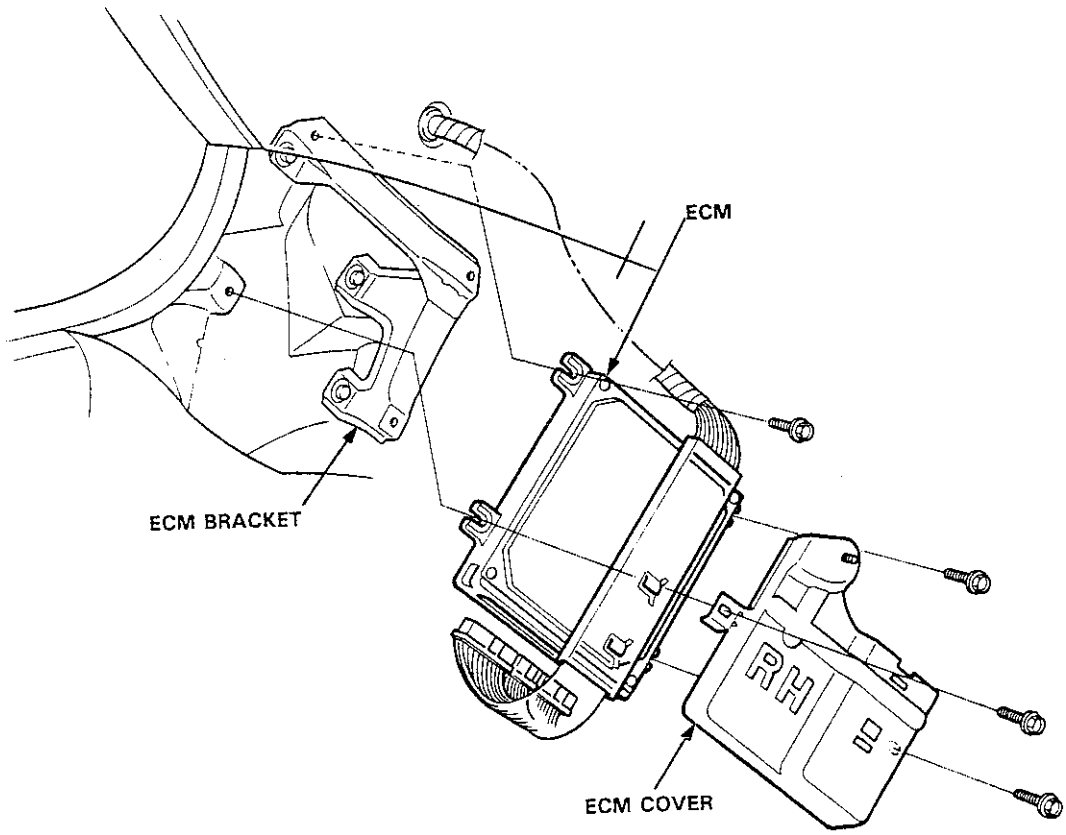
- If codes other than those listed above are indicated, verify the code. If the code indicated is not listed above, replace the ECM.
- The Malfunction Indicator light (MIL) may come on, indicating a system problem when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessay.

If the inspection for a diagnostic trouble code requires the test harness, remove the right door (RHD: left door) sill molding and pull the carpet back to expose the ECM. Unbolt the ECM bracket: Turn the ignition switch off and connect the test harness. Check the system according to the procedure described for the appropriate code(s) listed on the following pages

LHD:



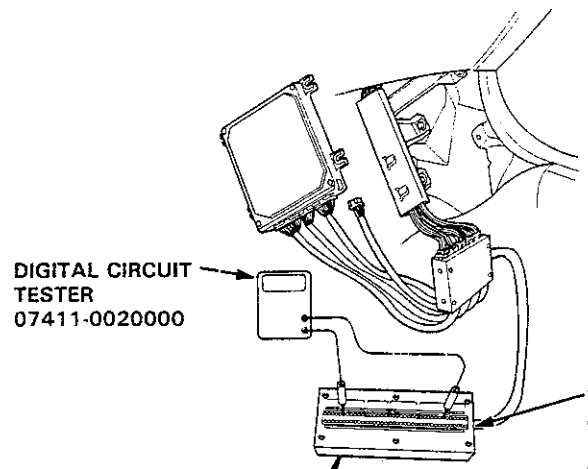
RHD:

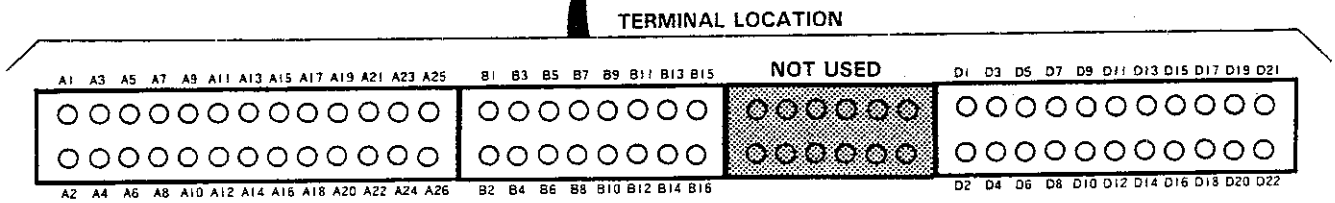


(cont'd)

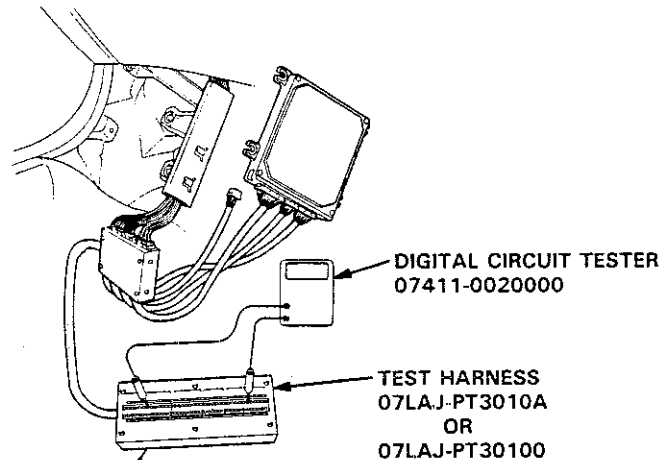
Self-diagnostic Procedures (cont'd)

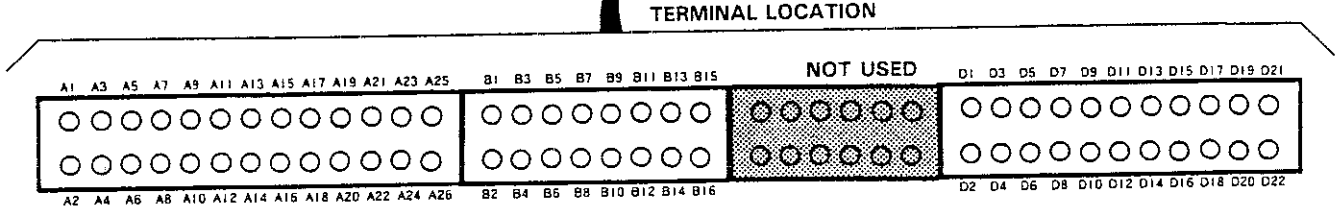
LHD:





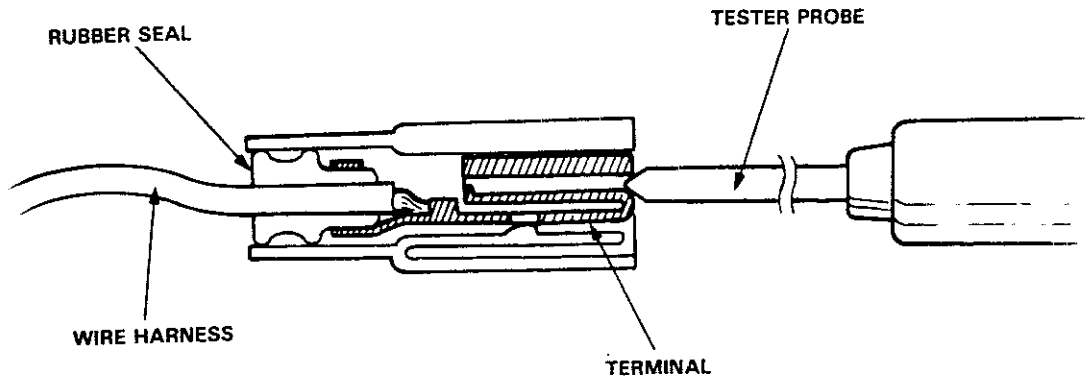
RHD:





CAUTION:

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- For testing at connectors other than the test harness, bring the tester probe into contact with the terminal from the connector 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.



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.

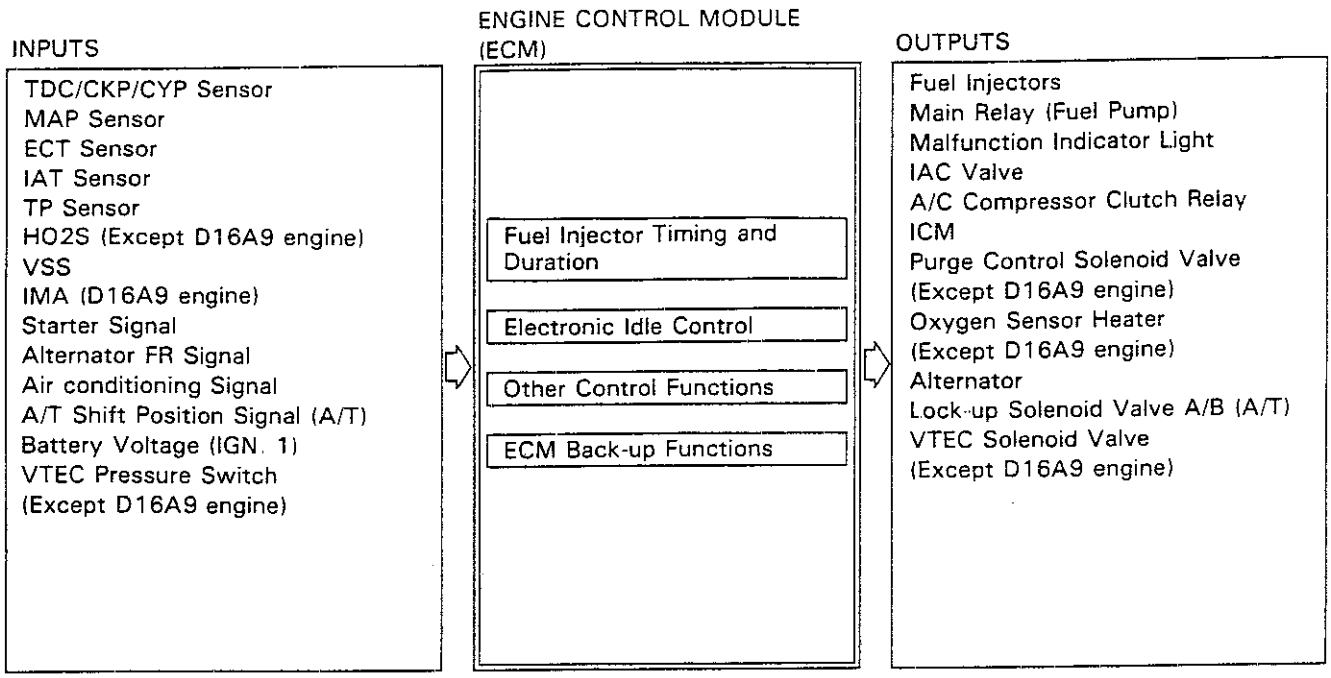
STOP (bold type) — The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm you repair.

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 light on the dash does not come on, check for poor connections or loose wires at all connections related to the circuit that you are troubleshooting.
- Most of the troubleshooting flowcharts have you reset the ECM and try to duplicate the diagnostic trouble code. 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.
- If the electrical readings are not as specified when using the test harness, check the test harness connections before proceeding.

PGM-FI Control System

System Description



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.

Electronic 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) 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

Other Control Functions

1. Starting Control
   When the engine is started, the ECM provides a rich mixture
2. Fuel Pump Control
   - When the ignition switch is initially turned on, the ECM supplies ground to the 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 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 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 engine speed:

  - D16Z6, D16Z7 engine: M/T 1,000 min^{-1} (rpm) A/T 990 min^{-1} (rpm)
  - B16A2 engine: 990 min^{-1} (rpm)
  - D16A9 engine: 990 min^{-1} (rpm)

- Fuel cut-off action also takes place when engine speed exceeds D16Z6 D16Z7, D16A9 engine: 7,400 min^{-1} (rpm), B16A2 engine: 8,100 min^{-1} (rpm) regardless of the position of the throttle valve, to protect the engine from overrevving

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 translation to the A/C mode.

5 Purge Control Solenoid Valve (Except D16A9 engine)
When the engine coolant temperature is below 70°C (158°F) the ECM supplies a ground to the purge control solenoid valve which cuts vacuum to the purge control diaphragm valve.

6 Lock-up Control Solenoid Valve (A/T)
The speed and throttle position sensor inputs to the ECM are sued to send an on/off voltage signal to the lock-up control solenoid valve for precise timing of the torque converter lock-up system.

ECM 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 valve 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 (Malufnction Indicator light)
When an abnormality occurs in a signal from a sensor the ECM lights the Malfunction Indicator light and stores the diagnostic trouble code in erasable memory. When the ignition is initially turned on the ECM supplies ground for the Malfunction Indicator light for two seconds.

Troubleshooting Flowchart — Engine Will Not Start

Engine will not start

Watch the Malfunction Indicator light (MIL) and turn the ignition switch ON

Did the MIL come on at all? — NO → **Perform troubleshooting on page 11-29**

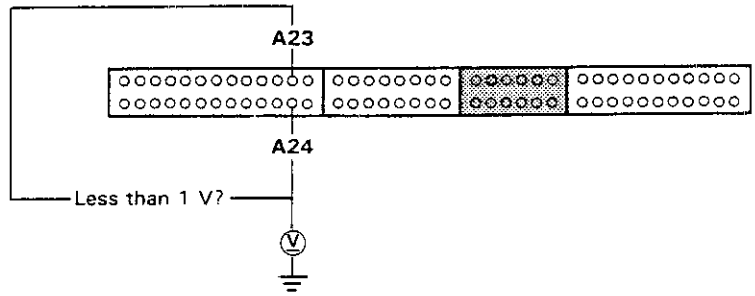
YES

Did the MIL go off after two seconds? — NO → **Perform troubleshootin on page 11-30**

YES

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22)



Turn the ignition switch ON

Measure voltage between body ground and the following terminals individually: A23, A24

Is there less than 1 V? — NO → **Repair open in wire between ECM and G101 on wire that more than 1 V**

YES

Inspect Fuel Pressure (page 11-82)

Is fuel pressure OK? — NO → **Repair as necessary**

YES

Perform ignition system check (section 23)

Troubleshooting Flowchart — Engine Control Module (ECM)

Malfunction Indicator light (MIL) never comes on (even for two seconds) after ignition is turned on.

Is the oil pressure light on?

NO → Inspect BACK UP LIGHT (10A) fuse

Is BACK UP LIGHT (10A) fuse OK?

NO → **Replace the fuse.**

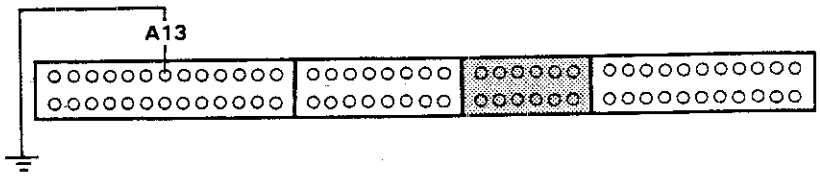
YES → **Repair open in YEL between BACK UP LIGHT (10A) and gauge assembly.**

YES

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22).

Connect A13 terminal to body ground.

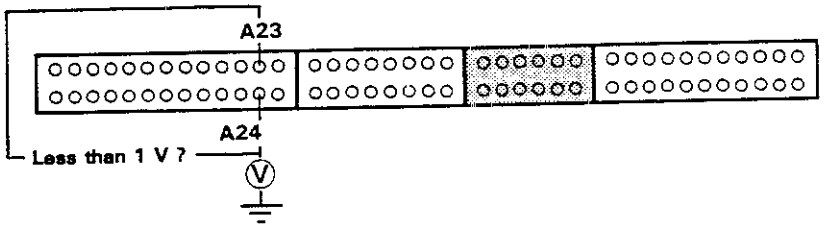


Turn the ignition switch ON

Is MIL ON?

NO →
- **Replace the MIL bulb.**
- **Repair open in GRN/ORN wire between ECM (A13) and gauge assembly**

YES



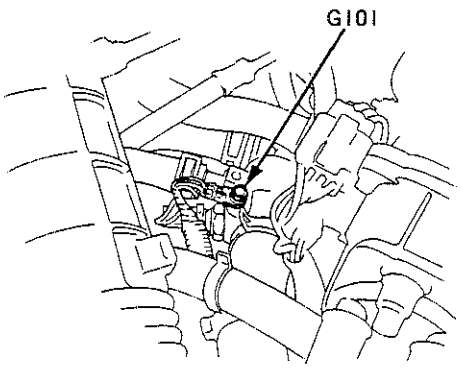
Measure voltage between body ground and the following terminals individually: A23 A24

Is there less than 1V?

NO → **Repair open in wire between ECM and G101 that had more than 1 V**

YES

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



(cont'd)

Troubleshooting Flowchart — Engine Control Module (ECM) (cont'd)

NOTE: When there is no diagnostic trouble code stored, the Malfunction Indicator light will stay on if the service check connector is jumped.

Malfunction Indicator light (MIL) stays on or comes on after two seconds

Turn the ignition switch ON

Connect the service check connector with a jumper wire (page 11-18).

Does MIL indicate any Diagnostic Trouble Code (DTC)?

YES → **Go to self-diagnostic procedures (page 11-20)**

NO

Remove the jumper wire from the service check connector

Try to start the engine

Did the engine start?

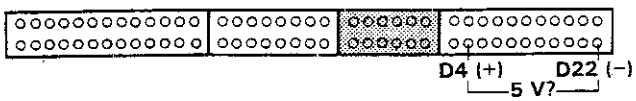
YES →

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22).

Turn the ignition switch ON

Measure voltage between D4 (+) terminal and D22 (−) terminal



Is there approx. 5V?

YES → Connect the service check connector with a jumper wire

Measure voltage between D4 (+) terminal and D22 (−) terminal

Is there approx. 5V?

YES →

* **— Repair open in BRN wire between ECM (D4) and service check connector.**
— Repair open in GRN/WHT wire between service check connector and ECM (D22).

NO

Remove the jumper wire from the service check connector

(To page 11-31)

NO

Repair short to body ground in BRN wire between the ECM (D4) and service check connector.

NO

Remove and inspect the ECM (ECU) (15 A) fuse in the underhood fuse/relay box.

Is the fuse OK?

NO → **Replace the fuse.**

YES

(To page 11-31)

*NOTE: After repair, disconnect the service check connector jumper wire, test drive the car, and recheck the Malfunction Indicator light for a diagnostic trouble code

(From page 11-30)

Inspect the ACG (S) (15 A) fuse in the under-dash fuse box.

Is the fuse OK?

NO → **Replace the fuse.**

YES

Turn the ignition switch ON.

Disconnect the 3P connector of each sensor one at a time:
- MAP sensor
- TP sensor
- IMA

Does MIL remain ON?

NO → **Replace the sensor that caused the light to go out**

YES

Turn the ignition switch OFF.

Connect the test harness Disconnect the 'D' connector from the ECM only, not the main wire harness. (page 11-22)

Check for continuity between body ground terminals D19 D20

Does continuity exist?

YES →
- **Repair short to body ground in YEL/GRN* wire between ECM (D19) and MAP sensor**
- **Repair short to body ground in YEL/WHT wire between ECM (D20) and TP sensor or **IMA.**

NO

Reconnect all the sensor connectors.
Reconnect the 'D' connector to the ECM

Turn the ignition switch ON

(To page 11-32)

(From page 11-30)

Turn the ignition switch OFF

Disconnect 'A' connector from the ECM

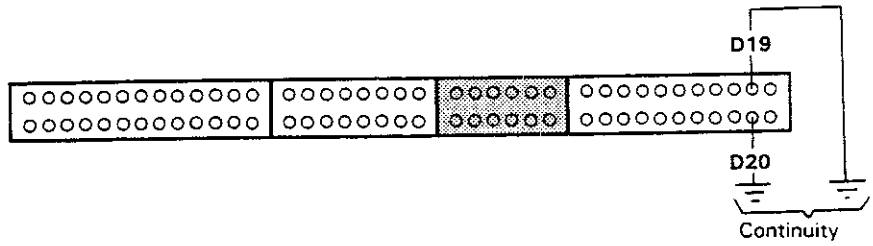
Turn the ignition switch ON.

Is MIL on?

NO → **Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.**

YES

Repair short to body ground in GRN/ORN wire between the ECM (A13) and MIL



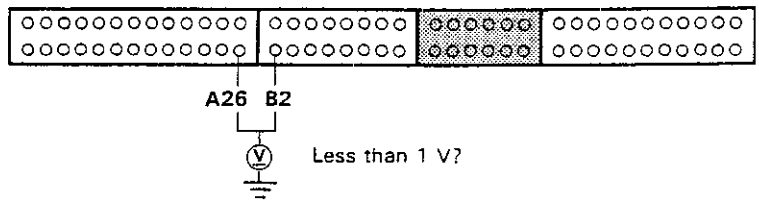
* : B16A2 engine
Except B16A2 engine (YEL/RED or YEL/GRN)
**: D16A9 engine

(cont'd)

Troubleshooting Flowchart — Engine Control Module (ECM) (cont'd)

(From page 11-31)

Measure voltage between body ground and the following terminal individually: A26, B2



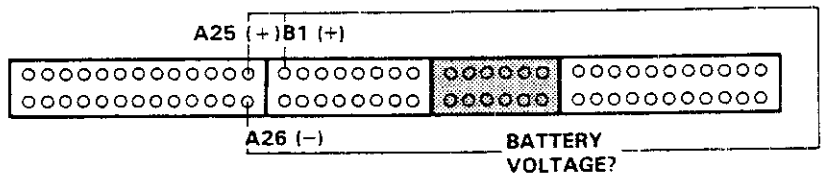
Is there less than 1 V?

NO → **Repair open in BLK/RED (A26) or BRN/BLK (B2) and G101.**

YES

Measure voltage between A26 (−) and the following: B1 (+) and A25 (+)

Measure voltage between A26 (−) and the following: B1 (+) and A25 (+)



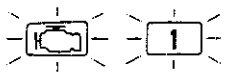
Is there battery voltage?

NO →
- **Repair open in YEL/BLK wire between ECM (A25, B1) and main relay**
- **Check main relay and wiring connectors at main relay.**

YES

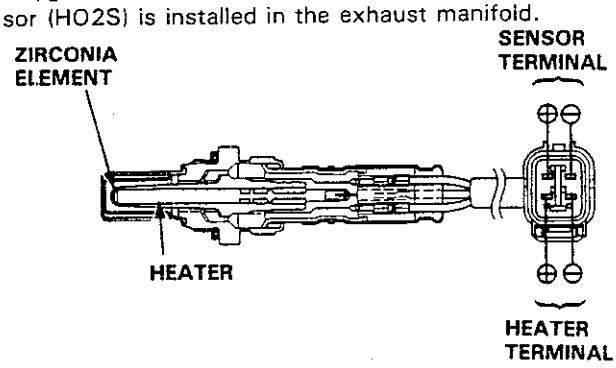
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

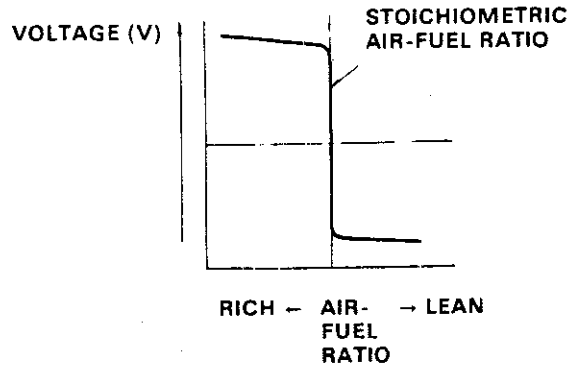
Troubleshooting Flowchart — Heated Oxygen Sensor (HO2S) [D16Z6, D16Z7, B16A2 engine]

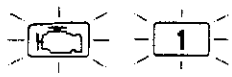


Malfunction Indicator light indicates diagnostic trouble code 1: A problem in the Heated Oxygen Sensor (HO2S) circuit

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. The Heated Oxygen Sensor (HO2S) has an internal heater. The heater stabilizes the sensor's output. The Heated Oxygen Sensor (HO2S) is installed in the exhaust manifold.







- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18). Diagnostic Trouble Code (DTC) 1 is indicated.

↓

Do the ECM Reset Procedure (page 11-19).

↓

Warm up engine to normal operating temperature (cooling fan comes on)

↓

Run engine for 60 seconds

↓

Road test with the transmission in 4th gear (A/T: Transmission in [2])
Starting at 1,600 min^{-1} (rpm), accelerate using wide open throttle for at least 5 seconds. Then decelerate for at least 5 seconds with the throttle completely closed

↓

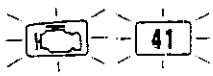
Is MIL on and does it indicate DTC 1?

NO → Intermittent failure, system is OK at this time. Check for poor connections or loose wires between HO2S and ECM.

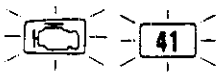
YES ↓

Go to page and perform test for DTC 43 (page 11-38)

Troubleshooting Flowchart — Heated Oxygen Sensor (HO2S) Heater [D16Z6, D16Z7, B16A2 engine]



Malfunction Indicator light indicates diagnostic trouble code 41: A problem in the Heated Oxygen Sensor (HO2S) Heater circuit



- **Engine is running.**
- **Malfunction Indicator light (MIL) has been reported on With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 41 is indicated.**

Do the ECM Reset Procedure (page 11-19)

Start the engine

Is MIL on and does it indicate DTC 41?

NO → **Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between HO2S and ECM.**

YES

Stop the engine

Disconnect the 4P connector from the HO2S

Measure resistance between terminals C and D on the HO2S.

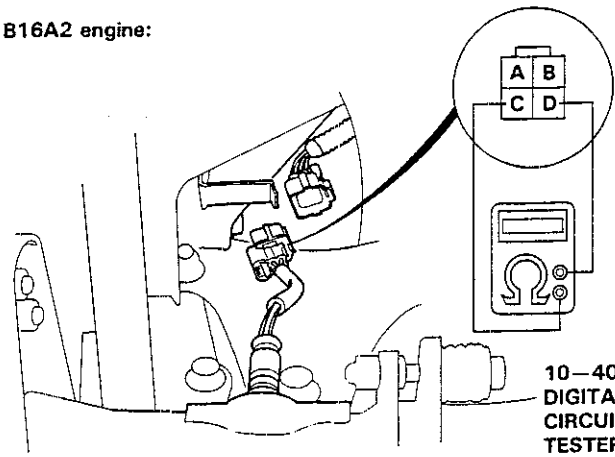
Is there 10 – 40 Ω

NO → **Replace the HO2S**

YES

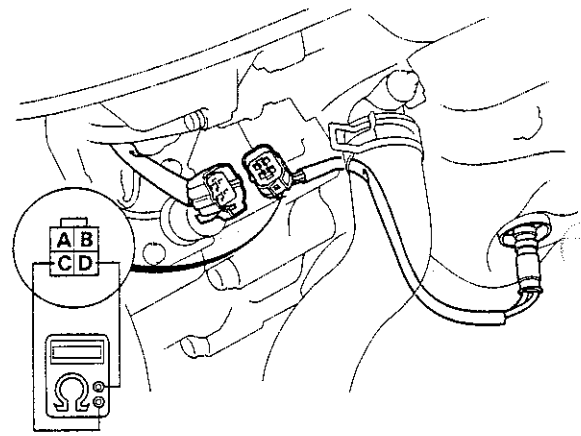
(To page 11-35)

B16A2 engine:



10 – 40 Ω DIGITAL CIRCUIT TESTER 07411 – 002000

D16Z6, D16Z7 engine:



10 – 40 Ω DIGITAL CIRCUIT TESTER 07411 – 002000

(From page 11-34)

Check for continuity to body ground on terminals C and D of the HO2S.

Does continuity exist? — YES → Replace the HO2S.

NO

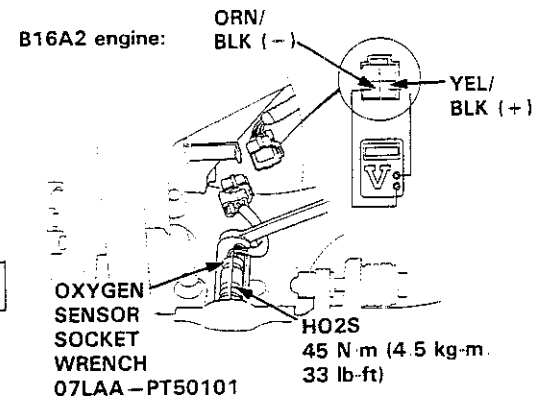
Check for continuity between terminal D and terminals A and B individually.

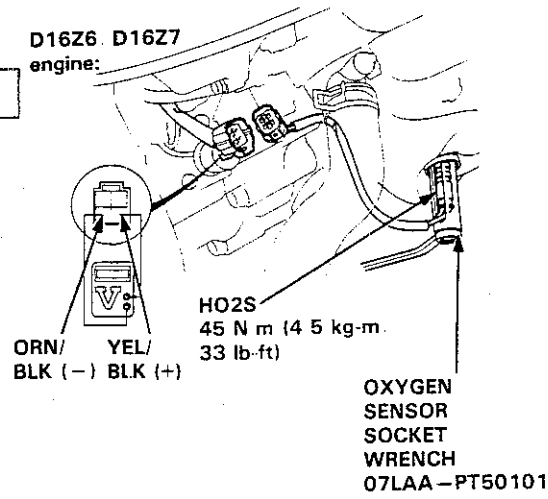
Does continuity exist? — YES → Replace the HO2S

NO

Turn the ignition switch ON.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (−) terminal





Is there battery voltage? — YES → Disconnect the "A" connector from the ECM.

NO

Measure voltage between YEL/BLK (+) terminal and body ground.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (−) terminal

Is there battery voltage? — YES → Repair short in ORN/BLK wire between ECM (A6) and O_2 sensor

NO

Is there battery voltage? — NO → Repair open in YEL/BLK wire between HO2S and main relay.

YES

Turn the ignition switch OFF

Reconnect the HO2S connector.

(To page 11-36)

(To page 11-36)

(cont'd)

Troubleshooting Flowchart — Heated Oxygen Sensor (HO2S) Heater [D16Z6, D16Z7, B16A2 engine] (cont'd)

(From page 11-35)

Reconnect the 4P connector to HO2S

Connect the test harness "A" connector to the main wire harness only, not the ECM (page 11-22).

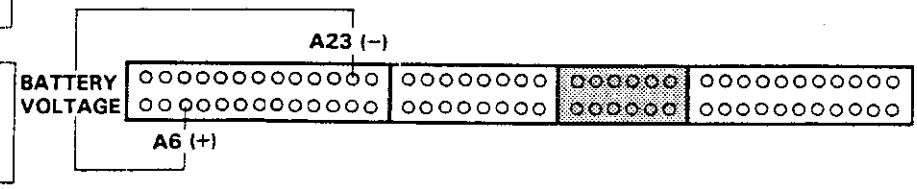
Turn the ignition switch ON

Measure voltage between A6 (+) terminal and A23 (−) terminal

Is there battery voltage?

NO → Repair open ORN/BLK wire between ECM (A6) and HO2S

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



(From page 11-35)

Connect the test harness "A" connector to the main wire harness only, not the ECM (page 11-22).

Connect an ammeter between terminals A6 (+) and A26 (−)

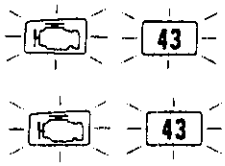
* Monitor over a 5 minutes period

Is the current less than 0.1 A? *

YES → Replace the HO2S

NO → Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

Troubleshooting Flowchart — Fuel Supply System [D16Z6, D16Z7, B16A2 engine]



Malfunction Indicator light indicates diagnostic trouble code 43: Most likely a problem in the Heated Oxygen Sensor (HO2S) circuit or a problem in the Fuel Supply System.

- **Malfunction Indicator light (MIL) has been reported on.**
- **With service check connector jumped (page 11-18), Diagnostic Trouble code (DTC) 43 is indicated.**
- **or continued from DTC 1.**

Is the DTC 43 accompanied by the MIL and poor driveability?

YES → **Go to Fuel Supply System (page 11-81)**

NO

Do the ECM Reset Procedure (page 11-19)

Warm up engine to normal operating temperature (cooling fan comes on).

Hold engine at 3 000 min^{-1} (rpm) for two minutes (A/T: Transmission [N] or [P])

Is MIL on and does it indicate DTC 43?

NO → **Intermittent failure, system is OK at this time (test drive may be necessary).**
Check for poor connections or loose wires between HO2S and ECM

YES

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22)

With the ignition switch OFF, wait for at least two minutes

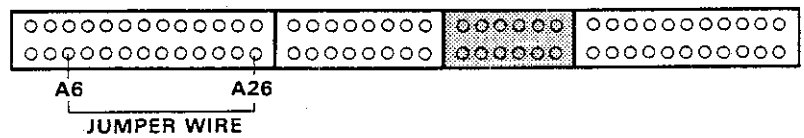
Install a jumper wire on the test harness between A6 and A26

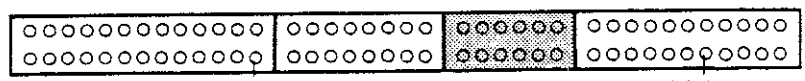
Turn the ignition switch ON

Measure voltage between D14 (+) terminal and A26 (−) terminal as soon as the ignition switch is turned on

(To page 11-39)

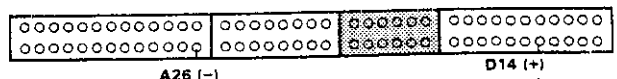
NOTE:
- Use DIGITAL CIRCUIT TESTER
- Use 2 Volt range.





Voltage should start at 0.4—0.5 V when the ignition switch is first turned on, and decrease to below 0.1 V in less than two minutes.

(From page 11-38)



Voltage should start at 0.4–0.5 V when the ignition switch is first turned on and decrease to below 0.1 V in less than two minutes

Is there 0.1 V or less when the ignition switch is first turned on?

YES → Disconnect the 4P connector from the HO2S.

Measure voltage between D14 (+) terminal and A26 (–) terminal.

Is there more than 0.1 V?

YES → Replace the HO2S.

NO → Disconnect the "D" connector from the main wire harness.

Measure voltage between D14 (+) terminal and A26 (–) terminal.

Is there more than 0.1 V?

YES → Repair short in WHT wire between ECM (D14) and HO2S.

NO → Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

NO → Disconnect the 4P connector from the HO2S.

Measure voltage at the engine wire harness side of the HO2S connector between GRN/WHT (–) and WHT (+)

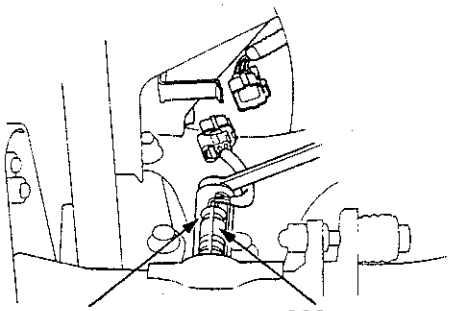
Is there more than 0.1 V?

YES → Replace the HO2S

NO → Repair open in WHT wire between ECM (D14) and HO2S

If wire is OK, check for open in GRN/WHT wire between ECM (D22) and HO2S.

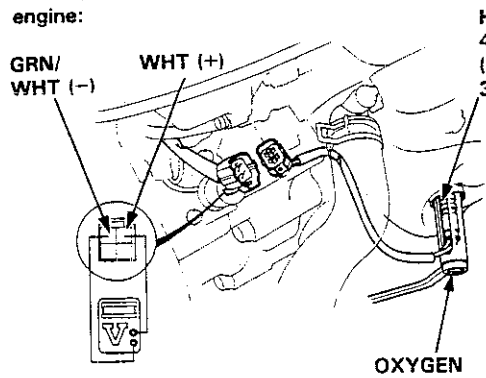
B16A2 engine:



OXYGEN SENSOR SOCKET WRENCH 07LAA–PT50101

HO2S 45 N·m (4.5 kg-m, 33 lb-ft)

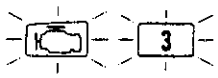
D16Z6, D16Z7 engine:



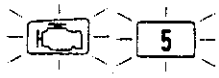
DIGITAL CIRCUIT TESTER 07411–002000

OXYGEN SENSOR SOCKET WRENCH 07LAA–PT50101

Troubleshooting Flowchart — Manifold Absolute Pressure Sensor (MAP Sensor)



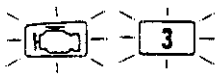
Malfunction Indicator light indicates diagnostic trouble code 3: An electrical problem in the Manifold Absolute Pressure Sensor (MAP Sensor) system.

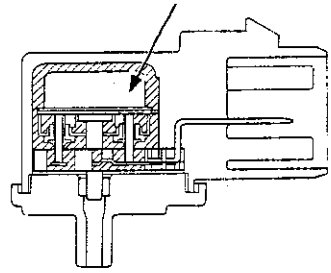


Malfunction Indicator light indicates diagnostic trouble code 5: A mechanical problem (broken hose) in the Manifold Absolute Pressure Sensor (MAP Sensor) system

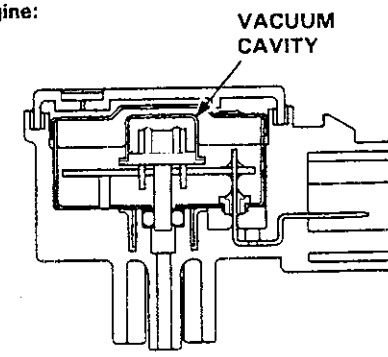
The Mainifold Absolute Pressure Sensor (MAP sensor) converts manifold absolute pressure into electrical signals and inputs the ECM

Except B16A2 engine:





B16A2 engine:



- Engine is warm and running.
- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 3 is indicated

Do the ECM Reset Procedure (page 11-19).

Start the engine and allow it to idle

Is MIL on and does it indicate DTC 3?

NO → Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connection or loose wires between MAP sensor and ECM.

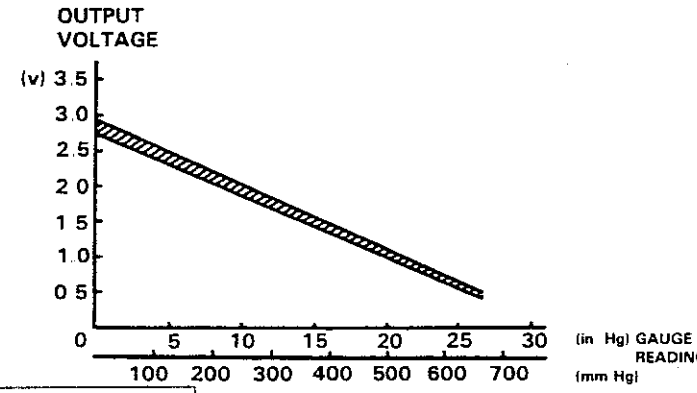
YES

Turn the ignition switch OFF

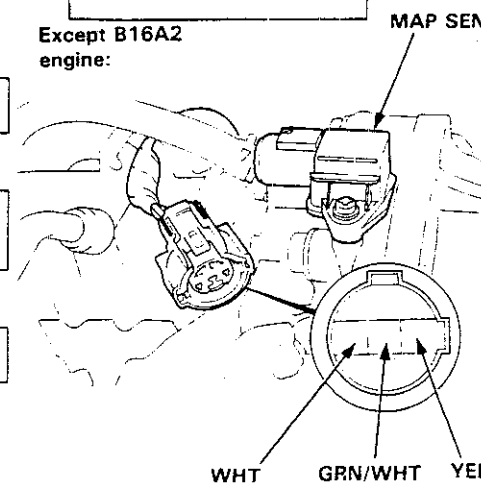
Disconnect the 3P connector from the MAP sensor

Turn the ignition switch ON

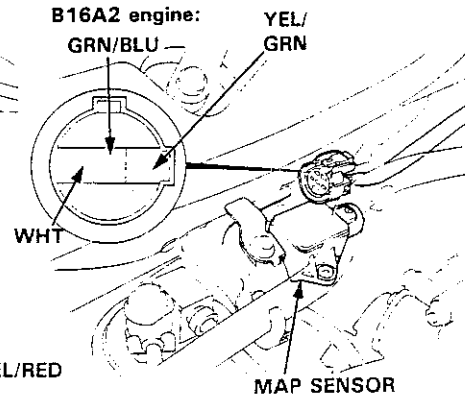
(To page 11-41)



Except B16A2 engine:



B16A2 engine:



(From page 11-40)

Measure voltage between YEL/RED (YEL/GRN)* (+) terminal and body ground

Is there approx 5V?

YES

Measure voltage between YEL/RED (YEL/GRN)* (+) terminal and GRN/WHT (GRN/BLU)* (−) terminal.

*: B16A2 engine

Is there approx 5V?

NO

Repair open in GRN/WHT or GRN/BLU wire between ECM (D21) and MAP sensor
* Repair open in GRN/BLU wire between ECM (D21) and MAP sensor

YES

NO

Connect the test harness 'D' connector to the ECM only not to the main wire harness (page 11-22).

Measure voltage between D19 (+) terminal and D21 (−) terminal.

*: B16A2 engine

Is there approx 5 V?

YES

NO

Repair open in YEL/RED or YEL/GRN wire between ECM (D19) and MAP sensor.
* Repair open in YEL/GRN wire between ECM (D19) and MAP sensor.

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

Measure voltage between WHT (+) terminal and GRN/WHT (GRN/BLU)* (−) terminal

Is there approx 5V?

NO

YES

Turn the ignition switch OFF

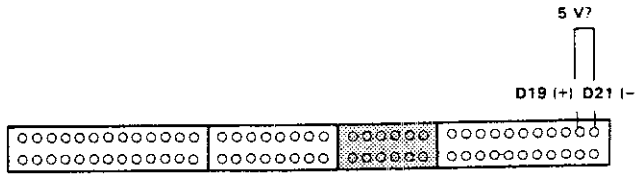
Reconnect the 3P connector to the MAP sensor

Connect the test harness between the ECM and connector (page 11-22).

Turn the ignition switch ON

(To page 11-42)

(To page 11-42)



(cont'd)

Troubleshooting Flowchart — Manifold Absolute Pressure Sensor (MAP Sensor) (cont'd)

(From page 11-41)

Connect the test harness 'D' connector to the ECM only, not to the main wire harness (page 11-22)

Measure voltage between D17 (+) terminal and D21 (–) terminal

Is there approx. 5 V?

YES

- Repair short in WHT wire between ECM (D17) and MAP sensor.
- Repair open in WHT wire between ECM (D17) and MAP sensor.

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

(From page 11-41)

Measure voltage between D17 (+) terminal and D21 (–) terminal

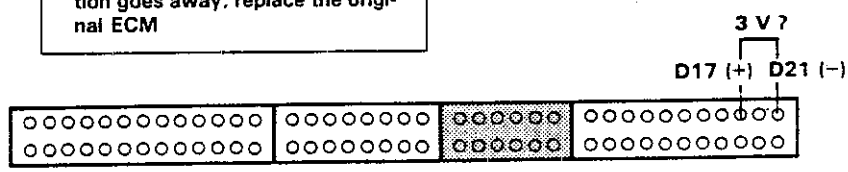
Is there approx. 3 V?

NO

Replace the MAP sensor.

YES

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



(cont'd)

Troubleshooting Flowchart — Manifold Absolute Pressure Sensor (MAP Sensor) [Except B16A2 engine] (cont'd)

- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 5 is indicated

Do the ECM Reset Procedure (page 11-19)

Start the engine and keep engine speed at 2 000 min^{-1} (rpm) for one minute (A/T: Transmission in N or P)

Is MIL on and does it indicate DTC 5?

NO

- Intermittent failure, system is OK at this time (test drive may be necessary)
- Check vacuum hoses, pipes and connections
- Make sure all connectors are secure

YES

Stop the engine

Remove the MAP sensor from throttle body

Connect a vacuum pump to the MAP sensor and apply vacuum

Does it hold vacuum?

NO

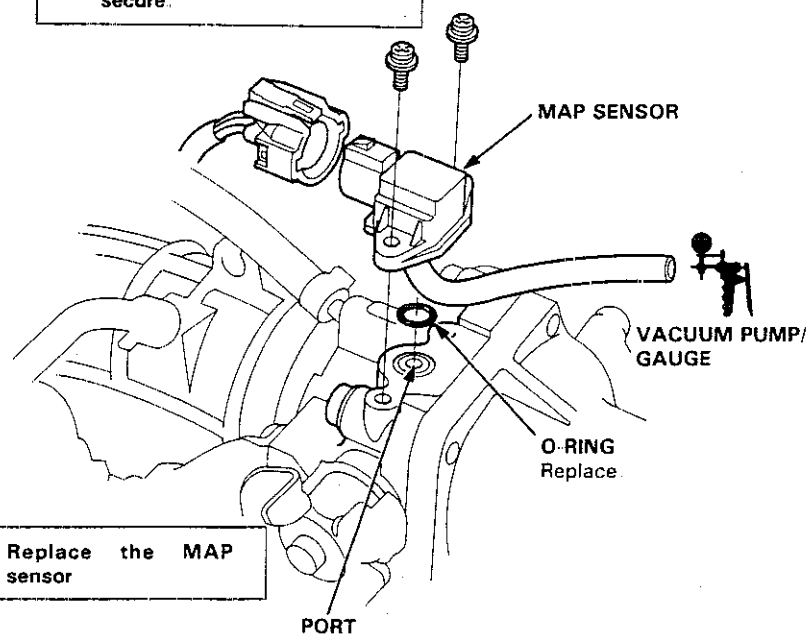
Replace the MAP sensor

YES

Start the engine

Put your finger over the MAP sensor port on throttle body

(To page 11-45)



(From page 11-44)

Is there manifold vacuum?

NO → Remove restriction from throttle body

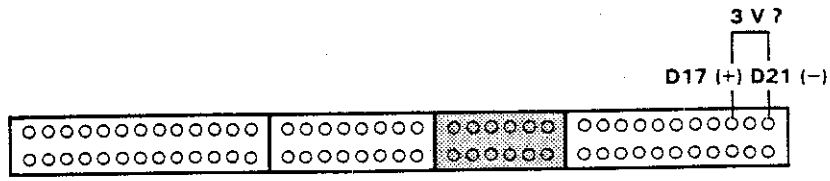
YES

Stop the engine

Connect the test harness between the ECM and connector (page 11-22).

Turn the ignition switch ON

Measure voltage between D17 (+) terminal and D21 (–) terminal



Is there approx 3 V ?

NO → Replace the MAP sensor.

YES

Install the MAP sensor.

Start the engine and allow it to idle

Is there approx 1 V?

NO → Replace the MAP sensor.

YES

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

(cont'd)

Troubleshooting Flowchart — Manifold Absolute Pressure Sensor (MAP Sensor) [B16A2 engine] (cont'd)

- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 5 is indicated

Do the ECM Reset Procedure (page 11-19).

Start the engine and keep engine speed at 2 000 min^{-1} (rpm) for one minute (A/T: Transmission in N or P).

Is MIL on and does it indicate DTC 5?

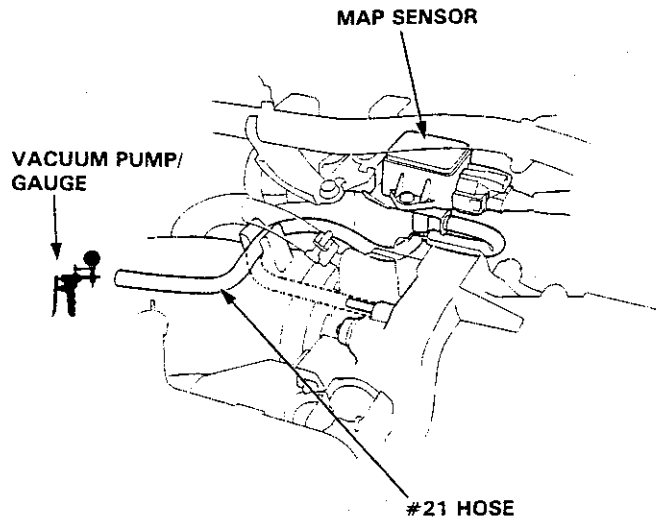
NO

- Intermittent failure, system is OK at this time (test drive may be necessary)
- Check vacuum hoses, pipes and connections
- Make sure all connectors are secure

YES

Stop the engine

Disconnect #21 hose from the throttle body, connect vacuum pump to the hose and apply vacuum



Does it hold vacuum?

NO

Connect a vacuum pump to the MAP sensor and apply vacuum

Does it hold vacuum?

NO

Replace the MAP sensor

YES

Repair vacuum leak in hose routing between MAP sensor and throttle body.

YES

Connect a T-fitting from a vacuum gauge between the throttle body base and #21 hose

(From page 11-47)

(From page 11-46)

Start the engine

Is there manifold vacuum? NO → Remove restriction from throttle body

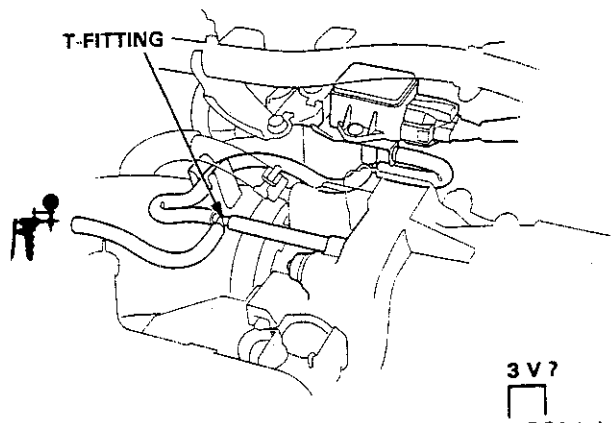
YES

Stop the engine

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

Measure voltage between D17 (+) terminal and D21 (–) terminal



Is there approx. 3 V? NO → Replace the MAP sensor

YES

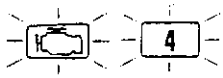
Start the engine and allow it to idle

Is there approx. 1 V? NO → Replace the MAP sensor

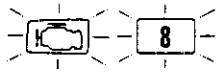
YES

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

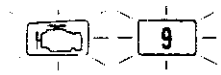
Troubleshooting Flowchart — Top Dead Center/Crankshaft Position/ Cylinder Position Sensor (TDC/CKP/CYP Sensor)



Malfunction Indicator light indicates diagnostic trouble code 4: A problem in the Crankshaft Position Sensor (CKP Sensor) circuit.

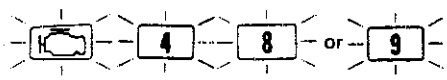


Malfunction Indicator light indicates diagnostic trouble code 8: A problem in the Top Dead Center Sensor (TDC Sensor) circuit



Malfunction Indicator light indicates diagnostic trouble code 9: A problem in the Cylinder Position Sensor (CYP Sensor) circuit.

The Crankshaft Position Sensor (CKP Sensor) determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The Top Dead Center Sensor (TDC Sensor) determines ignition timing at start-up (cranking) and when crank angle is abnormal. The Cylinder Position Sensor (CYP Sensor) detects the position of No 1 cylinder for sequential fuel injection to each cylinder.



- **Malfunction Indicator light (MIL) has been reported on.**
- **With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 4, 8 and/or 9 are indicated.**

Do the ECM Reset Procedure (page 11-19)

Start the engine

Is MIL on and does it indicate DTC 4, 8 or 9 ?

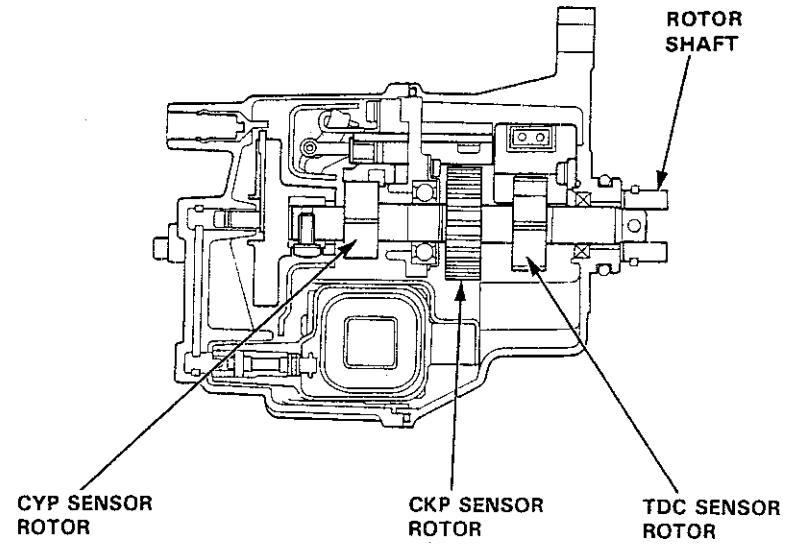
NO — **Intermittent failure, system is OK at this time (test drive may be necessary) Check for poor connections or loose wires between TDC/CKP/CYP sensor and ECM.**

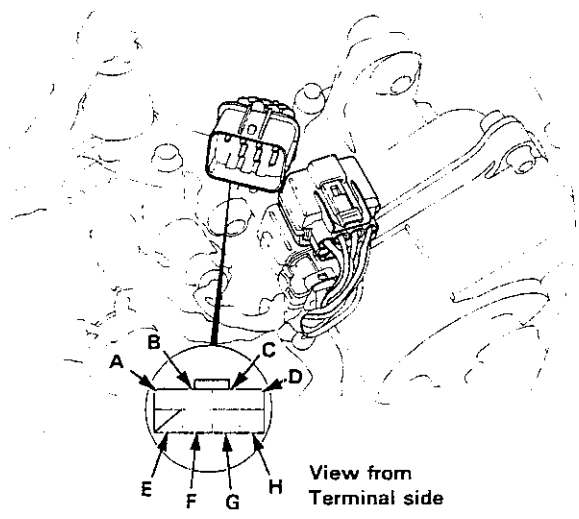
YES

Stop the engine.

Disconnect the 8P connector from the TDC/CKP/CYP sensor.

(To page 11-49)





(From page 11-48)

Measure resistance between terminals of the indicated sensor
*see table

Is there 350 – 700 Ω?
- NO → **Replace the distributor sub-assembly (Section 23)**
- YES →

Check for continuity to body ground on both terminals of the indicated sensor

Does continuity exist?
- YES → **Replace the distributor sub-assembly (Section 23)**
- NO →

Reconnect the connector.

Connect the test harness to the main wire harness only not to the ECM (page 11-22).

Measure resistance between terminals of the indicated sensor on test harness
*see table

Is there 350 – 700 Ω?
- NO → **Repair open in the indicated sensor wires.**
***see table**
- YES →

Check for continuity to body ground on B15 B13 and B11 terminals

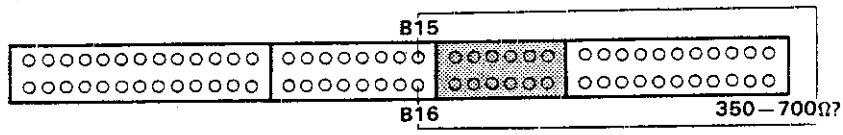
Does continuity exist?
- YES → **Repair short to body ground in the indicated sensor wires.**
***see table**
- NO →

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

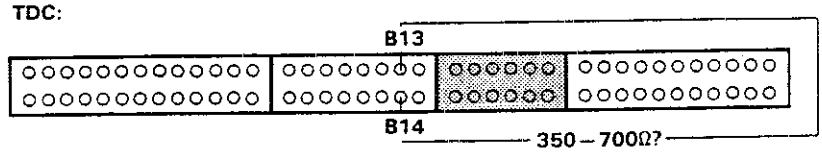
*:

SENSOR	DTC	SENSOR TERMINAL	ECM TERMINAL	WIRE COLOR
CKP	4	B	B15	BLU/GRN
		F	B16	BLU/YEL
TDC	8	C	B13	ORN/BLU
		G	B14	WHT/BLU
CYP	9	D	B11	ORN
		H	B12	WHT

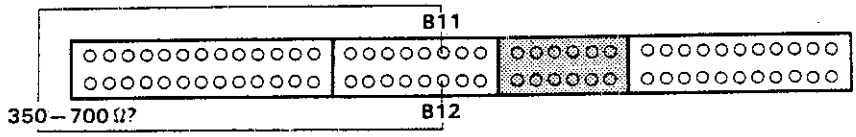
CKP:



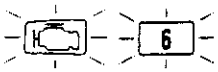
TDC:



CYP:

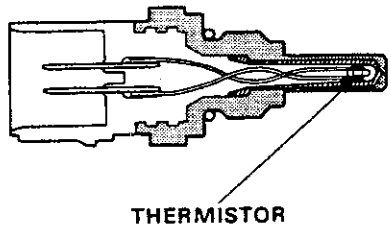


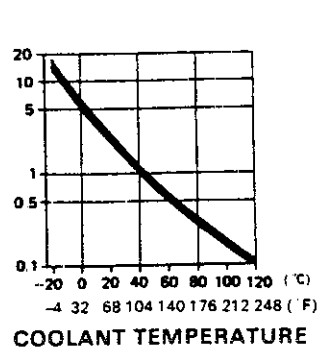
Troubleshooting Flowchart — Engine Coolant Temperature Sensor (ECT Sensor)

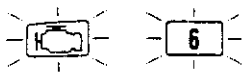


Malfunction Indicator light indicates diagnostic trouble code 6: A problem in the Engine Coolant Temperature Sensor (ECT Sensor) circuit.

The Engine Coolant Temperature Sensor (ECT Sensor) is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.







— Malfunction Indicator lignt (MIL) has been reported on.
— With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 6 is indicated.

Do the ECM Reset Procedure (page 11-19)

Turn the ignition switch ON

Is MIL on and does it indicate DTC 6?

NO → **Intermittent failure, system is OK at this time (test drive may be necessary).**
Check for poor connections or loose wires between ECT sensor and ECM.

YES

Warm up engine to normal operating temperature (cooling fan comes on)

Turn the ignition switch OFF

Disconnect the 2P connector from the ECT sensor.

Measure resistance between the 2 terminals on the ECT sensor

Is there 200—400 Ω?

NO → **Replace the ECT sensor.**

YES

(To page 11-51)

(From page 11-50)

Turn the ignition switch ON

Measure voltage between RED/ WHT and body ground

Is there approx. 5V ?

YES

Measure voltage between RED/ WHT (+) terminal and GRN/WHT (−) terminal

Is there approx. 5V ?

NO

Repair open in GRN/ WHT wire between ECM (D22) and ECT sensor.

YES

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

NO

Turn the ignition switch OFF

Connect the test harness "D" connector to the ECM only not to the main wire harness (page 11-22).

Turn the ignition switch ON

Measure voltage between D13 (+) terminal and D22 (−) terminal.

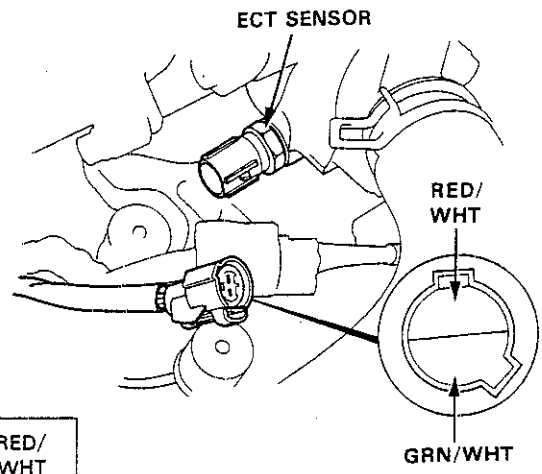
Is there approx. 5V?

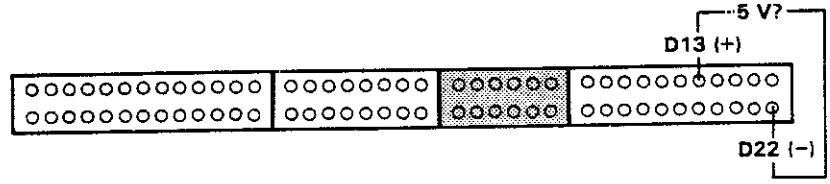
YES

Repair open or short in RED/ WHT wire between ECM (D13) and ECT sensor

NO

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

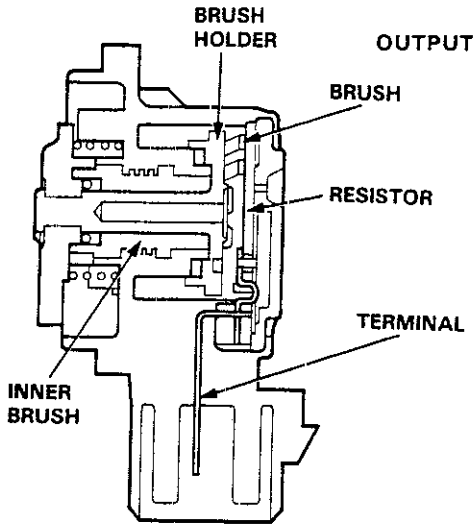


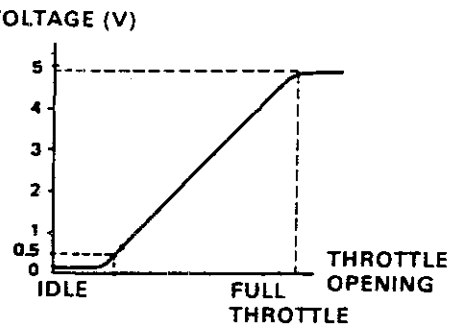


Troubleshooting Flowchart —— Throttle Position Sensor (TP Sensor)

Malfunction Indicator light indicates diagnostic trouble code 7: A problem in the Throttle Position Sensor (TP Sensor) circuit

The Throttle Position Sensor (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





- Engine is running
- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 7 is indicated.

Do the ECM Reset Procedure (page 11-19).

Start the engine.

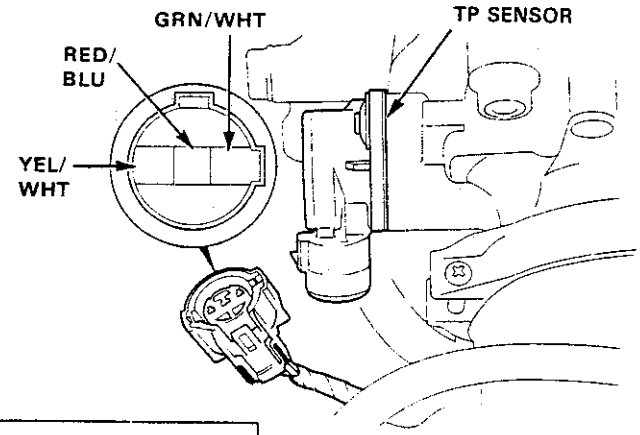
Is MIL on and does it indicate DTC 7?

NO → Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between TP sensor and ECM.

YES

Turn the ignition switch OFF

Disconnect the 3P connector from the TP sensor



Turn the ignition switch ON

Measure voltage between YEL/WHT (+) terminal and GRN/WHT (−) terminal

Is there approx. 5V ?

NO → Measure voltage between YEL/WHT (+) terminal and body ground

YES

(To page 11-53)

(To page 11-53)

(From page 11-52)

Turn the ignition switch OFF

Reconnect the 3P connector

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

Measure voltage between D11 (+) terminal and D22 (−) terminal.

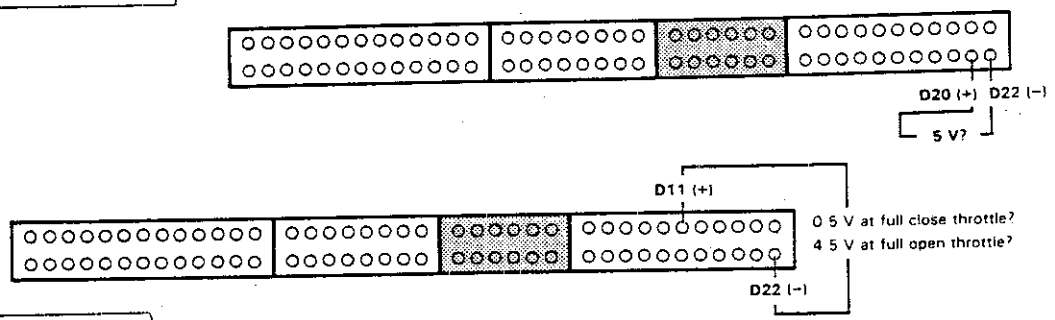
Is voltage 0.5 V at full close throttle and approx. 4.5 V at full open throttle?
NOTE: There should be a smooth transition from 0.5 V to approx. 4.5 V as the throttle is depressed.

NO

- Replace the TP sensor.
- Repair open or short in RED/BLU wire between ECM (D11) and TP sensor.

YES

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



(From page 11-52)

Is there approx. 5V ?

YES

Repair open in GRN/WHT wire between ECM (D22) and TP sensor.

NO

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

Measure voltage between D20 (+) terinal and D22 (−) terminal.

Is there approx. 5V ?

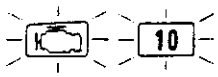
YES

Repair open in YEL/WHT wire between ECM (D20) and TP sensor.

NO

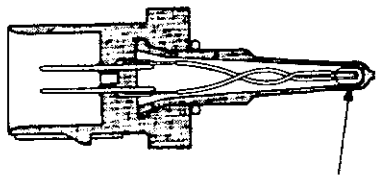
Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM

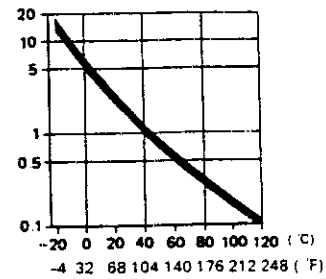
Troubleshooting Flowchart — Intake Air Temperature Sensor (IAT Sensor)

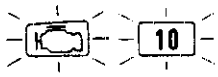


Malfunction Indicator light indicates diagnostic trouble code 10: A problem in the Intake Air Temperature Sensor (IAT Sensor) circuit

The Intake Air Temperature Sensor (IAT Sensor) is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below.







- **Malfunction Indicator light (MIL) has been reported on**
- **With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 10 is indicated.**

↓

Do the ECM Reset Procedure (page 11-19)

↓

Turn the ignition switch ON

↓

Is MIL on and does it indicate DTC 10?

NO → **Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between IAT sensor and ECM.**

YES ↓

Turn the ignition switch OFF

↓

Disconnect the 2P connector from the IAT sensor

↓

Measure resistance between the 2 terminals on the IAT sensor.

↓

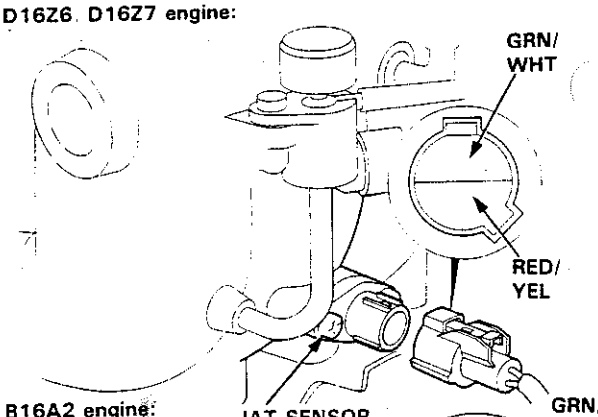
Is there 0.4 – 4.0 kΩ?

NO → **Replace the IAT sensor.**

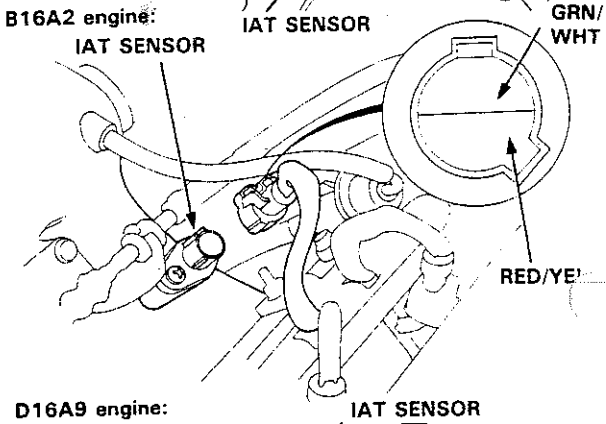
YES ↓

(To page 11-55)

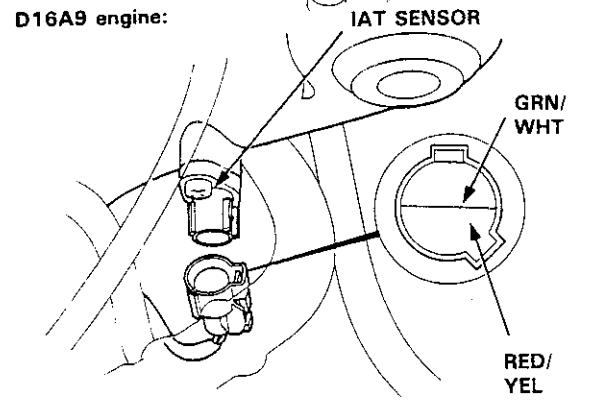
D16Z6, D16Z7 engine:



B16A2 engine:



D16A9 engine:



(From page 11-54)

Turn the ignition switch ON.

Measure voltage between RED/YEL (+) terminal and body ground

Is there approx. 5 V ?

YES

Measure voltage between RED/YEL (+) terminal and GRN/WHT (−) terminal

Is there approx. 5 V ?

NO

Repair open in GRN/WHT wire between ECM (D22) and IAT sensor.

YES

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

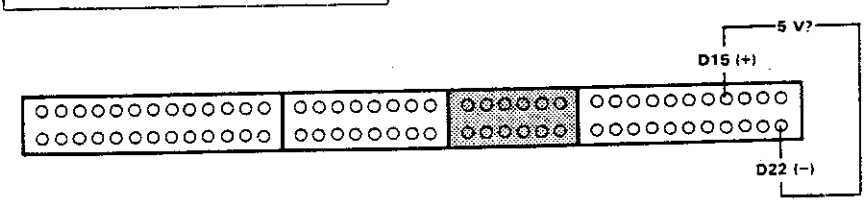
NO

Turn the ignition switch OFF

Connect the test harness 'D' connector to the ECM only, not to the main wire harness (page 11-22)

Turn the ignition switch ON.

Measure voltage between D15 (+) terminal and D22 (−) terminal



Is there approx. 5V?

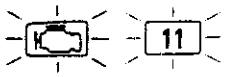
YES

Repair open or short in RED/YEL wire between ECM (D15) and IAT sensor

NO

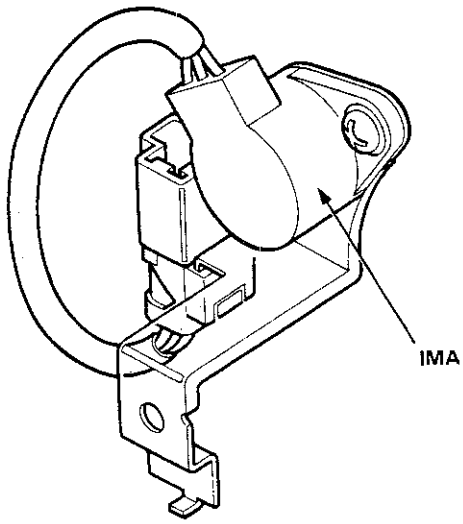
Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

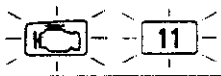
Troubleshooting Flowchart — Idle Mixture Adjuster (IMA) [D16A9 engine]



Malfunction Indicator light indicates diagnostic trouble code 11: A problem in the Idle Mixture Adjuster (IMA) circuit

The Idle Mixture Adjuster (IMA) is selected resistance device used to control idle mixture





– Malfunction Indicator light (MIL) has been reported on.
– With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 11 is indicated

↓

Do the ECM Reset Procedure (page 11-19)

↓

Turn the ignition switch ON

↓

Is MIL on and does it indicate DTC 11 ?

NO → **Intermittent failure, system is OK at this time (test drive may be necessary)**
Check for poor connections of loose wires at the IMA connector and ECM

YES ↓

Turn the ignition switch OFF

↓

Disconnect the 3P connector from the IMA

↓

Measure resistance between A terminal and C terminal on IMA harness

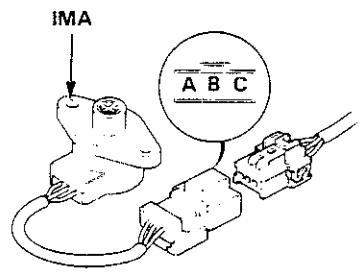
↓

Is there 4—6 kΩ ?

NO → **Replace the IMA.**

YES ↓

(To page 11-57)



(From page 11-56)

Measure resistance between A and B terminals and between C and B terminals

Does the sum of the two resistance checks equal 4 – 6 kΩ?

NO → Replace the IMA

YES

Turn the ignition switch ON

Measure voltage between YEL/WHT (+) terminal and GRN/WHT (–) terminal on the wire harness

Is there approx. 5 V ?

NO → Measure voltage between YEL/WHT (+) terminal and body ground.

Is there approx. 5 V ?

YES → Repair open in GRN/WHT wire between ECM (D22) and IMA.

NO

Turn the ignition switch OFF

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

Measure voltage between D20 (+) terminal and D22 (–) terminal.

Is there approx. 5 V ?

YES → Repair open in YEL/WHT wire between ECM (D20) and IMA.

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM

YES

Turn the ignition switch OFF

Reconnect the 3 P connector

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

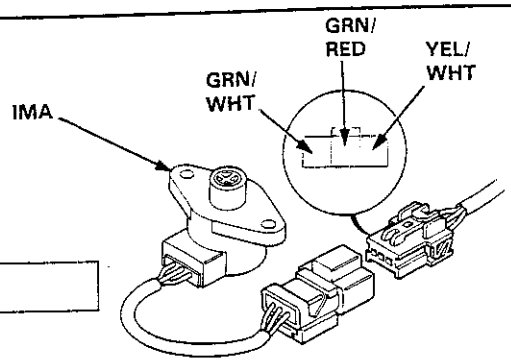
Measure voltage between D10 (+) terminal and D22 (–) terminal

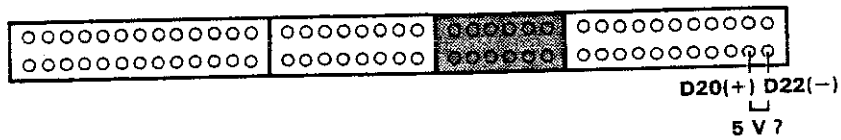
Is voltage 0.5—4.5 V ?

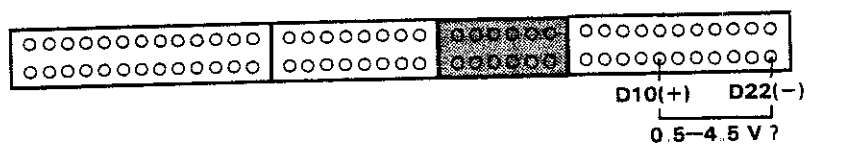
NO → Repair open or short in GRN/RED wire between ECM (D10) and IMA.

YES

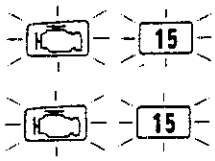
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM







Troubleshooting Flowchart — Ignition Output Signal



Malfunction Indicator light indicates diagnostic trouble code 15: A problem in the Ignition Output Signal circuit.

- Malfunction Indicator light (MIL) has been reported on.
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 15 is indicated.

Do the ECM Reset Procedure (page 11-19)

Start the engine

NOTE: If the engine won't start, it may take 20 seconds of cranking to set the code.

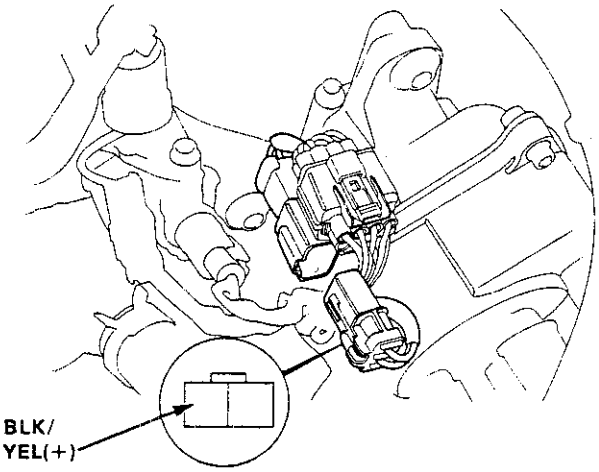
Is MIL on and does it indicate DTC 15 ?

NO → Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between Ignition Control Module (ICM) and ECM.

YES

Turn the ignition switch OFF

Disconnect the 2P connector from the distributor



Turn the ignition switch ON

Measure voltage between BLK / YEL (+) terminal and body ground

Is there battery voltage ?

NO → Repair open in BLK/YEL wire between the 2P connector and ignition switch

YES

(To page 11-59)

(From page 11-58)

Turn the ignition switch OFF.

Reconnect the 2P connector

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON

Measure voltage individually between A21 (+), A22 (+) terminals and A26 (−) terminal

Is there approx. 10 V?

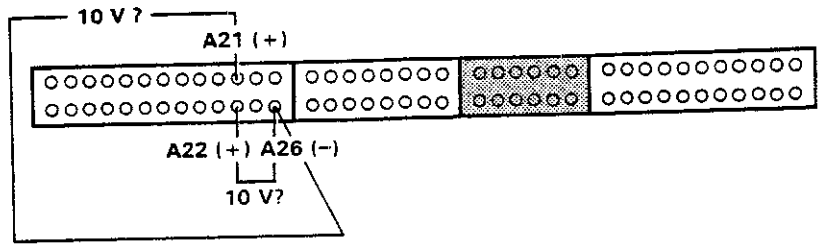
NO

- **Replace the ICM.**
- **Repair open or short in YEL/GRN or RED/GRN wire between ICM and ECM (A21 or A22)**

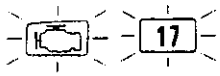
NOTE: If the YEL/GRN or RED/GRN wire was shorted, the ICM may be damaged.

YES

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

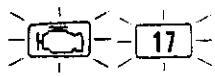


Troubleshooting Flowchart — Vehicle Speed Sensor (VSS)



Malfunction Indicator light indicates diagnostic trouble code 17: A problem in the Vehicle Speed Sensor (VSS) circuit.

The signal generated by the Vehicle Speed Sensor (VSS) produces pulses when the front wheels turn.



– Malfunction Indicator light (MIL) has been reported on
– With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 17 is indicated

Do the ECM Reset Procedure (page 11-19)

Road test necessary.
In 2nd gear accelerate to 4,000 min^{-1} (rpm) then decelerate to 1,500 min^{-1} (rpm) with throttle fully closed (A/T: Transmission in [2])

Is MIL on and does it indicate DTC 17? — NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires between VSS and ECM.**

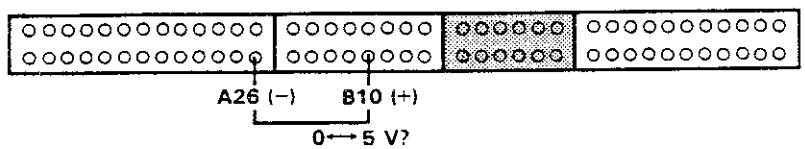
YES

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands

⚠WARNING Block rear wheels before jacking up front of car.

Connect the test harness between the ECM and connector (page 11-22)

Turn the ignition switch ON



Block the right front wheel and slowly rotate left front wheel and measure voltage between B10 (+) terminal and A26 (–) terminal

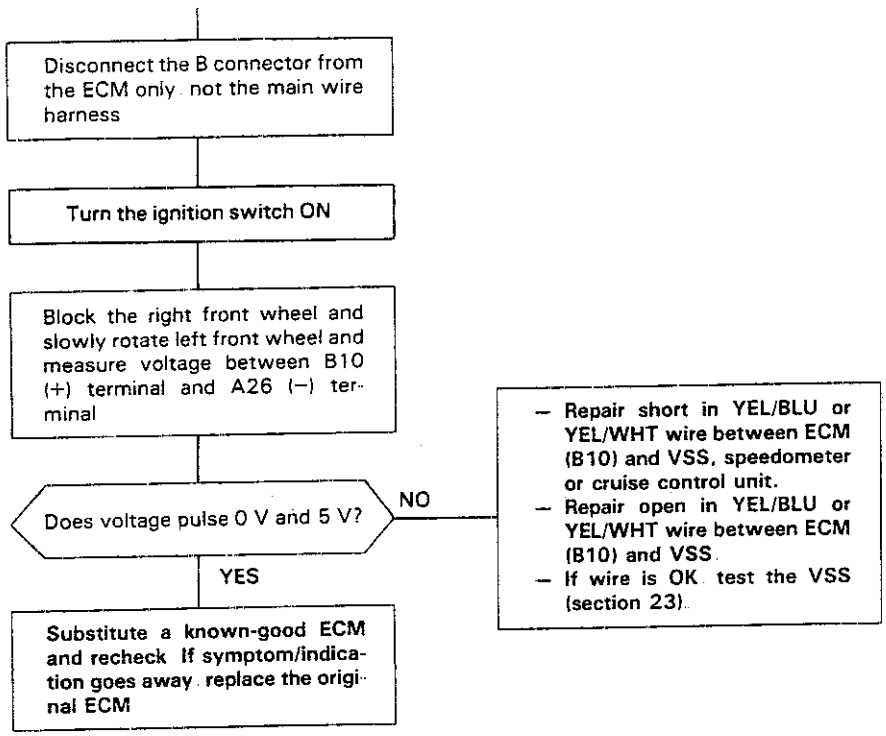
Does voltage pulse 0 V and 5 V? — NO → Turn the ignition switch OFF

YES

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

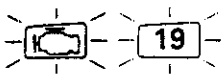
(To page 11-61)

(From page 11-60)



Troubleshooting Flowchart — Lock-up Control Solenoid Valve (A/T)

Malfunction Indicator light indicates diagnostic trouble code 19: A problem in the Lock-up Control Solenoid Valve A (or B) circuit.



– Malfunction Indicator light (MIL) has been reported on
– With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 19 is indicated.

Do the ECM Reset Procedure (page 11-19).

Test drive necessary.
Drive the car for several miles so that the transmission upshifts and downshifts several times

Is MIL on and does it indicate DTC 19?

NO → **Intermittent failure, system is OK at this time.**
Check for poor connections or loose wires between lock-up control solenoid valve and ECM.

YES

Turn the ignition switch OFF.

Connet the test harness to the main harness only, not to the ECM (page 11-22)

Disconnect the 2P connector from the lock-up control solenoid valve

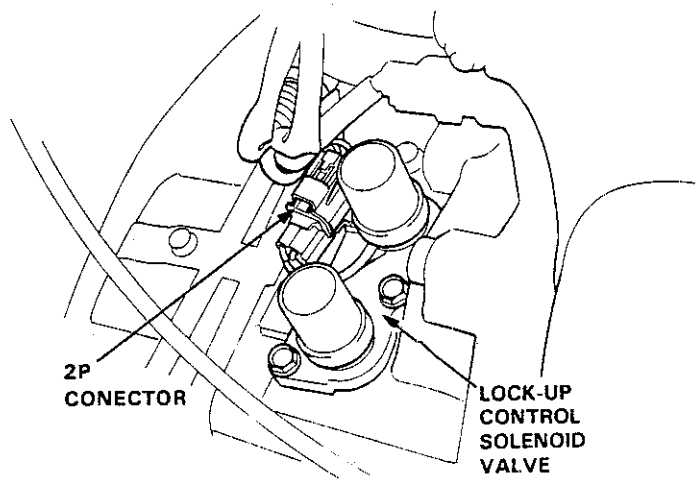
Check for continuity between A19 or A17* and body ground

Does continuity exist?

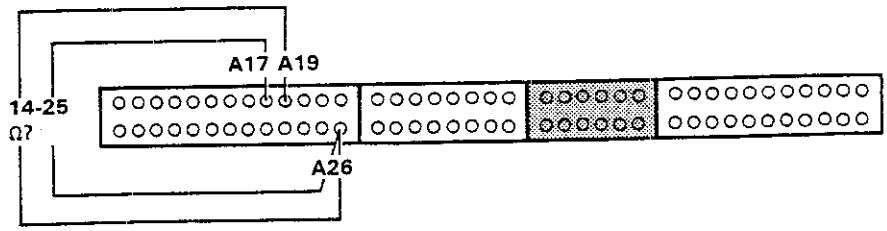
YES → **Repair short in YEL or GRN/BLK* wire between ECM (A19 or A17*) and the 2P connector**

NO

(To page 11-63)



* : Lock-up Control Solenoid Valve B



(From page 11-62)

Reconnect the 2P connector

Measure resistance between A19 or A17* terminal and A26 terminal

Is there 14-25 Ω ?

NO

Check for continuity in YEL or GRN/BLK wire between ECM (A19 or A17*) and the 2P connector

Does continuity exist?

YES

Faulty lock-up control solenoid valve (page 14-41)

NO

Repair open in YEL or GRN/BLK* wire between ECM (A19 or A17*) and the 2P connector

YES

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

Idle Control System

System Troubleshooting Guide

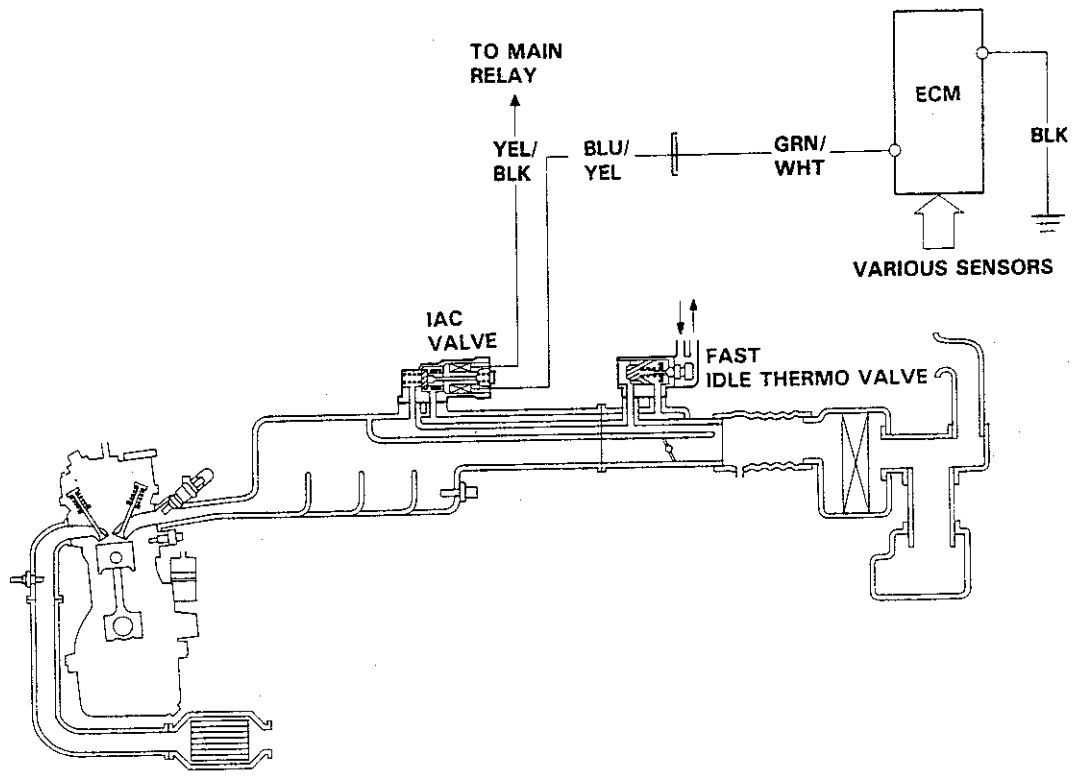
NOTE:

- Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ① Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc
- If the idle speed is out of specification and the Malfunction Indicator Light (MIL) does not blink Diagnostic Trouble Code (DTC) 14, go to inspection dscribed on page 11-67

PAGE / SUB SYSTEM / SYMPTOM		IDLE ADJUSTING SCREW	IDLE AIR CONTROL VALVE	AIR CONDITIONING SIGNAL	ALTERNATOR FR SIGNAL	AUTOMATIC TRANSMISSION GEAR POSITION SWITCH SIGNAL	STARTER SWITCH SIGNAL	FAST IDLE THERMO VALVE	HOSES AND CONNECTIONS
		78	68	70	72	74	76	77	–
DIFFICULT TO START ENGINE WHEN COLD								①	
WHEN COLD FAST IDLE OUT OF SPEC (1.000 – 2.000 min^{-1} rpm)		③	②					①	
ROUGH IDLE			②						①
WHEN WARM ENGINE SPEED TOO HIGH		③	①					②	③
WHEN WARM ENGINE SPEED TOO LOW	Idle speed is below specified engine speed (no load)	②	①						
	Idle speed does not increase after initial start up		①						
	On models with automatic transmission the idle speed drops in gear		②			①			
	Idle speeds drops when air conditioner is ON		②	①					
	Idle speed fluctuates with electrical load		②		③				①
FREQUENT STALLING	WHILE WARMING UP	②	①						
	AFTER WARMING UP	①	②						
FAILS EMISSION TEST									①

System Description

The idle speed of the engine is controlled by the Idle Air Control Valve (IAC Valve).
The valve changes the amount of air bypassing into the intake manifold in response to electric current sent from the ECM.
When the Idle Air Control Valve (IAC Valve) is activated, the valve opens to maintain the proper idle speed.

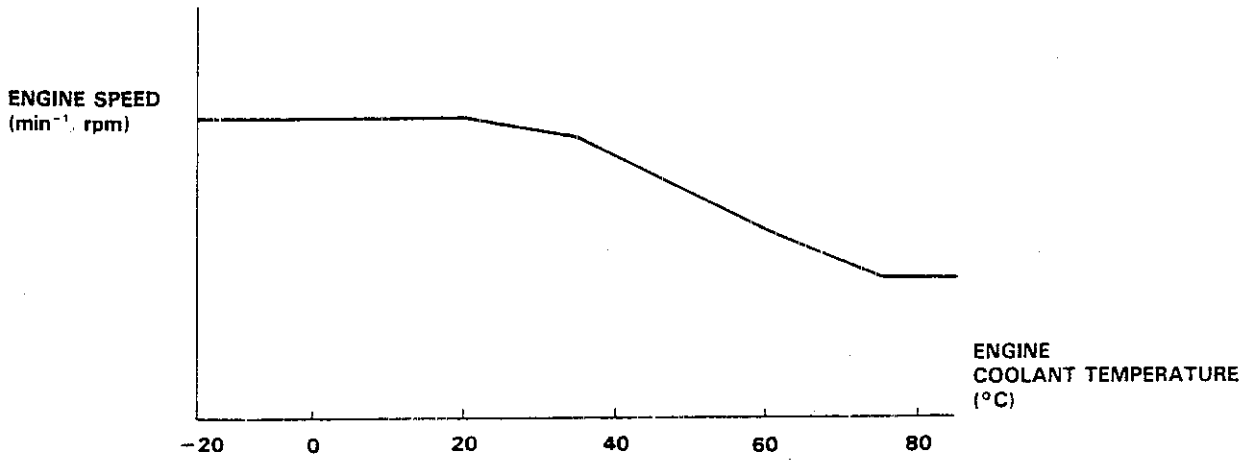


(cont'd)

System Description (cont'd)

1. After the engine starts, the Idle Air Control Valve (IAC Valve) opens for a certain time The amount of air is increased to raise the idle speed about 150-300 min^{-1} (rpm)

2. When the coolant temperature is low, the Idle Air Control Valve (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 Malfunction Indicator light (MIL) does not blink Diagnostic Trouble Code (DTC) 14, check the following items:
- Adjust the idle speed (page 11-78)
- Air conditioning signal (page 11-70)
- Alternator FR signal (page 11-72)
- Automatic transmission gear position switch signal (page 11-74)
- Starter switch signal (page 11-76)
- Fast idle thermo valve (page 11-77)
- Hoses and connections
- IAC valve and its mounting O-rings

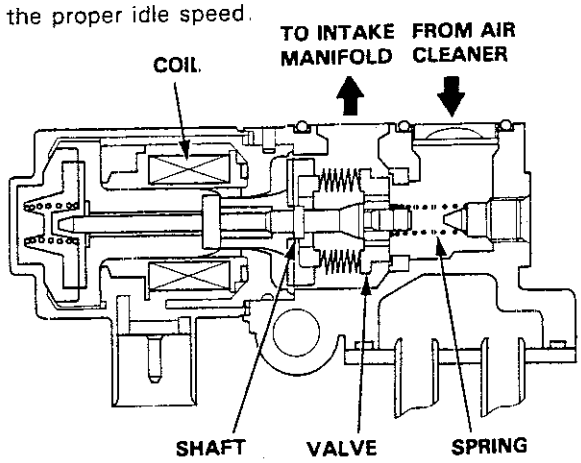
2. If the above items are normal, substitute a known-good IAC valve and readjust the idle speed (page 11-78).
- If the idle speed still cannot be adjusted to specification (and the MIL does not blink DTC 14) after IAC valve replacement, substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM

Idle Control System

Troubleshooting Flowchart —— Idle Air Control Valve (IAC Valve)

14 Malfunction Indicator light indicates diagnostic trouble code 14: A problem in the Idle Air Control Valve (IAC Valve) circuit.

The Idle Air Control Valve (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.



14

- Malfunction Indicator light (MIL) has been reported on
- With service check connector jumped (page 11-18), Diagnostic Trouble Code (DTC) 14 is indicated.

Do the ECM Reset Procedure (page 11-19)

Start the engine

Is MIL on and does it indicate DTC 17?

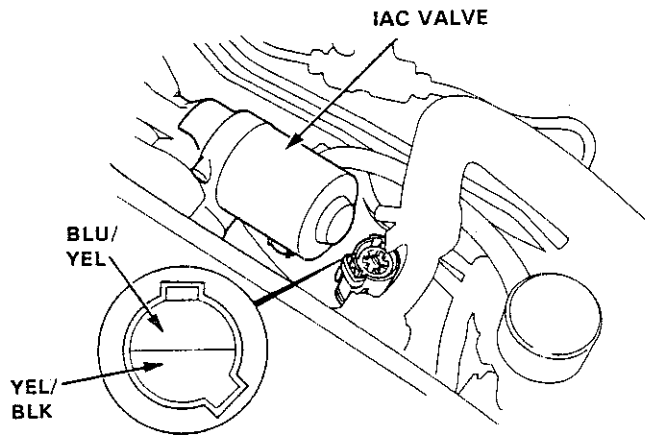
NO → With the engine running and the accelerator pedal released, disconnect the 2P connector from the IAC valve.

Is there a reduction in engine speed?

YES → Intermittent failure, system is OK at this time. (test driving may be necessary) Check for poor connections or loose wires between IAC valve and ECM.

NO → Substitute a known-good IAC valve and retest

YES → Remove the 2P connector from the IAC valve.



(To page 11-69)

(From page 11-68)

Measure voltage between the YEL/BLK wire and body ground

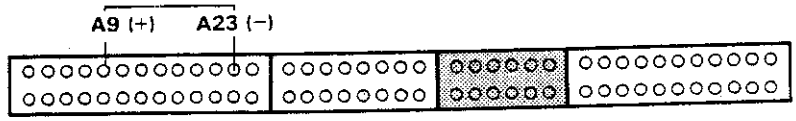
Is there battery voltage?

NO → **Repair open in YEL/BLK wire between IAC valve and main relay.**

YES

Turn the ignition switch off and reconnect the 2P connector the IAC valve.

Connect the test harness "A" connector to the main wire harness only, not the ECM (page 11-22)



Turn the ignition switch ON

Momentarily connect A9 terminal to A23 terminal several times.

Does the IAC valve click?

YES → **Substitute a known-good ECM and retest. If symptom/indication goes away, replace the original ECM.**

NO

Repair open or short in GRN/WHT or BLU/YEL wire between IAC valve and ECM (A9). If the wire is OK, replace the IAC valve.

Troubleshooting Flowchart — Air Conditioning Signal

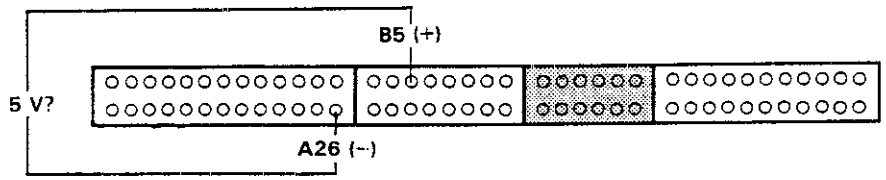
This signals the ECM when there is a demand for cooling from the air conditioning system.

Inspection of Air Conditioning Signal

Connect the test harness between the ECM and connector. Disconnect "B" connector from the main wire harness only, not the ECM (page 11-22).

Turn the ignition switch ON

Measure voltage between B5 (+) terminal and A26 (–) terminal



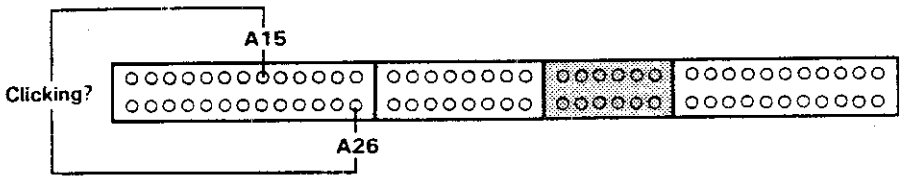
Is there approx. 5 V?

NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

YES

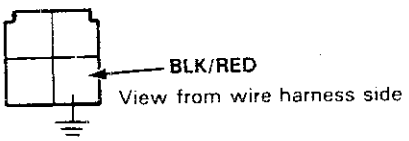
Reconnect "B" connector to the main wire harness

Momentarily connect A15 terminal to A26 terminal several times.



Is there a clicking noise from the A/C compressor clutch?

NO → Connect the BLK/RED terminal of the 4P connector on the A/C clutch relay to body ground



YES

Start the engine

Blower switch ON

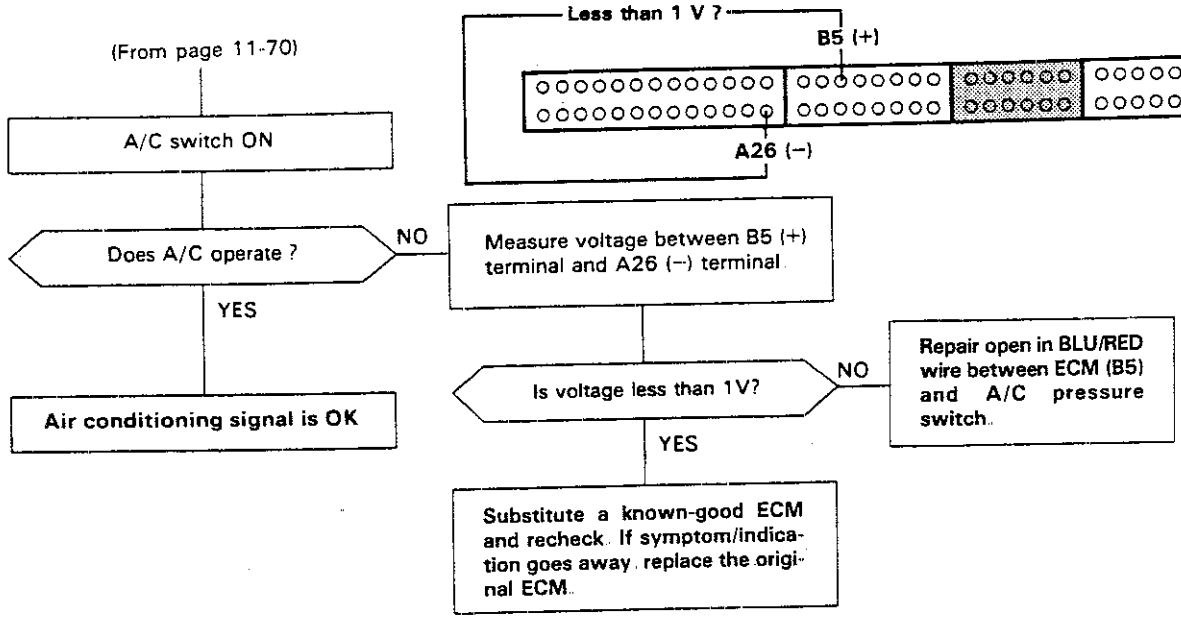
(To page 11-71)

Is there a clicking noise from the A/C compressor clutch?

NO → **See Air conditioner inspection (section 22)**

YES

Repair open in BLK/RED wire between ECM (A15) and A/C clutch relay


(From page 11-70)
A/C switch ON
Does A/C operate ?
NO
YES
Air conditioning signal is OK
Less than 1 V ?
B5 (+)
A26 (–)
Measure voltage between B5 (+) terminal and A26 (–) terminal.
Is voltage less than 1V?
NO
YES
Repair open in BLU/RED wire between ECM (B5) and A/C pressure switch.
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

Troubleshooting Flowchart — Alternator FR Signal

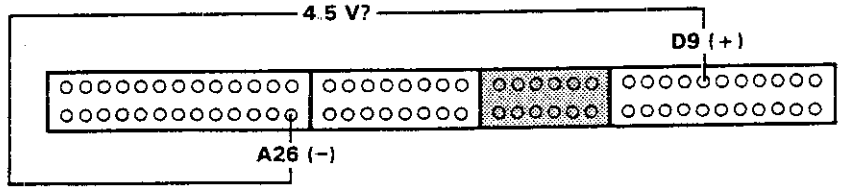
This signals the ECM when the alternator is charging

Inspection of Alternator FR signal

Connect the test harness between the ECM and connector. Disconnect "D" connector from the main wire harness only, not the ECM (page 11-22)

Turn the ignition switch ON

Measure voltage between D9 (+) terminal and A26 (−) terminal



Is there approx. 4.5 V? — NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

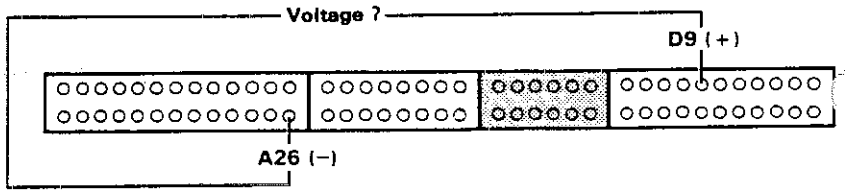
YES

Turn the ignition switch OFF

Reconnect "D" connector to the main wire harness

Warm up engine to normal operating temperature (cooling fan comes on)

Measure voltage between D9 (+) terminal and A26 (−) terminal



Does the voltage decrease when headlights and rear defogger are turned on ? — NO → Stop the engine

YES

Do the ECM Reset Procedure (page 11-19)

Alternator FR signal is OK

(To page 11-73)

(From page 11-72)

Disconnect "D" connector form ECM only, not the main wire harness

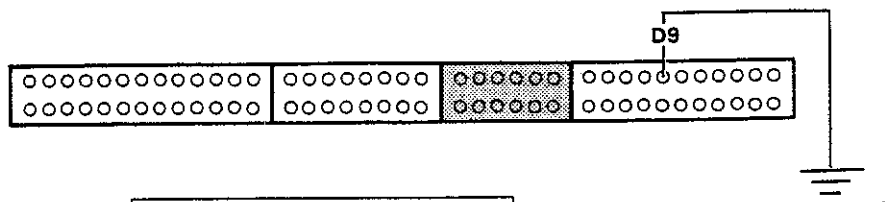
Disconnect the negative battery cable from the battery

Check for continuity between D9 terminal and body ground

Does continuity exist ?

YES

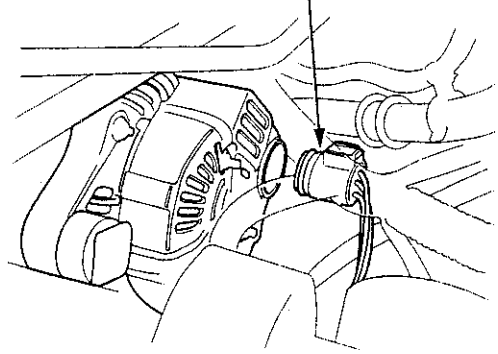
Disconnect GRN connector from the alternator



NO

Disconnect GRN connector from the alternator

GRN CONNECTOR



Connect BLU wire to body ground

Check for continuity between D9 terminal and body ground

Does continuity exist ?

YES

NO

Repair open in PNK or BLU wire between ECM (D9) and alternator

See Alternator Inspection (section 23)

Check for continuity between D9 terminal and body ground

Does continuity exist ?

NO

See Alternator Inspection (section 23)

YES

Repair short in PNK or BLU wire between ECM (D9) and alternator

Troubleshooting Flowchart — Automatic Transmission Gear Position Switch Signal (A/T)

The signals the ECM when the transmission is in Neutral or Park.

Inspection of Automatic Transmission Gear Position Switch Signal.

Turn the ignition switch ON.

Observe the automatic transmission gear position switch indicator and select each position separately.

Does the indicator light properly? NO → **See Automatic Transmission Gear Position Switch Indicator Inspection (section 14).**

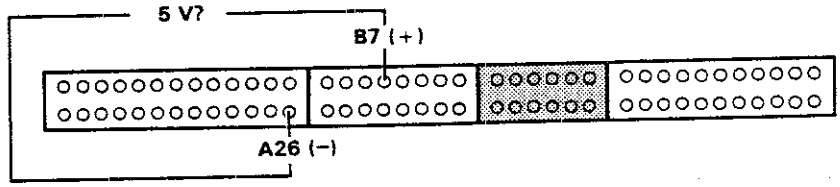
YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connector. Disconnet "B" connector from the main wire harness only not the ECM (page 11-22)

Turn the ignition switch ON

Measure voltage between B7 (+) terminal and A26 (−) terminal



Is there approx. 5 V? NO → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

YES

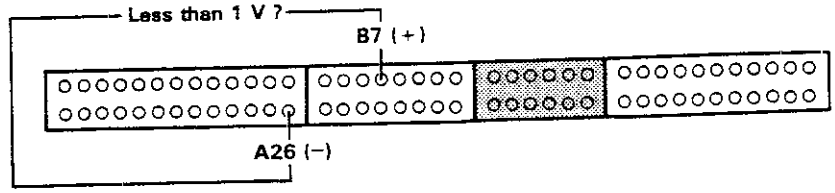
Turn the ignition switch OFF

Reconnect "B" connector to the main wire harness

Start the engine.

(To page 11-75)

(From page 11-74)

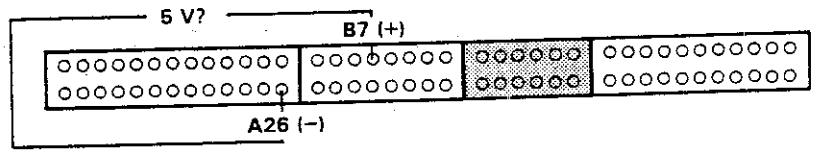


Measure voltage between B7 (+) terminal and A26 (–) terminal with the transmission in [N] and [P] individually.

Is there less than 1 V?

NO → Repair open in GRN wire between ECM (B7) and gauge assembly.

YES

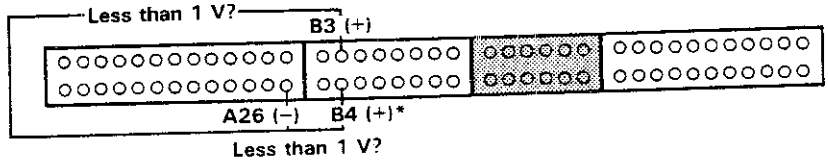


Measure voltage between B7 (+) terminal and A26 (–) terminal with the transmission in gear

Is there approx. 5 V?

NO → Repair short in GRN wire between ECM (B7) and gauge assembly

YES



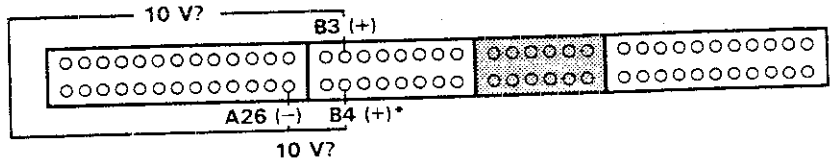
Measure voltage between B3 or B4* terminal and A26 (–) terminal with the transmission in [D3] or [D4] individually

*: [D4]

Is there less than 1 V?

NO → Repair open in GRN/BLU or GRN/BLK wire between ECM (B3 or B4*) and automatic transmission gear position switch.

YES



Measure voltage between B3 or B4* (+) terminal and A26 (–) terminal with the transmission in [N] or [P]

Is there approx. 10 V?

NO → Repair short in GRN/BLU or GRN/BLK* wire between ECM (B3 or B4*) and automatic transmission gear Position Swtich

YES

Automatic Transmission Gear Position Switch signal is OK.

Troubleshooting Flowchart — Starter Switch Signal

This signals the ECM when the engine is cranking

Inspection of Starter Switch Signal

Connect the test harness between the ECM and connector (page 11-22)

Measure voltage between B9 (+) terminal and A26 (–) terminal with the ignition switch in the start position.

Is there battery voltage ?

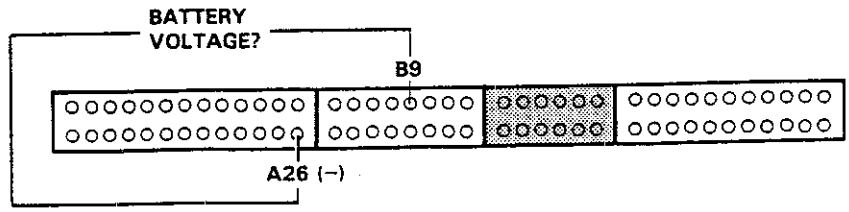
NO → Inspect STARTER SIGNAL(7 5A) fuse

Is STARTER SIGNAL(7 5A) fuse OK?

NO → **Replace the fuse**

YES → **Repair open in BLU/WHT wire between ECM (B9) and STARTER SIGNAL (7.5 A) fuse.**

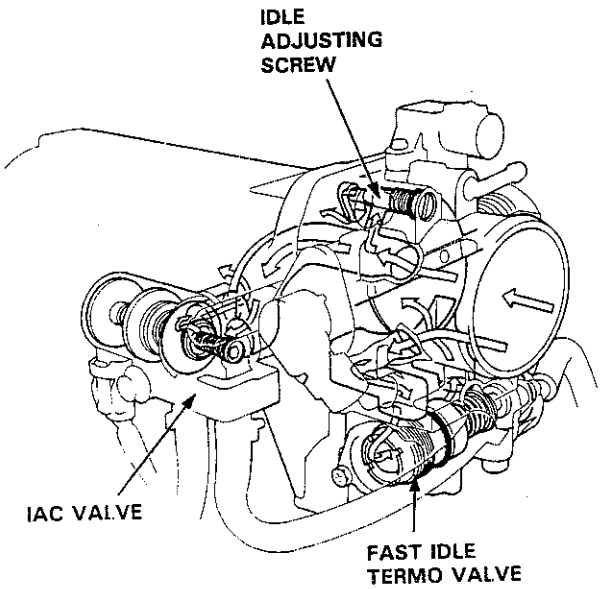
YES → **Starter switch signal is OK**

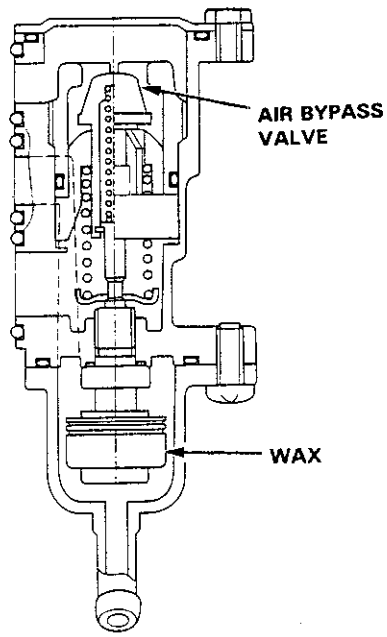


Fast Idle Thermo Valve

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.

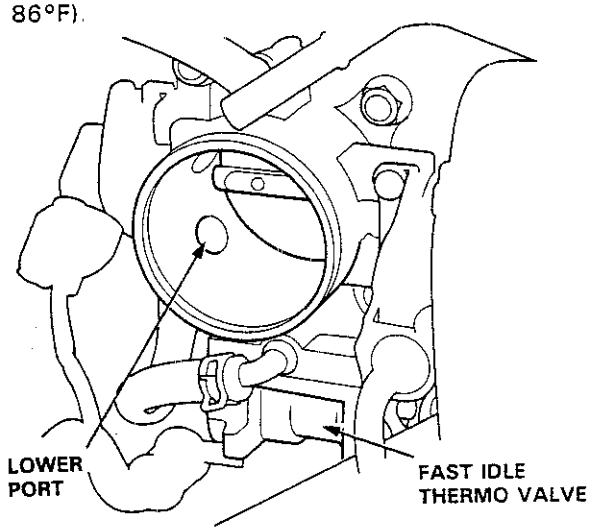




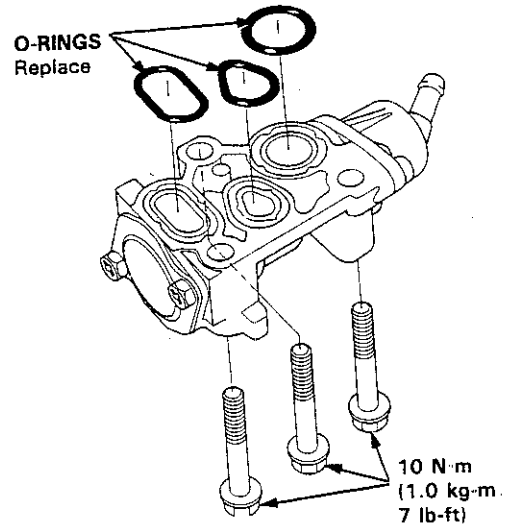
Inspection

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 30°C, 86°F).



- If not, replace the fast idle thermo valve and retest.



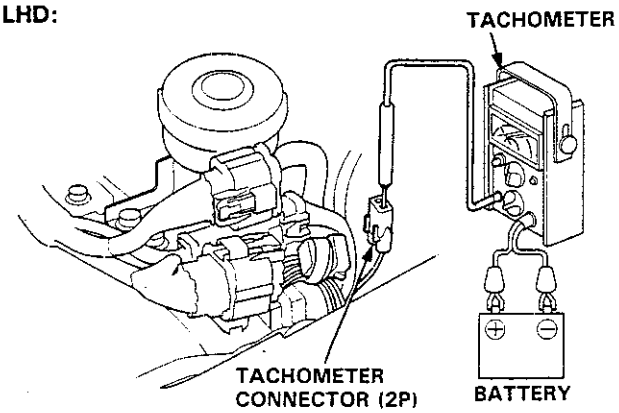
4. Warm up the engine (cooling fan comes on).
5. Check that the valve is completely closed. If not, air suction can be felt at the lower port in the throttle body.
   - If any suction is felt, the fast idle thermo valve is leaking. Replace the fast idle thermo valve and recheck.

Idle Speed Setting

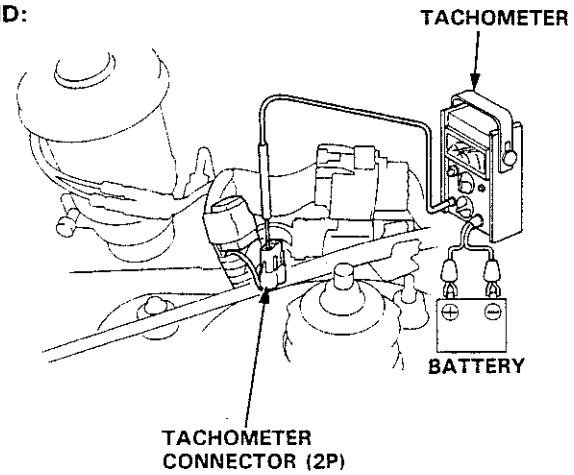
Inspection/Adjustment

1. Start the engine and warm it up to normal operating temperature (the cooling fan comes on).
2. Connect a tachometer.

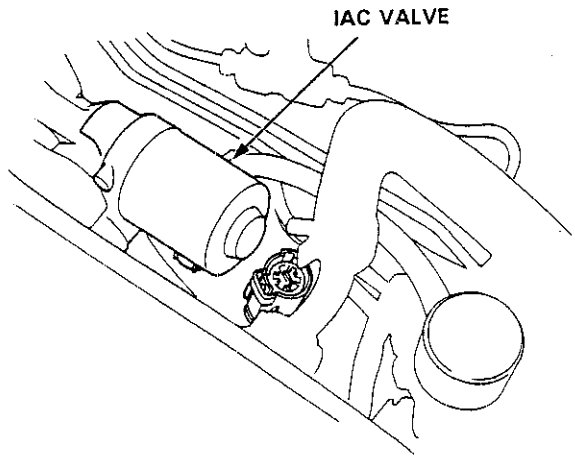
LHD:



RHD:



3. Disconnect the 2P connector from the IAC valve.



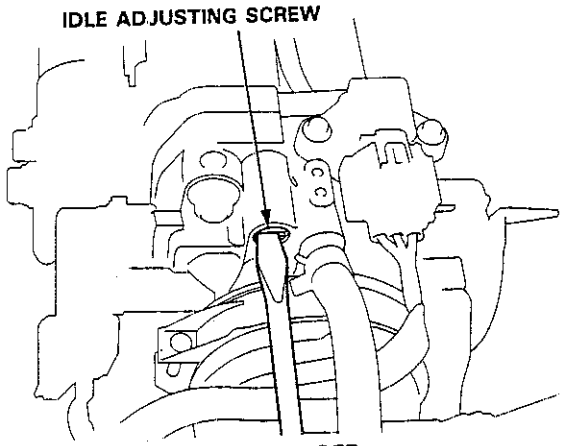
4. Start the engine with the accelerator pedal slightly depressed. Stabilize the engine speed at 1,000, then slowly release the pedal until the engine idles.
5. Check idling in no-load conditions: headlights, blower fan, rear defogger, cooling fan, and air conditioner are not operating.

   NOTE: (KS) Remove RUNNING LIGHT RELAY (7.5 A) fuse in the under-dash fuse box, then check that the headlights and side marker lights are off.

   Idle speed should be:

Manual	420 ± 50 min^{-1} (rpm)
Automatic	420 ± 50 min^{-1} (rpm) (in N or P)

   Adjust the idle speed, if necessary, by turning the idle adjusting screw.



6. Turn the ignition switch OFF.

7 Reconnect the 2P connector on the IAC valve, then remove BACK UP fuse in the under-hood fuse/relay box for 10 seconds to reset the ECM

8. Restart and idle the engine with no-load conditions for one minute, then check the idle speed.

NOTE: (KS) Remove RUNNING LIGHT RELAY (7.5 A) fuse in the under-dash fuse box, then check that the headlights and side marker lights are off.

Idle speed should be:

Manual	750 ± 50 min^{-1} (rpm)
Automatic	750 ± 50 min^{-1} (rpm) (in N or P)

9. Idle the engine for one minute with headlights (Hi) ON and check the idle speed

Idle speed should be:

Manual	750 ± 50 min^{-1} (rpm)
Automatic	750 ± 50 min^{-1} (rpm) (in N or P)

10. Turn the headlights and rear defogger 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:

Manual	810 ± 50 min^{-1} (rpm)
Automatic	810 ± 50 min^{-1} (rpm) (in N or P)

NOTE: If the idle speed is not within specification, see System Trobleshooting Guide on page 11-64.

System Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE / SUB SYSTEM / SYMPTOM		FUEL INJECTOR	FUEL PRESSURE REGURATOR	FUEL FILTER	FUEL PUMP	MAIN RELAY	CONTAMINATED FUEL
		83	87	88	90	93	–
ENGINE WON'T START				③	①	②	
DIFFICULT TO START ENGINE WHEN COLD OR HOT				①			
ROUGH IDLE		①					②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	①	③				②
	FAILS EMISSION TEST	②	①				
	LOSS OF POWER	③		②	①		
FREQUENT STALLING	WHILE WARMING UP		①				
	AFTER WARMING UP		①				

Fuel Supply System

System Description

The fuel supply system consists of a fuel tank, in-tank high pressure fuel pump, main relay, fuel filter, fuel pressure regulator, fuel injector, 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

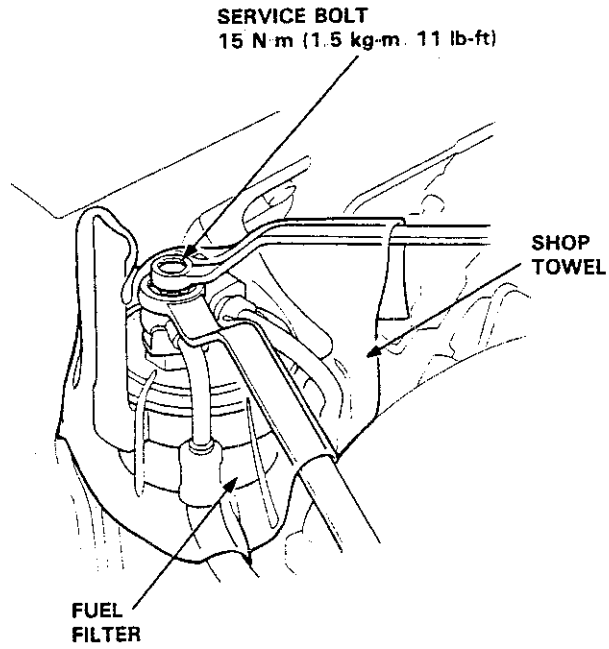
Relieving

⚠ WARNING

- **Do not smoke while working on the fuel system. Keep open flames or sparks away from the work area.**
- **Be sure to relieve fuel pressure while the engine is off.**

NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt on top of the fuel filter

1. Disconnect the battery negative cable from the battery negative terminal.
2. Remove fuel filler cap.
3. Use a box end wrench on the 6 mm service bolt at the fuel filter, while holding the special banjo bolt with another wrench.
4. Place a rag or shop towel over the 6 mm service bolt.
5. Slowly loosen the 6 mm service bolt one complete turn.



NOTE:

- A fuel pressure gauge can be attached at the 6 mm service bolt hole.
- Always replace the washer between the service bolt and the special banjo bolt, whenever the service bolt is loosened.
- Replace all wahers whenever the bolts are removed.

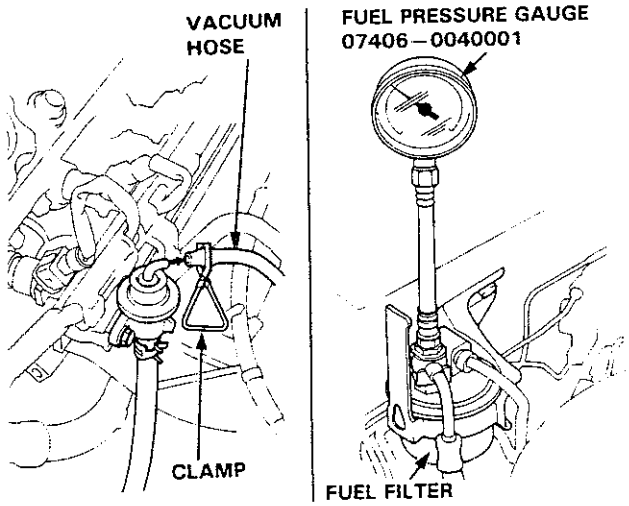
Inspection

1. Relieve fuel pressure (page 11-82).

2. Remove the service bolt on the fuel filter while holding the banjo bolt with another wrench. Attach the special tool.

3. Start the engine.* Measure the fuel pressure with the engine idling and vacuum hose of the fuel pressure regulator disconnected from the fuel pressure regulator.
   Pressure should be:
   280–330 kPa (2.8–3.3 kg/cm², 40–47 psi)

4. Reconnect vacuum hose to the fuel pressure regulator
   Pressure should be:
   215–265 kPa (2.15–2.65 kg/cm ², 31–38 psi)



* : If the engine will not start, turn the ignition switch on, wait for two seconds, turn it off, then back on again and read the fuel pressure

- If the fuel pressure is not as specified, first check the fuel pump (page 11-91). If the fuel pump is OK, check the following:

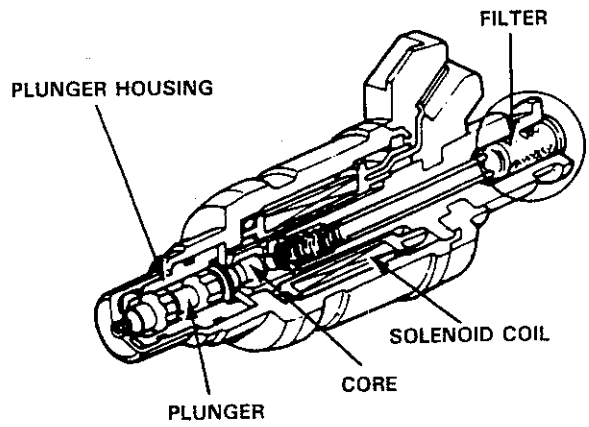
– If the fuel pressure is higher than specified, inspect for:
  - Pinched or clogged fuel return hose or piping
  - Faulty fuel pressure regulator (page 11-87)

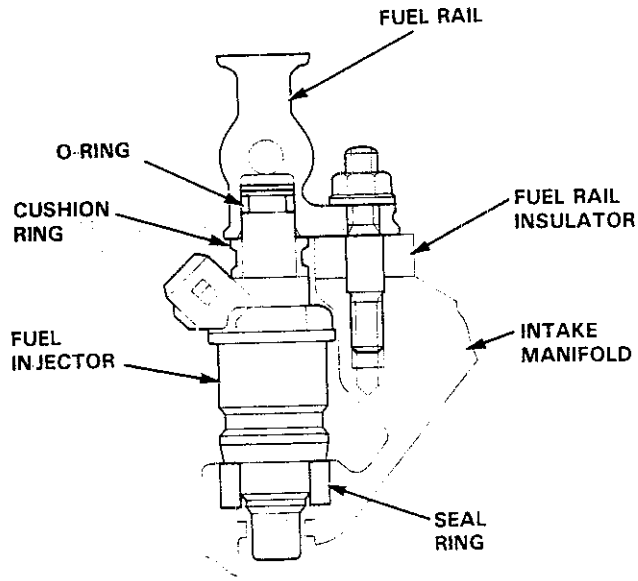
– If the pressure is lower than specified, inspect for:
  - Clogged fuel filter
  - Faulty fuel pressure regulator (page 11-87)
  - Leakage in the fuel line

Fuel Injectors

Description

The fuel injectors are a solenoid-actuated constant-stroke pintle type consisting of a solenoid, plunger needle valve and housing. When current is applied to the solenoid coil, the valve lifts up and pressurized fuel is injected. Because the needle valve lift and the fuel pressure are constant, the injection quantity is determined by the length of time that the valve is open (i.e., the duration the current is supplied to the solenoid coil). The fuel injector is sealed by an O-ring and seal ring at the top and bottom. These seals also reduce operating noise.





(cont'd)

Fuel Injectors (cont'd)

Testing

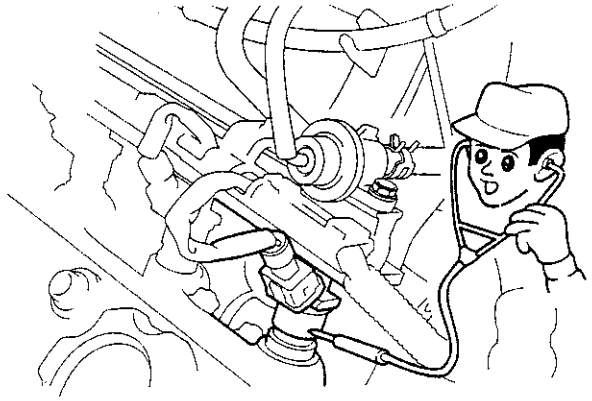
NOTE: Check the following items before testing: idle speed, ignition timing and idle CO %

If the engine will run:

1. With the engine idling, disconnect each fuel injector connector individually and inspect the change in the idling speed.

   - If the idle speed drop is almost the same for each cylinder, the fuel injectors are normal.
   - If the idle speed or quality remains the same when you disconnect a particular fuel injector, replace the fuel injector and re-test.

2. Check the clicking sound of each fuel injector by means of a stethoscope when the engine is idling.



   - If any fuel injector fails to make the typical clicking sound, check the sound again after replacing the fuel injector.

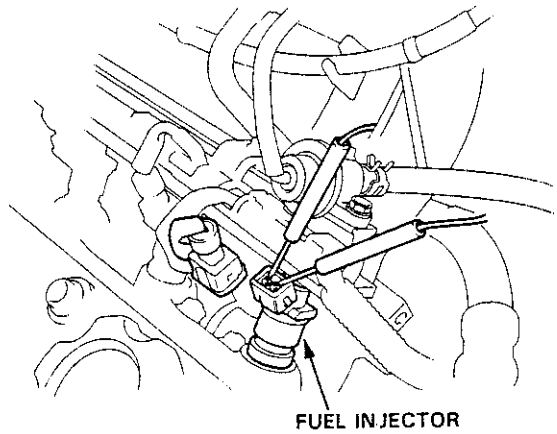
   – If clicking sound is still absent, check the following
     - Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the main relay and the fuel injector
     - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM

     If all is OK, check the ECM (page 11-29) and main relay (page 11-93)

If the engine cannot be started:

1. Remove the connector of the fuel injector, and measure the resistance between the 2 terminals of the fuel injector

   Resistance should be: 10—13 Ω



   - If the resistance is not as specified, replace the fuel injector

   - If the resistance is as specified, check the fuel pressure (page 11-82)

   – If the fuel pressure is as specified, check the following:
     - Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the main relay and the fuel injector.
     - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM

     If all is OK, check the ECM (page 11-29)

Replacement

⚠WARNING **Do not smoke when working on the fuel system. Keep open flames away from your work area.**

1 Relieve the fuel pressure (page 11-82).

2. Disconnect the connectors from the fuel injectors.

3 Disconnect the vacuum hose and fuel return hose from the fuel pressure regulator

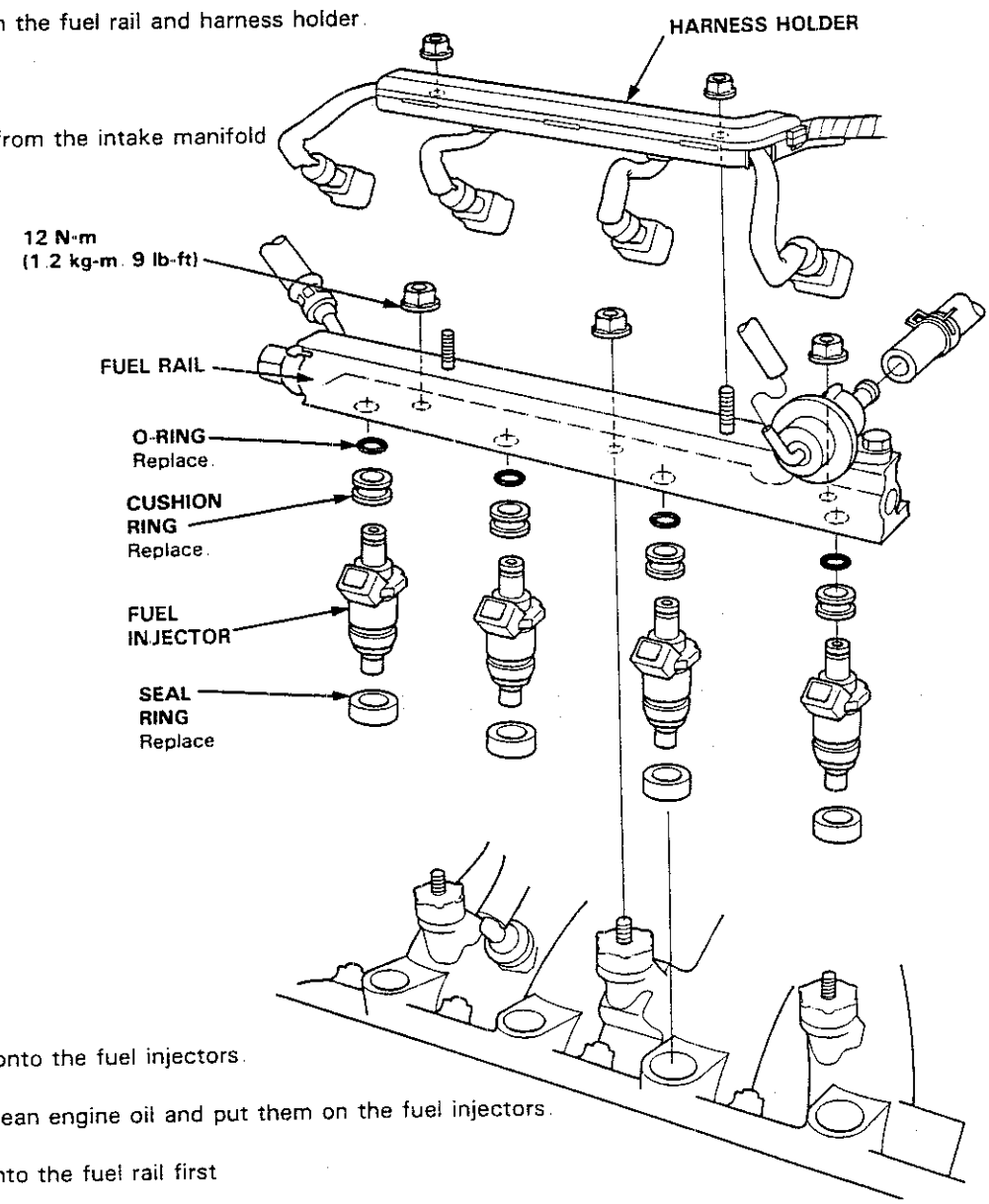
NOTE: Place a rag or shop towel over the hoses before disconnecting them.

4 Disconnect the fuel hose from the fuel rail.

5. Loosen the retainer nuts on the fuel rail and harness holder.

6. Disconnect the fuel rail.

7. Remove the fuel injectors from the intake manifold



8 Slide new cushion rings onto the fuel injectors.

9 Coat new O-rings with clean engine oil and put them on the fuel injectors.

10. Insert the fuel injectors into the fuel rail first

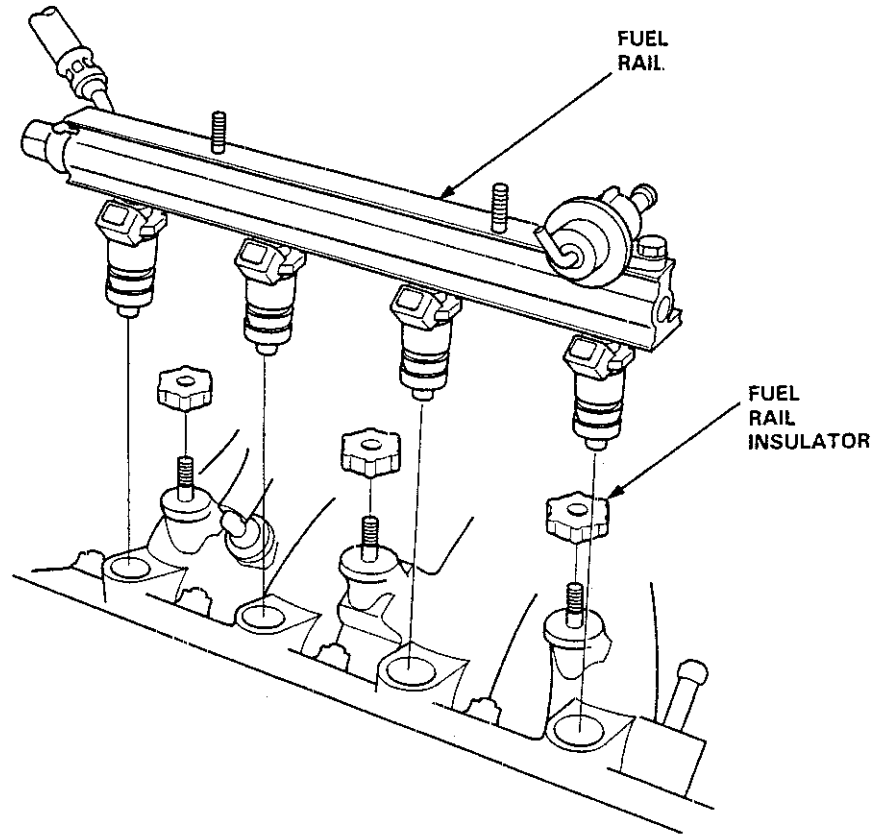
11 Coat new seal rings with clean engine oil and press them into the intake manifold

(cont'd)

Fuel Injectors (cont'd)

12. Install the fuel injectors and fuel rail assembly in the manifold.

CAUTION: To prevent damage to the O-ring, install the fuel injectors in the fuel rail first, then install them in the intake manifold.



13. Install and tighten the retainer nuts.

14. Connect the fuel hose to the fuel rail with new washers.

15. Connect the vacuum hose and fuel return hose to the fuel pressure regulator.

16. Install the connectors on the fuel injectors.

17. Replace the 6 mm service bolt washer and tighten the bolt.

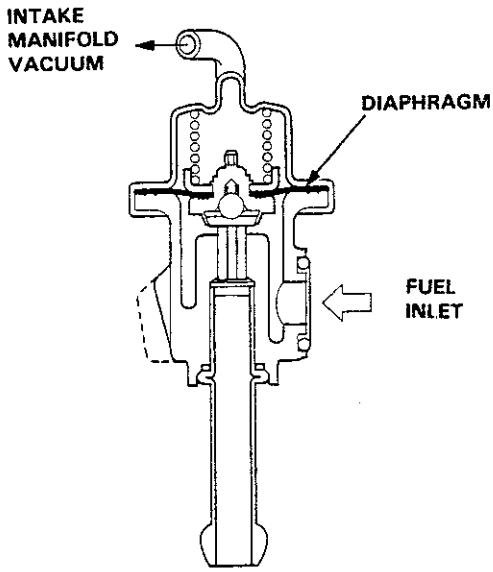
18. Turn the ignition switch ON but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

Fuel Pressure Regulator

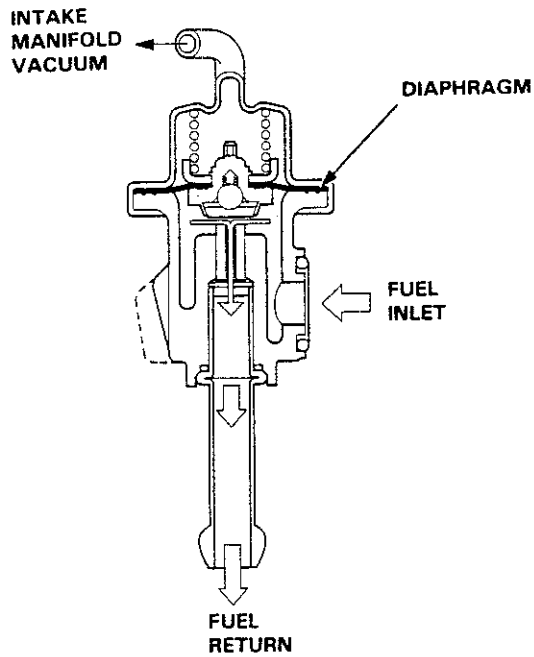
Description

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 kg/cm² (43 psi), the diaphragm is pusher upward, and the excess fuel is fed back into the fuel tank through the return line

CLOSE



OPEN



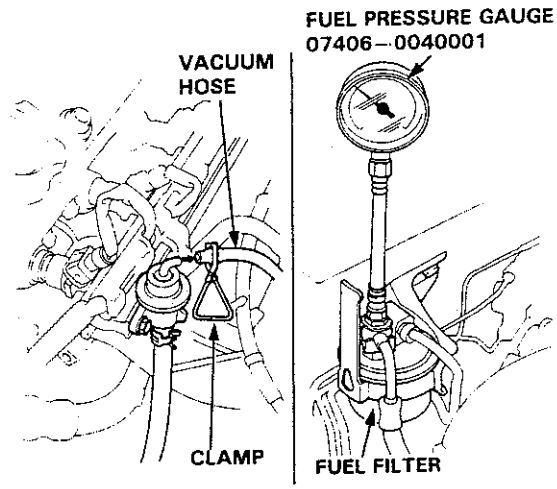
Testing

⚠ 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 (page 11-83).

   Pressure should be:

   280—330 kPa (2.8—3.3 kg/cm², 40—47 psi) (with the regulator vacuum hose disconnected)



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

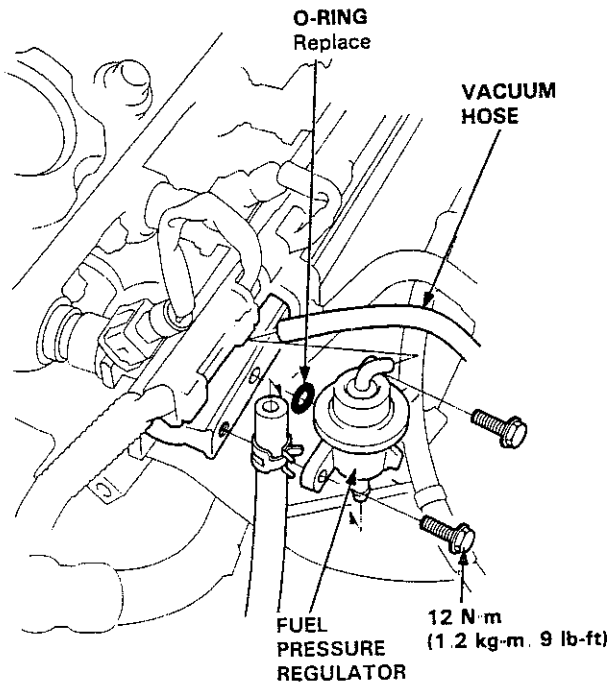
(cont d)

Fuel Pressure Regulator (cont'd)

Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flame away from work area.

1. Place a shop towel under fuel pressure regulator, then relieve fuel pressure (page 11-82)
2. Disconnect the vacuum hose and fuel return hose.
3. Remove the two 6 mm mounting 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

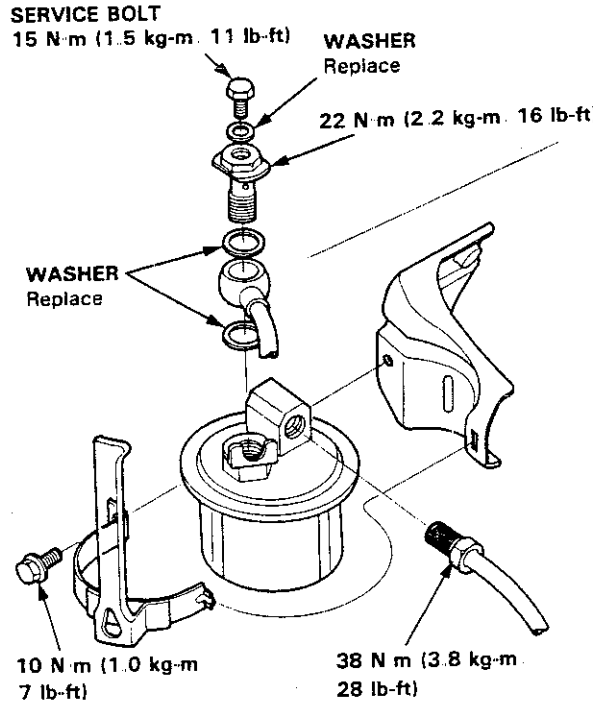
Fuel Filter

Replacement

⚠ WARNING
- **Do not smoke while working on fuel system. Keep open flame away from work area.**
- **While replacing be careful to keep a safe distance between battery terminals and any tools.**

The filter should be replaced every 2 years or 40,000 km (24,000 miles), whichever comes first or whenever the fuel pressure drops below the specified value (280—330 kPa, 2.8—3.3 kg/cm², 40—47 psi with the fuel pressure regulator vacuum hose disconnected) after making sure that the fuel pump and the fuel pressure regulator are OK.

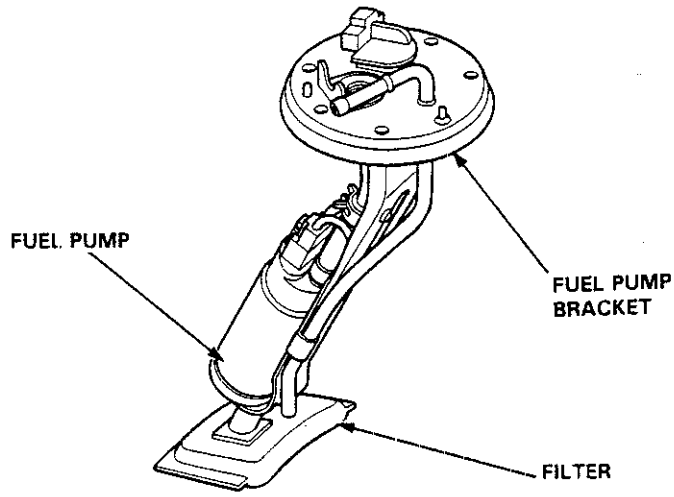
1. Disconnect the battery negative cable from the battery negative terminal.
2. Place a shop towel under and around the fuel filter
3. Relieve fuel pressure (page 11-82).
4. Remove the 12 mm banjo bolt and the fuel rail (feed) from the fuel filtler.
5. Remove the fuel filter clamp and fuel filter
6. When assembling, use new washers, as shown



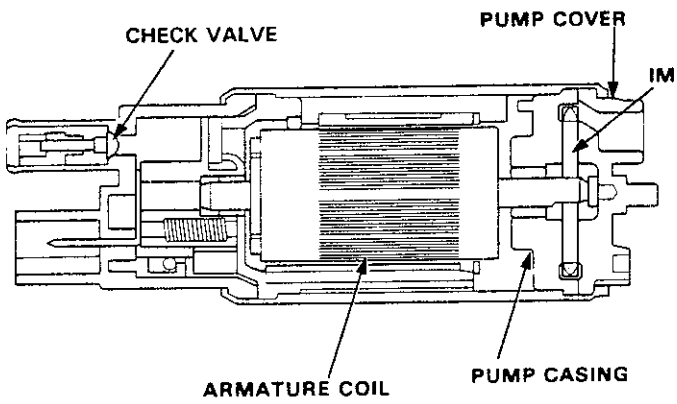
NOTE: Clean the flared joint of high pressure hoses thoroughly before reconnecting them.

Fuel Pump (FP)

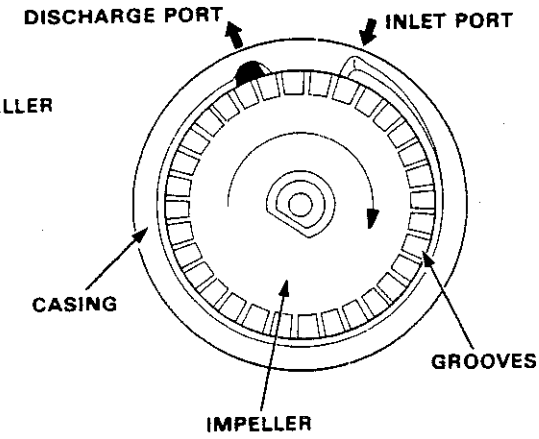
Description
Because of its compact impeller design, the fuel pump (FP) is installed inside the fuel tank, therby saving space and simplifying the fuel line system.



FUEL PUMP CROSS SECTION (Side view)



PUMP ASSEMBLY CROSS SECTION (Top view)



The fuel pump (FP) is comprised of a DC motor, a circumference flow pump, a relief valve for protecting the fuel line systems, a check valve for retaining residual pressure, and inlet port, and a discharge port. The pump assembly consists of the impeller (driven by the motor), the pump casing (which forms the pumping chamber), and the fuel pump cover.

OPERATION

(1) When the engine is started, the main relay actuates the fuel pump (FP), and the motor turns the impeller. Differential pressure is generated by the numerous grooves around the impeller.
(2) Fuel entering the inlet port flows inside the motor from the pumping chamber and is forced through the discharge port via the check valve. If fuel flow is obstructed at the discharge side of the fuel line, the relief valve will open to bypass the fuel to the inlet port and prevent excessive fuel pressure.
(3) When the engine stops, the fuel pump (FP) stops automatically. However, a check valve closes by self weight to retain the residual pressure in the line, helping the engine to restart more easily.

Testing

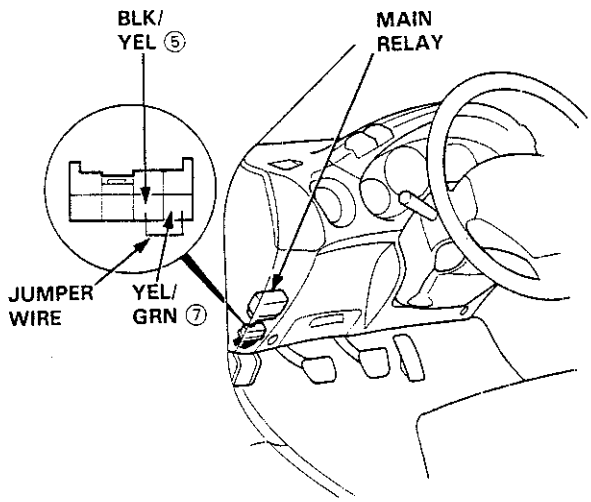
⚠WARNING Do not smoke during the test. Keep open flame away from your work area.

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 near the fuel fill pipe. The fuel pump should run for two seconds when the ignition switch is first turned on. If there is no noise at the fuel fill pipe, check as follows:

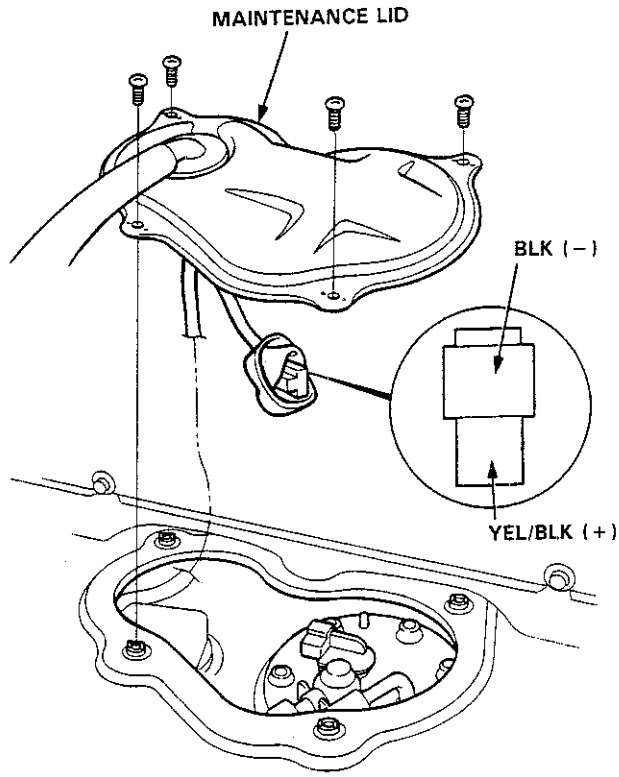
1. Remove the interior trims (page 20-36)
2. Remove the maintenance lid.
3. Disconnect the 2P connector.

   CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

4. Disconnect the main relay connector and connect the BLK/YEL ⑤ wire and YEL/GRN ⑦ wire with a jumper wire



5. Check that battery voltage is available at the fuel pump connector when the ignition switch is turned ON (positive probe to the YEL/GRN wire, negative probe to the BLK wire)



- If battery voltage is available, replace the fuel pump.
- If there is no voltage, check the fuel pump ground and wire harness.

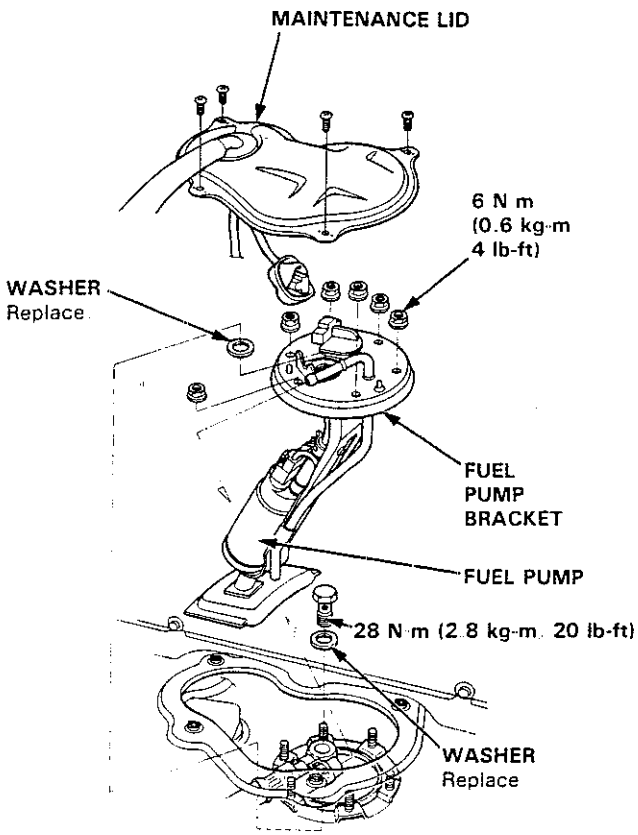
(cont'd)

Fuel Pump (cont'd)

Replacement

⚠ WARNING **Do not smoke while working on fuel system. Keep open flames away from your work area.**

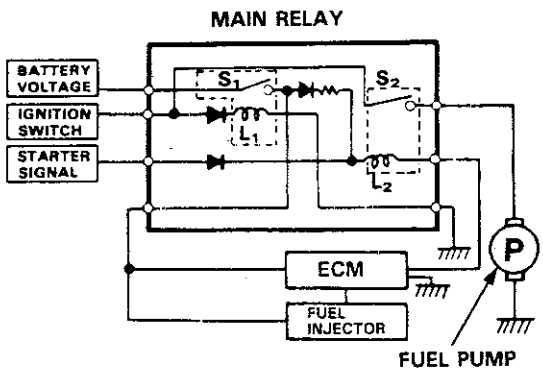
1. Relieve fuel pressure (page 11-82)
2. Remove the interior trims (page 20-36).
3. Remove the maintenance lid.
4. Disconnect the fuel lines and connector.
5. Remove the fuel pump mounting nuts.
6. Remove the fuel pump from the fuel tank.



Main Relay

Description

The main relay actually contains two individual relays. This relay is installed at the left side (RHD: right 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 realy.
The second relay is energized for 2 seconds when the ignition is switched on, and when the engine is running which suupplies power to the fuel pump (FP)

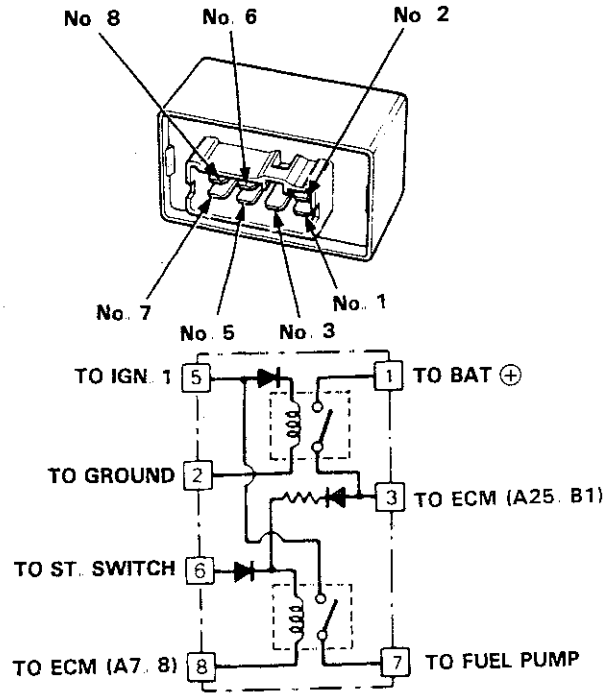


Relay Testing

NOTE: If the car starts and coninues to run, the main relay is OK.

1. Remove the main relay.

2. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 8 terminal of the main relay. Then check for continuity between the No. 5 terminal and No. 7 terminal of the mian relay.
   - If there is continuity, go on to step 3.
   - If there is continuity, replace the relay and retest



3. Attach the battery positive terminal to the No. 5 terminal and the battery negative treminal to the No. 2 terminal of the main relay. Then check that there is continuity between the No. 1 terminal and No. 3 terminal of the main relay.
   - If there is continuity, go no to step 4.
   - If there is no continuity, replace the relay and retest.

4. Attach the battery positive terminal to the No. 3 terminal and the battery negative terminal to the No. 8 terminal of the main relay. Then check that there is continuity between the No. 5 terminal and No. 7 terminal of the main relay
   - If there is continuity. the relay is OK.
   - If there is no continuity, replace the relay and retest.

(cont'd)

Main Relay (cont'd)

Troubleshooting Flowchart

- Engine will not start.
- Inspection of main relay and relay harness

Disconnect the main relay connectors

Check for continuity between BLK terminal ② and body ground.

Does continuity exist? — NO → **Repair open in BLK wire between main relay and G101**

YES

Measure the voltage between YEL/WHT terminal ① and body ground

Is there battery voltage? — NO →
- Replace ECM (ECU) (15 A) fuse.
- Repair open in the YEL/WHT wire ① between the main relay and the ECM (ECU) (15 A) fuse.

YES

Turn the ignition switch ON

Measure the voltage between BLK/YEL terminal ⑤ and body ground.

Is there battery voltage? — NO →
- Replace ACG (S) (15A) fuse.
- Repair open in the BLK/YEL wire ⑤ between the main relay and the ACG(S) (15A) fuse

YES

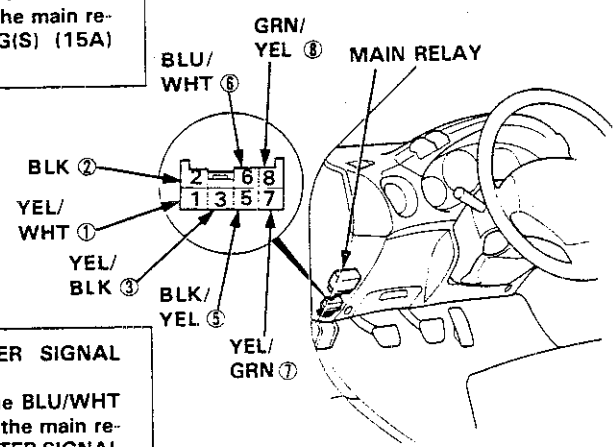
Turn the ignition switch to the START position

Measure the voltage between BLU/WHT terminal ⑥ and body ground

Is there battery voltage? — NO →
- Replace STARTER SIGNAL (7.5 A) fuse.
- Repair open in the BLU/WHT wire ⑥ between the main relay and the STARTER SIGNAL (7.5 A) fuse.

YES

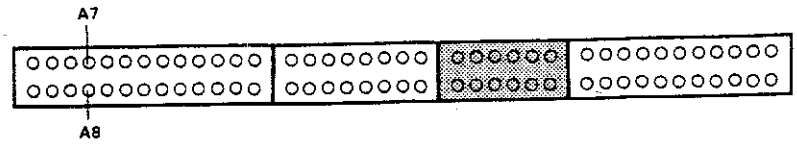
(To page 11-95)



(From page 11-94)

Turn the ignition switch off.

Connect the test harnes between the ECM and connector. Disconnect "A" connector from the ECM only, not the main wire harness (page 11-22).



Check for continuity between GRN/YEL terminal ⑧ and the following terminals; A7, A8

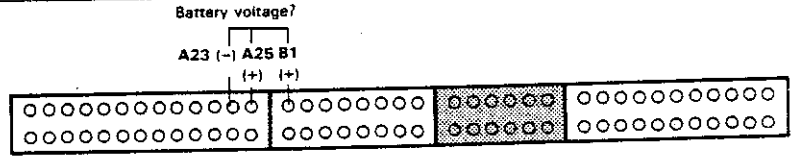
Does continuity exist?

NO → **Repair open in GRN/YEL wire ⑧ between ECM (A7, A8) and main relay.**

YES

Reconnect "A" connector to the ECM.

Battery voltage?



Connect the main relay connector

Turn the ignition switch ON

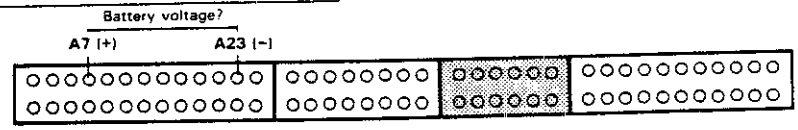
Measure the voltage between A23 (–) terminal and the following terminals: A25 (+) B1 (+)

Is there battery voltage?

NO →
- **Repair open in the YEL/BLK wire ③ between the ECM (A25 B1) and main relay.**
- **Replace main relay**

YES

Battery voltage?



Turn the ignition switch OFF.

Connect a voltmeter between A7 (+) terminal and A23 (–) terminal

Is there battery voltage for two seconds when the ignition switch is first turned on?

YES → **Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.**

NO

Check the mian relay (page 11-93)

Fuel Tank

Replacement

⚠WARNING Do not smoke while working on fuel system. Keep open flame away from work your work area.

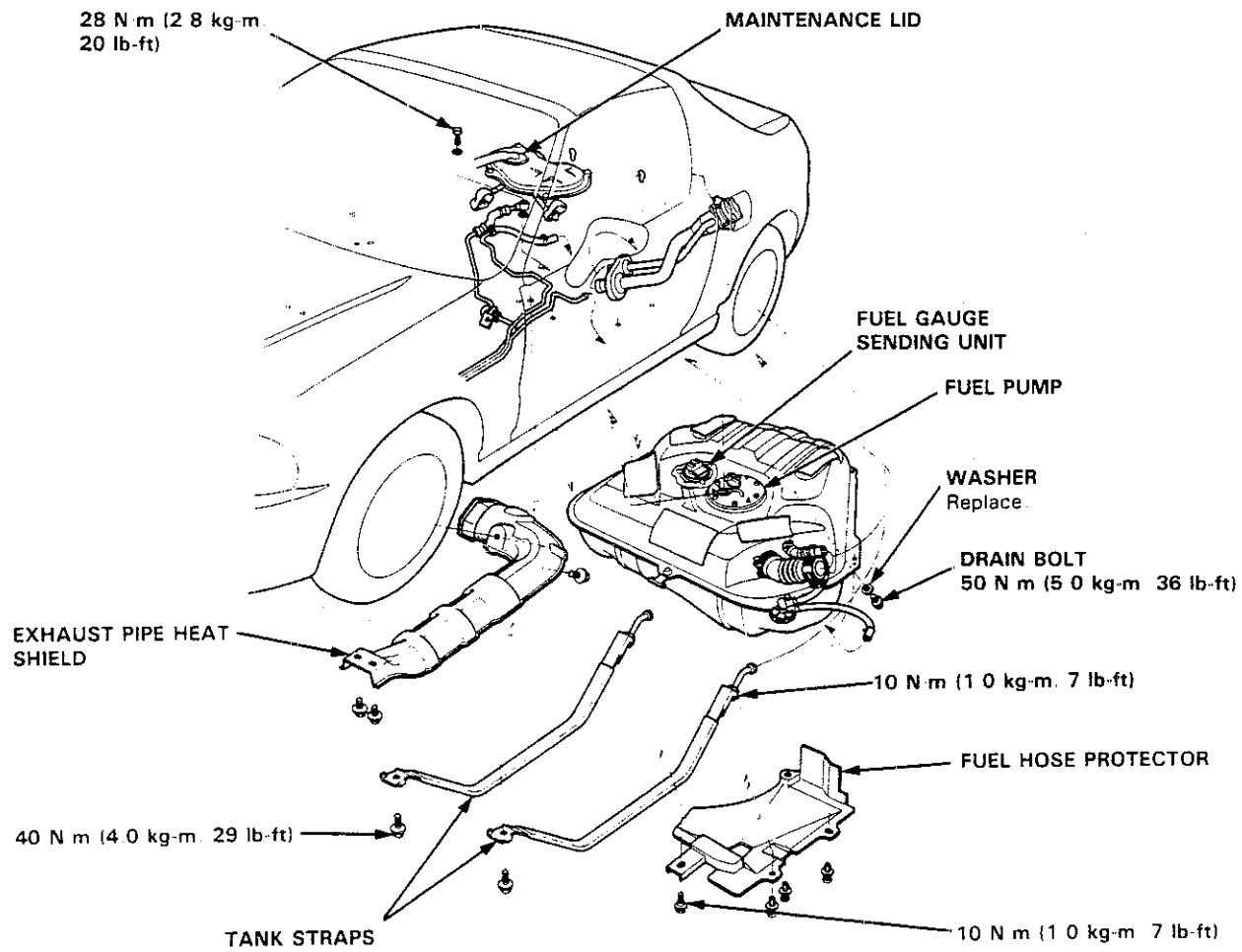
1. Block front wheels. Jack up the rear of the car and support with jackstands.
2. Remove the drain bolt and drain the fuel into an approved container
3. Remove the interior trims (page 20-36) and the maintenance lid.
4. Disconnect the connectors from the fuel gauge sending unit and the fuel pump, then disconnect the hoses from the fuel pump.

   CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

5. Remove the fuel hose protector.
6. Remove the exhaust pipe heat shield.
7. Disconnect the hoses.

   CAUTION: When disconnecting the hoses, slide back the clamps, then twist hoses as you pull to avoid damaging them.

8. Place a jack, or other support, under the fuel tank.
9. Remove the strap bolts and nuts, and let the straps fall free.
10. Remove the fuel tank.
    NOTE: The tank may stick on the undercoat applied to its mount. To remove, carefully pry it off the mount
11. Install a new washer on the drain bolt and the fuel pump line, then install parts in the reverse order of removal



System Troubleshooting Guide

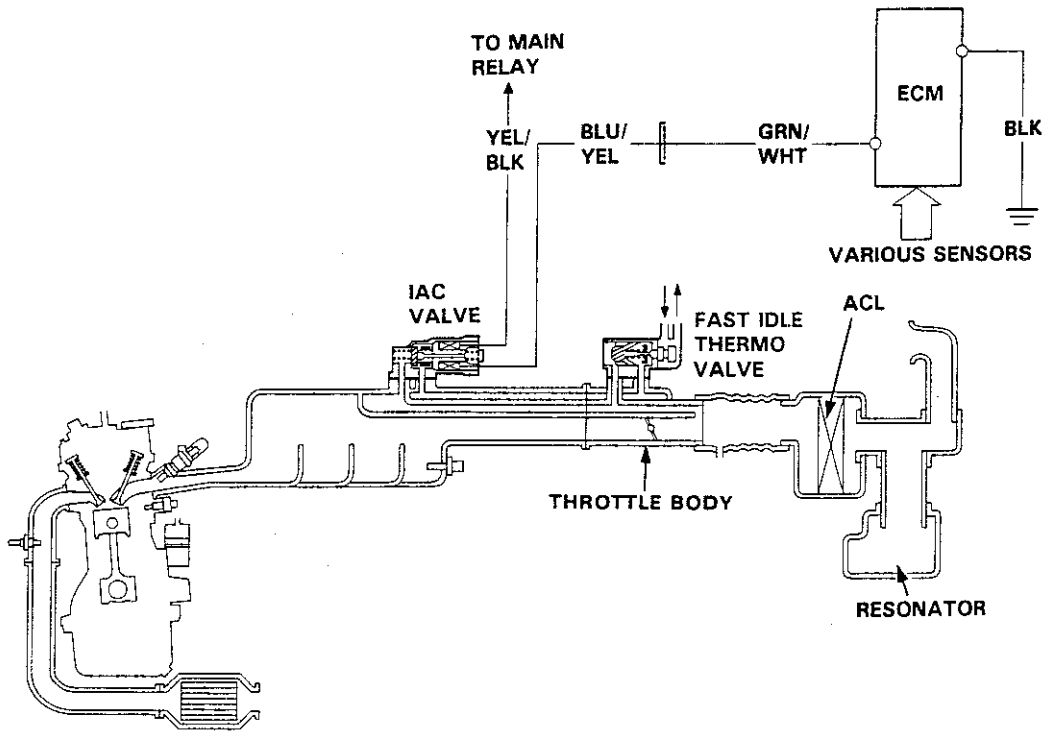
NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc

PAGE / SUB SYSTEM / SYMPTOM	THROTTLE CABLE	THROTTLE BODY
	100	102
WHEN COLD FAST IDLE OUT OF SPEC.	①	②
WHEN WARM ENGINE SPEED TOO HIGH	②	①
LOSS OF POWER	①	

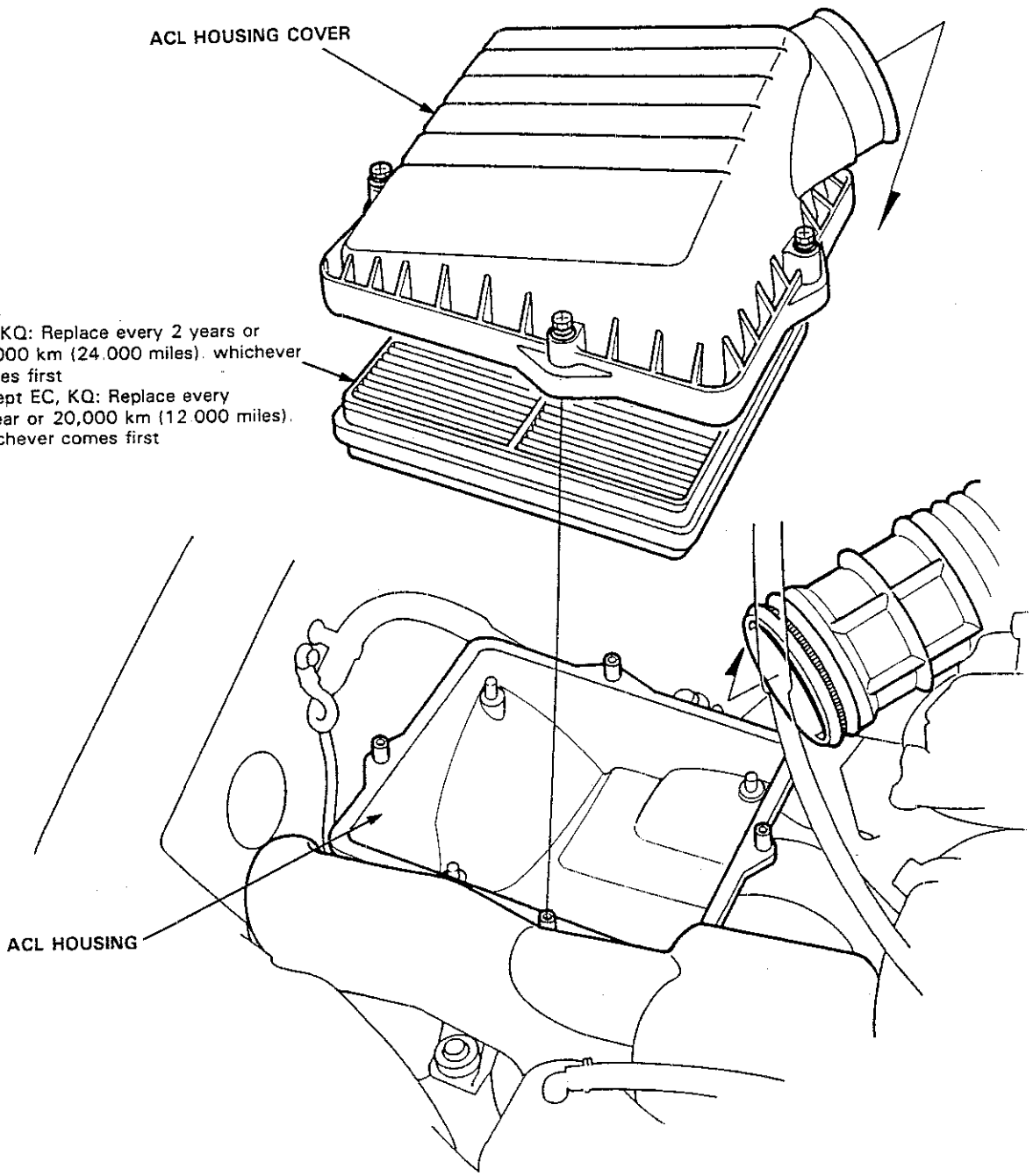
Air Intake System

System Description

The system supplies air for all engine needs. It consists of the air cleaner (ACL), air intake pipe, throttle body (TB), Idle Air Control Valve (IAC Valve), fast idle thermo valve and intake manifold. A resonator in the air intake pipe provides additional silencing as air is drawn into the system.



AIR CLEANER (ACL) Replacement

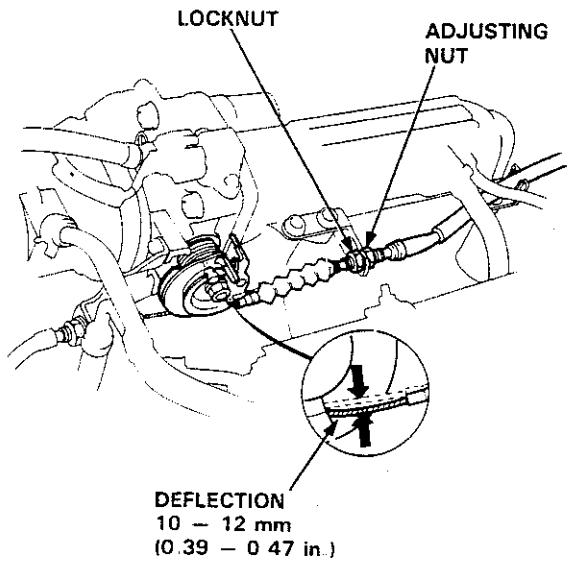


Throttle Cable

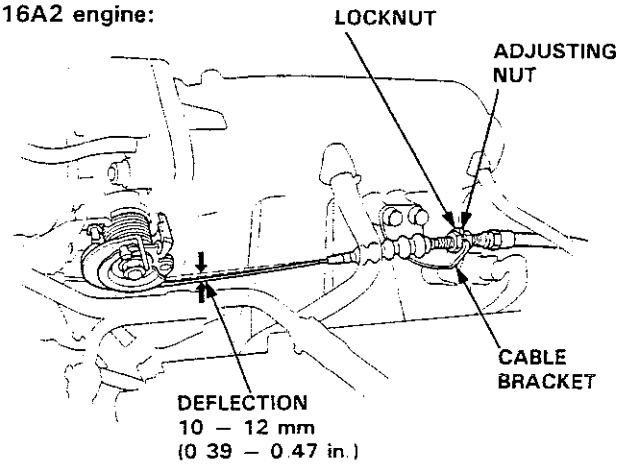
Inspection/Adjustment

1. Warm up the engine to normal operating temperature (cooling fan comes on).
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 (0.39 — 0.47 in.).

Except B16A2 engine:



B16A2 engine:

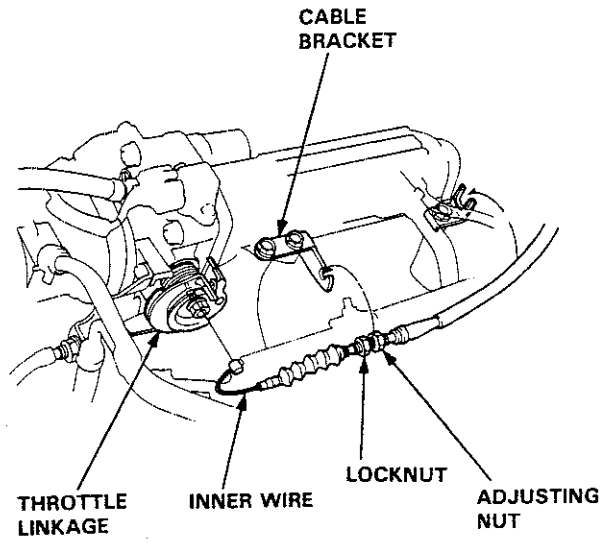


4. If deflection is not within specs, loosen the locknut and turn the adjusting nut until the deflection is as specified.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator.

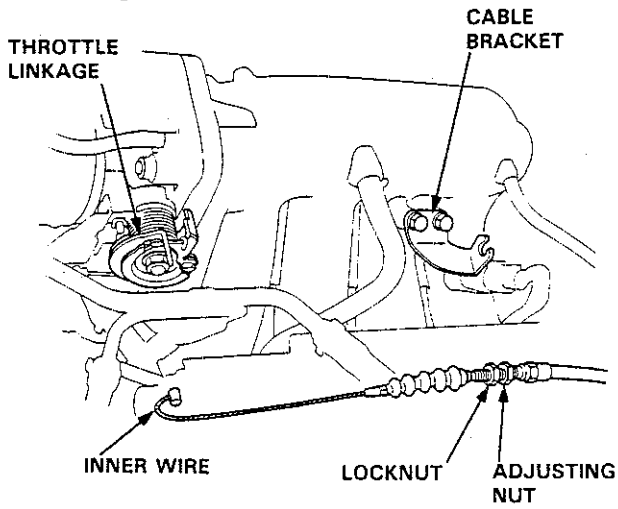
Installation

1. Fully open the throttle valve, then install the throttle cable in the throttle linkage and install the cable housing in the cable bracket.
2. Warm up the engine to normal operating temperature (the cooling fan comes on).

Except B16A2 engine:



B16A2 engine:

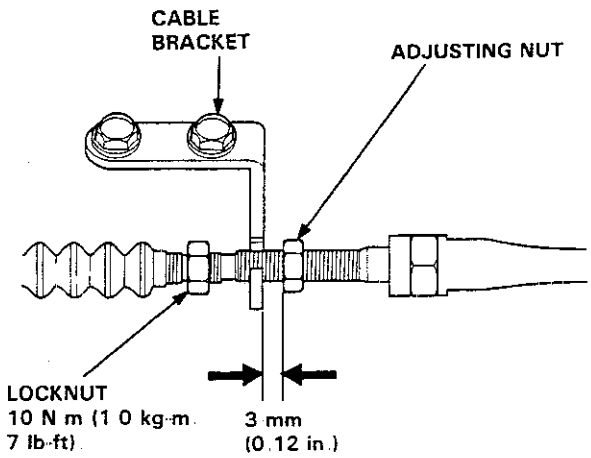


3. Hold the cable sheath, removing all slack from the cable.

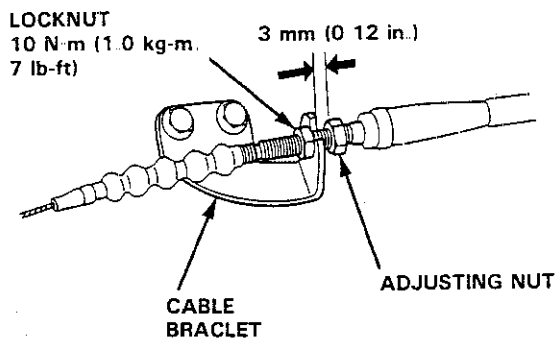
4 Turn the adjusting nut until it is 3 mm (0.12 in.) away from the cable bracket

5 Tighten the locknut. The cable deflection should now be 10—12 mm (0.39—0.47 in.). If not, see Inspection/Adjustment.

Except B16A2 engine:



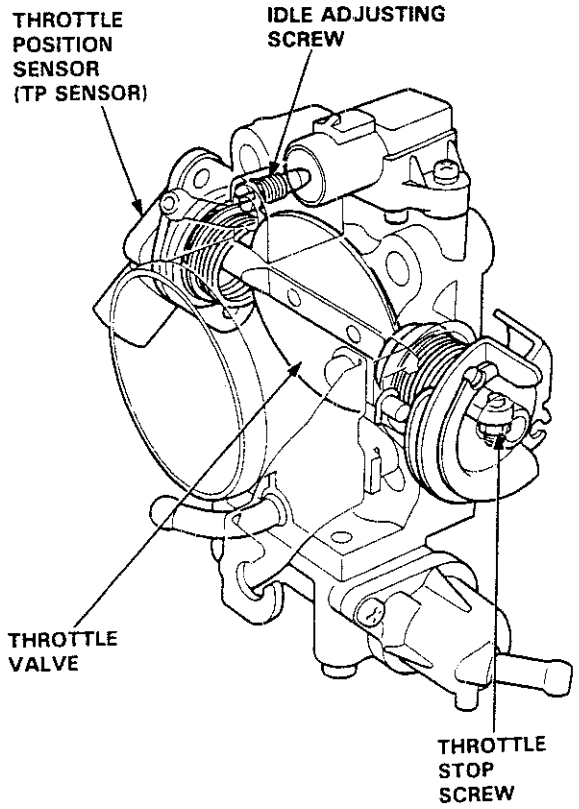
B16A2 engine:



Throttle Body (TB)

Description

The throttle body (TB) is of the single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant which is fed from the cylinder head The idle adjusting screw which increases/decreases bypass air and the evaporative emission control canister (EVAP control canister) port are located on the top of the throttle body (TB)

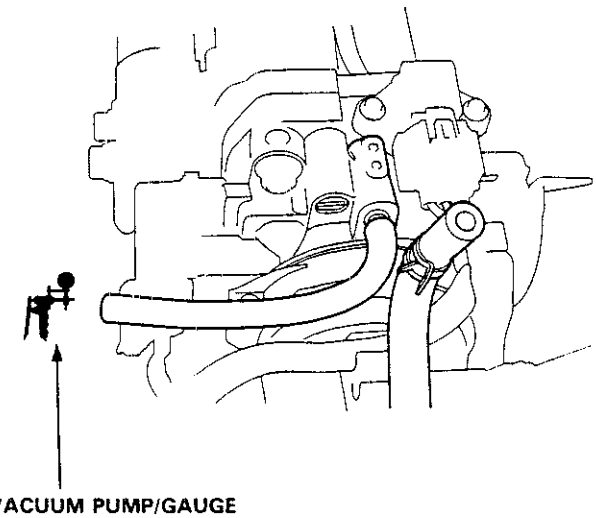


Inspection

CAUTION: Do not adjust the throttle stop screw. It is preset at the factory.

1. Start the engine and allow it to reach normal operating temperature (cooling fan comes on).

2. Disconnect the vacuum hose (to the EVAP control canister) from the top of the throttle body; connect a vacuum gauge to the throttle body.

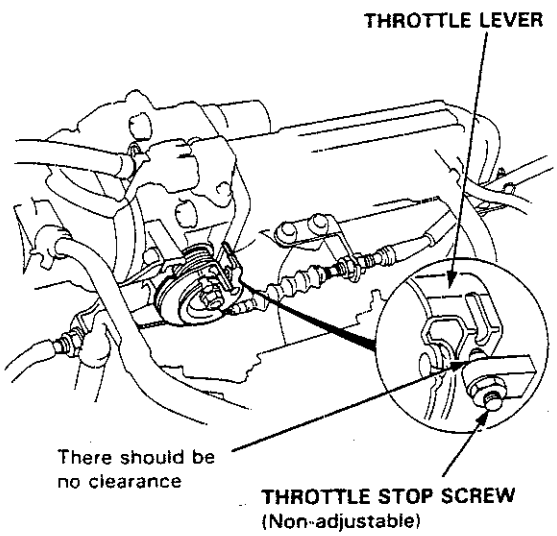


3 Allow the engine to idle and check that the gauge indicates no vacuum
- If there is vacuum, check the throttle cable (page 11-100)

4. Check that vacuum is indicated on the gauge when the throttle is opened slightly from idle
- If the gauge indicates no vacuum, check the throttle body port. If the throttle body port is clogged, clean it with carburetor cleaner

5 Stop the engine and check that the throttle cable operates smoothly without binding or sticking
- If there are any abnormalities in the above steps, check for:

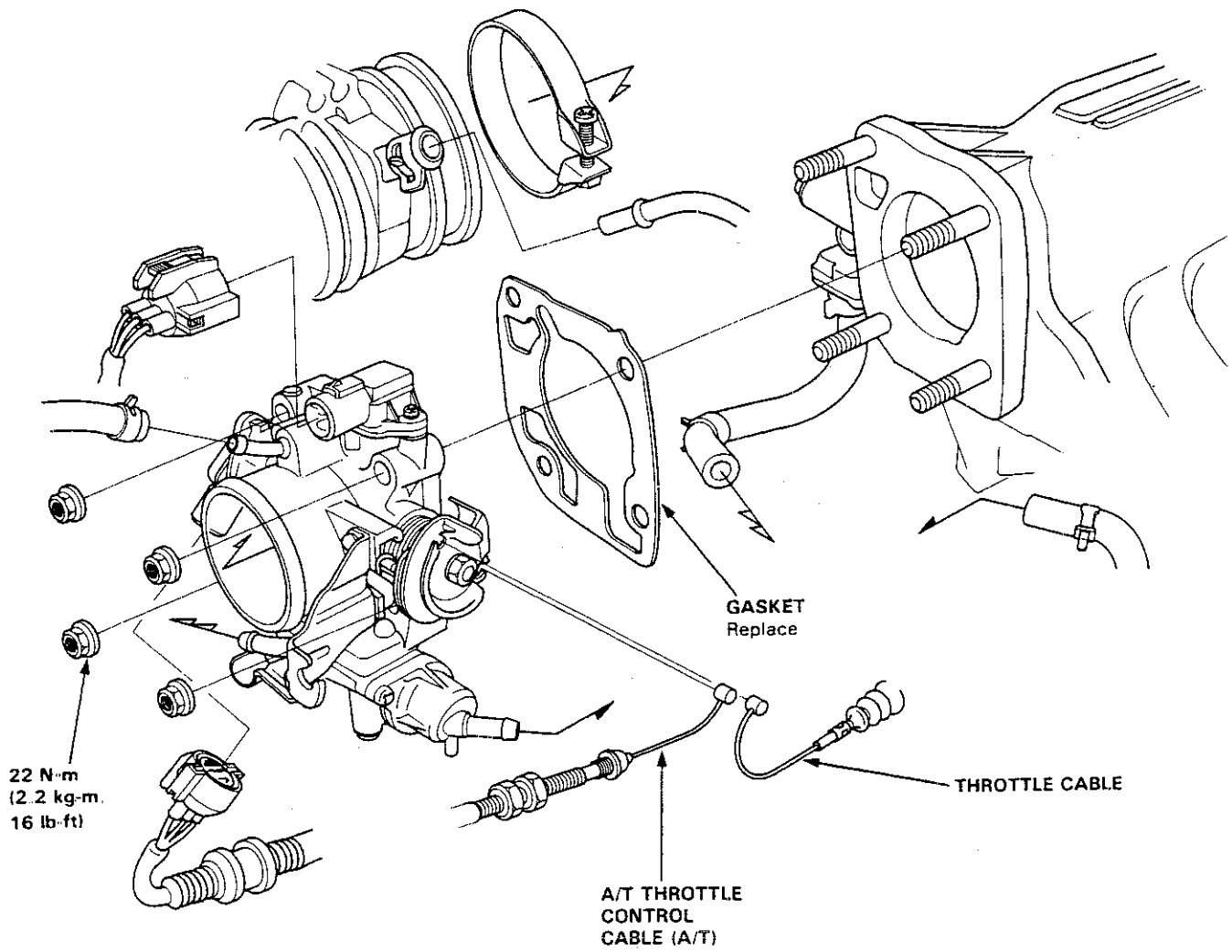
  – Excessive wear or play in the throttle valve shaft
  – Sticky or binding throttle lever at full close position
  – Clearance between throttle stop screw and throttle lever at full close position



Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

Throttle Body (TB) (cont'd)

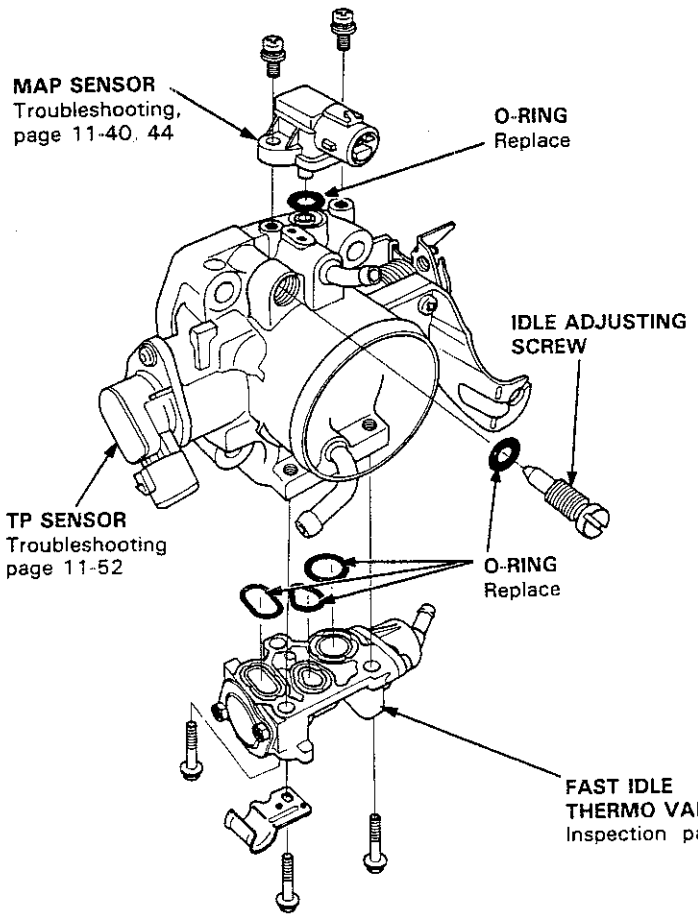
Diassembly



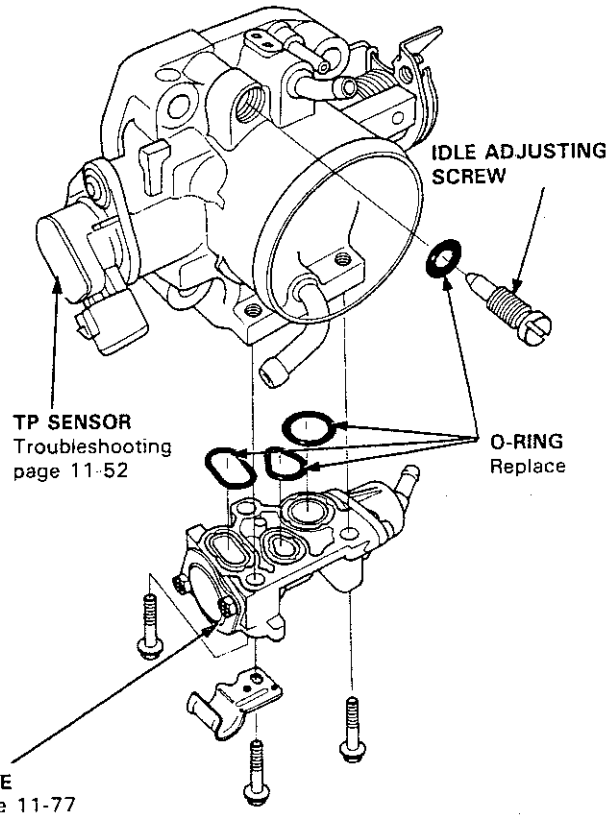
CAUTION:

- The throttle stop screw is non-adjustable
- After reassembly, adjust the throttle cable (page 11-100), and A/T throttle control cable (section 14) for cars with A/T

Except B16A2 engine:

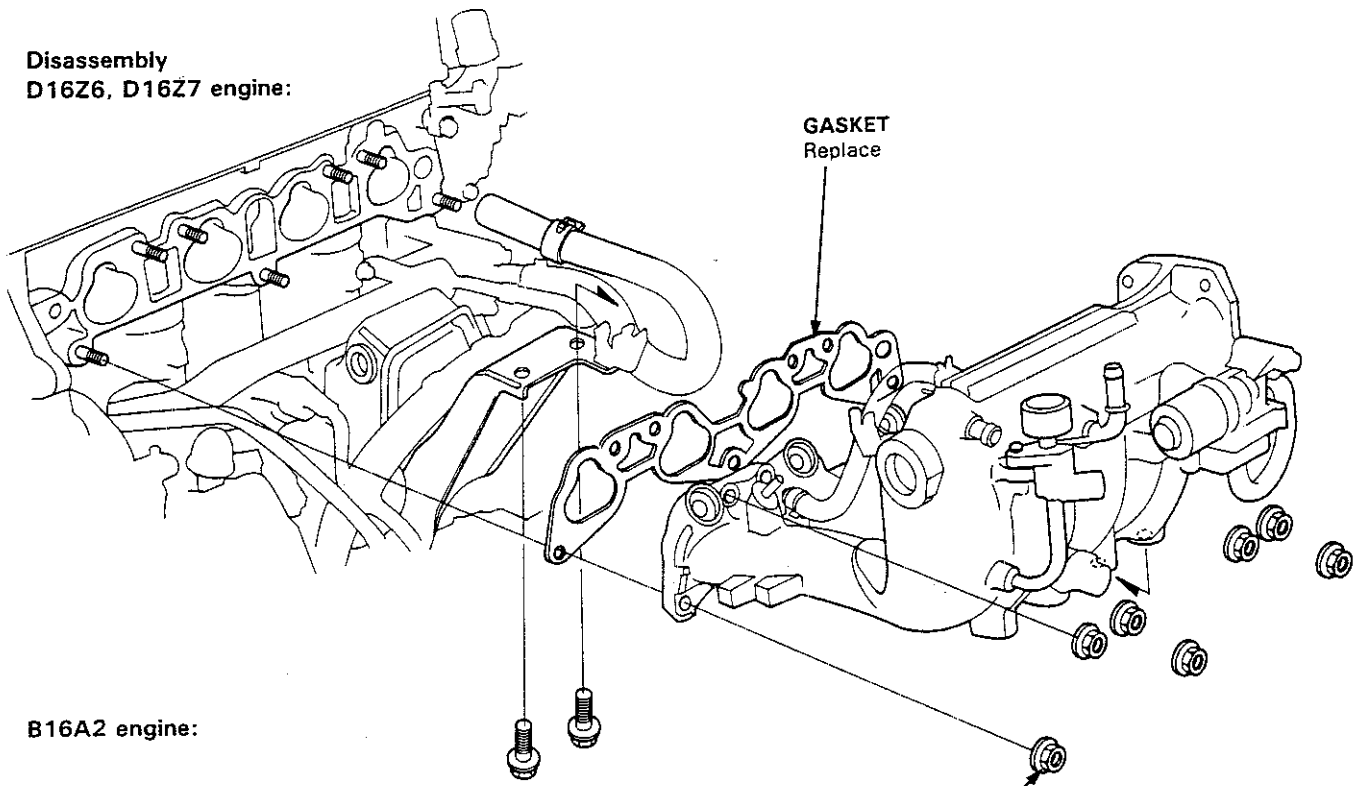


B16A2 engine:

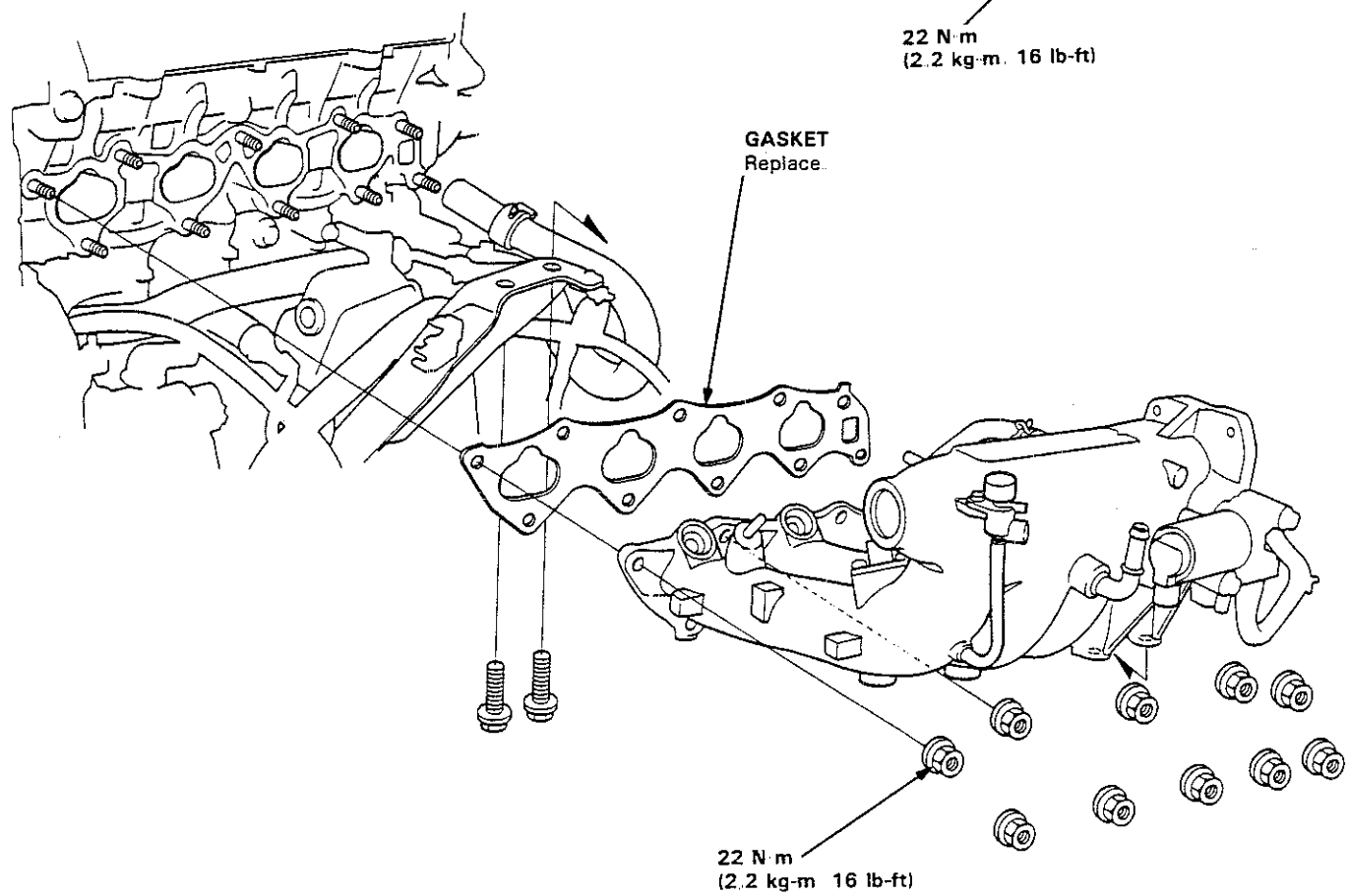


Intake Manifold

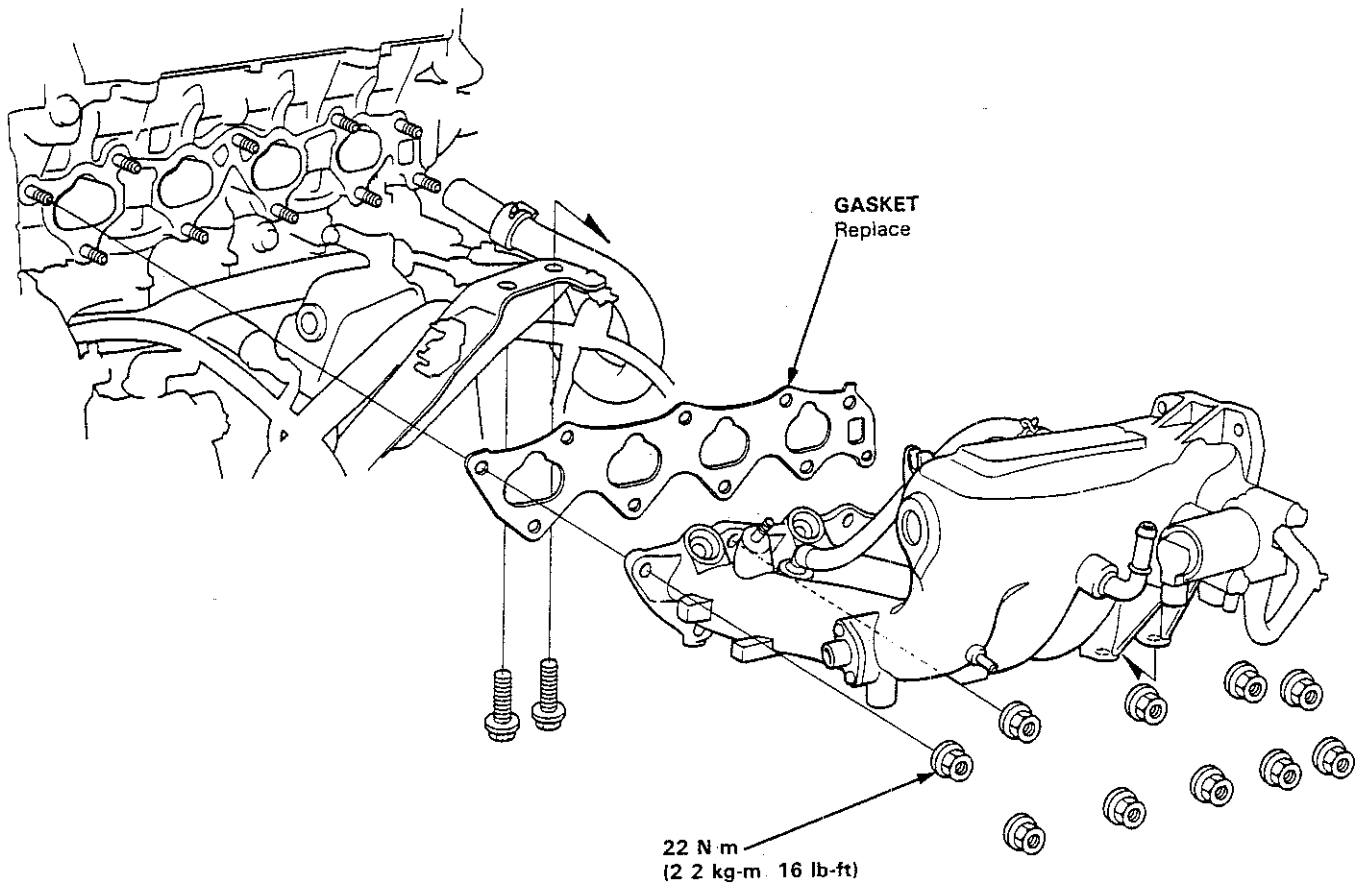
Disassembly
D16Z6, D16Z7 engine:



B16A2 engine:



D16A9 engine:



System Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc

PAGE / SUB SYSTEM / SYMPTOM		THREE WAY CATALYTIC CONVERTER (Except D16A9 engine) 111	POSITIVE CRANKCASE VENTILATION SYSTEM 113	EVAPORATIVE EMISSION CONTROLS (Except D16A9 KP and KT engine) 114
ROUGH IDLE			②	
POOR PERFORMANCE	FAILS EMISSION TEST	①		②
	LOSS OF POWER	①		

Emission Control System

System Description

The emission control system includes a *three way catalytic converter (TWC), crankcase ventilation system and **evaporative control system.
*: Except D16A9 engine
**: Except D16A9 KP and KT engine

Tailpipe Emission

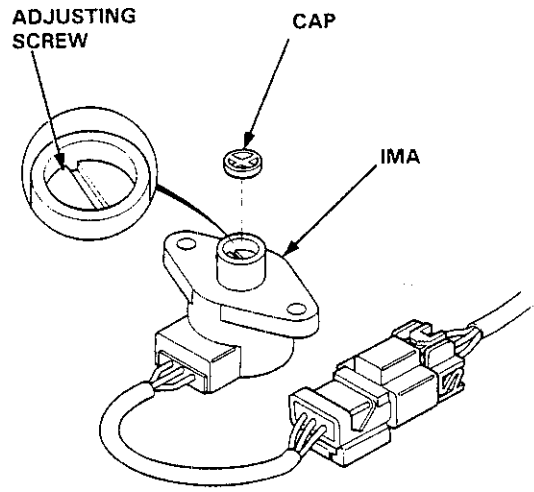
Inspection

⚠WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

1. Start the engine and warm up to normal operating temperature (cooling fan comes on)
2. Connect tachometer
3. Check idle speed and adjust the idle speed, if necessary (page 11-78).
4. Warm up and calibrate the CO meter according to the meter manufacture's instructions
5. Check idle CO with the headights, heater blower, rear window defogger, cooling fan, and air conditioner off.

   Specified CO%:
   With TWC: 0.1% maximum
   Without TWC: 1.0 ±1.0%

   - If unable to obtain this reading:
     On With TWC, see ECM troubleshooting guide (page 11-16)
     On other models, adjust by turning the adjusting screw of the IMA.

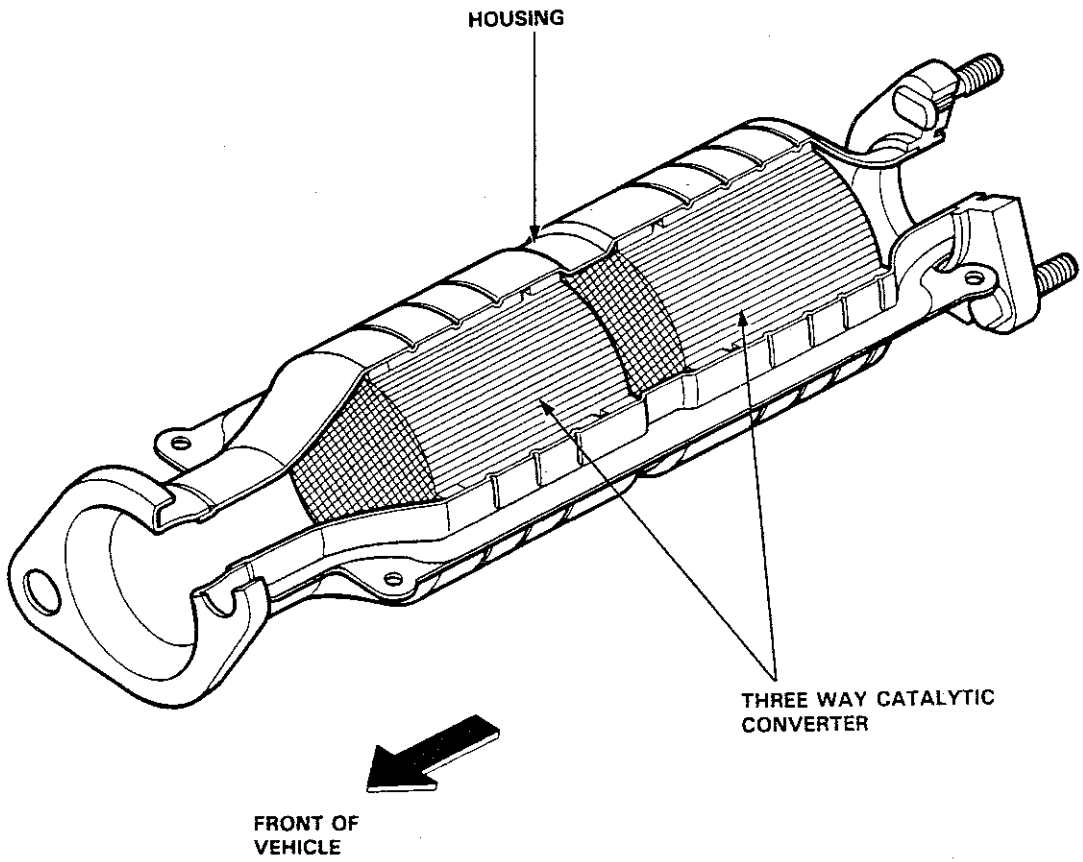


   – If unable to obtain a CO reading of specified % by this procedure, check the engine tune-up condition

Three Way Catalytic Converter (TWC) [Except D16A9 engine] (cont'd)

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

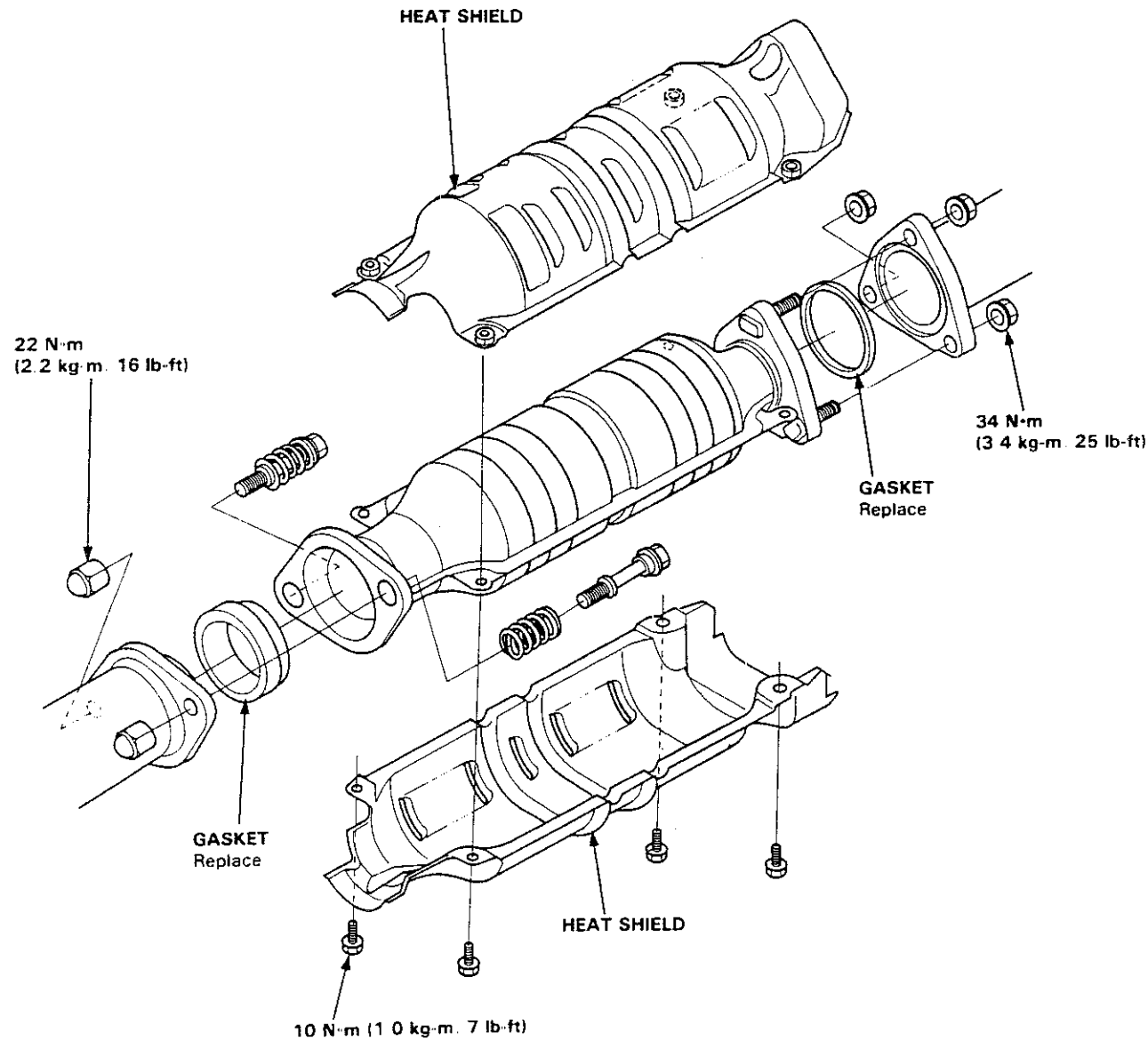


(cont d)

Three Way Catalytic Converter (TWC) [Except D16A9 engine] (cont'd)

Inspection

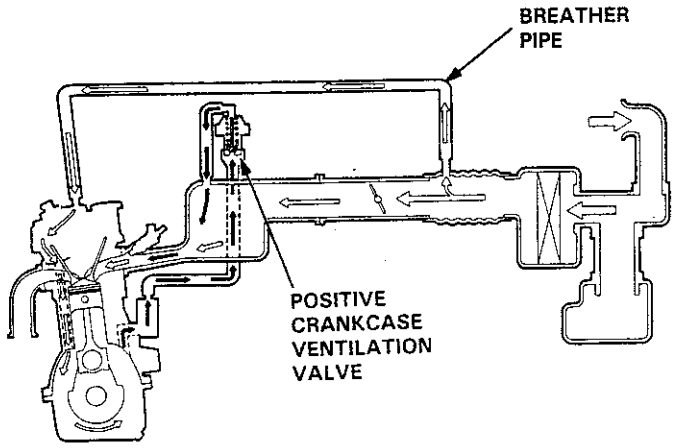
If excessive exhaust system back-pressure is suspected, remove the TWC from the car and make a visual check for plugging, melting or cracking of the catalyst. Replace the TWC if any of the visible area is damaged or plugged.



Positive Crankcase Ventilation System

Description

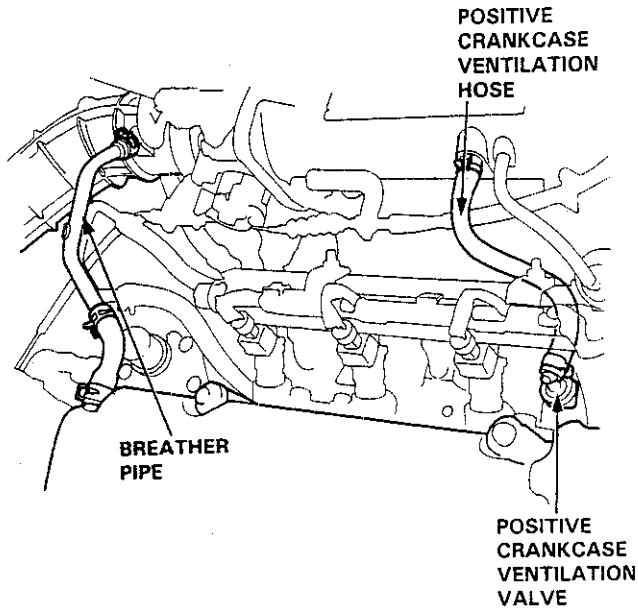
The positive crankcase ventilation system is designed to prevent blow-by gas from escaping to the atmosphere. The positive crankcase ventilation valve contains a spring-loaded plunger. When the engine starts, the plunger in the positive crankcase ventilation valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold



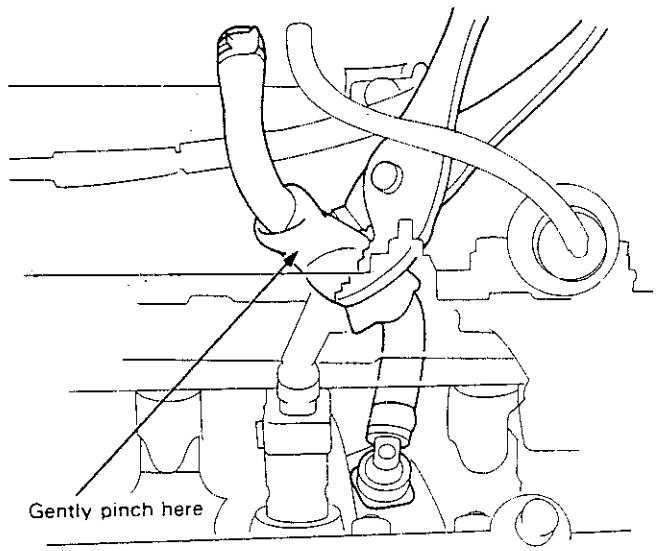
⬅ : BLOW-BY VAPOR
⇦ : FRESH AIR

Inspection

1. Check the positive crankcse ventilation hoses and connections for leaks and clogging



2. At idle, make sure there is a clicking sound from the positive crankcase ventilation valve when the hose between positive crankcase ventilation valve and intake manifold in lightly pinched with your fingers or pliers.



- If there is no clicking sound, check the positive crankcase ventilation valve grommet for cracks or damage. If the grommet is OK, replace the positive crankcase ventilation valve and recheck.

Emission Control System

Evaporative Emission Controls [Except D16A9 KP and KT engine]

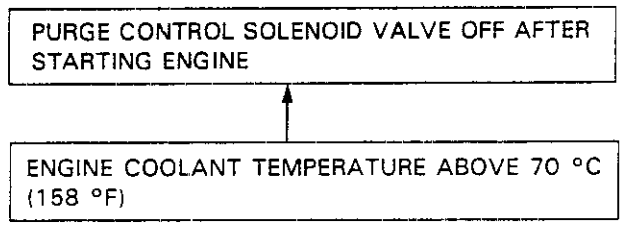
Description

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 Control Canister (EVAP CONTROL CANISTER)**
A evaporative emission control canister (EVAP control canister) for the temporary storage of fuel vapor until the fuel vapor can be purged from the evaporative emission control canister (EVAP control canister) into the engine and burned.

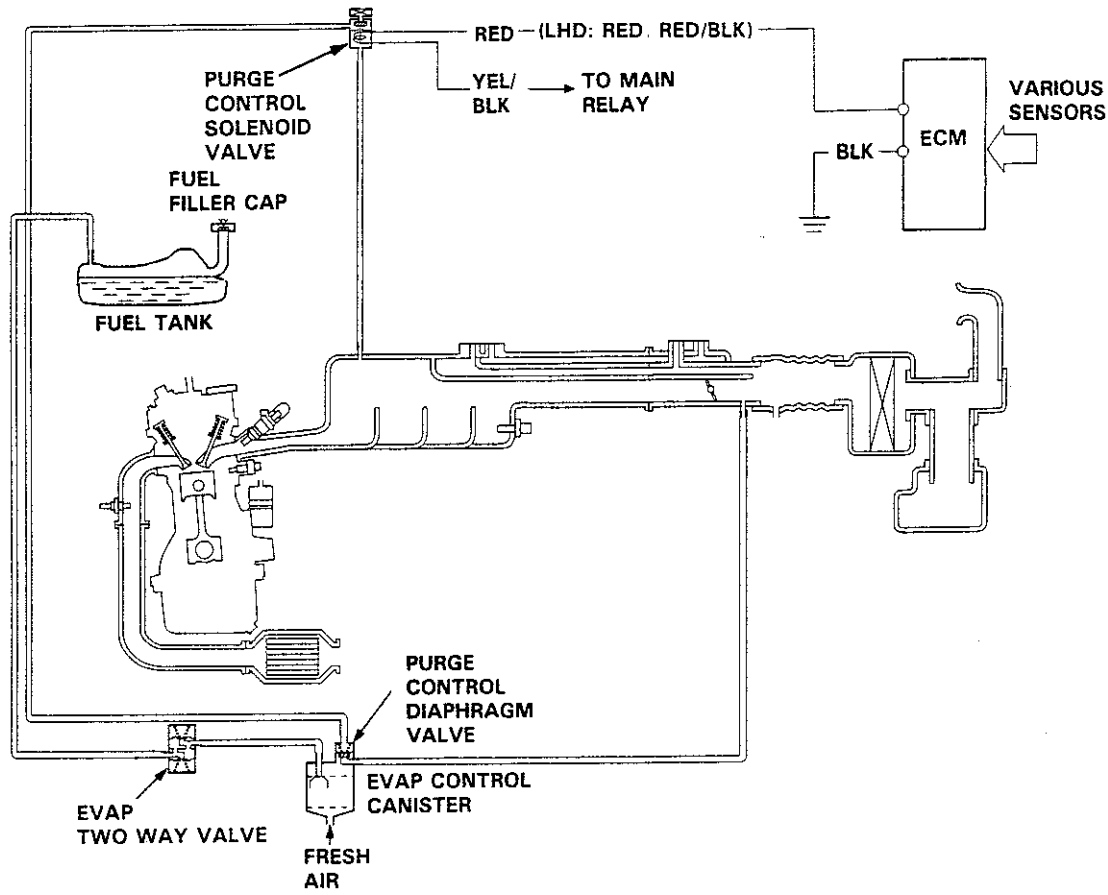
B. **Vapor Purge Control System**
Evaporative emission control canister (EVAP control canister) purging is accomplished by drawing fresh air through the evaporative emission control canister (EVAP control canister) and into a port on the throttle body (TB). The purging vacuum is controlled by the purge control diaphragm valve and the purge control solenoid valve

Except KY:

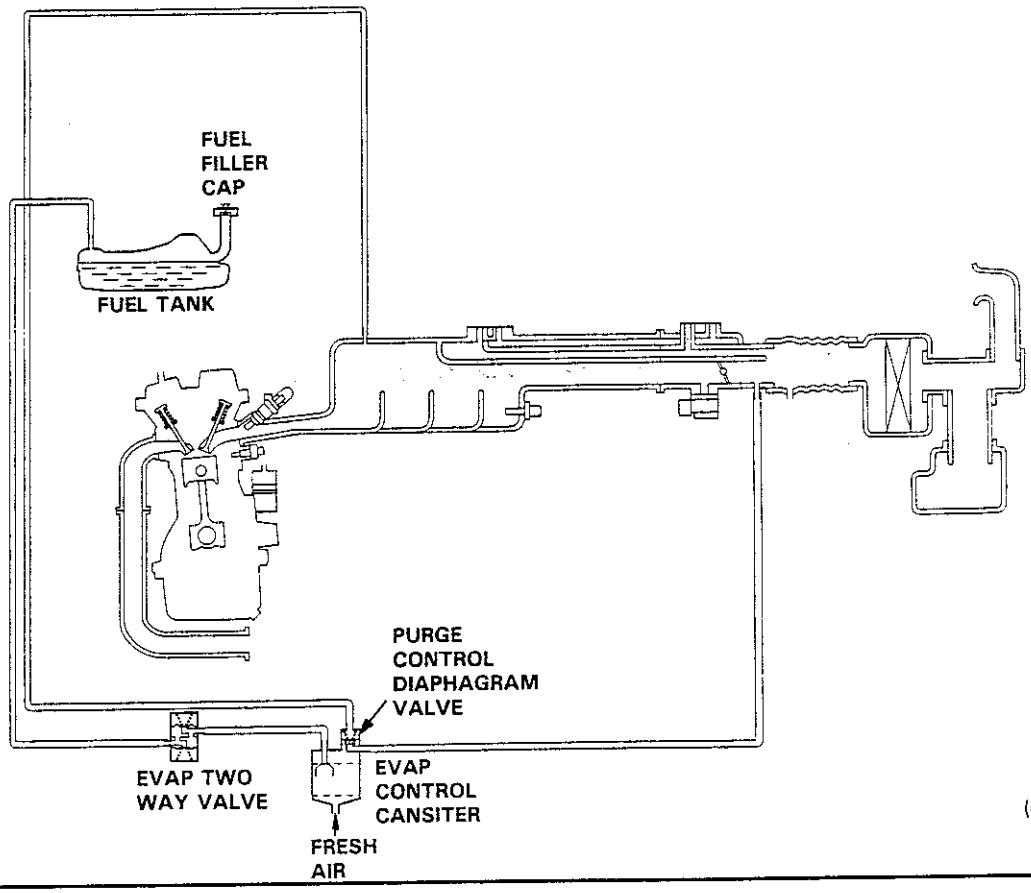


C. **Fuel Tank Vapor Control System**
When fuel vapor pressure in the fuel tank is higher than the set value of the evaporative emission two way valve, (EVAP two way valve) the evaporative emssion two way valve (EVAP two way valve) opens and regulates the flow of fuel vapor to the evaporative emission control canister (EVAP control canister).

Except KY:



KY:



(cont'd)

Evaporate Emission Controls [Except D16A9 KP and KT engine]

Except KY:

Troubleshooting Flowchart

Inspection of Evaporative Emission Controls

Disoconnect #7 vacuum hose from the purge control diaphragm valve (on the EVAP control canister) and connect a vacuum gauge to the hose

Start the engine and allow it to idle.
NOTE: Engine coolant temperature must be below 70 °C (158 °F)

Is there vacuum ?

YES

Disconnect the 2P connector from the purge control solenoid valve

NO

Measure voltage between YEL/BLK (+) terminal and RED (−) terminal

Is there battery voltage ?

YES

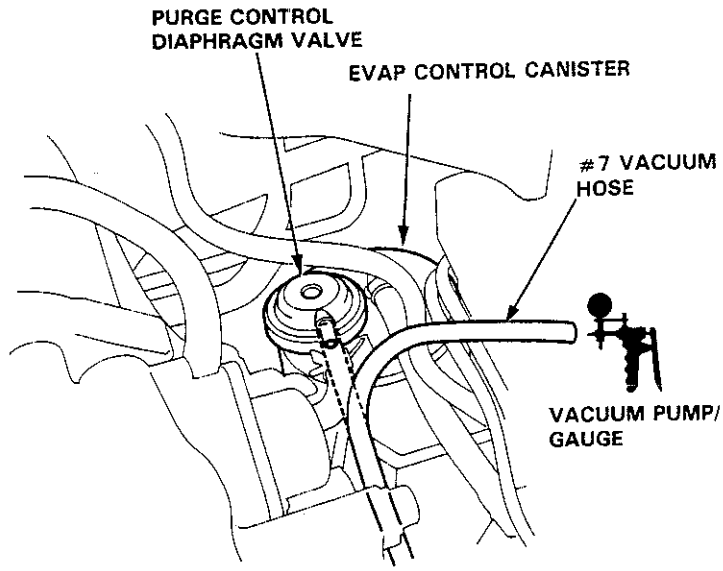
Inspect vacuum hose routing.
If OK, replace purge control solenoid valve.

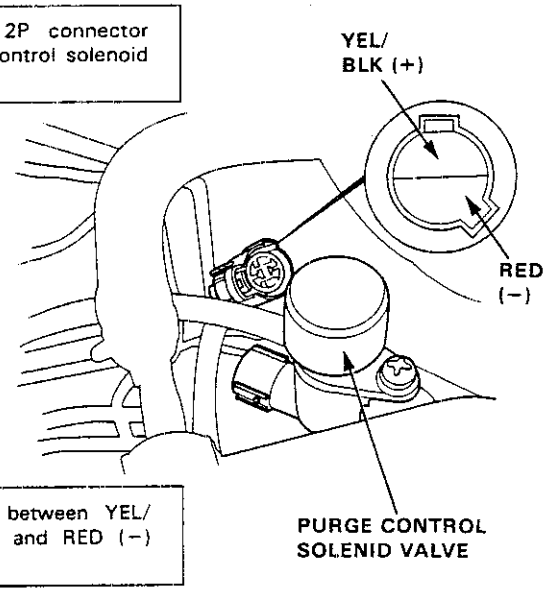
NO

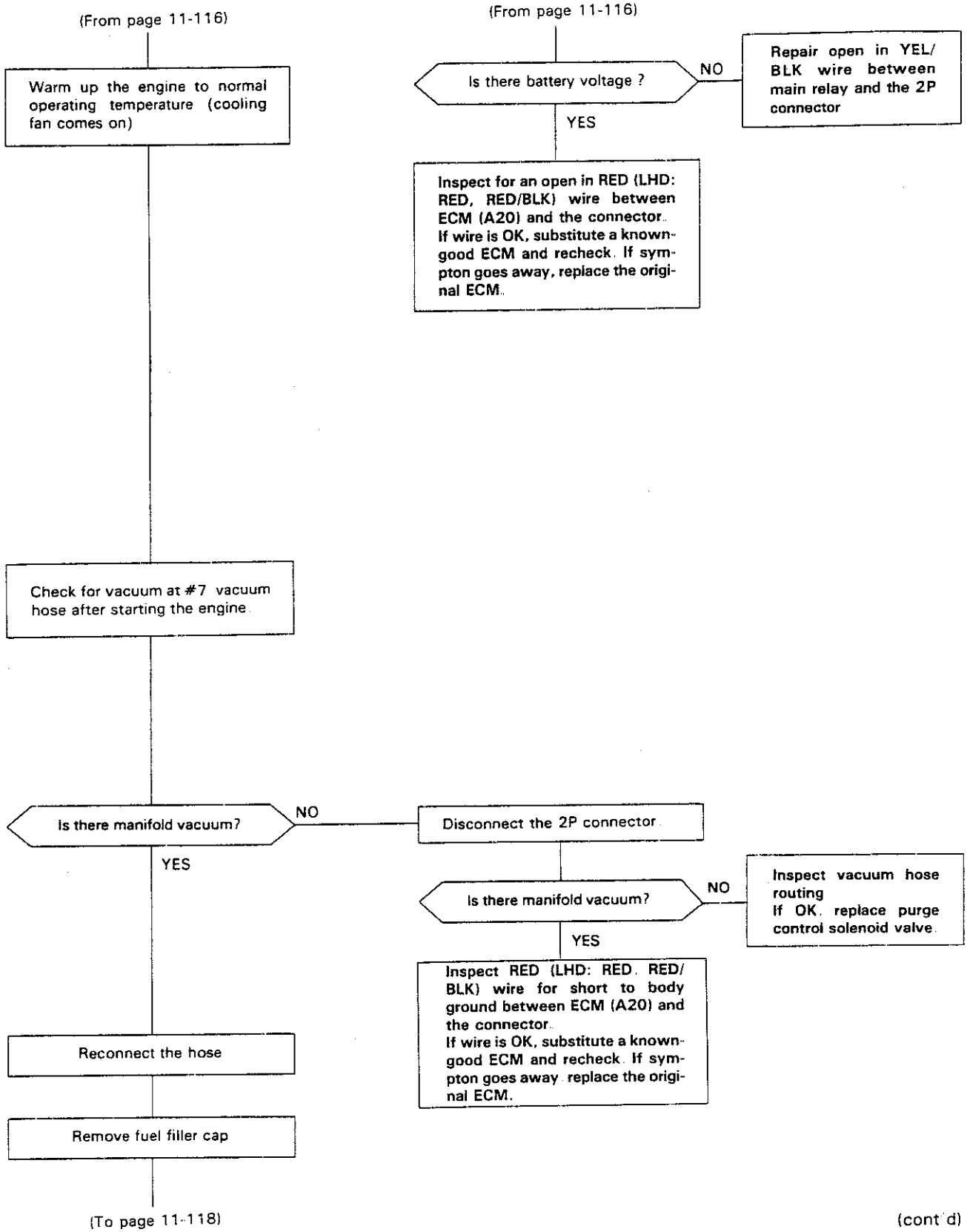
Measure voltage between YEL/BLK (+) terminal and body ground.

(To page 11-117)

(To page 11-117)



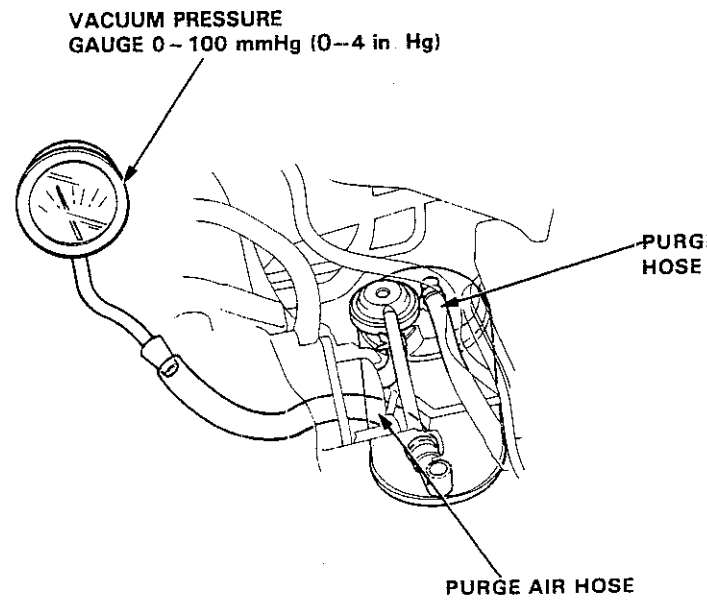



(From page 11-116)
Warm up the engine to normal operating temperature (cooling fan comes on)
Check for vacuum at #7 vacuum hose after starting the engine
Is there manifold vacuum?
NO
YES
Reconnect the hose
Remove fuel filler cap
(To page 11-118)
(From page 11-116)
Is there battery voltage ?
NO
Repair open in YEL/BLK wire between main relay and the 2P connector
YES
Inspect for an open in RED (LHD: RED, RED/BLK) wire between ECM (A20) and the connector.
If wire is OK, substitute a known-good ECM and recheck. If sympton goes away, replace the original ECM.
Disconnect the 2P connector
Is there manifold vacuum?
NO
Inspect vacuum hose routing
If OK, replace purge control solenoid valve.
YES
Inspect RED (LHD: RED, RED/BLK) wire for short to body ground between ECM (A20) and the connector.
If wire is OK, substitute a known-good ECM and recheck. If sympton goes away, replace the original ECM.
(cont'd)

Evaporatvie Emission Controls [Except D16A9 KP and KT engine] (cont'd)

(From page 11-117)

Connect a vacuum gauge to purge air hose.



Start the engine and raise speed to 3,500 min^{-1} (rpm)

Does vacuum appear on gauge within 1 minute ?

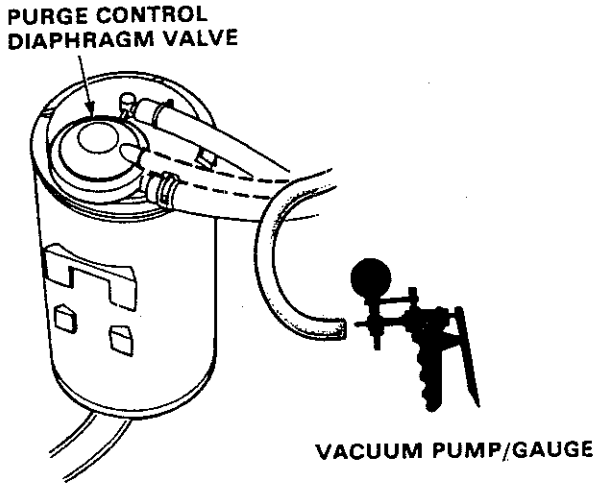
NO → Replace the EVAP Control Canister

YES

See EVAP Two Way Valve test to complete
Evaporative emission controls are OK

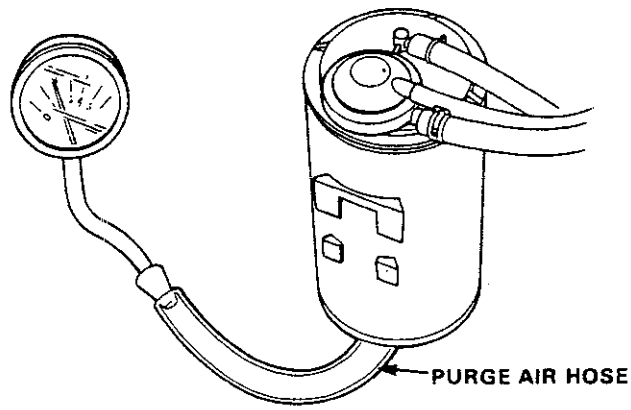
KY:

1. Remove the fuel filler cap.
2. Start the engine and allow to idle.
3. Disconnect vacuum hose at the purge control diaphragm valve (on the EVAP control canister) and connect a vacuum gauge to the hose.



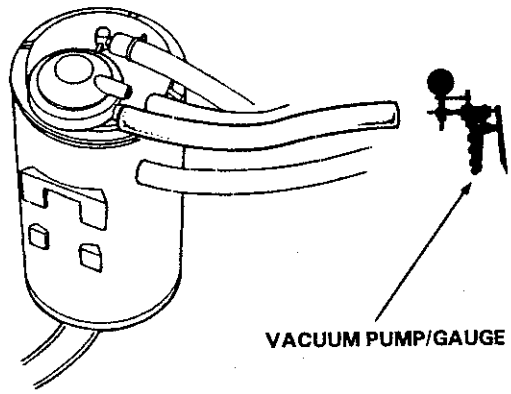
- If there is no vacuum, check vacuum hose for blockage, cracks or disconnected hose, as well as vacuum port for blockage.

4. Disconnect the vacuum gauge and reconnect the hose.
5. Connect a vacuum gauge to EVAP control canister purge air hose



6. Raise engine speed to 3,500 min^{-1} (rpm)
   Vacuum should appear on gauge within 1 minute.
   - If vacuum appears on gauge in 1 minute, remove gauge, test is complete.
   - If no vaccum, disconnect vacuum gauge and reinstall fuel filler cap.
7. Remove EVAP control canister and check for signs of damage or defects
   - If detective, replace EVAP control canister
8. Stop engine. Disconnect upper vacuum hose from purge control diaphragm valve
   Connect a vacuum pump to lower vacuum as shown, and apply vacuum.

   Vacuum should remain steady



   - If vacuum drops replace the EVAP control canister and retest.
9. Restart engine. Reconnect upper vacuum hose to purge control diaphragm valve

   Vacuum (lower vacuum hose side) should drop to zero.
   - If vacuum does not drop to zero, replace the EVAP control canister and retest.

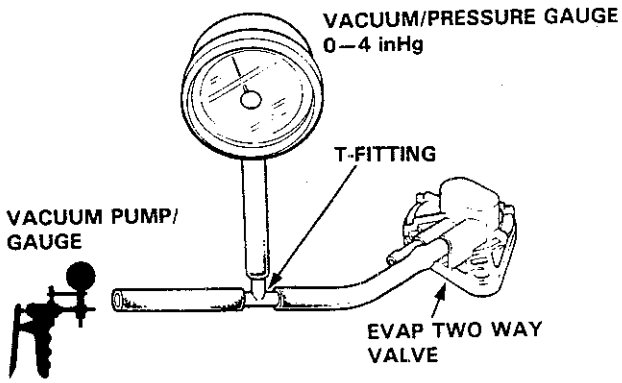
(cont'd)

Evaporative Emission Controls [Except D16A9 KP and KT engine] (cont'd)

Evaporative Emission Two Way Valve (EVAP Two Way Valve) Testing

1. Remove the filler cap.

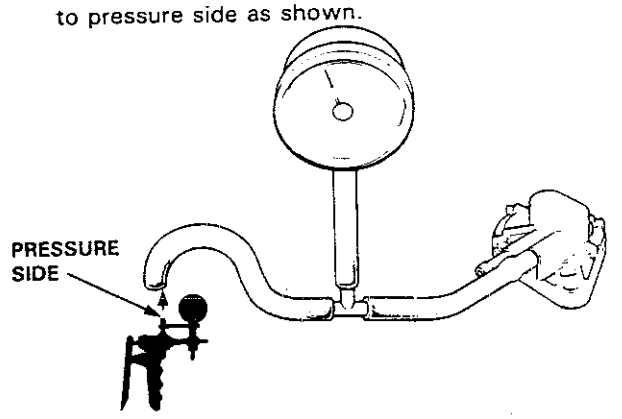
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown



3. Apply vacuum slowly and continuously while watching the gauge.

   Vacuum should stabilize momentarily at 5 to 15 mmHg (0.2 to 0.6 in Hg).
   - If vacuum stabilizes (EVAP Two Way Valve opens) below 5 mmHg (0.2 in. Hg) or above 15 mmHg (0.6 in. Hg), install new EVAP Two Way Valve and retest

4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.



5. Slowly pressurize the vapor line while watching the gauge.

   Pressure should stabilize at 10 to 35 mmHg (0.4 to 1.4 in. Hg)
   - If pressure momentarily stabilizes (EVAP Two Way Valve opens) at 10 to 35 mmHg (0.4 to 1.4 in. Hg), the EVAP Two Way Valve is OK.
   - If pressure stabilizes below 10 mmHg (0.4 in. Hg) or above 35 mmHg (1.4 in. Hg), install a new EVAP Two Way Valve and retest.