Fuel and Emissions

Fuel and Emissions Systems

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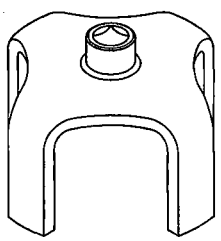
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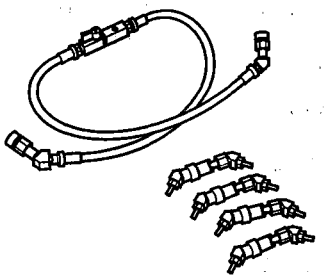
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Special Tools

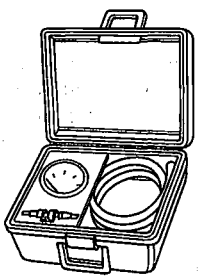
Ref. No.	Tool Number	Description	Qty
①	07AAA-S0XA100	Fuel Sender Wrench	1
②	07AAJ-S6MA150	Fuel Pressure Gauge Attachment Set	1
③	07JAZ-001000B	Vacuum/Pressure Gauge, 0—4 in.Hg	1
④	07NAJ-P07010A	Pressure Gauge Adapter	1
⑤	07ZAJ-S5AA200	Oil Pressure Hose	1
⑥-1	07406-0020201	A/T Pressure Hose	1
⑥-2	07406-0070301	A/T Low Pressure Gauge W/Panel	1
⑥-3	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	1
⑥-4	07MAJ-PY40120	A/T Pressure Hose, Adapter	1
⑦	07406-004000B	Fuel Pressure Gauge	1



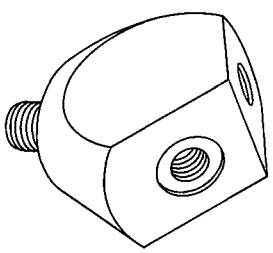
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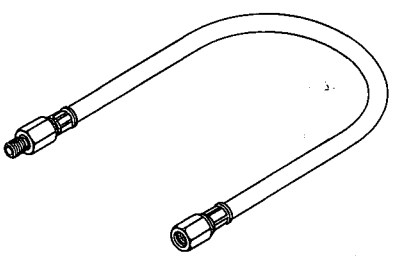
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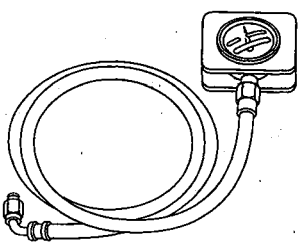
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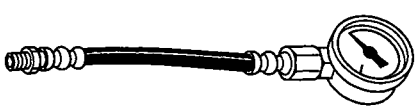
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⑤



⑥-1, ⑥-2, ⑥-3, ⑥-4



⑦

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BACK

General Troubleshooting Information

Intermittent Failures

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the malfunction indicator lamp (MIL) on the dash does not come on, check for poor connections or loose pins at all connectors related to the circuit that you are troubleshooting. If the MIL was on but then went out, the original problem may have been intermittent.

Opens and Shorts

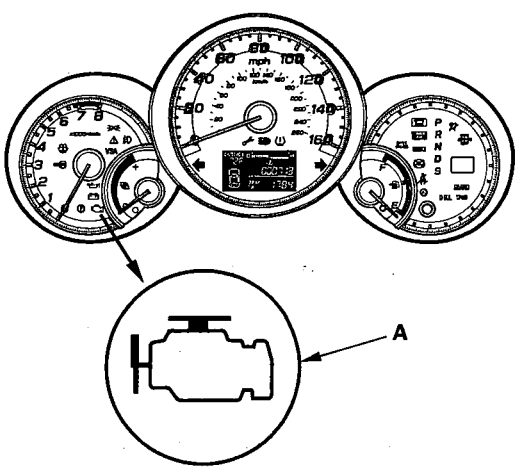
"Open" and "short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won't work at all. With complex electronics (such as PCMs) this can sometimes mean something works, but not the way it's supposed to.

How to Use the HDS (Honda Diagnostic System)

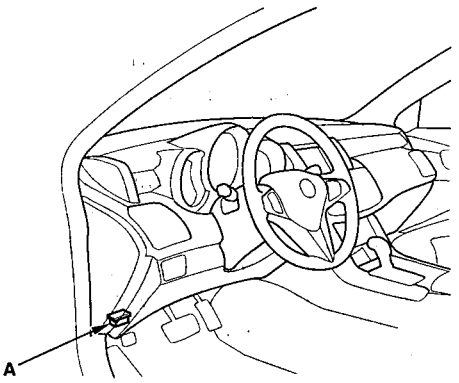
If the MIL (malfunction indicator lamp) has come on

1. Start the engine, and check the MIL (A).

   NOTE: If the ignition switch is turned ON (II), and the engine is not started, the MIL stays on for 15—20 seconds (see page 11-76).



2. If the MIL stays on, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Turn the ignition switch ON (II).

4. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).

5. Check the diagnostic trouble code (DTC) and note it. Also check the freeze data and/or on-board snapshot data, and download any data found. Then refer to the indicated DTC's troubleshooting, and begin the appropriate troubleshooting procedure.

   NOTE:
   - Freeze data indicates the engine conditions when the first malfunction, misfire, or fuel trim malfunction was detected.
   - The HDS can read the DTC, freeze data, on-board snapshot, current data, and other powertrain control module (PCM) data.
   - For specific operations, refer to the user's manual that came with the HDS.

6. If no DTCs are found, go to MIL troubleshooting (see page 11-228).

If the MIL did not stay on
If the MIL did not stay on but there is a driveability problem, do the symptom troubleshooting.

If you can't duplicate the DTC
Some of the troubleshooting requires you to reset the PCM and try to duplicate the DTC. If the problem is intermittent and you can't duplicate the code, do not continue through the procedure. To do so will only result in confusion and possibly, a needlessly replaced PCM.

(cont'd)

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General Troubleshooting Information (cont'd)

HDS Clear Command

The PCM stores various specific data to correct the system even if there is no electrical power such as when the battery negative terminal or No. 19 FI MAIN (15 A) fuse are disconnected. Stored data based on failed parts should be cleared by using the "CLEAR COMMAND" of the HDS, if parts are replaced.

The HDS has three kinds of clear commands to meet this purpose. They are DTC clear, PCM reset, and crank (CKP) pattern clear. DTC clear command erases all stored DTC codes, freeze data, on-board snapshot, and readiness codes. This must be done with the HDS after reproducing the DTC during troubleshooting.
The PCM reset command erases all stored DTC codes, freeze data, on-board snapshot, readiness codes, and all specific data to correct the system except crank (CKP) pattern. If the crank (CKP) pattern data in the PCM was cleared, you must do the crank (CKP) pattern learn procedure. The crank (CKP) pattern clear command erases only crank (CKP) pattern data. This command is for repair of a misfire or the CKP sensor.

Scan Tool Clear Command

If you are using a generic scan tool to clear commands, be aware that there is only one setting for clearing the PCM, and it clears all commands at the same time (crank (CKP) pattern learn, idle learn, readiness codes, freeze data, on-board snapshot, and DTCs). After you clear all commands, you then need to do these procedures, in this order: PCM idle learn procedure (see page 11-339); crank (CKP) pattern learn procedure; test-drive to set readiness codes to complete (see page 11-76).

DTC Clear

1. Clear the DTC with the HDS while the engine is stopped.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON (II), and wait for 30 seconds.
4. Turn the ignition switch OFF, and disconnect the HDS from the DLC.

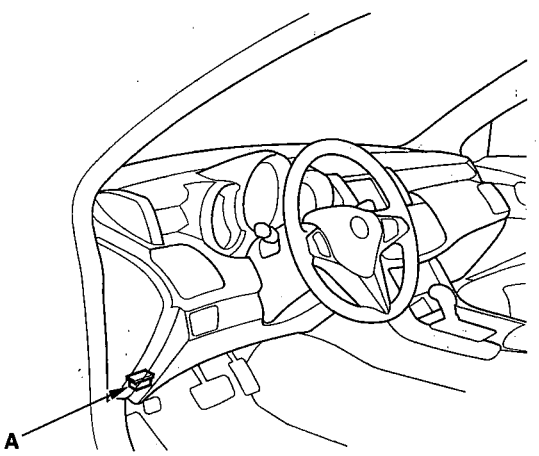
PCM Reset

1. Reset the PCM with the HDS while the engine is stopped.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON (II), and wait for 30 seconds.
4. Turn the ignition switch OFF, and disconnect the HDS from the DLC.
5. Do the PCM idle learn procedure (see page 11-339).

Crank (CKP) Pattern Clear/Crank (CKP) Pattern Learn

Clear/Learn Procedure (with the HDS)

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).
4. Select CRANK PATTERN in the ADJUSTMENT MENU with the HDS.
5. Select CRANK PATTERN LEARNING with the HDS, and follow the screen prompts.

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Learn Procedure (without the HDS)

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
2. Test-drive the vehicle on a level road: Decelerate (with the throttle fully closed) from an engine speed of 2,500 rpm down to 1,000 rpm with the transmission in S position 1st or 2nd gear.
3. Repeat step 2 several times.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON (II), and wait for 30 seconds.

How to End a Troubleshooting Session (required after any troubleshooting)

1. Reset the PCM with the HDS.
2. Do the PCM idle learn procedure (see page 11-339).
3. Turn the ignition switch OFF.
4. Disconnect the HDS from the DLC.

NOTE: The PCM is part of the immobilizer system. If you replace the PCM, it will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the HDS.

(cont'd)

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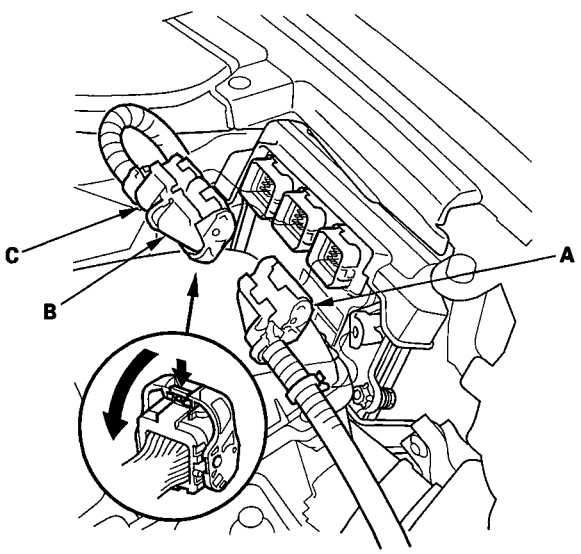
General Troubleshooting Information (cont'd)

How to Troubleshoot Circuits at the PCM Connectors

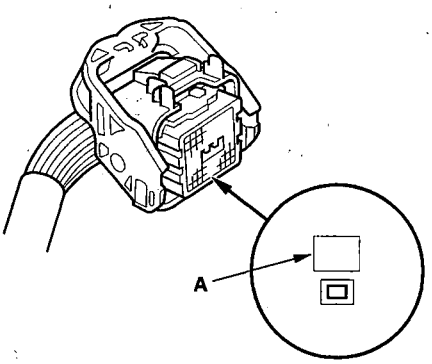
NOTE: The PCM overwrites data and monitors the EVAP system for up to 30 minutes after the ignition switch is turned OFF. Jumping the SCS line after turning the ignition switch OFF cancels this function. Disconnecting the PCM during this function, without jumping the SCS line first, can damage the PCM.

1. Jump the SCS line with the HDS.
2. Disconnect the PCM connectors A, B, and C.

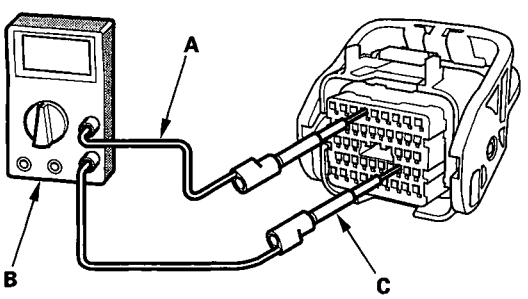
   NOTE: PCM connectors A, B, and C have symbols (A=□, B=△, C=○) embossed on them for identification.



3. When diagnosis/troubleshooting is done at the PCM connector, use the terminal test port (A) above the terminal you need to check.



4. Connect one side of the patch cord (A) terminals to a commercially available digital multimeter (B), and connect the other side of the patch cord terminals to a commercially available banana jack (Pomona Electronics Tool No. 3563 or equivalent) (C).



5. Gently contact the pin probe (male) at the terminal test port from the terminal side. Do not force the tips into the terminals.

NOTICE

- For accurate results, always use the pin probe (male).
- To prevent damage to the connector terminals, do not insert test equipment probes, paper clips, or other substitutes as they can damage the terminals. Damaged terminals cause a poor connection and an incorrect measurement.
- Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.

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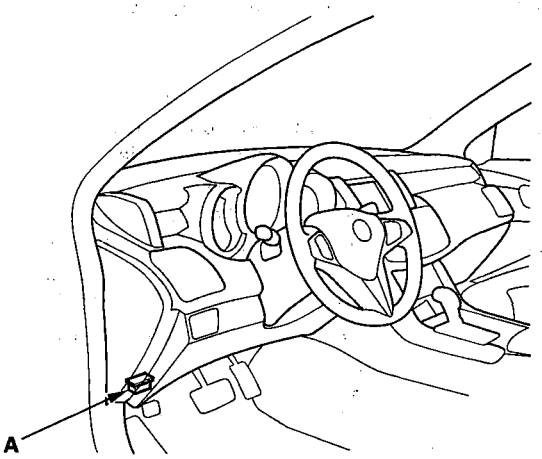
BACK

Updating the PCM

Special Tools Required
- Honda diagnostic system (HDS)
- Honda interface module (HIM)
- HDS pocket tester

NOTE:
- Use this procedure when you need to update the PCM in a troubleshooting procedure.
- Make sure the HDS/HIM has the latest software version.
- Before you update the PCM, make sure the battery in the vehicle is fully charged.
- Never turn the ignition switch OFF during the update. If there is a problem with the update, leave the ignition switch ON.
- To prevent PCM damage, do not operate anything electrical (headlights, audio system, brakes, A/C, power windows, moonroof (if equipped), door locks, etc.) during the update.
- To ensure the latest program is installed, do an PCM update whenever the PCM is substituted or replaced.
- You cannot update an PCM with a program it already has. It will only accept a new program.
- High temperature in the engine compartment might cause the PCM to become too hot to run the update. If the engine has been running before this procedure, open the hood and cool the engine compartment.
- If you need to diagnose the Honda interface module (HIM) because the HIM's red (#3) lamp came on or was flashed during the update, leave the ignition switch in the ON (II) position when you disconnect the HIM from the data link connector (DLC). This will prevent PCM damage.

1. Turn the ignition switch ON (II), but do not start the engine.
2. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229). If you are returning from the DLC circuit troubleshooting, skip step 4 to 5 and clean the throttle body after updating the PCM (see page 11-394).
4. USA, Canada models: Select the INSPECTION MENU with the HDS.
5. USA, Canada models: Select the ETCS TEST, then select the TP POSITION CHECK, and follow the HDS screen prompts.

   NOTE: If the TP POSITION CHECK indicates FAILED, continue this procedure.
6. Exit the Honda diagnostic system (USA, Canada models). Select the update program, and follow the screen prompts to update the PCM.

(cont'd)

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General Troubleshooting Information (cont'd)

7. If the software in the PCM is the latest, disconnect the HDS/HIM from the DLC, and go back to the procedure that you were doing. If the software in the PCM is not the latest, follow the instructions on the screen. If prompted to choose the PGM-FI system or the A/T system, make sure you update both.

   NOTE: If the PCM update system requires you to cool the PCM, follow the instructions on screen. If you run into a problem during the update procedure, (programming takes over 15 minutes, status bar goes over 100 %, D or immobilizer light flashes, HDS tablet freezes, etc.), follow these steps to minimize the chance of damaging the PCM:
   - Leave the ignition switch in the ON (II) position.
   - Connect a jumper battery (do not connect a battery charger).
   - Shut down the HDS.
   - Disconnect the HDS from the DLC.
   - Reboot the HDS.
   - Reconnect the HDS to the DLC, and try the update procedure again.

8. USA, Canada models: If the TP POSITION CHECK failed in step 6, clean the throttle body (see page 11-394).

9. Do the PCM idle learn procedure (see page 11-339).

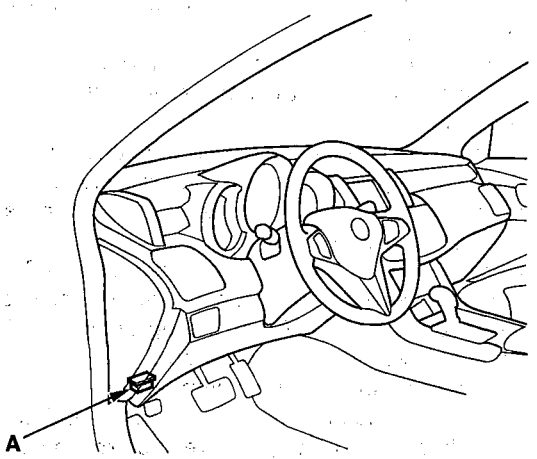
10. Do the CKP pattern learn procedure.

Substituting the PCM

Special Tools Required
- Honda diagnostic system (HDS)
- Honda interface module (HIM)
- HDS pocket tester

NOTE: Use this procedure when you need to substitute a known-good PCM during troubleshooting procedures.

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch ON (II).

3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229). If you are returning from DLC circuit troubleshooting, skip step 4 to 8, and clean the throttle body after substituting the PCM (see page 11-394).

4. USA, Canada models: Select the INSPECTION MENU with the HDS.

5. USA, Canada models: Select the ETCS TEST, then select the TP POSITION CHECK, and follow the screen prompts.

   NOTE: If the TP POSITION CHECK indicates FAILED, continue this procedure.

6. Turn the ignition switch OFF.

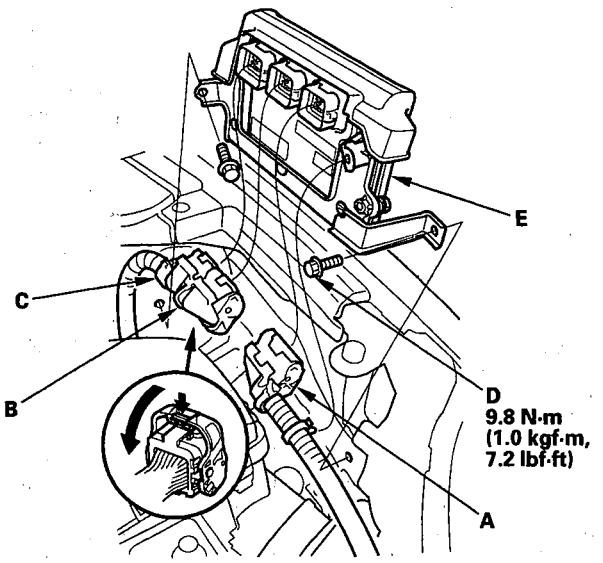
7. Jump the SCS line with the HDS.

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BACK

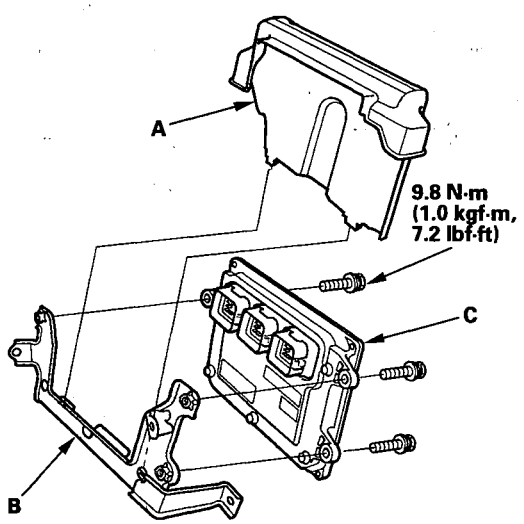
8. Disconnect the PCM connectors A, B, and C.

   NOTE: PCM connectors A, B, and C have symbols (A=□, B=△, C=○) embossed on them for identification.



9. Remove the bolts (D), then remove the PCM assembly (E).

10. Remove the cover (A) and the bracket (B) from the PCM (C).



11. Install the PCM in the reverse order of removal.

12. Turn the ignition switch ON (II).

    NOTE: DTC P0630 "VIN Not Programmed or Mismatch" may be stored because the VIN has not been programmed into the PCM; ignore it, and continue this procedure.

13. Manually input the VIN to the PCM with the HDS.

14. Update the PCM if it does not have the latest software.

15. Select the IMMOBI SYSTEM with the HDS.

16. Enter the immobilizer code using the PCM replacement procedure in the HDS; this allows you to start the engine.

17. Reset the PCM with the HDS.

18. USA, Canada models: If the TP POSITION CHECK failed in step 5, clean the throttle body (see page 11-394).

19. Do the PCM idle learn procedure (see page 11-339).

20. Do the CKP pattern learn procedure.

OBD Status

The OBD status shows the current system status of each DTC and all of the parameters. This function is used to see if the repair was successfully completed. The results of diagnostic tests for the DTC are displayed as:

- PASSED: The on board diagnosis is successfully finished.
- FAILED: The on board diagnosis has finished but failed.
- EXECUTING: The vehicle is in enable criteria conditions for the DTC and the on board diagnosis is running.
- NOT COMPLETED: The on board diagnosis was running but is out of the enable conditions of the DTC.
- OUT OF CONDITION: The vehicle has stayed out of the enable conditions for the DTC.

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DTC Troubleshooting Index

DTC (MIL indication*1)	Two Drive Cycle Detection	Detection Item	MIL	Note
P0010 (56)	—	Variable Valve Timing Control (VTC) Oil Control Solenoid Valve Malfunction	ON	(see page 11-297)
P0011 (56)	○	Variable Valve Timing Control (VTC) System Malfunction	ON	(see page 11-300)
P0034 (194)	—	Turbocharger Bypass Control Solenoid Valve Circuit Low Voltage	ON	(see page 11-398)
P0035 (194)	—	Turbocharger Bypass Control Solenoid Valve Circuit High Voltage	ON	(see page 11-402)
P0045 (172)	—	Turbocharger Boost Control Solenoid Valve Circuit Malfunction	ON	(see page 11-403)
P0096 (10)	—	Intake Temperature (IAT) Sensor 2 Circuit Range/Performance Problem	ON	(see page 11-81)
P0097 (10)	—	Intake Air Temperature (IAT) Sensor 2 Circuit Low Voltage	ON	(see page 11-82)
P0098 (10)	—	Intake Air Temperature (IAT) Sensor 2 Circuit High Voltage	ON	(see page 11-84)
P0101 (50)	○	Mass Air Flow (MAF) Sensor Circuit Range/Performance Problem	ON	(see page 11-87)
P0102 (50)	—	Mass Air Flow (MAF) Sensor Circuit Low Voltage	ON	(see page 11-89)
P0103 (50)	—	Mass Air Flow (MAF) Sensor Circuit High Voltage	ON	(see page 11-92)
P0107 (3)	—	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	ON	(see page 11-94)
P0108 (3)	—	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	ON	(see page 11-96)
P0112 (125)	—	Intake Air Temperature (IAT) Sensor 1 Circuit Low Voltage	ON	(see page 11-99)
P0113 (125)	—	Intake Air Temperature (IAT) Sensor 1 Circuit High Voltage	ON	(see page 11-101)
P0116 (86)	○	Engine Coolant Temperature (ECT) Sensor 1 Circuit Range/ Performance Problem	ON	(see page 11-104)
P0117 (6)	—	Engine Coolant Temperature (ECT) Sensor 1 Circuit Low Voltage	ON	(see page 11-105)
P0118 (6)	—	Engine Coolant Temperature (ECT) Sensor 1 Circuit High Voltage	ON	(see page 11-107)
P0122 (7)	—	Throttle Position (TP) Sensor A Circuit Low Voltage	ON	(see page 11-255)
P0123 (7)	—	Throttle Position (TP) Sensor A Circuit High Voltage	ON	(see page 11-257)
P0125 (86)	○	Engine Coolant Temperature (ECT) Sensor 1 Malfunction/Slow Response	ON	(see page 11-110)
P0128 (87)	○	Cooling System Malfunction	ON	(see page 11-111)
P0133 (61)	○	Air Fuel Ratio (A/F) Sensor (Sensor 1) Malfunction/Slow Response	ON	(see page 11-113)
P0134 (41)	○	Air Fuel Ratio (A/F) Sensor (Sensor 1) Heater System Malfunction	ON	(see page 11-114)
P0135 (41)	—	Air Fuel Ratio (A/F) Sensor (Sensor 1) Heater Circuit Malfunction	ON	(see page 11-115)
P0137 (63)	○	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Low Voltage	ON	(see page 11-120)
P0138 (63)	○	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit High Voltage	ON	(see page 11-122)
P0139 (63)	○	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Slow Response	ON	(see page 11-125)
P0141 (65)	—	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Heater Circuit Malfunction	ON	(see page 11-126)
P0171 (45)	○	Fuel System Too Lean	ON	(see page 11-130)
P0172 (45)	○	Fuel System Too Rich	ON	(see page 11-130)
P0222 (7)	—	Throttle Position (TP) Sensor B Circuit Low Voltage	ON	(see page 11-260)
P0223 (7)	—	Throttle Position (TP) Sensor B Circuit High Voltage	ON	(see page 11-263)
P0234 (26)	○	Turbocharger Overboost Problem	ON	(see page 11-407)
P0236 (171)	○	Turbocharger Boost Sensor Circuit Range/Performance Problem	ON	(see page 11-409)
P0237 (171)	—	Turbocharger Boost Sensor Circuit Low Voltage	ON	(see page 11-411)
P0238 (171)	—	Turbocharger Boost Sensor Circuit High Voltage	ON	(see page 11-413)
P0243 (193)	—	Turbocharger Wastegate Control Solenoid Valve Circuit Malfunction	ON	(see page 11-416)
P0299 (26)	○	Turbocharger Underboost Problem	ON	(see page 11-420)
P0300 (75) any combination of the following P0301 (71) P0302 (72) P0303 (73) P0304 (74)	○	Random Misfire Detected	ON	(see page 11-132)
P0301 (71)	○	No. 1 Cylinder Misfire Detected	ON	(see page 11-135)
P0302 (72)	○	No. 2 Cylinder Misfire Detected	ON	(see page 11-135)
P0303 (73)	○	No. 3 Cylinder Misfire Detected	ON	(see page 11-135)
P0304 (74)	○	No. 4 Cylinder Misfire Detected	ON	(see page 11-135)

NOTE: The above DTCs are indicated when the PGM-FI system is selected in the HDS. Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check the automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.

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DTC (MIL indication *1)	Two Drive Cycle Detection	Detection Item	MIL	Note
P0325 (23)	—	Knock Sensor Circuit Malfunction	ON	(see page 11-144)
P0335 (4)	—	Crankshaft Position (CKP) Sensor No Signal	ON	(see page 11-146)
P0339 (4)	—	Crankshaft Position (CKP) Sensor Circuit Intermittent Interruption	ON	(see page 11-149)
P0340 (57)	—	Camshaft Position (CMP) Sensor A No Signal	ON	(see page 11-302)
P0341 (57)	—	Camshaft Position (CMP) Sensor A and Crankshaft Position (CKP) Sensor Incorrect Phase Detected	ON	(see page 11-305)
P0344 (57)	—	Camshaft Position (CMP) Sensor A Circuit Intermittent Interruption	ON	(see page 11-307)
P0365 (8)	—	Camshaft Position (CMP) Sensor B No Signal	ON	(see page 11-150)
P0369 (8)	—	Camshaft Position (CMP) Sensor B Circuit Intermittent Interruption	ON	(see page 11-153)
P0420 (67)	○	Catalyst System Efficiency Below Threshold	ON	(see page 11-438)
P0443 (92)	—	Evaporative Emission (EVAP) Canister Purge Valve Circuit Malfunction	ON	(see page 11-447)
P0451 (91)	○	Fuel Tank Pressure (FTP) Sensor Circuit Range/Performance Problem	ON	(see page 11-454)
P0452 (91)	○	Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	ON	(see page 11-455)
P0453 (91)	○	Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	ON	(see page 11-458)
P0455 (90)	○	Evaporative Emission (EVAP) System Large Leak Detected	ON	(see page 11-461)
P0456 (90)	○	Evaporative Emission (EVAP) System Very Small Leak Detected	ON	(see page 11-461)
P0457 (90)	—	Evaporative Emission (EVAP) System Leak Detected/Fuel Fill Cap Loose or Missing	OFF	(see page 11-464)
P0461 (121)	—	Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Range/ Performance Problem	OFF	(see page 11-342)
P0462 (121)	—	Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Low Voltage	OFF	(see page 11-343)
P0463 (121)	—	Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit High Voltage	OFF	(see page 11-347)
P0496 (92)	○	Evaporative Emission (EVAP) System High Purge Flow Detected	ON	(see page 11-466)
P0497 (90)	○	Evaporative Emission (EVAP) System Low Purge Flow Detected	ON	(see page 11-467)
P0498 (117)	—	Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit Low Voltage	ON	(see page 11-471)
P0499 (117)	—	Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit High Voltage	ON	(see page 11-474)
P0506 (14)	○	Idle Control System RPM Lower Than Expected	ON	(see page 11-323)
P0507 (14)	○	Idle Control System RPM Higher Than Expected	ON	(see page 11-325)
P050A (167)	○	Cold Start Idle Air Control System Performance Problem	ON	(see page 11-154)
P050B (167)	○	Cold Start Ignition Timing Control System Performance Problem	ON	(see page 11-156)
P0532 (191)	—	A/C Pressure Sensor Circuit Low Voltage	OFF	(see page 11-327)
P0533 (191)	—	A/C Pressure Sensor Circuit High Voltage	OFF	(see page 11-329)
P0562 (34)	—	Charging System Low Voltage	OFF	(see page 11-159)
P0563 (34)	—	Powertrain Control Module (PCM) Power Source Circuit Unexpected Voltage	OFF	(see page 11-160)
P0602 (196)	—	Powertrain Control Module (PCM) Programming Error	ON	(see page 11-163)
P0606 (0)	—	Powertrain Control Module (PCM) Processor Malfunction	ON	(see page 11-163)
P060A (131)	—	Powertrain Control Module (PCM) (A/T System) Internal Control Module Malfunction	ON	(see page 11-164)
P0627 (169)	—	Fuel Pump Control Module System Malfunction	ON	(see page 11-351)
P062F (131)	—	Powertrain Control Module (PCM) Internal Control Module Keep Alive Memory (KAM) Error	ON	(see page 11-164)
P0630 (139)	—	VIN Not Programmed or Mismatch	ON	(see page 11-165)
P0685 (135)	○	Powertrain Control Module (PCM) Power Control Circuit/Internal Circuit Malfunction	ON	(see page 11-166)

NOTE: The above DTCs are indicated when the PGM-FI system is selected in the HDS. Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check the automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.

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DTC Troubleshooting Index (cont'd)

DTC (MIL indication*1)	Two Drive Cycle Detection	Detection Item	MIL	Note
P0720 (122)*2	—	Output Shaft (Countershaft) Speed Sensor Circuit Malfunction	ON	(see page 11-167)
P1009 (56)	—	Variable Valve Timing Control (VTC) Advance Malfunction	ON	(see page 11-308)
P1109 (13)	—	Barometric Pressure (BARO) Sensor Circuit Out of Range High	ON	(see page 11-168)
P1116 (86)	○	Engine Coolant Temperature (ECT) Sensor 1 Circuit Range/ Performance Problem	ON	(see page 11-168)
P1128 (5)	○	Manifold Absolute Pressure (MAP) Sensor Signal Lower Than Expected	ON	(see page 11-170)
P1129 (5)	○	Manifold Absolute Pressure (MAP) Sensor Signal Higher Than Expected	ON	(see page 11-171)
P1157 (48)	—	Air Fuel Ratio (A/F) Sensor (Sensor 1) AFS Circuit High Voltage	ON	(see page 11-173)
P1172 (61)	○	Air Fuel Ratio (A/F) Sensor (Sensor 1) Circuit Out of Range High	ON	(see page 11-176)
P1233 (171)	○	Turbocharger Boost Sensor/Barometric Pressure (BARO) Sensor Incorrect Correlation	ON	(see page 11-423)
P1234 (171)	○	Turbocharger Boost Sensor/Manifold Absolute Pressure (MAP) Sensor Incorrect Correlation	ON	(see page 11-423)
P1297 (20)	—	Electrical Load Detector (ELD) Circuit Low Voltage	OFF	(see page 11-177)
P1298 (20)	—	Electrical Load Detector (ELD) Circuit High Voltage	OFF	(see page 11-179)
P1454 (90)	○	Fuel Tank Pressure (FTP) Sensor Range/Performance Problem	ON	(see page 11-475)
P145A (90)	○	Evaporative Emission (EVAP) System Incorrect Purge Flow Detected	ON	(see page 11-478)
P145B (90)	○	Evaporative Emission (EVAP) System Purge Line Non-return Valve A Stuck Open	ON	(see page 11-482)
P145C (90)	○	Evaporative Emission (EVAP) System Purge Flow Malfunction (Vacuum Purge)	ON	(see page 11-482)
P145D (90)	○	Evaporative Emission (EVAP) System Purge Flow Malfunction (Jet Purge)	ON	(see page 11-482)
P1549 (34)	—	Charging System High Voltage	OFF	(see page 11-181)
P1658 (40)	—	Electronic Throttle Control System (ETCS) Control Relay ON Malfunction	ON	(see page 11-266)
P1659 (40)	—	Electronic Throttle Control System (ETCS) Control Relay OFF Malfunction	ON	(see page 11-268)
P1683 (40)	—	Throttle Valve Default Position Spring Performance Problem	ON	(see page 11-272)
P1684 (40)	—	Throttle Valve Return Spring Performance Problem	ON	(see page 11-273)
P16BB (116)	—	Alternator B Terminal Circuit Low Voltage	OFF	(see page 11-182)
P16BC (116)	—	Alternator FR Terminal Circuit/IGP Circuit Low Voltage	OFF	(see page 11-183)
P2101 (40)	—	Electronic Throttle Control System (ETCS) Malfunction	ON	(see page 11-274)
P2118 (40)	—	Throttle Actuator Current Range/Performance Problem	ON	(see page 11-276)
P2122 (37)	—	Accelerator Pedal Position (APP) Sensor A (Throttle Position (TP) Sensor D) Circuit Low Voltage	ON	(see page 11-278)
P2123 (37)	—	Accelerator Pedal Position (APP) Sensor A (Throttle Position (TP) Sensor D) Circuit High Voltage	ON	(see page 11-281)
P2127 (37)	—	Accelerator Pedal Position (APP) Sensor B (Throttle Position (TP) Sensor E) Circuit Low Voltage	ON	(see page 11-283)
P2128 (37)	—	Accelerator Pedal Position (APP) Sensor B (Throttle Position (TP) Sensor E) Circuit High Voltage	ON	(see page 11-286)
P2135 (7)	—	Throttle Position (TP) Sensor A/B Incorrect Voltage Correlation	ON	(see page 11-288)
P2138 (37)	—	Accelerator Pedal Position (APP) Sensor A/B (Throttle Position (TP) Sensor D/E) Incorrect Voltage Correlation	ON	(see page 11-290)
P2176 (40)	—	Throttle Actuator Control System Idle Position Not Learned	ON	(see page 11-292)
P2183 (192)	○	Engine Coolant Temperature (ECT) Sensor 2 Circuit Range/ Performance Problem	ON	(see page 11-186)
P2184 (192)	—	Engine Coolant Temperature (ECT) Sensor 2 Circuit Low Voltage	ON	(see page 11-188)
P2185 (192)	—	Engine Coolant Temperature (ECT) Sensor 2 Circuit High Voltage	ON	(see page 11-190)
P2195 (48)	○	Air Fuel Ratio (A/F) Sensor (Sensor 1) Signal Stuck Lean	ON	(see page 11-193)
P2199 (125)	○	Intake Air Temperature (IAT) Sensor 1, 2 Incorrect Correlation	ON	(see page 11-195)

NOTE: The above DTCs are indicated when the PGM-FI system is selected in the HDS. Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check the automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.
* 2: The D indicator and MIL may come on at the same time.

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DTC (MIL indication*1)	Two Drive Cycle Detection	Detection Item	MIL	Note
P2227 (13)	○	Barometric Pressure (BARO) Sensor Circuit Range/Performance Problem	ON	(see page 11-196)
P2228 (13)	—	Barometric Pressure (BARO) Sensor Circuit Low Voltage	ON	(see page 11-197)
P2229 (13)	—	Barometric Pressure (BARO) Sensor Circuit High Voltage	ON	(see page 11-197)
P2238 (48)	—	Air Fuel Ratio (A/F) Sensor (Sensor 1) AFS+ Circuit Low Voltage	ON	(see page 11-198)
P2252 (48)	—	Air Fuel Ratio (A/F) Sensor (Sensor 1) AFS− Circuit Low Voltage	ON	(see page 11-200)
P2261 (194)	○	Turbocharger Bypass Control Valve Stuck Closed	ON	(see page 11-424)
P2263 (26)	○	Turbocharger Boost System Performance Problem	ON	(see page 11-426)
P2270 (63)	○	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Signal Stuck Lean	ON	(see page 11-202)
P2271 (63)	○	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Signal Stuck Rich	ON	(see page 11-202)
P2422 (117)	○	Evaporative Emission (EVAP) Canister Vent Shut Valve Stuck Closed Malfunction	ON	(see page 11-475)
P2610 (132)	—	Powertrain Control Module (PCM) Ignition Off Internal Timer Malfunction	ON	(see page 11-203)
P2646 (22)	—	Rocker Arm Oil Pressure Switch Circuit Low Voltage	ON	(see page 11-309)
P2647 (22)	—	Rocker Arm Oil Pressure Switch Circuit High Voltage	ON	(see page 11-312)
P2648 (21)	—	Rocker Arm Oil Control Solenoid Circuit Low Voltage	ON	(see page 11-315)
P2649 (21)	—	Rocker Arm Oil Control Solenoid Circuit High Voltage	ON	(see page 11-317)
P2A00 (61)	○	Air Fuel Ratio (A/F) Sensor (Sensor 1) Circuit Range/Performance Problem	ON	(see page 11-204)
U0028 (126)	—	F-CAN Malfunction (BUS-OFF)	ON	(see page 11-205)
U0114 (126)	—	F-CAN Malfunction (Powertrain Control Module (PCM)-SH-AWD Control Unit)	OFF	(see page 11-206)
U0122 (126)	—	F-CAN Malfunction (Powertrain Control Module (PCM)-VSA Modulator-Control Unit)	OFF	(see page 11-208)
U0155 (126)	—	F-CAN Malfunction (Powertrain Control Module (PCM)-Gauge Control Module)	ON	(see page 11-210)
U0300 (131)	—	PGM-FI System and A/T System Program Version Mismatch	ON	(see page 11-212)

NOTE: The above DTCs are indicated when the PGM-FI system is selected in the HDS. Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check the automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.

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Symptom Troubleshooting Index

When the vehicle has one of these symptoms, check for a diagnostic trouble code (DTC) with the HDS. If there is no DTC, do the diagnostic procedure for the symptom, in the sequence listed, until you find the cause.

Symptom	Diagnostic procedure	Also check for
Engine will not start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-63). 2. Test the starter (see page 4-8). 3. Check the fuel pressure (see page 11-365).	• Low compression • No ignition spark • Intake air leaks • Locked up engine • Broken cam chain • Contaminated fuel
Engine will not start (MIL comes on and stays on, or never comes on at all, no DTCs set)	Troubleshoot the MIL circuit (see page 11-228).	
MIL comes on and stays on, or never comes on at all, no DTCs set	Troubleshoot the MIL circuit (see page 11-228).	
Engine will not start (MIL works OK, no DTCs set, immobilizer indicator stays on or flashes)	Check the immobilizer system.	
Engine starts but stalls immediately (MIL works OK, no DTCs set, immobilizer indicator stays on or flashes)	Check the immobilizer system.	
Engine is hard to start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-63). 2. Check the fuel pressure (see page 11-365). 3. Clean the throttle body (see page 11-394).	• Low compression • Intake air leaks • Contaminated fuel • Weak spark
Cold fast idle too low (MIL works OK, no DTCs set)	1. Do the PCM idle learn procedure (see page 11-339). 2. Check the idle speed (see page 11-338). 3. Clean the throttle body (see page 11-394).	
Cold fast idle too high (MIL works OK, no DTCs set)	1. Do the PCM idle learn procedure (see page 11-339). 2. Check the idle speed (see page 11-338). 3. Do the throttle position learning check (see page 11-393).	
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Do the PCM idle learn procedure (see page 11-339). 2. Check the idle speed (see page 11-338). 3. Do the carbon accumulation check (see page 11-393).	Intake vacuum leaks
After warming up, idle speed is below specification without load (MIL works OK, no DTCs set)	1. Troubleshoot the alternator FR signal circuit (see page 11-333). 2. Do the carbon accumulation check (see page 11-393). 3. Troubleshoot the A/C signal circuit (see page 11-332).	
After warming up, idle speed is above specification without load (MIL works OK, no DTCs set)	1. Troubleshoot the alternator FR signal circuit (see page 11-333). 2. Inspect the APP sensor (see page 11-294). 3. Troubleshoot the A/C signal circuit (see page 11-332).	

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Symptom	Diagnostic procedure	Also check for
After warming up, idle speed drops when steering wheel is turning (MIL works OK, no DTCs set)	1. Do the PCM idle learn procedure (see page 11-339). 2. Troubleshoot the PSP switch signal circuit (see page 11-334). 3. Do the carbon accumulation check (see page 11-393).	Power steering system
Low power (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-365). 2. Check the turbocharger wastegate control solenoid valve (see page 11-433). 3. Check the turbocharger wastegate control actuator control line. 4. Check the turbocharger wastegate control actuator (see page 9-11). 5. Check the turbocharger boost control solenoid valve (see page 11-435). 6. Check the turbocharger boost control actuator control line. 7. Check the turbocharger boost control actuator 8. Check the turbocharger bypass control solenoid valve (see page 11-431). 9. Check the turbocharger bypass control line. 10. Check the turbocharger bypass control valve (see page 9-11).	• Low compression • Incorrect camshaft timing • Incorrect engine oil level • Turbocharger wastegate control actuator stuck open • Turbocharger boost control actuator stuck open • Turbocharger bypass valve stuck closed • Turbocharger bypass valve stuck open
Engine stalls (MIL works OK, no DTCs set)	1. Do the PCM idle learn procedure (see page 11-339). 2. Check the fuel pressure (see page 11-365). 3. Check the idle speed (see page 11-338). 4. Troubleshoot the brake pedal position switch signal circuit (see page 11-336).	• Intake air leaks • Faulty harness and sensor connections
Abnormal sound during deceleration with fuel cut (MIL works OK, no DTCs set)	1. Check the turbocharger bypass control solenoid valve (see page 11-431). 2. Check the turbocharger bypass valve control line. 3. Check the turbocharger bypass valve (see page 9-11).	Turbocharger bypass valve stuck closed
Fuel cut happens during acceleration with throttle widely open (MIL works OK, no DTCs set)	1. Check the turbocharger wastegate control solenoid valve (see page 11-433). 2. Check the turbocharger wastegate control actuator control line. 3. Check the turbocharger wastegate control actuator (see page 9-11).	Turbocharger wastegate control actuator stuck closed

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Symptom Troubleshooting Index (cont'd)

Symptom	Diagnostic procedure	Also check for
Difficult to refuel (MIL works OK, no DTCs set)	1. Check the fuel vent tube between the EVAP canister and the fuel tank. 2. Check the fuel tank vapor recirculation tube between the fuel pipe and the fuel tank. 3. Replace the fuel tank unit (see page 11-380). 4. Replace the fuel tank (see page 11-385).	Malfunctioning gas station filling nozzle.
Fuel overflows during refueling (No DTCs set)	1. Replace the fuel tank unit (see page 11-380). 2. Replace the fuel tank (see page 11-385).	Malfunctioning gas station filling nozzle.
HDS does not communicate with the PCM or the vehicle	Troubleshoot the DLC circuit (see page 11-229).	
Fuel cap warning message comes on and stays on (MIL works OK, no DTCs set)	Troubleshoot the fuel cap warning message system (see page 11-483).	

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System Description

Electronic Control System

The functions of the fuel and emission control systems are managed by the powertrain control module (PCM).

Self-diagnosis
The PCM detects a failure of a signal from a sensor or from another control unit and stores a Temporary DTC or a DTC in erasable memory (RAM). Depending on the failure, a DTC is stored in either the first or the second drive cycle (for DTC P0457, the DTC is set in the beginning of the third drive cycle). When a DTC is stored, the PCM turns on the malfunction indicator lamp (MIL) by sending a command to the gauge control module.

- **One Drive Cycle Detection Method**
  When an abnormality occurs in the signal from a sensor or from another control unit, the PCM stores a DTC for the failure in the RAM and turns on the MIL immediately.

- **Two Drive Cycle Detection Method**
  When an abnormality occurs in the signal from a sensor or from another control unit in the first drive cycle, the PCM stores a Temporary DTC for the failure in RAM. The MIL does not come on at this time. If the failure continues in the second drive cycle, the PCM stores a DTC in erasable memory and turns on the MIL.

Fail-safe Function
When an abnormality occurs in the signal from a sensor or from another control unit, the PCM ignores that signal and substitutes a pre-programmed value for them that allows the engine to continue running. This causes a DTC to be stored and the MIL to come on.

MIL Bulb Check and Readiness Code Condition
When the ignition switch is turned ON (II), the PCM supplies ground to the MIL circuit for about 15 to 20 seconds to check the bulb condition. If any readiness codes are not set to complete, the MIL flashes five times. If all readiness codes are set to complete, the MIL goes off.

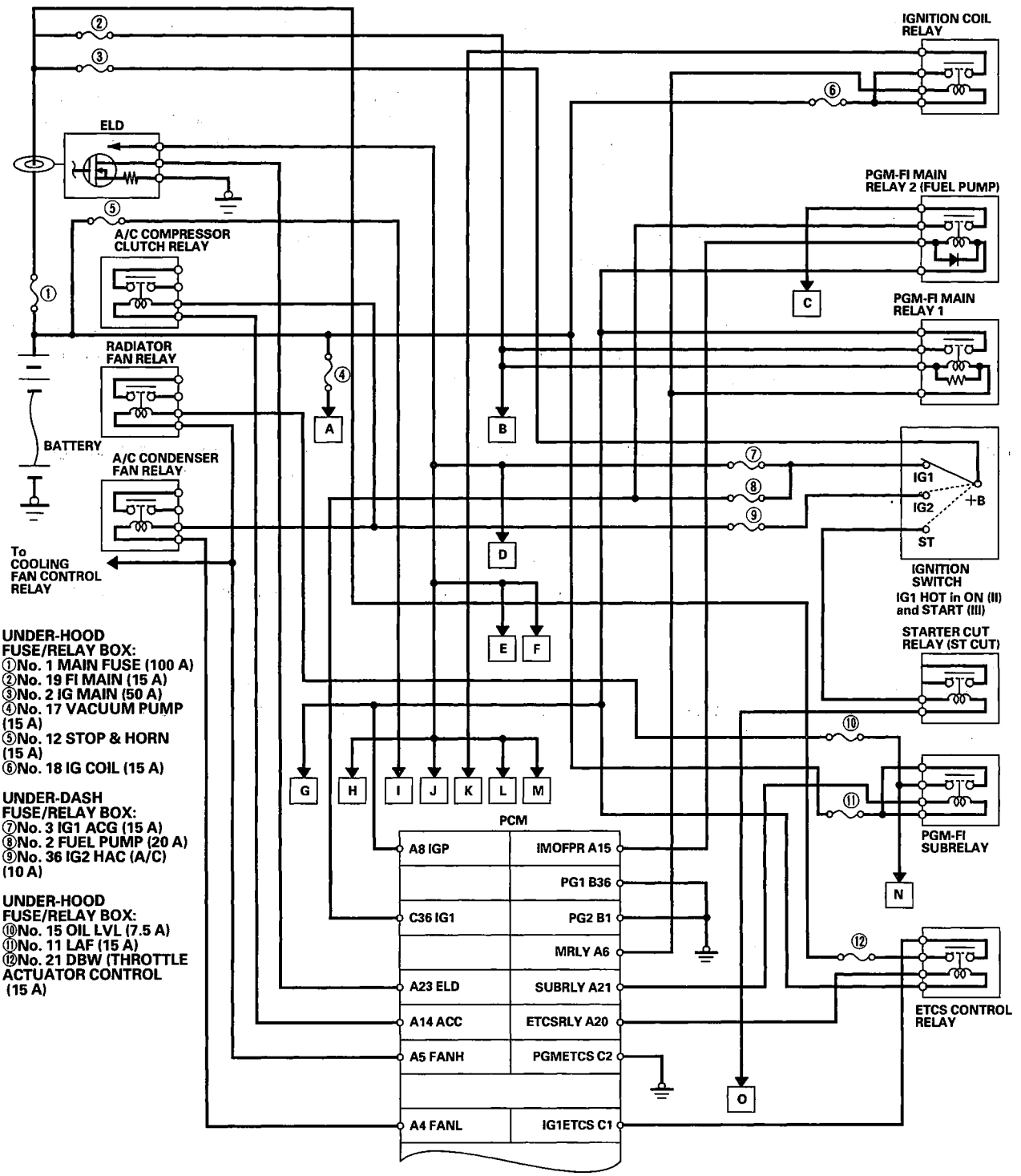
Self Shut Down (SSD) Mode
After the ignition switch is turned OFF, the PCM stays on (up to 30 minutes). If the PCM connector is disconnected during this time, the PCM may be damaged. To cancel this mode, disconnect the negative cable from the battery or jump the SCS line with the HDS after the ignition switch is turned OFF.

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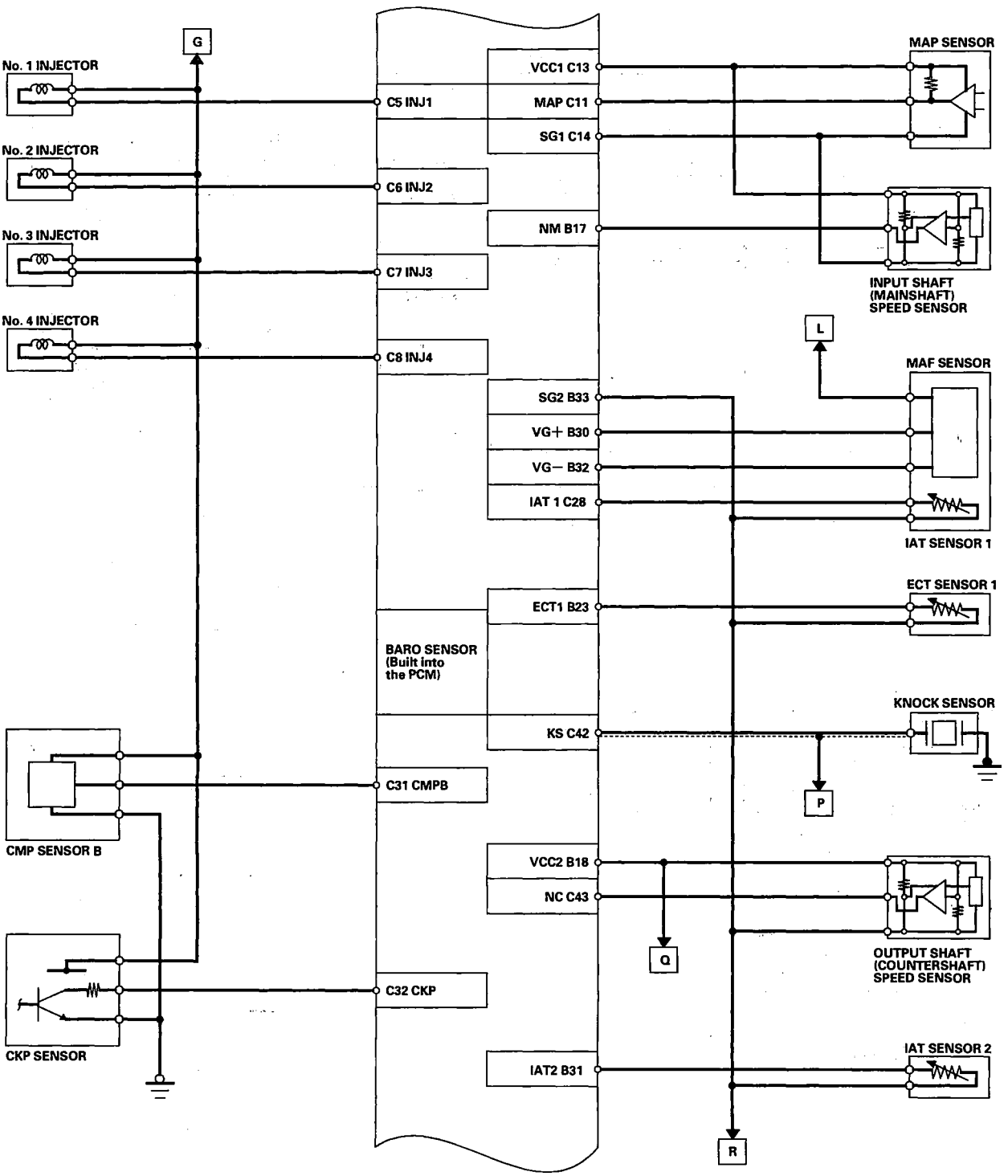
System Description (cont'd)

PCM Electrical Connections



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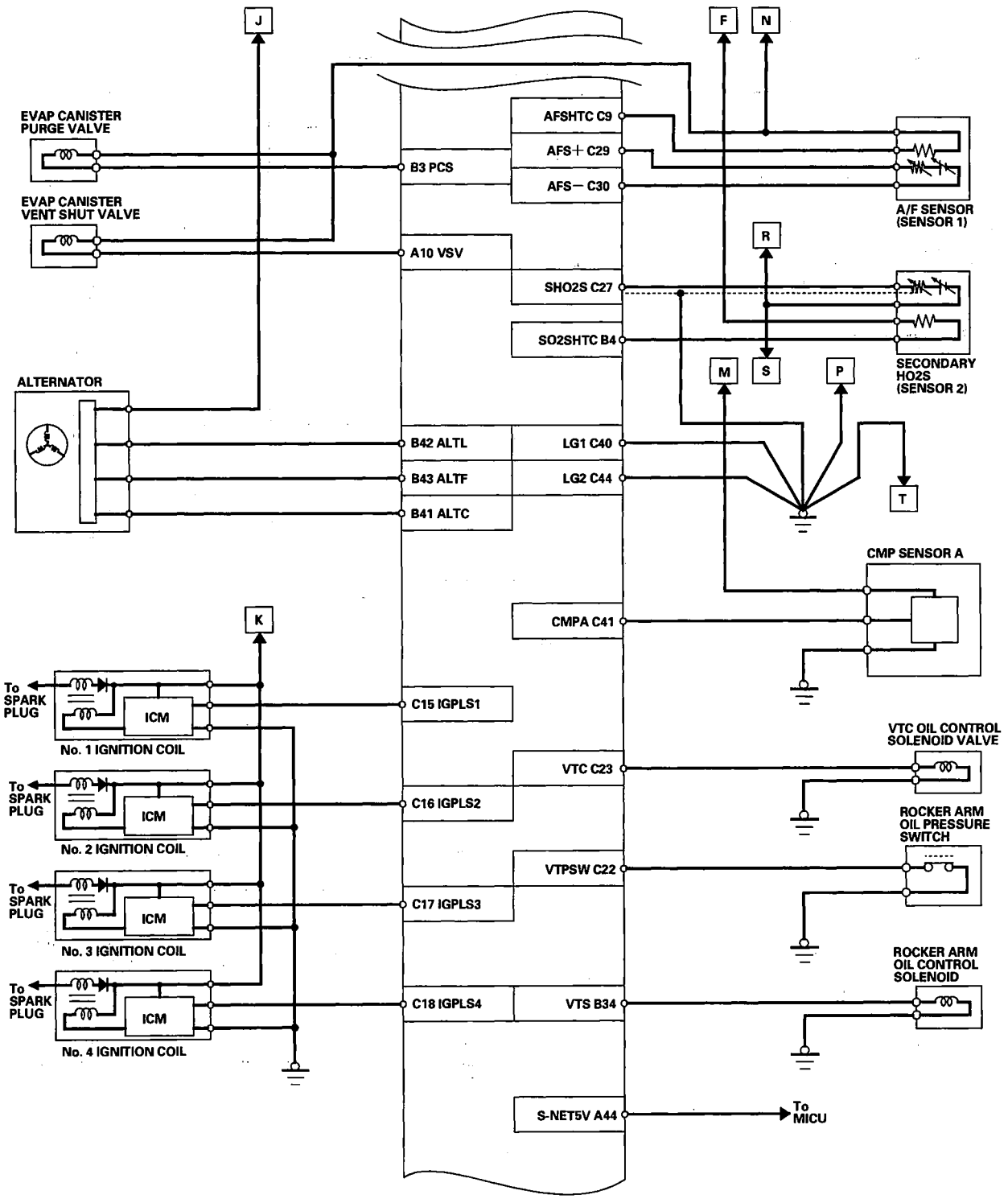


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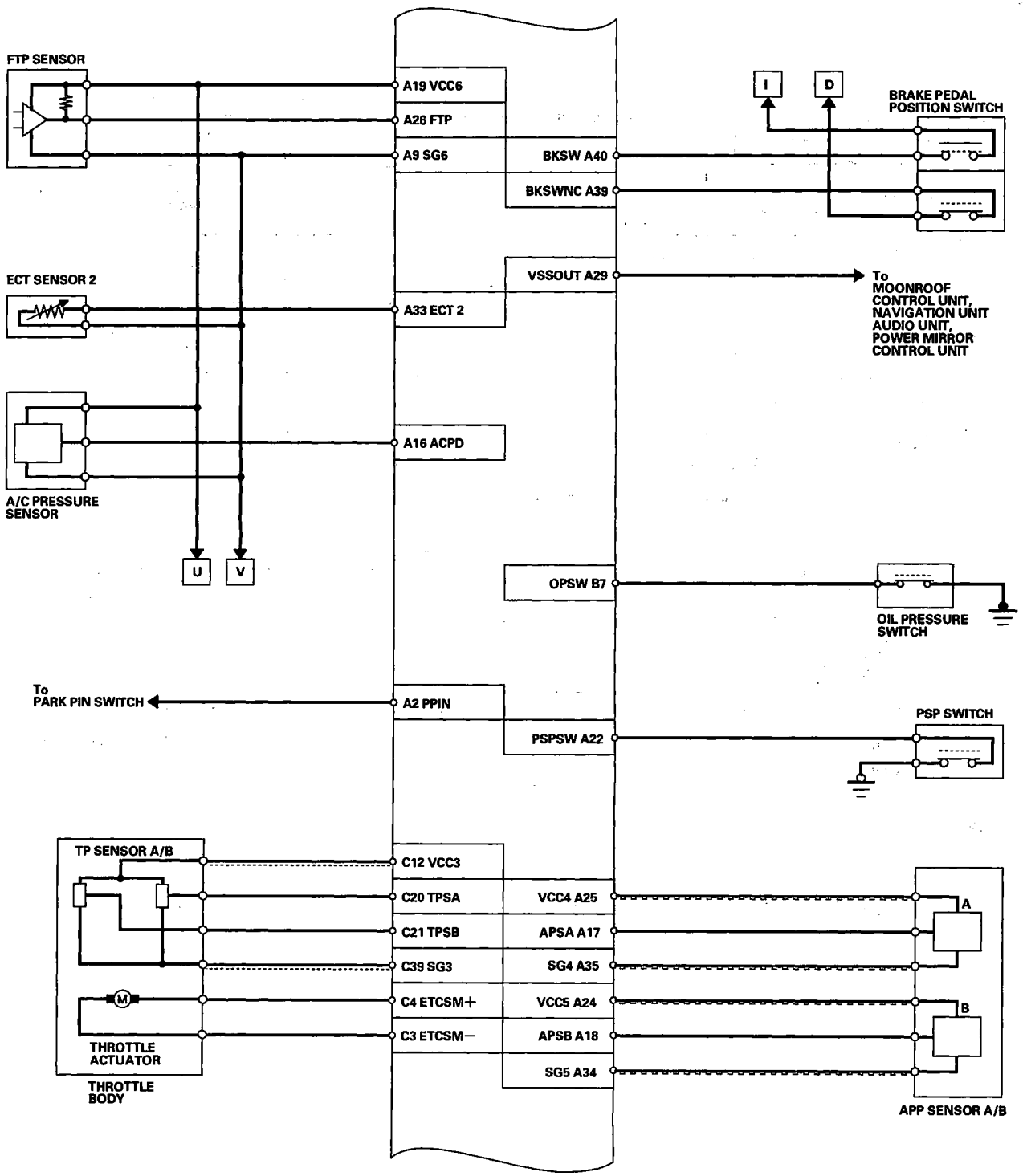
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PCM Electrical Connections (cont'd)



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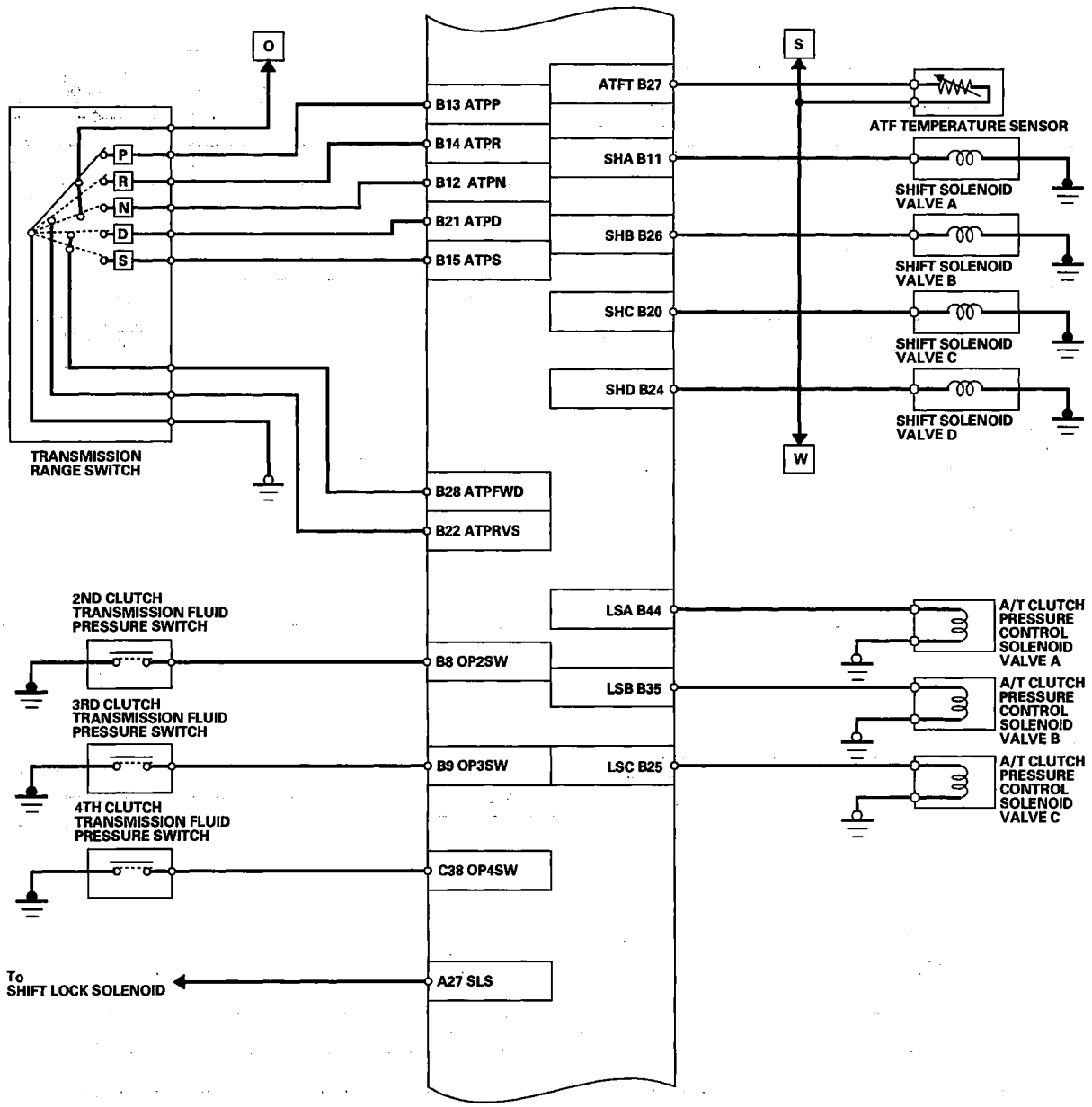


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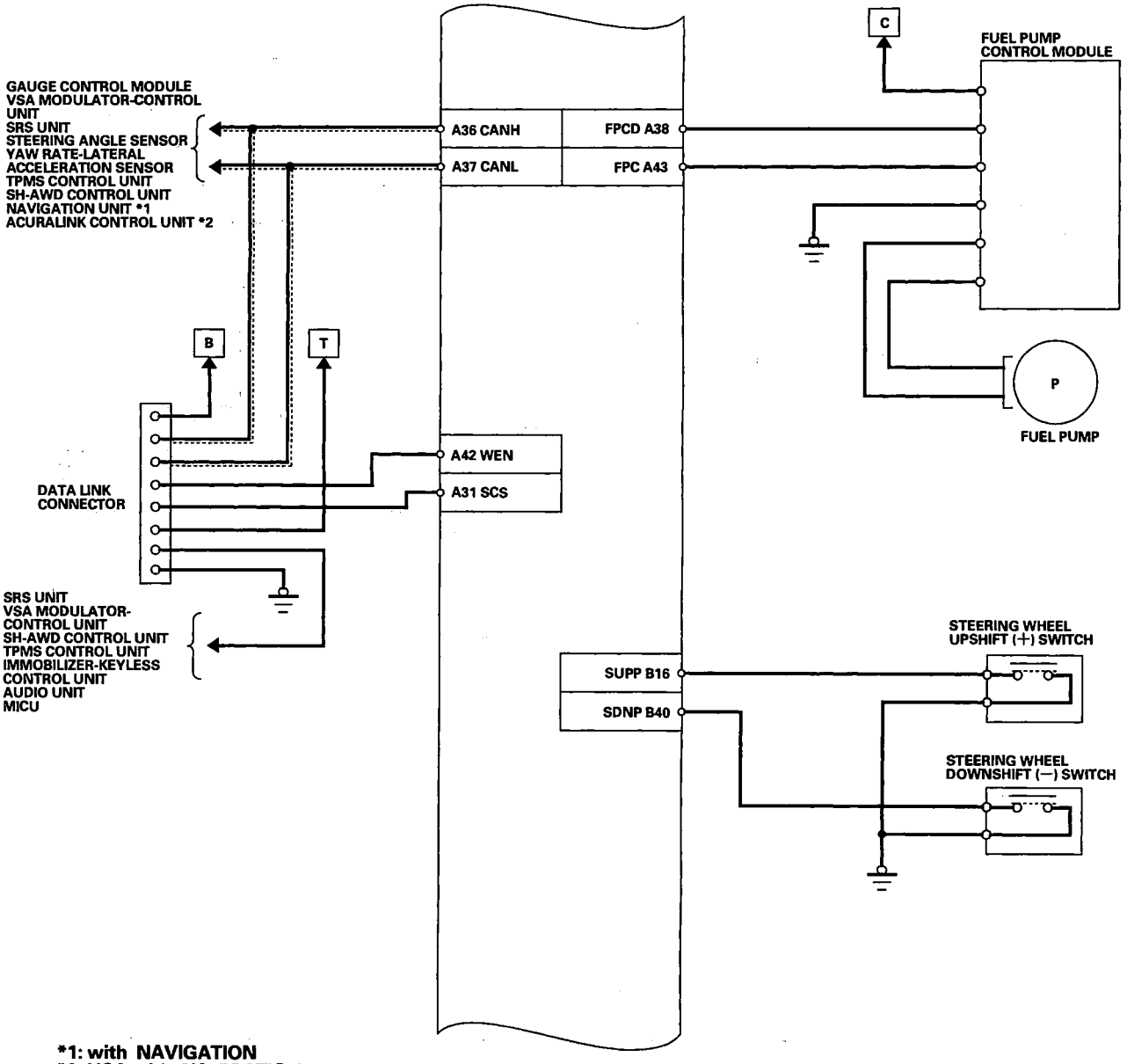
System Description (cont'd)

PCM Electrical Connections (cont'd)



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BACK



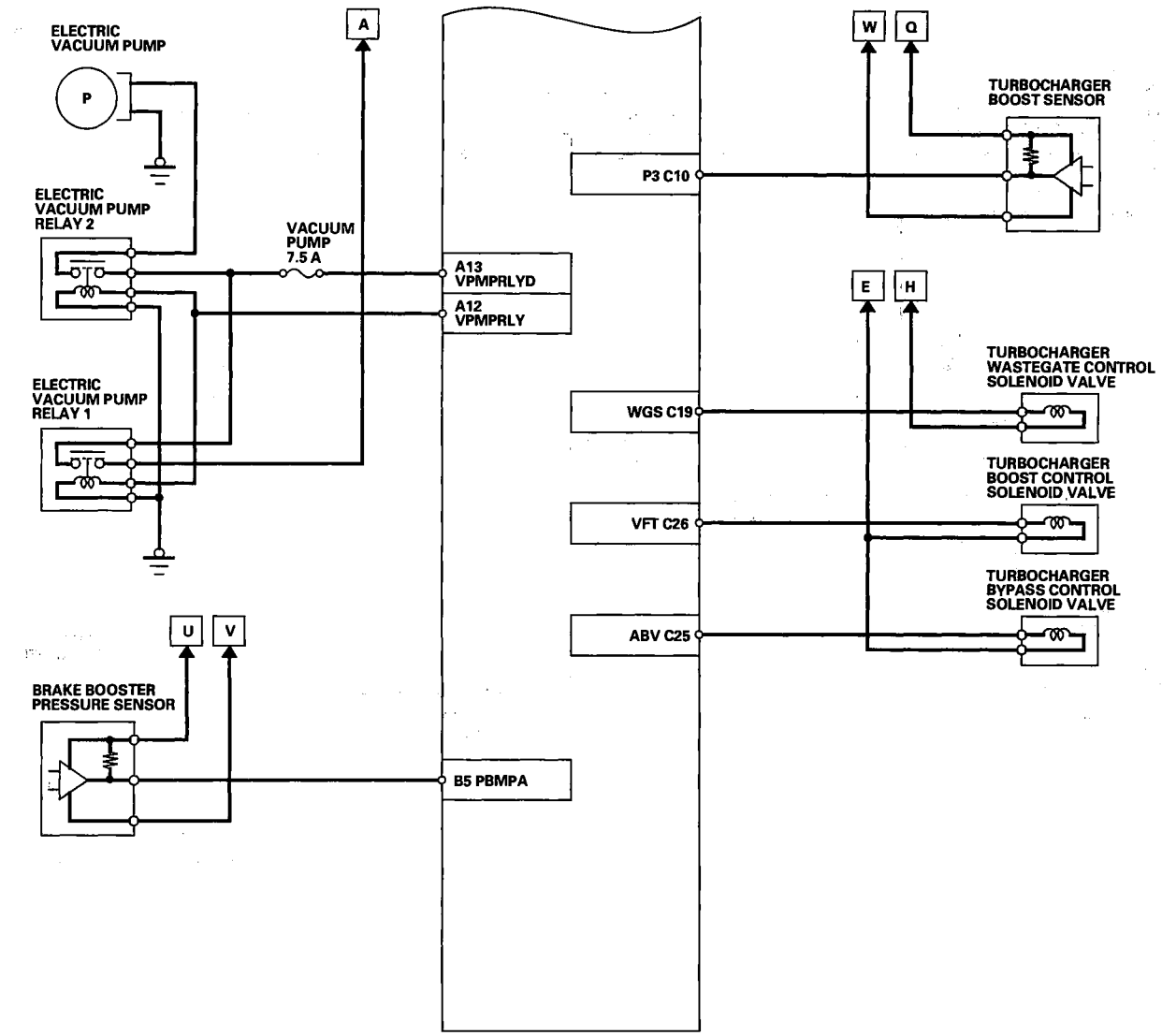
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*2: USA with NAVIGATION

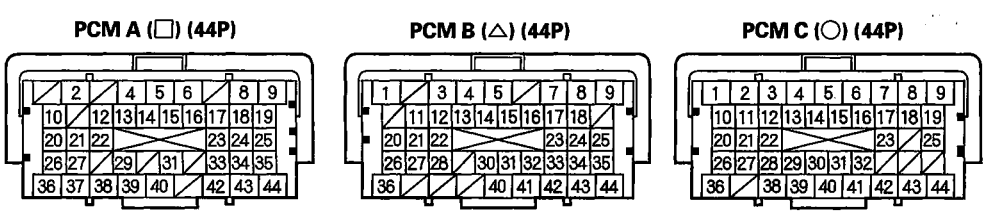
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System Description (cont'd)

PCM Electrical Connections (cont'd)



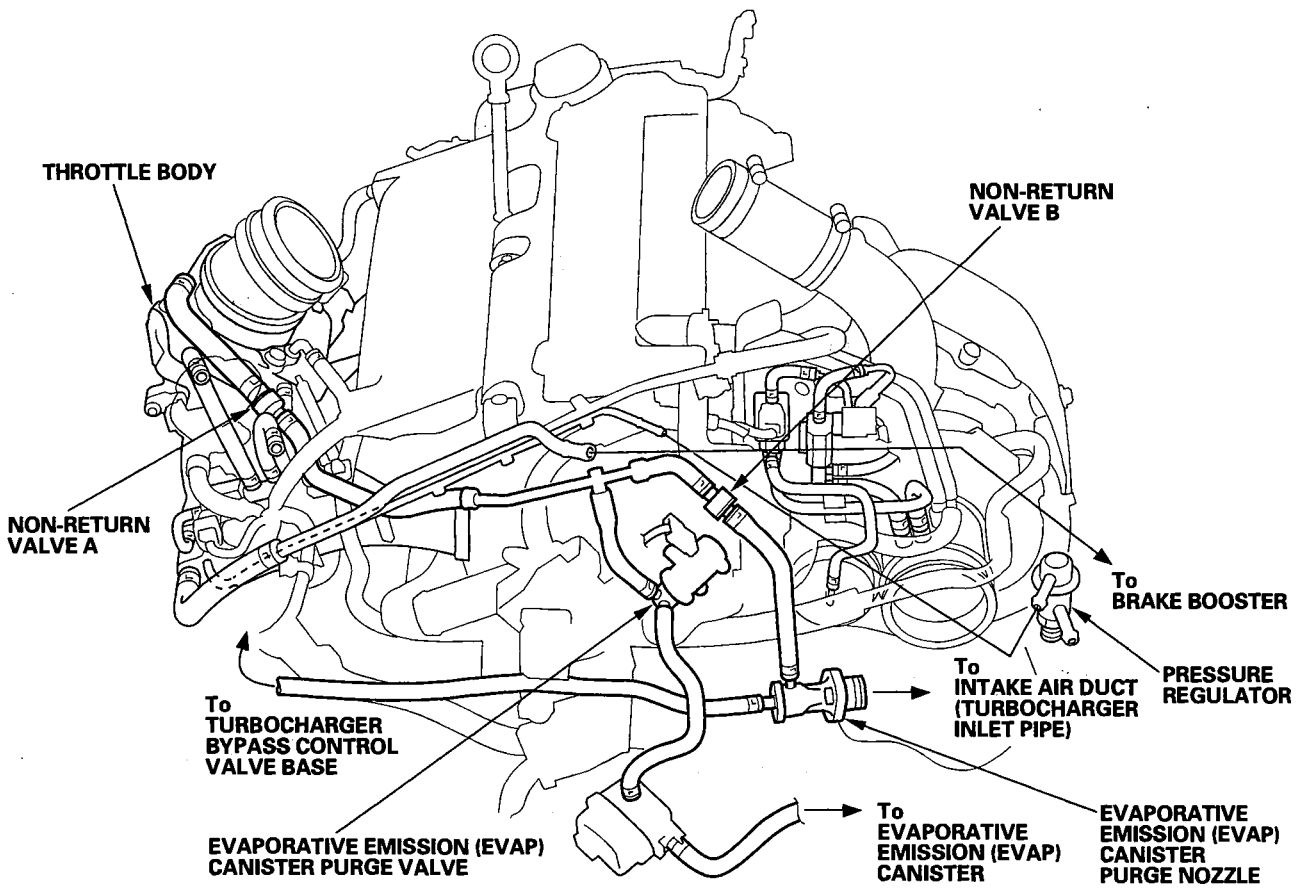


TERMINAL LOCATIONS

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BACK

Vacuum/Pressure Hose Routing



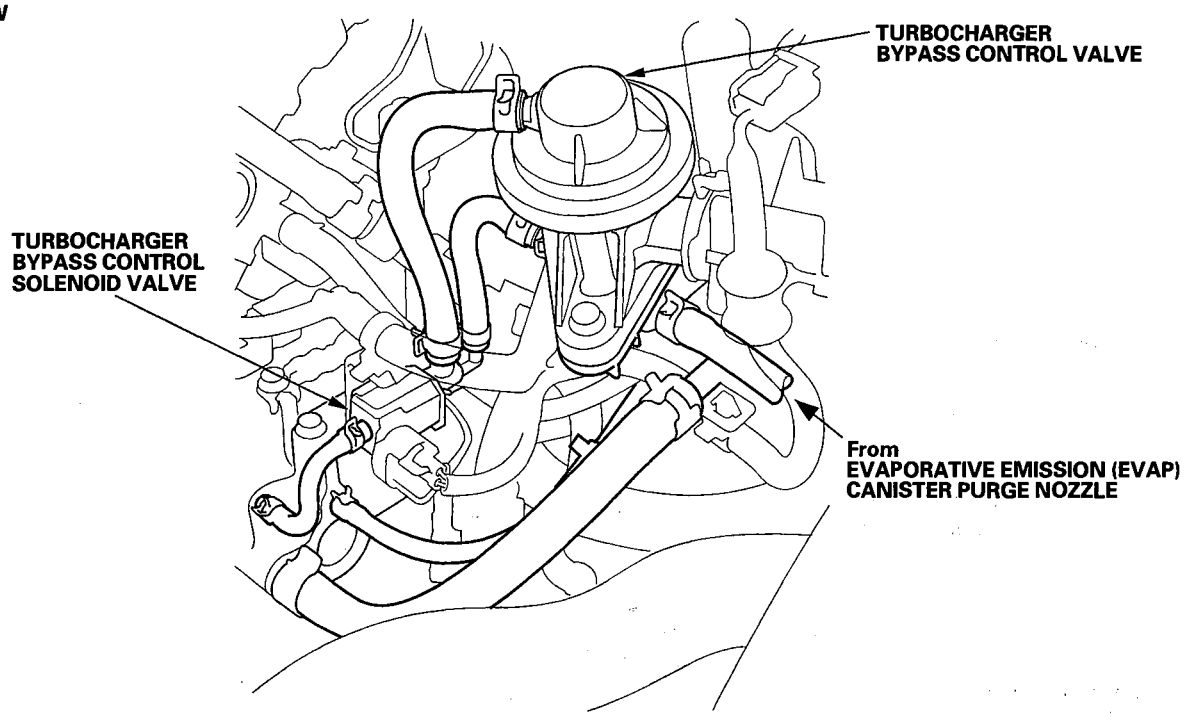
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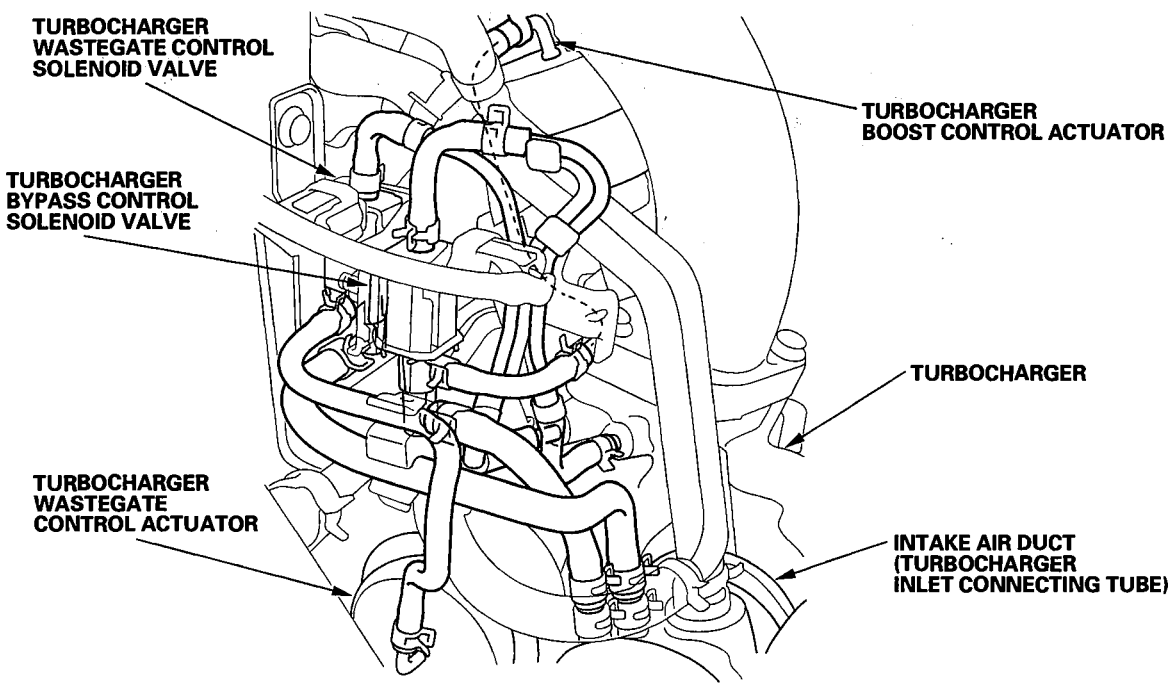
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Vacuum/Pressure Hose Routing (cont'd)

FRONT VIEW



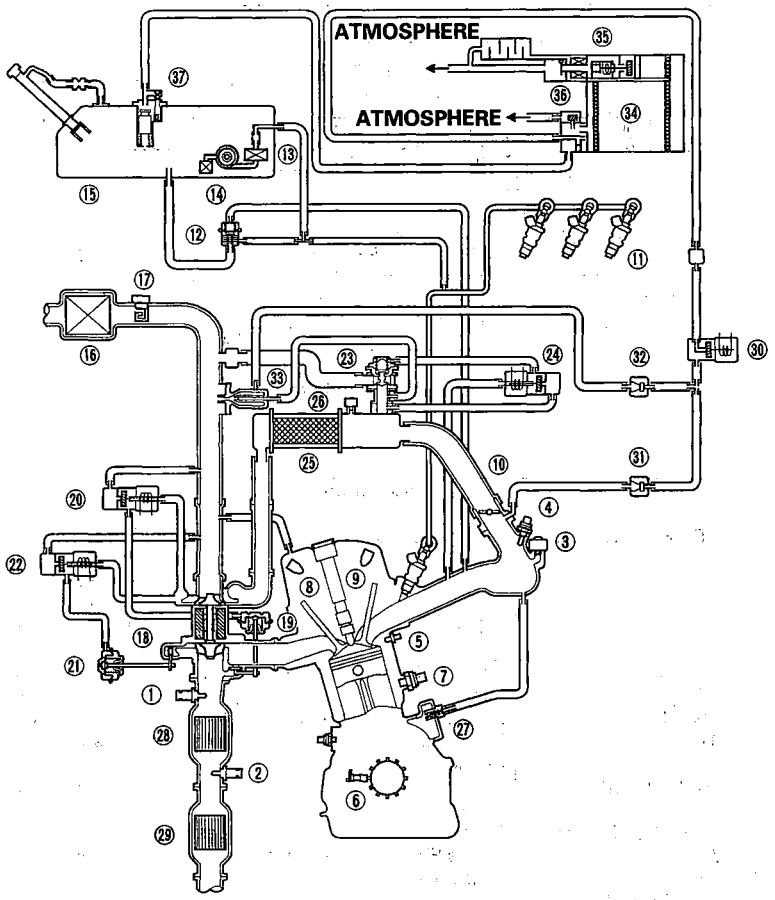
REAR VIEW



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BACK

Vacuum/Pressure Distribution



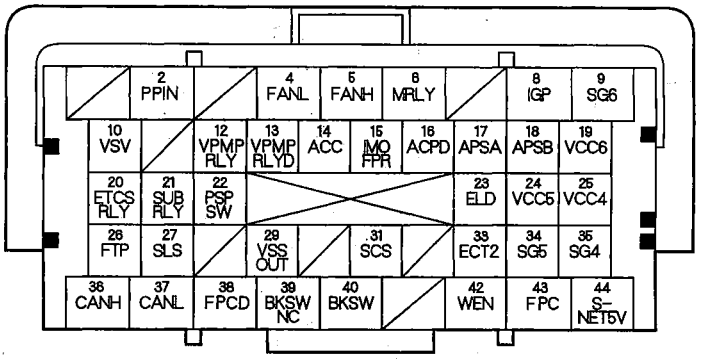
① AIR FUEL RATIO (A/F) SENSOR (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ INTAKE AIR TEMPERATURE (IAT) SENSOR 2
⑤ ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1
⑥ CRANKSHAFT POSITION (CKP) SENSOR
⑦ KNOCK SENSOR
⑧ CAMSHAFT POSITION (CMP) SENSOR A
⑨ CAMSHAFT POSITION (CMP) SENSOR B
⑩ THROTTLE BODY
⑪ INJECTOR
⑫ FUEL PRESSURE REGULATOR
⑬ FUEL FILTER
⑭ FUEL PUMP
⑮ FUEL TANK
⑯ AIR CLEANER
⑰ MASS AIR FLOW (MAF) SENSOR/ INTAKE AIR TEMPERATURE (IAT) SENSOR 1
⑱ TURBOCHARGER
⑲ TURBOCHARGER WASTEGATE CONTROL ACTUATOR
⑳ TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE
㉑ TURBOCHARGER BOOST CONTROL ACTUATOR
㉒ TURBOCHARGER BOOST CONTROL SOLENOID VALVE
㉓ TURBOCHARGER BYPASS CONTROL VALVE
㉔ TURBOCHARGER BYPASS CONTROL SOLENOID VALVE
㉕ CHARGER AIR COOLER
㉖ TURBOCHARGER BOOST SENSOR
㉗ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
㉘ WARM UP THREE WAY CATALYTIC CONVERTER (WU-TWC)
㉙ UNDER FLOOR THREE WAY CATALYTIC CONVERTER
㉚ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
㉛ NON-RETURN VALVE A
㉜ NON-RETURN VALVE B
㉝ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE NOZZLE
㉞ EVAPORATIVE EMISSION (EVAP) CANISTER
㉟ EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
㊱ FUEL TANK PRESSURE (FTP) SENSOR
㊲ FUEL TANK VAPOR CONTROL VALVE

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System Description (cont'd)

PCM Inputs and Outputs at Connector A (□) (44P)



Terminal side of female terminals

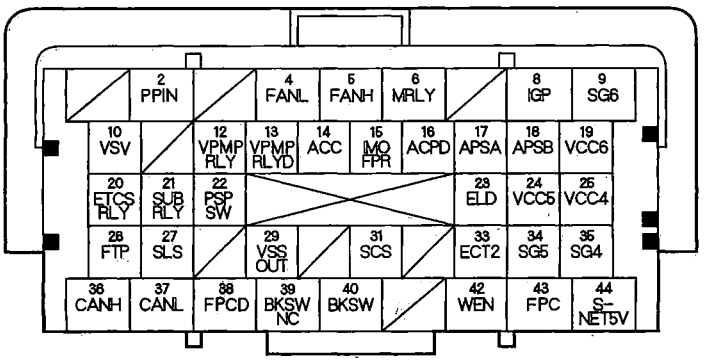
NOTE: Standard battery voltage is about 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
2	LT GRN	PPIN (PARK PIN SWITCH)	Detects park pin switch signal	With ignition switch ON (II) in P position: battery voltage With ignition switch ON (II) in any position other than P position: about 0 V
4	PUR	FANL (RADIATOR FAN CONTROL)	Drives radiator fan relay	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
5	GRY	FANH (RADIATOR FAN CONTROL)	Drives A/C condenser fan relay	With A/C condenser fan running: about 0 V With A/C condenser fan stopped: battery voltage
6	GRN	MRLY (PGM-FI MAIN RELAY 1)	Drives PGM-FI main relay 1 Power source for DTC memory	With ignition switch ON (II): about 0 V With ignition switch OFF: battery voltage
8	ORN	IGP (POWER SOURCE)	Power source for PCM circuit	With ignition switch ON (II): battery voltage
9	BLK	SG6 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
10	ORN	VSV (EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE)	Drives EVAP canister vent shut valve	With ignition switch ON (II): battery voltage
12	WHT	VPMPRLY (VACUUM PUMP RELAY)	Drives electric vacuum pump relay	With electric vacuum pump OFF: about 0 V With electric vacuum pump ON: about 14.0 V
13	PNK	VPMPRLYD (VACUUM PUMP RELAY SIGNAL LOAD)	Detects electric vacuum pump signal load	At idle with electric vacuum pump OFF: about 2.3 V With electric vacuum pump ON: about 14.0 V
14	RED	ACC (A/C COMPRESSOR CLUTCH RELAY)	Drives A/C compressor clutch relay	With compressor ON: about 0 V With compressor OFF: battery voltage
15	BRN	IMOFPR (IMMOBILIZER FUEL PUMP RELAY)	Drives PGM-FI main relay 2 (FUEL PUMP)	About 0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
16	LT GRN	ACPD (A/C PRESSURE SENSOR)	Detects A/C pressure sensor signal	With A/C switch ON: about 1.7—4.8 V (depending on A/C pressure)
17	YEL	APSA (ACCELERATOR PEDAL POSITION (APP) SENSOR A)	Detects APP sensor A signal	With ignition switch ON (II) and accelerator pedal pressed: about 4.7 V With ignition switch ON (II) and accelerator pedal released: about 1.0 V
18	PUR	APSB (ACCELERATOR PEDAL POSITION (APP) SENSOR B)	Detects APP sensor B signal	With ignition switch ON (II) and accelerator pedal pressed: about 2.3 V With ignition switch ON (II) and accelerator pedal released: about 0.5 V

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BACK

PCM Inputs and Outputs at Connector A (□) (44P)



Terminal side of female terminals

NOTE: Standard battery voltage is about 12 V.

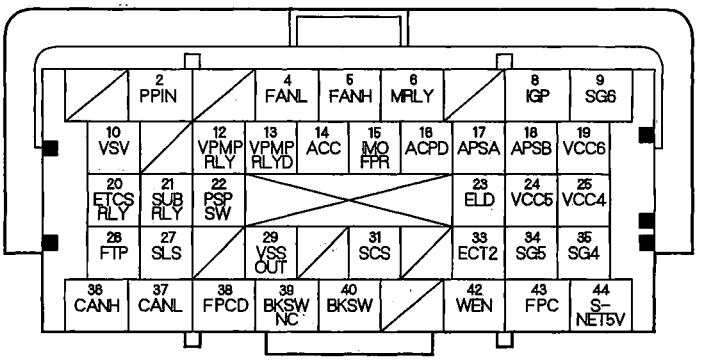
Terminal number	Wire color	Terminal name	Description	Signal
19	RED	VCC6 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
20	YEL	ETCSRLY (ELECTRONIC THROTTLE CONTROL SYSTEM (ETCS) CONTROL RELAY)	Drives electronic throttle control system (ETCS) control relay	With ignition switch ON (II): about 0 V
21	RED	SUBRLY (PGM-FI SUBRELAY)	Drives PGM-FI subrelay	With ignition switch ON (II): about 0 V
22	BRN	PSPSW (POWER STEERING PRESSURE SWITCH SIGNAL)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: about 0 V At idle with steering wheel at full lock: battery voltage
23	ORN	ELD (ELECTRICAL LOAD DETECTOR (ELD))	Detects ELD signal	With ignition switch ON (II): about 0.1—4.8 V (depending on electrical load)
24	GRY	VCC5 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
25	BRN	VCC4 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
26	LT GRN	FTP (FUEL TANK PRESSURE (FTP) SENSOR)	Detects FTP sensor signal	With ignition switch ON (II) and fuel fill cap removed: about 2.5 V
27	PNK	SLS (SHIFT LOCK SOLENOID)	Drives shift lock solenoid	With ignition switch ON (II), in P position, brake pedal pressed, and accelerator released: about 0 V
29	BLU	VSSOUT (VEHICLE SPEED SIGNAL OUTPUT)	Sends vehicle speed signal	Depending on vehicle speed: pulses
31	ORN	SCS (SERVICE CHECK SIGNAL)	Detects service check signal	With service check signal shorted using the HDS: about 0 V With service check signal opened: about 5.0 V
33	RED	ECT2 (ENGINE COOLANT TEMPERATURE (ECT) SENSOR 2)	Detects ECT sensor 2 signal	With ignition switch ON (II): about 0.1—4.8 V (depending on engine coolant temperature)
34	LT BLU	SG5 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
35	BLU	SG4 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
36	WHT	CANH (CAN COMMUNICATION SIGNAL HIGH)	Sends communication signal	With ignition switch ON (II): about 2.5 V (pulses)
37	RED	CANL (CAN COMMUNICATION SIGNAL LOW)	Sends communication signal	With ignition switch ON (II): about 2.5 V (pulses)

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System Description (cont'd)

PCM Inputs and Outputs at Connector A (□) (44P)



Terminal side of female terminals

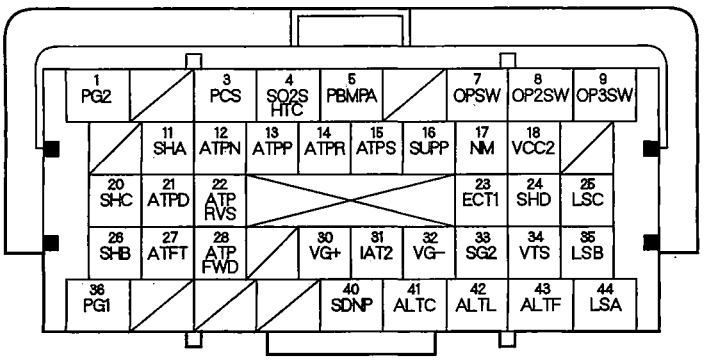
NOTE: Standard battery voltage is about 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
38	BLU	FPCD (FUEL PUMP CONTROL MODULE DIAGNOSIS)	Detects fuel pump control diagnosis	With ignition switch ON (II): about 0 V At idle: about 10.0 V
39	BRN	BKSWNC (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal	With ignition switch ON (II) and brake pedal released: battery voltage With ignition switch ON (II) and brake pedal pressed: about 0 V
40	LT GRN	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal	With brake pedal released: about 0 V With brake pedal pressed: battery voltage
42	YEL	WEN (WRITE ENABLE SIGNAL)	Detects write enable signal	With ignition switch ON (II): about 0 V
43	GRN	FPC (FUEL PUMP CONTROL)	Detects fuel pump control signal	With ignition switch ON (II): pulses With ignition switch OFF: about 0 V
44	PNK	S-NET5V (SERIAL COMMUNICATION FOR IMMOBILIZER)	Sends serial communication signal	With ignition switch ON (II): pulses With ignition switch OFF: about 5.0 V

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BACK

PCM Inputs and Outputs at Connector B (△) (44P)



Terminal side of female terminals

NOTE: Standard battery voltage is about 12 V.

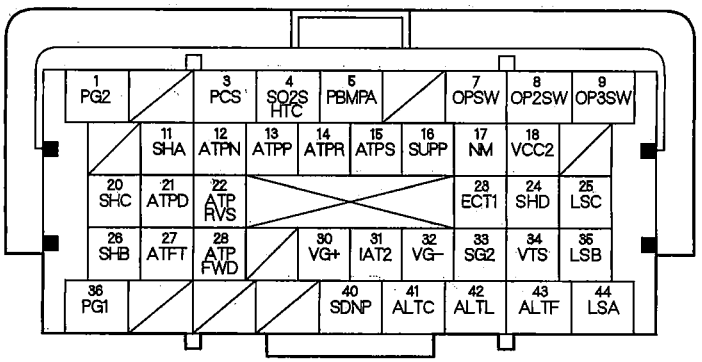
Terminal number	Wire color	Terminal name	Description	Signal
1	BLK	PG2 (POWER GROUND)	Ground circuit for PCM circuit	Less than 1.0 V at all times
3	YEL/BLU	PCS (EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE)	Drives EVAP canister purge valve	With engine running, engine coolant below 140 °F (60 °C): battery voltage With engine running, engine coolant above 140 °F (60 °C): duty controlled
4	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) HEATER CONTROL (SENSOR 2))	Drives secondary HO2S heater (sensor 2)	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
5	GRN/BLK	PBMPA (BRAKE BOOSTER PRESSURE)	Detects brake booster pressure sensor signal	With ignition switch ON (II) and brake pedal released: about 2.0 V
7	YEL/RED	OPSW (OIL PRESSURE SWITCH)	Detects engine oil pressure signal	With ignition switch ON (II): about 0 V With engine running: battery voltage
8	BLU/RED	OP2SW (2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH)	Detects 2nd clutch transmission fluid pressure switch input	With ignition switch ON (II): Without 2nd clutch pressure: about 5.0 V With 2nd clutch pressure: about 0 V
9	BLU/WHT	OP3SW (3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH)	Detects 3rd clutch transmission fluid pressure switch input	With ignition switch ON (II): Without 3rd clutch pressure: about 5.0 V With 3rd clutch pressure: about 0 V
11	BLU/YEL	SHA (SHIFT SOLENOID VALVE A)	Drives shift solenoid valve A	With engine running in R, and D or S position (in 2nd and 3rd gears): battery voltage With engine running in P, N position, and D or S position (in 1st, 4th and 5th gears): about 0 V
12	RED/BLK	ATPN (TRANSMISSION RANGE SWITCH NEUTRAL)	Detects transmission range switch N position signal input	In N position: about 0 V In any position other than N: about 5.0 V
13	BLU/BLK	ATPP (TRANSMISSION RANGE SWITCH PARK)	Detects transmission range switch P position signal input	In P position: about 0 V In any position other than P: battery voltage
14	WHT	ATPR (TRANSMISSION RANGE SWITCH R)	Detects transmission range switch R position signal input	In R position: about 0 V In any position other than R: battery voltage
15	RED	ATPS (TRANSMISSION RANGE SWITCH S)	Detects transmission range switch S position signal input	In S position: about 0 V In any position other than S: battery voltage

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System Description (cont'd)

PCM Inputs and Outputs at Connector B (△) (44P)



Terminal side of female terminals

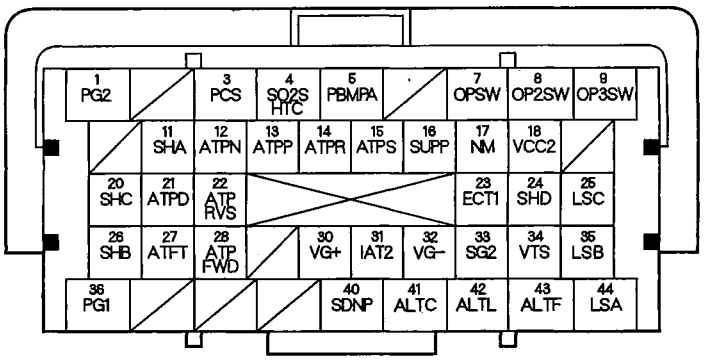
NOTE: Standard battery voltage is about 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
16	WHT/BLU	SUPP (UPSHIFT SWITCH)	Detects steering wheel upshift switch (+) signal	With steering wheel upshift switch (+) pressed: about 0 V With steering wheel upshift switch (+) not pressed: battery voltage
17	RED	NM (INPUT SHAFT (MAINSHAFT) SPEED SENSOR)	Detects input shaft (mainshaft) speed sensor signal	With ignition switch ON (II): about 0 V or about 5.0 V With engine idling in N position: about 2.5 V (pulses)
18	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
20	GRN	SHC (SHIFT SOLENOID VALVE C)	Drives shift solenoid valve C	With engine running in D or S position (in 1st, 3rd and 5th gears): battery voltage With engine running in P, R, N positions, and D or S position (in 2nd and 4th gears): about 0 V
21	YEL	ATPD (TRANSMISSION RANGE SWITCH D)	Detects transmission range switch D position signal input	In D position: about 0 V In any position other than D: battery voltage
22	RED/WHT	ATPRVS (TRANSMISSION RANGE SWITCH R)	Detects transmission range switch R position signal input	In R position: about 0 V In any position other than R: battery voltage
23	RED/WHT	ECT1 (ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1)	Detects ECT sensor 1 signal	With ignition switch ON (II): about 0.1—4.8 V (depending on engine coolant temperature)
24	YEL	SHD (SHIFT SOLENOID VALVE D)	Drives shift solenoid valve D	With engine running in N or D position (during lock-up condition): battery voltage With engine running in P, R or D position (no lock-up condition): about 0 V
25	GRN/RED	LSC (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C)	Drives A/T clutch pressure control solenoid valve C	With ignition switch ON (II): current controlled
26	GRN/WHT	SHB (SHIFT SOLENOID VALVE B)	Drives shift solenoid valve B	With engine running in P, R, N position, and D or S position (in 1st, 2nd and 5th gears): battery voltage With engine running in D or S position (in 3rd and 4th gears): about 0 V
27	BLU/YEL	ATFT (ATF TEMPERATURE SENSOR)	Detects ATF temperature signal	With ignition switch ON (II): about 0.2—4.0 V (about 1.8 V at operating temperature) (depending on ATF temperature)
28	BLU/YEL	ATPFWD (TRANSMISSION RANGE SWITCH D and S POSITION)	Detects transmission range switch D and S positions signal	In D or S positions: about 0 V In any other position: battery voltage

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BACK

PCM Inputs and Outputs at Connector B (△) (44P)



Terminal side of female terminals

NOTE: Standard battery voltage is about 12 V.

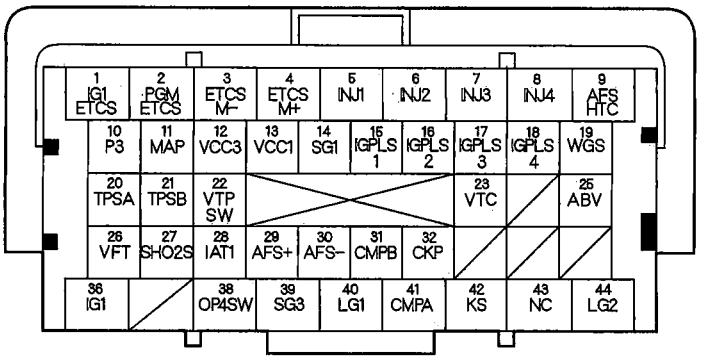
Terminal number	Wire color	Terminal name	Description	Signal
30	RED/GRN	VG+ (MASS AIR FLOW (MAF) SENSOR +SIDE)	Detects MAF sensor signal	At idle: 1.1—1.6 V (between VG+ terminal and VG— terminal)
31	RED/YEL	IAT 2 (INTAKE AIR TEMPERATURE (IAT) 2 SENSOR)	Detects IAT 2 sensor signal	With ignition switch ON (II): about 0.1—4.0 V
32	BLK/RED	VG— (MASS AIR FLOW (MAF) SENSOR —SIDE)	Ground for MAF sensor signal	
33	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
34	GRN/YEL	VTS (ROCKER ARM OIL CONTROL SOLENOID)	Drives rocker arm oil control solenoid	At idle: about 0 V
35	BRN/WHT	LSB (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B)	Drives A/T clutch pressure control solenoid valve B	With ignition switch ON (II): current controlled
36	BLK	PG1 (POWER GROUND)	Ground circuit for PCM circuit	Less than 1.0 V at all times
40	BRN/WHT	SDNP (DOWNSHIFT SWITCH)	Detects steering wheel downshift switch (—) signal	With steering wheel downshift switch (—) pressed: about 0 V With steering wheel downshift switch (—) not pressed: about 5.0 V
41	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal	With fully warmed up engine running: 5.0 V (depending on electrical load)
42	WHT/BLU	ALTL (ALTERNATOR L SIGNAL)	Detects alternator L signal	With ignition switch ON (II): about 0 V With engine running: battery voltage
43	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With engine running: about 2.6—3.4 V (depending on electrical load)
44	RED	LSA (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A)	Drives A/T clutch pressure control solenoid valve A	With ignition switch ON (II): current controlled

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System Description (cont'd)

PCM Inputs and Outputs at Connector C (○) (44P)



Terminal side of female terminals

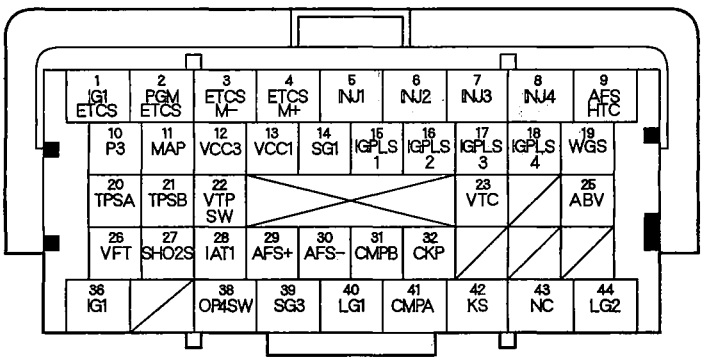
NOTE: Standard battery voltage is about 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/GRN	IG1ETCS (IGNITION SIGNAL ETCS)	Detects ignition signal	With ignition switch ON (II): battery voltage
2	BLK	PGMETCS (POWER GROUND ETCS)	Ground circuit for PCM circuit	Less than 1.0 V at all times
3	GRN	ETCSM− (THROTTLE ACTUATOR −SIDE)	Ground for throttle actuator	With ignition switch ON (II): about 0 V
4	BLU	ETCSM+ (THROTTLE ACTUATOR +SIDE)	Drives throttle actuator	With ignition switch ON (II): about 0 V
5	BRN	INJ1 (No. 1 INJECTOR)	Drives No. 1 injector	At idle: duty controlled With ignition switch ON (II): battery voltage
6	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector	
7	BLU	INJ3 (No. 3 INJECTOR)	Drives No. 3 injector	
8	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector	
9	GRN	AFSHTC (AIR FUEL RATIO (A/F) SENSOR HEATER CONTROL (SENSOR 1))	Drives A/F sensor heater (sensor 1)	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
10	GRN	P3 (TURBOCHARGER BOOST SENSOR)	Detects turbocharger boost sensor	At idle: about 0 V
11	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 2.0 V At idle: about 1.0 V (depending on engine speed)
12	BLU	VCC3 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
13	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II): about 5.0 V
14	GRN/WHT	SG1 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
15	YEL/GRN	IGPLS1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil	With ignition switch ON (II): about 0 V With engine running: pulses
16	BLU/RED	IGPLS2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil	
17	WHT/BLU	IGPLS3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil	
18	BRN	IGPLS4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil	
19	RED/WHT	WGS (TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE)	Drives turbocharger wastegate control solenoid valve	With ignition switch ON (II): battery voltage With engine running: duty controlled
20	RED/BLK	TPSA (THROTTLE POSITION (TP) SENSOR A)	Detects TP sensor A signal	With throttle fully open: about 1.8 V With throttle fully closed: about 0.9 V
21	RED/BLU	TPSB (THROTTLE POSITION (TP) SENSOR B)	Detects TP sensor B signal	With throttle fully open: about 4.1 V With throttle fully closed: about 1.7 V

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BACK

PCM Inputs and Outputs at Connector C (○) (44P)



Terminal side of female terminals

NOTE: Standard battery voltage is about 12 V.

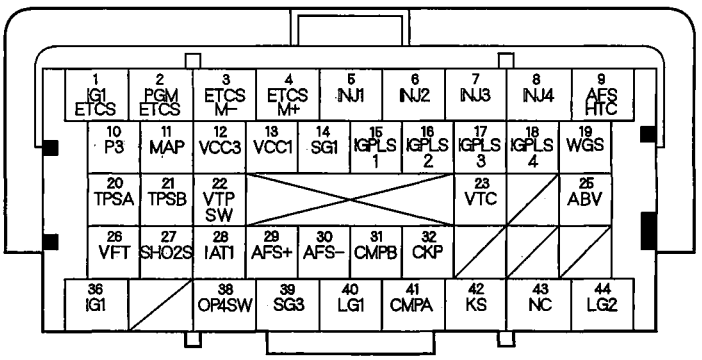
Terminal number	Wire color	Terminal name	Description	Signal
22	BLU/BLK	VTPSW (ROCKER ARM OIL PRESSURE SWITCH)	Detects rocker arm oil pressure switch signal	With engine at low speed: about 0 V With engine at high speed: battery voltage
23	BLU/WHT	VTC (VTC OIL CONTROL SOLENOID VALVE)	Drives VTC oil control solenoid valve	With ignition switch ON (II): about 0 V
25	BLU/YEL	ABV (TURBOCHARGER BYPASS CONTROL SOLENOID VALVE)	Drives turbocharger bypass control solenoid valve	With ignition switch ON (II): battery voltage With engine running: duty controlled
26	YEL/RED	VFT (TURBOCHARGER BOOST CONTROL SOLENOID)	Drives turbocharger boost control solenoid valve	With ignition switch ON (II): battery voltage With engine running: duty controlled
27	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)	Detects secondary HO2S (sensor 2) signal	With throttle fully opened at idle and fully warmed up engine: about 0.6 V With throttle quickly closed: below 0.4 V
28	RED/YEL	IAT1 (INTAKE AIR TEMPERATURE (IAT) SENSOR 1)	Detects IAT sensor 1 signal	With ignition switch ON (II): about 0.1—4.0 V
29	RED	AFS+ (AIR FUEL RATIO (A/F) SENSOR (SENSOR 1) +SIDE)	Detects A/F sensor (sensor 1) signal	
30	RED/YEL	AFS− (AIR FUEL RATIO (A/F) SENSOR (SENSOR 1) −SIDE)	Detects A/F sensor (sensor 1) signal	
31	GRN	CMPB (CAMSHAFT POSITION (CMP) SENSOR B)	Detects CMP sensor B signal	With engine running: pulses
32	BLU	CKP (CRANKSHAFT POSITION (CKP) SENSOR)	Detects CKP sensor signal	With engine running: pulses
36	BLK/YEL	IG1 (IGNITION SIGNAL)	Detects ignition signal	With ignition switch ON (II): battery voltage
38	BLU/YEL	OP4SW (4TH CLUTCH TRANSMISSION FLUID PRESSURE SWITCH)	Detects 4th clutch transmission fluid pressure switch input	With ignition switch ON (II): without 4th clutch pressure: about 5.0 V With 4th clutch pressure: about 0 V

(cont'd)

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System Description (cont'd)

PCM Inputs and Outputs at Connector C (◯) (44P)



Terminal side of female terminals

NOTE: Standard battery voltage is about 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
39	GRN	SG3 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
40	BRN/YEL	LG1 (LOGIC GROUND)	Ground circuit for PCM circuit	Less than 1.0 V at all times
41	BLU/WHT	CMPA (CAMSHAFT POSITION (CMP) SENSOR A)	Detects CMP sensor A signal	With engine running: pulses
42	RED/BLU	KS (KNOCK SENSOR)	Detects knock sensor signal	With engine knocking: pulses
43	BLK/BLU	NC (OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR)	Detects output shaft (countershaft) speed sensor signals	With ignition switch ON (II): pulses With vehicle moving: about 5.0 V (pulses)
44	BRN/YEL	LG2 (LOGIC GROUND)	Ground circuit for PCM circuit	Less than 1.0 V at all times

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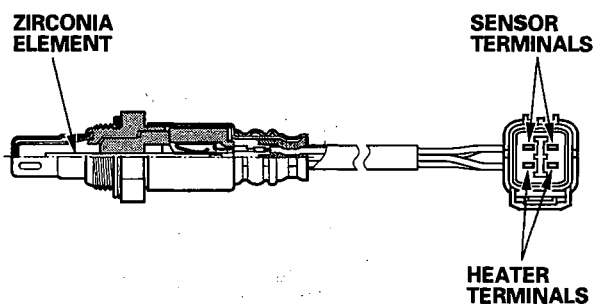
BACK

PGM-FI System

The programmed fuel injection (PGM-FI) system is a sequential multiport fuel injection system.

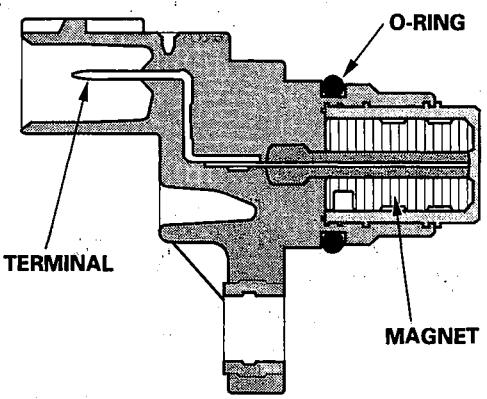
Air Conditioning (A/C) Compressor Clutch Relay
When the PCM receives a demand for cooling from the A/C system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

Air Fuel Ratio (A/F) Sensor
The A/F sensor operates over a wide air/fuel range. The A/F sensor is installed upstream of the warm up three way catalytic converter (WU-TWC), and sends signals to the PCM which varies the duration of fuel injection accordingly.

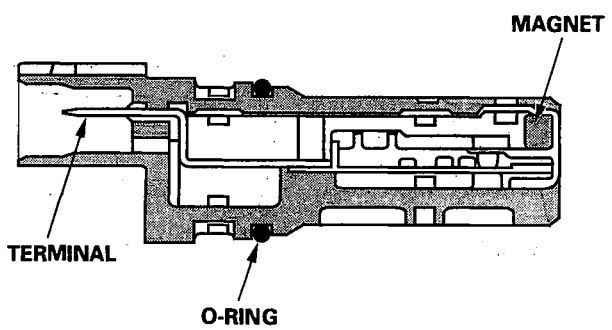


Barometric Pressure (BARO) Sensor
The BARO sensor is inside the PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

Camshaft Position (CMP) Sensor B
CMP sensor B detects the position of the No. 1 cylinder as a reference for sequential fuel injection to each cylinder.



Crankshaft Position (CKP) Sensor
The CKP sensor detects crankshaft speed and is used by the PCM to determine ignition timing and timing for fuel injection of each cylinder as well as detecting engine misfire.



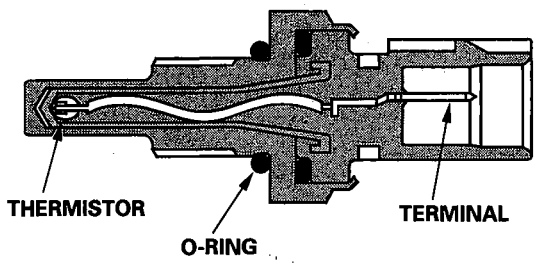
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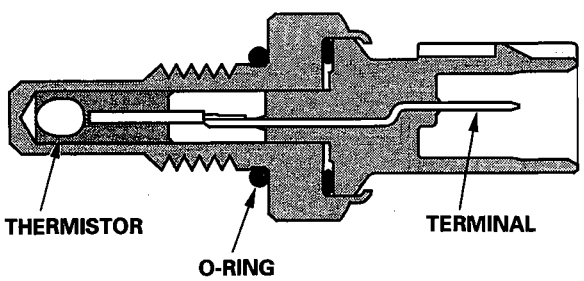
System Description (cont'd)

Engine Coolant Temperature (ECT) Sensors 1 and 2
ECT sensors 1 and 2 are temperature dependent resistor (thermistor). The resistance decreases as the engine coolant temperature increases.
ECT sensors 1 is installed to the cylinder head, and ECT sensor 2 is installed to the radiator.

ECT sensor 1



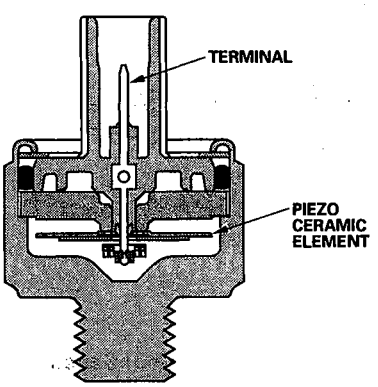
ECT sensor 2



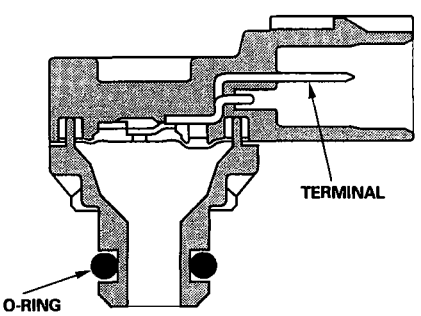
Ignition Timing Control
The PCM contains the memory for basic ignition timing at various engine speeds and manifold absolute pressure. It also adjusts the timing according to engine coolant temperature and intake air temperature.

Injector Timing and Duration
The PCM contains the memory for basic discharge duration 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.
By monitoring long term fuel trim, the PCM detects long term malfunctions in the fuel system and sets a diagnostic trouble code (DTC).

Knock Sensor
The knock control system adjusts the ignition timing to minimize knock.



Manifold Absolute Pressure (MAP) Sensor
The MAP sensor converts manifold absolute pressure into electrical signals to the PCM.



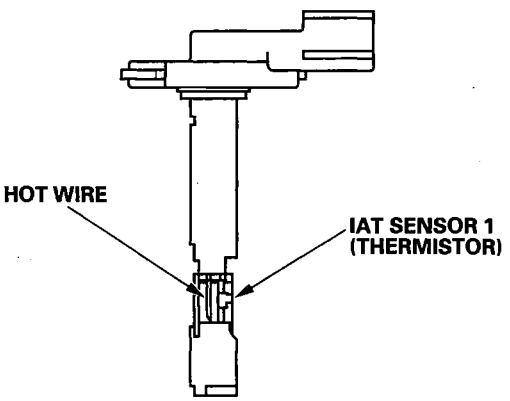
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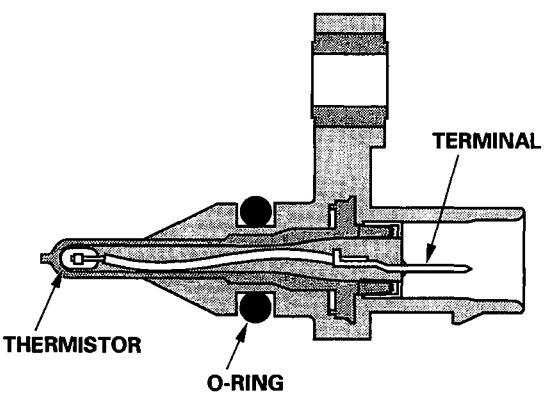
Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)
The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the PCM has been reset, these codes are reset. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the vehicle may fail the test, or the test cannot be finished.

To check if the readiness codes are set to complete, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are complete. If it flashes five times, one or more readiness codes are not complete. To set each code, drive the vehicle or run the engine as described in the procedures (see page 11-76).

Mass Air Flow (MAF) Sensor/Intake Air Temperature (IAT) Sensor 1
The mass air flow (MAF) sensor/intake air temperature (IAT) sensor contains a hot wire and a thermistor. It is located in the intake air passage. The resistance of the hot wire and thermistor change due to intake air flow and air temperature. The control circuit in the MAF sensor controls the current to keep the hot wire at a set temperature. The current is converted to voltage in the control circuit, then output to the PCM.



Intake Air Temperature (IAT) Sensor 2
The IAT sensor 2 is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.

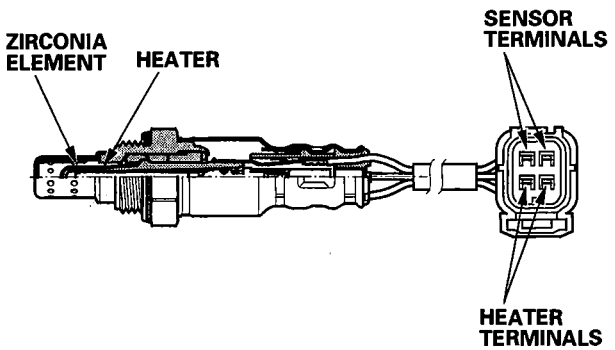


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System Description (cont'd)

Secondary Heated Oxygen Sensor (Secondary HO2S)
The secondary HO2S detects the oxygen content in the exhaust gas downstream of the warm up three way catalytic converter (WU-TWC), and sends signals to the PCM which varies the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The PCM compares the HO2S output with the A/F sensor output to determine catalyst efficiency. The secondary HO2S is located on the WU-TWC.



Electronic Throttle Control System

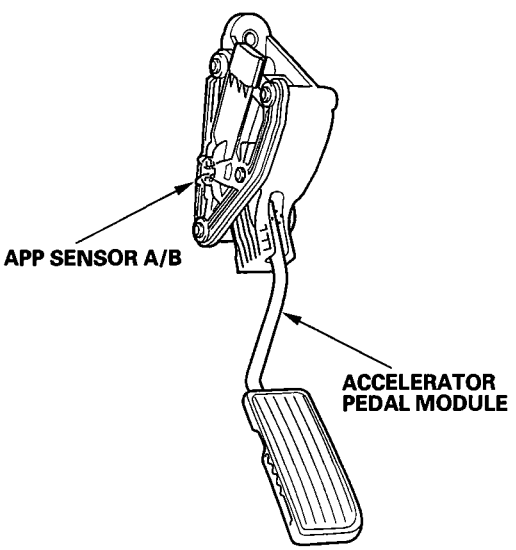
The throttle is electronically controlled by the electronic throttle control system. Refer to the system diagram to see the functional layout of the system.

Idle control: When the engine is idling, the PCM controls the throttle actuator to maintain the proper idle speed according to engine loads.

Acceleration control: When the accelerator pedal is pressed, the PCM opens the throttle valve depending on the accelerator pedal position (APP) sensor signal.

Cruise control: The PCM controls the throttle actuator to maintain set speed when the cruise control is operating. The throttle actuator takes the place of the cruise control actuator.

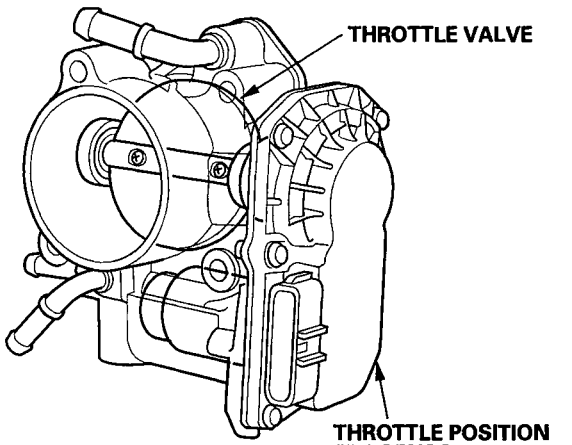
Accelerator Pedal Position (APP) Sensor
As the accelerator pedal position changes, the sensor varies the signal voltage to the PCM.



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Throttle Body
The throttle body is a single-barrel side draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head to prevent icing of the throttle plate.



Idle Control System

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is pressed, the power steering load is high, or the alternator is charging, the PCM controls current to the throttle actuator to maintain the correct idle speed.

Brake Pedal Position Switch
The brake pedal position switch signals the PCM when the brake pedal is pressed.

Power Steering Pressure (PSP) Switch
The PSP switch signals the PCM when the power steering load is high.

Fuel Supply System

Fuel Cutoff Control
During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at engine speeds over 850 rpm. Fuel cutoff control also occurs when the engine speed exceeds 6,900 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving. When the vehicle is stopped, the PCM cuts the fuel at engine speeds over 5,000 rpm. Engine speed of fuel cut is lower on a cold engine.

Fuel Pump Control
When the ignition is turned on, the PCM grounds PGM-FI main relay 2 (FUEL PUMP) which feeds current to the fuel pump (fuel pump control module) for 2 seconds to pressurize the fuel system. With the engine running, the PCM grounds PGM-FI main relay 2 (FUEL PUMP) and feeds current to the fuel pump (fuel pump control module). When the engine is not running and the ignition is on, the PCM cuts ground to PGM-FI main relay 2 (FUEL PUMP) which cuts current to the fuel pump (fuel pump control module).

PGM-FI Main Relay 1 and 2
PGM-FI main relay 1 is energized whenever the ignition switch is ON (II) to supply battery voltage to the PCM, power to the injectors, and power for PGM-FI main relay 2 (FUEL PUMP). PGM-FI main relay 2 (FUEL PUMP) is energized to supply power to the fuel pump (fuel pump control module) for 2 seconds when the ignition switch is turned ON (II), and when the engine is cranking or running.

Transfer Fuel Pump
The fuel in the right side of the fuel tank is drawn over to the left side by the transfer fuel pump.

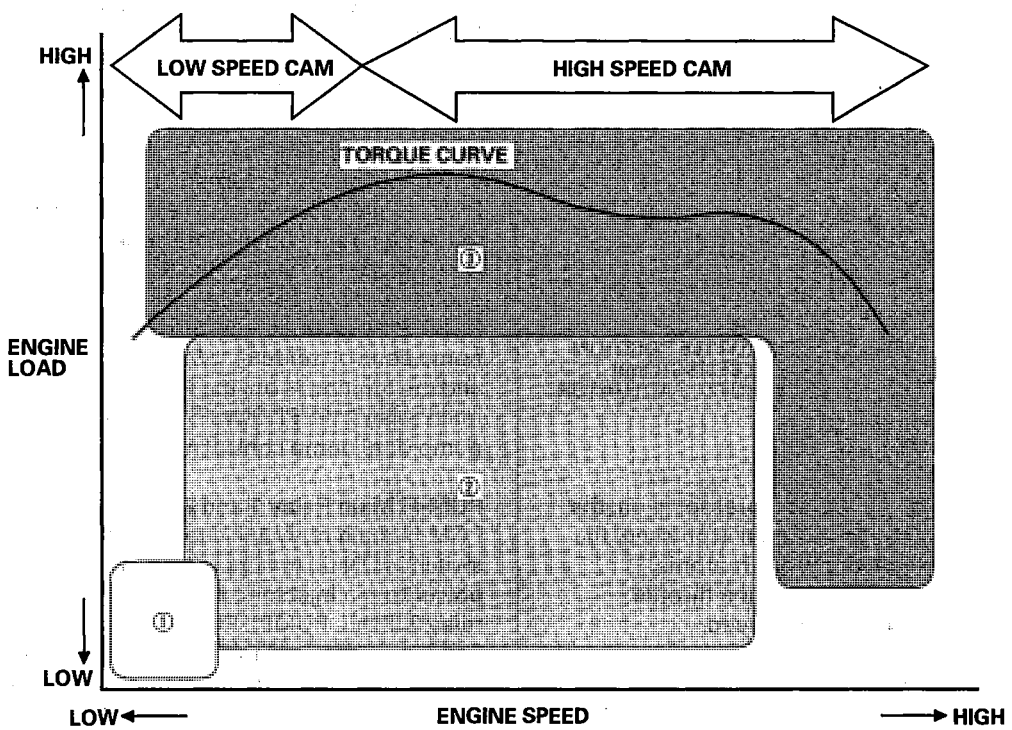
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System Description (cont'd)

VTEC/VTC

- The i-VTEC has a variable valve timing control (VTC) mechanism on the intake camshaft in addition to the usual VTEC.
  This mechanism improves fuel efficiency and reduces exhaust emissions at all levels of engine speed, vehicle speed, and engine load.
- The VTEC mechanism changes the valve lift and timing by using more than one cam profile.
- The VTC changes the phase of the intake camshaft via oil pressure. It changes the intake valve timing continuously.



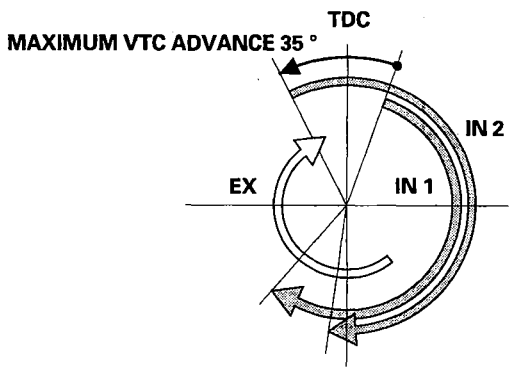
Driving Condition	VTC Control	Description
① Light-load	Base Position	For stable combustion the cam angle is retarded, and reduces the entry of exhaust gas into the cylinder.
② Medium/high-load	Advance Control	Cam phase angle is controlled to optimize valve timing, improving fuel efficiency and reducing emissions.
③ High speed	Advance-Base Position	To reduce the pumping loss, the intake valve is closed quickly. This helps the entry of fuel air mixture by the charging effect, and maximizes engine power.

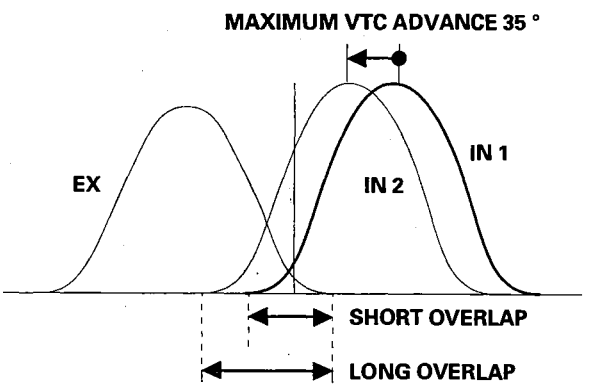
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VTC System

- The VTC system makes continuous intake valve timing changes based on operating conditions.
- Intake valve timing is optimized to allow the engine to produce maximum power.
- Cam angle is advanced to obtain EGR effect and reduce pumping loss. The intake valve is closed quickly to reduce the entry of the air/fuel mixture into the intake port and improve the charging effect.
- The system reduces the cam advance at idle, stabilizes combustion, and reduces engine speed.
- If a malfunction occurs, the VTC system control is disabled and the valve timing is fixed at the fully retarded position.

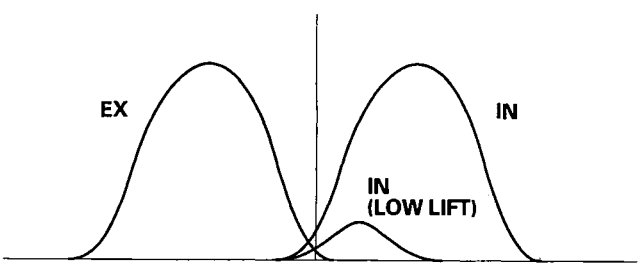




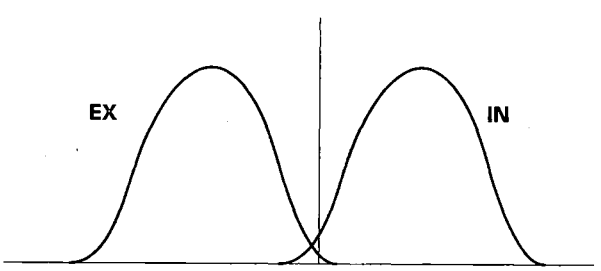
VTEC System

- The VTEC system changes the one side of the intake side cam profile to correspond to the engine speed. It maximizes torque at low engine speed and output at high engine speed.
- The low lift cam is used by one side of the intake valves at a low engine speed. At high engine speed, both intake valves uses the high lift cam.

LOW SPEED VALVE TIMING



HIGH SPEED VALVE TIMING



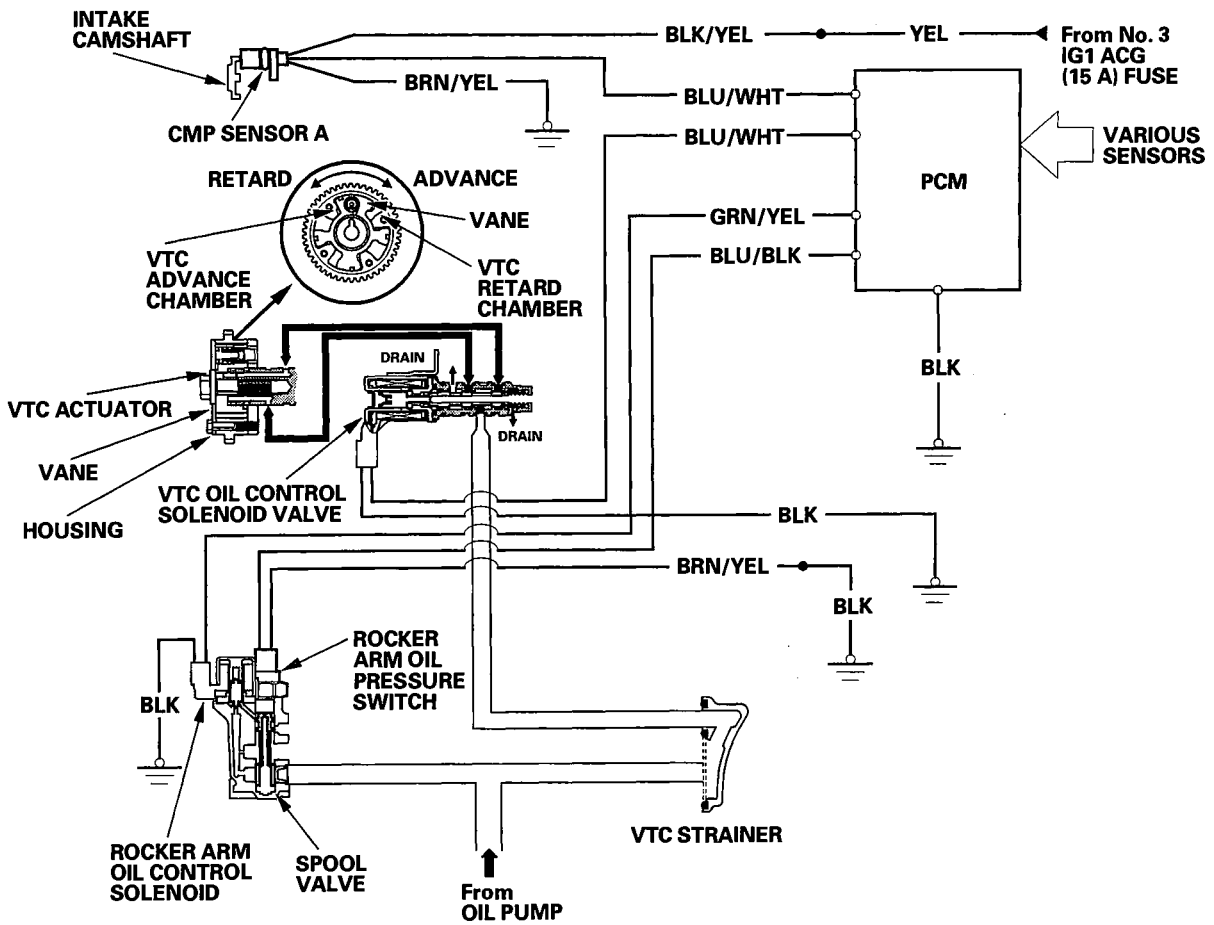
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System Description (cont'd)

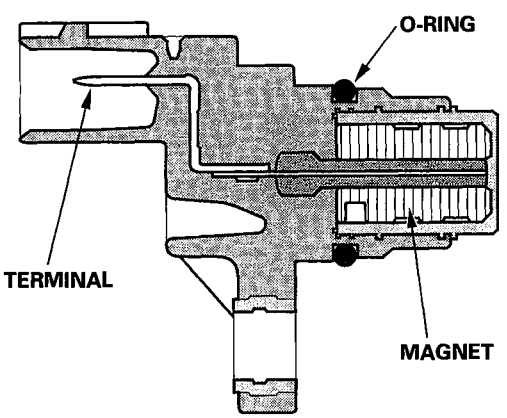
VTEC/VTC

System Diagram



Camshaft Position (CMP) Sensor A

CMP sensor A detects camshaft angle position for the VTC system.



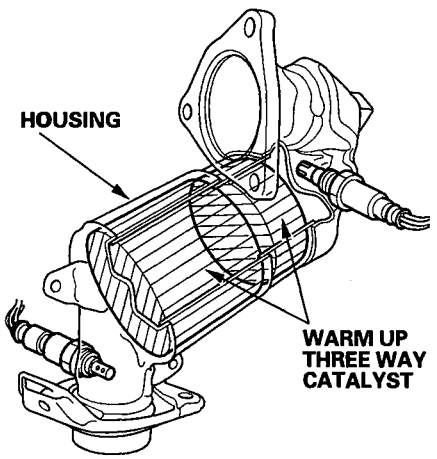
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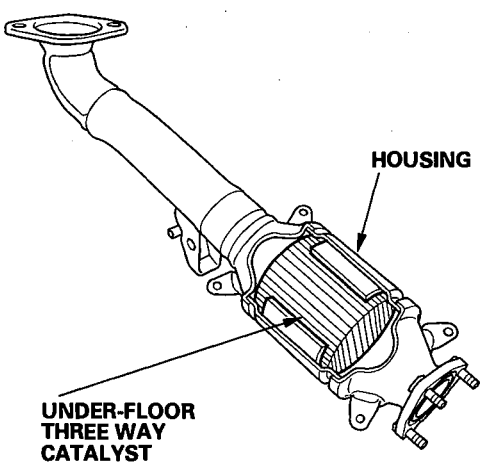
Catalytic Converter System

Warm Up Three Way Catalytic Converter (WU-TWC) and Three Way Catalytic Converter (TWC)
The WU-TWC/TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO_2), nitrogen (N_2), and water vapor.

WU-TWC (ATTACHED TO THE TURBOCHARGER)

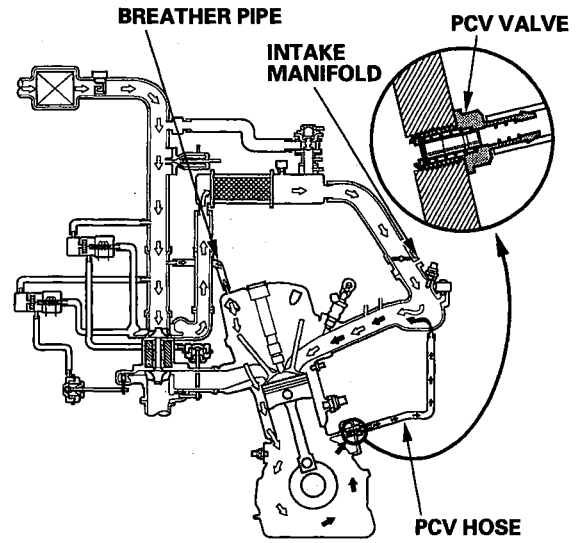


TWC (UNDER THE FLOOR)



Positive Crankcase Ventilation (PCV) System

The PCV valve prevents blow-by gasses from escaping into the atmosphere by venting them into the intake manifold. The PCV valve opens at idle, low load, and decelerating with the throttle valve fully closed.



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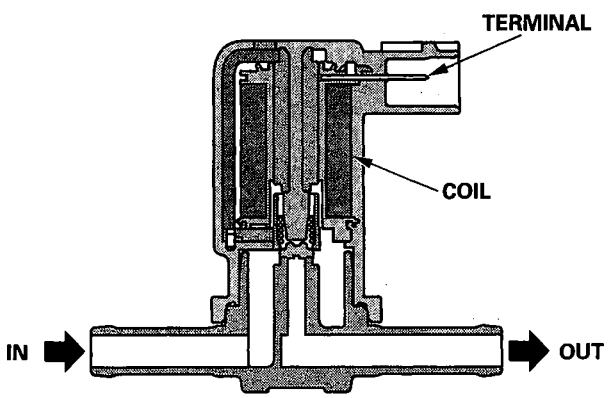
System Description (cont'd)

Evaporative Emission (EVAP) Control System

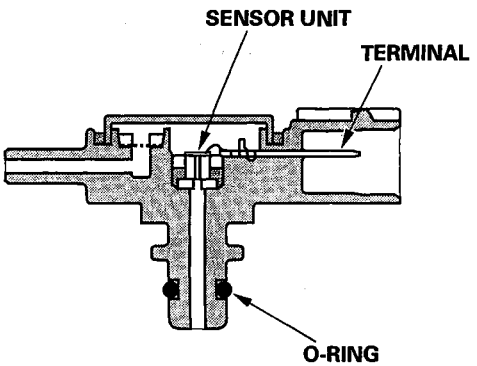
Refer to the system diagram to see the functional layout of the system.

EVAP Canister
The EVAP canister temporarily stores fuel vapor from the fuel tank until it can be purged back into the engine and burned (refer to the system diagram to see the functional layout of the system).

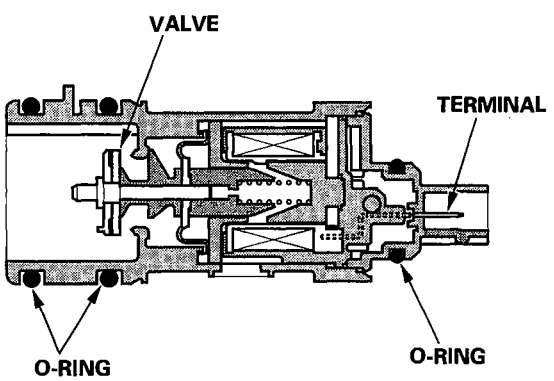
EVAP Canister Purge Valve
When the engine coolant temperature is below 140 °F (60 °C), the PCM turns off the EVAP canister purge valve which cuts vacuum to the EVAP canister.



Fuel Tank Pressure (FTP) Sensor
The FTP sensor converts fuel tank absolute pressure into an electrical input to the PCM during the EVAP leak check.



EVAP Canister Vent Shut Valve
The EVAP canister vent shut valve is on the EVAP canister.
The EVAP canister vent shut valve controls the venting of the EVAP canister.



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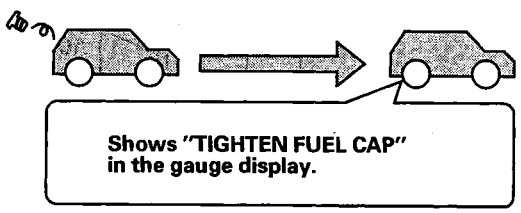
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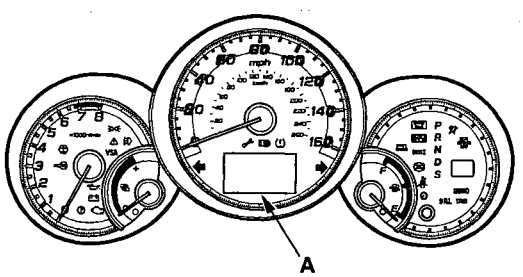
Fuel Cap Warning Message

The PCM will detect a loose or missing fuel fill cap as an evaporative system leak and alerts the driver by showing a warning message in the gauge display.

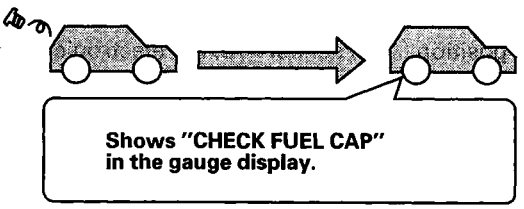
First drive cycle
The first time a leak is detected a "TIGHTEN FUEL CAP" (multi-information display model) ("CHECK FUEL CAP" (information display model)) message in the gauge display (A). To scroll to another message, press the select/reset button. The "TIGHTEN FUEL CAP"/"CHECK FUEL CAP" message will appear each time you restart the engine until the system turns the message off. Turn the engine off then replace or tighten the fuel fill cap until it clicks at least once. The message should go off after several days of normal driving after the fuel fill cap has been tightened or replaced.

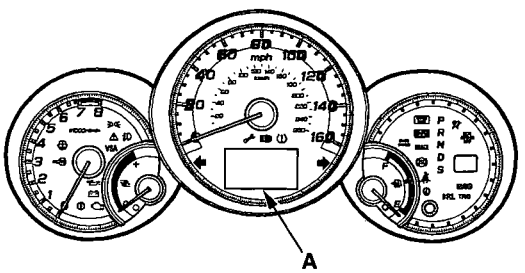
Multi-information display model





Information display model





To make the message go off (With the HDS)

Procedure

1. Tighten the fuel fill cap until it clicks.
2. Clear the Temporary DTC with the HDS.
3. Verify there is no leak by doing the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

To make the message go off (Without the HDS)

Procedure

1. Tighten the fuel fill cap until it clicks.
2. The message should go off after severval days of normal driving.

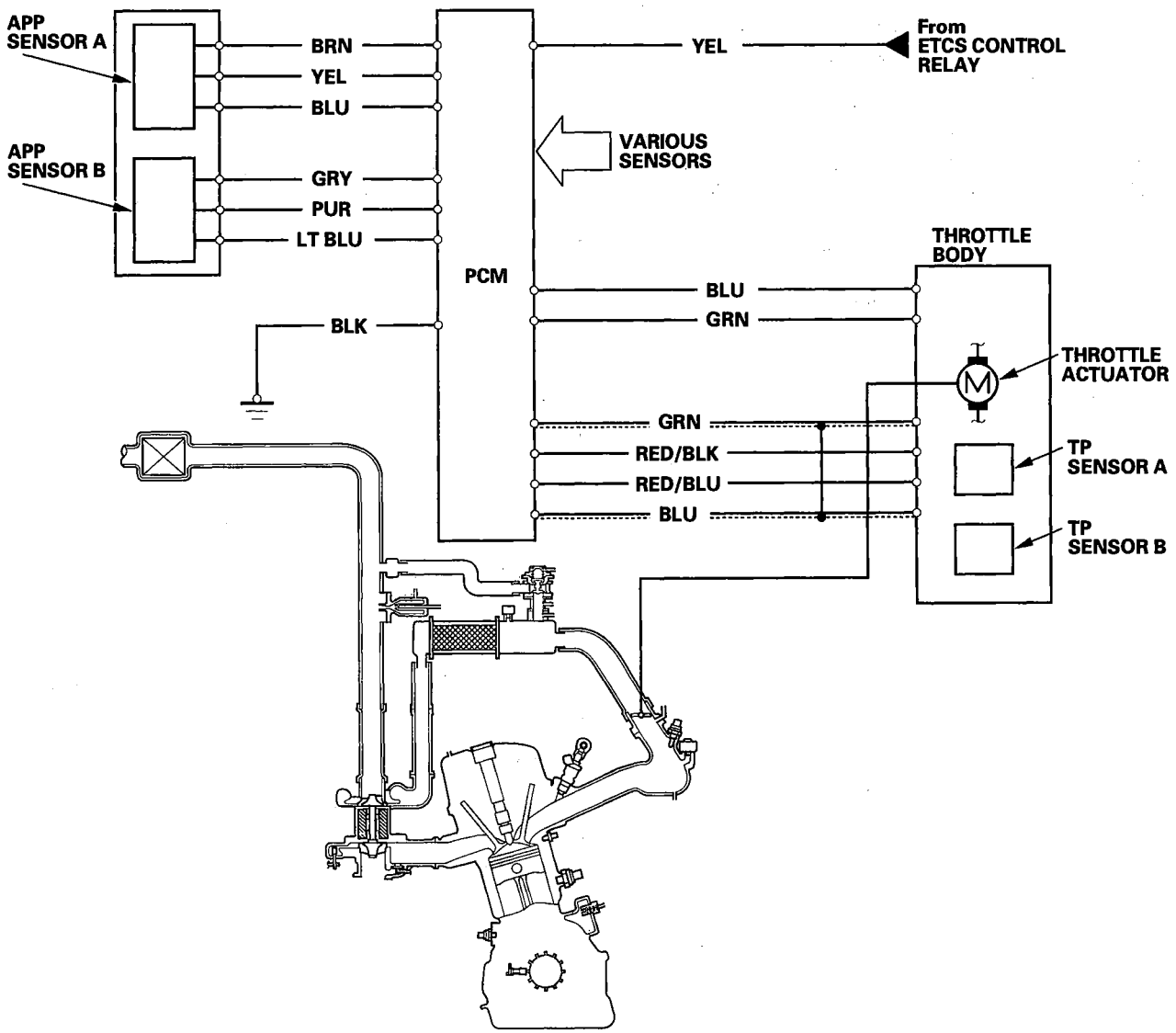
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System Description (cont'd)

Electronic Throttle Control System Diagram

The electronic throttle control system consists of the throttle actuator, throttle position (TP) sensor A/B, accelerator pedal position (APP) sensor A/B, the electronic throttle control system (ETCS) control relay, and the PCM.



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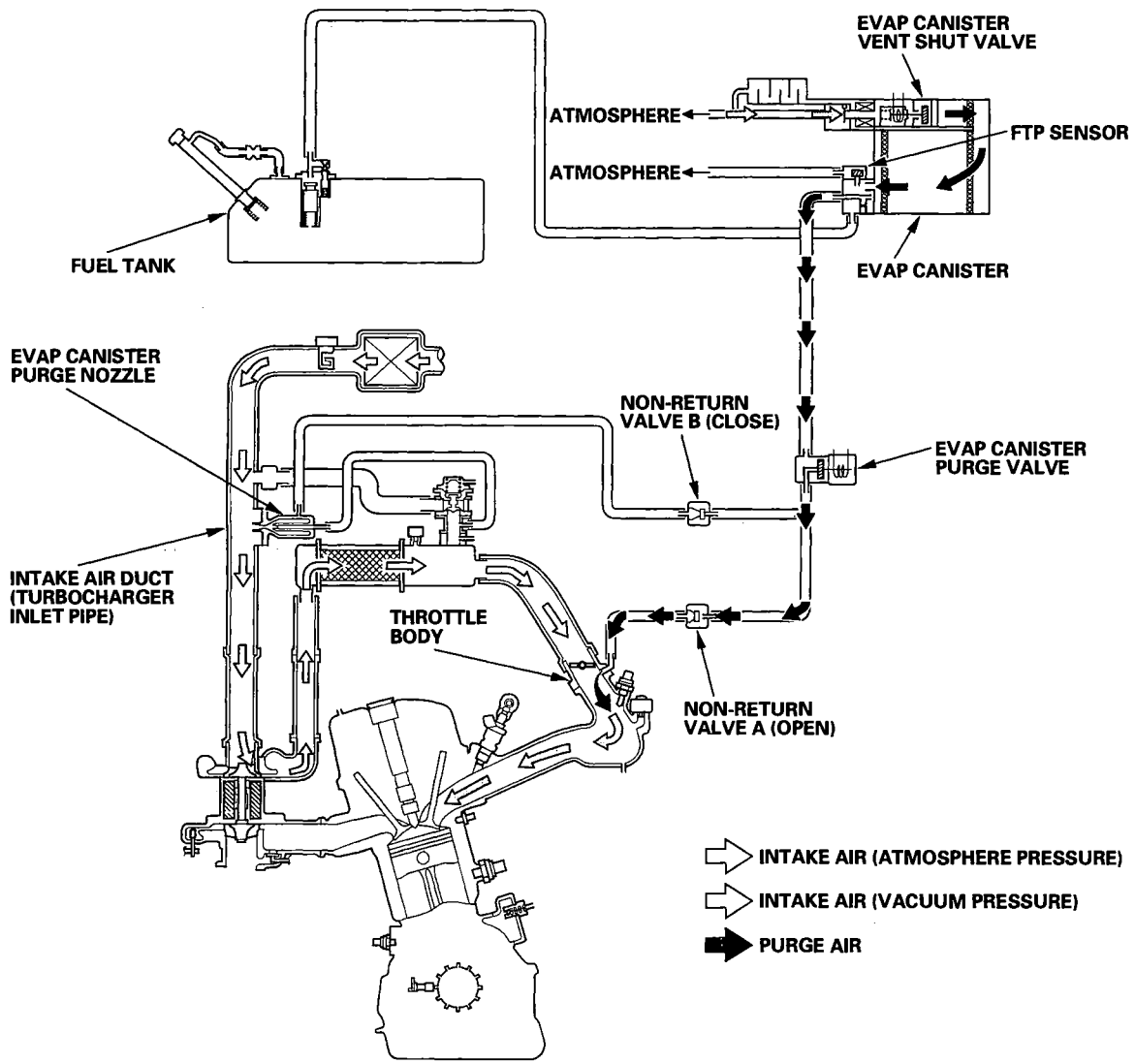
BACK

Evaporative Emissions (EVAP) Control System Diagram

The EVAP control system minimizes the fuel vapor escaping to the atmosphere. Vapor from the fuel tank is temporarily stored in the EVAP canister until it can be purged from the canister into the engine and burned. The purge amount and timing is duty controlled by the PCM by operating the EVAP canister purge valve. This system is operated whenever the engine coolant temperature is above 140 °F (60 °C). For this turbo engine model, there are two different purge flow passages, because the intake manifold pressure can be positive (boost pressure) or negative (vacuum pressure).

Purge to the throttle body

When the engine is under a low load condition, the pressure inside the intake manifold is negative (vacuum pressure). The vacuum pressure of the intake manifold opens non-return valve A and closes non-return valve B. Under this condition, the purge air flows from the EVAP canister through the EVAP canister purge valve and non-return valve A, into the throttle body.

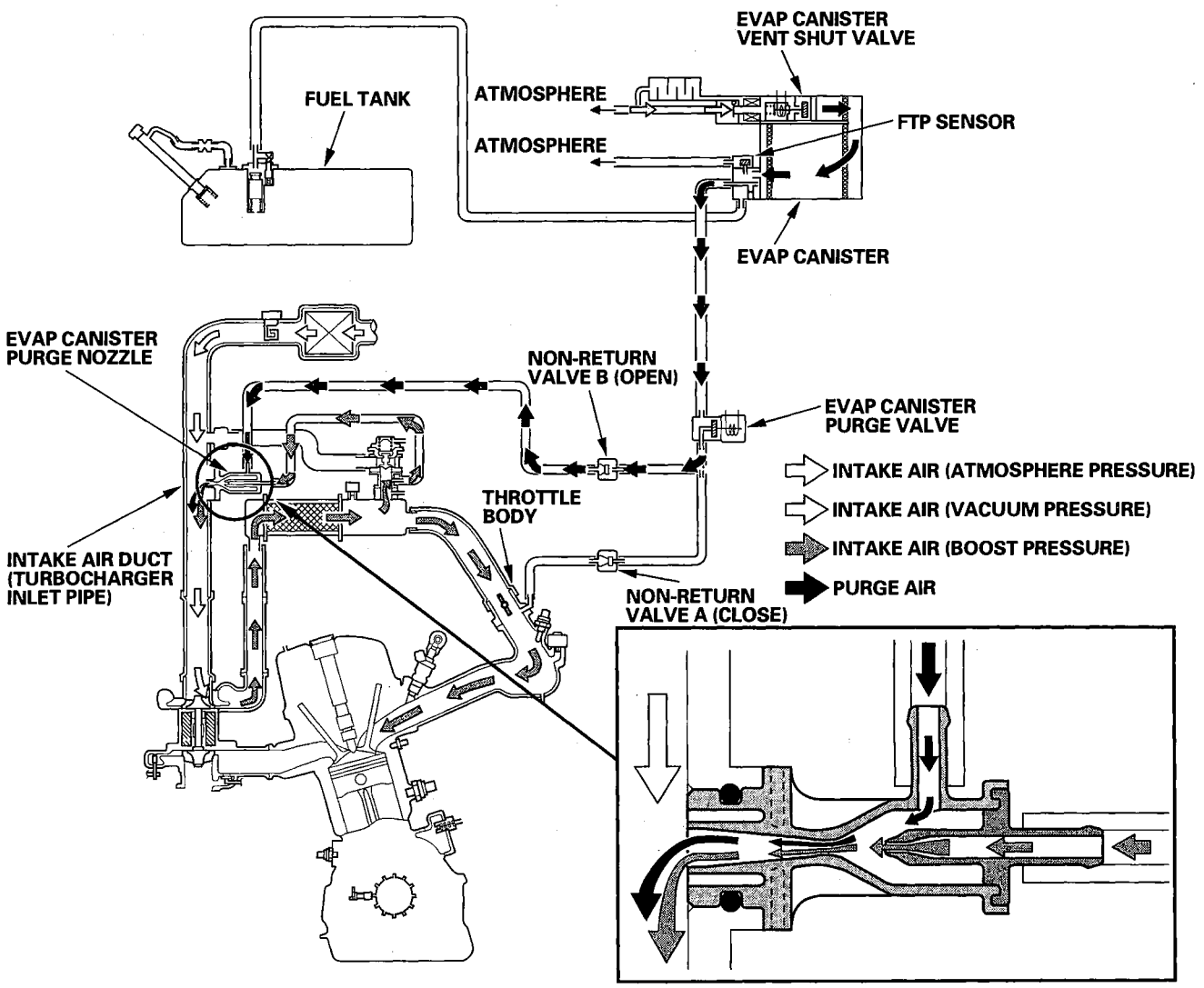


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System Description (cont'd)

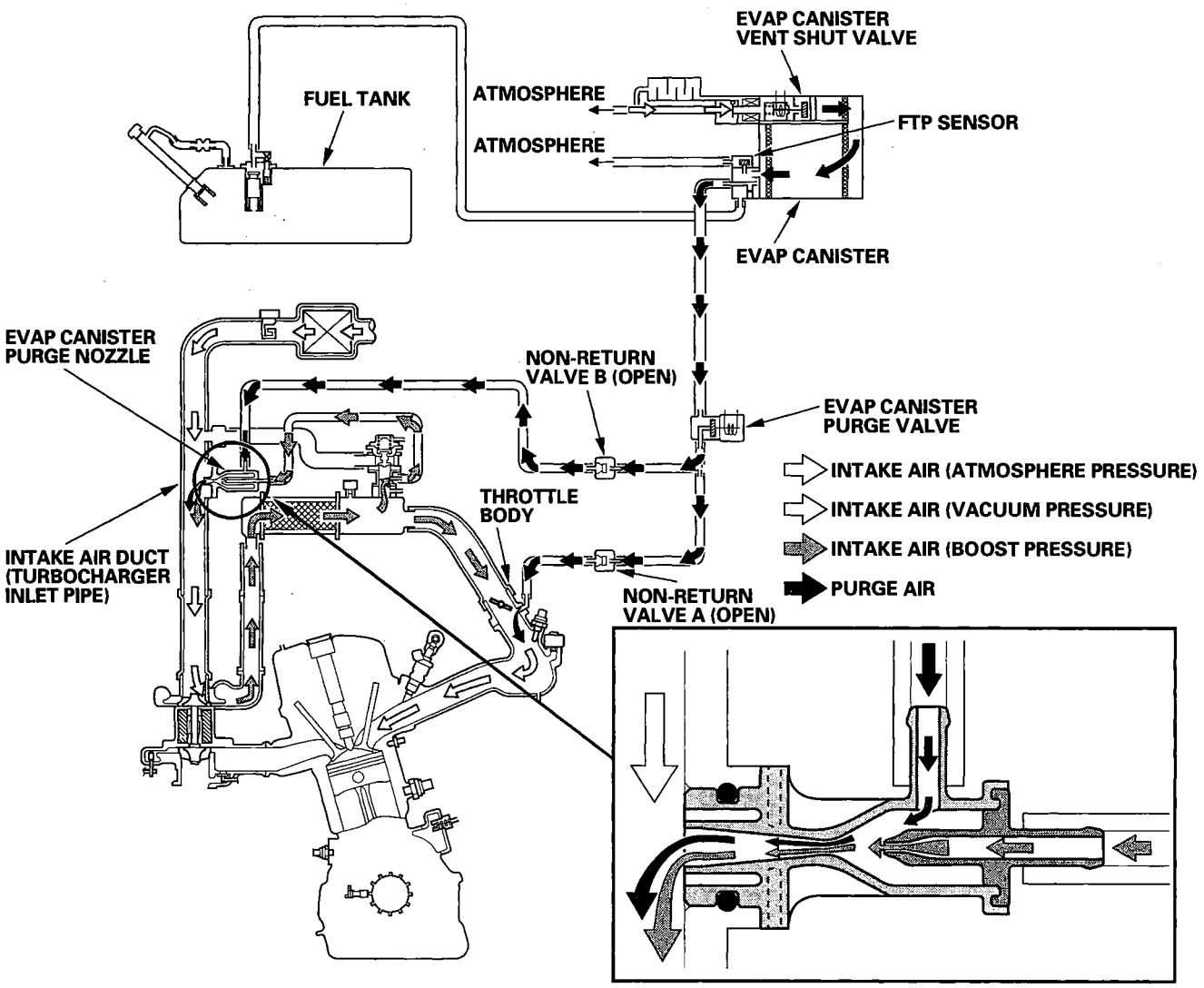
Purge to the intake air duct (turbocharger inlet pipe)
When the engine load increases, the pressure after the turbocharger changes to positive pressure due to turbocharger operation. The boost pressure at the throttle body closes non-return valve A, and due to the boost pressure at the charge air cooler, some part of the compressed air flows through the passage from the air bypass valve base to the intake air duct (turbocharger inlet pipe). When the speed of that compressed air increases at the EVAP canister purge nozzle, it draws the purge air from the EVAP canister side. The non-return valve B opens by this vacuum pressure, and the purge air flows from the EVAP canister through the EVAP canister purge valve and non-return valve B, into the intake air duct (turbocharger inlet pipe).



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Purge to the both intake air duct (turbocharger inlet pipe) and the throttle body
When the engine is under a mid load condition, the pressure after the turbocharger is positive due to the turbocharger operation, but the pressure at the intake manifold is negative because the throttle valve is nearly closed. Under this condition, both non-return valves A and B open and the purge air flows from the EVAP canister through the EVAP canister purge valve and non-return valves A and B, into the throttle body and the intake air duct (turbocharger inlet pipe).



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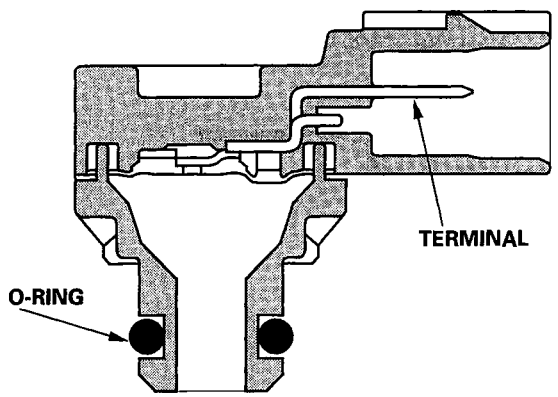
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System Description (cont'd)

Turbocharger Control System

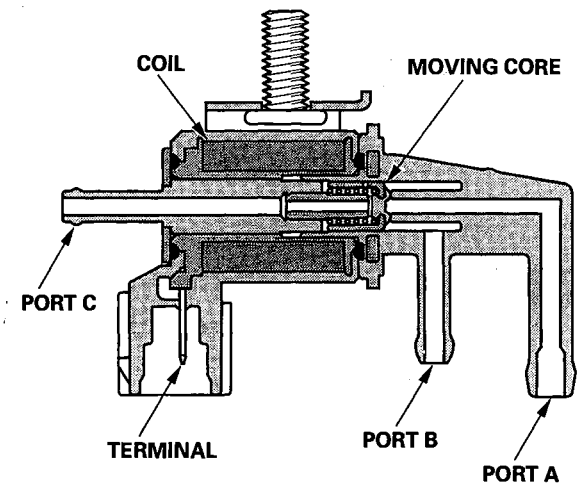
Refer to the system diagram to see the functional layout of the system.

Turbocharger Boost Sensor
This sensor converts charge air cooler pressure into an electrical signal that is received by the PCM.



Turbocharger Wastegate Control Solenoid Valve
This solenoid valve controls pressure to the turbocharger wastegate control actuator. The solenoid itself is controlled by the PCM. The following information describes the ports on the valve and where the pressure flows when the solenoid switches the valve on and off.

- **Port A—To the intake air duct (turbocharger inlet connecting tube)**
- **Port B—To the turbocharger wastegate control actuator**
- **Port C—To the intake air duct (turbocharger outlet pipe)**



SOLENOID CONTROL	PORT		
	A	B	C
ON (DUTY MAX)	○	○	
OFF (DUTY MIN)		○	○

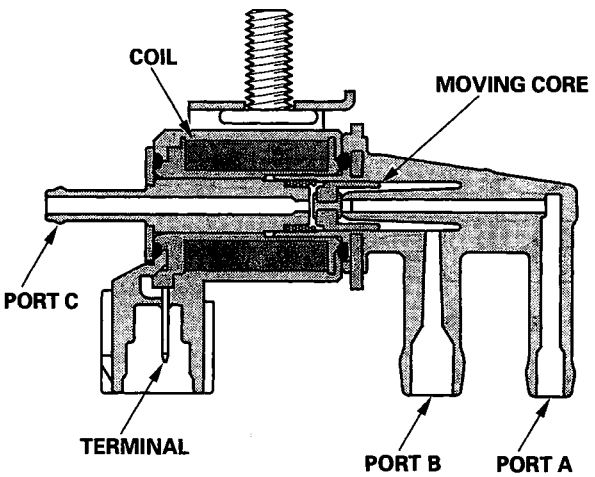
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Turbocharger Bypass Control Solenoid Valve

This solenoid valve controls pressure to the turbocharger bypass control valve. The solenoid itself is controlled by the PCM. The following information describes the ports on the valve and where the pressure flows when the solenoid switches the valve on and off.

- **Port A—To the charge air cooler**
- **Port B—To the turbocharger bypass control valve**
- **Port C—To the intake manifold**

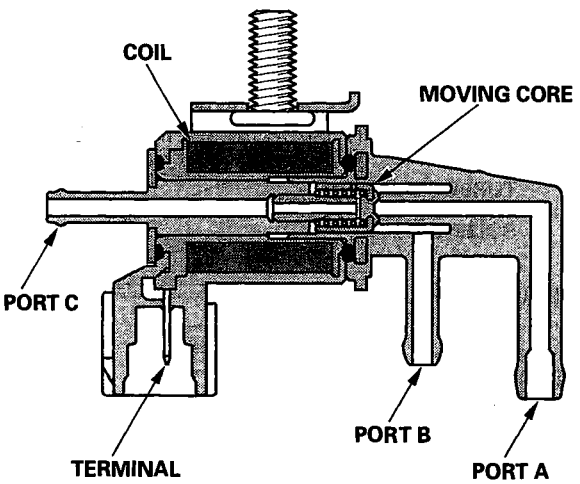


SOLENOID CONTROL	PORT		
	A	B	C
ON	○	○	
OFF		○	○

Turbocharger Boost Control Solenoid Valve

This solenoid valve controls pressure to the tubocharger boost control valve. The solenoid itself is controlled by the PCM. The following information describes the ports on the valve and where the pressure flows when the solenoid switches the valve on and off.

- **Port A—To the intake air duct (turbocharger inlet connecting tube)**
- **Port B—To the turbocharger boost control actuator**
- **Port C—To the intake air duct (turbocharger outlet pipe)**



SOLENOID CONTROL	PORT		
	A	B	C
ON (DUTY MAX)	○	○	
OFF (DUTY MIN)		○	○

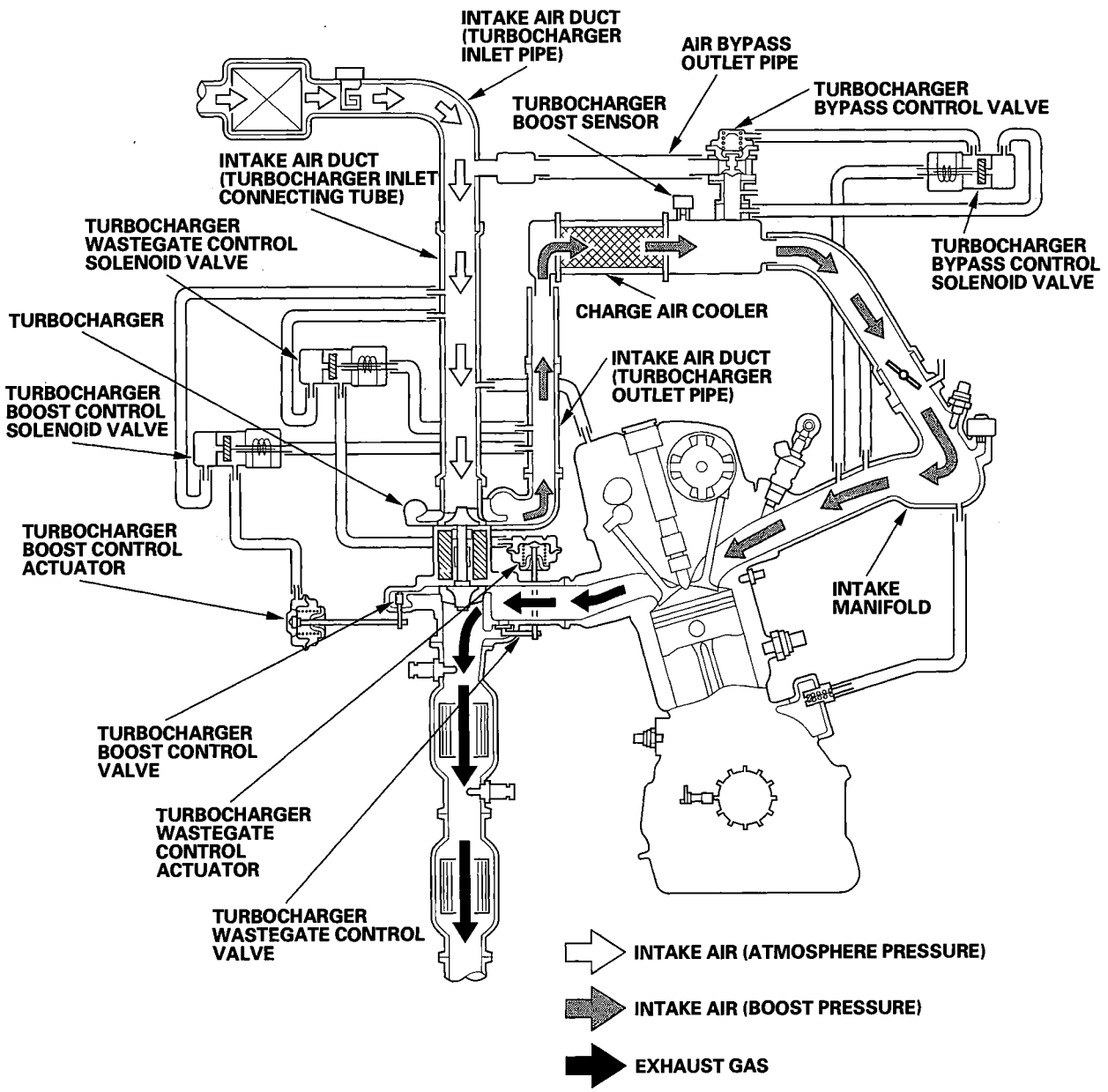
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System Description (cont'd)

Turbocharger Control System Diagram

The turbocharger control system controls the boost pressure and the response of the turbocharger. The PCM controls the turbocharger wastegate control solenoid valve (duty controlled), the turbocharger bypass control solenoid valve (on/off controlled), and the turbocharger boost control valve (duty controlled). The boost pressure is monitored by the turbocharger boost sensor.



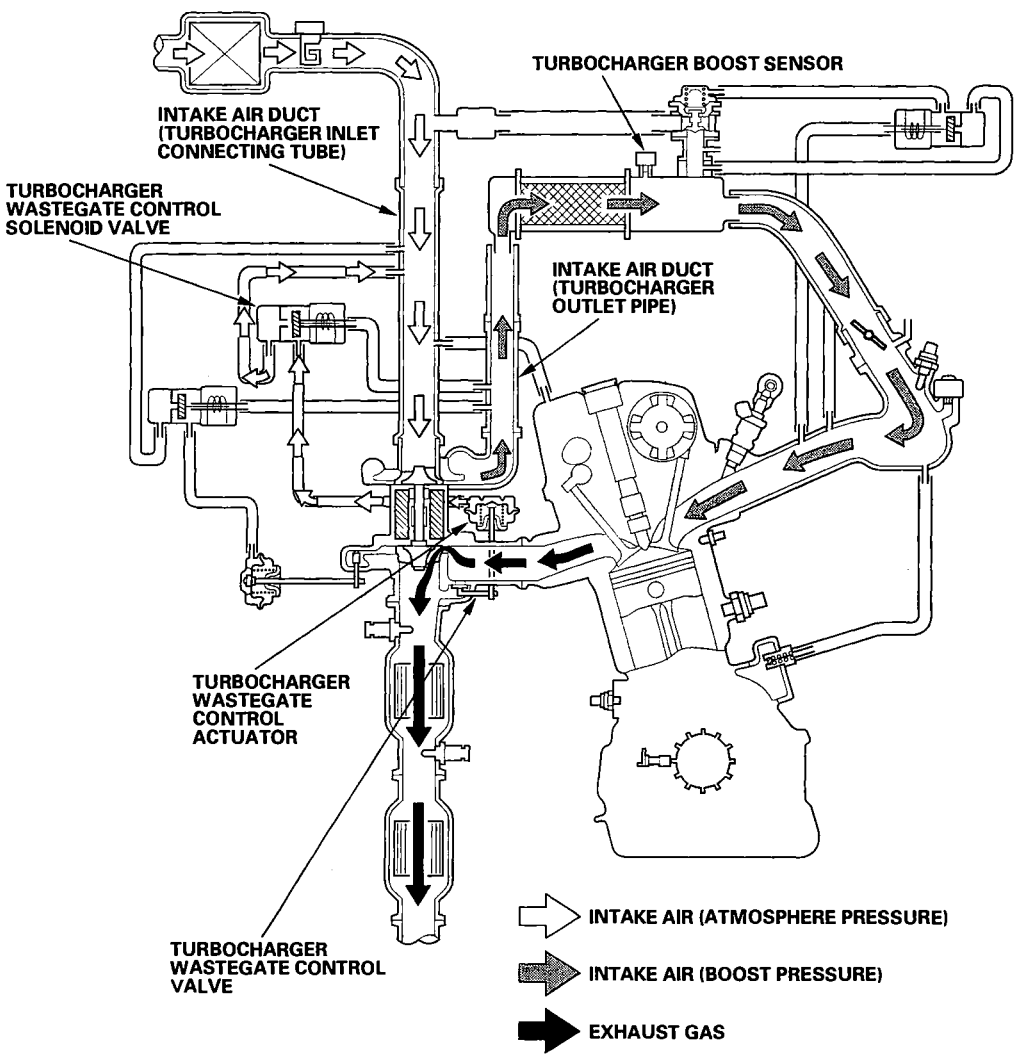
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Turbocharger Wastegate Control System

This system controls the wastegate control solenoid to prevent the turbo from exceeding maximum boost pressure. This system is duty controlled by the PCM. The descriptions A and B are the two conditions of duty. Condition A (maximum duty) and condition B (minimum duty). At other times, the turbocharger wastegate control solenoid controls both the passages from the intake air duct (turbocharger inlet connecting tube), and the intake air duct (turbocharger outlet pipe) to the turbocharger wastegate control actuator.

Condition A (maximum duty):
When the turbocharger boost sensor signal is lower than the upper limit, the PCM turns on (maximum duty) the turbocharger wastegate control solenoid valve, and opens the passage between the intake air duct (turbocharger inlet connecting tube) and the turbocharger wastegate control actuator and closes the passage from the intake air duct (turbocharger outlet pipe) and the turbocharger wastegate control actuator. The pressure at the turbocharger wastegate control actuator is freed to the intake air duct (turbocharger inlet connecting tube), and the spring in the turbocharger wastegate control actuator closes the turbocharger wastegate control valve. In this condition, all of the exhaust gas flows to the turbine. This increases the rpm of the turbine, increasing boost pressure.

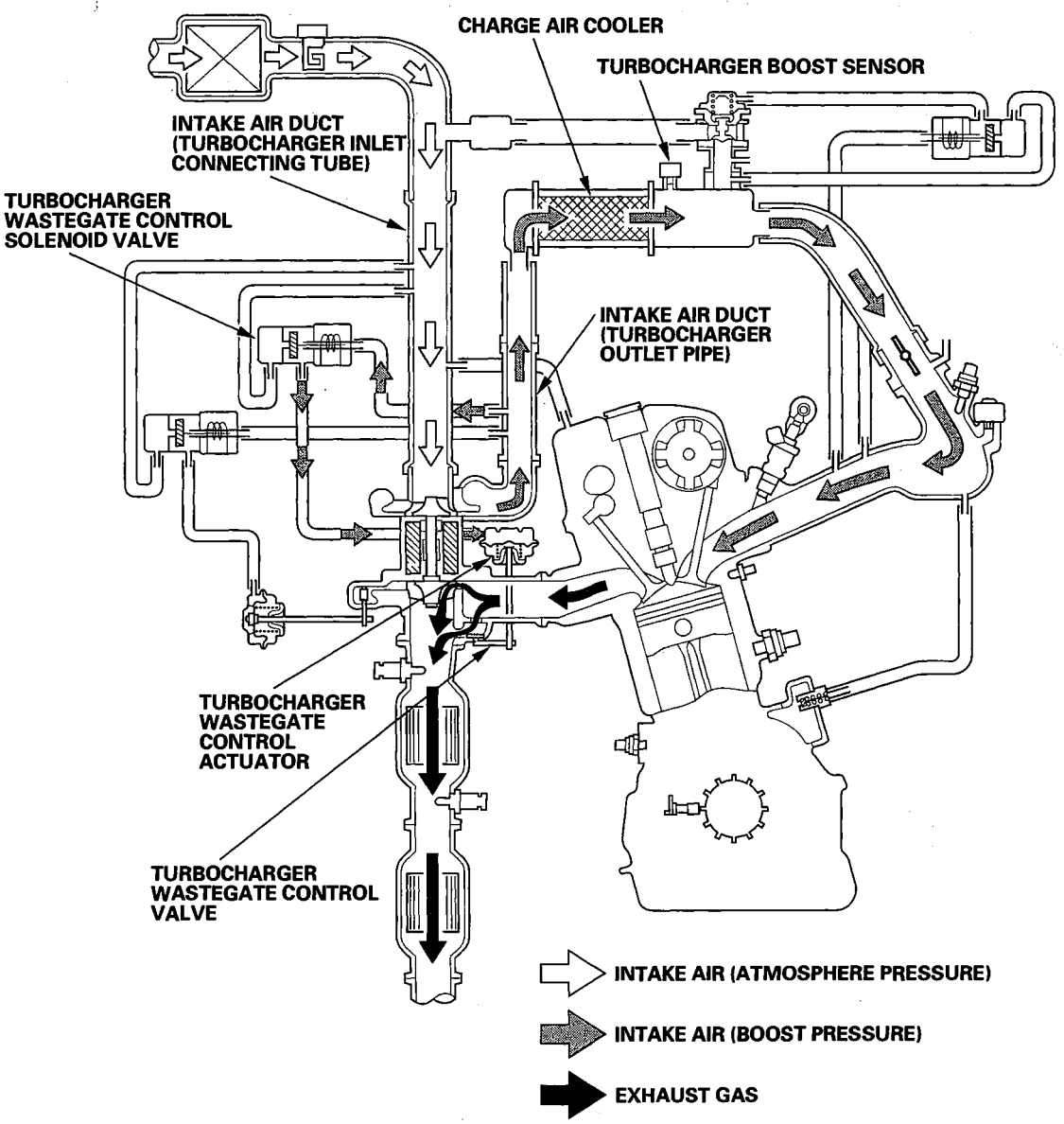


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System Description (cont'd)

Condition B (minimum duty):
When the turbocharger boost sensor signal reaches the upper limit, the PCM turns off (minimum duty) the turbocharger wastegate control solenoid valve, and opens the passage between the intake air duct (turbocharger outlet pipe) and the turbocharger wastegate control actuator and closes the passage from the intake air duct (turbocharger inlet connecting tube) and the turbocharger wastegate control actuator. The boost pressure from the intake air duct (turbocharger outlet pipe) pushes the turbocharger wastegate control actuator and opens the turbocharger wastegate control valve. In this condition, only a portion of the exhaust gas flows through the bypass passage bypassing the turbocharger wastegate control valve, and the amount of exhaust gas to the turbocharger decreases. This decreases the rpm of the turbine decreasing boost pressure.



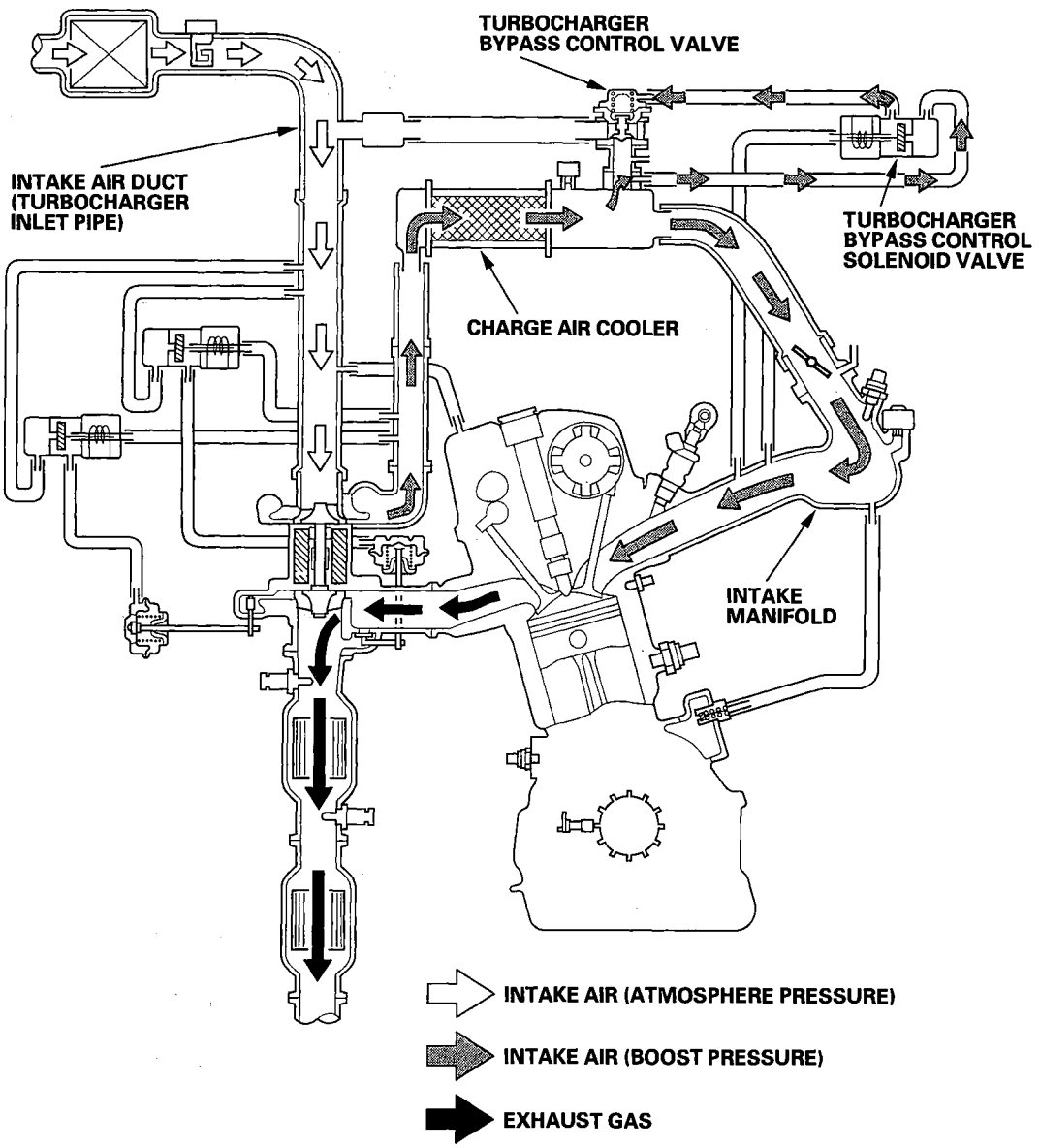
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Turbocharger Bypass Control System

This system improves the boost response of acceleration immediately after deceleration. This system also protects the turbocharger from the negative effects of compressor surge during high boost. The descriptions A and B are the two conditions of the turbocharger bypass control solenoid valve on and off. Condition A (on) and conditon B (off).

Condition A (Solenoid Valve ON):
When the vehicle is in cruise or accelerating, the PCM turns on the turbocharger bypass control solenoid valve, and opens the passage between the charge air cooler and the turbocharger bypass control valve and closes the passage between the intake manifold and the turbocharger bypass control valve. The boost pressure from the charge air cooler pushes the turbocharger bypass control valve, and closes the passage between the charge air cooler and the intake air duct (turbocharger inlet pipe). By doing this, all compressed air is routed to the intake manifold.

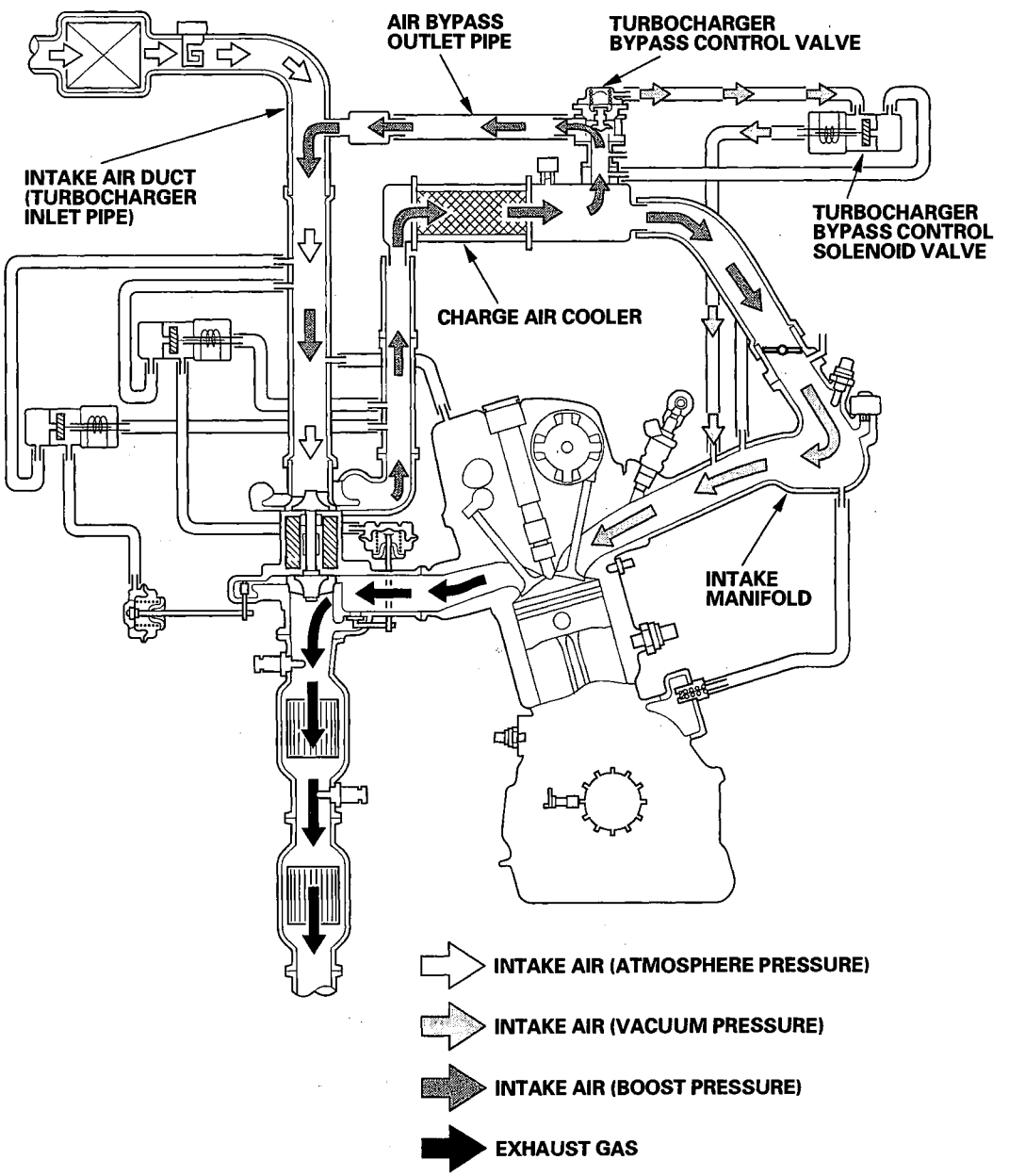


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System Description (cont'd)

Condition B (Solenoid Valve OFF):
Durnig the deceleration with the throttle valve closed, the PCM turns off the turbocharger bypass control solenoid valve and opens the passage between the intake manifold and the turbocharger bypass control valve and closes the passage between the charge air cooler and the turbocharger bypass control valve. The vacuum pressure from the intake manifold pulls the turbocharger bypass control valve and opens the passage between the charge air cooler and the intake air duct (turbocharger inlet pipe). By doing this, the compressed air flows from the charge air cooler to the intake air duct (turbocharger inlet pipe) to keep the turbine spinning. This improves the acceleration response of the turbocharger after deceleration.

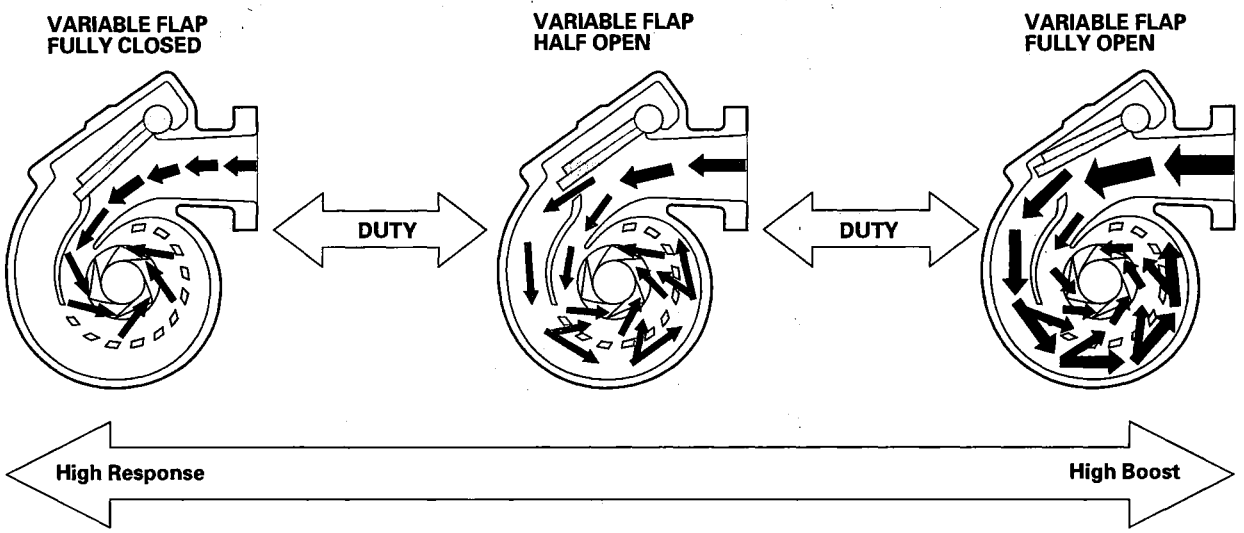


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Turbocharger Boost Control System

This system controls the exhaust gas passage to the turbine by changing the variable flap angle. The variable flap is moved by the turbocharger boost control actuator, and it is duty controlled by the PCM depending on the driving condition.



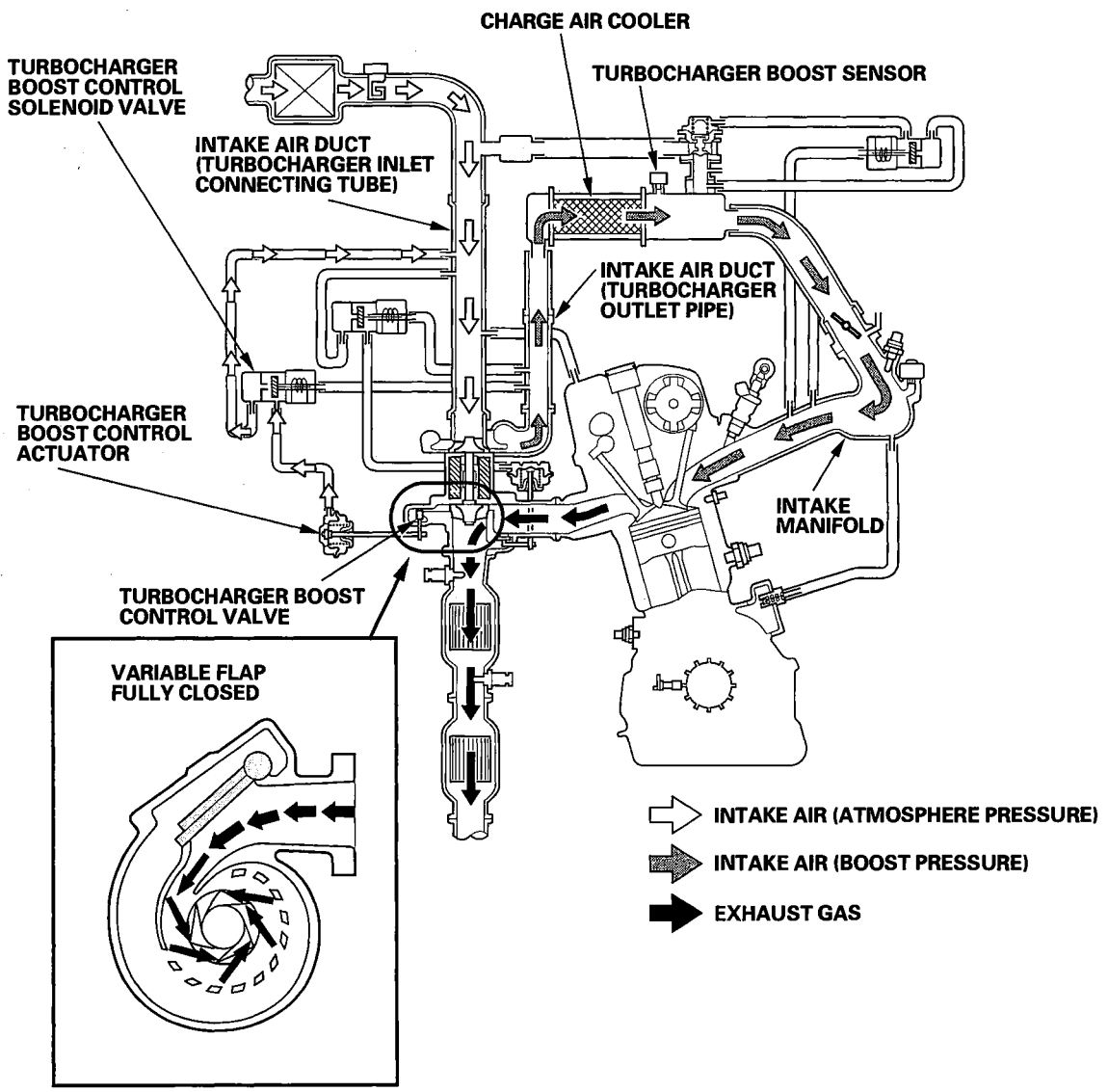
When the variable flap is fully closed, all exhaust gas flows to the inner scroll of the turbocharger. Under this condition, the exhaust gas speed is accelerated, and the turbocharger response is improved. When the variable flap is fully opened, the exhaust gas flows through both the outer and the inner scroll of the turbocharger. Under this condition, the exhaust gas is efficiently used to improve the maximum boost. Because of this system, the turbocharger functions both as a quick responding small size turbocharger, and high capacity turbocharger.
The description A and B are the two conditions of duty. Condition A (maximum duty) and condition B (minimum duty). At other times, the turbocharger boost controls both the passages from the intake air duct (turbocharger inlet connecting tube), and the intake air duct (turbocharger outlet pipe) to the turbocharger boost control actuator.

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System Description (cont'd)

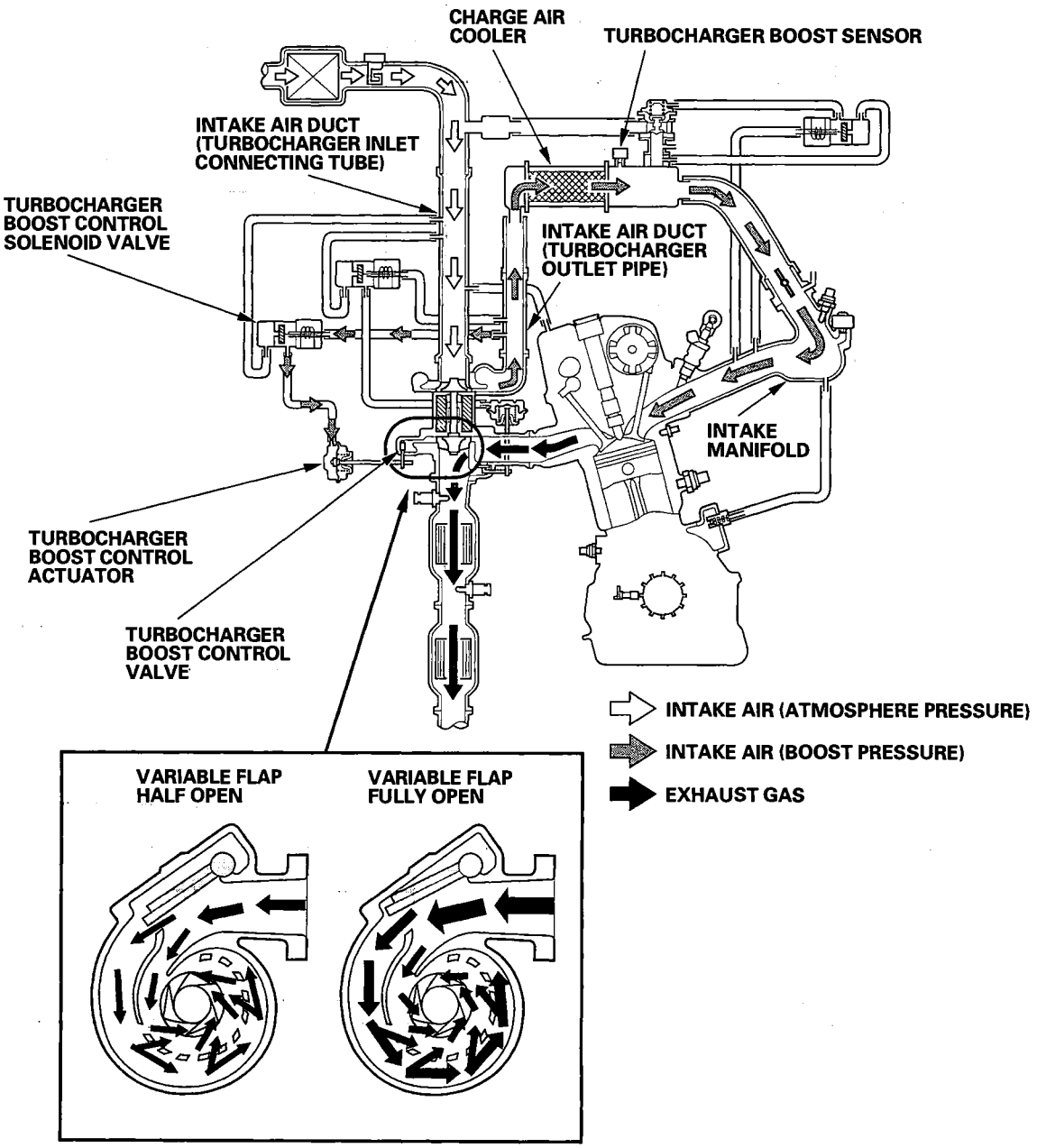
Condition A (maximum duty):
Under a low engine speed/low load condition (with only a small amount of exhaust gas), the PCM turns on (maximum duty) the turbocharger boost control solenoid valve and opens the passage between the intake air duct (turbocharger inlet connecting tube) and the turbocharger boost control actuator and closes the passage between the intake air duct (turbocharger outlet pipe) and the turbocharger boost control actuator. The pressure at the turbocharger boost control actuator is freed to the intake air duct (turbocharger inlet connecting tube), and the spring inside the turbocharger boost control actuator closes the variable flap. With the variable flap closed, the exhaust gas flows at high speed through the inner scroll of the turbocharger improving the turbo response.



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Condition B (minimum duty):
Under a mid or high load conditions (with large amount of exhaust gas), the PCM turns off (minimum duty) the turbocharger boost control solenoid valve and opens the passage between the intake air duct (turbocharger outlet pipe) and the turbocharger boost control actuator and closes the passage between the intake air duct (turbocharger inlet connecting tube) and the turbocharger boost control actuator. The boost pressure from intake air duct (turbocharger outlet pipe) pushes the turbocharger boost control actuator which opens the variable flap. With the variable flap opened, the exhaust gas flows through both the inner and the outer scroll for efficient turbo operation at mid and high engine speed.

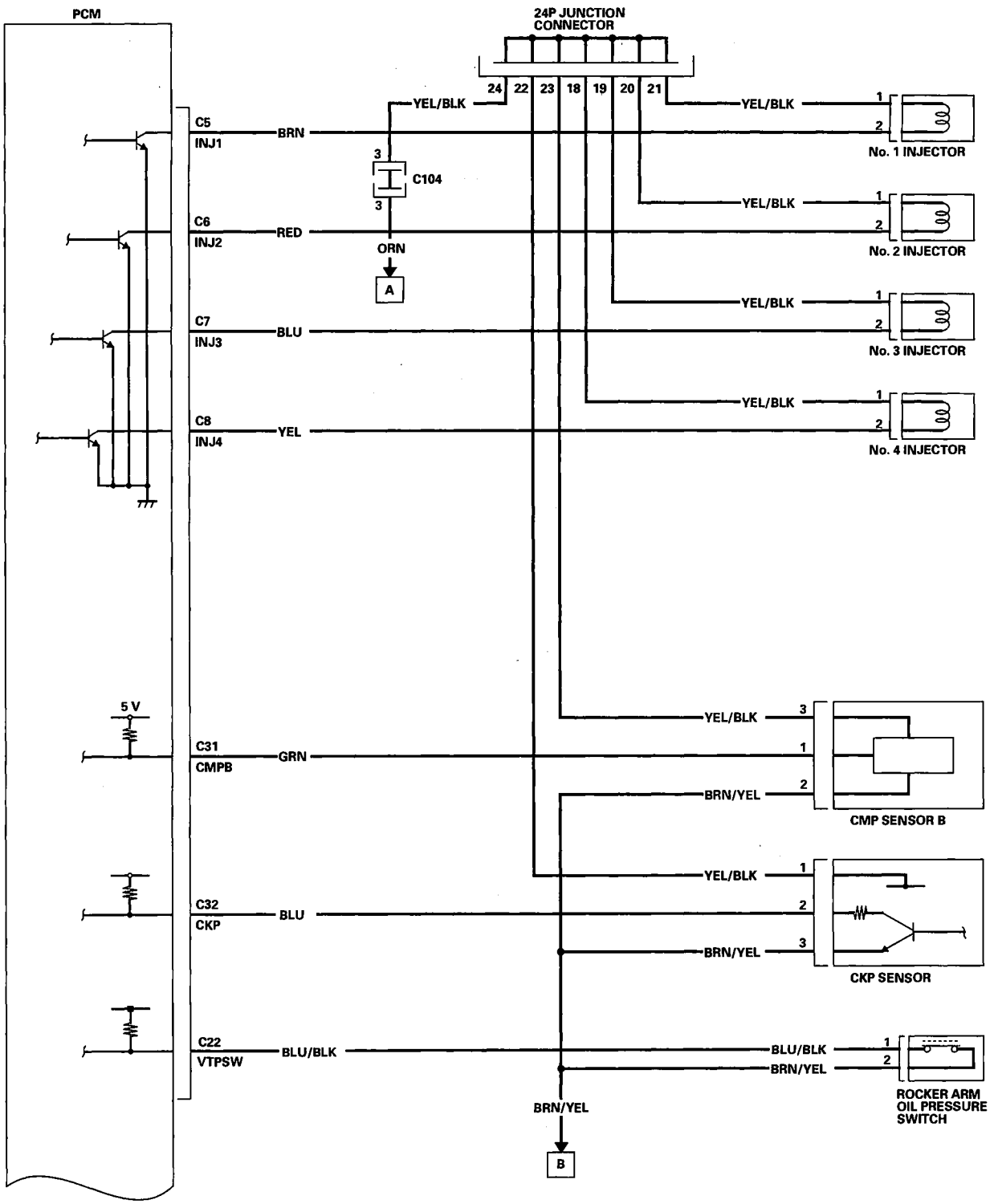


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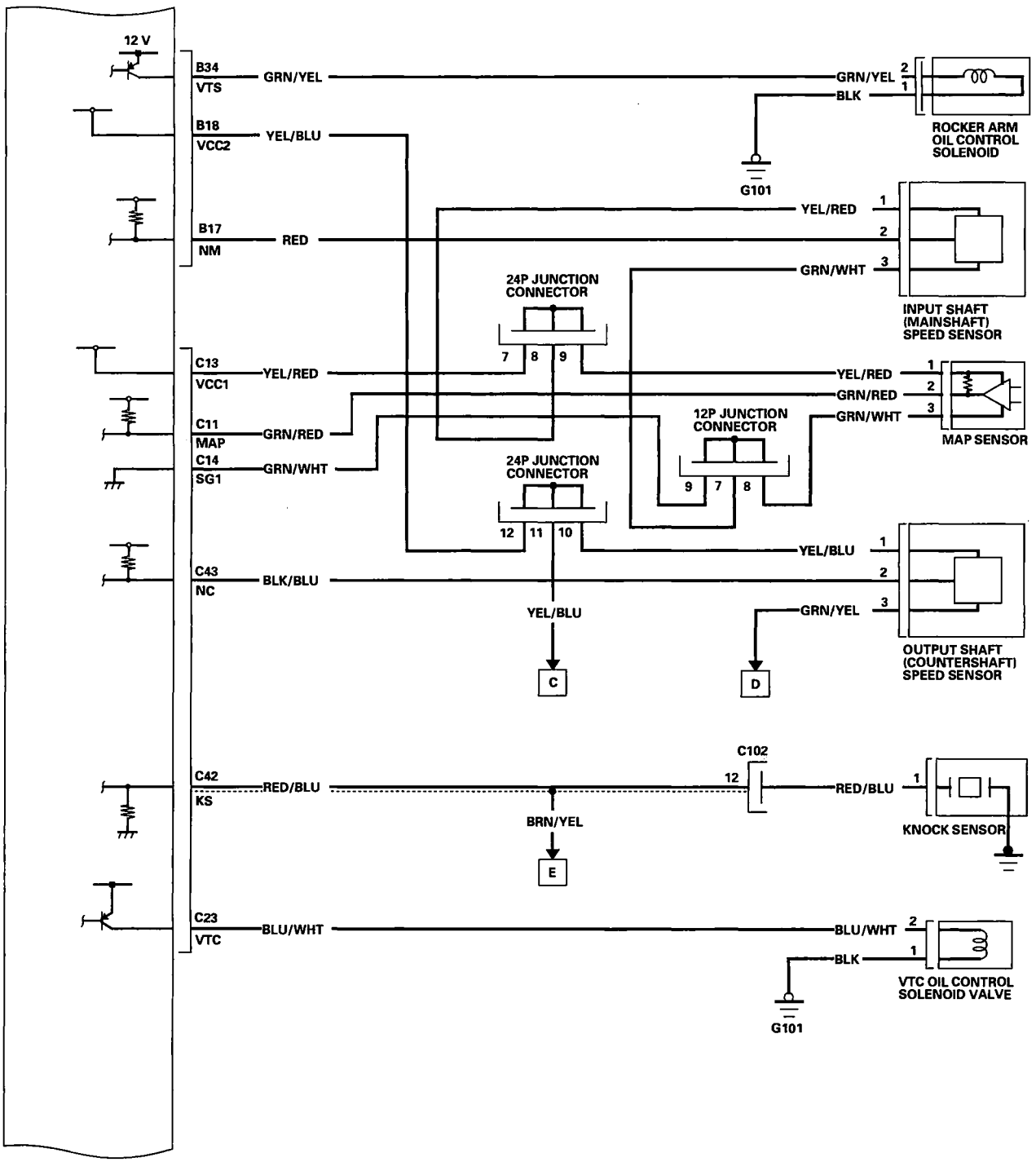
System Description (cont'd)

PCM Circuit Diagram



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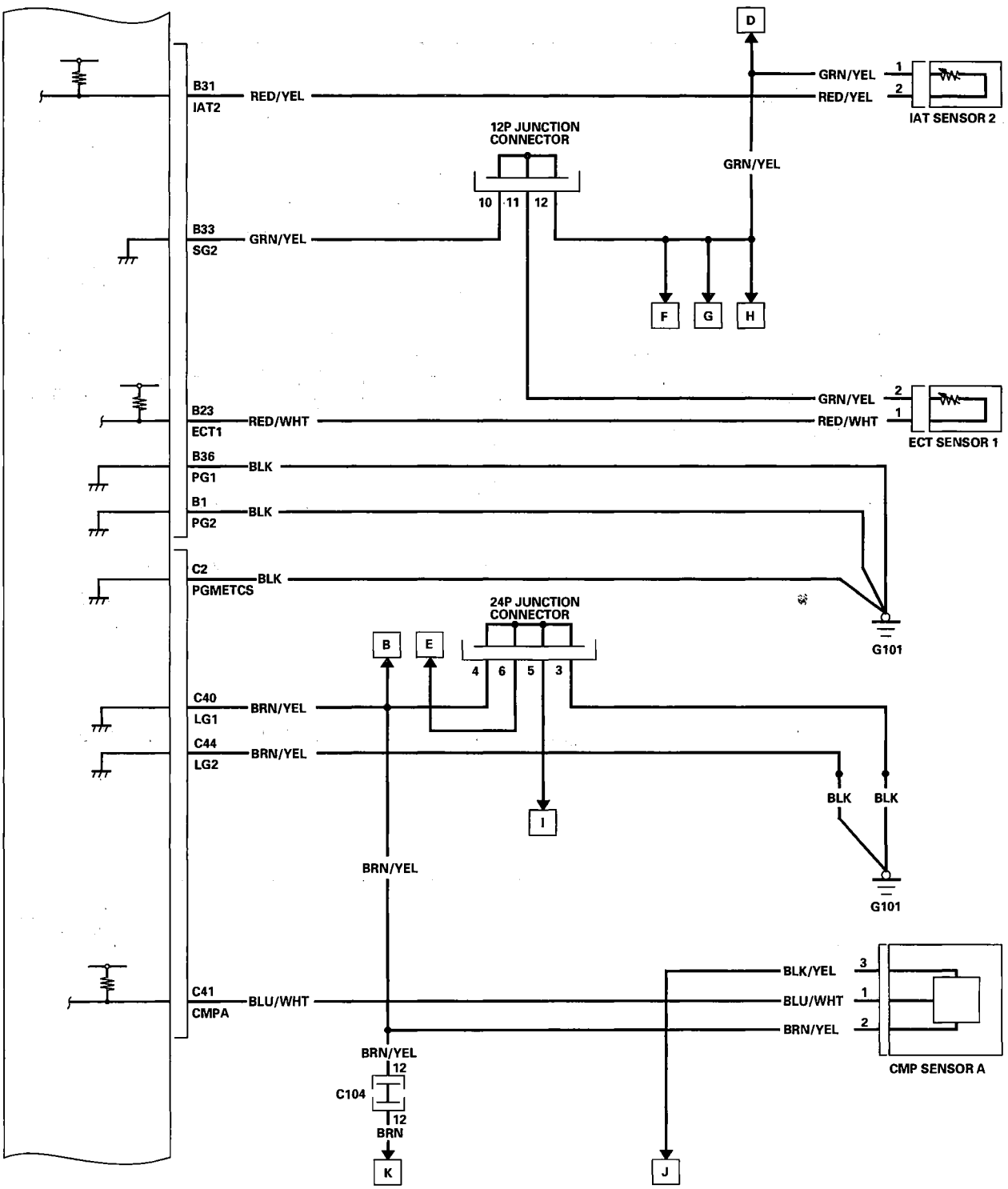


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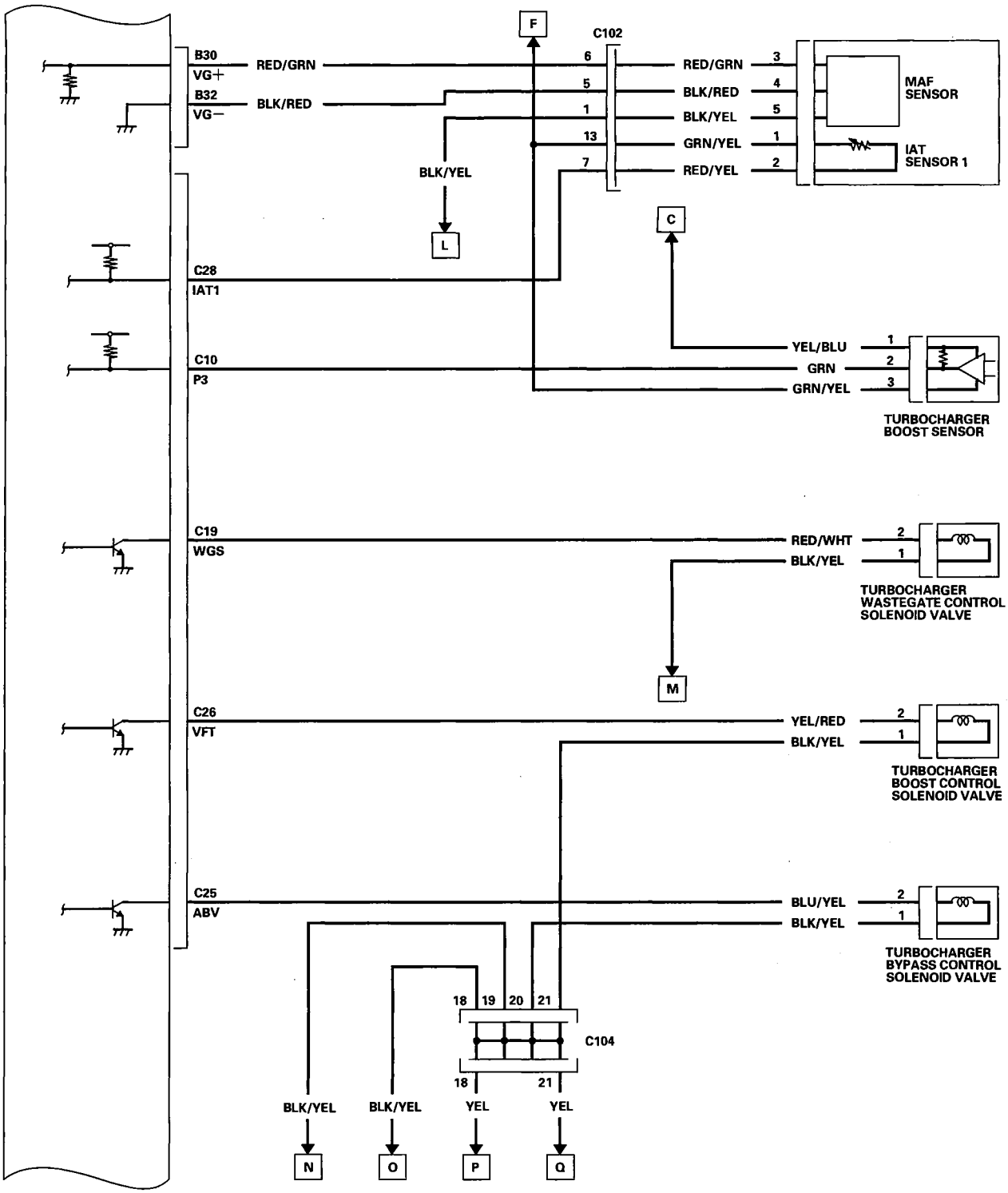
System Description (cont'd)

PCM Circuit Diagram (cont'd)



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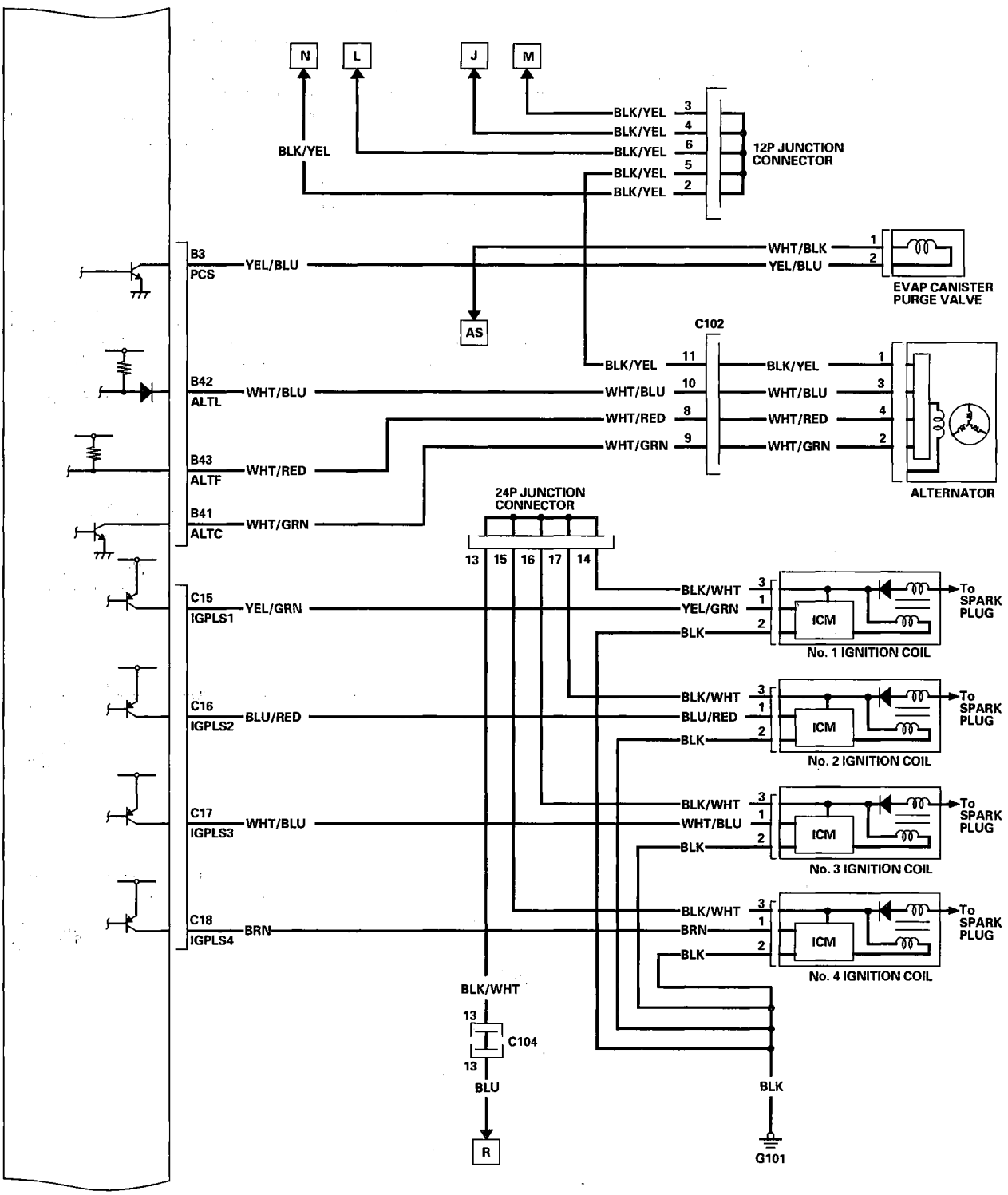


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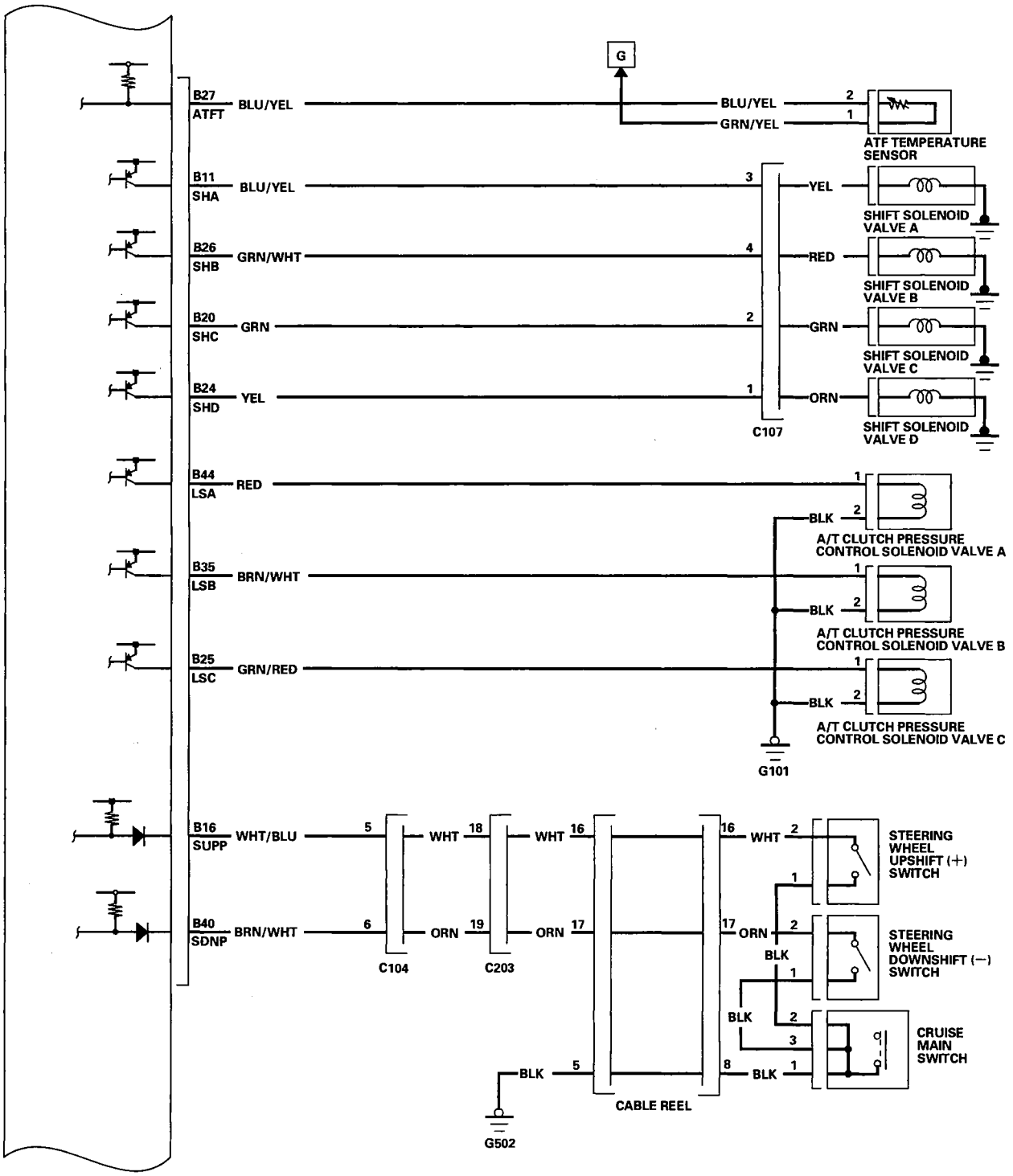
System Description (cont'd)

PCM Circuit Diagram (cont'd)



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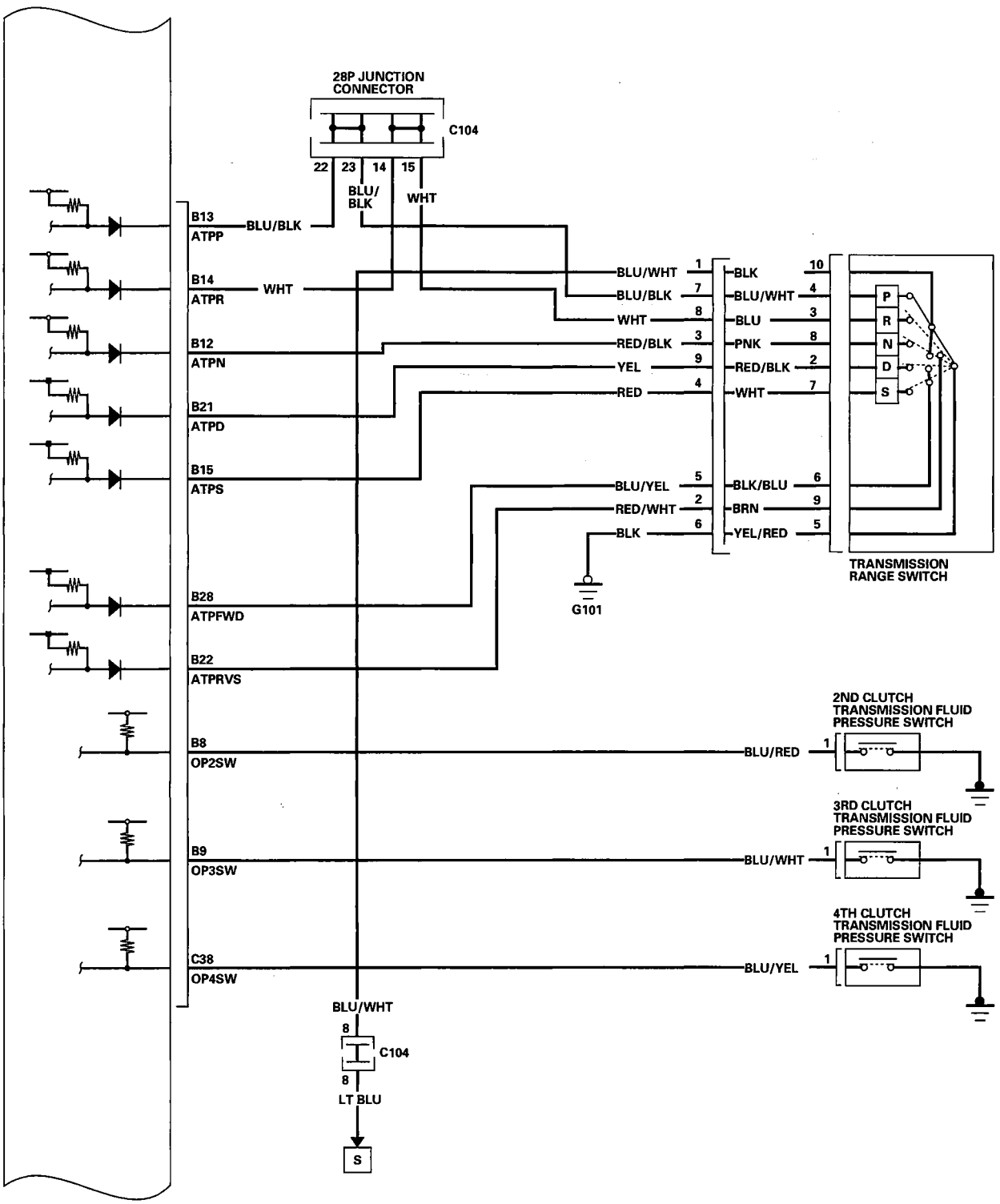


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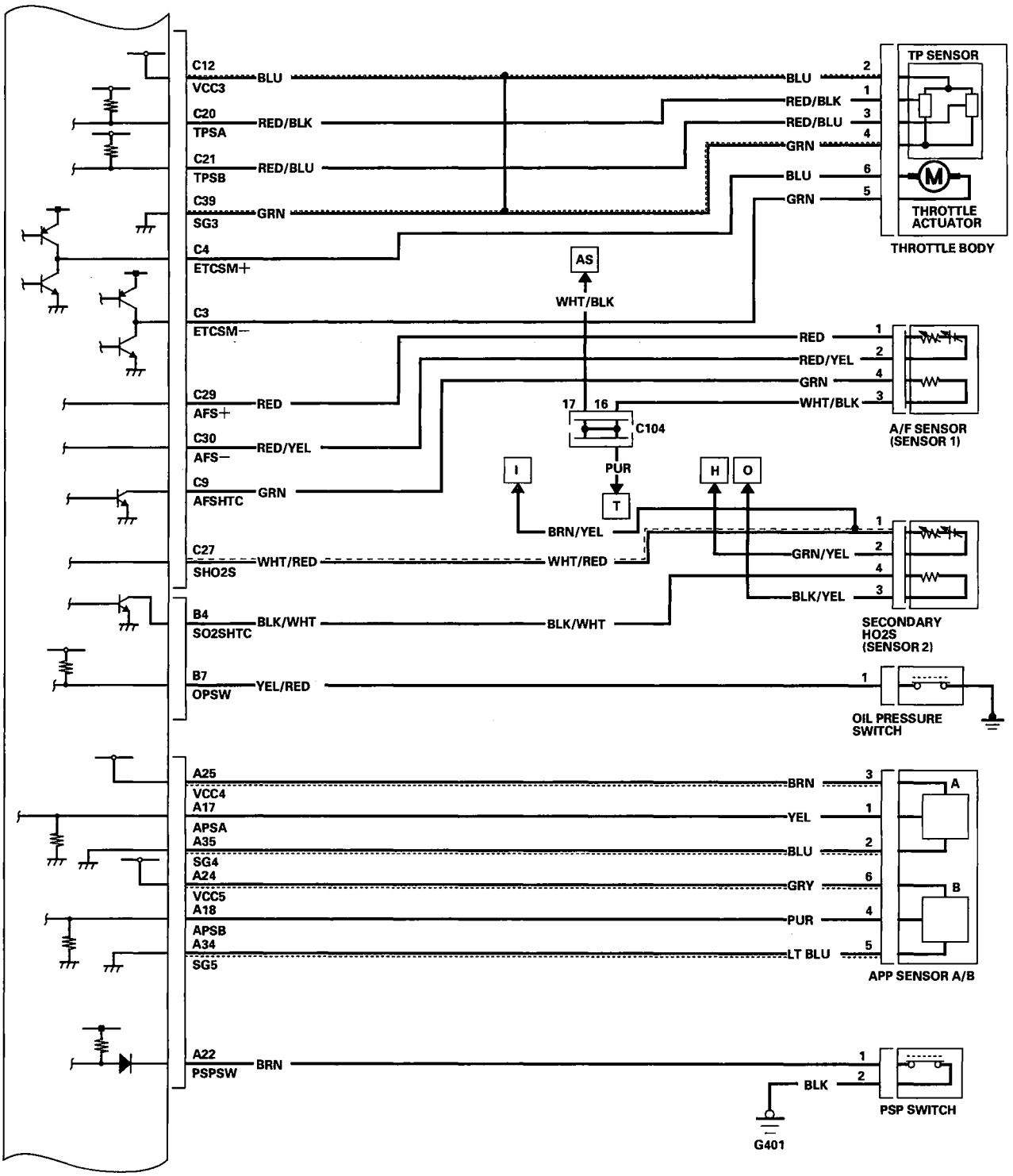
System Description (cont'd)

PCM Circuit Diagram (cont'd)



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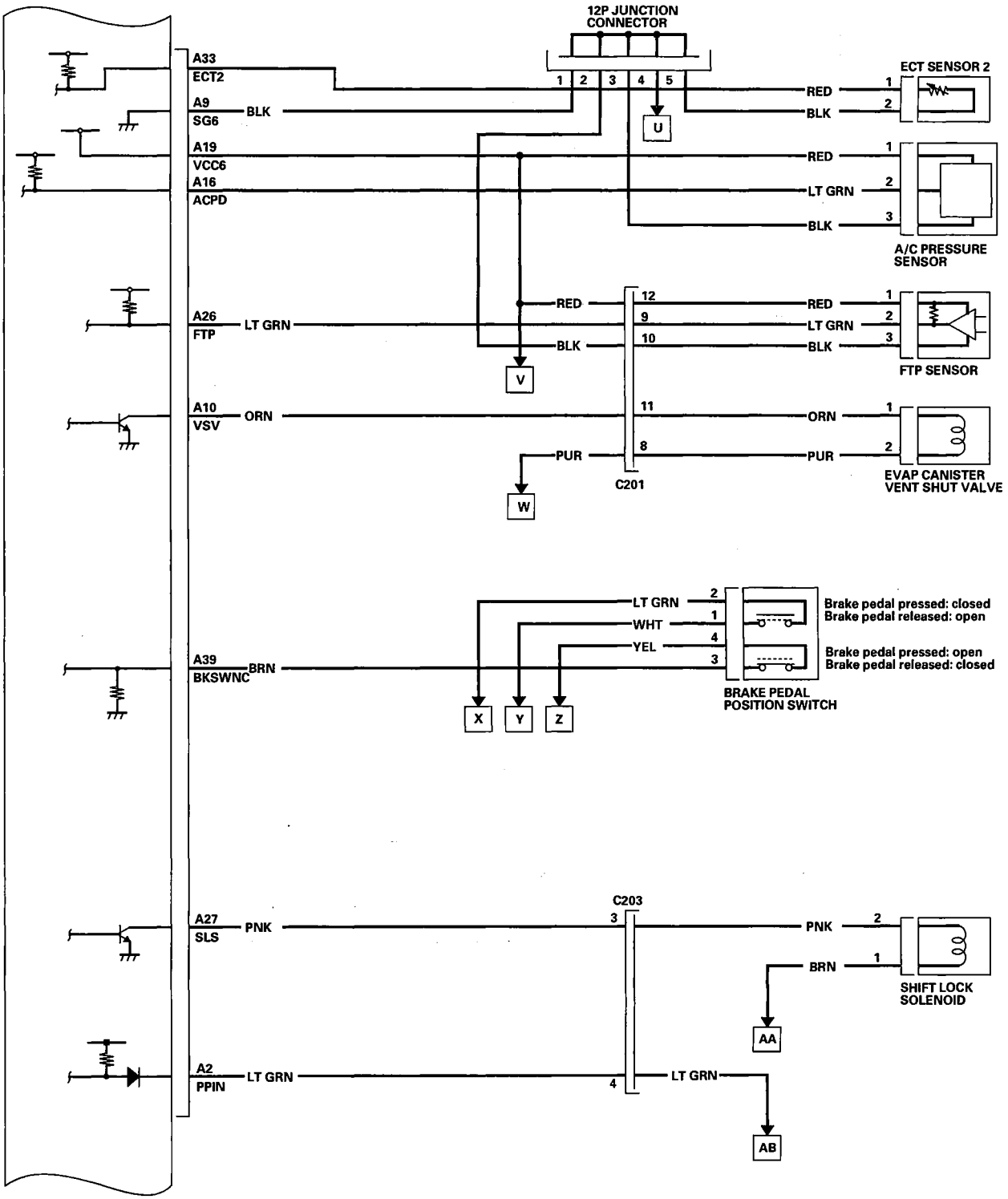


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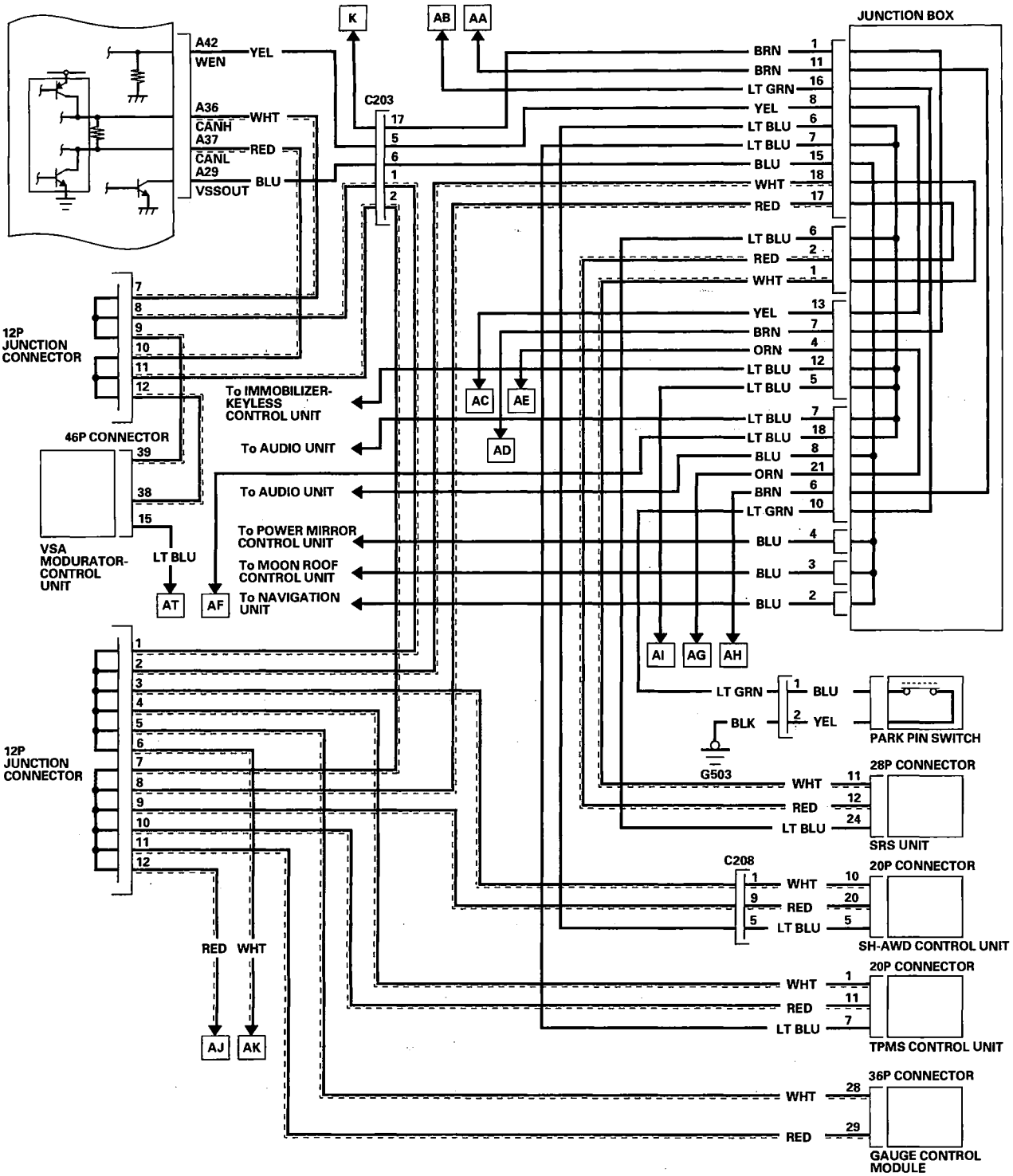
System Description (cont'd)

PCM Circuit Diagram (cont'd)



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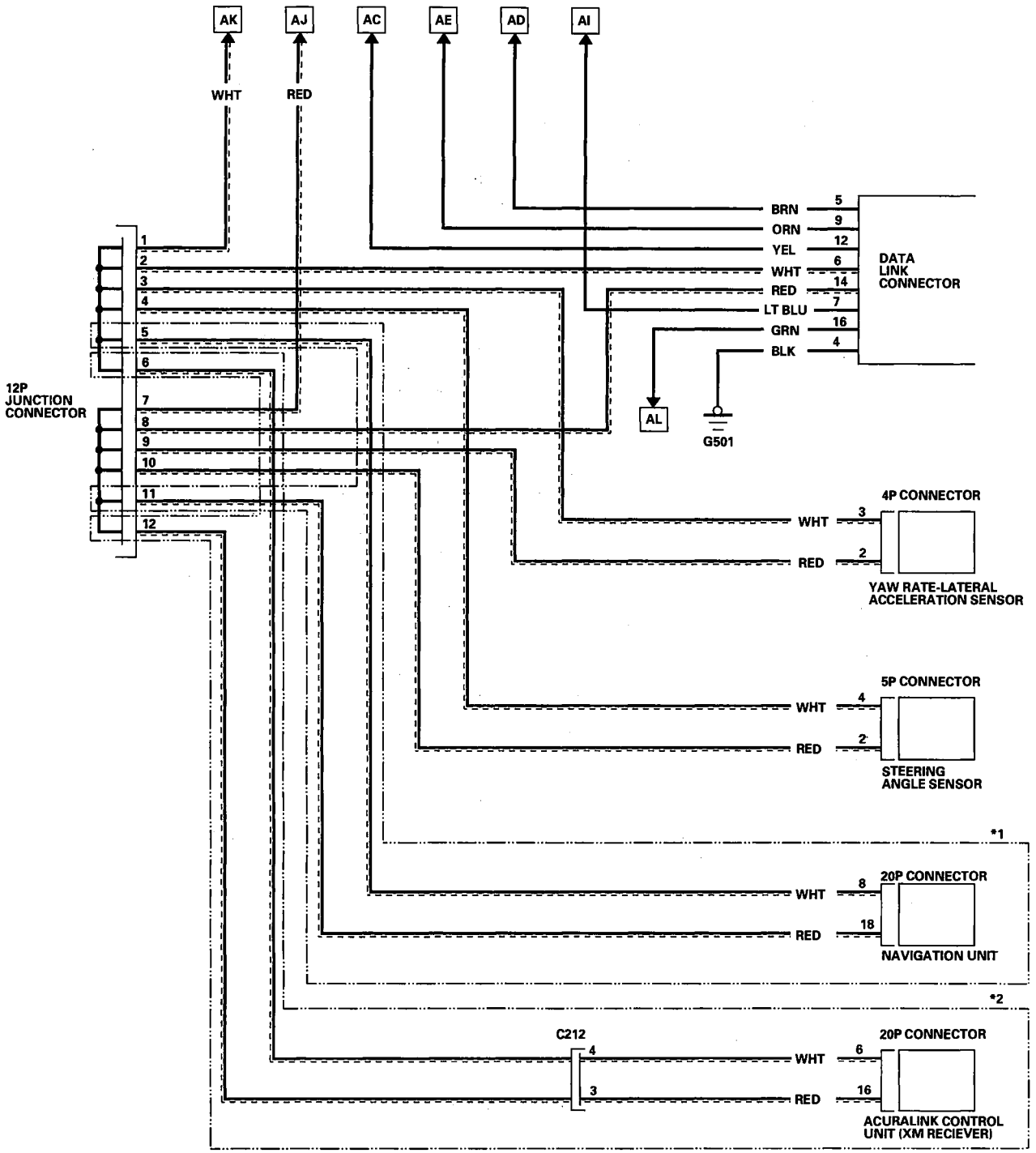


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System Description (cont'd)

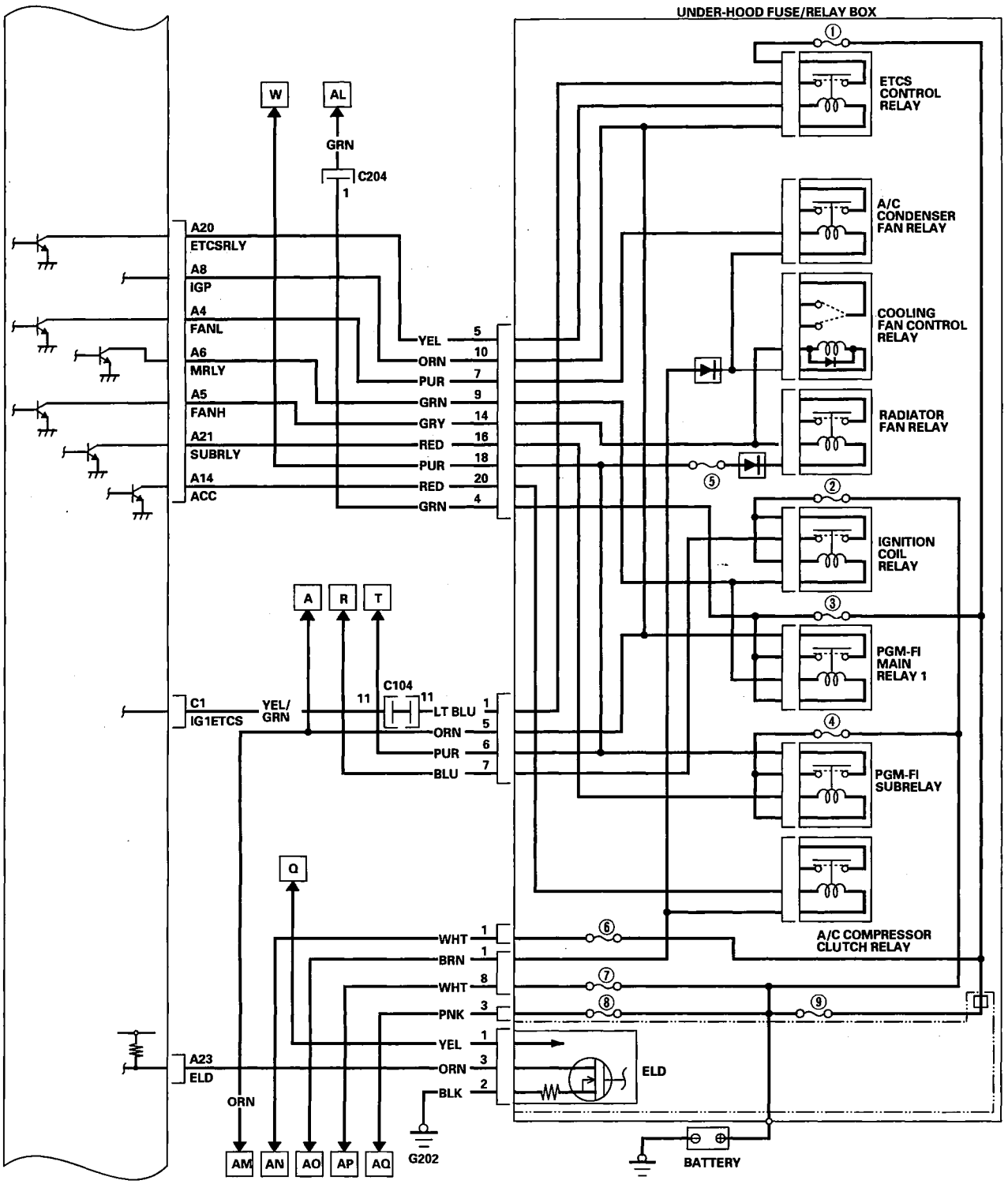
PCM Circuit Diagram (cont'd)



*1: with NAVIGATION
*2: USA with NAVIGATION

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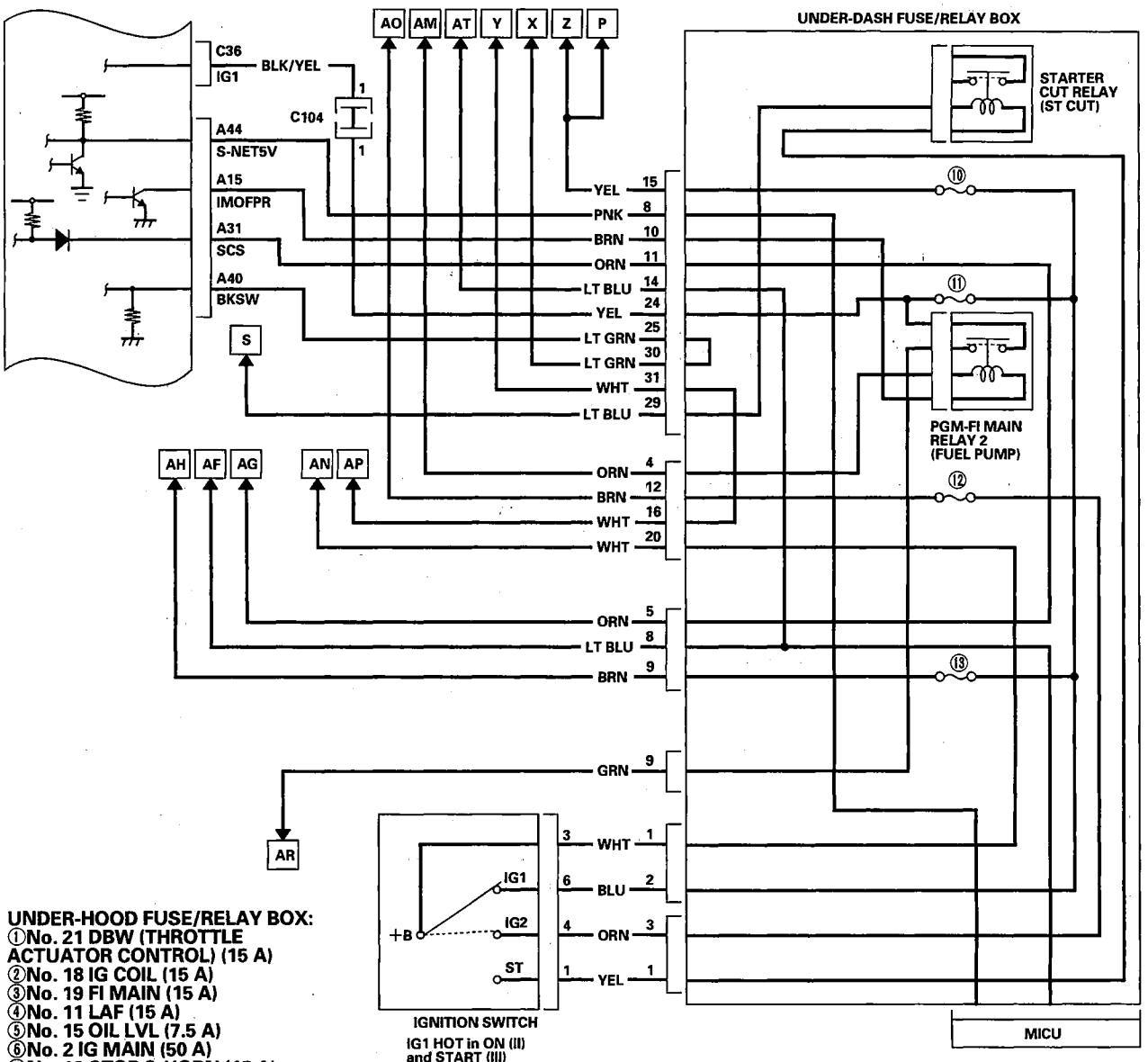


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System Description (cont'd)

PCM Circuit Diagram (cont'd)

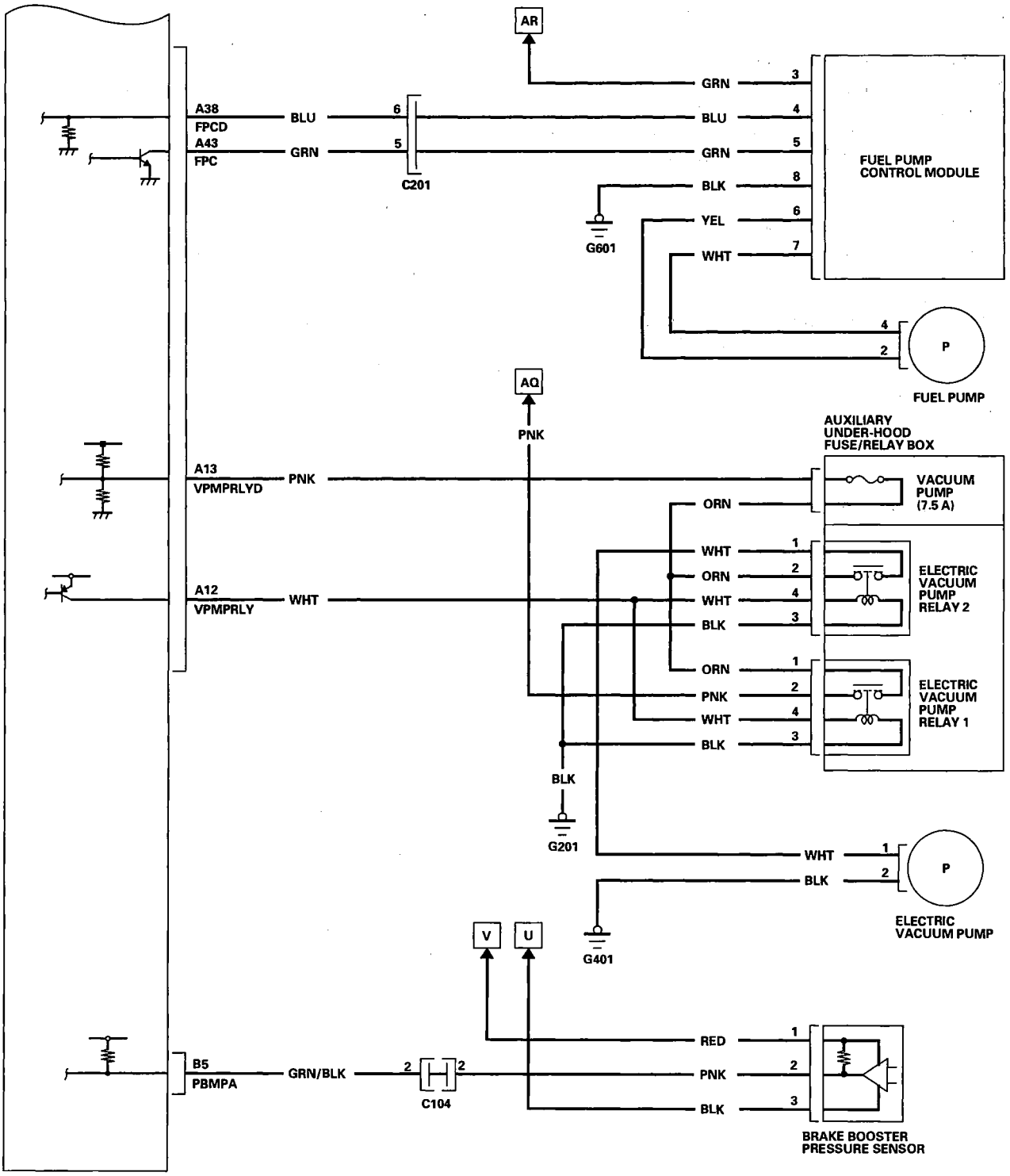


UNDER-HOOD FUSE/RELAY BOX:
①No. 21 DBW (THROTTLE ACTUATOR CONTROL) (15 A)
②No. 18 IG COIL (15 A)
③No. 19 FI MAIN (15 A)
④No. 11 LAF (15 A)
⑤No. 15 OIL LVL (7.5 A)
⑥No. 2 IG MAIN (50 A)
⑦No. 12 STOP & HORN (15 A)
⑧No. 17 VACUUM PUMP (15 A)
⑨No. 1 MAIN FUSE (100 A)

UNDER-DASH FUSE/RELAY BOX:
⑩No. 3 IG1 ACG (15 A)
⑪No. 2 FUEL PUMP (20 A)
⑫No. 36 IG2 HAC (A/C) (10 A)
⑬No. 10 METER (7.5 A)

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How to Set Readiness Codes

Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)

The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the PCM has been reset, these readiness codes are reset to incomplete. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the vehicle may fail the emission test, or the test cannot be finished.

To check if the readiness codes are set to complete, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are set to complete. If it flashes five times, one or more readiness codes are not set to complete. To set readiness codes from incomplete to complete, do the procedure for the appropriate code.

To check the status of a specific DTC system, check the OBD status in the DTC MENU with the HDS (see page 11-9). This screen displays the code, the current data list of the enable criteria, and the status of the readiness testing.

Catalytic Converter Monitor and Readiness Code

NOTE:
- Do not turn the ignition switch off during the procedure.
- All readiness codes are cleared when the battery is disconnected, if the DTCs have been cleared, or if the PCM is reset with the HDS.
- Low ambient temperatures or excessive stop-and-go traffic may increase the drive time needed to switch the readiness code from incomplete to complete.
- The readiness code will not switch to complete until all the enable criteria are met.
- If a fault in the secondary HO2S system caused the MIL to come on, the readiness code cannot be set to complete until you correct the fault.

Enable Criteria

- Engine coolant temperature (ECT SENSOR 1) at 158 °F (70 °C) or more.
- Intake air temperature (IAT SENSOR 1) at 20 °F (—7 °C) or more.
- Vehicle speed (VSS) above 25 mph (40 km/h).

Procedure

1. Connect the HDS to the vehicle's data link connector (DLC), and bring up the READINESS CODEs screen for Catalyst in the DTCs MENU.
2. Start the engine.
3. Test-drive the vehicle under stop-and-go conditions with short periods of steady cruise. After about 5 miles (8 km), the readiness code should switch to complete.
4. If the readiness code is still not set to complete, check for a Temporary DTC with the HDS. If there is no DTC, one or more of the enable criteria were probably not met; repeat the procedure.

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Evaporative Emission (EVAP) Control System Monitor and Readiness Code

NOTE: All readiness codes are cleared when the battery is disconnected, if the DTCs have been cleared, or if the PCM is reset with the HDS.

Enable Criteria

- Battery voltage is more than 10.5 V.
- Engine at idle.
- Engine coolant temperature (ECT SENSOR 1 and 2) between 176 °F (80 °C) and 212 °F (100 °C).
- Vehicle speed (VSS) 0 mph (0 km/h).
- Intake air temperature (IAT SENSOR 1) between 32 °F (0 °C) and 212 °F (100 °C).

Procedure

1. Connect the HDS to the DLC.
2. Start the engine.
3. Select EVAP TEST in the INSPECTION MENU with the HDS, then select the FUNCTION TEST in the EVAP TEST MENU.
   - If the result is normal, readiness is complete.
   - If the result is not normal, go to the next step.
4. Check for a Temporary DTC. If there is no DTC, one or more of the enable criteria were probably not met; repeat the procedure.

Air Fuel Ratio (A/F) Sensor Monitor and Readiness Code

NOTE:
- Do not turn the ignition switch off during the procedure.
- All readiness codes are cleared when the battery is disconnected, if the DTCs have been cleared, or if the PCM is reset with the HDS.

Enable Criteria

Engine coolant temperature (ECT SENSOR 1) at 140 °F (60 °C) or more.

Procedure

1. Start the engine.
2. Test-drive the vehicle under stop-and-go conditions with short periods of steady cruise. During the drive, decelerate (with the throttle fully closed) for 5 seconds. After about 3.5 miles (5.6 km), the readiness code should switch from incomplete to complete.
3. Check the readiness codes screen for the AIR FUEL RATIO (A/F) SENSOR in the DTCs MENU with the HDS.
   - If the screen shows complete, readiness is complete.
   - If the screen shows not complete, go to the next step.
4. Check for a Temporary DTC. If there is no DTC, the enable criteria was probably not met. Select the DATA LIST MENU. Check the ECT SENSOR 1 in the ALL DATA LIST with the HDS. If ECT SENSOR 1 is less than 140 °F (60 °C), run the engine until it is more than 140 °F (60 °C), then repeat the procedure.

(cont'd)

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How to Set Readiness Codes (cont'd)

Air Fuel Ratio (A/F) Sensor Heater Monitor Readiness Code

NOTE: All readiness codes are cleared when the battery is disconnected, if the DTCs have been cleared, or if the PCM is reset with the HDS.

Procedure

1. Start the engine, and let it idle for 1 minute. The readiness code should switch from incomplete to complete.

2. If the readiness code is still not set to complete, check for a Temporary DTC. If there is no DTC, repeat the procedure.

Misfire Monitor and Readiness Code

- This readiness code is always set to available because misfiring is continuously monitored.
- Monitoring pauses, and the misfire counter resets, if the vehicle is driven over a rough road.
- Monitoring also pauses, and the misfire counter holds at its current value, if the throttle position changes more than a predetermined value, or if driving conditions fall outside the range of any related enable criteria.

Fuel System Monitor and Readiness Code

- This readiness code is always set to available because the fuel system is continuously monitored during closed loop operation.
- Monitoring pauses when the catalytic converter, EVAP control system, and A/F sensor monitors are active.
- Monitoring also pauses when any related enable criteria are not being met. Monitoring resumes when the enable criteria is again being met.

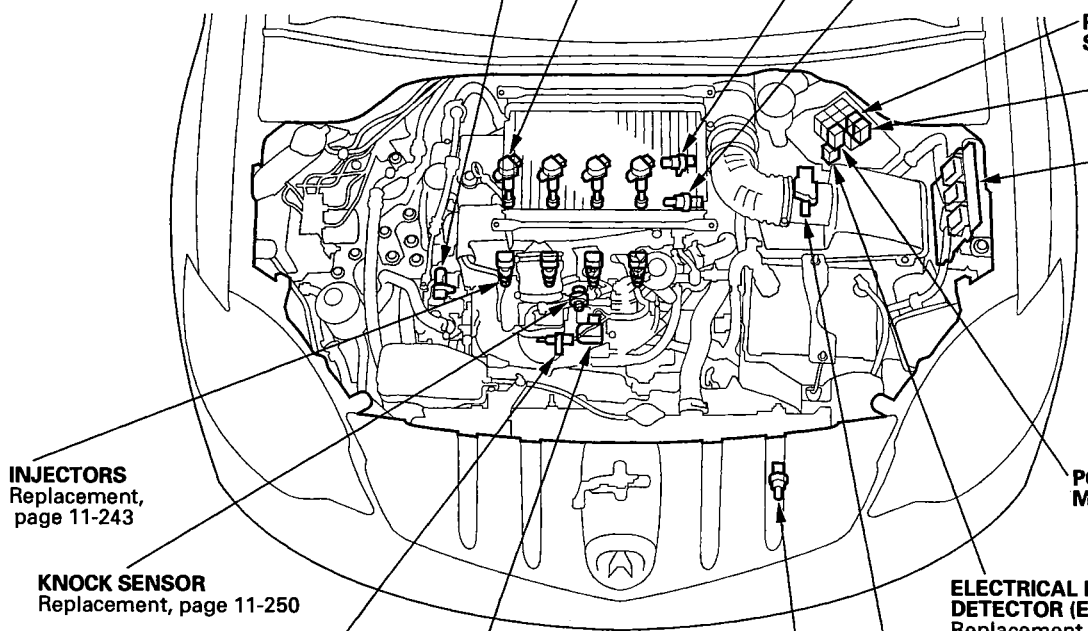
Comprehensive Component Monitor and Readiness Code

This readiness code is always set to available because the comprehensive component monitor is continuously running whenever the engine is cranking or running.

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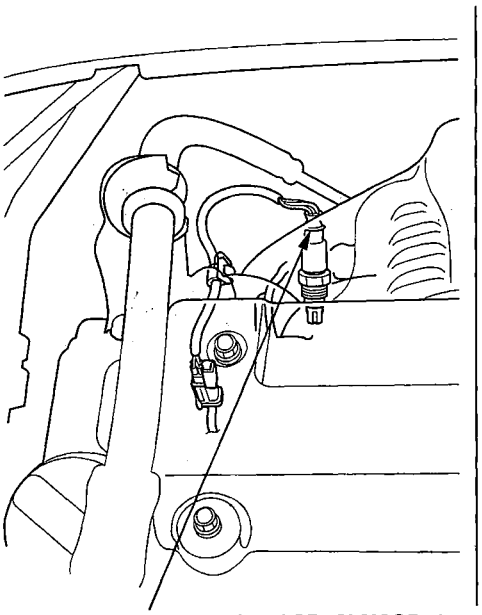
Component Location Index



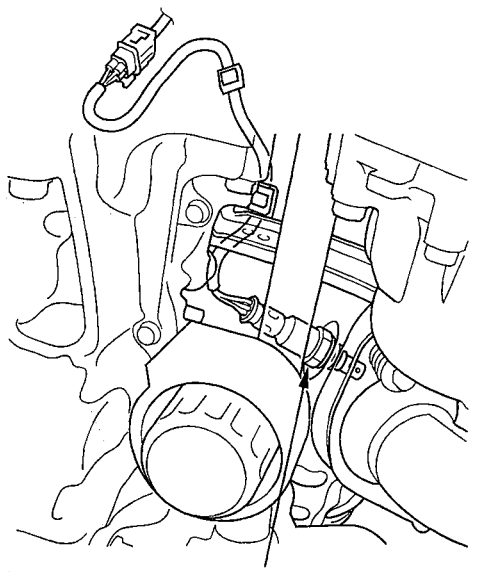
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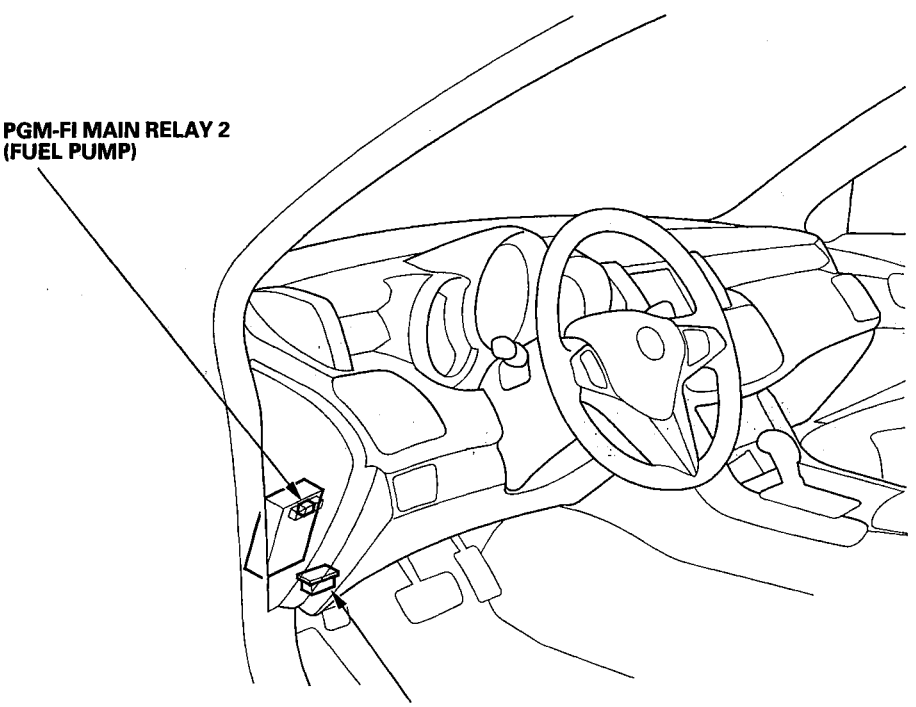
Component Location Index (cont'd)



AIR FUEL RATIO (A/F) SENSOR (SENSOR 1)
Replacement, page 11-245



SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
Replacement, page 11-245



DATA LINK CONNECTOR (DLC)
General Troubleshooting Information, page 11-3
Circuit Troubleshooting, page 11-229

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DTC P0096: IAT Sensor 2 Circuit Range/ Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check for poor connections or loose terminals at ECT sensors 1/2 and IAT sensor 2.

   Are the connections and terminals OK?

   YES—Go to step 2.

   NO—Repair the connectors or terminals, then go to step 15.

2. Remove the IAT sensor 2 (see page 11-248).
3. Allow IAT sensor 2 to cool to ambient temperature.
4. Note the ambient temperature.
5. Connect the IAT sensor 2 to the 2P connector, but do not install the sensor onto the intake manifold.
6. Turn the ignition switch ON (II).
7. Note the value of IAT SENSOR 2 quickly in the DATA LIST with the HDS.
8. Compare the value of IAT SENSOR 2 and the ambient temperature.

   Does the value of IAT SENSOR 2 differ 5.4 °F (3 °C) or more?

   YES—Go to step 13.

   NO—Go to step 9.

9. Disconnect IAT sensor 2 from its 2P connector.
10. Using a heat gun, blow hot air on IAT sensor 2 for a few seconds. Do not apply the heat longer than a few seconds or you will damage the sensor.
11. Connect IAT sensor 2 to its 2P connector, but do not install the sensor onto the intake manifold.
12. Check IAT SENSOR 2 in the DATA LIST with the HDS.

    Does IAT SENSOR 2 change 58 °F (32 °C) or more?

    YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 2 and the PCM. ■

    NO—Go to step 13.

13. Turn the ignition switch OFF.
14. Replace IAT sensor 2 (see page 11-248).
15. Turn the ignition switch ON (II).
16. Reset the PCM with the HDS.
17. Do the PCM idle learn procedure (see page 11-339).
18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0096 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 2 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0097: IAT Sensor 2 Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check IAT SENSOR 2 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 3.

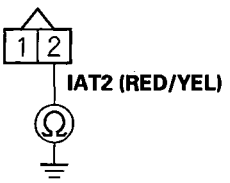
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 2 and the PCM.■
3. Turn the ignition switch OFF.
4. Disconnect IAT sensor 2 2P connector.
5. Turn the ignition switch ON (II).
6. Check IAT SENSOR 2 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector B (44P).
10. Check for continuity between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between IAT sensor 2 and the PCM (B31), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace IAT sensor 2 (see page 11-248).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0097 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 2 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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18. Reconnect all connectors.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0097 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 2 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0098: IAT Sensor 2 Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

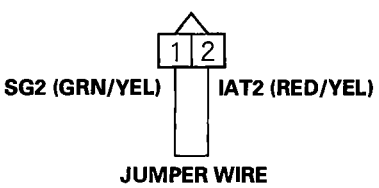
1. Turn the ignition switch ON (II).
2. Check IAT SENSOR 2 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 2 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect IAT sensor 2 2P connector.
5. Connect IAT sensor 2 2P connector terminals No. 1 and No. 2 with a jumper wire.

IAT SENSOR 2 2P CONNECTOR



Wire side of female terminals

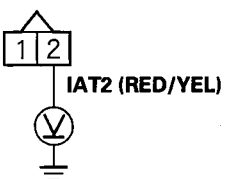
6. Turn the ignition switch ON (II).
7. Check IAT SENSOR 2 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 20
8. Turn the ignition switch OFF.
9. Remove the jumper wire from IAT sensor 2 2P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between IAT sensor 2 2P connector terminal No. 2 and body ground.

IAT SENSOR 2 2P CONNECTOR



Wire side of female terminals

Is there about 5 V?

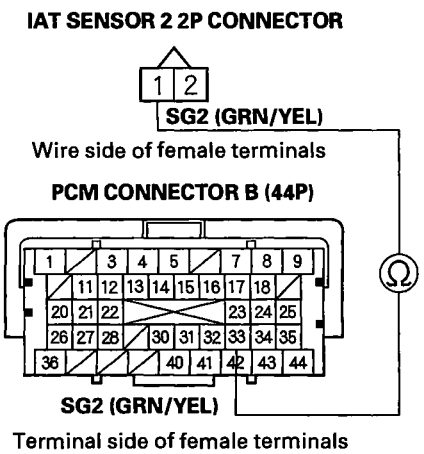
YES—Go to step 12.

NO—Go to step 16.

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12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector B (44P).
15. Check for continuity between IAT sensor 2 2P connector terminal No. 1 and PCM connector terminal B33.

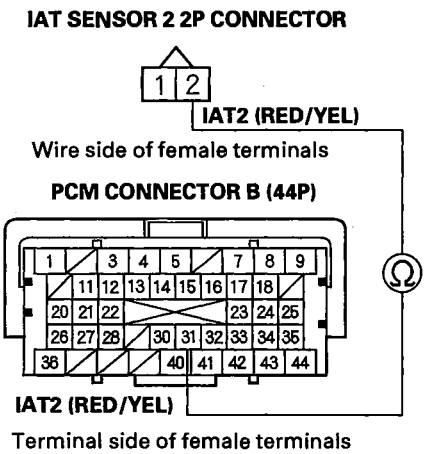


Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B33) and IAT sensor 2, then go to step 22.

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector B (44P).
19. Check for continuity between IAT sensor 2 2P connector terminal No. 2 and PCM connector terminal B31.



Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B31) and IAT sensor 2, then go to step 22.

(cont'd)

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DTC Troubleshooting (cont'd)

20. Turn the ignition switch OFF.
21. Replace IAT sensor 2 (see page 11-248).
22. Reconnect all connectors.
23. Turn the ignition switch ON (II).
24. Reset the PCM with the HDS.
25. Do the PCM idle learn procedure (see page 11-339).
26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0098 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 2 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
27. Reconnect all connectors.
28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
29. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0098 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 2 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0101: MAF Sensor Circuit Range/ Performance Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P2228 and/or P2229 are stored at the same time as DTC P0101, troubleshoot those DTCs first, then recheck for DTC P0101.

1. Check for poor connections or damage to these parts:

   - PCV hose
   - Air cleaner
   - Intake air duct (air flow tube)
   - Intake manifold
   - Purge (PCS) line
   - Brake booster
   - Brake booster hose
   - Turbocharger
   - Intake air duct (turbocharger inlet tube and pipe)
   - Intake air duct (turbocharger outlet pipe)
   - Charge air cooler
   - Intake air duct (charge air cooler inlet hose)
   - Intake air duct (charge air cooler outlet tube)
   - Turbocharger bypass control solenoid valve
   - Pressure regulator (vacuum hose line)

   Are the parts OK?

   YES—Go to step 2.

   NO—Repair or replace the damaged parts, then go to step 15.

2. Check for damage or looseness at the air duct in the air cleaner.

   Is it OK?

   YES—Go to step 3.

   NO—Reconnect or replace the air duct in the air cleaner, then go to step 15.

3. Check for a dirty air cleaner element.

   Is it dirty?

   YES—Replace the air cleaner element (see page 11-395), then go to step 15.

   NO—Go to step 4.

4. Turn the ignition switch OFF.

5. Turn the ignition switch ON (II).

6. Check the MAF SENSOR in the DATA LIST with the HDS.

   Is there about 0.2 gm/s or 0.5 V?

   YES—Go to step 7.

   NO—Go to step 13.

7. Start the engine.

8. Vary the engine speed between 2,000 rpm and 3,000 rpm.

9. Check the MAF SENSOR in the DATA LIST with the HDS.

   Does the reading change?

   YES—Go to step 10.

   NO—Go to step 13.

10. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

11. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - MAP SENSOR
    - MAF SENSOR

12. Monitor the OBD STATUS for DTC P0101 in the DTCs MENU with the HDS.

    Does the screen indicate FAILED?

    YES—Go to step 13.

    NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAF sensor and the PCM. If the screen indicates NOT COMPLETED, go to step 11 and recheck.

(cont'd)

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DTC Troubleshooting (cont'd)

13. Turn the ignition switch OFF.
14. Replace MAF sensor/IAT sensor 1 (see page 11-247).
15. Turn the ignition switch ON (II).
16. Reset the PCM with the HDS.
17. Do the PCM idle learn procedure (see page 11-339).
18. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:
    - ENGINE SPEED
    - VSS
    - MAP SENSOR
    - MAF SENSOR
19. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0101 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor and the PCM, then go to step 1.

    NO—Go to step 20.
20. Monitor the OBD STATUS for DTC P0101 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 19, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the MAF sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 18.

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DTC P0102: MAF Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II), and wait 2 seconds.
2. Check the MAF SENSOR in the DATA LIST with the HDS.

   Is about 0 gm/s, or 0.1 V or less indicated?

   YES—Go to step 3.

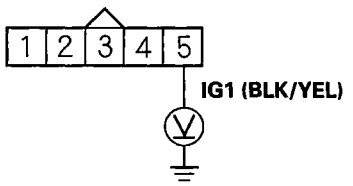
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAF sensor and the PCM. ■
3. Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 4.

   NO—Repair short in the wire between the MAF sensor and the No. 3 IG1 ACG (15 A) fuse. Also replace the No. 3 IG1 ACG (15 A) fuse, then go to step 20.
4. Turn the ignition switch OFF.
5. Disconnect the MAF sensor/IAT sensor 1 5P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between MAF sensor/IAT sensor 1 5P connector terminal No. 5 and body ground.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

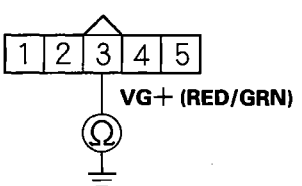
Is there battery voltage?

YES—Go to step 8.

NO—Repair open in the wire between the No. 3 IG1 ACG (15 A) fuse and the MAF sensor, then go to step 20.

8. Turn the ignition switch OFF.
9. Measure resistance between MAF sensor/IAT sensor 1 5P connector terminal No. 3 and body ground.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

Is there 190—210 kΩ?

YES—Go to step 14.

NO—Go to step 10.

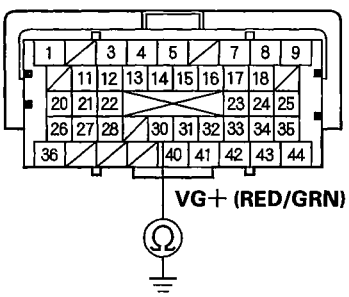
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DTC Troubleshooting (cont'd)

10. Jump the SCS line with the HDS.
11. Disconnect PCM connector B (44P).
12. Check for continuity between PCM connector terminal B30 and body ground.

PCM CONNECTOR B (44P)



Terminal side of female terminals

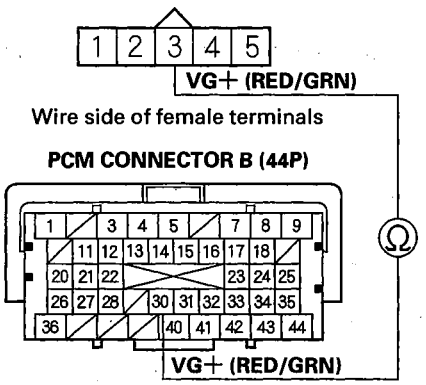
Is there continuity?

YES—Repair short in the wire between the PCM (B30) and the MAF sensor, then go to step 21.

NO—Go to step 13.

13. Check for continuity between MAF sensor/IAT sensor 1 5P connector terminal No. 3 and PCM connector terminal B30.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the PCM (B30) and the MAF sensor, then go to step 21.

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14. Substitute a known-good MAF sensor/IAT sensor 1 (see page 11-247).

15. Reconnect all connectors.

16. Turn the ignition switch ON (II).

17. Clear the DTC with the HDS.

18. Start the engine. Hold the engine speed at 2,000 rpm without load (in Park or neutral).

19. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0102 indicated?

    YES—Go to step 27.

    NO—Replace the original MAF sensor/IAT sensor 1 (see page 11-247), then go to step 20.

20. Turn the ignition switch OFF.

21. Reconnect all connectors.

22. Turn the ignition switch ON (II).

23. Reset the PCM with the HDS.

24. Do the PCM idle learn procedure (see page 11-339).

25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0102 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

26. Reconnect all connectors.

27. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

28. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0102 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0103: MAF Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

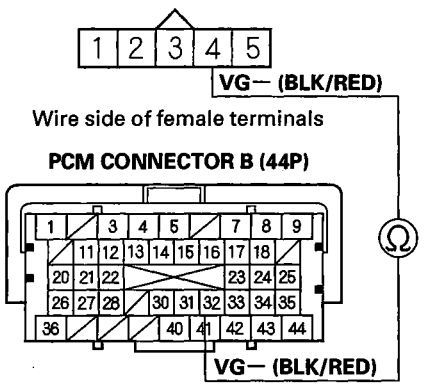
1. Turn the ignition switch ON (II), and wait 2 seconds.
2. Check the MAF SENSOR in the DATA LIST with the HDS.

   Is about 202 gm/s, or 4.89 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAF sensor and the PCM.■
3. Turn the ignition switch OFF.
4. Jump the SCS line with the HDS.
5. Disconnect the MAF sensor/IAT sensor 1 5P connector.
6. Disconnect PCM connector B (44P).
7. Check for continuity between MAF sensor/IAT sensor 1 5P connector terminal No. 4 and PCM connector terminal B32.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Is there continuity?

YES—Go to step 8.

NO—Repair open in the wire between the PCM (B32) and the MAF sensor, then go to step 15.

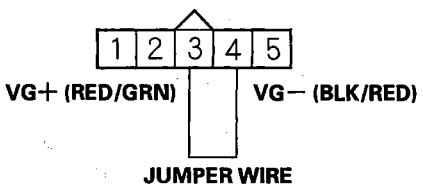
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8. Reconnect PCM connector B (44P).

9. Connect MAF sensor/IAT sensor 1 5P connector terminals No. 3 and No. 4 with a jumper wire.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

10. Turn the ignition switch ON (II).

11. Clear the DTC with the HDS.

12. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0103 indicated?

    YES—Go to step 20.

    NO—Go to step 13.

13. Turn the ignition switch OFF.

14. Replace the MAF sensor/IAT sensor 1 (see page 11-247).

15. Reconnect all connectors.

16. Turn the ignition switch ON (II).

17. Reset the PCM with the HDS.

18. Do the PCM idle learn procedure (see page 11-339).

19. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0103 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

20. Turn the ignition switch OFF.

21. Reconnect all connectors.

22. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

23. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0103 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0107: MAP Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

   YES—Go to step 3.

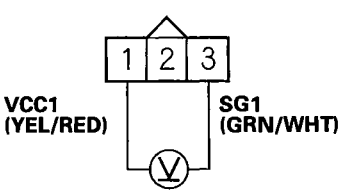
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

   YES—Go to step 12.

   NO—Go to step 7.
7. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

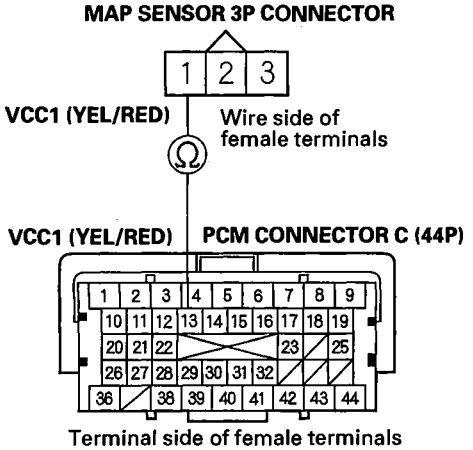
Is there about 5 V?

YES—Go to step 16.

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (44P).
11. Check for continuity between PCM connector terminal C13 and MAP sensor 3P connector terminal No. 1.

MAP SENSOR 3P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the PCM (C13) and the MAP sensor, then go to step 18.

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BACK

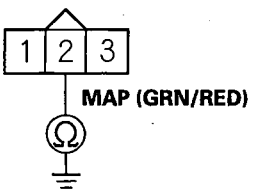
12. Turn the ignition switch OFF.

13. Jump the SCS line with the HDS.

14. Disconnect PCM connector C (44P).

15. Check for continuity between MAP sensor 3P connector terminal No. 2 and body ground.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C11) and the MAP sensor, then go to step 18.

NO—Go to step 23.

16. Turn the ignition switch OFF.

17. Replace the MAP sensor (see page 11-247).

18. Reconnect all connectors.

19. Turn the ignition switch ON (II).

20. Reset the PCM with the HDS.

21. Do the PCM idle learn procedure (see page 11-339).

22. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0107 indicated?

YES—Check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

23. Reconnect all connectors.

24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

25. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0107 indicated?

YES—Check for poor connections or loose terminals at the MAP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0108: MAP Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

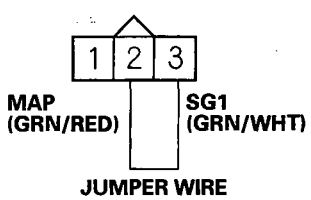
1. Turn the ignition switch ON (II).
2. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Connect MAP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

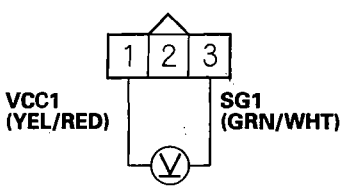
6. Turn the ignition switch ON (II).
7. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 18.
8. Remove the jumper wire from the MAP sensor 3P connector.
9. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

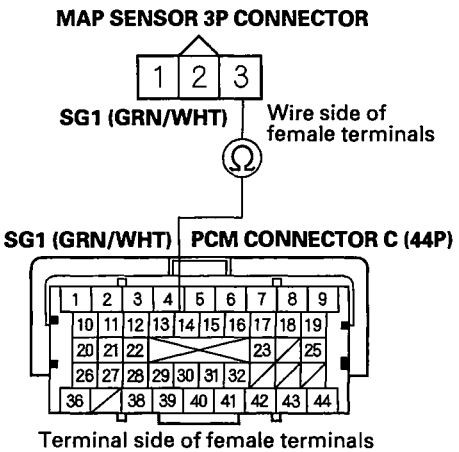
YES—Go to step 14.

NO—Go to step 10.

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10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect PCM connector C (44P).
13. Check for continuity between PCM connector terminal C14 and MAP sensor 3P connector terminal No. 3.

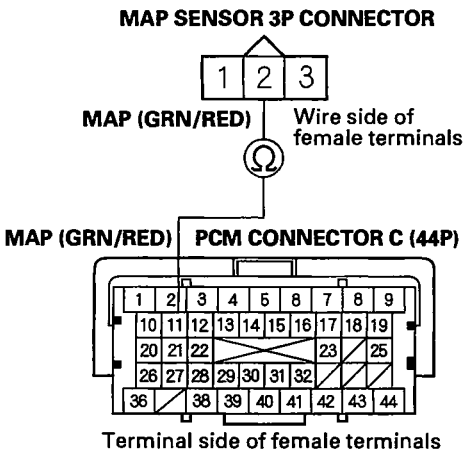


Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the PCM (C14) and the MAP sensor, then go to step 20.

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector C (44P).
17. Check for continuity between PCM connector terminal C11 and MAP sensor 3P connector terminal No. 2.



Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the PCM (C11) and the MAP sensor, then go to step 20.

(cont'd)

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DTC Troubleshooting (cont'd)

18. Turn the ignition switch OFF.
19. Replace the MAP sensor (see page 11-247).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the PCM with the HDS.
23. Do the PCM idle learn procedure (see page 11-339).
24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0108 indicated?

    YES—Check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■
25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0108 indicated?

    YES—Check for poor connections or loose terminals at the MAP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0112: IAT Sensor 1 Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check IAT SENSOR 1 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 3.

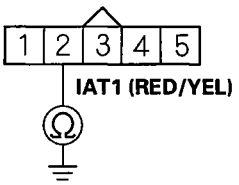
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 1 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the MAF sensor/IAT sensor 1 5P connector.
5. Turn the ignition switch ON (II).
6. Check the IAT SENSOR 1 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector C (44P).
10. Check for continuity between MAF sensor/IAT sensor 1 5P connector terminal No. 2 and body ground.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the IAT sensor 1 and the PCM (A28), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace the MAF sensor/IAT sensor 1 (see page 11-247).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0112 indicated?

    YES—Check for poor connections or loose terminals at the IAT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

18. Reconnect all connectors.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0112 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0113: IAT Sensor 1 Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

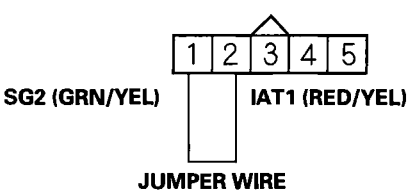
1. Turn the ignition switch ON (II).
2. Check IAT SENSOR 1 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 1 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the MAF sensor/IAT sensor 1 5P connector.
5. Connect MAF sensor/IAT sensor 1 5P connector terminals No. 1 and No. 2 with a jumper wire.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

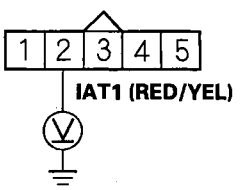
6. Turn the ignition switch ON (II).
7. Check IAT SENSOR 1 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 20
8. Turn the ignition switch OFF.
9. Remove the jumper wire from the MAF sensor/IAT sensor 1 5P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between MAF sensor/IAT sensor 1 5P connector terminal No. 2 and body ground.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 12.

NO—Go to step 16.

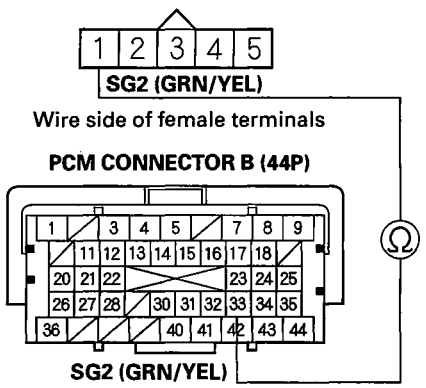
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DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector C (44P).
15. Check for continuity between MAF sensor/IAT sensor 1 5P connector terminal No. 1 and PCM connector terminal B33.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



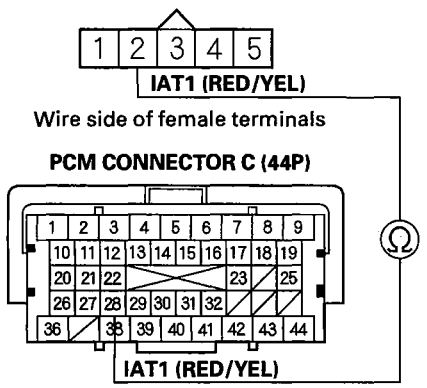
Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B33) and IAT sensor 1, then go to step 22.

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector C (44P).
19. Check for continuity between MAF sensor/IAT sensor 1 5P connector terminal No. 2 and PCM connector terminal C28.

MAF SENSOR/IAT SENSOR 1 5P CONNECTOR



Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (C28) and IAT sensor 1, then go to step 22.

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20. Turn the ignition switch OFF.

21. Replace the MAF sensor/IAT sensor 1 (see page 11-247).

22. Reconnect all connectors.

23. Turn the ignition switch ON (II).

24. Reset the PCM with the HDS.

25. Do the PCM idle learn procedure (see page 11-339).

26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0113 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

27. Reconnect all connectors.

28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

29. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0113 indicated?

    YES—Check for poor connections or loose terminals at the MAF sensor/IAT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0116: ECT Sensor 1 Circuit Range/ Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about 176 °F (80 °C) or more, or 0.78 V or less indicated?

   YES—Go to step 6.

   NO—Go to step 3.
3. Note the value of ECT SENSOR 1 in the DATA LIST with the HDS.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Does ECT SENSOR 1 change 18 °F (10 °C) or more?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1 and the PCM. ■

   NO—Go to step 11.
6. Note the value of ECT SENSOR 1 in the DATA LIST with the HDS.
7. Turn the ignition switch OFF.
8. Open the hood, and let the engine cool for 3 hours.
9. Turn the ignition switch ON (II).
10. Check ECT SENSOR 1 in the DATA LIST with the HDS.

    Does ECT SENSOR 1 change 18 °F (10 °C) or more?

    YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1 and the PCM. ■

    NO—Go to step 11.
11. Turn the ignition switch OFF.
12. Replace ECT sensor 1 (see page 11-249).
13. Turn the ignition switch ON (II).
14. Reset the PCM with the HDS.
15. Do the PCM idle learn procedure (see page 11-339).
16. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0116 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0117: ECT Sensor 1 Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 3.

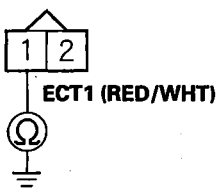
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1 and the PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 1 2P connector.
5. Turn the ignition switch ON (II).
6. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector B (44P).
10. Check for continuity between ECT sensor 1 2P connector terminal No. 1 and body ground.

ECT SENSOR 1 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between ECT sensor 1 and the PCM (B23), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace ECT sensor 1 (see page 11-249).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0117 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

18. Reconnect all connectors.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0117 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC P0118: ECT Sensor 1 Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

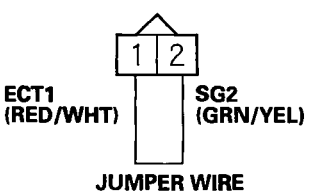
1. Turn the ignition switch ON (II).
2. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 1 2P connector.
5. Connect ECT sensor 1 2P connector terminals No. 1 and No. 2 with a jumper wire.

ECT SENSOR 1 2P CONNECTOR



Wire side of female terminals

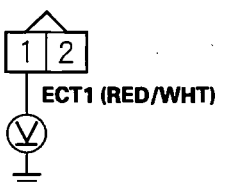
6. Turn the ignition switch ON (II).
7. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 20
8. Turn the ignition switch OFF.
9. Remove the jumper wire from the ECT sensor 1 2P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between ECT sensor 1 2P connector terminal No. 1 and body ground.

ECT SENSOR 1 2P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 12.

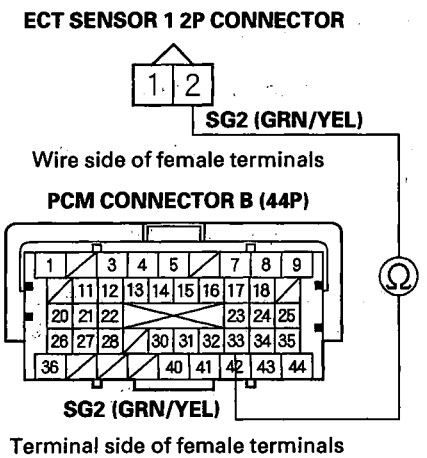
NO—Go to step 16.

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DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector B (44P).
15. Check for continuity between ECT sensor 1 2P connector terminal No. 2 and PCM connector terminal B33.

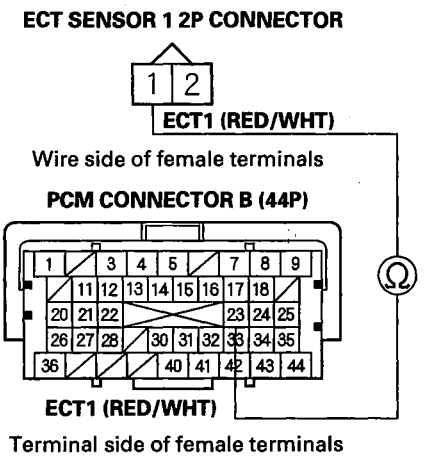


Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B33) and ECT sensor 1, then go to step 22.

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector B (44P).
19. Check for continuity between ECT sensor 1 2P connector terminal No. 1 and PCM connector terminal B23.



Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B23) and ECT sensor 1, then go to step 22.

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20. Turn the ignition switch OFF.
21. Replace ECT sensor 1 (see page 11-249).
22. Reconnect all connectors.
23. Turn the ignition switch ON (II).
24. Reset the PCM with the HDS.
25. Do the PCM idle learn procedure (see page 11-339).
26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0118 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
27. Reconnect all connectors.
28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
29. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0118 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P0125: ECT Sensor 1 Malfunction/Slow Response

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Start the engine, and let it idle for 5 minutes or more.
2. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about −1 °F (−18 °C) or less indicated?

   YES—Go to step 9.

   NO—Go to step 3.
3. Allow the engine to cool to 104 °F (40 °C) or less.
4. Note the value of ECT SENSOR 1 and ECT SENSOR 2 in the DATA LIST with the HDS.
5. Start the engine, and let it idle.
6. Let the engine idle until ECT SENSOR 1 goes up 49 °F (27 °C) or more from the recorded temperature.
7. Note the value of ECT SENSOR 2 in the DATA LIST with the HDS.
8. Compare ECT SENSOR 2 and the recorded temperature.

   Did ECT SENSOR 2 change 17 °F (9.5 °C) or more?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. ■

   NO—Check the thermostat (see page 10-4). If the thermostat is OK, go to step 9. If the thermostat is faulty, replace the thermostat (see page 10-9), then go to step 11.
9. Turn the ignition switch OFF.
10. Replace ECT sensor 1 (see page 11-249).
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Allow the engine to cool to ambient temperature.
15. Start the engine, and let it idle for 20 minutes.
16. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0125 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1.

    NO—Go to step 17.
17. Monitor the OBD STATUS for DTC P0125 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 16, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 14.

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DTC P0128: Cooling System Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the blower switch OFF.
4. Check the FAN CTRL in the DATA LIST with the HDS.

   Is it OFF?

   YES—Go to step 5.

   NO—Wait until the FAN CTRL is off, then go to step 5.
5. Check the radiator fan operation.

   Does the radiator fan keep running?

   YES—Check the radiator fan circuit (see page 10-25), and the radiator fan relay (see page 22-64). If the circuits and the relay are OK, go to step 19.

   NO—Go to step 6.
6. Let the engine cool until the coolant temperature is 104 °F (40 °C) or less.
7. Note the value of ECT SENSOR 1 and ECT SENSOR 2 in the DATA LIST with the HDS.
8. Start the engine, and let it idle.
9. Let the engine idle until ECT SENSOR 1 goes up 41 °F (23 °C) or more from the recorded temperature.
10. Check ECT SENSOR 2 in the DATA LIST with the HDS.
11. Compare the recorded value of ECT SENSOR 2 and the present value of ECT SENSOR 2.

    Did temperature rise 14 °F (8 °C) or more?

    YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. ■

    NO—Test the thermostat (see page 10-4), then go to step 12.
12. Turn the ignition switch ON (II).
13. Reset the PCM with the HDS.
14. Let the engine cool until the coolant temperature is between 21 °F (—6 °C) and 104 °F (40 °C).
15. Do the PCM idle learn procedure (see page 11-339).
16. Test-drive at a steady speed between 15—75 mph (24—120 km/h) for 10 minutes.
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0128 indicated?

    YES—Check the cooling system, then go to step 1.

    NO—Go to step 18.
18. Monitor the OBD STATUS for DTC P0128 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check the cooling system, then go to step 1. If the screen indicates NOT COMPLETED, go to step 14.

(cont'd)

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DTC Troubleshooting (cont'd)

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Let the engine cool until the coolant temperature is between 21 °F (−6 °C) and 104 °F (40 °C).

21. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

22. Test-drive at a steady speed between 15—75 mph (24—120 km/h) for 10 minutes.

23. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0128 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1.

    NO—Go to step 24.

24. Monitor the OBD STATUS for DTC P0128 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 20.

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BACK

DTC P0133: A/F Sensor (Sensor 1) Malfunction/Slow Response

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Drive the vehicle at 25 mph (40 km/h) or less for 5 minutes, then drive at a steady speed between 26—81 mph (41—130 km/h).
5. Monitor the OBD STATUS for DTC P0133 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the A/F sensor (Sensor 1) (see page 11-245).
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Drive the vehicle at 25 mph (40 km/h) or less for 5 minutes, then drive at a steady speed between 26—81 mph (41—130 km/h).
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0133 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P0133 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11.

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DTC Troubleshooting (cont'd)

DTC P0134: A/F Sensor (Sensor 1) Heater System Malfunction

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If the vehicle was out of fuel and the engine stalled before this DTC was stored, refuel and clear the DTC with the HDS.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral) for at least 1 minute.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0134 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM. ■
5. Turn the ignition switch OFF.
6. Replace the A/F sensor (Sensor 1) (see page 11-245).
7. Turn the ignition switch ON (II).
8. Reset the PCM with the HDS.
9. Do the PCM idle learn procedure (see page 11-339).
10. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0134 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM, then go to step 1.

    NO—Go to step 11.
11. Monitor the OBD STATUS for DTC P0134 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 10, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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BACK

DTC P0135: A/F Sensor (Sensor 1) Heater Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0135 indicated?

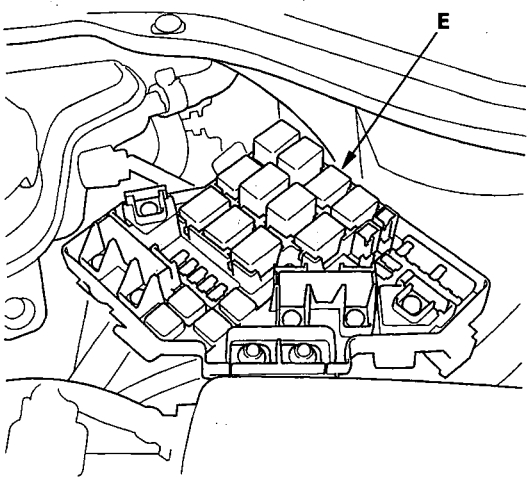
   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM. ■
5. Turn the ignition switch OFF.
6. Check the No. 11 LAF (15 A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES—Go to step 7.

   NO—Go to step 20.
7. Test the PGM-FI subrelay (E) in the under-hood fuse/relay box (see page 22-64).

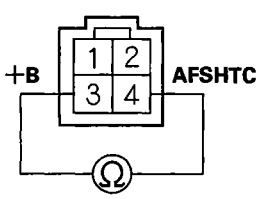


   Is the PGM-FI subrelay OK?

   YES—Go to step 8.

   NO—Replace the PGM-FI subrelay, then go to step 27.
8. Disconnect the A/F sensor (Sensor 1) 4P connector.
9. At the sensor side, measure resistance between A/F sensor (Sensor 1) 4P connector terminals No. 3 and No. 4.

A/F SENSOR (SENSOR 1) 4P CONNECTOR



Terminal side of male terminals

Is there 2.0—2.7 Ω at room temperature?

YES—Go to step 10.

NO—Go to step 25.

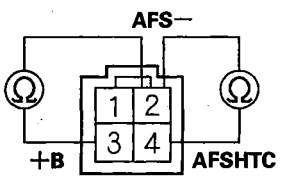
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DTC Troubleshooting (cont'd)

10. At the sensor side, check for continuity between A/F sensor (Sensor 1) 4P connector terminals No. 2 and No. 3, and between terminals No. 2 and No. 4 individually.

A/F SENSOR (SENSOR 1) 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Go to step 25.

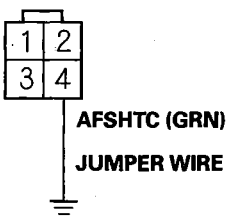
NO—Go to step 11.

11. Jump the SCS line with the HDS.

12. Disconnect PCM connector C (44P).

13. Connect A/F sensor (Sensor 1) 4P connector terminal No. 4 to body ground with a jumper wire.

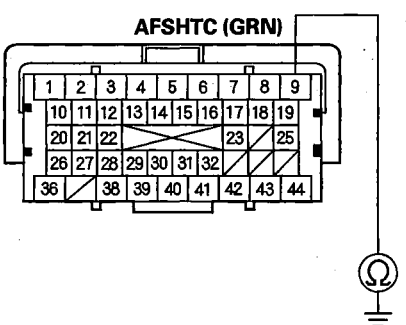
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between PCM connector terminal C9 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

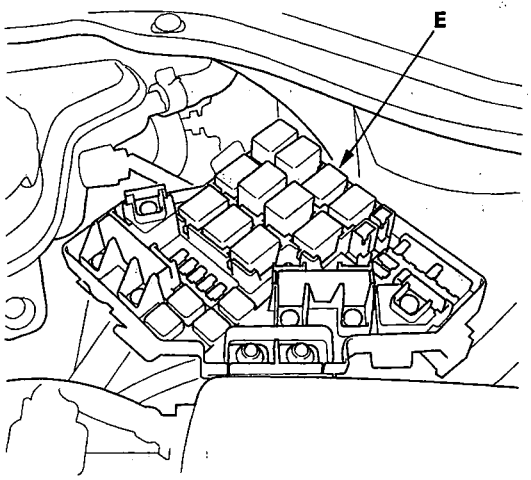
YES—Go to step 15.

NO—Repair open in the wire between the PCM (C9) and the A/F sensor (Sensor 1), then go to step 26.

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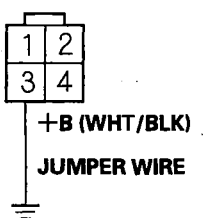
BACK

15. Remove the PGM-FI subrelay (E) from the under-hood fuse/relay box.



16. Connect A/F sensor (Sensor 1) 4P connector terminal No. 3 to body ground with a jumper wire.

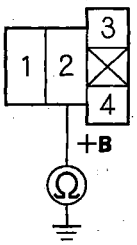
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

17. Check for continuity between PGM-FI subrelay 4P connector terminal No. 2 and body ground.

PGM-FI SUBRELAY 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 18.

NO—Repair open in the wire between the A/F sensor (Sensor 1) and the PGM-FI subrelay, then go to step 26.

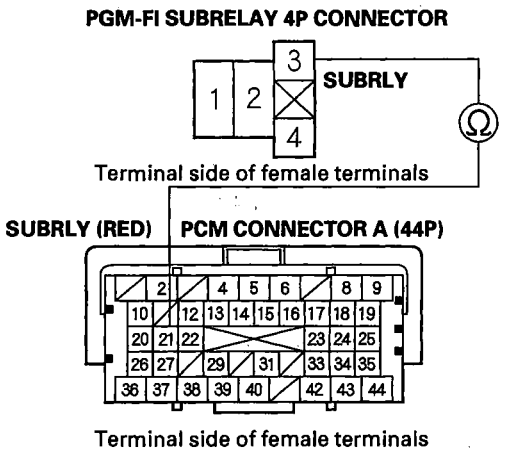
18. Disconnect PCM connector A (44P).

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DTC Troubleshooting (cont'd)

19. Check for continuity between PGM-FI subrelay 4P connector terminal No. 3 and PCM connector terminal A21.

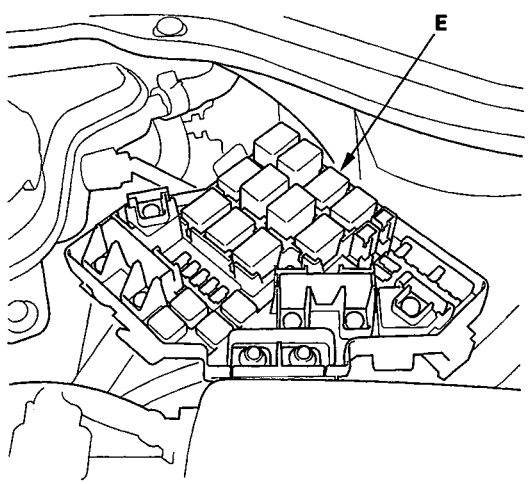


Is there continuity?

YES—Go to step 32.

NO—Repair open in the wire between the PCM (A21) and the PGM-FI subrelay, then go to step 26.

20. Remove the PGM-FI subrelay (E) from the under-hood fuse/relay box.

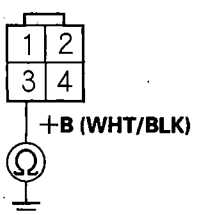


21. Disconnect the A/F sensor (Sensor 1) 4P connector.

22. Disconnect the EVAP canister purge valve 2P connector.

23. Disconnect the EVAP canister vent shut valve 2P connector.

24. Check for continuity between A/F sensor (Sensor 1) 4P connector terminal No. 3 and body ground.



Is there continuity?

YES—Repair short in the wire between the PGM-FI subrelay, the EVAP canister purge valve, the EVAP canister vent shut valve, and the A/F sensor (Sensor 1). Also replace the No. 11 LAF (15 A) fuse, then go to step 26.

NO—Replace the under-hood fuse/relay box (see page 22-61), then go to step 26.

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BACK

25. Replace the A/F sensor (Sensor 1) (see page 11-245).

26. Reconnect all connectors.

27. Turn the ignition switch ON (II).

28. Reset the PCM with the HDS.

29. Do the PCM idle learn procedure (see page 11-339).

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0135 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM, then go to step 1.

    NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0135 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

32. Reconnect all connectors.

33. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

34. Start the engine, and let it idle.

35. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0135 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 34. If the PCM was substituted, go to step 1.

    NO—Go to step 36.

36. Monitor the OBD STATUS for DTC P0135 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 35, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the PGM-FI subrelay, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 34. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 5.

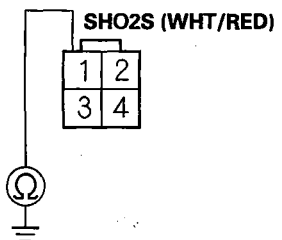
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the secondary HO2S (Sensor 2) 4P connector.
7. Turn the ignition switch ON (II).
8. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 9.

   NO—Go to step 13.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (44P).
12. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 1 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C27) and the secondary HO2S (Sensor 2), then go to step 15.

NO—Go to step 23.

13. Turn the ignition switch OFF.
14. Replace the secondary HO2S (Sensor 2) (see page 11-245).
15. Reconnect all connectors.
16. Turn the ignition switch ON (II).
17. Reset the PCM with the HDS.
18. Do the PCM idle learn procedure (see page 11-339).
19. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.

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BACK

20. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed between 1,500—3,000 rpm
    - Maintain a steady speed about 1 minute or more

21. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0137 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1.

    NO—Go to step 22.

22. Monitor the OBD STATUS for DTC P0137 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 21, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 19.

23. Reconnect all connectors.

24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

25. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.

26. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed between 1,500—3,000 rpm
    - Maintain a steady speed about 1 minute or more

27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0137 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 25. If the PCM was substituted, go to step 1.

    NO—Go to step 28.

28. Monitor the OBD STATUS for DTC P0137 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 27, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 25. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 25.

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DTC Troubleshooting (cont'd)

DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

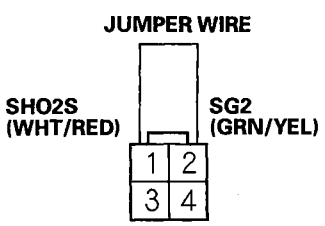
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 1.25 V or more?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the secondary HO2S (Sensor 2) 4P connector.
7. Connect secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

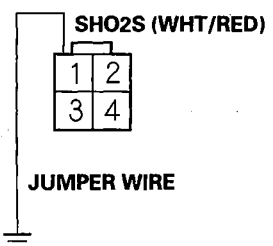
8. Turn the ignition switch ON (II).
9. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 1.25 V or more?

   YES—Go to step 10.

   NO—Go to step 19.
10. Turn the ignition switch OFF.
11. Remove the jumper wire from the secondary HO2S (Sensor 2) 4P connector.
12. Connect secondary HO2S (Sensor 2) 4P connector terminal No. 1 to body ground with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

13. Turn the ignition switch ON (II).
14. Check the HO2S S2 in the DATA LIST with the HDS.

    Does the voltage stay at 1.25 V or more?

    YES—Go to step 15.

    NO—Repair open in the wire between the PCM (B33) and the secondary HO2S (Sensor 2), then go to step 21.

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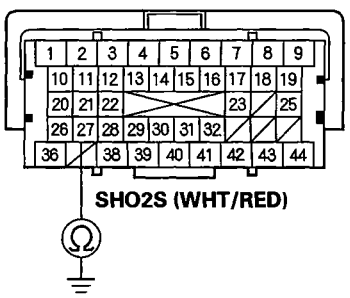
15. Turn the ignition switch OFF.

16. Jump the SCS line with the HDS.

17. Disconnect PCM connector C (44P).

18. Check for continuity between PCM connector terminal C27 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 29.

NO—Repair open in the wire between the PCM (C27) and the secondary HO2S (Sensor 2), then go to step 21.

19. Turn the ignition switch OFF.

20. Replace the secondary HO2S (Sensor 2) (see page 11-245).

21. Reconnect all connectors.

22. Turn the ignition switch ON (II).

23. Reset the PCM with the HDS.

24. Do the PCM idle learn procedure (see page 11-339).

25. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.

26. Test-drive under these conditions:

- ECT SENSOR 1 above 158 °F (70 °C)
- Transmission in D position
- Engine speed between 1,500—3,000 rpm
- Maintain a steady speed about 1 minute or more

27. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0138 indicated?

YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1.

NO—Go to step 28.

28. Monitor the OBD STATUS for DTC P0138 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 27, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 25.

(cont'd)

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DTC Troubleshooting (cont'd)

29. Reconnect all connectors.

30. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

31. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on, then let it idle.

32. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed between 1,500—3,000 rpm
    - Maintain a steady speed about 1 minute or more

33. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0138 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 31. If the PCM was substituted, go to step 1.

    NO—Go to step 34.

34. Monitor the OBD STATUS for DTC P0138 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 33, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 31. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 31.

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DTC P0139: Secondary HO2S (Sensor 2) Slow Response

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Vehicle speed at 35 mph (56 km/h) or more
   - Drive 20 seconds or more
5. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the secondary HO2S (Sensor 2) (see page 11-245).
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Vehicle speed at 35 mph (56 km/h) or more
    - Drive 20 seconds or more
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0139 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11.

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DTC Troubleshooting (cont'd)

DTC P0141: Secondary HO2S (Sensor 2) Heater Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0141 indicated?

   YES—Go to step 5.

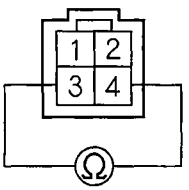
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM.■
5. Turn the ignition switch OFF.
6. Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 7.

   NO—Repair short in the wire between the secondary HO2S (Sensor 2) and the No. 3 IG1 ACG (15 A) fuse. Also replace the No. 3 IG1 ACG (15 A) fuse, then go to step 23.
7. Disconnect the secondary HO2S (Sensor 2) 4P connector.
8. At the secondary HO2S (Sensor 2) side, measure resistance between secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

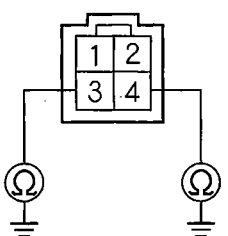
Is there 5.4– 7.3 Ω at room temperature?

YES—Go to step 9.

NO—Go to step 22.

9. At the secondary HO2S (Sensor 2) side, check for continuity between body ground and secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4 individually.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Go to step 22.

NO—Go to step 10.

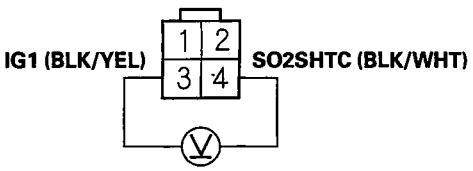
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10. Turn the ignition switch ON (II).

11. Measure voltage between secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 12.

NO—Go to step 16.

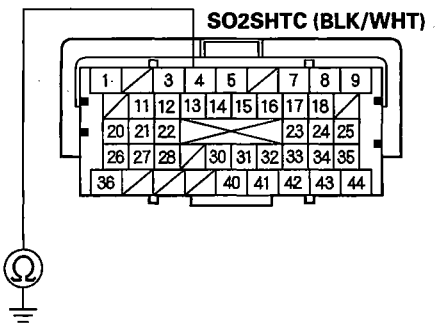
12. Turn the ignition switch OFF.

13. Jump the SCS line with the HDS.

14. Disconnect PCM connector B (44P).

15. Check for continuity between PCM connector terminal B4 and body ground.

PCM CONNECTOR B (44P)



Terminal side of female terminals

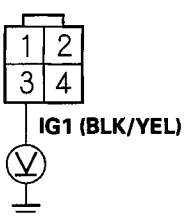
Is there continuity?

YES—Repair short in the wire between the PCM (B4) and the secondary HO2S (Sensor 2), then go to step 23.

NO—Go to step 29.

16. Measure voltage between secondary HO2S (Sensor 2) 4P connector terminal No. 3 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 17.

NO—Repair open in the wire between the secondary HO2S (Sensor 2) and the No. 3 IG1 ACG (15 A) fuse, then go to step 23.

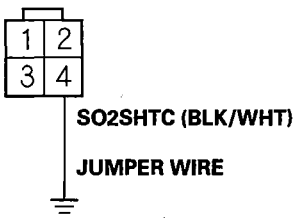
(cont'd)

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DTC Troubleshooting (cont'd)

17. Turn the ignition switch OFF.
18. Jump the SCS line with the HDS.
19. Disconnect PCM connector B (44P).
20. Connect secondary HO2S (Sensor 2) 4P connector terminal No. 4 to body ground with a jumper wire.

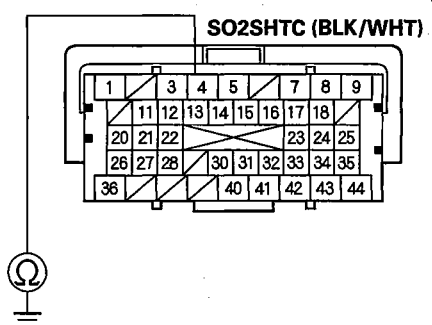
SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

21. Check for continuity between PCM connector terminal B4 and body ground.

PCM CONNECTOR B (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 29.

NO—Repair open in the wire between the PCM (B4) and the secondary HO2S (Sensor 2), then go to step 23.

22. Replace the secondary HO2S (Sensor 2) (see page 11-245).
23. Reconnect all connectors.
24. Turn the ignition switch ON (II).
25. Reset the PCM with the HDS.
26. Do the PCM idle learn procedure (see page 11-339).
27. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0141 indicated?

YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1.

NO—Go to step 28.

28. Monitor the OBD STATUS for DTC P0141 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 27, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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29. Reconnect all connectors.

30. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

31. Start the engine, and let it idle.

32. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0141 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 31. If the PCM was substituted, go to step 1.

    NO—Go to step 33.

33. Monitor the OBD STATUS for DTC P0141 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 32, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 31. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P0171: Fuel System Too Lean

DTC P0172: Fuel System Too Rich

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If any of the DTCs listed below are indicated at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then recheck for P0171 and/or P0172.
  P0101, P0102, P0103: Mass air flow (MAF) sensor
  P0133, P1172, P2A00: Air fuel ratio (A/F) sensor (Sensor 1)
  P0139: Secondary HO2S (Sensor 2)
  P0141: Secondary HO2S (Sensor 2) heater
  P2646, P2647, P2648, P2649: VTEC system

1. Check the fuel pressure (see page 11-365).

   Is the fuel pressure OK?

   YES—Go to step 2.

   NO—Repair the cause, then go to step 7.

2. Check for vacuum or air leaks at these parts:

   - PCV valve
   - PCV hose
   - EVAP canister purge valve
   - Throttle body
   - Intake air duct (air flow tube)
   - Intake manifold
   - Turbocharger
   - Intake air duct (turbocharger inlet tube and pipe)
   - Intake air duct (turbocharger outlet pipe)
   - Charge air cooler
   - Intake air duct (charge air cooler inlet hose)
   - Intake air duct (charge air cooler outlet tube)
   - Turbocharger bypass control solenoid valve
   - Brake booster
   - Brake booster hose

   Are the parts OK?

   YES—Go to step 3.

   NO—Repair or replace parts with leaks, then go to step 7.

3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

4. Check for these conditions:

   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in Park or neutral
   - All electrical loads off

5. Monitor the ENGINE SPEED in the DATA LIST with the HDS, and hold the engine speed at 2,500 rpm. Once the engine speed is met, hold the accelerator pedal steady for more than 10 seconds.

   Did the engine speed vary more than 100 rpm from 2,500 rpm?

   YES—Repeat step 5.

   NO—Go to step 6.

6. While holding the engine speed at 2,500 rpm, check the MAF SENSOR in the DATA LIST with the HDS.

   Is there about 7.8– 11.2 gm/s?

   YES—Check the engine valve clearances and adjust if necessary (see page 6-9). If the valve clearances are OK, replace the injectors (see page 11-243), then go to step 7.

   NO—Replace the MAF sensor/IAT sensor 1 (see page 11-247), then go to step 7.

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7. Turn the ignition switch ON (II).

8. Reset the PCM with the HDS.

9. Do the PCM idle learn procedure (see page 11-339).

10. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

11. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Drive at a steady speed between 15—75 mph (20—120 km/h)

    NOTE: DTC P0171 and/or P0172 may take up to 80 minutes of test driving to set. Using the HDS, monitor the air fuel feed back average (AF FB AVE). If the air fuel feed back average stays within 0.80—1.25, there is no problem at this time.

12. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0171 or P0172 indicated?

    YES—Go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P0300: Random Misfire and Any Combination of the Following:

DTC P0301: No. 1 Cylinder Misfire Detected

DTC P0302: No. 2 Cylinder Misfire Detected

DTC P0303: No. 3 Cylinder Misfire Detected

DTC P0304: No. 4 Cylinder Misfire Detected

Special Tools Required
- Pressure gauge adapter 07NAJ-P07010A
- A/T low pressure gauge w/panel 07406-0070301
- A/T pressure hose 07406-0020201
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure adapter 07MAJ-PY40120
- Oil pressure hose 07ZAJ-S5AA200

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If the misfire is frequent enough to trigger detection of increased emissions during two consecutive driving cycles, the MIL will come on, and DTC P0300 (and some of the combination of P0301 through P0304) will be stored.
- If the misfire is frequent enough to damage the catalyst, the MIL will flash whenever the misfire occurs, and DTC P0300 (and some of the combination of P0301 through P0304) will be stored. When the misfire stops, the MIL will remain on.
- If any of the DTCs listed below are indicated at the same time as the random misfire DTCs, troubleshoot those DTCs first, then recheck for random misfire DTCs (Because parts can sometimes fail without setting DTCs, you should also do a physical inspection of the systems listed below.):

  P0101, P0102, P0103: Mass air flow (MAF) sensor
  P0171, P0172: Fuel system
  P0365, P0369: Camshaft position (CMP) sensor B
  P0506, P0507: Idle control system
  P2646, P2647, P2648, P2649: VTEC system

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral).
4. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 5. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, wait for several minutes, then recheck.
5. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Go to step 6.
6. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   - ENGINE SPEED
   - VSS
   - REL TP SENSOR
   - CLV (calculated load value)
   - APP SENSOR
7. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 8. If the screen indicates EXECUTING, keep driving until a result comes on. if the screen indicates OUT OF CONDITION, go to step 6 and recheck.

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8. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Intermittent failure, the system is OK at this time.■

9. Turn the ignition switch OFF.

10. Check the fuel quality.

    Is the quality good?

    YES—Go to step 11.

    NO—Drain the tank and fill with a known-good fuel, then go to step 24.

11. Inspect the spark plugs (see page 4-22). If the spark plugs are fouled or worn, replace them.

12. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR

13. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 14.

    NO—Go to step 24.

14. Check the fuel pressure (see page 11-365).

    Is the fuel pressure OK?

    YES—Go to step 15.

    NO—Repair the faulty part(s), then go to step 24.

15. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

16. Check for these conditions:

    - ECT SENSOR 1 above 176 °F (80 °C)
    - Transmission in Park or neutral
    - All electrical loads off

17. Monitor the ENGINE SPEED in the DATA LIST with the HDS, and hold the engine speed at 2,500 rpm . Once the engine speed is met, hold the accelerator pedal steady for more than 10 seconds.

    Did the engine speed vary more than 100 rpm from 2,500 rpm?

    YES—Repeat step 17.

    NO—Go to step 18.

18. While holding the engine speed at 2,500 rpm, check the MAF SENSOR in the DATA LIST with the HDS.

    Is there about 7.8– 11.2 gm/s?

    YES—Go to step 19.

    NO—Replace the MAF sensor/IAT sensor 1 (see page 11-247), then go to step 24.

(cont'd)

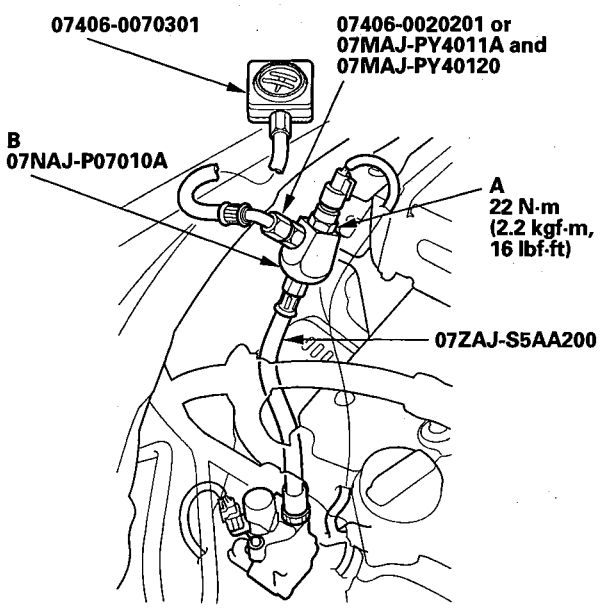
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DTC Troubleshooting (cont'd)

19. Turn the ignition switch OFF.

20. Remove the rocker arm oil pressure switch (A), and install the special tools as shown, then install the rocker arm oil pressure switch on the pressure gauge attachment (B).

    NOTE: Install the rocker arm oil pressure switch in the reverse order of removal with a new O-ring.



21. Reconnect the rocker arm oil pressure switch 2P connector.

22. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

23. Check the oil pressure at engine speeds of 1,000 rpm and 2,000 rpm.

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

    YES—Check for air in the fuel line, then go to step 24.

    NO—Inspect the VTEC system, then go to step 24.

24. Turn the ignition switch ON (II).

25. Reset the PCM with the HDS.

26. Clear the CKP pattern with the HDS.

27. Do the PCM idle learn procedure (see page 11-339).

28. Do the CKP pattern learn procedure (see page 11-4).

29. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0300, P0301, P0302, P0303, or P0304 indicated?

    YES—Check for poor connections or loose terminals at the ignition coil, the injector, and the PCM, then go to troubleshooting DTC P0301, P0302, P0303, or P0304 (see page 11-135).

    NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 29 and recheck.

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BACK

DTC P0301: No. 1 Cylinder Misfire Detected

DTC P0302: No. 2 Cylinder Misfire Detected

DTC P0303: No. 3 Cylinder Misfire Detected

DTC P0304: No. 4 Cylinder Misfire Detected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral).
4. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 5. If the screen indicates EXECUTING, let the engine idle until a result comes on. If the screen indicates OUT OF CONDITION, wait for several minutes, and recheck.
5. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Go to step 6.
6. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   - ENGINE SPEED
   - VSS
   - REL TP SENSOR
   - CLV (calculated load value)
   - APP SENSOR
   - GEAR POSITION
7. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 8. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 6 and recheck.
8. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Intermittent failure, the system is OK at this time. Check for loose wires or poor connections in the fuel system circuit. ■
9. Turn the ignition switch OFF.
10. Remove the charge air cooler (see page 9-7), and the injector cover, then reinstall the charge air cooler.
11. Start the engine, and listen for a clicking sound at the injector of the problem cylinder.

    Does the injector click?

    YES—Go to step 12.

    NO—Go to step 42.

(cont'd)

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DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.

13. Exchange the ignition coil from the problem cylinder with one from another cylinder.

14. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
    - GEAR POSITION

15. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 16.

    NO—Intermittent misfire due to poor contact at the ignition coil connector. (no misfire at this time). Make sure the coil connections are secure. ■

16. Determine which cylinder had the misfire.

    Does the misfire occur in the cylinder where the ignition coil was exchanged?

    YES—Replace the faulty ignition coil (see page 4-20), then go to step 60.

    NO—Go to step 17.

17. Turn the ignition switch OFF.

18. Exchange the spark plug from the problem cylinder with one from another cylinder.

19. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
    - GEAR POSITION

20. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 21.

    NO—Intermittent misfire due to spark plug fouling (no misfire at this time). ■

21. Determine which cylinder had the misfire.

    Does the misfire occur in the cylinder where the spark plug was exchanged?

    YES—Replace the faulty spark plug, then go to step 60.

    NO—Go to step 22.

22. Turn the ignition switch OFF.

23. Exchange the injector from the problem cylinder with one from the another cylinder.

24. Start the engine, and let it idle for 2 minutes.

25. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
    - GEAR POSITION

26. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 27.

    NO—Intermittent misfire due to bad contact at the injector connector (no misfire at this time). Check for poor connections or loose terminals at the injector. ■

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BACK

27. Determine which cylinder had the misfire.

Does the misfire occur in the cylinder where the injector was exchanged?

YES—Replace the faulty injector (see page 11-243), then go to step 60.

NO—Go to step 28.

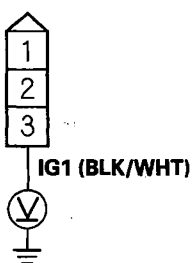
28. Turn the ignition switch OFF.

29. Disconnect the ignition coil 3P connector from the problem cylinder.

30. Turn the ignition switch ON (II).

31. Measure voltage between ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

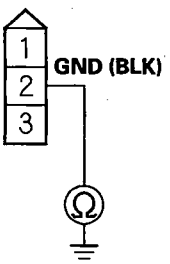
YES—Go to step 32.

NO—Repair open in the wire between the ignition coil and the ignition coil relay, then go to step 60.

32. Turn the ignition switch OFF.

33. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 34.

NO—Repair open in the wire between the ignition coil and G101 (see page 22-18), then go to step 60.

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DTC Troubleshooting (cont'd)

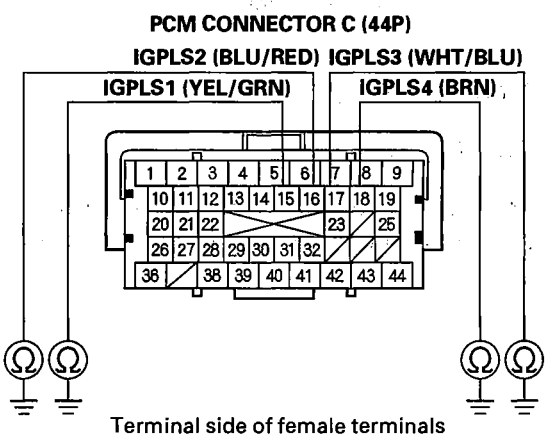
34. Turn the ignition switch OFF.

35. Jump the SCS line with the HDS.

36. Disconnect PCM connector C (44P).

37. Check for continuity between body ground and the appropriate PCM connector terminal of the problem cylinder (see table).

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C15	YEL/GRN
No. 2	P0302	C16	BLU/RED
No. 3	P0303	C17	WHT/BLU
No. 4	P0304	C18	BRN



Terminal side of female terminals

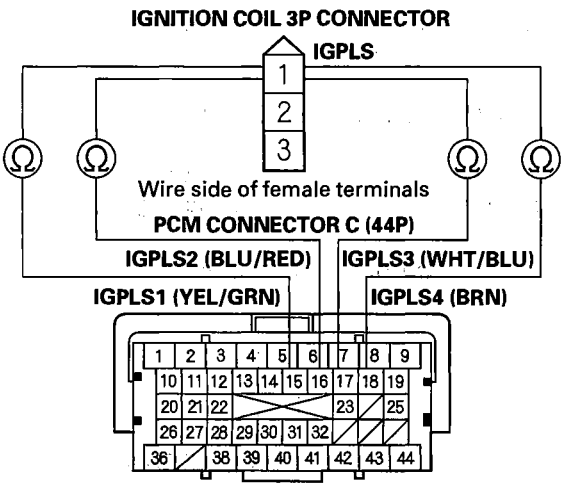
Is there continuity?

YES—Repair short in the wire between the PCM and the ignition coil, then go to step 60.

NO—Go to step 38.

38. Check for continuity between appropriate ignition coil 3P connector terminal No. 1 and the appropriate PCM connector terminal of the problem cylinder (see table).

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C15	YEL/GRN
No. 2	P0302	C16	BLU/RED
No. 3	P0303	C17	WHT/BLU
No. 4	P0304	C18	BRN



Terminal side of female terminals

Is there continuity?

YES—Go to step 39.

NO—Repair open in the wire between the PCM and the ignition coil, then go to step 60.

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BACK

39. Reconnect all connectors.

40. Do an engine compression and a cylinder leakdown test (see page 6-6).

Did the engine pass both tests?

YES—Go to step 41.

NO—Repair the engine, then go to step 60.

41. Do the VTEC rocker arm test (see page 6-7).

Did the engine pass the test?

YES—Go to step 42.

NO—Repair the VTEC rocker arm (see page 6-38), then go to step 60.

42. Turn the ignition switch OFF.

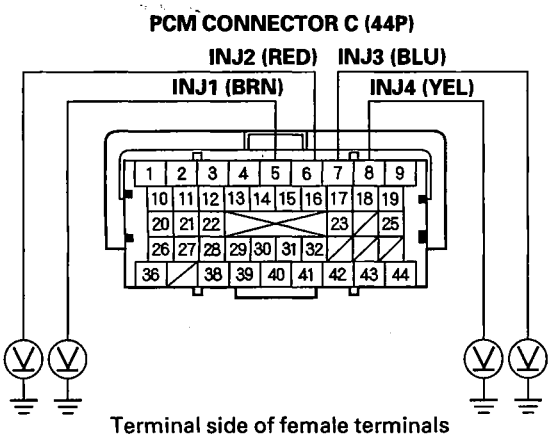
43. Jump the SCS line with the HDS.

44. Disconnect PCM connector C (44P).

45. Turn the ignition switch ON (II).

46. Measure voltage between body ground and the appropriate PCM connector terminal of the problem cylinder (see table).

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C5	BRN
No. 2	P0302	C6	RED
No. 3	P0303	C7	BLU
No. 4	P0304	C8	YEL



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 54.

NO—Go to step 47.

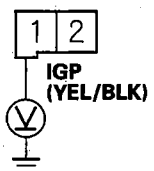
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DTC Troubleshooting (cont'd)

47. Turn the ignition switch OFF.
48. Disconnect the injector 2P connector from the problem cylinder.
49. Turn the ignition switch ON (II).
50. Measure voltage between injector 2P connector terminal No. 1 and body ground.

INJECTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

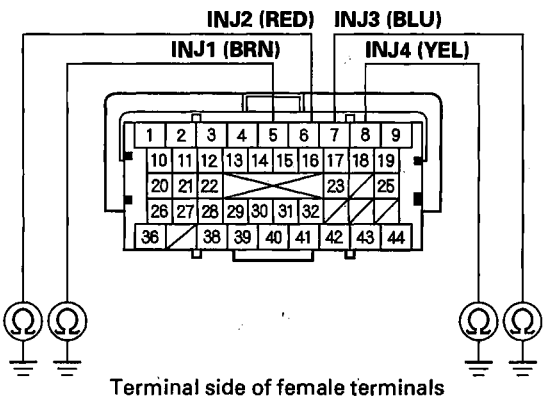
YES—Go to step 51.

NO—Repair open in the wire between the injector and PGM-FI main relay 1 (C), then go to step 60.

51. Turn the ignition switch OFF.
52. Check for continuity between body ground and the appropriate PCM connector terminal of the problem cylinder (see table).

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C5	BRN
No. 2	P0302	C6	RED
No. 3	P0303	C7	BLU
No. 4	P0304	C8	YEL

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM and the injector, then go to step 60.

NO—Go to step 53.

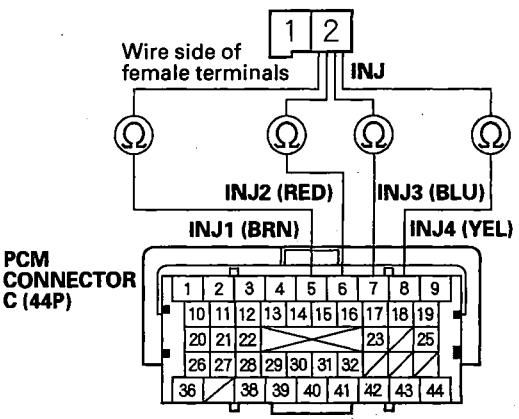
BACK

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53. Check for continuity between appropriate injector 2P connector terminal No. 2 and the appropriate PCM connector terminal of the problem cylinder (see table).

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C5	BRN
No. 2	P0302	C6	RED
No. 3	P0303	C7	BLU
No. 4	P0304	C8	YEL

INJECTOR 2P CONNECTOR



Terminal side of female terminals

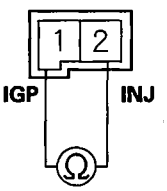
Is there continuity?

YES—Go to step 54.

NO—Repair open in the wire between the PCM and the injector, then go to step 60.

54. At the injector side, measure resistance between injector 2P connector terminals No. 1 and No. 2.

INJECTOR 2P CONNECTOR



Terminal side of male terminals

Is there 10– 13 Ω ?

YES—Go to step 55.

NO—Replace the injector (see page 11-243), then go to step 60.

55. Substitute a known-good injector into the problem cylinder.

56. Reconnect all connectors.

57. Start the engine, and let it idle for 2 minutes.

58. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

- ENGINE SPEED
- VSS
- REL TP SENSOR
- CLV (calculated load value)
- APP SENSOR
- GEAR POSITION

(cont'd)

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DTC Troubleshooting (cont'd)

59. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 70.

    NO—Replace the original injector (see page 11-243), then go to step 60.

60. Turn the ignition switch OFF.

61. Reconnect all connectors.

62. Turn the ignition switch ON (II).

63. Reset the PCM with the HDS.

64. Clear the CKP pattern with the HDS.

65. Do the PCM idle learn procedure (see page 11-339).

66. Do the CKP pattern learn procedure (see page 11-4).

67. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
    - GEAR POSITION

68. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0301, P0302, P0303, or P0304 indicated?

    YES—Check for poor connections or loose terminals at the ignition coil, the injector, and the PCM, then go to troubleshooting DTC P0300, P0301, P0302, P0303, or P0304 (see page 11-132).

    NO—Go to step 69.

69. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 68, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the ignition coil, the injector, and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 67.

70. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

71. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
    - GEAR POSITION

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72. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0301, P0302, P0303, or P0304 indicated?

YES—Check for poor connections or loose terminals at the ignition coil, the injector, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 71. If the PCM was substituted, go to step 1.

NO—Go to step 73.

73. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 72, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the ignition coil, the injector, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 71. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 71.

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DTC Troubleshooting (cont'd)

DTC P0325: Knock Sensor Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

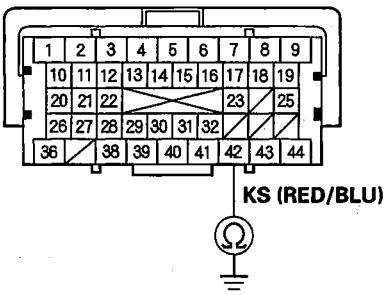
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed between 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Hold the engine speed between 3,000—4,000 rpm for at least 10 seconds.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0325 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the knock sensor and the PCM. ■
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect the knock sensor 1P connector (see page 11-250).
9. Disconnect PCM connector C (44P).
10. Check for continuity between PCM connector terminal C42 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

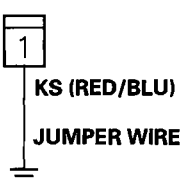
Is there continuity?

YES—Repair short in the wire between the PCM (C42) and the knock sensor, then go to step 14.

NO—Go to step 11.

11. Connect the knock sensor 1P connector terminal to body ground with a jumper wire.

KNOCK SENSOR 1P CONNECTOR



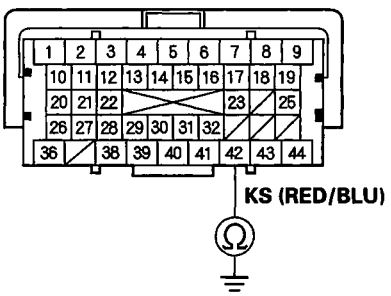
Wire side of female terminals

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BACK

12. Check for continuity between PCM connector terminal C42 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the PCM (C42) and the knock sensor, then go to step 14.

13. Replace the knock sensor (see page 11-250).

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the PCM with the HDS.

17. Do the PCM idle learn procedure (see page 11-339).

18. Hold the engine speed between 3,000—4,000 rpm for at least 10 seconds.

19. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0325 indicated?

YES—Go to step 21.

NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0325 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 19, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the knock sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 18.

21. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

22. Hold the engine speed between 3,000—4,000 rpm for at least 10 seconds.

23. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0325 indicated?

YES—Check for poor connections or loose terminals at the knock sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 22. If the PCM was substituted, go to step 1.

NO—Go to step 24.

24. Monitor the OBD STATUS for DTC P0325 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the knock sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 22. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 22.

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DTC Troubleshooting (cont'd)

DTC P0335: CKP Sensor No Signal

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

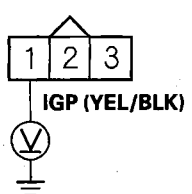
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0335 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the CKP sensor and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the CKP sensor 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CKP sensor 3P connector terminal No. 1 and body ground.

   CKP SENSOR 3P CONNECTOR



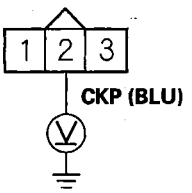
   Wire side of female terminals

   Is there battery voltage?

   YES—Go to step 9.

   NO—Repair open in the wire between the CKP sensor and PGM-FI main relay 1, then go to step 19.
9. Measure voltage between CKP sensor 3P connector terminal No. 2 and body ground.

   CKP SENSOR 3P CONNECTOR



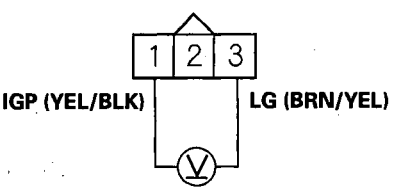
   Wire side of female terminals

   Is there about 5 V?

   YES—Go to step 10.

   NO—Go to step 11.
10. Measure voltage between CKP sensor 3P connector terminals No. 1 and No. 3.

    CKP SENSOR 3P CONNECTOR



    Wire side of female terminals

    Is there battery voltage?

    YES—Go to step 17.

    NO—Repair open in the wire between the CKP sensor and G101 (see page 22-18), then go to step 19.

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BACK

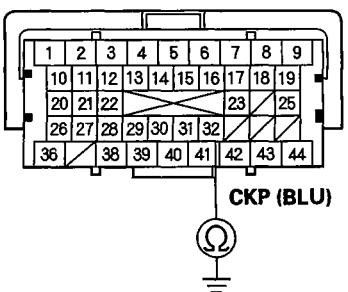
11. Turn the ignition switch OFF.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (44P).

14. Check for continuity between PCM connector terminal C32 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

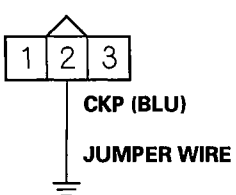
Is there continuity?

YES—Repair short in the wire between the PCM (C32) and the CKP sensor, then go to step 19.

NO—Go to step 15.

15. Connect CKP sensor 3P connector terminal No. 2 to body ground with a jumper wire.

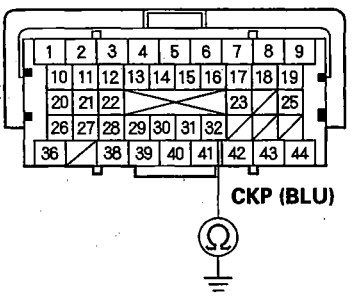
CKP SENSOR 3P CONNECTOR



Wire side of female terminals

16. Check for continuity between PCM connector terminal C32 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the PCM (C32) and the CKP sensor, then go to step 19.

17. Turn the ignition switch OFF.

18. Replace the CKP sensor (see page 11-246).

19. Reconnect all connectors.

20. Turn the ignition switch ON (II).

21. Reset the PCM with the HDS.

22. Clear the CKP pattern with the HDS.

23. Do the PCM idle learn procedure (see page 11-339).

(cont'd)

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DTC Troubleshooting (cont'd)

24. Do the CKP pattern learn procedure (see page 11-4).

25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0335 indicated?

    YES—Check for poor connections or loose terminals at the CKP sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

26. Reconnect all connectors.

27. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

28. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0335 indicated?

    YES—Check for poor connections or loose terminals at the CKP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0339: CKP Sensor Intermittent Interruption

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle for 10 seconds.
4. Check the CKP NOISE count in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   • ENGINE SPEED
   • VSS
6. Check the CKP NOISE count in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the CKP sensor and the PCM.■
7. Check for poor or loose connections and terminals at these locations:

   • CKP sensor
   • PCM
   • Engine ground
   • Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Repair the connectors or terminals, then go to step 11.
8. Remove the cam chain case (see page 6-13), and check for damage on the CKP sensor pulser plate.

   Is the pulser plate damaged?

   YES—Replace the CKP sensor pulser plate (see page 6-26), then go to step 11.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Replace the CKP sensor (see page 11-246).
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Clear the CKP pattern with the HDS.
14. Do the PCM idle learn procedure (see page 11-339).
15. Do the CKP pattern learn procedure (see page 11-4).
16. Start the engine, and let it idle for 10 seconds.
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0339 indicated?

    YES—Check for poor connections or loose terminals at the CKP sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P0365: CMP Sensor B No Signal

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

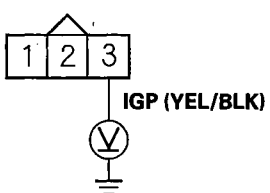
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0365 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at CMP sensor B and the PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the CMP sensor B 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CMP sensor B 3P connector terminal No. 3 and body ground.

CKP SENSOR B 3P CONNECTOR



Wire side of female terminals

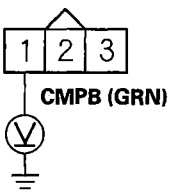
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the wire between CMP sensor B and PGM-FI main relay 1, then go to step 18.

9. Measure voltage between CMP sensor B 3P connector terminal No. 1 and body ground.

CKP SENSOR B 3P CONNECTOR



Wire side of female terminals

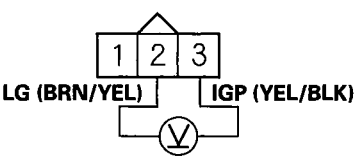
Is there about 5 V?

YES—Go to step 10.

NO—Go to step 11.

10. Measure voltage between CMP sensor 3P connector terminals No. 2 and No. 3.

CKP SENSOR B 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 16.

NO—Repair open in the wire between CMP sensor B and G101 (see page 22-18), then go to step 18.

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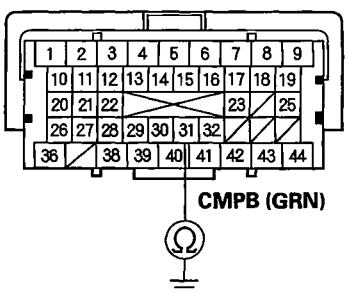
11. Turn the ignition switch OFF.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (44P).

14. Check for continuity between PCM connector terminal C31 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

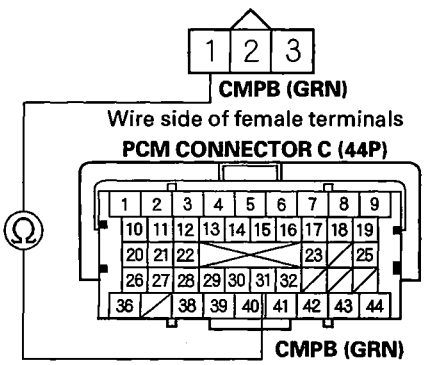
Is there continuity?

YES—Repair short in the wire between the PCM (C31) and CMP sensor B, then go to step 18.

NO—Go to step 15.

15. Check for continuity between CMP sensor B 3P connector terminal No. 1 and PCM connector terminal C31.

CMP SENSOR B 3P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the PCM (C31) and CMP sensor B, then go to step 18.

(cont'd)

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DTC Troubleshooting (cont'd)

16. Turn the ignition switch OFF.
17. Replace CMP sensor B (see page 11-246).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0365 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor B and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0365 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0369: CMP Sensor B Circuit Intermittent Interruption

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle for 10 seconds.
4. Check the CMP NOISE B COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   • ENGINE SPEED
   • VSS
6. Check the CMP NOISE B COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at CMP sensor B and the PCM. ■
7. Check for poor or loose connections and terminals at these locations:

   • CMP sensor B
   • PCM
   • Engine ground
   • Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Repair the connectors or terminals, then go to step 11.
8. Check for damage on the CMP sensor B pulser plate (see page 6-34).

   Is the pulser plate damaged?

   YES—Replace the CMP sensor B pulser plate (see page 6-34), then go to step 11.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Replace CMP sensor B (see page 11-246).
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Start the engine, and let it idle for 10 seconds.
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0369 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor B and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P050A: Cold Start Idle Air Control System Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs other than P050A indicated?

   YES—Go to the indicated DTC's troubleshooting. ■

   NO—Go to step 3.
3. Check for poor connections or blockage at the air intake duct.

   Is it OK?

   YES—Go to step 4.

   NO—Reconnect or repair the air intake duct, then go to step 20.
4. Check for damage at the air cleaner housing.

   Is it OK?

   YES—Go to step 5.

   NO—Replace the air cleaner housing (see page 11-394), then go to step 20.
5. Check for dirt or debris in the air cleaner element.

   Is it dirty?

   YES—Replace the air cleaner element or remove the debris (see page 11-395), then go to step 20.

   NO—Go to step 6.
6. Let the engine cool until the value of ECT SENSOR 1 is 122 °F (50 °C) or less.
7. Clear the DTC with the HDS.
8. Start the engine, and let it idle 10 seconds or more.
9. Monitor the OBD STATUS for DTC P050A in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates EXECUTING, let the engine idle until a result comes on. If the screen indicates OUT OF CONDITION, go to step 6 and recheck.
10. Do the ETCS TEST in the INSPECTION MENU with the HDS.

    Is the THROTTLE ACTUATOR CONTROL VALVE normal?

    YES—Go to step 11.

    NO—Replace the throttle body (see page 11-396), then go to step 20.
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

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12. Monitor the ENGINE SPEED in the DATA LIST with the HDS, and hold the engine speed at 2,500 rpm for at least 30 seconds.

13. While holding the engine speed at 2,500 rpm, check the MAF SENSOR in the DATA LIST with the HDS.

    Is there about 7.8— 11.2 gm/s?

    YES—Go to step 14.

    NO—Replace the MAF sensor/IAT sensor 1 (see page 11-247), then go to step 20.

14. Turn the ignition switch OFF.

15. Allow the engine to cool to ambient temperature.

16. Note the ambient temperature.

17. Turn the ignition switch ON (II).

18. Note the value of IAT SENSOR quickly in the DATA LIST with the HDS.

19. Compare the value of the IAT SENSOR and the ambient temperature.

    Does the value of the IAT SENSOR differ 5.4 °F (3 °C) or more?

    YES—Replace the MAF sensor/IAT sensor 1 (see page 11-247), then go to step 20.

    NO—Check for dirt, carbon, or damage in the throttle bore. If there is dirt or carbon, clean the throttle body (see page 11-394), then go to step 20. If there is damage in the throttle bore, replace the throttle body (see page 11-396), then go to step 20.

20. Turn the ignition switch ON (II).

21. Reset the PCM with the HDS.

22. Do the PCM idle learn procedure (see page 11-339).

23. Let the engine cool until the value of ECT SENSOR 1 is 122 °F (50 °C) or less.

24. Start the engine, and let it idle for 10 seconds or more.

25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P050A indicated?

    YES—Check for poor connections or loose terminals at the throttle body, the MAF sensor/IAT sensor 1, and the PCM, then go to step 1.

    NO—Go to step 26.

26. Monitor the OBD STATUS for DTC P050A in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 25, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the throttle body, the MAF sensor/IAT sensor 1, and the PCM, then go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 23.

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DTC Troubleshooting (cont'd)

DTC P050B: Cold Start Ignition Timing Control System Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs other than P050B indicated?

   YES—Go to the indicated DTC's troubleshooting. ■

   NO—Go to step 3.
3. Check for poor connections or blockage at the air intake duct.

   Is it OK?

   YES—Go to step 4.

   NO—Reconnect or repair the air intake duct, then go to step 25.
4. Check for damage at the air cleaner housing.

   Is it OK?

   YES—Go to step 5.

   NO—Replace the air cleaner housing (see page 11-394), then go to step 25.
5. Check for dirt or debris in the air cleaner element.

   Is it dirty?

   YES—Replace the air cleaner element or remove the debris (see page 11-395), then go to step 25.

   NO—Go to step 6.
6. Let the engine cool until the value of ECT SENSOR 1 is 122 °F (50 °C) or less.
7. Clear the DTC with the HDS.
8. Start the engine, and let it idle 10 seconds or more.
9. Monitor the OBD STATUS for DTC P050B in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 6 and recheck.
10. Inspect the ignition timing (see page 4-19).

    Is the ignition timing OK?

    YES—Go to step 12.

    NO—Go to step 11.
11. Check for damage at the CKP sensor (see page 11-246) and the CKP sensor pulser plate (see page 6-26).

    Is the CKP sensor and/or the CKP sensor pulser plate damaged?

    YES—Replace the CKP sensor (see page 11-246) and/or the CKP sensor pulser plate (see page 6-26), then go to step 26.

    NO—Go to step 32.

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BACK

12. Do the ETCS TEST in the INSPECTION MENU with the HDS.

    Is the THROTTLE ACTUATOR CONTROL VALVE normal?

    YES—Go to step 13.

    NO—Replace the throttle body (see page 11-396), then go to step 25.

13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

14. Monitor the ENGINE SPEED in the DATA LIST with the HDS, and hold the engine speed at 2,500 rpm for at least 30 seconds.

15. While holding the engine speed at 2,500 rpm, check the MAF SENSOR in the DATA LIST with the HDS.

    Is there about 7.8– 11.2 gm/s?

    YES—Go to step 16.

    NO—Replace the MAF sensor/IAT sensor 1 (see page 11-247), then go to step 25.

16. Turn the ignition switch OFF.

17. Drain the coolant (see page 10-7).

18. Remove ECT sensor 1 (see page 11-249), and ECT sensor 2 (see page 11-250).

19. Allow the sensors to cool to ambient temperature.

20. Note the ambient temperature.

21. Connect ECT sensor 1 to its 2P connector, and ECT sensor 2 to its 2P connector, but do not install them on the engine or the radiator.

22. Turn the ignition switch ON (II).

23. Note the value of ECT SENSOR 1 and ECT SENSOR 2 quickly in the DATA LIST with the HDS.

24. Compare the value of ECT SENSOR 1 and the ambient temperature, and the value of ECT SENSOR 2 and the ambient temperature individually.

    Does either sensor differ more than 5.4 °F (3 °C) from the ambient temperature?

    YES—Replace the sensor that differed more than 5.4 °F (3 °C) from the ambient temperature, then go to step 25.

    NO—Check and repair any problems with the following items, then go to step 25.

    - Engine compression and cylinder leakdown
    - VTEC system
    - Engine oil
    - A/C system
    - Power steering

25. Turn the ignition switch ON (II).

26. Reset the PCM with the HDS.

27. Do the PCM idle learn procedure (see page 11-339).

28. Let the engine cool until the value of ECT SENSOR 1 is 122 °F (50 °C) or less.

29. Start the engine, and let it idle 10 seconds or more.

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P050B indicated?

    YES—Check for poor connections or loose terminals at the CKP sensor, the throttle body, the MAF sensor/IAT sensor 1, ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1.

    NO—Go to step 31.

(cont'd)

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DTC Troubleshooting (cont'd)

31. Monitor the OBD STATUS for DTC P050B in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the CKP sensor, the throttle body, the MAF sensor/IAT sensor 1, ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 28.

32. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

33. Let the engine cool until the value of ECT SENSOR 1 is 122 °F (50 °C) or less.

34. Start the engine, and let it idle 10 seconds or more.

35. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P050B indicated?

    YES—Check for poor connections or loose terminals at the CKP sensor, the throttle body, the MAF sensor/IAT sensor 1, ECT sensor 1, ECT sensor 2, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 33. If the PCM was substituted, go to step 1.

    NO—Go to step 36.

36. Monitor the OBD STATUS for DTC P050B in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 35, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the CKP sensor, the throttle body, the MAF sensor/IAT sensor 1, ECT sensor 1, ECT sensor 2, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 33. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 33.

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DTC P0562: Charging System Low Voltage

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If any high current load accessories are installed, this DTC can be set.
- If DTC P16BB and/or P16BC is stored at the same time as DTC P0562, troubleshoot DTC P16BB and/or P16BC first, then recheck for DTC P0562.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0562 indicated?

   YES—Replace the alternator (see page 4-34), then go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, and check the battery performance (see page 22-63).■
7. Turn the ignition switch ON (II).
8. Reset the PCM with the HDS.
9. Do the PCM idle learn procedure (see page 11-339).
10. Start the engine.
11. Check under these conditions:
    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam
12. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0562 indicated?

    YES—Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P0563: PCM Power Source Circuit Unexpected Voltage

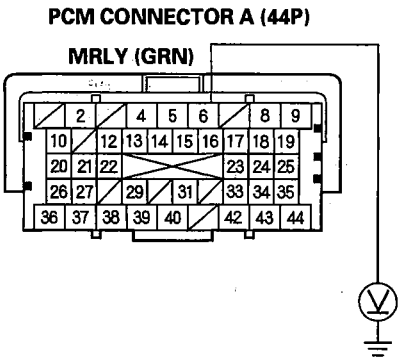
NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Wait 10 seconds.
5. Turn the ignition switch ON (II).
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0563 indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at PGM-FI main relay 1 and the PCM. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Measure voltage between PCM connector terminal A6 and body ground.



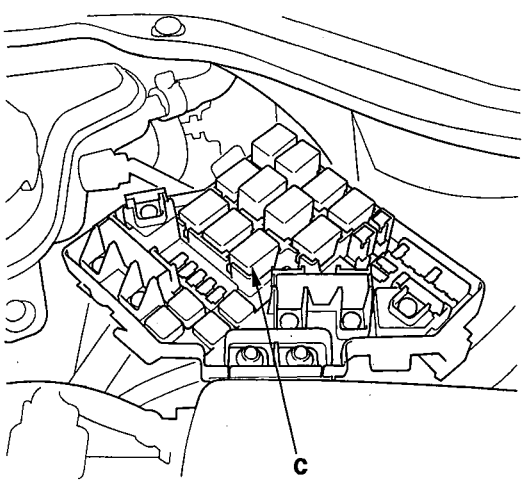
Terminal side of female terminals

Is there battery voltage?

YES—Go to step 13.

NO—Go to step 11.

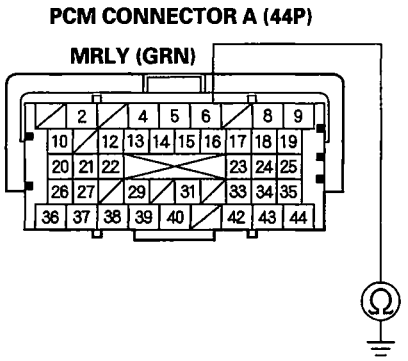
11. Remove PGM-FI main relay 1 (C) from the under-hood fuse/relay box.



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12. Check for continuity between PCM connector terminal A6 and body ground.



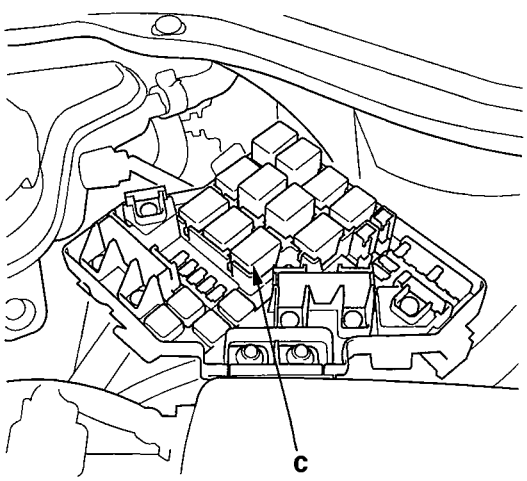
Terminal side of female terminals

Is there continuity?

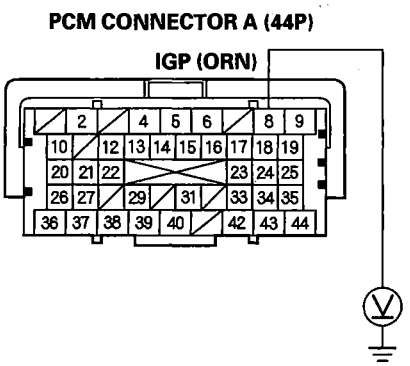
YES—Repair short in the wire between the PCM (A6) and PGM-FI main relay 1, then go to step 16.

NO—Go to step 15.

13. Remove PGM-FI main relay 1 (C) from the under-hood fuse/relay box.



14. Measure voltage between PCM connector terminal A8 and body ground.



Terminal side of female terminals

Is there battery voltage?

YES—Repair short to power in the wire between the PCM (A8) and PGM-FI main relay 1, then go to step 16.

NO—Go to step 15.

15. Test PGM-FI main relay 1 (see page 22-64).

Is PGM-FI main relay 1 OK?

YES—Go to step 23.

NO—Replace PGM-FI main relay 1, then go to step 16.

(cont'd)

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DTC Troubleshooting (cont'd)

16. Reconnect all connectors.
17. Turn the ignition switch ON (II).
18. Reset the PCM with the HDS.
19. Do the PCM idle learn procedure (see page 11-339).
20. Turn the ignition switch OFF.
21. Wait 10 seconds.
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0563 indicated?

    YES—Check for poor connections or loose terminals at PGM-FI main relay 1 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0563 indicated?

    YES—Check for poor connections or loose terminals at PGM-FI main relay 1 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC P0602: PCM Programming Error

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- This DTC is indicated when a PCM update is not completed.
- Do not turn the ignition switch OFF while updating the PCM. If you turn the ignition switch OFF before completion, the PCM can be damaged.

1. Do the PCM update procedure (see page 11-7).
2. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0602 indicated?

   YES—Replace the original PCM (see page 11-252). ■

   NO—Update is complete. ■

DTC P0606: PCM Processor Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Wait 40 seconds.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0606 indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. ■
7. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
8. Turn the ignition switch OFF.
9. Turn the ignition switch ON (II).
10. Wait 40 seconds.
11. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0606 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 8. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P060A: PCM (A/T system) Internal Control Module Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P060A indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time.■
4. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P060A indicated?

   YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

DTC P062F: PCM Internal Control Module Keep Alive Memory (KAM) Error

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time.■
4. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P062F indicated?

   YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0630: VIN Not Programmed or Mismatch

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- This DTC is stored only when the PCM does not have the VIN information of the vehicle. Use the HDS to input the missing VIN information.

1. Turn the ignition switch ON (II).
2. Check the VIN with the HDS.

   Does the HDS show the vehicle's VIN?

   YES—Go to step 5.

   NO—Go to step 3.
3. Input the VIN to the PCM with the HDS.

   Does the screen show COMPLETE?

   YES—Go to step 5.

   NO—Go to step 4.
4. Check for DTCs with the HDS.

   Is DTC P0603 indicated?

   YES—Go to the DTC P0603 troubleshooting.■

   NO—Go to step 9.
5. Clear the DTC with the HDS.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II), and wait for 5 seconds.
8. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0630 indicated?

   YES—Go to step 9.

   NO—Intermittent failure, the system is OK at this time.■
9. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
10. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0630 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P0685: PCM Power Control Circuit/ Internal Circuit Malfunction

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If the problem doesn't return after you clear the DTC, or if this DTC is stored intermittently, check for loose terminals at the IGP line connectors before replacing the PCM.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, then let it idle for 30 seconds.
4. Turn the ignition switch OFF.
5. Start the engine, then let it idle for 30 seconds.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II).
8. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0685 indicated?

   YES—Go to step 9.

   NO—Intermittent failure, the system is OK at this time.■
9. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
10. Start the engine, then let it idle for 30 seconds.
11. Turn the ignition switch OFF.
12. Start the engine, then let it idle for 30 seconds.
13. Turn the ignition switch OFF.
14. Turn the ignition switch ON (II).
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0685 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 10. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0720: Output Shaft (Countershaft) Speed Sensor Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).

2. Check for Temporary DTCs or DTCs in the AT SYSTEM menu with the HDS.

   Is DTC P0722 indicated?

   YES—Troubleshoot for DTC P0722 in the AT system (see page 14-107).

   NO—Go to step 3.

3. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

4. Test-drive under these conditions:

   - ECT SENSOR 1 above 176 °F (80 °C)
   - Transmission in D position
   - ENGINE SPEED between 2,000—4,500 rpm
   - Drive for several minutes, then decelerate (with throttle fully closed) for 5 seconds or more

5. Check for Temporary DTCs or DTCs in the PGM-FI SYSTEM with the HDS.

   Is DTC P0720 indicated?

   YES—Go to step 6.

   NO—Go to step 7.

6. Check for Temporary DTCs or DTCs in the AT SYSTEM menu with the HDS.

   Is DTC P0722 indicated?

   YES—Troubleshoot for DTC P0722 in the AT system (see page 14-107).

   NO— If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 4. If the PCM was substituted, check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and the PCM, then go to step 1.

7. Monitor the OBD STATUS for DTC P0720 in the DTCs MENU with the HDS.

   Does the screen indicate PASSED?

   YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252).■

   NO—If the screen indicates FAILED, check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 4. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 4.

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DTC Troubleshooting (cont'd)

DTC P1109: BARO Sensor Circuit Out of Range High

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Reset the PCM with the HDS.
2. Start the engine.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1109 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time.■
4. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1109 indicated?

   YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

DTC P1116: ECT Sensor 1 Circuit Range/ Performance Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P0111 is stored at the same time as DTC P1116, troubleshoot DTC P0111 first, then recheck for DTC P1116.

1. Check for poor connections or loose terminals at ECT sensor 1 and ECT sensor 2.

   Are the connections and terminals OK?

   YES—Go to step 2.

   NO—Repair the connectors or terminals, then go to step 27.
2. Turn the ignition switch ON (II).
3. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P1116 and P2183 indicated at the same time?

   YES—Go to step 15.

   NO—Go to step 4.
4. Start the engine, and let it idle 10 minutes.
5. Check ECT SENSOR 1 in the DATA LIST with the HDS.

   Is about 127 °F (53 °C) or less indicated?

   YES—Replace ECT sensor 1 (see page 11-249), then go to step 27.

   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Drain the coolant (see page 10-7).
8. Remove ECT sensor 1 (see page 11-249).
9. Allow ECT sensor 1 to cool to ambient temperature.
10. Note the ambient temperature.

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11. Connect ECT sensor 1 to its 2P connector, but do not install it on the engine.

12. Turn the ignition switch ON (II).

13. Note the value of ECT SENSOR 1 quickly in the DATA LIST with the HDS.

14. Compare the value of ECT SENSOR 1 and the ambient temperature.

    Does the value of ECT SENSOR 1 differ 5.4 °F (3 °C) or more?

    YES—Replace ECT sensor 1 (see page 11-249), then go to step 27.

    NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM.■

15. Start the engine, and let it idle 10 minutes.

16. Check ECT SENSOR 1 in the DATA LIST with the HDS.

    Is about 127 °F (53 °C) or less indicated?

    YES—Replace ECT sensor 1 (see page 11-249), then go to step 27.

    NO—Go to step 17.

17. Let the engine idle 10 minutes.

18. Check ECT SENSOR 2 in the DATA LIST with the HDS.

    Is about 124 °F (51 °C) or less indicated?

    YES—Replace ECT sensor 2 (see page 11-250), then go to step 27.

    NO—Go to step 19.

19. Turn the ignition switch OFF.

20. Drain the coolant (see page 10-7).

21. Remove ECT sensor 1 (see page 11-249) and ECT sensor 2 (see page 11-250).

22. Allow the sensors to cool to ambient temperature.

23. Note the ambient temperature.

24. Connect ECT sensor 1 and ECT sensor 2 their 2P connector, but do not install them on the engine or the radiator.

25. Note the value of ECT SENSOR 1 and ECT SENSOR 2 quickly in the DATA LIST with the HDS.

26. Compare the value of ECT SENSOR 1 and the ambient temperature, and the value of ECT SENSOR 2 and the ambient temperature individually.

    Does one of the sensors differ more than 5.4 °F (3 °C) from the ambient temperature?

    YES—Replace the sensor that differed more than 5.4 °F (3 °C) from the ambient temperature.

    - ECT sensor 1 (see page 11-249)
    - ECT sensor 2 (see page 11-250)

    NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM.■

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DTC Troubleshooting (cont'd)

27. Turn the ignition switch ON (II).
28. Reset the PCM with the HDS.
29. Do the PCM idle learn procedure (see page 11-339).
30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1116 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

DTC P1128: MAP Sensor Signal Lower Than Expected

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- Before starting this troubleshooting check for poor connections or blockage at the air intake duct.

1. Turn the ignition switch ON (II).
2. Compare the value of the MAP SENSOR and the TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Does the value differ more than 26.7 kpa (7.9 in.Hg, 200 mmHg)?

   YES—Go to step 10.

   NO—Go to step 3.
3. Note the value of MAP SENSOR in the DATA LIST with the HDS.
4. Start the engine, and let it idle.
5. Check the MAP SENSOR in the DATA LIST with the HDS.

   Does the MAP SENSOR change 0.67 kpa (0.2 in.Hg, 5 mmHg) or more?

   YES—Go to step 6.

   NO—Go to step 10.
6. Clear the DTC with the HDS.
7. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
8. Test-drive under these conditions:

   - Engine speed above 1,750 rpm
   - Transmission in D position
   - REL TP SENSOR above 22 deg
   - Drive 5 seconds or more

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9. Monitor the OBD STATUS for DTC P1128 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?
   YES—Go to step 10.
   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the PCM. If the screen indicates NOT COMPLETED, go to step 7 and recheck.

10. Turn the ignition switch OFF.

11. Replace the MAP sensor (see page 11-247).

12. Turn the ignition switch ON (II).

13. Reset the PCM with the HDS.

14. Do the PCM idle learn procedure (see page 11-339).

15. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 10 seconds.

16. Test-drive under these conditions:

    - Engine speed above 1,750 rpm
    - Transmission in D position
    - REL TP SENSOR above 22 deg
    - Drive 5 seconds or more

17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1128 indicated?
    YES—Check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1.
    NO—Go to step 18.

18. Monitor the OBD STATUS for DTC P1128 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?
    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 17, go to the indicated DTC's troubleshooting.■
    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 15.

DTC P1129: MAP Sensor Signal Higher Than Expected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check for vacuum or air leaks in these parts:

   - PCV valve
   - PCV hose
   - EVAP canister purge valve
   - Throttle body
   - Intake air duct (air flow tube)
   - Intake manifold
   - Brake booster
   - Brake booster hose
   - Turbocharger
   - Intake air duct (turbocharger inlet tube and pipe)
   - Intake air duct (turbocharger outlet pipe)
   - Charge air cooler
   - Intake air duct (charge air cooler inlet hose)
   - Intake air duct (charge air cooler outlet tube)
   - Turbocharger bypass control solenoid valve
   - Pressure regulator

   Are there any vacuum or air leaks?

   YES—Repair or replace parts with vacuum or air leaks, then go to step 9.

   NO—Go to step 2.

2. Turn the ignition switch ON (II).

3. Compair the value of the MAP SENSOR and TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Does the value differ more than 26.7 kPa (7.9 in.Hg, 200 mmHg)?

   YES—Go to step 11.

   NO—Go to step 4.

(cont'd)

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DTC Troubleshooting (cont'd)

4. Note the value of MAP SENSOR in the DATA LIST with the HDS.
5. Start the engine, and let it idle.
6. Check the MAP SENSOR in the DATA LIST with the HDS.

   Does the MAP SENSOR change 0.67 kpa (0.2 in.Hg, 5 mmHg) or more?

   YES—Go to step 7.

   NO—Go to step 11.
7. Clear the DTC with the HDS.
8. Start the engine. Hold the engine speed at 3000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
9. Test-drive under these conditions:

   - Engine speed above 1,750 rpm
   - Transmission in D position
   - REL TP SENSOR above 22 deg
   - Drive 5 seconds or more
10. Monitor the OBD STATUS for DTC P1129 in the DTCs MENU with the HDS.

    Does the screen indicate FAILED?

    YES—Go to step 1.

    NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the PCM. If the screen indicates NOT COMPLETED, go to step 5 and recheck.
11. Turn the ignition switch OFF.
12. Replace the MAP sensor (see page 11-247).
13. Turn the ignition switch ON (II).
14. Reset the PCM with the HDS.
15. Do the PCM idle learn procedure (see page 11-339).
16. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
17. Test-drive under these conditions:

    - Engine speed above 1,750 rpm
    - Transmission in D position
    - REL TP SENSOR above 22 deg
    - Drive 5 seconds or more
18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1129 indicated?

    YES—Check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1.

    NO—Go to step 19.
19. Monitor the OBD STATUS for DTC P1129 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 18, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the MAP sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 16.

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DTC P1157: A/F Sensor (Sensor 1) AFS Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

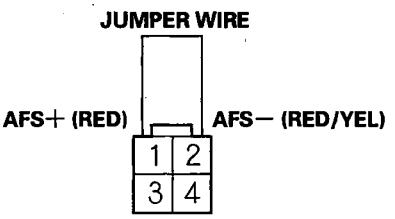
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and wait 1 minute.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1157 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect the A/F sensor (Sensor 1) 4P connector.
8. Disconnect PCM connector C (44P).
9. Connect A/F sensor (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.

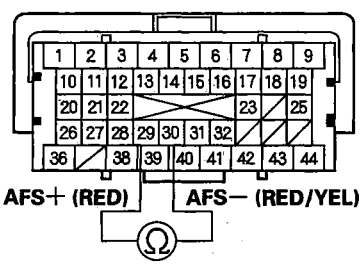
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

10. Check for continuity between PCM connector terminals C29 and C30.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 14.

NO—Go to step 11.

11. Remove the jumper wire from the A/F sensor (Sensor 1) 4P connector.

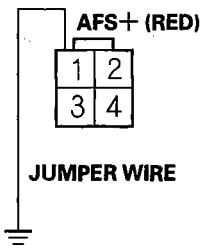
(cont'd)

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DTC Troubleshooting (cont'd)

12. Connect A/F sensor (Sensor 1) 4P connector terminal No. 1 to body ground with a jumper wire.

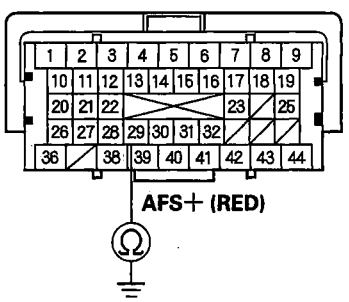
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

13. Check for continuity between PCM connector terminal C29 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair open in the wire between the PCM (C30) and the A/F sensor (Sensor 1), then go to step 15.

NO—Repair open in the wire between the PCM (C29) and the A/F sensor (Sensor 1), then go to step 15.

14. Replace the A/F sensor (Sensor 1) (see page 11-245).

15. Reconnect all connectors.

16. Turn the ignition switch ON (II).

17. Reset the PCM with the HDS.

18. Do the PCM idle learn procedure (see page 11-339).

19. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1157 indicated?

YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the connector and terminal fits are OK, go to step 21.

NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P1157 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 19, go to the indicated DTC's troubleshooting.■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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21. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

22. Start the engine, and let it idle.

23. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1157 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 22. If the PCM was substituted, go to step 1.

    NO—Go to step 24.

24. Monitor the OBD STATUS for DTC P1157 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 1. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 22. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P1172: A/F Sensor (Sensor 1) Circuit Out of Range High

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Monitor the OBD STATUS for DTC P1172 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If the screen indicates EXECUTING or OUT OF CONDITION, keep idling until a result comes on.
5. Turn the ignition switch OFF.
6. Replace the A/F sensor (Sensor 1) (see page 11-245).
7. Turn the ignition switch ON (II).
8. Reset the PCM with the HDS.
9. Do the PCM idle learn procedure (see page 11-339).
10. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
11. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1172 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1.

    NO—Go to step 12.
12. Monitor the OBD STATUS for DTC P1172 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 11, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 10.

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DTC P1297: ELD Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the ELD in the DATA LIST with the HDS.

   Is 72 A or more indicated?

   YES—Go to step 3.

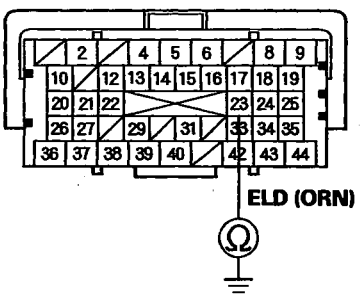
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ELD and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ELD 3P connector.
5. Turn the ignition switch ON (II).
6. Check the ELD in the DATA LIST with the HDS.

   Is 72 A or more indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Check for continuity between PCM connector terminal A23 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A23) and the ELD, then go to step 13.

NO—Go to step 20.

11. Turn the ignition switch OFF.
12. Replace the ELD (see page 11-251).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Start the engine, and let it idle.
18. Turn on the headlights.
19. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1297 indicated?

    YES—Check for poor connections or loose terminals at the ELD and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

(cont'd)

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DTC Troubleshooting (cont'd)

20. Reconnect all connectors.
21. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
22. Start the engine, and let it idle.
23. Turn on the headlights.
24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1297 indicated?

    YES—Check for poor connections or loose terminals at the ELD and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 22. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P1298: ELD Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

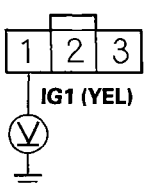
1. Turn the ignition switch ON (II).
2. Check the ELD in the DATA LIST with the HDS.

   Is 0.2 A or less indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ELD and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ELD 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between ELD 3P connector terminal No. 1 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

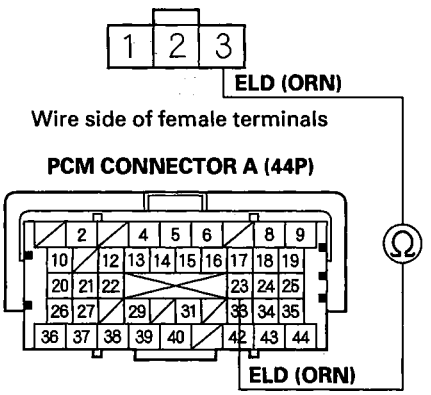
Is there battery voltage?

YES—Go to step 7.

NO—Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the No. 3 IG1 ACG (15 A) fuse and the ELD, then go to step 12.

7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (44P).
9. Check for continuity between ELD 3P connrctor terminal No. 3 and PCM connector terminal A23.

ELD 3P CONNECTOR



Wire side of female terminals

Terminal side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between the PCM (A23) and the ELD, then go to step 12.

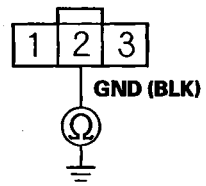
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DTC Troubleshooting (cont'd)

10. Check for continuity between ELD 3P connector terminal No. 2 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Repair open in the wire between the ELD and G202 (see page 22-22), then go to step 12.

11. Replace the ELD (see page 11-251).
12. Reconnect all connectors.
13. Turn the ignition switch ON (II).
14. Reset the PCM with the HDS.
15. Do the PCM idle learn procedure (see page 11-339).
16. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1298 indicated?

YES—Go to step 17.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

17. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
18. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1298 indicated?

YES—Check for poor connections or loose terminals at the ELD and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC P1549: Charging System High Voltage

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If a high voltage battery (24 V, etc.) is connected to the vehicle, this DTC can be stored.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C off
   - Headlights off
   - Rear window defogger off
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1549 indicated?

   YES—Replace the alternator (see page 4-34), then go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box.■
7. Turn the ignition switch ON (II).
8. Reset the PCM with the HDS.
9. Do the PCM idle learn procedure (see page 11-339).
10. Start the engine.
11. Check under these conditions:
    - A/C off
    - Headlights off
    - Rear window defogger off
12. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1549 indicated?

    YES—Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P16BB: Alternator B Terminal Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P16BB indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, and check the battery performance (see page 22-63).■
7. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box (+B line).

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Repair the connectors or terminals, then go to step 9.
8. Check for an open in the wire (+B line) between the alternator and under-hood fuse/relay box.

   Is the harness OK?

   YES—Replace the alternator (see page 4-34), then go to step 9.

   NO—Repair open in the wire (+B line) between the alternator and the under-hood fuse/relay box, then go to step 9.
9. Turn the ignition switch ON (II).
10. Reset the PCM with the HDS.
11. Do the PCM idle learn procedure (see page 11-339).
12. Start the engine.
13. Check under these conditions:
    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam
14. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P16BB indicated?

    YES—Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC P16BC: Alternator FR Terminal Circuit/ IGP Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check for poor connections or loose terminals at the alternator 4P connector.

   Are the connections and terminals OK?

   YES—Go to step 2.

   NO—Repair the connector or terminals, then go to step 18.

2. Check the alternator mounting surface for corrosion.

   Is the mounting surface corroded?

   YES—Remove the alternator (see page 4-34). Clean all mounting surfaces, reinstall the alternator, then go to step 18.

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Start the engine.

6. Check under these conditions:

   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam

7. Hold the engine speed 2,000 rpm (in Park or neutral) for 1 minute.

8. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P16BC indicated?

   YES—Go to step 9.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the alternator. ■

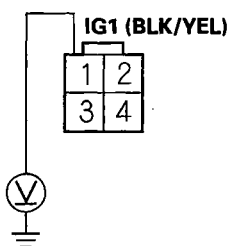
9. Turn the ignition switch OFF.

10. Disconnect the alternator 4P connector.

11. Turn the ignition switch ON (II).

12. Measure voltage between alternator 4P connector terminal No. 1 and body ground.

ALTERNATOR 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 13.

NO—Repair open in the wire between the alternator (IG1 line) and the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box, then go to step 18.

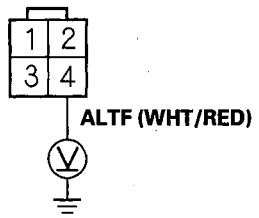
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DTC Troubleshooting (cont'd)

13. Measure voltage between alternator 4P connector terminal No. 4 and body ground.

ALTERNATOR 4P CONNECTOR



Wire side of female terminals

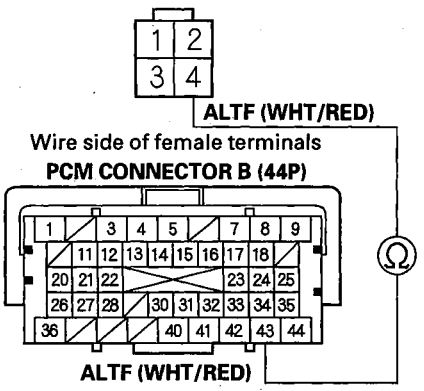
Is there about 5 V?

YES—Replace the alternator (see page 4-34), then go to step 18.

NO—Go to step 14.

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector B (44P).
17. Check for continuity between alternator 4P connector terminal No. 4 and PCM connector terminal B43.

ALTERNATOR 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (B43) and the alternator, then go to step 18.

18. Turn the ignition switch OFF.
19. Reconnect all connectors.
20. Turn the ignition switch ON (II).
21. Reset the PCM with the HDS.
22. Do the PCM idle learn procedure (see page 11-339).
23. Start the engine.
24. Check under these conditions:

- A/C on
- Temperature control at maximum cool
- Blower fan at maximum speed
- Rear window defogger on
- Headlights on high beam

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25. Hold the engine speed 2,000 rpm (in Park or neutral) for 1 minute.

26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P16BC indicated?

    YES—Check for poor connections or loose terminals at the alternator and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

27. Reconnect all connectors.

28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

29. Start the engine.

30. Check under these conditions:

    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam

31. Hold the engine speed 2,000 rpm (in Park or neutral) for 1 minute.

32. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P16BC indicated?

    YES—Check for poor connections or loose terminals at the alternator and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 29. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2183: ECT Sensor 2 Circuit Range/ Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check for poor connections or loose terminals at ECT sensor 1 and ECT sensor 2.

   Are the connections and terminals OK?

   YES—Go to step 2.

   NO—Repair the connectors or terminals, then go to step 27.

2. Turn the ignition switch ON (II).
3. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P1116 and P2183 indicated at the same time?

   YES—Go to step 15.

   NO—Go to step 4.

4. Start the engine, and let it idle 10 minutes.
5. Check ECT SENSOR 2 in the DATA LIST with the HDS.

   Is about 124 °F (51 °C) or less indicated?

   YES—Replace ECT sensor 2 (see page 11-250), then go to step 27.

   NO—Go to step 6.

6. Turn the ignition switch OFF.
7. Drain the coolant (see page 10-7).
8. Remove ECT sensor 2 (see page 11-250).
9. Allow ECT sensor 2 to cool to ambient temperature.
10. Note the ambient temperature.
11. Connect ECT sensor 2 to its 2P connector, but do not install it in the radiator.
12. Turn the ignition switch ON (II).
13. Note the value of ECT SENSOR 2 quickly in the DATA LIST with the HDS.
14. Compare the value of ECT SENSOR 2 and the ambient temperature.

    Does ECT SENSOR 2 differ 5.4 °F (3 °C) or more?

    YES—Replace ECT sensor 2 (see page 11-250), then go to step 27.

    NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. ■
15. Start the engine, and let it idle 10 minutes.
16. Check ECT SENSOR 1 in the DATA LIST with the HDS.

    Is about 127 °F (53 °C) or less indicated?

    YES—Replace ECT sensor 1 (see page 11-249), then go to step 27.

    NO—Go to step 17.

17. Let the engine idle 10 minutes.
18. Check ECT SENSOR 2 in the DATA LIST with the HDS.

    Is about 124 °F (51 °C) or less indicated?

    YES—Replace ECT sensor 2 (see page 11-250), then go to step 27.

    NO—Go to step 19.

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19. Turn the ignition switch OFF.

20. Drain the coolant (see page 10-7).

21. Remove ECT sensor 1 (see page 11-249) and ECT sensor 2 (see page 11-250).

22. Allow the sensors to cool to ambient temperature.

23. Note the ambient temperature.

24. Connect ECT sensor 1 and ECT sensor 2 to their 2P connector, but do not install them on the engine or the radiator.

25. Note the value of ECT SENSOR 1 and ECT SENSOR 2 quickly in the DATA LIST with the HDS.

26. Compare the value of ECT SENSOR 1 and the ambient temperature, and the value of ECT SENSOR 2 and the ambient temperature individually.

    Does one of the sensors differ more than 5.4 °F (3 °C) from the ambient temperature?

    YES—Replace the sensor that differed more than 5.4 °F (3 °C) from the ambient temperature.

    - ECT sensor 1 (see page 11-249)
    - ECT sensor 2 (see page 11-250)

    After replacing the sensor, go to step 27.

    NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM. ■

27. Turn the ignition switch ON (II).

28. Reset the PCM with the HDS.

29. Do the PCM idle learn procedure (see page 11-339).

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2183 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 1, ECT sensor 2, and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P2184: ECT Sensor 2 Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check ECT SENSOR 2 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 3.

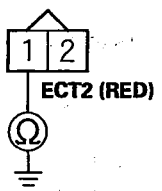
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 2 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2 2P connector.
5. Turn the ignition switch ON (II).
6. Check ECT SENSOR 2 in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or more, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Check for continuity between ECT sensor 2 2P connector terminal No. 1 and body ground.

ECT SENSOR 2 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between ECT sensor 2 and the PCM (A33), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace ECT sensor 2 (see page 11-250).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2184 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 2 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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18. Reconnect all connectors.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2184 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 2 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2185: ECT Sensor 2 Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

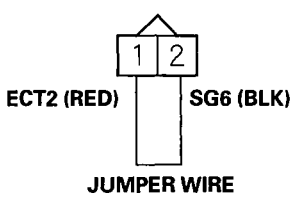
1. Turn the ignition switch ON (II).
2. Check ECT SENSOR 2 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at ECT sensor 2 and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2 2P connector.
5. Connect ECT sensor 2 2P connector terminals No. 1 and No. 2 with a jumper wire.

ECT SENSOR 2 2P CONNECTOR



Wire side of female terminals

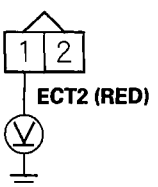
6. Turn the ignition switch ON (II).
7. Check ECT SENSOR 2 in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 20.
8. Turn the ignition switch OFF.
9. Remove the jumper wire from the ECT sensor 2 2P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between ECT sensor 2 2P connector terminal No. 1 and body ground.

ECT SENSOR 2 2P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 12.

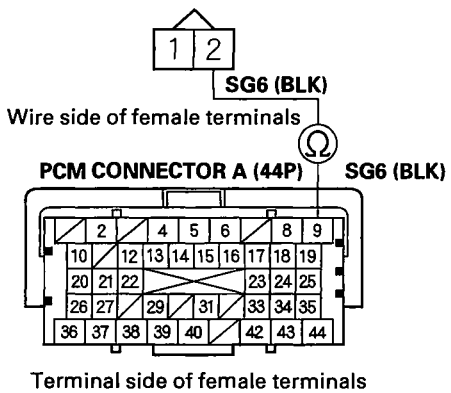
NO—Go to step 16.

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12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector A (44P).
15. Check for continuity between ECT sensor 2 2P connector terminal No. 2 and PCM connector terminal A9.

ECT SENSOR 2 2P CONNECTOR



Terminal side of female terminals

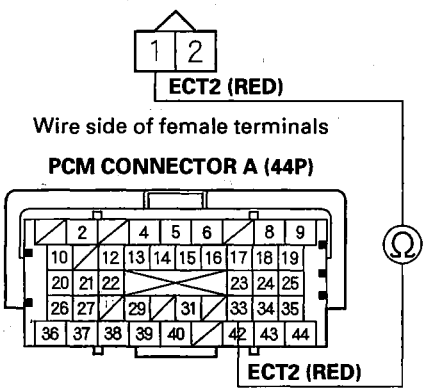
Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (A9) and ECT sensor 2, then go to step 22.

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector A (44P).
19. Check for continuity between ECT sensor 2 2P connector terminal No. 1 and PCM connector terminal A33.

ECT SENSOR 2 2P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the PCM (A33) and ECT sensor 2, then go to step 22.

(cont'd)

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DTC Troubleshooting (cont'd)

20. Turn the ignition switch OFF.
21. Replace ECT sensor 2 (see page 11-250).
22. Reconnect all connectors.
23. Turn the ignition switch ON (II).
24. Reset the PCM with the HDS.
25. Do the PCM idle learn procedure (see page 11-339).
26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2185 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 2 and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
27. Reconnect all connectors.
28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
29. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2185 indicated?

    YES—Check for poor connections or loose terminals at ECT sensor 2 and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P2195: A/F Sensor (Sensor 1) Signal Stuck Lean

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If the vehicle was out of fuel and the engine stalled before this DTC was stored, refuel and clear the DTC with the HDS.
- If DTC P2101, P2118, P2135, P2138, P2176 or a combination of P2122 and P2127, P2122 and P2138, or P2127 and P2138 is stored at the same time, troubleshoot them first, then recheck for DTC P2195.

1. Check the installation of the A/F sensor (Sensor 1).

   Is the A/F sensor loose or disconnected from the warm up TWC?

   YES—Go to step 6.

   NO—Go to step 2.

2. Turn the ignition switch ON (II).
3. Clear the DTC with the HDS.
4. Start the engine, and let it idle for 2 minutes.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2195 indicated?

   YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 13.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

6. Turn the ignition switch OFF.
7. Reinstall the A/F sensor (Sensor 1) (see page 11-245).
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2195 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1.

    NO—Go to step 12.

12. Monitor the OBD STATUS for DTC P2195 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 11, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicated NOT COMPLETED, keep idling until a result comes on.

(cont'd)

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DTC Troubleshooting (cont'd)

13. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

14. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2195 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—Go to step 16.

16. Monitor the OBD STATUS for DTC P2195 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 15, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 14. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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BACK

DTC P2199: IAT Sensor 1, 2 Incorrect Correlation

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch OFF.
2. Remove MAF sensor/IAT sensor 1 (see page 11-247).
3. Remove IAT sensor 2 (see page 11-248).
4. Cool the sensors to ambient temperature.
5. Note the ambient temperature.
6. Connect MAF sensor/IAT sensor 1 5P connector and IAT sensor 2 2P connector.
7. Turn the ignition switch ON (II).
8. Note the value of IAT SENSOR 1 and IAT SENSOR 2 quickly in the DATA LIST with the HDS.
9. Compare the value of IAT SENSOR 1 and IAT SENSOR 2 to the ambient temperature.

   Does the value of IAT SENSOR 1 or IAT SENSOR 2 differ 34 °F (19 °C) or more?

   YES—Go to step 10.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at IAT sensor 1, IAT sensor 2, and the PCM. ■
10. Replace the sensor that differed more than 34 °F (19 °C) from the ambient temperature.

    - MAF sensor/IAT sensor 1 (see page 11-247)
    - IAT sensor 2 (see page 11-248)
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Turn the ignition switch OFF.
15. Open the hood, and let the engine cool for more than 6 hours.
16. Start the engine, and let it idle.
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2199 indicated?

    YES—Check for poor connections or loose terminals at IAT sensor 1, IAT sensor 2, and the PCM, then go to step 1.

    NO—Go to step 18.
18. Monitor the OBD STATUS for DTC P2199 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at IAT sensor 1, IAT sensor 2, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 14.

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DTC Troubleshooting (cont'd)

DTC P2227: BARO Sensor Circuit Range/ Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II), and wait 2 seconds.
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is about 101 kPa (29.9 in.Hg, 760 mmHg), or about 2.9 V at sea level indicated?

   YES—Go to step 3.

   NO—Go to step 7.
3. Clear the DTC with the HDS.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Test-drive under these conditions:

   - Engine speed above 1,750 rpm
   - Transmission in D position
   - REL TP SENSOR above 22 deg
   - Drive 5 seconds or more
6. Monitor the OBD STATUS for DTC P2227 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 7.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates NOT COMPLETED, go to step 4 and recheck.
7. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
8. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park neutral) until the radiator fan comes on, then let it idle.
9. Test-drive under these conditions:

   - Engine speed above 1,750 rpm
   - Transmission in D position
   - REL TP SENSOR above 22 deg
   - Drive 5 seconds or more
10. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2227 indicated?

    YES—Check for poor connections or loose terminals at the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 8. If the PCM was substituted, go to step 1.

    NO—Go to step 11.
11. Monitor the OBD STATUS for DTC P2227 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 10, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 8. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 8.

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BACK

DTC P2228: BARO Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is about 53 kPa (15.6 in.Hg, 397 mmHg), or 1.58 V or less indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. ■
3. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2228 indicated?

   YES—Check for poor connections or loose terminals at the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

DTC P2229: BARO Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.2 in.Hg, 1,200 mmHg), or 4.5 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. ■
3. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2229 indicated?

   YES—Check for poor connections or loose terminals at the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P2238: A/F Sensor (Sensor 1) AFS+ Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

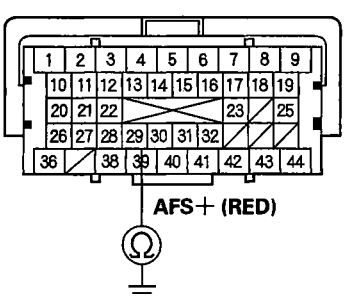
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2238 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. ■
4. Turn the ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the A/F sensor (Sensor 1) 4P connector.
7. Disconnect PCM connector C (44P).
8. Check for continuity between PCM connector terminal C29 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C29) and the A/F sensor (Sensor 1), then go to step 10.

NO—Go to step 9.

9. Replace the A/F sensor (Sensor 1) (see page 11-245).
10. Reconnect all connectors.
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2238 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the connector and terminal fits are OK, go to step 16.

    NO—Go to step 15.

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15. Monitor the OBD STATUS for DTC P2238 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 14, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result come on.

16. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

17. Start the engine, and let it idle.

18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2238 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 17. If the PCM was substituted, go to step 1.

    NO—Go to step 19.

19. Monitor the OBD STATUS for DTC P2238 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 18, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, go to step 1. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 17. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling idle until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P2252: A/F Sensor (Sensor 1) AFS— Circuit Low Voltage

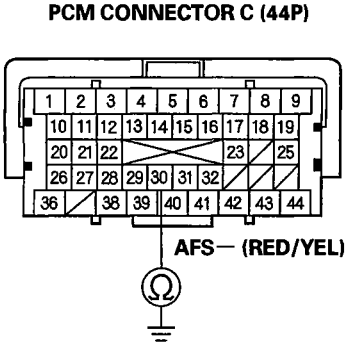
NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2252 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect the A/F sensor (Sensor 1) 4P connector.
8. Disconnect PCM connector C (44P).
9. Check for continuity between PCM connector terminal C30 and body ground.



Terminal side of female terminals

   Is there continuity?

   YES—Repair short in the wire between the PCM (C30) and the A/F sensor (Sensor 1), then go to step 11.

   NO—Go to step 10.
10. Replace the A/F sensor (Sensor 1) (see page 11-245).
11. Reconnect all connectors.
12. Turn the ignition switch ON (II).
13. Reset the PCM with the HDS.
14. Do the PCM idle learn procedure (see page 11-339).
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2252 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the connector and terminal fits are OK, go to step 17.

    NO—Go to step 16.

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16. Monitor the OBD STATUS for DTC P2252 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 15, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

17. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

18. Start the engine, and let it idle.

19. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2252 indicated?

    YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 18. If the PCM was substituted, go to step 1.

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P2252 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 19, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 1. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 18. If the screen indicates NOT COMPLETED, keep idling idle until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P2270: Secondary HO2S (Sensor 2) Circuit Signal Stuck Lean

DTC P2271: Secondary HO2S (Sensor 2) Circuit Signal Stuck Rich

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Vehicle speed at 35 mph (56 km/h) or more for at least 25 seconds
5. Monitor the OBD STATUS for DTC P2270 or P2271 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the secondary HO2S (Sensor 2) (see page 11-245).
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
12. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Vehicle speed at 35 mph (56 km/h) or more for at least 25 seconds
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2270 or P2271 indicated?

    YES—Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P2270 or P2271 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11.

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DTC P2610: PCM Ignition Off Internal Timer Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2610 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. ■
4. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2610 indicated?

   YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P2A00: A/F Sensor (Sensor 1) Circuit Range/Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Vehicle speed between 25—55 mph (40—88 km/h) for 5 minutes.
   - Drive at a steady speed between 55—75 mph (88—120 km/h) for 10 seconds.
5. Monitor the OBD STATUS for DTC P2A00 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the A/F sensor (Sensor 1) (see page 11-245).
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Start the engine. Hold the engine speed at 3000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Vehicle speed between 25—55 mph (40—88 km/h) for 5 minutes.
    - Drive at a steady speed between 55—75 mph (88—120 km/h) for 10 seconds.
13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2A00 indicated?

    YES—Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P2A00 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11.

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DTC U0028: F-CAN Malfunction (BUS-OFF)

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC U0028 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time.■
4. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
5. Turn the ignition switch ON (II).
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0028 indicated?

   YES—If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC U0114: F-CAN Malfunction (PCM-SH-AWD Control Unit)

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC U0028 is stored at the same time as DTC U0114, troubleshoot DTC U0028 first, then recheck for DTC U0114.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC U0114 indicated?

   YES—Go to step 4.

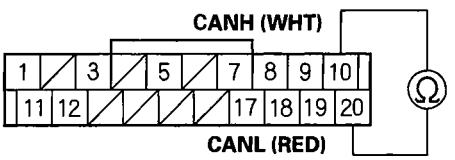
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the gauge assembly, the SH-AWD control unit, and the PCM. ■
4. Check for SH-AWD system DTCs with the HDS.

   Is SH-AWD system DTC 41 and/or 77 indicated?

   YES—Go to step 5.

   NO—Go to step 8.
5. Turn the ignition switch OFF.
6. Disconnect SH-AWD control unit connector A (20P) (see page 15-71).
7. Check for continuity between SH-AWD control unit connector terminals A10 and A20.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit, then go to step 16 and recheck. If DTC U0114 is not indicated, replace the original SH-AWD control unit, then go to step 16.

NO—Repair open in the wire between the SH-AWD control unit (A10 (A20)*) and the PCM (A36 (A37)*), then go to step 16.

*: CANL line

8. Check for a poor connection at SH-AWD control unit connectors A (20P) and B (8P).

   Are the connections OK?

   YES—Go to step 9.

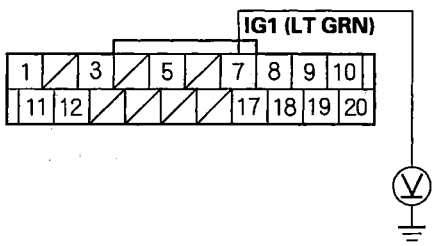
   NO—Repair the poor connection at SH-AWD control unit connectors A (20P) and B (8P), then go to step 16.
9. Turn the ignition switch OFF.
10. Disconnect SH-AWD control unit connector A (20P) (see page 15-71).
11. Turn the ignition switch ON (II).

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12. Measure voltage between SH-AWD control unit connector terminal A7 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there battery voltage?

YES—Go to step 13.

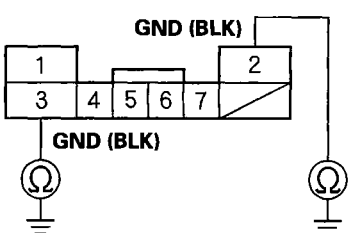
NO—Check the No. 1 IG1 SH-AWD (7.5 A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the No. 1 IG1 SH-AWD (7.5 A) fuse and the SH-AWD control unit, then go to step 16.

13. Turn the ignition switch OFF.

14. Disconnect SH-AWD control unit connector B (8P).

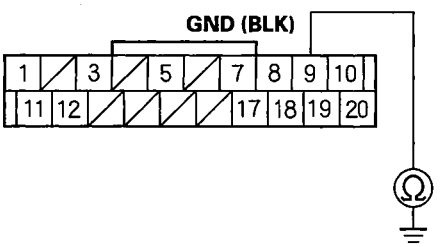
15. Check for continuity between body ground and SH-AWD control unit connector terminals B2 and B3 individually, and between SH-AWD control unit connector terminal A9 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit, then go to step 16 and recheck. If DTC U0114 is not indicated, replace the original SH-AWD control unit, then go to step 16.

NO—Repair open in the wire between the SH-AWD control unit and G601, then go to step 16.

16. Reconnect all connectors.

17. Turn the ignition switch ON (II).

18. Reset the PCM with the HDS.

19. Do the PCM idle learn procedure (see page 11-339).

20. Check for Temporary DTCs or DTCs with the HDS.

Is DTC U0114 indicated?

YES—Check for poor connections or loose terminals at the gauge control module, the SH-AWD control unit, and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC U0122: F-CAN Malfunction (PCM-VSA)

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC U0122 indicated?

   YES—Go to step 4.

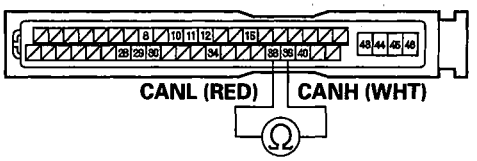
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the gauge control module, the VSA modulator-control unit, and the PCM. ■
4. Check for VSA system DTCs in the DTCs MENU with the HDS.

   Is VSA DTC 86 indicated?

   YES—Go to step 5.

   NO—Go to step 8.
5. Turn the ignition switch OFF.
6. Disconnect the VSA modulator-control unit 46P connector (see page 19-137).
7. Check for continuity between VSA modulator-control unit 46P connector terminals No. 38 and No. 39.

VSA MODULATOR-CONTROL UNIT 46P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good VSA modulator-control unit, then go to step 15 and recheck. If DTC U0122 is not indicated, replace the original VSA modulator-control unit, then go to step 15.

NO—Repair open in the wire between the VSA modulator-control unit (No. 39 (No. 38)*) and the PCM (A36 (A37)*), then go to step 15.

*: CANL line

8. Check for poor connections at the VSA modulator-control unit 46P connector.

   Are the connections OK?

   YES—Go to step 9.

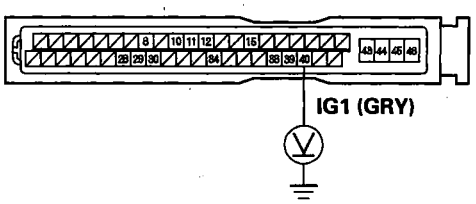
   NO—Repair the poor connection(s), then go to step 15.

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9. Turn the ignition switch OFF.
10. Disconnect the VSA modulator-control unit 46P connector (see page 19-137).
11. Turn the ignition switch ON (II).
12. Measure voltage between VSA modulator-control unit 46P connector terminal No. 40 and body ground.

VSA MODULATOR-CONTROL UNIT 46P CONNECTOR



Wire side of female terminals

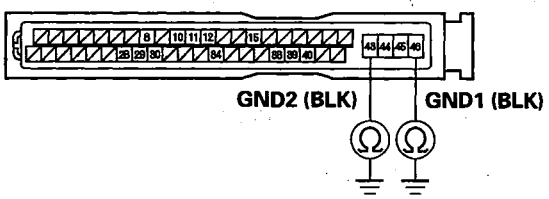
Is there battery voltage?

YES—Go to step 13.

NO—Check the No. 4 ABS VSA (7.5 A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the No. 4 ABS VSA (7.5 A) fuse and the VSA modulator-control unit, then go to step 15.

13. Turn the ignition switch OFF.
14. Check for continuity between VSA modulator-control unit 46P connector terminal No. 43, No. 46 and body ground individually.

VSA MODULATOR-CONTROL UNIT 46P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good VSA modulator-control unit (see page 19-137), then go to step 15 and recheck. If DTC U0122 is not indicated, replace the original VSA modulator-control unit (see page 19-137), then go to step 15.

NO—Repair open in the wire between the VSA modulator-control unit and body ground (G402), then go to step 15.

15. Reconnect the VSA modulator-control unit 46P connector.
16. Turn the ignition switch ON (II).
17. Reset the PCM with the HDS.
18. Do the PCM idle learn procedure (see page 11-339).
19. Check for Temporary DTCs or DTCs with the HDS.

Is DTC U0122 indicated?

YES—Check for poor connections or loose terminals at the gauge control module, the VSA modulator-control unit, and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC U0155: F-CAN Malfunction (PCM-Gauge Control Module)

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC U0155 indicated?

   YES—Go to step 4.

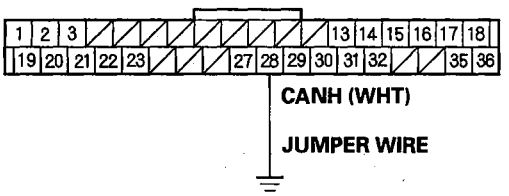
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the gauge control module and the PCM.■
4. Check for body electrical DTCs with the HDS.

   Is DTC B1168, B1169, and/or B1178 indicated?

   YES—Go to step 5.

   NO—Do the gauge control module input test (see page 22-282).■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Remove the gauge control module (see page 22-284).
8. Disconnect the gauge control module 36P connector.
9. Disconnect PCM connector A (44P).
10. Connect gauge control module 36P connector terminal No. 28 to body ground with a jumper wire.

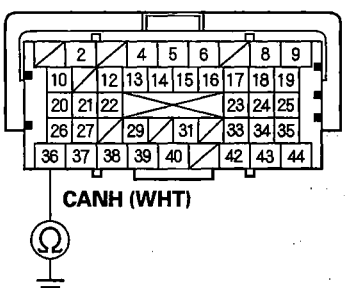
GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

11. Check for continuity between PCM connector terminal A36 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 12.

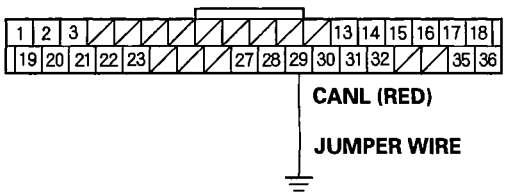
NO—Repair open in the wire between the PCM (A36) and the gauge control module, then go to step 14.

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12. Connect gauge control module 36P connector terminal No. 29 to body ground with a jumper wire.

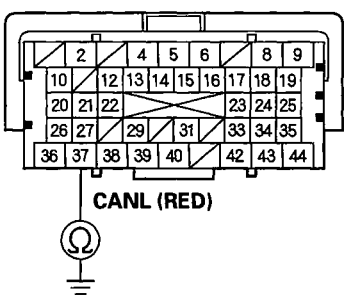
GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

13. Check for continuity between PCM connector terminal A37 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Substitute a known-good gauge control module (see page 22-284), then go to step 14 and recheck. If no DTCs are indicated, replace the original gauge control module (see page 22-284), then go to step 14.

NO—Repair open in the wire between the PCM (A37) and the gauge control module, then go to step 14.

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the PCM with the HDS.

17. Do the PCM idle learn procedure (see page 11-339).

18. Check for Temporary DTCs or DTCs with the HDS.

Is DTC U0155 indicated?

YES—Check for poor connections or loose terminals at the gauge control module and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC U0300: PGM-FI System and A/T System Program Version Mismatch

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- Do not turn the ignition switch OFF while updating the PCM. If you turn the ignition switch OFF before completion, the PCM will be damaged.

1. Do the PCM update procedure (PGM-FI system) (see page 11-7).

2. Do the PCM update procedure (A/T system) (see page 14-8).

3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC U0300 indicated?

   YES—Replace the original PCM (see page 11-252). ■

   NO—The update is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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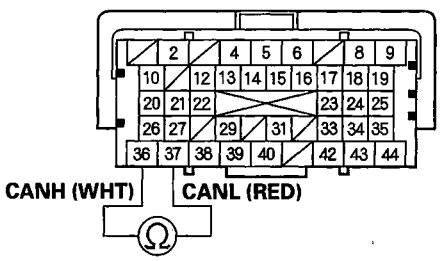
BACK

F-CAN Circuit Troubleshooting (Part 1)

NOTE: Information marked with an asterisk (*) applies to the CANL line.

1. Turn the ignition switch OFF.
2. Jump the SCS line with the HDS.
3. Disconnect PCM connector A (44P), then disconnect the HDS.
4. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

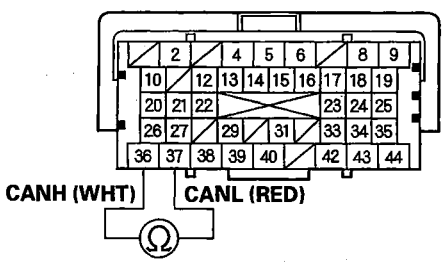
Is there about 85— 103 Ω ((with AcuraLink navigation system), 88— 107 Ω (with non-AcuraLink navigation system), or 91— 111 Ω (without navigation system))?

YES—Go to "F-CAN Circuit Trouble shooting (Part 2)" (see page 11-224).

NO—Go to step 5.

5. Disconnect the gauge control module 36P connector (see page 22-284).
6. Disconnect the VSA modulator-control unit 46P connector (see page 19-37).
7. Disconnect SRS unit connector A (28P) (see step 12 on page 24-23).
8. Disconnect the steering angle sensor 5P connector (see page 19-82).
9. Disconnect the yaw rate-lateral acceleration sensor 4P connector (see page 19-135).
10. Disconnect TPMS control unit 20P connector (see page 18-90).
11. Disconnect the SH-AWD control unit connector A (20P) (see page 15-71).
12. With navigation system: Disconnect the navigation unit connector A (20P) (see page 23-190).
13. With AcuraLink system: Disconnect the AcuraLink control unit (XM receiver) connector A (20P) (see page 23-108).
14. Check for continuity between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wires between PCM connector terminals A36 and A37*. ■

NO—Go to step 15.

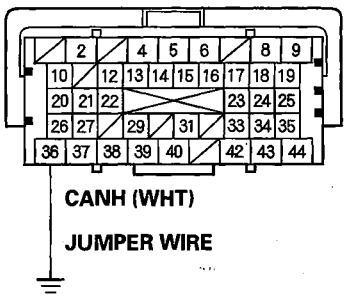
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F-CAN Circuit Troubleshooting (Part 1) (cont'd)

15. Connect PCM connector terminal A36 to body ground with a jumper wire.

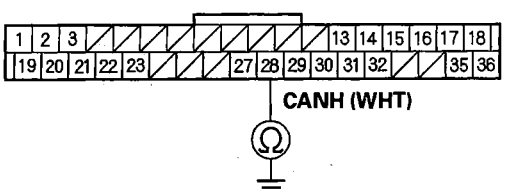
PCM CONNECTOR A (44P)



Terminal side of female terminals

16. Check for continuity between gauge control module 36P connector terminal No. 28 and body ground.

GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

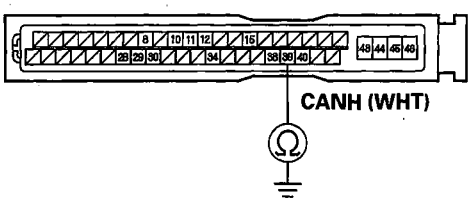
Is there continuity?

YES—Go to step 17.

NO—Repair open in the wire between the PCM (A36) and the gauge control module.■

17. Check for continuity between VSA modulator-control unit 46P connector terminal No. 39 and body ground.

VSA MODULATOR-CONTROL UNIT 46P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 18.

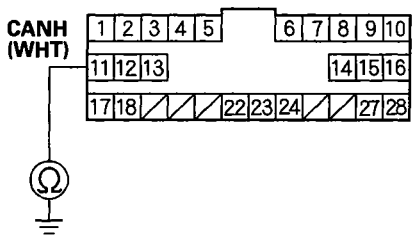
NO—Repair open in the wire between the PCM (A36) and the VSA modulator-control unit.■

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BACK

18. Check for continuity between SRS unit connector A (28P) terminal No. 11 and body ground.

SRS UNIT CONNECTOR A (28P)



Wire side of female terminals

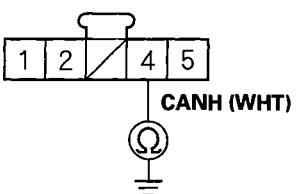
Is there continuity?

YES—Go to step 19.

NO—Repair open in the wire between the PCM (A36) and the SRS unit. ■

19. Check for continuity between steering angle sensor 5P connector terminal No. 4 and body ground.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

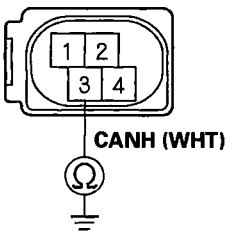
Is there continuity?

YES—Go to step 20.

NO—Repair open in the wire between the PCM connector (A36) and the steering angle sensor. ■

20. Check for continuity between yaw rate-lateral acceleration sensor 4P connector terminal No. 3 and body ground.

YAW RATE-LATERAL ACCELERATION SENSOR 4P CONNECTOR



Wire side of female terminals

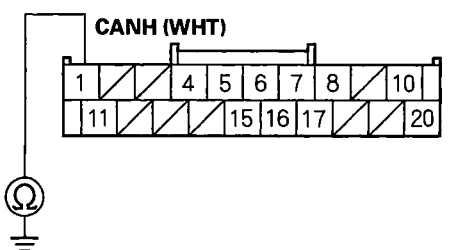
Is there continuity?

YES—Go to step 21.

NO—Repair open in the wire between the PCM (A36) and the yaw rate-lateral acceleration sensor. ■

21. Check for continuity between TPMS control unit 20P connector terminal No. 1 and body ground.

TPMS CONTROL UNIT 20P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 22.

NO—Repair open in the wire between the PCM (A36) and the TPMS control unit. ■

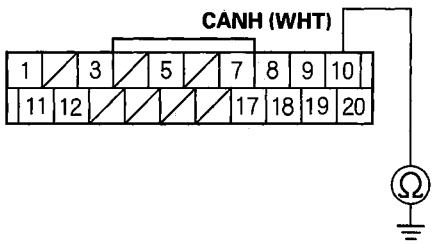
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F-CAN Circuit Troubleshooting (Part 1) (cont'd)

22. Check for continuity between SH-AWD control unit connector A (20P) terminal No. 10 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

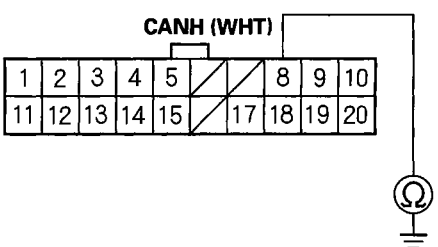
Is there continuity?

YES—
- With navigation system: Go to step 23.
- Without navigation system: Go to step 25.

NO—Repair open in the wire between the PCM (A36) and the SH-AWD control unit. ■

23. Check for continuity between navigation unit connector A (20P) terminal No. 8 and body ground.

NAVIGATION UNIT CONNECTOR A (20P)



Wire side of female terminals

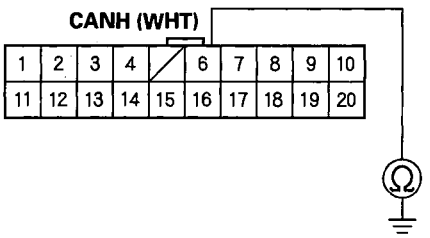
Is there continuity?

YES—
- With AcuraLink system: Go to step 24.
- Without AcuraLink system: Go to step 25.

NO—Repair open in the wire between the PCM (A36) and the navigation unit. ■

24. Check for continuity between AcuraLink control unit (XM receiver) connector A (20P) terminal No. 6 and body ground.

ACURALINK CONTROL UNIT (XM RECEIVER) CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the PCM (A36) and the AcuraLink control unit (XM receiver). ■

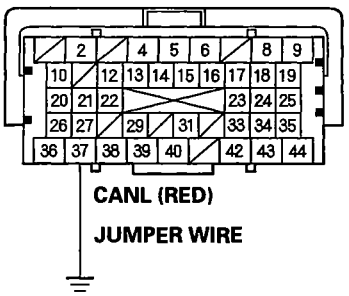
25. Remove the jumper wire from PCM connector A (44P).

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BACK

26. Connect PCM connector terminal A37 to body ground with a jumper wire.

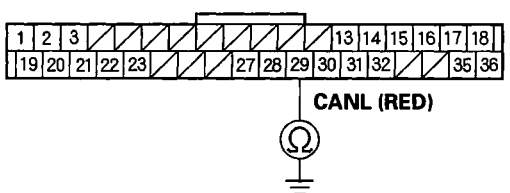
PCM CONNECTOR A (44P)



Terminal side of female terminals

27. Check for continuity between gauge control module 36P connector terminal No. 29 and body ground.

GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

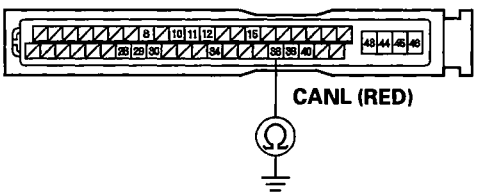
Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between the PCM (A37) and the gauge control module. ■

28. Check for continuity between VSA modulator-control unit 46P connector terminal No. 38 and body ground.

VSA MODULATOR-CONTROL UNIT 46P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 29.

NO—Repair open in the wire between the PCM (A37) and the VSA modulator-control unit. ■

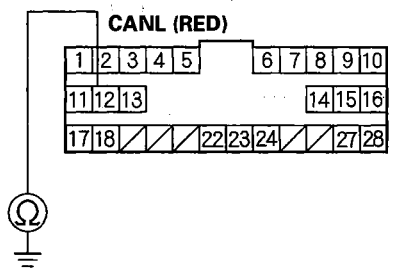
(cont'd)

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F-CAN Circuit Troubleshooting (Part 1) (cont'd)

29. Check for continuity between SRS unit connector A (28P) terminal No. 12 and body ground.

SRS UNIT CONNECTOR A (28P)



Wire side of female terminals

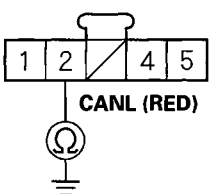
Is there continuity?

YES—Go to step 30.

NO—Repair open in the wire between the PCM (A37) and the SRS unit. ■

30. Check for continuity between steering angle sensor 5P connector terminal No. 2 and body ground.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

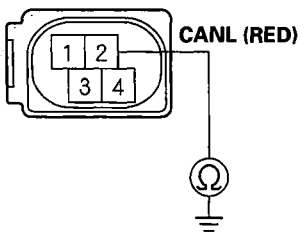
Is there continuity?

YES—Go to step 31.

NO—Repair open in the wire between the PCM connector (A37) and the steering angle sensor. ■

31. Check for continuity between yaw rate-lateral acceleration sensor 4P connector terminal No. 2 and body ground.

YAW RATE-LATERAL ACCELERATION SENSOR 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 32.

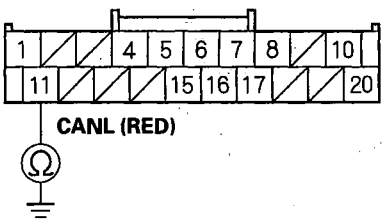
NO—Repair open in the wire between the PCM (A37) and the yaw rate-lateral acceleration sensor. ■

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BACK

32. Check for continuity between TPMS control unit 20P connector terminal No. 11 and body ground.

TPMS CONTROL UNIT 20P CONNECTOR



Wire side of female terminals

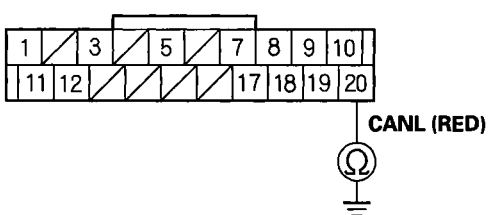
Is there continuity?

YES—Go to step 33.

NO—Repair open in the wire between the PCM (A37) and the TPMS control unit. ■

33. Check for continuity between SH-AWD control unit connector A (20P) terminal No. 20 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

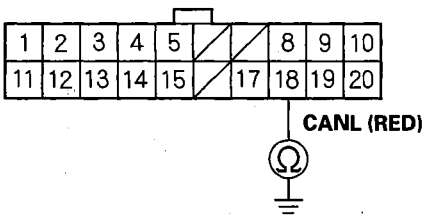
Is there continuity?

YES—
- With navigation system: Go to step 34.
- Without navigation system: Go to step 36.

NO—Repair open in the wire between the PCM (A37) and the SH-AWD control unit. ■

34. Check for continuity navigation unit connector A (20P) terminal No. 18 and body ground.

NAVIGATION UNIT CONNECTOR A (20P)



Wire side of female terminals

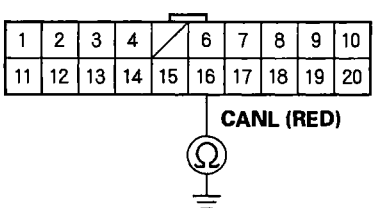
Is there continuity?

YES—
- With AcuraLink system: Go to step 35.
- Without AcuraLink system: Go to step 36.

NO—Repair open in the wire between the PCM (A37) and the navigation unit. ■

35. Check for continuity between AcuraLink control unit (XM receiver) connector A (20P) terminal No. 16 and body ground.

ACURALINK CONTROL UNIT (XM RECEIVER) CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Go to step 36.

NO—Repair open in the wire between the PCM (A37) and the AcuraLink control unit (XM receiver). ■

(cont'd)

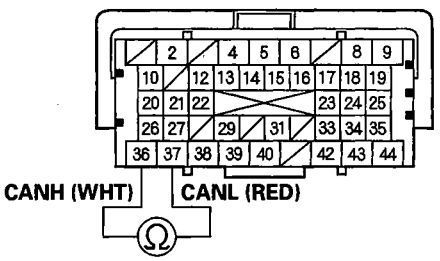
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F-CAN Circuit Troubleshooting (Part 1) (cont'd)

36. Reconnect the gauge control module 36P connector.

37. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 108—132 kΩ ?

YES—Go to step 38.

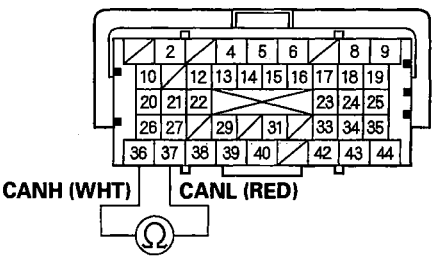
NO—Substitute a known-good gauge control module (see page 22-284) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original gauge control module (see page 22-284).■

38. Disconnect the gauge control module 36P connector (see page 22-284) and PCM connector A.

39. Reconnect the VSA modulator-control unit 46P connector.

40. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

YES—Go to step 41.

NO—Substitute a known-good VSA modulator-control unit (see page 19-137) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original VSA modulator-control unit (see page 19-137).■

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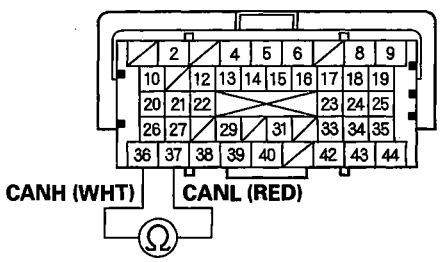
BACK

41. Disconnect the VSA modulator-control unit 46P connector (see page 19-137) and PCM connector A (44P).

42. Reconnect SRS unit connector A (28P).

43. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

YES—Go to step 44.

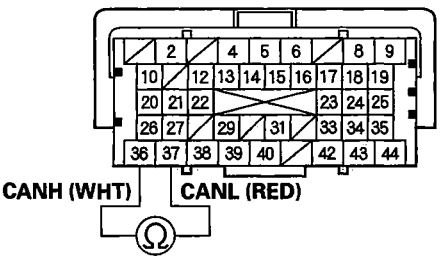
NO—Substitute a known-good SRS unit (see page 24-161) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original SRS unit (see page 24-161).■

44. Disconnect SRS unit connector A (28P) (see step 12 on page 24-23) and PCM connector A (44P).

45. Reconnect TPMS control unit 20P connector.

46. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

YES—Go to step 47.

NO—Substitute a known-good TPMS control unit (see page 18-90) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original TPMS control unit (see page 18-90).■

47. Disconnect the TPMS control unit 20P connector (see page 18-90) and PCM connector A (44P).

48. Reconnect SH-AWD control unit connector A (20P).

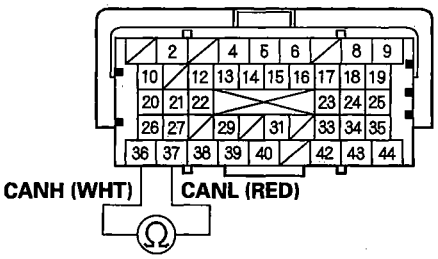
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F-CAN Circuit Troubleshooting (Part 1) (cont'd)

49. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

YES—
- With navigation system: Go to step 50.
- Without navigation system: Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

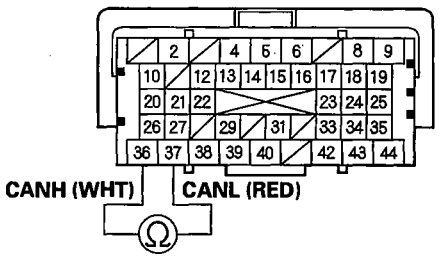
NO—Substitute a known-good SH-AWD control unit (see page 15-71) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original SH-AWD control unit (see page 15-71). ■

50. Disconnect SH-AWD control unit connector A (20P) and PCM connector A (44P).

51. Reconnect navigation unit connector A (20P).

52. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

YES—
- With AcuraLink system: Go to step 53.
- Without AcuraLink system: Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

NO—Substitute a known-good navigation unit (see page 23-190) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original navigation unit (see page 23-190).■

53. Disconnect navigation unit connector A (20P) (see page 23-190) and PCM connector A (44P).

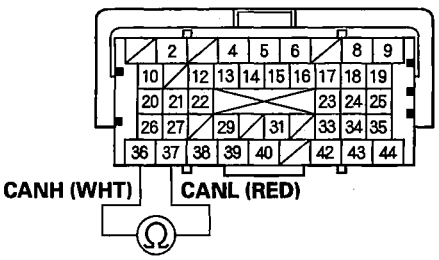
54. Reconnect the AcuraLink control unit (XM receiver) connector A (20P).

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BACK

55. Measure resistance between PCM connector terminals A36 and A37.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there about 2.34—2.86 kΩ ?

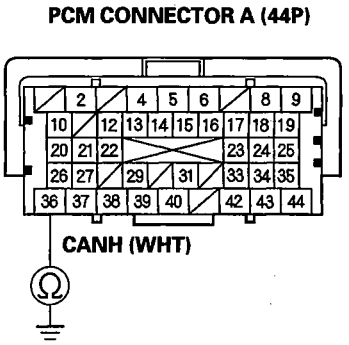
YES—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

NO—Substitute a known-good AcuraLink control unit (XM receiver) (see page 23-108) and reconnect PCM connector A (44P). If the HDS identifies the vehicle, replace the original AcuraLink control unit (XM receiver) (see page 23-108).■

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F-CAN Circuit Troubleshooting (Part 2)

1. Disconnect the gauge control module 36P connector (see page 22-284).
2. Disconnect the VSA modulator-control unit 46P connector (see page 19-137).
3. Disconnect SRS unit connector A (28P) (see step 14 on page 24-23).
4. Disconnect the steering angle sensor 5P connector (see page 19-134).
5. Disconnect the yaw rate-lateral acceleration sensor 4P connector (see page 19-135).
6. Disconnect TPMS control unit 20P connector (see page 18-90).
7. Disconnect SH-AWD control unit connector A (20P) (see page 15-71).
8. With navigation system: Disconnect navigation unit connector A (20P) (see page 23-190).
9. With ACURALINK system: Disconnect ACURALINK control unit (XM receiver) connector A (20P) (see page 23-108).
10. Check for continuity between PCM connector terminals A36 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal A36 and the gauge control module, the VSA modulator-control unit, the SRS unit, the steering angle sensor, the yaw rate-lateral acceleration sensor, the TPMS control unit, the SH-AWD control unit, the navigation unit, the ACURALINK control unit (XM receiver), or the DLC.■

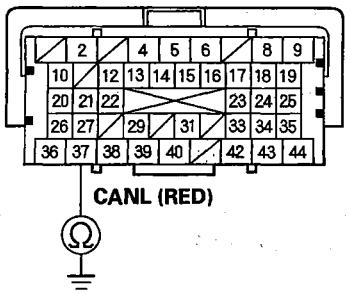
NO—Go to step 11.

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BACK

11. Check for continuity between PCM connector terminal A37 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal A37 and the gauge control module, the VSA modulator-control unit, the SRS unit, the steering angle sensor, the yaw rate-lateral acceleration sensor, the TPMS control unit, the SH-AWD control unit, the navigation unit, the ACURALINK control unit (XM receiver), or the DLC. ■

NO—Go to step 12.

12. Reconnect all connectors.

13. Connect the HDS to the DLC (see page 11-3).

14. Disconnect the gauge control module 36P connector (see page 22-284).

15. Turn the ignition switch ON (II), and read the HDS.

Does the HDS identify the vehicle?

YES—Replace the gauge control module (see page 22-284). ■

NO—Go to step 16.

16. Turn the ignition switch OFF.

17. Reconnect the gauge control module 36P connector.

18. Disconnect the VSA modulator-control unit 46P connector (see page 19-137).

19. Turn the ignition switch ON (II), and read the HDS.

Does the HDS identify the vehicle?

YES—Replace the VSA modulator-control unit (see page 19-137). ■

NO—Go to step 20.

(cont'd)

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F-CAN Circuit Troubleshooting (Part 2) (cont'd)

20. Turn the ignition switch OFF.
21. Reconnect the VSA modulator-control unit 46P connector.
22. Disconnect SRS unit connector A (28P) (see step 14 on page 24-23).
23. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the SRS unit (see page 24-161).■

    NO—Go to step 24.
24. Turn the ignition switch OFF.
25. Reconnect SRS unit connector A (28P).
26. Disconnect the steering angle sensor 5P connector (see page 19-134).
27. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the steering angle sensor (see page 19-134).■

    NO—Go to step 28.
28. Turn the ignition switch OFF.
29. Reconnect the steering angle sensor 5P connector.
30. Disconnect the yaw rate-lateral acceleration sensor 4P connector (see page 19-135).
31. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the yaw rate-lateral acceleration sensor (see page 19-135).■

    NO—Go to step 32.
32. Turn the ignition switch OFF.
33. Reconnect the yaw rate-lateral acceleration sensor.
34. Disconnect the TPMS control unit 20P connector (see page 18-90).
35. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the TPMS control unit (see page 18-90).■

    NO—Go to step 36.
36. Turn the ignition switch OFF.
37. Reconnect the TPMS control unit 20P connector.
38. Disconnect SH-AWD control unit connector A (20P) (see page 15-71).

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BACK

39. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the SH-AWD control unit (see page 15-71).■

    NO—
    - With navigation system: Go to step 40.
    - Without navigation system: Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

40. Turn the ignition switch OFF.

41. Reconnect SH-AWD control unit connector A (20P).

42. Disconnect navigation unit connector A (20P) (see page 23-190).

43. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the navigation unit (see page 23-190).■

    NO—
    - With ACURALINK system: Go to step 44.
    - Without ACURALINK system: Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

44. Turn the ignition switch OFF.

45. Reconnect navigation unit connector A (20P).

46. Disconnect the ACURALINK control unit (XM receiver) connector A (20P) (see page 23-108).

47. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS identify the vehicle?

    YES—Replace the ACURALINK control unit (XM receiver) (see page 23-108).■

    NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

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MIL Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Do the gauge self-diagnostic function (see page 22-258).

   Does the MIL indicator flash?

   YES—Go to step 3.

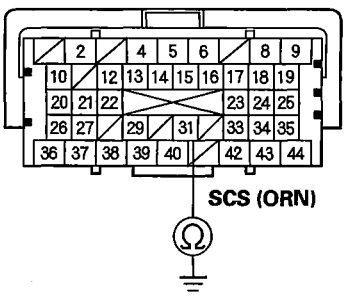
   NO—Substitute a known-good gauge control module, and recheck. If the MIL circuit is OK, replace the original gauge control module (see page 22-284). ■
3. Connect the HDS to the DLC (see page 11-3).
4. Check the SCS in the DATA LIST with the HDS.

   Is a short indicated?

   YES—Go to step 5.

   NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■
5. Turn the ignition switch OFF.
6. Disconnect PCM connector A (44P), then disconnect the HDS.
7. Check for continuity between PCM connector terminal A31 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A31) and the SRS unit, or the DLC. ■

NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

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DLC Circuit Troubleshooting

NOTE: Make sure the HDS operates normally and the DLC cable is in good condition.

1. Turn the ignition switch OFF.
2. Connect the HDS to the DLC (see page 11-3).

   NOTE: Make sure the HDS is properly connected to the DLC.
3. Turn the ignition switch ON (II), and read the HDS.

   Does the HDS identify the vehicle?

   YES—Go to step 4.

   NO—Go to step 23.
4. Check for Temporary DTCs or DTCs in the PGM-FI system with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—Go to the indicated DTC's troubleshooting. ■

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Turn the ignition switch ON (II), and watch the SRS indicator.

   Does the SRS indicator stay on?

   YES—Go to the SRS system's general troubleshooting information (see page 24-24). ■

   NO—Go to step 7.
7. Turn the ignition switch OFF.
8. Turn the ignition switch ON (II), and watch the VSA indicator.

   Does the VSA indicator stay on?

   YES—Go to the VSA system's general troubleshooting information (see page 19-83). ■

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Turn the ignition switch ON (II), and watch the SH-AWD indicator.

    Does the SH-AWD indicator stay on?

    YES—Go to the SH-AWD system's general troubleshooting information (see page 15-4). ■

    NO—Go to step 11.
11. Turn the ignition switch OFF.
12. Turn the ignition switch ON (II), and watch the TPMS indicator.

    Does the TPMS indicator stay on?

    YES—Go to the TPMS general troubleshooting information (see page 18-53). ■

    NO—Go to step 13.

(cont'd)

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DLC Circuit Troubleshooting (cont'd)

13. Turn the ignition switch OFF.

14. Turn the ignition switch ON (II), and watch the immobilizer indicator.

    Does the immobilizer indicator stay on or flash?

    YES—Check symptoms for the immobilizer system. ■

    NO—Go to step 15.

15. Do the gauge self-diagnostic function (see page 22-258).

16. Check for B-CAN system DTCs without the HDS (see page 22-93).

    Are any B-CAN DTCs indicated?

    YES—Go to the indicated DTC's troubleshooting. ■

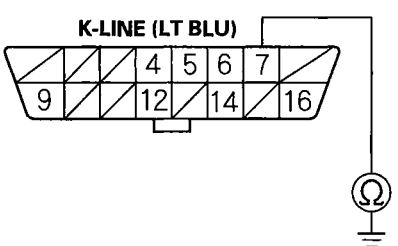
    NO—Go to step 17.

17. Turn the ignition switch OFF.

18. Disconnect the HDS from the DLC.

19. Check for continuity between DLC terminal No. 7 and body ground.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

Is there 5 Ω or less?

YES—Go to step 20.

NO—Go to step 21.

20. Continue to check for continuity between DLC terminal No. 7 and body ground, while disconnecting these parts, one at a time:

    - SRS unit connector A (28P)
    - VSA modulator-control unit 46P connector
    - SH-AWD control unit connector A (20P)
    - TPMS control unit 20P connector
    - Immobilizer-keyless control unit 7P connector
    - Audio unit 17P connector
    - Under-dash fuse/relay box (Q) (16P) connector

    Does continuity go away when one of the above components is disconnected?

    YES—Replace the part that caused an open when it was disconnected. ■

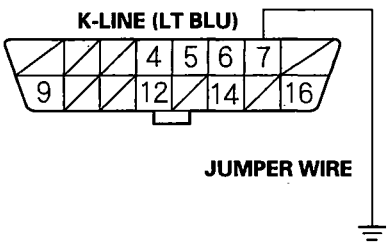
    NO—Repair short in the wire between the DLC (K-line) and the VSA modulator-control unit, the SRS unit, the SH-AWD control unit, the TPMS control unit, the immobilizer-keyless control unit, the audio unit, or the under-dash fuse/relay box. ■

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BACK

21. Connect DLC terminal No. 7 to body ground with a jumper wire.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

22. Check for continuity between body ground and these connector terminals:

Connector	Terminal
SRS unit A (28P)	No. 24 (LT BLU)
VSA modulator-control unit 46P	No. 15 (LT BLU)
SH-AWD control unit A (20P)	No. 5 (LT BLU)
TPMS control unit (20P)	No. 7 (LT BLU)
Immobilizer-keyless control unit 7P	No. 5 (LT BLU)
Audio unit 17P	No. 6 (LT BLU)
Under-dash fuse/relay box (Q) (16P)	No. 8 (LT BLU)

Is there continuity between the DLC terminal and each of the terminals in the chart?

YES—Replace the unit which cannot communicate with the HDS.■

NO—Repair open in the wire between the DLC (K-line) and the appropriate connector.■

23. Do the gauge self-diagnostic function (see page 22-258).

24. Check for B-CAN system DTCs without the HDS (see page 22-93).

Is DTC B1168, B1169, and/or B1178 indicated?

YES—Go to step 37.

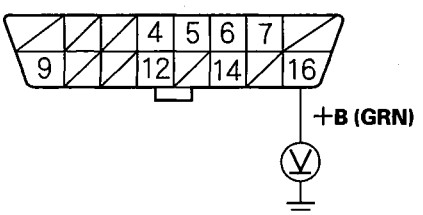
NO—Go to step 25.

25. Turn the ignition switch OFF.

26. Disconnect the HDS from the DLC.

27. Measure voltage between DLC terminal No. 16 and body ground.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 28.

NO—Repair open in the wire between DLC terminal No. 16 and the No. 19 FI MAIN (15 A) fuse in the under-hood fuse/relay box.■

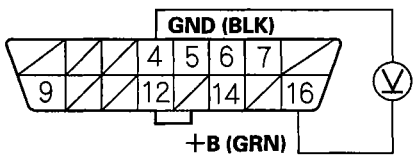
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DLC Circuit Troubleshooting (cont'd)

28. Measure voltage between DLC terminals No. 4 and No. 16.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

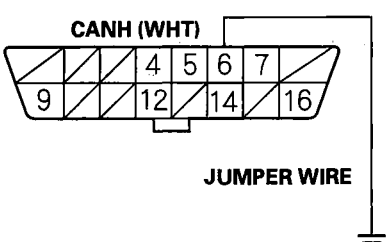
Is there battery voltage?

YES—Go to step 29.

NO—Repair open in the wire between DLC terminal No. 4 and body ground (G501) (see page 22-28).■

29. Connect the HDS to the DLC (see page 11-3).
30. Jump the SCS line with the HDS.
31. Disconnect PCM connector A (44P).
32. Disconnect the HDS from the DLC.
33. Connect DLC terminal No. 6 to body ground with a jumper wire.

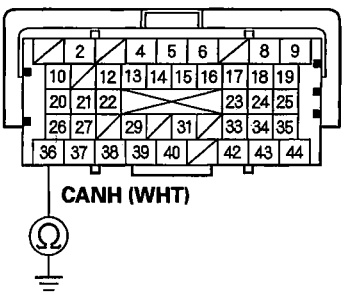
DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

34. Check for continuity between PCM connector terminal A36 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

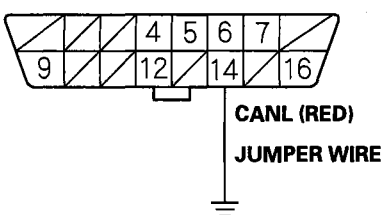
Is there continuity?

YES—Go to step 35.

NO—Repair open in the wire between the PCM (A36) and DLC terminal No. 6.■

35. Connect DLC terminal No. 14 to body ground with a jumper wire.

DATA LINK CONNECTOR (DLC)



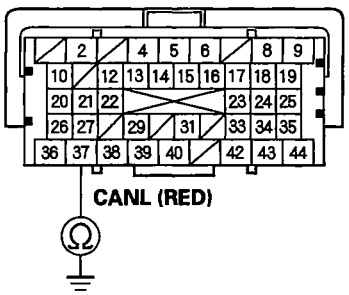
Terminal side of female terminals

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BACK

36. Check for continuity between PCM connector terminal A37 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

NO—Repair open in the wire between the PCM (A37) and DLC terminal No. 14. ■

37. Try to start the engine.

Does the engine start and idle smoothly?

YES—Go to F-CAN circuit troubleshooting (Part 1) (see page 11-213). ■

NO—Go to step 38.

38. Turn the ignition switch OFF.

39. Check the No. 2 IG MAIN (50 A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

YES—Repair open in the wire between the No. 2 IG MAIN (50 A) fuse and the ignition switch. If the wire is OK, go to step 40.

NO—Repair short in the wire between the No. 2 IG MAIN (50 A) fuse and the under-hood fuse/relay box. Also replace the No. 2 IG MAIN (50 A) fuse. ■

(cont'd)

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DLC Circuit Troubleshooting (cont'd)

40. Inspect the No. 19 FI MAIN (15 A) fuse in the under-hood fuse/relay box.

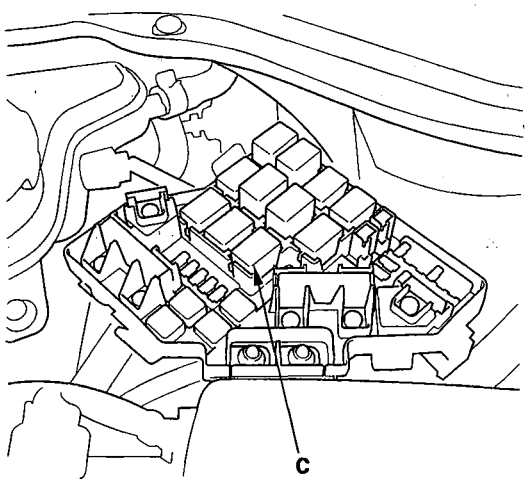
    Is the fuse OK?

    YES—Go to step 47.

    NO—Go to step 41.

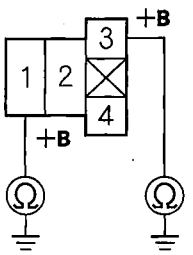
41. Remove the blown No. 19 FI MAIN (15 A) fuse from the under-hood fuse/relay box.

42. Remove PGM-FI main relay 1 (C) from the under-hood fuse/relay box.



43. Check for continuity between body ground and PGM-FI main relay 1 4P connector terminals No. 1 and No. 3 individually.

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Replace the under-hood fuse/relay box (see page 22-61). Also replace the No. 19 FI MAIN (15 A) fuse.■

NO—Go to step 44.

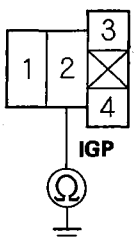
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44. Disconnect each of the following components, or the connectors from the components, one at a time, and check for continuity between PGM-FI main relay 1 4P connector terminal No. 2 and body ground.

- PGM-FI main relay 2 (FUEL PUMP)
- PCM connector A (44P)
- Each injector 2P connector
- Camshaft position (CMP) sensor B 3P connector
- Crankshaft position (CKP) sensor 3P connector
- Electronic throttle control system (ETCS) control relay

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals

Does continuity go away when one of the above components is disconnected?

YES—Replace the component that made the short to body ground go away when disconnected. If the item is the PCM, update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). Also replace the No. 19 FI MAIN (15 A) fuse. ■

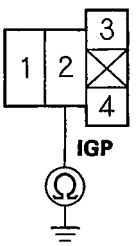
NO—Go to step 45.

45. Disconnect the connectors from these components:

- PGM-FI main relay 2 (FUEL PUMP)
- PCM connector A (44P)
- Injectors
- Camshaft position (CMP) sensor B
- Crankshaft position (CKP) sensor
- Electronic throttle control system (ETCS) control relay

46. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 2 and body ground.

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between PGM-FI main relay 1 and each item. Also replace the No. 19 FI MAIN (15 A) fuse. ■

NO—Replace PGM-FI main relay 1. Also replace the No. 19 FI MAIN (15 A) fuse. ■

47. Inspect the No. 2 FUEL PUMP (20 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES—Go to step 54.

NO—Go to step 48.

48. Remove the blown No. 2 FUEL PUMP (20 A) fuse from the under-dash fuse/relay box.

49. Jump the SCS line with the HDS.

50. Disconnect PCM connector C (44P).

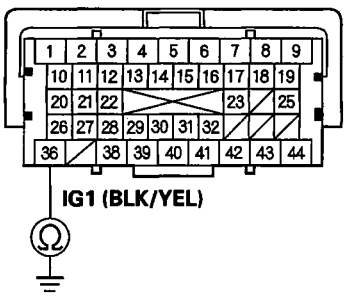
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DLC Circuit Troubleshooting (cont'd)

51. Check for continuity between PCM connector terminal C36 and body ground.

PCM CONNECTOR C (44P)



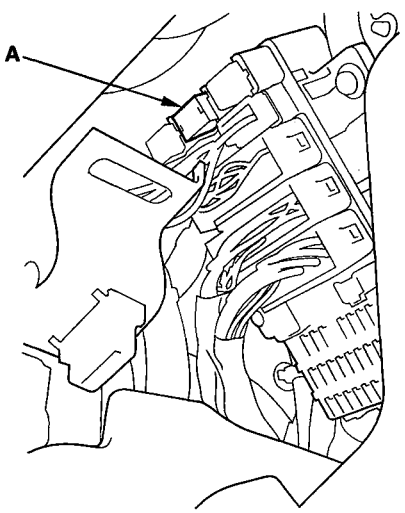
Terminal side of female terminals

Is there continuity?

YES—Go to step 52.

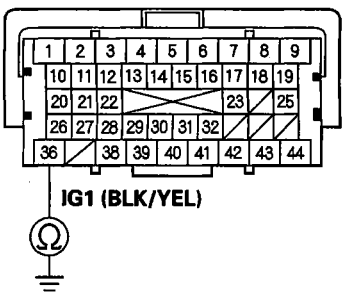
NO—Replace the No. 2 FUEL PUMP (20 A) fuse, and update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

52. Remove the driver's dashboard undercover (see page 20-102), then remove PGM-FI main relay 2 (FUEL PUMP) (A) from the under-dash fuse/relay box.



53. Check for continuity between PCM connector terminal C36 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the No. 2 FUEL PUMP (20 A) fuse and the PCM (C36), between the No. 2 FUEL PUMP (20 A) fuse and PGM-FI main relay 2 (FUEL PUMP), or between the No. 2 FUEL PUMP (20 A) fuse and the immobilizer control unit. Also replace the No. 2 FUEL PUMP (20 A) fuse.■

NO—Go to step 54.

54. Jump the SCS line with the HDS.

55. Disconnect PCM connectors A (44P) and C (44P).

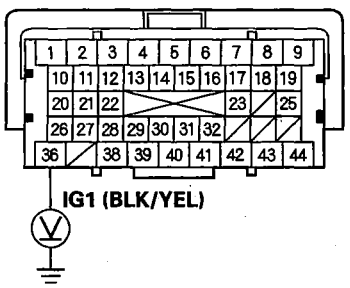
56. Turn the ignition switch ON (II).

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BACK

57. Measure voltage between PCM connector terminal C36 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

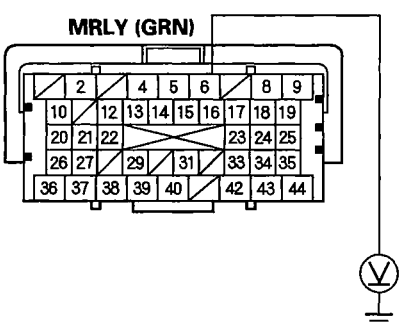
Is there battery voltage?

YES—Go to step 58.

NO—Repair open in the wire between the No. 2 FUEL PUMP (20 A) fuse and the PCM (C36). ■

58. Measure voltage between PCM connector terminal A6 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

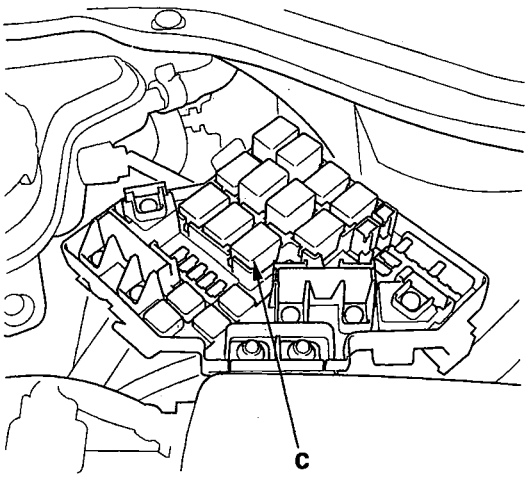
Is there battery voltage?

YES—Go to step 63.

NO—Go to step 59.

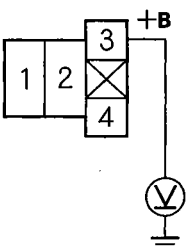
59. Turn the ignition switch OFF.

60. Remove PGM-FI main relay 1 (C) from the under-hood fuse/relay box.



61. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 3 and body ground.

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 62.

NO—Replace the under-hood fuse/relay box (see page 22-61). ■

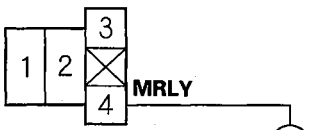
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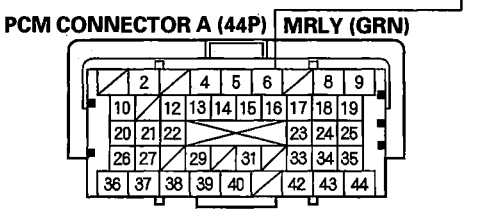
DLC Circuit Troubleshooting (cont'd)

62. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 4 and PCM connector terminal A6.

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals



Terminal side of female terminals

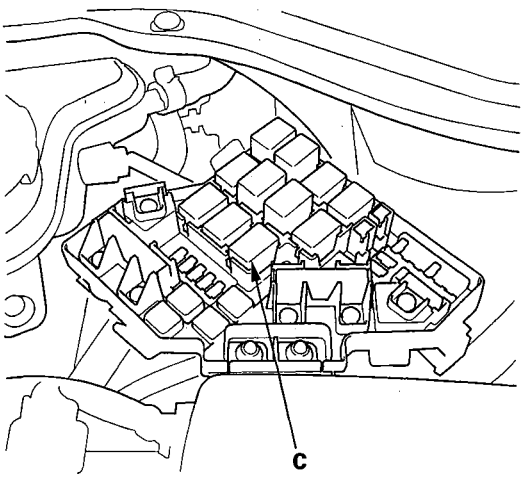
Is there continuity?

YES—Test PGM-FI main relay 1 (see page 22-64). If the relay is OK, update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

NO—Repair open in the wire between the PCM (A6) and PGM-FI main relay 1.■

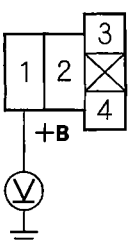
63. Turn the ignition switch OFF.

64. Remove PGM-FI main relay 1 (C) from the under-hood fuse/relay box.



65. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 1 and body ground.

PGM-FI MAIN RELAY 1 4P CONNECTOR



Terminal side of female terminals

Is there battery voltage?

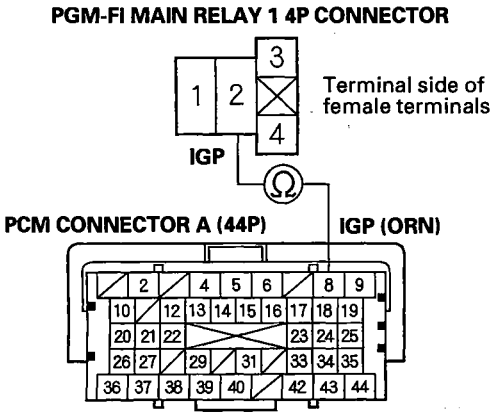
YES—Go to step 66.

NO—Replace the under-hood fuse/relay box (see page 22-61).■

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BACK

66. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 2 and PCM connector terminal A8.



Terminal side of female terminals

Is there continuity?

YES—Go to step 67.

NO—Repair open in the wire between the PCM (A8) and PGM-FI main relay 1.■

67. Test PGM-FI main relay 1 (see page 22-64).

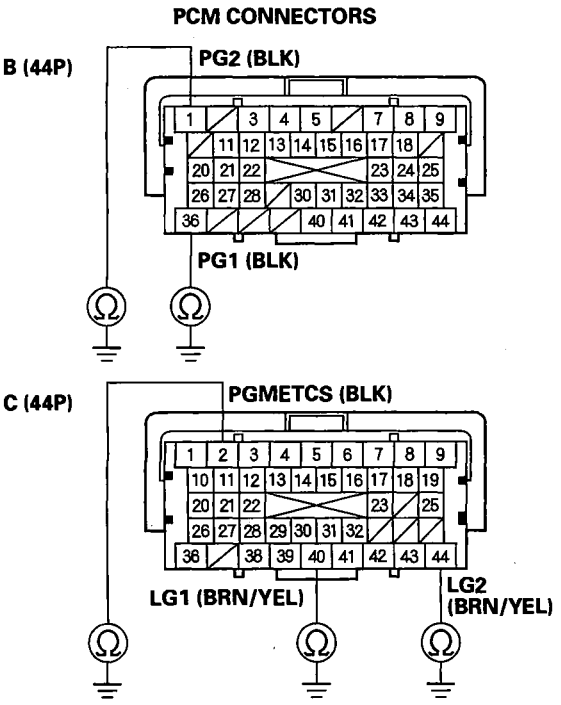
Is PGM-FI main relay 1 OK?

YES—Go to step 68.

NO—Replace PGM-FI main relay 1.■

68. Disconnect PCM connector B (44P).

69. Check for continuity between body ground and PCM connector terminals B1, B36, C2, C40, and C44 individually.



Terminal side of female terminals

Is there continuity?

YES—Go to step 70.

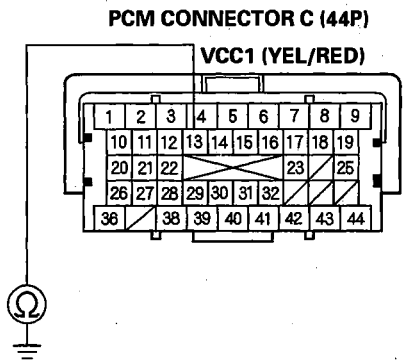
NO—Repair open in the wire between the PCM (B1, B36, C2, C40, C44) and G101 (see page 22-18).■

(cont'd)

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DLC Circuit Troubleshooting (cont'd)

70. Check for continuity between PCM connector terminal C13 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 71.

NO—Go to step 72.

71. Continue to check for continuity between PCM connector terminal C13 and body ground, while disconnecting these parts, one at a time:

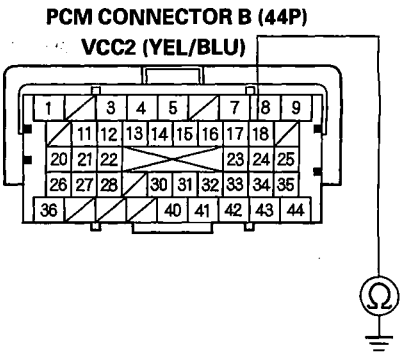
- MAP sensor 3P connector
- Input shaft (mainshaft) speed sensor 3P connector

Does continuity go away when one of the above components is disconnected?

YES—Replace the part that caused an open when it was disconnected.■

NO—Repair short in the wire between the PCM (C13) and the MAP sensor or the input shaft (mainshaft) speed sensor.■

72. Check for continuity between PCM connector terminal B18 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 73.

NO—Go to step 74.

73. Continue to check for continuity between PCM connector terminal B18 and body ground, while disconnecting these parts, one at a time:

- Turbocharger boost sensor 3P connector
- Output shaft (countershaft) speed sensor 3P connector

Does continuity go away when one of the above components is disconnected?

YES—Replace the part that caused an open when it was disconnected.■

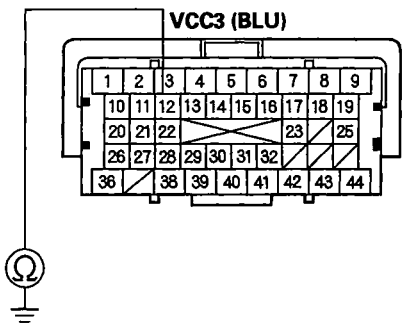
NO—Repair short in the wire between the PCM (B18) and the turbocharger boost sensor or the output shaft (countershaft) speed sensor.■

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BACK

74. Check for continuity between PCM connector terminal C12 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 75.

NO—Go to step 76.

75. Continue to check for continuity between PCM connector terminal C12 and body ground, while disconnecting the throttle body 6P connector.

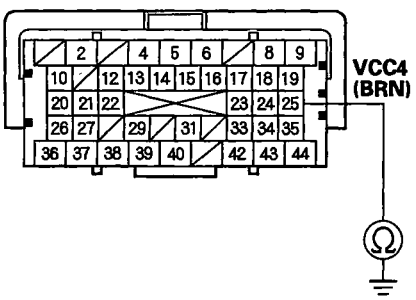
Is there continuity?

YES—Repair short in the wire between the PCM (C12) and the throttle body. ■

NO—Replace the throttle body (see page 11-396). ■

76. Check for continuity between PCM connector terminal A25 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 77.

NO—Go to step 78.

77. Continue to check for continuity between PCM connector terminal A25 and body ground, while disconnecting the APP sensor 6P connector.

Is there continuity?

YES—Repair short in the wire between the PCM (A25) and APP sensor A. ■

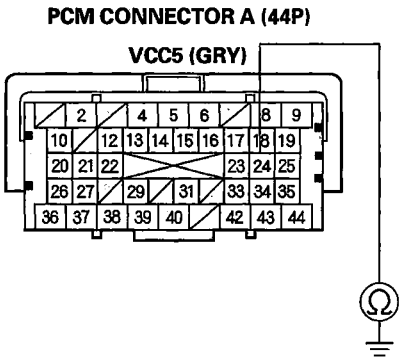
NO—Replace the accelerator pedal module (see page 11-295). ■

(cont'd)

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DLC Circuit Troubleshooting (cont'd)

78. Check for continuity between PCM connector terminal A24 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 79.

NO—Go to step 80.

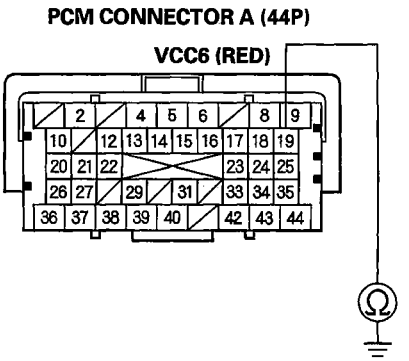
79. Continue to check for continuity between PCM connector terminal A24 and body ground, while disconnecting the APP sensor 6P connector.

Is there continuity?

YES—Repair short in the wire between the PCM (A24) and APP sensor B. ■

NO—Replace the accelerator pedal module (see page 11-295). ■

80. Check for continuity between PCM connector terminal A19 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 81.

NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

81. Continue to check for continuity between PCM connector terminal A19 and body ground, while disconnecting these parts, one at a time:

- A/C pressure sensor 3P connector
- FTP sensor 3P connector
- Brake booster pressure sensor 3P connector

Does continuity go away when one of the above components is disconnected?

YES—Replace the part that caused an open when it was disconnected. ■

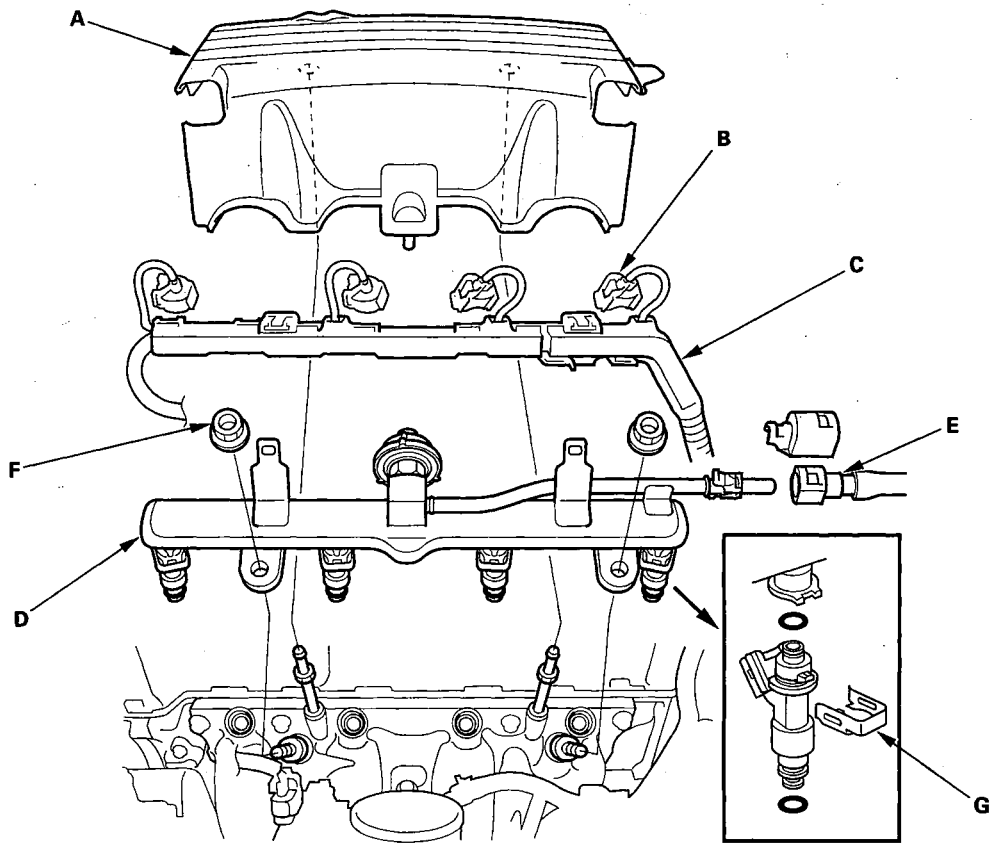
NO—Repair short in the wire between the PCM (A19) and the A/C pressure sensor, the FTP sensor or the brake booster pressure sensor. ■

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BACK

Injector Replacement

1. Relieve fuel pressure (see page 11-362).
2. Remove the charge air cooler (see page 9-7).
3. Disconnect the throttle body 6P connector, then remove the injector cover (A).
4. Disconnect the connectors (B) from the injectors, then remove the harness holder (C) from the fuel rail (D).



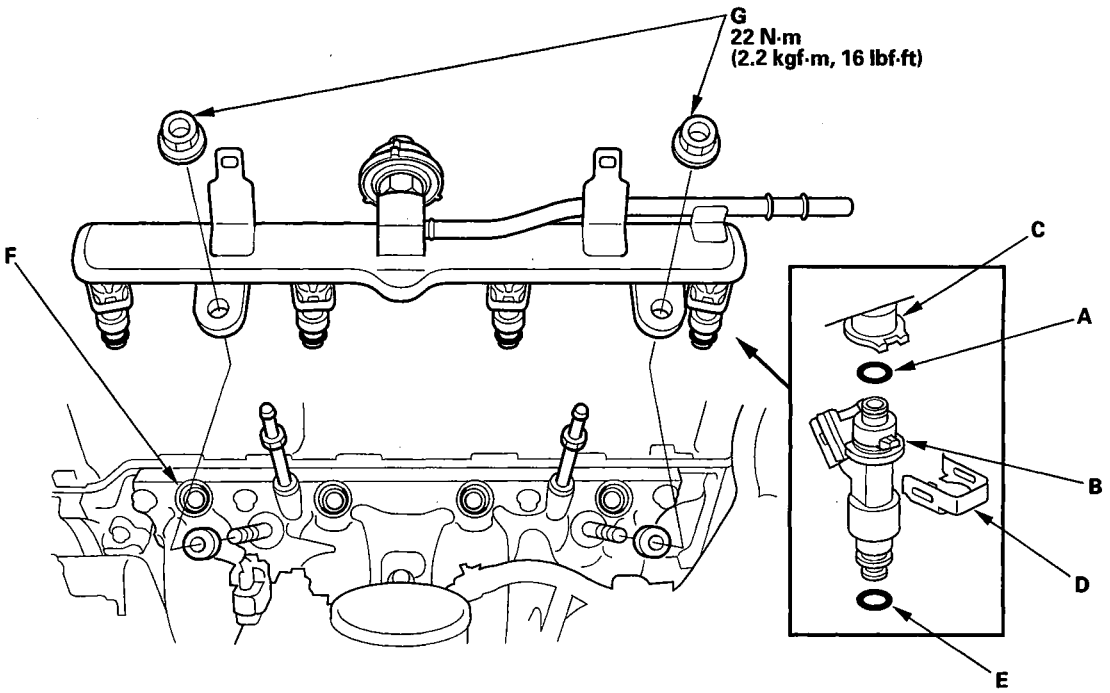
5. Disconnect the quick-connect fitting (E).
6. Remove the fuel rail mounting nuts (F), then remove the fuel rail.
7. Remove the injector clip (G) from the injector.
8. Remove the injector from the fuel rail.

(cont'd)

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Injector Replacement (cont'd)

9. Coat the new O-ring (black) (A) with clean engine oil, then insert the injectors (B) into the fuel rail (C).



10. Install the injector clip (D).
11. Coat the new O-ring (green) (E) with clean engine oil, then install the fuel rail and injectors in the injector base (F).
12. Install the fuel rail mounting nuts (G).
13. Connect the connectors on the injectors, and install the harness holder on the fuel rail.
14. Connect the quick-connect fitting.
15. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel rail will be pressurized. Repeat this two or three times, then check for fuel leakage.

    NOTE: Some DTCs will be stored because some connectors are disconnected at this time. Clear the DTC with the HDS after this procedure is completed.
16. Reinstall the injector cover and connect the throttle body 6P connector.
17. Reinstall the charge air cooler (see page 9-9).

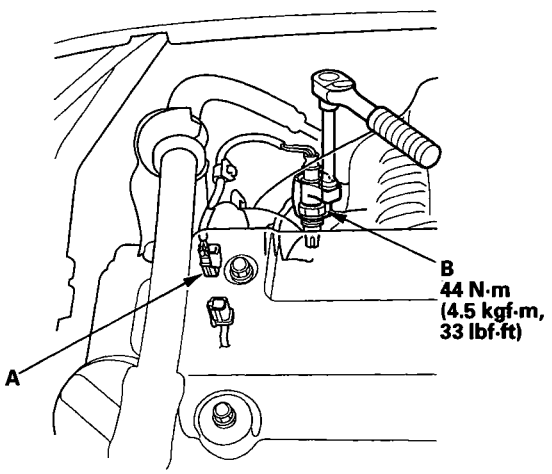
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BACK

A/F Sensor Replacement

Special Tools Required
O2 sensor socket wrench, Snap-on S6154, or equivalent, commercially available

1. Disconnect the A/F sensor 4P connector (A), then remove the A/F sensor (B).

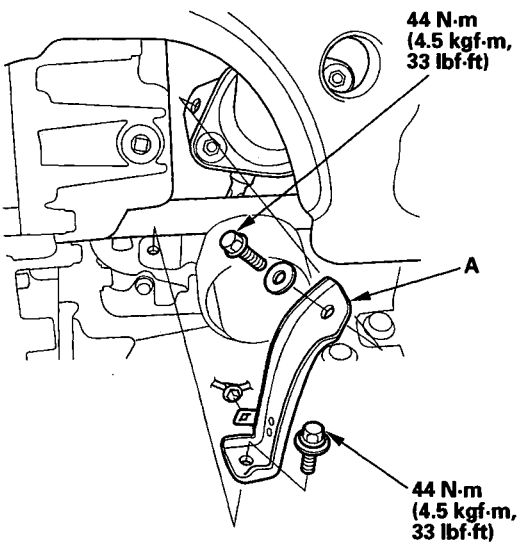


2. Install the parts in the reverse order of removal.

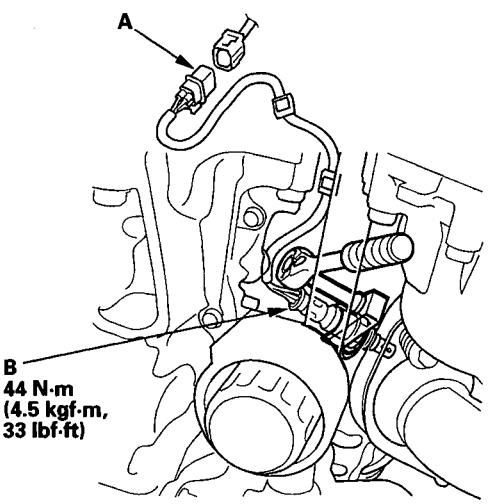
Secondary HO2S Replacement

Special Tools Required
O2 sensor socket wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Remove the WU-TWC stay (A).



2. Disconnect the secondary HO2S 4P connector (A), then remove the secondary HO2S (B).

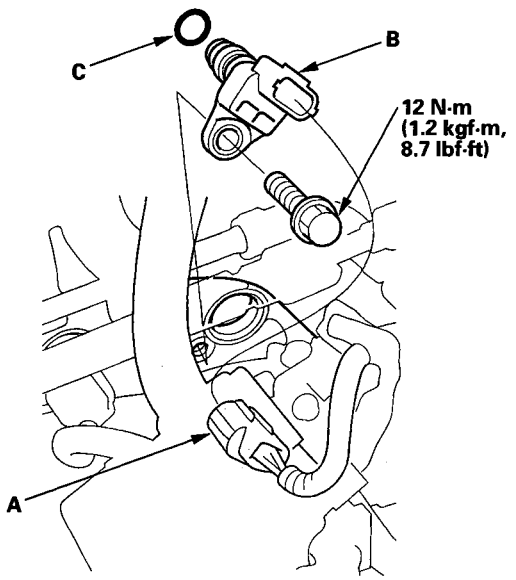


3. Install the parts in the reverse order of removal.

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CMP Sensor B Replacement

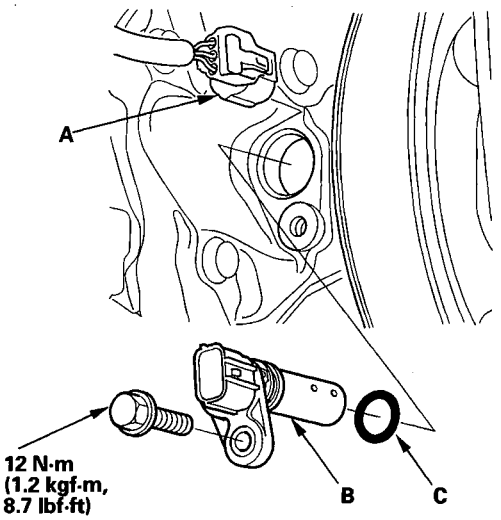
1. Remove the air cleaner (see page 11-394).
2. Remove the air bypass outlet pipe (see page 9-7).
3. Disconnect the CMP sensor B connector (A).



4. Remove CMP sensor B (B).
5. Install the parts in the reverse order of removal with a new O-ring (C).

CKP Sensor Replacement

1. Disconnect the CKP sensor connector (A).



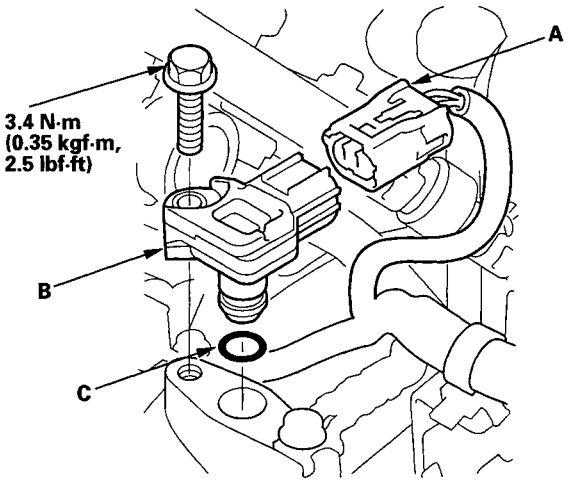
2. Remove the CKP sensor (B).
3. Install the parts in the reverse order of removal with a new O-ring (C).
4. Do the CKP pattern clear/CKP pattern learn procedure with the HDS (see page 11-4).

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MAP Sensor Replacement

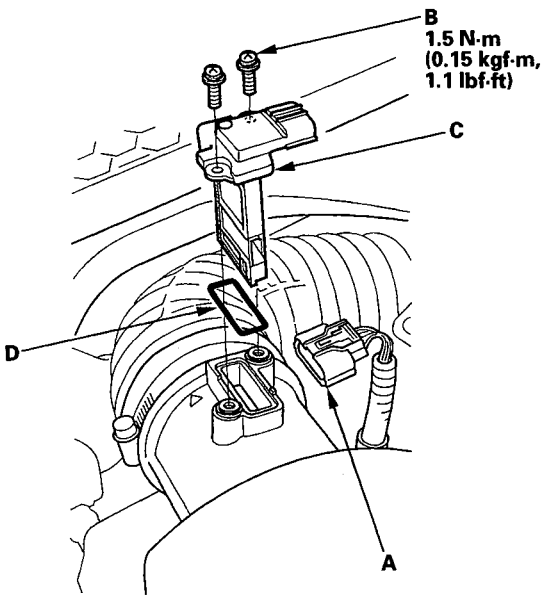
1. Disconnect the MAP sensor connector (A).



2. Remove the MAP sensor (B).
3. Install the parts in the reverse order of removal with a new O-ring (C).

MAF Sensor/IAT Sensor 1 Replacement

1. Disconnect the MAF sensor/IAT sensor 1 connector (A).

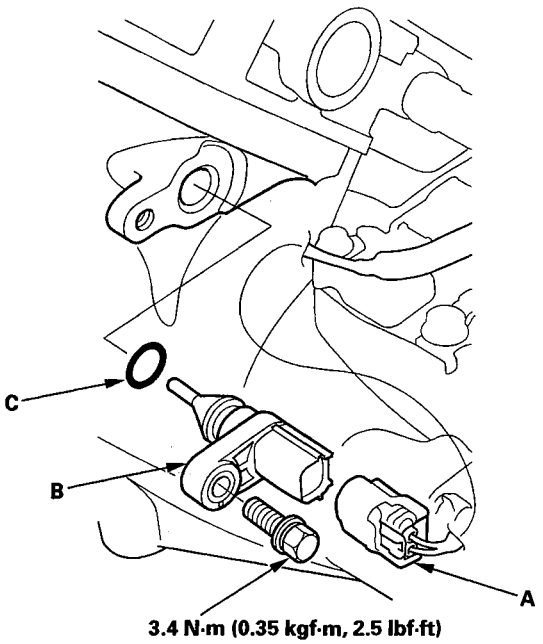


2. Remove the screws (B).
3. Remove the MAF sensor/IAT sensor 1 (C).
4. Install the parts in the reverse order of removal with a new O-ring (D).

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IAT Sensor 2 Replacement

1. Remove the charge air cooler cover (see page 9-8).
2. Disconnect the IAT sensor 2 connector (A).



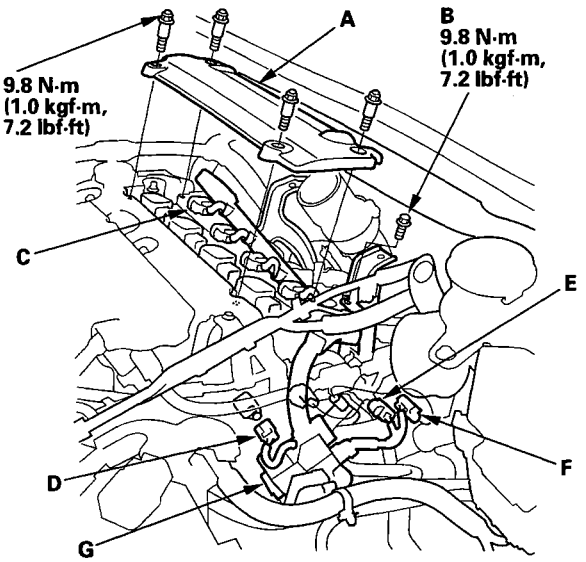
3. Remove the IAT sensor 2 (B).
4. Install the parts in the reverse order of removal with a new O-ring (C).

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ECT Sensor 1 Replacement

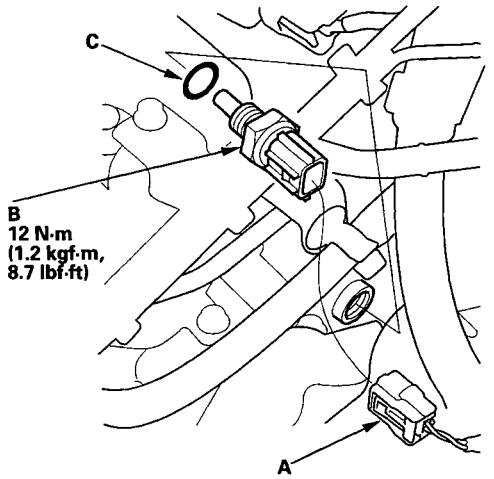
1. Drain the engine coolant (see page 10-7).
2. Remove the air cleaner (see page 11-394).
3. Remove the charge air cooler (see page 9-8).
4. Remove the ignition coil cover (A) and bolt (B).



5. Disconnect the ignition coil connectors (C), CMP sensor A connector (D), CMP sensor B connector (E), and the EVAP canister purge valve connector (F).
6. Remove the harness holder (G).

   NOTE: Be careful not to damage the ECT sensor 1 harness.

7. Disconnect the ECT sensor 1 connector (A).

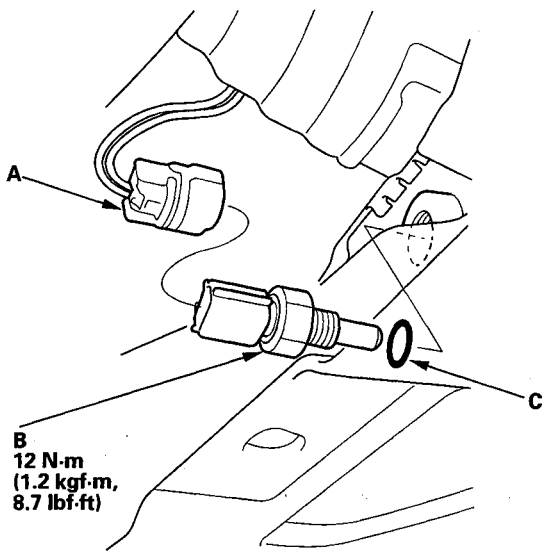


8. Remove ECT sensor 1 (B).
9. Install the parts in the reverse order of removal with a new O-ring (C), then refill the radiator with engine coolant (see page 10-7).

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ECT Sensor 2 Replacement

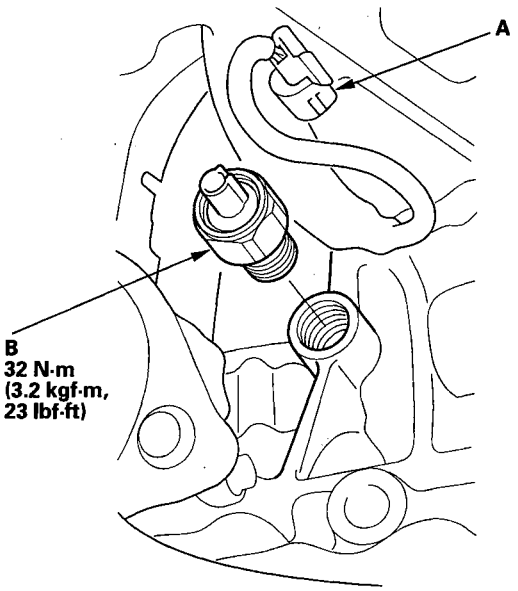
1. Drain the engine coolant (see page 10-7).
2. Remove the splash shield.
3. Disconnect the ECT sensor 2 connector (A), then remove ECT sensor 2 (B).



4. Install ECT sensor 2 with a new O-ring (C).
5. Install the splash shield.
6. Refill the radiator with engine coolant (see page 10-7).

Knock Sensor Replacement

1. Disconnect the knock sensor connector (A).



2. Remove the knock sensor (B).
3. Install the parts in the reverse order of removal.

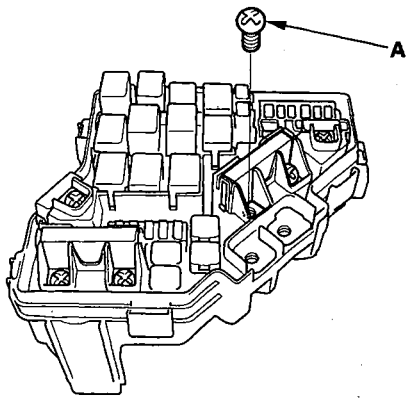
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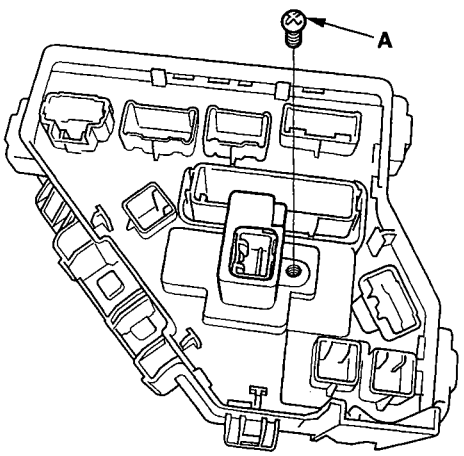
ELD Replacement

1. Remove the under-hood fuse/relay box (see page 22-61).

2. Remove the screw (A).

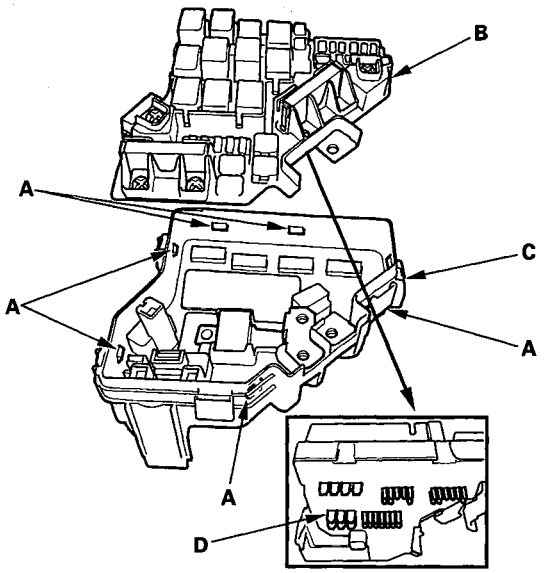


3. Turn the housing over, then remove the screw (A).

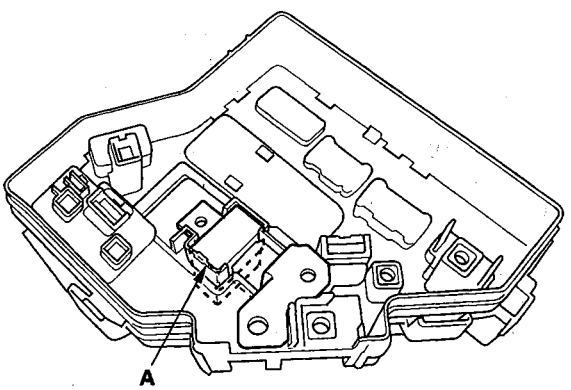


4. Turn the housing over again. Using two flat-tip screwdrivers, release the tabs (A), and pry up the fuse/relay box base (B) from the fuse/relay box housing (C).

   NOTE: Make sure the terminals (D) are not bent or damaged.



5. Remove the ELD (A).



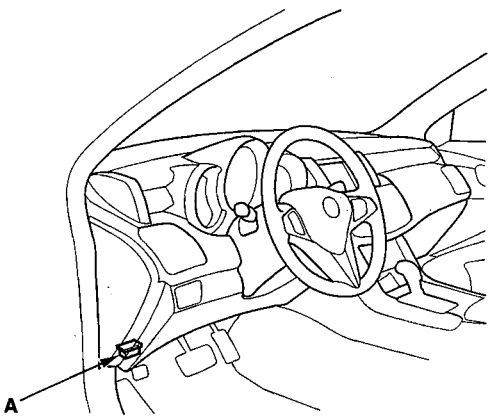
6. Install the parts in the reverse order of removal.

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PCM Replacement

NOTE:
- Make sure the HDS is loaded with the latest software version.
- If you are replacing the PCM after substituting a known-good PCM, reinstall the original PCM, then do this procedure.
- During the procedure, if any READ DATA, WRITE DATA, or other data checks fail, note the failure, then continue.

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch ON (II).

3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229). If you are returning from DLC circuit troubleshooting, skip steps 4 through 7, 16 through 18, and 21 through 22, and do the following procedures after replacing the PCM (USA, Canada models);

   - Replace the engine oil (see page 8-9) and the engine oil filter (see page 8-10).
   - Clean the throttle body (see page 11-394).

4. USA, Canada models: Select the PGM-FI system with the HDS.

5. USA, Canada models: Select the INSPECTION MENU with the HDS.

6. USA, Canada models: Select the ETCS TEST, then select the TP POSITION CHECK, and follow the screen prompts.

   NOTE: If the TP POSITION CHECK indicates FAILED, continue with this procedure.

7. USA, Canada models: Select the REPLACE PCM MENU, then READ DATA and follow the screen prompts.

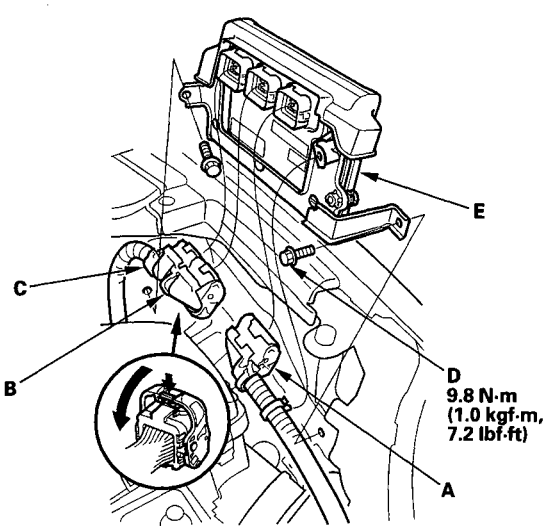
   NOTE:
   - Doing this step copies (READS) the engine oil life data from the original PCM so you can later download (WRITES) it into the new PCM.
   - If READ DATA indicates FAILED, continue with this procedure.

8. Turn the ignition switch OFF.

9. Jump the SCS line with the HDS.

10. Disconnect PCM connectors A, B, and C.

    NOTE: PCM connectors A, B, and C have symbols (A=□, B=△, C=○) embossed on them for identification.

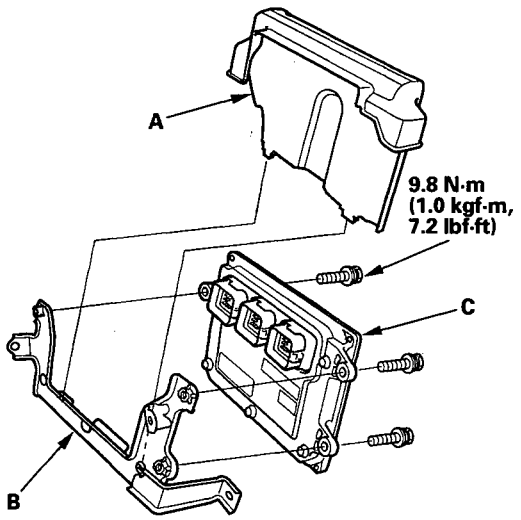


11. Remove the bolt (D), and remove the PCM assembly (E).

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12. Remove the cover (A), and the bracket (B) from the PCM (C).



13. Install the PCM in the reverse order of removal.

14. Turn the ignition switch ON (II).

15. Manually input the VIN to the PCM with the HDS.

    NOTE: DTC P0630 "VIN Not Programmed or Mismatch" may be stored because the VIN has not been programmed into the PCM; ignore it, and continue this procedure.

16. USA, Canada models: If the READ DATA (engine oil life) failed in step 7, go to step 19. Otherwise, go to step 17.

17. USA, Canada models: Select the PGM-FI system with the HDS.

18. USA, Canada models: Select the REPLACE PCM MENU, then WRITE DATA and follow the screen prompts.

    NOTE: If the WRITE DATA indicates FAILED, continue with this procedure.

19. Select IMMOBI system with the HDS.

20. Enter the immobilizer code with the PCM replacement procedure in the HDS; it allows you to start the engine.

21. USA, Canada models: If the TP POSITION CHECK failed in step 6, clean the throttle body (see page 11-394), then go to step 22.

22. USA, Canada models: If the READ DATA failed in step 7 or the WRITE DATA failed in step 18, replace the engine oil (see page 8-9) and engine oil filter (see page 8-10), then go to step 23.

23. Select PGM-FI system and reset the PCM with the HDS.

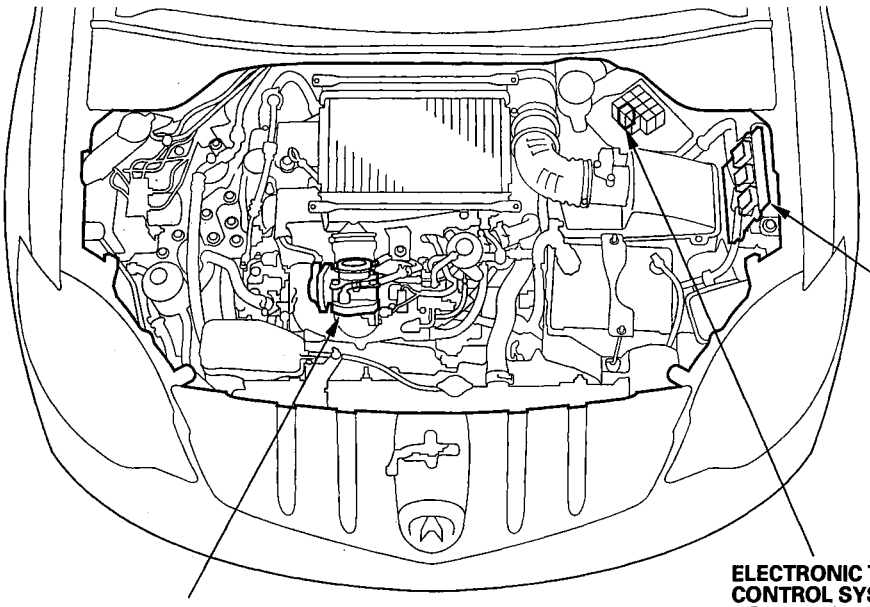
24. Update the PCM if it does not have the latest software (see page 11-7).

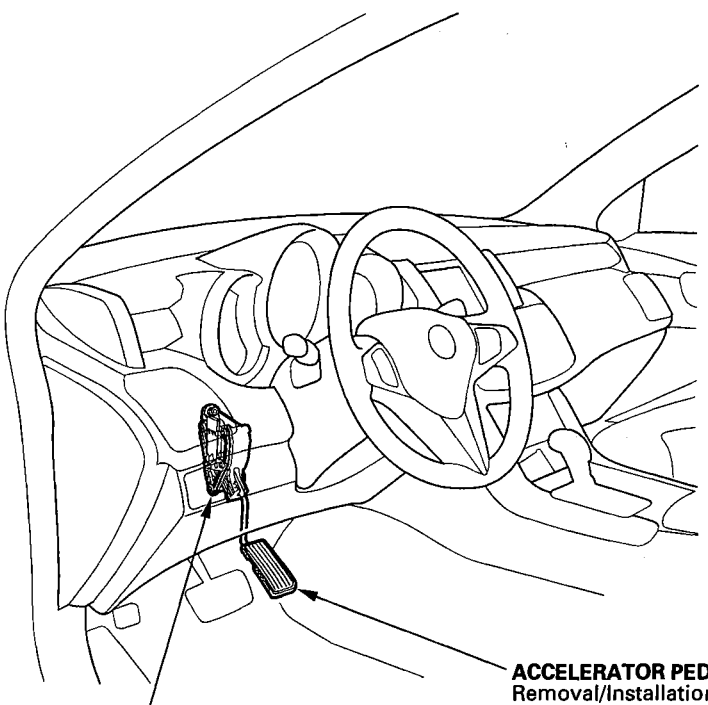
25. Do the PCM idle learn procedure (see page 11-339).

26. Do the CKP pattern learn procedure (see page 11-4).

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Component Location Index





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BACK

DTC P0122: TP Sensor A Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check TP SENSOR A in the DATA LIST with the HDS.

   Is there about 0.3 V or less?

   YES—Go to step 4.

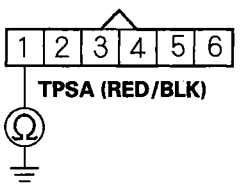
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM.■
4. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0122 and P0222 indicated at the same time?

   YES—Go to step 10.

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the throttle body 6P connector.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector C (44P).
9. Check for continuity between throttle body 6P connector terminal No. 1 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

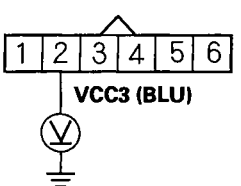
Is there continuity?

YES—Repair short in the wire between the throttle body and the PCM (C20), then go to step 18.

NO—Go to step 23.

10. Measure voltage between throttle body 6P connector terminal No. 2 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 16.

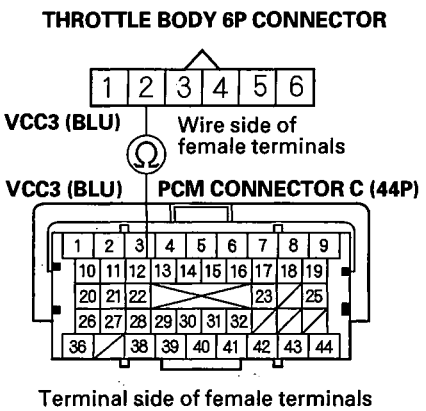
NO—Go to step 11.

(cont'd)

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DTC Troubleshooting (cont'd)

11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector C (44P).
14. Disconnect the throttle body 6P connector.
15. Check for continuity between PCM connector terminal C12 and throttle body 6P connector terminal No. 2.



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the throttle body and the PCM (C12), then go to step 18.

16. Turn the ignition switch OFF.
17. Replace the throttle body (see page 11-396).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0122 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0122 indicated?

    YES—Check for poor connections or loose terminals at TP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0123: TP Sensor A Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check TP SENSOR A in the DATA LIST with the HDS.

   Is there about 4.8 V or more?

   YES—Go to step 4.

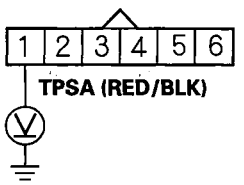
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
4. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0123 and P0223 indicated at the same time?

   YES—Go to step 13.

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the throttle body 6P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between throttle body 6P connector terminal No. 1 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

   Is there about 5 V?

   YES—Go to step 18.

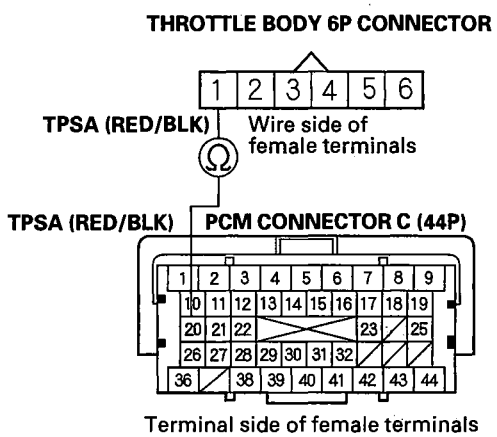
   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (44P).

(cont'd)

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DTC Troubleshooting (cont'd)

12. Check for continuity between PCM connector terminal C20 and throttle body 6P connector terminal No. 1.

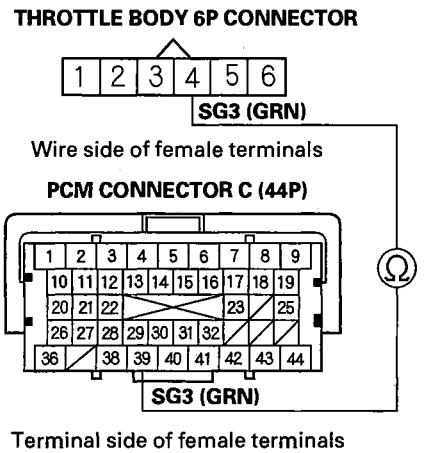


Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the throttle body and the PCM (C20), then go to step 20.

13. Turn the ignition switch OFF.
14. Disconnect the throttle body 6P connector.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector C (44P).
17. Check for continuity between PCM connector terminal C39 and throttle body 6P connector terminal No. 4.



Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the throttle body and the PCM (C39), then go to step 20.

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BACK

18. Turn the ignition switch OFF.
19. Replace the throttle body (see page 11-396).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the PCM with the HDS.
23. Do the PCM idle learn procedure (see page 11-339).
24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0123 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■
25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0123 indicated?

    YES—Check for poor connections or loose terminals at TP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0222: TP Sensor B Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check TP SENSOR B in the DATA LIST with the HDS.

   Is there about 0.3 V or less?

   YES—Go to step 4.

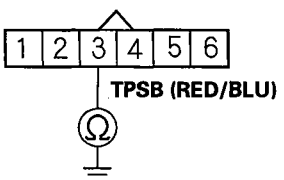
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
4. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0122 and P0222 indicated at the same time?

   YES—Go to step 10.

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the throttle body 6P connector.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector C (44P).
9. Check for continuity between throttle body 6P connector terminal No. 3 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the throttle body and the PCM (C21), then go to step 18.

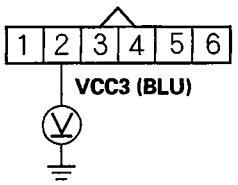
NO—Go to step 23.

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BACK

10. Measure voltage between throttle body 6P connector terminal No. 2 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

Is there about 5 V?

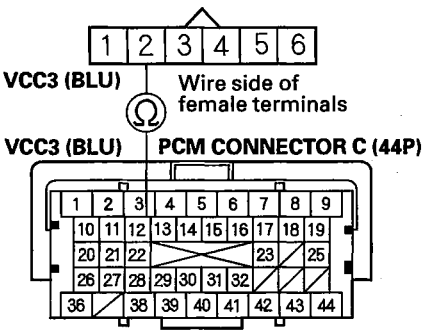
YES—Go to step 16.

NO—Go to step 11.

11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector C (44P).
14. Disconnect the throttle body 6P connector.

15. Check for continuity between PCM connector terminal C12 and throttle body 6P connector terminal No. 2..

THROTTLE BODY 6P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the throttle body and the PCM (C12), then go to step 18.

(cont'd)

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DTC Troubleshooting (cont'd)

16. Turn the ignition switch OFF.
17. Replace the throttle body (see page 11-396).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0222 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0222 indicated?

    YES—Check for poor connections or loose terminals at TP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0223: TP Sensor B Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check TP SENSOR B in the DATA LIST with the HDS.

   Is there about 4.8 V or more?

   YES—Go to step 4.

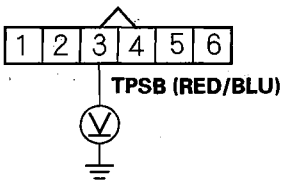
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
4. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0123 and P0223 indicated at the same time?

   YES—Go to step 13.

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the throttle body 6P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between throttle body 6P connector terminal No. 3 and body ground.

THROTTLE BODY 6P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 18.

NO—Go to step 9.

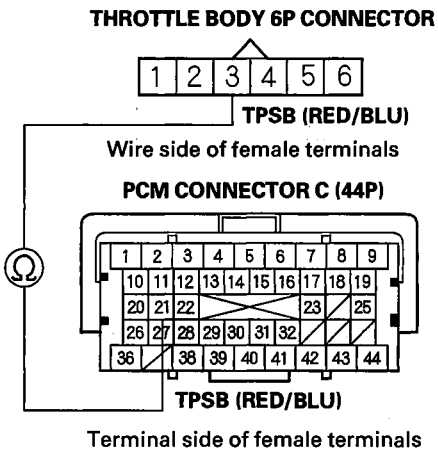
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (44P).

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DTC Troubleshooting (cont'd)

12. Check for continuity between PCM connector terminal C21 and throttle body 6P connector terminal No. 3.

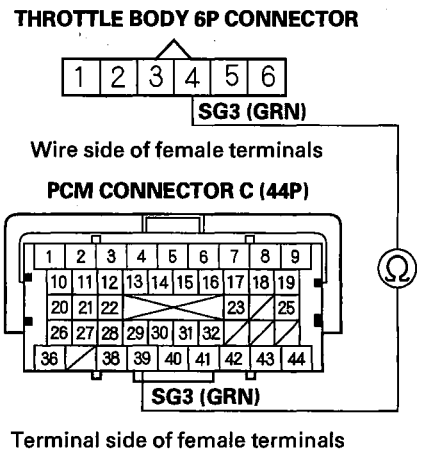


Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the throttle body and the PCM (C21), then go to step 20.

13. Turn the ignition switch OFF.
14. Disconnect the throttle body 6P connector.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector C (44P).
17. Check for continuity between PCM connector terminal C39 and throttle body 6P connector terminal No. 4.



Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the throttle body and the PCM (C39), then go to step 20.

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BACK

18. Turn the ignition switch OFF.
19. Replace the throttle body (see page 11-396).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the PCM with the HDS.
23. Do the PCM idle learn procedure (see page 11-339).
24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0223 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■
25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0223 indicated?

    YES—Check for poor connections or loose terminals at TP sensor B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P1658: Electronic Throttle Control System (ETCS) Control Relay ON Malfunction

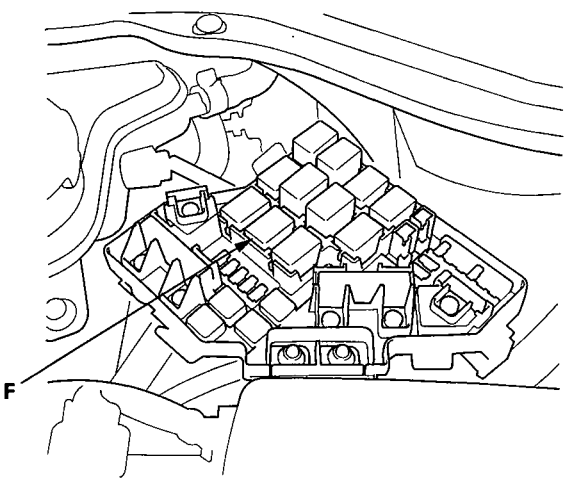
NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Do the ETCS TEST in the INSPECTION MENU with the HDS.

   Is the RELAY circuit OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ETCS control relay and the PCM. ■

   NO—Go to step 3.
3. Turn the ignition switch OFF.
4. Remove the ETCS control relay (F) from the under-hood fuse/relay box.



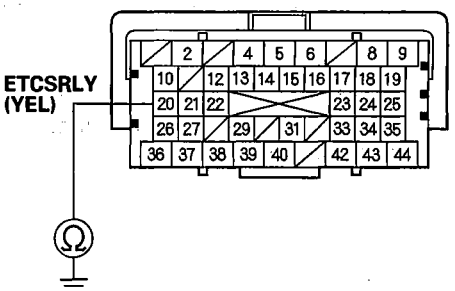
5. Test the ETCS control relay (see page 22-64).

   Is the ETCS control relay OK?

   YES—Go to step 6.

   NO—Replace the ETCS control relay, then go to step 13.
6. Jump the SCS line with the HDS.
7. Disconnect PCM connector A (44P).
8. Check for continuity between PCM connector terminal A20 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A20) and the ETCS control relay, then go to step 13.

NO—Go to step 9.

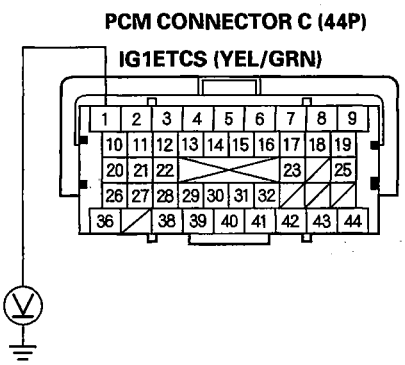
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BACK

9. Disconnect PCM connector C (44P).

10. Turn the ignition switch ON (II).

11. Measure voltage between PCM connector terminal C1 and body ground.



Terminal side of female terminals

Is there battery voltage?

YES—Repair short to power in the wire between the PCM (C1) and the ETCS control relay, then go to step 12.

NO—Go to step 18.

12. Turn the ignition switch OFF.

13. Reconnect all connectors.

14. Turn the ignition switch ON (II).

15. Reset the PCM with the HDS.

16. Do the PCM idle learn procedure (see page 11-339).

17. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1658 indicated?

YES—Check for poor connections or loose terminals at the ETCS control relay and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

18. Turn the ignition switch OFF.

19. Reconnect all connectors.

20. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

21. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1658 indicated?

YES—Check for poor connections or loose terminals at the ETCS control relay and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P1659: Electronic Throttle Control System (ETCS) Control Relay OFF Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1659 indicated?

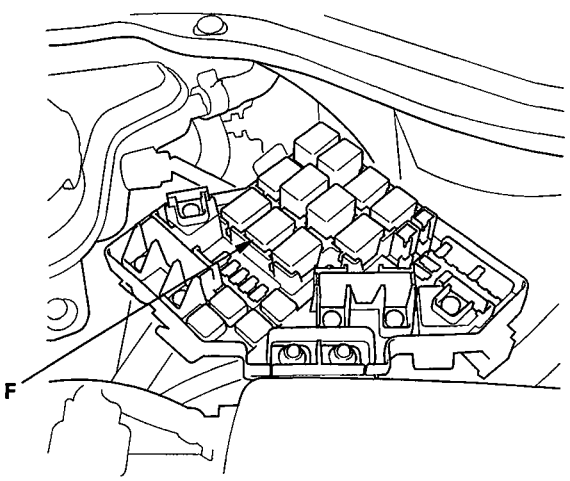
   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ETCS control relay and the PCM.■
4. Turn the ignition switch OFF.
5. Check the No. 21 DBW (THROTTLE ACTUATOR CONTROL) (15 A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES—Go to step 6.

   NO—Go to step 17.
6. Remove the ETCS control relay (F) from the under-hood fuse/relay box.



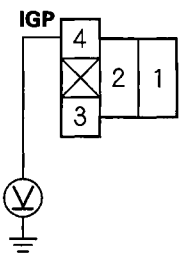
7. Test the ETCS control relay (see page 22-64).

   Is the ETCS control relay OK?

   YES—Go to step 8.

   NO—Replace the ETCS control relay, then go to step 23.
8. Turn the ignition switch ON (II).
9. Measure voltage between ETCS control relay 4P connector terminal No. 4 and body ground.

ETCS CONTROL RELAY 4P CONNECTOR



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 10.

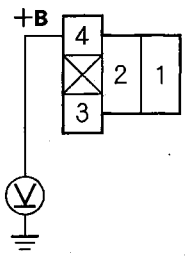
NO—Replace the under-hood fuse/relay box (see page 22-61), then go to step 22.

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BACK

10. Measure voltage between ETCS control relay 4P connector terminal No. 4 and body ground.

ETCS CONTROL RELAY 4P CONNECTOR



Terminal side of female terminals

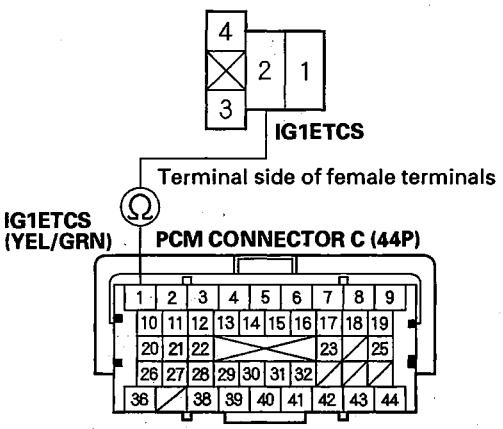
Is there battery voltage?

YES—Go to step 11.

NO—Replace the under-hood fuse/relay box (see page 22-61), then go to step 22.

11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector C (44P).
14. Check for continuity between ETCS control relay 4P connector terminal No. 2 and PCM connector terminal C1.

ETCS CONTROL RELAY 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between the PCM (C1) and the ETCS control relay, then go to step 23.

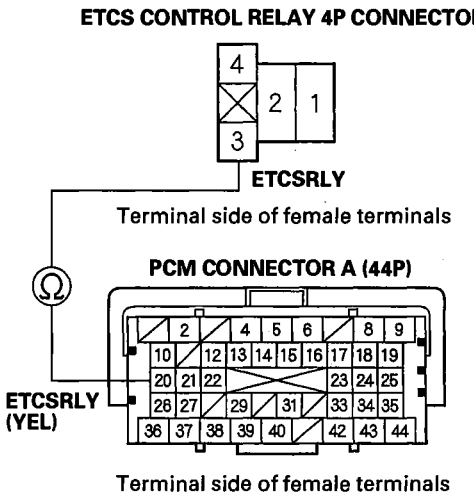
(cont'd)

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DTC Troubleshooting (cont'd)

15. Disconnect PCM connector A (44P).

16. Check for continuity between ETCS control relay 4P connector terminal No. 3 and PCM connector terminal A20.

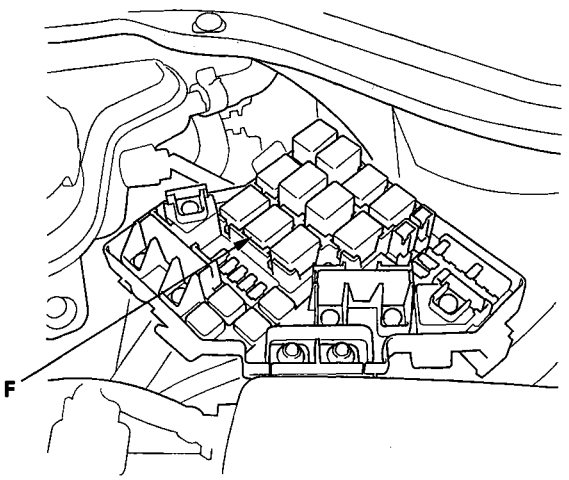


Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between the PCM (A20) and the ETCS control relay, then go to step 23.

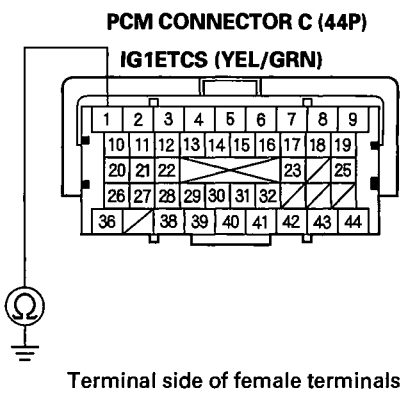
17. Remove the ETCS control relay (F) from the under-hood fuse/relay box.



18. Jump the SCS line with the HDS.

19. Disconnect PCM connector C (44P).

20. Check for continuity between PCM connector terminal C1 and body ground.



Is there continuity?

YES—Repair short in the wire between the PCM (C1) and the ETCS control relay, then go to step 23.

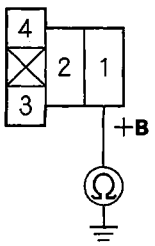
NO—Go to step 21.

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21. Check for continuity between ETCS control relay 4P connector terminal No. 1 and body ground.

ETCS CONTROL RELAY 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Replace the under-hood fuse/relay box (see page 22-61), then go to step 23.

NO—Go to step 28.

22. Turn the ignition switch OFF.
23. Reconnect all connectors.
24. Turn the ignition switch ON (II).
25. Reset the PCM with the HDS.
26. Do the PCM idle learn procedure (see page 11-339).
27. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1659 indicated?

YES—Check for poor connections or loose terminals at the ETCS control relay and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

28. Reconnect all connectors.
29. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
30. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1659 indicated?

YES—Check for poor connections or loose terminals at the ETCS control relay and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P1683: Throttle Valve Default Position Spring Performance Problem

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Turn the ignition switch OFF, and wait 10 seconds.
5. Turn the ignition switch ON (II).
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1683 indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
7. Turn the ignition switch OFF.
8. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
9. Push the throttle valve closed as shown.



10. Release the throttle valve.

    Does the throttle valve return?

    YES—Clean the throttle body (see page 11-394), then go to step 12 and recheck. If DTC P1683 is indicated, go to step 11.

    NO—Go to step 11.
11. Replace the throttle body (see page 11-396).
12. Turn the ignition switch ON (II).
13. Reset the PCM with the HDS.
14. Do the PCM idle learn procedure (see page 11-339).
15. Turn the ignition switch OFF, and wait 10 seconds.
16. Turn the ignition switch ON (II).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1683 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC P1684: Throttle Valve Return Spring Performance Problem

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Turn the ignition switch OFF, and wait 10 seconds.
5. Turn the ignition switch ON (II).
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1684 indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
7. Turn the ignition switch OFF.
8. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
9. Push the throttle valve open as shown.



10. Release the throttle valve.

    Does the throttle valve return?

    YES—Clean the throttle body (see page 11-394), then go to step 12 and recheck. If DTC P1684 is indicated, go to step 11.

    NO—Go to step 11.
11. Replace the throttle body (see page 11-396).
12. Turn the ignition switch ON (II).
13. Reset the PCM with the HDS.
14. Do the PCM idle learn procedure (see page 11-339).
15. Turn the ignition switch OFF, and wait 10 seconds.
16. Turn the ignition switch ON (II).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1684 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P2101: Electronic Throttle Control System (ETCS) Malfunction

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Do the ETCS TEST in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2101 indicated?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   • ENGINE SPEED
   • VSS
   • APP SENSOR A
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2101 indicated?

   YES—Go to step 7.

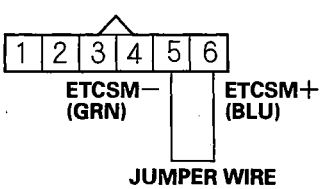
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM, then clean the throttle body (see page 11-394).■
7. Turn the ignition switch OFF.
8. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
9. Turn the ignition switch ON (II).
10. Clear the DTC with the HDS.
11. Do the ETCS TEST in the INSPECTION MENU with the HDS.
12. Visually check the throttle valve operation.

    Does the throttle valve operate smoothly?

    YES—Clean the throttle body (see page 11-394), then go to step 22 and recheck. If DTC P2101 is indicated, go to step 19.

    NO—Go to step 13.
13. Turn the ignition switch OFF.
14. Disconnect the throttle body 6P connector.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector C (44P).
17. Connect throttle body 6P connector terminals No. 5 and No. 6 with a jumper wire.

THROTTLE BODY 6P CONNECTOR

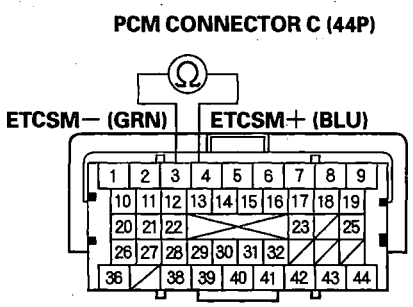


Wire side of female terminals

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18. Check for continuity between PCM connector terminals C3 and C4.



Terminal side of female terminals

Is there continuity?

YES—Go to step 27.

NO—Repair open in the wires between the throttle body and the PCM (C3, C4), then go to step 21.

19. Turn the ignition switch OFF.
20. Replace the throttle body (see page 11-396).
21. Reconnect all connectors.
22. Turn the ignition switch ON (II).
23. Reset the PCM with the HDS.
24. Do the PCM idle learn procedure (see page 11-339).
25. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    • ENGINE SPEED
    • VSS
    • APP SENSOR A

26. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2101 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then clean the throttle body (see page 11-394), and go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

27. Reconnect all connectors.
28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
29. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

    • ENGINE SPEED
    • VSS
    • APP SENSOR A

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2101 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 29. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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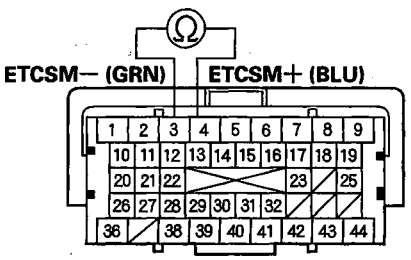
DTC Troubleshooting (cont'd)

DTC P2118: Throttle Actuator Current Range/ Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Jump the SCS line with the HDS.
2. Disconnect PCM connector C (44P).
3. Measure resistance between PCM connector terminals C3 and C4.

PCM CONNECTOR C (44P)



Terminal side of female terminals

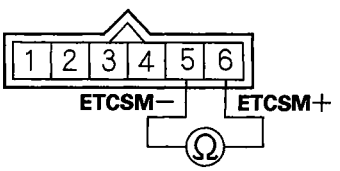
Is there about 1.0 Ω or less?

YES—Go to step 4.

NO—Go to step 15.

4. Disconnect the throttle body 6P connector.
5. At the throttle body side, measure resistance between throttle body 6P connector terminals No. 5 and No. 6 with the throttle fully closed.

THROTTLE BODY 6P CONNECTOR



Terminal side of male terminals

Is there about 1.0 Ω or less?

YES—Go to step 6.

NO—Repair short in the wires between the PCM C3 (ETCSM– line) and C4 (ETCSM+ line), then go to step 7.

6. Replace the throttle body (see page 11-396).
7. Reconnect all connectors.
8. Turn the ignition switch ON (II).
9. Reset the PCM with the HDS.

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10. Do the PCM idle learn procedure (see page 11-339).
11. Turn the ignition switch OFF.
12. Turn the ignition switch ON (II).
13. Slowly press the accelerator pedal to the floor.
14. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2118 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
15. Reconnect all connectors.
16. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
17. Turn the ignition switch OFF.
18. Turn the ignition switch ON (II).
19. Slowly press the accelerator pedal to the floor.
20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2118 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 17. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2122: APP Sensor A (TP Sensor D) Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

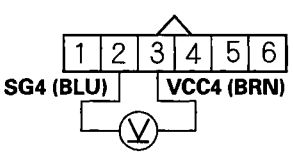
1. Turn the ignition switch ON (II).
2. Check APP SENSOR A in the DATA LIST with the HDS.

   Is there about 0.2 V or less?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at APP sensor A and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the APP sensor 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between APP sensor 6P connector terminals No. 2 and No. 3.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

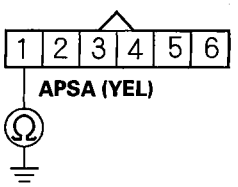
Is there about 5 V?

YES—Go to step 7.

NO—Go to step 17.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Check for continuity between APP sensor 6P connector terminal No. 1 and body ground.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

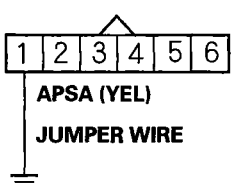
Is there continuity?

YES—Repair short in the wire between the PCM (A17) and APP sensor A, then go to step 24.

NO—Go to step 11.

11. Connect APP sensor 6P connector terminal No. 1 to body ground with a jumper wire.

APP SENSOR 6P CONNECTOR



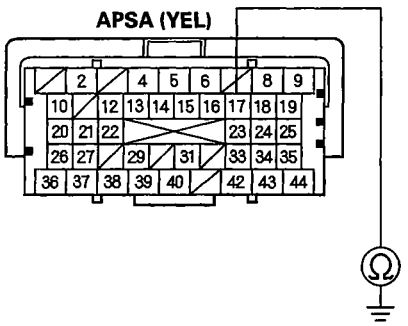
Wire side of female terminals

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BACK

12. Check for continuity between PCM connector terminal A17 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

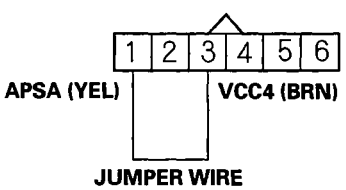
YES—Go to step 13.

NO—Repair open in the wire between the PCM (A17) and APP sensor A, then go to step 24.

13. Reconnect PCM connector A (44P).

14. Connect APP sensor 6P connector terminals No. 1 and No. 3 with a jumper wire.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

15. Turn the ignition switch ON (II).

16. Check APP SENSOR A in the DATA LIST with the HDS.

Is there about 0.2 V or less?

YES—Go to step 29.

NO—Go to step 22.

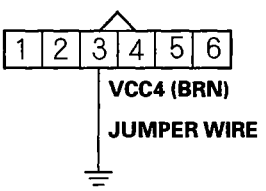
17. Turn the ignition switch OFF.

18. Jump the SCS line with the HDS.

19. Disconnect PCM connector A (44P).

20. Connect APP sensor 6P connector terminal No. 3 to body ground with a jumper wire.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

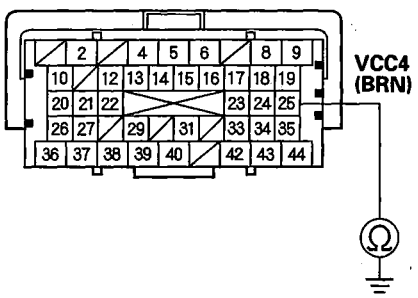
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DTC Troubleshooting (cont'd)

21. Check for continuity between PCM connector terminal A25 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 30.

NO—Repair open in the wire between the PCM (A25) and APP sensor A, then go to step 24.

22. Turn the ignition switch OFF.

23. Replace the accelerator pedal module (see page 11-295).

24. Reconnect all connectors.

25. Turn the ignition switch ON (II).

26. Reset the PCM with the HDS.

27. Do the PCM idle learn procedure (see page 11-339).

28. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2122 indicated?

YES—Check for poor connections or loose terminals at APP sensor A and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

29. Turn the ignition switch OFF.

30. Reconnect all connectors.

31. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

32. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2122 indicated?

YES—Check for poor connections or loose terminals at APP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC P2123: APP Sensor A (TP Sensor D) Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

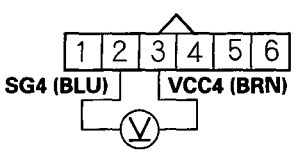
1. Turn the ignition switch ON (II).
2. Check APP SENSOR A in the DATA LIST with the HDS.

   Is there about 4.9 V or more?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at APP sensor A and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the APP sensor 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between APP sensor 6P connector terminals No. 2 and No. 3.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

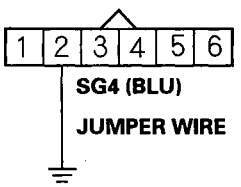
Is there about 5 V?

YES—Go to step 12.

NO—Go to step 7.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Connect APP sensor 6P connector terminal No. 2 to body ground with a jumper wire.

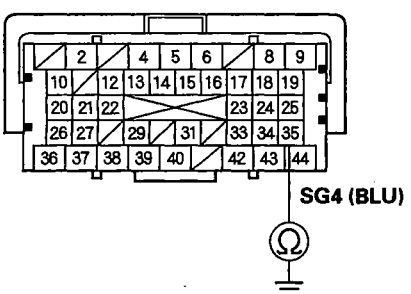
APP SENSOR 6P CONNECTOR



Wire side of female terminals

11. Check for continuity between PCM connector terminal A35 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 19.

NO—Repair open in the wire between the PCM (A35) and APP sensor A, then go to step 14.

(cont'd)

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DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Replace the accelerator pedal module (see page 11-295).
14. Reconnect all connectors.
15. Turn the ignition switch ON (II).
16. Reset the PCM with the HDS.
17. Do the PCM idle learn procedure (see page 11-339).
18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2123 indicated?

    YES—Check for poor connections or loose terminals at APP sensor A and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
19. Reconnect all connectors.
20. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
21. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2123 indicated?

    YES—Check for poor connections or loose terminals at APP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC P2127: APP Sensor B (TP Sensor E) Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

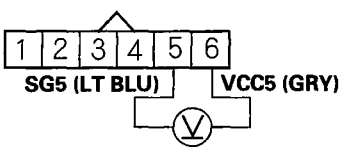
1. Turn the ignition switch ON (II).
2. Check APP SENSOR B in the DATA LIST with the HDS.

   Is there about 0.2 V or less?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at APP sensor B and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the APP sensor 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between APP sensor 6P connector terminals No. 5 and No. 6.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

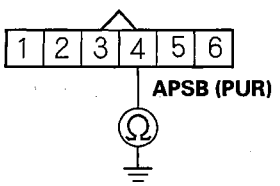
Is there about 5 V?

YES—Go to step 7.

NO—Go to step 17.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Check for continuity between APP sensor 6P connector terminal No. 4 and body ground.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

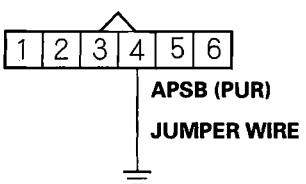
Is there continuity?

YES—Repair short in the wire between the PCM (A18) and APP sensor B, then go to step 24.

NO—Go to step 11.

11. Connect APP sensor 6P connector terminal No. 4 to body ground with a jumper wire.

APP SENSOR 6P CONNECTOR



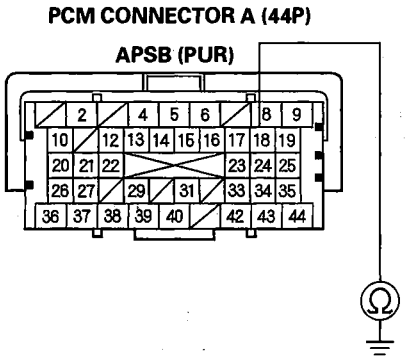
Wire side of female terminals

(cont'd)

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DTC Troubleshooting (cont'd)

12. Check for continuity between PCM connector terminal A18 and body ground.



Terminal side of female terminals

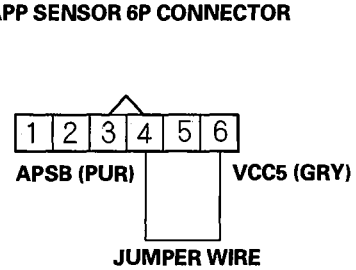
Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the PCM (A18) and APP sensor B, then go to step 24.

13. Reconnect PCM connector A (44P).

14. Connect APP sensor 6P connector terminals No. 4 and No. 6 with a jumper wire.



Wire side of female terminals

15. Turn the ignition switch ON (II).

16. Check APP SENSOR B in the DATA LIST with the HDS.

Is there about 0.2 V or less?

YES—Go to step 29.

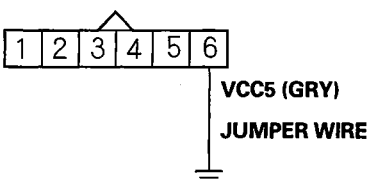
NO—Go to step 22.

17. Turn the ignition switch OFF.

18. Jump the SCS line with the HDS.

19. Disconnect PCM connector A (44P).

20. Connect APP sensor 6P connector terminal No. 6 to body ground with a jumper wire.

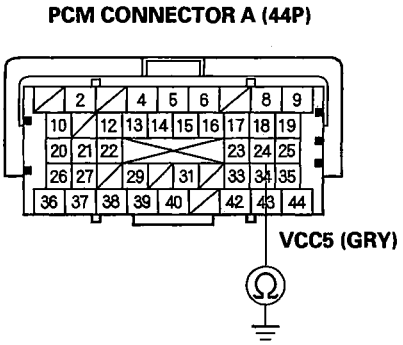


Wire side of female terminals

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BACK

21. Check for continuity between PCM connector terminal A24 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 30.

NO—Repair open in the wire between the PCM (A24) and APP sensor B, then go to step 24.

22. Turn the ignition switch OFF.

23. Replace the accelerator pedal module (see page 11-295).

24. Reconnect all connectors.

25. Turn the ignition switch ON (II).

26. Reset the PCM with the HDS.

27. Do the PCM idle learn procedure (see page 11-339).

28. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2127 indicated?

YES—Check for poor connections or loose terminals at APP sensor B and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

29. Turn the ignition switch OFF.

30. Reconnect all connectors.

31. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

32. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2127 indicated?

YES—Check for poor connections or loose terminals at APP sensor B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2128: APP Sensor B (TP Sensor E) Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

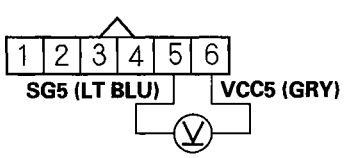
1. Turn the ignition switch ON (II).
2. Check APP SENSOR B in the DATA LIST with the HDS.

   Is there about 4.9 V or more?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at APP sensor B and the PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the APP sensor 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between APP sensor 6P connector terminals No. 5 and No. 6.

APP SENSOR 6P CONNECTOR



Wire side of female terminals

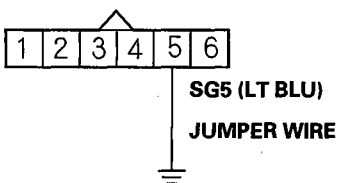
Is there about 5 V?

YES—Go to step 12.

NO—Go to step 7.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (44P).
10. Connect APP sensor 6P connector terminal No. 5 to body ground with a jumper wire.

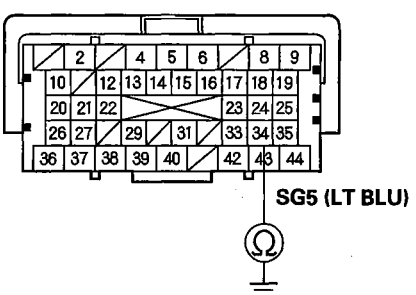
APP SENSOR 6P CONNECTOR



Wire side of female terminals

11. Check for continuity between PCM connector terminal A34 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 19.

NO—Repair open in the wire between the PCM (A34) and APP sensor B, then go to step 14.

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12. Turn the ignition switch OFF.

13. Replace the accelerator pedal module (see page 11-295).

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the PCM with the HDS.

17. Do the PCM idle learn procedure (see page 11-339).

18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2128 indicated?

    YES—Check for poor connections or loose terminals at APP sensor B and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

19. Reconnect all connectors.

20. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

21. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2128 indicated?

    YES—Check for poor connections or loose terminals at APP sensor B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2135: TP Sensor A/B Incorrect Voltage Correlation

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Do the ETCS TEST in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2135 indicated?

   YES—Go to step 5.

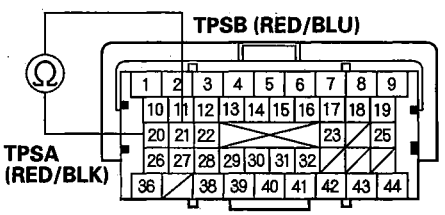
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM. ■
5. Turn the ignition switch OFF.
6. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
7. Turn the ignition switch ON (II).
8. Visually check the throttle valve operation while you clear the DTC with the HDS.

   Does the valve temporarily move to its fully closed position?

   YES—Go to step 15.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (44P).
12. Check for continuity between PCM connector terminals C20 and C21.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Go to step 22.

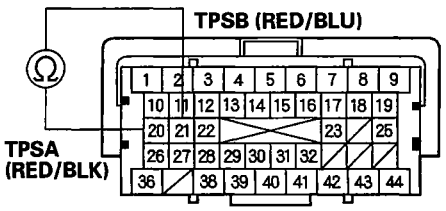
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13. Disconnect the throttle body 6P connector.

14. Check for continuity between PCM connector terminals C20 and C21.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wires between the PCM C20 (TPSA line) and the C21 (TPSB line), then go to step 17.

NO—Go to step 15.

15. Turn the ignition switch OFF.

16. Replace the throttle body (see page 11-394).

17. Reconnect all connectors.

18. Turn the ignition switch ON (II).

19. Reset the PCM with the HDS.

20. Do the PCM idle learn procedure (see page 11-339).

21. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2135 indicated?

YES—Check for poor connections or loose terminals at the throttle body and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

22. Reconnect all connectors.

23. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

24. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2135 indicated?

YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2138: APP Sensor A/B (TP Sensor D/E) Incorrect Voltage Correlation

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with HDS.
3. Press the accelerator pedal to the floor.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2138 indicated?

   YES—Go to step 5.

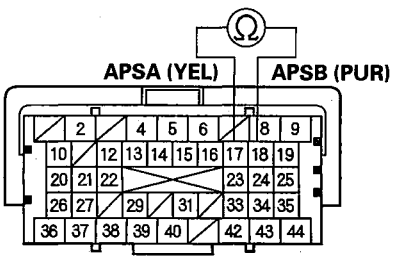
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the APP sensor and the PCM. ■
5. Check APP SENSOR A and APP SENSOR B in the DATA LIST with the HDS.

   Are they the same voltage?

   YES—Go to step 6.

   NO—Go to step 12.
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (44P).
9. Check for continuity between PCM connector terminals A17 and A18.

PCM CONNECTOR A (44P)



Terminal side of female terminals

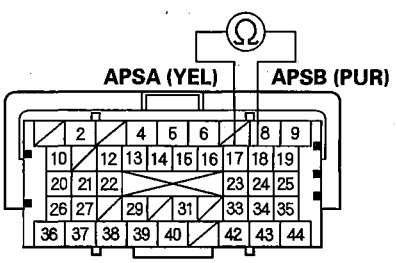
Is there continuity?

YES—Go to step 10.

NO—Go to step 22.

10. Disconnect the APP sensor 6P connector.
11. Check for continuity between PCM connector terminals A17 and A18.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wires between PCM connector terminals A17 (APSA line) and A18 (APSB line), then go to step 14.

NO—Go to step 13.

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12. Turn the ignition switch OFF.

13. Replace the accelerator pedal module (see page 11-295).

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the PCM with the HDS.

17. Do the PCM idle learn procedure (see page 11-339).

18. Turn the ignition switch OFF.

19. Turn the ignition switch ON (II).

20. Press the accelerator pedal to the floor.

21. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2138 indicated?

    YES—Check for poor connections or loose terminals at the APP sensor A/B and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

22. Reconnect all connectors.

23. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

24. Turn the ignition switch OFF.

25. Turn the ignition switch ON (II).

26. Press the accelerator pedal to the floor.

27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2138 indicated?

    YES—Check for poor connections or loose terminals at APP sensor A/B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 24. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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DTC Troubleshooting (cont'd)

DTC P2176: Throttle Actuator Control System Idle Position Not Learned

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P2135 is stored at the same time as DTC P2176, troubleshoot DTC P2135 first, then recheck for DTC P2176.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II), and wait 10 seconds.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2176 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the throttle body and the PCM, then clean the throttle body (see page 11-394).■
6. Turn the ignition switch OFF.
7. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
8. Turn the ignition switch ON (II).
9. Clear the DTC with the HDS.
10. Visually check the throttle valve operation while doing the ETCS TEST in the INSPECTION MENU with the HDS.

    Does the throttle valve move to its fully closed position?

    YES—Go to step 11.

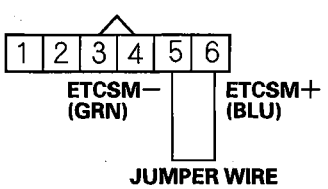
    NO—Go to step 12.
11. Check for sludge or carbon on the throttle valve.

    Is there sludge or carbon on the throttle valve?

    YES—Clean the throttle body (see page 11-394), then go to step 21.

    NO—Go to step 18.
12. Turn the ignition switch OFF.
13. Disconnect the throttle body 6P connector.
14. Jump the SCS line with the HDS.
15. Disconnect PCM connector C (44P).
16. Connect throttle body 6P connector terminals No. 5 and No. 6 with a jumper wire.

THROTTLE BODY 6P CONNECTOR



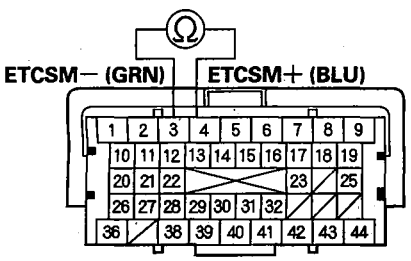
Wire side of female terminals

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17. Check for continuity between PCM connector terminals C3 and C4.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 27.

NO—Repair open in the wires between the throttle body and the PCM (C3, C4), then go to step 20.

18. Turn the ignition switch OFF.
19. Replace the throttle body (see page 11-396).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the PCM with the HDS.
23. Do the PCM idle learn procedure (see page 11-339).
24. Turn the ignition switch OFF.
25. Turn the ignition switch ON (II), and wait 10 seconds.
26. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2176 indicated?

YES—Check for poor connections or loose terminals at the throttle body and the PCM, then clean the throttle body (see page 11-394), and go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

27. Reconnect all connectors.
28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
29. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2176 indicated?

YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

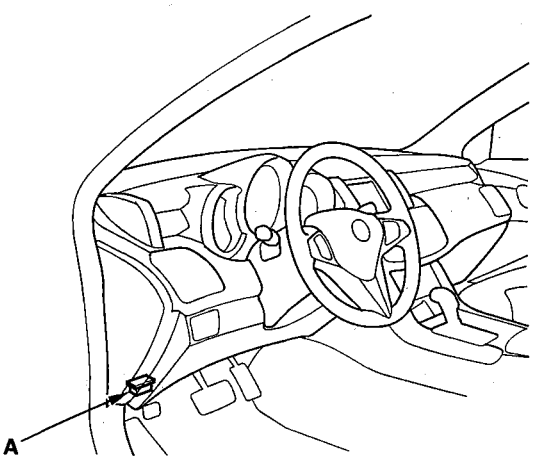
NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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APP Sensor Signal Inspection

NOTE:
- This procedure checks the APP sensor in its fully closed position. In any other position, the APP sensor stores DTCs which are covered in other troubleshooting procedures.
- Check for Temporary DTCs or DTCs with the HDS before doing this procedure. If any DTCs are indicated, troubleshoot them first, then do this procedure.
- Press the accelerator pedal several times, to check its operation. If it does not operate smoothly, check the pedal. If you find a problem, replace the accelerator pedal module (see page 11-295).

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch ON (II).

3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).

4. Make sure the accelerator pedal is not pressed, then check the APP SENSOR in the DATA LIST with the HDS.

   - If it is 0 %, the APP sensor is OK.
   - If it is not 0 %, update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then go to step 5.

5. Make sure the accelerator pedal is not pressed, then check the APP SENSOR in the DATA LIST with the HDS.

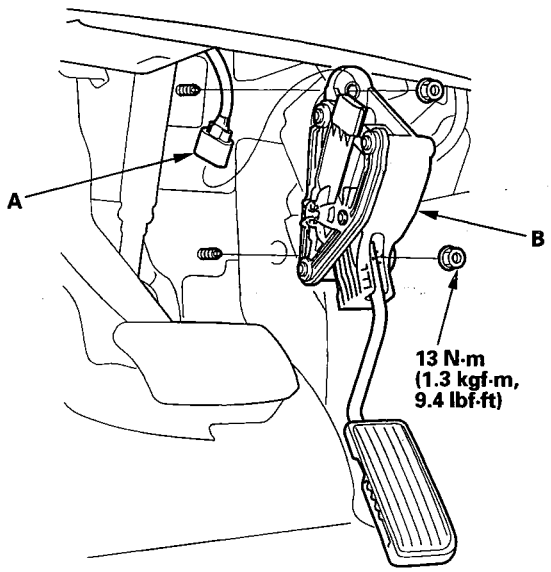
   - If it is 0 %, the APP sensor is OK.
   - If it is not 0 %, replace the accelerator pedal module (see page 11-295), then go to step 1.

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Accelerator Pedal Module Removal/Installation

1. Disconnect the accelerator pedal module 6P connector (A).



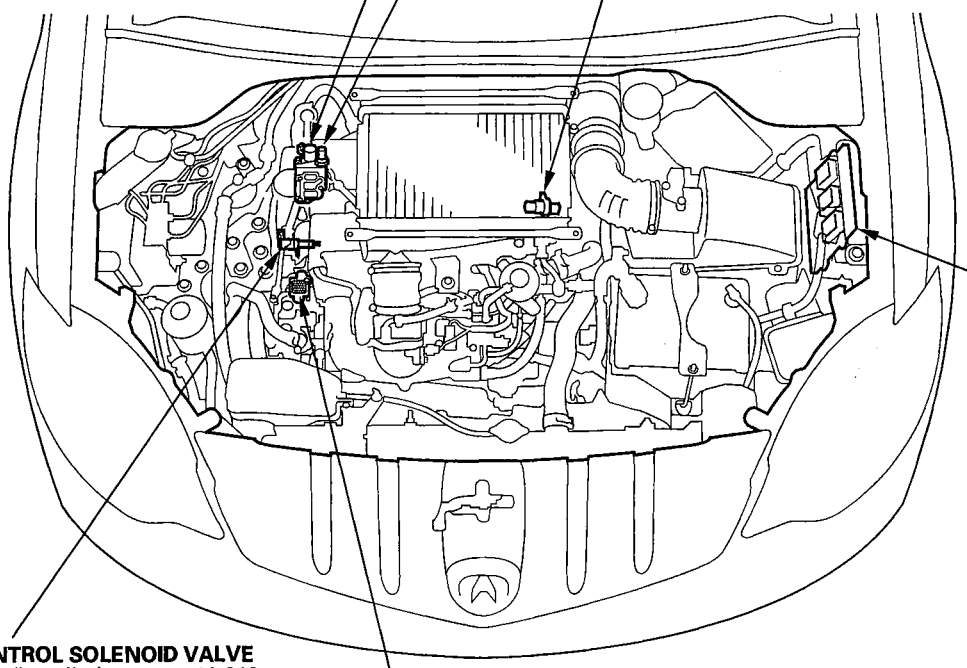
2. Remove the accelerator pedal module (B).

   NOTE: The APP sensor is not available separately. Do not disassemble the accelerator pedal module.

3. Install the parts in the reverse order of removal.

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Component Location Index



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DTC P0010: VTC Oil Control Solenoid Valve Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

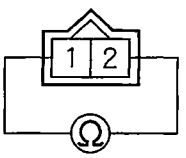
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Do the VTC TEST in the INSPECTION MENU with the HDS.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0010 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the VTC oil control solenoid valve 2P connector.
8. Measure resistance between VTC oil control solenoid valve 2P connector terminals No. 1 and No. 2.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there 6.75—8.25 Ω at room temperature?

YES—Go to step 9.

NO—Go to step 14.

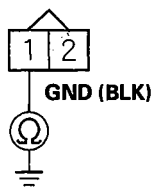
(cont'd)

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DTC Troubleshooting (cont'd)

9. Check for continuity between VTC oil control solenoid valve 2P connector terminal No. 1 and body ground.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

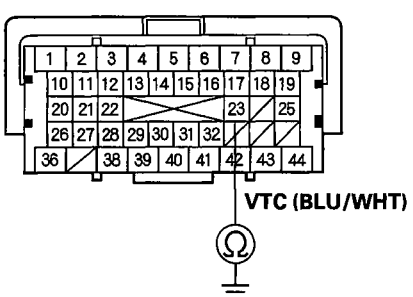
NO—Repair open in the wire between the VTC oil control solenoid valve and G101 (see page 22-18), then go to step 15.

10. Jump the SCS line with the HDS.

11. Disconnect PCM connector C (44P).

12. Check for continuity between PCM connector terminal C23 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

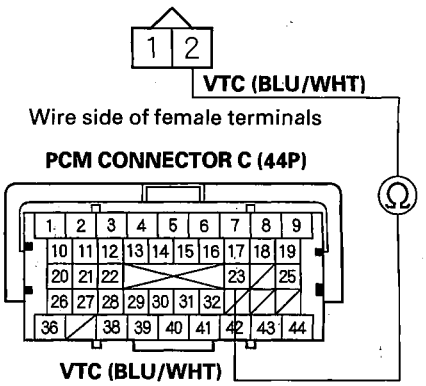
Is there continuity?

YES—Repair short in the wire between the PCM (C23) and the VTC oil control solenoid valve, then go to step 15.

NO—Go to step 13.

13. Check for continuity between VTC oil control solenoid valve 2P connector terminal No. 2 and PCM connector terminal C23.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 22.

NO—Repair open in the wire between the PCM (C23) and the VTC oil control solenoid valve, then go to step 15.

14. Replace the VTC oil control solenoid valve (see page 11-319).

15. Reconnect all connectors.

16. Turn the ignition switch ON (II).

17. Reset the PCM with the HDS.

18. Do the PCM idle learn procedure (see page 11-339).

19. Do the VTC TEST in the INSPECTION MENU with the HDS.

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20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0010 indicated?

    YES—Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1.

    NO—Go to step 21.

21. Monitor the OBD STATUS for DTC P0010 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 20, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19.

22. Reconnect all connectors.

23. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

24. Do the VTC TEST in the INSPECTION MENU with the HDS.

25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0010 indicated?

    YES—Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 24. If the PCM was substituted, go to step 1.

    NO—Go to step 26.

26. Monitor the OBD STATUS for DTC P0010 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 25, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 24. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 24.

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DTC Troubleshooting (cont'd)

DTC P0011: VTC System Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Watch the low oil pressure indicator with the engine running.

   Is the low oil pressure indicator on?

   YES—Check the oil pressure (see page 8-9), then go to step 15.

   NO—Go to step 5.
5. Do the VTC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 6.

   NO—Go to step 9.
6. Test-drive at a steady speed between 25—75 mph (40—120 km/h) for 10 minutes.
7. Check the VTC STATUS in the DATA LIST with the HDS.

   Does it indicate ON?

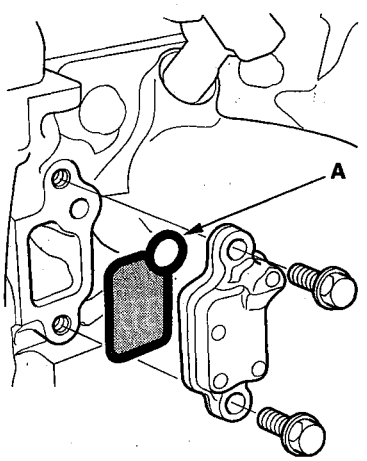
   YES—Go to step 8.

   NO—Go to step 6 and recheck.
8. Monitor the OBD STATUS for DTC P0011 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates NOT COMPLETED, go to step 5 and recheck.
9. Turn the ignition switch OFF.
10. Remove the drive belt auto-tensioner (see page 4-33).
11. Remove the VTC strainer (A), and check it for clogging.



   Is the strainer OK?

   YES—Go to step 12.

   NO—Clean the VTC strainer, replace the engine oil filter and the engine oil, then go to step 14.
12. Test the VTC oil control solenoid valve (see page 11-319).

   Is the VTC oil control solenoid valve OK?

   YES—Go to step 13.

   NO—Replace the VTC oil control solenoid valve (see page 11-319), then go to step 14.

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13. Inspect the VTC actuator (see page 6-8).

    Is the VTC actuator OK?

    YES—Check the VTC system oil passages, then go to step 14.

    NO—Replace the VTC actuator (see page 6-35), then go to step 14.

14. Turn the ignition switch ON (II).

15. Reset the PCM with the HDS.

16. Clear the CKP pattern with the HDS.

17. Do the PCM idle learn procedure (see page 11-339).

18. Do the CKP pattern learn procedure (see page 11-4).

19. Do the VTC TEST in the INSPECTION MENU with the HDS.

20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0011 indicated?

    YES—Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1.

    NO—Go to step 21.

21. Monitor the OBD STATUS for DTC P0011 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19.

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DTC Troubleshooting (cont'd)

DTC P0340: CMP Sensor A No Signal

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

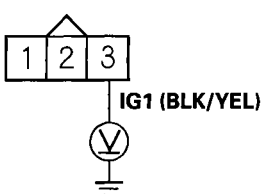
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0340 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at CMP sensor A and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the CMP sensor A 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CMP sensor A 3P connector terminal No. 3 and body ground.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

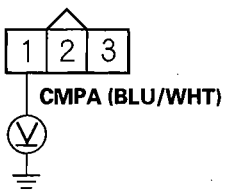
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the wire between CMP sensor A and the No. 3 IG1 ACG (15 A) fuse, then go to step 18.

9. Measure voltage between CMP sensor A 3P connector terminal No. 1 and body ground.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

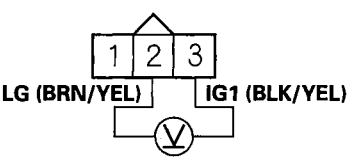
Is there about 5 V?

YES—Go to step 10.

NO—Go to step 11.

10. Measure voltage between CMP sensor A 3P connector terminals No. 2 and No. 3.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 16.

NO—Repair open in the wire between CMP sensor A and G101 (see page 22-18), then go to step 18.

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BACK

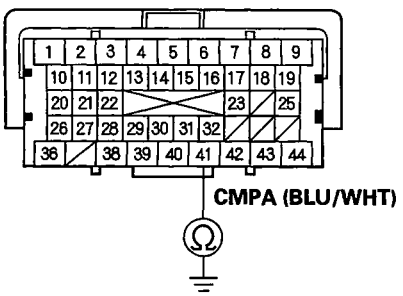
11. Turn the ignition switch OFF.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (44P).

14. Check for continuity between PCM connector terminal C41 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

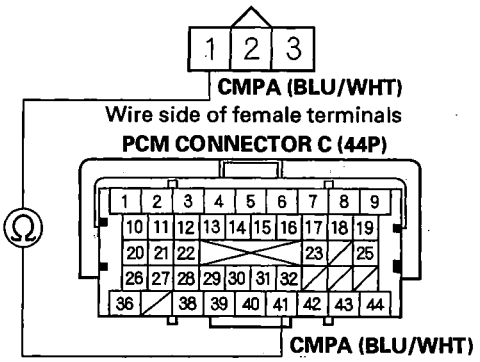
Is there continuity?

YES—Repair short in the wire between the PCM (C41) and CMP sensor A, then go to step 18.

NO—Go to step 15.

15. Check for continuity between CMP sensor A 3P connector terminal No. 1 and PCM connector terminal C41.

CMP SENSOR A 3P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the PCM (C41) and CMP sensor A, then go to step 18.

(cont'd)

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DTC Troubleshooting (cont'd)

16. Turn the ignition switch OFF.
17. Replace CMP sensor A (see page 11-320).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0340 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor A and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0340 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0341: CMP Sensor A and CKP Sensor Incorrect Phase Detected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0341 indicated?

   YES—Go to step 9.

   NO—Go to step 5.
5. Do the VTC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 6.

   NO—Go to step 9.
6. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
7. Check the VTC STATUS in the DATA LIST with the HDS.

   Does it indicate ON?

   YES—Go to step 8.

   NO—Go to step 6 and recheck.
8. Monitor the OBD STATUS for DTC P0341 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM. If the screen indicates NOT COMPLETED, go to step 6 and recheck.
9. Turn the ignition switch OFF.
10. Test the VTC oil control solenoid valve (see page 11-319).

    Is the VTC oil control solenoid valve OK?

    YES—Go to step 11.

    NO—Replace the VTC oil control solenoid valve (see page 11-319), then go to step 14.
11. Check the camshaft timing (see step 5 on page 6-13).

    Is the camshaft timing OK?

    YES—Go to step 12.

    NO—Reset the camshaft timing (see page 6-13), then go to step 14.
12. Check for damage or stretch at the cam chain (see page 6-24).

    Is the cam chain damaged?

    YES—Replace the cam chain and auto-tensioner (see page 6-22), then go to step 14.

    NO—Go to step 13.
13. Inspect the VTC actuator (see page 6-8).

    Is the actuator OK?

    YES—Go to step 14.

    NO—Replace the VTC actuator (see page 6-35), then go to step 14.

(cont'd)

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DTC Troubleshooting (cont'd)

14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Clear the CKP pattern with the HDS.
17. Do the PCM idle learn procedure (see page 11-339).
18. Do the CKP pattern learn procedure (see page 11-4).
19. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
20. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0341 indicated?

    YES—Check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1.

    NO—Go to step 21.

21. Monitor the OBD STATUS for DTC P0341 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19.

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BACK

DTC P0344: CMP Sensor A Circuit Intermittent Interruption

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle for 10 seconds.
4. Check the CMP NOISE A count in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive the vehicle for several minutes in the range of these recorded freeze data parameters:

   • ENGINE SPEED
   • VSS
6. Check the CMP NOISE A count in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at CMP sensor A and the PCM. ■
7. Check for poor or loose connections and terminals at these locations:

   • CMP sensor A
   • PCM
   • Engine ground
   • Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Repair the connectors or terminals, then go to step 11.
8. Check for damage to the CMP sensor A pulser plate (see page 6-34).

   Is the pulser plate damaged?

   YES—Replace the CMP sensor A pulser plate (see page 6-34), then go to step 11.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Replace CMP sensor A (see page 11-320).
11. Turn the ignition switch ON (II).
12. Reset the PCM with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Start the engine, and let it idle for 10 seconds.
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0344 indicated?

    YES—Check for poor connections or loose terminals at CMP sensor A and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P1009: VTC Advance Malfunction

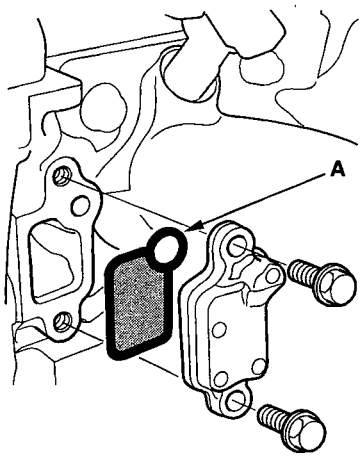
NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P0341 is stored at the same time as DTC P1009, troubleshoot DTC P1009 first, then recheck for DTC P0341.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1009 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time.■
5. Turn the ignition switch OFF.
6. Remove the drive belt auto-tensioner (see page 4-33).
7. Remove the VTC strainer (A), and check it for clogging.



   Is the strainer OK?

   YES—Go to step 8.

   NO—Clean the VTC strainer, replace the engine oil filter and the engine oil, then go to step 10.
8. Test the VTC oil control solenoid valve (see page 11-319).

   Is the valve OK?

   YES—Go to step 9.

   NO—Replace the VTC oil control solenoid valve (see page 11-319), then go to step 10.
9. Inspect the VTC actuator (see page 6-8).

   Is the actuator OK?

   YES—Check the VTC system oil passages, then go to step 10.

   NO—Replace the VTC actuator (see page 6-35), then go to step 10.
10. Turn the ignition switch ON (II).
11. Reset the PCM with the HDS.
12. Clear the CKP pattern with the HDS.
13. Do the PCM idle learn procedure (see page 11-339).
14. Do the CKP pattern learn procedure (see page 11-4).
15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1009 indicated?

    YES—Check the oil passages at the VTC system, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P2646: Rocker Arm Oil Pressure Switch Circuit Low Voltage

Special Tools Required
- Pressure gauge adapter 07NAJ-P07010A
- A/T low pressure gauge w/panel 07406-0070301
- A/T pressure hose 07406-0020201
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure adapter 07MAJ-PY40120
- Oil pressure hose 07ZAJ-S5AA200

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check the engine oil level.

   Is the engine oil level OK?

   YES—Go to step 2.

   NO—Adjust the engine oil to the proper level, then go to step 20.

2. Turn the ignition switch ON (II).

3. Clear the DTC with the HDS.

4. Do the VTEC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM.■

   NO—Go to step 5.

5. Turn the ignition switch OFF.

6. Disconnect the rocker arm oil pressure switch 2P connector.

7. Turn the ignition switch ON (II).

8. Check the VTEC PRES SW in the DATA LIST with the HDS.

   Is SWITCH ON indicated?

   YES—Go to step 16.

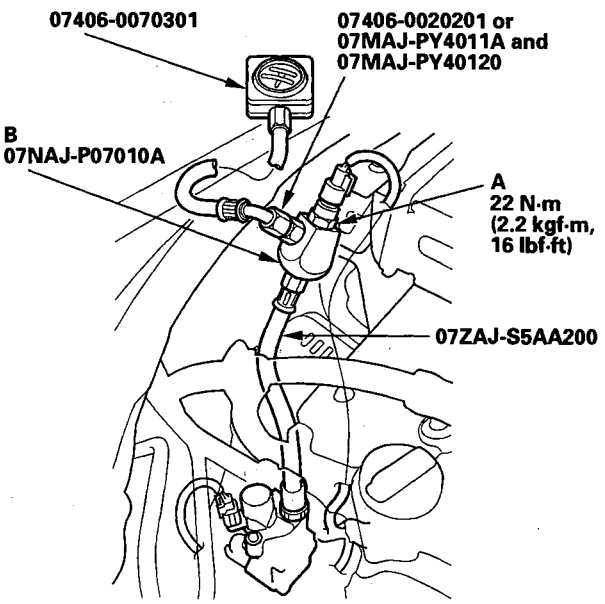
   NO—Go to step 9.

9. Turn the ignition switch OFF.

10. Remove the charge air cooler cover (see step 1 on page 9-8).

11. Remove the rocker arm oil pressure switch (A), and install the special tools as shown, then install the rocker arm oil pressure switch on the oil pressure gauge attachment (B).

    NOTE: Install the switch in the reverse order of removal with a new O-ring.



12. Reconnect the rocker arm oil pressure switch 2P connector.

13. Start the engine.

14. Do the VTEC TEST in the INSPECTION MENU with the HDS.

(cont'd)

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DTC Troubleshooting (cont'd)

15. Check the oil pressure.

    Does the oil pressure increase to at least 392 kPa (4.0 kgf/cm², 56.9 psi)?

    YES—Replace the rocker arm oil pressure switch (see page 11-321), then go to step 20.

    NO—Inspect the VTEC system. If it is OK, replace the rocker arm oil control solenoid (see page 11-321), then go to step 20.

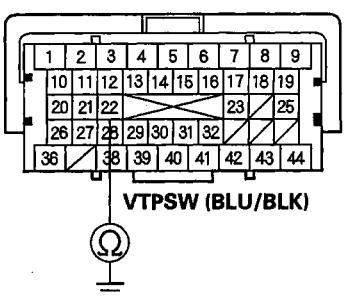
16. Turn the ignition switch OFF.

17. Jump the SCS line with the HDS.

18. Disconnect PCM connector C (44P).

19. Check for continuity between PCM connector terminal C22 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C22) and the rocker arm oil pressure switch, then go to step 20.

NO—Go to step 27.

20. Reconnect all connectors.

21. Turn the ignition switch ON (II).

22. Reset the PCM with the HDS.

23. Do the PCM idle learn procedure (see page 11-339).

24. Do the VTEC TEST in the INSPECTION MENU with the HDS.

25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2646 indicated?

    YES—Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid and the PCM, then go step 1.

    NO—Go to step 26.

26. Monitor the OBD STATUS for DTC P2646 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 25, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 24.

27. Reconnect all connectors.

28. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

29. Do the VTEC TEST in the INSPECTION MENU with the HDS.

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2646 indicated?

    YES—Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 29. If the PCM was substituted, go to step 1.

    NO—Go to step 31.

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31. Monitor the OBD STATUS for DTC P2646 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 29. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 29.

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DTC Troubleshooting (cont'd)

DTC P2647: Rocker Arm Oil Pressure Switch Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Check the engine oil level.

   Is the engine oil level OK?

   YES—Go to step 2.

   NO—Adjust the engine oil to the proper level, then go to step 17.

2. Turn the ignition switch ON (II).

3. Clear the DTC with the HDS.

4. Do the VTEC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM. ■

   NO—Go to step 5.

5. Check the result of step 4.

   - VTEC Switch Failure
   - VTEC Switch Open
   - VTEC Switch SIG Line Open
   - VTEC Switch GND Line Open

   Is the test result any of above?

   YES—Go to step 6.

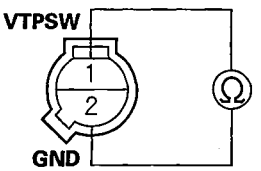
   NO—Check for poor connections or loose terminals at the rocker arm oil pressure switch. If it is OK, replace the rocker arm oil control valve (see page 11-321), then, go to step 15.

6. Turn the ignition switch OFF.

7. Disconnect the rocker arm oil pressure switch 2P connector.

8. At the rocker arm oil pressure switch side, check for continuity between rocker arm oil pressure switch 2P connector terminals No. 1 and No. 2.

ROCKER ARM OIL PRESSURE SWITCH 2P CONNECTOR



Terminal side of male terminals

Is there continuity?

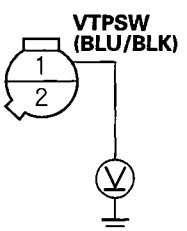
YES—Go to step 9.

NO—Replace the rocker arm oil pressure switch (see page 11-321), then go to step 16.

9. Turn the ignition switch ON (II).

10. Measure voltage between rocker arm oil pressure switch 2P connector terminal No. 1 and body ground.

ROCKER ARM OIL PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Repair open in the wire between the rocker arm oil pressure switch and G101 (see page 22-18), then go to step 15.

NO—Go to step 11.

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BACK

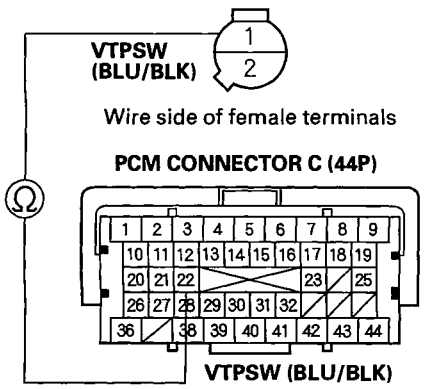
11. Turn the ignition switch OFF.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (44P).

14. Check for continuity between rocker arm oil pressure switch 2P connector terminal No. 1 and PCM connector terminal C22.

ROCKER ARM OIL PRESSURE SWITCH 2P CONNECTOR



Is there continuity?

YES—Go to step 22.

NO—Repair open in the wire between the PCM (C22) and the rocker arm oil pressure switch, then go to step 16.

15. Turn the ignition switch OFF.

16. Reconnect all connectors.

17. Turn the ignition switch ON (II).

18. Reset the PCM with the HDS.

19. Do the PCM idle learn procedure (see page 11-339).

20. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2647 indicated?

YES—Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid and the PCM, then go to step 1.

NO—Go to step 21.

21. Monitor the OBD STATUS for DTC P2647 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

22. Reconnect all connectors.

23. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

24. Start the engine, and let it idle.

25. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2647 indicated?

YES—Check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 24. If the PCM was substituted, go to step 1.

NO—Go to step 26.

(cont'd)

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DTC Troubleshooting (cont'd)

26. Monitor the OBD STATUS for DTC P2647 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 25, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil pressure switch, the rocker arm oil control solenoid, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 24. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC P2648: Rocker Arm Oil Control Solenoid Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Do the VTEC TEST in the INSPECTION MENU with the HDS.

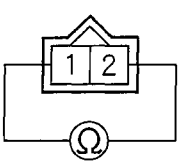
   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. ■

   NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Disconnect the rocker arm oil control solenoid 2P connector.
6. At the solenoid side, measure resistance between rocker arm oil control solenoid 2P connector terminals No. 1 and No. 2.

ROCKER ARM OIL CONTROL SOLENOID 2P CONNECTOR



Terminal side of male terminals

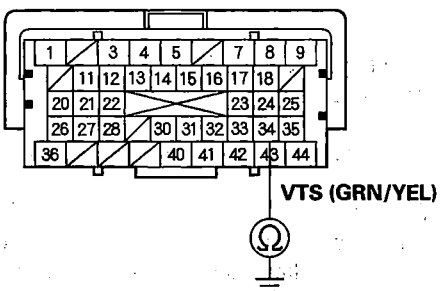
Is there 14—30 Ω at room temperature?

YES—Go to step 7.

NO—Go to step 10.

7. Jump the SCS line with the HDS.
8. Disconnect PCM connector B (44P).
9. Check for continuity between PCM connector terminal B34 and body ground.

PCM CONNECTOR B (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (B34) and the rocker arm oil control solenoid, then go to step 11.

NO—Go to step 18.

10. Replace the rocker arm oil control valve (see page 11-321).
11. Reconnect all connectors.
12. Turn the ignition switch ON (II).
13. Reset the PCM with the HDS.
14. Do the PCM idle learn procedure (see page 11-339).
15. Do the VTEC TEST in the INSPECTION MENU with the HDS.

(cont'd)

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DTC Troubleshooting (cont'd)

16. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2648 indicated?

    YES—Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM, then go to step 1.

    NO—Go to step 17.

17. Monitor the OBD STATUS for DTC P2648 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 16, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 15.

18. Reconnect all connectors.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Do the VTEC TEST in the INSPECTION MENU with the HDS.

21. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2648 indicated?

    YES—Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1.

    NO—Go to step 22.

22. Monitor the OBD STATUS for DTC P2648 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 21, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 20.

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BACK

DTC P2649: Rocker Arm Oil Control Solenoid Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

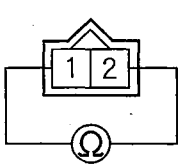
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2649 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the rocker arm oil control solenoid 2P connector.
7. At the solenoid side, measure resistance between rocker arm oil control solenoid 2P connector terminals No. 1 and No. 2.

ROCKER ARM OIL CONTROL SOLENOID 2P CONNECTOR



Terminal side of male terminals

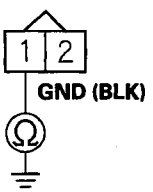
Is there 14—30 Ω at room temperature?

YES—Go to step 8.

NO—Go to step 12.

8. Check for continuity between rocker arm oil control solenoid 2P connector terminal No. 1 and body ground.

ROCKER ARM OIL CONTROL SOLENOID 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 9.

NO—Repair open in the wire between the rocker arm oil control solenoid and G101 (see page 22-18), then go to step 13.

9. Jump the SCS line with the HDS.
10. Disconnect PCM connector B (44P).

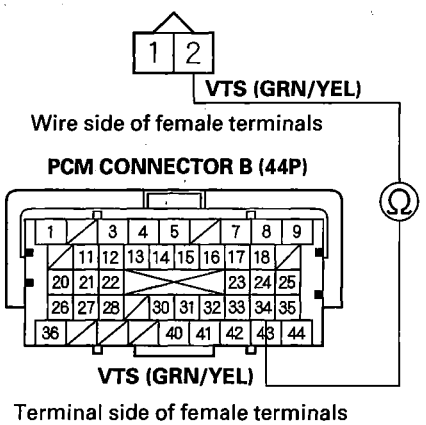
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DTC Troubleshooting (cont'd)

11. Check for continuity between PCM connector terminal B34 and rocker arm oil control solenoid 2P connector terminal No. 2.

ROCKER ARM OIL CONTROL SOLENOID 2P CONNECTOR



Is there continuity?

YES—Go to step 19.

NO—Repair open in the wire between the PCM (B34) and the rocker arm oil control solenoid, then go to step 13.

12. Replace the rocker arm oil control valve (see page 11-321).

13. Reconnect all connectors.

14. Turn the ignition switch ON (II).

15. Reset the PCM with the HDS.

16. Do the PCM idle learn procedure (see page 11-339).

17. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2649 indicated?

YES—Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM, then go to step 1.

NO—Go to step 18.

18. Monitor the OBD STATUS for DTC P2649 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

19. Reconnect all connectors.

20. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

21. Start the engine, and let it idle.

22. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P2649 indicated?

YES—Check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 21. If the PCM was substituted, go to step 1.

NO—Go to step 23.

23. Monitor the OBD STATUS for DTC P2649 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 22, go to the indicated DTC's troubleshooting. ■

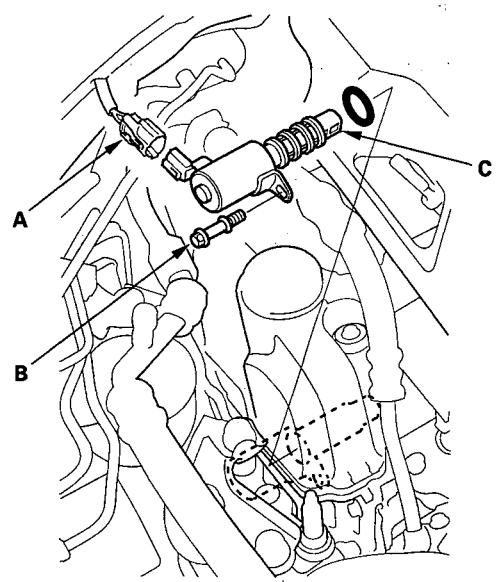
NO—If the screen indicates FAILED, check for poor connections or loose terminals at the rocker arm oil control solenoid and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 21. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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BACK

VTC Oil Control Solenoid Valve Removal/Test/Installation

1. Disconnect the VTC oil control solenoid valve 2P connector (A).

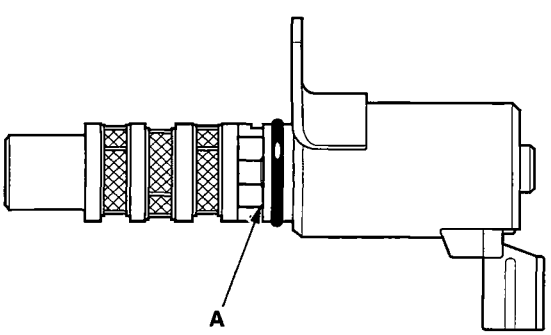


2. Remove the bolt (B) and the VTC oil control solenoid valve (C).

3. Check the VTC oil control solenoid valve strainer for clogging. If the strainer is clogged, replace the VTC oil control solenoid valve.

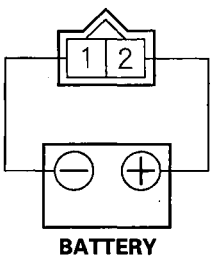
4. Note the amount of valve opening by observing the position of the piston shoulder (A) through the valve retard drain port. If you see the shoulder of the piston, the valve is open and must be replaced.

Closed



5. Connect the battery positive terminal to VTC oil control solenoid valve 2P connector terminal No. 2.

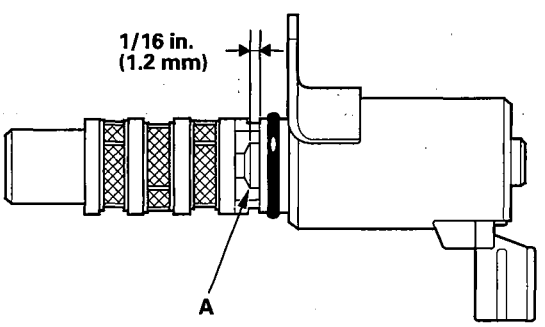
VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

6. Connect the battery negative terminal to VTC oil control solenoid valve 2P connector terminal No. 1. Appearance of inner valve (A) in the port should be at least 1/16 in. (1.2 mm). If the inner valve does not open, replace it; then go to step 7.

Open

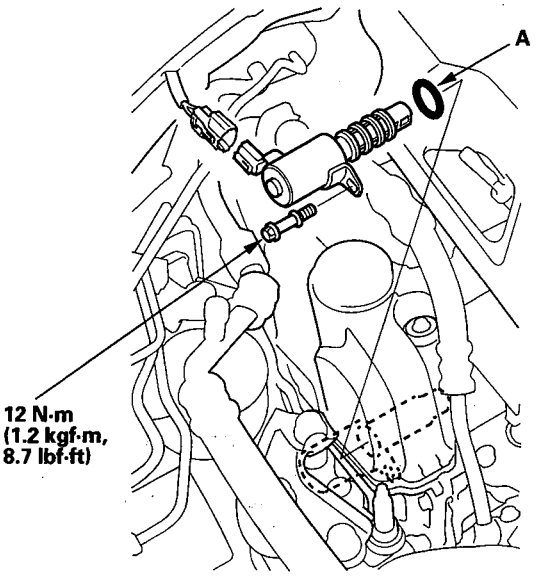


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VTC Oil Control Solenoid Valve Removal/Test/Installation (cont'd)

7. Coat a new O-ring (A) with engine oil, then install it.

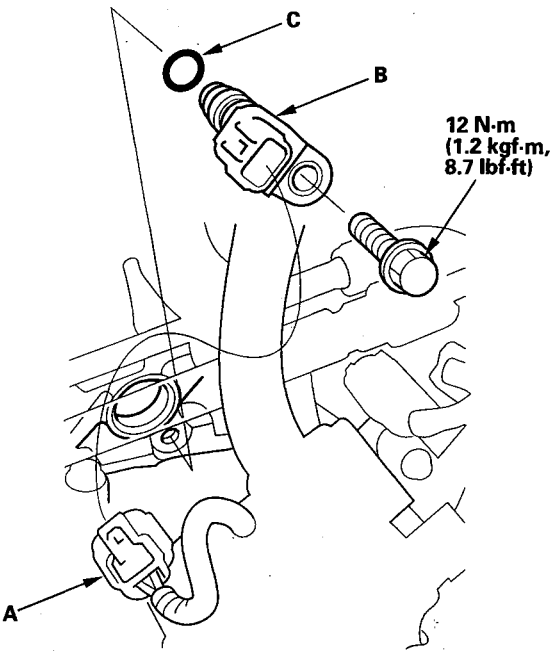


8. Clean and dry the mating surface of the valve.
9. Install the valve.

   NOTE: Do not install the valve while wearing cloth fibrous gloves. Be careful not to contaminate the cylinder head opening.

CMP Sensor A Replacement

1. Remove the air cleaner (see page 11-394).
2. Remove the air bypass outlet pipe (see page 9-7).
3. Disconnect the CMP sensor A 3P connector (A).



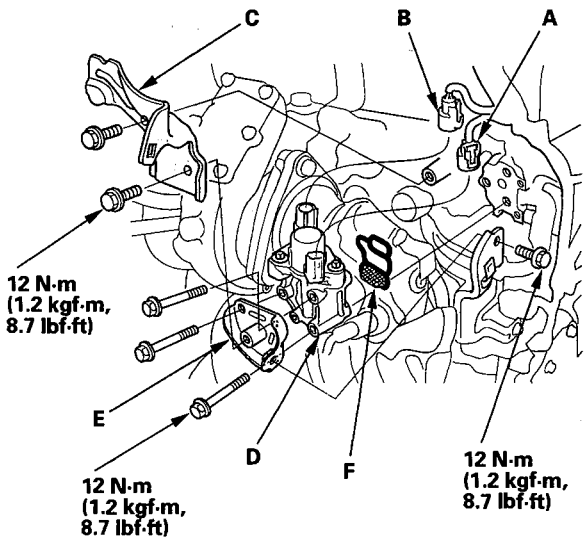
4. Remove CMP sensor A (B) from the intake camshaft side of the cylinder head.
5. Install the parts in the reverse order of removal with a new O-ring (C).

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BACK

Rocker Arm Oil Control Valve Removal/Installation

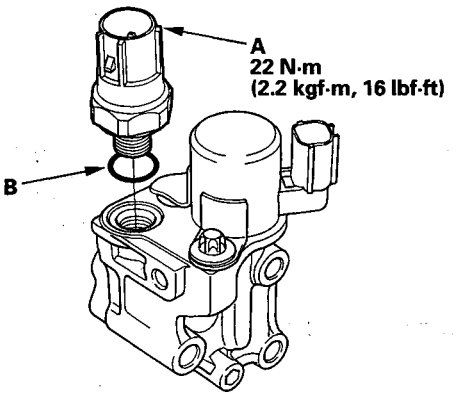
1. Remove the charge air cooler cover (see step 1 on page 9-8).
2. Remove the turbocharger cover (see step 4 on page 11-440).
3. Disconnect the rocker arm oil control solenoid connector (A) and the rocker arm oil pressure switch connector (B).



4. Remove the water hose upper cover (C).
5. Remove the rocker arm oil control valve (D) and cover (E).
6. Install the parts in the reverse order of removal with a new solenoid valve filter (F).

Rocker Arm Oil Pressure Switch Removal/Installation

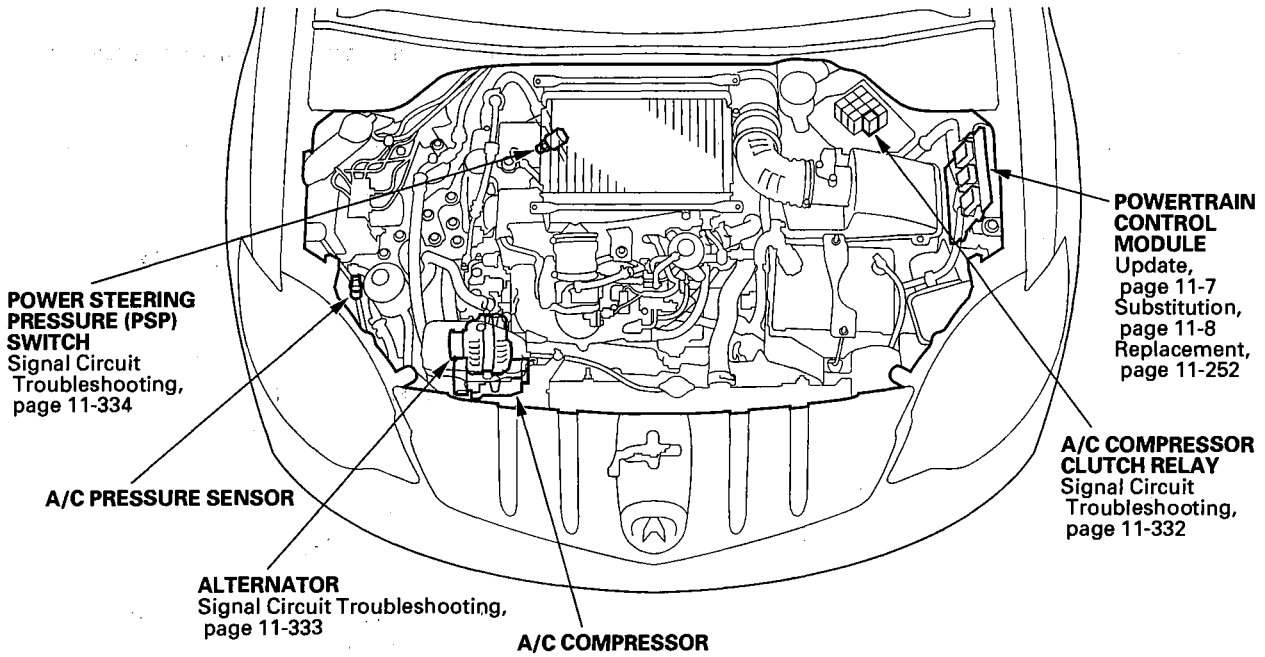
1. Remove the rocker arm oil control valve (see page 11-321).
2. Remove the rocker arm oil pressure switch (A).

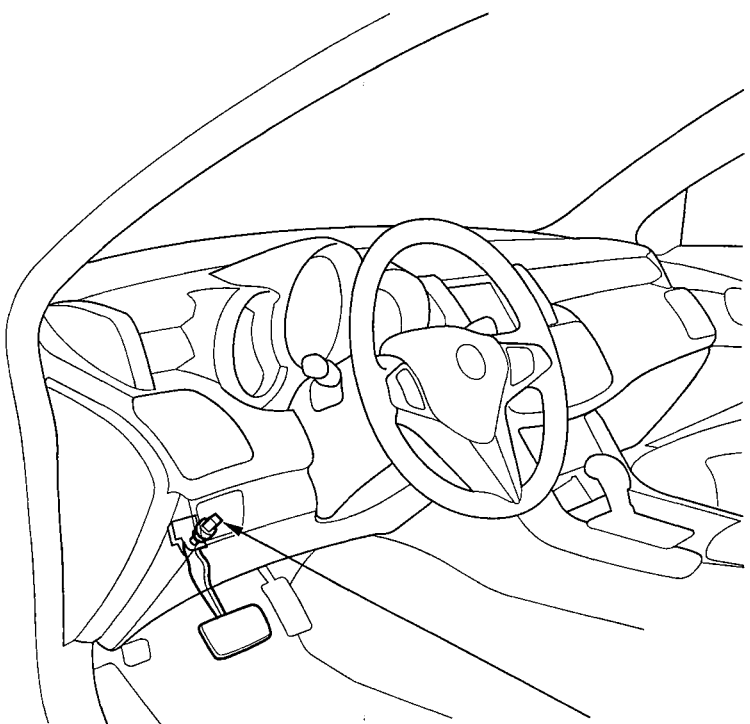


3. Install the parts in the reverse order of removal with a new O-ring (B).

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Component Location Index





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BACK

DTC P0506: Idle Control System RPM Lower Than Expected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check under these DATA LIST parameter conditions with the HDS:

   - ECT SENSOR 1 above 156 °F (70 °C)
   - IAT SENSOR above 32 °F (0 °C)
   - VSS is 0 mph (0 km/h)
   - ST FUEL TRIM between 0.69—1.47
   - FSS is CLOSED

5. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, go to step 15. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 4 and recheck.

6. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).
7. Check for dirt, carbon, or damage in the throttle bore.

   Is there dirt, carbon, or damage in the throttle bore?

   YES—If there is dirt or carbon, clean the throttle body (see page 11-394). Also check for damage to the air cleaner element (see page 11-395), then go to step 9. If there is damage in the throttle bore, go to step 8.

   NO—Check the A/C system or power steering system, then go to step 9.

8. Replace the throttle body (see page 11-396).
9. Reset the PCM with the HDS.
10. Do the PCM idle learn procedure (see page 11-339).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Check under these DATA LIST parameter conditions with the HDS:

    - ECT SENSOR 1 above 156 °F (70 °C)
    - IAT SENSOR above 32 °F (0 °C)
    - VSS is 0 mph (0 km/h)
    - ST FUEL TRIM between 0.69—1.47
    - FSS is CLOSED

13. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0506 indicated?

    YES—Go to step 19.

    NO—Go to step 14.

(cont'd)

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DTC Troubleshooting (cont'd)

14. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 19. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 12.

15. Remove the charge air cooler (see page 9-7) and intake air duct (charge air cooler outlet tube) (see page 9-11).

16. Check for dirt, carbon, or damage in the throttle bore.

    Is there dirt, carbon, or damage in the throttle bore?

    YES—If there is dirt or carbon, clean the throttle body (see page 11-394). Also check for damage to the air cleaner element (see page 11-395), then go to step 9. If there is damage in the throttle bore, go to step 8.

    NO—Go to step 17.

17. Recheck with different load conditions (turn on the headlights, blower motor, rear window defogger and/or A/C, change the gear position, etc.).

18. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Intermittent failure, the system is OK at this time. ■

    NO—If the screen indicates FAILED, check the A/C system and/or power steering system, then go to step 1 and recheck. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 17.

19. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

20. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

21. Check under these DATA LIST parameter conditions with the HDS:

    - ECT SENSOR 1 above 156 °F (70 °C)
    - IAT SENSOR above 32 °F (0 °C)
    - VSS is 0 mph (0 km/h)
    - ST FUEL TRIM between 0.69—1.47
    - FSS is CLOSED

22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0506 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1.

    NO—Go to step 23.

23. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 22, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 20. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 20.

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BACK

DTC P0507: Idle Control System RPM Higher Than Expected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
4. Monitor the OBD STATUS for DTC P0507 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with different load conditions (electrical, A/C, gear position, etc.), then go to step 3.
5. Check for vacuum or air leaks at these parts:

   - PCV valve
   - PCV hose
   - EVAP canister purge valve
   - Throttle body
   - Intake air duct (air flow tube)
   - Intake manifold
   - Turbocharger
   - Intake air duct (turbocharger inlet tube and pipe)
   - Intake air duct (turbocharger outlet pipe)
   - Charge air cooler
   - Intake air duct (charge air cooler inlet hose)
   - Intake air duct (charge air cooler outlet tube)
   - Turbocharger bypass control solenoid valve
   - Pressure regulator
   - Brake booster hose
   - Brake booster

   Are there any leaks?

   YES—Repair or replace the leaking part(s), then go to step 6.

   NO—Go to step 6.
6. Turn the ignition switch ON (II).
7. Reset the PCM with the HDS.
8. Do the PCM idle learn procedure (see page 11-339).
9. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
10. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0507 indicated?

    YES—Go to step 12.

    NO—Go to step 11.

(cont'd)

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DTC Troubleshooting (cont'd)

11. Monitor the OBD STATUS for DTC P0507 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 10, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, go to step 12. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with different load conditions (turn on the headlights, blower motor, or A/C; change the gear position, etc.), then go to step 9.

12. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.

14. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0507 indicated?

    YES—Check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 13. If the PCM was substituted, go to step 1.

    NO—Go to step 15.

15. Monitor the OBD STATUS for DTC P0507 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 14, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the throttle body and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 13. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 13.

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BACK

DTC P0532: A/C Pressure Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Start the engine, and let it idle.
2. Turn the blower switch on.
3. Turn the A/C switch on.
4. Check the A/C PRESSURE SENSOR in the DATA LIST with the HDS.

   Is there about 0.3 V or less?

   YES—Go to step 5.

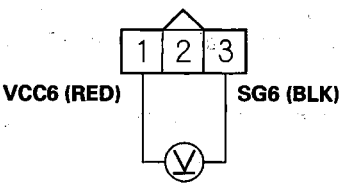
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/C pressure sensor and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the A/C pressure sensor 3P connector.
7. Turn the ignition switch ON (II).
8. Check the A/C PRESSURE SENSOR in the DATA LIST with the HDS.

   Is there about 0.3 V or less?

   YES—Go to step 10.

   NO—Go to step 9.
9. Measure voltage between A/C pressure sensor 3P connector terminals No. 1 and No. 3.

A/C PRESSURE SENSOR 3P CONNECTOR



Wire side of female terminals

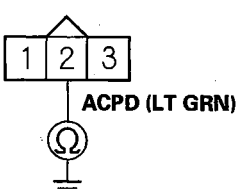
Is there about 5 V?

YES—Go to step 18.

NO—Go to step 14.

10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect PCM connector A (44P).
13. Check for continuity between A/C pressure sensor 3P connector terminal No. 2 and body ground.

A/C PRESSURE SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A16) and the A/C pressure sensor, then go to step 20.

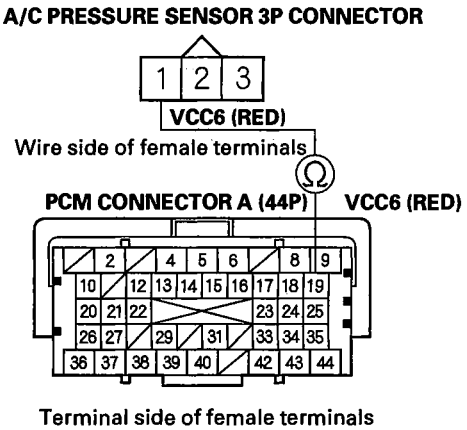
NO—Go to step 28.

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DTC Troubleshooting (cont'd)

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector A (44P).
17. Check for continuity between A/C pressure sensor 3P connector terminal No. 1 and PCM connector terminal A19.



Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between the PCM (A19) and the A/C pressure sensor, then go to step 20.

18. Turn the ignition switch OFF.
19. Replace the A/C pressure sensor (see page 21-7).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the PCM with the HDS.
23. Do the PCM idle learn procedure (see page 11-339).
24. Start the engine, and let it idle.
25. Turn the blower switch on.
26. Turn the A/C switch on.
27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0532 indicated?

    YES—Check for poor connections or loose terminals at the A/C pressure sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

28. Reconnect all connectors.
29. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
30. Start the engine, and let it idle.
31. Turn the blower switch on.
32. Turn the A/C switch on.
33. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0532 indicated?

    YES—Check for poor connections or loose terminals at the A/C pressure sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 30. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0533: A/C Pressure Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

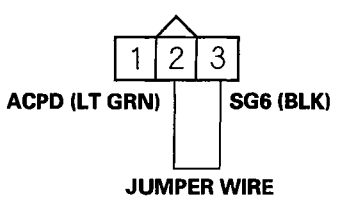
1. Start the engine, and let it idle.
2. Turn the blower switch on.
3. Turn the A/C switch on.
4. Check the A/C PRESSURE SENSOR in the DATA LIST with the HDS.

   Is there about 4.75 V or more?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/C pressure sensor and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the A/C pressure sensor 3P connector.
7. Connect A/C pressure sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

A/C PRESSURE SENSOR 3P CONNECTOR



Wire side of female terminals

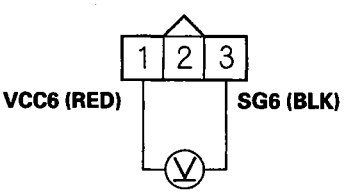
8. Turn the ignition switch ON (II).
9. Check the A/C PRESSURE SENSOR in the DATA LIST with the HDS.

   Is there about 4.75 V or more?

   YES—Go to step 10.

   NO—Go to step 22.
10. Turn the ignition switch OFF.
11. Remove the jumper wire from the A/C pressure sensor 3P connector.
12. Turn the ignition switch ON (II).
13. Measure voltage between A/C pressure sensor 3P connector terminal No. 1 and No. 3.

A/C PRESSURE SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 14.

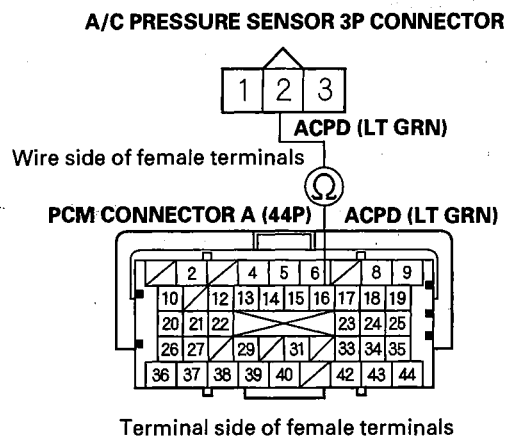
NO—Go to step 18.

(cont'd)

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DTC Troubleshooting (cont'd)

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector A (44P).
17. Check for continuity between A/C pressure sensor 3P connector terminal No. 2 and PCM connector terminal A16.

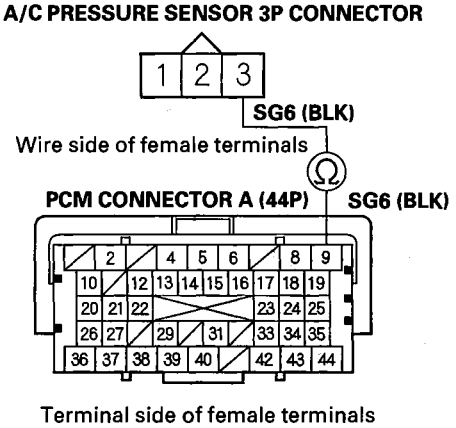


Is there continuity?

YES—Go to step 32.

NO—Repair open in the wire between the PCM (A16) and the A/C pressure sensor, then go to step 24.

18. Turn the ignition switch OFF.
19. Jump the SCS line with the HDS.
20. Disconnect PCM connector A (44P).
21. Check for continuity between A/C pressure sensor 3P connector terminal No. 3 and PCM connector terminal A9.



Is there continuity?

YES—Go to step 32.

NO—Repair open in the wire between the PCM (A9) and the A/C pressure sensor, then go to step 24.

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BACK

22. Turn the ignition switch OFF.
23. Replace the A/C pressure sensor (see page 21-7).
24. Reconnect all connectors.
25. Turn the ignition switch ON (II).
26. Reset the PCM with the HDS.
27. Do the PCM idle learn procedure (see page 11-339).
28. Start the engine, and let it idle.
29. Turn the blower switch on.
30. Turn the A/C switch on.
31. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0533 indicated?

    YES—Check for poor connections or loose terminals at the A/C pressure sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

32. Reconnect all connectors.
33. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
34. Start the engine, and let it idle.
35. Turn the blower switch on.
36. Turn the A/C switch on.
37. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0533 indicated?

    YES—Check for poor connections or loose terminals at the A/C pressure sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 34. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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A/C Signal Circuit Troubleshooting

1. Start the engine, and let it idle.
2. Turn the blower switch on.
3. Turn the A/C switch on.
4. Check the A/C CLUTCH in the DATA LIST with the HDS.

   Does it indicate ON?

   YES—Go to step 5.

   NO—Do the A/C system test (see page 21-109). ■
5. Check the A/C system.

   Does the A/C system operate?

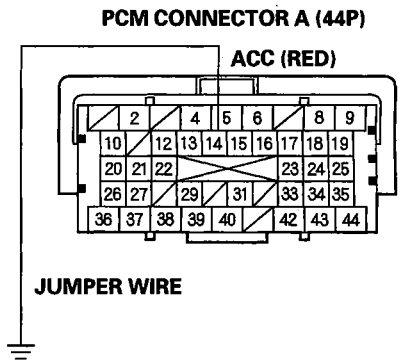
   YES—The air conditioning system circuit is OK. ■

   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II).
8. Activate the A/C CLUTCH in the INSPECTION MENU with the HDS.

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

   YES—Do the A/C system test (see page 21-109). ■

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector A (44P).
12. Turn the ignition switch ON (II).
13. Momentarily connect PCM connector terminal A14 to body ground with a jumper wire several times.



Terminal side of female terminals

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

YES—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

NO—Check for poor connections or loose terminals at the A/C compressor clutch relay and the PCM. If the connections are OK, check the A/C compressor clutch relay (see page 22-64), then repair open in the wire between the PCM (A14) and the A/C compressor clutch relay and the other A/C systems. ■

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BACK

Alternator FR Signal Circuit Troubleshooting

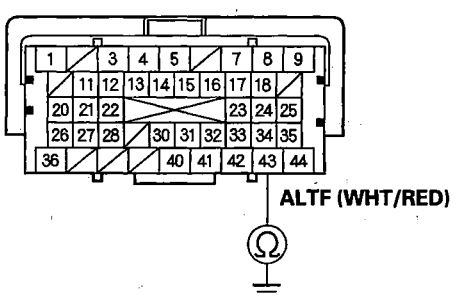
1. Start the engine, and let it idle.
2. Monitor the ALTERNATOR in the DATA LIST with the HDS.
3. Check if the indicated percentage varies when the headlight switch is turned on.

   Does the percentage vary?

   YES—The alternator signal circuit is OK. ■

   NO—Go to step 4.
4. Turn the headlight switch and ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the alternator 4P connector.
7. Disconnect PCM connector B (44P).
8. Check for continuity between body ground and PCM connector terminal B43.

PCM CONNECTOR B (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (B43) and the alternator. ■

NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

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PSP Switch Signal Circuit Troubleshooting

1. Start the engine, and let it idle.
2. Align the steering wheel straight ahead.
3. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it indicate ON?

   YES—Go to step 4.

   NO—Go to step 14.
4. Turn the steering wheel to the full lock position.
5. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it change to OFF?

   YES—The PSP switch signal circuit is OK.■

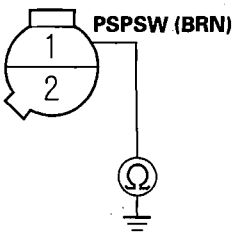
   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Disconnect the PSP switch 2P connector.
8. Start the engine.
9. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it change to OFF?

   YES—Replace the PSP switch (see page 17-13).■

   NO—Go to step 10.
10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect PCM connector A (44P).
13. Check for continuity between PSP switch 2P connector terminal No. 1 and body ground.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

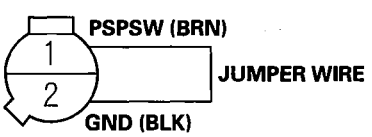
Is there continuity?

YES—Repair short in the wire between the PCM (A22) and the PSP switch.■

NO—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

14. Turn the ignition switch OFF.
15. Disconnect the PSP switch 2P connector.
16. Connect PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire, then start the engine.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

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BACK

17. Check the PSP SWITCH in the DATA LIST with the HDS.

    Does it change to ON?

    YES—Replace the PSP switch (see page 17-13).■

    NO—Go to step 18.

18. Turn the ignition switch OFF.

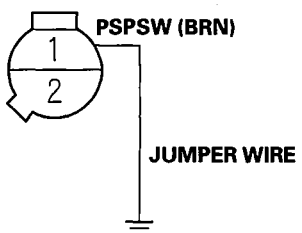
19. Remove the jumper wire from the PSP switch 2P connector.

20. Jump the SCS line with the HDS.

21. Disconnect PCM connector A (44P).

22. Connect PSP switch 2P connector terminal No. 1 to body ground with a jumper wire.

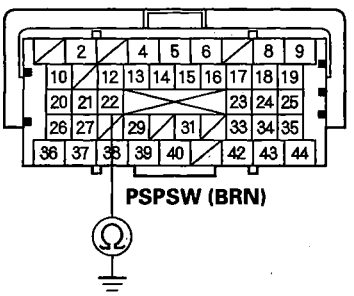
PSP SWITCH 2P CONNECTOR



Wire side of female terminals

23. Check for continuity between body ground and PCM connector terminal A22.

PCM CONNECTOR A (44P)



Terminal side of female terminals

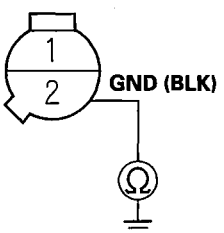
Is there continuity?

YES—Go to step 24.

NO—Repair open in the wire between the PSP switch and the PCM (A22).■

24. Check for continuity between PSP switch 2P connector terminal No. 2 and body ground.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252).■

NO—Repair open in the wire between the PSP switch and G401 (see page 22-26).■

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Brake Pedal Position Switch Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Check the BRAKE SWITCH in the DATA LIST with the HDS.

   Does it indicate OFF?

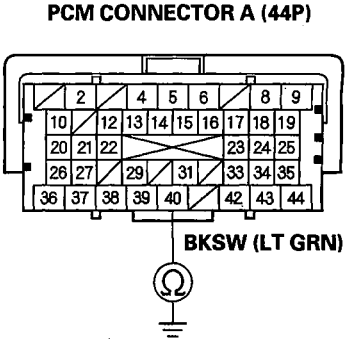
   YES—Go to step 3.

   NO—Inspect the brake pedal position switch (see page 19-6).■
3. Press the brake pedal, and check the BRAKE SWITCH in the DATA LIST with the HDS.

   Does it change to ON?

   YES—The brake pedal position switch signal circuit (BKSW line) is OK.■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the brake pedal position switch 4P connector.
7. Disconnect PCM connector A (44P).
8. Check for continuity between PCM connector terminal A40 and body ground.



Terminal side of female terminals

Is there continuity?

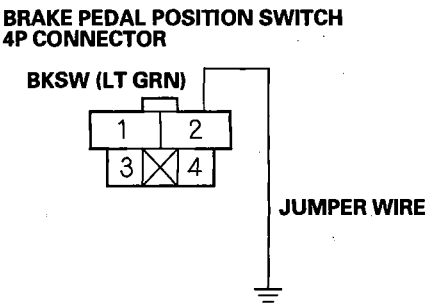
YES—Repair short in the wire between the PCM (A40) and the No. 12 HORN, STOP (15 A) fuse. Replace the No. 12 HORN, STOP (15 A) fuse.■

NO—Go to step 9.

BACK

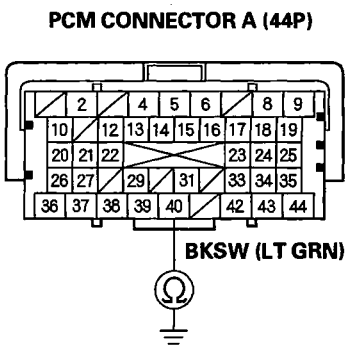
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9. Connect brake pedal position switch 4P connector terminal No. 2 to body ground with a jumper wire.



Wire side of female terminals

10. Check for continuity between PCM connector terminal A40 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Repair open in the wire between the brake pedal position switch and the No. 12 HORN, STOP (15 A) fuse. Inspect the brake pedal position switch (see page 19-6). ■

NO—Repair open in the wire between the PCM (A40) and the brake pedal position switch. ■

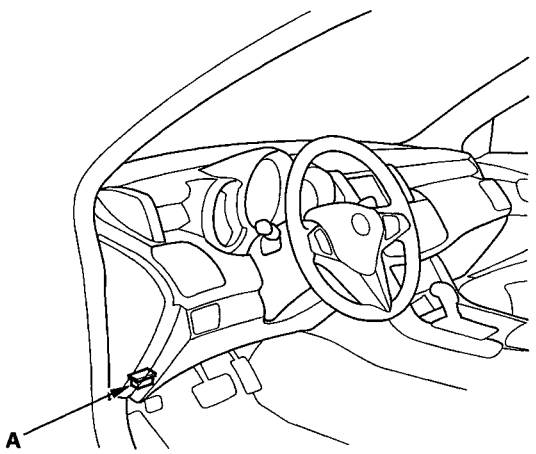
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Idle Speed Inspection

NOTE:
- Before checking the idle speed, check these items:
  - The malfunction indicator lamp (MIL) has not been reported on, and there are no DTCs.
  - Ignition timing
  - Spark plugs
  - Air cleaner
  - PCV system
- Apply the parking brake.
- Make sure the daytime running lights are off.

1. Disconnect the evaporative emission (EVAP) canister purge valve connector.

2. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).

4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

5. Check the idle speed without load conditions: headlights, blower fan, radiator fan, and air conditioner off.

   Idle speed should be: 720±50 rpm

6. Let the engine idle for 1 minute with high electric load (A/C switch on, temperature set to max cool, blower fan on High, and headlights on high beam).

   Idle speed should be: 720±50 rpm

   NOTE: If the idle speed is not within specification, do the PCM idle learn procedure (see page 11-339). If the idle speed is still not within specification, go to symptom troubleshooting.

7. Reconnect the EVAP canister purge valve connector.

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PCM Idle Learn Procedure

The idle learn procedure must be done so the PCM can learn the engine idle characteristics.

Do the idle learn procedure whenever you do any of these actions:

- Replace PCM.
- Reset PCM.
- Update PCM.
- Replace or clean the throttle body.

NOTE: Erasing DTCs with the HDS does not require you to do the idle learn procedure.

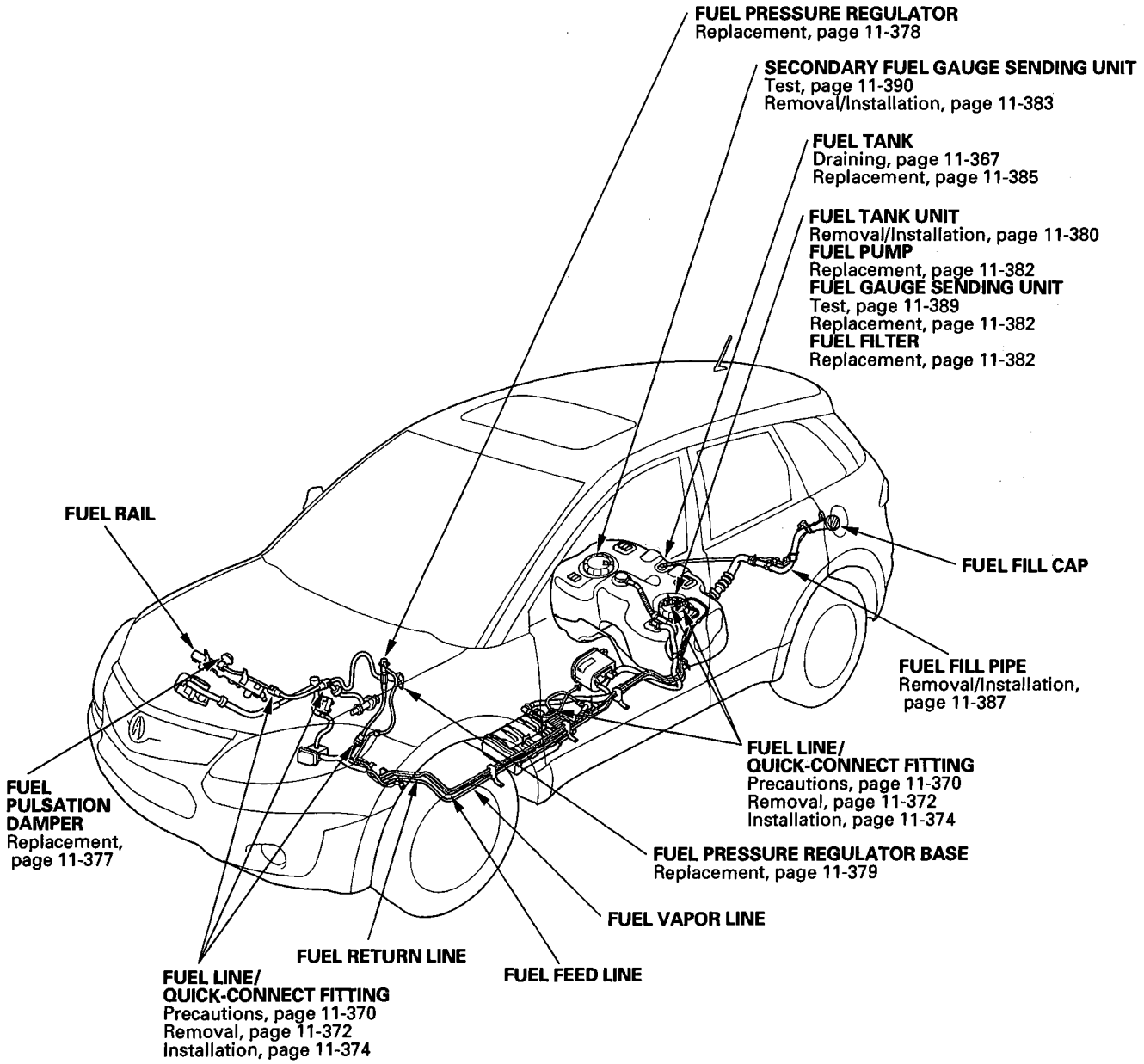
Procedure

1. Make sure all electrical items (A/C, audio, lights, etc.) are off.
2. Reset the PCM with the HDS.
3. Turn the ignition switch ON (II), and wait 2 seconds.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, or until the engine coolant temperature reaches 194 °F (90 °C).
5. Let the engine idle for about 5 minutes with the throttle fully closed.

   NOTE: If the radiator fan comes on, do not include its running time in the 5 minutes.

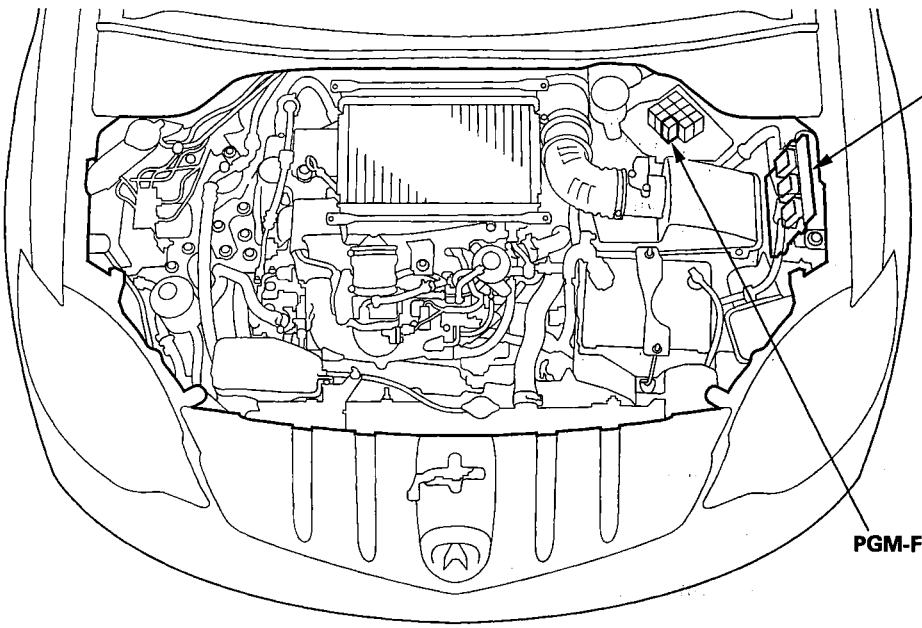
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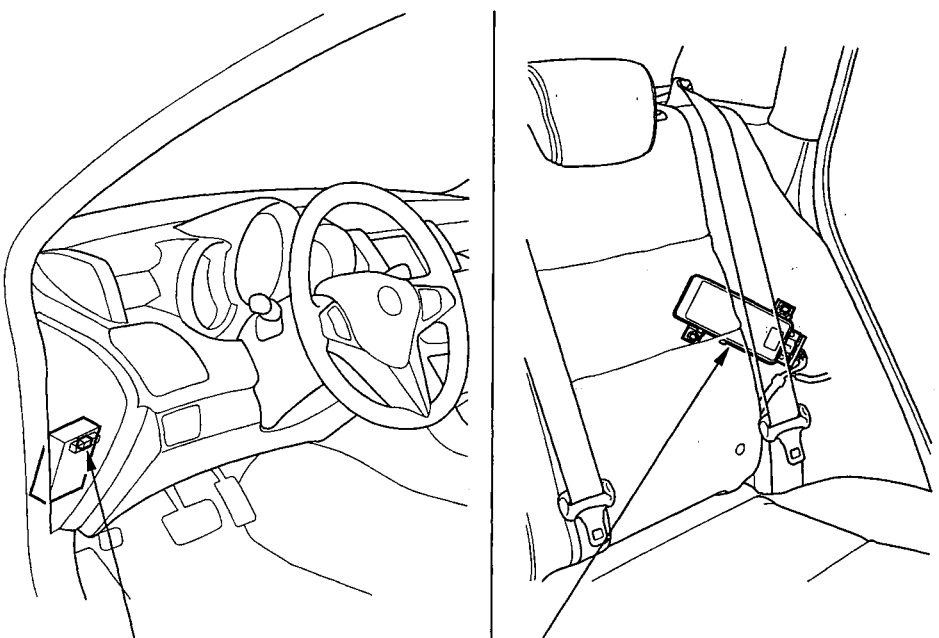
Component Location Index



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BACK





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DTC Troubleshooting

DTC P0461: Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Range/Performance Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- Because it requires 162 miles (260 km) of driving without refueling to complete this diagnosis, DTC P0461 cannot be duplicated during this troubleshooting.

1. Test the fuel gauge sending unit (see page 11-389).

   Is the fuel gauge sending unit OK?

   YES—Check for poor connections or loose terminals at the fuel gauge sending unit and the gauge control module. ■

   NO—Replace the fuel gauge sending unit (see page 11-382), then go to step 2.

2. Turn the ignition switch ON (II).
3. Reset the PCM with the HDS.
4. Do the PCM idle learn procedure (see page 11-339).
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0461 indicated?

   YES—Check for poor connections or loose terminals at the fuel gauge sending unit and the gauge control module, then go to step 1.

   NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0462: Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS, and wait 5 seconds.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0462 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit.■
4. Turn the ignition switch OFF.
5. Fold the rear seat down, then remove the right rear side garnish (see page 20-76).
6. Pull back the carpet to expose the access panel (see step 9 on page 20-91), then remove the access panel from the right side of the floor (see page 11-383).
7. Disconnect the secondary fuel gauge sending unit 4P connector.
8. Turn the ignition switch ON (II).
9. Clear the DTC with the HDS, and wait 5 seconds.
10. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0463 indicated?

    YES—Check the secondary fuel gauge sending unit (see page 11-383), then go to step 31.

    NO—Go to step 11.
11. Turn the ignition switch OFF.
12. Remove the left cargo area side trim panel (see page 20-76), then remove the access panel from the left side of the floor (see page 11-380).
13. Disconnect the fuel tank unit 4P connector.
14. Turn the ignition switch ON (II).
15. Clear the DTC with the HDS, and wait 5 seconds.
16. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0463 indicated?

    YES—Go to step 21.

    NO—Go to step 17.
17. Turn the ignition switch OFF.
18. Remove the gauge control module (see page 22-284).
19. Disconnect the gauge control module 36P connector.

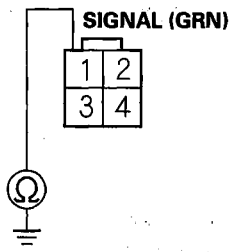
(cont'd)

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DTC Troubleshooting (cont'd)

20. Check for continuity between fuel tank unit 4P connector terminal No. 1 and body ground.

FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

Is there continuity?

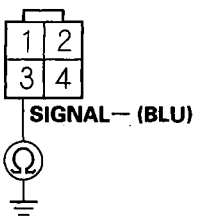
YES—Repair short in the wire between the gauge control module (signal line) and the fuel gauge sending unit, then go to step 31.

NO—Go to step 23.

21. Turn the ignition switch OFF.

22. Check for continuity between fuel tank unit 4P connector terminal No. 3 and body ground.

FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the fuel gauge sending unit and secondary fuel gauge sending unit, then go to step 31.

NO—Check the fuel gauge sending unit (see page 11-389).

23. Reconnect the gauge control module 36P connector.

24. Remove the fuel tank unit (see page 11-380) and the secondary fuel gauge sending unit (see page 11-383)

25. Connect the fuel tank unit and secondary fuel gauge sending unit 4P connectors.

26. Turn the ignition switch ON (II).

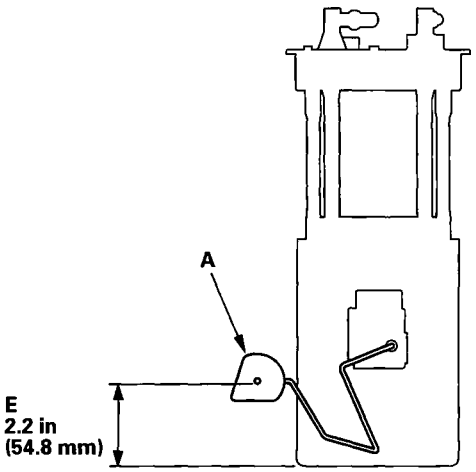
27. Clear the DTC with the HDS.

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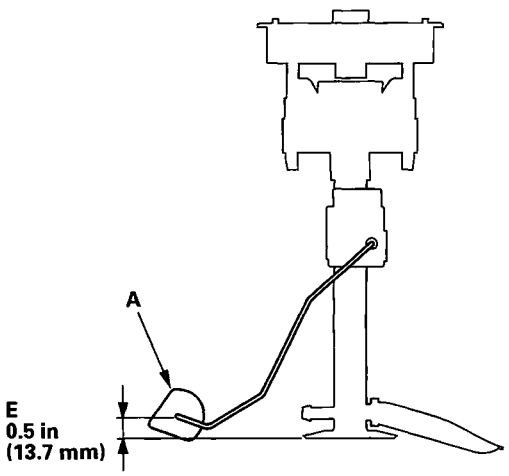
BACK

28. Set the floats (A) to the E position.

Fuel tank unit



Secondary fuel gauge sending unit



29. Check the fuel gauge.

    Does the gauge move to the empty position?

    YES—Go to step 37.

    NO—Replace the gauge control module (see page 22-284), then go to step 30.

30. Turn the ignition switch OFF.

31. Install the parts in the reverse order of removal.

32. Reconnect all connectors.

33. Turn the ignition switch ON (II).

34. Reset the PCM with the HDS.

35. Do the PCM idle learn procedure (see page 11-339).

36. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0462 indicated?

    YES—Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

(cont'd)

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DTC Troubleshooting (cont'd)

37. Reconnect all connectors.

38. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

39. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0462 indicated?

    YES—Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

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BACK

DTC P0463: Fuel Level Sensor (Fuel Gauge Sending Unit) Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

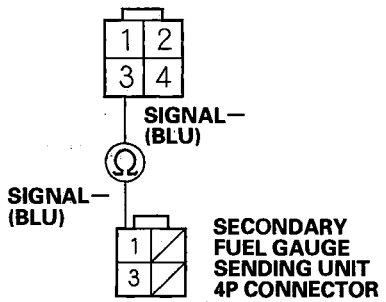
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS, and wait 5 seconds.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0463 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit.■
4. Turn the ignition switch OFF.
5. Fold the rear seat down, then remove the left cargo area side trim panel (see page 20-76).
6. Pull back the carpet to expose the access panel (see step 9 on page 20-91), then remove the access panel from the left side of the floor (see page 11-380).
7. Disconnect the fuel tank unit 4P connector.
8. Remove the access panel from the right side of the floor (see page 11-383).
9. Disconnect the secondary fuel gauge sending unit 4P connector.
10. Check for continuity between fuel tank unit 4P connector terminal No. 3 and the secondary fuel gauge sending unit 4P connector terminal No. 1.

FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Repair open in the wire between the fuel gauge sending unit and the secondary fuel gauge sending unit, then go to step 27.

11. Remove the gauge control module (see page 22-284).
12. Disconnect the gauge control module 36P connector.

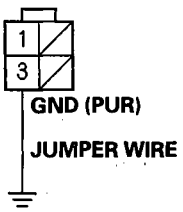
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DTC Troubleshooting (cont'd)

13. Connect secondary fuel gauge sending unit 4P connector terminal No. 3 to body ground with a jumper wire.

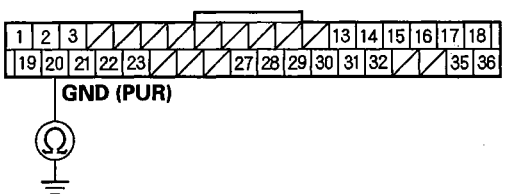
SECONDARY FUEL GAUGE SENDING UNIT 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between gauge control module 36P connector terminal No. 20 and body ground.

GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

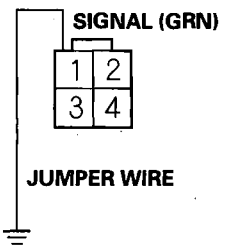
Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between the gauge control module and the secondary fuel gauge sending unit, then go to step 27.

15. Connect fuel tank unit 4P connector terminal No. 1 to body ground with a jumper wire.

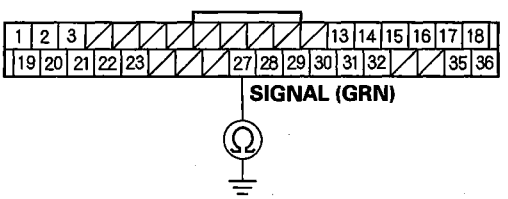
FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

16. Check for continuity between gauge control module 36P connector terminal No. 27 and body ground.

GAUGE CONTROL MODULE 36P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 17.

NO—Repair open in the wire between the gauge control module and the fuel gauge sending unit, then go to step 27.

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17. Disconnect the jumper wire from the fuel gauge sending unit 4P connector.

18. Remove the fuel tank unit (see page 11-380).

19. Test the fuel gauge sending unit (see page 11-389).

    Is the fuel gauge sending unit OK?

    YES—Go to step 20.

    NO—Replace the fuel gauge sending unit (see page 11-382), then go to step 27.

20. Remove the secondary fuel gauge sending unit (see page 11-383).

21. Test the secondary fuel gauge sending unit (see page 11-390).

    Is the secondary fuel gauge sending unit OK?

    YES—Go to step 22.

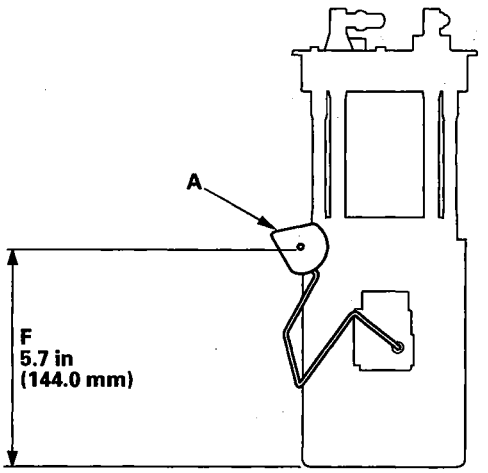
    NO—Replace the secondary fuel gauge sending unit (see page 11-383), then go to step 27.

22. Reconnect the fuel tank unit 4P connector, the secondary fuel gauge sending unit 4P connector, and the gauge control module 36P connector.

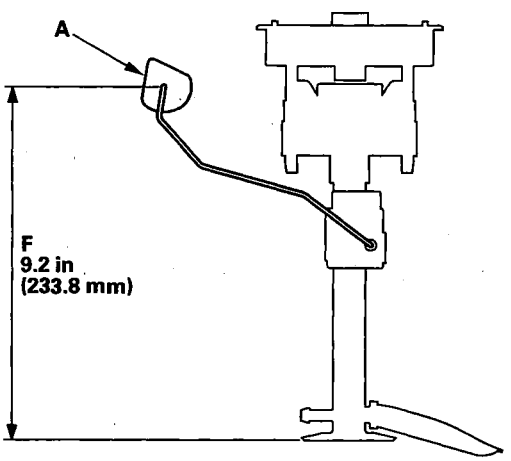
23. Turn the ignition switch ON (II).

24. Set the floats (A) to the F position.

Fuel sending unit



Secondary fuel sending unit



(cont'd)

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DTC Troubleshooting (cont'd)

25. Check the fuel gauge.

    Does the gauge move to the full position?

    YES—Go to step 33.

    NO—Replace the gauge control module (see page 22-284), then go to step 26.

26. Turn the ignition switch OFF.

27. Install the parts in the reverse order of removal.

28. Reconnect all connectors.

29. Turn the ignition switch ON (II).

30. Reset the PCM with the HDS.

31. Do the PCM idle learn procedure (see page 11-339).

32. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0463 indicated?

    YES—Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

33. Reconnect all connectors.

34. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

35. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0463 indicated?

    YES—Check for poor connections or loose terminals at the gauge control module, the fuel gauge sending unit, and the secondary fuel gauge sending unit. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC P0627: Fuel Pump Control Module System Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to the start (III) position.

   NOTE:
   - If the engine starts, release the ignition switch.
   - If the engine does not start, do not keep cranking for more than 10 seconds.

4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0627 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the fuel pump control module, PGM-FI main relay 2 (FUEL PUMP), the fuel pump, and the PCM.■

5. Turn the ignition switch OFF.
6. Check the No. 2 FUEL PUMP (20 A) fuse in under-dash fuse/relay box.

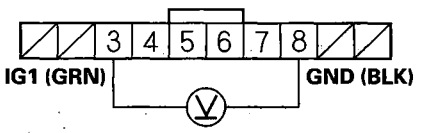
   Is the fuse blown?

   YES—Repair short in the wire between PGM-FI main relay 2 (FUEL PUMP) and the No. 2 FUEL PUMP (20 A) fuse. Also replace the No. 2 FUEL PUMP (20 A) fuse, then go to step 79.

   NO—Go to step 7.

7. Disconnect the fuel pump control module 10P connector (see page 11-388).
8. Turn the ignition switch ON (II), and measure voltage between fuel pump control module 10P connector terminals No. 3 and No. 8 within 2 seconds.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



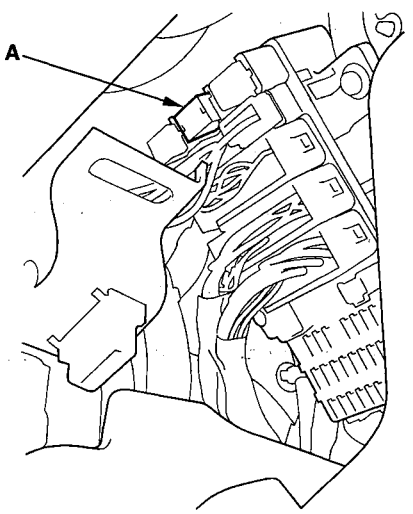
Wire side of female terminals

Is there battery voltage?

YES—Go to step 35.

NO—Go to step 9.

9. Turn the ignition switch OFF.
10. Remove the driver's dashboard under cover (see page 20-102), then remove PGM-FI main relay 2 (FUEL PUMP) (A) from the under-dash fuse/relay box.



(cont'd)

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DTC Troubleshooting (cont'd)

11. Test PGM-FI main relay 2 (FUEL PUMP) (see page 22-64).

    Is PGM-FI main relay 2 (FUEL PUMP) OK?

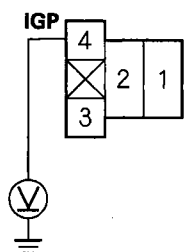
    YES—Go to step 12.

    NO—Replace PGM-FI main relay 2 (FUEL PUMP), then go to step 79.

12. Turn the ignition switch ON (II).

13. Measure voltage between PGM-FI main relay 2 (FUEL PUMP) 4P connector terminal No. 4 and body ground.

PGM-FI MAIN RELAY 2 (FUEL PUMP) 4P CONNECTOR



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 20.

NO—Go to step 14.

14. Turn the ignition switch OFF.

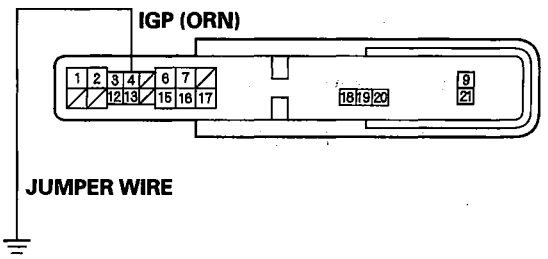
15. Disconnect the under-hood fuse/relay box 10P connector.

16. Disconnect the engine wire harness 23P connector.

17. Disconnect the under-dash fuse/relay box 21P connector.

18. Connect under-dash fuse/relay box 21P connector terminal No. 4 to body ground with a jumper wire.

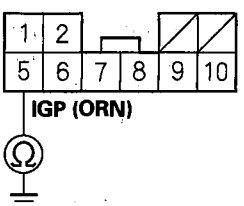
UNDER-DASH FUSE/RELAY BOX 21P CONNECTOR



Wire side of female terminals

19. Check for continuity between under-hood fuse/relay box 10P connector terminal No. 5 and body ground.

UNDER-HOOD FUSE/RELAY BOX 10P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—
- Replace PGM-FI main relay 1. ■
- If needed, replace the under-hood fuse/relay box (see page 22-61). ■

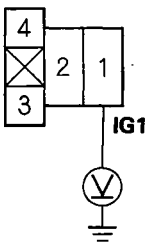
NO—Repair open in the wire between the under-hood fuse/relay box and the under-dash fuse/relay box. ■

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BACK

20. Measure voltage between PGM-FI main relay 2 (FUEL PUMP) 4P connector terminal No. 1 and body ground.

PGM-FI MAIN RELAY 2 (FUEL PUMP) 4P CONNECTOR



Terminal side of female terminals

Is there battery voltage?

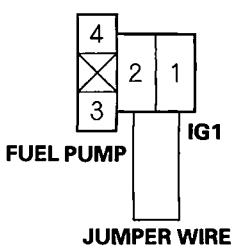
YES—Go to step 21.

NO—Replace the under-dash fuse/relay box (see page 22-62). ■

21. Turn the ignition switch OFF.

22. Connect PGM-FI main relay 2 (FUEL PUMP) 4P connector terminals No. 1 and No. 2 with a jumper wire.

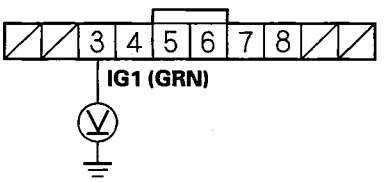
PGM-FI MAIN RELAY 2 (FUEL PUMP) 4P CONNECTOR



Terminal side of female terminals

23. Turn the ignition switch ON (II), and measure voltage between fuel pump control module 10P connector terminal No. 3 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 24.

NO—
- Repair open in the wire between the under-dash fuse/relay box and the fuel pump control module, then go to step 79.
- If needed, replace the under-dash fuse/relay box (see page 22-62), then go to step 79.

24. Turn the ignition switch OFF.

25. Jump the SCS line with the HDS.

26. Disconnect PCM connector A (44P).

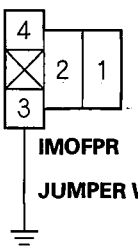
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DTC Troubleshooting (cont'd)

27. Connect PGM-FI main relay 2 (FUEL PUMP) 4P connector terminal No. 3 to body ground with a jumper wire.

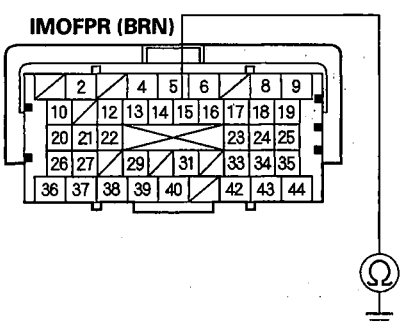
PGM-FI MAIN RELAY 2 (FUEL PUMP) 4P CONNECTOR



Terminal side of female terminals

28. Check for continuity between PCM connector terminal A15 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 29.

NO—Repair open in the wire between the PCM (A15) and PGM-FI main relay 2 (FUEL PUMP), then go to step 79.

29. Remove the jumper wire.

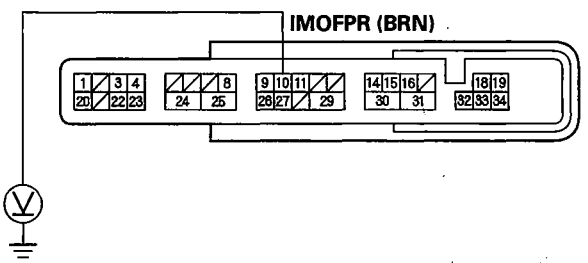
30. Reinstall PGM-FI main relay 2 (FUEL PUMP).

31. Reconnect PCM connector A (44P).

32. Open SCS line with the HDS.

33. Turn the ignition switch ON (II), and measure voltage between under-dash fuse/relay box 34P connector terminal No. 10 and body ground within 2 seconds.

UNDER-DASH FUSE/RELAY BOX 34P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-252). ■

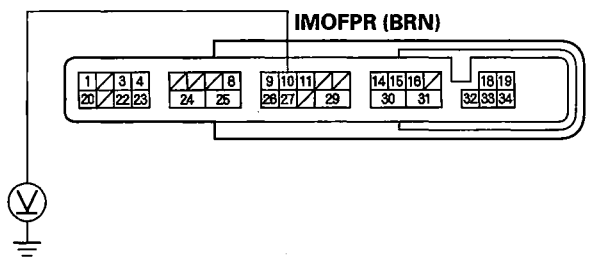
NO—Go to step 34.

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BACK

34. Turn the ignition switch ON (II), and measure voltage between under-dash fuse/relay box 34P connector terminal No. 10 and body ground after 2 seconds.

UNDER-DASH FUSE/RELAY BOX 34P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 85.

NO—If needed, replace the under-dash fuse/relay box (see page 22-62), then go to step 79.

35. Turn the ignition switch OFF.

36. Reconnect the fuel pump control module 10P connector (see page 11-388).

37. Turn the ignition switch ON (II).

38. Clear the DTC with the HDS.

39. Turn the ignition switch OFF.

40. Turn the ignition switch ON (II), and check for sound from the fuel pump within 2 seconds.

Does the fuel pump operate?

YES—Go to step 41.

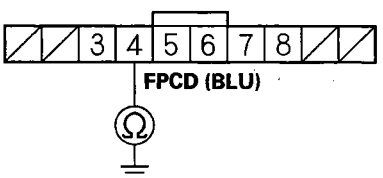
NO—Go to step 60.

41. Turn the ignition switch OFF.

42. Disconnect the fuel pump control module 10P connector.

43. Check for continuity between fuel pump control module 10P connector terminal No. 4 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 44.

NO—Go to step 47.

(cont'd)

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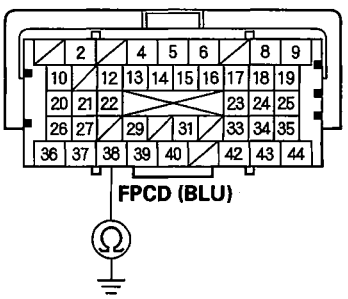
DTC Troubleshooting (cont'd)

44. Jump the SCS line with the HDS.

45. Disconnect PCM connector A (44P).

46. Check for continuity between PCM connector terminal A38 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A38) and the fuel pump control module, then go to step 79.

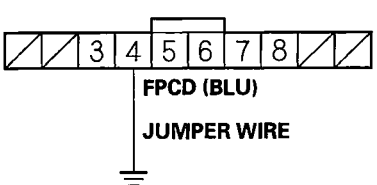
NO—Go to step 86.

47. Jump the SCS line with the HDS.

48. Disconnect PCM connector A (44P).

49. Connect fuel pump control module 10P connector terminal No. 4 to body ground with a jumper wire.

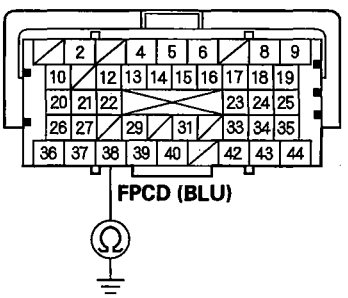
FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

50. Check for continuity between PCM connector terminal A38 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 51.

NO—Repair open in the wire between the PCM (A38) and the fuel pump control module, then go to step 79.

51. Remove the jumper wire from the fuel pump control module 10P connector.

52. Reconnect the fuel pump control module 10P connector and PCM connector A (44P).

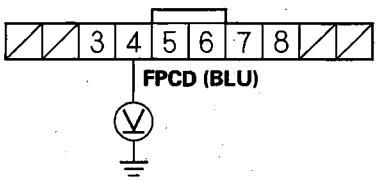
53. Turn the ignition switch ON (II).

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BACK

54. Measure voltage between fuel pump control module 10P connector terminal No. 4 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there about 8 V or more?

YES—Go to step 55.

NO—Replace the fuel pump control module (see page 11-388), then go to step 79.

55. Turn the ignition switch OFF.

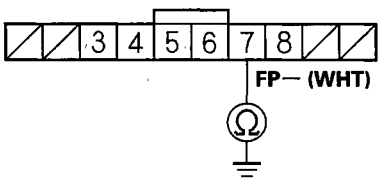
56. Fold the rear seat down, then remove the left cargo area side trim panel (see page 20-76).

57. Pull back the carpet to expose the access panel (see step 9 on page 20-91), then remove the access panel from the left side of the floor (see page 11-380).

58. Disconnect the fuel pump 4P connector.

59. Check for continuity between fuel pump control module 10P connector terminal No. 7 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the fuel pump control module (FP— line) and the fuel pump, then go to step 79.

NO—Substitute a known-good fuel pump control module (see page 11-388), then go to step 79 and recheck. If DTC P0627 is not indicated, replace the original fuel pump control module (see page 11-388), then go to step 79. If DTC P0627 is indicated, go to step 85.

60. Turn the ignition switch OFF.

61. Disconnect the fuel pump control module 10P connector (see page 11-388).

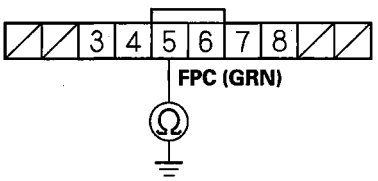
(cont'd)

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DTC Troubleshooting (cont'd)

62. Check for continuity between fuel pump control module 10P connector terminal No. 5 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 63.

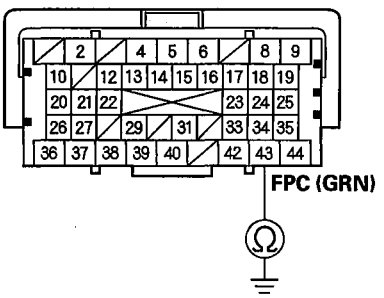
NO—Go to step 66.

63. Jump the SCS line with the HDS.

64. Disconnect PCM connector A (44P).

65. Check for continuity between PCM connector terminal A43 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A43) and the fuel pump control module, then go to step 79.

NO—Go to step 86.

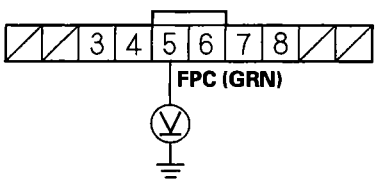
66. Reconnect the fuel pump control module 10P connector.

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BACK

67. Turn the ignition switch ON (II), and measure voltage between fuel pump control module 10P connector terminal No. 5 and body ground within 2 seconds.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 68.

NO—Replace the fuel pump control module (see page 11-388), then go to step 79.

68. Turn the ignition switch OFF.

69. Fold the rear seat down, then remove the left cargo area side trim panel (see page 20-76).

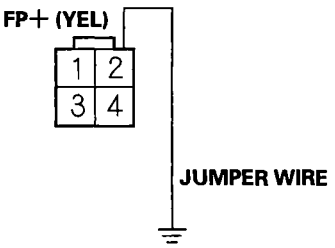
70. Pull back the carpet to expose the access panel (see step 9 on page 20-91), then remove the access panel from the left side of the floor (see page 11-380).

71. Disconnect the fuel tank unit 4P connector.

72. Disconnect the fuel pump control module 10P connector (see page 11-388).

73. Connect fuel tank unit 4P connector terminal No. 2 to body ground with a jumper wire.

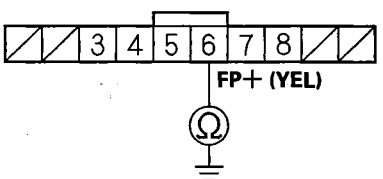
FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

74. Check for continuity between fuel pump control module 10P connector terminal No. 6 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 75.

NO—Repair open in the wire between the fuel pump control module (FP+ line) and the fuel pump, then go to step 79.

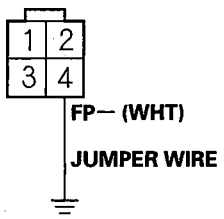
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DTC Troubleshooting (cont'd)

75. Remove the jumper wire from the fuel tank unit 4P connector terminal No. 2, then connect between fuel tank unit 4P connector terminal No. 4 to body ground with a jumper wire.

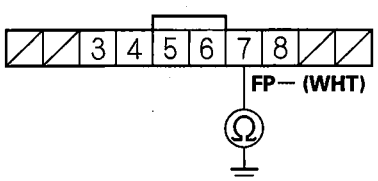
FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

76. Check for continuity between fuel pump control module 10P connector terminal No. 7 and body ground.

FUEL PUMP CONTROL MODULE 10P CONNECTOR



Wire side of female terminals

Is there continuity?

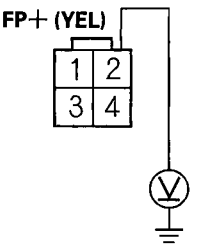
YES—Go to step 77.

NO—Repair open in the wire between the fuel pump control module (FP— line) and the fuel pump, then go to step 79.

77. Remove the jumper wire from the fuel tank unit 4P connector terminal No. 4, and reconnect the fuel pump control module 10P connector.

78. Turn the ignition switch ON (II), and measure voltage between fuel tank unit 4P connector terminal No. 2 and body ground within 2 seconds.

FUEL TANK UNIT 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Replace the fuel pump (see page 11-382), then go to step 79.

NO—Substitute a known-good fuel pump control module (see page 11-388), then go to step 79 and recheck. If DTC P0627 is not indicated, replace the original fuel pump control module (see page 11-388), then go to step 79. If DTC P0627 is indicated, go to step 85.

79. Turn the ignition switch OFF.

80. Reconnect all connectors.

81. Turn the ignition switch ON (II).

82. Reset the PCM with the HDS.

83. Do the PCM idle learn procedure (see page 11-339).

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BACK

84. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0627 indicated?

YES—Check for poor connections or loose terminals at the fuel pump control module, PGM-FI main relay 2 (FUEL PUMP), the fuel pump, and the PCM, then go to step 1.

NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

85. Turn the ignition switch OFF.

86. Reconnect all connectors.

87. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

88. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0627 indicated?

YES—Check for poor connections or loose terminals at the fuel pump control module, PGM-FI main relay 2 (FUEL PUMP), the fuel pump, and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

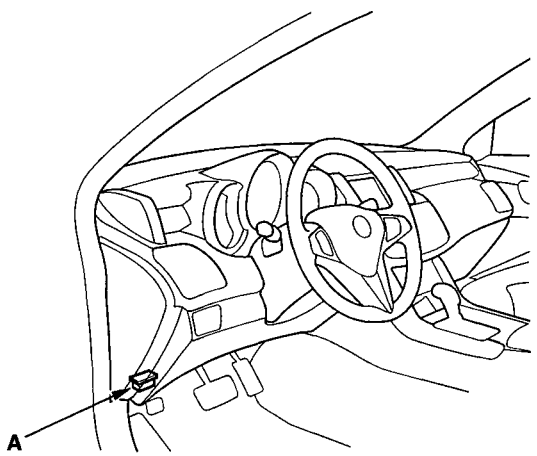
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Fuel Pressure Relieving

Before disconnecting fuel lines or hoses, relieve pressure from the system by disabling the fuel pump and then disconnecting the fuel tube/quick connect fitting in the engine compartment.

With the HDS

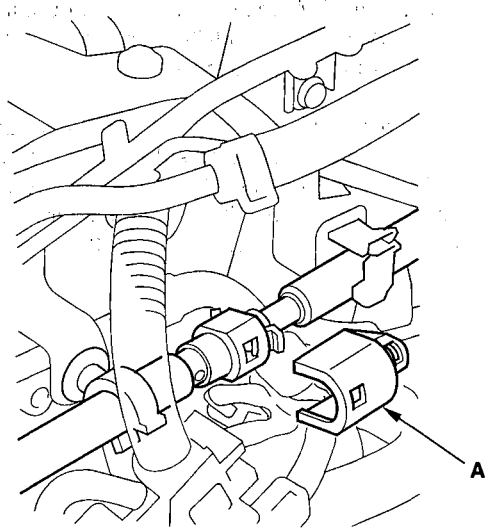
1. Make sure you have the anti-theft code for the audio system and the navigation system (if equipped).
2. Turn the ignition switch OFF.
3. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



4. Turn the ignition switch ON (II).
5. Make sure the HDS communicates with the PCM and other vehicle systems. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).
6. Turn the ignition switch OFF.
7. Remove the fuel fill cap to relieve the pressure in the fuel tank.
8. Turn the ignition switch ON (II).
9. From the INSPECTION MENU of the HDS, select Fuel Pump OFF, then start the engine, and let it idle until it stalls.
10. Turn the ignition switch OFF.

    NOTE:
    - Do not allow the engine to idle above 1,000 rpm or the PCM will continue to operate the fuel pump.
    - A DTC or a Temporary DTC may be set during this procedure. Check for DTCs, and clear them as needed (see page 11-4).

11. Turn the ignition switch OFF.
12. Disconnect the negative cable from the battery.
13. Remove the charge air cooler cover (see step 1 on page 9-8) and intake air duct (air flow tube) (see step 19 on page 9-16).
14. Remove the quick-connect fitting cover (A).

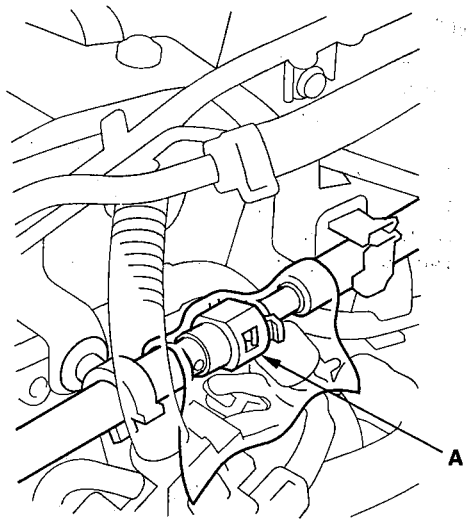


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BACK

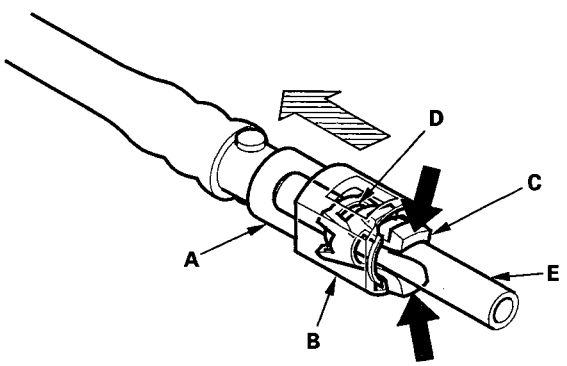
15. Check the fuel quick-connect fitting for dirt, and clean it if needed.

16. Place a rag or shop towel over the quick-connect fitting (A).



17. Disconnect the quick-connect fitting (A): Hold the connector (B) with one hand, and squeeze the retainer tabs (C) with the other hand to release them from the locking tabs (D). Pull the connector off.

    NOTE:
    - Be careful not to damage the line (E) or other parts.
    - Do not use tools.
    - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
    - Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



18. After disconnecting the quick-connect fitting, check it for dirt or damage (see step 4 on page 11-373).

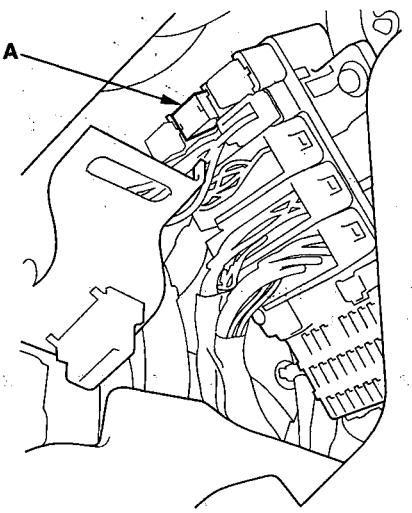
19. Reconnect the negative cable to the battery, then do this:

    - Enter the anti-theft code for the audio system and the navigation system (if equipped).
    - Set the clock.

Without the HDS

1. Make sure you have the anti-theft code for the audio system and the navigation system (if equipped).

2. Remove the driver's dashboard under cover (see page 20-102), then remove PGM-FI main relay 2 (FUEL PUMP) (A) from the under-dash fuse/relay box.



3. Start the engine, and let it idle until it stalls.

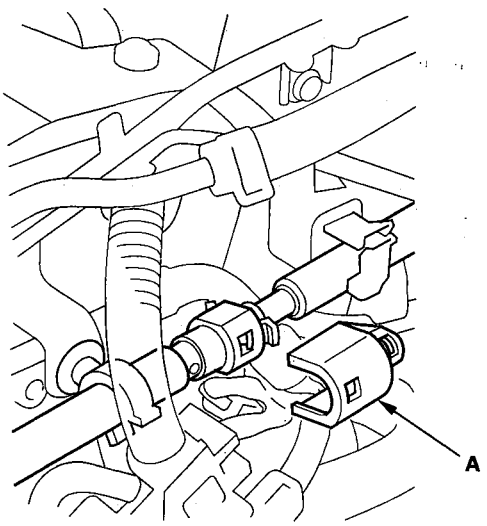
    NOTE: If any DTCs are stored, clear and ignore them.

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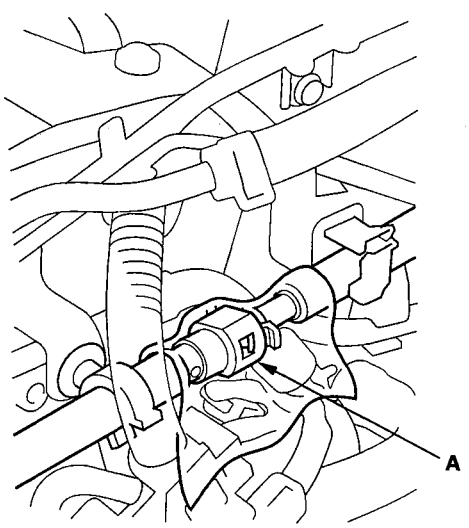
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Fuel Pressure Relieving (cont'd)

4. Turn the ignition switch OFF.
5. Remove the fuel fill cap.
6. Disconnect the negative cable from the battery.
7. Remove the charge air cooler cover (see step 1 on page 9-8) and intake air duct (air flow tube) (see step 19 on page 9-16).
8. Remove the quick-connect fitting cover (A).

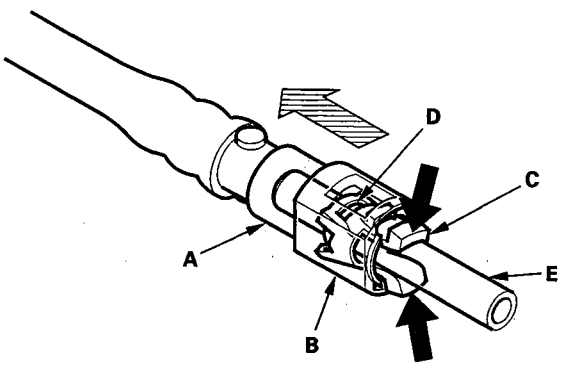


9. Check the fuel quick-connect fitting for dirt, and clean it if needed.
10. Place a rag or shop towel over the quick-connect fitting (A).



11. Disconnect the quick-connect fitting (A): Hold the connector (B) with one hand, and squeeze the retainer tabs (C) with the other hand to release them from the locking tabs (D). Pull the connector off.

    NOTE:
    - Be careful not to damage the line (E) or other parts.
    - Do not use tools.
    - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
    - Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



12. After disconnecting the quick-connect fitting, check it for dirt or damage (see step 4 on page 11-373).
13. Reconnect the negative cable to the battery, then do this:
    - Enter the anti-theft code for the audio system and the navigation system (if equipped).
    - Set the clock.

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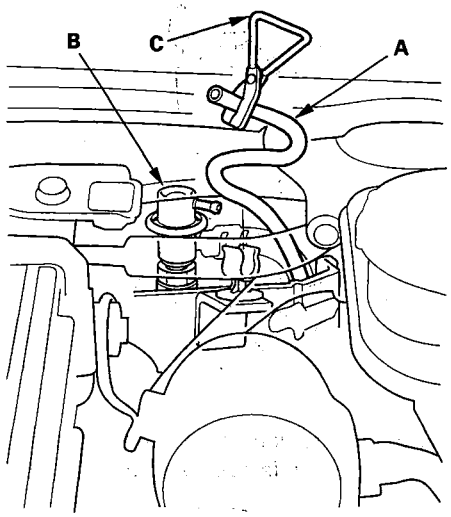
BACK

Fuel Pressure Test

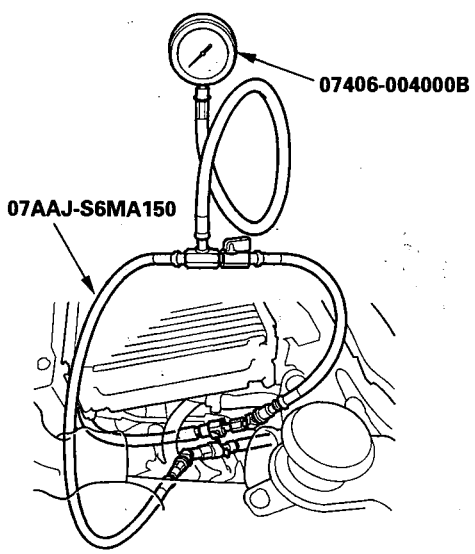
Special Tools Required
- Fuel pressure gauge 07406-004000B
- Fuel pressure gauge attachment set 07AAJ-S6MA150

1. Relieve the fuel pressure (see page 11-362).

2. Disconnect the vacuum hose (A) from the fuel pressure regulator (B), and pinch it closed with a clamp (C).



3. Disconnect the quick-connect fitting. Attach the fuel pressure gauge set and the fuel pressure gauge.



4. Reinstall the intake air duct (air flow tube) (see step 16 on page 9-20).

5. Start the engine, and let it idle.

   - If the engine starts, go to step 7.
   - If the engine does not run, go to step 6.

6. Check to see if the fuel pump is running: Listen to the fuel filler port with the fuel fill cap removed. The fuel pump should run for 2 seconds when the ignition switch is first turned on.

   - If the pump runs, go to step 7.
   - If the pump does not start, refer to the DTC troubleshooting.

7. Read the fuel pressure gauge. The pressure should be 320—370 kPa (3.3—3.8 kgf/cm^2, 47—54 psi).

8. With the engine running, unpinch and reconnect the vacuum hose while you watch the pressure gauge. The pressure should fall when you connected the hose.

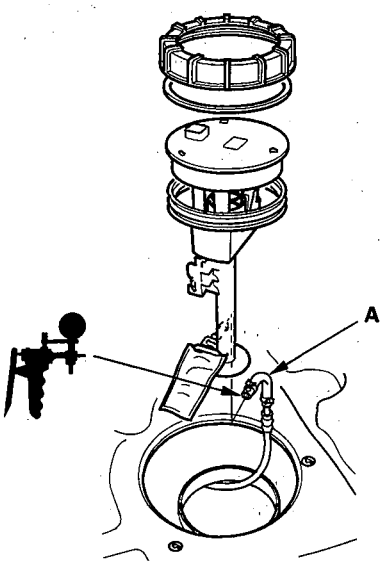
   - If the pressure falls, and the fuel pressure was OK in step 7, the test is complete.
   - If the pressure did not fall, check the vacuum line between the pressure regulator and the intake manifold. If the line is OK, replace the fuel pressure regulator (see page 11-378).
   - If the pressure falls, but the fuel pressure was lower than specified in step 7, check for a clogged fuel filter (see page 11-382), and for leaks in the fuel lines (see page 11-368).
   - If the pressure falls, but the fuel pressure was higher than specified in step 7, check for a pinched or clogged fuel return hose or line (see page 11-368).

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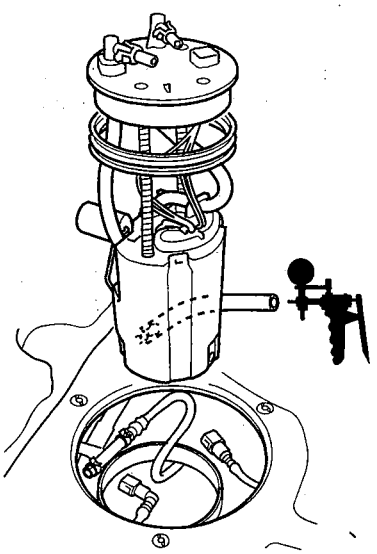
Transfer Fuel Pump Test

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

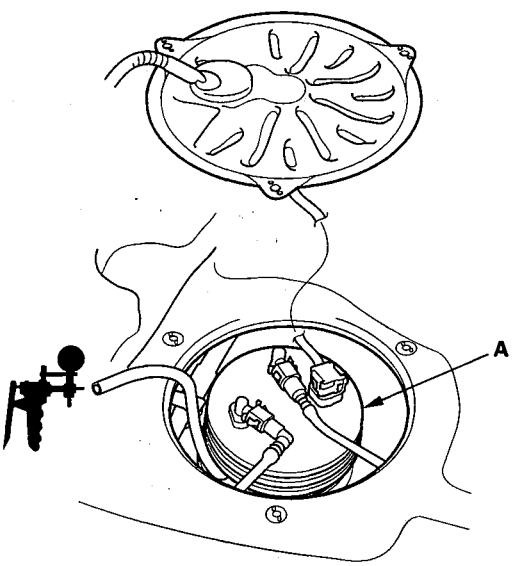
1. Remove the secondary fuel gauge sending unit (see page 11-383).
2. Connect the vacuum pump/gauge 0—30 in.Hg to the transfer tube (A).



3. Turn the ignition switch ON (II).
4. From the INSPECTION MENU of the HDS, select Fuel Pump ON.
5. Read the vacuum pump/gauge 0—30 in.Hg. The vacuum should be 4.0 kPa (1.2 in.Hg, 30 mmHg).
   - If the vacuum is OK, the transfer fuel pump and transfer tube is OK.
   - If the vacuum is out of specification, go to step 6.
6. Turn the ignition switch OFF.
7. Install the secondary fuel gauge sending unit (see page 11-383).
8. Remove the fuel tank unit (see page 11-380).
9. Connect the vacuum pump/gauge 0—30 in.Hg to the fuel tank unit.



10. Lower the fuel tank unit (A) into the fuel tank until the pick up screen is submerged in the fuel.



11. Connect the fuel tank unit 4P connector.

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12. Turn the ignition switch ON (II).

13. From INSPECTION MENU of the HDS, select Fuel Pump ON.

14. Read the vacuum pump/gauge 0—30 in.Hg. The vacuum should be 4.0 kPa (1.2 in.Hg, 30 mmHg).

    - If the vacuum is OK, replace the transfer tube, then recheck the fuel vacuum.
    - If the vacuum is out of specification, replace the fuel tank unit (see page 11-380), then recheck the fuel vacuum.

1. Remove the fuel tank unit (see page 11-380).

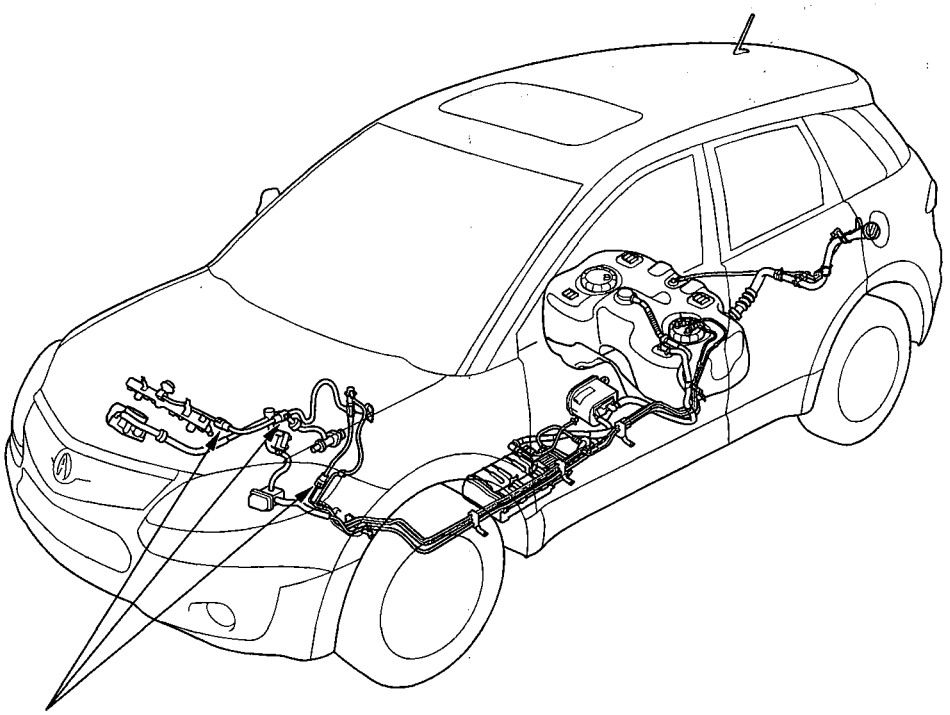
2. Using a hand pump, a hose, and a container suitable for fuel, draw the fuel from the fuel tank.

3. Reinstall the fuel tank unit (see page 11-380).

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Fuel Line Inspection

Check the fuel system lines and hoses for damage, leaks, and deterioration. Replace any damaged parts.

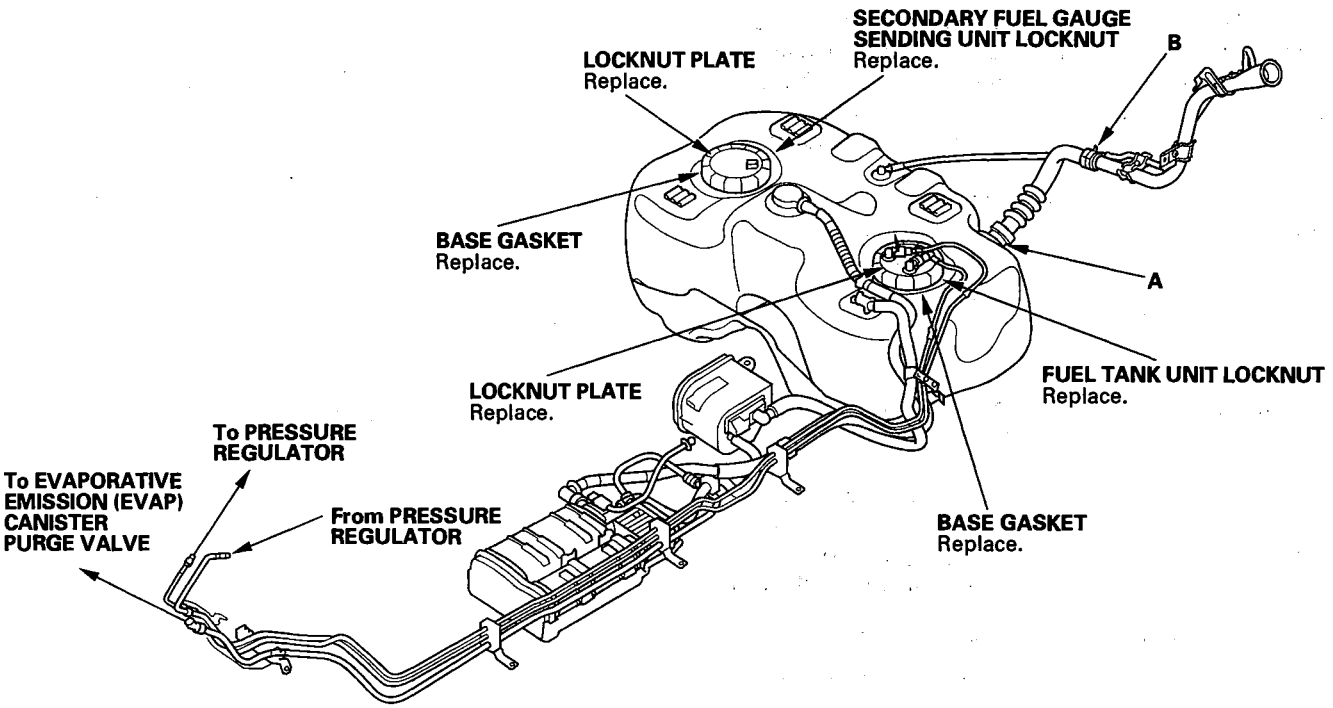


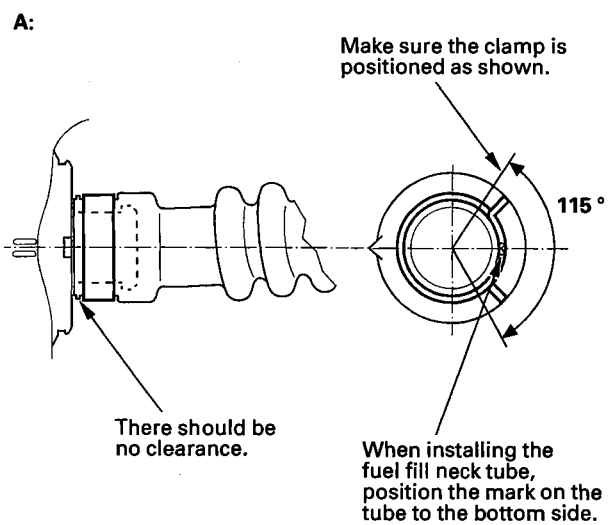
Make sure the connections are secure and the quick-connect fitting covers are firmly locked in place.

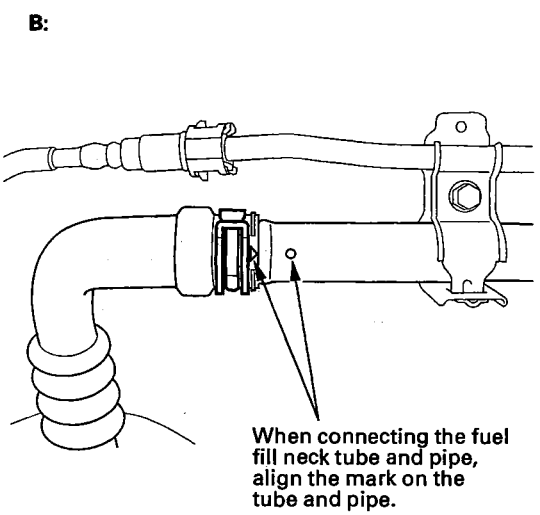
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Check all clamps, and retighten if necessary.





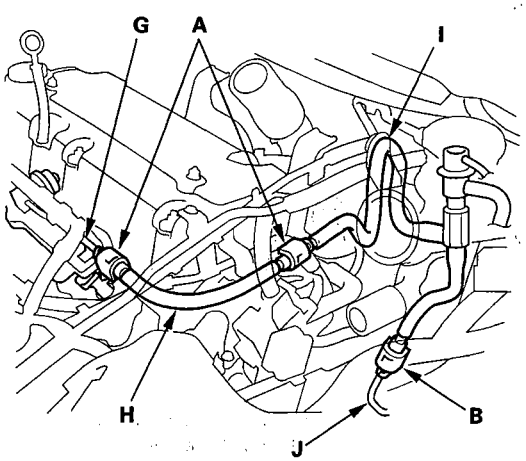


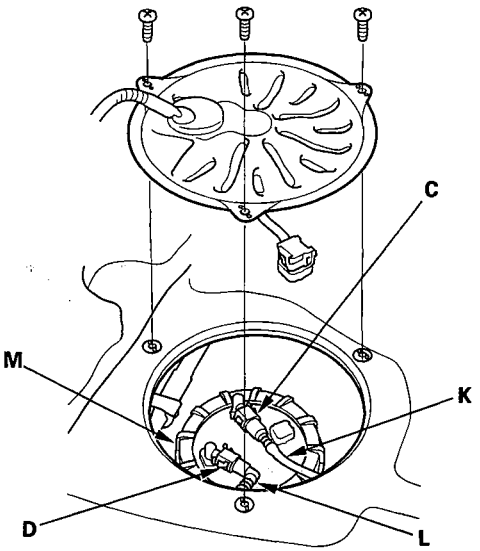
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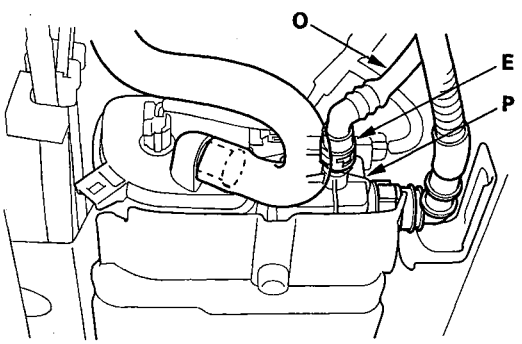
Fuel Line/Quick-Connect Fitting Precautions

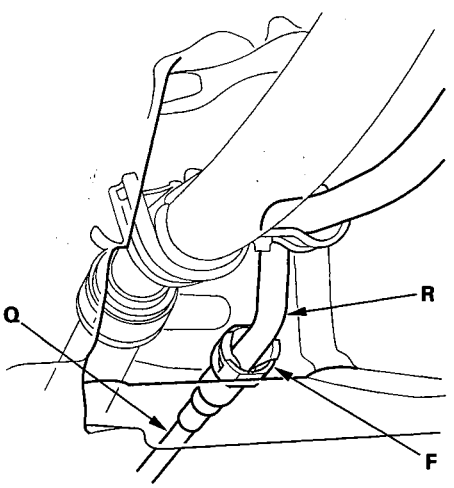
The fuel line/quick-connect fittings (A), (B), (C), (D), (E), and (F) connect the fuel rail (G) to the fuel feed hose (H), the fuel feed hose to the fuel pressure regulator base (I), the fuel pressure regulator base to the fuel feed line (J), the fuel feed line (K) and fuel return line (L) to the fuel tank unit (M), the fuel vapor line (O) to the EVAP canister (P), and the fuel tank vapor recirculation tube (Q) to the fuel fill pipe (F).
When removing or installing the fuel feed hose, fuel pressure regulator base, the fuel tank unit, the fuel tank, or the fuel fill pipe, it is necessary to disconnect or connect the quick-connect fittings.
Pay attention to the following:

- The fuel feed hoses, fuel line, and quick-connect fittings are not heat-resistant; be careful not to damage them during welding or other heat-generating procedures.
- The fuel feed hoses, fuel line, and quick-connect fittings are not acid-proof; do not touch them with a shop towel that was used for wiping battery electrolyte. Replace them if they come in contact with electrolyte or something similar.
- When connecting or disconnecting the fuel feed hoses, fuel line, and quick-connect fittings, be careful not to bend or twist them excessively. Replace them if they are damaged.









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A disconnected quick-connect fitting can be reconnected, but the retainer on the mating line cannot be reused once it has been removed from the line. Replace the retainer when:

- replacing the fuel rail.
- replacing the fuel line.
- replacing the fuel return line.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- replacing the EVAP purge line.
- replacing the EVAP canister.
- replacing the fuel tank.
- replacing the fuel fill pipe.
- it has been removed from the line.
- it is damaged.

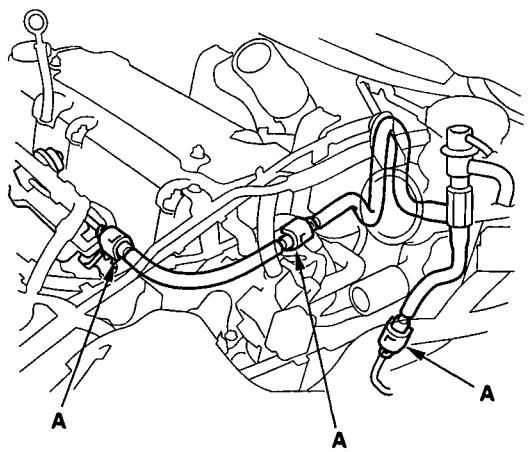
Location	Manufacturer	Retainer color	Line diameter
A	Tokai	Blue Green	0.3 in. (8 mm)
B	Sanoh	White	0.3 in. (8 mm)
C	Sanoh	White	0.4 in. (9.5 mm)
D	Sanoh	White	0.3 in. (8 mm)
E	Sanoh	White	0.4 in. (9.5 mm)
F	Tokai	Natural	0.5 in. (12 mm)

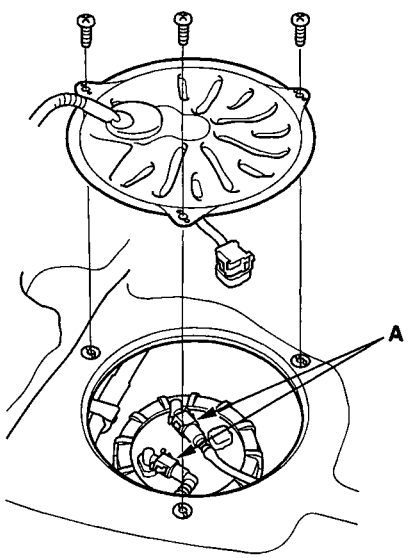
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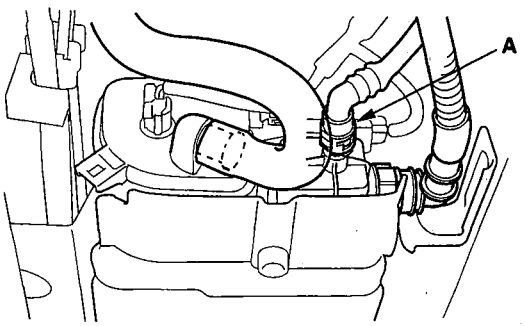
Fuel Line/Quick-Connect Fitting Removal

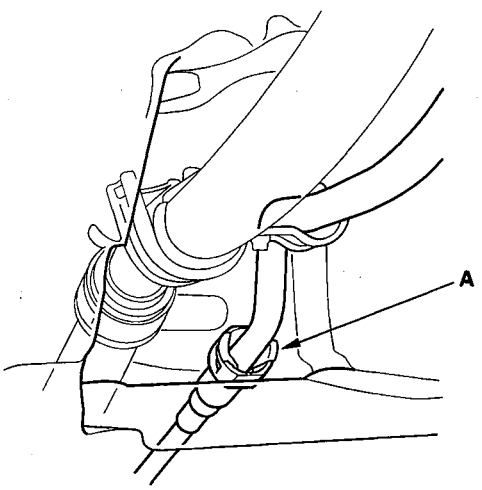
NOTE: Before you work on the fuel lines and fittings, read the "Fuel Line/Quick-Connect Fitting Precautions" (see page 11-370).

1. Relieve the fuel pressure (see page 11-362).
2. Check the fuel quick-connect fittings (A) for dirt, and clean them if needed.







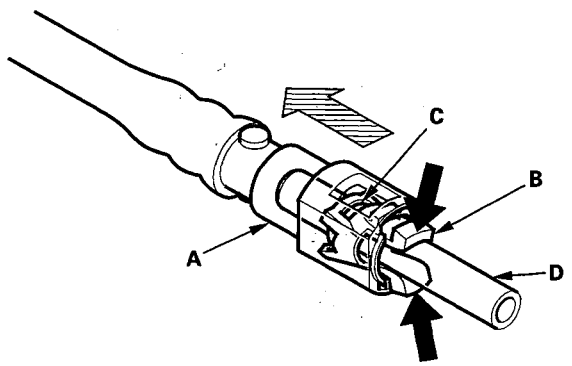


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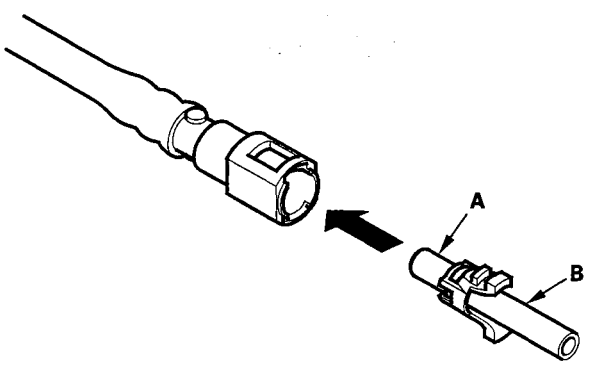
3. Place a rag or shop towel over the quick-connect fitting. Hold the connector (A) with one hand, and squeeze the retainer tabs (B) with the other hand to release them from the locking tabs (C). Pull the connector off.

NOTE:
- Be careful not to damage the line (D) or other parts. Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
- Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



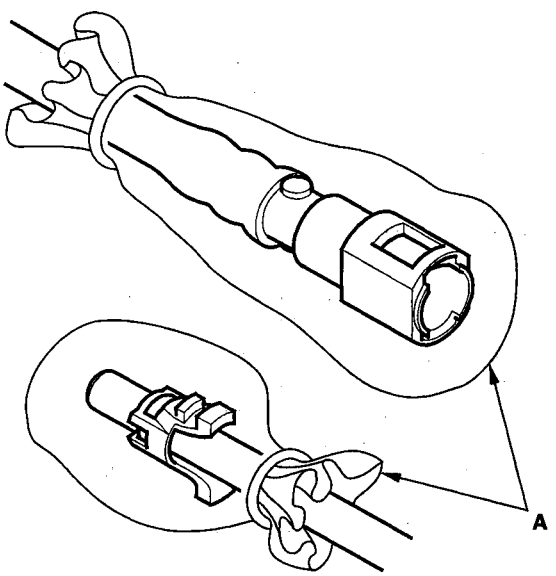
4. Check the contact area (A) of the line (B) for dirt or damage.

- If dirty, clean the connector with a pressure washer, and dry it with the compressed air.
- If it is rusty or damaged, replace the fuel filter, or fuel feed line.



5. To prevent damage and keep foreign matter out, cover the disconnected connector and line ends with plastic bags (A).

NOTE: The retainer cannot be reused once it has been removed from the line.
Replace the retainer when:
- replacing the fuel rail.
- replacing the fuel feed line.
- replacing the fuel return line.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- replacing the EVAP purge pipe.
- replacing the EVAP canister.
- replacing the fuel tank.
- replacing the fuel fill pipe.
- it has been removed from the line.
- it is damaged.

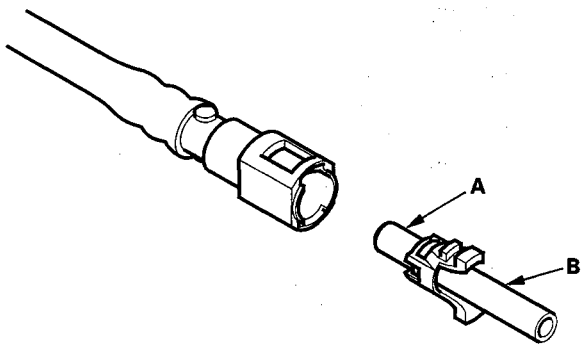


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Fuel Line/Quick-Connect Fitting Installation

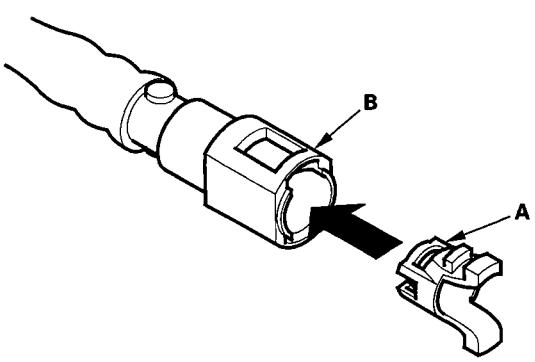
NOTE: Before you work on the fuel lines and fittings, read the "Fuel Line/Quick-Connect Fitting Precautions" (see page 11-370).

1. Check the contact area (A) of the line (B) for dirt or damage, and clean it if needed.

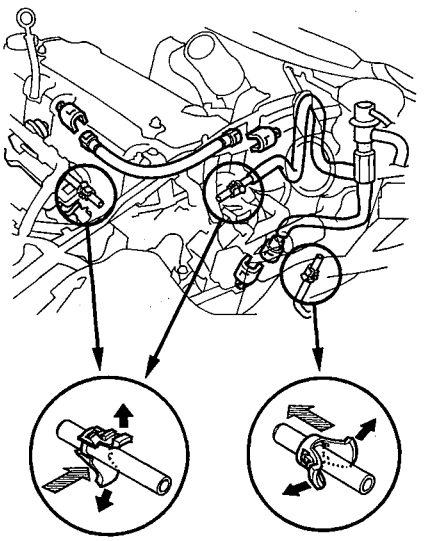


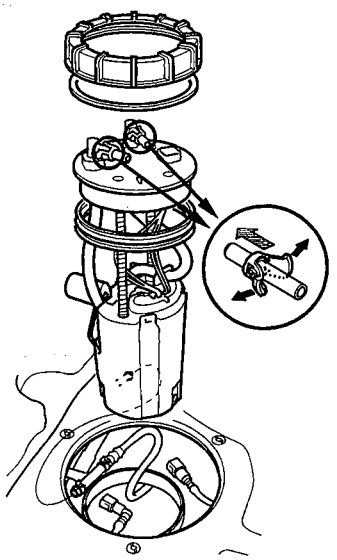
2. Insert a new retainer (A) into the connector (B) if the retainer is damaged, or after:

- replacing the fuel rail.
- replacing the fuel feed line.
- replacing the fuel return line.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- replacing the EVAP purge pipe.
- replacing the EVAP canister.
- replacing the fuel tank.
- replacing the fuel fill pipe.
- removing the retainer from the line.
- Use the same manufacturer retainer and the same size retainer when the replacing the retainer (see page 11-370).



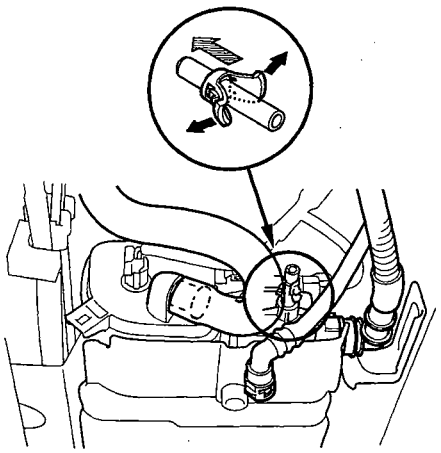
3. Before connecting a new fuel tube/quick-connect fitting assembly (A), remove the old retainer from the mating line.

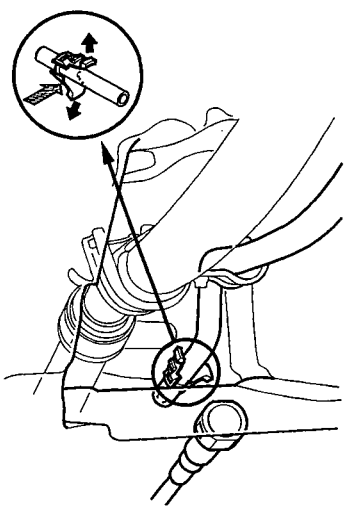




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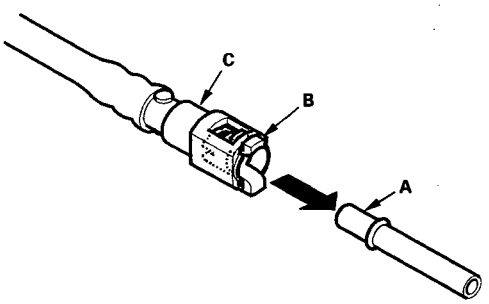




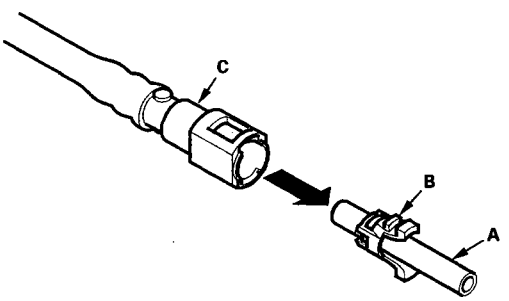
4. Align the quick-connect fittings with the line (A), and align the retainer locking tabs (B) with the connector grooves (C). Then press the quick-connect fittings onto the line until both retainer tabs lock with a clicking sound.

   NOTE: If it is hard to connect, put a small amount of new engine oil on the line end.

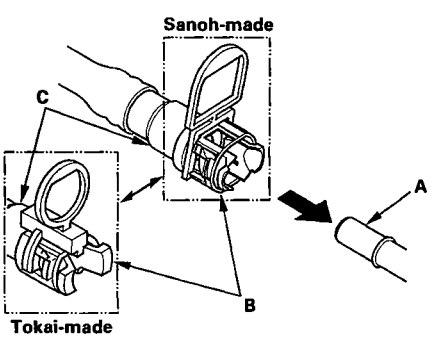
Connection with new retainer



Reconnection to existing retainer



Connection to new fuel line



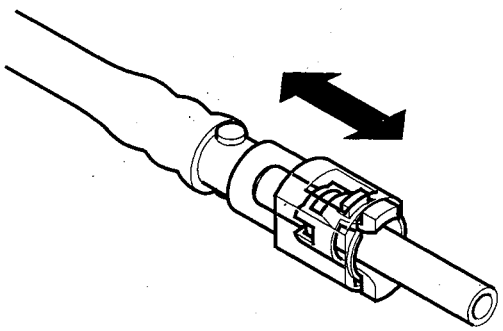
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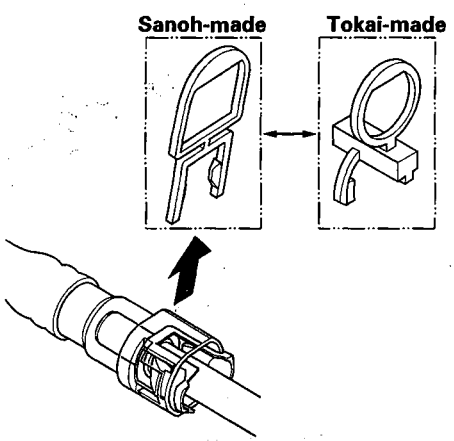
Fuel Line/Quick-Connect Fitting Installation (cont'd)

5. When you reconnect the connector with the old retainer, make sure the connection is secure and the tabs are firmly locked into place; check visually and also by pulling the connector. When you replace the fuel line with a new one, make sure you remove the ring pull upwards after you confirm the connection is secure.

   NOTE: Before you remove the ring pull, make sure the fuel line connection is secure. If the connection is not secure, the ring pull could break when you try to remove it.



Connection to new fuel line



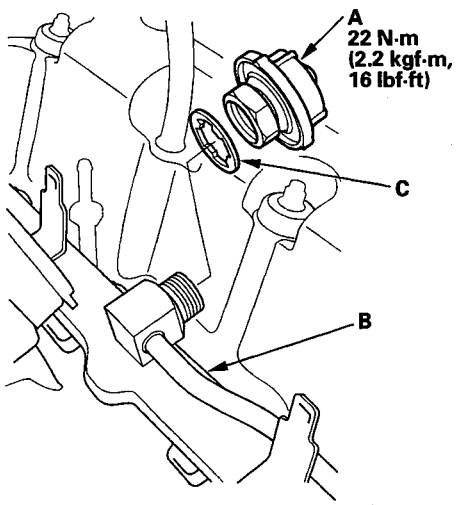
6. Reconnect the negative cable to the battery, and turn the ignition switch ON (II) (but do not operate the starter motor). The fuel pump will run for about 2 seconds, and fuel pressure will rise. Repeat this two or three times, and check that there is no leakage in the fuel supply system.

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Fuel Pulsation Damper Replacement

1. Relieve the fuel pressure (see page 11-362).
2. Remove the charge air cooler (see page 9-7).
3. Remove the injector cover (see step 3 on page 11-243).
4. Disconnect the connectors from the injectors, then, Remove the harness holder (see step 4 on page 11-243).
5. Remove the fuel pulsation damper (A) from the fuel rail (B).

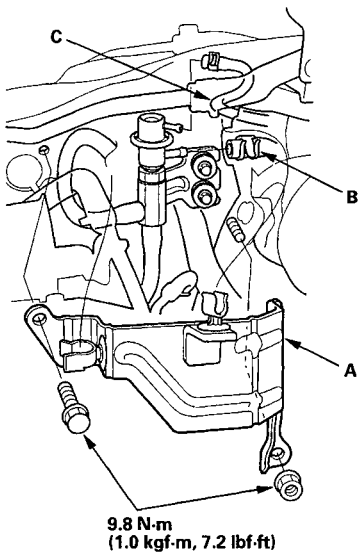


6. Install the parts in the reverse order of removal with a new sealing washer (C).

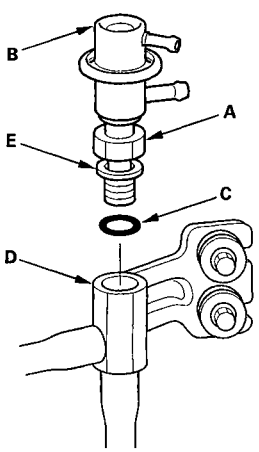
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Fuel Pressure Regulator Replacement

1. Relieve the fuel pressure (see page 11-362).
2. Remove the charge air cooler (see page 9-7).
3. Remove the pressure regulator cover (A).



4. Disconnect the fuel return hose (B), and vacuum hose (C).
5. Loosen the nut (A), then remove the fuel pressure regulator (B).

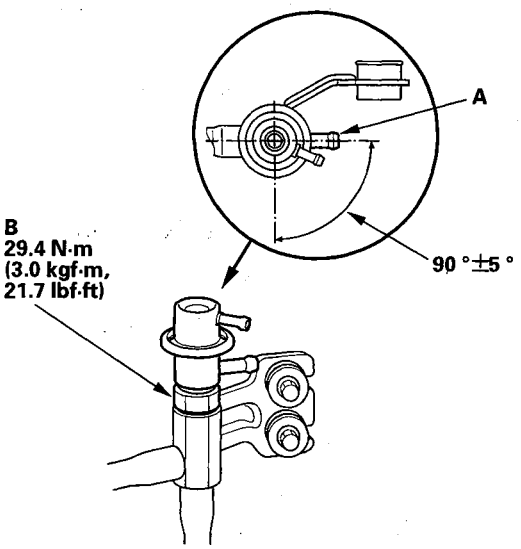


6. Coat the new O-ring (C) with clean engine oil, and install the fuel pressure regulator into the fuel pressure regulator base (D) by hand until the washer (E) is pressed between the base and the regulator.

   NOTE: Do not fully tighten the fuel pressure regulator yet.

7. Make sure the fuel return pipe (A) is positioned as shown. If needed, turn the fuel pressure regulator counterclockwise to line up the pipe.

   NOTE:
   - Do not turn the fuel pressure regulator clockwise.
   - Do not turn the fuel pressure regulator counterclockwise more than once complete turn.



8. Tighten the nut (B) to the specified torque.
9. Connect the fuel return hose and vacuum hose.
10. Install the pressure regulator cover, then install the charge air cooler (see page 9-9).

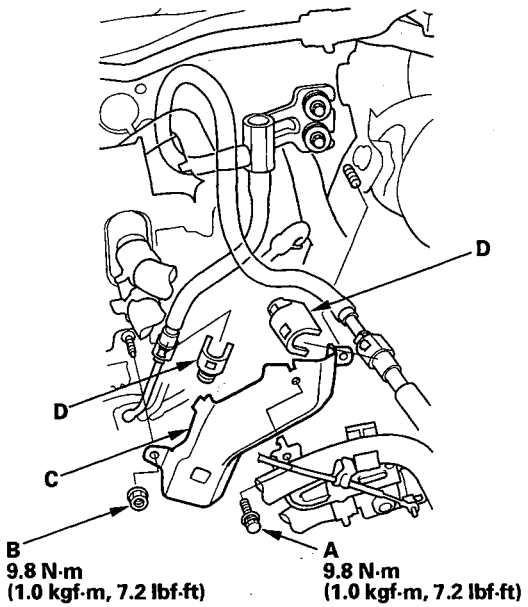
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Fuel Pressure Regulator Base Replacement

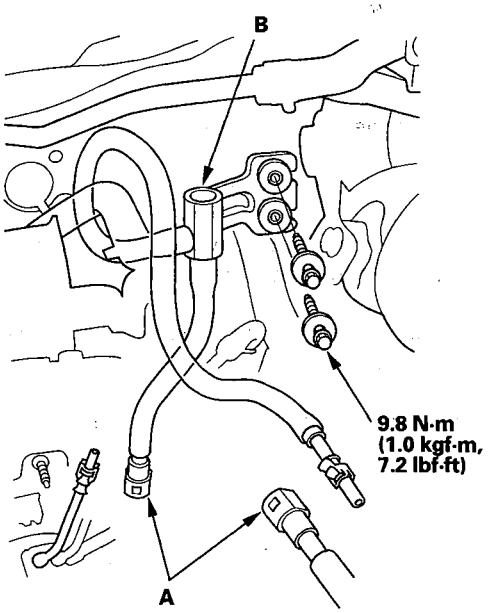
1. Remove the fuel pressure regulator (see page 11-378).

2. Remove the bolt (A) and nut (B), then remove the fuel pipe protector (C).



3. Remove the quick-connect fitting covers (D).

4. Disconnect the quick-connect fittings (A).



5. Remove the pressure regulator base (B).

6. Reinstall the parts in the reverse order of removal.

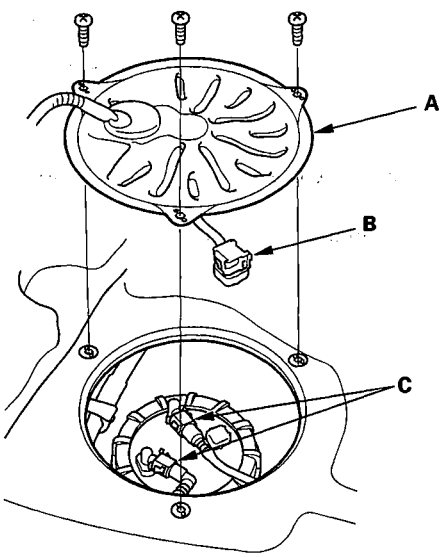
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Fuel Tank Unit Removal/Installation

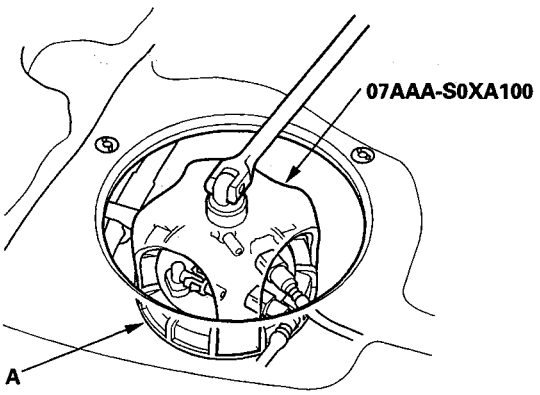
Special Tools Required
Fuel sender wrench 07AAA-S0XA100

Removal

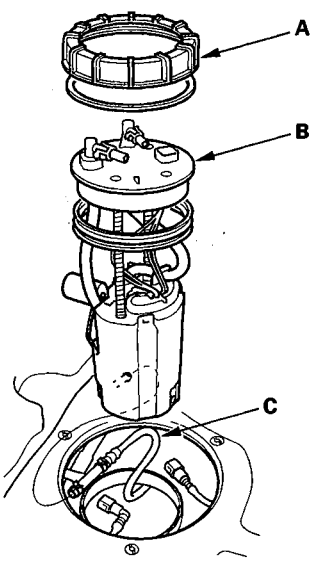
1. Relieve the fuel pressure (see page 11-362).
2. Remove the fuel fill cap.
3. Fold the rear seat down, then remove the left cargo area side trim panel (see page 20-76).
4. Pull back the carpet to expose the access panel (see step 9 on page 20-91).
5. Remove the access panel (A) from the left side of the floor.



6. Disconnect the fuel tank unit 4P connector (B).
7. Disconnect the quick-connect fittings (C) from the fuel tank unit.
8. Using the special tool, loosen the locknut (A).



9. Remove the locknut (A).



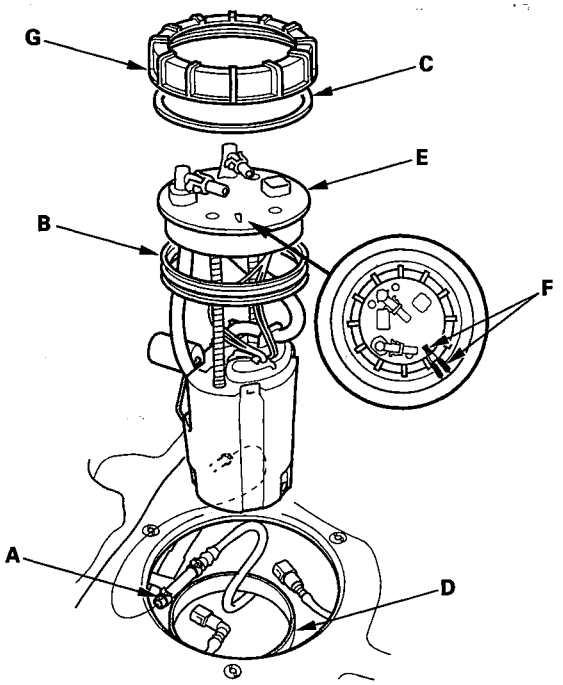
10. Remove the fuel tank unit (B), and disconnect the transfer tube (C).

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BACK

Installation

1. Position the mark of the transfer tube (A) up, then connect the tube.



2. Install a new base gasket (B), and locknut plate (C) to the fuel tank (D).

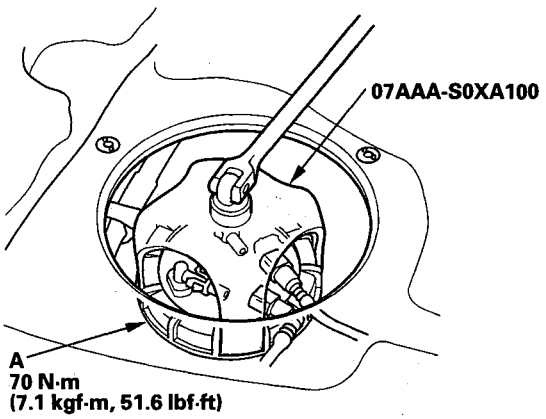
3. Insert the fuel tank unit (E) into the fuel tank. Be careful not to bend the fuel gauge sending unit.

4. Align the marks (F) on the fuel tank and the fuel tank unit, then tighten a new locknut (G) by hand.

   NOTE:
   - After tightening, make sure the marks are aligned. Check circumference of the base gasket visually or by hand and be sure that the gasket is not pinched.
   - Do not coat the base gasket and the locknut plate with engine oil.

5. Using the tool, tighten the fuel tank unit locknut (A).

   NOTE: After installation, check the base gasket visually or by hand to be sure the gasket is not pinched.

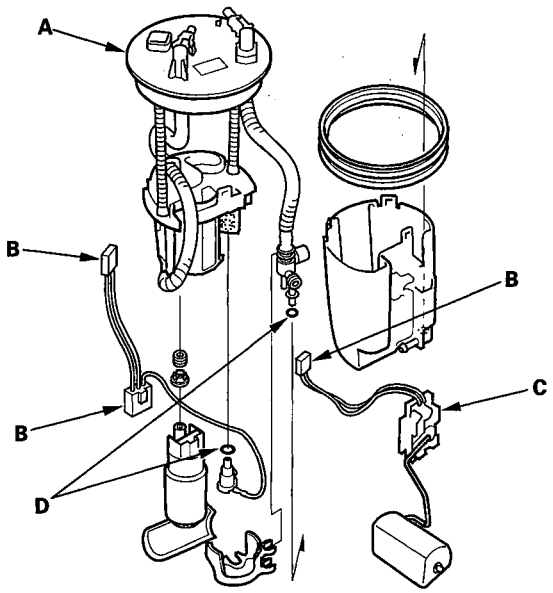


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Fuel Filter Replacement

The fuel filter should be replaced whenever the fuel pressure drops below the specified value (see page 11-365), after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Remove the fuel tank unit (see page 11-380).
2. Remove the fuel filter set (A).

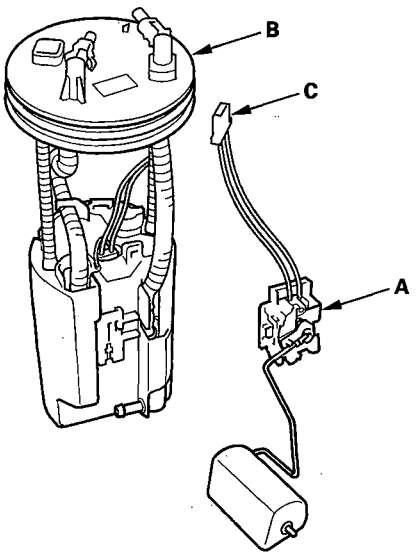


3. Check these items before installing the fuel tank unit:
   - When connecting the wire harness, make sure the connection is secure and the connectors (B) are firmly locked into place.
   - When installing the fuel gauge sending unit (C), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.
4. Install the parts in the reverse order of removal with new O-rings (D).

   NOTE: Coat the O-rings with clean engine oil.
5. Install the fuel tank unit (see page 11-380).

Fuel Pump/Fuel Gauge Sending Unit Replacement

1. Remove the fuel tank unit (see page 11-380).
2. Remove the fuel level sensor (fuel gauge sending unit) (A) from the fuel tank unit (B).



3. Check these items before installing the fuel tank unit:
   - When connecting the wire harness, make sure the connection is secure and the connector (C) it firmly locked into place.
   - When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.
4. Install the parts in the reverse order of removal.
5. Install the fuel tank unit (see page 11-380).

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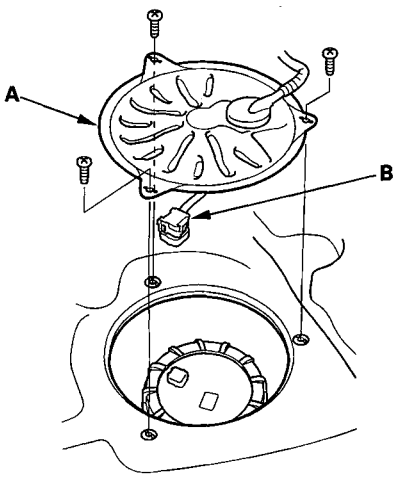
BACK

Secondary Fuel Gauge Sending Unit Removal/Installation

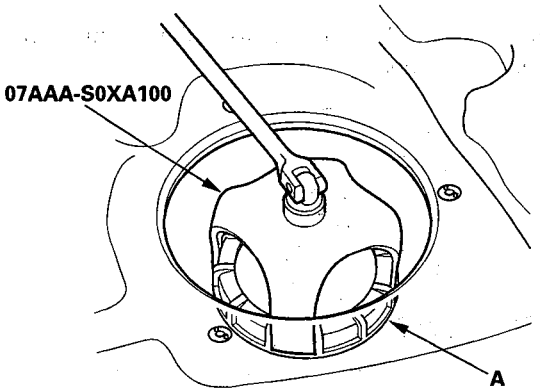
Special Tools Required
Fuel sender wrench 07AAA-S0XA100

Removal

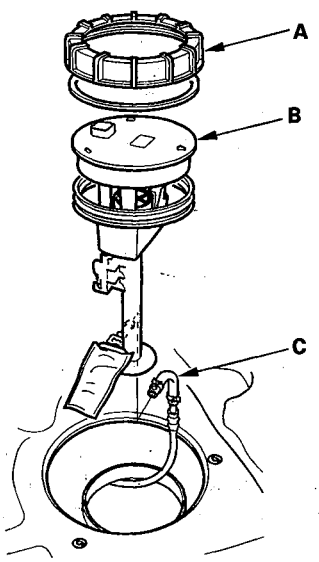
1. Relieve the fuel pressure (see page 11-362).
2. Remove the fuel fill cap.
3. Fold the rear seat down, then remove the right cargo area side trim panel (see page 20-76).
4. Pull back the carpet to expose the access panel (see step 9 on page 20-91).
5. Remove the access panel (A) from the right side of the floor.



6. Disconnect the fuel tank unit 4P connector (B).
7. Using the special tool, loosen the locknut (A).



8. Remove the locknut (A).



9. Remove the secondary fuel gauge sending unit (B), then disconnect the transfer tube (C).

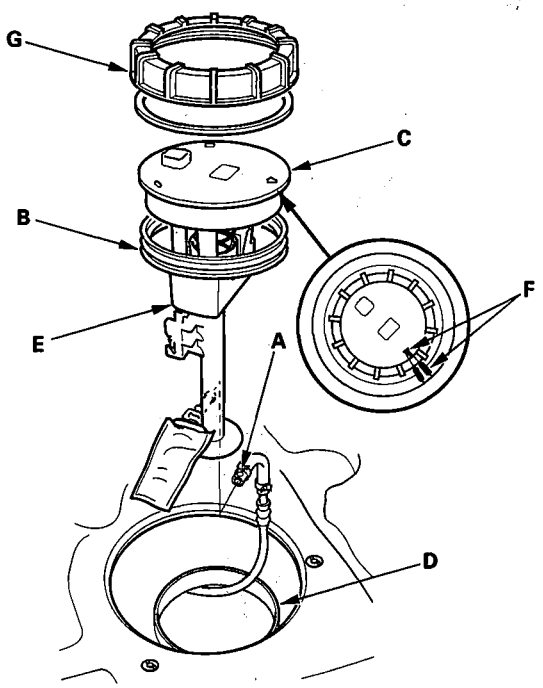
(cont'd)

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Secondary Fuel Gauge Sending Unit Removal/Installation (cont'd)

Installation

1. Position the mark of the transfer tube (A) up, then connect the tube.



2. Install a new base gasket (B), and locknut plate (C) to the fuel tank (D).

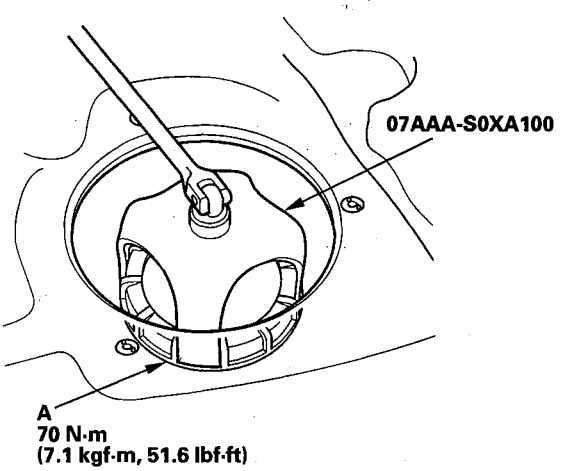
3. Insert the secondary fuel gauge sending unit (E) into the fuel tank. Be careful not to bend the secondary fuel gauge sending unit.

4. Align the marks (F) on the fuel tank and the fuel tank unit, then tighten a new locknut (G) by hand.

   NOTE:
   - After tightening, make sure the marks are aligned. Check circumference of the base gasket visually or by hand and be sure that the gasket is not pinched.
   - Do not coat the base gasket and the locknut plate with engine oil.

5. Using the tool, tighten the fuel tank unit locknut (A).

   NOTE: After installation, check the base gasket visually or by hand to be sure the gasket is not pinched.

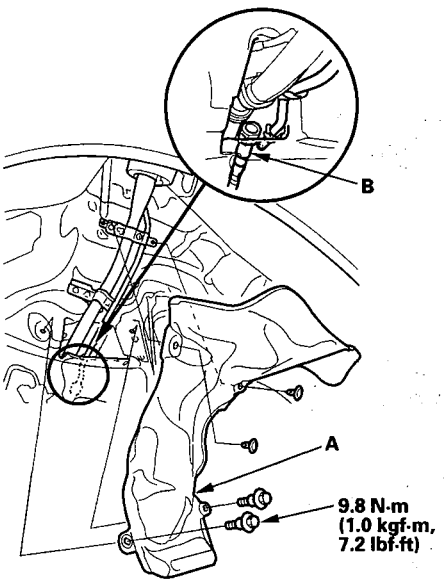


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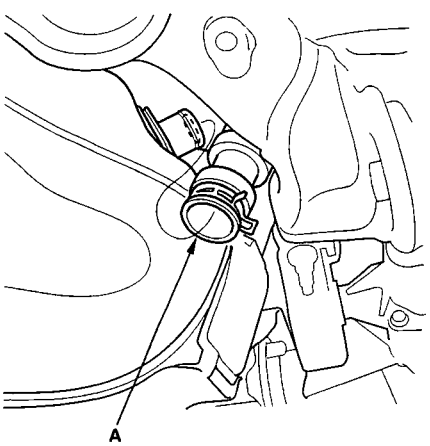
BACK

Fuel Tank Replacement

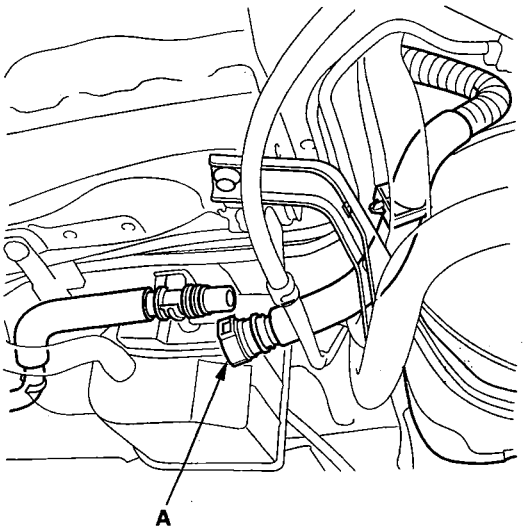
1. Drain the fuel tank (see page 11-367).
2. Reinstall the fuel tank unit without connecting quick-connect fittings and fuel tank unit 4P connector.
3. Disconnect the secondary fuel gauge sending unit 4P connector (see step 5 on page 11-383).
4. Remove the fuel fill pipe cover (A).



5. Disconnect the quick-connect fitting (B).
6. Lift the vehicle, and support it with jackstands.
7. Disconnect the fuel fill tube (A) from the fuel tank. Slide back the clamp, then twist the tube as you pull to avoid damage it.



8. Disconnect the fuel vent tube (A).



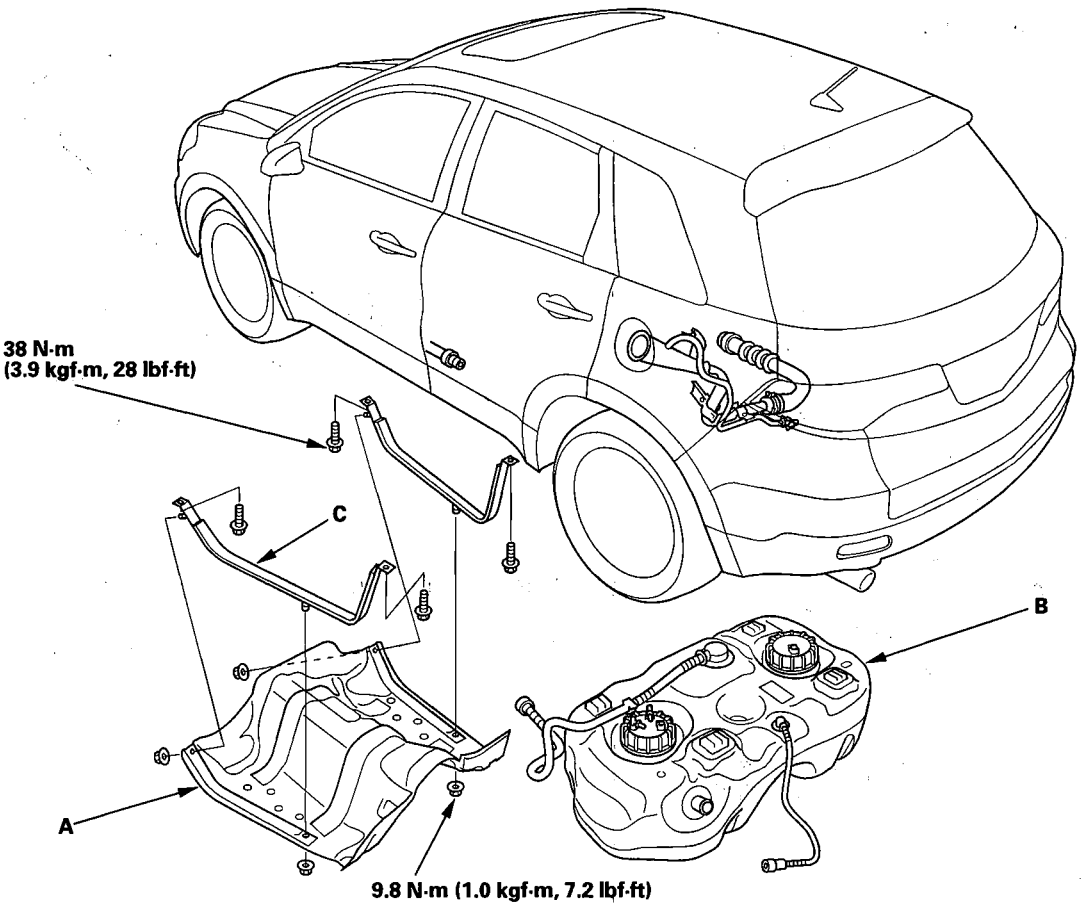
9. Remove the exhaust pipe (see page 9-23).
10. Remove the propeller shaft (see page 16-38).

(cont'd)

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Fuel Tank Replacement (cont'd)

11. Remove the fuel tank cover (A).



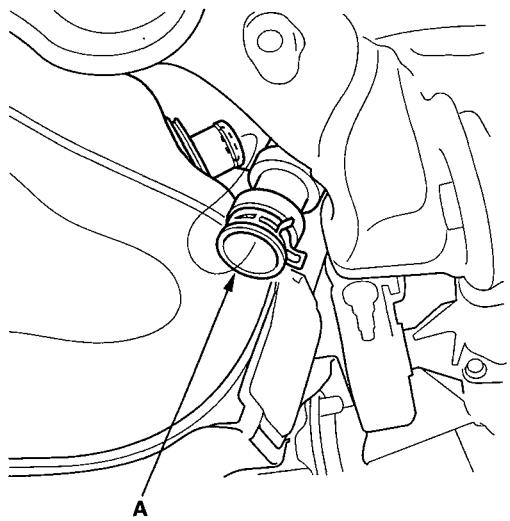
12. Place a jack or support under the fuel tank (B).
13. Remove the strap bolts and straps (C).
14. Remove the fuel tank.
15. Install the parts in the reverse order of removal.

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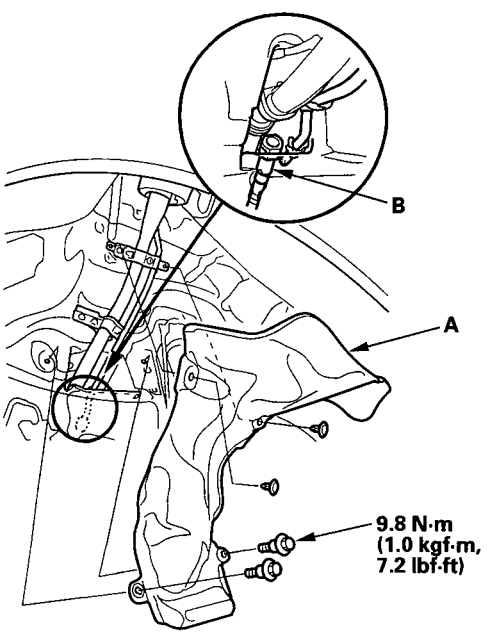
BACK

Fuel Fill Pipe Removal/Installation

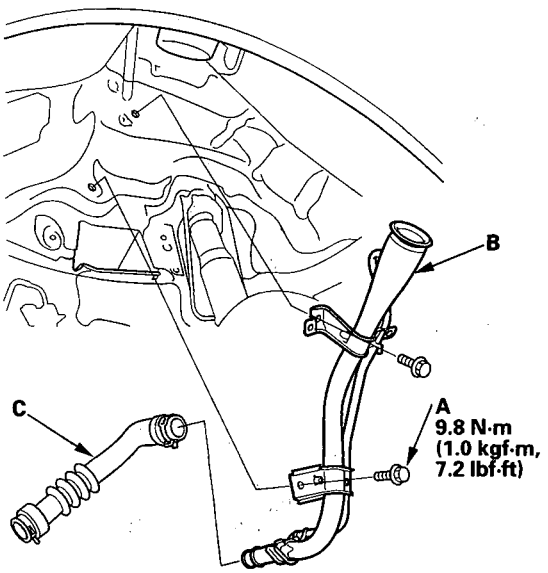
1. Drain the fuel tank (see page 11-367).
2. Remove the fuel fill cap.
3. Disconnect the fuel fill tube (A) from the fuel tank. Slide back the clamp, then twist the tube as you pull to avoid damage it.



4. Remove the fuel fill pipe cover (A).



5. Disconnect the quick-connect fitting (B).
6. Remove the bolts (A), then remove the fuel fill pipe (B) and fuel fill tube (C).

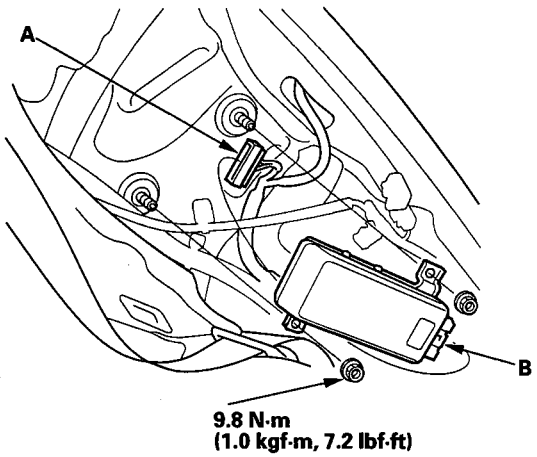


7. Install the parts in the reverse order of removal.

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Fuel Pump Control Module Replacement

1. Fold the rear seat down, then remove the rear seat side bolster (see page 20-138).
2. Disconnect the fuel pump control module connector (A).



3. Remove the fuel pump control module (B).
4. Install the parts in the reverse order of removal.

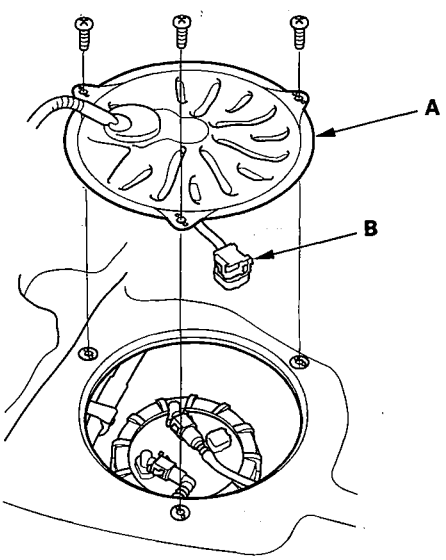
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BACK

Fuel Gauge Sending Unit Test

NOTE: For the fuel gauge system circuit diagram, refer to the Gauges Circuit Diagram (see page 22-262).

1. Check the No. 10 METER (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Check for body electrical system DTCs.
   - If no problem is found, go to step 3.
   - If DTC B1175 or B1176 is indicated, go to the indicated DTC's troubleshooting.
3. Turn the ignition switch OFF.
4. Fold the rear seat down, then remove the left cargo area side trim panel (see page 20-76).
5. Pull back the carpet to expose the access panel (see step 9 on page 20-91).
6. Remove the access panel (A) from the left side of the floor.



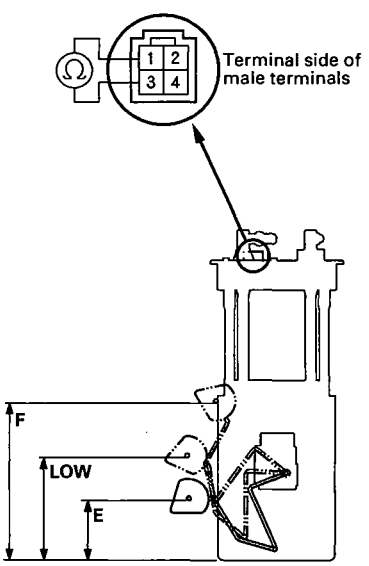
7. Disconnect the fuel tank unit 4P connector (B).
8. Remove the fuel tank unit from the fuel tank (see page 11-380).

   NOTE: If the fuel tank is full, drain the fuel (see page 11-367).

9. Measure resistance between the No. 1 and No. 3 terminals of the fuel tank unit 4P connector with the float at E (EMPTY), LOW (LOW FUEL INDICATOR), and F (FULL) positions.
   - If you do not get the following readings, replace the fuel gauge sending unit (see page 11-382).
   - If the fuel gauge sending unit test is OK, do the secondary fuel gauge sending unit test (see page 11-390).

Float Position	F 5.7 in. (144.0 mm)	LOW 3.7 in. (93.7 mm)	E 2.2 in. (54.8 mm)
Resistance (Ω)	18 to 22	703.6 to 743	772 to 788

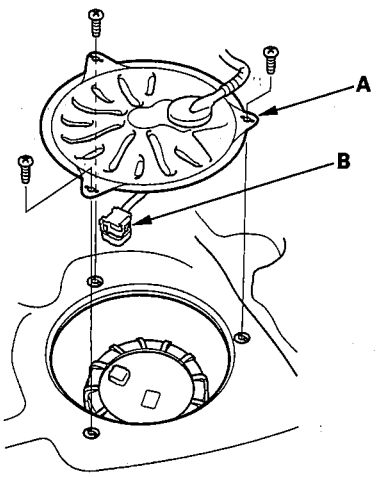
NOTE: Remove the No. 23 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 30 seconds after completing troubleshooting, otherwise it may take up to 20 minutes for the fuel gauge to indicate the correct fuel level.



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Secondary Fuel Gauge Sending Unit Test

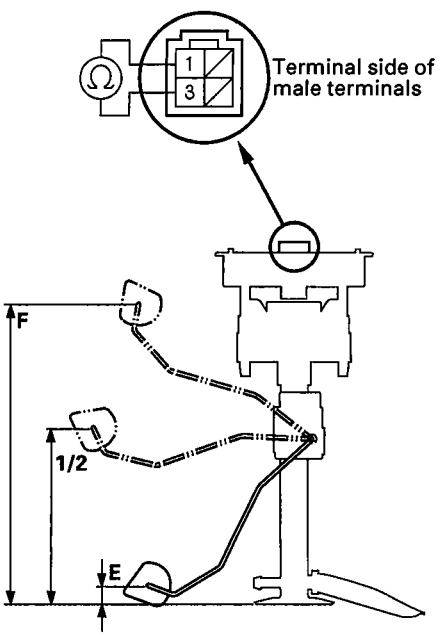
1. Fold the rear seat down, then remove the right cargo area side trim panel (see page 20-76).
2. Pull back the carpet to expose the access panel (see step 9 on page 20-91).
3. Remove the access panel (A) from the right side of the floor.



4. Disconnect the secondary fuel gauge sending unit 4P connector (B).
5. Remove the secondary fuel gauge sending unit from the fuel tank (see page 11-383).
6. Measure resistance between the No. 1 and No. 3 terminals of the secondary fuel gauge sending unit 4P connector with the float at E (EMPTY), 1/2 (HALF FULL), and F (FULL) positions.

Float Position	F 9.2 in. (233.8 mm)	1/2 5.4 in. (136.8 mm)	E 0.5 in. (13.7 mm)
Resistance (Ω)	18 to 22	402 to 414	772 to 788

NOTE: Remove the No. 23 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 10 seconds after completing troubleshooting, otherwise it may take up to 20 minutes for the fuel gauge to indicate the correct fuel level.



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BACK

Low Fuel Indicator Test

1. Do the gauge self-diagnostic test (see page 22-258).

   - If the low fuel indicator flashes, go to step 2.
   - If the low fuel indicator does not flash, replace the gauge control module (see page 22-284).

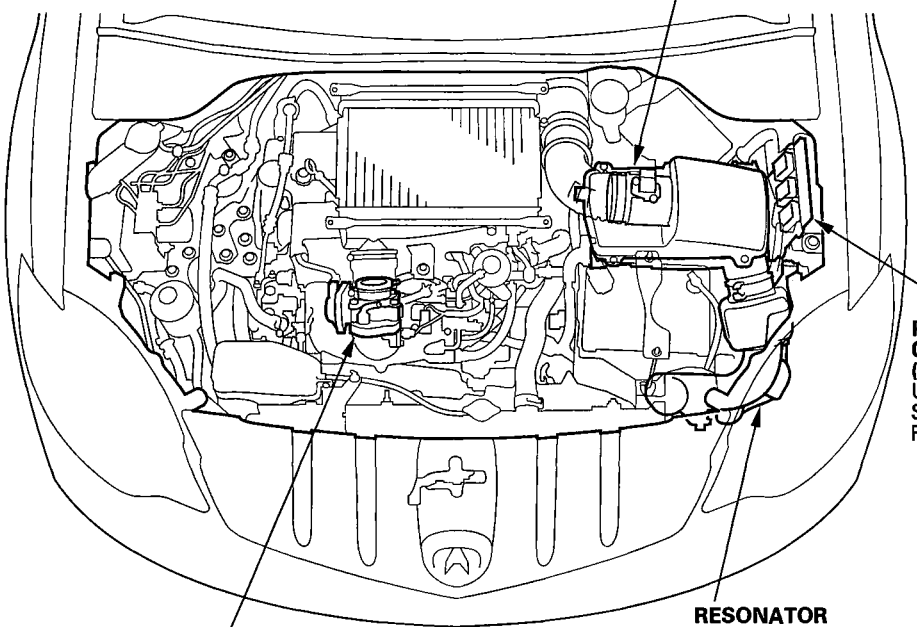
2. Check for body electrical system DTCs.

   - If any DTCs are indicated, do the indicated DTC's troubleshooting.
   - If no DTCs are indicated, go to step 3.

3. Do the fuel gauge sending unit test (see page 11-389), and secondary fuel gauge sending unit test (see page 11-390),

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Component Location Index



AIR CLEANER
Removel/Installation, page 11-394
Element Inspection/Replacement, page 11-395

POWERTRAIN CONTROL MODULE (PCM)
Update, page 11-7
Substitution, page 11-8
Replacement, page 11-252

RESONATOR
Removel/Installation, page 11-395

THROTTLE BODY
Test, page 11-393
Cleaning, page 11-394
Removal/Installation, page 11-396

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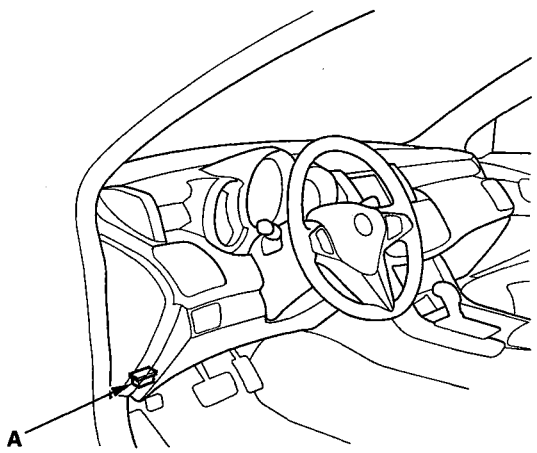
BACK

Throttle Body Test

Carbon Accumulation Check

NOTE: If the malfunction indicator lamp (MIL) has been reported on, check for diagnostic trouble codes (DTCs).

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.

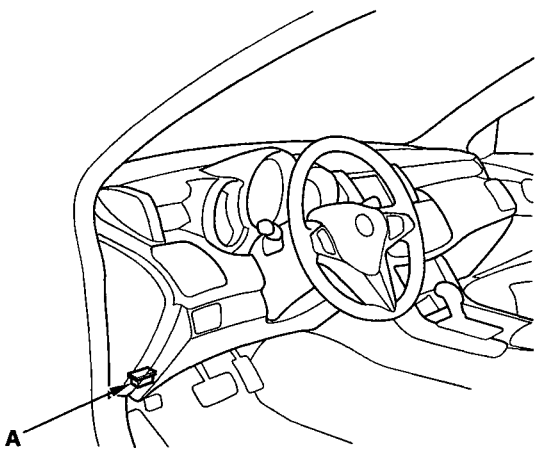


2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Check the REL TP SENSOR in the DATA LIST with the HDS. The reading should be below 2.46 deg. If it is not, clean the throttle body (see page 11-394).

Throttle Position Learning Check

NOTE: If the malfunction indicator lamp (MIL) has been reported on, check for diagnostic trouble codes (DTCs).

1. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch ON (II).
3. Make sure the HDS communicates with the PCM. If it doesn't, go to the DLC circuit troubleshooting (see page 11-229).
4. Select the INSPECTION MENU with the HDS.
5. Do the TP POSITION CHECK in the ETCS TEST. If needed, clean the throttle body (see page 11-394).

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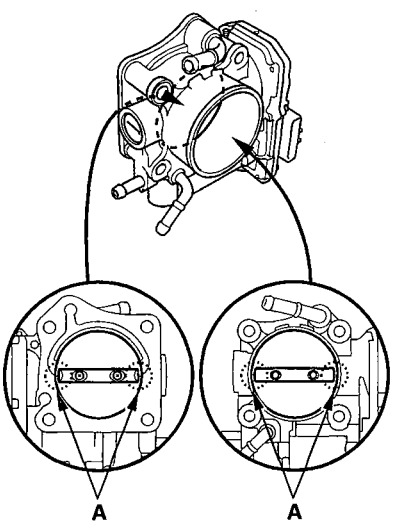
Throttle Body Cleaning

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, you will seriously injure your fingers if the throttle valve is activated.

1. Check for damage to the air cleaner. If the air cleaner is damaged, replace it (see page 11-395).
2. Remove the throttle body (see page 11-396).
3. Clean off the carbon from the throttle valve and inside the throttle body with a paper towel soaked in throttle plate and induction cleaner.

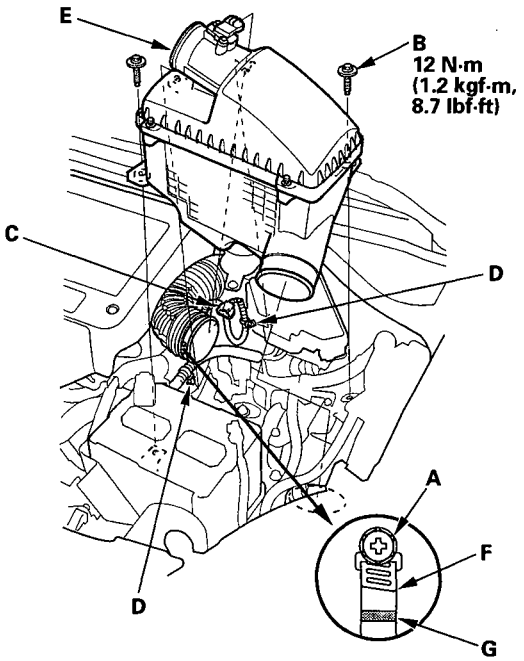
   NOTE:
   - Remove the throttle body to clean it.
   - Be careful not to pinch your fingers.
   - To avoid removing the molybdenum coating, do not clean the bearing area of the throttle shaft (A).
   - Do not spray throttle plate and induction cleaner directly on the throttle body.
   - Use Honda genuine throttle plate and induction cleaner.



4. Install the throttle body (see page 11-396).
5. Reset the PCM with the HDS (see page 11-4).
6. Turn the ignition switch ON (II), and wait for 2 seconds.
7. Do the PCM idle learn procedure (see page 11-339).

Air Cleaner Removal/Installation

1. Remove the battery upper bracket to avoid damaging the air cleaner.
2. Loosen the screw of the hose band (A).



3. Remove the bolts (B).
4. Remove the MAF/IAT sensor connector (C) and harness clamps (D).
5. Remove the air cleaner (E).
6. Install the parts in the reverse order of removal.

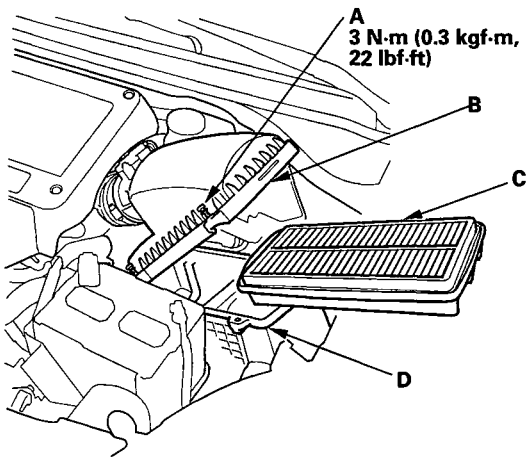
   NOTE: Tigthen the hose band screw (A) until the edge of the hose band (F) goes over the paint mark (G) up to 11 mm.

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BACK

Air Cleaner Element Inspection/ Replacement

1. Loosen the bolts (A), then open the air cleaner housing cover (B).



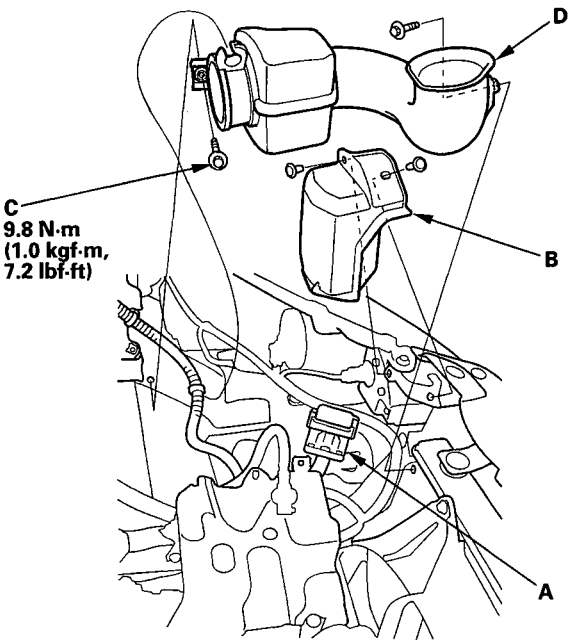
2. Remove the air cleaner element (C) from the air cleaner housing (D).
3. Check the air cleaner element for damage or clogging. If there is damage or clogging, replace the air cleaner element.

   NOTE: Do not use compressed air to clean the air cleaner element.

4. Install the parts in the reverse order of removal. Clean and remove any debris from inside the air cleaner housing.
5. If the maintenance minder indicated air cleaner replacement, reset the maintenance minder (see page 3-9), and this procedure is complete. If the maintenance minder did not indicated air cleaner replacement, go to step 6.
6. Select BODY ELECTRICAL with the HDS.
7. Select ADJUSTMENT in the GAUGES MENU with the HDS.
8. Select RESET in the MAINTENANCE MINDER with the HDS.
9. Select MAINTENANCE SUB ITEM 2 RESET with the HDS.

Resonator Removal/Installation

1. Make sure you have anti-theft code for the audio system and the navigation system (if equipped).
2. Remove the battery and battery tray.
3. Remove the under-hood sub fuse/relay box (A) from the battery base.



4. Remove the air intake cover (B).
5. Remove the bolts (C), then remove the resonator (D).
6. Install the parts in the reverse order of removal.
7. Reinstall the battery, and do the these items:
   - Enter the anti-theft code for the audio system and navigation system (if equipped).
   - Set the clock.

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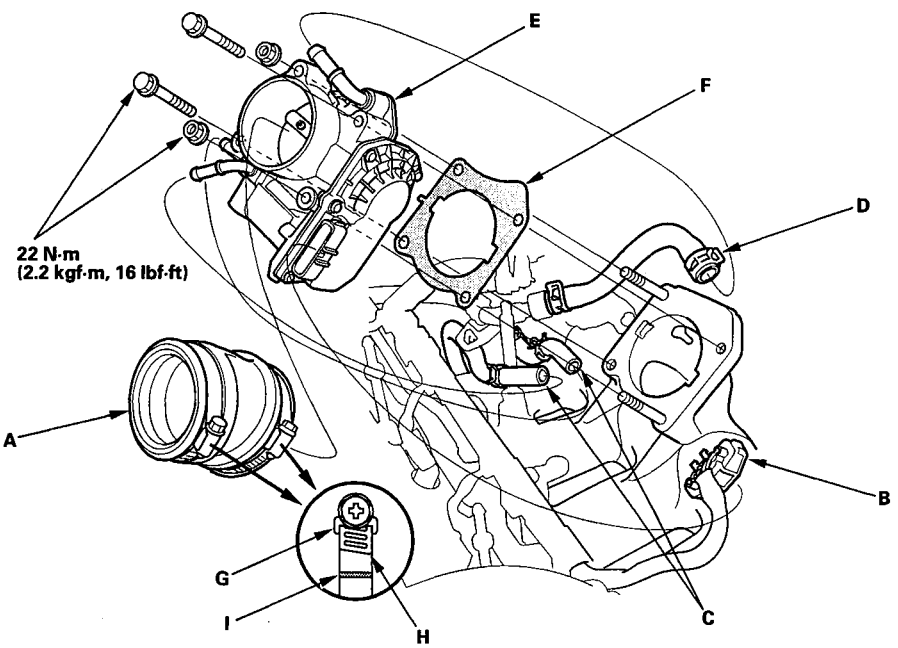
Throttle Body Removal/Installation

⚠CAUTION

Do not insert your fingers into the installed throttle body when you turn the ignition switch ON (II) or while the ignition switch is ON (II). If you do, there will be serious injury to your fingers if the throttle valve is activated.

NOTE: If you are replacing or cleaning the throttle body, start at step 1. If you are removing the throttle body, start at step 4.

1. USA, Canada models: Connect the HDS to the DLC while the engine is stopped.
2. USA, Canada models: Select the INSPECTION MENU on the HDS.
3. USA, Canada models: Do the TP POSITION CHECK in the ETCS TEST.
4. Remove the charge air cooler (see page 9-7), then remove the intake air duct (charge air cooler outlet tube) (A).



5. Disconnect the throttle body connector (B), the water bypass hoses (C), and the vacuum hose (D).

   NOTE: Plug the water bypass hoses after disconnecting them.

6. Remove the throttle body (E).
7. Install the parts in the reverse order of removal with a new gasket (F).

   NOTE: When torquing the screw of the hose band (G), align the edge of the hose band (H) with the mark (I) painted on the hose band. If you tighten the screw over the mark, replace the hose band.

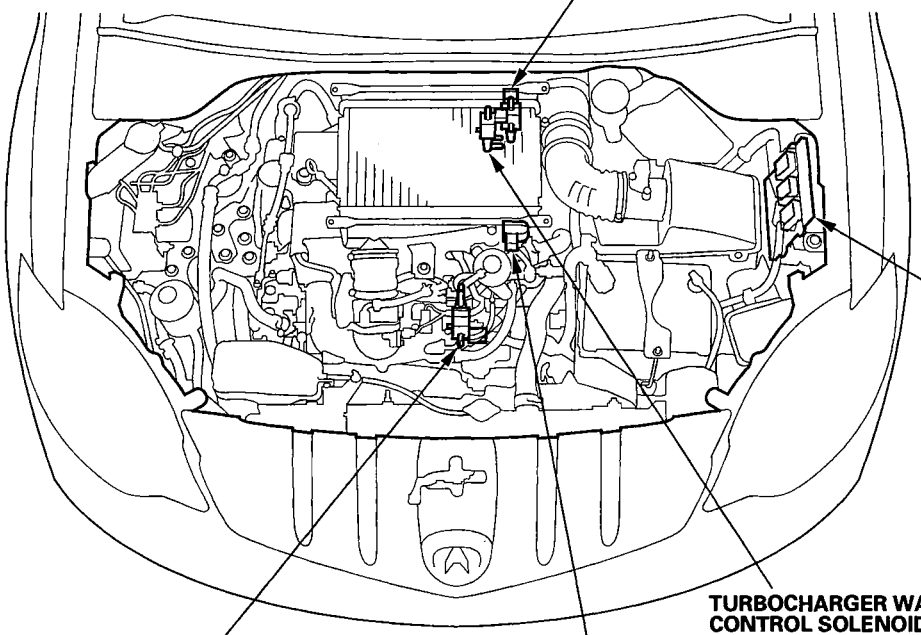
8. Check these items.

   - Do the PCM idle learn procedure after replacing the throttle body (see page 11-339).
   - Refill the radiator with engine coolant (see page 10-7).

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Component Location Index



TURBOCHARGER BOOST CONTROL SOLENOID VALVE
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POWERTRAIN CONTROL MODULE (PCM)
Update, page 11-7
Substitution, page 11-8
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TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE
Inspection, page 11-433
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DTC Troubleshooting

DTC P0034: Turbocharger Bypass Control Solenoid Valve Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

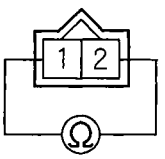
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0034 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the turbocharger bypass control solenoid valve 2P connector.
7. At the solenoid side, measure resistance between turbocharger bypass control solenoid valve 2P connector terminals No.1 and No.2.

TURBOCHARGER BYPASS CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there 30.0 Ω – 34.0 Ω at room temperature?

YES—Go to step 8.

NO—Go to step 16.

8. Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 9.

   NO—Repair short in the wire between the turbocharger bypass control solenoid valve and the fuse. Also replace the blown fuse, then go to step 17.

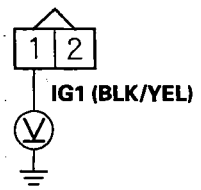
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BACK

9. Turn the ignition switch ON (II).

10. Measure voltage between turbocharger bypass control solenoid valve 2P connector terminal No. 1 and body ground.

TURBOCHARGER BYPASS CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 11.

NO—Repair open in the wire between the turbocharger bypass control solenoid valve and No. 3 IG1 ACG fuse, then go to step 17.

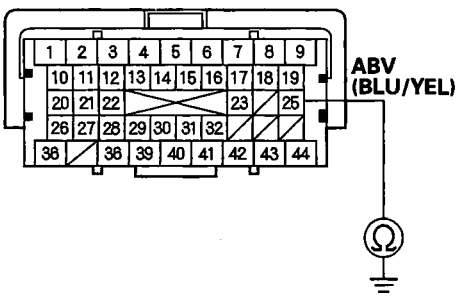
11. Turn the ignition switch OFF.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (44P).

14. Check for continuity between PCM connector terminal C25 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C25) and turbocharger bypass control solenoid valve, then go to step 17.

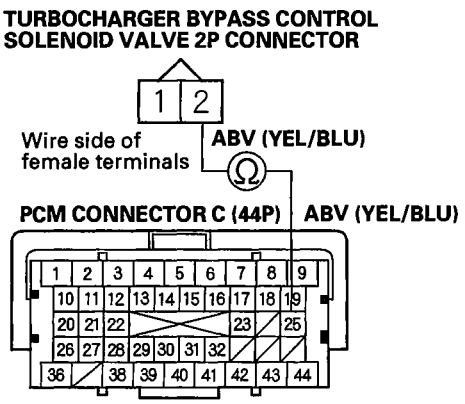
NO—Go to step 15.

(cont'd)

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DTC Troubleshooting (cont'd)

15. Check for continuity between turbocharger bypass control solenoid valve 2P connector terminal No. 2 and PCM connector terminal C25.



Terminal side of female terminals

Is there continuity?

YES—Go to step 24.

NO—Repair open in the wire between the PCM (C25) and turbocharger bypass control solenoid valve, then go to step 17.

16. Replace the turbocharger bypass control solenoid valve (see page 11-432).

17. Reconnect all connectors.

18. Turn the ignition switch ON (II).

19. Reset the PCM with the HDS.

20. Do the PCM idle learn procedure (see page 11-339).

21. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

22. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0034 indicated?

YES—Check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM, then go to step 1.

NO—Go to step 23.

23. Monitor the OBD STATUS for DTC P0034 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 22, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 21.

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24. Reconnect all connectors.

25. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

26. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0034 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 26. If the PCM was substituted, go to step 1.

    NO—Go to step 28.

28. Monitor the OBD STATUS for DTC P0034 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 27, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 26. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 26.

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DTC Troubleshooting (cont'd)

DTC P0035: Turbocharger Bypass Control Solenoid Valve Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0035 indicated?

   YES—Go to step 6.

   NO—Go to step 5.
5. Monitor the OBD STATUS for P0035 in the DTC MENU with the HDS.

   Does the screen indicate PASSED?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger bypass control valve and the PCM. ■

   NO—If the screen indicate FAILED, go to step 6. If the screen indicate NOT COMPLETED, go to step 3 and recheck.
6. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
7. Select the TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.
8. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0035 indicated?

   YES—Check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

   NO—Go to step 9.
9. Monitor the OBD STATUS for P0035 in the DTC MENU with the HDS.

   Does the screen indicate PASSED?

   YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 8, go to the indicated DTC's troubleshooting. ■

   NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger bypass control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 7.

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BACK

DTC P0045: Turbocharger Boost Control Solenoid Valve Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

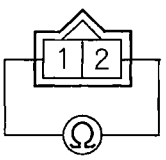
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Engine speed above 3,800 rpm
   - REL TP SENSOR above 59 deg
   - Drive at least 2 seconds
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0045 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger boost control solenoid valve and the PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the turbocharger boost control solenoid valve 2P connector.
8. At the solenoid side, measure resistance between turbocharger boost control solenoid valve 2P connector terminals No. 1 and No. 2.

TURBOCHARGER BOOST CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there 22.0 Ω – 26.0 Ω at room temperature?

YES—Go to step 9.

NO—Go to step 17.

9. Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 10.

   NO—Repair short in the wire between the turbocharger boost control solenoid valve and No. 3 IG1 ACG (15 A) fuse. Also replace the blown fuse, then go to step 18.

(cont'd)

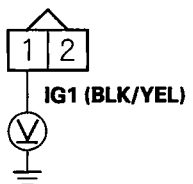
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DTC Troubleshooting (cont'd)

10. Turn the ignition switch ON (II).

11. Measure voltage between turbocharger boost control solenoid valve 2P connector terminal No. 1 and body ground.

TURBOCHARGER BOOST CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 12.

NO—Repair open in the wire between the turbocharger boost control solenoid valve and No. 3 IG1 ACG fuse, then go to step 18.

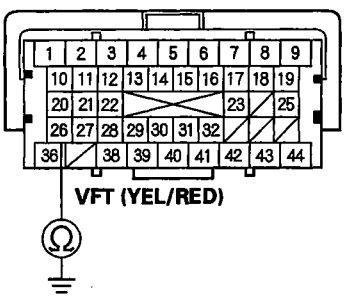
12. Turn the ignition switch OFF.

13. Jump the SCS line with the HDS.

14. Disconnect the PCM connector C (44P).

15. Check for continuity between PCM connector terminal C26 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

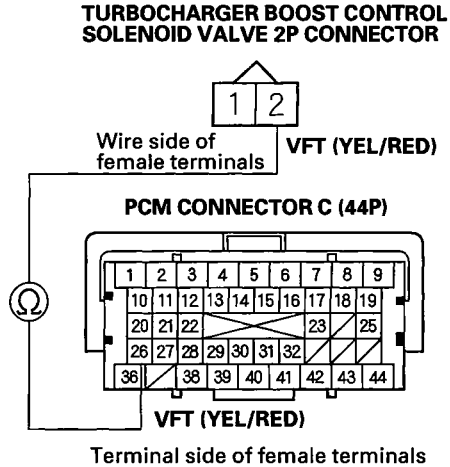
YES—Repair short in the wire between PCM (C26) and turbocharger boost control solenoid valve, then go to step 18.

NO—Go to step 16.

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16. Check for continuity between turbocharger boost control solenoid valve 2P connector terminal No. 2 and PCM connector terminal C26.



Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the PCM (C26) and turbocharger boost control solenoid valve, then go to step 18.

17. Replace the turbocharger boost control solenoid valve (see page 11-436).

18. Reconnect all connectors.

19. Turn the ignition switch ON (II).

20. Reset the PCM with the HDS.

21. Do the PCM idle learn procedure (see page 11-339).

22. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

23. Test-drive under these conditions:

- ECT SENSOR 1 above 158 °F (70 °C)
- Transmission in D position
- Engine speed above 3,800 rpm
- REL TP SENSOR above 59 deg
- Drive at least 2 seconds

24. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0045 indicated?

YES—Check for poor connections or loose terminals at the turbocharger boost control solenoid valve and the PCM, then go to step 1.

NO—Go to step 25.

25. Monitor the OBD STATUS for DTC P0045 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 24, go to the indicated DTC's troubleshooting.■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger boost control solenoid valve and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 22.

(cont'd)

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DTC Troubleshooting (cont'd)

26. Reconnect all connectors.

27. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

28. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

29. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed above 3,800 rpm
    - REL TP SENSOR above 59 deg
    - Drive at least 2 seconds

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0045 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 28. If the PCM was substituted, go to step 1.

    NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0045 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger boost control solenoid valve and the PCM. If the PCM was updated, substitute a known good PCM (see page 11-8), then go to step 28. If PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 28.

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BACK

DTC P0234: Turbocharger Overboost Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If any of the DTCs listed below are indicated at the same time as DTC P0234, troubleshoot those DTCs first, then recheck for P0234.
  P0107, P0108, P1128, P1129: Manifold absolute pressure (MAP) sensor.
  P0236, P0237, P0238: Turbocharger boost sensor.

1. Turn the ignition switch ON (II).

2. Clear the DTC with the HDS.

3. Select the TURBOCHARGER WASTEGATE CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time.■

   NO—Go to step 4.

4. Select TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

   Do you hear the solenoid operating?

   YES—Go to step 5.

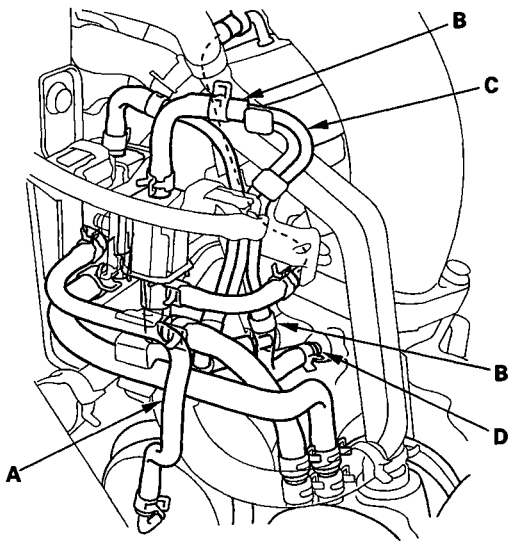
   NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 10.

5. Turn the ignition switch OFF.

6. Remove the charge air cooler (see page 9-7).

7. Check for poor connections, blockage, or damage at these parts:

   - Hose (A) between the turbocharger wastegate control solenoid valve and the turbocharger wastegate control actuator
   - Hoses (B) and pipe (C) between the turbocharger wastegate control solenoid valve and turbocharger
   - Turbocharger port (D)



*: This view is from the rear of the engine compartment.

Are the parts OK?

YES—Go to step 8.

NO—Repair or replace any damaged parts, then go to step 9.

(cont'd)

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DTC Troubleshooting (cont'd)

8. Inspect the turbocharger wastegate control solenoid valve (see page 11-433).

   Is the solenoid valve OK?

   YES—Check the turbocharger (see page 9-11) and turbocharger wastegate control actuator (see page 9-11), make any necessary repairs, then go to step 9.

   NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 9.

9. Reinstall the charge air cooler (see page 9-9).

10. Turn the ignition switch ON (II).

11. Reset the PCM with the HDS.

12. Do the PCM idle learn procedure (see page 11-339).

13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

14. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed above 3,800 rpm
    - REL TP SENSOR above 59 deg
    - Drive at least 2 seconds

15. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0234 indicated?

    YES—Make sure the turbocharger wastegate control solenoid valve, connecting hose, and port are OK, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0236: Turbocharger Boost Sensor Circuit Range/Performance Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the TURBOCHARGER BOOST SENSOR and the BARO SENSOR in the DATA LIST with the HDS.

   Is the difference in value between the sensors 26.7 kPa (7.9 in Hg, 200 mmHg) or more?

   YES—Go to step 9.

   NO—Go to step 3.
3. Note the value of TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Hold the engine speed at 4,500 rpm without load.
6. Check the TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Does the TURBOCHARGER BOOST SENSOR change 0.67 kPa (0.2 in Hg, 5 mmHg) or more?

   YES—Go to step 7.

   NO—Go to step 9.
7. Test-drive the vehicle for several minutes in the range of recorded freeze data parameters:

   - ENGINE SPEED
   - VSS
   - REL TP SENSOR
   - CLV (calculated load value)
   - APP SENSOR
8. Monitor the OBD STATUS for DTC P0236 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger boost pressure sensor and the PCM. If the screen indicates EXECUTING, keep driving until a result come on. If the screen indicates OUT OF CONDITION, go to step 4.
9. Replace the turbocharger boost sensor (see page 11-436).
10. Reset the PCM with the HDS.
11. Do the PCM idle learn procedure (see page 11-339).
12. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.
13. Test-drive the vehicle for several minutes in the range of recorded freeze data parameters:

    - ENGINE SPEED
    - VSS
    - REL TP SENSOR
    - CLV (calculated load value)
    - APP SENSOR
14. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0236 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM, then go to step 1.

    NO—Go to step 15.

(cont'd)

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DTC Troubleshooting (cont'd)

15. Monitor the OBD STATUS for DTC P0236 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 14, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger boost sensor and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 12.

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BACK

DTC P0237: Turbocharger Boost Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Check the TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

   YES—Go to step 3.

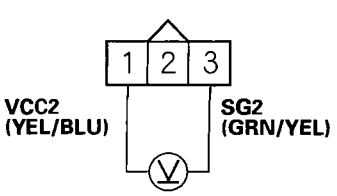
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the turbocharger boost sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Check the TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

   YES—Go to step 12.

   NO—Go to step 7.
7. Measure voltage between turbocharger boost sensor 3P connector terminals No. 1 and No. 3.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Wire side of female terminals

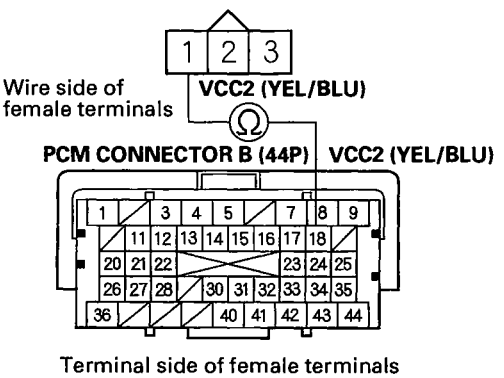
Is there about 5 V?

YES—Go to step 16.

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (44P).
11. Check for continuity between PCM connector terminal B18 and turbocharger boost sensor 3P connector terminal No. 1.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the PCM (B18) and the turbocharger boost sensor, then go to step 18.

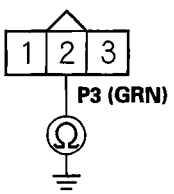
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DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector C (44P).
15. Check for continuity between turbocharger boost sensor 3P connector terminal No. 2 and body ground.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C10) and the turbocharger boost sensor, then go to step 18.

NO—Go to step 23.

16. Turn the ignition switch OFF.
17. Replace the turbocharger boost sensor (see page 11-436).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0237 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■
23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
25. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0237 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P0238: Turbocharger Boost Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

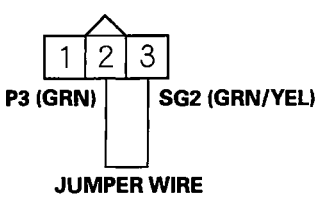
1. Turn the ignition switch ON (II).
2. Check the TURBOCHARGER BOOST SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the turbocharger boost sensor 3P connector.
5. Connect turbocharger boost sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Wire side of female terminals

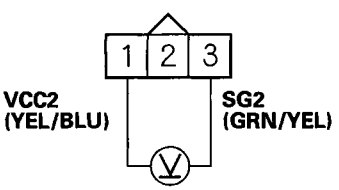
6. Turn the ignition switch ON (II).
7. Check the TURBO BOOST SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 18.
8. Remove the jumper wire from the turbocharger boost sensor 3P connector.
9. Measure voltage between turbocharger boost sensor 3P connector terminals No. 1 and No. 3.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 14.

NO—Go to step 10.

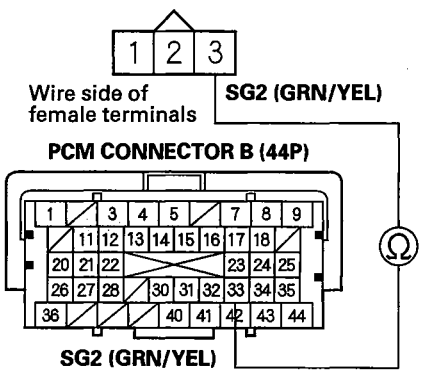
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DTC Troubleshooting (cont'd)

10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect PCM connector B (44P).
13. Check for continuity between PCM connector terminal B33 and turbocharger boost sensor 3P connector terminal No. 3.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Terminal side of female terminals

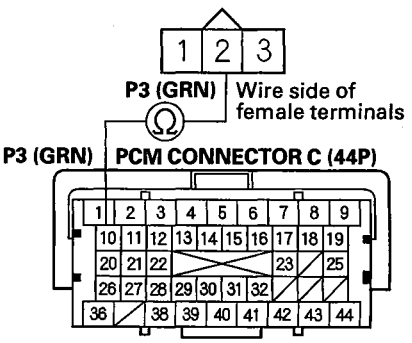
Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the PCM (B33) and the turbocharger boost sensor, then go to step 20.

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect PCM connector C (44P).
17. Check for continuity between PCM connector terminal C10 and turbocharger boost sensor 3P connector terminal No. 2.

TURBOCHARGER BOOST SENSOR 3P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the PCM (C10) and the turbocharger boost sensor, then go to step 20.

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BACK

18. Turn the ignition switch OFF.

19. Replace the turbocharger boost sensor (see page 11-436).

20. Reconnect all connectors.

21. Turn the ignition switch ON (II).

22. Reset the PCM with the HDS.

23. Do the PCM idle learn procedure (see page 11-339).

24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0238 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

25. Reconnect all connectors.

26. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0238 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger boost sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then recheck. If the PCM was substituted, go to step 1.

    NO—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P0243: Turbocharger Wastegate Control Solenoid Valve Circuit Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

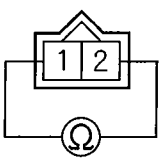
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Engine speed above 3,800 rpm
   - REL TP SENSOR above 59 deg
   - Drive at least 2 seconds
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0243 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the turbocharger wastegate control solenoid valve and the PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the turbocharger wastegate control solenoid valve 2P connector.
8. At the solenoid side, measure resistance between turbocharger wastegate control solenoid valve 2P connector terminals No. 1 and No. 2.

TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there 22.0—26.0 Ω at room temperature?

YES—Go to step 9.

NO—Go to step 17.

9. Check the No. 3 IG1 ACG (15 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 10.

   NO—Repair short in the wire between the turbocharger wastegate control solenoid valve and No. 3 IG1 ACG (15 A) fuse. Also replace the blown fuse, then go to step 18.

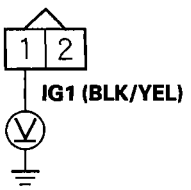
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BACK

10. Turn the ignition switch ON (II).

11. Measure voltage between turbocharger wastegate control solenoid valve 2P connector terminal No. 1 and body ground.

TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 12.

NO—Repair open in the wire between the turbocharger wastegate control solenoid valve and No. 3 IG1 ACG (15 A) fuse, then go to step 18.

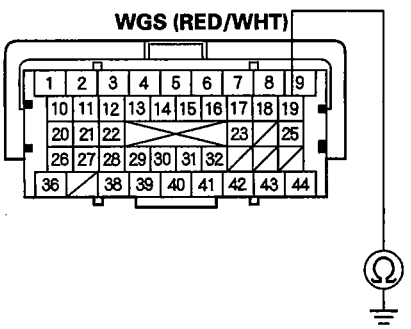
12. Turn the ignition switch OFF.

13. Jump the SCS line with the HDS.

14. Disconnect PCM connector C (44P).

15. Check for continuity between PCM connector terminal C19 and body ground.

PCM CONNECTOR C (44P)



Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C19) and turbocharger wastegate control solenoid valve, then go to step 18.

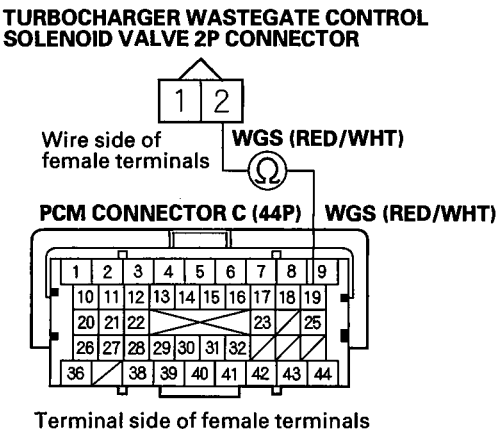
NO—Go to step 16.

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DTC Troubleshooting (cont'd)

16. Check for continuity between turbocharger wastegate control solenoid valve 2P connector terminal No. 2 and PCM connector terminal C19.



Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the PCM (C19) and the turbocharger wastegate control solenoid valve, then go to step 18.

17. Replace the turbocharger wastegate control solenoid valve (see page 11-434).

18. Reconnect all connectors.

19. Turn the ignition switch ON (II).

20. Reset the PCM with the HDS.

21. Do the PCM idle learn procedure (see page 11-339).

22. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

23. Test-drive under these conditions:

- ECT SENSOR 1 above 158 °F (70 °C)
- Transmission in D position
- Engine speed above 3,800 rpm
- REL TP SENSOR above 59 deg
- Drive at least 2 seconds

24. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0243 indicated?

YES—Check for poor connections or loose terminals at the turbocharger wastegate control solenoid valve and the PCM, then go to step 1.

NO—Go to step 25.

25. Monitor the OBD STATUS for DTC P0243 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 24, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger wastegate control solenoid valve and the PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 22.

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BACK

26. Reconnect all connectors.

27. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

28. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

29. Test-drive under these conditions:

    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Engine speed above 3,800 rpm
    - REL TP SENSOR above 59 deg
    - Drive at least 2 seconds

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0243 indicated?

    YES—Check for poor connections or loose terminals at the turbocharger wastegate control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 28. If the PCM was substituted, go to step 1.

    NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0243 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the turbocharger wastegate control solenoid valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 28. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 28.

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DTC Troubleshooting (cont'd)

DTC P0299: Turbocharger Underboost Problem

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Inspect the air cleaner element (see page 11-395).

   Is the air cleaner element clogged?

   YES—Replace the air cleaner element (see page 11-395), then go to step 18.

   NO—Go to step 2.

2. Check for leak or damage at these parts.

   - Intake air duct (turbocharger outlet pipe)
   - Intake air duct (charge air cooler inlet hose)
   - Intake air duct (charge air cooler outlet tube)

   Are the parts OK?

   YES—Go to step 3.

   NO—Repair or replace the damaged parts, then go to step 18.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Select the TURBOCHARGER BYPASS CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 11.

   NO—Go to step 6.

6. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

   Do you hear the solenoid operating?

   YES—Go to step 7.

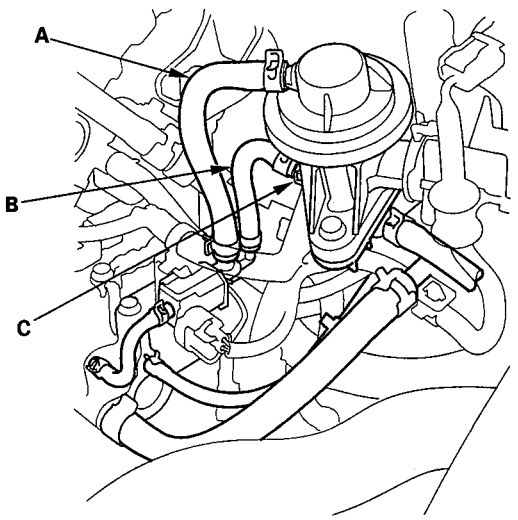
   NO—Replace the turbocharger bypass control solenoid valve (see page 11-432), then go to step 18.

7. Turn the ignition switch OFF.

8. Remove the charge air cooler cover (see step 1 on page 9-8).

9. Check for poor connections, blockage, or damage at these parts.

   - Hose (A) between the turbocharger bypass control solenoid valve and the turbocharger bypass control valve
   - Hose (B) between the turbocharger bypass control solenoid valve and the turbocharger bypass control valve base
   - Turbocharger bypass control valve base port (C)



   Are the parts OK?

   YES—Go to step 10.

   NO—Repair or replace any damaged parts, then go to step 18.

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BACK

10. Inspect the turbocharger bypass control solenoid valve (see page 11-431).

    Is the solenoid valve OK?

    YES—Inspect the turbocharger bypass control valve (see page 9-10).

    NO—Replace the turbocharger bypass control solenoid valve (see page 11-432), then go to step 18.

11. Select the TURBOCHARGER WASTEGATE CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Go to step 12.

    NO—Go to step 13.

12. Check for clogging or damaged in these parts:

    - Turbocharger (see page 9-11)
    - Warm up TWC (see page 11-440)
    - Under-floor TWC (see page 11-443)
    - Exhaust pipe (see page 9-23)

    Are the parts OK?

    YES—Intermittent failure, the system is OK at this time.■

    NO—Repair or replace any damaged parts, then go to step 18.

13. Select TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

    Do you hear the solenoid operating?

    YES—Go to step 14.

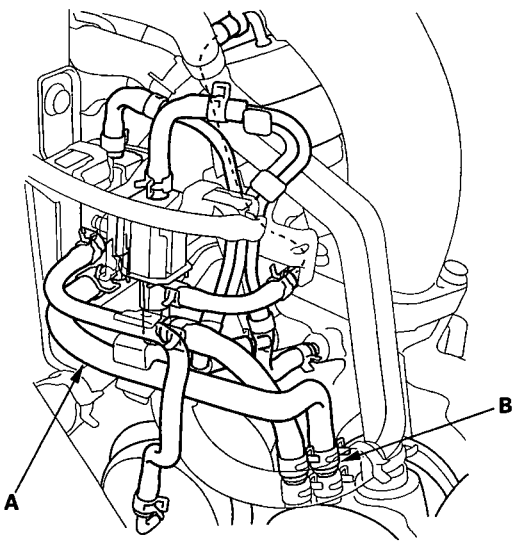
    NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 18.

14. Turn the ignition switch OFF.

15. Remove the charge air cooler (see page 9-7).

16. Check for blockage or clogging at these parts:

    - Hose (A) between the turbocharger wastegate control solenoid valve and intake air duct (turbocharger inlet connecting tube)
    - Intake air duct (turbocharger inlet connecting tube) port (B)



*: This view is from the rear of the engine compartment.

    Are the parts OK?

    YES—Go to step 17.

    NO—Repair or replace any damaged parts, then go to step 18.

17. Inspect the turbocharger wastegate control solenoid valve (see page 11-433).

    Is the solenoid valve OK?

    YES—Check the turbocharger (see page 9-11) and turbocharger wastegate control actuator (see page 9-11). Repair or replace any faulty parts, then go to step 18.

    NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 18.

(cont'd)

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DTC Troubleshooting (cont'd)

18. Install the parts in the reverse order of removal.

19. Turn the ignition switch ON (II).

20. Reset the PCM with the HDS.

21. Do the PCM idle learn procedure (see page 11-339).

22. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

23. Test-drive under these conditions:

    - Engine speed above 3,800 rpm
    - REL TP SENSOR above 59 deg
    - Transmission in D position
    - Drive at least 4 seconds

24. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0229 indicated?

    YES—Check the turbocharger bypass control solenoid valve, turbocharger wastegate control solenoid valve, and its connecting hose and port, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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BACK

DTC P1233: Turbocharger Boost Sensor/ BARO Sensor Incorrect Correlation

DTC P1234: Turbocharger Boost Sensor/MAP Sensor Incorrect Correlation

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P1233 is indicated alone, do the troubleshooting for DTC P0236 and P2227 using freeze data from P1233. If DTC P1234 is indicated alone, do the troubleshooting for DTC P0236, P1128, and P1129 using freeze data from P1234.
- If any of the DTCs listed below are indicated at the same time as DTC P1233 and/or P1234, troubleshoot those DTCs first, then recheck for P1233 and/or P1234.

P0236: Turbocharger boost sensor
P1128, P1129: Manifold absolute pressure (MAP) sensor
P2227: Barometric pressure (BARO) sensor

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DTC Troubleshooting (cont'd)

DTC P2261: Turbocharger Bypass Control Valve Stuck Closed

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select TURBOCHARGER BYPASS CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time.■

   NO—Go to step 4.
4. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

   Do you hear the solenoid operating?

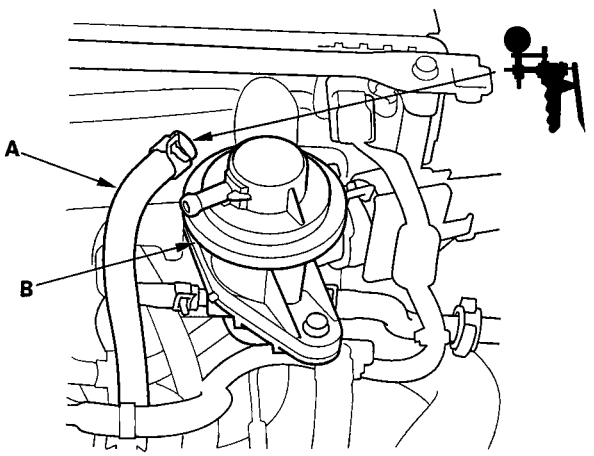
   YES—Go to step 5.

   NO—Go to step 9.
5. Turn the ignition switch OFF.
6. Check for clogging at the air bypass outlet pipe (see page 9-7).

   Is the pipe OK?

   YES—Go to step 8.

   NO—Repair the pipe, then go to step 10.
7. Disconnect the vacuum/pressure hose (A) from the turbocharger bypass control valve (B), then connect the vacuum pump/gauge, 0—30 in.Hg, as shown.



8. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

   Is there vacuum?

   YES—Inspect the turbocharger bypass control valve (see page 9-10).

   NO—Go to step 9.

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9. Replace the turbocharger bypass control solenoid valve (see page 11-431).

10. Turn the ignition switch ON(II).

11. Reset the PCM with the HDS.

12. Do the PCM idle learn procedure (see page 11-339).

13. Test-drive under these conditions:

    - Engine speed above 4,500 rpm
    - Accelerate with throttle fully open, then decelerate with throttle fully closed at least 3 seconds

14. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2261 indicated?

    YES—Check the turbocharger bypass control solenoid valve and its connecting hose, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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DTC Troubleshooting (cont'd)

DTC P2263: Turbocharger Boost System Performance Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P0229 is stored at the same time as DTC P2263, troubleshoot DTC P0229 first, then recheck for DTC P2263.

1. Inspect the air cleaner element (see page 11-395).

   Is the air cleaner element clogged?

   YES—Replace the air cleaner element (see page 11-395), then go to step 26.

   NO—Go to step 2.

2. Check for leak or damage at these parts.

   - Intake air duct (turbocharger outlet pipe)
   - Intake air duct (charger air cooler inlet hose)
   - Intake air duct (charger air cooler outlet tube)

   Are the parts OK?

   YES—Go to step 3.

   NO—Repair or replace the damaged parts, then go to step 26.

3. Turn the ignition switch ON (II).

4. Check the TURBOCHARGER BOOST SENSOR and BARO SENSOR in the DATA LIST with the HDS.

   Does the value of TURBOCHARGER BOOST SENSOR and BARO SENSOR differ 6.8 kPa (2.0 in.Hg, 50 mmHg) or more?

   YES—Replace the turbocharger boost sensor (see page 11-436), then go to step 26.

   NO—Go to step 5.

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BACK

5. Clear the DTC with the HDS.

6. Select TURBOCHARGER BYPASS CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 12.

   NO—Go to step 7.

7. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

   Do you hear the solenoid operating?

   YES—Go to step 8.

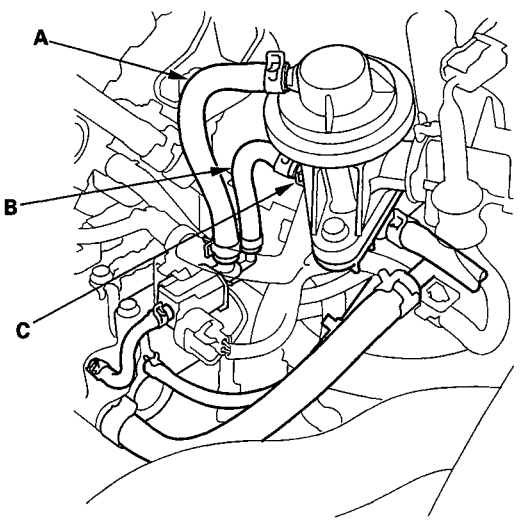
   NO—Replace the turbocharger bypass control solenoid valve (see page 11-432), then go to step 26.

8. Turn the ignition switch OFF.

9. Remove the charge air cooler cover (see step 1 on page 9-8).

10. Check for poor connections, blockage, or damage at these parts.

    - Hose (A) between the turbocharger bypass control solenoid valve and the turbocharger bypass control valve
    - Hose (B) between the turbocharger bypass control solenoid valve and the turbocharger bypass control valve
    - Turbocharger bypass control valve base port (C)



    Are the parts OK?

    YES—Go to step 11.

    NO—Repair or replace any damaged parts, then go to step 26.

11. Inspect the turbocharger bypass control solenoid valve (see page 11-431).

    Is the solenoid valve OK?

    YES—Inspect the turbocharger bypass control valve (see page 9-10). If the turbocharger bypass control valve is faulty, replace the turbocharger bypass control valve, then go to step 26. If the turbocharger bypass control valve is OK, go to step 12.

    NO—Replace the turbocharger bypass control solenoid valve (see page 11-432), then go to step 26.

(cont'd)

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DTC Troubleshooting (cont'd)

12. Select the TURBOCHARGER WASTEGATE CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Go to step 18.

    NO—Go to step 13.

13. Select the TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

    Do you hear the solenoid operating?

    YES—Go to step 14.

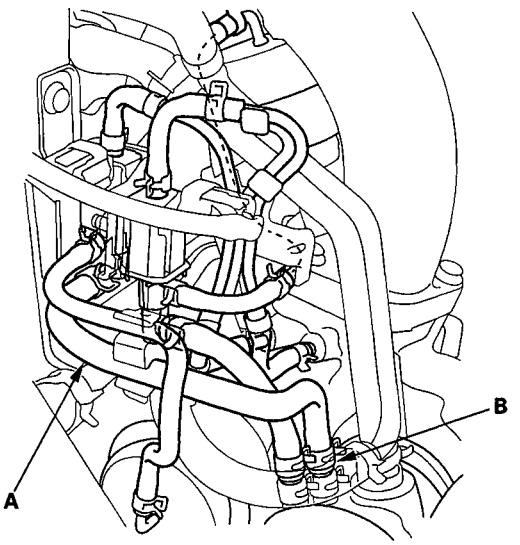
    NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 26.

14. Turn the ignition switch OFF.

15. Remove the charge air cooler (see page 9-7).

16. Check for blockage or clogging at these parts.

    - Hose (A) between the turbocharger wastegate control solenoid valve and Intake air duct (turbocharger inlet connecting tube)
    - Intake air duct (turbocharger inlet connecting tube) port (B)



*: This view is from the rear of the engine compartment.

Are the parts OK?

YES—Go to step 17.

NO—Repair or replace any damaged parts, then go to step 26.

17. Inspect the turbocharger wastegate control solenoid valve (see page 11-433).

    Is the solenoid valve OK?

    YES—Check the turbocharger (see page 9-11), and turbocharger wastegate control actuator (see page 9-11). If the turbocharger or the turbocharger wastegate control actuator is faulty, replace the faulty parts, then go to step 26. If the turbocharger and the turbocharger wastegate actuator are OK, go to step 18.

    NO—Replace the turbocharger wastegate control solenoid valve (see page 11-434), then go to step 26.

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18. Clear the DTC with the HDS.

19. Select the TURBOCHARGER BOOST CONTROL SYSTEM TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Go to step 20.

    NO—Go to step 21.

20. Check for clogging or damaged in these parts.

    - Turbocharger (see page 9-11).
    - Warm up TWC (see page 11-440).
    - Under-floor TWC (see page 11-443).
    - Exhaust pipe (see page 9-23).

    Are the parts OK?

    YES—Intermittent failure, the system is OK at this time.■

    NO—Repair or replace any damaged parts, then go to step 26.

21. Select TURBOCHARGER BOOST CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

    Do you hear the solenoid operating?

    YES—Go to step 22.

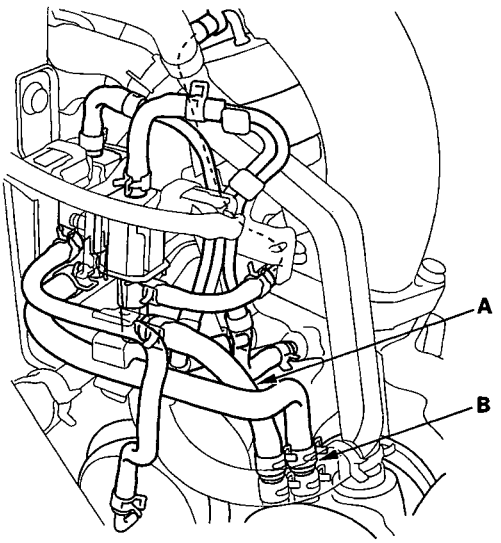
    NO—Replace the turbocharger boost control solenoid valve (see page 11-436), then go to step 26.

22. Turn the ignition switch OFF.

23. Remove the charge air cooler (see page 9-7).

24. Check for blockage or clogging at these parts.

    - Hose (A) between the turbocharger boost control solenoid valve and intake air duct (turbocharger inlet connecting tube)
    - Intake air duct (turbocharger inlet connecting tube) port (B)



*: This view is from the rear of the engine compartment.

    Are the parts OK?

    YES—Go to step 25.

    NO—Repair or replace any damaged parts, then go to step 26.

25. Inspect the turbocharger boost control solenoid valve (see page 11-435).

    Is the solenoid valve OK?

    YES—Check the turbocharger (see page 9-11), and turbocharger boost control actuator (see page 9-11). Replace the turbocharger or turbocharger boost control actuator if they are faulty, then go to step 26.

    NO—Replace the turbocharger boost control solenoid valve (see page 11-436), then go to step 26.

(cont'd)

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DTC Troubleshooting (cont'd)

26. Reinstall all parts.
27. Turn the ignition switch ON (II).
28. Reset the PCM with the HDS.
29. Do the PCM idle learn procedure (see page 11-339).
30. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
31. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Engine speed above 1,500 rpm
    - Accelerate for 2 seconds or more (under half throttle) at least 10 times
32. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2263 indicated?

    YES—Check the turbocharger boost sensor, the turbocharger bypass control solenoid valve, the turbocharger wastegate control solenoid valve, the turbocharger boost control solenoid valve, and its connecting hose and port, then go to step 1.

    NO—Troubleshooting is complete. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

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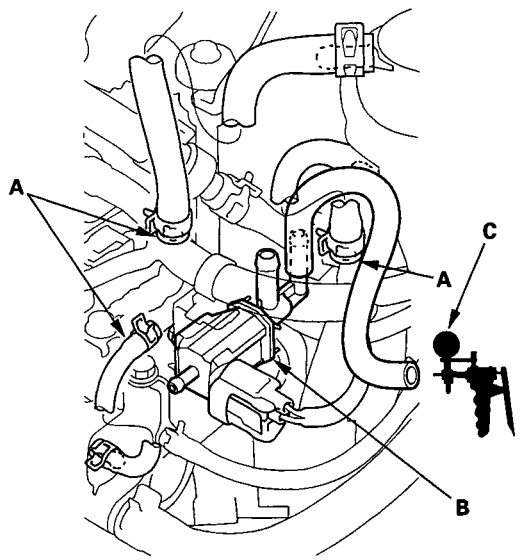
BACK

Turbocharger Bypass Control Solenoid Valve Inspection

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equipment, commercially available

1. Remove the charge air cooler cover (see step 1 on page 9-8).

2. Disconnect the hoses (A) from the turbocharger bypass control solenoid valve (B), and connect the vacuum pump/gauge, 0—30 in.Hg (C) to the solenoid valve as shown.



3. Apply vacuum to the port.

   - If it holds vacuum, release the vacuum, then go to step 4.
   - If it doesn't hold vacuum, replace the turbocharger bypass control solenoid valve (see page 11-432).

4. Turn the ignition switch ON (II).

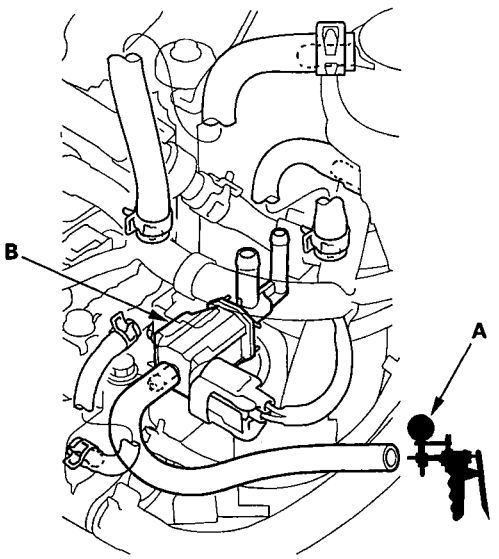
5. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

6. Reapply vacuum to the port.

   - If it holds vacuum, replace the turbocharger bypass control solenoid valve (see page 11-432).
   - If it doesn't hold vacuum, go to step 7.

7. Turn the ignition switch OFF, then remove the vacuum pump/gauge from the turbocharger bypass control solenoid valve.

8. Connect the vacuum pump/gauge, 0—30 in.Hg (A) to the turbocharger bypass control solenoid valve (B) as shown.



9. Apply vacuum to the port.

   - If it holds vacuum, replace the turbocharger bypass control solenoid valve (see page 11-432).
   - If it doesn't hold vacuum, go to step 10.

10. Turn the ignition switch ON (II).

11. Select TURBOCHARGER BYPASS CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

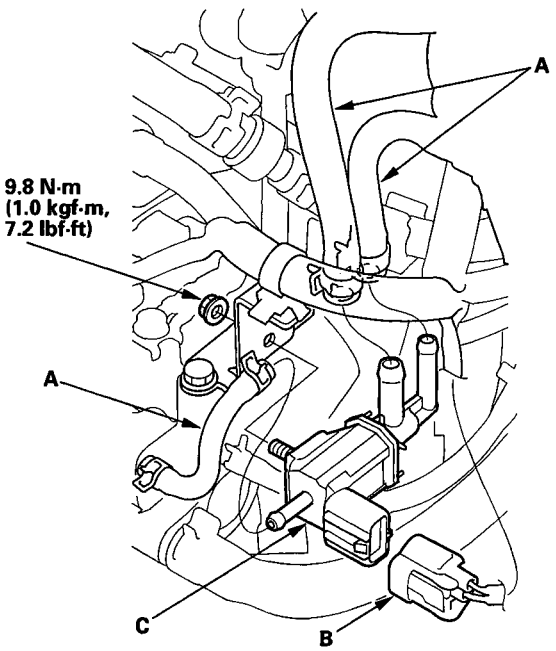
12. Reapply vacuum to the port.

    - If it holds vacuum, the turbocharger bypass control solenoid valve is OK.
    - If it doesn't hold vacuum, replace the turbocharger bypass control solenoid valve (see page 11-432).

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Turbocharger Bypass Control Solenoid Valve Replacement

1. Remove the charge air cooler cover (see step 1 on page 9-8).
2. Disconnect the hoses (A).



3. Disconnect the turbocharger bypass control solenoid valve connector (B).
4. Remove the turbocharger bypass control solenoid valve (C).
5. Install the parts in the reverse order of removal.

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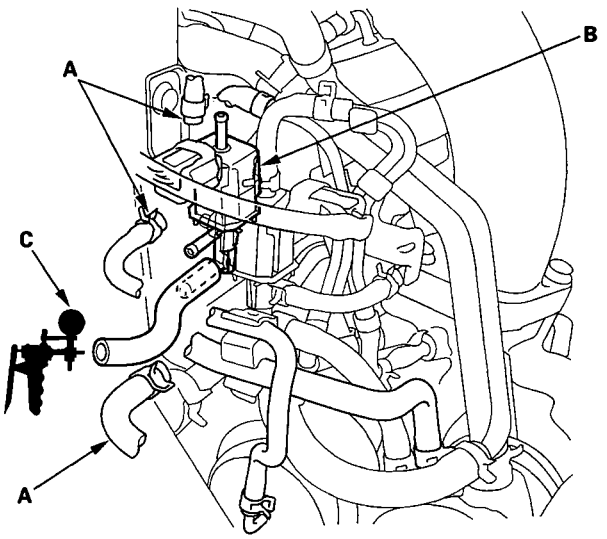
BACK

Turbocharger Wastegate Control Solenoid Valve Inspection

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equipment, commercially available

1. Remove the charge air cooler (see page 9-7).

2. Disconnect the hoses (A) from the turbocharger wastegate control solenoid valve (B), and connect the vacuum pump/gauge, 0—30 in.Hg (C) to the solenoid valve as shown.



*: This view is from the rear of the engine compartment.

3. Apply vacuum to the port.

   - If it holds vacuum, release the vacuum, then go to step 4.
   - If it doesn't hold vacuum, replace the turbocharger wastegate control solenoid valve (see page 11-434).

4. Turn the ignition switch ON (II).

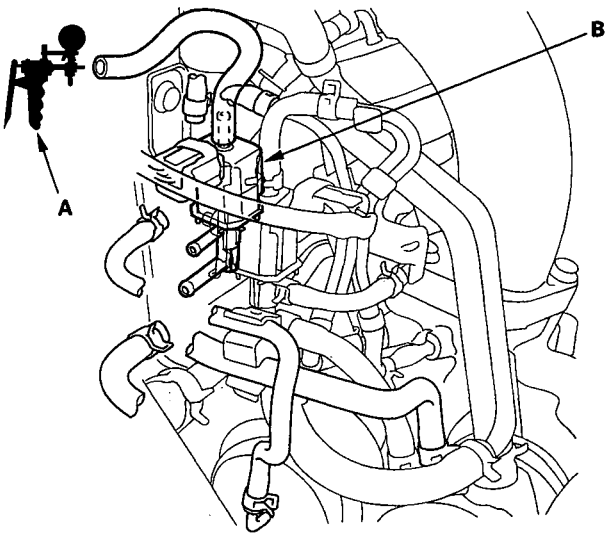
5. Select TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

6. Reapply vacuum to the port.

   - If it holds vacuum, replace the turbocharger wastegate control solenoid valve (see page 11-434).
   - If it doesn't hold vacuum, go to step 7.

7. Turn the ignition switch OFF, then remove the vacuum pump/gauge from the turbocharger wastegate control solenoid valve.

8. Connect the vacuum pump/gauge, 0—30 in.Hg (A) to the turbocharger wastegate control solenoid valve (B) as shown.



*: This view is from the rear of the engine compartment.

9. Apply vacuum to the port.

   - If it holds vacuum, replace the turbocharger wastegate control solenoid valve (see page 11-434).
   - If it doesn't hold vacuum, go to step 10.

10. Turn the ignition switch ON (II).

11. Select TURBOCHARGER WASTEGATE CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

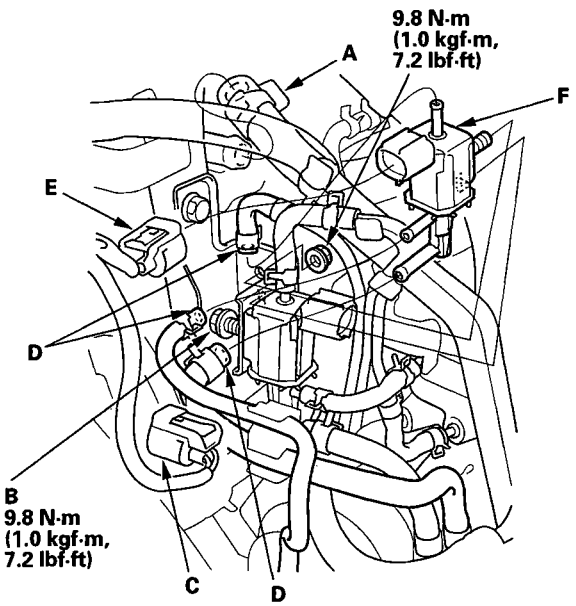
12. Reapply vacuum to the port.

    - If it holds vacuum, replace the turbocharger wastegate control solenoid valve (see page 11-434).
    - If it doesn't hold vacuum, the turbocharger wastegate control solenoid valve is OK.

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Turbocharger Wastegate Control Solenoid Valve Replacement

1. Remove the charge air cooler (see page 9-7).
2. Disconnect the breather hose (A).



*: This view is from the rear of the engine compartment.

3. Loosen the nut (B), and disconnect the turbocharger boost control solenoid valve connector (C).
4. Disconnect the hoses (D), and the turbocharger wastegate control solenoid valve connector (E).
5. Remove the turbocharger wastegate control solenoid valve (F).
6. Install the parts in the reverse order of removal.

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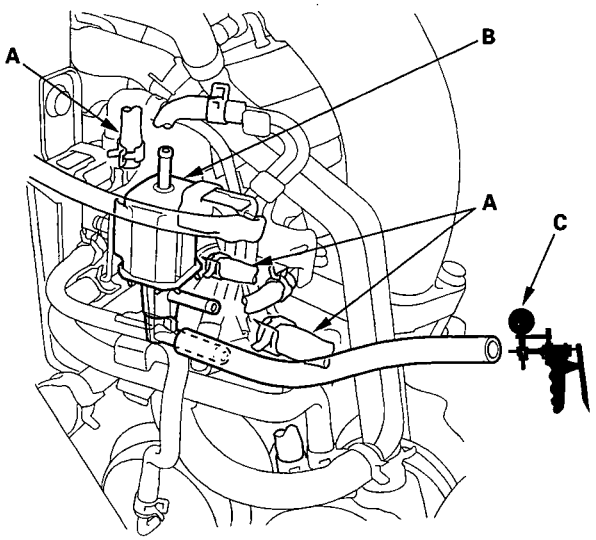
BACK

Turbocharger Boost Control Solenoid Valve Inspection

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equipment, commercially available

1. Remove the charge air cooler (see page 9-7).

2. Disconnect the hoses (A) from the turbocharger boost control solenoid valve (B), and connect the vacuum pump/gauge, 0—30 in.Hg (C) to the solenoid valve as shown.



*: This view is from the rear of the engine compartment.

3. Apply vacuum to the port.

   - If it holds vacuum, release the vacuum, then go to step 4.
   - If it doesn't hold vacuum, replace the turbocharger boost control solenoid valve (see page 11-436).

4. Turn the ignition switch ON (II).

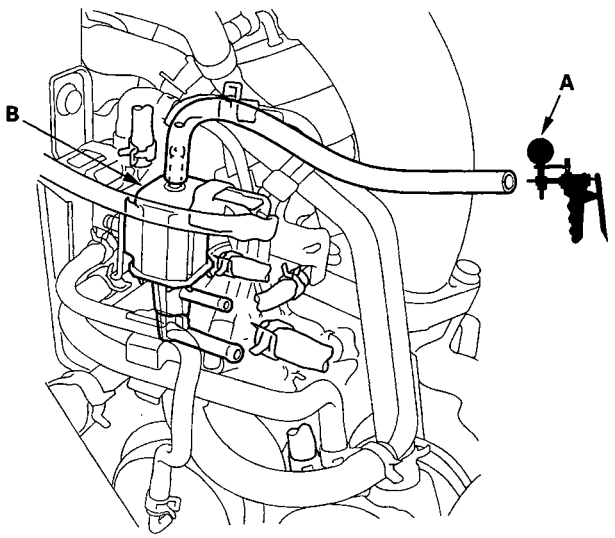
5. Select TURBOCHARGER BOOST CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

6. Reapply vacuum to the port.

   - If it holds vacuum, replace the turbocharger boost control solenoid valve (see page 11-436).
   - If it doesn't hold vacuum, go to step 7.

7. Turn the ignition switch OFF, then remove the vacuum pump/gauge from the turbocharger boost control solenoid valve.

8. Connect the vacuum pump/gauge, 0—30 in.Hg (A) to the turbocharger boost control solenoid valve (B) as shown.



*: This view is from the rear of the engine compartment.

9. Apply vacuum to the port.

   - If it holds vacuum, replace the turbocharger boost control solenoid valve (see page 11-436).
   - If it doesn't hold vacuum, go to step 10.

10. Turn the ignition switch ON (II).

11. Select TURBOCHARGER BOOST CONTROL SOLENOID VALVE ON in the INSPECTION MENU with the HDS.

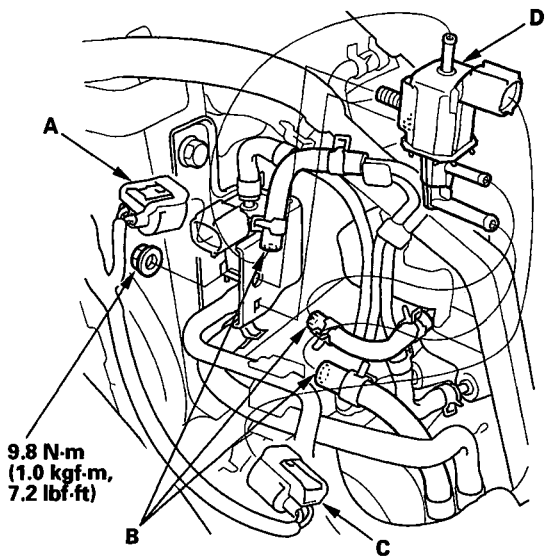
12. Reapply vacuum to the port.

    - If it holds vacuum, the turbocharger boost control solenoid valve is OK.
    - If it doesn't hold vacuum, replace the turbocharger boost control solenoid valve (see page 11-436).

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Turbocharger Boost Control Solenoid Valve Replacement

1. Remove the charge air cooler (see page 9-7).
2. Disconnect the turbocharger wastegate control solenoid valve connector (A).

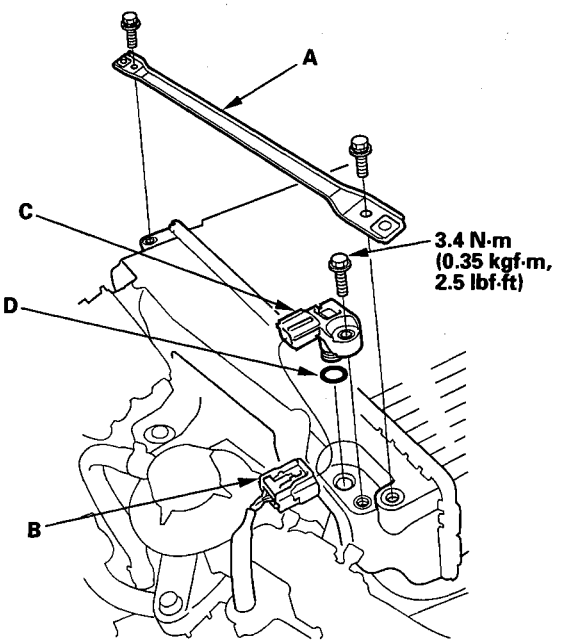


*: This view is from the rear of the engine compartment.

3. Disconnect the hoses (B), and the turbocharger boost control valve connector (C).
4. Remove the turbocharger boost control solenoid valve (D).
5. Install the parts in the reverse order of removal.

Turbocharger Boost Sensor Replacement

1. Remove the charge air cooler cover (see step 1 on page 9-8).
2. Remove the charge air cooler cover stay (A).

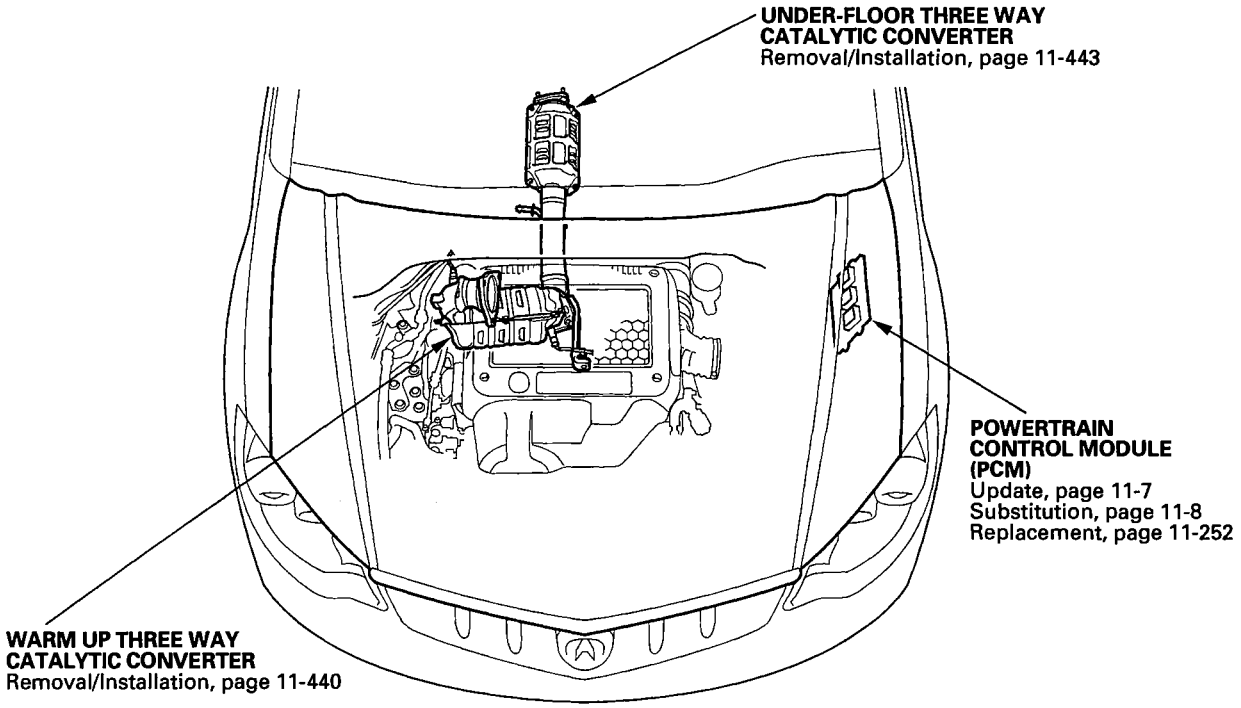


3. Disconnect the turbocharger boost sensor connector (B).
4. Remove the turbocharger boost sensor (C).
5. Install the parts in the reverse order of removal with a new O-ring (D).

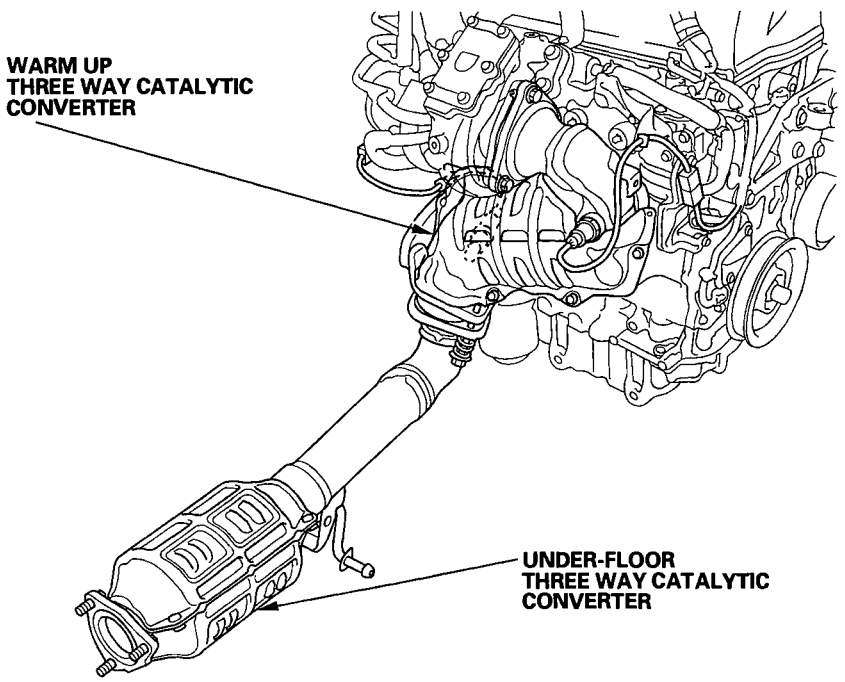
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BACK

Component Location Index



ENGINE REAR VIEW



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DTC Troubleshooting

DTC P0420: Catalyst System Efficiency Below Threshold

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- Poor quality fuel may cause this DTC.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - ECT SENSOR 1 above 158 °F (70 °C)
   - Transmission in D position
   - Vehicle speed between 45—75 mph (72—120 km/h) for 5 minutes or more with cruise control set
   - Maintain the vehicle speed at 55 mph (88 km/h) for 5 minutes or more with cruise control set
5. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate EXECUTING?

   YES—Go to step 6.

   NO—If the screen indicates OUT OF CONDITION, go to step 4 and recheck. If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates FAILED, go to step 8.
6. Continue test driving until a result comes on.
7. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 8.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 4 and recheck.
8. Turn the ignition switch OFF.
9. Replace the WU-TWC (see page 11-440).
10. Turn the ignition switch ON (II).
11. Reset the PCM with the HDS.
12. Do the PCM idle learn procedure (see page 11-339).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
14. Test-drive for about 10 minutes, varying the vehicle speed.
15. Check the CATA MONITOR CONDITION in the DATA LIST with the HDS.

    Is the temperature OK?

    YES—Go to step 16.

    NO—Go to step 13 and recheck.
16. Test-drive under these conditions:
    - ECT SENSOR 1 above 158 °F (70 °C)
    - Transmission in D position
    - Vehicle speed at 55 mph (88 km/h) for 5 minutes or more with cruise control set

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17. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate EXECUTING?

    YES—Go to step 18.

    NO—Go to step 16 and recheck.

18. Continue test-driving until a result comes on.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—Go to the indicated DTC's troubleshooting. ■

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

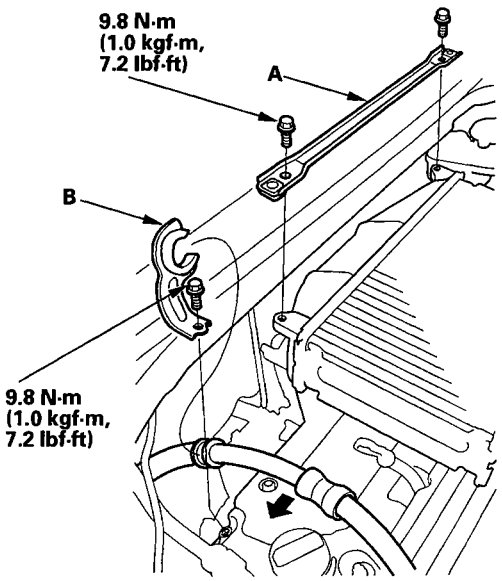
    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check the fuel quality. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 13 and recheck.

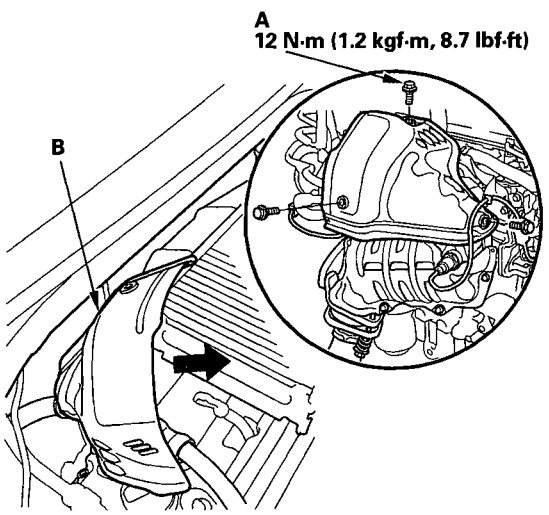
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Warm Up TWC Removal/Installation

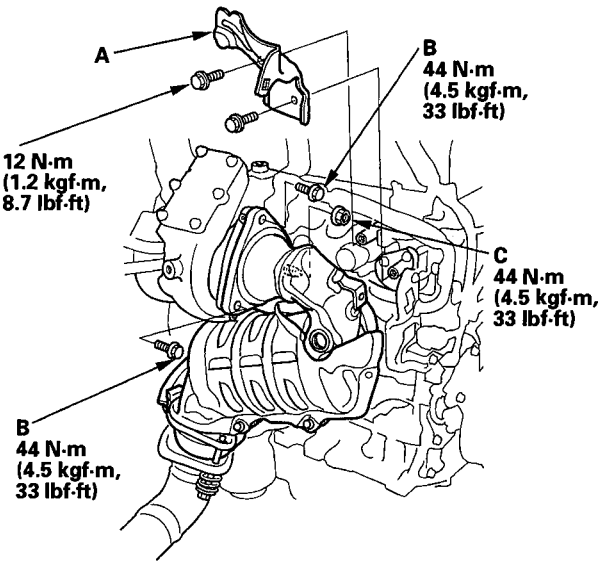
1. Remove the charge air cooler cover.
2. Remove the charge air cooler cover bracket (A).



3. Remove the power steering feed hose stay (B), then move the hose (C) in the direction of the arrow.
4. Remove the bolts (A), then remove the turbocharger cover (B).



5. Remove the A/F sensor (see page 11-245).
6. Remove the water hose upper cover (A).



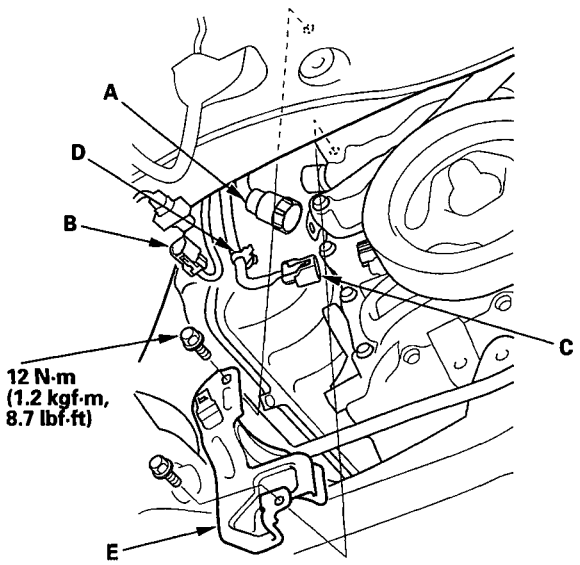
*: This view is from the rear of the engine compartment.

7. Remove the bolts (B) and nut (C).
8. Raise the vehicle all the way up on a lift.
9. Remove the under-floor TWC (see page 11-443).
10. Remove the secondary HO2S (see page 11-245).
11. Remove the splash shield (see page 20-177).
12. Remove the intermediate shaft (see page 16-21).
13. Remove the P/S heat shield (see step 22 on page 17-32).

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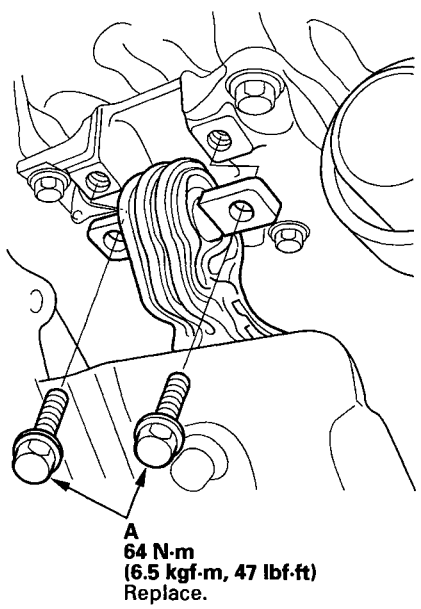
BACK

14. Disconnect the engine oil pressure switch connector (A), the right front wheel sensor connector (B), and the CKP sensor connector (C), then remove harness clamp (D).

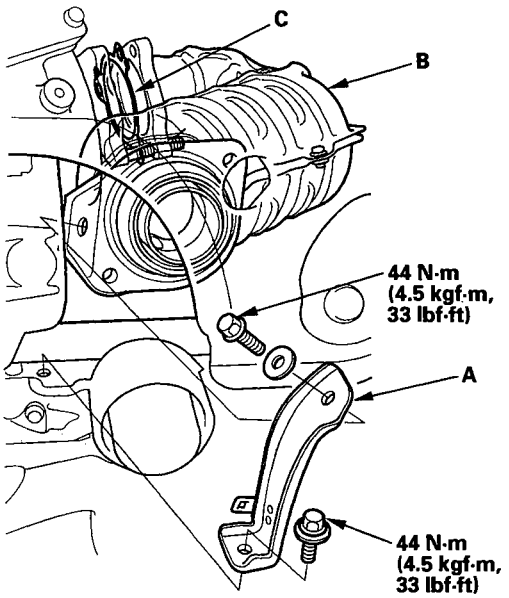


15. Remove the water hose lower cover (E).

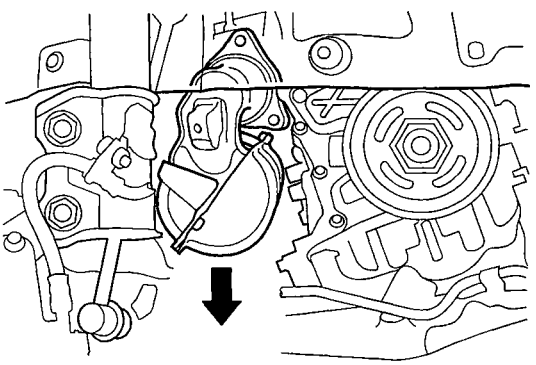
16. Remove the torque rod mounting bolts (A) from the oil pan.



17. Remove the WU-TWC bracket (A), then remove the WU-TWC (B) and gasket (C) from the turbocharger.



18. Lower the WU-TWC.

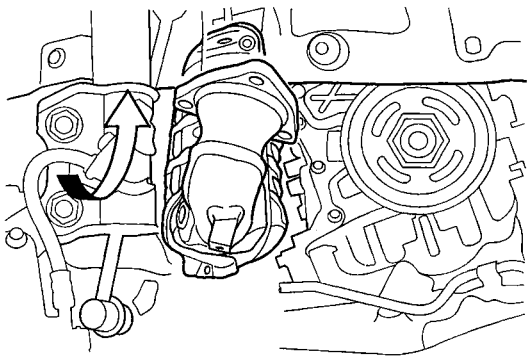


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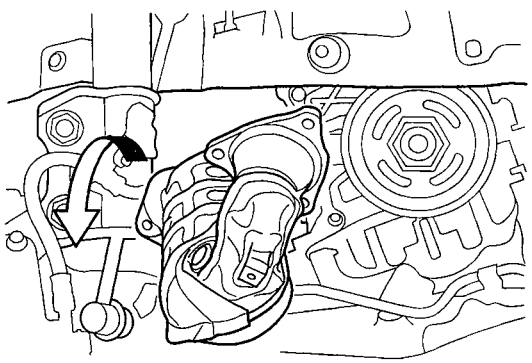
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Warm Up TWC Removal/Installation (cont'd)

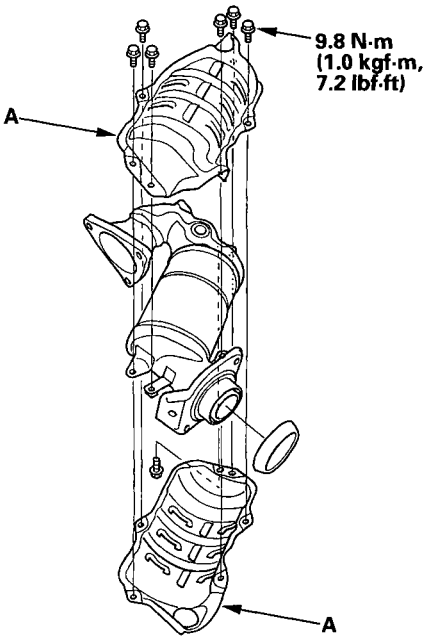
19. Turn the under-floor TWC side of the WU-TWC upward as shown.



20. After the turbocharger side of the WU-TWC came out, turn the under-floor TWC side of the WU-TWC downward, and take it out by turning it.



21. Remove the converter cover (A).



22. Install the parts in the reverse order of removal with new gaskets (turbocharger side and under-floor TWC side). Also, replace the bolts and nut that attach the WU-TWC to the turbocharger.

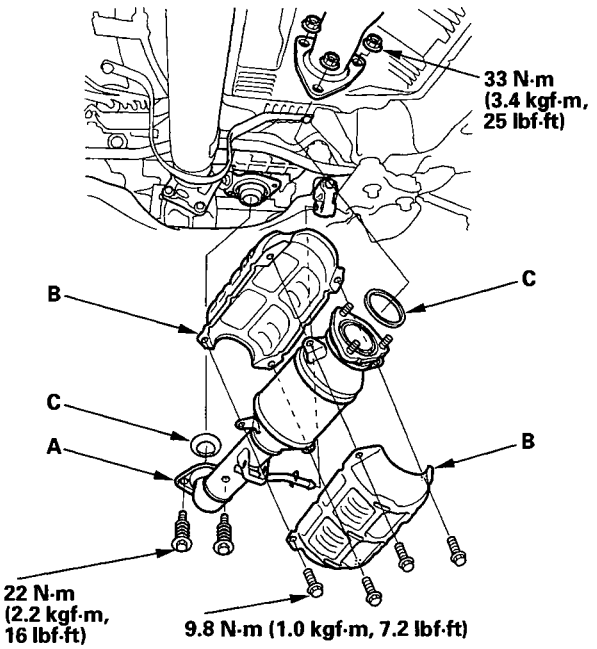
23. Refill the ATF (see page 14-239).

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BACK

Under-floor TWC Removal/Installation

1. Remove the under-floor TWC (A).

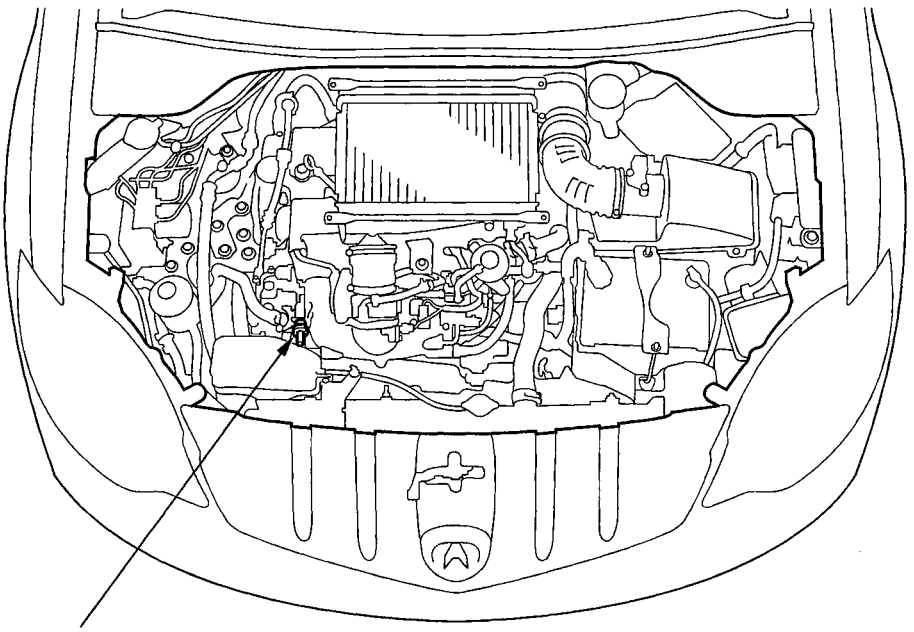


2. Remove the converter cover (B).

3. Install the parts in the reverse order of removal with new gaskets (C).

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Component Location Index



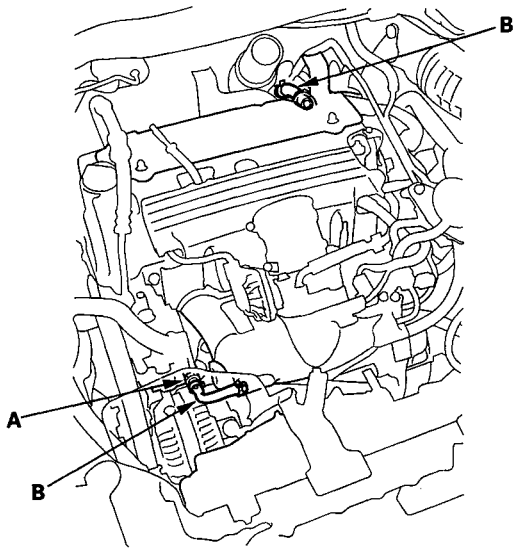
PCV VALVE
Inspection, page 11-445
Replacement, page 11-445

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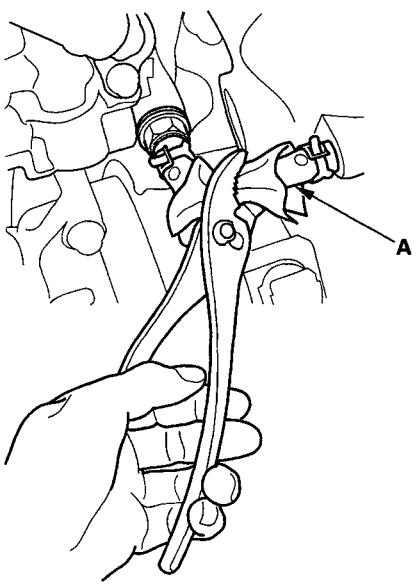
BACK

PCV Valve Inspection

1. Check the PCV valve (A), hoses (B), and connections for leaks or restrictions.

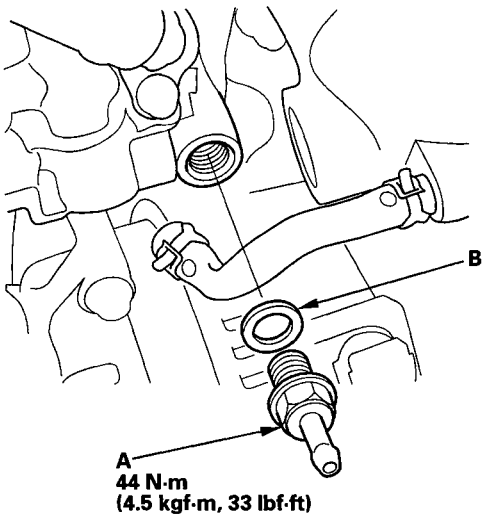


2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and intake manifold is lightly pinched (A) with your fingers or pliers.
   If there is no clicking sound, check the PCV valve washer for cracks or damage. If the washer is OK, replace the PCV valve and recheck.



PCV Valve Replacement

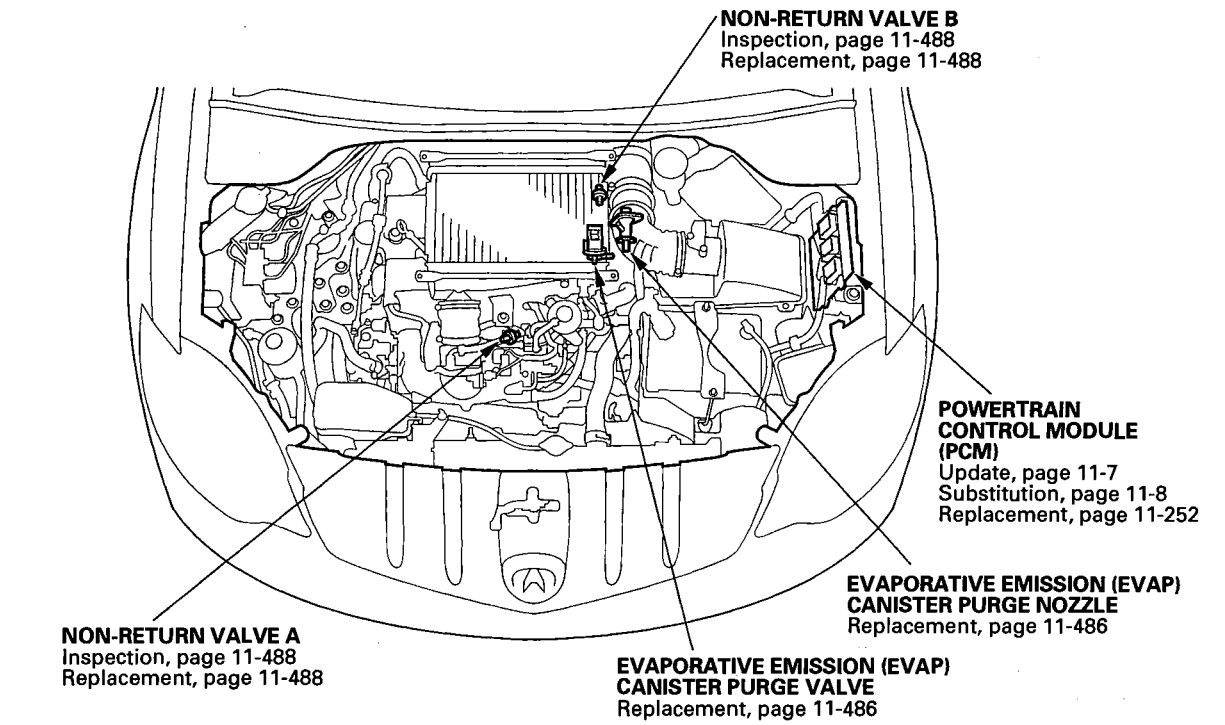
1. Disconnect the PCV hose.
2. Remove the PCV valve (A).

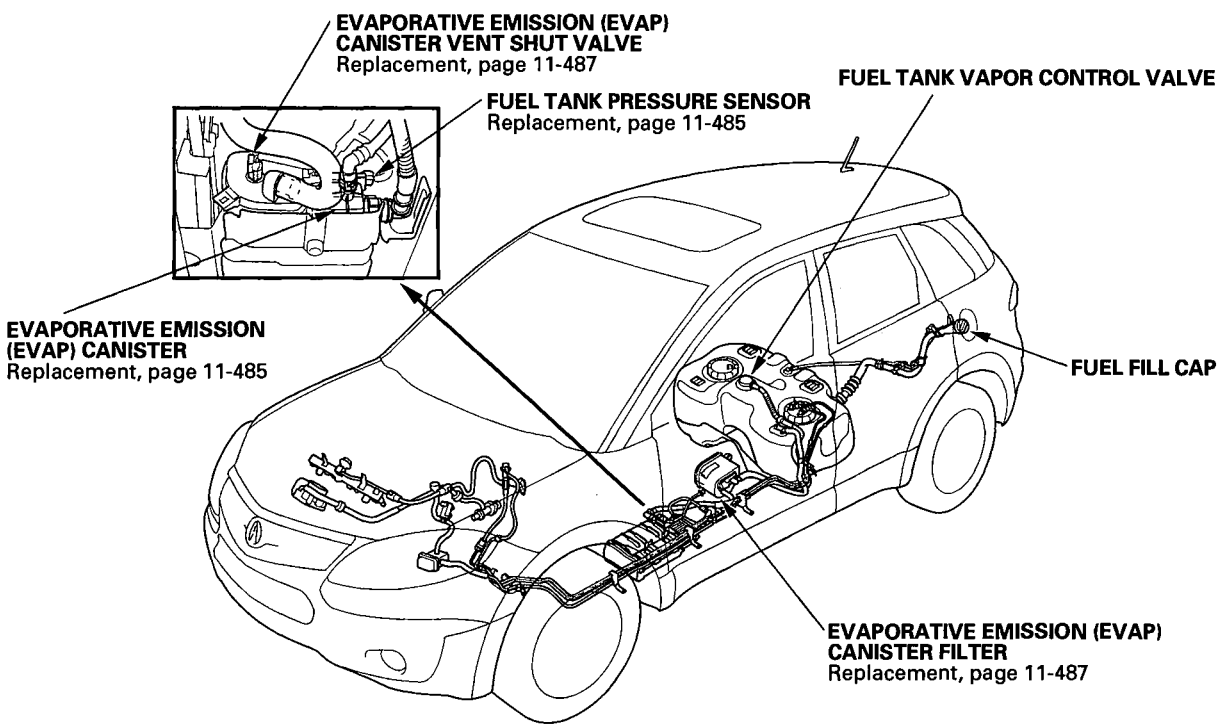


3. Install the parts in the reverse order of removal with a new washer (B).

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Component Location Index





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BACK

DTC P0443: EVAP Canister Purge Valve Circuit Malfunction

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

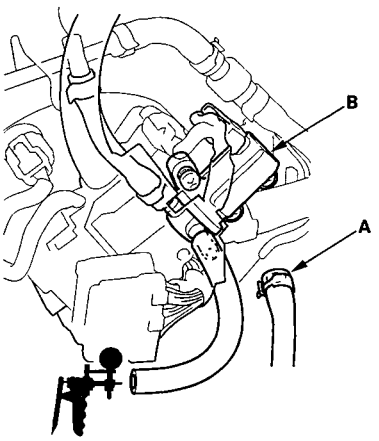
NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0443 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the EVAP canister purge valve and the PCM. ■
5. Turn the ignition switch OFF, and allow the engine to cool below 140 °F (60 °C).
6. Remove the intake air duct (air flow tube) (see step 19 on page 9-16).
7. Disconnect the vacuum hose (A) from the purge valve (B) in the engine compartment, and connect a vacuum pump/gauge, 0—30 in.Hg, to the EVAP canister purge valve.



8. Install the intake air duct (air flow tube) (see step 16 on page 9-20).
9. Start the engine, and let it idle.

   Is there vacuum?

   YES—Go to step 10.

   NO—Go to step 16.
10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect the EVAP canister purge valve 2P connector.

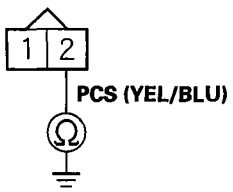
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DTC Troubleshooting (cont'd)

13. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

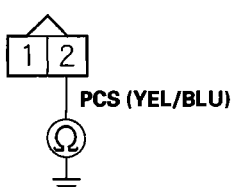
YES—Go to step 14.

NO—Go to step 39.

14. Disconnect PCM connector B (44P).

15. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the EVAP canister purge valve and the PCM (B3), then go to step 40.

NO—Go to step 46.

16. Turn the ignition switch OFF.

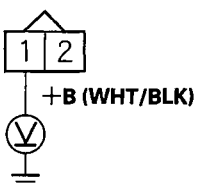
17. Jump the SCS line with the HDS.

18. Disconnect the EVAP canister purge valve 2P connector.

19. Turn the ignition switch ON (II).

20. Measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 34.

NO—Go to step 21.

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BACK

21. Turn the ignition switch OFF.

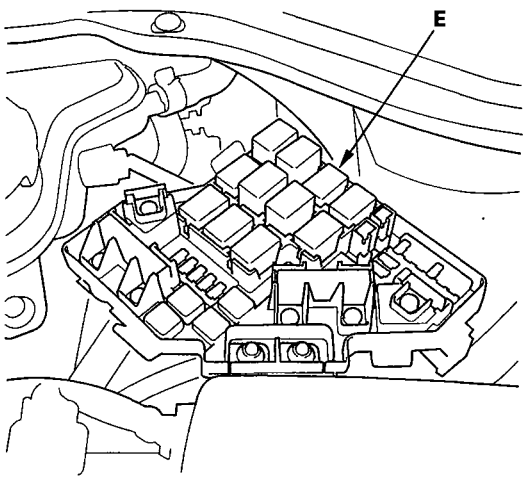
22. Check the No. 11 LAF (15 A) fuse in the under-hood fuse/relay box.

    Is the fuse OK?

    YES—Go to step 23.

    NO—Go to step 29.

23. Remove the PGM-FI subrelay (E) from the under-hood fuse/relay box.



24. Test the PGM-FI subrelay.

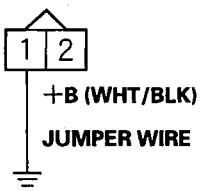
    Is the PGM-FI subrelay OK?

    YES—Go to step 25.

    NO—Replace the PGM-FI subrelay, then go to step 40.

25. Connect EVAP canister purge valve 2P connector terminal No. 1 to body ground with a jumper wire.

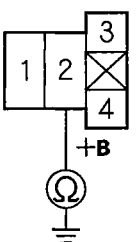
EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

26. Check for continuity between PGM-FI subrelay 4P connector terminal No. 2 and body ground.

PGM-FI SUBRELAY 4P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 27.

NO—Repair open in the wire between the EVAP canister purge valve and the PGM-FI subrelay, then go to step 40.

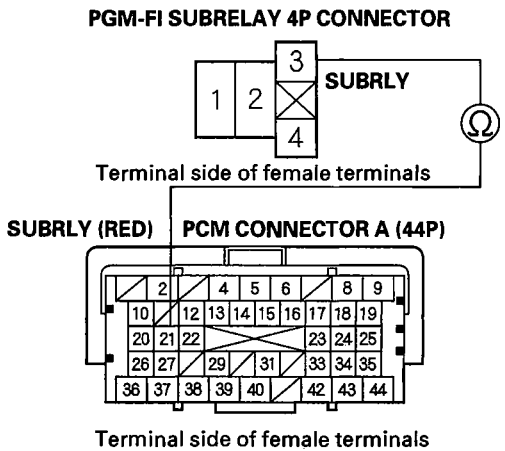
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DTC Troubleshooting (cont'd)

27. Disconnect PCM connector A (44P).

28. Check for continuity between PGM-FI subrelay 4P connector terminal No. 3 and PCM connector terminal A21.

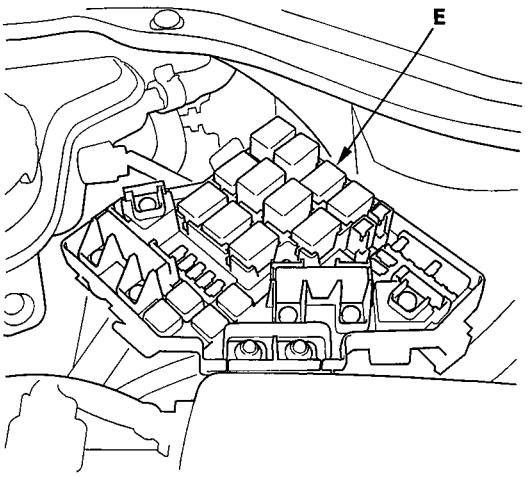


Is there continuity?

YES—Go to step 46.

NO—Repair open in the wire between the PCM (A21) and the PGM-FI subrelay, then go to step 40.

29. Remove the PGM-FI subrelay (E) from the under-hood fuse/relay box.



30. Disconnect the EVAP canister purge valve 2P connector.

31. Disconnect the A/F sensor (Sensor 1) 4P connector.

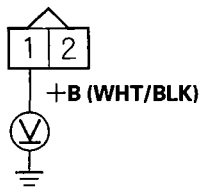
32. Disconnect the EVAP canister vent shut valve 2P connector.

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33. Check for continuity between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PGM-FI subrelay, the EVAP canister purge valve, the EVAP canister vent shut valve, and the A/F sensor (Sensor 1). Also replace the No. 11 LAF (15 A) fuse, then go to step 40.

NO—Replace the under-hood fuse/relay box (see page 22-61), then go to step 40.

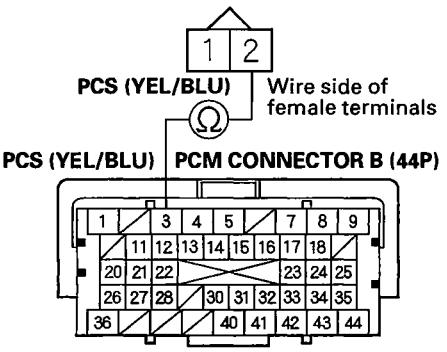
34. Turn the ignition switch OFF.

35. Jump the SCS line with the HDS.

36. Disconnect PCM connector B (44P).

37. Check for continuity between PCM connector terminal B3 and EVAP canister purge valve 2P connector terminal No. 2.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Terminal side of female terminals

Is there continuity?

YES—Go to step 38.

NO—Repair open in the wire between the EVAP canister purge valve and the PCM (B3), then go to step 40.

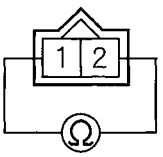
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DTC Troubleshooting (cont'd)

38. At the valve side, measure resistance between EVAP canister purge valve 2P connector terminals No. 1 and No. 2.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Terminal side of male terminals

Is there about 20 Ω at room temperature?

YES—Go to step 46.

NO—Go to step 39.

39. Replace the EVAP canister purge valve (see page 11-486).

40. Reconnect all connectors.

41. Turn the ignition switch ON (II).

42. Reset the PCM with the HDS.

43. Do the PCM idle learn procedure (see page 11-339).

44. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0443 indicated?

YES—Check for poor connections or loose terminals at the EVAP canister purge valve and the PCM, then go to step 1.

NO—Go to step 45.

45. Monitor the OBD STATUS for DTC P0443 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 44, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the EVAP canister purge valve and the PCM, then go to step 1. If the screen indicates EXECUTING or OUT OF CONDITION, keep idling until a result comes on.

46. Reconnect all connectors.

47. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

48. Start the engine, and let it idle.

49. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P0443 indicated?

YES—Check for poor connections or loose terminals at the EVAP canister purge valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 48. If the PCM was substituted, go to step 1.

NO—Go to step 50.

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50. Monitor the OBD STATUS for DTC P0443 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 49, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the EVAP canister purge valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 48. If the PCM was substituted, go to step 1. If the screen indicates EXECUTING or OUT OF CONDITION, keep idling until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P0451: FTP Sensor Circuit Range/ Performance Problem

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P2422 is stored at the same time as DTC P0451, troubleshoot DTC P2422 first, then recheck for DTC P0451.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
4. Monitor the OBD STATUS for DTC P0451 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the PCM. If the screen indicates NOT COMPLETED, keep idling until a result comes on.
5. Turn the ignition switch OFF.
6. Replace the FTP sensor (see page 11-485).
7. Turn the ignition switch ON (II).
8. Reset the PCM with the HDS.
9. Do the PCM idle learn procedure (see page 11-339).
10. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
11. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0451 indicated?

    YES—Check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1.

    NO—Go to step 12.
12. Monitor the OBD STATUS for DTC P0451 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 11, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC P0452: FTP Sensor Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Remove the fuel fill cap.
5. Turn the ignition switch ON (II).
6. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is about −7.3 kPa (−2.16 in.Hg, −55 mmHg), or 0.3 V or less indicated?

   YES—Go to step 10.

   NO—Go to step 7.
7. Install the fuel fill cap.
8. Start the engine.
9. Monitor the OBD STATUS for DTC P0452 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

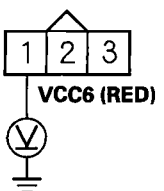
   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the PCM. If the screen indicates NOT COMPLETED, go to step 4 and recheck.
10. Turn the ignition switch OFF.
11. Disconnect the FTP sensor 3P connector.
12. Turn the ignition switch ON (II).
13. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is about −7.3 kPa (−2.16 in.Hg, −55 mmHg) or 0.3 V or more indicated?

    YES—Go to step 20.

    NO—Go to step 14.
14. Measure voltage between FTP sensor 3P connector terminal No. 1 and body ground.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 24.

NO—Go to step 15.

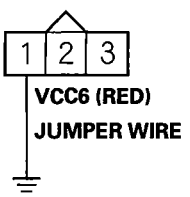
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DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF.
16. Jump the SCS line with the HDS.
17. Disconnect PCM connector A (44P).
18. Connect FTP sensor 3P connector terminal No. 1 to body ground with a jumper wire.

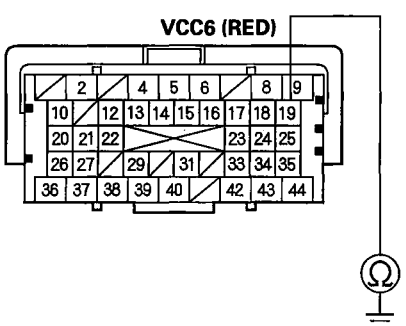
FTP SENSOR 3P CONNECTOR



Wire side of female terminals

19. Check for continuity between PCM connector terminal A19 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

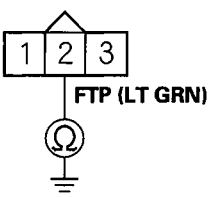
Is there continuity?

YES—Go to step 32.

NO—Repair open in the wire between the PCM (A19) and the FTP sensor, then go to step 26.

20. Turn the ignition switch OFF.
21. Jump the SCS line with the HDS.
22. Disconnect PCM connector A (44P).
23. Check for continuity between FTP sensor 3P connector terminal No. 2 and body ground.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A26) and the FTP sensor, then go to step 26.

NO—Go to step 32.

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BACK

24. Turn the ignition switch OFF.

25. Replace the FTP sensor (see page 11-485).

26. Reconnect all connectors.

27. Turn the ignition switch ON (II).

28. Reset the PCM with the HDS.

29. Do the PCM idle learn procedure (see page 11-339).

30. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0452 indicated?

    YES—Check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1.

    NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0452 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 30, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, go to step 32. If the screen indicates NOT COMPLETED keep idling until a result comes on.

32. Reconnect all connectors.

33. Update the PCM if it does not have the latest software (see page 11-7). or substitute a known-good PCM (see page 11-8).

34. Start the engine, and let it idle.

35. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0452 indicated?

    YES—Check for poor connections or loose terminals at the FTP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 34. If the PCM was substituted, go to step 1.

    NO—Go to step 36.

36. Monitor the OBD STATUS for DTC P0452 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 35, go to the indicated DTC's troubleshooting. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 34. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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DTC Troubleshooting (cont'd)

DTC P0453: FTP Sensor Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Remove the fuel fill cap.
5. Turn the ignition switch ON (II).
6. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is about 7.3 kPa (2.16 in.Hg, 55 mmHg), or 4.7 V or more indicated?

   YES—Go to step 10.

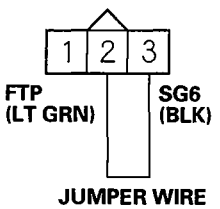
   NO—Go to step 7.
7. Install the fuel fill cap.
8. Start the engine, and let it idle.
9. Monitor the OBD STATUS for DTC P0453 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the PCM. If the screen indicates NOT COMPLETED, go to step 3 and recheck.
10. Turn the ignition switch OFF.
11. Disconnect the FTP sensor 3P connector.
12. Connect FTP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

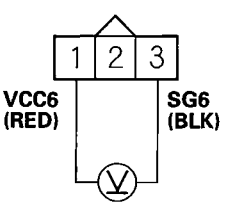
13. Turn the ignition switch ON (II).
14. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is about 7.3 kPa (2.16 in.Hg, 55 mmHg), or 4.7 V or more indicated?

    YES—Go to step 15.

    NO—Go to step 26.
15. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 3.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 21.

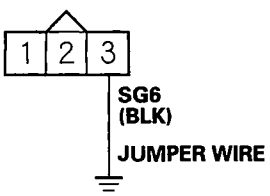
NO—Go to step 16.

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BACK

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector A (44P).
19. Connect FTP sensor 3P connector terminal No. 3 to body ground with a jumper wire.

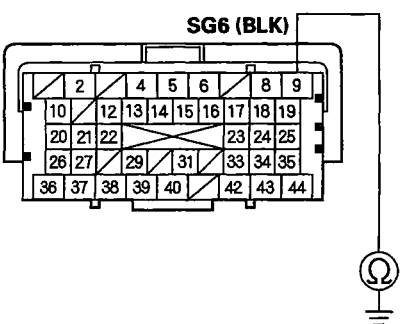
FTP SENSOR 3P CONNECTOR



Wire side of female terminals

20. Check for continuity between PCM connector terminal A9 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

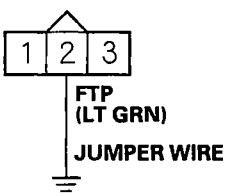
Is there continuity?

YES—Go to step 34.

NO—Repair open in the wire between the PCM (A9) and the FTP sensor, then go to step 28.

21. Turn the ignition switch OFF.
22. Jump the SCS line with the HDS.
23. Disconnect PCM connector A (44P).
24. Connect FTP sensor 3P connector terminal No. 2 to body ground with a jumper wire.

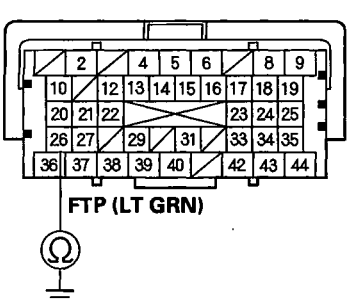
FTP SENSOR 3P CONNECTOR



Wire side of female terminals

25. Check for continuity between PCM connector terminal A26 and body ground.

PCM CONNECTOR A (44P)



Terminal side of female terminals

Is there continuity?

YES—Go to step 34.

NO—Repair open in the wire between the PCM (A26) and the FTP sensor, then go to step 28.

(cont'd)

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DTC Troubleshooting (cont'd)

26. Turn the ignition switch OFF.
27. Replace the FTP sensor (see page 11-485).
28. Reconnect all connectors.
29. Turn the ignition switch ON (II).
30. Reset the PCM with the HDS.
31. Do the PCM idle learn procedure (see page 11-339).
32. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0453 indicated?

    YES—Check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1.

    NO—Go to step 33.

33. Monitor the OBD STATUS for DTC P0453 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs were indicated in step 32, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

34. Reconnect all connectors.
35. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
36. Start the engine, and let it idle.
37. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0453 indicated?

    YES—Check for poor connections or loose terminals at the FTP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 36. If the PCM was substituted, go to step 1.

    NO—Go to step 38.

38. Monitor the OBD STATUS for DTC P0453 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs were indicated in step 37, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 36. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, keep idling until a result comes on.

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BACK

DTC P0455: EVAP System Large Leak Detected

DTC P0456: EVAP System Very Small Leak Detected

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is less than a full tank of fresh fuel. If possible, to assist in leak detection, add 1 gallon of fresh fuel to the tank (as long as it will not fill the tank), just before starting these procedures.

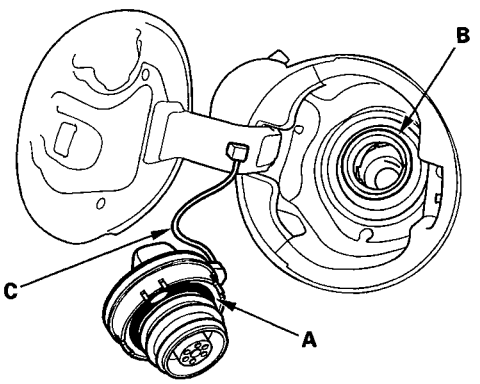
1. Check the fuel fill cap (the cap must say "Tighten to click"). It should turn 1/4 turn after it's tight, then it clicks.

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 23.

2. Check the fuel fill cap seal (A) and the fuel fill pipe mating surface (B). Verify that the fuel fill cap tether cord (C) is not caught under the cap.



   Is the fuel fill cap seal missing or damaged, is the fuel fill pipe damaged, or is the tether cord caught under the cap?

   YES—Replace the fuel fill cap or the fuel fill pipe, then go to step 23.

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve, and the PCM. ■

   NO—Go to step 6.

(cont'd)

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DTC Troubleshooting (cont'd)

6. Turn the ignition switch OFF.

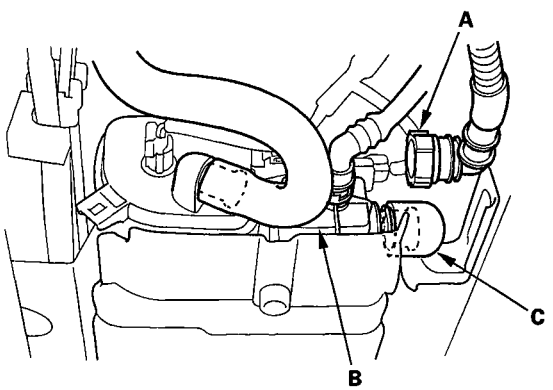
7. Check for a poor connection or damage at the fuel tank vapor recirculation tube.

   Is the tube OK?

   YES—Go to step 8.

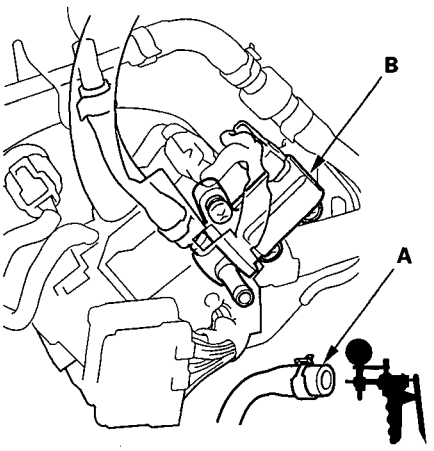
   NO—
   - Replace the fuel tank vapor recirculation tube, then go to step 23.
   - If necessary, replace the fuel tank (see page 11-385), then go to step 23.

8. Disconnect the fuel tank vapor recirculation tube (A) from the EVAP canister (B), and plug the EVAP canister port (C).



9. Remove the intake air duct (air flow tube) (see step 19 on page 9-16).

10. Disconnect the vacuum hose (purge line) (A) from the EVAP canister purge valve (B) in the engine compartment, and connect a vacuum pump/gauge, 0—30 in.Hg, to the vacuum hose as shown.



11. Turn the ignition switch ON (II).

12. Select EVAP CVS ON in the INSPECTION MENU with the HDS.

13. Apply vacuum to the hose until the FTP reads 1.90 V (—0.59 in.Hg, —15.1 mmHg).

    NOTE: Be careful not to exceed the pressure. If you exceed the pressure, the FTP sensor can be damaged.

14. Monitor the FTP SENSOR in the DATA LIST for 1 minute with the HDS.

    Does the voltage increase more than 0.2 V (0.1 in.Hg, 0.5 mmHg)?

    YES—Go to step 15.

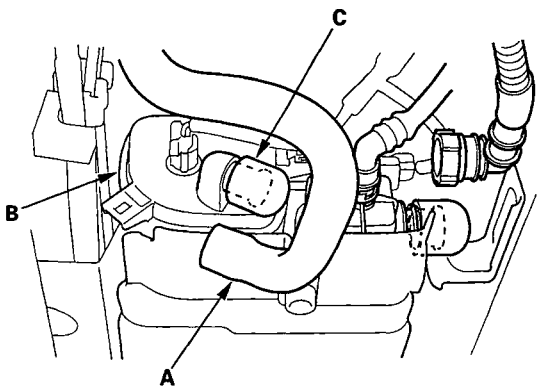
    NO—Go to step 20.

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BACK

15. Select EVAP CVS OFF in the INSPECTION MENU with the HDS.

16. Disconnect the fresh air hose (A) from the EVAP canister (B), and plug the EVAP canister port (C).



17. Apply vacuum to the EVAP system until the FTP reads 1.90 V (−0.59 in.Hg, −15.1 mmHg).

    NOTE: Be careful not to exceed the pressure. If you exceed the pressure, the FTP sensor can be damaged.

18. Monitor the FTP SENSOR in the DATA LIST for 1 minute with the HDS.

    Does the voltage increase more than 0.2 V (0.1 in.Hg, 2.5 mmHg)?

    YES—Go to step 19.

    NO—Replace the EVAP canister vent shut valve, then go to step 22.

19. Check for a loose or damaged EVAP canister purge line between the EVAP canister and the EVAP canister purge valve.

    Is the line OK?

    YES—Replace these parts, then go to step 22:

    - FTP sensor O-ring
    - EVAP canister vent shut valve case and O-ring
    - EVAP canister

    NO—Reconnect or repair the EVAP canister purge hose, then go to step 22.

20. Select EVAP CVS OFF in the INSPECTION MENU with the HDS.

21. Check these parts for looseness or damage:

    - Fuel fill pipe
    - Fuel vapor return pipe

    Are the parts OK?

    YES—Check the fuel tank unit base gasket (see page 11-381), and check the fuel tank, then go to step 22.

    NO—Repair or replace the damaged parts, then go to step 22.

22. Reconnect all hoses and connectors, and reinstall all parts.

23. Turn the ignition switch ON (II).

24. Reset the PCM with the HDS.

25. Do the PCM idle learn procedure (see page 11-339).

26. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, the EVAP canister vent shut valve, and the PCM, then go to step 1.

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DTC Troubleshooting (cont'd)

DTC P0457: EVAP System Leak Detected/Fuel Fill Cap Loose or Missing

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

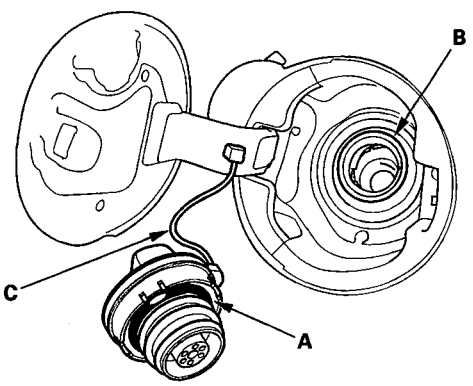
1. Check the fuel fill cap (the cap must say "Tighten to click"). It should turn 1/4 turn after it's tight, then it clicks.

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 19.

2. Check the fuel fill cap seal (A) and the fuel fill pipe mating surface (B). Verify that the fuel fill cap tether cord (C) is not caught under the cap.



   Is the fuel fill cap seal missing or damaged, is the fuel fill pipe damaged, or is the tether cord caught under the cap?

   YES—Replace the fuel fill cap or the fuel fill pipe, then go to step 19.

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at *this* time. Check for poor connections or loose terminals at the FTP sensor, or the EVAP canister vent shut valve, and the PCM. ■

   NO—Go to step 6.

6. Turn the ignition switch OFF.

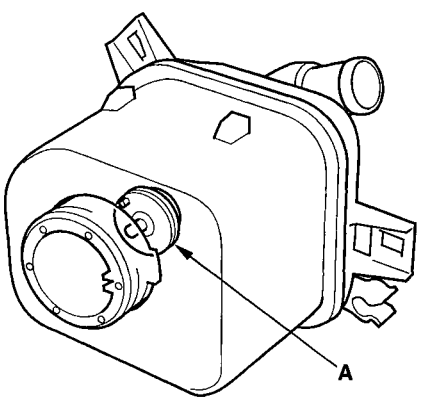
7. Remove the EVAP canister vent shut valve from the EVAP canister (see page 11-487).

8. Connect the 2P connector to the EVAP canister vent shut valve.

9. Turn the ignition switch ON (II).

10. Select EVAP CVS ON in the INSPECTION MENU with the HDS.

11. Check the EVAP canister vent shut valve (A) operation.



   Does the valve operate?

   YES—Check the routing of the EVAP canister vent tube, then go to step 18.

   NO—Go to step 12.

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12. Turn the ignition switch OFF.
13. Replace the EVAP canister vent shut valve (see page 11-487).
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete. ■

    NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister vent shut valve, and the PCM, then go to step 1.
18. Reinstall the EVAP canister vent shut valve.
19. Turn the ignition switch ON (II).
20. Reset the PCM with the HDS.
21. Do the PCM idle learn procedure (see page 11-339).
22. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete. ■

    NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister vent shut valve, and the PCM, then go to step 1.

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DTC Troubleshooting (cont'd)

DTC P0496: EVAP System High Purge Flow Detected

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, the EVAP canister vent shut valve, and the PCM. ■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Replace the EVAP canister purge valve (see page 11-486).
6. Turn the ignition switch ON (II).
7. Reset the PCM with the HDS.
8. Do the PCM idle learn procedure (see page 11-339).
9. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Troubleshooting is complete. ■

   NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, the EVAP canister vent shut valve, and the PCM, then go to step 1.

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BACK

DTC P0497: EVAP System Low Purge Flow Detected

Special Tools Required
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B
- Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the PCM. ■

   NO—Go to step 4.

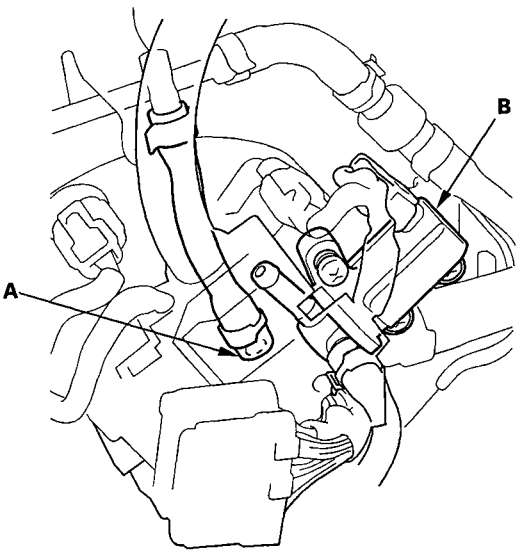
4. Check for poor connection, blockage, or damage at the EVAP canister purge line between the throttle body and EVAP canister.

   Is the line OK?

   YES—Go to step 5.

   NO—Reconnect or repair the EVAP canister purge line, then go to step 26.

5. Remove the intake air duct (air flow tube) (see step 19 on page 9-16).
6. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B).

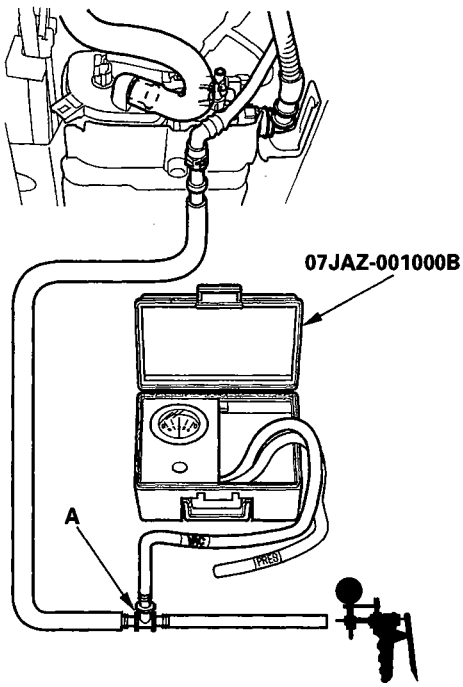


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DTC Troubleshooting (cont'd)

7. Disconnect the vacuum hose from the purge line (at the EVAP canister side), and connect a T-fitting (A) from the vacuum gauge and the vacuum pump/ gauge, 0—30 in.Hg, to the hose as shown.



8. Apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

9. Select EVAP PCS ON in the INSPECTION MENU with the HDS.

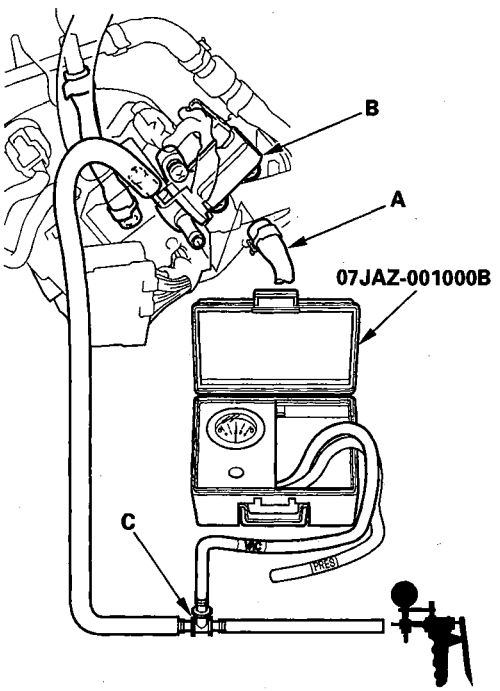
   Does the vacuum release immediately?

   YES—Go to step 14.

   NO—Go to step 10.

10. Select EVAP PCS OFF in the INSPECTION MENU with the HDS.

11. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B). Connect a T-fitting (C) from the vacuum gauge and the vacuum pump/ gauge, 0—30 in.Hg, to the EVAP canister purge valve as shown.



12. Apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

13. Select EVAP PCS ON in the INSPECTION MENU with the HDS.

    Does the vacuum release immediately?

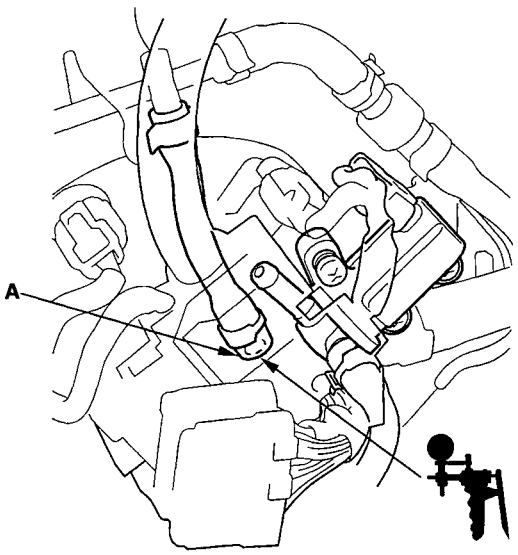
    YES—Check for blockage in the vacuum hose between the EVAP canister purge valve and the EVAP canister, then go to step 26.

    NO—Replace the EVAP canister purge valve (see page 11-486), then go to step 26.

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14. Connect the vacuum pump/gauge, 0—30 in.Hg, to the vacuum hose (A) as shown.



15. Reinstall the intake air duct (air flow tube). Start the engine, and let it idle.

    Is there vacuum?

    YES—Go to step 18.

    NO—Go to step 16.

16. Turn the ignition switch OFF.

17. Inspect non-return valve A (see page 11-488).

    Is the valve OK?

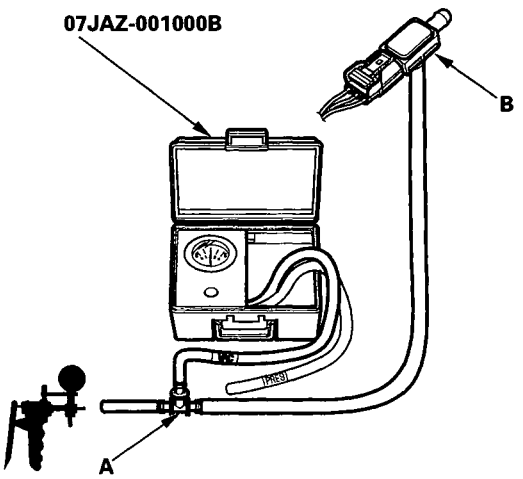
    YES—Check for blockage at the EVAP purge line between the throttle body and EVAP canister purge valve, then go to step 26.

    NO—Replace non-return valve A (see page 11-488), then go to step 26.

18. Turn the ignition switch OFF.

19. Remove the FTP sensor with its connector connected (see page 11-485).

20. Connect a T-fitting (A) from the vacuum pump/gauge, 0—30 in.Hg, and the vacuum pump to the FTP sensor (B) as shown.



21. Turn the ignition switch ON (II).

22. Check and record the FTP SENSOR reading in the DATA LIST with the HDS.

23. Slowly apply about 1.3 kPa (0.4 in.Hg, 10 mmHg) of vacuum to the hose.

24. Check the FTP SENSOR in the DATA LIST with the HDS.

    Does the value change?

    YES—Check for debris or blockage at the FTP sensor port and at the EVAP canister, then go to step 26.

    NO—Go to step 25.

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DTC Troubleshooting (cont'd)

25. Replace the FTP sensor (see page 11-485).
26. Reconnect all hoses.
27. Turn the ignition switch ON (II).
28. Reset the PCM with the HDS.
29. Do the PCM idle learn procedure (see page 11-339).
30. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor and the PCM, then go to step 1.

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DTC P0498: EVAP Canister Vent Shut Valve Circuit Low Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0498 indicated?

   YES—Go to step 6.

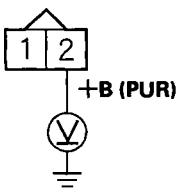
   NO—Go to step 4.
4. Select EVAP CVS ON in the INSPECTION MENU with the HDS.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0498 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the EVAP canister vent shut valve 2P connector.
8. Turn the ignition switch ON (II).
9. Measure voltage between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Wire side of female terminals

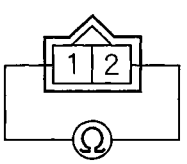
Is there battery voltage?

YES—Go to step 10.

NO—Repair open in the wire between the EVAP canister vent shut valve and the PGM-FI subrelay, then go to step 18.

10. Turn the ignition switch OFF.
11. Measure resistance between EVAP canister vent shut valve 2P connector terminals No. 1 and No. 2.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Terminal side of male terminals

Is there about 25—30 Ω at room temperature?

YES—Go to step 12.

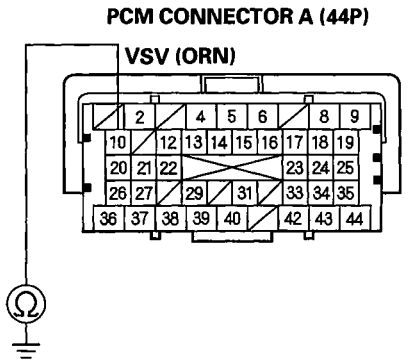
NO—Go to step 17.

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DTC Troubleshooting (cont'd)

12. Jump the SCS line with the HDS.
13. Disconnect PCM connector A (44P).
14. Check for continuity between PCM connector terminal A10 and body ground.



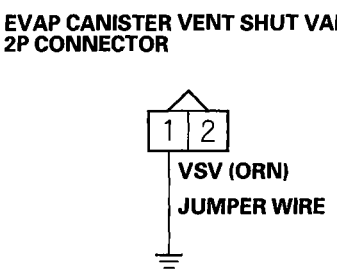
Terminal side of female terminals

Is there continuity?

YES—Repair short in the wire between the EVAP canister vent shut valve and the PCM (A10), then go to step 18.

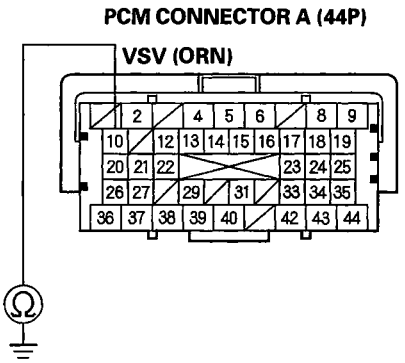
NO—Go to step 15.

15. Connect EVAP canister vent shut valve 2P connector terminal No. 1 to body ground with a jumper wire.



Wire side of female terminals

16. Check for continuity between PCM connector terminal A10 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the EVAP canister vent shut valve and the PCM (A10), then go to step 18.

17. Replace the EVAP canister vent shut valve (see page 11-487).
18. Reconnect all connectors.

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19. Turn the ignition switch ON (II).

20. Reset the PCM with the HDS.

21. Do the PCM idle learn procedure (see page 11-339).

22. Select EVAP CVS ON in the INSPECTION MENU with the HDS.

23. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0498 indicated?

    YES—Check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM, then go to step 1.

    NO—Go to step 24.

24. Monitor the OBD STATUS for DTC P0498 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 23, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.

26. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).

27. Select EVAP CVS ON in the INSPECTION MENU with the HDS.

28. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P0498 indicated?

    YES—Check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 27. If the PCM was substituted, go to step 1.

    NO—Go to step 29.

29. Monitor the OBD STATUS for DTC P0498 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 28, go to the indicated DTC's troubleshooting.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 27. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 27.

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DTC Troubleshooting (cont'd)

DTC P0499: EVAP Canister Vent Shut Valve Circuit High Voltage

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select EVAP CVS ON in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0499 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. ■
5. Update the PCM if it does not have the latest software (see page 11-7), or substitute a known-good PCM (see page 11-8).
6. Select EVAP CVS ON in the INSPECTION MENU with the HDS.
7. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0499 indicated?

   YES—Check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 6. If the PCM was substituted, go to step 1.

   NO—Go to step 8.
8. Monitor the OBD STATUS for DTC P0499 in the DTCs MENU with the HDS.

   Does the screen indicate PASSED?

   YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-252). If any other Temporary DTCs or DTCs were indicated in step 7, go to the indicated DTC's troubleshooting. ■

   NO—If the screen indicates FAILED, check for poor connections or loose terminals at the EVAP canister vent shut valve and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-8), then go to step 6. If the PCM was substituted, go to step 1. If the screen indicates NOT COMPLETED, go to step 6.

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DTC P1454: FTP Sensor Range/Performance Problem

DTC P2422: EVAP Canister Vent Shut Valve Stuck Closed Malfunction

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Remove the fuel fill cap, and wait 1 minute.
5. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is it between −0.67 and 0.67 kPa (−0.2 and 0.2 in.Hg, −5 and 5 mmHg), or 2.4 and 2.6 V?

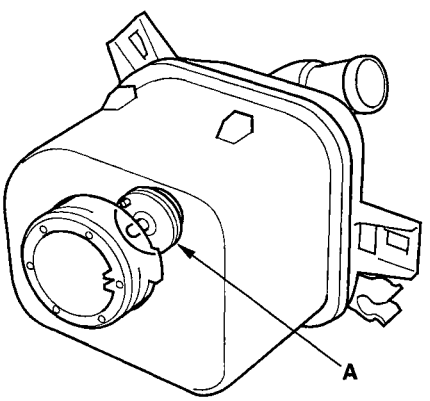
   YES—Go to step 6.

   NO—Go to step 17.
6. Install the fuel fill cap.
7. Clear the DTC with the HDS.
8. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
9. Monitor the OBD STATUS for DTC P1454 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister vent shut valve, and the PCM. Also check for a blockage in the vent hoses and the drain joint. If the screen indicates NOT COMPLETED, go to step 8 and recheck.
10. Clear the DTC with the HDS.
11. Turn the ignition switch OFF.
12. Remove the EVAP canister vent shut valve from the EVAP canister (see page 11-487).
13. Connect the 2P connector to the EVAP canister vent shut valve.
14. Turn the ignition switch ON (II).
15. Select EVAP CVS ON in the INSPECTION MENU with the HDS.
16. Check the EVAP canister vent shut valve (A) operation.



Does the valve operate?

YES—Check for a blockage in the EVAP canister, vent hoses, and drain joint, then install the EVAP canister vent shut valve, and go to step 23.

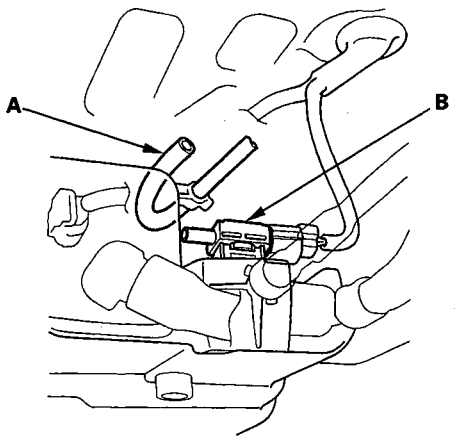
NO—Replace the EVAP canister vent shut valve (see page 11-487), then go to step 23.

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DTC Troubleshooting (cont'd)

17. Disconnect the air tube (A) from the FTP sensor (B).



18. Check the FTP SENSOR in the DATA LIST with the HDS.

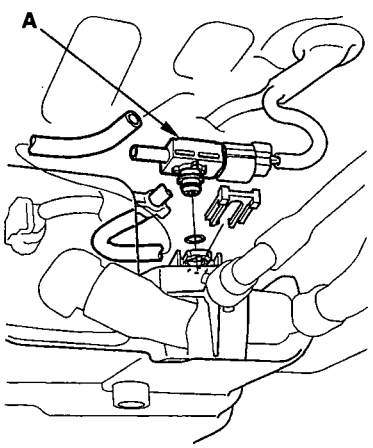
    Is it between −0.67 and 0.67 kPa (−0.2 and 0.2 in.Hg, −5 and 5 mmHg), or 2.4 and 2.6 V?

    YES—Check for a blockage in the FTP sensor air tube or vent, then go to step 23.

    NO—Go to step 19.

19. Turn the ignition switch OFF.

20. Remove the FTP sensor (A) from the EVAP canister with its connector connected (see page 11-485).



21. Turn the ignition switch ON (II).

22. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is it between −0.67 kPa and 0.67 kPa (−0.2 and 0.2 in.Hg, −5 and 5 mmHg), or 2.4 and 2.6 V?

    YES—Check for debris or clogging at the EVAP canister and the FTP sensor port, then go to step 23.

    NO—Replace the FTP sensor (see page 11-485), then go to step 23.

23. Turn the ignition switch ON (II).

24. Reset the PCM with the HDS.

25. Do the PCM idle learn procedure (see page 11-339).

26. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.

27. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P1454 and/or P2422 indicated.?

    YES—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister vent shut valve, and the PCM, then go to step 1.

    NO—Go to step 28.

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28. Monitor the OBD STATUS for DTC P1454 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. If any other Temporary DTCs or DTCs were indicated in step 27, go to the indicated DTC's troubleshooting. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor, the EVAP canister vent shut valve, and the PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 26.

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DTC Troubleshooting (cont'd)

DTC P145A: EVAP System Incorrect Purge Flow Detected

Special Tools Required
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B
- Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the PCM. ■

   NO—Go to step 4.

4. Check for poor connection, blockage, or damage at the EVAP canister purge line between the EVAP canister purge nozzle and EVAP canister purge valve.

   Is the hose OK?

   YES—Go to step 5.

   NO—Reconnect or repair the EVAP canister purge line, then go to step 21.

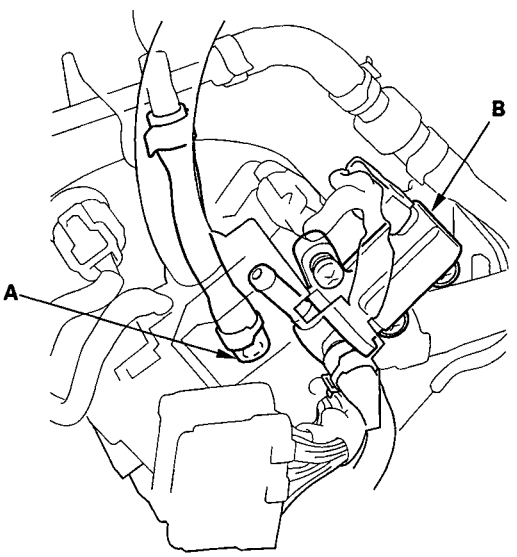
5. Check for poor connection, blockage, or damage at the hose between EVAP canister purge nozzle and turbocharger bypass valve base.

   Is the hose OK?

   YES—Go to step 6.

   NO—Reconnect or repair the hose, then go to step 21.

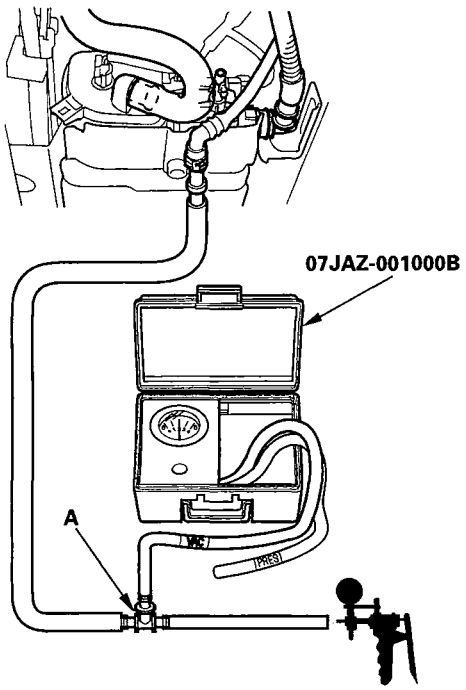
6. Remove the intake air duct (air flow tube) (see step 19 on page 9-16).
7. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B).



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8. Disconnect the vacuum hose from the purge line (at the EVAP canister side), and connect a T-fitting (A) from the vacuum gauge and the vacuum pump/gauge, 0—30 in.Hg, to the hose as shown.



9. Apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

10. Select EVAP PCS ON in the INSPECTION MENU with the HDS.

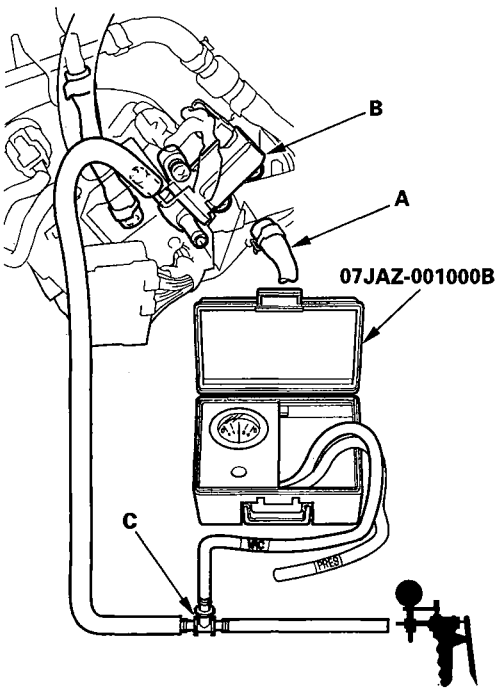
Does the vacuum release immediately?

YES—Go to step 15.

NO—Go to step 11.

11. Select EVAP PCS OFF in the INSPECTION MENU with the HDS.

12. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B). Connect a T-fitting (C) from the vacuum gauge the vacuum pump/gauge, 0—30 in.Hg, to the EVAP canister purge valve as shown.



13. Apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

14. Select EVAP PCS ON in the INSPECTION MENU with the HDS.

Does the vacuum release immediately?

YES—Check for blockage in the vacuum hose between the EVAP canister purge valve and the EVAP canister, then go to step 21.

NO—Replace the EVAP canister purge valve (see page 11-486), then go to step 21.

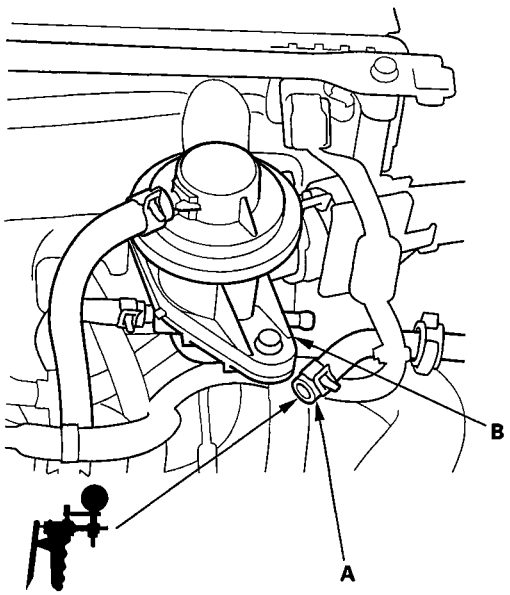
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DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF.

16. Disconnect the hose (A) from the turbocharger bypass control valve base (B), and connect the vacuum pump/gauge, 0—30 in.Hg, to the pressure hose as shown.



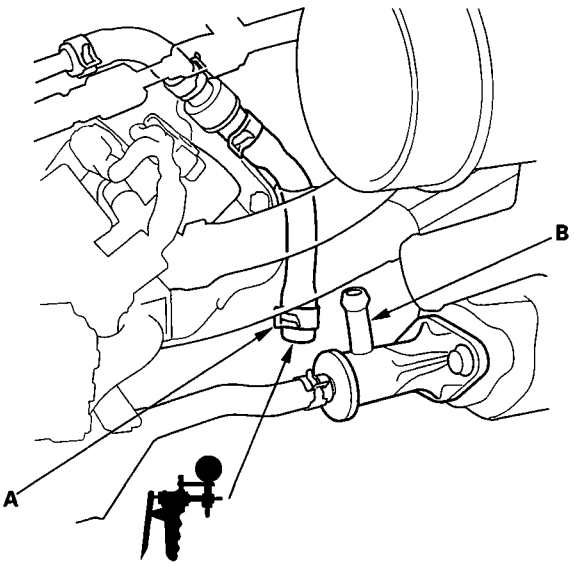
17. Apply vacuum to the hose.

    Does it hold vacuum?

    YES—Repair the hose between the turbocharger bypass control valve base and the EVAP canister purge nozzle, then go to step 21.

    NO—Go to step 18.

18. Disconnect the vacuum hose (A) from the EVAP canister purge nozzle (B), and connect the vacuum pump/gauge, 0—30 in.Hg, to the vacuum hose as shown.



19. Apply vacuum to the hose.

    Dose it hold vacuum?

    YES—Go to step 20.

    NO—Check for debris or clogging at the EVAP canister purge nozzle port and the turbocharger bypass control valve base port , then go to step 21.

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20. Inspect non-return valve B (see page 11-488).

    Is the valve OK?

    YES—Repair the EVAP canister purge line between the EVAP canister purge nozzle and EVAP canister purge valve, then go to step 21.

    NO—Replace non-return valve B, then go to step 21.

21. Reconnect all hoses, and reinstall all parts.

22. Turn the ignition switch ON (II).

23. Reset the PCM with the HDS.

24. Do the PCM idle learn procedure (see page 11-339).

25. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check the EVAP purge control solenoid valve, the EVAP canister purge nozzle and its hose, and the EVAP canister purge line (jet purge line), then go to step 1.

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DTC Troubleshooting (cont'd)

DTC P145B: EVAP System Purge Line Non-return Valve A Stuck Open

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).

1. Turn the ignition switch ON (II).
2. Select the EVAP TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, the system is OK at this time.■

   NO—Go to step 3.
3. Replace non-return valve A (see page 11-488).
4. Reset the PCM with the HDS.
5. Do the PCM idle learn procedure (see page 11-339).
6. Select the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Troubleshooting is complete.■

   NO—Check the EVAP canister purge line, then go to step 1.

DTC P145C: EVAP System Purge Flow Malfunction (Vacuum Purge)

DTC P145D: EVAP System Purge Flow Malfunction (Jet Purge)

NOTE:
- Before you troubleshoot, record all freeze data and any on-board snapshot, and review the general troubleshooting information (see page 11-3).
- If DTC P145C is indicated alone, do the troubleshooting for DTC P0496 and P0497 using freeze data from P145C. If DTC P145D is indicated alone, do the troubleshooting for DTC P0496 and P145A using freeze data from P145D.
- If DTC P0497, P145A, P145C, and P145D stored at the same time, check for poor connection, blockage, or damage at the EVAP canister purge line between the EVAP canister purge valve and the EVAP canister. Also check for a stuck closed EVAP canister purge valve.
- If any of the DTCs listed below are indicated at the same time as DTC P145C and/or P145D, troubleshoot those DTCs first, then recheck for P145C and/or P145D.

P0496, P0497, P145A: EVAP system purge flow

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Fuel Cap Warning Message System Troubleshooting

Special Tools Required
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B
- Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

When the fuel cap warning message does not go off after fuel cap tightened, or the message turned on frequently, do this troubleshooting procedure.

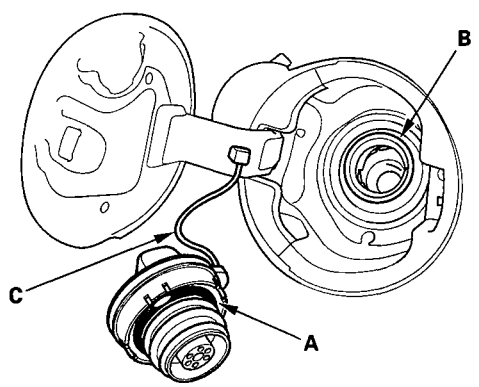
1. Check the fuel fill cap (the cap must say "Tighten to click"). It should turn 1/4 after it's tight, then it clicks.

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 13.

2. Check the fuel fill cap seal (A) and the fuel fill pipe mating surface (B). Verify that the fuel fill cap tether cord (C) is not caught under the cap.



   Is the fuel fill cap seal missing or damaged, is the fuel fill pipe damaged, or is the tether cord caught under the cap?

   YES—Replace the fuel fill cap or the fuel fill pipe, then go to step 13.

   NO—Go to step 3.

3. Reinstall and tighten the fuel fill cap.

4. Clear the DTC with the HDS.

5. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 1 minute.

6. Test drive at 45 mph (72 km/h) for 1 minute or more.

   Does the fuel cap warning message comes on?

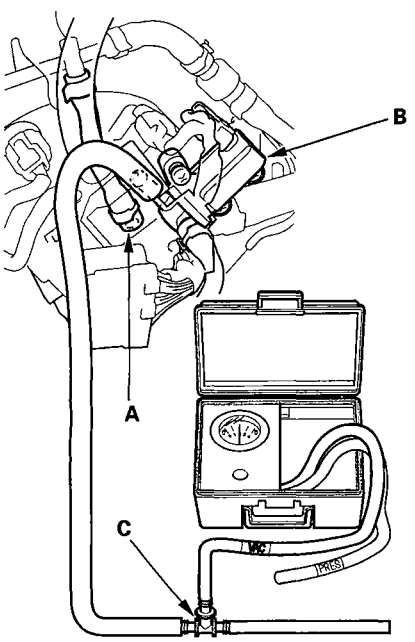
   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. ■

7. Turn the ignition switch OFF.

8. Remove the intake air duct (air flow tube) (see step 19 on page 9-16).

9. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B) in the engine compartment, and connect a T-fitting (C) from the vacuum gauge and the vacuum pump/gauge 0—30 in.Hg, to the EVAP canister purge valve as shown.



(cont'd)

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Fuel Cap Warning Message System Troubleshooting (cont'd)

10. Turn the ignition switch ON(II).
11. Apply vacuum to the hose about 2 kPa (0.6 in.Hg, 15 mmHg).
12. Select EVAP PCS ON in the INSPECTION MENU with the HDS.

    Does the vacuum release immediately?

    YES—Check for blockage the vacuum hose between EVAP canister purge valve and the EVAP canister, then go to step 13.

    NO—Replace the EVAP canister purge valve (see page 11-486), then go to step 13.
13. Install the parts in the reverse order of removal.
14. Turn the ignition switch ON (II).
15. Reset the PCM with the HDS.
16. Do the PCM idle learn procedure (see page 11-339).
17. Start the engine. Hold the engine speed 3,000 rpm without load (in Park or neutral) until a radiator fan comes on, then let it idle for 1 minute.
18. Test drive at 45 mph (72 km/h) for 1 minute or more.

    Does the fuel cap warning message comes on?

    YES—Go to step 1 and recheck.

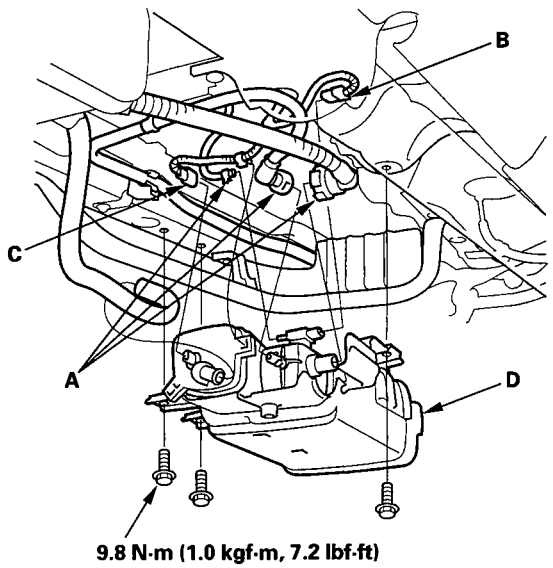
    NO—Troubleshooting is complete.■

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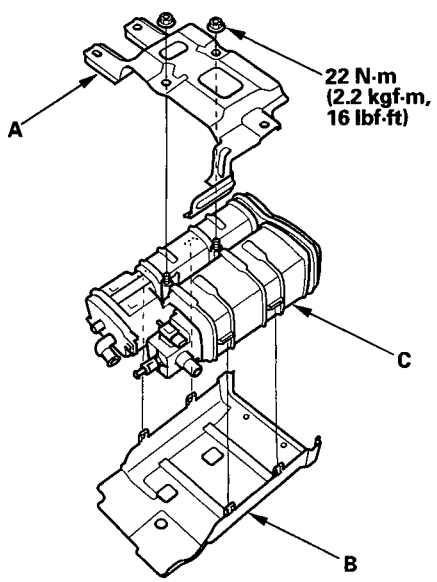
EVAP Canister Replacement

1. Disconnect the hoses (A), the FTP sensor 3P connector (B), and the EVAP canister vent shut valve 2P connector (C).



2. Remove the EVAP canister assembly D).

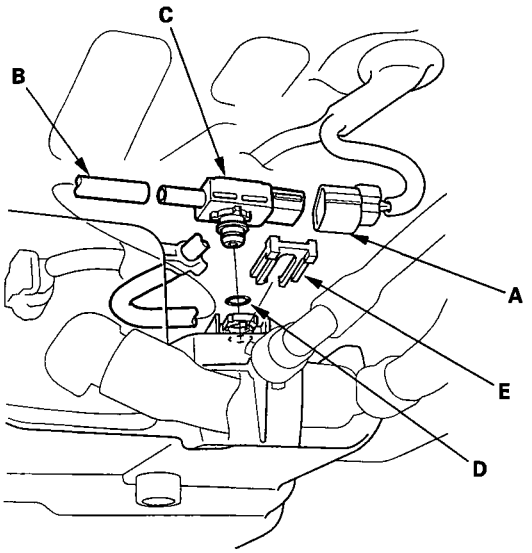
3. Remove the EVAP canister bracket (A) and the EVAP canister cover (B) from the EVAP canister (C).



4. Install the parts in the reverse order of removal.

FTP Sensor Replacement

1. Disconnect the FTP sensor connector (A).



2. Disconnect the hose (B), then remove the FTP sensor (C).

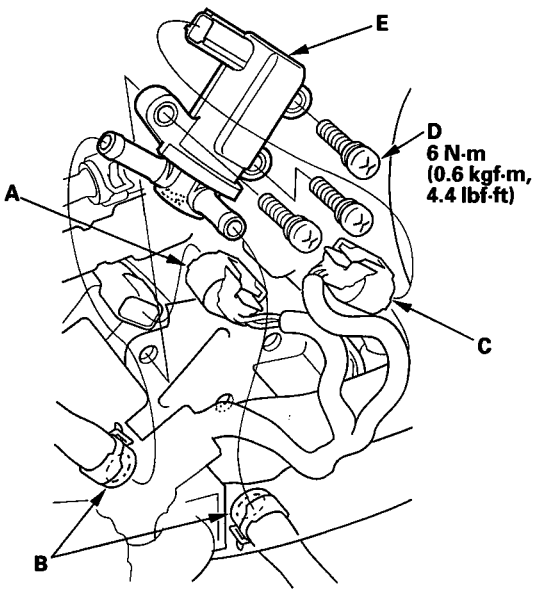
3. Reinstall the parts in the reverse order of removal with a new O-ring (D) and a new retainer (E).

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EVAP Canister Purge Valve Replacement

NOTE: DTC P0443 may be stored if the EVAP canister purge valve connector is removed within 15 seconds after ignition switch is turned OFF.

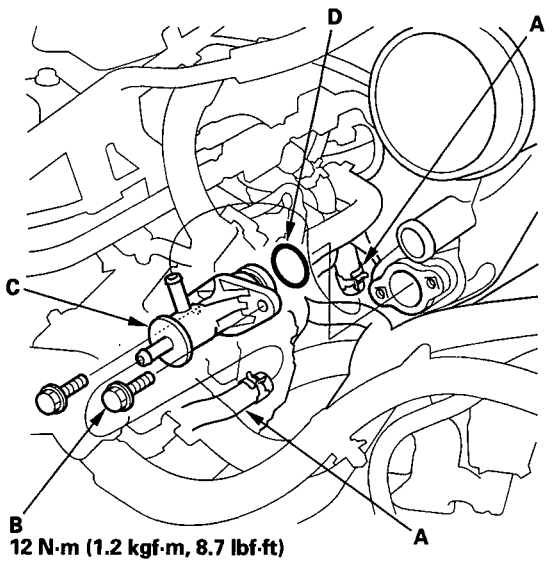
1. Remove the air cleaner (see page 11-394).
2. Remove the air bypass outlet pipe (see page 9-7).
3. Disconnect the CMP sensor B 3P connector (A).



4. Disconnect the hoses (B), and EVAP canister purge valve 2P connector (C).
5. Remove the screws (D), then remove the EVAP canister purge valve (E).
6. Install the parts in the reverse order of removal.

EVAP Canister Purge Nozzle Replacement

1. Remove the air cleaner (see page 11-394).
2. Remove the air bypass outlet pipe (see page 9-7).
3. Disconnect the hoses (A).



4. Remove the bolts (B), then remove the EVAP canister purge nozzle (C).
5. Install the parts in the reverse order of removal with a new O-ring (D).

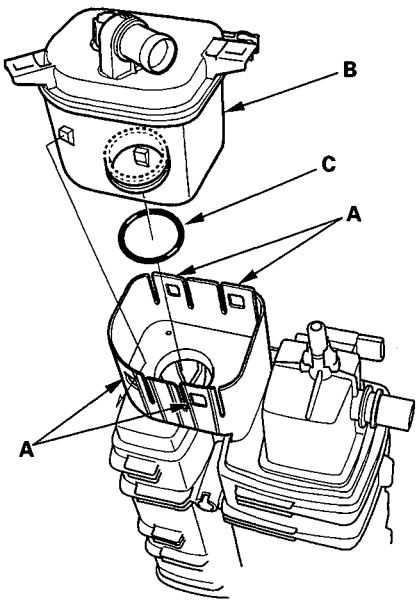
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EVAP Canister Vent Shut Valve Replacement

1. Remove the EVAP canister (see page 11-485).
2. Pry the lock tabs outward (A), then remove the EVAP canister vent shut valve (B).

   NOTE: Be careful not to damage the lock tabs.

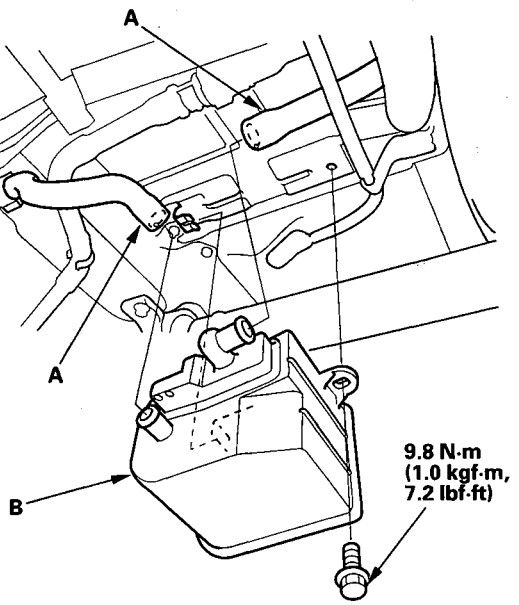


3. Install the parts in the reverse order of removal with a new O-ring (C).

   NOTE: Do not coat the O-ring with oil.

EVAP Canister Filter Replacement

1. Disconnect the hoses (A).



2. Remove the EVAP canister filter (B).
3. Install the parts in the reverse order of removal.

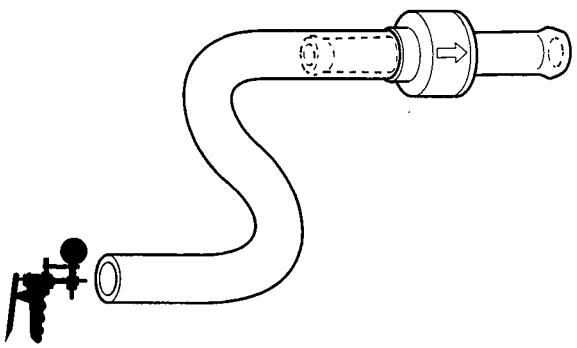
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Non-return Valve A/B Inspection/Replacement

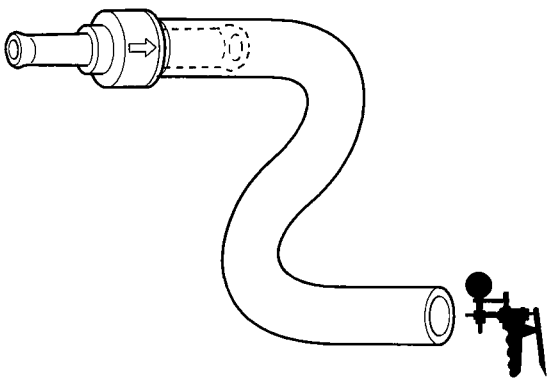
Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

Inspection

1. Remove the non-return valve.
2. Connect the vacuum pump/gauge, 0—30 in.Hg, to the non-return valve as shown. Note the direction of the arrow on the valve.



3. Apply vacuum to the valve.
   - If it holds vacuum, go to step 4.
   - If it doesn't hold the vacuum, replace the non-return valve.
4. Connect the vacuum pump/gauge, 0—30 in.Hg, to the non-return valve as shown. Note the direction of the arrow on the valve.



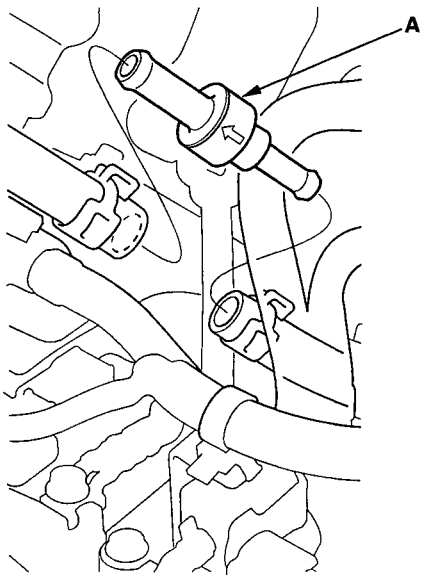
5. Apply vacuum to the valve.
   - If it holds vacuum, replace the non-return valve.
   - If it doesn't hold the vacuum, the non-return valve is OK.

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Non-Return Valve A Replacement

1. Remove the charge air cooler cover (see step 1 on page 9-8).
2. Disconnect the hoses, then remove the non-return valve A.

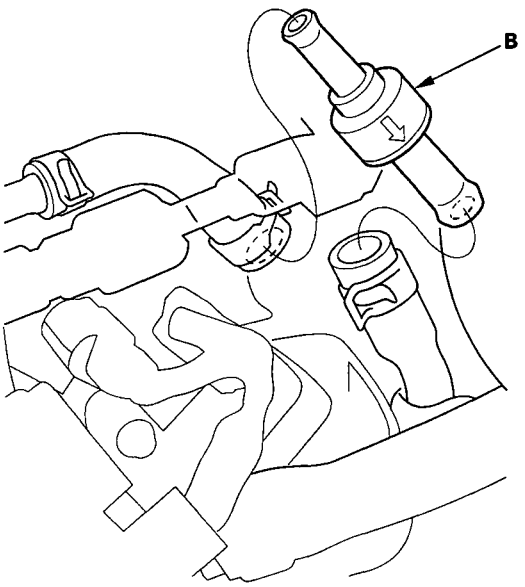


3. Install the parts in the reverse order of removal.

   NOTE: Make sure the arrow on the valve points in the correct direction.

Non-Return Valve B Replacement

1. Remove the air cleaner (see page 11-394).
2. Remove the air bypass outlet pipe (see page 9-7).
3. Disconnect the hoses, then remove the non-return valve B.



4. Install the parts in the reverse order of the removal.

   NOTE: Make sure the arrow on the valve points in the correct direction.

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