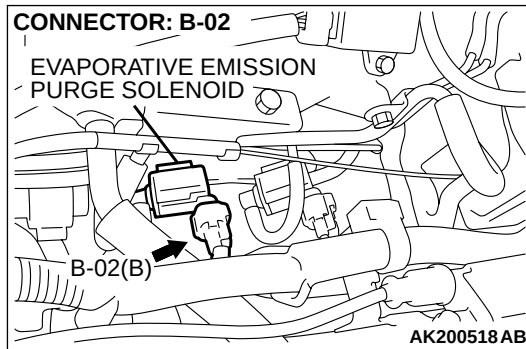
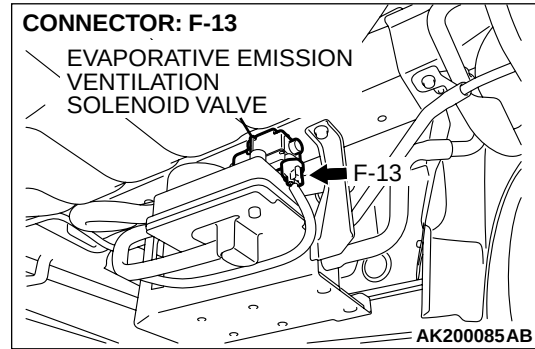


DTC P0441: Evaporative Emission Control System Incorrect Purge Flow



TECHNICAL DESCRIPTION

- ECM <M/T> or PCM <A/T> detects stuck open of evaporative emission purge solenoid valve and stuck close of evaporative emission ventilation solenoid valve by pressure change in fuel tank.
- Stuck open of evaporative emission purge solenoid valve is judged through monitoring leak of evaporative emission system.
- Stuck close of evaporative emission ventilation solenoid valve is judged after 20 seconds of end of monitoring leak of evaporative emission system, or of usual operation of evaporative emission purge solenoid from ON to OFF.



DESCRIPTIONS OF MONITOR METHODS

- If the internal pressure of the fuel tank has dropped significantly while the evaporative emission purge is being cut, a malfunction is determined to have occurred (EVAP purge solenoid stuck open or EVAP ventilation solenoid stuck closed).

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

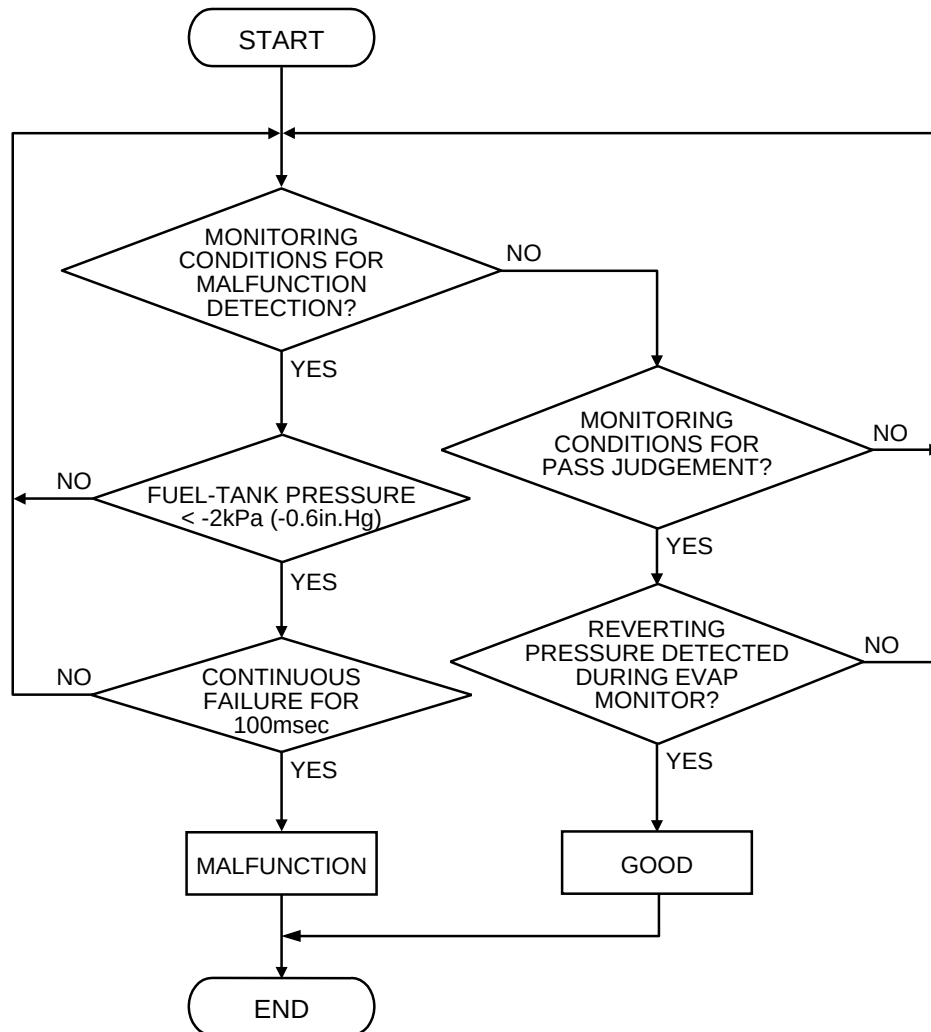
- Fuel tank differential pressure sensor monitor

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302328

Check Conditions

- ON duty cycle of the evaporative emission purge solenoid is 0 percent.
- 20 seconds have elapsed from the time the duty cycle of the evaporative emission purge solenoid has turned to 0 percent.

Judgment Criteria

- The pressure in the fuel tank is -2 kPa (-0.6 in.Hg) or less for 0.1 second.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Evaporative emission purge solenoid failed.
- Evaporative emission ventilation solenoid failed.
- Choking up of hose between evaporative emission canister and evaporative emission ventilation solenoid.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

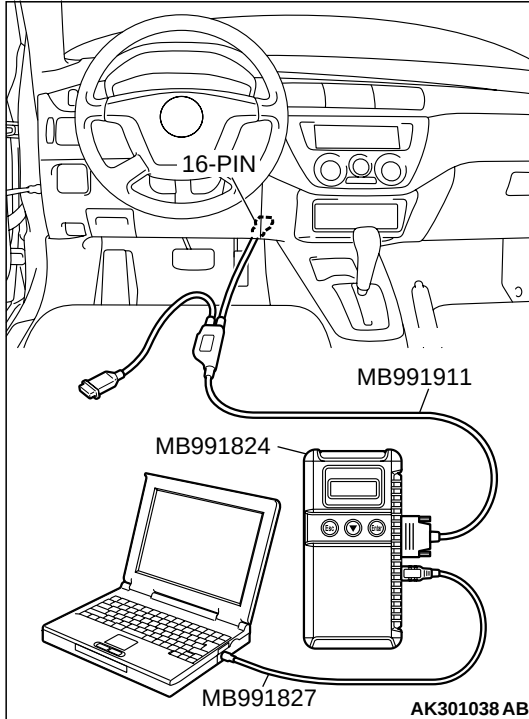
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

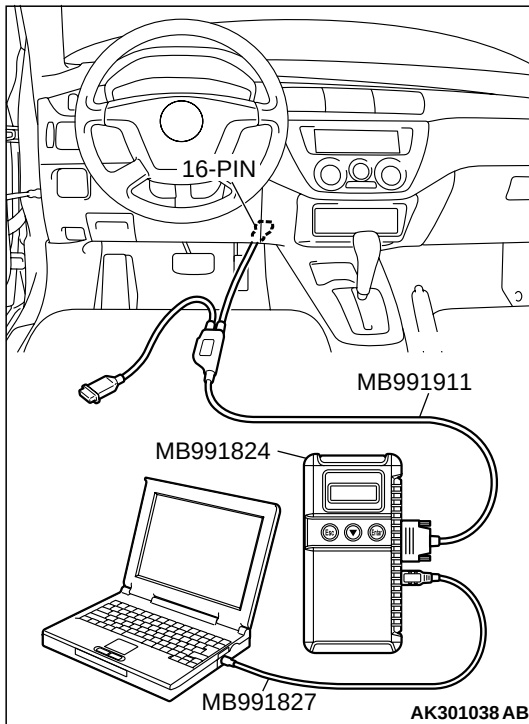
Q: Is DTC P0451 set?

YES : Refer to, DTC P0451 – Evaporative Emission Control System Pressure Sensor Range/Performance

[P.13A-463.](#)

NO : Go to Step 2.





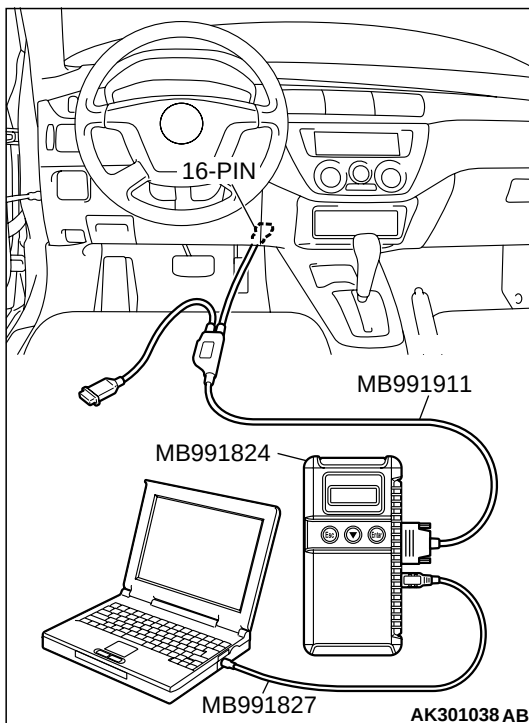
STEP 2. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

- (1) Turn the ignition switch to the "ON" position.
- (2) Remove the fuel cap.
- (3) Set scan tool MB991958 to the data reading mode for item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank differential pressures should be -3.3 to 3.3 kPa (-0.97 – 0.97 in.Hg).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the fuel tank pressure between -3.3 and 3.3 kPa (-0.97 to 0.97 inHg)?

YES : Go to Step 3.

NO : Refer to, DTC P0451 – Evaporative Emission Control System Pressure Sensor Range/Performance
[P.13A-463](#).



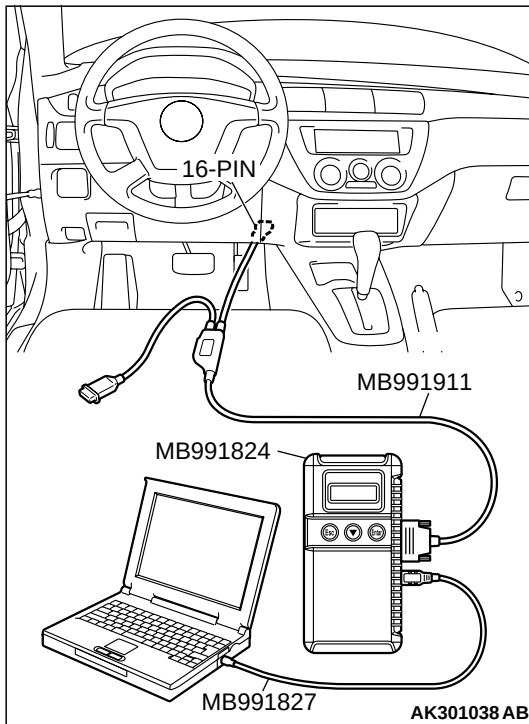
STEP 3. Using scan tool MB991958, check actuator test item 08: Evaporative Emission Purge Solenoid.

- (1) Turn the ignition switch to the "ON" position.
- (2) Set scan tool MB991958 to the actuator test mode for item 08, Evaporative emission purge solenoid.
 - An operation sound should be heard and vibration should be felt when the evaporative emission purge solenoid is operated.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid operating properly?

YES : Go to Step 4.

NO : Replace the evaporative emission purge solenoid.
Then go to Step 5.



STEP 4. Using scan tool MB991958, check actuator test item 29: Evaporative Emission Ventilation Solenoid.

- (1) Turn the ignition switch to the "ON" position.
- (2) Set scan tool MB991958 to the actuator test mode for item 29, Evaporative emission ventilation solenoid.
 - An operation sound should be heard and vibration should be felt when the evaporative emission ventilation solenoid is operated.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid operating properly?

YES : Repair or replace the vent hose and air filter. Then go to Step 5.

NO : Replace the evaporative emission ventilation solenoid. Then go to Step 5.

STEP 5. Test the OBD-II drive cycle.

- (1) Carry out a test drive with the drive cycle pattern. (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6.](#))
- (2) Read the diagnostic trouble code.

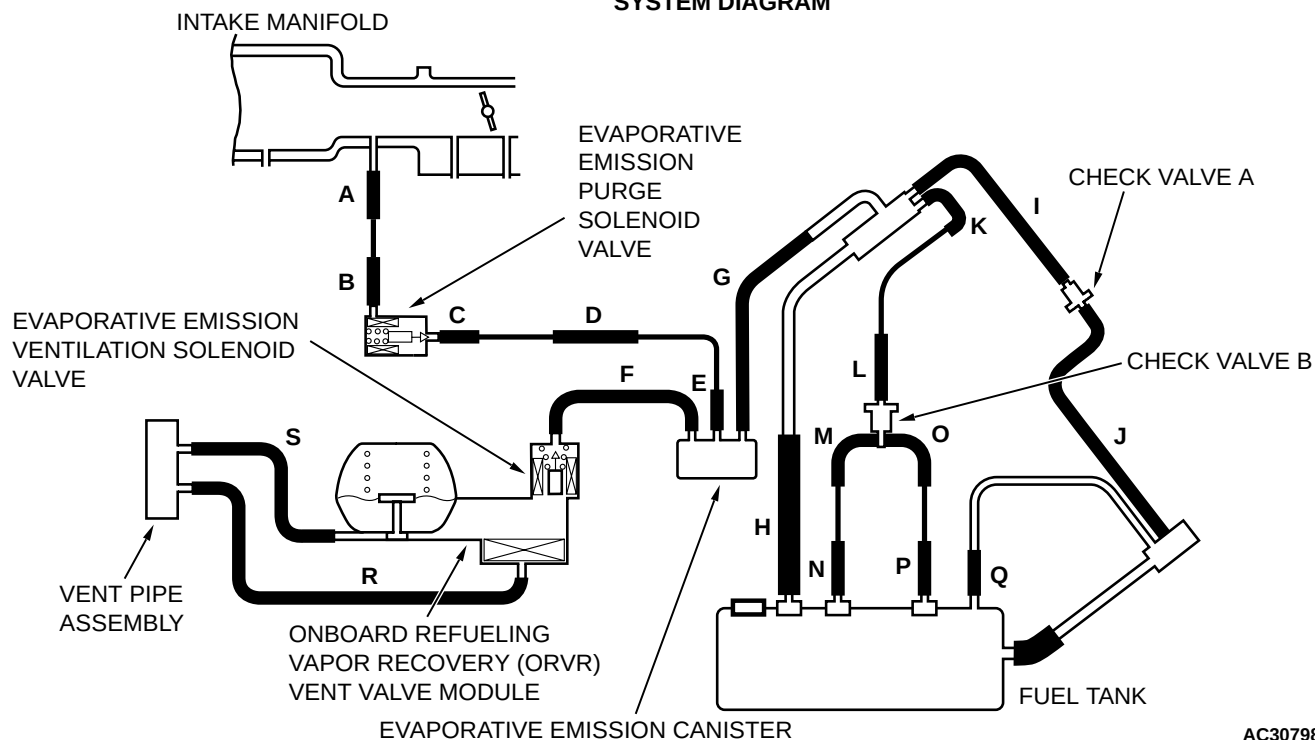
Q: Is DTC P0441 set?

YES : Retry the troubleshooting.

NO : The inspection is complete.

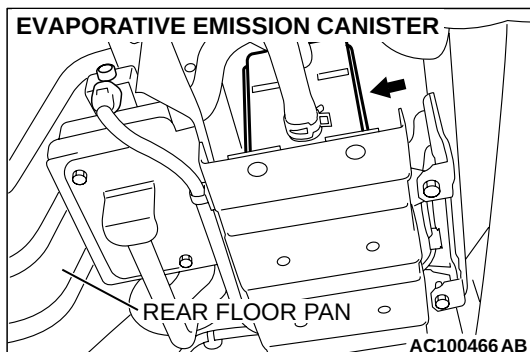
DTC P0442: Evaporative Emission Control System Leak Detected (Small Leak)

SYSTEM DIAGRAM

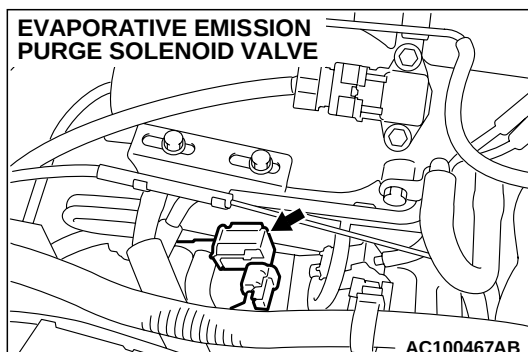


AC307986AB

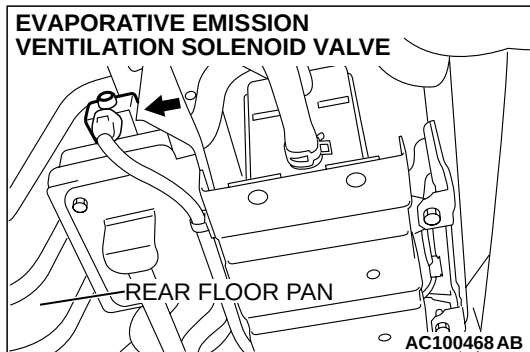
EVAPORATIVE EMISSION CANISTER



EVAPORATIVE EMISSION PURGE SOLENOID VALVE



EVAPORATIVE EMISSION VENTILATION SOLENOID VALVE



TECHNICAL DESCRIPTION

- The ECM <M/T> or PCM <A/T> monitors the Evaporative Emission (EVAP) System pressure.
- The ECM <M/T> or PCM <A/T> controls the evaporative emission ventilation solenoid. It closes the evaporative emission ventilation solenoid to seal the evaporative emission canister side of the system.
- The evaporative emission purge solenoid is opened to allow manifold vacuum to create low pressure (vacuum) in the EVAP system.
- When the EVAP system develops a vacuum of 2 kPa (0.29 psi), the evaporative emission purge solenoid is closed and the fuel system vacuum is maintained at 2 kPa. (0.29 psi).
- The ECM <M/T> or PCM <A/T> determines whether there is a leak in the EVAP system by monitoring the vacuum inside the fuel tank.
- The test is stopped when fuel vapor pressure exceeds predetermined limits.

DESCRIPTIONS OF MONITOR METHODS

- Measure reverting pressure after depressurizing by intake manifold negative pressure and detect malfunction if reverting pressure rises largely.

MONITOR EXECUTION

- Once per driving cycle.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

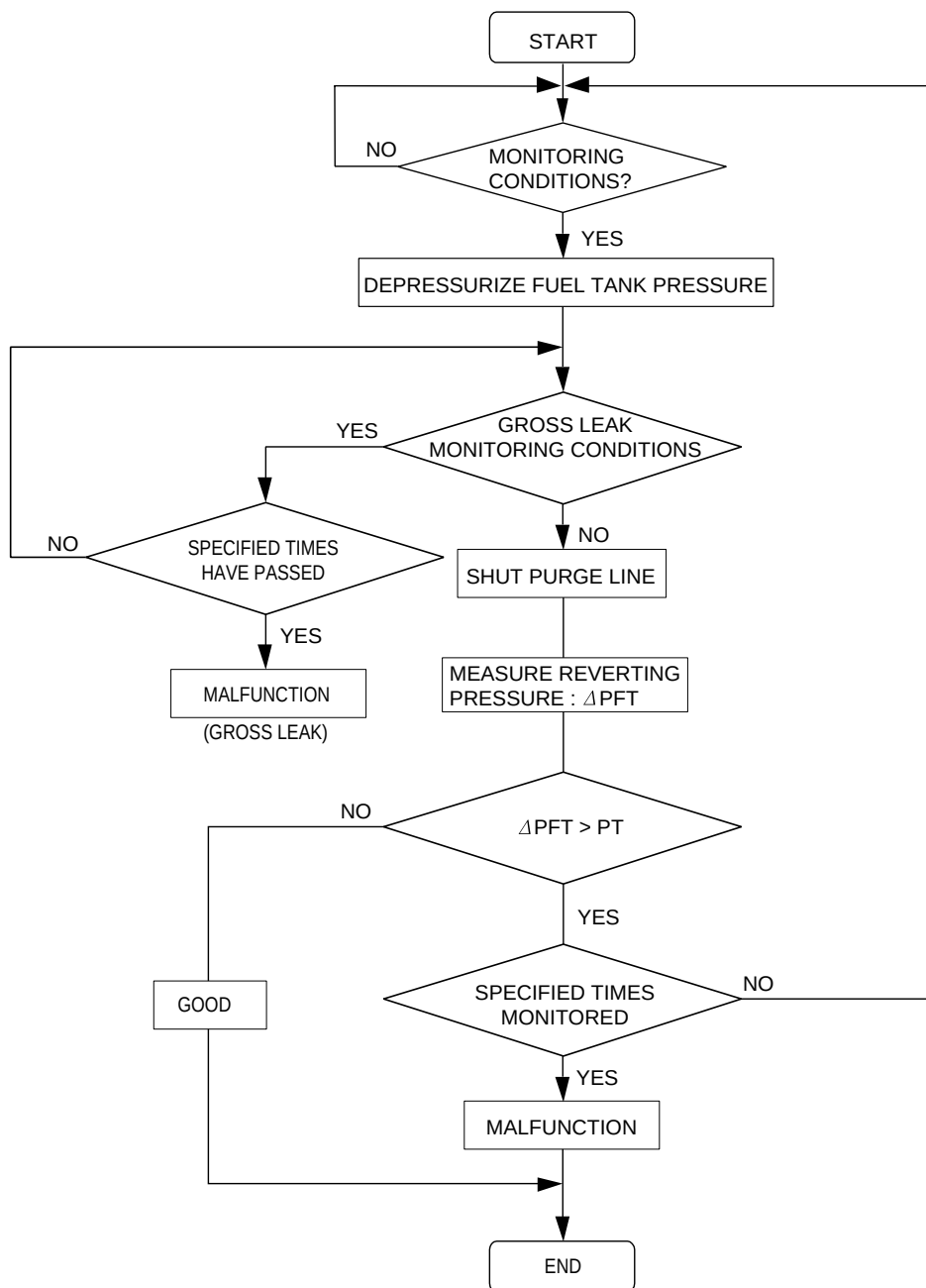
- Evaporative emission purge solenoid monitor
- Evaporative emission purge system monitor
- Fuel tank differential pressure sensor monitor
- Evaporative emission ventilation solenoid monitor
- Fuel level sensor monitor
- Fuel temperature sensor monitor

Sensor (The sensors below are determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)

0.04in, 0.02in GROSS LEAK MONITOR



AC306649

DTC SET CONDITIONS

Remaining fuel amount is 15 – 40 percent of capacity (fuel level sensor output signal voltage is 1.4 – 2.4 volts).

Check Conditions A: At Start up

- Intake air temperature is 36°C (97°F) or less when the engine is started.
- The engine coolant temperature is 36 °C (97 °F) or less when the engine is started.

Check Conditions B: For Test to Run

- The fuel temperature is 36°C (97°F) or less.
- 14 minutes have elapsed since the engine was started.
- Engine coolant temperature is greater than 60°C (140°F).
- Power steering pressure switch: "OFF"
- Barometric pressure is greater than 76 kPa (11 psi).
- Fuel tank differential pressure sensor output voltage is 1 to 4 volts.
- Vehicle speed is greater than or equal to 20 km/h (12.4 mph).

Check Conditions C: For Test to Stop

- Intake air temperature is greater than -10°C (14°F).
- When the evaporative emission purge solenoid and evaporative emission ventilation solenoid are closed, the pressure in the fuel tank is less than 451 Pa (0.065 psi).
- The pressure fluctuation is less than 647 Pa (0.094 psi).
- 10 seconds have elapsed from the start of the previous monitoring.
- Monitoring time: 75 – 125 seconds.

Judgment Criteria

- Internal pressure of the fuel tank has changed more than 785 Pa (0.114 psi) in 20 seconds after the tank and vapor line were closed.

DTC SET CONDITIONS

Remaining fuel amount is 40 – 85 percent of capacity (fuel level sensor output voltage is 2.4 – 3.7 volts).

Test Conditions A: At Start up

- Intake air temperature is less than 36 °C (97 °F) when the engine is started.
- The engine coolant temperature is less than 36 °C (97°F) when the engine is started.

Test Conditions B: For Test to Run

- The fuel temperature is 36°C (97°F).
- Barometric pressure is greater than 76 kPa. (11 psi).
- Fuel tank differential pressure sensor output voltage is 1 to 4 volts.

Test Conditions C: For Test to Stop

- Intake air temperature is greater than -10°C (14°F).
- Engine coolant temperature is greater than 20°C (68°F).
- When the evaporative emission purge solenoid and evaporative emission ventilation solenoid are closed, the pressure in the fuel tank is less than 324 Pa (0.047 psi).
- 10 seconds have elapsed from the start of the previous monitoring.
- Monitoring time: 10 – 14 minutes.

Judgment Criteria

- Internal pressure of the fuel tank has changed more than 1.9 kPa (0.28 psi) in 128 seconds after the tank and vapor line were closed.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Loose fuel cap.
- Fuel cap relief pressure is incorrect.
- Evaporative emission canister seal is leaking.
- Fuel tank, purge line or vapor line seal is leaking.
- Evaporative emission ventilation solenoid does not seal.

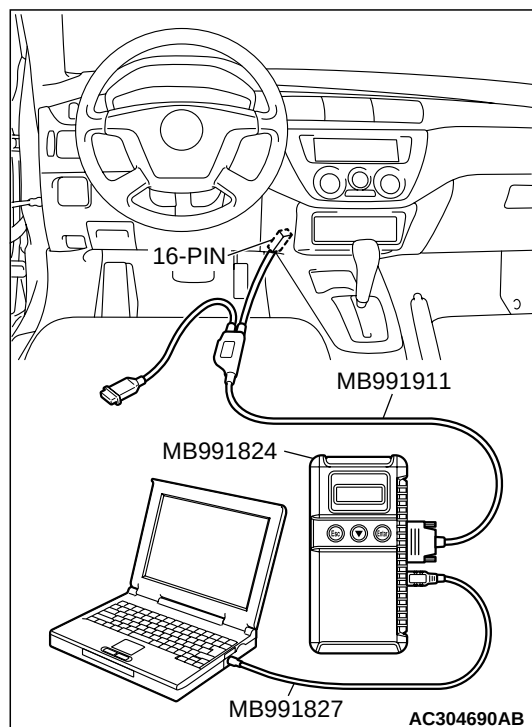
DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check the EVAP system monitor test.**⚠ CAUTION**

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

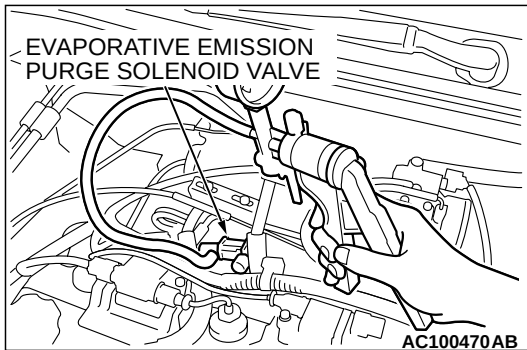
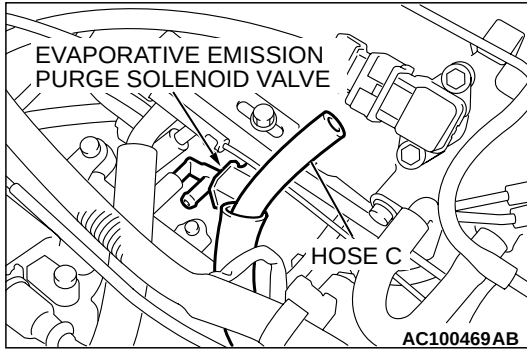
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During this test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position, and disconnect scan tool MB991958.

**Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?**

YES : A malfunction has been detected during the monitor test. Refer to the Diagnostic Trouble Code Chart and diagnose any other DTCs that are set [P.13A-29](#). If no other DTC's have been set, then go to Step 2.

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Explain to the customer that an improperly tightened fuel cap can cause the MIL to illuminate. Return the vehicle to the customer.

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 1.



STEP 2. Check the evaporative emission purge solenoid for leaks.

(1) Disconnect hose C from the evaporative emission purge solenoid and connect a hand vacuum pump to the nipple of the evaporative emission purge solenoid.

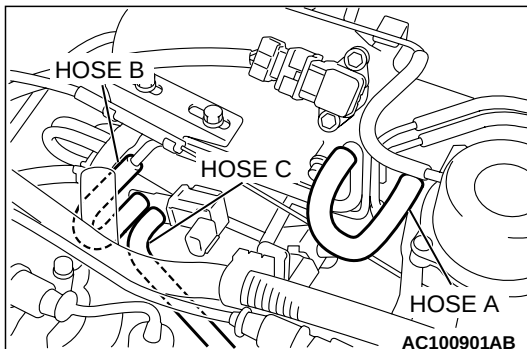
(2) Use the hand vacuum pump to confirm that the evaporative emission purge solenoid holds vacuum.

(3) Disconnect the hand vacuum pump, and connect hose C to the evaporative emission purge solenoid.

Q: Does the evaporative emission purge solenoid hold vacuum?

YES : Go to Step 3.

NO : Replace the evaporative emission purge solenoid.
Then go to Step 15.



STEP 3. Check for leaks in evaporative emission system hoses A through C.

Use a hand vacuum pump to test each hose from hose A to hose C.

Q: Do the hoses hold vacuum?

YES : Go to Step 4.

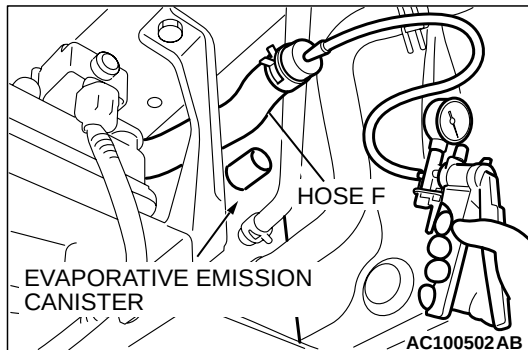
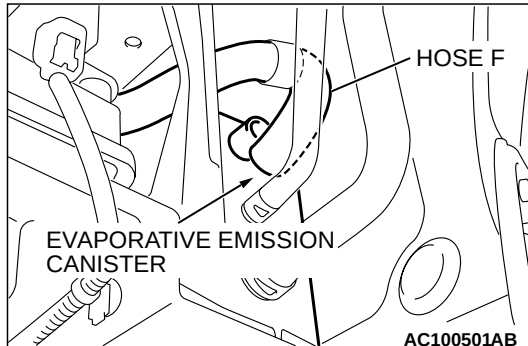
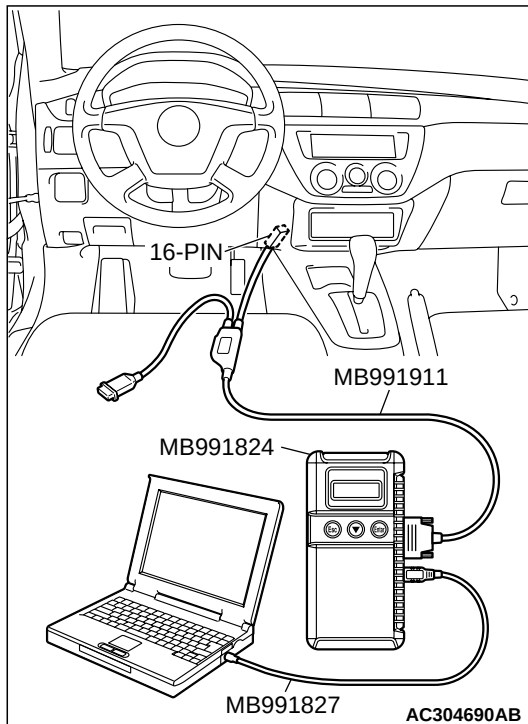
NO : Replace any damaged hose. Then go to Step 15.

STEP 4. Using scan tool MB991958, check data list item 29: Evaporative Emission Ventilation Solenoid.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

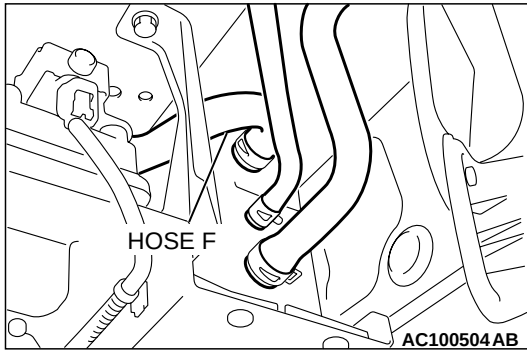


- (2) Disconnect hose F from the evaporative emission canister side, and connect a hand vacuum pump.
- (3) Turn the ignition switch to the "ON" position.
- (4) Set scan tool MB991958 to actuator test mode.
 - Item 29: Evaporative Emission Ventilation Solenoid.
 - While the evaporative emission ventilation solenoid is energized, operate the hand vacuum pump and confirm that the solenoid holds vacuum.
- (5) Turn the ignition switch to the "LOCK" (OFF) position, and disconnect scan tool MB991958.
- (6) Disconnect the hand vacuum pump, and connect hose F to the evaporative emission canister.

Q: Did the evaporative emission ventilation solenoid hold vacuum?

YES : Go to Step 6.

NO : Go to Step 5.

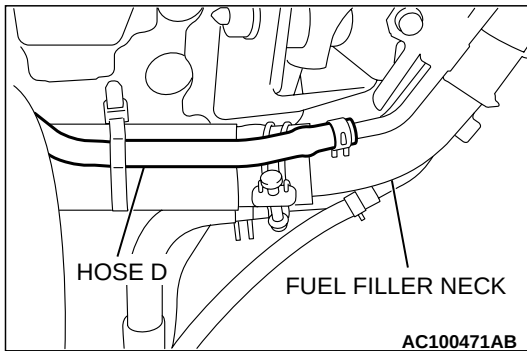


STEP 5. Check for leaks in evaporative emission hose F.
Perform a leakage test using a hand vacuum pump on hose F.

Q: Do the hose hold vacuum?

YES : Replace the evaporative emission ventilation solenoid. Then go to Step 15.

NO : Replace hose F. Then go to Step 15.



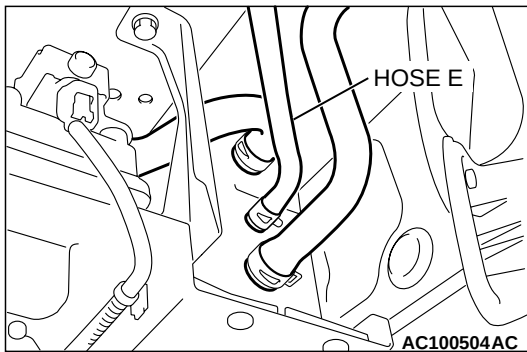
STEP 6. Check for leaks in evaporative emission system hoses D and E.

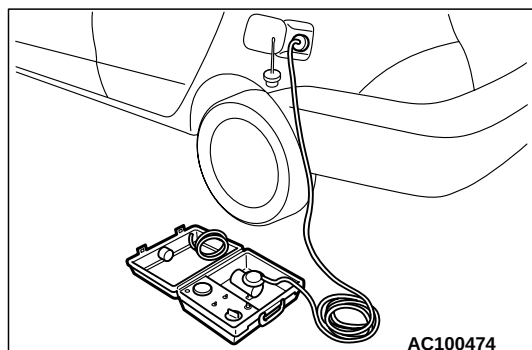
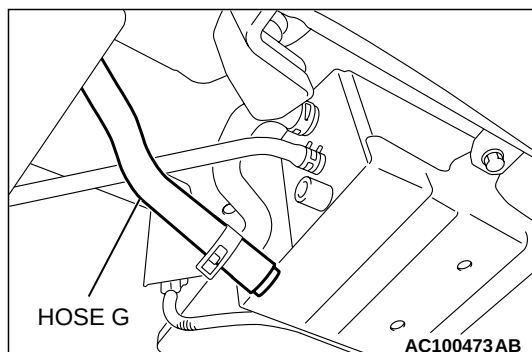
Perform a leakage test with a hand vacuum pump on each hose between hose D and hose E.

Q: Do the hoses hold vacuum?

YES : Go to Step 7.

NO : Replace the damaged hose. Then go to Step 15.



**STEP 7. Pressure test for leaks in evaporative system lines from hose G through the fuel tank to hose Q.**

- (1) Disconnect hose G from the canister, and plug hose G securely.
- (2) Confirm that the evaporative emission system pressure pump (Miller number 6872A) is operating properly. Perform the self-test as described in the manufacturer's instructions.

- (3) Connect the evaporative emission system pressure pump to the fuel filler neck.
- (4) Pressure test the system to determine whether any leaks are present.

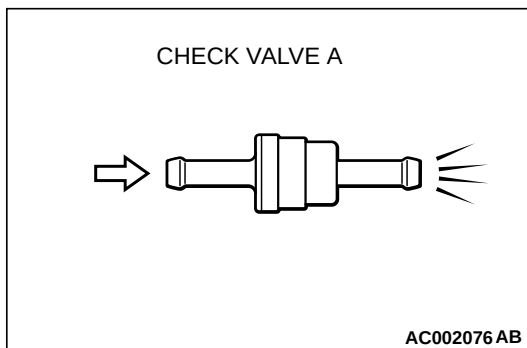
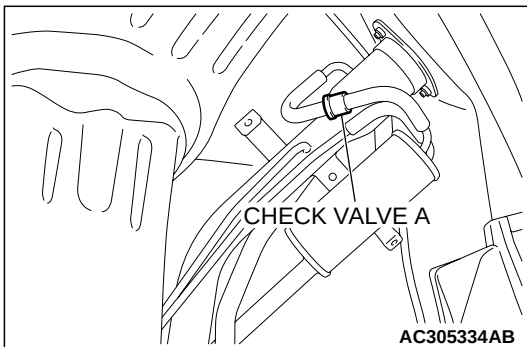
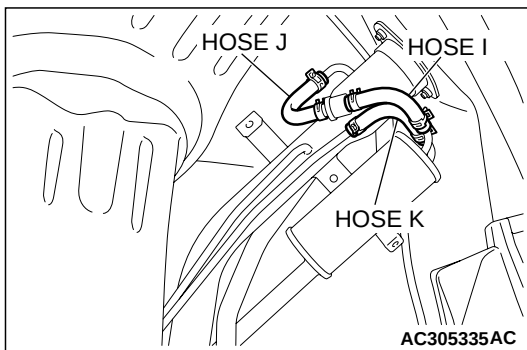
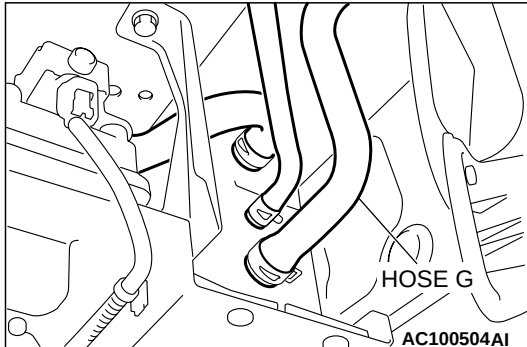
NOTE: The "Pressure test" in this procedure refers to the I/M240 Simulation Test. The eight steps of this test are described in the manufacturer's instructions for the evaporative emission system pressure pump, Miller number 6872A.

- (5) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (6) Connect hose G to the canister.

Q: Is the evaporative emission system line free of leaks?

YES : Go to Step 13.

NO : Go to Step 8.



STEP 8. Check for leaks in evaporative emission hoses G, I, J and K.

- (1) Remove the fuel filler neck protector. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Perform a leakage test with a hand vacuum pump on each hose: G, I, J and K.

Q: Do the hoses hold vacuum?

YES : Go to Step 9.

NO : Replace any damaged hose, and reinstall the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.

STEP 9. Test check valve A.

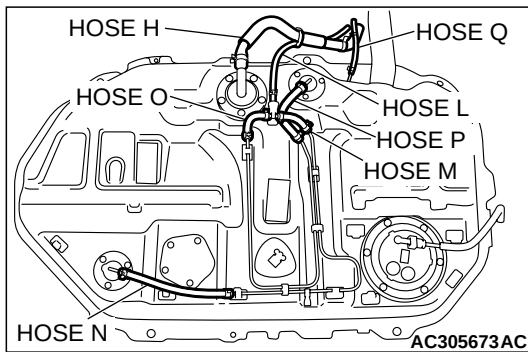
- (1) Check valve A is a one-way check valve.

- (2) Check valve A should allow air to flow in only one direction.

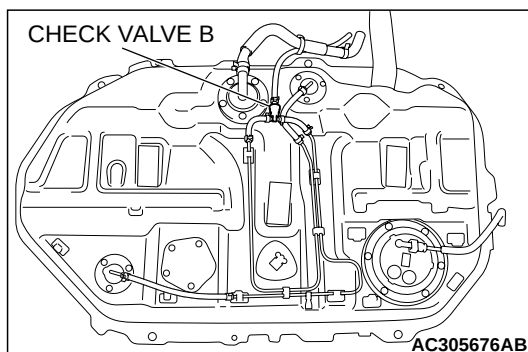
Q: Does check valve A allow air to pass in one direction only?

YES : Go to Step 10.

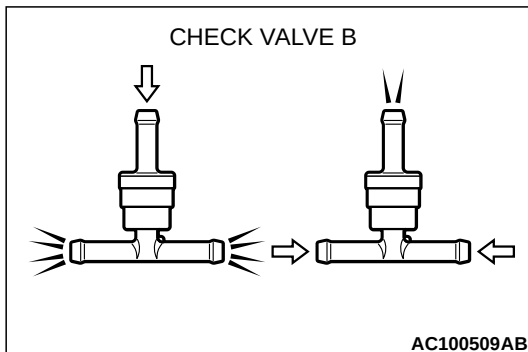
NO : Replace check valve A, and reinstall the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.

**STEP 10. Check for leaks in evaporative emission hoses H, L, M, N, O, P, and Q.**

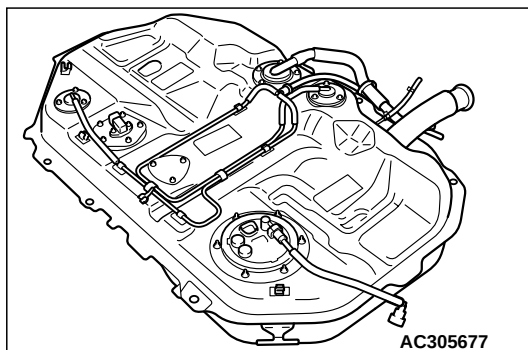
- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Perform a leakage test with a hand vacuum pump on each hose H, L, M, N, O, P and Q.

Q: Do the hoses hold vacuum?**YES :** Go to Step 11.**NO :** Replace any damaged hose, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.**STEP 11. Test check valve B.**

- (1) Check valve B is a one-way check valve.

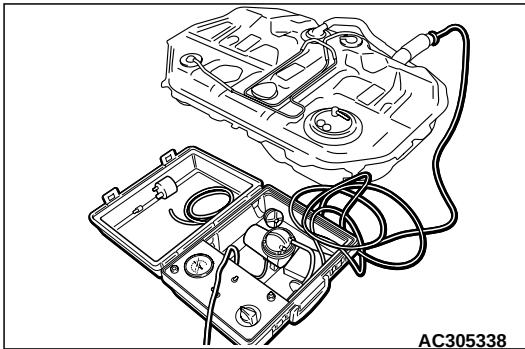


- (2) Check valve B should allow air to flow in only one direction.

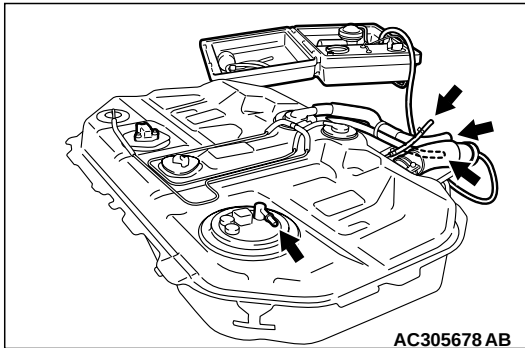
Q: Does check valve B allow air to pass in one direction only?**YES :** Go to Step 12.**NO :** Replace check valve B, and reinstall the fuel tank and the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.**STEP 12. Check for leaks in the fuel tank.**

- (1) Visually check for cracks or other leaks in the fuel tank.

NOTE: Carefully check the fuel pump assembly and the differential pressure sensor installation in the fuel tank.



- (2) Connect an evaporative emission system pressure pump (Miller number 6872A) to the filler hose.



- (3) Plug the fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

- (4) Pressurize the fuel tank with the evaporative emission system pressure pump.
(5) In the pressurized state, check for leaks by applying a soapy water solution to each section and look for bubbles.

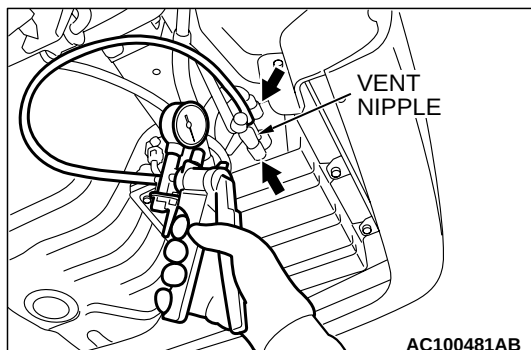
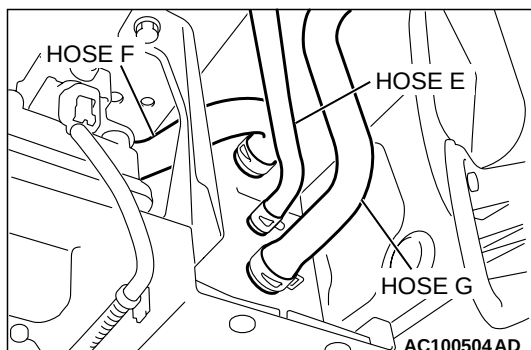
Q: Is any leaks found?

YES <When there is a leak from the attachment points of the fuel pump assembly, fuel tank differential pressure sensor, leveling valve or fuel tank rollover valve.> :

Reassemble the leaked parts and check again that there are no leaks. Then reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 15 .

YES <When there is a leak from the fuel tank.> : Replace the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 15.

NO : When there is no leak, reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 14.

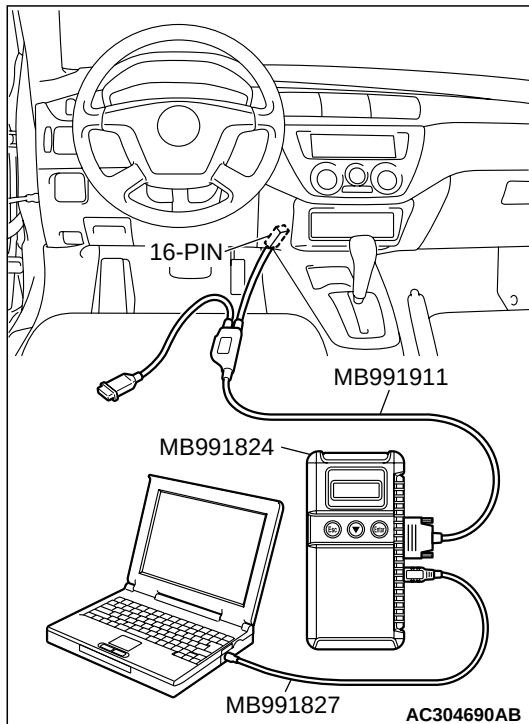
**STEP 13. Check the evaporative emission canister for vacuum leaks.**

- (1) Disconnect hoses E, F and G from the evaporative emission canister side, and connect a hand vacuum pump to the evaporative emission canister instead of hose E, and plug the other nipples.
- (2) Apply a pressure on the hand vacuum pump, and confirm that air is maintained.
- (3) Disconnect the hand vacuum pump, and connect hoses E, F and G to the canister.

Q: Does the evaporative emission canister hold vacuum?

YES : Go to Step 13.

NO : Replace the evaporative emission canister. Refer to GROUP 17, Evaporative Emission Canister and Fuel Tank Pressure Relief Valve [P.17-230](#). Then go to Step 15 .



STEP 14. Using scan tool MB991958, check the EVAP system monitor test.

⚠ CAUTION

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During the test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position. Disconnect scan tool MB991958.

Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?

YES : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 15.

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Then go to Step 15.

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 14.

STEP 15. Perform the OBD-II drive cycle.

- (1) Confirm the repair by performing the appropriate drive cycle (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).

- (2) Read the diagnostic trouble code (DTC).

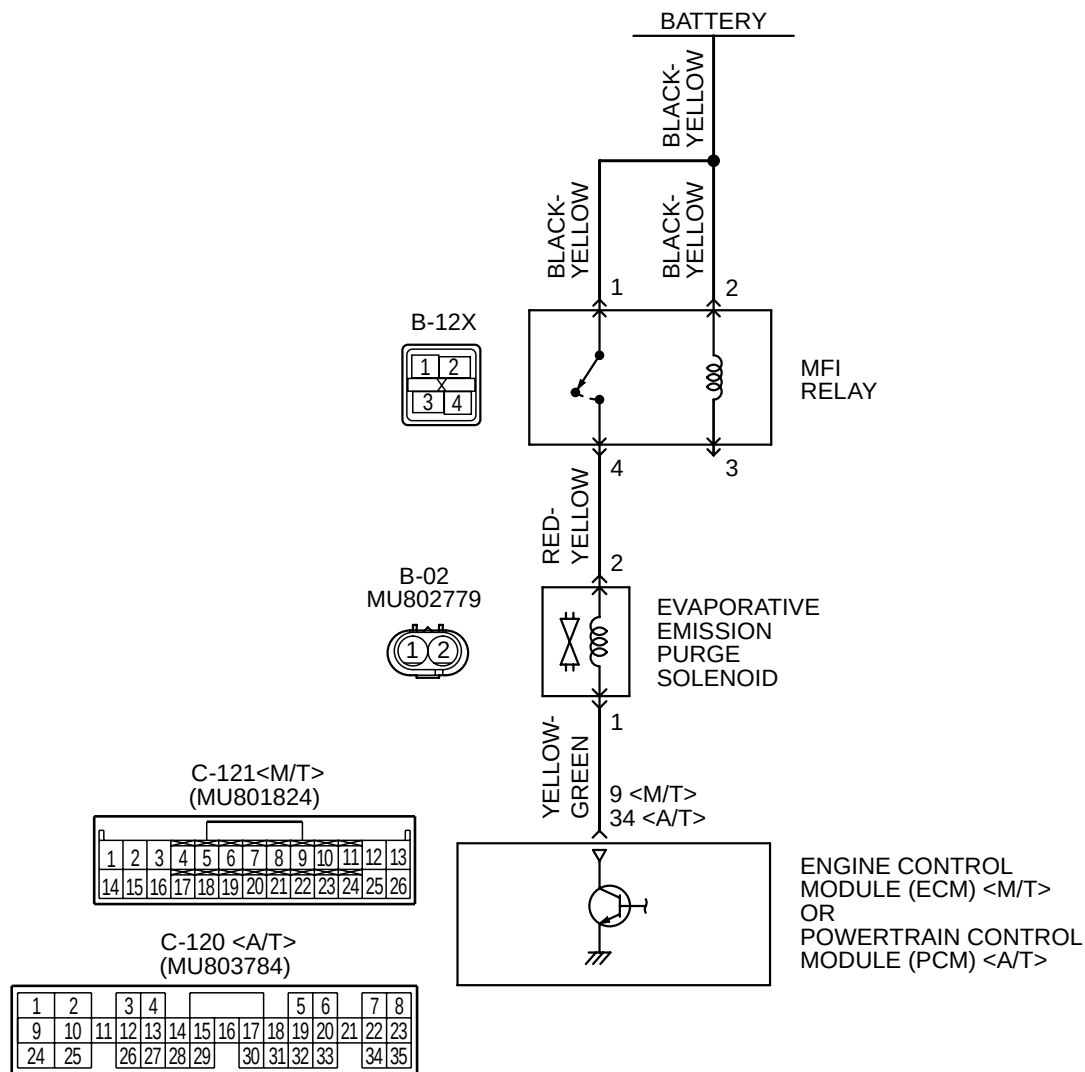
Q: Is DTC P0442 set?

YES : Repeat the troubleshooting from Step 1.

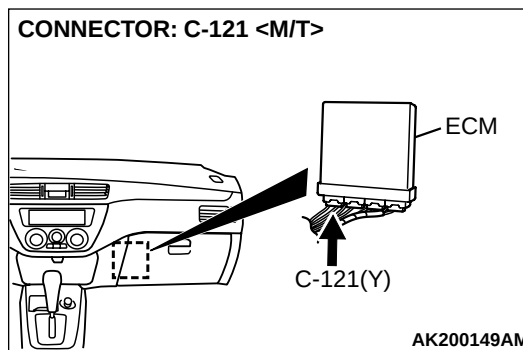
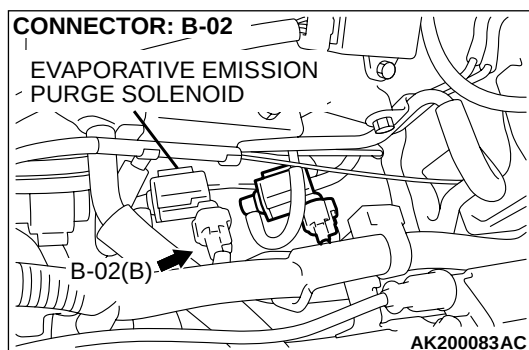
NO : The procedure is complete.

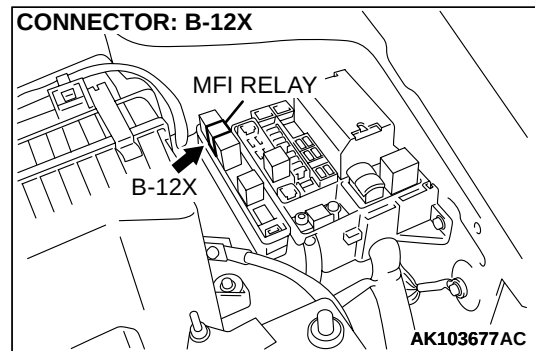
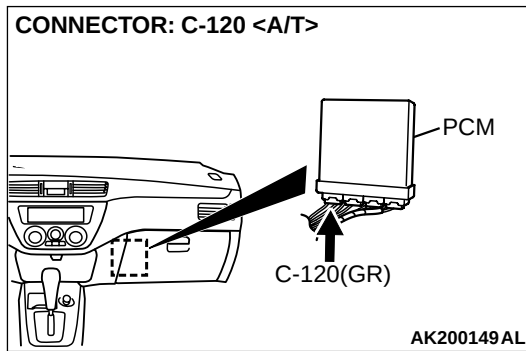
DTC P0443: Evaporative Emission Control System Purge Control Valve Circuit

Evaporative Emission Purge Solenoid Circuit



AK100031





CIRCUIT OPERATION

- Power to the evaporative emission purge solenoid power is supplied from the MFI relay (terminal No. 4).
- The ECM <M/T> or PCM <A/T> controls ground evaporative emission purge solenoid by turning the power transistor in the ECM <M/T> or PCM <A/T> "ON" and "OFF".

TECHNICAL DESCRIPTION

- To judge if there is open circuit in the evaporative emission purge solenoid drive circuit, ECM <M/T> or PCM <A/T> measures the surge voltage of the evaporative emission purge solenoid coil.
- The ECM <M/T> or PCM <A/T> drives the evaporative emission purge solenoid. After the solenoid is turned off, the ECM <M/T> or PCM <A/T> will check if the solenoid coil produces a surge voltage of 2 volts or more.

DESCRIPTIONS OF MONITOR METHODS

- If a surge current is not generated in the coil after the evaporative emission purge solenoid has been actuated, an open circuit is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

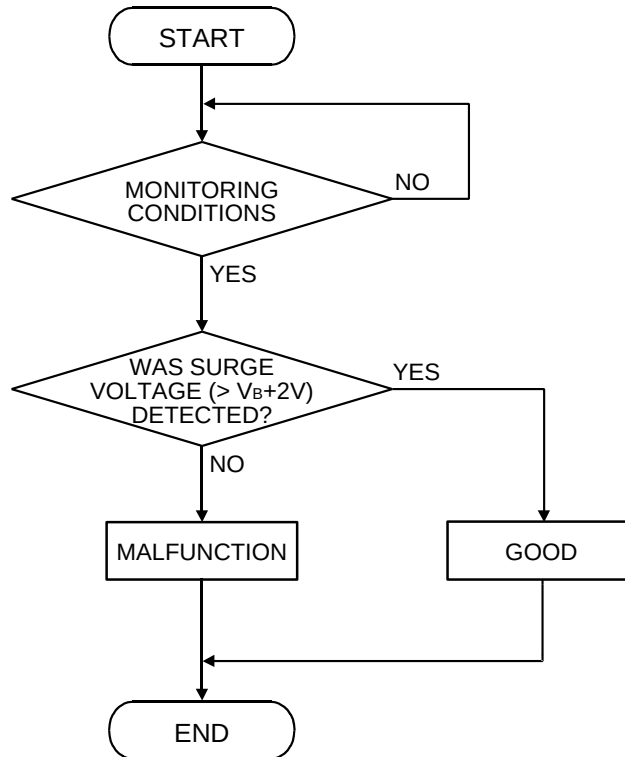
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302329

Check Conditions

- Engine is being cranked.
- Battery positive voltage is at between 10 and 16.5 volts.

Judgment Criteria

- The evaporative emission purge solenoid coil surge voltage (battery positive voltage + 2 volts) is not detected for 0.2 second.
- The ECM <M/T> or PCM <A/T> PCM monitors for this condition once during the drive cycle.

Check Conditions

- Battery positive voltage is at between 10 and 16.5 volts.
- ON duty cycle of the evaporative emission purge solenoid is between 10 and 90 percent.

- ON duty cycle of the EGR vacuum regulator solenoid valve is 0 percent.
- Evaporative emission ventilation solenoid is OFF.
- More than 1 second has elapsed after the above mentioned conditions have been met.

Judgment Criteria

- The evaporative emission purge solenoid coil surge voltage (battery positive voltage + 2 volts) is not detected for 1 second. When the evaporative emission purge solenoid is turned OFF.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Evaporative emission purge solenoid failed.
- Open or shorted evaporative emission purge solenoid circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 08: Evaporative Emission Purge Solenoid.

⚠ CAUTION

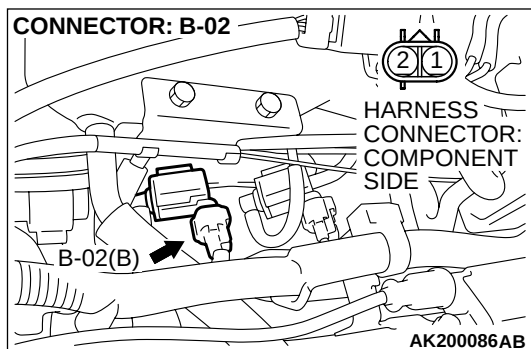
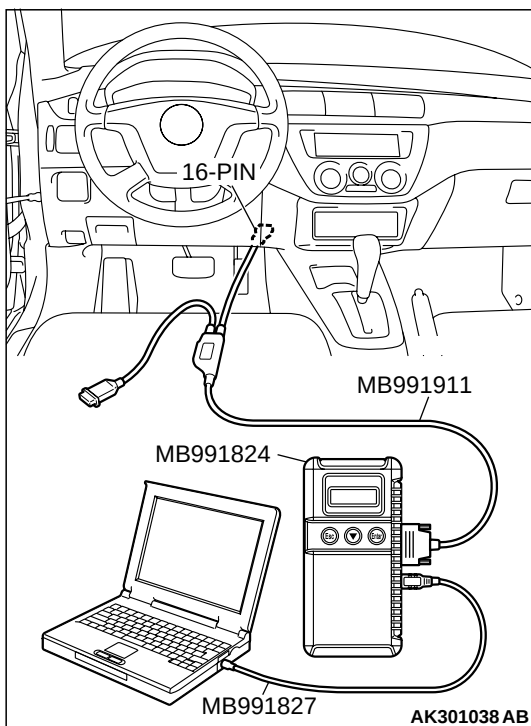
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the actuator test mode for item 08, Evaporative emission purge solenoid.
 - An operation sound should be heard and vibration should be felt when the evaporative emission purge solenoid is operated.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.

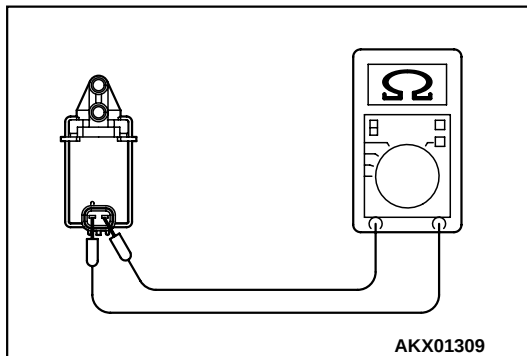
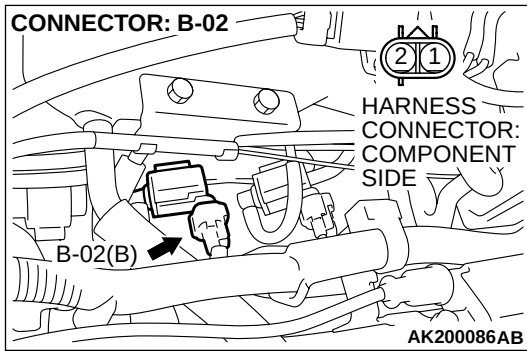


STEP 2. Check harness connector B-02 at the evaporative emission purge solenoid for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

**STEP 3. Check the evaporative emission purge solenoid.**

- (1) Disconnect the evaporative emission purge solenoid connector B-02.

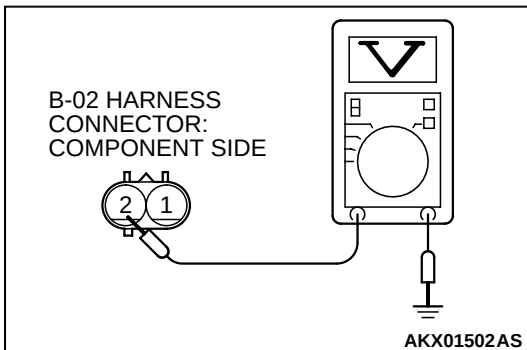
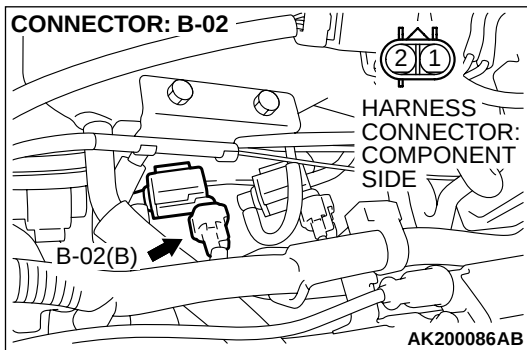
- (2) Measure the resistance between evaporative emission purge solenoid side connector terminal No. 1 and No. 2.

Standard value: 30 – 34 ohms [at 20°C (68°F)]

Q: Is the resistance between 30 and 34 ohms [at 20°C (68°F)]?

YES : Go to Step 4.

NO : Replace the evaporative emission purge solenoid.
Then go to Step 12.

**STEP 4. Measure the power supply voltage at evaporative emission purge solenoid harness side connector B-02.**

- (1) Disconnect connector B-02 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.

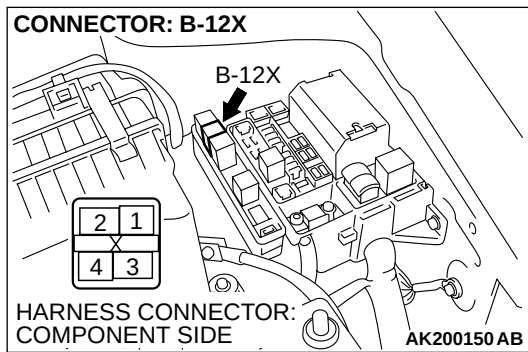
- (3) Measure the voltage between terminal No. 2 and ground.
• Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 6.

NO : Go to Step 5.



STEP 5. Check harness connector B-12X at MFI relay for damage.

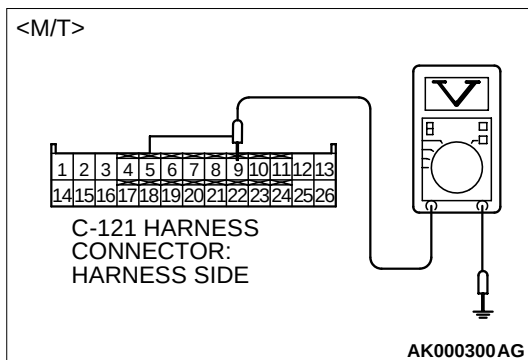
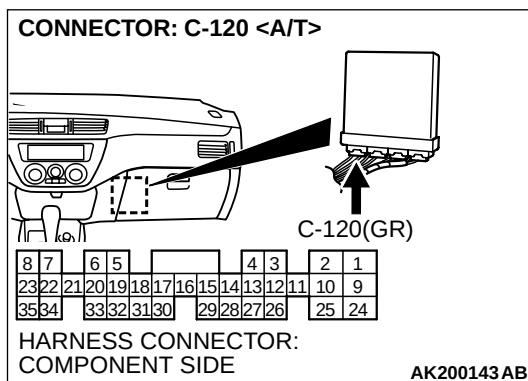
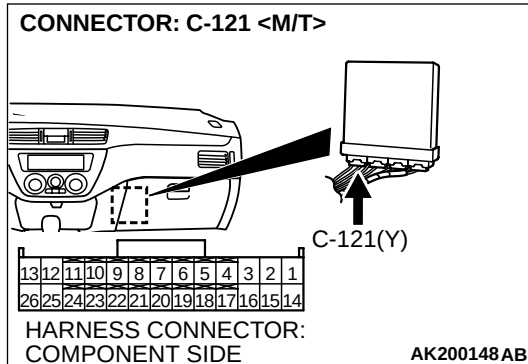
Q: Is the harness connector in good condition?

YES : Repair harness wire between MFI relay connector B-12X (terminal No. 4) and evaporative emission purge solenoid connector B-02 (terminal No. 2) because of open circuit or short circuit to ground. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

STEP 6. Measure the power supply voltage at ECM connector C-121 <M/T> or PCM connector <A/T> C-120 by backprobing.

- (1) Do not disconnect connector C-121 <M/T> or C-120 <A/T>.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal No. 9 <M/T> or No. 34 <A/T> and ground by backprobing.

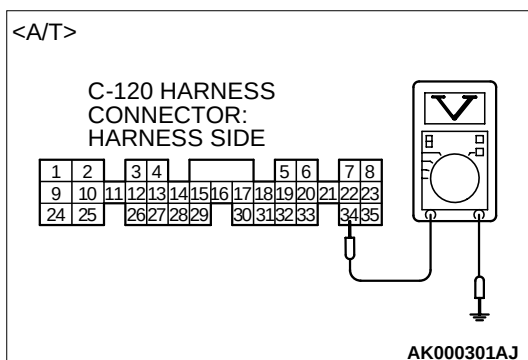
- Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 9.

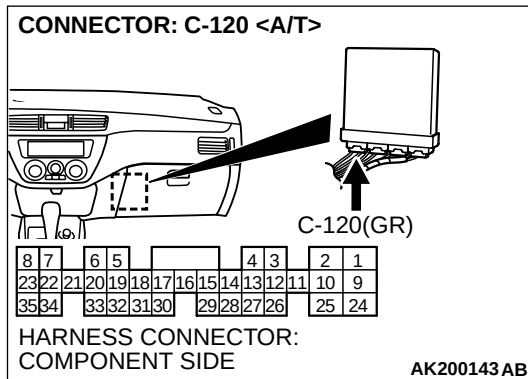
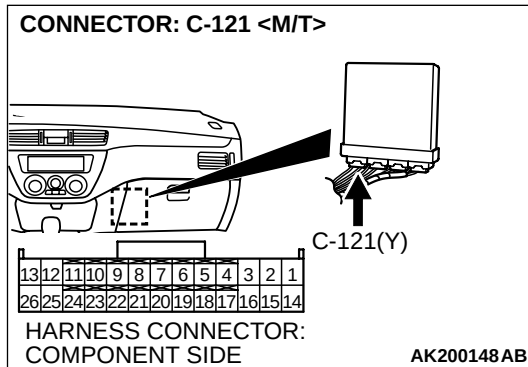
NO : Go to Step 7.



STEP 7. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

YES : Go to Step 8.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

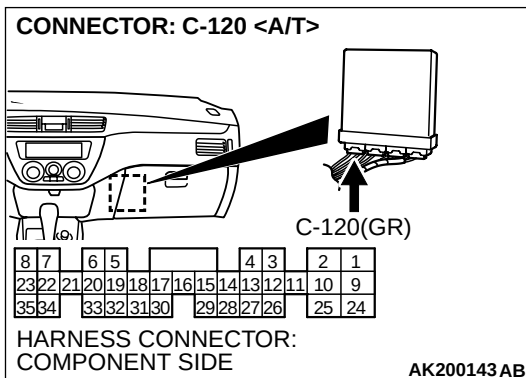
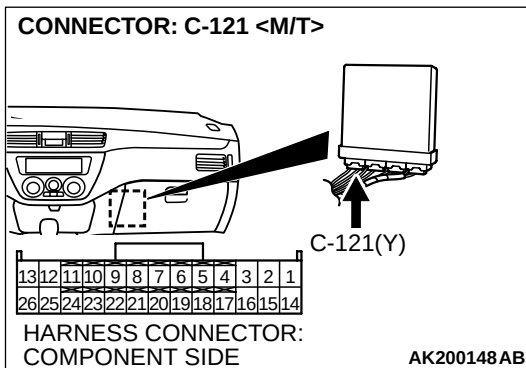
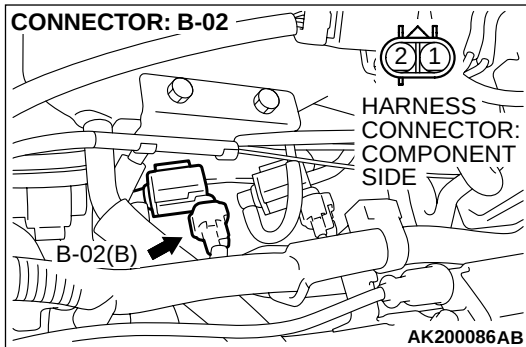


STEP 8. Check for open circuit and short circuit to ground between evaporative emission purge solenoid connector B-02 (terminal No. 1) and ECM connector C-121 (terminal No. 9) <M/T> or PCM connector C-120 (terminal No. 34) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

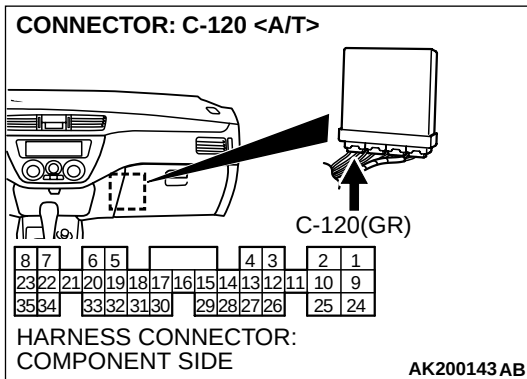
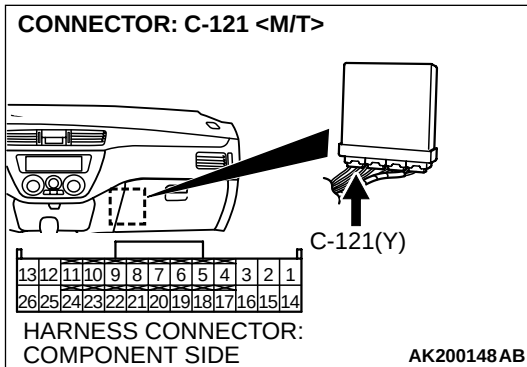
NO : Repair it. Then go to Step 12.



STEP 9. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

YES : Go to Step 10.

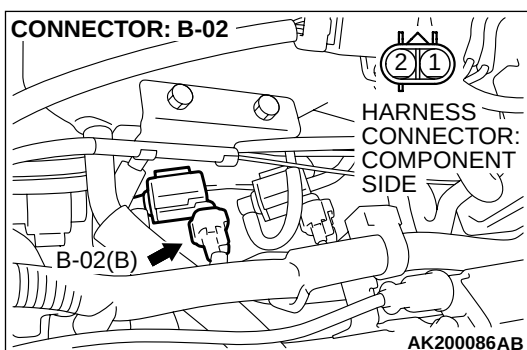
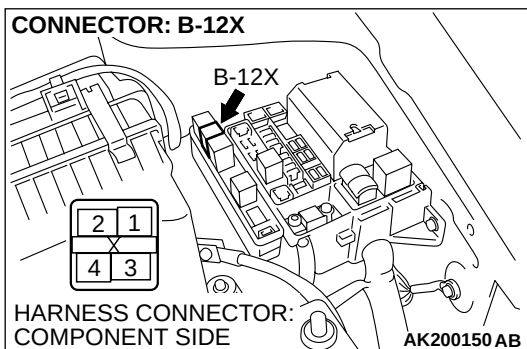
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.



STEP 10. Check for harness damage between MFI relay connector B-12X (terminal No. 4) and evaporative emission purge solenoid connector B-02 (terminal No. 2).
Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it. Then go to Step 12.

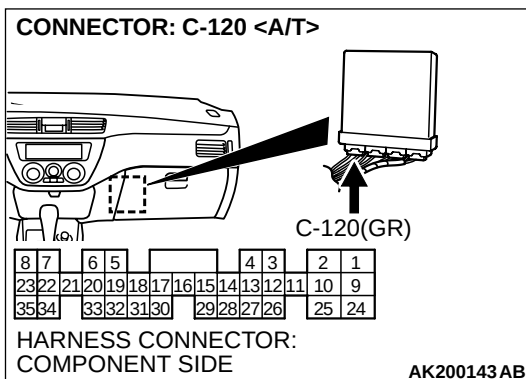
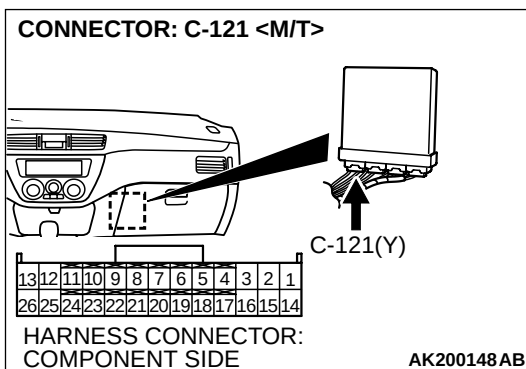
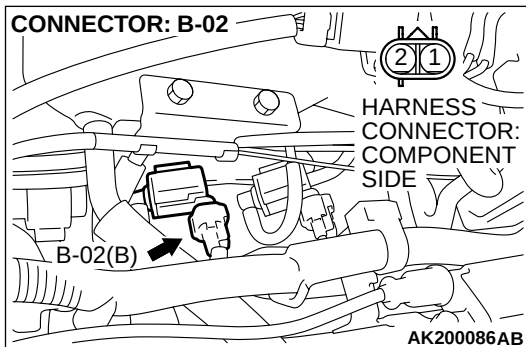


STEP 11. Check for harness damage between evaporative emission purge solenoid connector B-02 (terminal No. 1) and ECM connector C-121 (terminal No. 9) <M/T> or PCM connector C-120 (terminal No. 34) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.



STEP 12. Test the OBD-II drive cycle.

(1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

(2) Check the diagnostic trouble code (DTC).

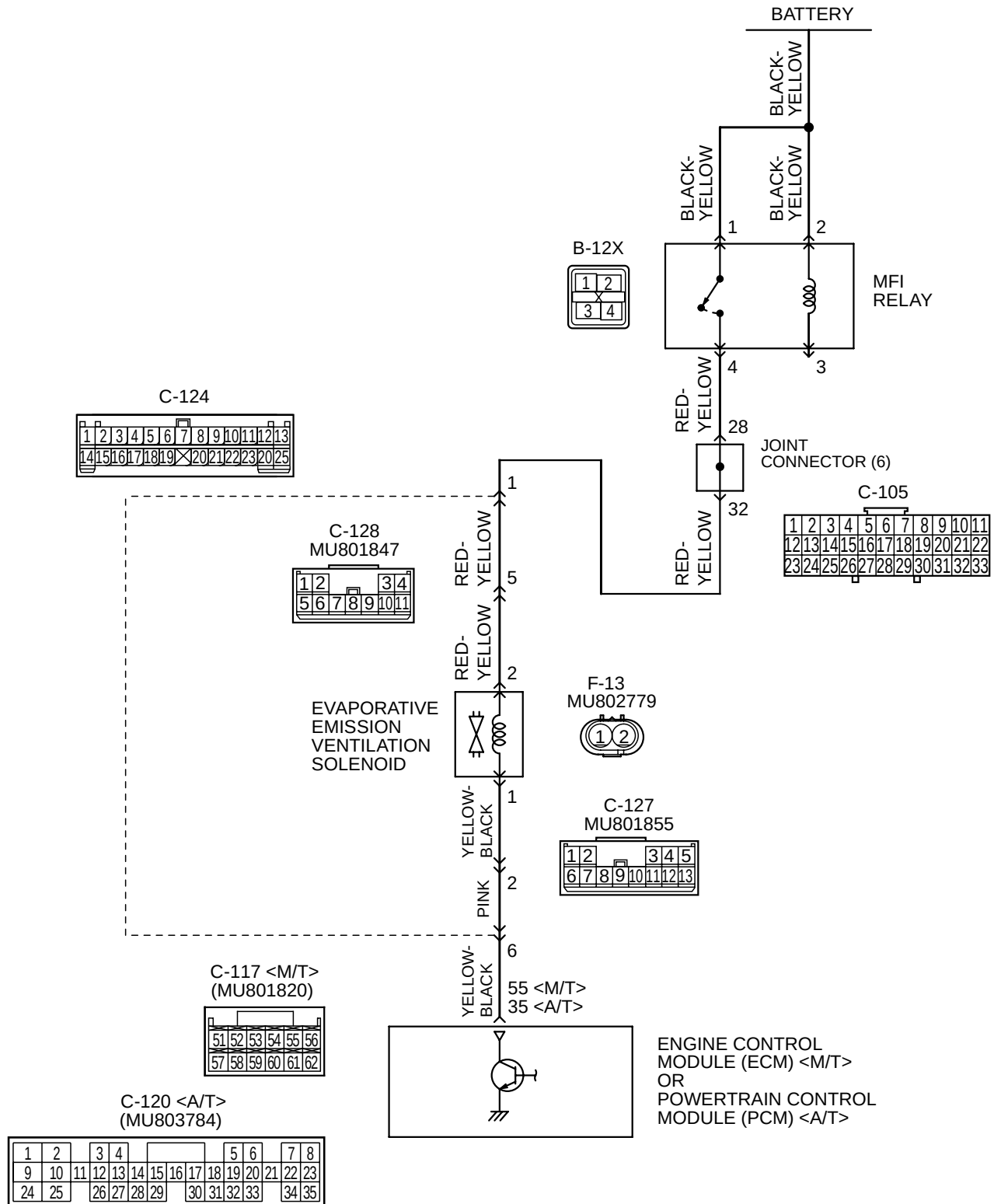
Q: Is DTC P0443 set?

YES : Retry the troubleshooting.

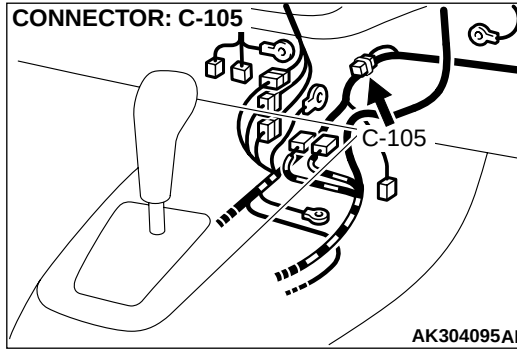
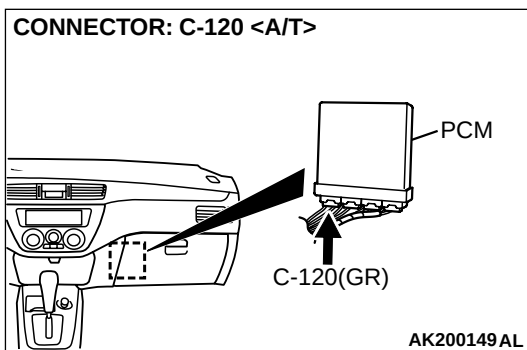
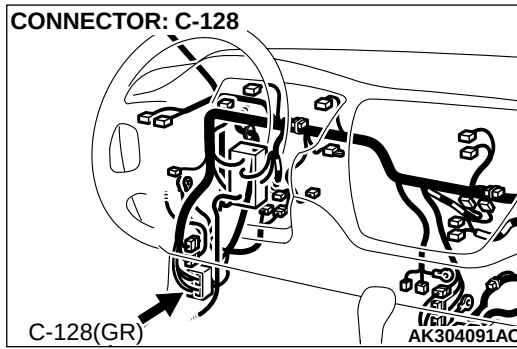
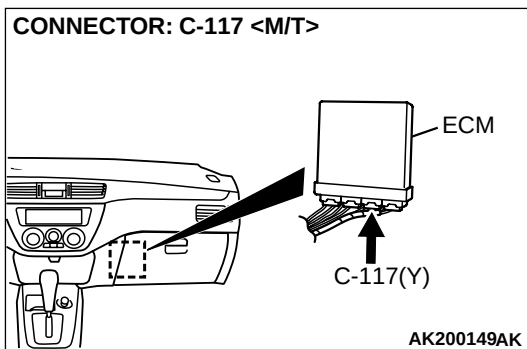
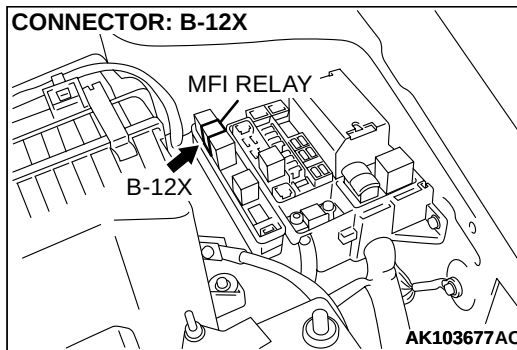
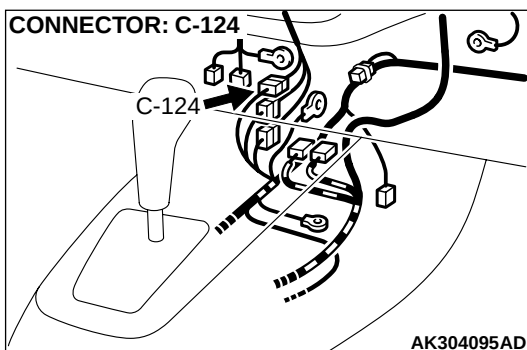
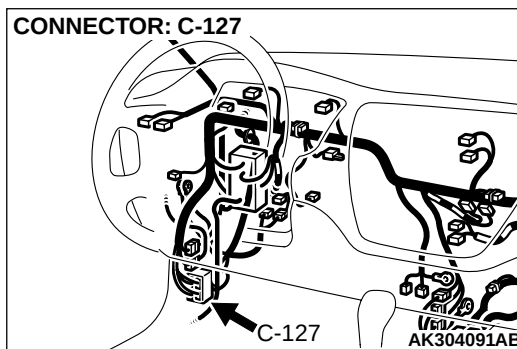
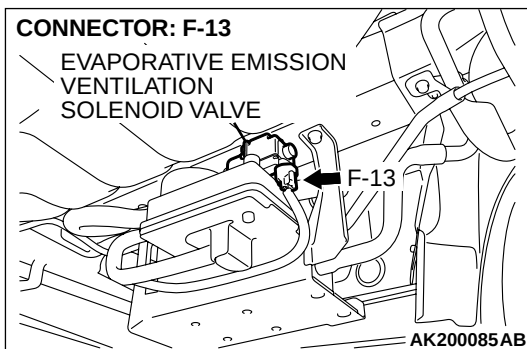
NO : The inspection is complete.

DTC P0446: Evaporative Emission Control System Vent Control Circuit

Evaporative Emission Ventilation Solenoid Circuit



AK100032

**CIRCUIT OPERATION**

- The evaporative emission ventilation solenoid power is supplied from the MFI relay (terminal No. 4).
- The ECM <M/T> or PCM <A/T> controls the evaporative emission ventilation solenoid ground by turning the power transistor in the ECM <M/T> or PCM <A/T> ON and OFF.

TECHNICAL DESCRIPTION

- To judge if there is open circuit in the evaporative emission ventilation solenoid drive circuit, ECM <M/T> or PCM <A/T> measures the surge voltage of the evaporative emission ventilation solenoid coil.
- The ECM <M/T> or PCM <A/T> drives the evaporative emission ventilation solenoid. After the solenoid is turned off, the ECM <M/T> or PCM <A/T> will check if the solenoid coil produces a surge voltage of 2 volts or more.

DESCRIPTIONS OF MONITOR METHODS

- If a surge current is not generated in the coil after the evaporative emission ventilation solenoid has been actuated, an open circuit is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

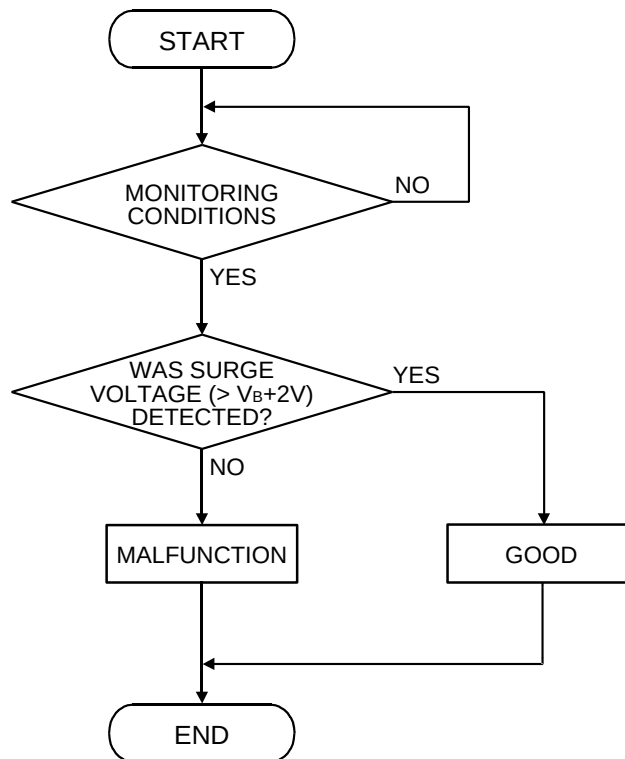
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302326

Check Conditions

- Engine is being cranked.
- Battery positive voltage is at between 10 and 16.5 volts.

Judgment Criteria

- The evaporative emission ventilation solenoid coil surge voltage (battery positive voltage + 2 volts) is not detected for 0.2 second.
- The ECM <M/T> or PCM <A/T> monitors for this condition once during the drive cycle.

Check Conditions

- Battery positive voltage is at between 10 and 16.5 volts.
- ON duty cycle of the evaporative emission purge solenoid is 0 percent.
- ON duty cycle of the EGR vacuum regulator solenoid valve is 0 percent.
- Evaporative emission ventilation solenoid is ON.
- More than 1 second has elapsed after the above mentioned conditions have been met.

Judgment Criteria

- The evaporative emission ventilation solenoid coil surge voltage (battery positive voltage + 2 volts) is not detected for 1 second. When the evaporative emission ventilation solenoid is turned OFF.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Evaporative emission ventilation solenoid failed.
- Open or shorted evaporative emission ventilation solenoid circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 29: Evaporative Emission Ventilation Solenoid.**⚠ CAUTION**

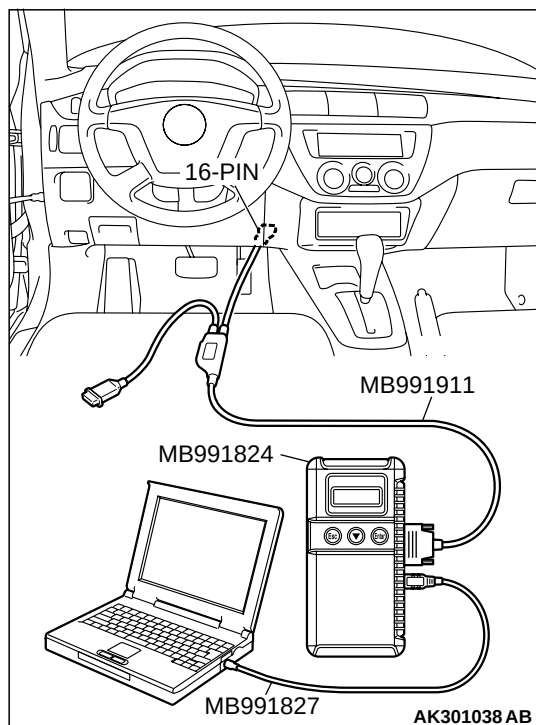
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

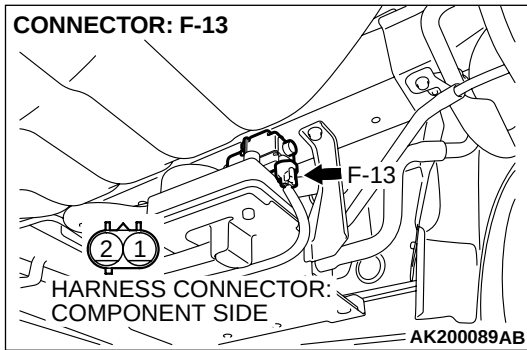
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the actuator test mode for item 29, Evaporative emission ventilation solenoid.
 - An operation sound should be heard and vibration should be felt when the evaporative emission ventilation solenoid is operated.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid operating properly?

YES : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.



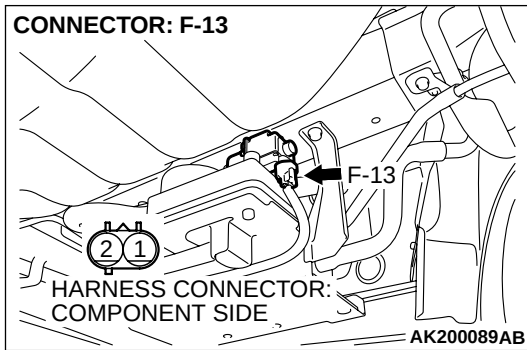


STEP 2. Check harness connector F-13 at the evaporative emission ventilation solenoid for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.



STEP 3. Check the evaporative emission ventilation solenoid.

(1) Disconnect the evaporative emission ventilation solenoid connector F-13.

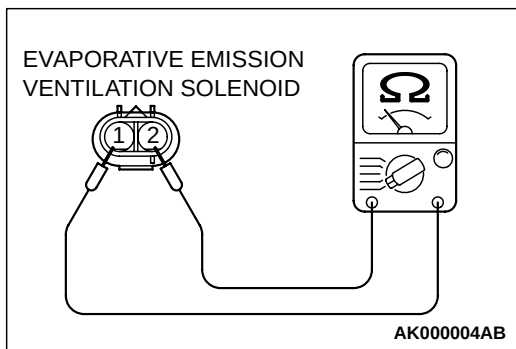
(2) Measure the resistance between evaporative emission ventilation solenoid side connector terminal No. 1 and No. 2.

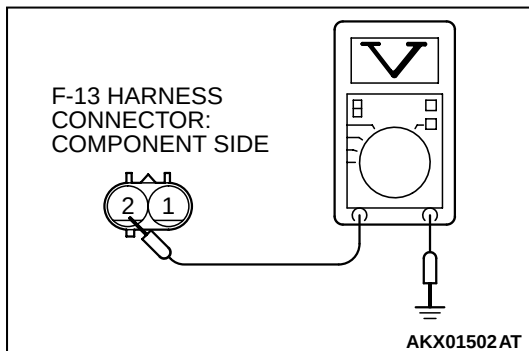
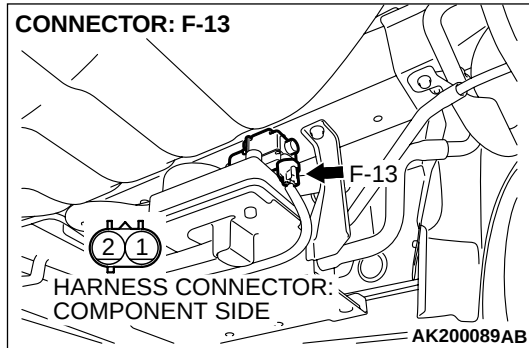
Standard value: 17 – 21 ohms [at 20°C (68°F)]

Q: Is the resistance between 17 and 21 ohms [at 20°C (68°F)]?

YES : Go to Step 4.

NO : Replace the over vent valve module. Then go to Step 12.





STEP 4. Measure the power supply voltage at evaporative emission ventilation solenoid harness side connector F-13.

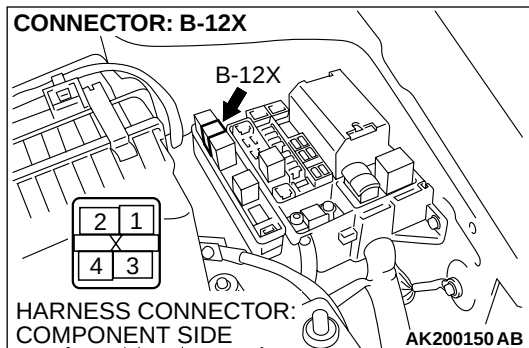
- (1) Disconnect connector F-13 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 2 and ground.
 - Voltage should be battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 6.

NO : Go to Step 5.



STEP 5. Check harness connector B-12X at MFI relay for damage.

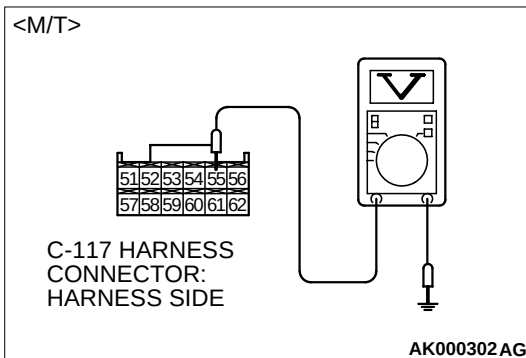
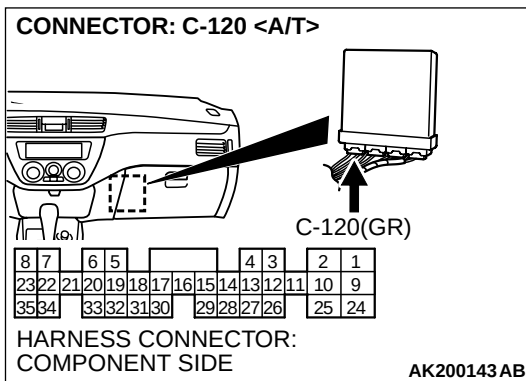
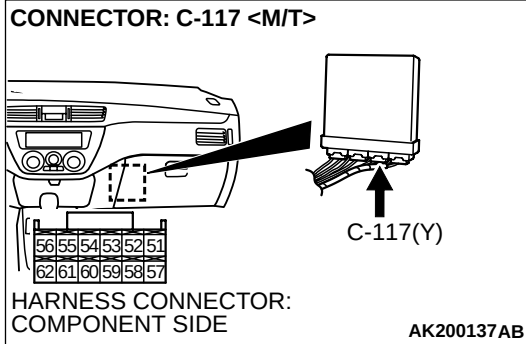
Q: Is the harness connector in good condition?

YES : Check connectors C-105, C-124 and C-128 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connectors are in good condition, repair harness wire between MFI relay connector B-12X (terminal No. 4) and evaporative emission ventilation solenoid connector F-13 (terminal No. 2) because of open circuit or short circuit to ground. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

STEP 6. Measure the power supply voltage at ECM connector C-117 <M/T> or PCM connector C-120 <A/T> by backprobing.

- (1) Do not disconnect connector C-117 <M/T> or C-120 <A/T>.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal No. 55 <M/T> or No. 35 <A/T> and ground by backprobing.

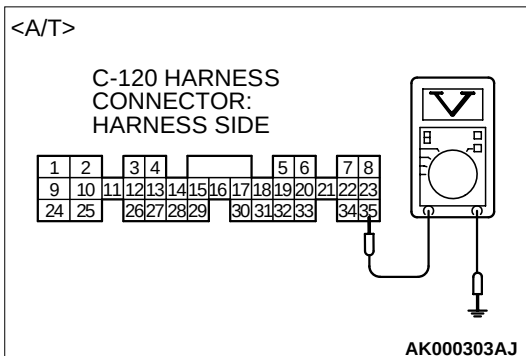
- Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

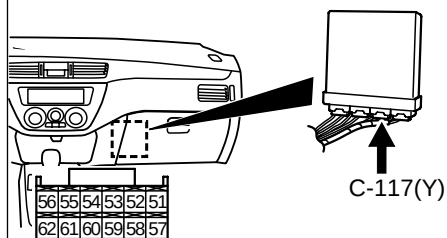
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 9.

NO : Go to Step 7.



CONNECTOR: C-117 <M/T>

HARNESS CONNECTOR:
COMPONENT SIDE

AK200137AB

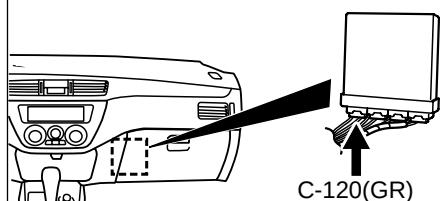
STEP 7. Check harness connector C-117 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 8.

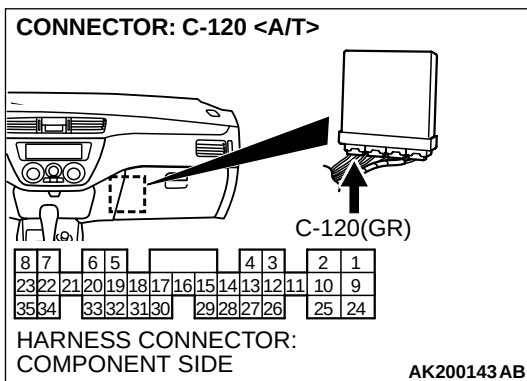
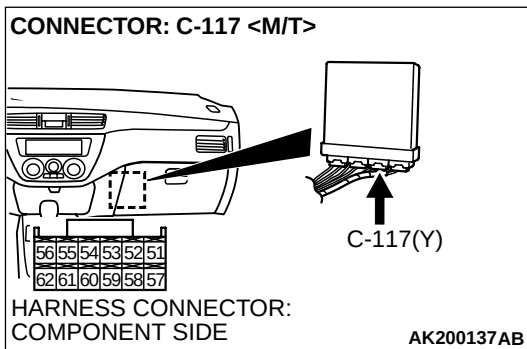
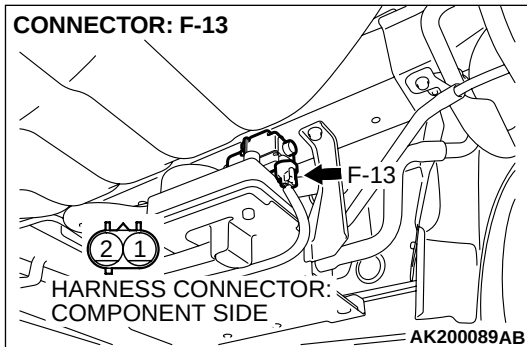
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

CONNECTOR: C-120 <A/T>

HARNESS CONNECTOR:
COMPONENT SIDE

AK200143AB

STEP 8. Check for open circuit and short circuit to ground between evaporative emission ventilation solenoid connector F-13 (terminal No. 1) and ECM connector C-117 (terminal No. 55) <M/T> or PCM connector C-120 (terminal No. 35) <A/T>.



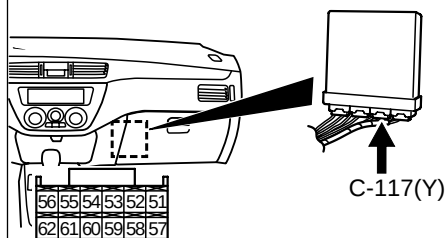
NOTE: Check harness after checking intermediate connectors C-124 and C-127. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.

CONNECTOR: C-117 <M/T>

HARNESS CONNECTOR:
COMPONENT SIDE

AK200137 AB

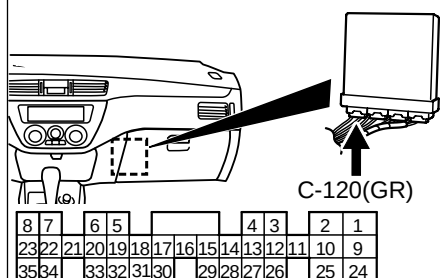
STEP 9. Check harness connector C-117 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 10.

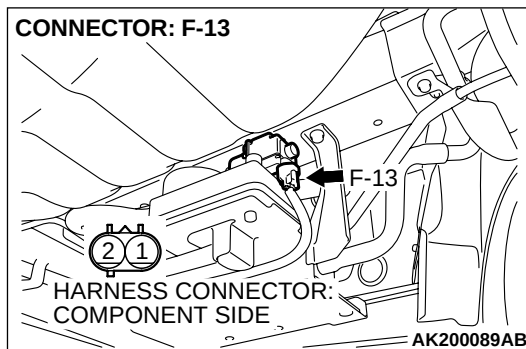
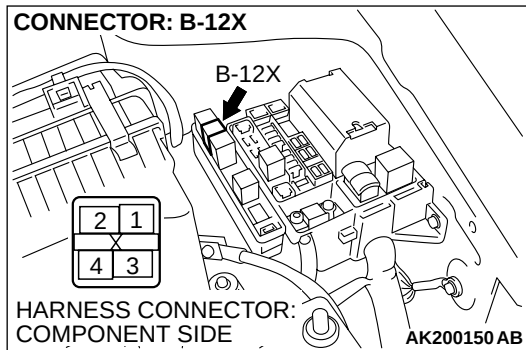
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

CONNECTOR: C-120 <A/T>

HARNESS CONNECTOR:
COMPONENT SIDE

AK200143 AB

STEP 10. Check for harness damage between MFI relay connector B-12X (terminal No. 4) and evaporative emission ventilation solenoid connector F-13 (terminal No. 2).



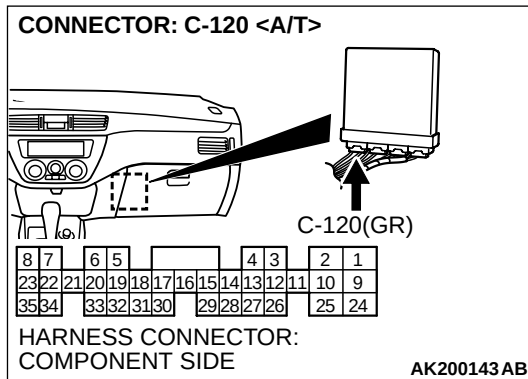
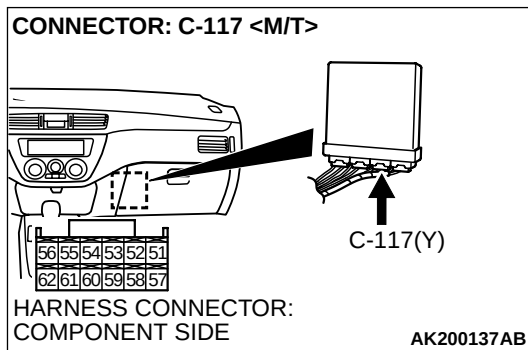
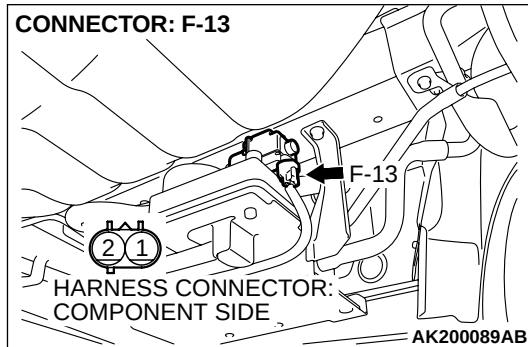
NOTE: Check harness after checking intermediate connectors C-105, C-124 and C-128. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair it. Then go to Step 12.

STEP 11. Check for harness damage between evaporative emission ventilation solenoid connector F-13 (terminal No. 1) and ECM connector C-117 (terminal No. 55) <M/T> or PCM connector C-120 (terminal No. 35) <A/T>.



NOTE: Check harness after checking intermediate connectors C-124 and C-127. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.

STEP 12. Test the OBD-II drive cycle.

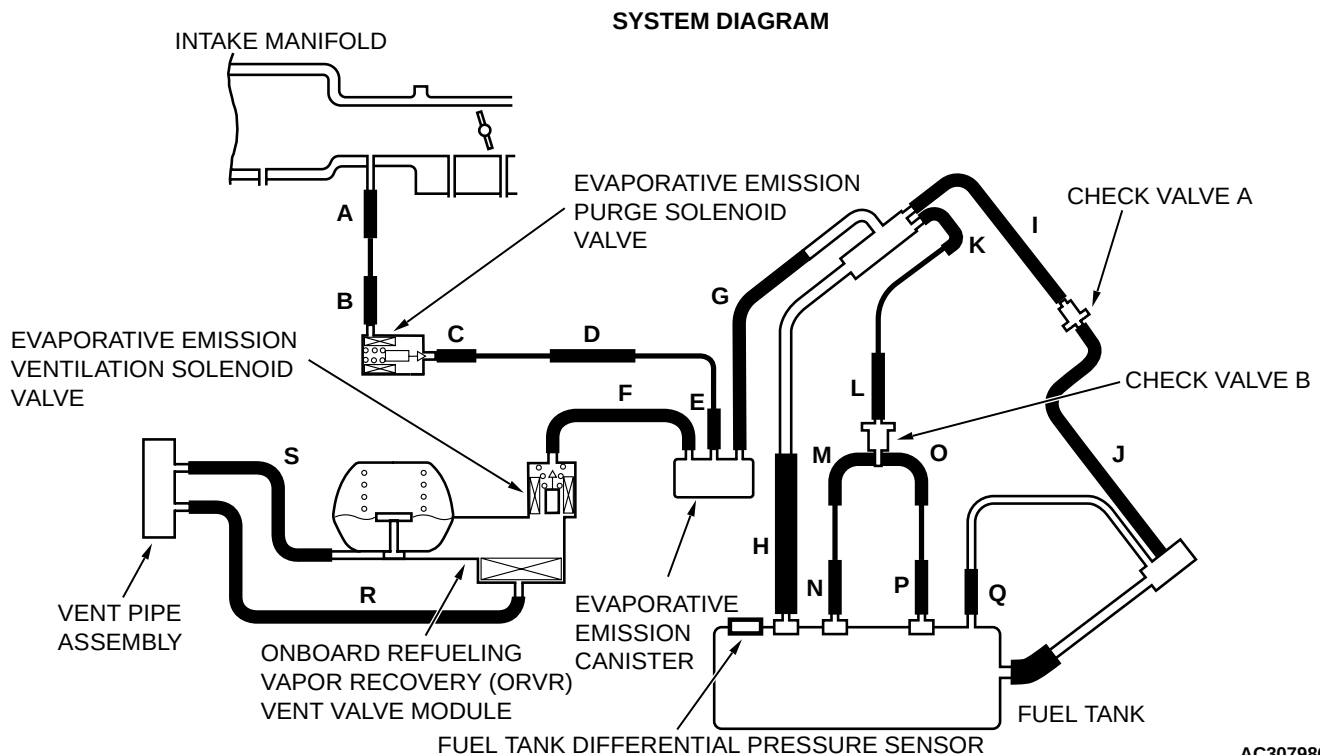
- (1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- (2) Check the diagnostic trouble code (DTC).

Q: Is DTC P0446 set?

YES : Retry the troubleshooting.

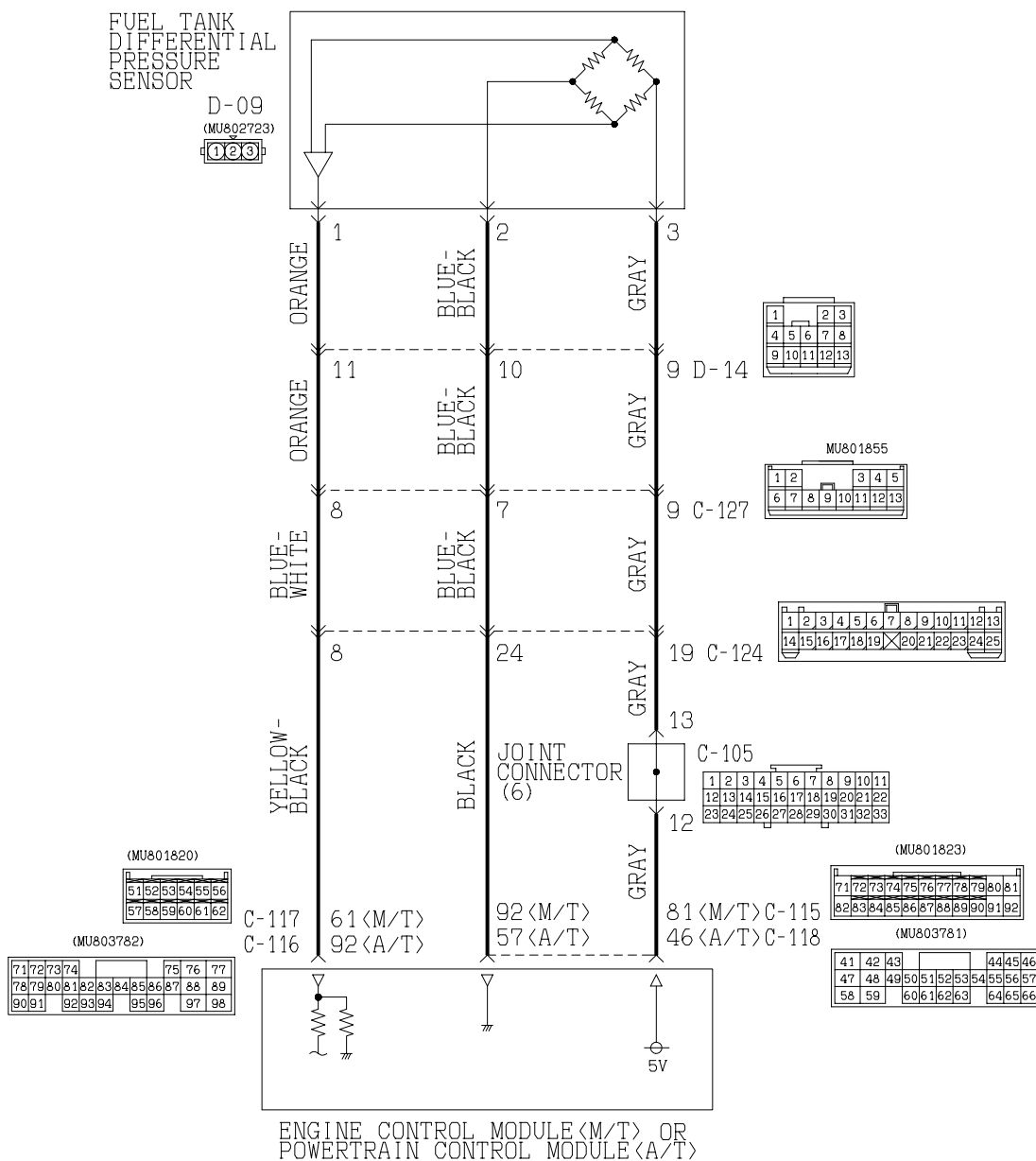
NO : The inspection is complete.

DTC P0451: Evaporative Emission Control System Pressure Sensor Range/Performance

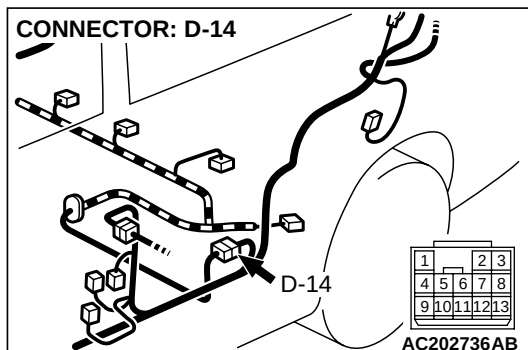
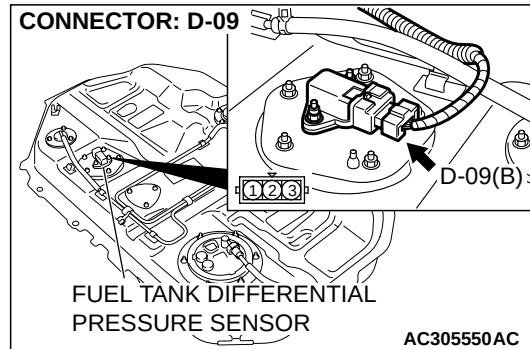
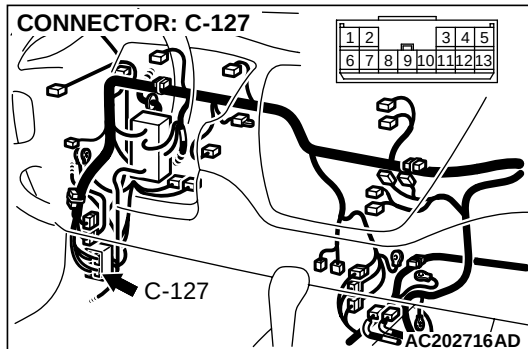
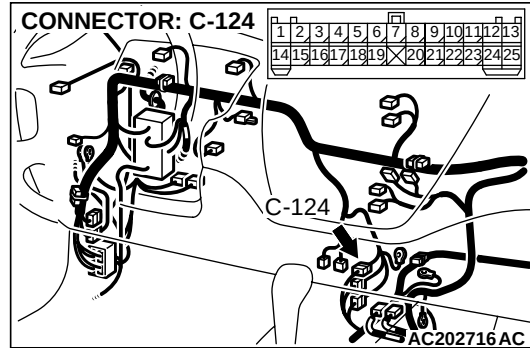
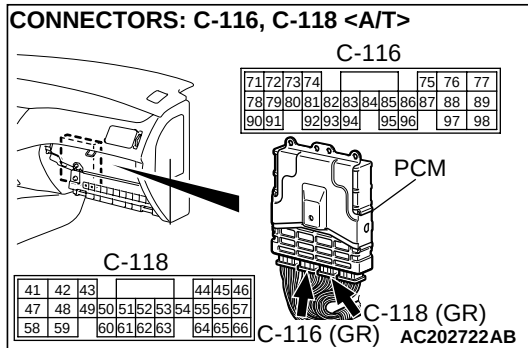
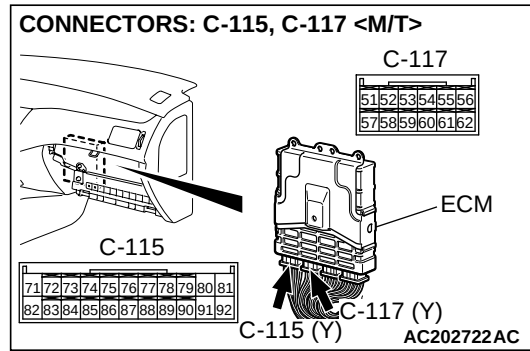
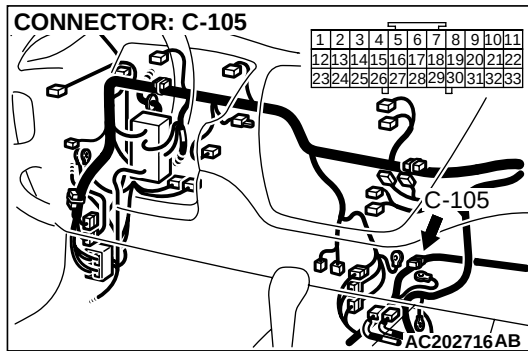


AC307986 AC

Fuel Tank Differential Pressure Sensor Circuit



W2J06M01AA



CIRCUIT OPERATION

- The ECM (terminal 81) <M/T> or PCM (terminal 46) <A/T> supplies a 5-volt reference signal to the fuel tank differential pressure sensor (terminal 3). The fuel tank differential pressure sensor (terminal 2) is grounded through the ECM (terminal 81) <M/T> or PCM (terminal 57) <A/T>.
- The fuel tank differential pressure sensor (terminal 1) returns a voltage signal to the ECM (terminal 81) <M/T> or PCM (terminal 92) <A/T> that is proportional to the pressure in the fuel tank.

TECHNICAL DESCRIPTION

- The ECM <M/T> or PCM <A/T> monitors the fuel tank differential pressure sensor signal voltage.
- The ECM <M/T> or PCM <A/T> determines whether the fuel tank differential pressure sensor signal voltage is within normal operating parameters.

DESCRIPTIONS OF MONITOR METHODS

- Detect malfunction if change of fuel tank differential pressure sensor output voltage during idling stays large during specified go/stop operations.

MONITOR EXECUTION

- Continuous.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)**Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

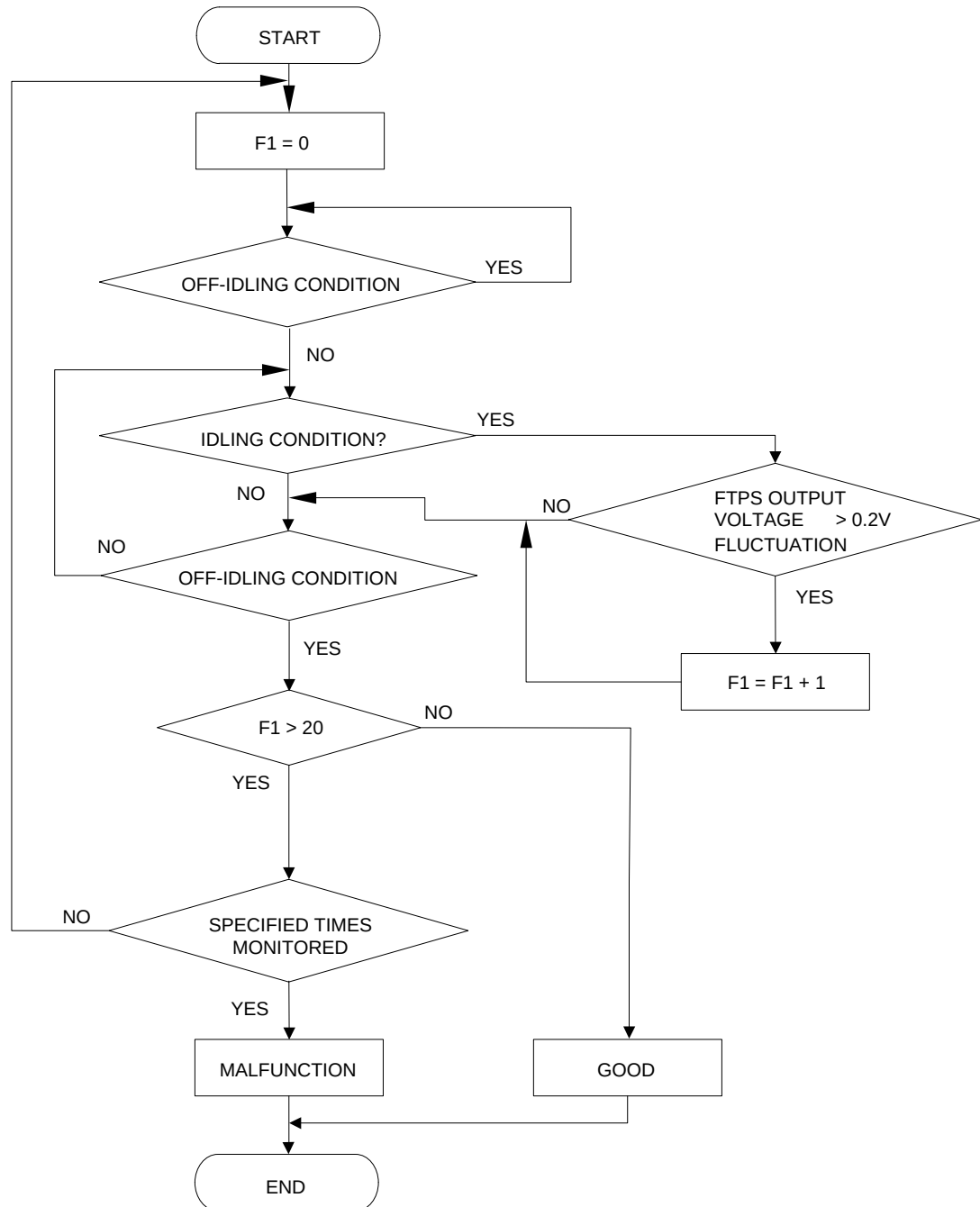
- Evaporative emission purge solenoid monitor
- Evaporative emission ventilation solenoid monitor

Sensor (The sensors below are determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)

RATIONALITY - NOISE



AC306647

DTC SET CONDITIONS

- Vehicle speed is 1.5 km/h (0.93 mph) or less.

Check Conditions

- Throttle valve is closed.

Judgment Criteria

- If the voltage signal from the fuel tank differential pressure sensor changes by 0.2 volt or more, DTC P0451 will set. The code may also set if a sudden pressure fluctuation occurs twenty times while the engine is idling, and then eight consecutive times during normal driving.

NOTE: If the number of sudden pressure fluctuations does not reach twenty during any one period of engine idling, or if the ignition switch is turned OFF, the counter will reset to zero.

NOTE: The conditions for deviating from idling operation are as follows:

- Engine speed is greater than 2,500 r/min.
- Vehicle speed is 15 km/h (9.3 mph) or greater.
- Volumetric efficiency is 55 percent or greater.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Malfunction of the fuel tank differential pressure sensor.
- A damaged harness in the fuel tank differential pressure sensor circuit.
- Malfunction of the ECM <M/T> or PCM <A/T>.

OVERVIEW OF TROUBLESHOOTING

- DTC P0451 can be set by a faulty fuel tank differential pressure sensor or related circuit, or PCM failure.
- To check for system blockage, do a performance test which uses a mechanical vacuum gauge and scan tool MB991958 set on the fuel tank differential pressure sensor (TANK PRS SNSR 73). The mechanical gauge reading is used to verify scan tool MB991958 reading. A comparison of the mechanical gauge with the reading on scan tool MB991958 will locate a problem in the system.

DIAGNOSIS**Required Special Tools:**

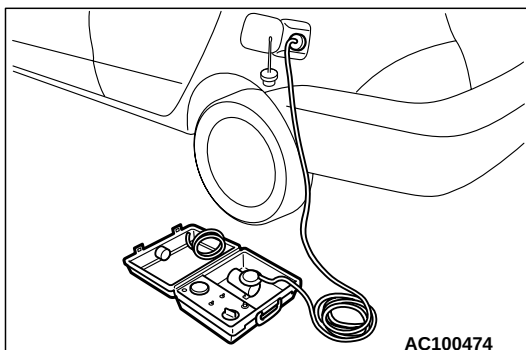
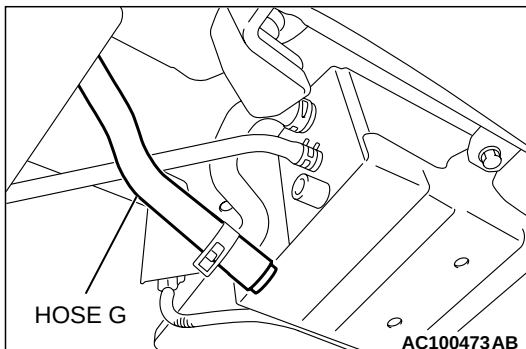
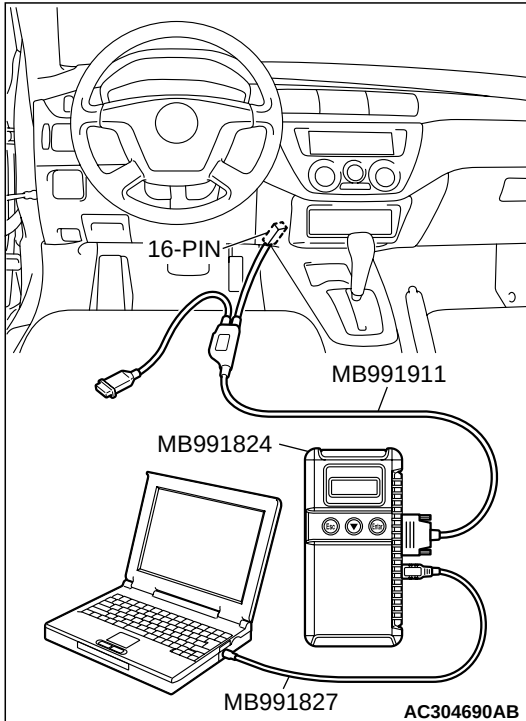
- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991658: Test Harness Set

STEP 1. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

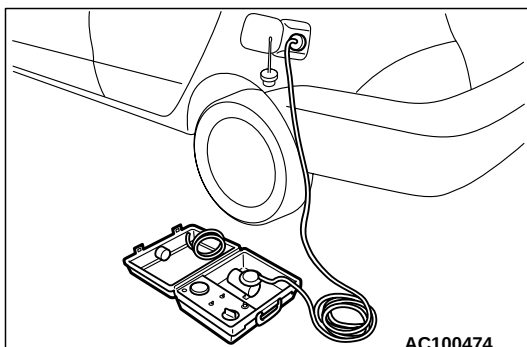
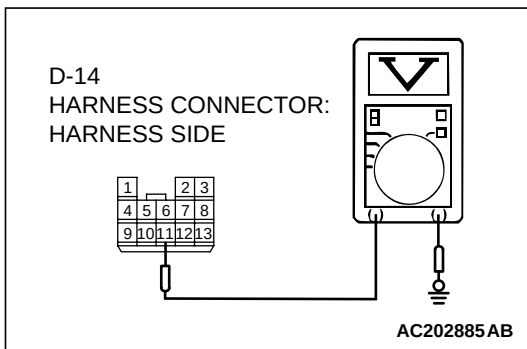
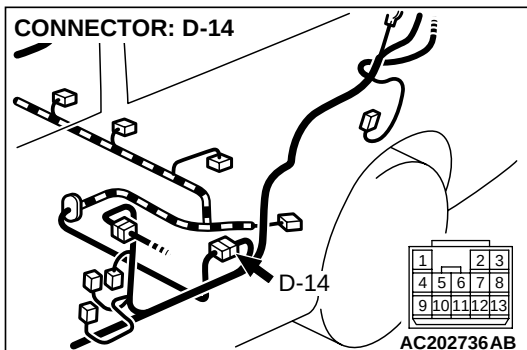
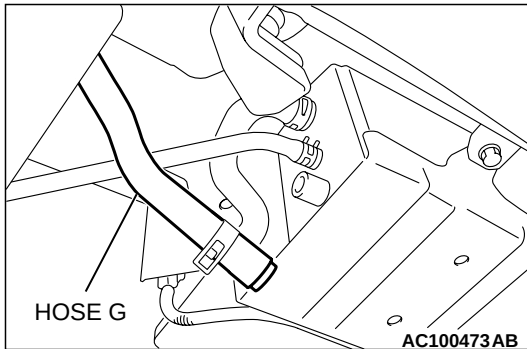


- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).
- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between -1.5 and 1.5 kPa (-0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction P.00-6). Then go to Step 27.

NO : Go to Step 2.



STEP 2. Measure the signal voltage at intermediate connector D-14 by backprobing.

- (1) Disconnect hose G from the evaporative emission canister side, and plug the hose.
- (2) Remove the rear seat cushion. (Refer to GROUP 52A, Rear Seat P.52A-23.)
- (3) Pull up the carpet.
- (4) Turn the ignition switch to the "ON" position.
- (5) Remove the fuel cap.

- (6) Measure the voltage between connector D-14 terminal 11 and ground by backprobing.
 - The measured voltage should be between 2.0 and 3.0 volts.

- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (10) Connect hose G to the canister.

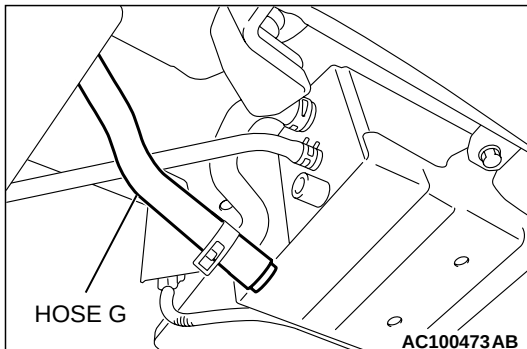
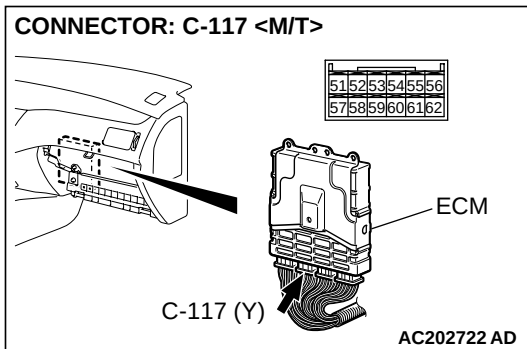
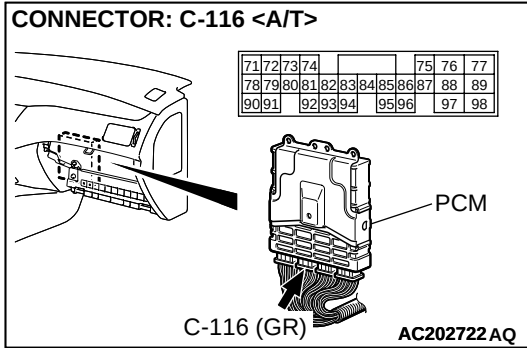
Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 3.

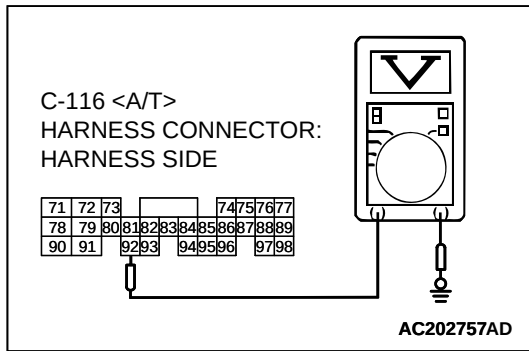
NO : Go to Step 7.

STEP 3. Measure the signal voltage at ECM connector C-117 <M/T> or PCM connector C-116 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-117 <M/T> or PCM connector C-116 <A/T>.

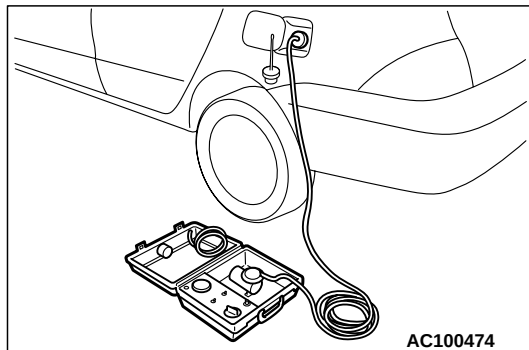
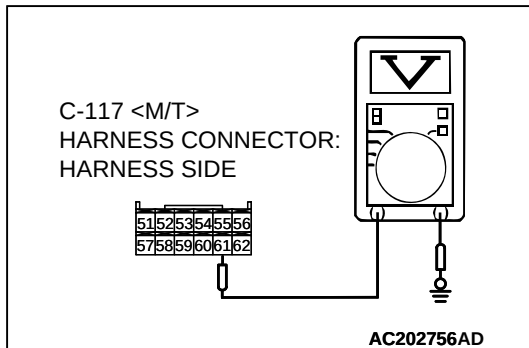


- (2) Disconnect hose G from the evaporative emission canister side, and plug the hose.
(3) Turn the ignition switch to the "ON" position.
(4) Remove the fuel cap.



- (5) Measure the voltage between connector C-117 terminal 61 <M/T> or C-116 terminal 92 <A/T> and ground by backprobing.

- The measured voltage should be between 2.0 and 3.0 volts.



- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.

- The fuel tank pressure reading should increase.

- (7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
(9) Connect hose G to the canister.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 4.

NO : Go to Step 5.

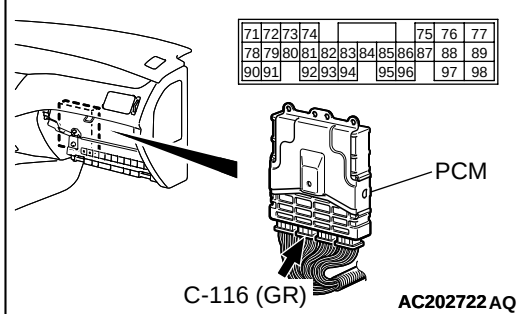
STEP 4. Check ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminal in good condition?

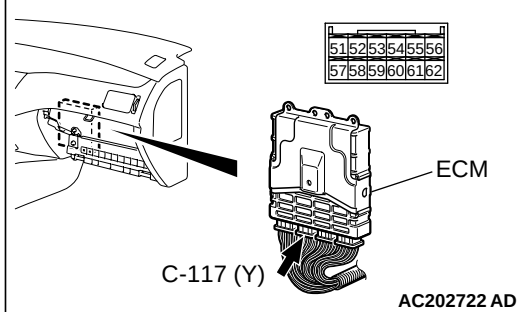
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

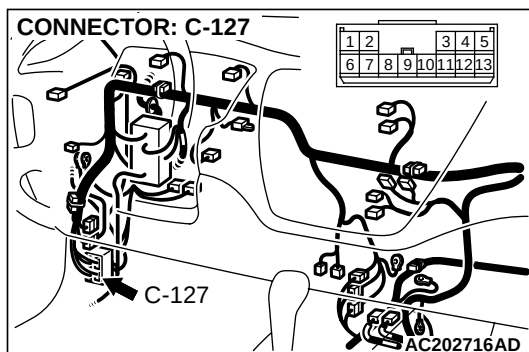
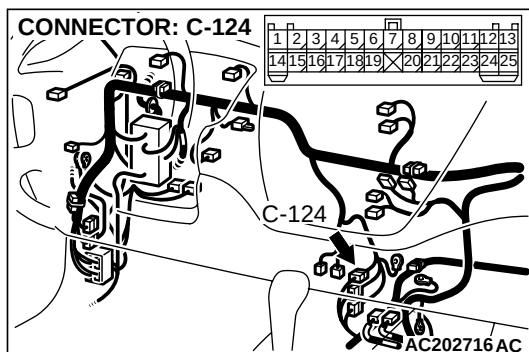
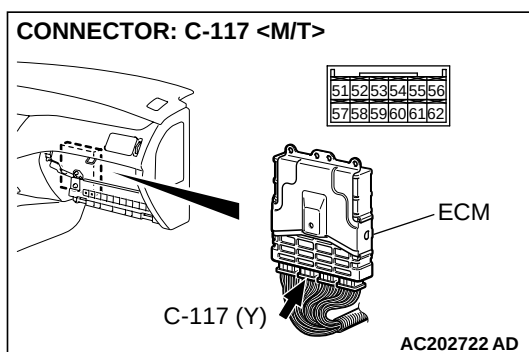
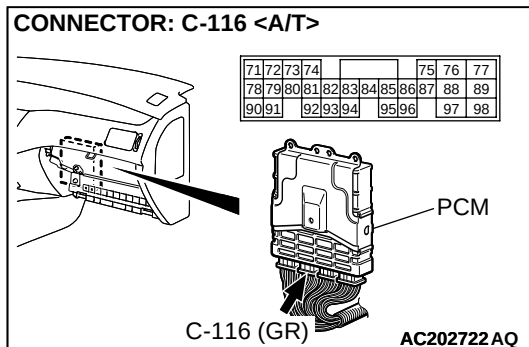
CONNECTOR: C-116 <A/T>

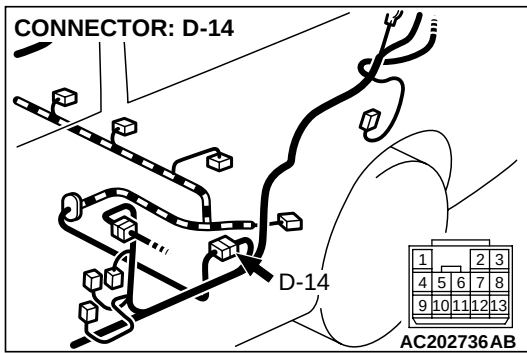


CONNECTOR: C-117 <M/T>



STEP 5. Check intermediate connectors C-124, C-127, D-14 and ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.



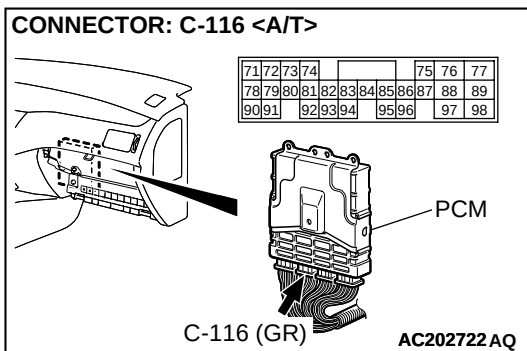


Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the faulty component. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Go to Step 27.

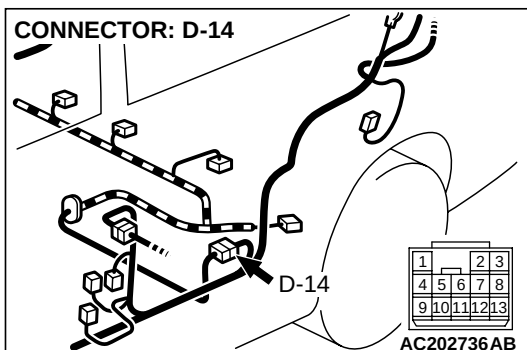
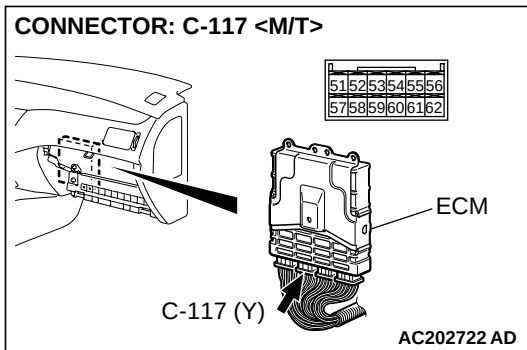


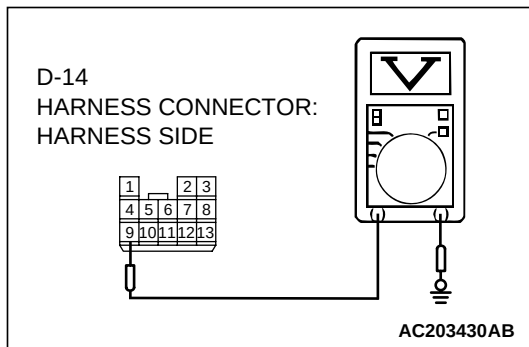
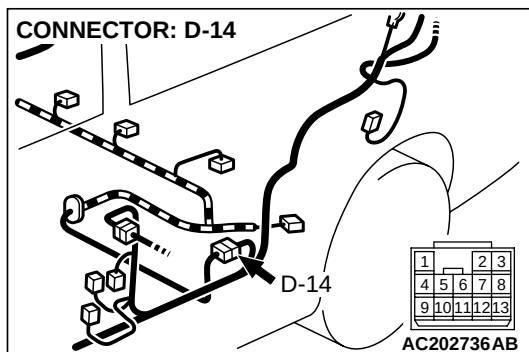
STEP 6. Check the harness wire between ECM connector C-117 terminal 61 <M/T> or PCM connector C-116 terminal 92 <A/T> and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.



**STEP 7. Measure the 5-volt reference signal at intermediate connector D-14 by backprobing.**

- (1) Do not disconnect intermediate connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 9 and ground.

- The voltage should be between 4.9 and 5.1 volts.

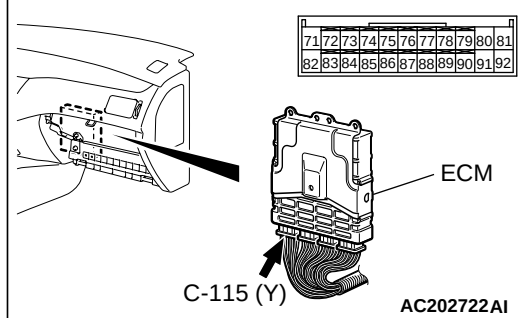
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

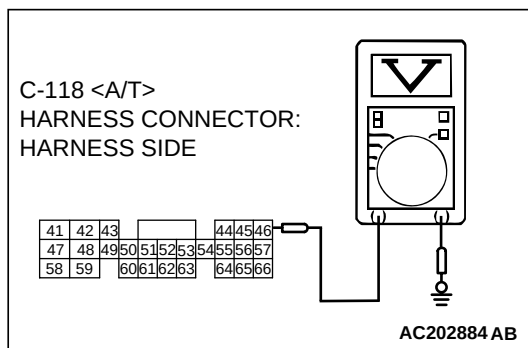
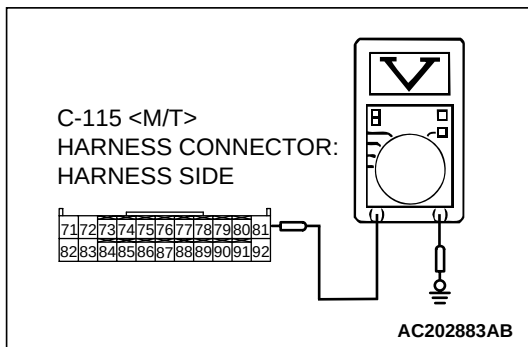
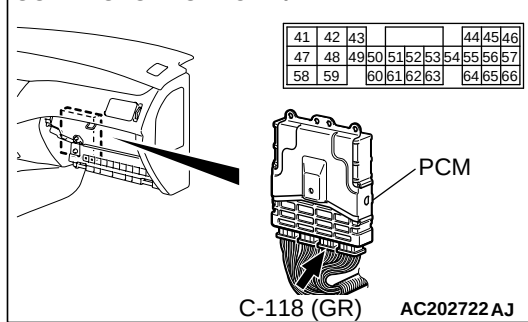
YES : Go to Step 11.

NO : Go to Step 8.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



STEP 8. Measure the 5-volt reference signal at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector C-115 terminal 81 <M/T> or connector C-118 terminal 46 <A/T> and ground by backprobing.

- The measured voltage should be between 4.9 and 5.1 volts.

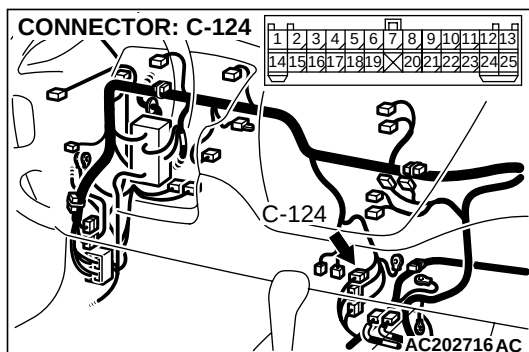
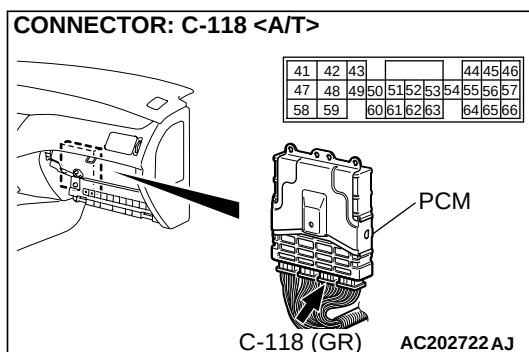
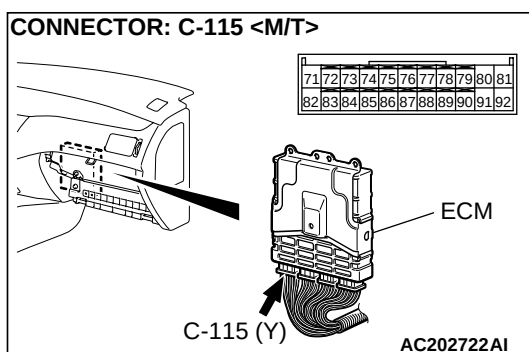
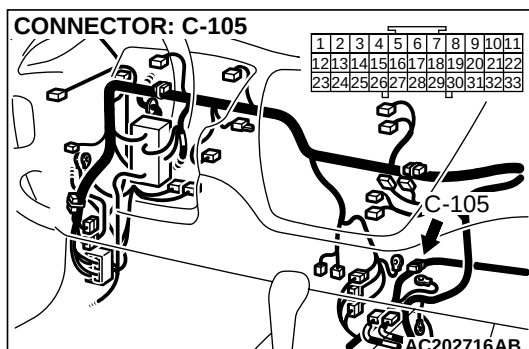
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

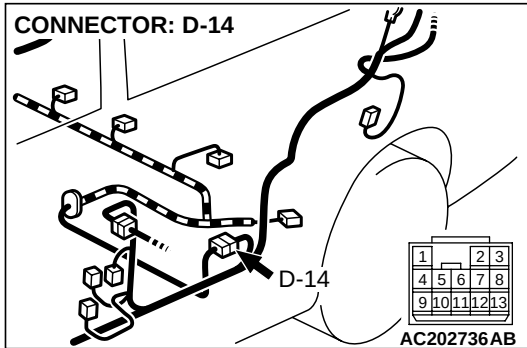
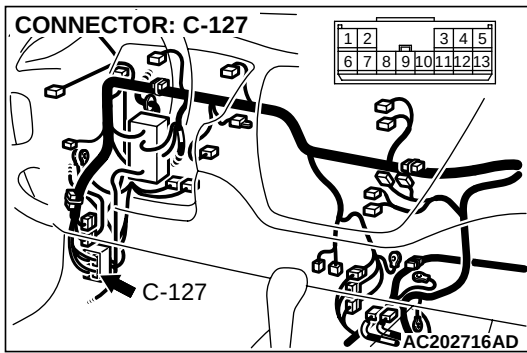
Q: Is the measured voltage between 4.9 and 5.1 volts?

YES : Go to Step 9.

NO : Go to Step 25.

STEP 9. Check intermediate connectors C-105, C-124, C-127, and D-14 and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 27.

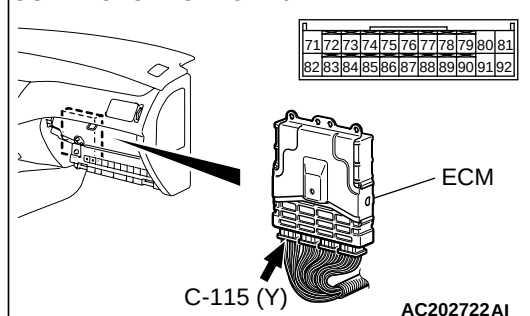
STEP 10. Check the harness wire between ECM connector C-115 <M/T> terminal 81 or PCM connector C-118 <A/T> terminal 46 and intermediate connector D-14 terminal 9 for damage.

Q: Is the harness wire in good condition?

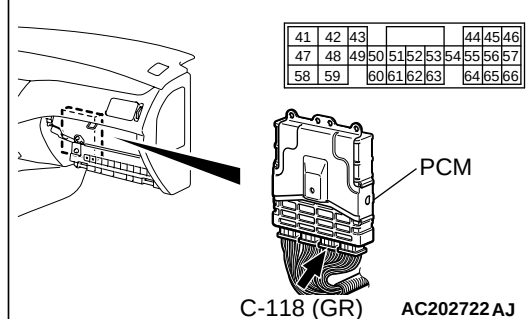
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.

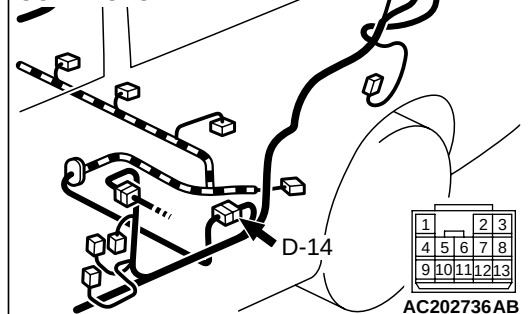
CONNECTOR: C-115 <M/T>

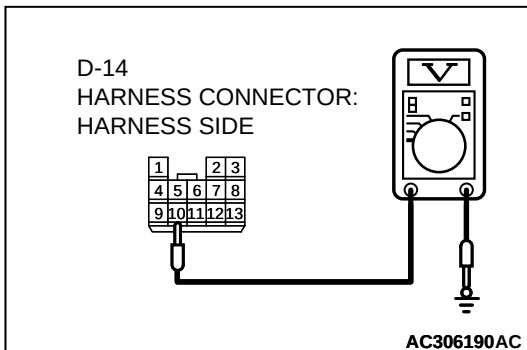
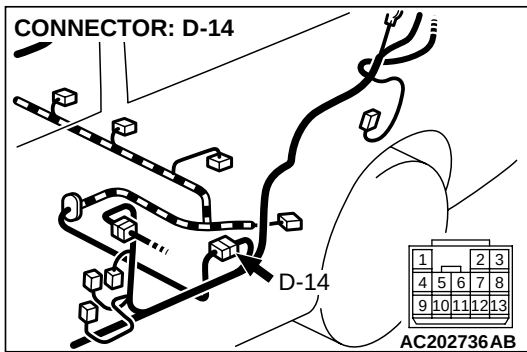


CONNECTOR: C-118 <A/T>



CONNECTOR: D-14





STEP 11. Check the sensor ground at intermediate connector D-14 by backprobing.

- (1) Do not disconnect connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 10 and ground by backprobing.

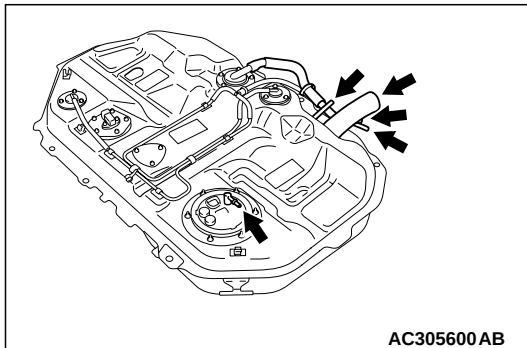
- The measured voltage should be 0.5 volt or less.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 15.

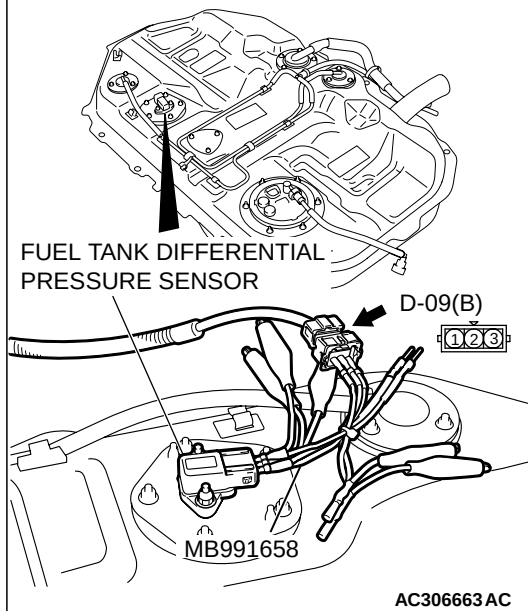
NO : Go to Step 12.



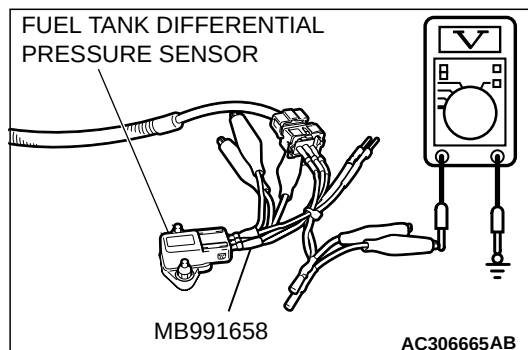
STEP 12. Check the signal voltage at fuel tank differential pressure sensor connector D-09.

- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

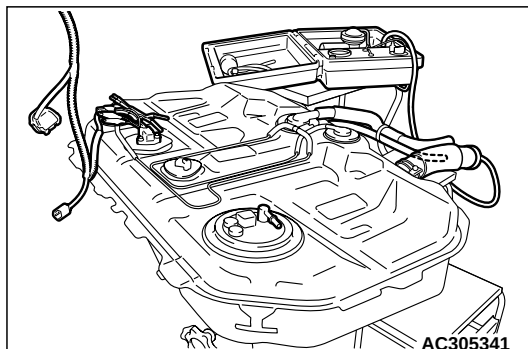
NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

CONNECTOR: D-09

- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 2 and ground.
 - The measured voltage should be 0.5 volt or less.



- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 13.

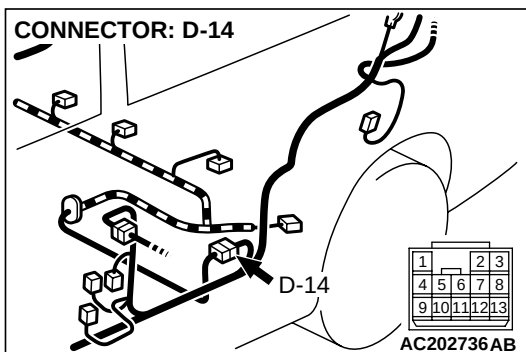
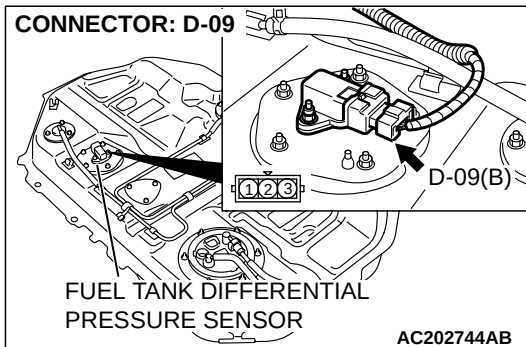
NO : Go to Step 19.

STEP 13. Check fuel tank differential pressure sensor connector D-09 and intermediate connector for D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

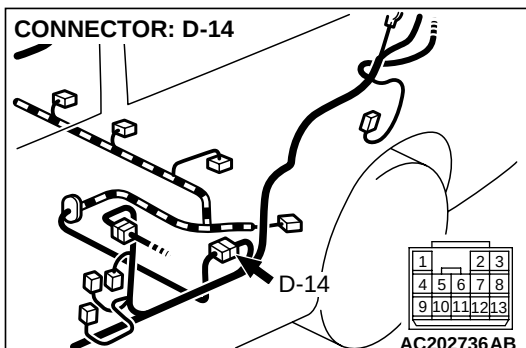
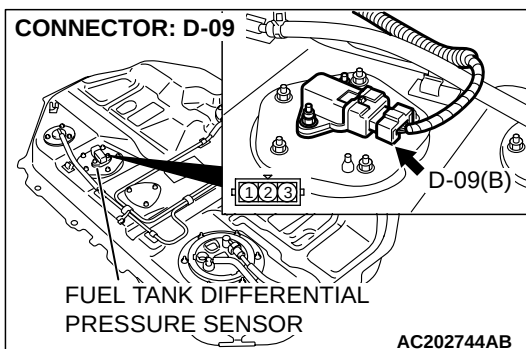


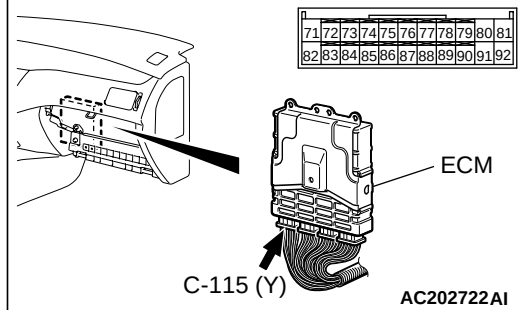
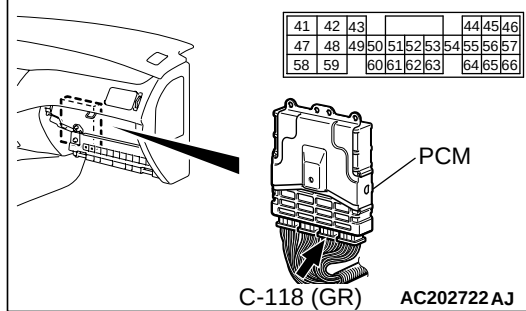
STEP 14. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 2 and intermediate connector D-14 terminal 10 for damage.

Q: Is the harness wire in good condition?

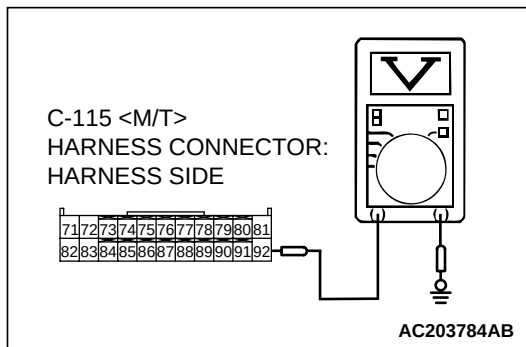
YES : It can be assumed that this malfunction is intermittent, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair the damaged harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



CONNECTOR: C-115 <M/T>**CONNECTOR: C-118 <A/T>****STEP 15. Check the sensor ground at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.**

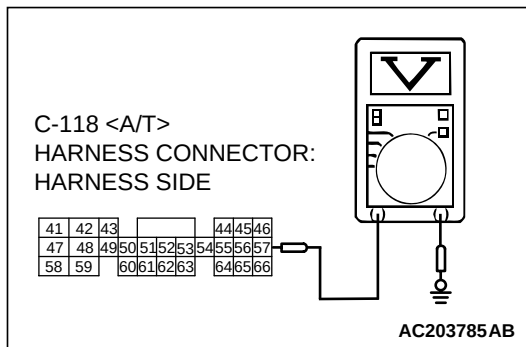
- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between connector C-115 terminal 92 <M/T> or connector C-118 terminal 57 <A/T> and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

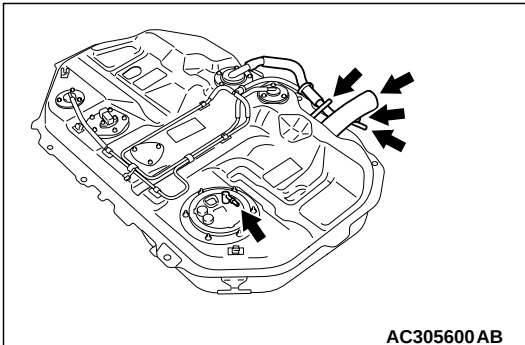
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

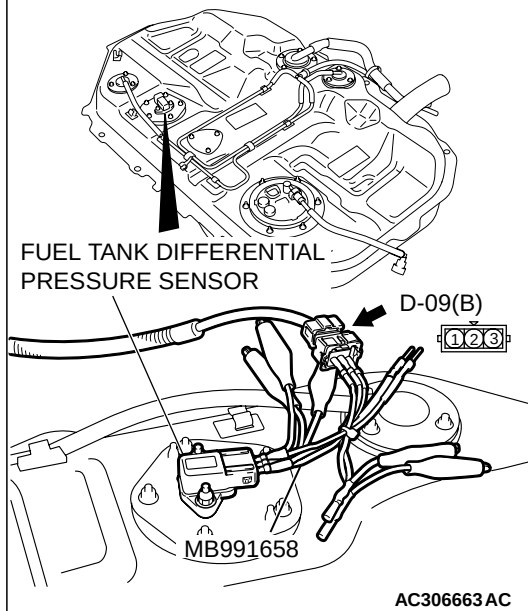
Q: Is the measured voltage 0.5 volt or less?**YES :** Go to Step 16.**NO :** Go to Step 23.

STEP 16. Check the signal voltage at fuel tank differential pressure sensor connector D-09.

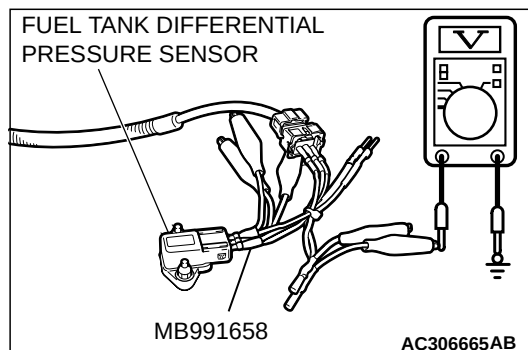
- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose I, hose M and hose R connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

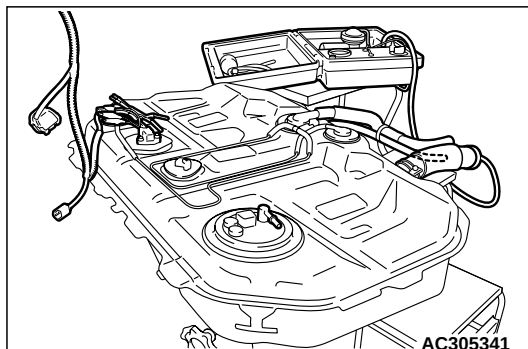


CONNECTOR: D-09

- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 1 and ground.
 - The measured voltage should be between 2.0 and 3.0 volts.

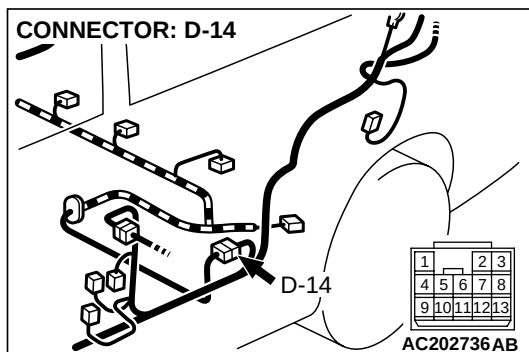
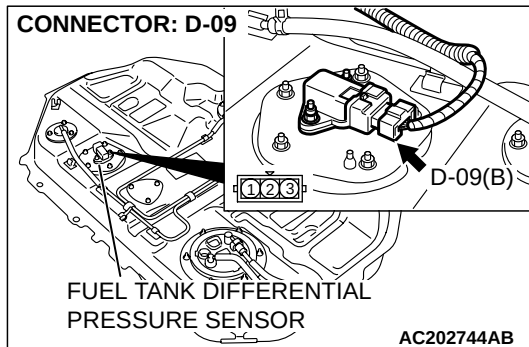


- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 17.

NO : Go to Step 20.

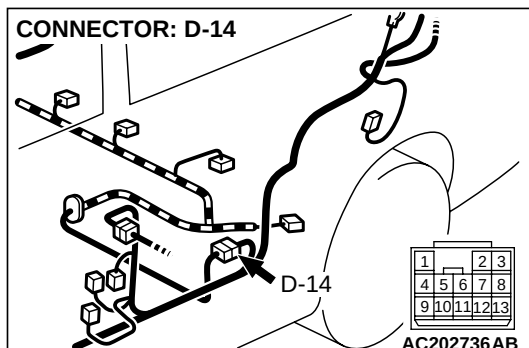
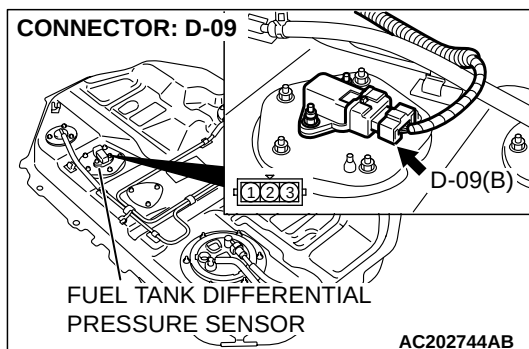


STEP 17. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 18.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

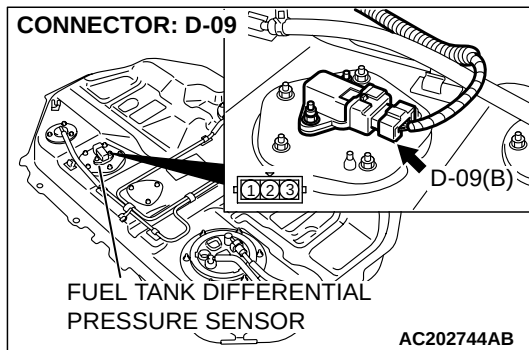
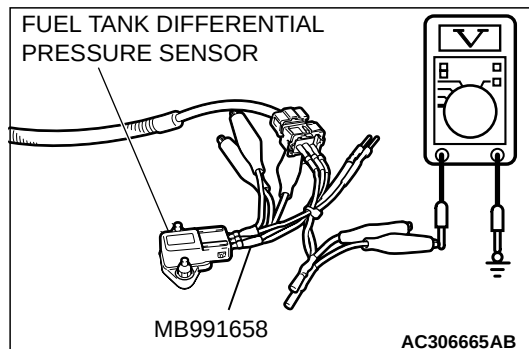
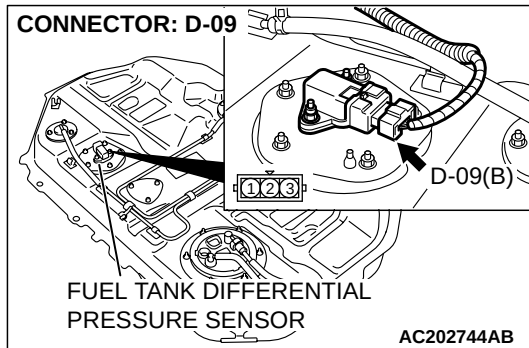


STEP 18. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 1 and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

**STEP 19. Measure the 5-volt reference signal at fuel tank differential pressure sensor connector D-09.**

- (1) Turn the ignition switch to the "ON" position.
- (2) Measure the voltage between connector D-09 terminal 3 and ground.

- The voltage should be between 4.9 and 5.1 volts.

- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

YES : Go to Step 20.

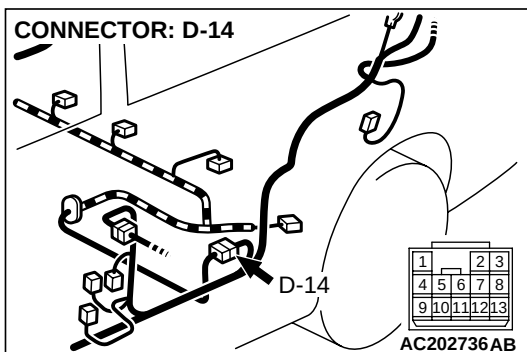
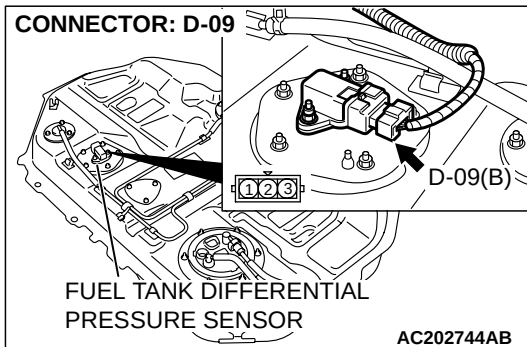
NO : Go to Step 21.

STEP 20. Check fuel tank differential pressure sensor connector D-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Replace the fuel tank differential pressure sensor, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 21. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 22.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

STEP 22. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 3 and intermediate connector D-14 terminal 9 for damage.

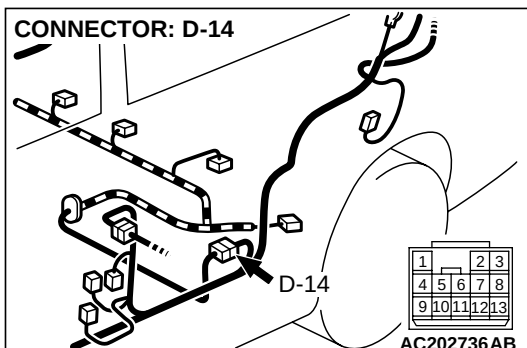
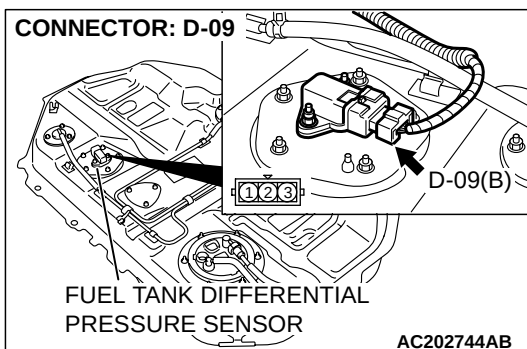
Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent.

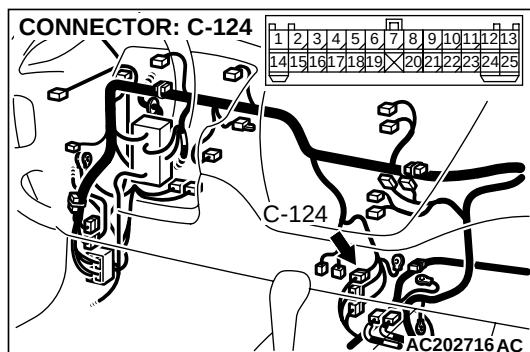
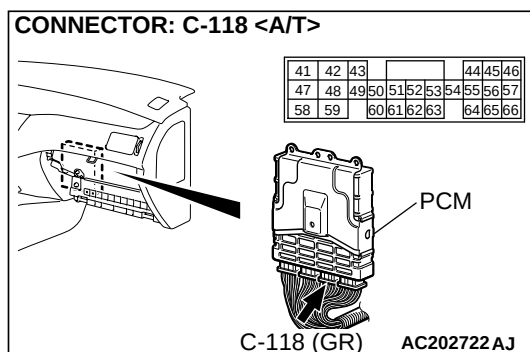
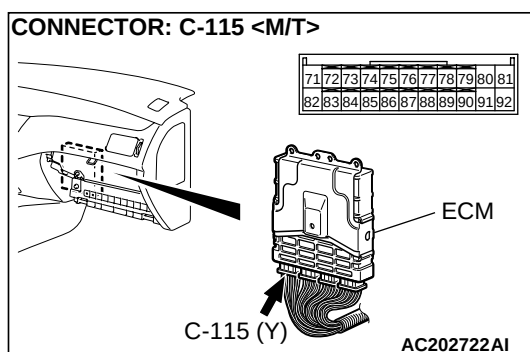
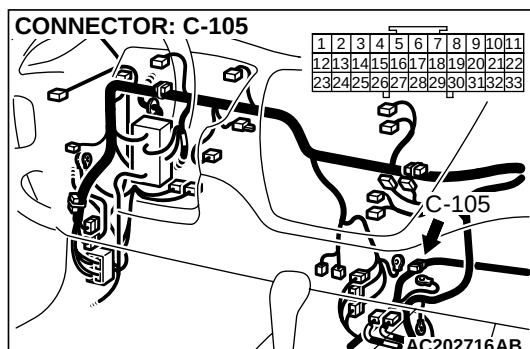
Refer to GROUP 00, How to Use

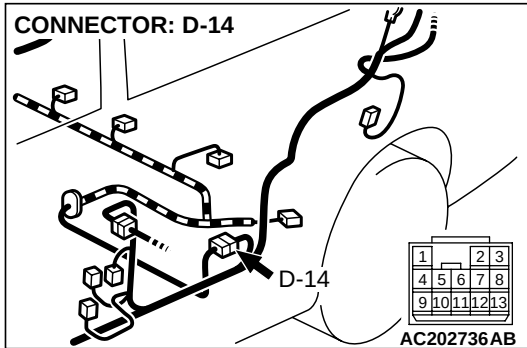
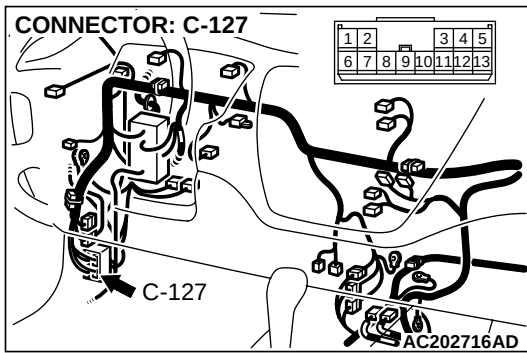
Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 23. Check intermediate connectors C-105, C-124, C-127, and D-14, and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 24.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 27.

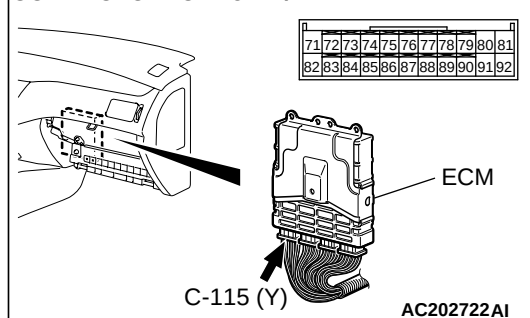
STEP 24. Check the harness wire between ECM connector C-115 terminal 92 <M/T> or PCM connector C-118 terminal 57 <A/T> and intermediate connector D-14 terminal 10 for damage.

Q: Is the harness wire in good condition?

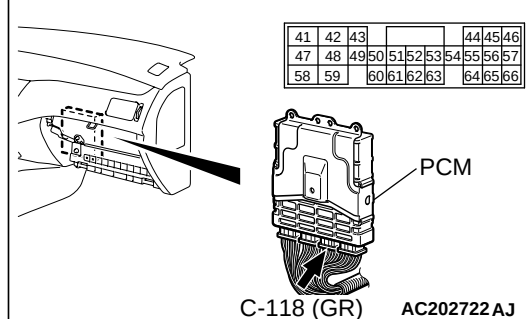
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.

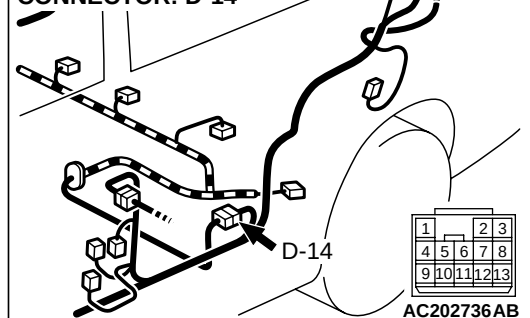
CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



CONNECTOR: D-14



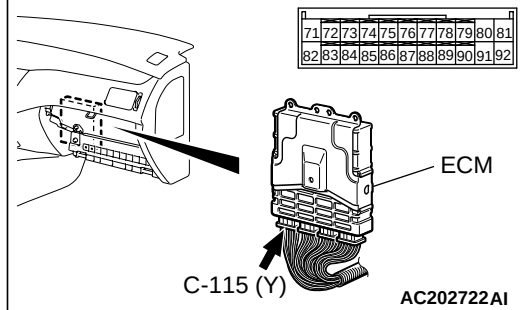
STEP 25. Check ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

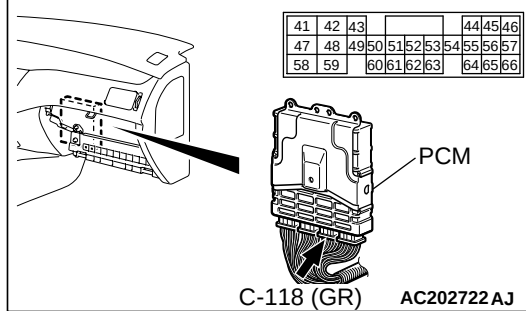
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>

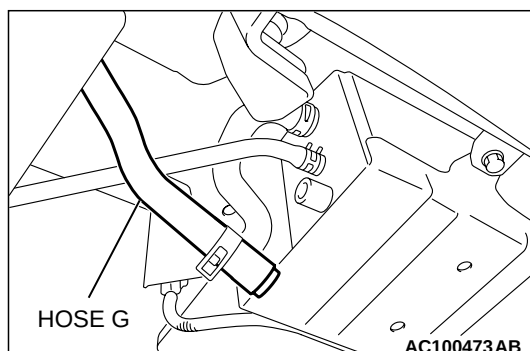
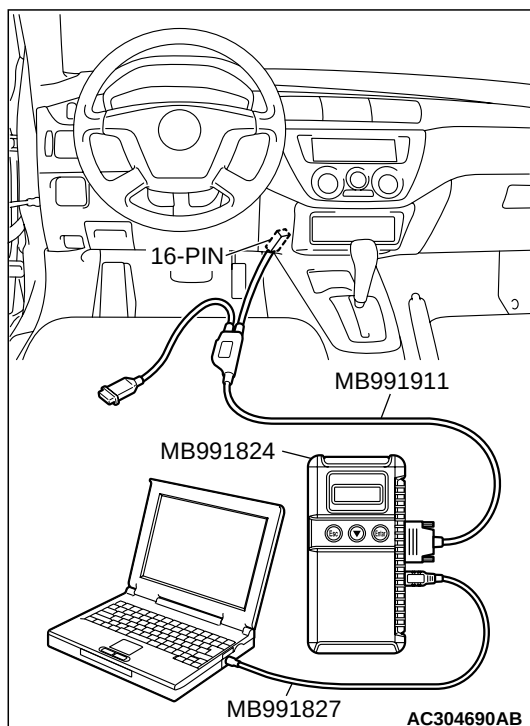


STEP 26. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

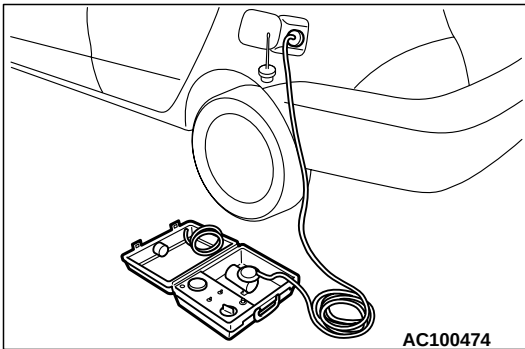
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).



- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between -1.5 and 1.5 kPa (-0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction [P.00-6](#)). Then go to Step 27.

NO : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 27.

STEP 27. Perform the OBD-II drive cycle.

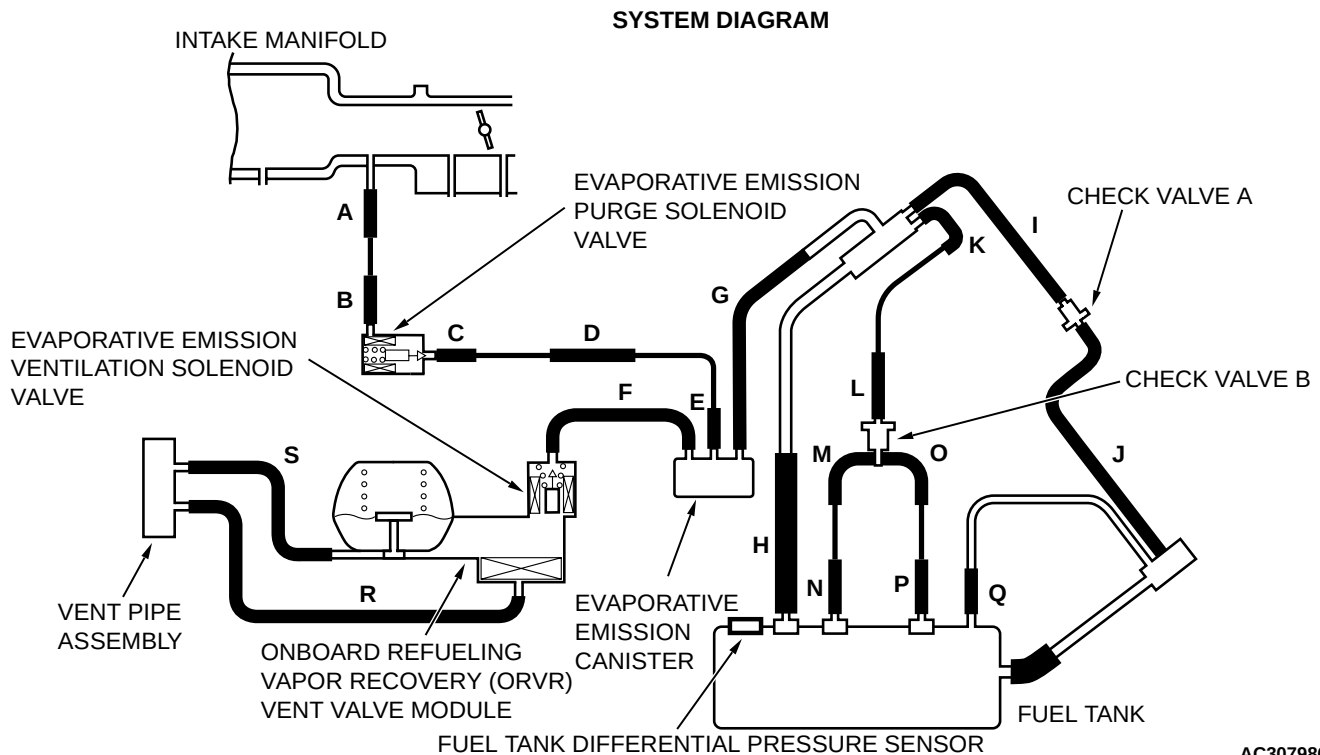
- (1) Carry out a test drive with the drive cycle pattern (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).
- (2) Read the diagnostic trouble code (DTC).

Q: Is DTC P0451 set?

YES : Go to Step 2.

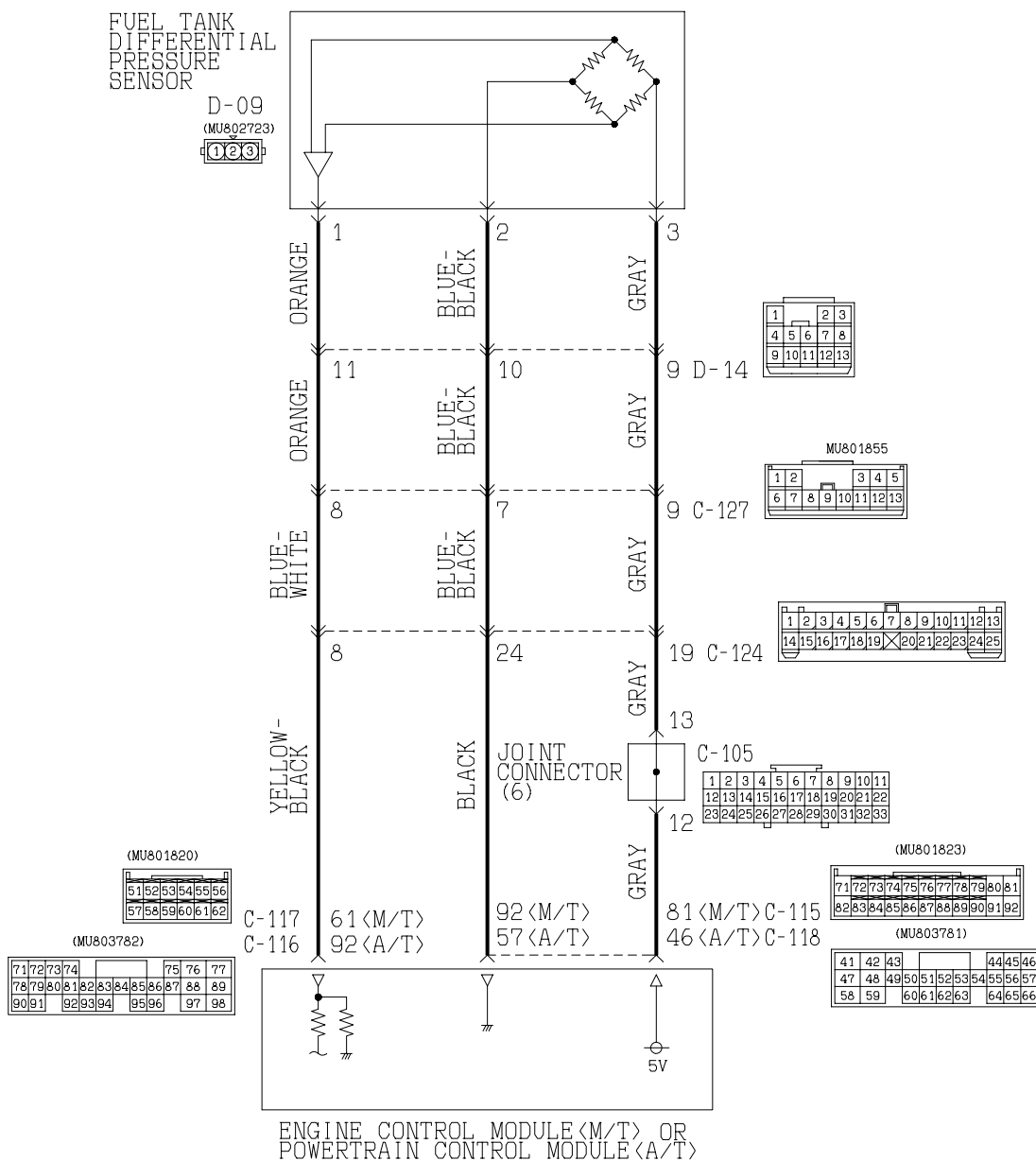
NO : The procedure is complete.

DTC P0452: Evaporative Emission Control System Pressure Sensor Low Input

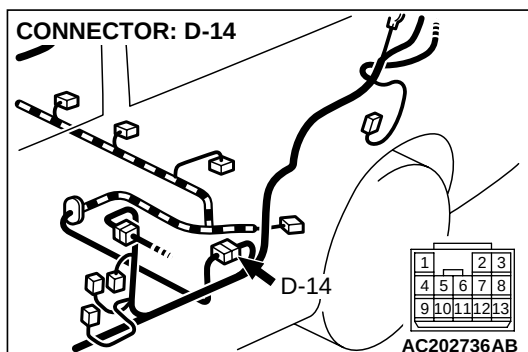
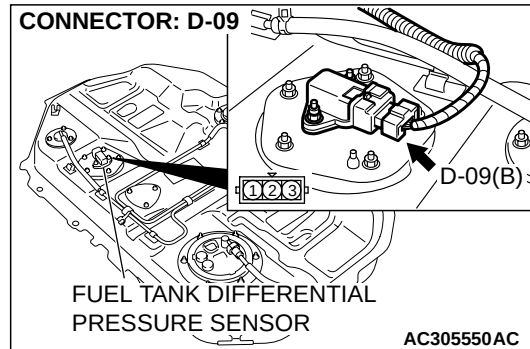
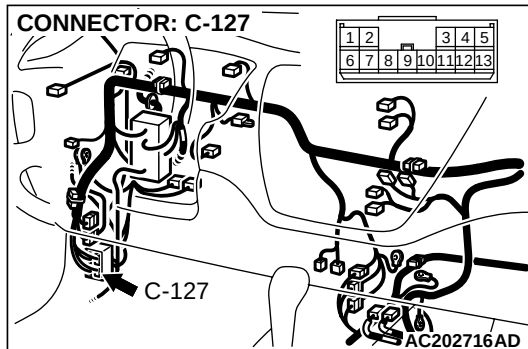
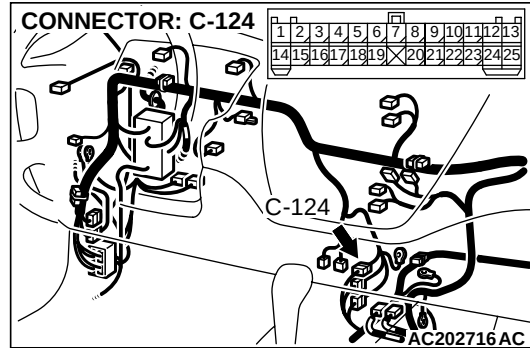
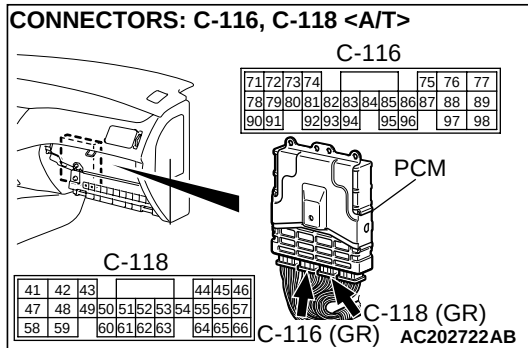
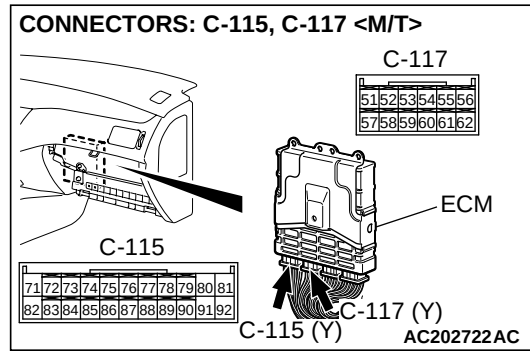
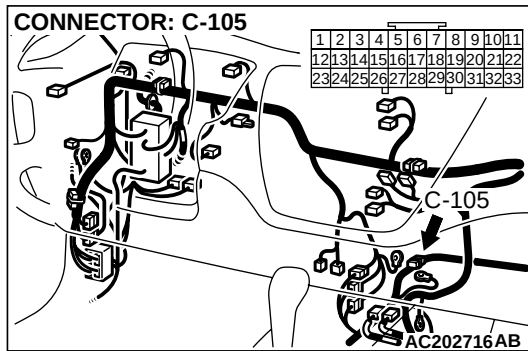


AC307986 AC

Fuel Tank Differential Pressure Sensor Circuit



W2J06M01AA



CIRCUIT OPERATION

- The ECM (terminal 81) <M/T> or PCM (terminal 46) <A/T> supplies a 5-volt reference signal to the fuel tank differential pressure sensor (terminal 3). The fuel tank differential pressure sensor (terminal 2) is grounded through the ECM (terminal 92) <M/T> or PCM (terminal 57) <A/T>.
- The fuel tank differential pressure sensor (terminal 1) returns a voltage signal to the ECM (terminal 61) <M/T> or PCM (terminal 92) <A/T> that is proportional to the pressure in the fuel tank.

TECHNICAL DESCRIPTION

- The ECM <M/T> or PCM <A/T> monitors the fuel tank differential pressure sensor output voltage.
- The ECM <M/T> or PCM <A/T> determines whether the fuel tank differential pressure sensor signal voltage is within normal operating parameters.

DESCRIPTIONS OF MONITOR METHODS

- Compare purge solenoid status with fuel tank differential pressure sensor output voltage.

MONITOR EXECUTION

- Continuous.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

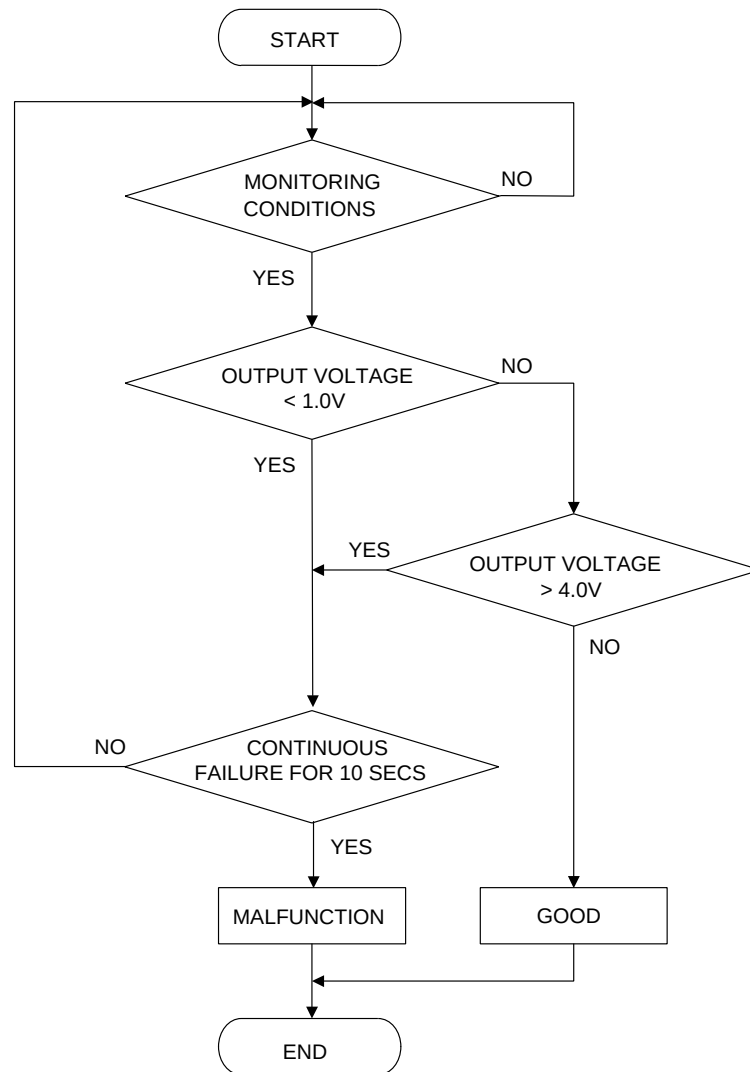
- Evaporative emission purge solenoid monitor
- Evaporative emission ventilation solenoid monitor

Sensor (The sensors below are determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)

RANGE CHECK - MIN/MAX



AC306648

DTC SET CONDITIONS

Check Conditions

- Intake air temperature is greater than 5°C (41°F).
- Engine speed is 1,600 r/min or greater.
- Volumetric efficiency is between 20 and 80 per-cent.

Judgment Criteria

- When the evaporative emission purge solenoid is off, the fuel differential pressure sensor output voltage remains 1.0 volt or less for ten seconds.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Malfunction of the fuel tank differential pressure sensor.
- A damaged harness in the fuel tank differential pressure sensor circuit.
- Malfunction of the ECM <M/T> or PCM <A/T>.

OVERVIEW OF TROUBLESHOOTING

- DTC P0452 can be set by a faulty fuel tank differential pressure sensor or related circuit, or PCM failure.
- To check for system blockage, do a performance test which uses a mechanical vacuum gauge and scan tool MB991958 set on the fuel tank differential pressure sensor (TANK PRS SNSR 73). The mechanical gauge reading is used to verify scan tool MB991958 reading. A comparison of the mechanical gauge with the reading on scan tool MB991958 will locate a problem in the system.

DIAGNOSIS

Required Special Tools:

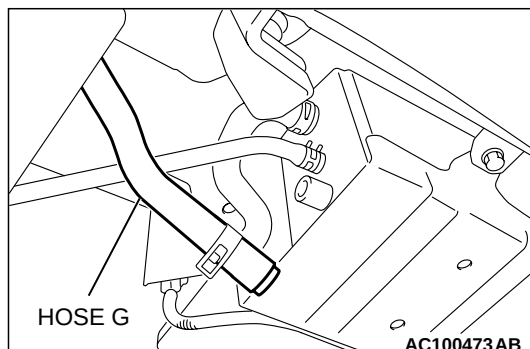
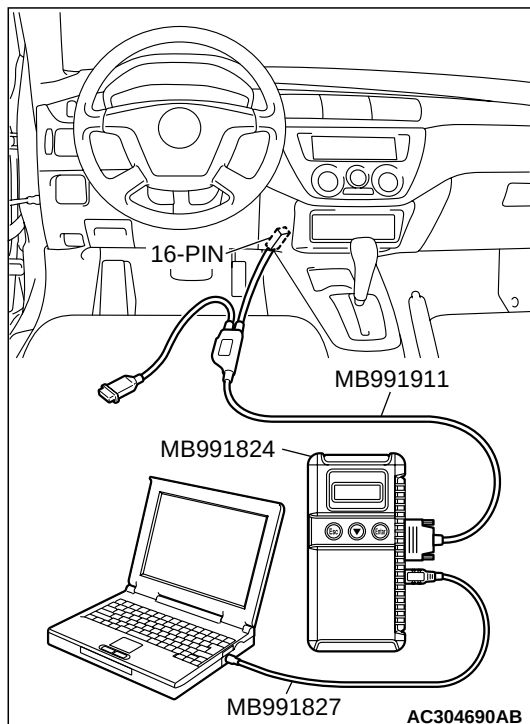
- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991658: Test Harness Set

STEP 1. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

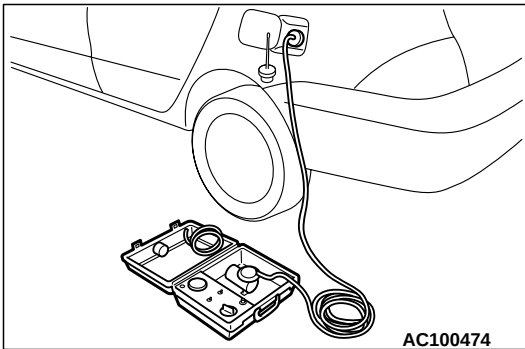
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).

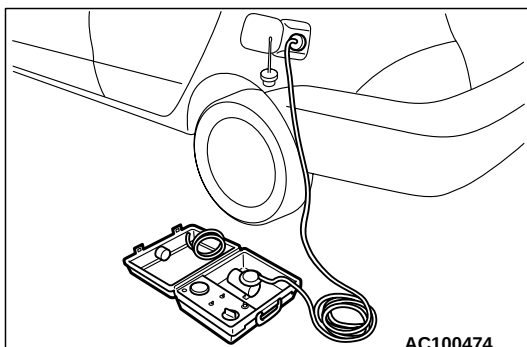
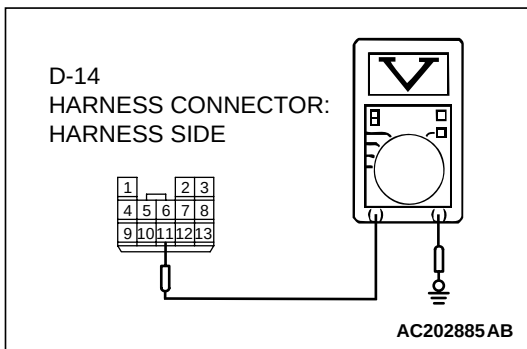
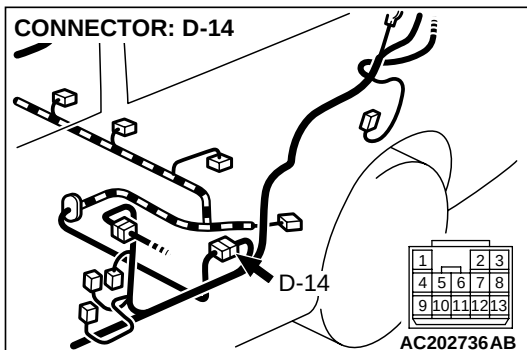
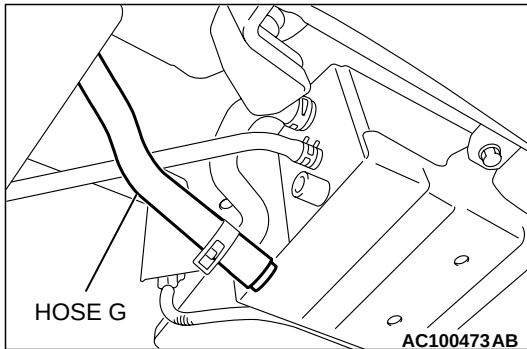


- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between –1.5 and 1.5 kPa (–0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction [P.00-6](#)). Then go to Step 27.

NO : Go to Step 2.



STEP 2. Measure the signal voltage at intermediate connector D-14 by backprobing.

- (1) Disconnect hose G from the evaporative emission canister side, and plug the hose.
- (2) Remove the rear seat cushion. (Refer to GROUP 52A, Rear Seat P.52A-23.)
- (3) Pull up the carpet.
- (4) Turn the ignition switch to the "ON" position.
- (5) Remove the fuel cap.

- (6) Measure the voltage between connector D-14 terminal 11 and ground by backprobing.
 - The measured voltage should be between 2.0 and 3.0 volts.

- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (10) Connect hose G to the canister.

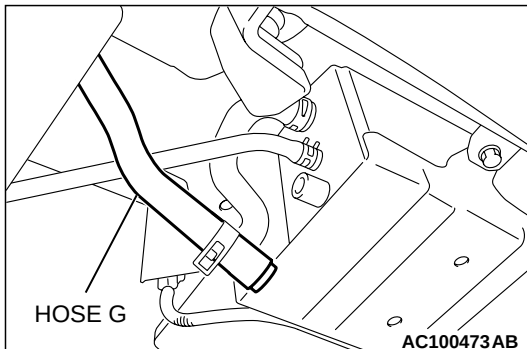
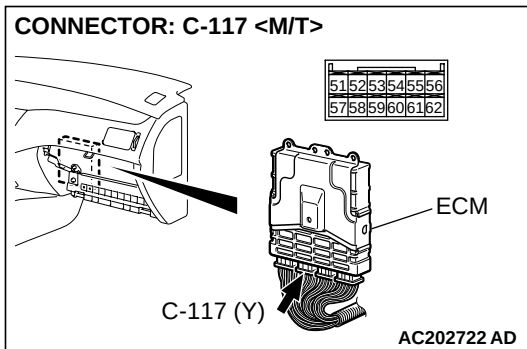
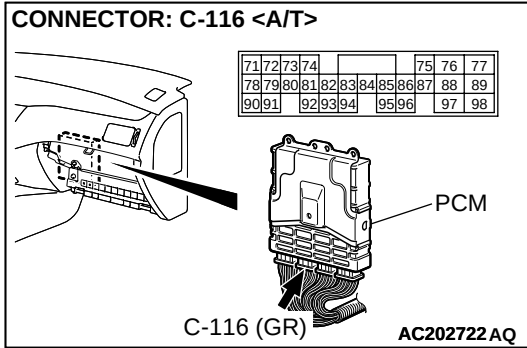
Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 3.

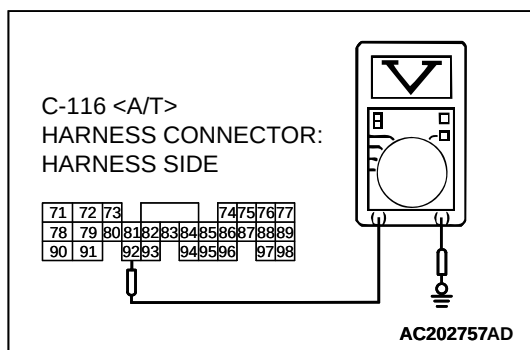
NO : Go to Step 7.

STEP 3. Measure the signal voltage at ECM connector C-117 <M/T> or PCM connector C-116 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-117 <M/T> or PCM connector C-116 <A/T>.

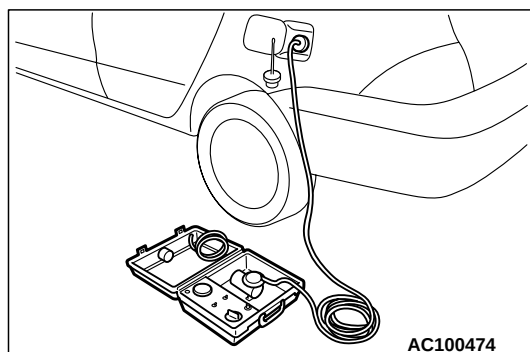
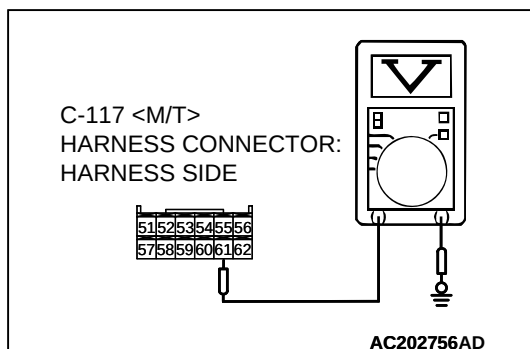


- (2) Disconnect hose G from the evaporative emission canister side, and plug the hose.
(3) Turn the ignition switch to the "ON" position.
(4) Remove the fuel cap.



- (5) Measure the voltage between connector C-117 terminal 61 <M/T> or C-116 terminal 92 <A/T> and ground by backprobing.

- The measured voltage should be between 2.0 and 3.0 volts.



- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.

- The fuel tank pressure reading should increase.

- (7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
(9) Connect hose G to the canister.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 4.

NO : Go to Step 5.

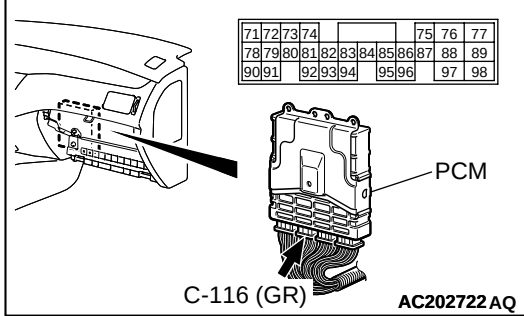
STEP 4. Check ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminal in good condition?

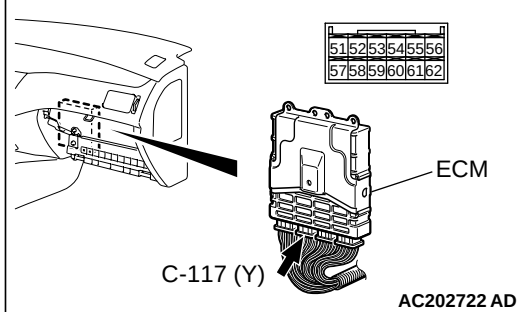
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

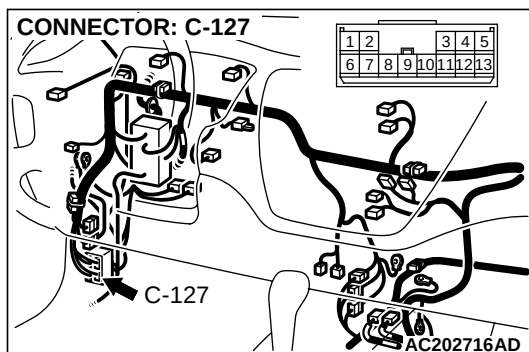
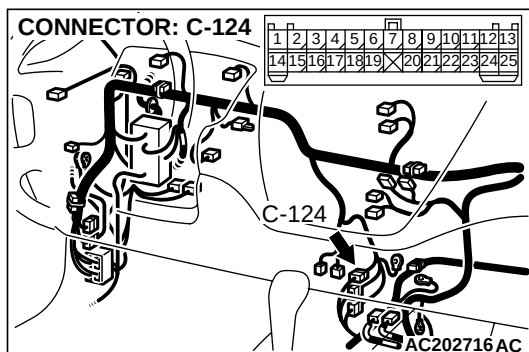
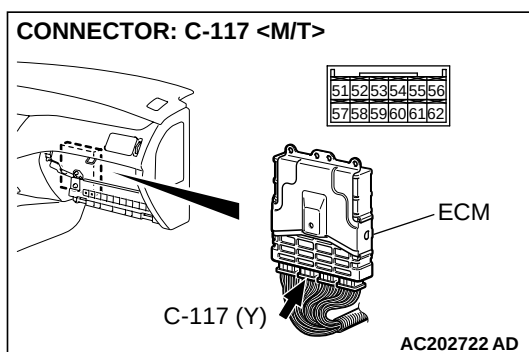
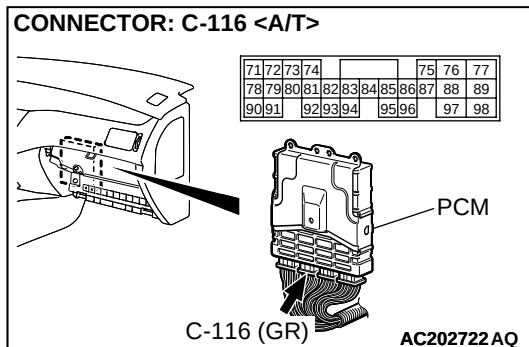
CONNECTOR: C-116 <A/T>

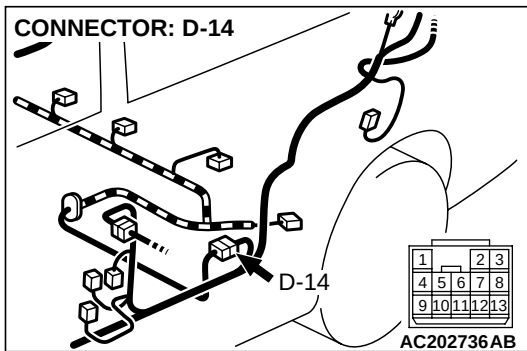


CONNECTOR: C-117 <M/T>



STEP 5. Check intermediate connectors C-124, C-127, D-14 and ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.



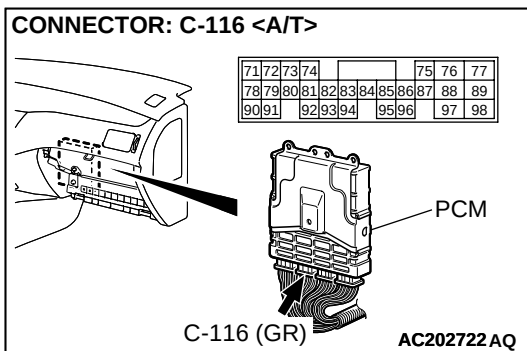


Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the faulty component. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Go to Step 27.

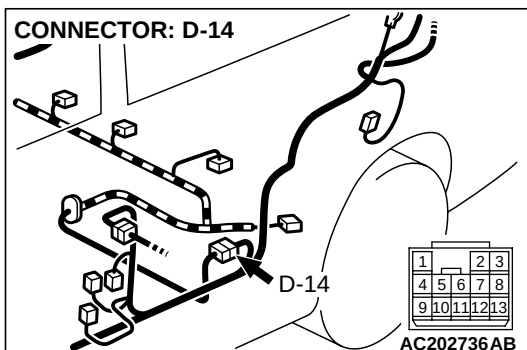
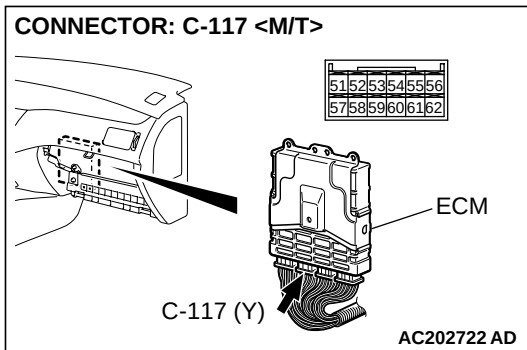


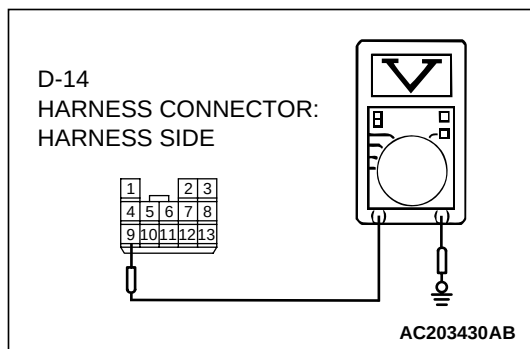
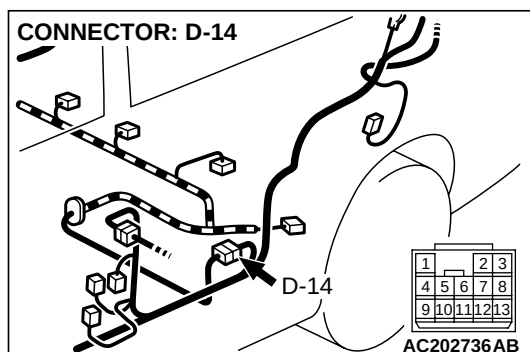
STEP 6. Check the harness wire between ECM connector C-117 terminal 61 <M/T> or PCM connector C-116 terminal 92 <A/T> and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.



**STEP 7. Measure the 5-volt reference signal at intermediate connector D-14 by backprobing.**

- (1) Do not disconnect intermediate connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 9 and ground.

- The voltage should be between 4.9 and 5.1 volts.

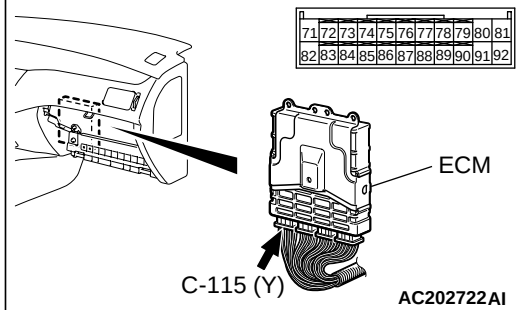
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

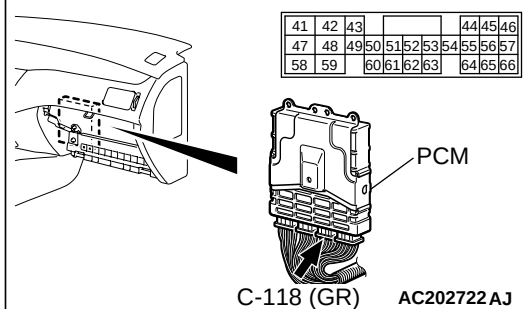
YES : Go to Step 11.

NO : Go to Step 8.

CONNECTOR: C-115 <M/T>

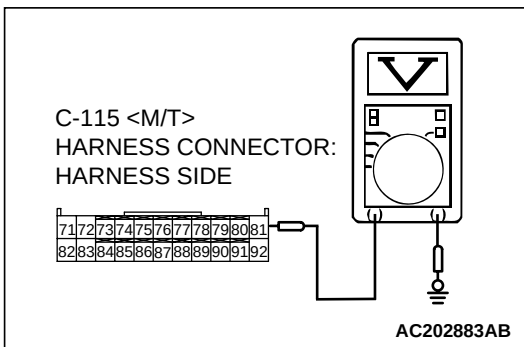


CONNECTOR: C-118 <A/T>



STEP 8. Measure the 5-volt reference signal at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between connector C-115 terminal 81 <M/T> or connector C-118 terminal 46 <A/T> and ground by backprobing.

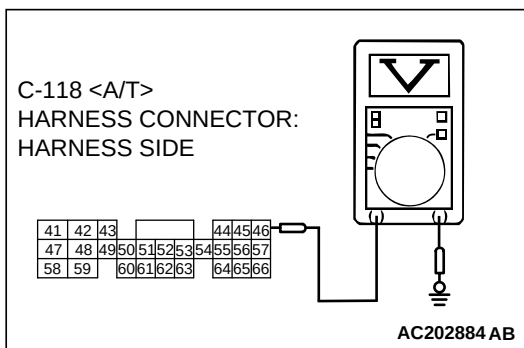
- The measured voltage should be between 4.9 and 5.1 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

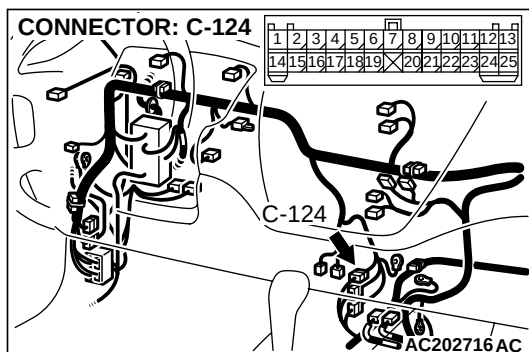
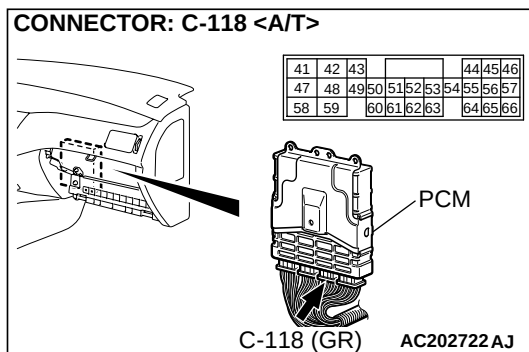
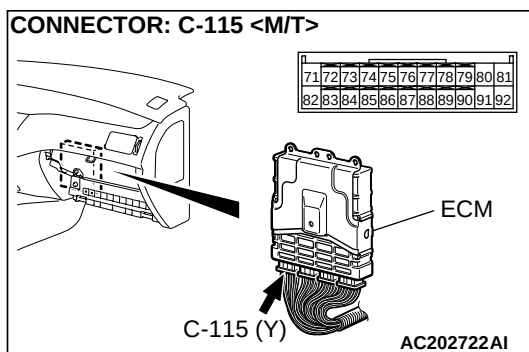
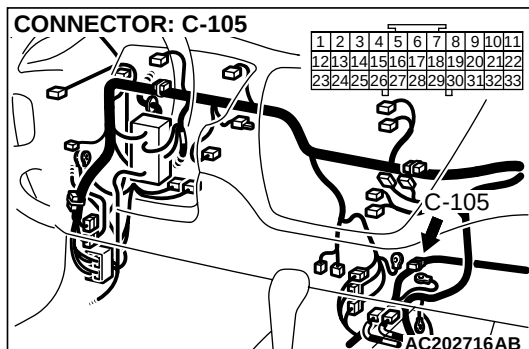
Q: Is the measured voltage between 4.9 and 5.1 volts?

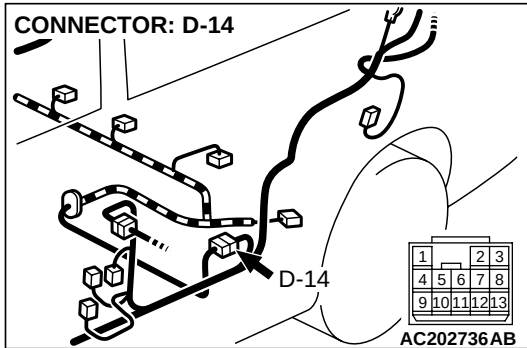
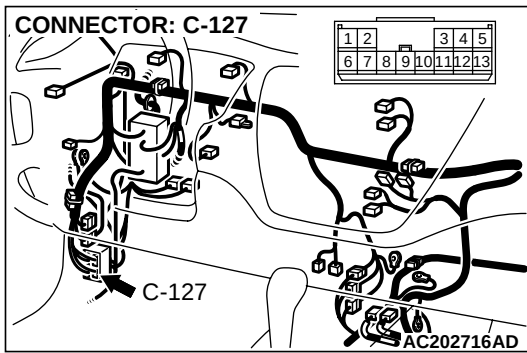
YES : Go to Step 9.

NO : Go to Step 25.



STEP 9. Check intermediate connectors C-105, C-124, C-127, and D-14 and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 27.

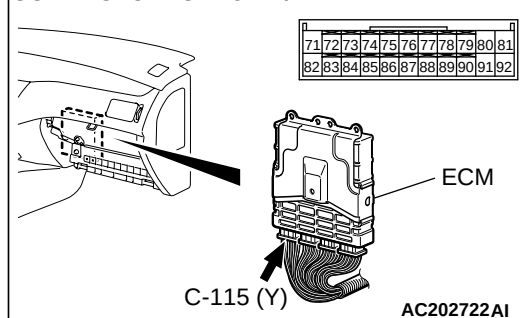
STEP 10. Check the harness wire between ECM connector C-115 <M/T> terminal 81 or PCM connector C-118 <A/T> terminal 46 and intermediate connector D-14 terminal 9 for damage.

Q: Is the harness wire in good condition?

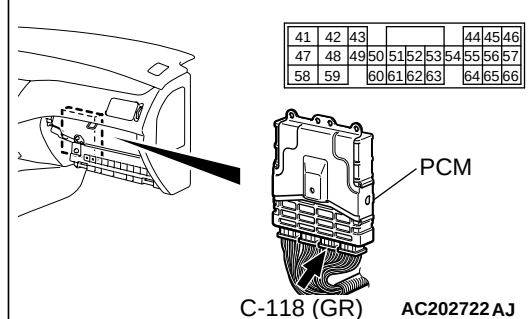
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.

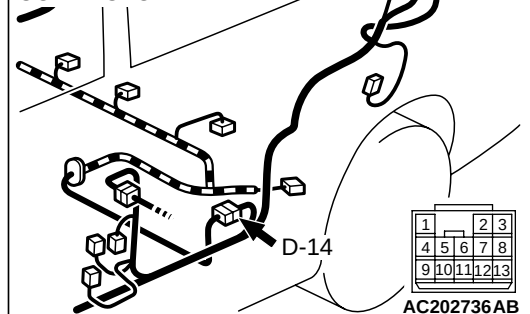
CONNECTOR: C-115 <M/T>

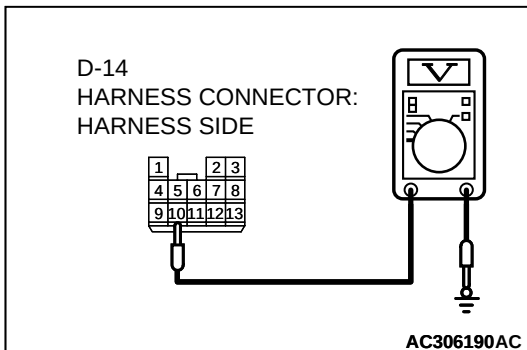
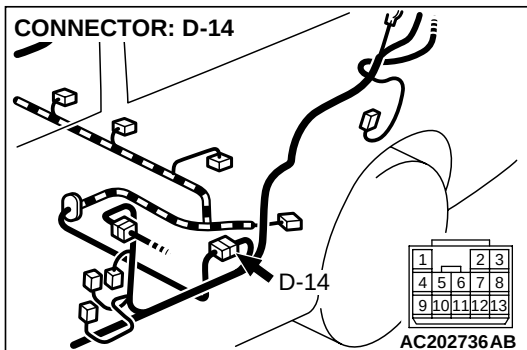


CONNECTOR: C-118 <A/T>



CONNECTOR: D-14





STEP 11. Check the sensor ground at intermediate connector D-14 by backprobing.

- (1) Do not disconnect connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 10 and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

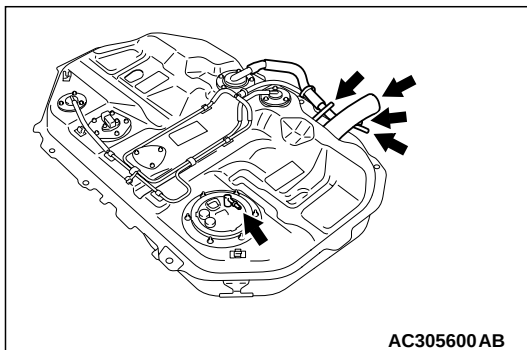
YES : Go to Step 15.

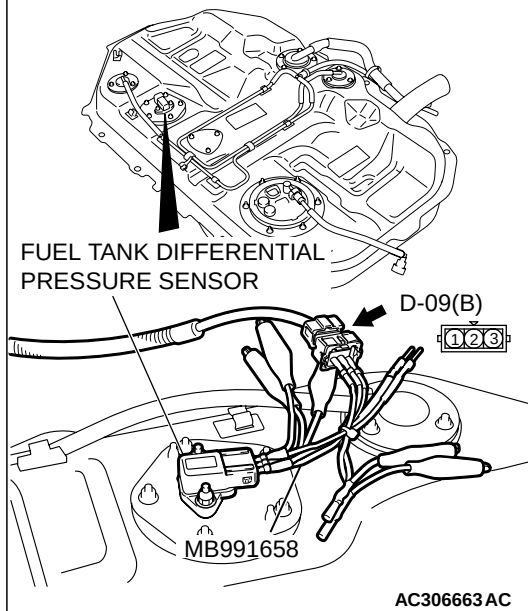
NO : Go to Step 12.

STEP 12. Check the signal voltage at fuel tank differential pressure sensor connector D-09.

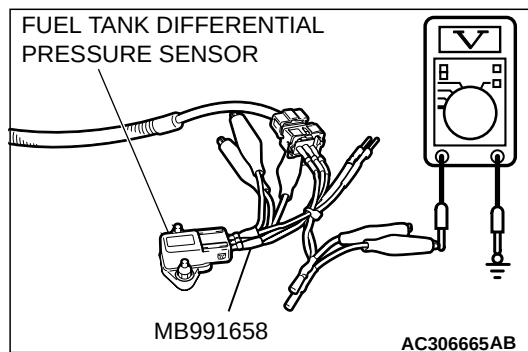
- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

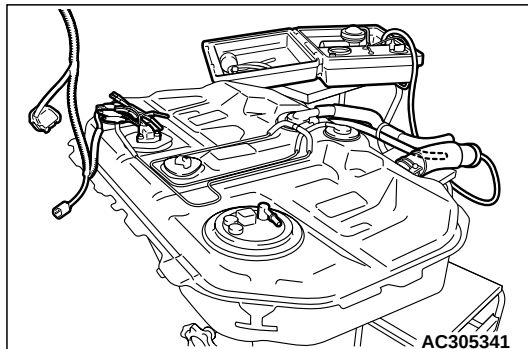


CONNECTOR: D-09

- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 2 and ground.
 - The measured voltage should be 0.5 volt or less.



- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 13.

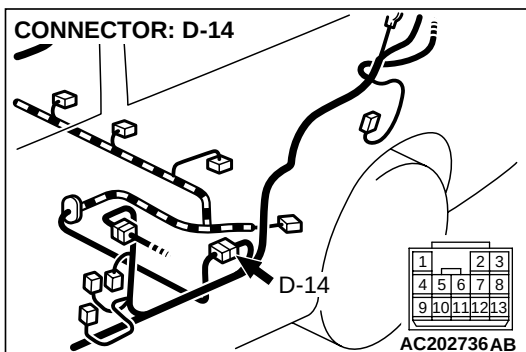
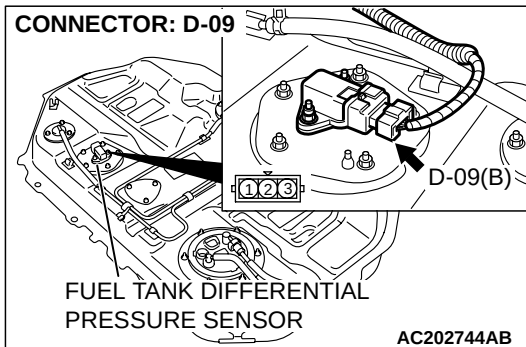
NO : Go to Step 19.

STEP 13. Check fuel tank differential pressure sensor connector D-09 and intermediate connector for D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

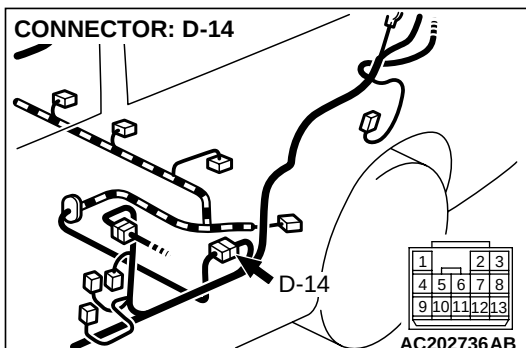
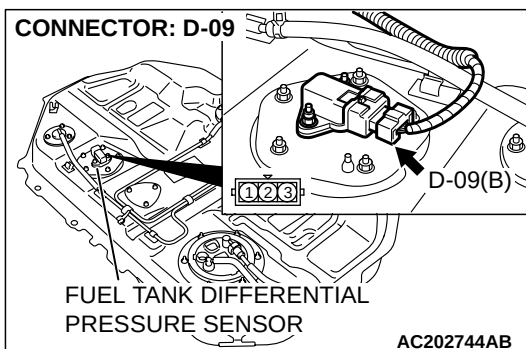


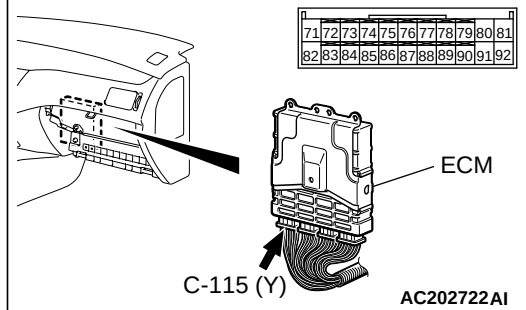
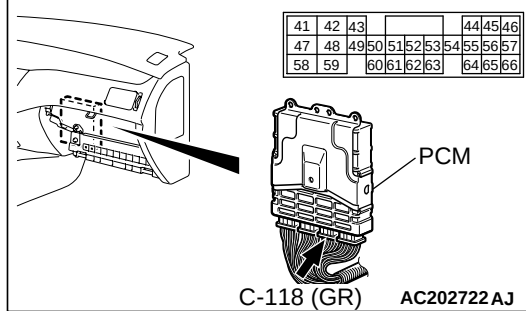
STEP 14. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 2 and intermediate connector D-14 terminal 10 for damage.

Q: Is the harness wire in good condition?

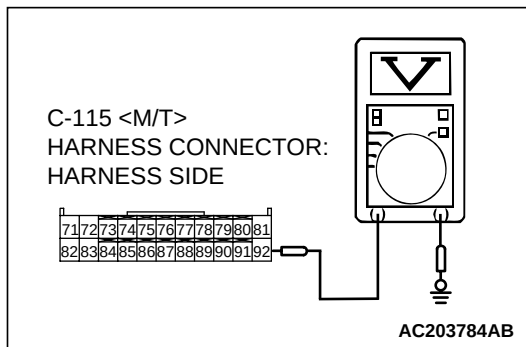
YES : It can be assumed that this malfunction is intermittent, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair the damaged harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



CONNECTOR: C-115 <M/T>**CONNECTOR: C-118 <A/T>****STEP 15. Check the sensor ground at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.**

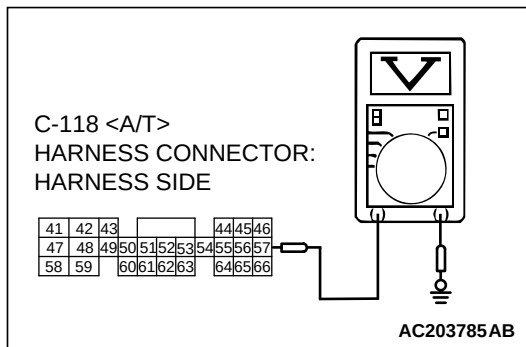
- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between connector C-115 terminal 92 <M/T> or connector C-118 terminal 57 <A/T> and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

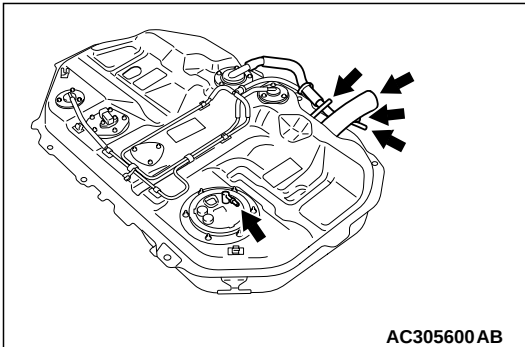
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

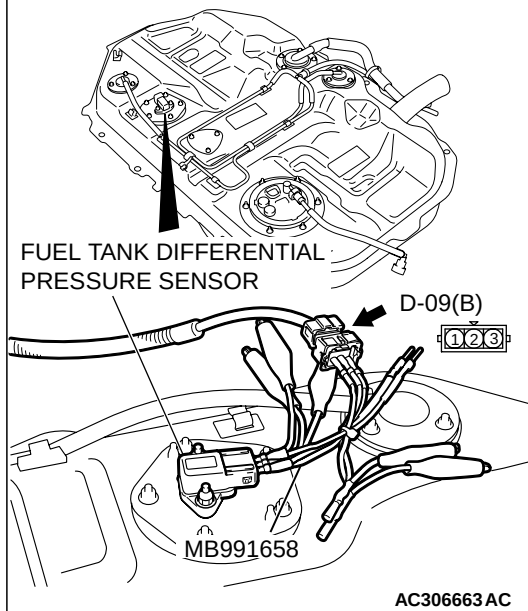
Q: Is the measured voltage 0.5 volt or less?**YES :** Go to Step 16.**NO :** Go to Step 23.

STEP 16. Check the signal voltage at fuel tank differential pressure sensor connector D-09.

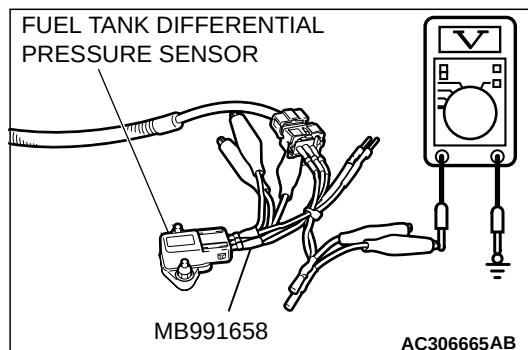
- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose I, hose M and hose R connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

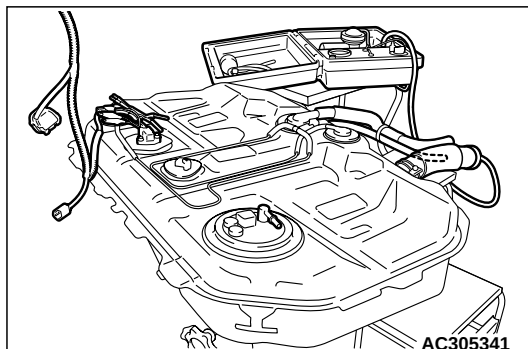


CONNECTOR: D-09

- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 1 and ground.
 - The measured voltage should be between 2.0 and 3.0 volts.

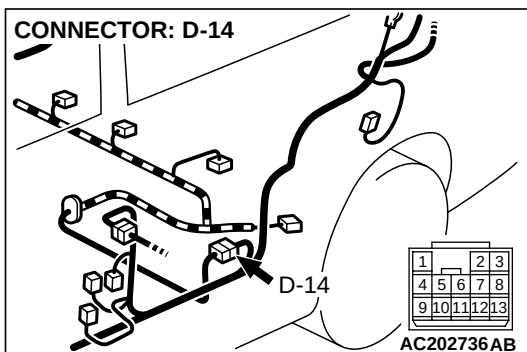
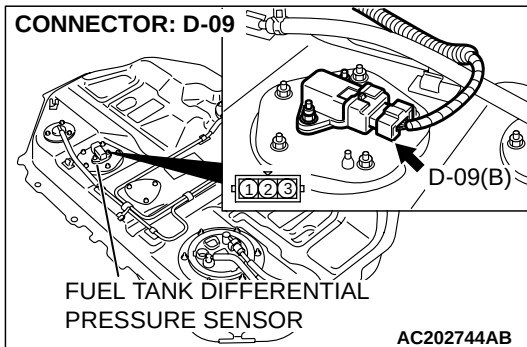


- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 17.

NO : Go to Step 20.

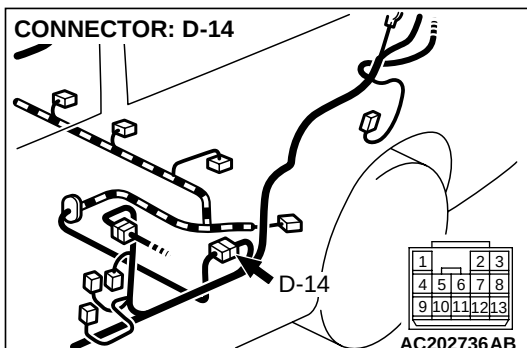
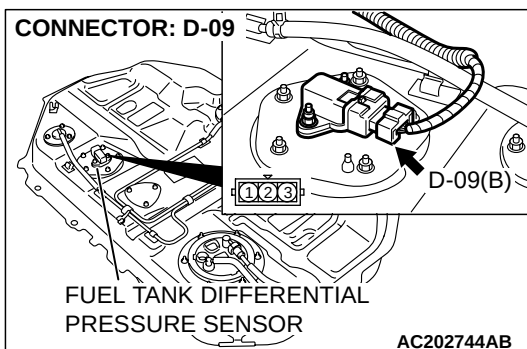


STEP 17. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 18.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

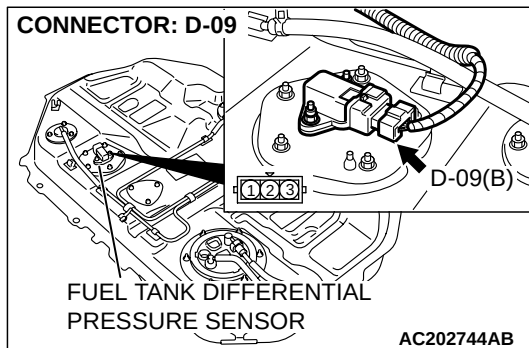
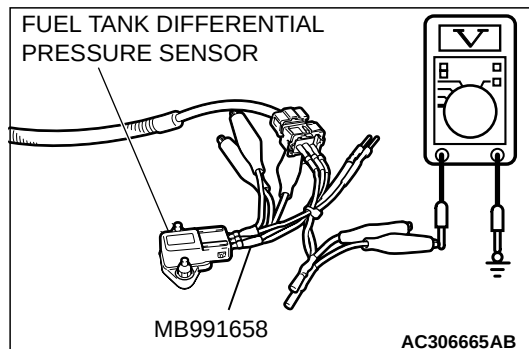
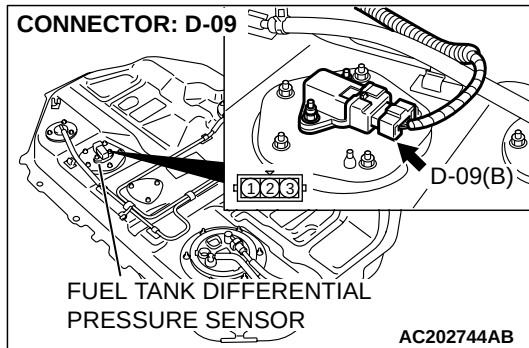


STEP 18. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 1 and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

**STEP 19. Measure the 5-volt reference signal at fuel tank differential pressure sensor connector D-09.**

- (1) Turn the ignition switch to the "ON" position.
- (2) Measure the voltage between connector D-09 terminal 3 and ground.

- The voltage should be between 4.9 and 5.1 volts.

- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

YES : Go to Step 20.

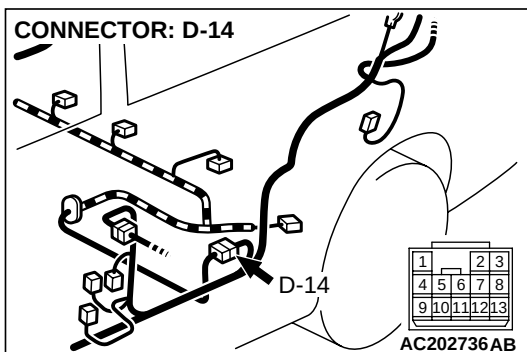
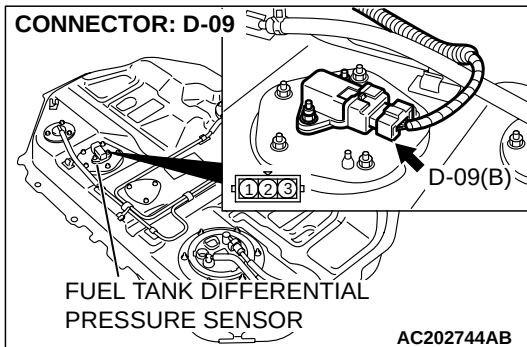
NO : Go to Step 21.

STEP 20. Check fuel tank differential pressure sensor connector D-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Replace the fuel tank differential pressure sensor, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 21. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

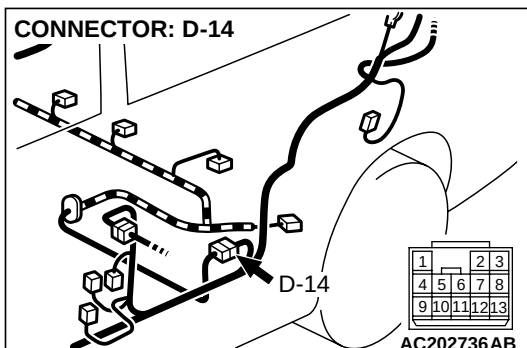
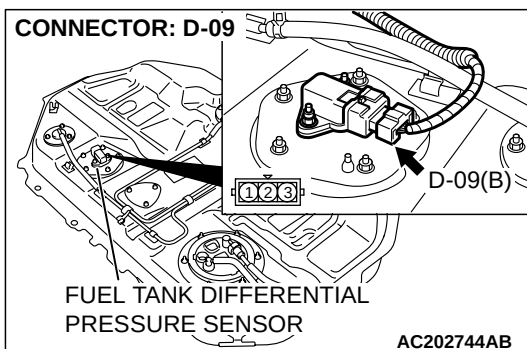
Q: Are the connectors and terminals in good condition?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 22.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 22. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 3 and intermediate connector D-14 terminal 9 for damage.

Q: Is the harness wire in good condition?

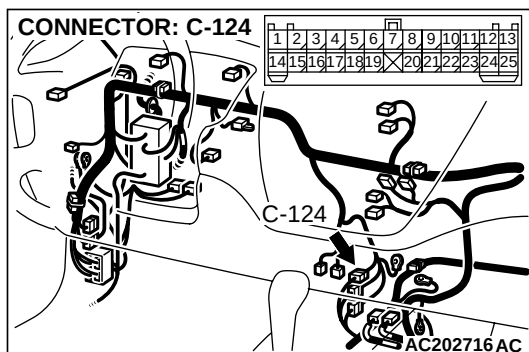
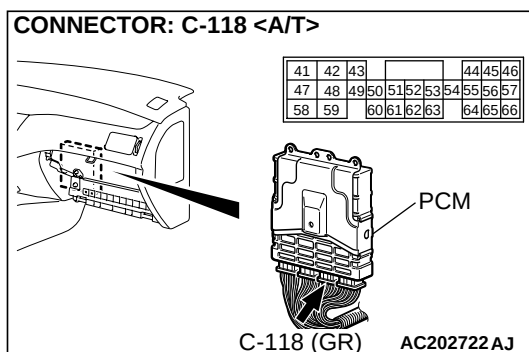
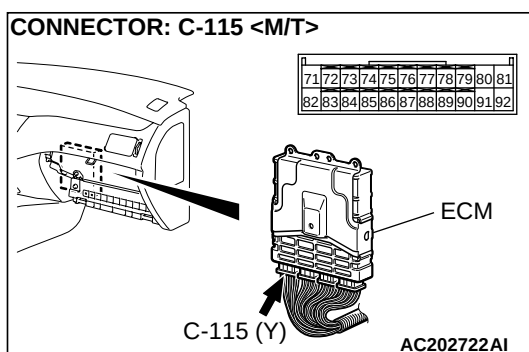
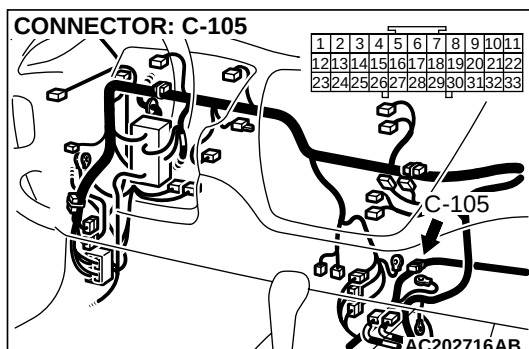
YES : It can be assumed that this malfunction is intermittent.

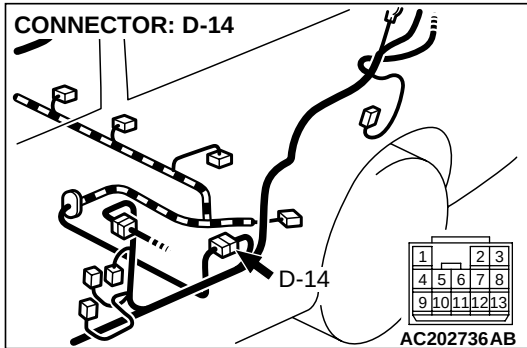
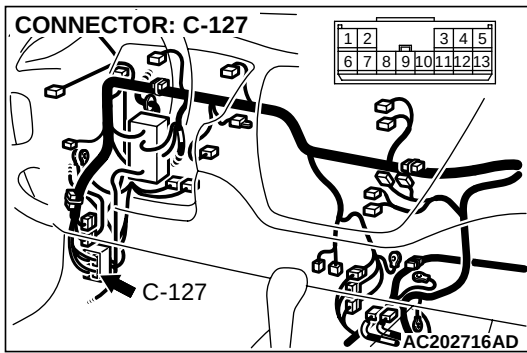
Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

STEP 23. Check intermediate connectors C-105, C-124, C-127, and D-14, and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 24.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 27.

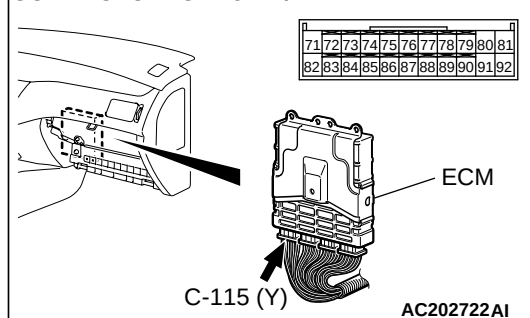
STEP 24. Check the harness wire between ECM connector C-115 terminal 92 <M/T> or PCM connector C-118 terminal 57 <A/T> and intermediate connector D-14 terminal 10 for damage.

Q: Is the harness wire in good condition?

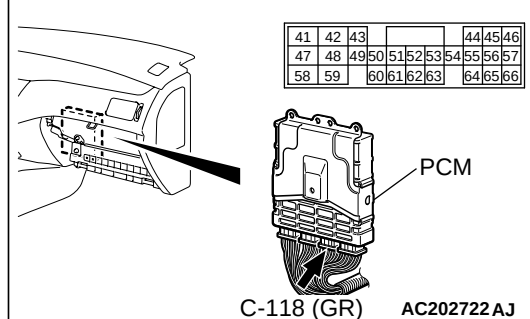
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.

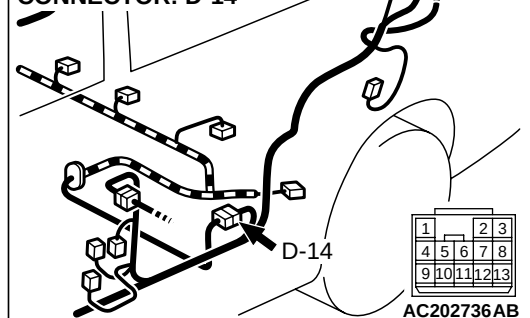
CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



CONNECTOR: D-14



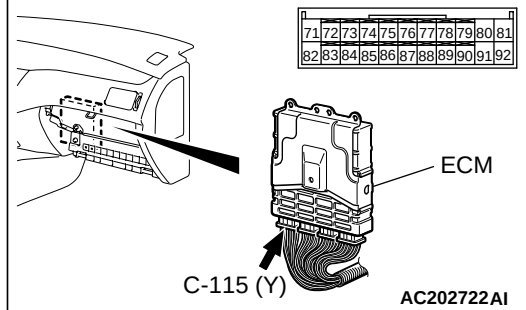
STEP 25. Check ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

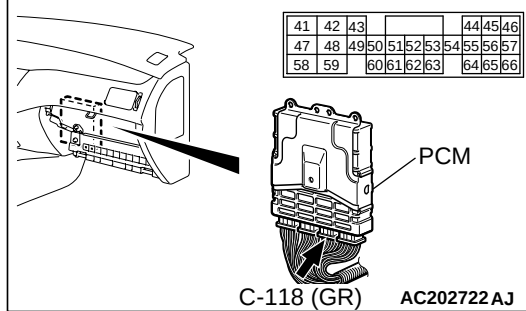
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>

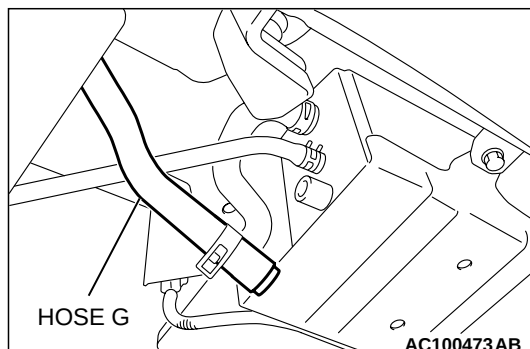
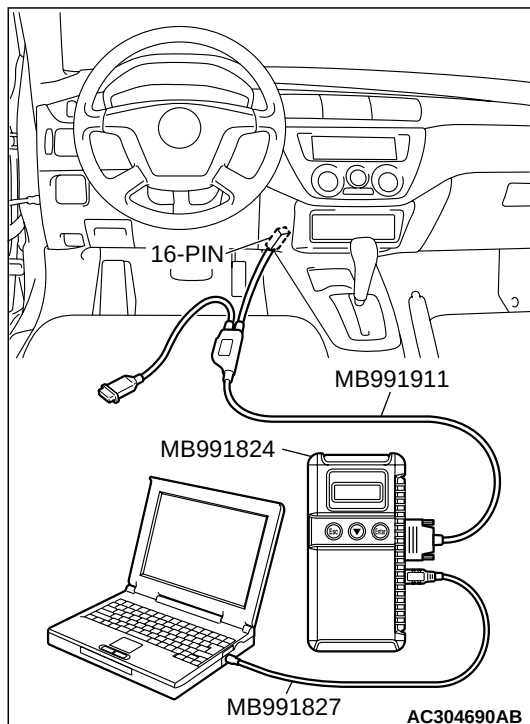


STEP 26. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

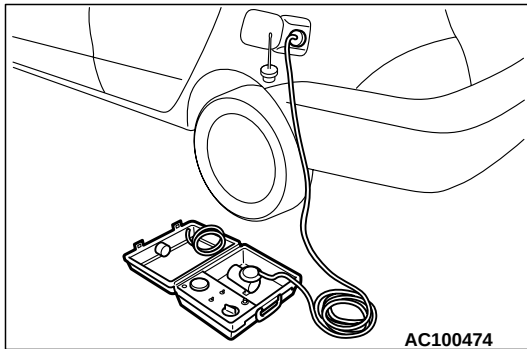
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).



- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between –1.5 and 1.5 kPa (–0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction [P.00-6](#)). Then go to Step 27.

NO : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 27.

STEP 27. Perform the OBD-II drive cycle.

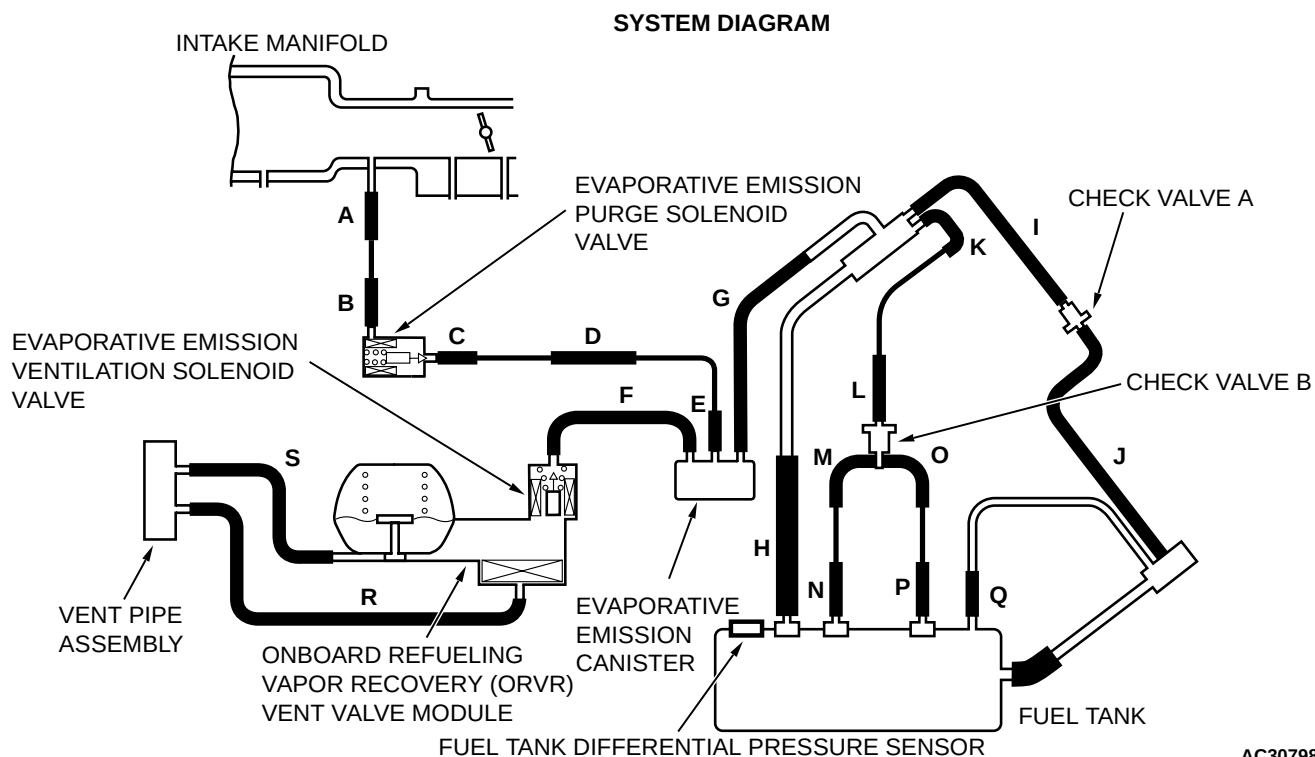
- (1) Carry out a test drive with the drive cycle pattern (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).
- (2) Read the diagnostic trouble code (DTC).

Q: Is DTC P0452 set?

YES : Go to Step 2.

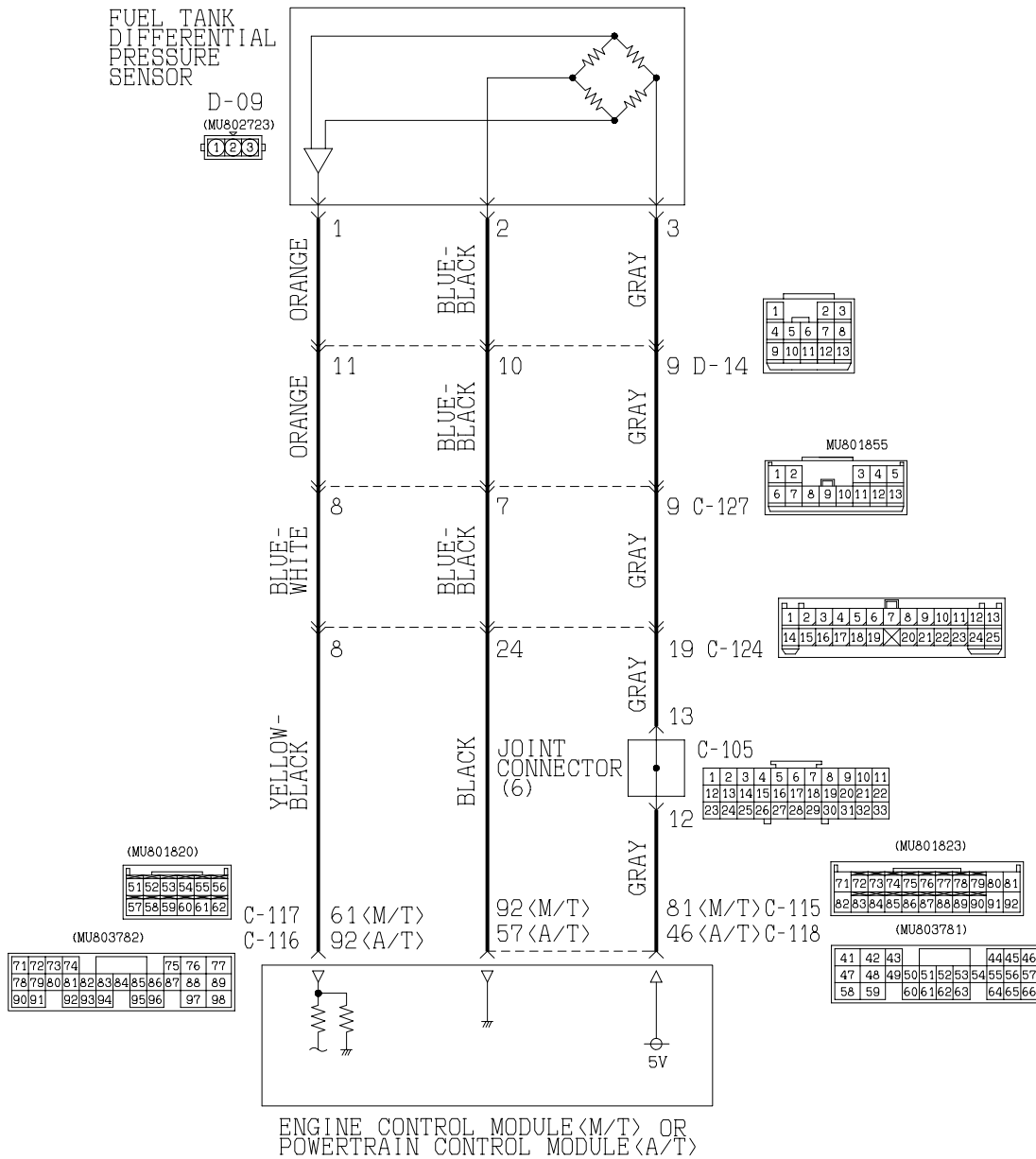
NO : The procedure is complete.

DTC P0453: Evaporative Emission Control System Pressure Sensor High Input

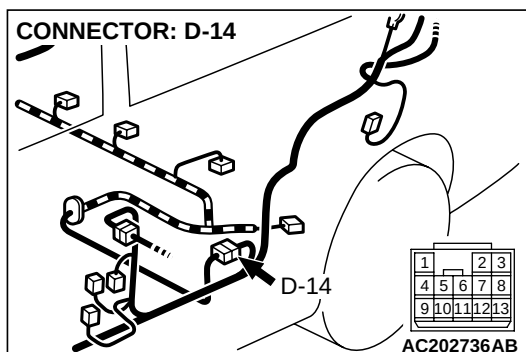
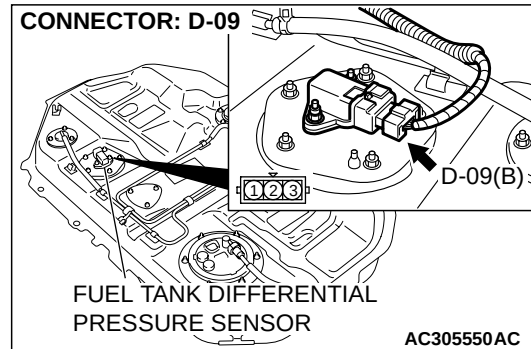
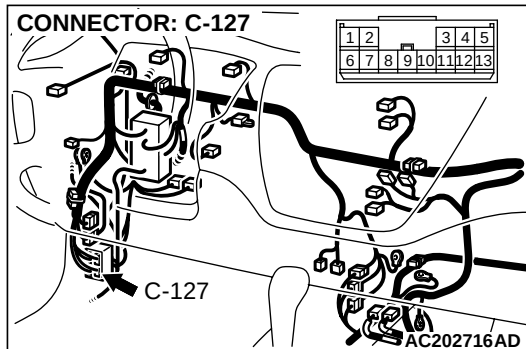
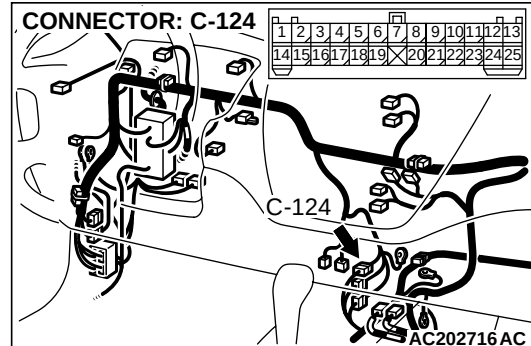
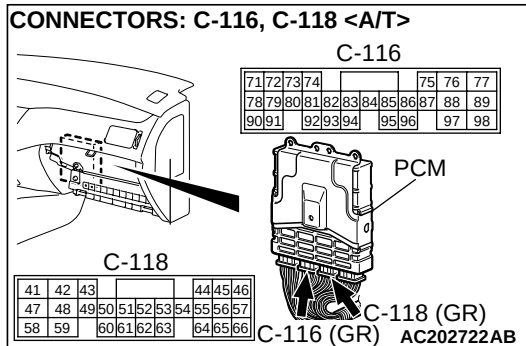
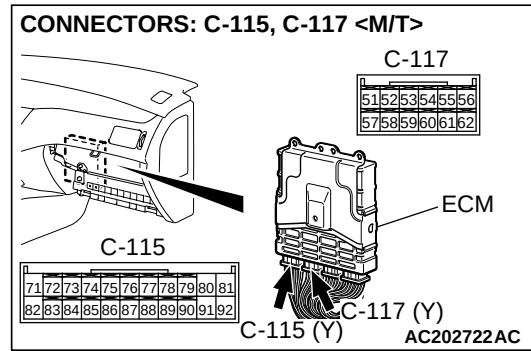
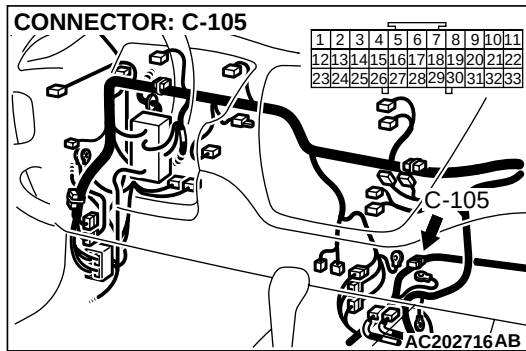


AC307986AC

Fuel Tank Differential Pressure Sensor Circuit



W2J06M01AA

**CIRCUIT OPERATION**

- The ECM (terminal 81) <M/T> or PCM (terminal 46) <A/T> supplies a 5-volt reference voltage to the fuel tank differential pressure sensor (terminal 3). The ECM (terminal 92) <M/T> or PCM (terminal 57) <A/T> supplies a ground to the fuel tank differential pressure sensor (terminal 2).
- The ECM (terminal 61) <M/T> or PCM (terminal 92) <A/T> receives a voltage signal proportional to the pressure in the fuel tank from the fuel tank differential pressure sensor (terminal 1).

TECHNICAL DESCRIPTION

- To determine whether the fuel tank differential pressure sensor is defective, the ECM <M/T> or PCM <A/T> monitors the fuel tank differential pressure sensor output voltage.
- Based on the test conditions and judgment criteria, the ECM <M/T> or PCM <A/T> determines whether the fuel tank differential pressure sensor output voltage is normal.

NOTE: In rare cases, this DTC may be also set under some fuel and driving conditions regardless of the fuel pressure sensor output voltage when the fuel system is clogged.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Evaporative emission purge solenoid monitor
- Evaporative emission ventilation solenoid monitor

Sensor (The sensors below are determined to be normal)

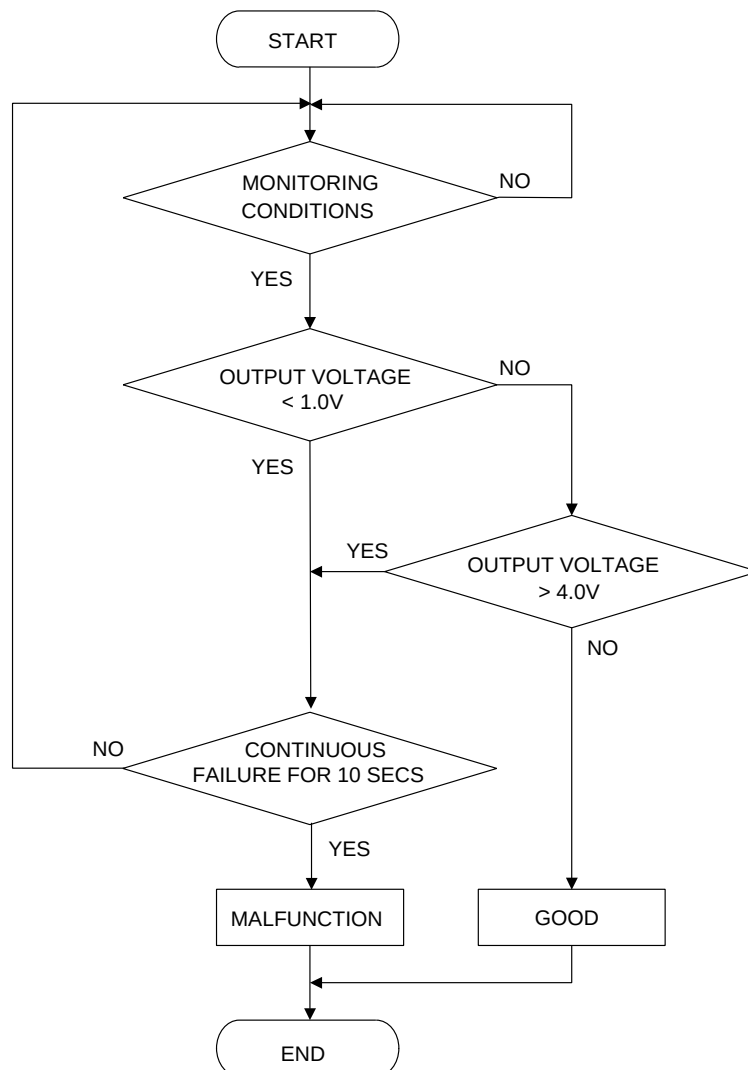
- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

MONITOR EXECUTION

- Continuous.

LOGIC FLOW CHARTS (Monitor Sequence)

RANGE CHECK - MIN/MAX



AC306648

DTC SET CONDITIONS**Test Conditions: For Test to Run**

- Intake air temperature is between 5°C (41°F) and 45°C (113°F) or greater.
- Engine speed is 1,600 r/min or greater.
- Volumetric efficiency is between 20 to 80 percent.

Judgment Criteria

- When the evaporative emission purge solenoid valve is fully operational (100 percent ratio), the fuel differential pressure sensor output voltage remains at 4.0 volts or greater for ten seconds.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Malfunction of the fuel tank differential pressure sensor.
- Open or shorted fuel tank differential pressure sensor circuit.
- Malfunction of the ECM <M/T> or PCM <A/T>.

OVERVIEW OF TROUBLESHOOTING

- DTC P0453 can be set by a faulty fuel tank differential pressure sensor or related circuit, or ECM <M/T> or PCM <A/T> failure.
- To check for system blockage, do a performance test which uses a mechanical vacuum gauge and scan tool MB991958 set on the fuel tank differential pressure sensor (TANK PRS SNSR 73). The mechanical gauge reading is used to verify scan tool MB991958 reading. A comparison of the mechanical gauge with the reading on scan tool MB991958 will locate a problem in the system.

DIAGNOSIS**Required Special Tools:**

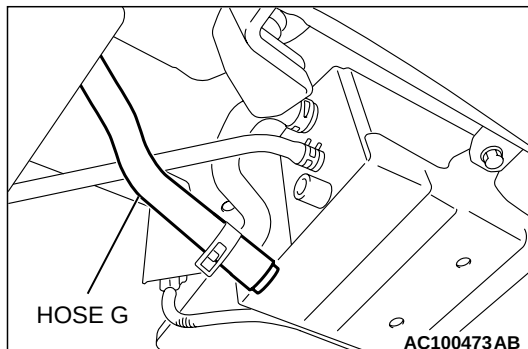
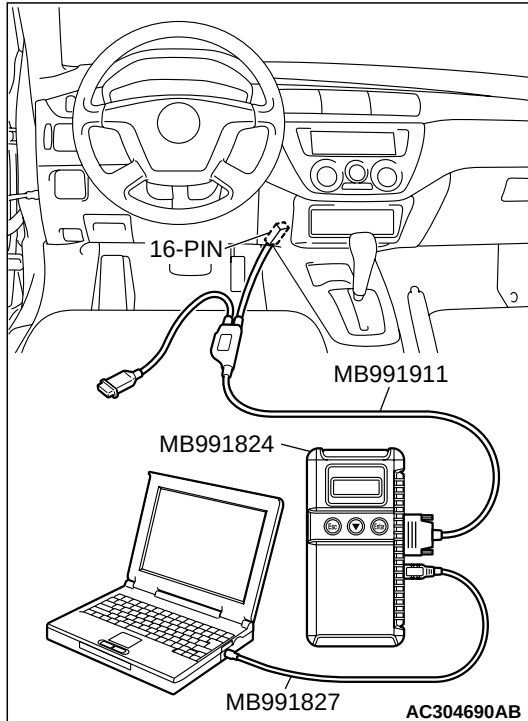
- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991658: Test Harness Set

STEP 1. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

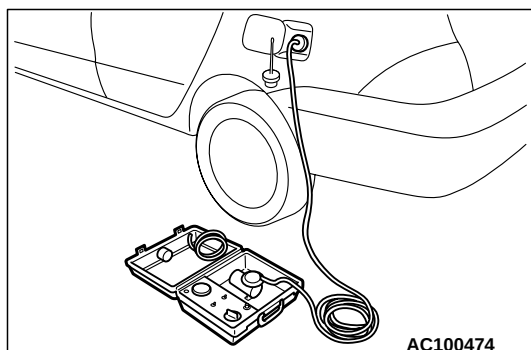
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).

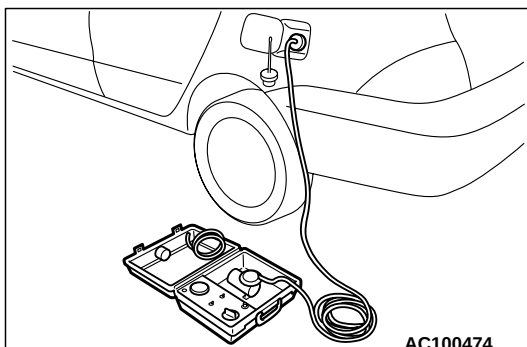
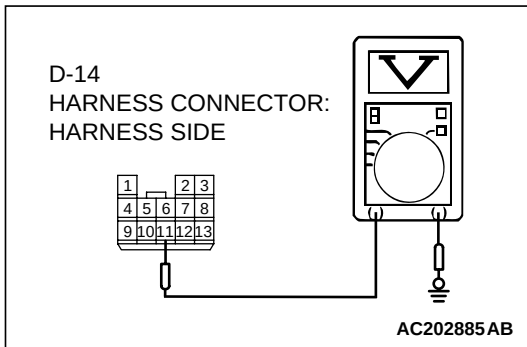
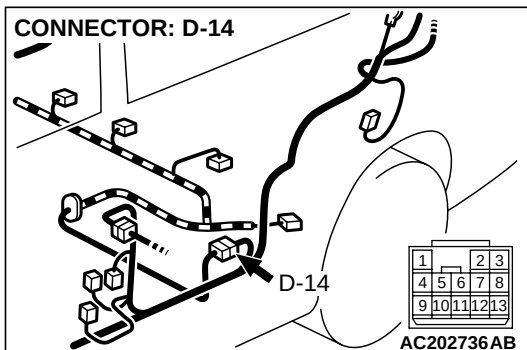
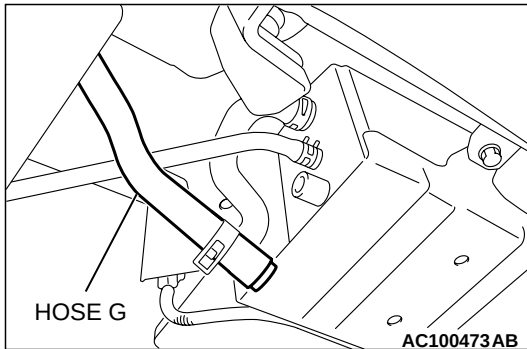


- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between –1.5 and 1.5 kPa (–0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction [P.00-6](#)). Then go to Step 27.

NO : Go to Step 2.



STEP 2. Measure the signal voltage at intermediate connector D-14 by backprobing.

- (1) Disconnect hose G from the evaporative emission canister side, and plug the hose.
- (2) Remove the rear seat cushion. (Refer to GROUP 52A, Rear Seat P.52A-23.)
- (3) Pull up the carpet.
- (4) Turn the ignition switch to the "ON" position.
- (5) Remove the fuel cap.

- (6) Measure the voltage between connector D-14 terminal 11 and ground by backprobing.
 - The measured voltage should be between 2.0 and 3.0 volts.

- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (10) Connect hose G to the canister.

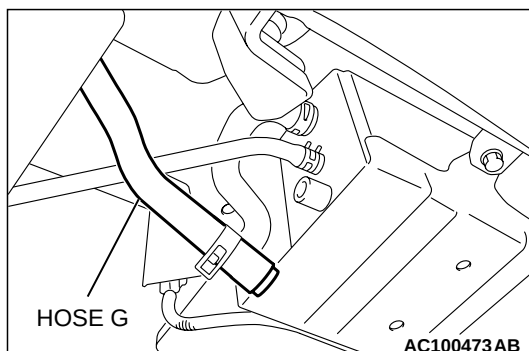
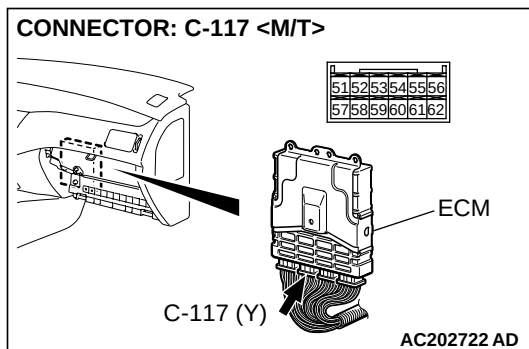
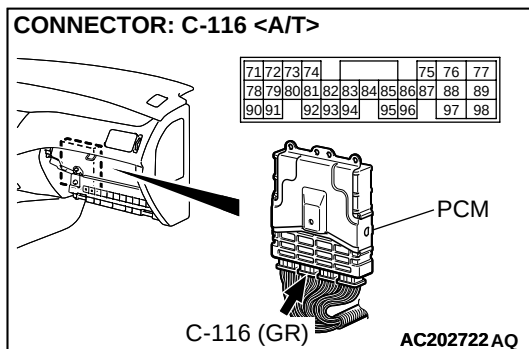
Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 3.

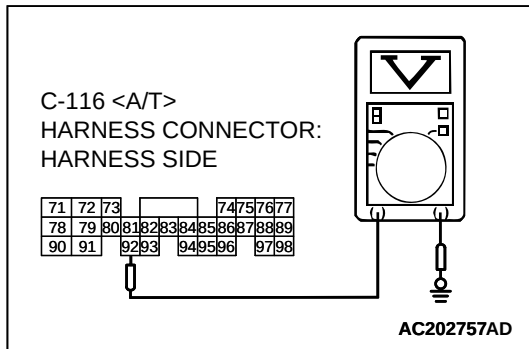
NO : Go to Step 7.

STEP 3. Measure the signal voltage at ECM connector C-117 <M/T> or PCM connector C-116 <A/T> by backprobing.

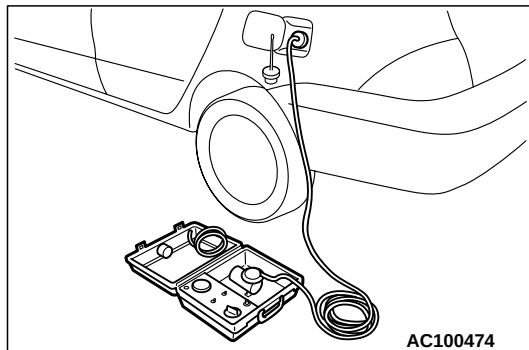
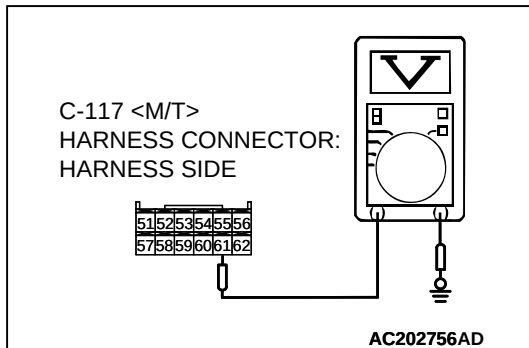
- (1) Do not disconnect ECM connector C-117 <M/T> or PCM connector C-116 <A/T>.



- (2) Disconnect hose G from the evaporative emission canister side, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.



- (5) Measure the voltage between connector C-117 terminal 61 <M/T> or C-116 terminal 92 <A/T> and ground by backprobing.
- The measured voltage should be between 2.0 and 3.0 volts.

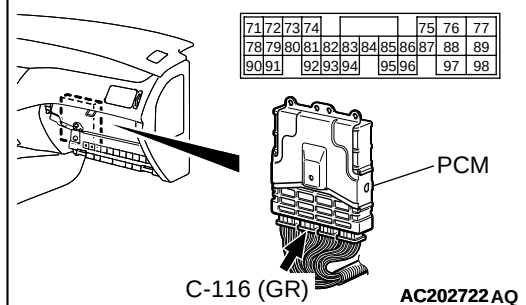


- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
- The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 4.

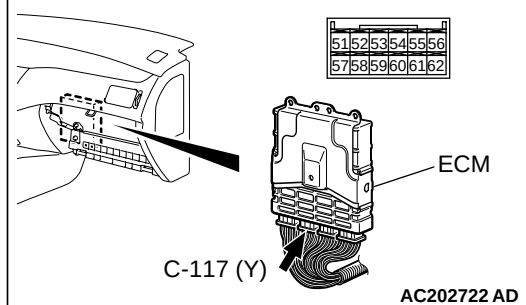
NO : Go to Step 5.

CONNECTOR: C-116 <A/T>

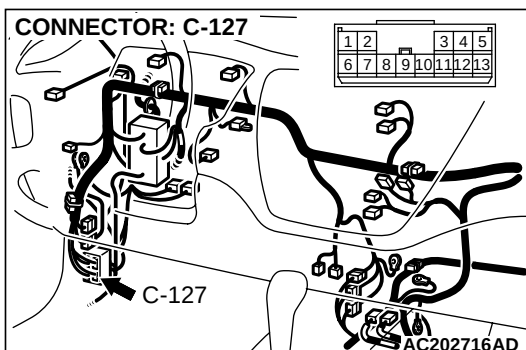
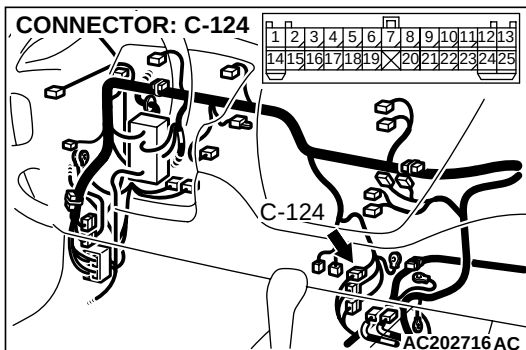
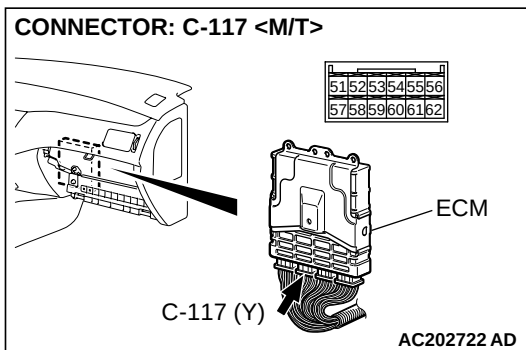
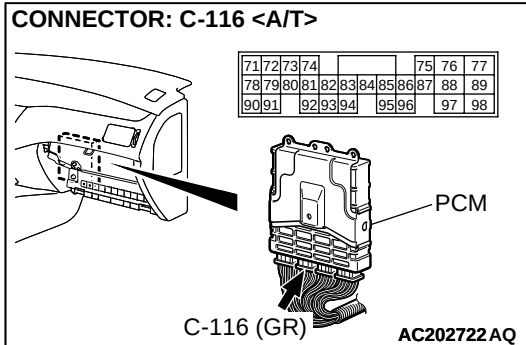
STEP 4. Check ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminal in good condition?

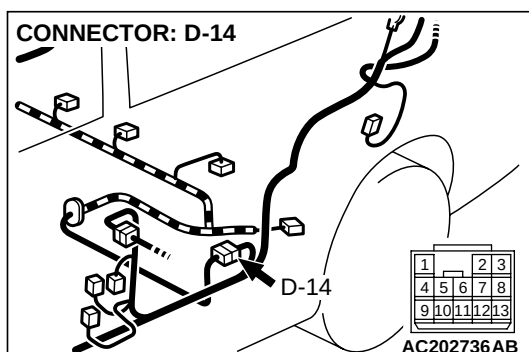
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

CONNECTOR: C-117 <M/T>

STEP 5. Check intermediate connectors C-124, C-127, D-14 and ECM connector C-117 <M/T> or PCM connector C-116 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.



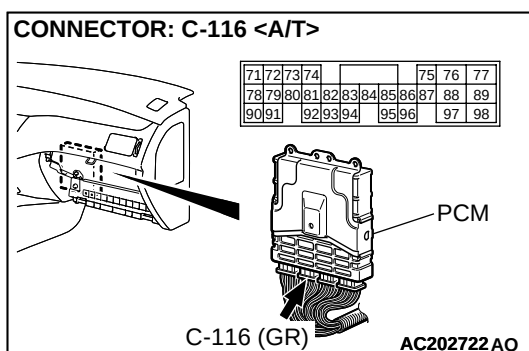


Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the faulty component. Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Go to Step 27.

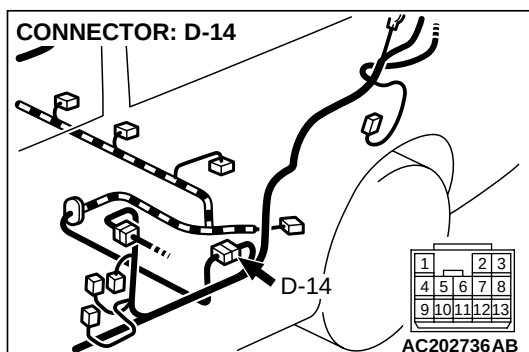
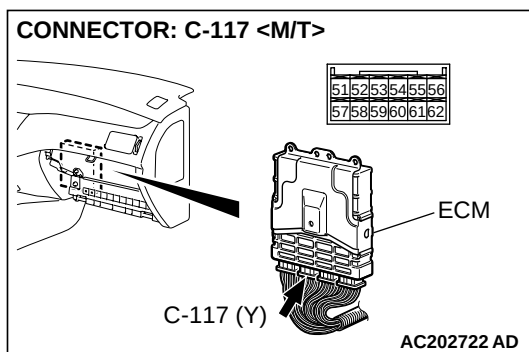


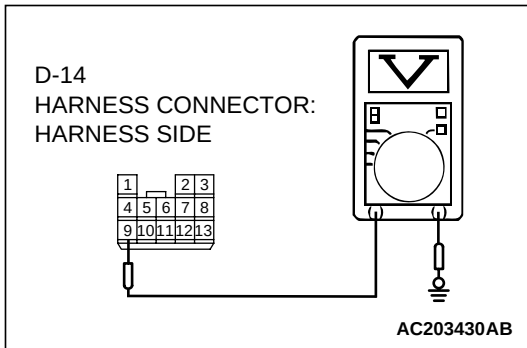
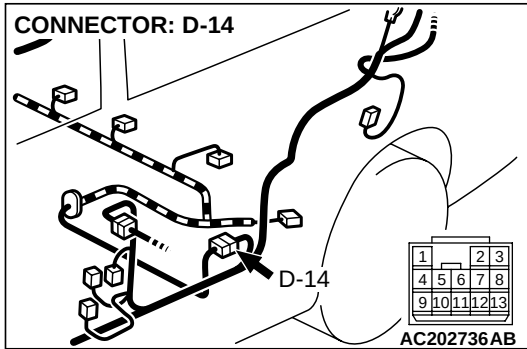
STEP 6. Check the harness wire between ECM connector C-117 terminal 61 <M/T> or PCM connector C-116 terminal 92 <A/T> and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.





STEP 7. Measure the 5-volt reference signal at intermediate connector D-14 by backprobing.

- (1) Do not disconnect intermediate connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 9 and ground.

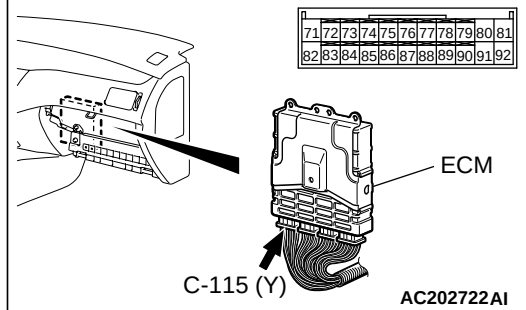
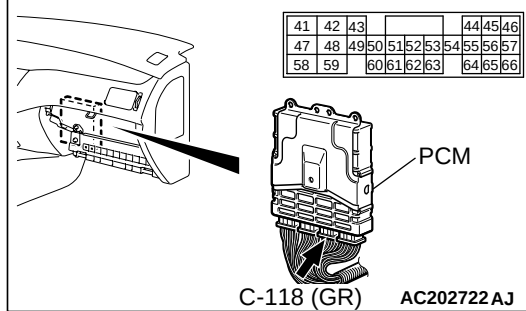
- The voltage should be between 4.9 and 5.1 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

YES : Go to Step 11.

NO : Go to Step 8.

CONNECTOR: C-115 <M/T>**CONNECTOR: C-118 <A/T>****STEP 8. Measure the 5-volt reference signal at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.**

- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector C-115 terminal 81 <M/T> or connector C-118 terminal 46 <A/T> and ground by backprobing.

- The measured voltage should be between 4.9 and 5.1 volts.

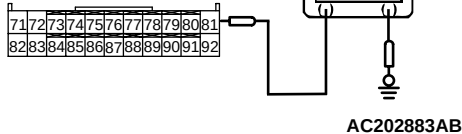
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

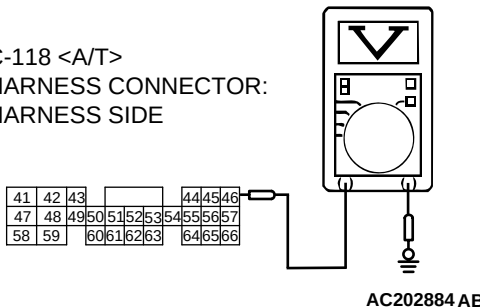
YES : Go to Step 9.

NO : Go to Step 25.

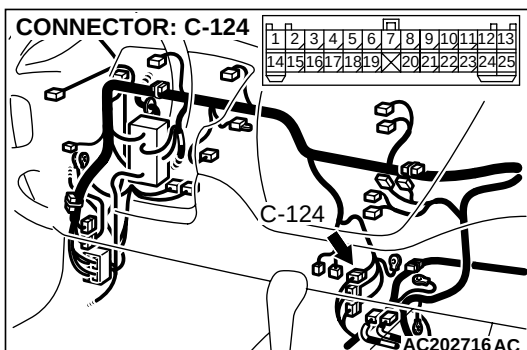
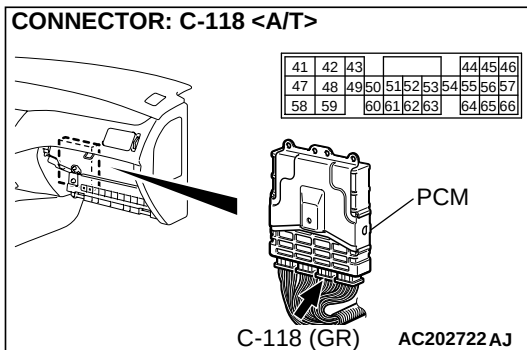
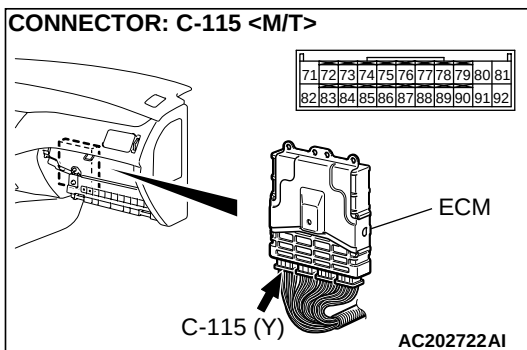
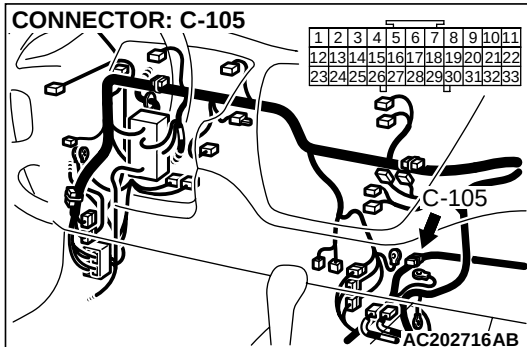
C-115 <M/T>
HARNESS CONNECTOR:
HARNESS SIDE

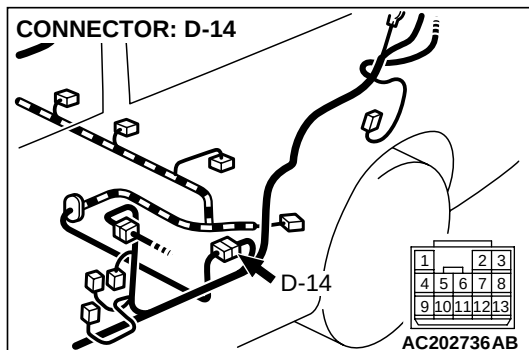
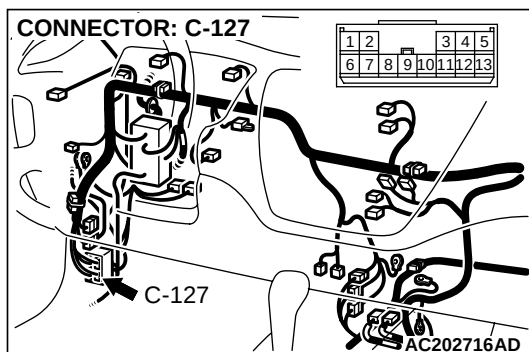


C-118 <A/T>
HARNESS CONNECTOR:
HARNESS SIDE



STEP 9. Check intermediate connectors C-105, C-124, C-127, and D-14 and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

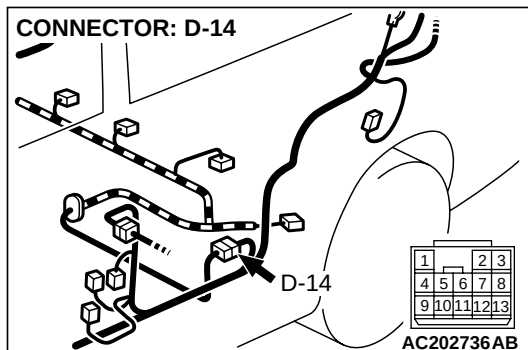
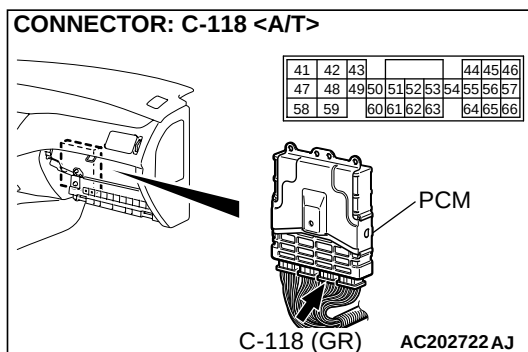
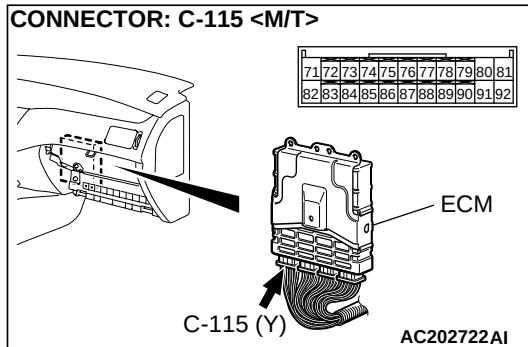
[P.00E-2](#). Then go to Step 27.

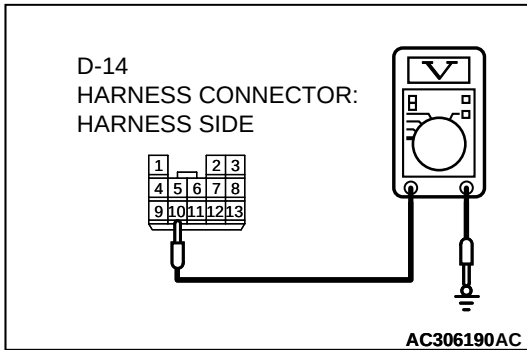
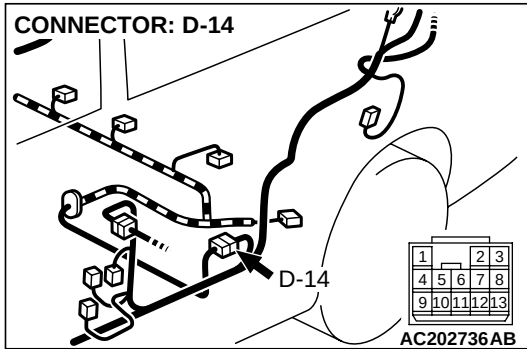
STEP 10. Check the harness wire between ECM connector C-115 <M/T> terminal 81 or PCM connector C-118 <A/T> terminal 46 and intermediate connector D-14 terminal 9 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Then go to Step 27.

NO : Repair the damaged harness wire. Then go to Step 27.





STEP 11. Check the sensor ground at intermediate connector D-14 by backprobing.

- (1) Do not disconnect connector D-14.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between connector D-14 terminal 10 and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

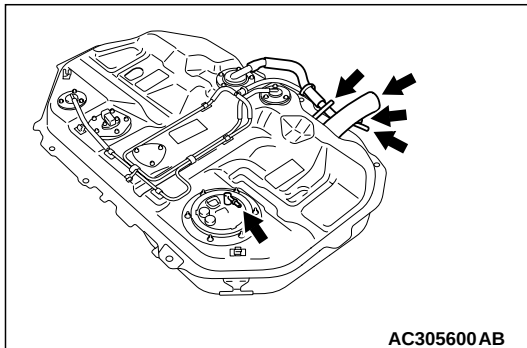
YES : Go to Step 15.

NO : Go to Step 12.

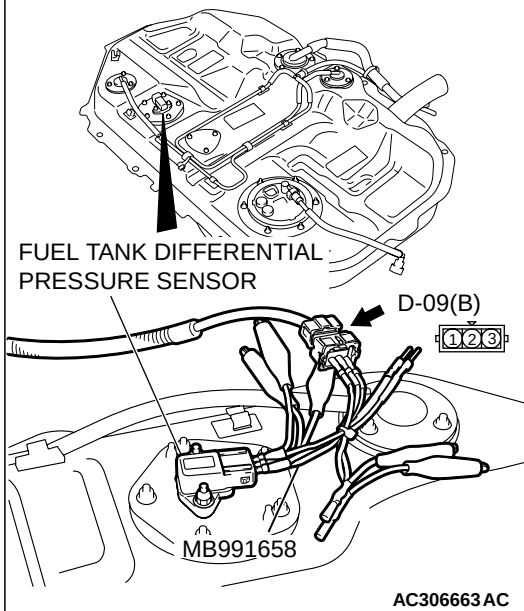
STEP 12. Check the signal voltage at fuel tank differential pressure sensor connector D-09.

- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

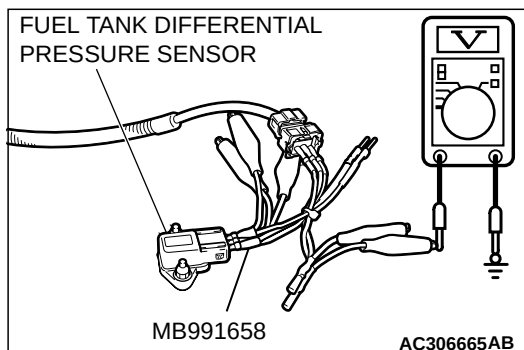
NOTE: If these items are not securely plugged here, the fuel could leak in the next step.



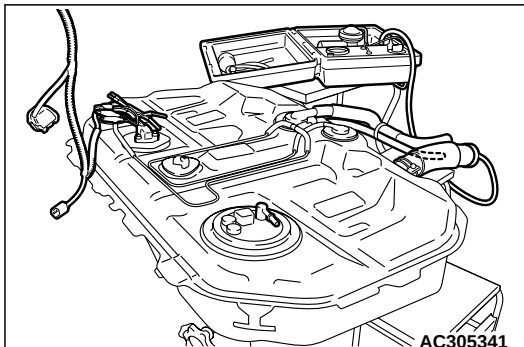
CONNECTOR: D-09



- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 2 and ground.
 - The measured voltage should be 0.5 volt or less.

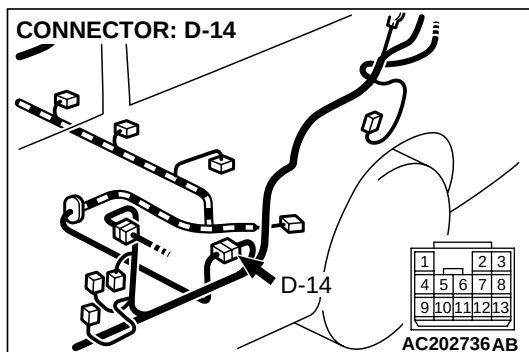
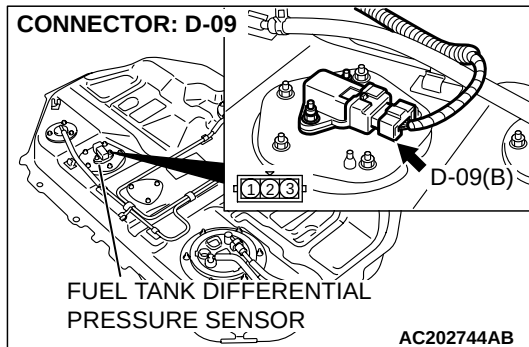


- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 13.

NO : Go to Step 19.

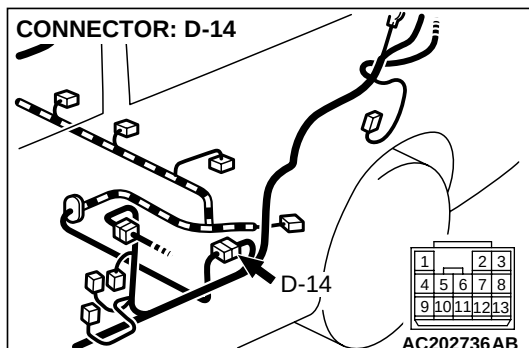
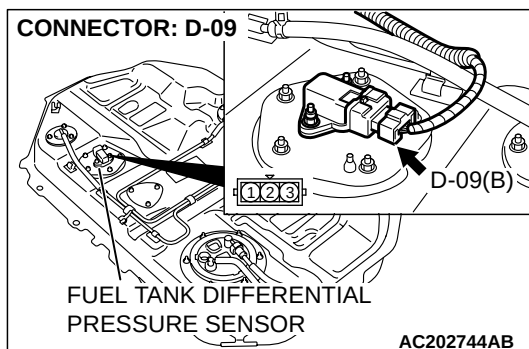


STEP 13. Check fuel tank differential pressure sensor connector D-09 and intermediate connector for D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 14. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 2 and intermediate connector D-14 terminal 10 for damage.

Q: Is the harness wire in good condition?

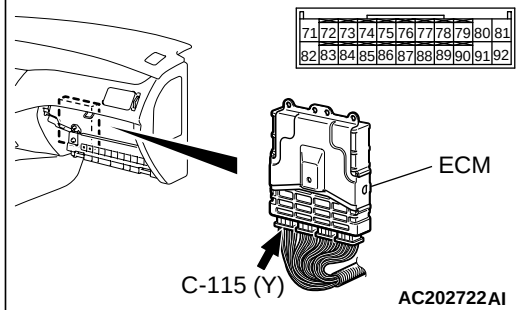
YES : It can be assumed that this malfunction is intermittent, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair the damaged harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

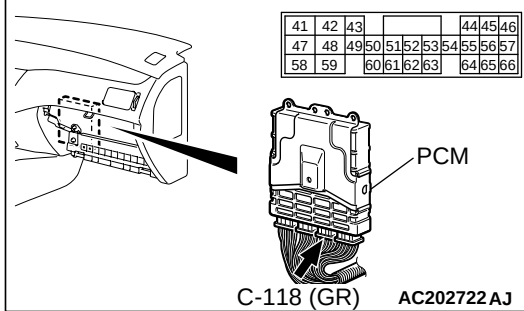
STEP 15. Check the sensor ground at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



- (3) Measure the voltage between connector C-115 terminal 92 <M/T> or connector C-118 terminal 57 <A/T> and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

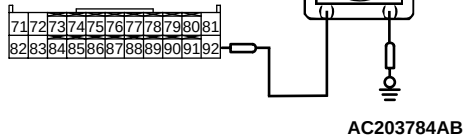
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

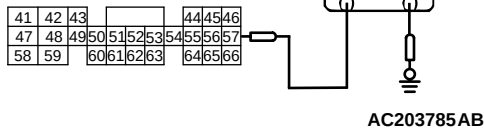
YES : Go to Step 16.

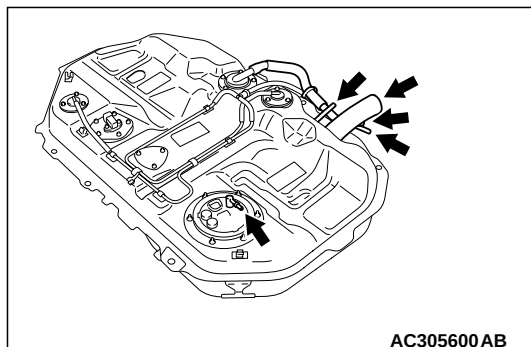
NO : Go to Step 23.

C-115 <M/T>
HARNESS CONNECTOR:
HARNESS SIDE



C-118 <A/T>
HARNESS CONNECTOR:
HARNESS SIDE

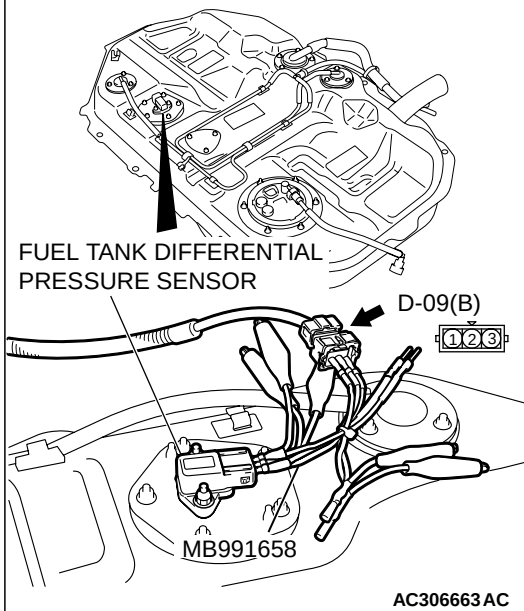


**STEP 16. Check the signal voltage at fuel tank differential pressure sensor connector D-09.**

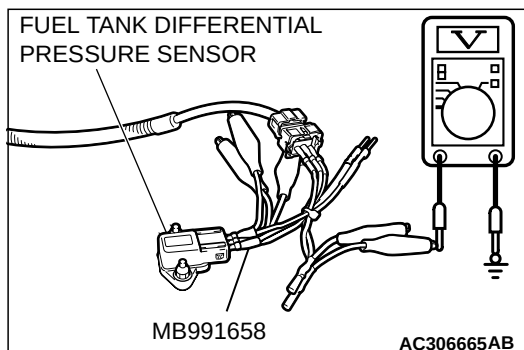
- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Plug the filler hose, fuel pump feed nipple, hose I, hose M and hose R connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

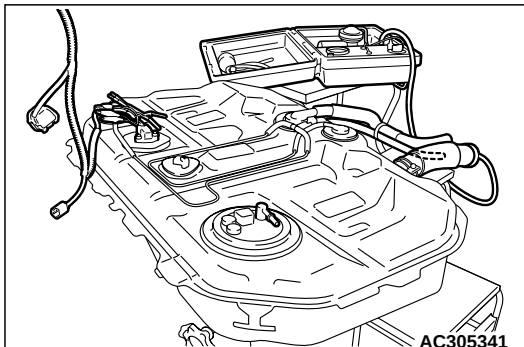
CONNECTOR: D-09



- (3) Lift the fuel tank.
- (4) Connect special tool MB991658 to both halves of connector D-09.
- (5) Turn the ignition switch to the "ON" position.



- (6) Measure the voltage between connector D-09 terminal 1 and ground.
 - The measured voltage should be between 2.0 and 3.0 volts.

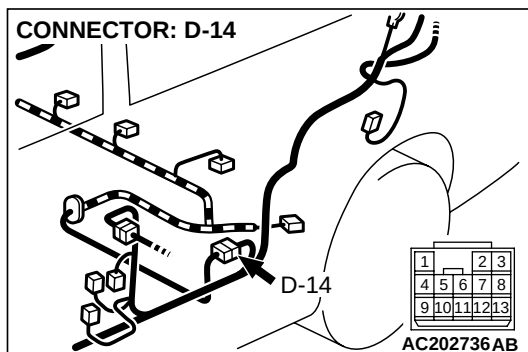
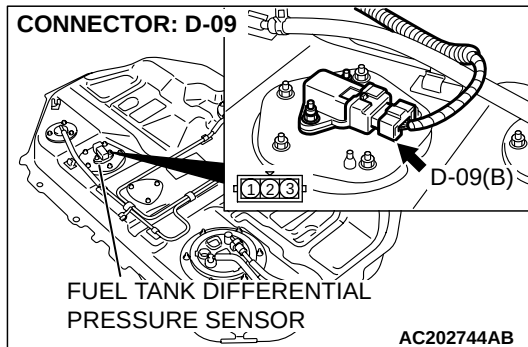


- (7) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.
- (9) Disconnect the evaporative emission system pressure pump.

Q: Is the measured voltage between 2.0 and 3.0 volts?

YES : Go to Step 17.

NO : Go to Step 20.

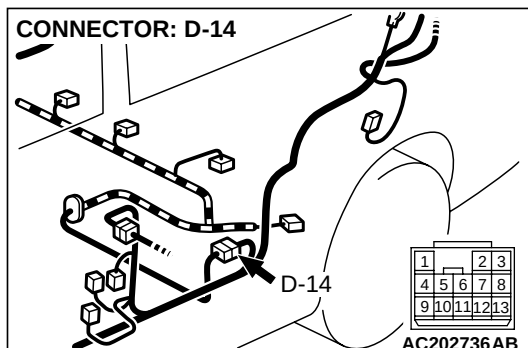
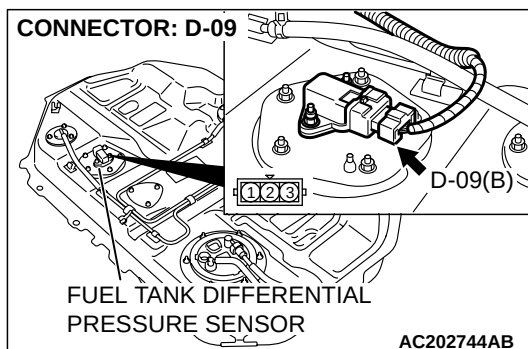


STEP 17. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 18.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

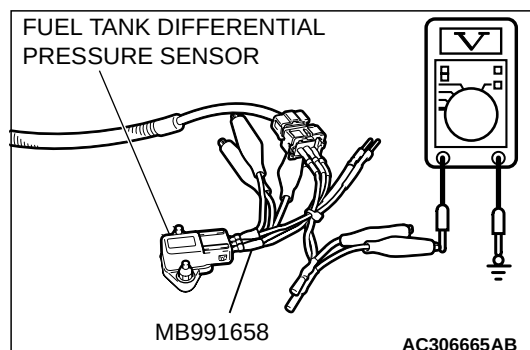
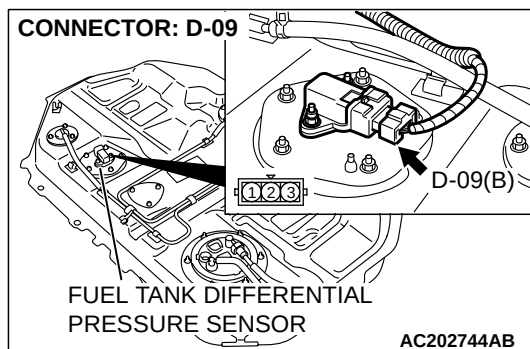


STEP 18. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 1 and intermediate connector D-14 terminal 11 for damage.

Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 19. Measure the 5-volt reference signal at fuel tank differential pressure sensor connector D-09.

- (1) Turn the ignition switch to the "ON" position.
- (2) Measure the voltage between connector D-09 terminal 3 and ground.

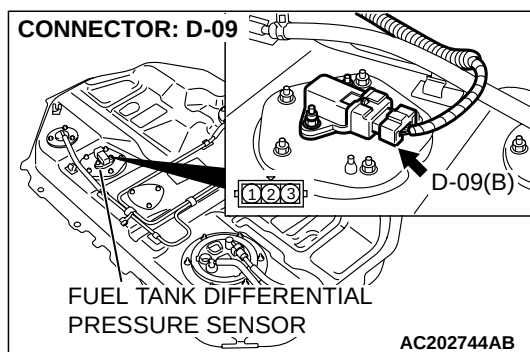
- The voltage should be between 4.9 and 5.1 volts.

- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.9 and 5.1 volts?

YES : Go to Step 20.

NO : Go to Step 21.

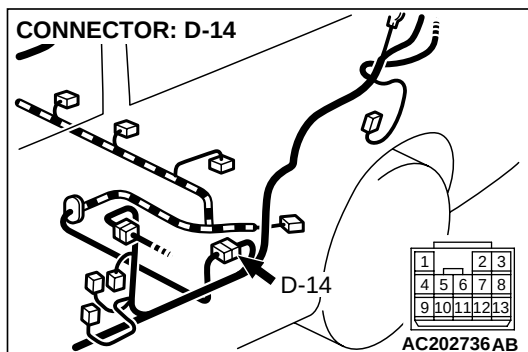
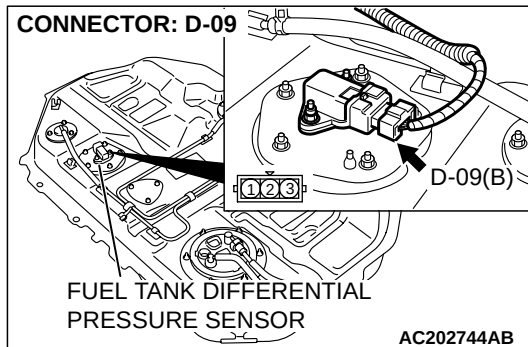


STEP 20. Check fuel tank differential pressure sensor connector D-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Replace the fuel tank differential pressure sensor, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 21. Check fuel tank differential pressure sensor connector D-09 and intermediate connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 22.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

STEP 22. Check the harness wire between fuel tank differential pressure sensor connector D-09 terminal 3 and intermediate connector D-14 terminal 9 for damage.

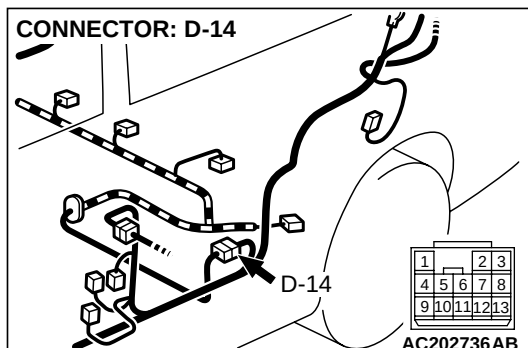
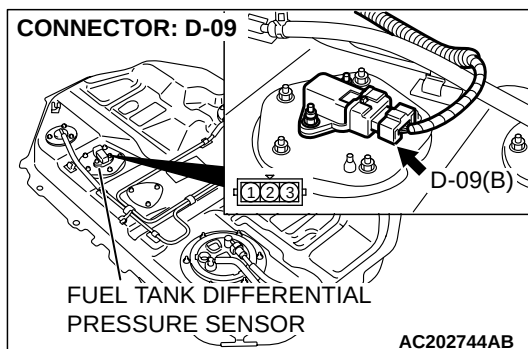
Q: Is the harness wire in good condition?

YES : It can be assumed that this malfunction is intermittent.

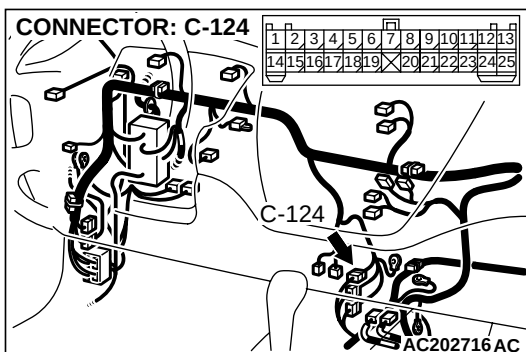
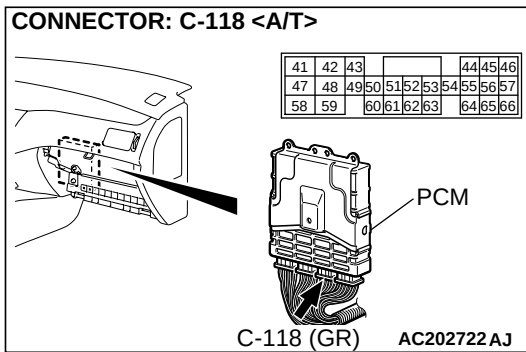
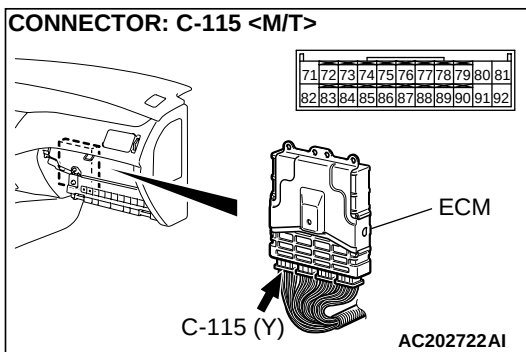
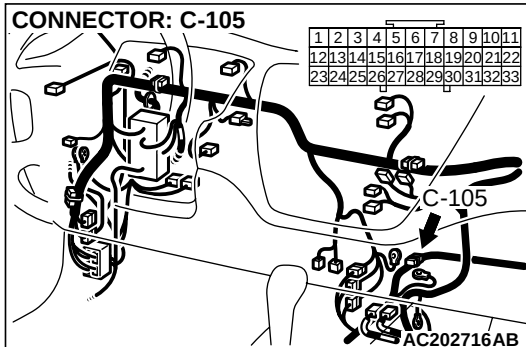
Refer to GROUP 00, How to Use

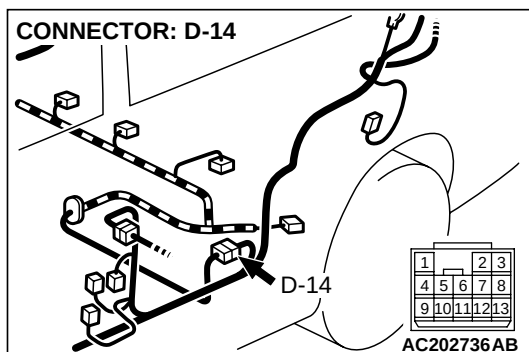
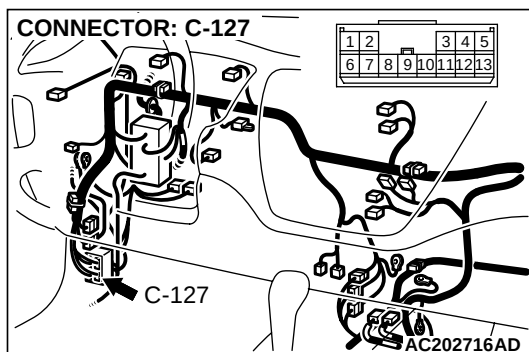
Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-6](#). Reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.

NO : Repair or replace the harness wire, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 27.



STEP 23. Check intermediate connectors C-105, C-124, C-127, and D-14, and ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are the connectors and terminals in good condition?

YES : Go to Step 24.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection

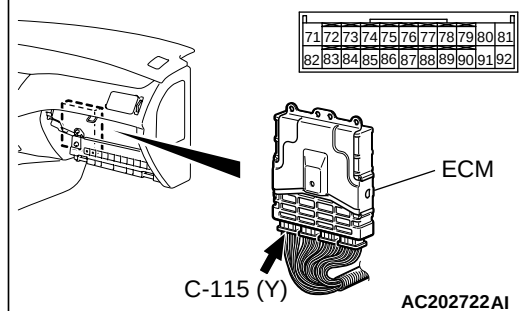
[P.00E-2](#). Then go to Step 27.

STEP 25. Check ECM connector C-115 <M/T> or PCM connector C-118 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

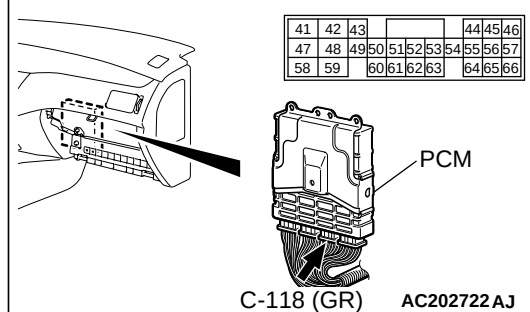
YES : Go to Step 26.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 27.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>

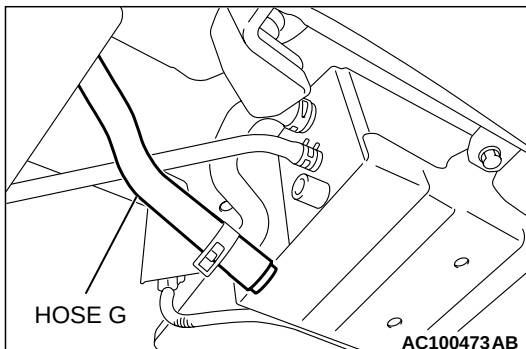
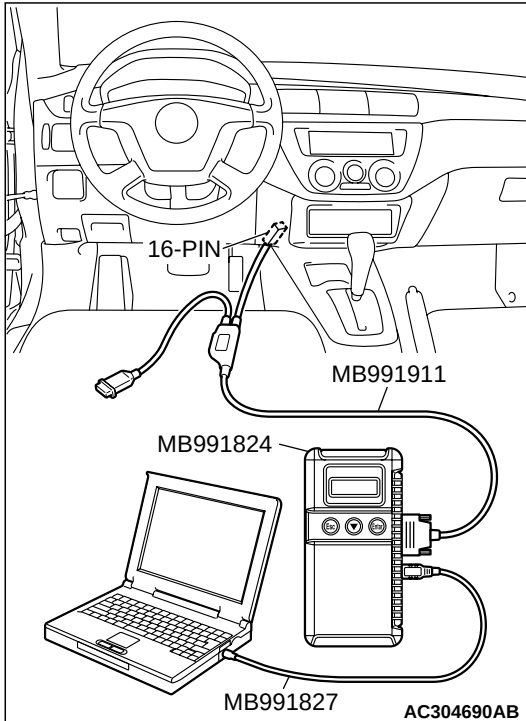


STEP 26. Using scan tool MB991958, check data list item 73: Fuel Tank Differential Pressure Sensor.

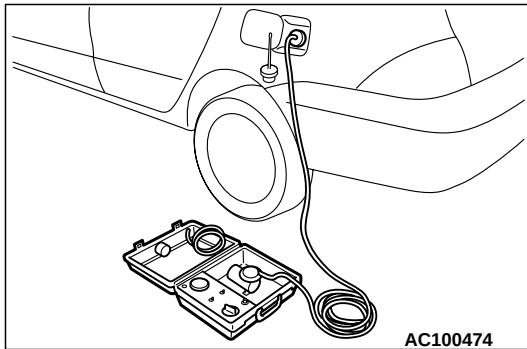
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



- (2) Disconnect hose G from the evaporative emission canister, and plug the hose.
- (3) Turn the ignition switch to the "ON" position.
- (4) Remove the fuel cap.
- (5) Set scan tool MB991958 to the data reading mode.
 - Item 73, Fuel Tank Differential Pressure Sensor.
 - The fuel tank pressure reading on the scan tool should be -1.5 to 1.5 kPa (-0.443 to 0.443 inHg).



- (6) Connect an evaporative emission system pressure pump (Miller number 6872A) to the fuel filler neck and pressurize the fuel tank.
 - The fuel tank pressure reading should increase.
- (7) Turn the ignition switch to the "LOCK" (OFF) position. Then disconnect scan tool MB991958.
- (8) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (9) Connect hose G to the canister.

Q: Is the fuel tank pressure between –1.5 and 1.5 kPa (–0.443 and 0.443 inHg)?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Intermittent Malfunction [P.00-6](#)). Then go to Step 27.

NO : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 27.

STEP 27. Perform the OBD-II drive cycle.

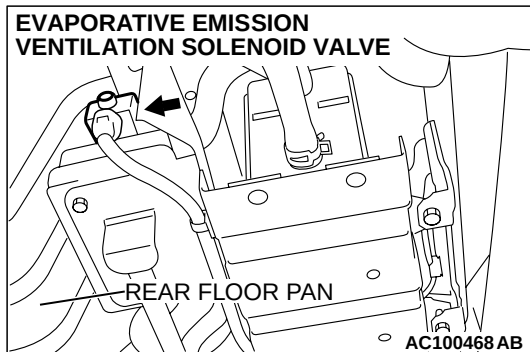
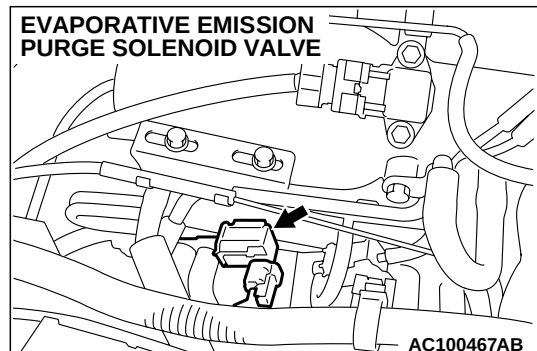
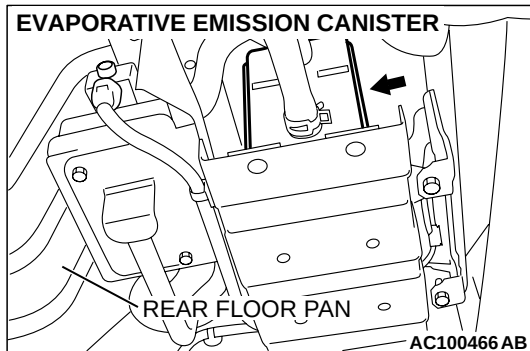
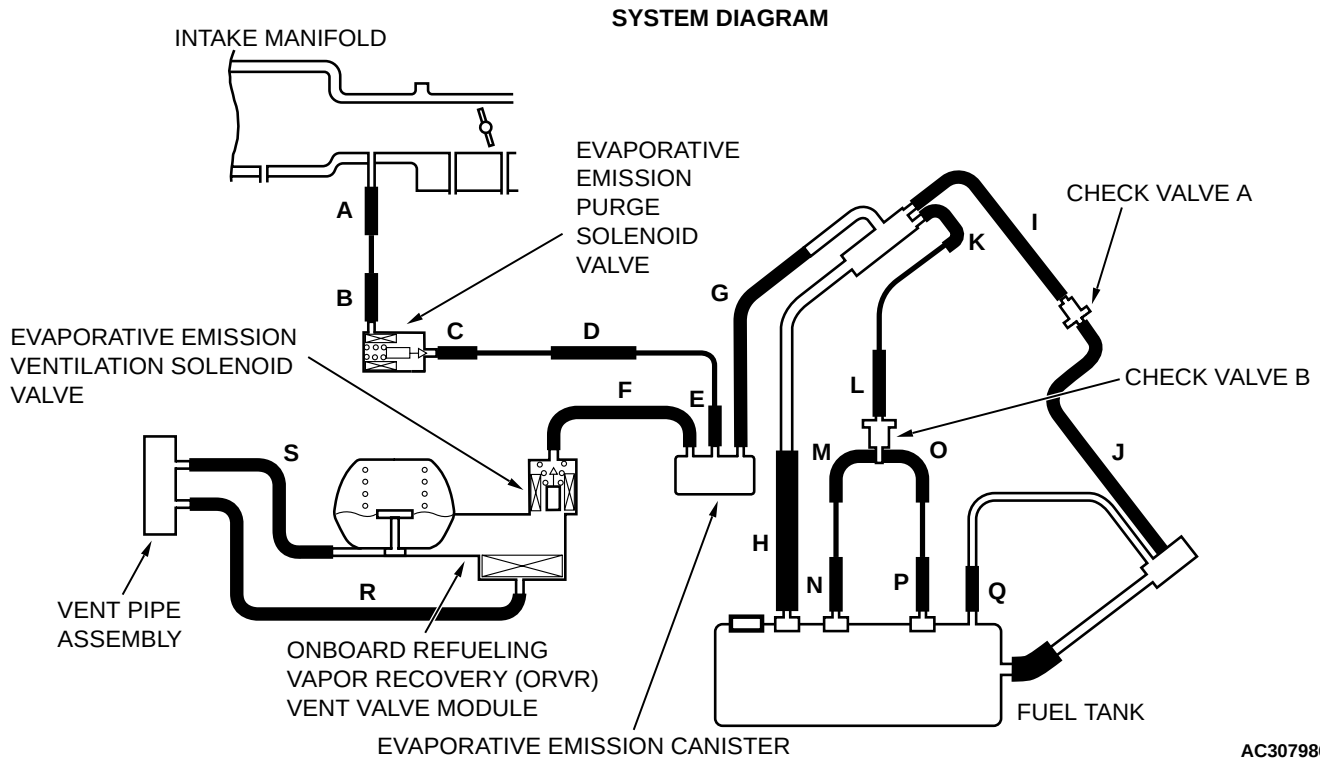
- (1) Carry out a test drive with the drive cycle pattern (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).
- (2) Read the diagnostic trouble code (DTC).

Q: Is DTC P0453 set?

YES : Go to Step 2.

NO : The procedure is complete.

DTC P0455: Evaporative Emission Control System Leak Detected (Gross Leak)



TECHNICAL DESCRIPTION

- The fuel tank may be under a slight pressure or vacuum depending on the state of the evaporative emission (EVAP) system. The ECM <M/T> or PCM <A/T> monitors and responds to these pressure/vacuum changes. If the pressure/vacuum varies from the specified range, the ECM <M/T> or PCM <A/T> will set DTC P0455.
- The ECM <M/T> or PCM <A/T> energizes the evaporative emission ventilation solenoid to shut off the evaporative emission canister outlet port.
- The evaporative emission purge solenoid is activated to apply engine manifold vacuum to the EVAP system.
- When the fuel system develops a vacuum of 2 kPa (0.29 psi), the evaporative emission purge solenoid is turned "off" and the fuel system vacuum is maintained at 2 kPa (0.29 psi).
- The ECM <M/T> or PCM <A/T> determines whether there is a leak or clog in the fuel system by measuring the change in vacuum inside the fuel tank.
- The test is stopped when fuel vapor pressure is determined to be too high.

DESCRIPTIONS OF MONITOR METHODS

- Depressurizing EVAP system by intake manifold negative pressure is impossible within specified period.

MONITOR EXECUTION

- Once per driving cycle.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)**Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

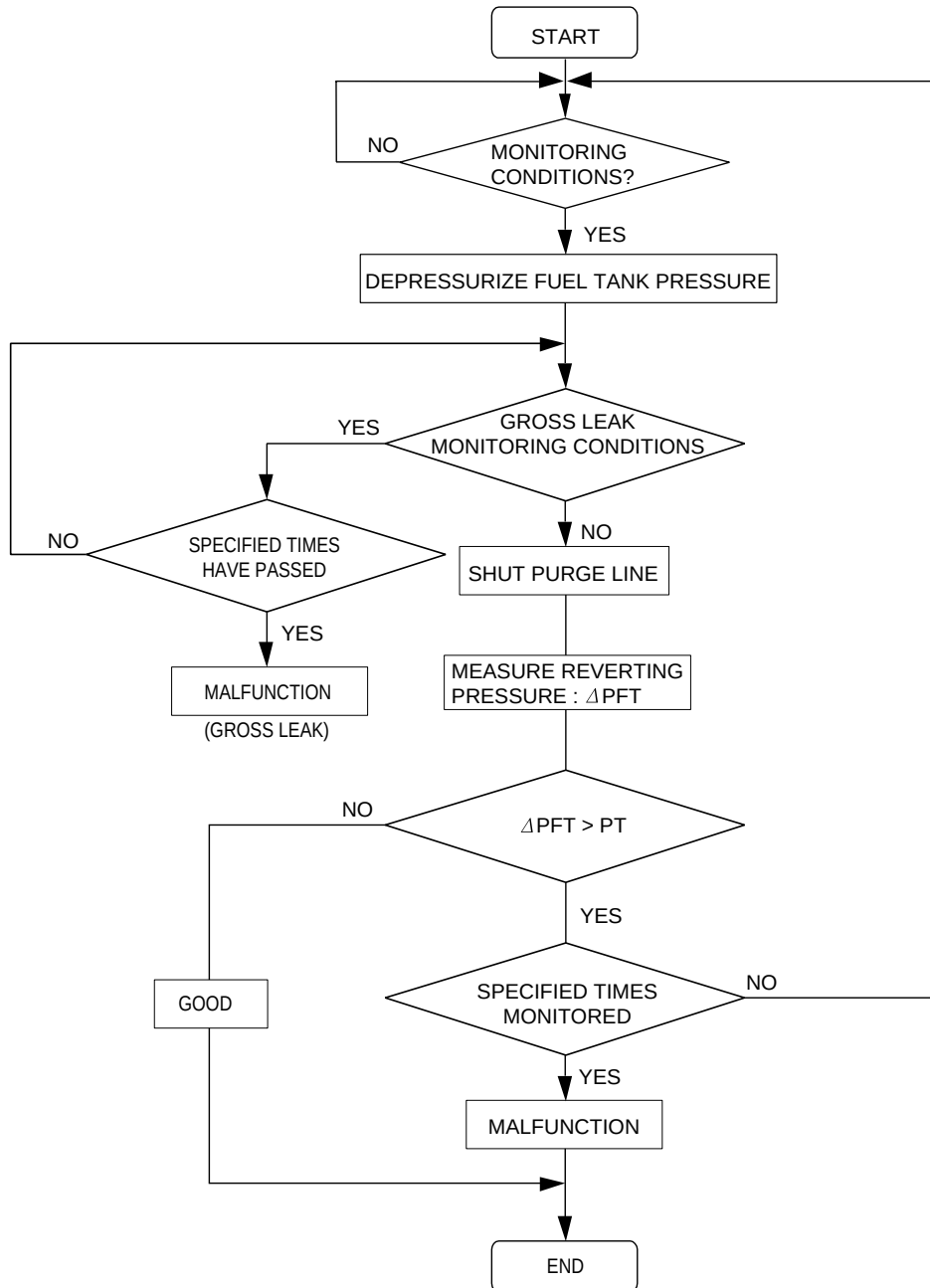
- Evaporative emission purge solenoid monitor
- Evaporative emission purge system monitor
- Fuel tank differential pressure sensor monitor
- Evaporative emission ventilation solenoid monitor
- Fuel level sensor monitor
- Fuel temperature sensor monitor

Sensor (The sensors below are determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)

0.04in, 0.02in GROSS LEAK MONITOR



AC306649

DTC SET CONDITIONS

Check Conditions A: At Start up

- Intake air temperature is 36°C (97°F) or less upon engine start up.

- The engine coolant temperature is 36°C (97°F) or less upon engine start up.

Check Conditions B: For Test to Run

- The engine coolant temperature is 60°C (140°F) or greater and the fuel tank is 15 – 40 percent full.
- The engine coolant temperature is 20°C (68°F) or greater and the fuel tank is 40 – 85 percent full.
- The engine speed is greater than or equal to 1,600 r/min.
- Barometric pressure is greater than 76 kPa (11 psi).
- Volumetric efficiency is between 20 and 80 percent.
- The fuel temperature is 36°C (97°F) or less.
- The fuel tank differential pressure sensor output voltage is 1 – 4 volts.

Check Conditions C: For Test to Stop

- The intake air temperature is greater than 5°C (41°F).
- When the evaporative emission purge solenoid and evaporative emission ventilation solenoid are closed, the pressure in the fuel tank rises to 451 Pa (0.065 psi) or less and the amount of remaining fuel is 15 – 40 percent of capacity upon engine start up.
- When the evaporative emission purge solenoid and evaporative emission ventilation solenoid are closed, the pressure in the fuel tank rises to 324 Pa (0.047 psi) or less and the amount of remaining fuel is 40 – 85 percent of capacity upon engine start up.

- 10 seconds have elapsed from the start of the previous monitoring.
- Monitoring time: 170 seconds.

Judgment Criteria

- The fuel tank internal pressure is 2kPa (0.29 psi) or more after the evaporative emission purge solenoid valve has been driven when the fuel tank and vapor line were closed.

OBD-II DRIVE CYCLE PATTERN

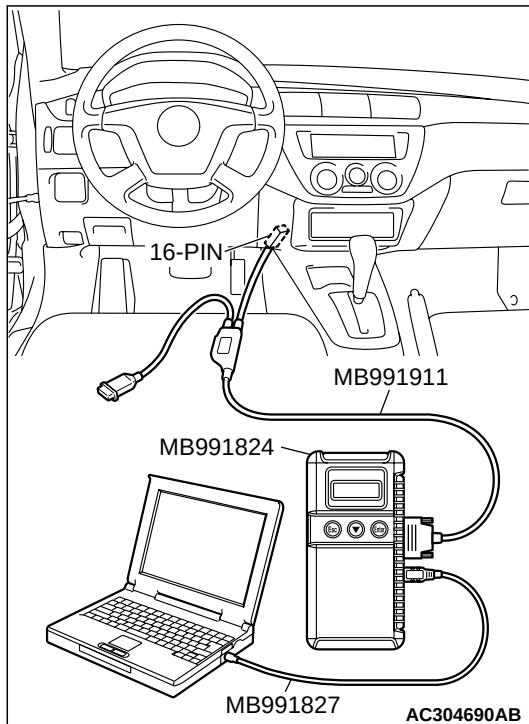
Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Loose fuel cap.
- Fuel cap relief pressure is incorrect.
- Fuel overflow limiter valve failed.
- Purge line or vapor line is clogged.
- Fuel tank, purge line or vapor line seal failed.
- Evaporative emission purge solenoid valve failed.
- Evaporative emission ventilation solenoid valve failed.
- Fuel tank differential pressure sensor failed.
- Evaporative emission canister seal is faulty.
- Evaporative emission canister is clogged.

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check the EVAP system monitor test.

⚠ CAUTION

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

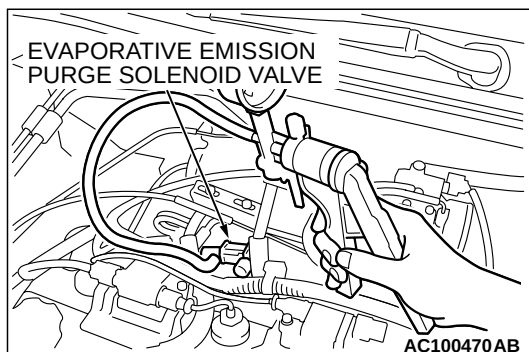
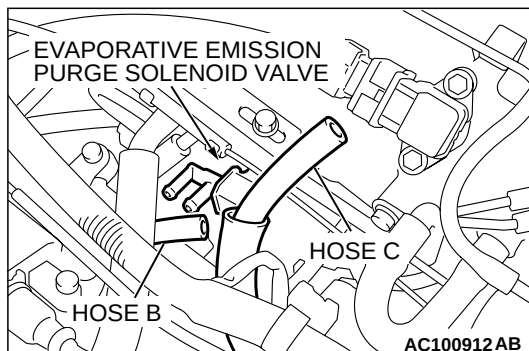
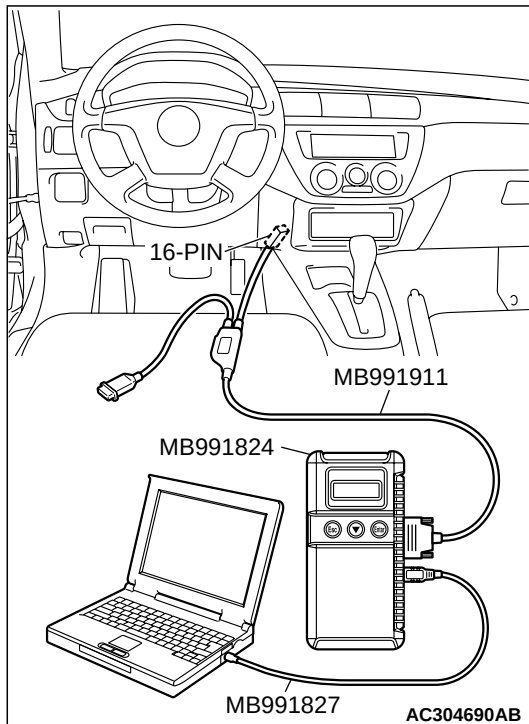
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During this test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position, and disconnect scan tool MB991958.

Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?

YES : A malfunction has been detected during the monitor test. Refer to the Diagnostic Trouble Code Chart and diagnose any other DTCs that are set [P.13A-29](#). If no other DTC's have been set, then go to Step 2.

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Explain to the customer that an improperly tightened fuel cap can cause the MIL to illuminate. Return the vehicle to the customer.

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 1.



STEP 2. Using scan tool MB991958, check actuator test item 08: Evaporative Emission Purge Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

(2) Disconnect hoses B and C from the evaporative emission purge solenoid valve side, and connect the hand vacuum pump to the evaporative emission purge solenoid valve instead of hose C.

(3) Turn the ignition switch to the "ON" position.

(4) Set scan tool MB991958 to actuator test mode.

- Item 08: Evaporative Emission Purge Solenoid Valve.
 - When the evaporative emission purge solenoid valve is operated, apply a pressure on the hand vacuum pump and confirm that air is blown from the other side nipple.

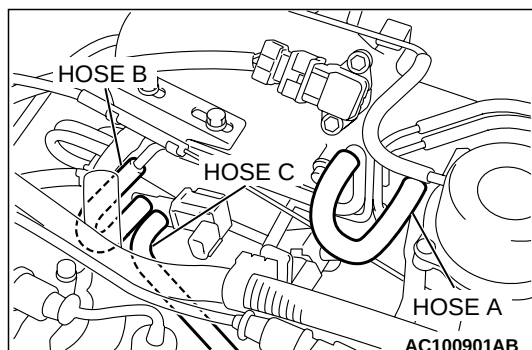
(5) Turn the ignition switch to the "LOCK" (OFF) position.

(6) Disconnect the hand vacuum pump, and connect hoses B and C to the evaporative emission purge solenoid valve.

Q: Is the solenoid valve in good condition?

YES : Go to Step 3.

NO : Replace the evaporative emission purge solenoid valve. Go to Step 19.



STEP 3. Check for leaks and clogging in evaporative emission hoses A through C.

Q: Are the hoses in good condition?

YES : Go to Step 4.

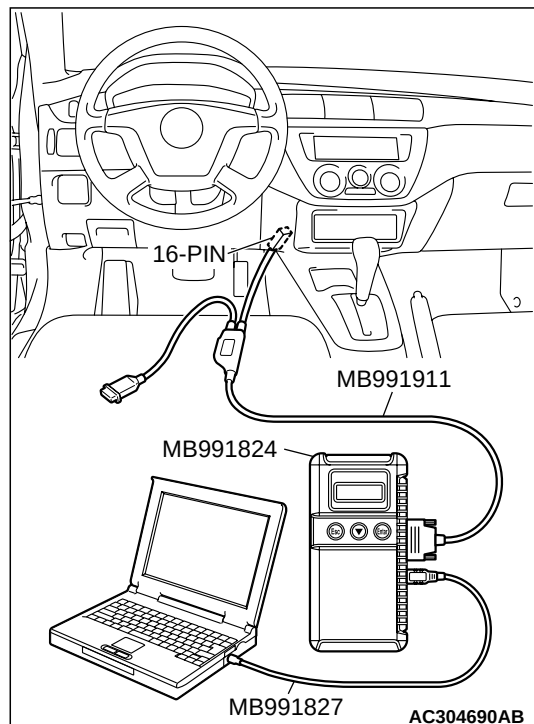
NO : Replace the damaged hose. Go to Step 19.

STEP 4. Using scan tool MB991502, check data list item 29: Evaporative emission ventilation solenoid.

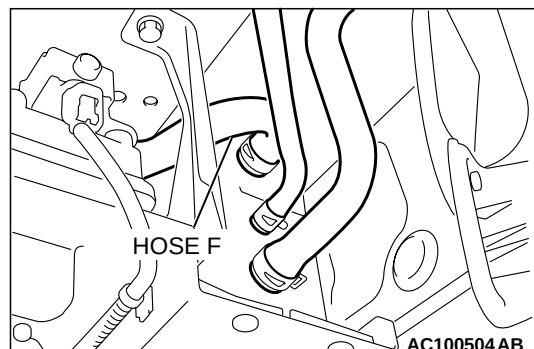
⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

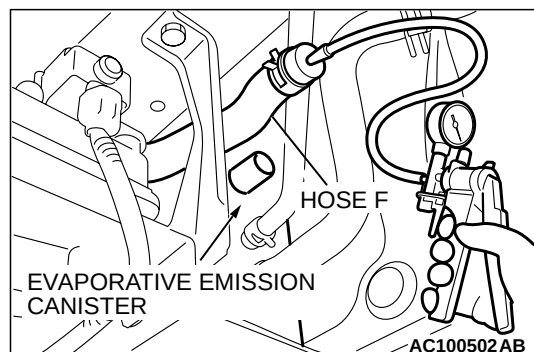
(1) Connect scan tool MB991502 to the data link connector.



(2) Disconnect hose F from the evaporative emission Ventilation solenoid.



(3) Connect a hand vacuum pump to the nipple of the evaporative emission ventilation solenoid from which the hose was disconnected.



- (4) Turn the ignition switch to the "ON" position.
- (5) Set scan tool MB991958 to actuator test mode.
 - Item 29: Evaporative Emission Ventilation Solenoid.
 - While the evaporative emission ventilation solenoid is activated, operate the hand vacuum pump and confirm that the solenoid holds vacuum.
- (6) Turn the ignition switch to the "LOCK" (OFF) position and disconnect scan tool MB991958.
- (7) Disconnect the hand vacuum pump, and connect hose F to the evaporative emission ventilation solenoid.

Q: Did the evaporative emission ventilation solenoid hold vacuum?

YES : Go to Step 5.

NO : Replace the evaporative emission ventilation solenoid (Refer to GROUP 17, Evaporative Emission Canister and Fuel Tank Pressure Relief Valve [P.17-230](#)). Then go to Step 19.

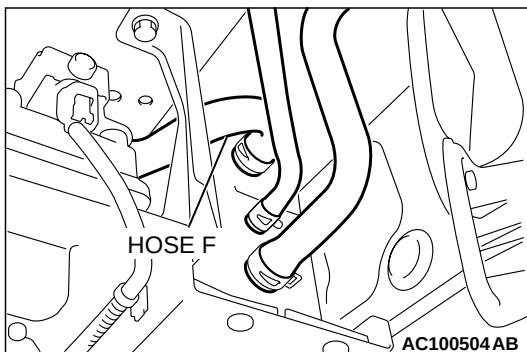
STEP 5. Check for leaks and clogging in the evaporative emission hose F.

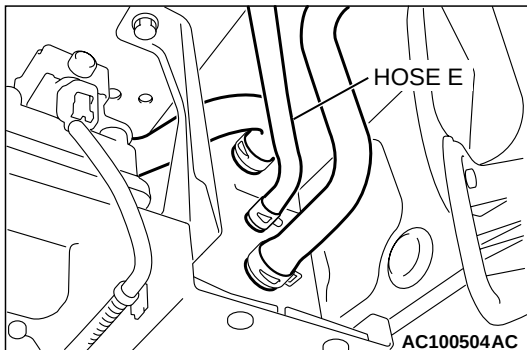
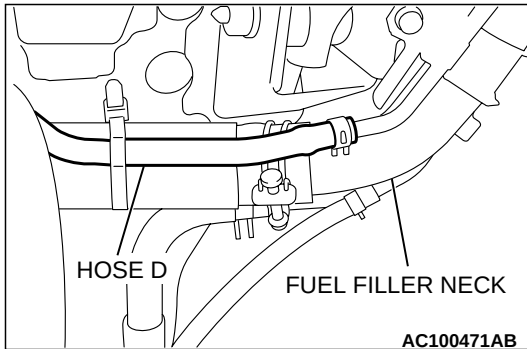
Perform a vacuum test using a hand vacuum pump on hose F.

Q: Is the hose in good condition?

YES : Go to Step 6.

NO : Replace the damaged hose. Go to Step 19.



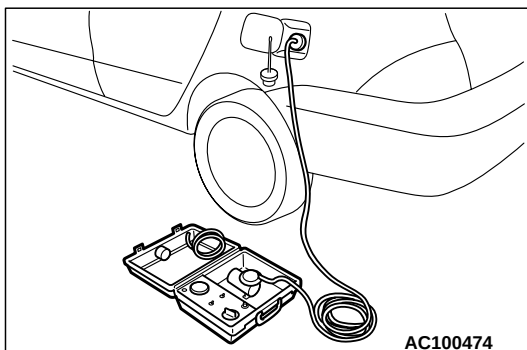
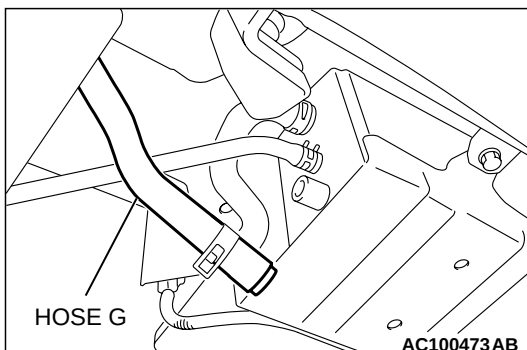
**STEP 6. Check for leaks and clogging in evaporative emission hoses D through E.**

Perform a vacuum test using a hand vacuum pump on hoses D through E.

Q: Are the hoses in good condition?

YES : Go to Step 7.

NO : Replace the damaged hose. Go to Step 19.

**STEP 7. Pressure test for leaks in evaporative system lines from hose G through the fuel tank to hose Q.**

- (1) Disconnect hose G from the canister, and plug hose G securely.
- (2) Confirm that the evaporative emission system pressure pump (Miller number 6872A) is operating properly. Perform the self-test as described in the manufacturer's instructions.

- (3) Connect the evaporative emission system pressure pump to the fuel filler neck.
- (4) Pressure test the system to determine whether any leaks are present.

NOTE: The "Pressure test" in this procedure refers to the I/M240 Simulation Test. The eight steps of this test are described in the manufacturer's instructions for the evaporative emission system pressure pump, Miller number 6872A.

- (5) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.

(6) Connect hose G to the canister.

Q: Is the evaporative emission line free of leaks?

YES : Go to Step 13.

NO : Go to Step 8.

STEP 8. Check for vacuum leaks in evaporative emission system hoses G, I, J and K.

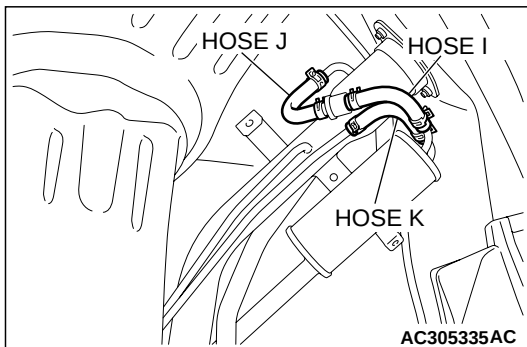
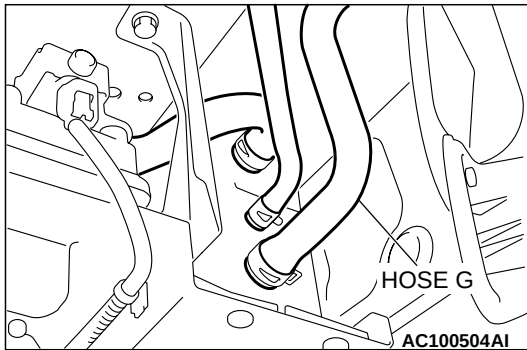
(1) Remove the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)).

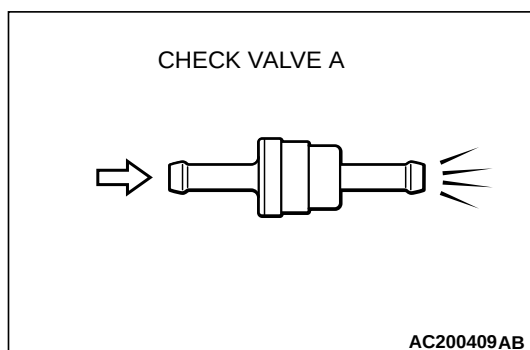
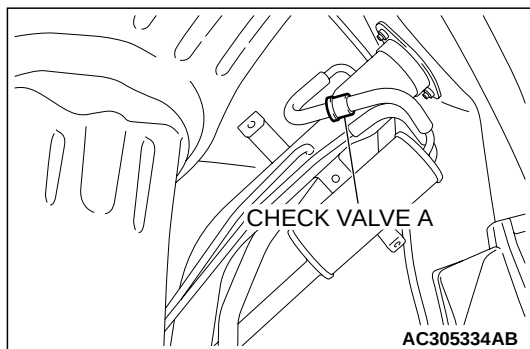
(2) Perform a leakage test with a hand vacuum pump on each hose from hoses G, I, J and K.

Q: Do the hoses hold vacuum?

YES : Go to Step 9.

NO : Replace the damaged hose, and reinstall the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Go to Step 19.



**STEP 9. Test check valve A.**

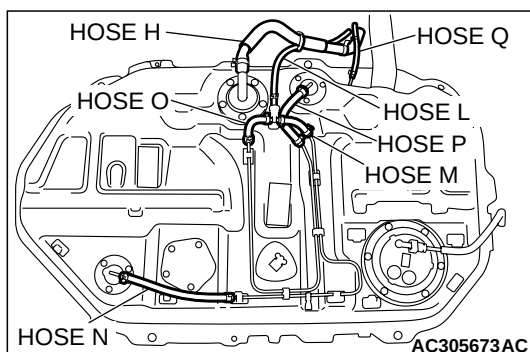
(1) Check valve A is a one-way check valve.

(2) Check valve A should allow air to flow in only one direction.

Q: Does check valve A allow air to pass in one direction only?

YES : Go to Step 10.

NO : Replace check valve A, and reinstall the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Go to Step 19.

**STEP 10. Check for leaks in evaporative emission hoses H, L, M, N, O, P and Q.**

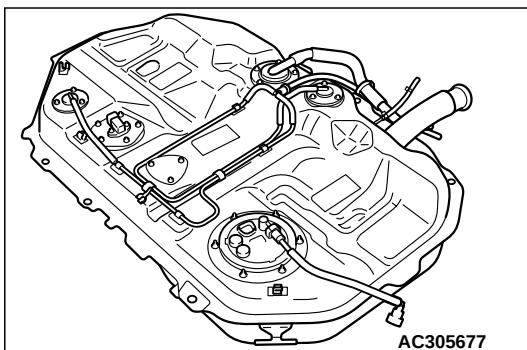
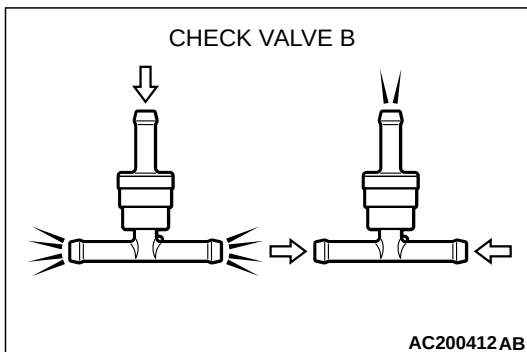
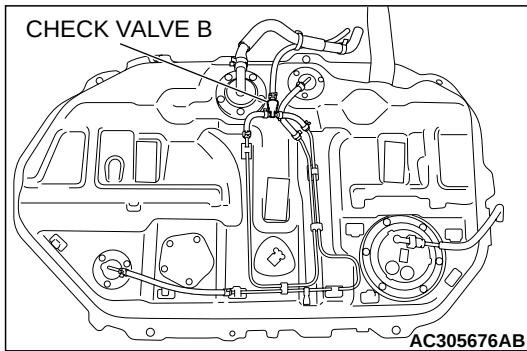
(1) Remove the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)).

(2) Perform a leakage test with a hand vacuum pump on each hose H, L, M, N, O, P and Q.

Q: Do the hoses hold vacuum?

YES : Go to Step 11.

NO : Replace the damaged hose, and reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.



STEP 11. Test check valve B.

(1) Check valve B is a one-way check valve.

(2) Check valve B should allow air to flow in only one direction.

Q: Does check valve B allow air to pass in one direction only?

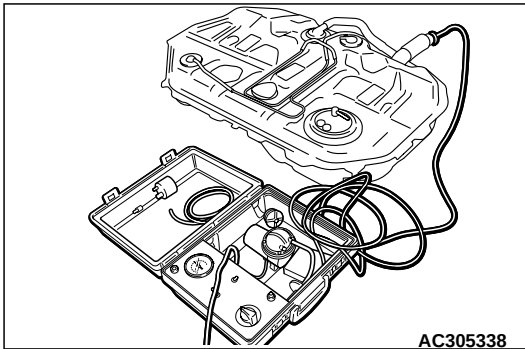
YES : Go to Step 12.

NO : Replace check valve B, and reinstall the fuel tank and the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.

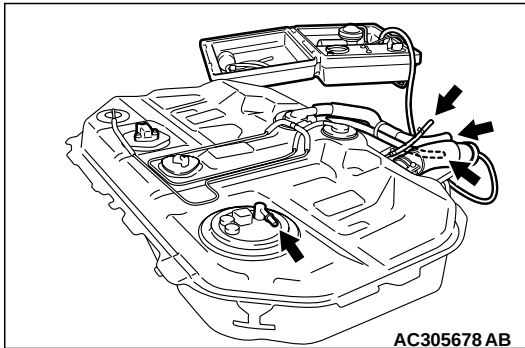
STEP 12. Check for leaks in the fuel tank.

(1) Visually check for cracks or other leaks in the fuel tank.

NOTE: Carefully check the fuel pump assembly and the differential pressure sensor installation in the fuel tank.



- (2) Connect the evaporative emission system pressure pump (Miller number 6872A) to the filler hose.



- (3) Plug the fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

- (4) Pressurize the fuel tank with the evaporative emission system pressure pump.
(5) In the pressurized state, check for leaks by applying a soapy water solution to each section and look for bubbles.

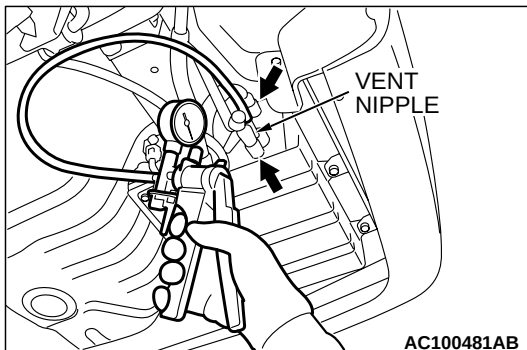
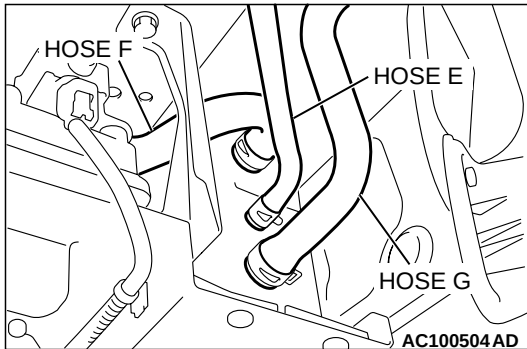
Q: Is any leaks found?

YES <When there is a leak from the attachment points of the fuel pump assembly, fuel tank differential pressure sensor, leveling valve or fuel tank rollover valve.> :

Reassemble the leaked parts and check again that there are no leaks. Then reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.

YES <When there is a leak from the fuel tank.> : Replace the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.

NO : When there is no leak, reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 18.



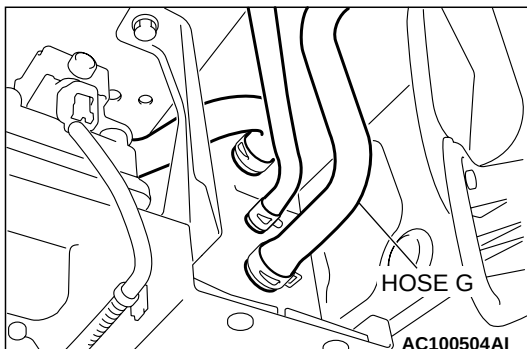
STEP 13. Check the evaporative emission canister for leaks and clogging.

- (1) Disconnect hoses E, F and G from the canister side, and connect a hand vacuum pump to the canister instead of hose E, and plug the other nipples.
- (2) Apply a pressure on the hand vacuum pump, and confirm that air is maintained.
- (3) Disconnect the hand vacuum pump, and connect hoses E, F and G to the canister.

Q: Is the evaporative emission canister in good condition?

YES : Go to Step 14.

NO : Replace the canister (Refer to GROUP 17, Evaporative Emission Canister and Fuel Tank Pressure Relief Valve [P.17-230](#)). Then go to Step 19.



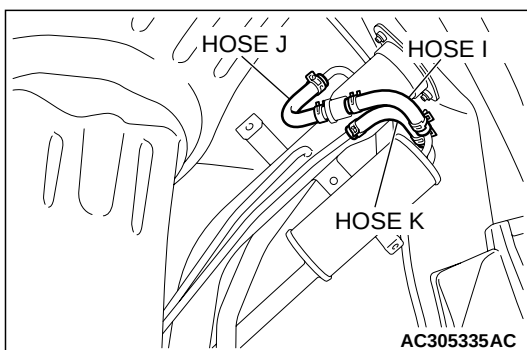
STEP 14. Check for clogging in the evaporator line hoses G, I, J and K.

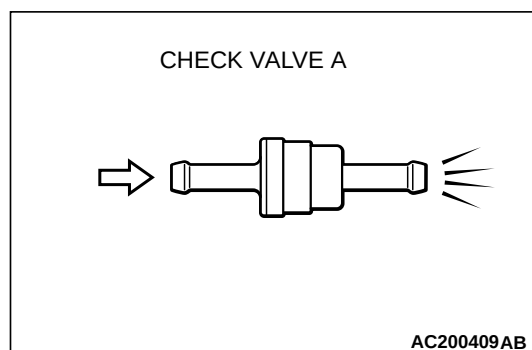
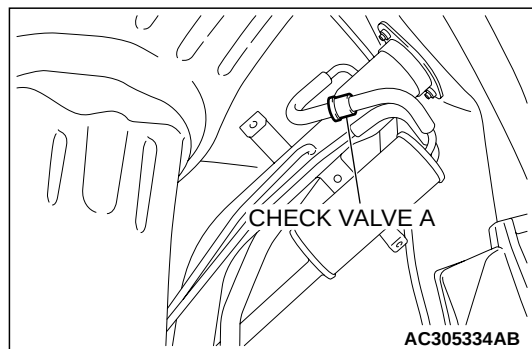
- (1) Remove the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)).
- (2) The clogging test with a hand vacuum pump on each hose from hoses G, I, J and K.

Q: Are the hoses in good condition?

YES : Go to Step 15.

NO : Replace the damaged hose, and the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.



**STEP 15. Test check valve A.**

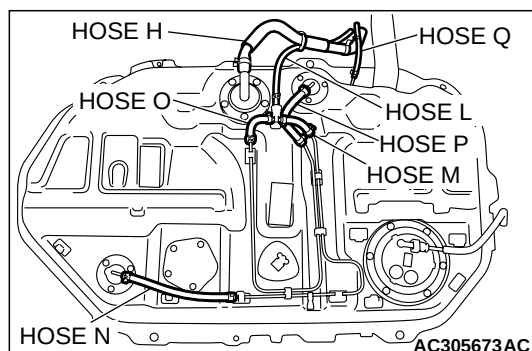
(1) Check valve A is a one-way check valve.

(2) Check valve A should allow air to flow in only one direction.

Q: Does check valve A allow air to pass in one direction only?

YES : Go to Step 16.

NO : Replace check valve A, and reinstall the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.

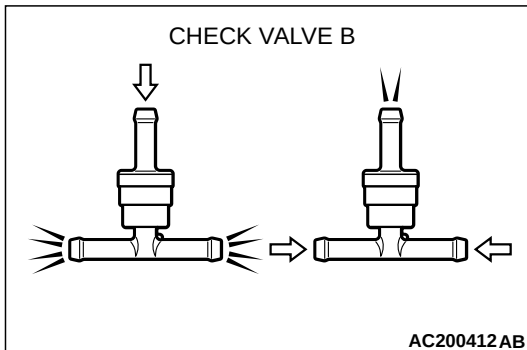
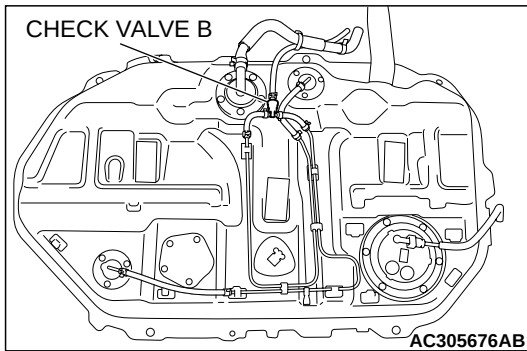
**STEP 16. Check for clogging in the evaporator line from hoses H, L, M, N, O, P and Q.**

Remove the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)).

Q: Are the hoses in good condition?

YES : Go to Step 17.

NO : Replace the damaged hose, and reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.



STEP 17. Test check valve B.

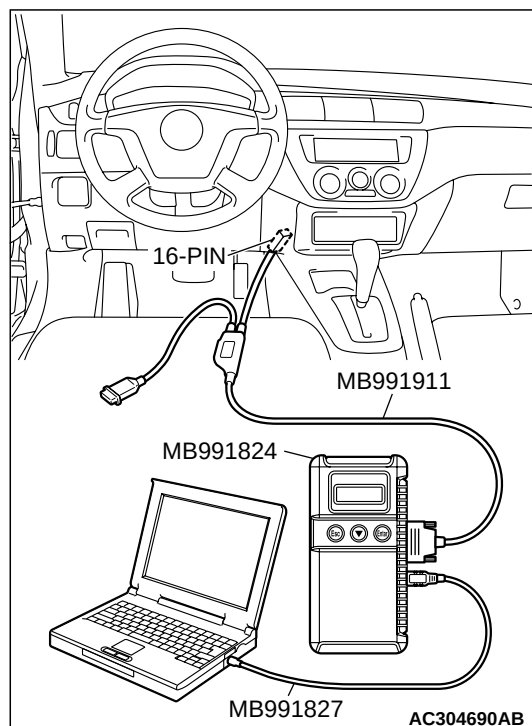
(1) Check valve B is a one-way check valve.

(2) Check valve B should allow air to flow in only one direction.

Q: Does check valve B allow air to pass in one direction only?

YES : Reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 18.

NO : Replace check valve B, reinstall the fuel tank and the fuel filler neck protector (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 19.



STEP 18. Using scan tool MB991958, check the EVAP system monitor test.

⚠ CAUTION

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During the test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position. Disconnect scan tool MB991958.

Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?

YES : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 19 .

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Go to Step 19 .

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 18.

STEP 19. Perform the OBD-II drive cycle.

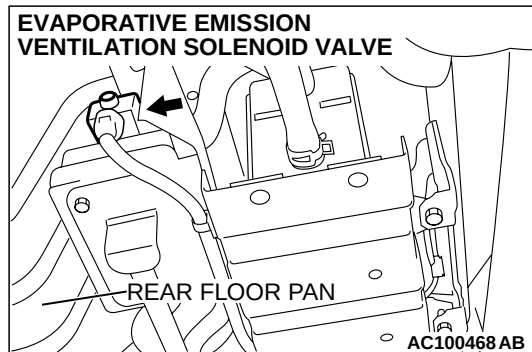
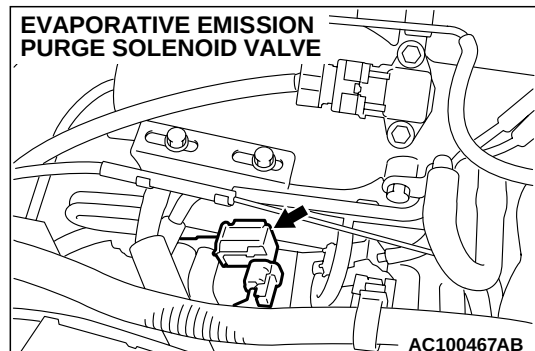
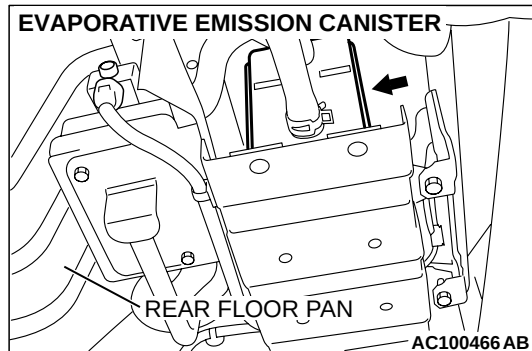
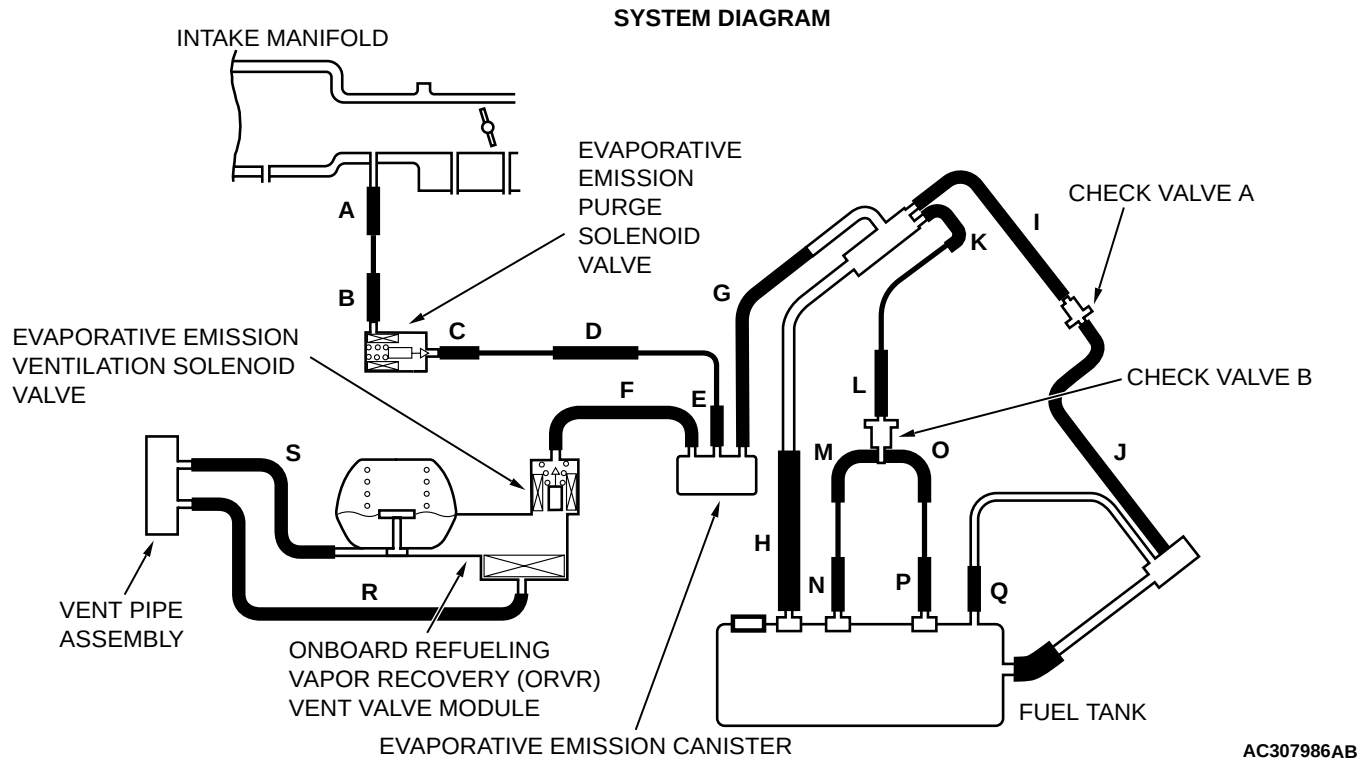
- (1) Confirm the repair by performing the appropriate drive cycle (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).
- (2) Read the diagnostic trouble code (DTC).

Q: Is DTC P0455 set?

YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

DTC P0456: Evaporative Emission Control System Leak Detected (Very Small Leak)



TECHNICAL DESCRIPTION

- The ECM <M/T> or PCM <A/T> monitors the Evaporative Emission (EVAP) System pressure.
- The ECM <M/T> or PCM <A/T> controls the evaporative emission ventilation solenoid. It closes the evaporative emission ventilation solenoid to seal the evaporative emission canister side of the system.
- The evaporative emission purge solenoid is opened to allow manifold vacuum to create low pressure (vacuum) in the EVAP system.
- When the EVAP system develops a vacuum of 2 kPa (0.29 psi), the evaporative emission purge solenoid is closed and the fuel system vacuum is maintained at 2 kPa (0.29 psi).
- The ECM <M/T> or PCM <A/T> determines whether there is a leak in the EVAP system by monitoring the vacuum inside the fuel tank.
- The test is stopped when fuel vapor pressure exceeds predetermined limits.

DESCRIPTIONS OF MONITOR METHODS

- Measure reverting pressure after depressurizing by intake manifold negative pressure and detect malfunction if reverting pressure rises largely.

MONITOR EXECUTION

- Once per driving cycle.

MONITOR EXECUTION CONDITIONS (Other Monitor and Sensor)**Other Monitor (There is no temporary DTC stored in memory for the item monitored below)**

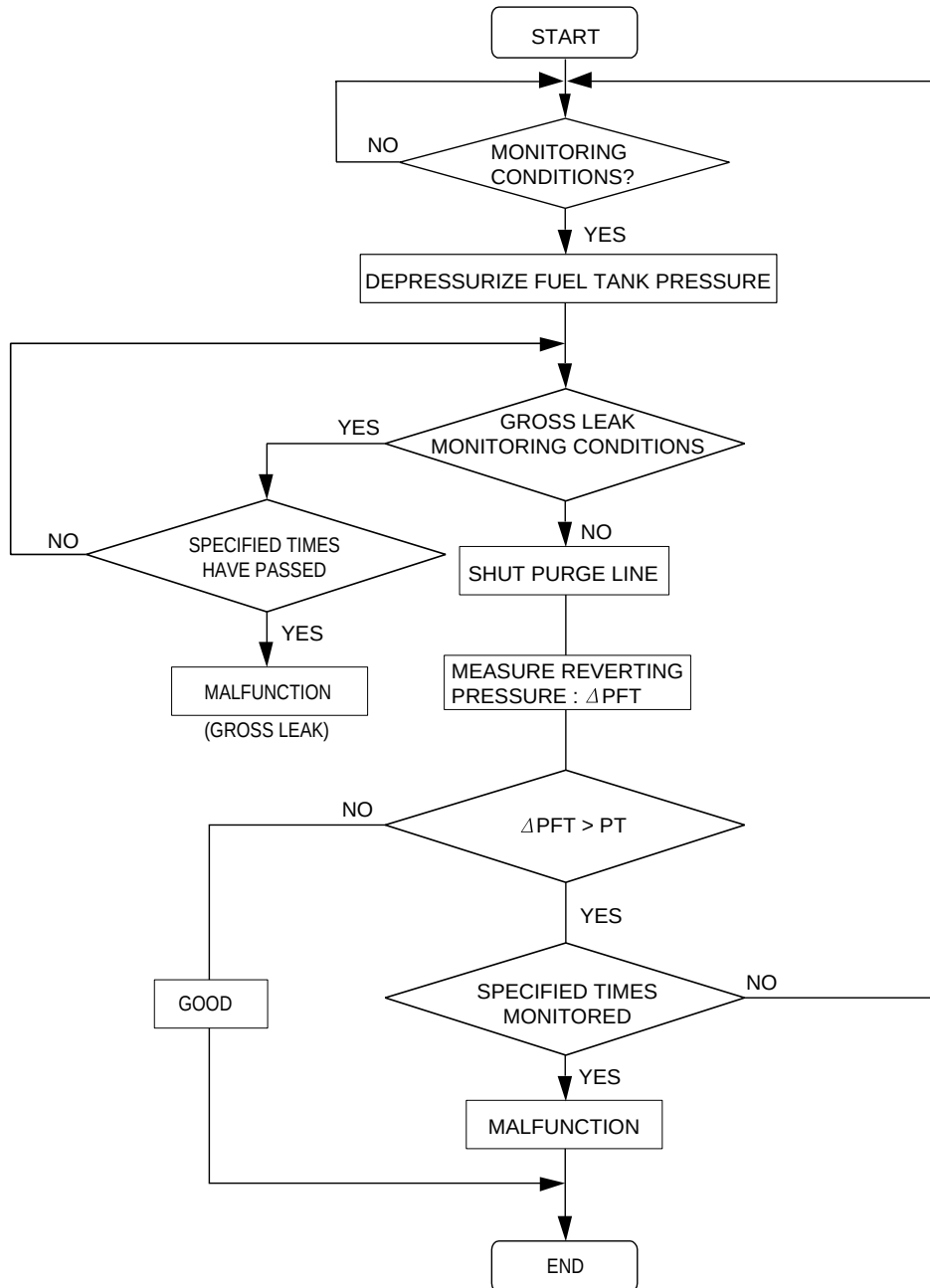
- Evaporative emission purge solenoid monitor
- Evaporative emission purge system monitor
- Fuel tank differential pressure sensor monitor
- Evaporative emission ventilation solenoid monitor
- Fuel level sensor monitor
- Fuel temperature sensor monitor

Sensor (The sensors below are determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)

0.04in, 0.02in GROSS LEAK MONITOR



AC306649

DTC SET CONDITIONS

Check Conditions A: At Start up

- Intake air temperature is 36°C (97°F) or less when the engine is started.

- The engine coolant temperature 36°C (97°F) or less when the engine is started.
- The fuel level sensor output voltage is 2.4 – 3.7 volts when the engine starts and the amount of remaining fuel is 40 – 85 percent of capacity.

Check Conditions B: For Test to Run

- Barometric pressure is greater than 76 kPa (11 psi).
- The fuel temperature is 33°C (91°F) or less.
- Fuel tank differential pressure sensor output voltage is 1 to 4 volts.

Check Conditions C: For Test to Stop

- Engine coolant temperature is greater than 20 °C (68 °F).
- Intake air temperature is greater than -10 °C (14 °F).
- When the evaporative emission purge solenoid and evaporative emission ventilation solenoid are closed, the pressure rises in the fuel tank is less than 324 Pa (0.047 psi).
- 10 seconds have elapsed from the start of the previous monitoring.
- Monitoring time: 10 – 14 minutes.

Judgment Criteria

- Internal pressure of the fuel tank has changed greater than 1,177 – 1,373 Pa (0.177 – 0.199 psi) in 128 seconds after the tank and vapor line were closed.

OBD-II DRIVE CYCLE PATTERN

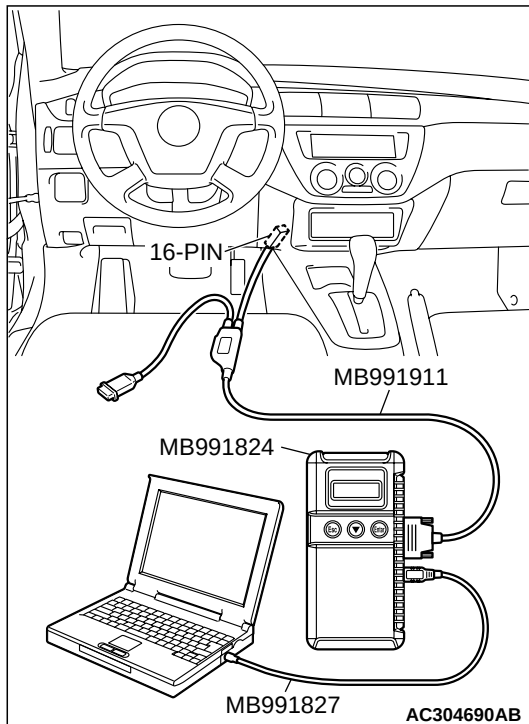
Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Loose fuel cap.
- Fuel cap relief pressure is incorrect.
- Malfunction of the evaporative emission canister seal.
- Malfunction of the fuel tank, purge line or vapor line seal.
- Malfunction of the evaporative emission ventilation solenoid.

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check the EVAP system monitor test.

⚠ CAUTION

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

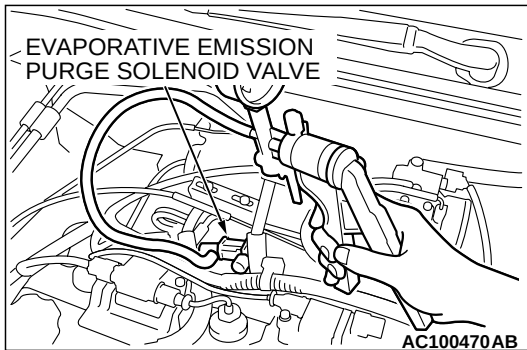
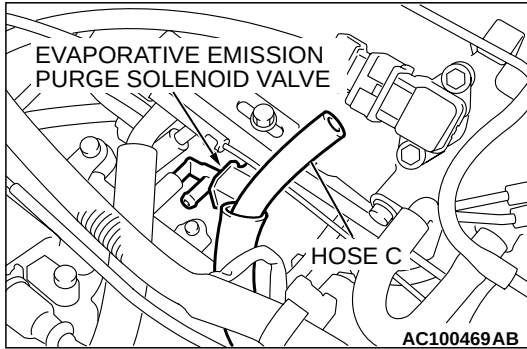
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During this test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position, and disconnect scan tool MB991958.

Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?

YES : A malfunction has been detected during the monitor test. Refer to the Diagnostic Trouble Code Chart and diagnose any other DTCs that are set [P.13A-29](#). If no other DTC's have been set, then go to Step 2.

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Explain to the customer that an improperly tightened fuel cap can cause the MIL to illuminate. Return the vehicle to the customer.

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 1.

**STEP 2. Check the evaporative emission purge solenoid for leaks.**

- (1) Disconnect hose C from the evaporative emission purge solenoid and connect a hand vacuum pump to the nipple of the evaporative emission purge solenoid.

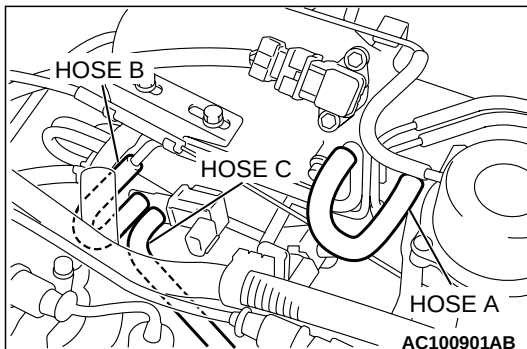
- (2) Use the hand vacuum pump to confirm that the evaporative emission purge solenoid holds vacuum.

- (3) Disconnect the hand vacuum pump, and connect hose C to the evaporative emission purge solenoid.

Q: Does the evaporative emission purge solenoid hold vacuum?

YES : Go to Step 3.

NO : Replace the evaporative emission purge solenoid.
Then go to Step 15.

**STEP 3. Check for leaks in evaporative emission system hoses A through C.**

Use a hand vacuum pump to test each hose from hose A to hose C.

Q: Do the hoses hold vacuum?

YES : Go to Step 4.

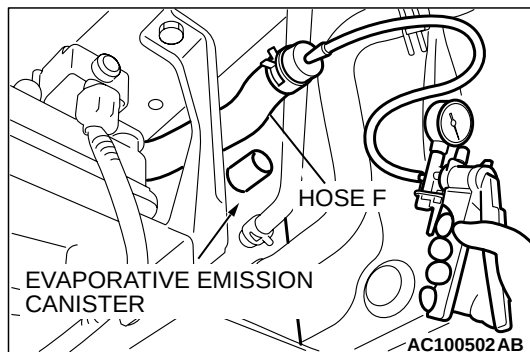
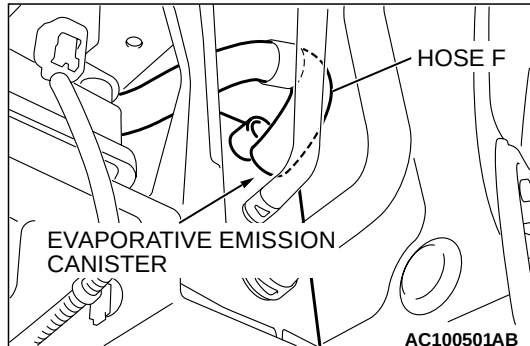
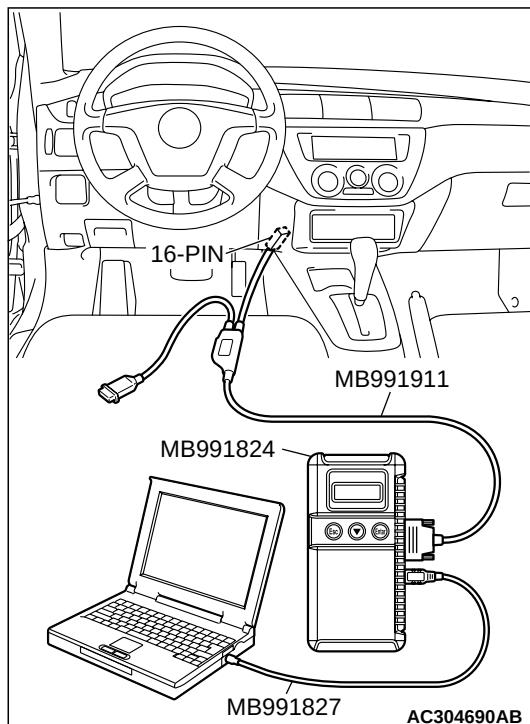
NO : Replace any damaged hose. Then go to Step 15.

STEP 4. Using scan tool MB991958, check data list item 29: Evaporative Emission Ventilation Solenoid.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.



(2) Disconnect hose F from the evaporative emission canister side, and connect a hand vacuum pump.

(3) Turn the ignition switch to the "ON" position.

(4) Set scan tool MB991958 to actuator test mode.

- Item 29: Evaporative Emission Ventilation Solenoid.
- While the evaporative emission ventilation solenoid is energized, operate the hand vacuum pump and confirm that the solenoid holds vacuum.

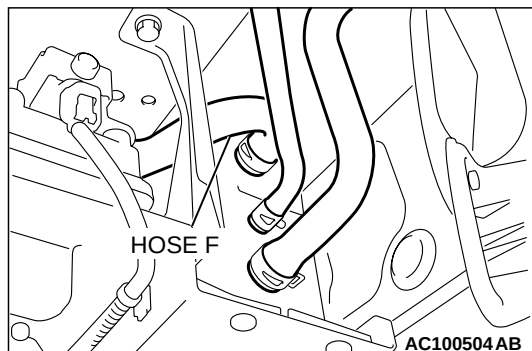
(5) Turn the ignition switch to the "LOCK" (OFF) position, and disconnect scan tool MB991958.

(6) Disconnect the hand vacuum pump, and connect hose F to the evaporative emission canister.

Q: Did the evaporative emission ventilation solenoid hold vacuum?

YES : Go to Step 6.

NO : Go to Step 5.

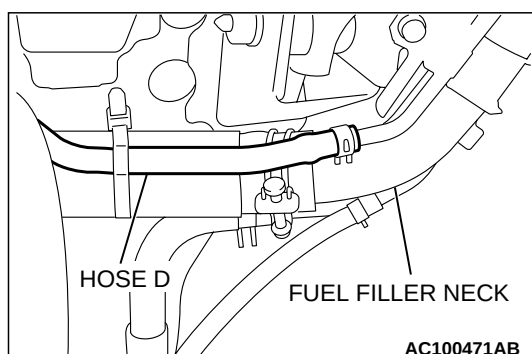


STEP 5. Check for leaks in evaporative emission hose F.
Perform a leakage test using a hand vacuum pump on hose F.

Q: Do the hose hold vacuum?

YES : Replace the evaporative emission ventilation solenoid. Then go to Step 15.

NO : Replace hose F. Then go to Step 15.



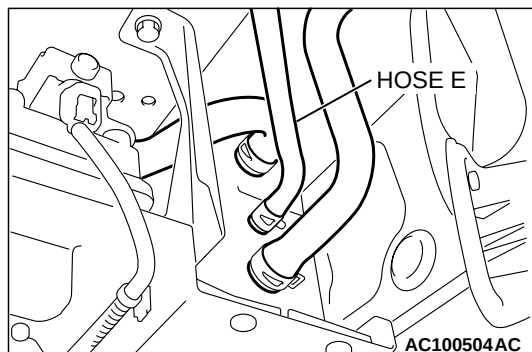
STEP 6. Check for leaks in evaporative emission system hoses D and E.

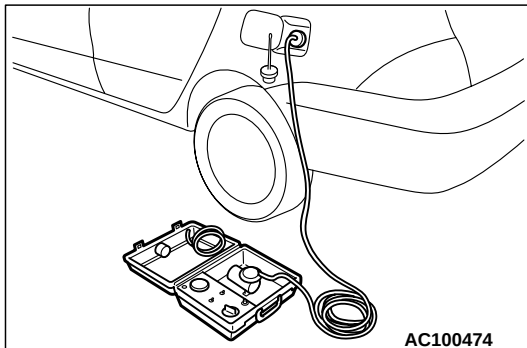
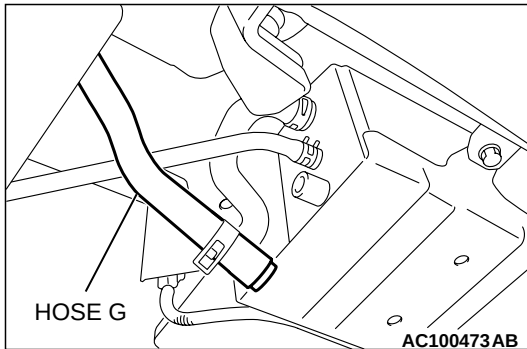
Perform a leakage test with a hand vacuum pump on each hose between hose D and hose E.

Q: Do the hoses hold vacuum?

YES : Go to Step 7.

NO : Replace the damaged hose. Then go to Step 15.





STEP 7. Pressure test for leaks in evaporative system lines from hose G through the fuel tank to hose Q.

- (1) Disconnect hose G from the canister, and plug hose G securely.
- (2) Confirm that the evaporative emission system pressure pump (Miller number 6872A) is operating properly. Perform the self-test as described in the manufacturer's instructions.

- (3) Connect the evaporative emission system pressure pump to the fuel filler neck.
- (4) Pressure test the system to determine whether any leaks are present.

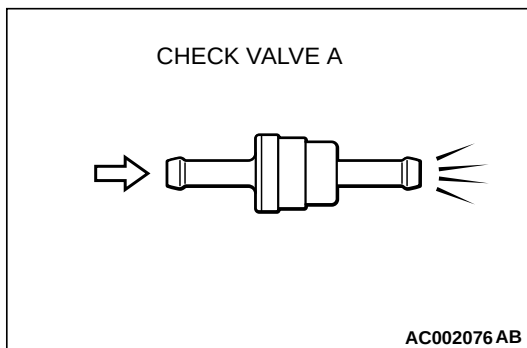
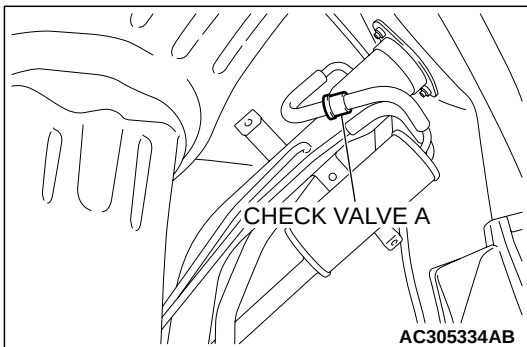
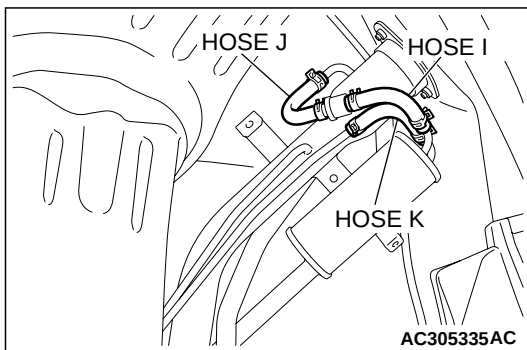
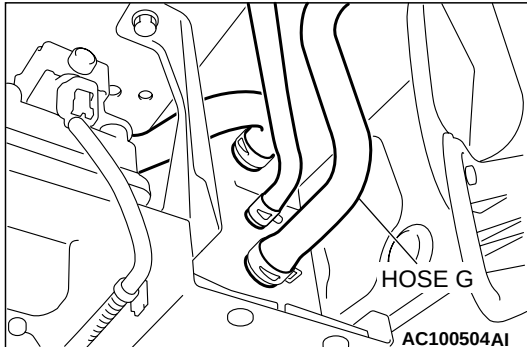
NOTE: The "Pressure test" in this procedure refers to the I/M240 Simulation Test. The eight steps of this test are described in the manufacturer's instructions for the evaporative emission system pressure pump, Miller number 6872A.

- (5) Disconnect the evaporative emission system pressure pump, and reinstall the fuel cap.
- (6) Connect hose G to the canister.

Q: Is the evaporative emission system line free of leaks?

YES : Go to Step 13.

NO : Go to Step 8.

**STEP 8. Check for leaks in evaporative emission hoses G, I, J and K.**

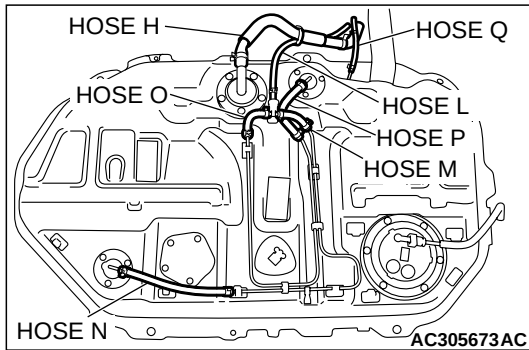
- (1) Remove the fuel filler neck protector. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Perform a leakage test with a hand vacuum pump on each hose: G, I, J and K.

Q: Do the hoses hold vacuum?**YES :** Go to Step 9.**NO :** Replace any damaged hose, and reinstall the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.**STEP 9. Test check valve A.**

- (1) Check valve A is a one-way check valve.

- (2) Check valve A should allow air to flow in only one direction.

Q: Does check valve A allow air to pass in one direction only?**YES :** Go to Step 10.**NO :** Replace check valve A, and reinstall the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.



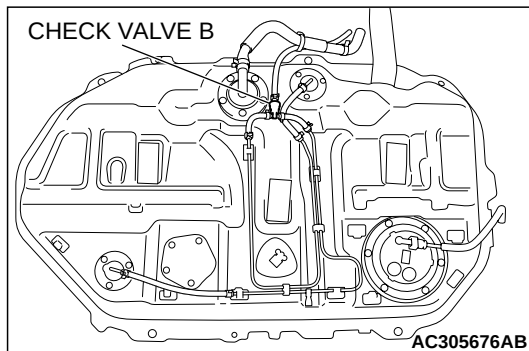
STEP 10. Check for leaks in evaporative emission hoses H, L, M, N, O, P, and Q.

- (1) Remove the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-9](#).)
- (2) Perform a leakage test with a hand vacuum pump on each hose H, L, M, N, O, P and Q.

Q: Do the hoses hold vacuum?

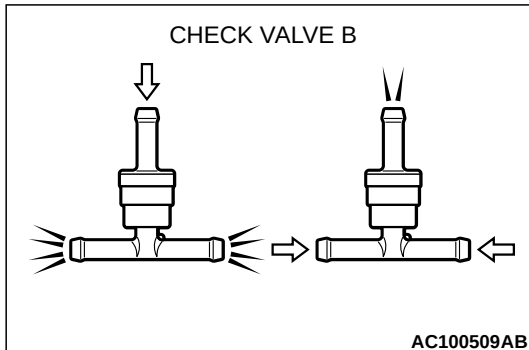
YES : Go to Step 11.

NO : Replace any damaged hose, and reinstall the fuel tank. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.



STEP 11. Test check valve B.

- (1) Check valve B is a one-way check valve.

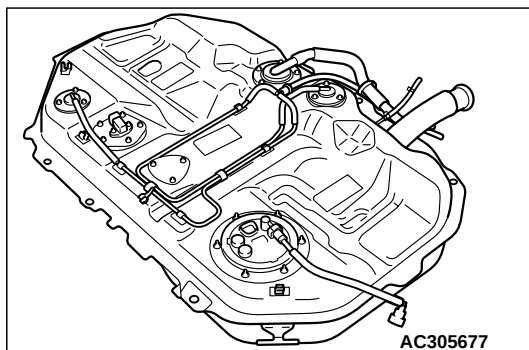


- (2) Check valve B should allow air to flow in only one direction.

Q: Does check valve B allow air to pass in one direction only?

YES : Go to Step 12.

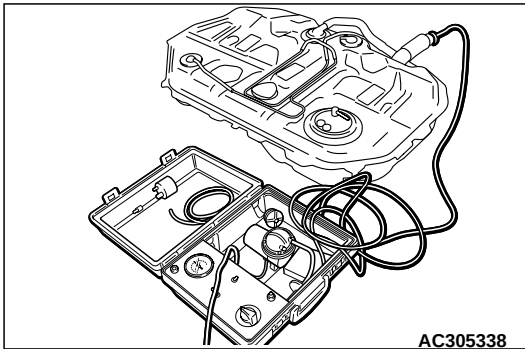
NO : Replace check valve B, and reinstall the fuel tank and the fuel filler neck protector. Refer to GROUP 13C, Fuel Tank [P.13C-9](#). Then go to Step 15.



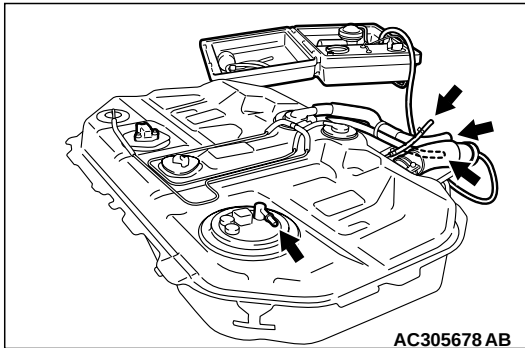
STEP 12. Check for leaks in the fuel tank.

- (1) Visually check for cracks or other leaks in the fuel tank.

NOTE: Carefully check the fuel pump assembly and the differential pressure sensor installation in the fuel tank.



- (2) Connect an evaporative emission system pressure pump (Miller number 6872A) to the filler hose.



- (3) Plug the fuel pump feed nipple, hose H, hose L and hose Q connected to the fuel tank.

NOTE: If these items are not securely plugged here, the fuel could leak in the next step.

- (4) Pressurize the fuel tank with the evaporative emission system pressure pump.
(5) In the pressurized state, check for leaks by applying a soapy water solution to each section and look for bubbles.

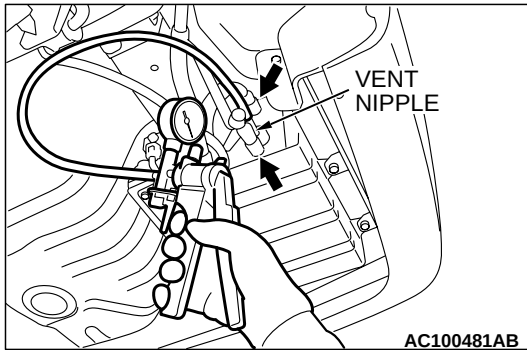
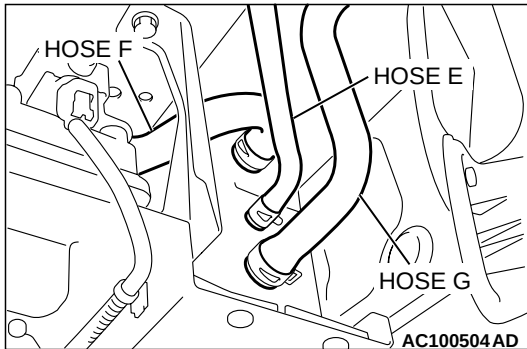
Q: Is any leaks found?

YES <When there is a leak from the attachment points of the fuel pump assembly, fuel tank differential pressure sensor, leveling valve or fuel tank rollover valve.> :

Reassemble the leaked parts and check again that there are no leaks. Then reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 15 .

YES <When there is a leak from the fuel tank.> : Replace the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 15.

NO : When there is no leak, reinstall the fuel tank (Refer to GROUP 13C, Fuel Tank [P.13C-9](#)). Then go to Step 14.



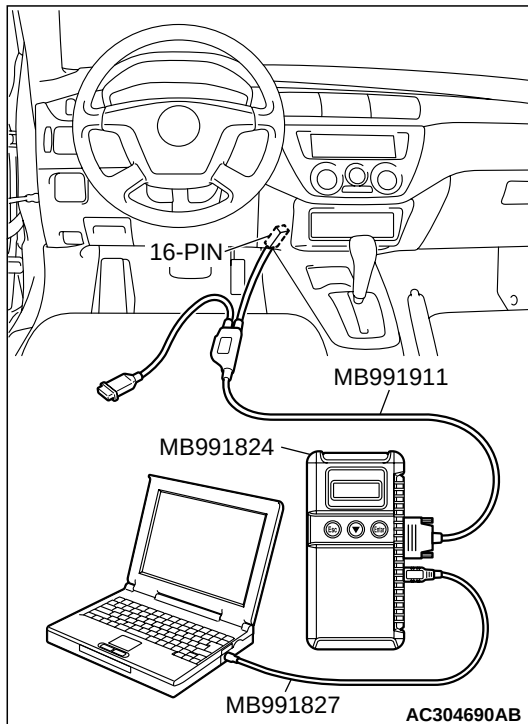
STEP 13. Check the evaporative emission canister for vacuum leaks.

- (1) Disconnect hoses E, F and G from the evaporative emission canister side, and connect a hand vacuum pump to the evaporative emission canister instead of hose E, and plug the other nipples.
- (2) Apply a pressure on the hand vacuum pump, and confirm that air is maintained.
- (3) Disconnect the hand vacuum pump, and connect hoses E, F and G to the canister.

Q: Does the evaporative emission canister hold vacuum?

YES : Go to Step 13.

NO : Replace the evaporative emission canister. Refer to GROUP 17, Evaporative Emission Canister and Fuel Tank Pressure Relief Valve [P.17-230](#). Then go to Step 15 .



STEP 14. Using scan tool MB991958, check the EVAP system monitor test.

⚠ CAUTION

- To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.
- During this test, the ECM <M/T> or PCM <A/T> will automatically increase the engine speed to 1,600 r/min or greater. Check that the transaxle is set to "neutral" <M/T> or "P" <A/T> position.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTCs using scan tool MB991958.
- (4) Check that the fuel cap is securely closed (Tighten until three clicks are heard).
- (5) Start the engine.
- (6) Select "System Test."
- (7) Select "Evap Leak Mon."
- (8) During the test, keep the accelerator pedal at the idle position.
- (9) Keep the engine speed and engine load within the specified range. When the monitor test starts, the "In Progress" item on scan tool MB991958 will change from "NO" to "YES."
- (10) Turn the ignition switch to the "LOCK" (OFF) position. Disconnect scan tool MB991958.

Q: Is "Evap Leak Mon. Completed. Test Failed and DTCs Set" displayed on scan tool MB991958?

YES : Replace the ECM <M/T> or PCM <A/T> (Refer to [P.13A-926](#)). Then go to Step 15.

NO <"Evap Leak Mon. Completed. Test Passed" is displayed on scan tool MB991958.> : The evaporative emission system is working properly at this time. Then go to Step 15.

NO <"Evap Leak Mon. Discontinued. Retest again from the first" is displayed on scan tool MB991958.> : The EVAP monitor has been interrupted during the test. Turn the ignition switch to the "LOCK" (OFF) position once, and repeat the monitoring from Step 14.

STEP 15. Perform the OBD-II drive cycle.

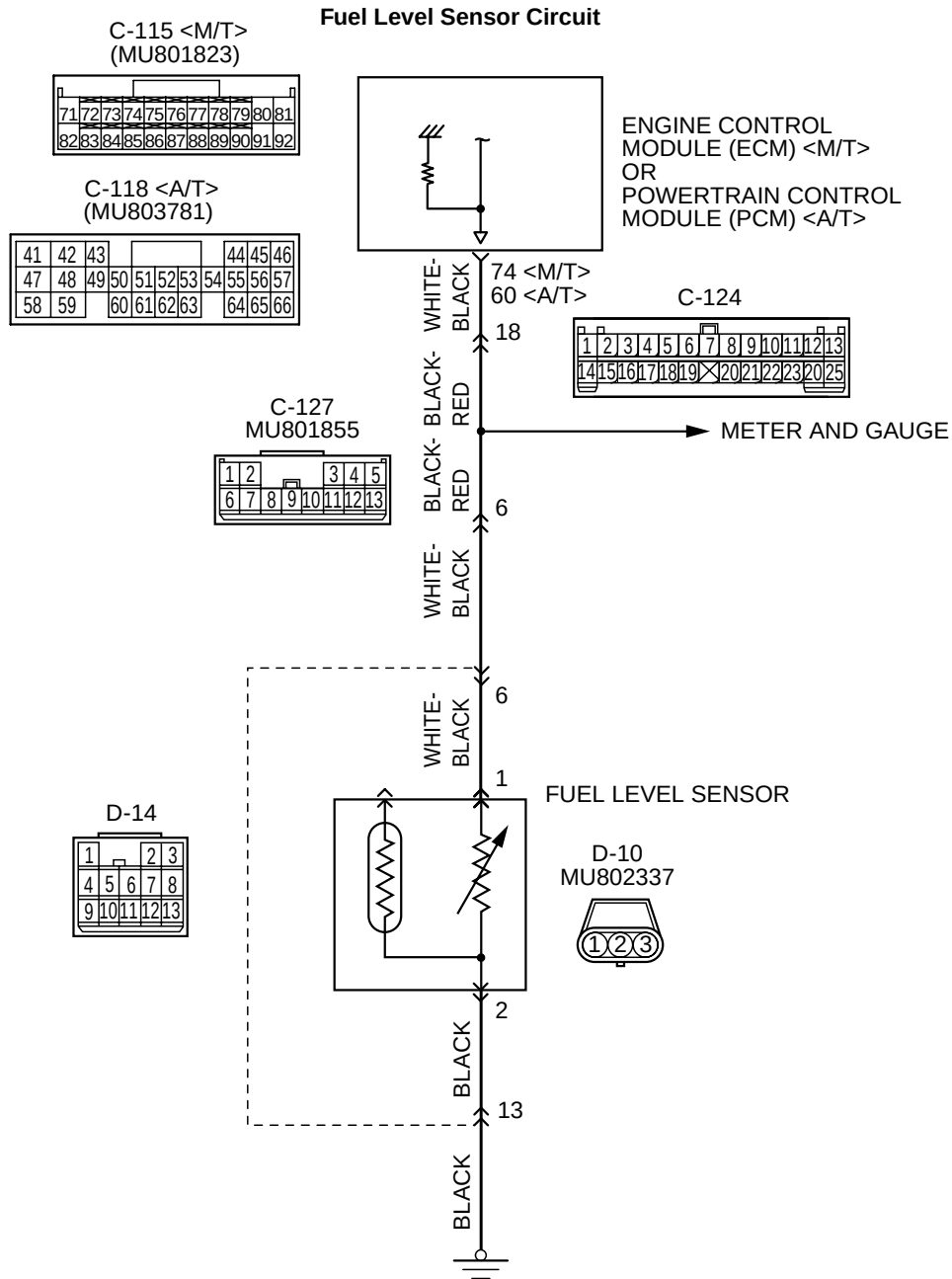
- (1) Confirm the repair by performing the appropriate drive cycle (Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 1 – Evaporative Emission System Leak Monitor [P.13A-6](#)).
- (2) Read the diagnostic trouble code (DTC).

Q: Is DTC P0456 set?

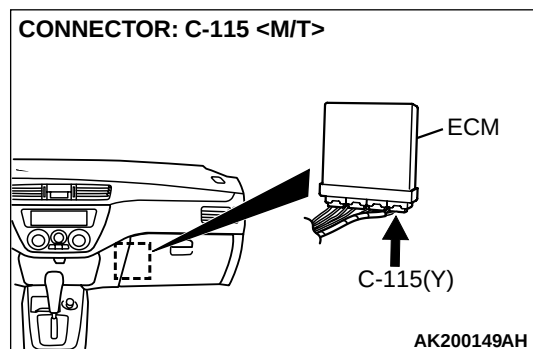
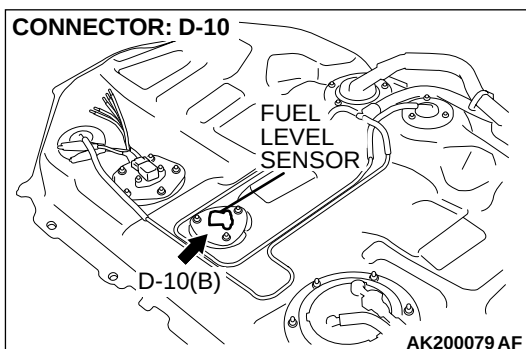
YES : Repeat the troubleshooting from Step 1.

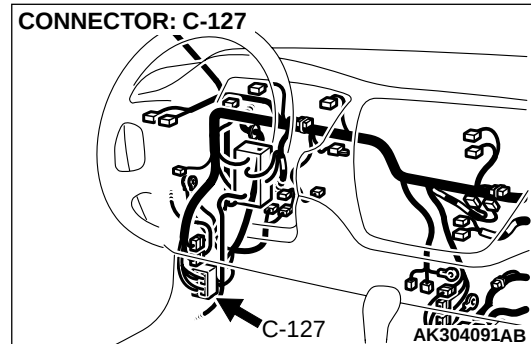
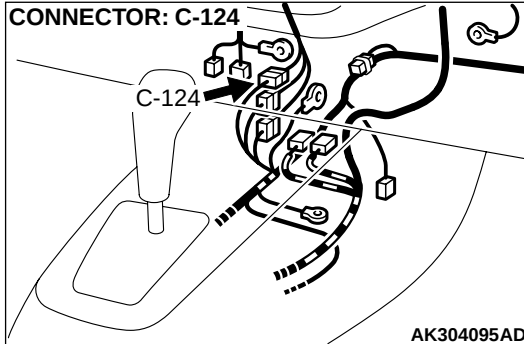
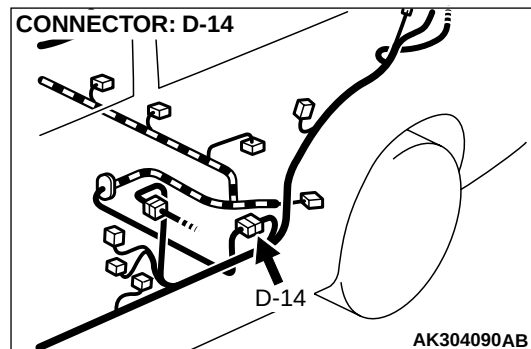
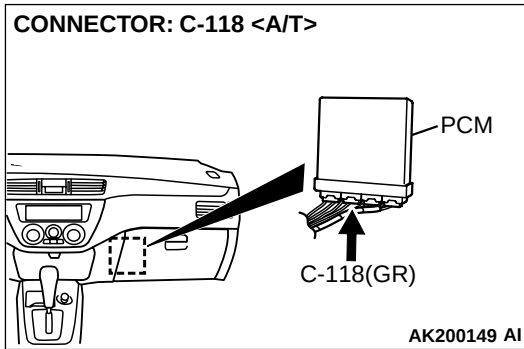
NO : The procedure is complete.

DTC P0461: Fuel Level Sensor Circuit Range/Performance



AK304159





CIRCUIT OPERATION

- The fuel gauge drive signal is input in ECM (terminal No. 74) <M/T> or PCM (terminal No. 60) <A/T>.

TECHNICAL DESCRIPTION

- Branch the drive signal from the fuel gauge circuit, and input it into ECM <M/T> or PCM <A/T>.
- The ECM <M/T> or PCM <A/T> detects the amount of fuel left in the fuel tank with this signal, and also controls the fuel level warning light.

DESCRIPTIONS OF MONITOR METHODS

- If the change in the fuel level sensor output is found to be small through a comparison of the fuel consumption volume (obtained from the injector actuation duration) and the fuel volume in the fuel tank (obtained from the fuel level sensor), a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

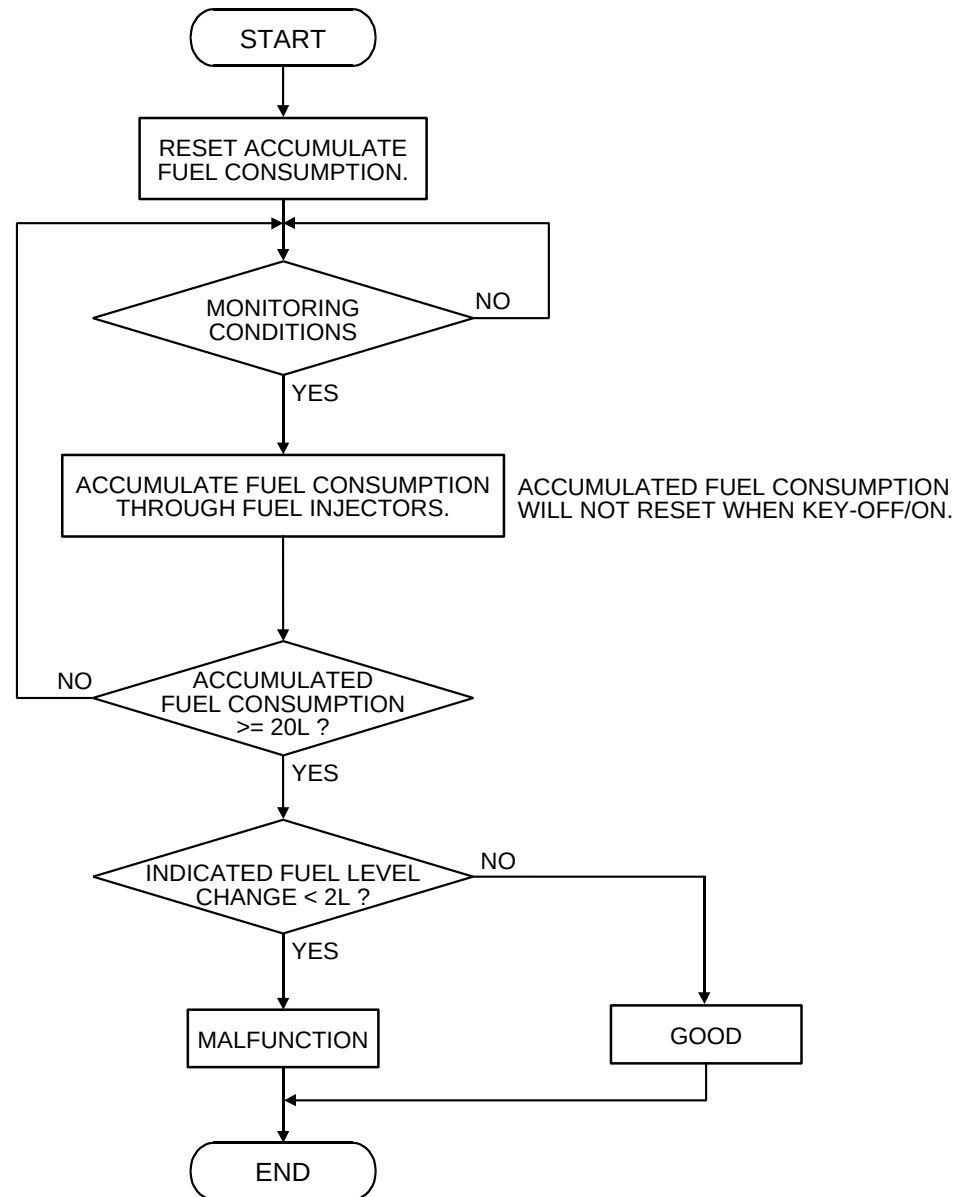
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302330

Check Conditions, Judgement Criteria

- When the fuel consumption calculated from the operation time of the injector amounts to 20 liter, the diversity of the amount of fuel in tank calculated from the fuel level sensor is 2 liter or less.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Fuel level sensor failed.
- Open or shorted fuel level sensor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

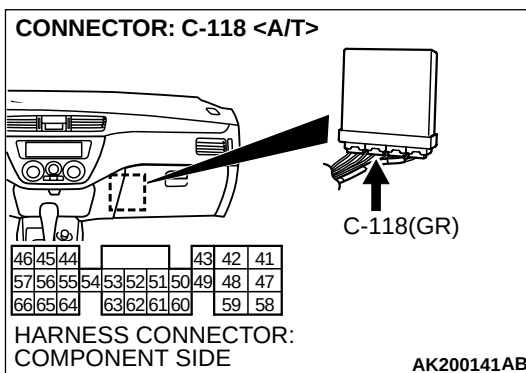
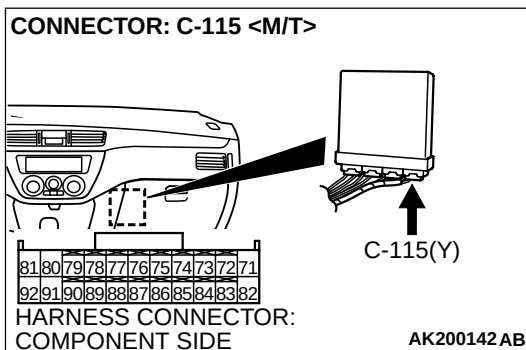
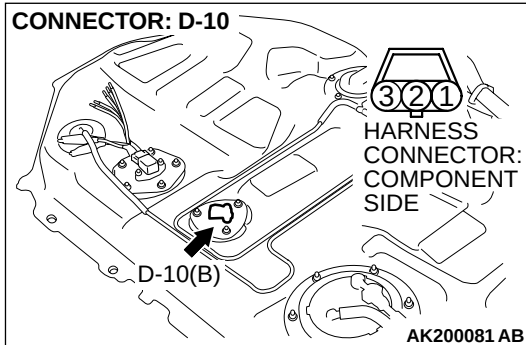
STEP 1. Check fuel gauge.

Q: Is the fuel gauge functioning?

YES : Go to Step 3.

NO : Go to Step 2.

STEP 2. Check for short circuit to ground between fuel level sensor connector D-10 (terminal No. 1) and ECM connector C-115 (terminal No. 74) <M/T> or PCM connector C-118 (terminal No. 60) <A/T>.



NOTE: Check harness after checking intermediate connectors C-124, C-127 and D-14. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 6.

Q: Is the harness wire in good condition?

YES : Refer to GROUP 54A, Combination Meter [P.54A-44](#).

NO : Repair it. Then go to Step 6.

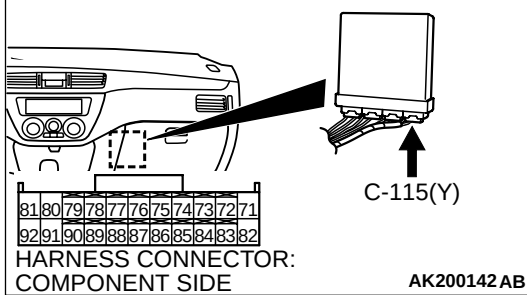
STEP 3. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

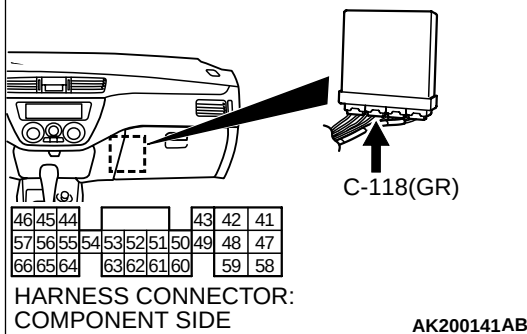
YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 6.

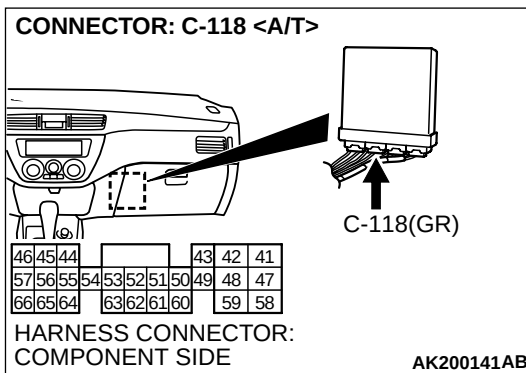
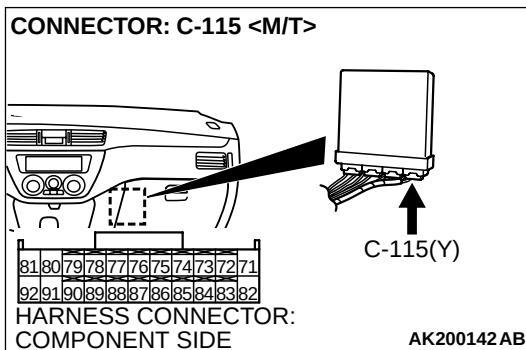
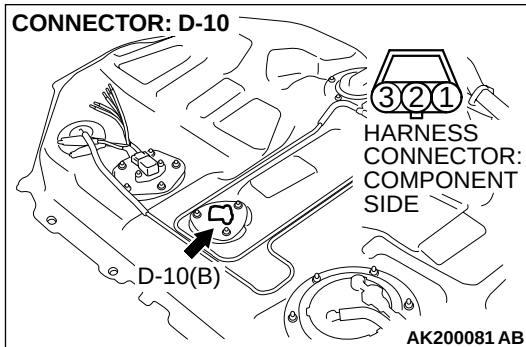
CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



STEP 4. Check for open circuit or harness damage between fuel level sensor connector D-10 (terminal No. 1) and ECM connector C-115 (terminal No. 74) <M/T> or PCM connector C-118 (terminal No. 60) <A/T>.



NOTE: Check harness after checking intermediate connectors C-124, C-127 and D-14. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 6.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair it. Then go to Step 6.

STEP 5. Check the trouble symptoms.

- (1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- (2) Check the diagnostic trouble code (DTC).

Q: Is DTC P0461 set?

YES : Replace the ECM or PCM. Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use
Troubleshooting/Inspection Service Points [P.00-6](#).

STEP 6. Test the OBD-II drive cycle.

- (1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- (2) Check the diagnostic trouble code (DTC).

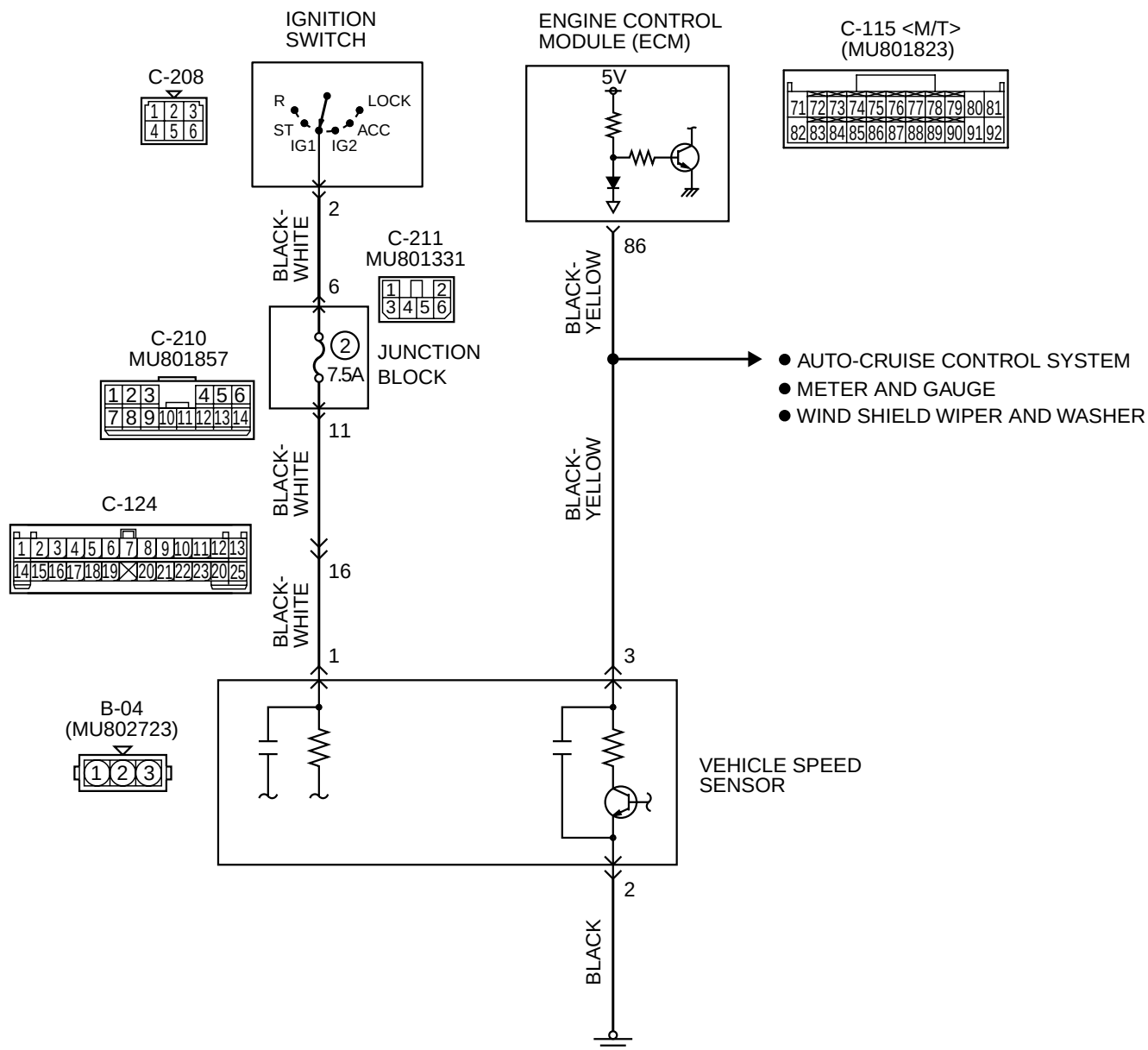
Q: Is DTC P0461 set?

YES : Retry the troubleshooting.

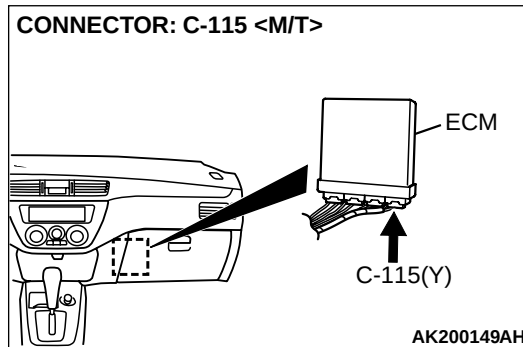
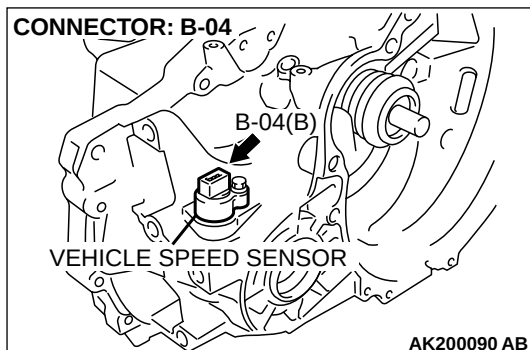
NO : The inspection is complete.

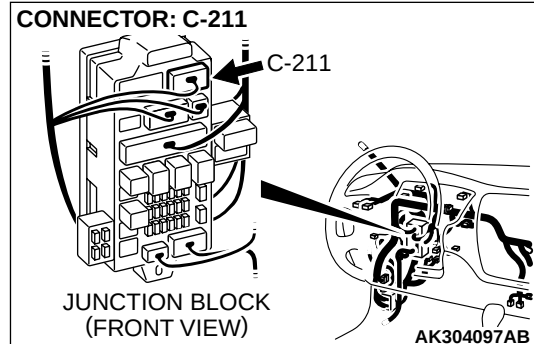
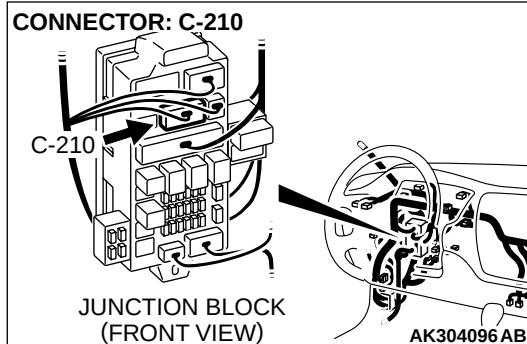
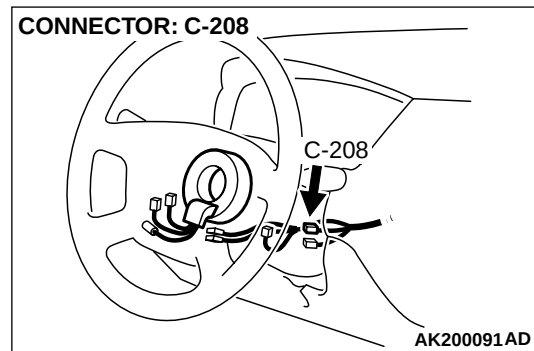
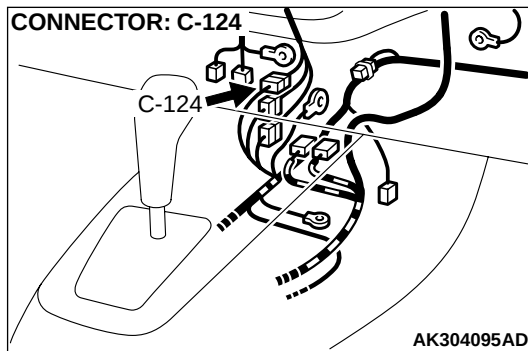
DTC P0500: Vehicle Speed Sensor <M/T>

Vehicle Speed Sensor Circuit



AK304162





CIRCUIT OPERATION

- A 5-volt voltage is applied to the vehicle speed sensor output terminal (terminal No. 3) from the ECM (terminal No. 86). The vehicle speed sensor generates a pulse signal when the output terminal is opened and grounded.

TECHNICAL DESCRIPTION

- The vehicle speed sensor converts the vehicle speed into pulse signals and inputs them to the ECM.
- The vehicle speed sensor outputs a pulse signal while the vehicle is driven.
- The ECM checks whether the pulse signal is output.

DESCRIPTIONS OF MONITOR METHODS

- If the vehicle speed sensor output does not change while the vehicle is being driven in the medium- to high-speed range, a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

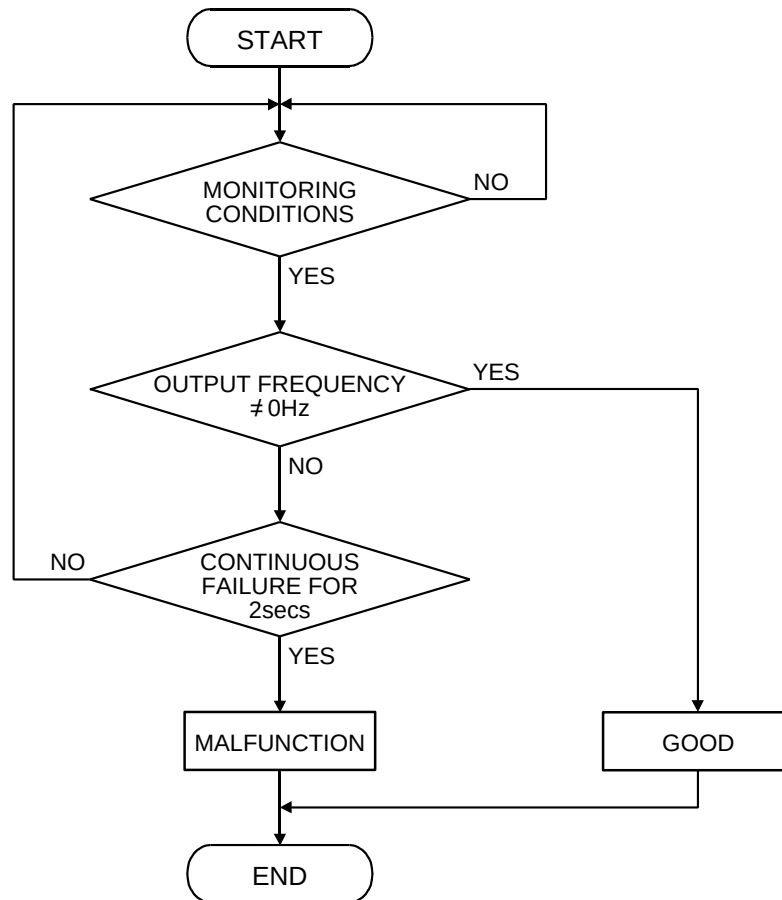
- Not applicable

Sensor (The sensor below is determined to be normal)

- Volume airflow sensor

DTC SET CONDITIONS

Logic Flow Chart



AK302331

Check Conditions

- Two seconds or more have passed the starting sequence was completed.
- Engine speed is at between 2,000 and 4,000 r/min.
- Volumetric efficiency is at between 45 and 100 percent.

Judgement Criteria

- Vehicle speed sensor output voltage has not changed (no pulse signal is input) for 2 seconds.

OBD-II DRIVE CYCLE PATTERN

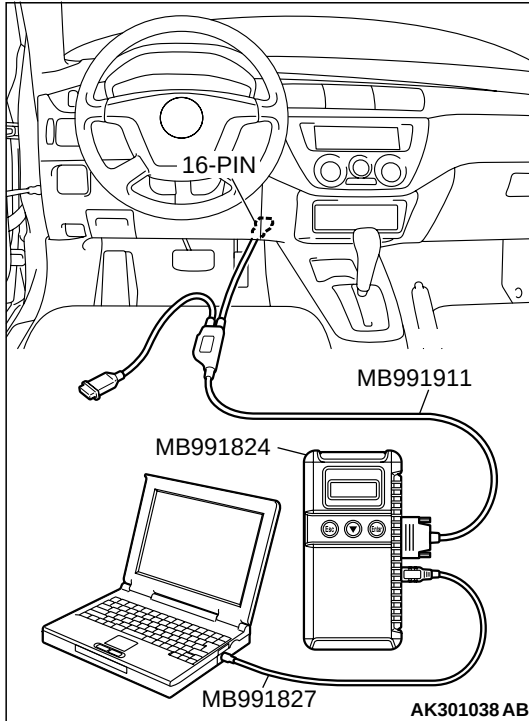
None.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Vehicle speed sensor failed.
- Open or shorted vehicle speed sensor circuit, or connector damage.
- ECM failed.

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B



STEP 1. Using scan tool MB991958, check data list item 24: Vehicle Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode for item 24, Vehicle Speed Sensor.
 - Check that the speedometer and MUT-III display speed match when traveling at a vehicle speed of 40 km/h (25 mph).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.

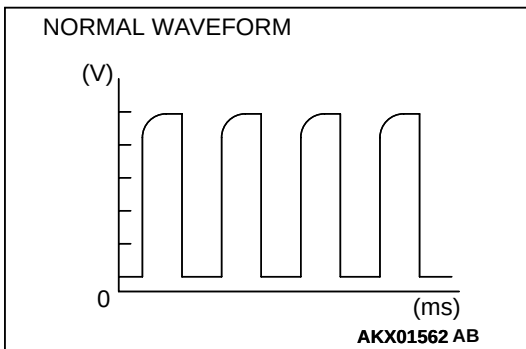
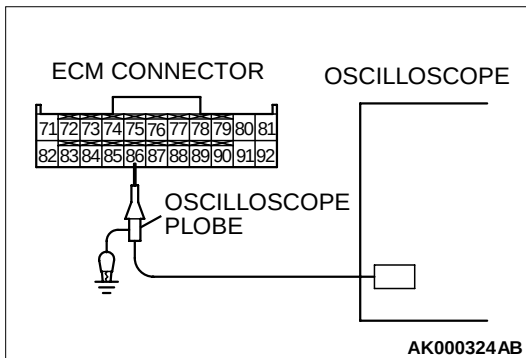
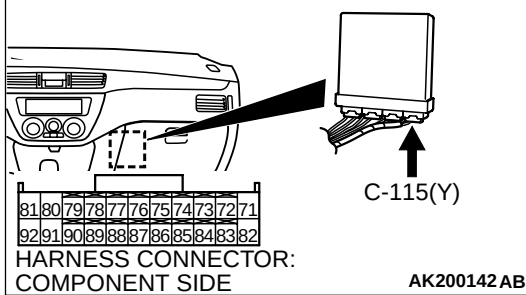
STEP 2. Check speed meter.

Q: Is the speed meter functioning?

YES : Go to Step 3.

NO : Go to Step 8.

CONNECTOR: C-115 <M/T>

**STEP 3. Using the oscilloscope, check the sensor output voltage at ECM connector C-115.**

- (1) Do not disconnect the ECM connector C-115.
- (2) Disconnect the combination meter connector, auto-cruise control-ECU connector and ETACS-ECU connector.
- (3) Connect the oscilloscope probe to ECM terminal No. 86 by backprobing.
- (4) Start the engine.
- (5) Check the waveform.
 - The waveform should show a pattern similar to the illustration while the vehicle is being moved.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

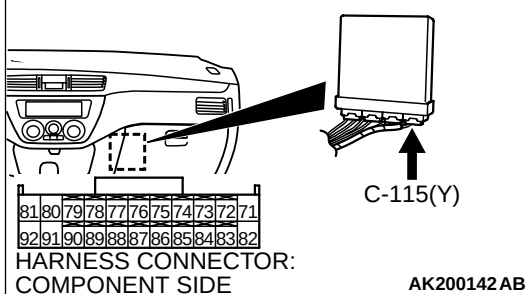
Q: Is the waveform normal?

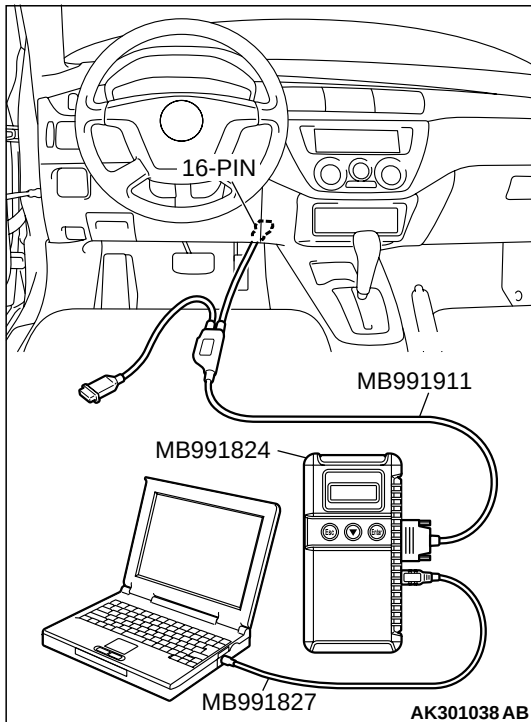
- YES :** Go to Step 4.
NO : Go to Step 6.

STEP 4. Check connector C-115 at ECM for damage.**Q: Is the connector in good condition?**

- YES :** Go to Step 5.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 17.

CONNECTOR: C-115 <M/T>





STEP 5. Using scan tool MB991958, check data list item 24: Vehicle Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

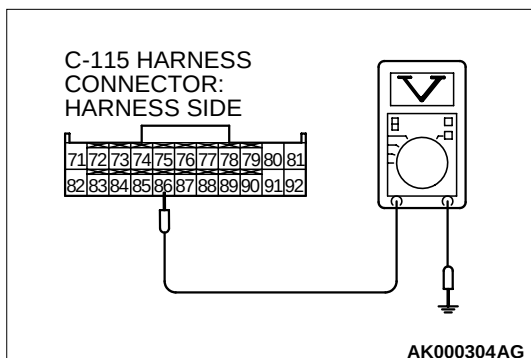
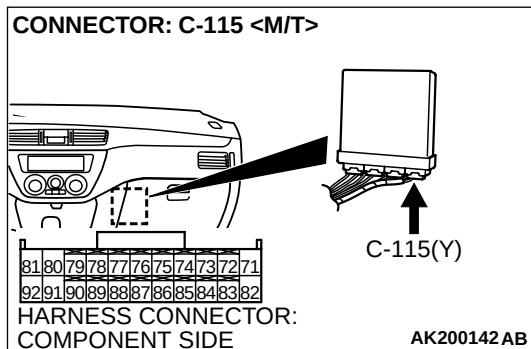
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode for item 24, Vehicle Speed Sensor.
 - Check that the speedometer and MUT-III display speed match when traveling at a vehicle speed of 40 km/h (25 mph).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Replace the ECM. Then go to Step 17.



STEP 6. Measure the sensor supply voltage at ECM connector C-115 by backprobing.

- (1) Do not disconnect the ECM connector C-115.
- (2) Disconnect the vehicle speed sensor connector B-04.
- (3) Turn the ignition switch to the "ON" position.

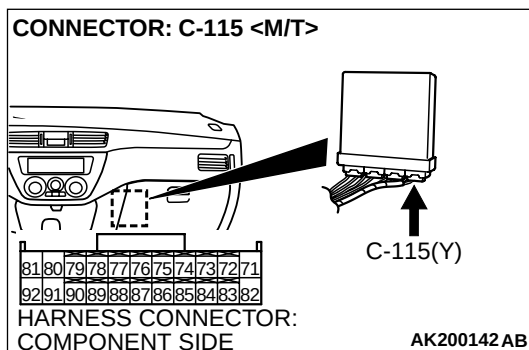
- (4) Measure the voltage between terminal No. 86 and ground by backprobing.
 - Voltage should be between 4.8 and 5.2 volts.

- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.8 and 5.2 volts?

YES : Go to Step 7.

NO : Replace the ECM. Then go to Step 17.

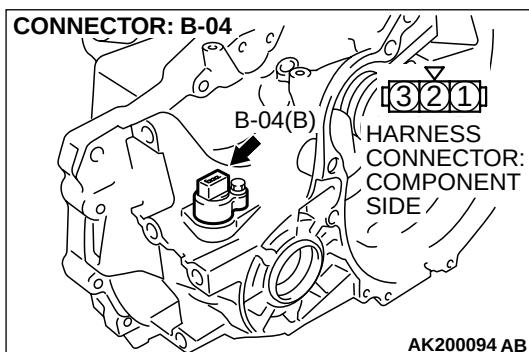


STEP 7. Check harness connector C-115 at ECM for damage.

Q: Is the harness connector in good condition?

YES : Repair harness wire between vehicle speed sensor connector B-04 (terminal No. 3) and ECM connector C-115 (terminal No. 86) because of open circuit. Then go to Step 17.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 17.

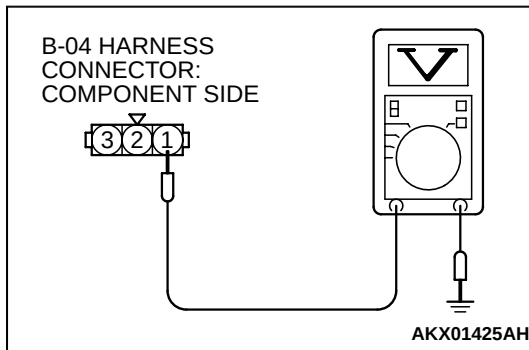
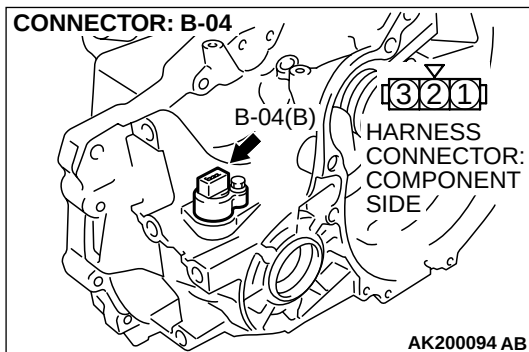


STEP 8. Check harness connector B-04 at vehicle speed sensor for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 9.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 17.



STEP 9. Measure the power supply voltage at vehicle speed sensor harness side connector B-04.

- (1) Disconnect connector B-04 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 1 and ground.
 - Voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

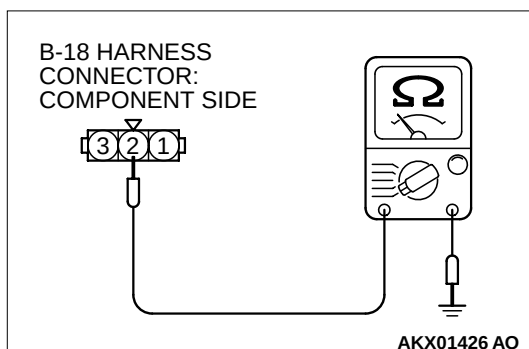
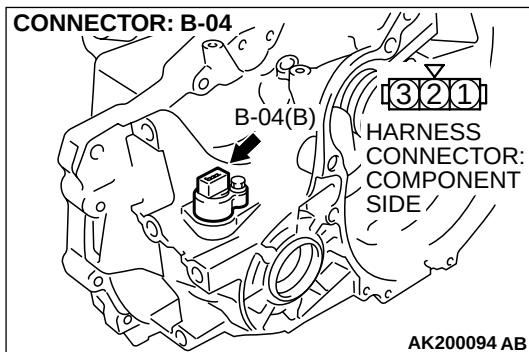
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 10.

NO : Check connectors C-124, C-210 and C-211 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connectors are in good condition, repair harness wire between ignition switch connector C-208 (terminal No. 2) and vehicle speed sensor connector B-04 (terminal No. 1) because of open circuit or short circuit to ground. Then go to Step 17.

STEP 10. Check for continuity at vehicle speed sensor harness side connector B-04.

- (1) Disconnect connector B-04 and measure at the harness side.

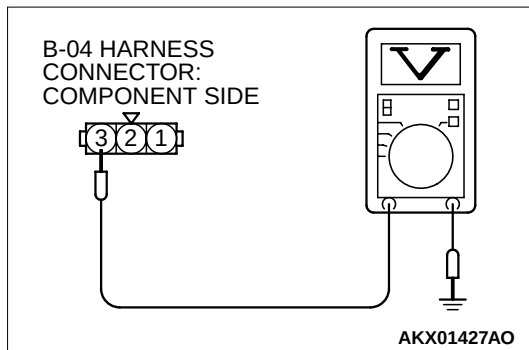
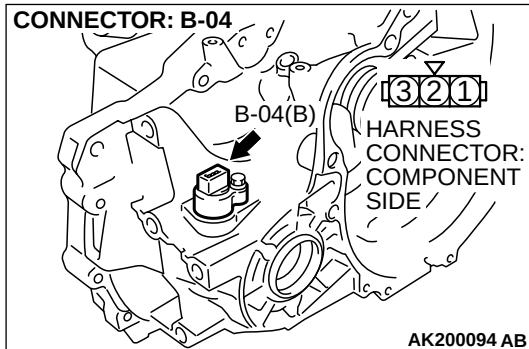


- (2) Check for the continuity between terminal No. 2 and ground.
 - Should be less than 2 ohms.

Q: Does continuity exist?

YES : Go to Step 11.

NO : Repair harness wire between vehicle speed sensor connector B-04 (terminal No. 2) and ground because of open circuit or harness damage. Then go to Step 17.



STEP 11. Measure the sensor supply voltage at vehicle speed sensor harness side connector B-04.

- (1) Disconnect the vehicle speed sensor connector B-04 and measure at the harness side.
- (2) Disconnect the combination meter connector, auto-cruise control-ECU connector and ETACS-ECU connector.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between terminal No. 3 and ground.
 - Voltage should measure between 4.8 and 5.2 volts.
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.8 and 5.2 volts?

YES : Go to Step 12.

NO : Repair harness wire between vehicle speed sensor connector B-04 (terminal No. 3) and ECM connector C-115 (terminal No. 86) because of short circuit to ground or harness damage. Then go to Step 17.

STEP 12. Check the vehicle speed sensor.

Refer to GROUP 54A, Combination Metre – Inspection – Vehicle Speed Sensor Check [P.54A-47](#).

Q: Is the vehicle speed sensor normal?

YES : Go to Step 13.

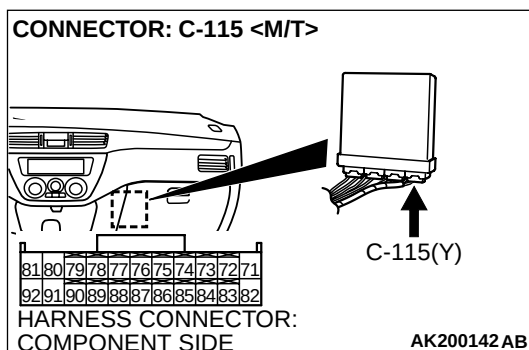
NO : Replace the vehicle speed sensor. Then go to Step 17.

STEP 13. Check harness connector C-115 at ECM for damage.

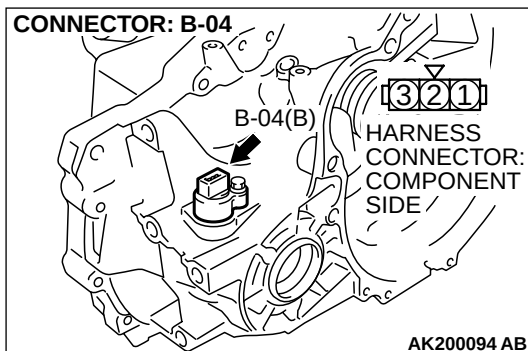
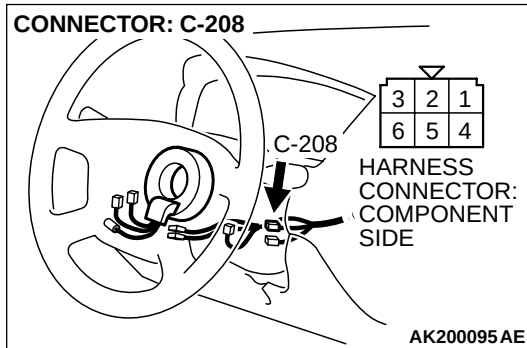
Q: Is the harness connector in good condition?

YES : Go to Step 14.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 17.



STEP 14. Check for harness damage between ignition switch connector C-208 (terminal No. 2) and vehicle speed sensor connector B-04 (terminal No. 1).

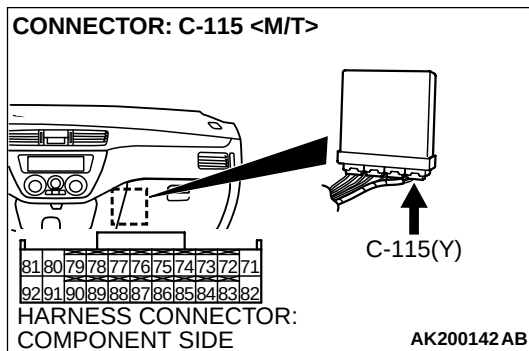
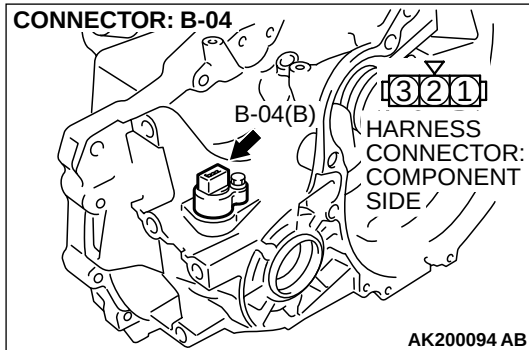


NOTE: Check harness after checking intermediate connectors C-124, C-210 and C-211. If intermediate connectors are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 17.

Q: Is the harness wire in good condition?

YES : Go to Step 15.

NO : Repair it. Then go to Step 17.

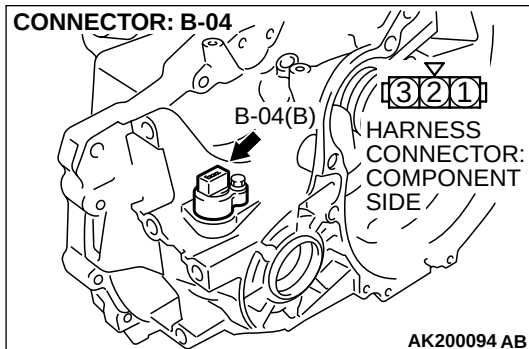


STEP 15. Check for harness damage between vehicle speed sensor connector B-04 (terminal No. 3) and ECM connector C-115 (terminal No. 86).

Q: Is the harness wire in good condition?

YES : Go to Step 16.

NO : Repair it. Then go to Step 17.

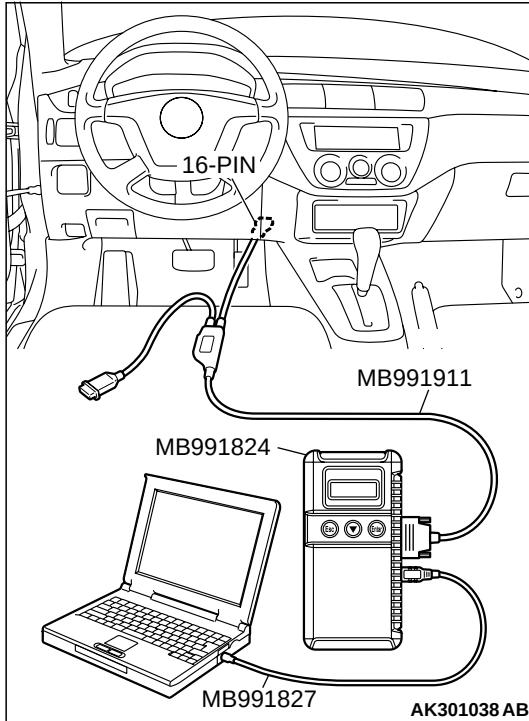


STEP 16. Check for harness damage between vehicle speed sensor connector B-04 (terminal No. 2) and ground.

Q: Is the harness wire in good condition?

YES : Check for harness wire between vehicle speed sensor connector B-04 (terminal No. 3) and other system because of short circuit to ground. Then go to Step 17.

NO : Repair it. Then go to Step 17.



STEP 17. Using scan tool MB991958, check data list item 24: Vehicle Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode for item 24, Vehicle Speed Sensor.
 - Check that the speedometer and MUT-III display speed match when traveling at a vehicle speed of 40 km/h (25 mph).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

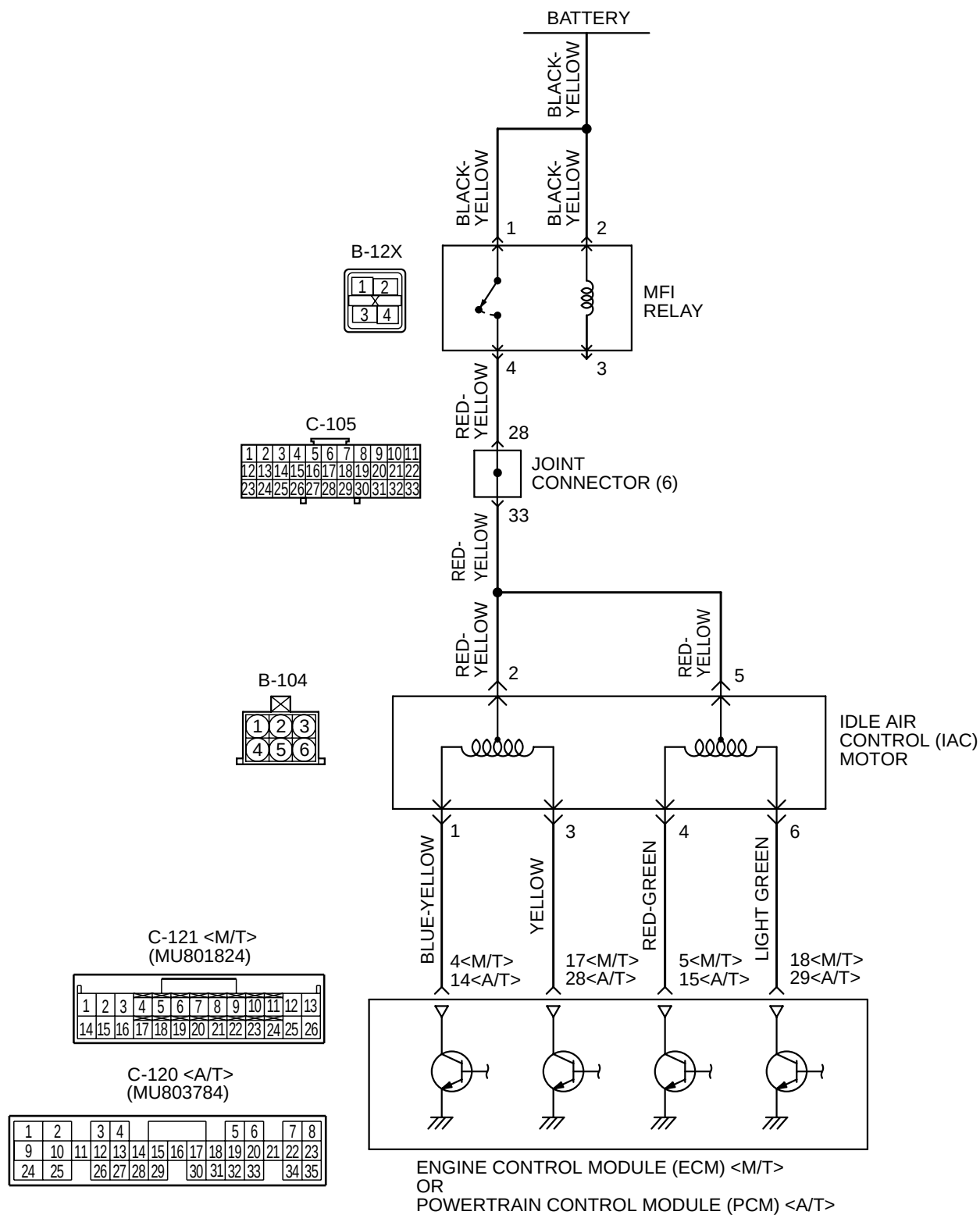
Q: Is the sensor operating properly?

YES : The procedure is complete.

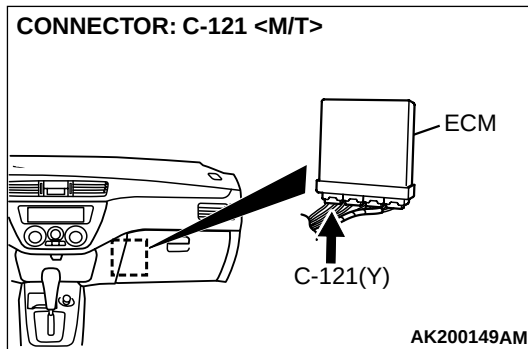
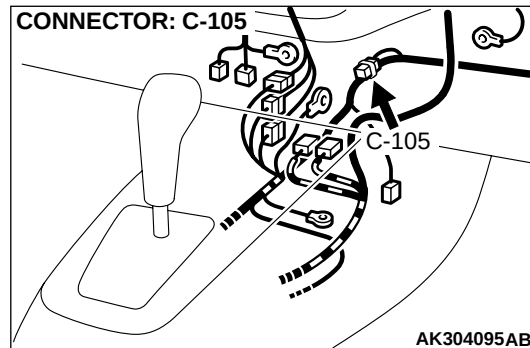
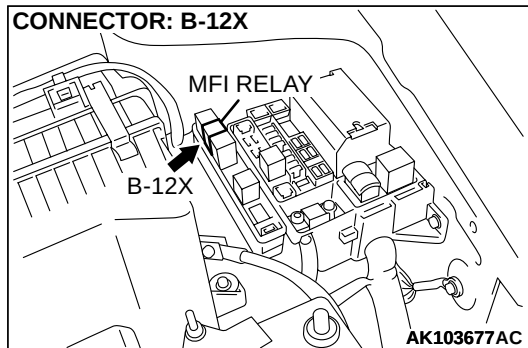
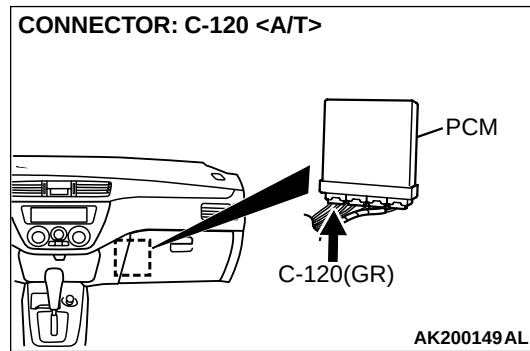
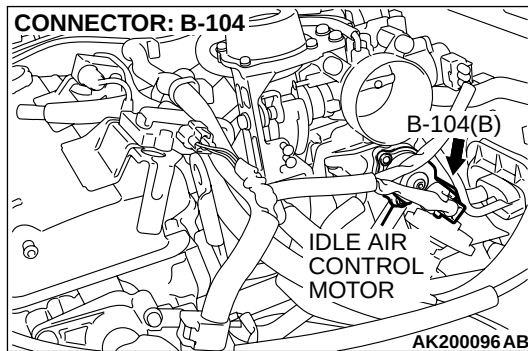
NO : Retry the troubleshooting.

DTC P0506: Idle Control System RPM Lower Than Expected

Idle Air Control (IAC) Motor Circuit



AK100034



CIRCUIT OPERATION

- The idle air control motor power is supplied from the MFI relay (terminal No. 4).
- The ECM (terminals No. 4, No. 5, No. 17, No. 18) <M/T> or PCM (terminals No. 14, No. 15, No. 28, No. 29) <A/T> drives the stepper motor by sequentially turning "ON" the power transistors in the ECM <M/T> or PCM <A/T> and providing ground to the idle air control motor (terminals No. 1, No. 3, No. 4, No. 6).

TECHNICAL DESCRIPTION

- The amount of air taken in during idling is regulated by the opening and closing of the servo valve located in the air passage that bypasses the throttle body.

- If there is a malfunction of the IAC system, the actual engine speed will not be identical to the target engine speed.
- The ECM <M/T> or PCM <A/T> checks the difference between the actual engine speed and the target engine speed.

DESCRIPTIONS OF MONITOR METHODS

- If the actual engine speed is lower by a prescribed value than the target idle speed, a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

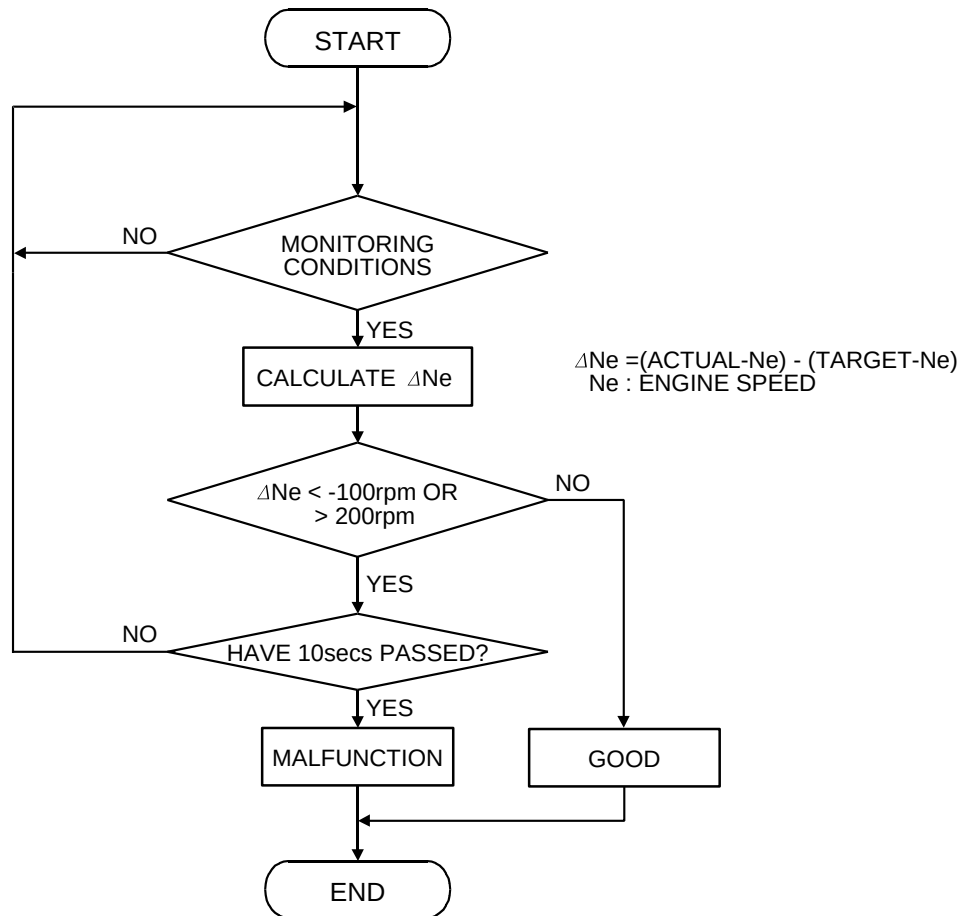
MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Misfire monitor
- EGR system monitor
- Fuel system monitor

Sensor (The sensor below is determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor
- Throttle position sensor

DTC SET CONDITIONS**Logic Flow Chart**

AK302332

Check Conditions

- Under the closed loop idle speed control.
- Engine coolant temperature is more than 77°C (171°F).
- Battery positive voltage is higher than 10 volts.
- Power steering pressure switch: "OFF".
- Volumetric efficiency is lower than 40 percent.
- Barometric pressure is higher than 76 kPa (22.4 in.Hg).
- Intake air temperature is higher than -10°C (14°F).
- 60 seconds have elapsed from the start of the previous monitoring.
- Target idle air control motor position is more than 100 steps.

Judgment Criteria

- The actual idle speed is more than 100 r/min lower than the target idle speed for 12 seconds.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle –
Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Idle air control motor failed.
- Open or shorted idle air control motor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B
- MB991709: Test Harness Set

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

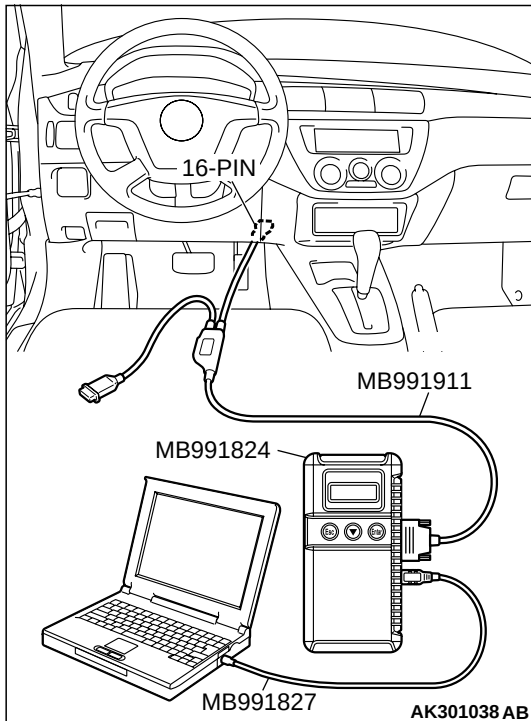
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958, read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the diagnostic trouble code other than P0506 set?

YES : Refer to Diagnostic Trouble Code Chart [P.13A-29](#).

NO : Go to Step 2.



STEP 2. Check the throttle body. (throttle valve area)**Q: Is the throttle valve area dirty?**

YES : Perform cleaning. Refer to On-vehicle Service – Throttle body (throttle valve area) cleaning

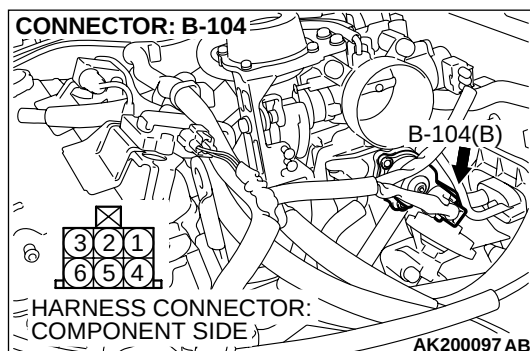
[P.13A-900](#). Then go to Step 14.

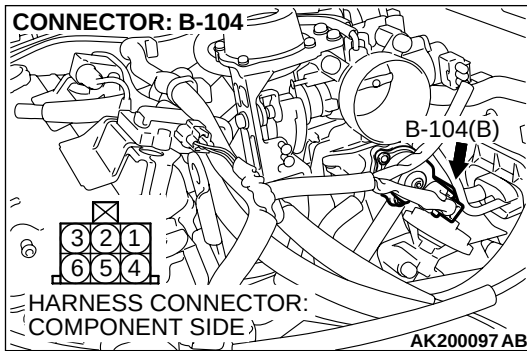
NO : Go to Step 3.

STEP 3. Check harness connector B-104 at idle air control motor for damage.**Q: Is the harness connector in good condition?**

YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.





STEP 4. Measure the idle air control motor coil resistance.

(1) Disconnect the idle air control motor connector B-104.

(2) Measure the resistance between idle air control motor connector terminal No. 2 and either terminal No. 1 or terminal No. 3.

Standard value: 28 – 33 ohms [at 20°C (68°F)]

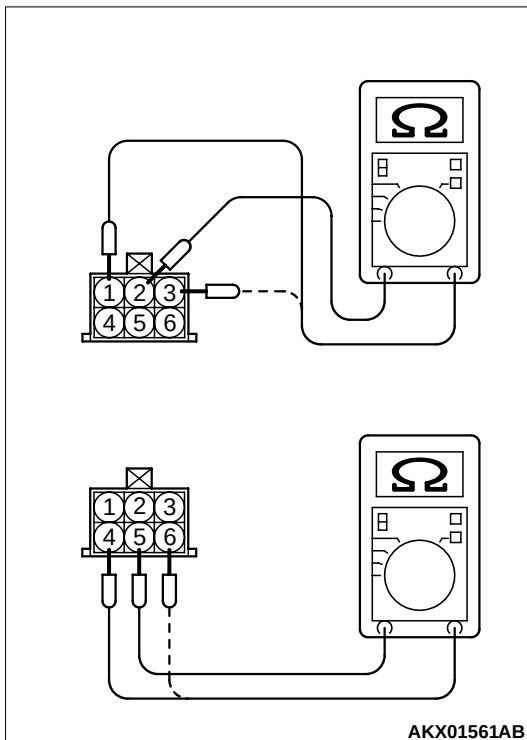
(3) Measure the resistance between idle air control motor connector terminal No. 5 and either terminal No. 4 or terminal No. 6.

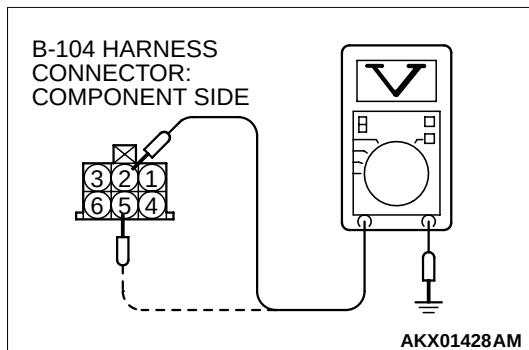
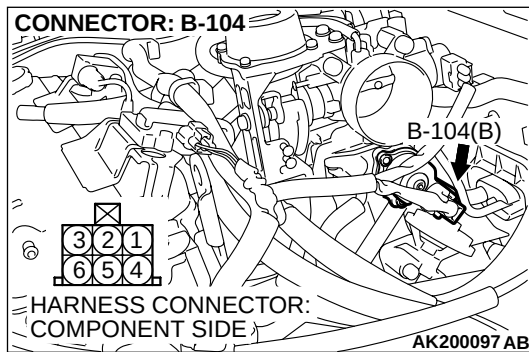
Standard value: 28 – 33 ohms [at 20°C (68°F)]

Q: Is the measured resistance between 28 and 33 ohms [at 20°C (68°F)]?

YES : Go to Step 5.

NO : Replace the idle air control motor. Then go to Step 14.



**STEP 5. Measure the power supply voltage at idle air control motor harness side connector B-104.**

- (1) Disconnect connector B-104 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminals No. 2, No. 5 and ground.

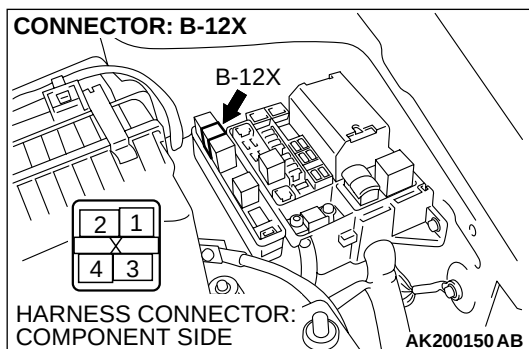
- Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 7.

NO : Go to Step 6.

**STEP 6. Check harness connector B-12X at MFI relay for damage.**

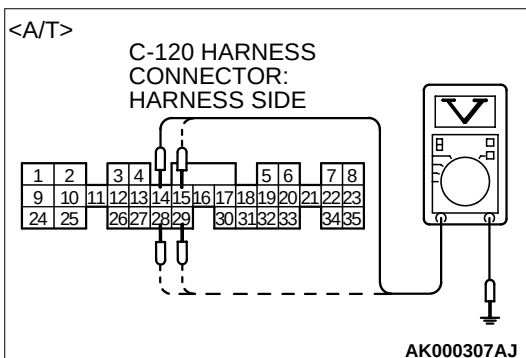
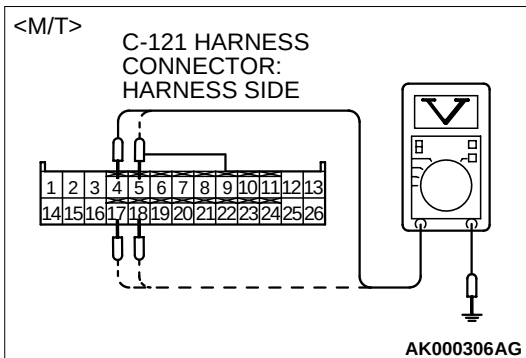
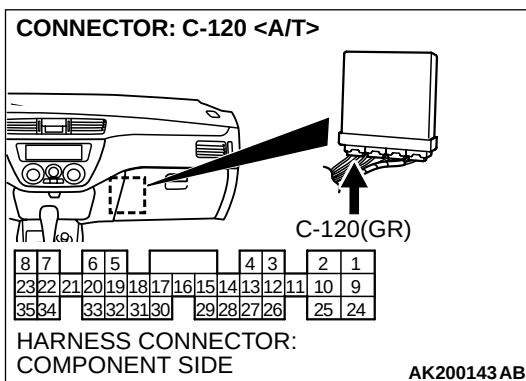
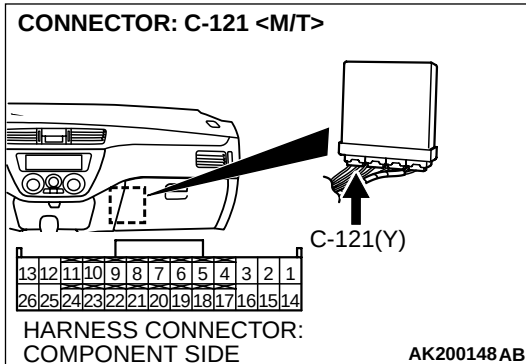
Q: Is the harness connector in good condition?

YES : Check connector C-105 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector is in good condition, repair harness wire between MFI relay connector B-12X (terminal No. 4) and idle air control motor connector B-104 (terminals No. 2, No. 5) because of open circuit or short circuit to ground. Then go to Step 14.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.

STEP 7. Measure the power supply voltage at ECM connector C-121 <M/T> or PCM connector C-120 <A/T> by backprobing.

(1) Do not disconnect connector C-121 <M/T> or C-120 <A/T>.



(2) Measure the voltage between terminals (No. 4, No. 5, No. 17, No. 18) <M/T> or (No. 14, No. 15, No. 28, No. 29) <A/T> and ground by backprobing.

- The voltage is 1 volt or lower for approximately 3 seconds, then changes to the battery positive voltage when the Ignition switch is turned from the "LOCK" (OFF) position to the "ON" position.

(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 10.

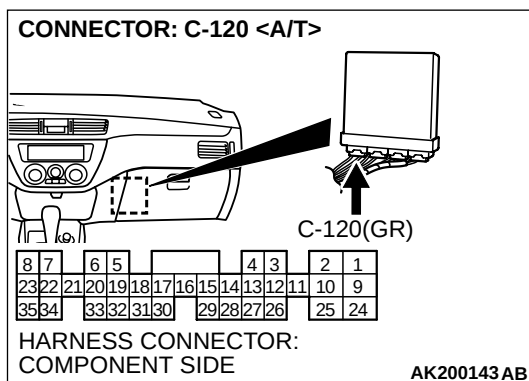
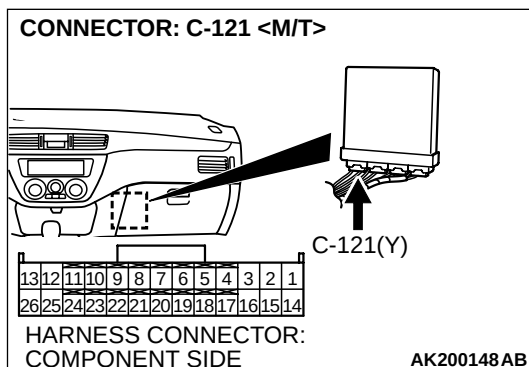
NO : Go to Step 8.

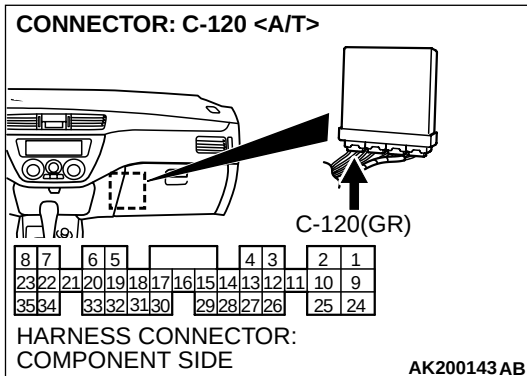
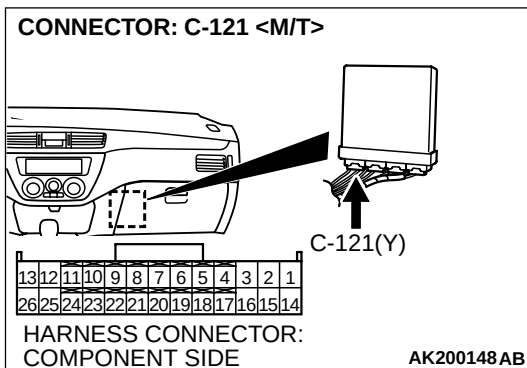
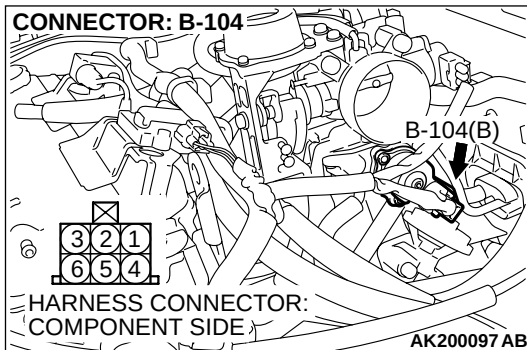
STEP 8. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 9.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.





STEP 9. Check for open circuit and short circuit to ground between idle air control motor connector B-104 and ECM connector C-121 <M/T> or PCM connector C-120 <A/T>.

- Idle air control motor connector B-104 (terminal No. 1) and ECM connector C-121 (terminal No. 4) <M/T> or PCM connector C-120 (terminal No. 14) <A/T>.
- Idle air control motor connector B-104 (terminal No. 3) and ECM connector C-121 (terminal No. 17) <M/T> or PCM connector C-120 (terminal No. 28) <A/T>.
- Idle air control motor connector B-104 (terminal No. 4) and ECM connector C-121 (terminal No. 5) <M/T> or PCM connector C-120 (terminal No. 15) <A/T>.
- Idle air control motor connector B-104 (terminal No. 6) and ECM connector C-121 (terminal No. 18) <M/T> or PCM connector C-120 (terminal No. 29) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

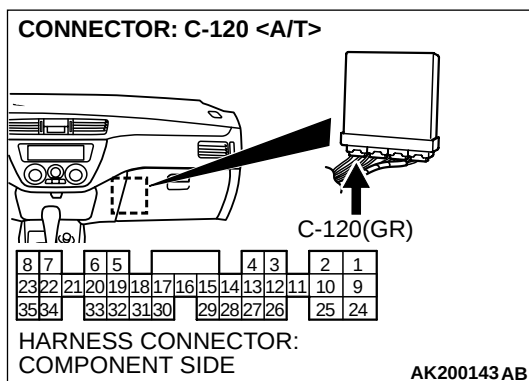
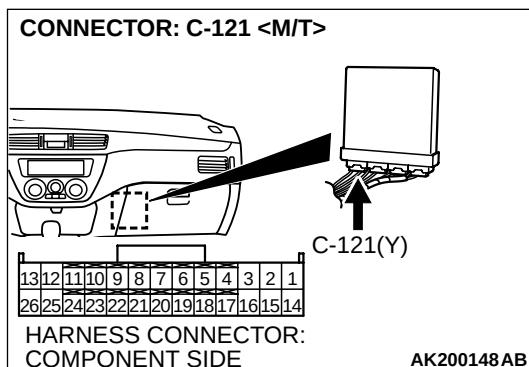
NO : Repair it. Then go to Step 14.

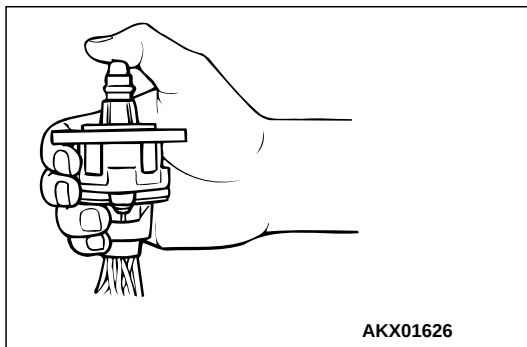
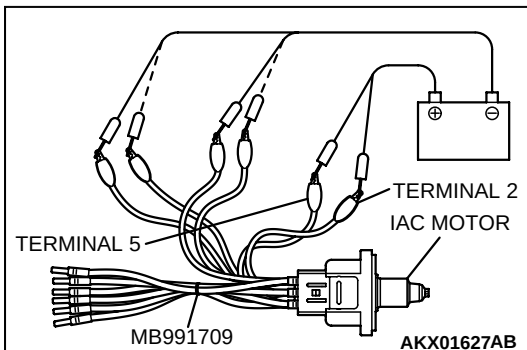
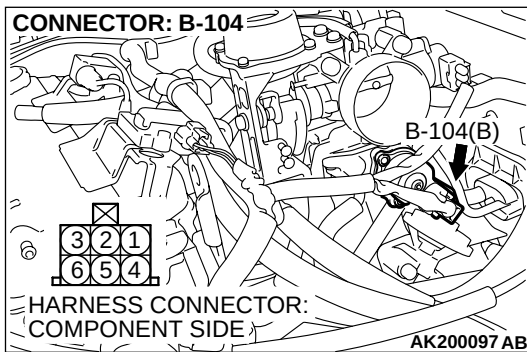
STEP 10. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 11.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.





STEP 11. Check the idle air control motor operation using special tool MB991709.

(1) Remove the idle air control motor.

(2) Connect special tool MB991709 to the idle air control motor.
(All terminals should be connected.)

(3) Use the jumper wires to connect terminal No. 2 of the idle air control motor connector to the positive battery terminal.

(4) Check to ensure that the motor operates when the terminals No. 1 and No. 3 of the idle air control motor connector are respectively connected to the negative battery terminal using a jumper wire.

- Vibration should be present at each application of voltage to test clip combination.

(5) Then, use jumper wires to connect the terminal No. 5 of the idle air control motor connector to the positive battery terminal.

(6) Check to ensure that the motor operates when the terminals No. 4 and No. 6 of the idle air control motor connector are respectively connected to the negative battery terminal using a jumper wire.

- Vibration should be present at each application of voltage to test clip combination.

(7) Install the idle air control motor. Refer to Throttle Body Assembly – Disassembly and Assembly [P.13A-923](#).

Q: Is the idle air control motor operating properly?

YES : Go to Step 12.

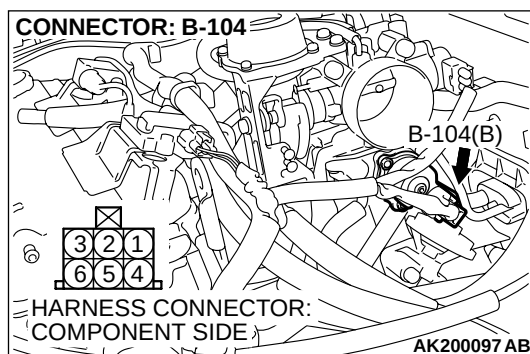
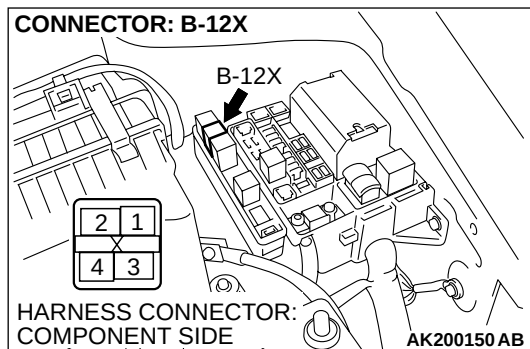
NO : Replace the idle air control motor. Then go to Step 14.

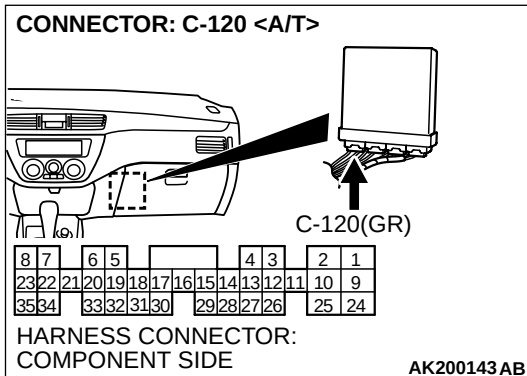
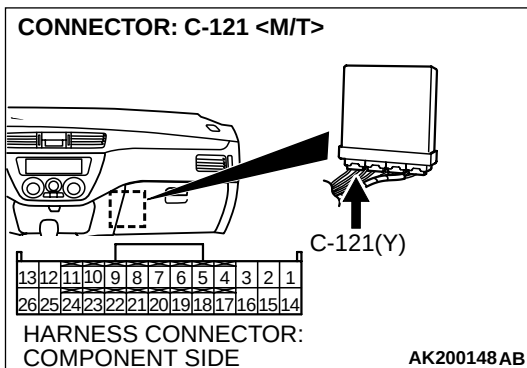
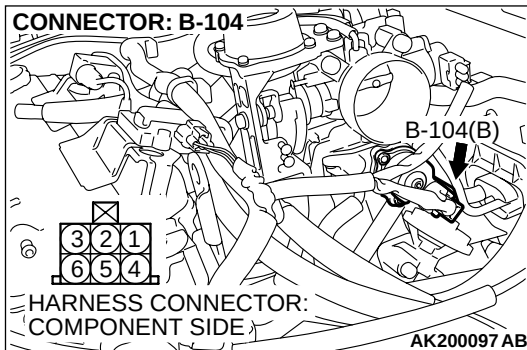
STEP 12. Check for harness damage between MFI relay connector B-12X (terminal No. 4) and idle air control motor connector B-104 (terminals No. 2, No. 5).

Q: Is the harness wire in good condition?

YES : Go to Step 13.

NO : Repair it. Then go to Step 14.





STEP 13. Check for harness damage between idle air control motor connector B-104 and ECM connector C-121 <M/T> or PCM connector C-120 <A/T>.

- Idle air control motor connector B-104 (terminal No. 1) and ECM connector C-121 (terminal No. 4) <M/T> or PCM connector C-120 (terminal No. 14) <A/T>.
- Idle air control motor connector B-104 (terminal No. 3) and ECM connector C-121 (terminal No. 17) <M/T> or PCM connector C-120 (terminal No. 28) <A/T>.
- Idle air control motor connector B-104 (terminal No. 4) and ECM connector C-121 (terminal No. 5) <M/T> or PCM connector C-120 (terminal No. 15) <A/T>.
- Idle air control motor connector B-104 (terminal No. 6) and ECM connector C-121 (terminal No. 18) <M/T> or PCM connector C-120 (terminal No. 29) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

NO : Repair it. Then go to Step 14.

STEP 14. Test the OBD-II drive cycle.

- Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- Check the diagnostic trouble code (DTC).

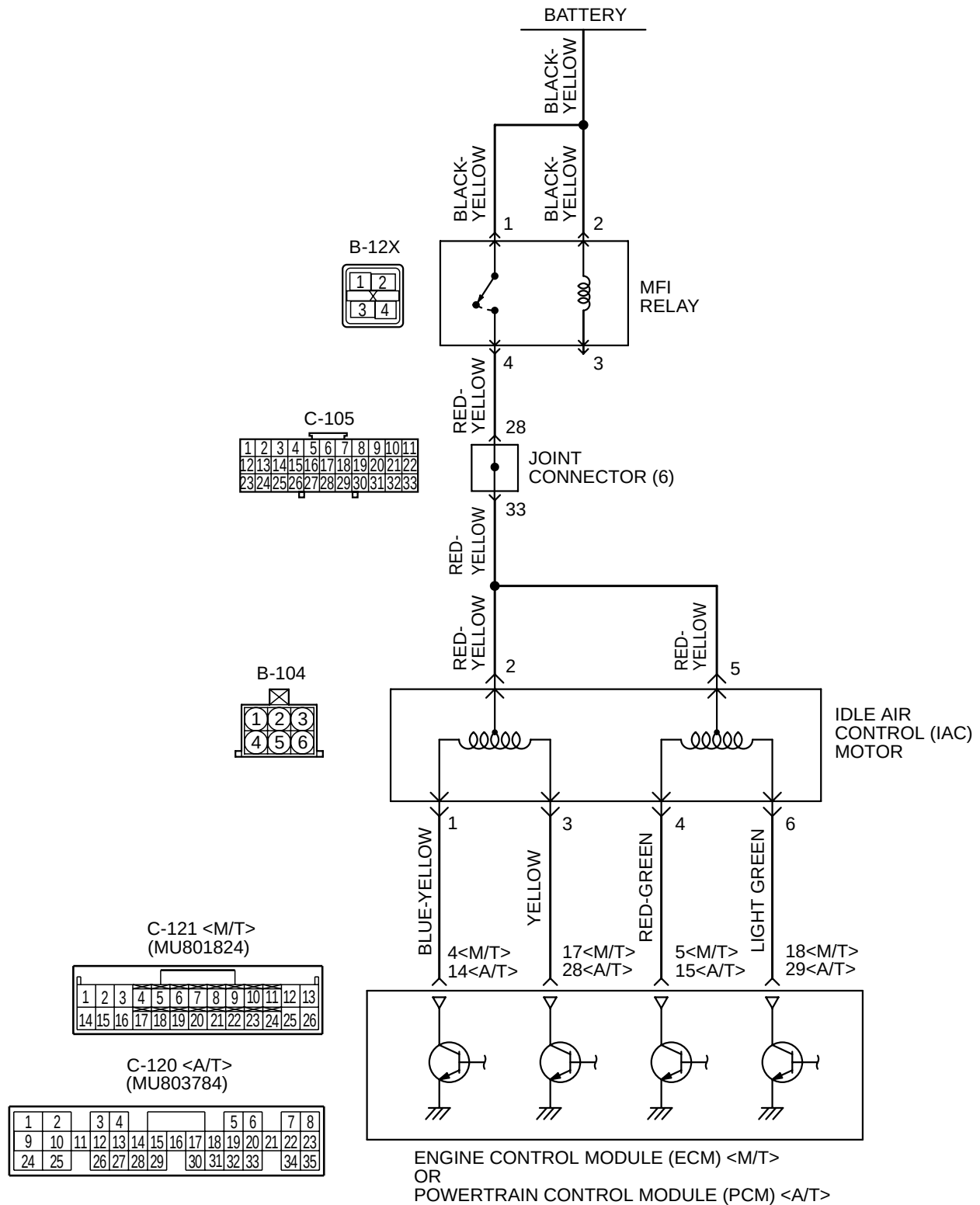
Q: Is DTC P0506 set?

YES : Retry the troubleshooting.

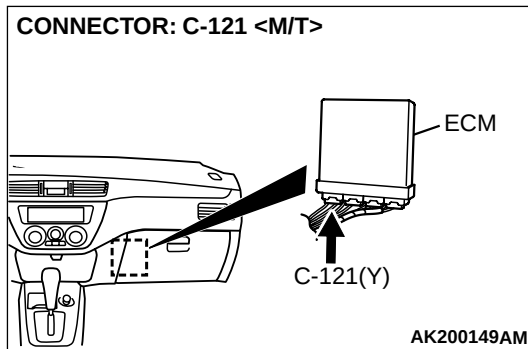
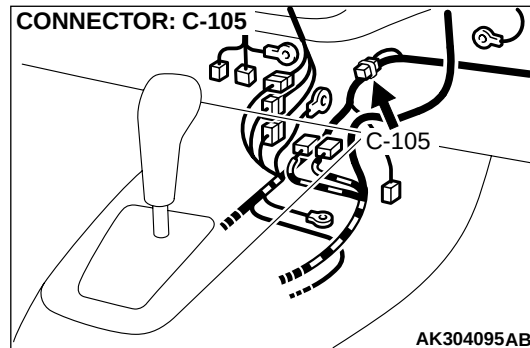
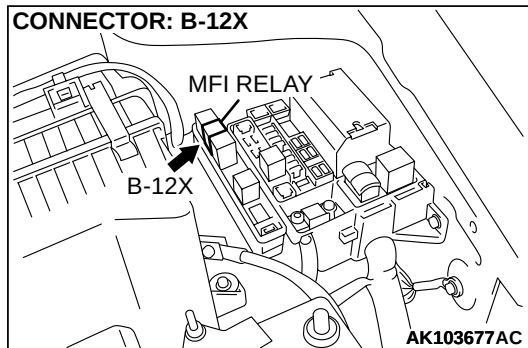
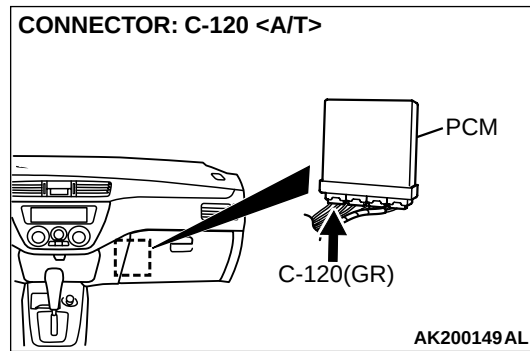
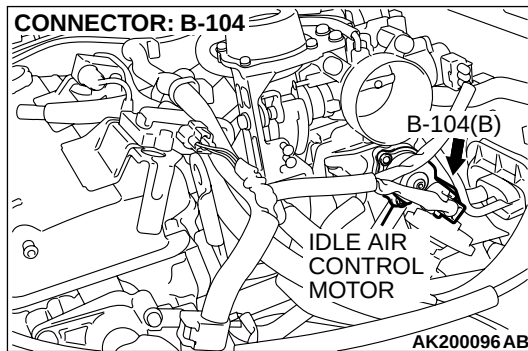
NO : The inspection is complete.

DTC P0507: Idle Control System RPM Higher Than Expected

Idle Air Control (IAC) Motor Circuit



AK100034



CIRCUIT OPERATION

- The idle air control motor power is supplied from the MFI relay (terminal No. 4).
- The ECM (terminals No. 4, No. 5, No. 17, No. 18) <M/T> or PCM (terminals No. 14, No. 15, No. 28, No. 29) <A/T> drives the stepper motor by sequentially turning "ON" the power transistors in the ECM <M/T> or PCM <A/T> and providing ground to the idle air control motor (terminals No. 1, No. 3, No. 4, No. 6).

TECHNICAL DESCRIPTION

- The amount of air taken in during idling is regulated by the opening and closing of the servo valve located in the air passage that bypasses the throttle body.

- If there is a malfunction of the IAC system, the actual engine speed will not be identical to the target engine speed.
- The ECM <M/T> or PCM <A/T> checks the difference between the actual engine speed and the target engine speed.

DESCRIPTIONS OF MONITOR METHODS

- If the actual engine speed is higher by a prescribed value than the target idle speed, a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

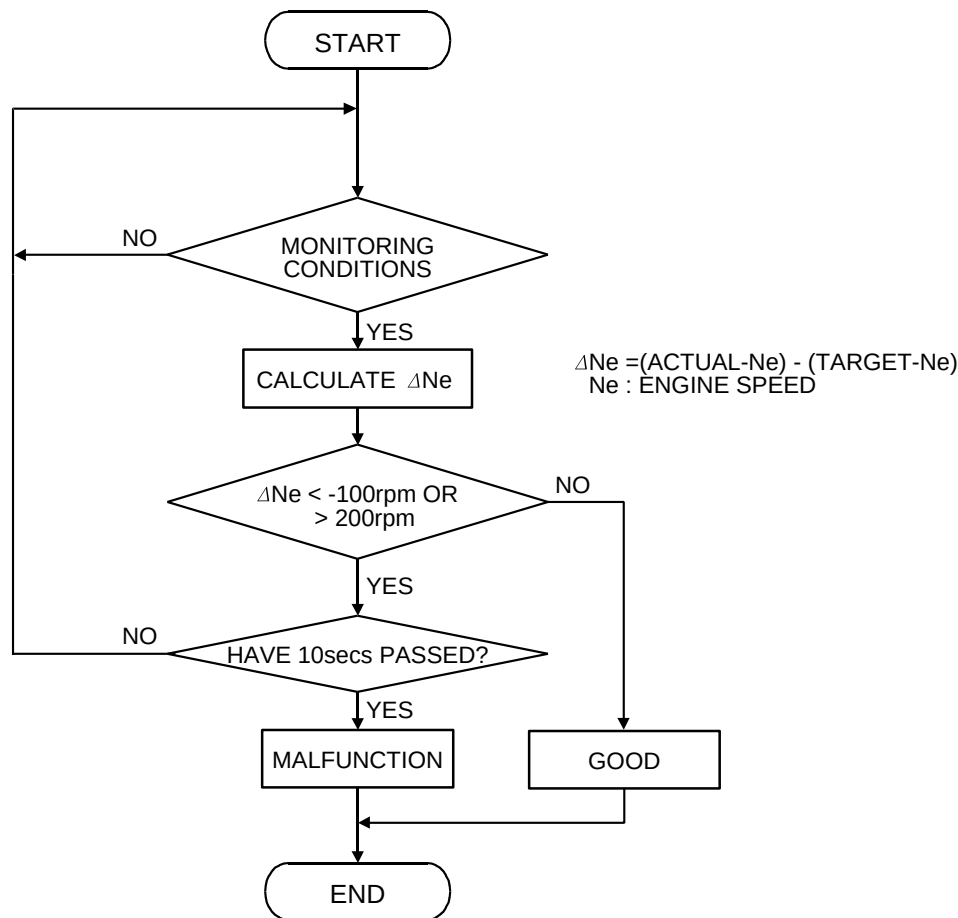
MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Misfire monitor
- EGR system monitor
- Fuel system monitor

Sensor (The sensor below is determined to be normal)

- Volume airflow sensor
- Barometric pressure sensor
- Intake air temperature sensor
- Engine coolant temperature sensor
- Throttle position sensor

DTC SET CONDITIONS**Logic Flow Chart**

AK302332

Check Conditions

- Vehicle speed has reached 1.5 km/h (0.93 mph) or more at least once.
- Under the closed loop idle speed control.
- Engine coolant temperature is higher than 77°C (171°F).
- Battery positive voltage is higher than 10 volts.
- Barometric pressure is higher than 76 kPa (22.4 in.Hg).

- Intake air temperature is higher than -10°C (14°F).
- 60 seconds have elapsed from the start of the previous monitoring.
- Target idle air control motor position is 0 steps.

Judgment Criteria

- Actual idle speed has continued to be higher than the target idle speed by 200 r/min (300 r/min*) or more for 12 seconds.

*: Specs in parentheses are applicable if the maximum air temperature during the previous operation was more than 45°C (113°F).

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle –
Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Idle air control motor failed.
- Open or shorted idle air control motor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B
- MB991709: Test Harness Set

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

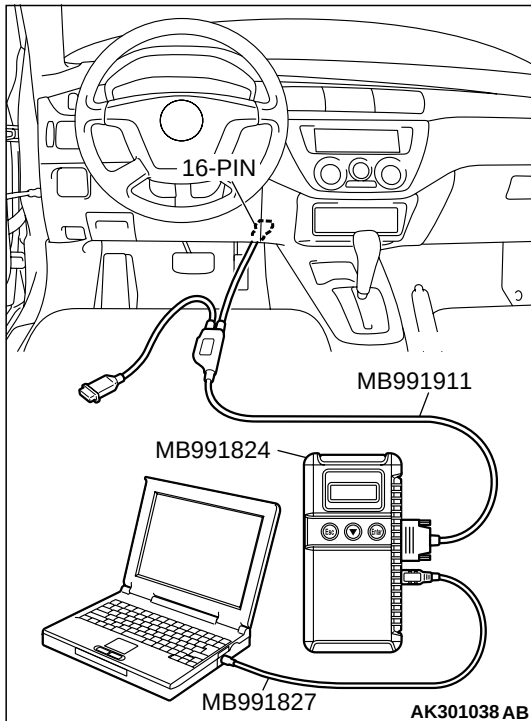
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958, read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the diagnostic trouble code other than P0507 output?

YES : Refer to Diagnostic Trouble Code Chart [P.13A-29](#).

NO : Go to Step 2.

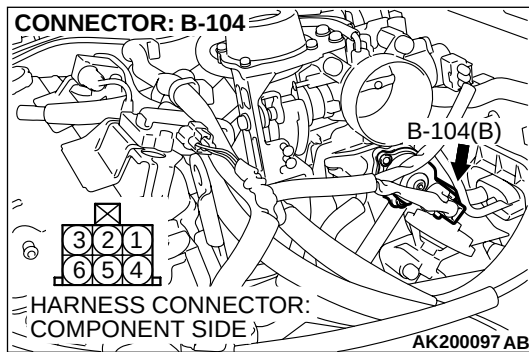


STEP 2. Check for intake system vacuum leaks.

Q: Are there any abnormalities?

YES : Go to Step 3.

NO : Repair or replace it. Then go to Step 14.

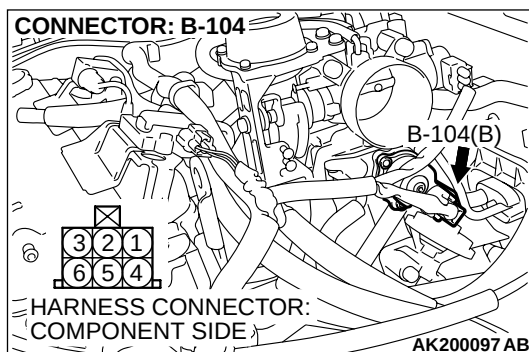


STEP 3. Check harness connector B-104 at idle air control motor for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.



STEP 4. Measure the idle air control motor coil resistance.

(1) Disconnect the idle air control motor connector B-104.

(2) Measure the resistance between idle air control motor connector terminal No. 2 and either terminal No. 1 or terminal No. 3.

Standard value: 28 – 33 ohms [at 20°C (68°F)]

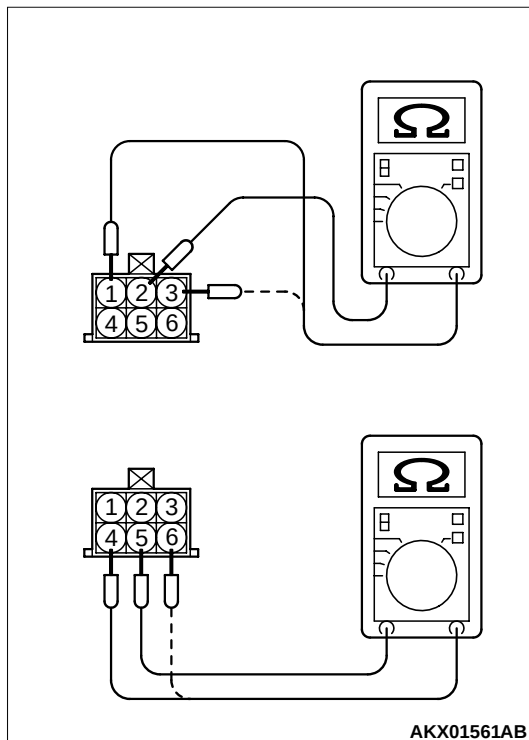
(3) Measure the resistance between idle air control motor connector terminal No. 5 and either terminal No. 4 or terminal No. 6.

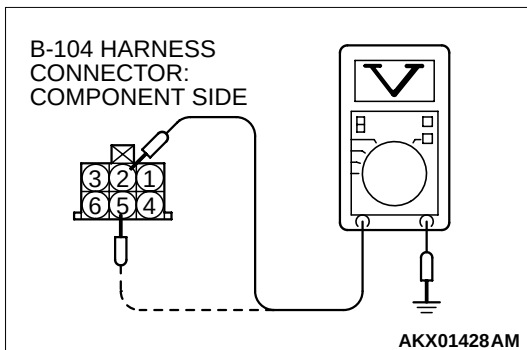
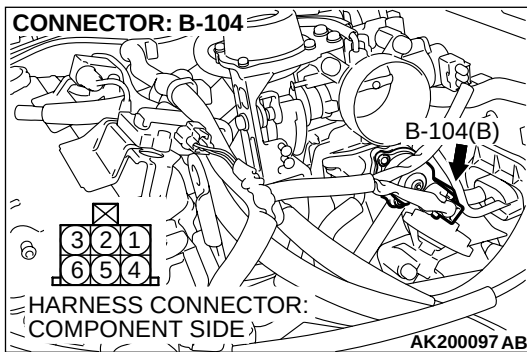
Standard value: 28 – 33 ohms [at 20°C (68°F)]

Q: Is the measured resistance between 28 and 33 ohms [at 20°C (68°F)]?

YES : Go to Step 5.

NO : Replace the idle air control motor. Then go to Step 14.





STEP 5. Measure the power supply voltage at idle air control motor harness side connector B-104.

- (1) Disconnect connector B-104 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminals No. 2, No. 5 and ground.

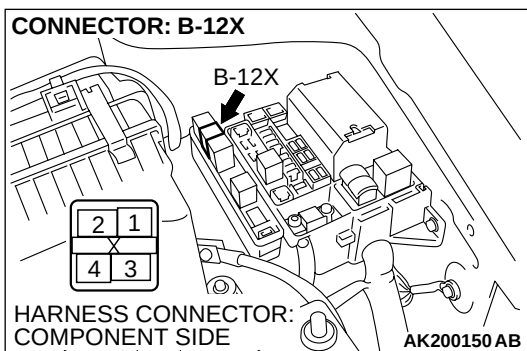
- Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 7.

NO : Go to Step 6.



STEP 6. Check harness connector B-12X at MFI relay for damage.

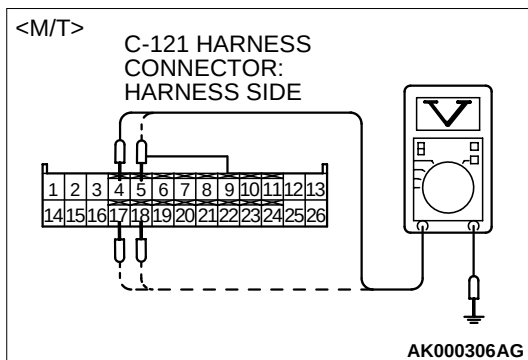
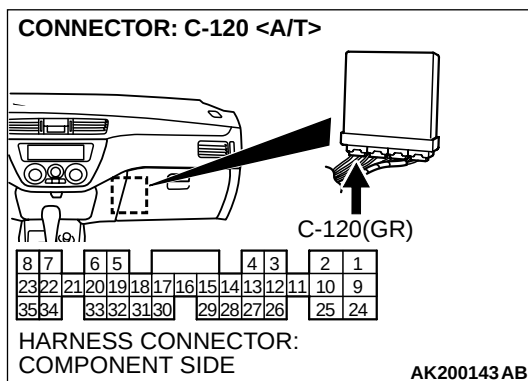
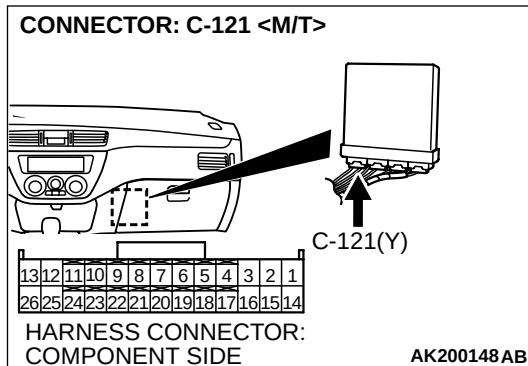
Q: Is the harness connector in good condition?

YES : Check connector C-105 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector is in good condition, repair harness wire between MFI relay connector B-12X (terminal No. 4) and idle air control motor connector B-104 (terminals No. 2, No. 5) because of open circuit or short circuit to ground. Then go to Step 14.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.

STEP 7. Measure the power supply voltage at ECM connector C-121 <M/T> or PCM connector C-120 <A/T> by backprobing.

(1) Do not disconnect connector C-121 <M/T> or C-120 <A/T>.



(2) Measure the voltage between terminals (No. 4, No. 5, No. 17, No. 18) <M/T> or (No. 14, No. 15, No. 28, No. 29) <A/T> and ground by backprobing.

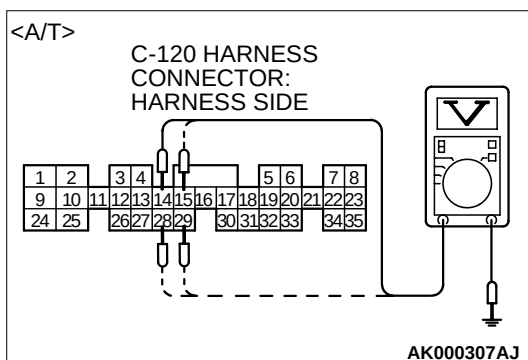
- The voltage is 1 volt or lower for approximately 3 seconds, then changes to the battery positive voltage when the Ignition switch is turned from the "LOCK" (OFF) position to the "ON" position.

(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 10.

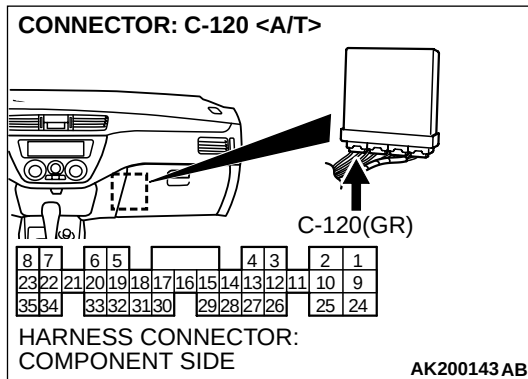
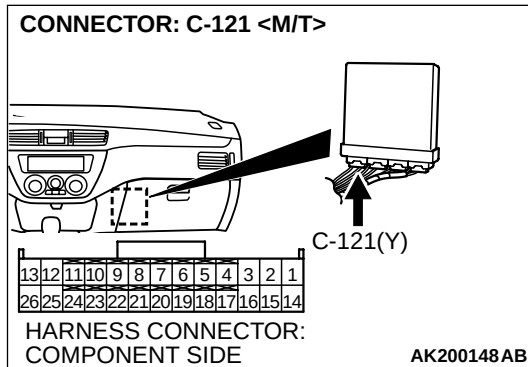
NO : Go to Step 8.

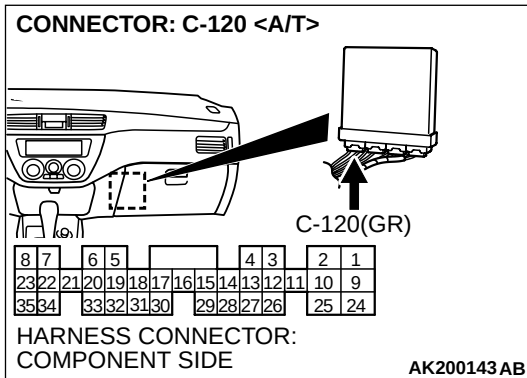
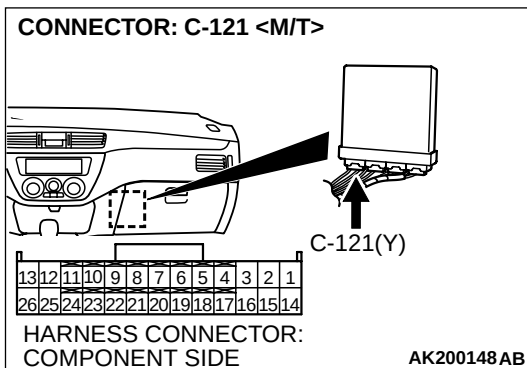
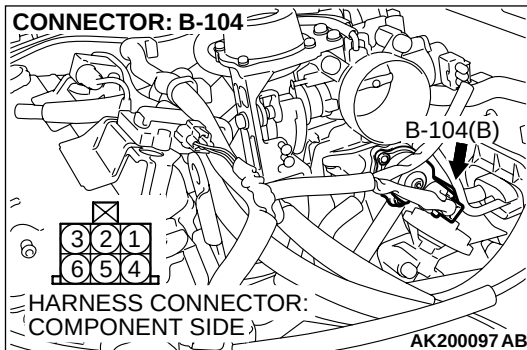


STEP 8. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

YES : Go to Step 9.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.





STEP 9. Check for open circuit and short circuit to ground between idle air control motor connector B-104 and ECM connector C-121 <M/T> or PCM connector C-120 <A/T>.

- Idle air control motor connector B-104 (terminal No. 1) and ECM connector C-121 (terminal No. 4) <M/T> or PCM connector C-120 (terminal No. 14) <A/T>.
- Idle air control motor connector B-104 (terminal No. 3) and ECM connector C-121 (terminal No. 17) <M/T> or PCM connector C-120 (terminal No. 28) <A/T>.
- Idle air control motor connector B-104 (terminal No. 4) and ECM connector C-121 (terminal No. 5) <M/T> or PCM connector C-120 (terminal No. 15) <A/T>.
- Idle air control motor connector B-104 (terminal No. 6) and ECM connector C-121 (terminal No. 18) <M/T> or PCM connector C-120 (terminal No. 29) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

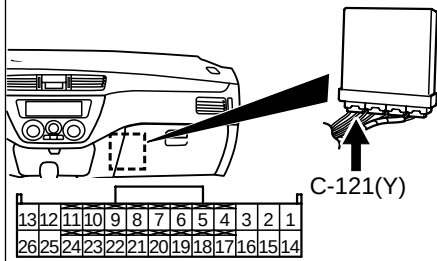
NO : Repair it. Then go to Step 14.

STEP 10. Check harness connector C-121 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

YES : Go to Step 11.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.

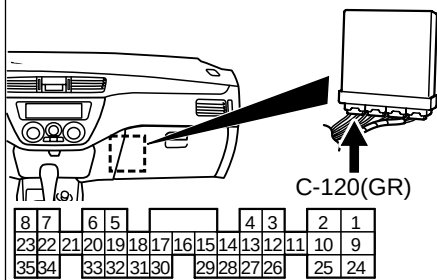
CONNECTOR: C-121 <M/T>



HARNESS CONNECTOR:
COMPONENT SIDE

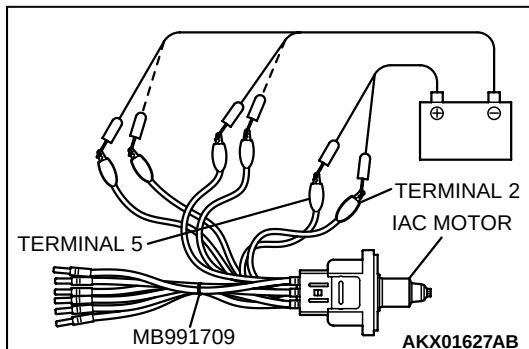
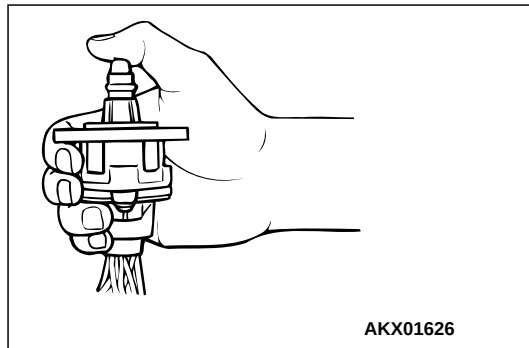
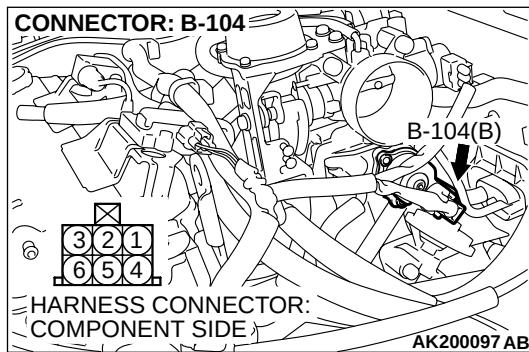
AK200148 AB

CONNECTOR: C-120 <A/T>



HARNESS CONNECTOR:
COMPONENT SIDE

AK200143 AB



STEP 11. Check the idle air control motor operation using special tool MB991709.

(1) Remove the idle air control motor.

(2) Connect special tool MB991709 to the idle air control motor.
(All terminals should be connected.)

(3) Use the jumper wires to connect terminal No. 2 of the idle air control motor connector to the positive battery terminal.

(4) Check to ensure that the motor operates when the terminals No. 1 and No. 3 of the idle air control motor connector are respectively connected to the negative battery terminal using a jumper wire.

- Vibration should be present at each application of voltage to test clip combination.

(5) Then, use jumper wires to connect the terminal No. 5 of the idle air control motor connector to the positive battery terminal.

(6) Check to ensure that the motor operates when the terminals No. 4 and No. 6 of the idle air control motor connector are respectively connected to the negative battery terminal using a jumper wire.

- Vibration should be present at each application of voltage to test clip combination.

(7) Install the idle air control motor. Refer to Throttle Body Assembly – Disassembly and Assembly [P.13A-923](#).

Q: Is the idle air control motor operating properly?

YES : Go to Step 12.

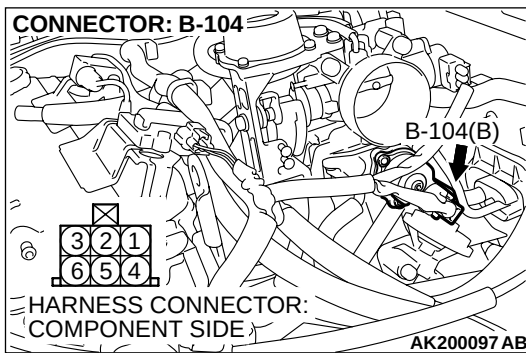
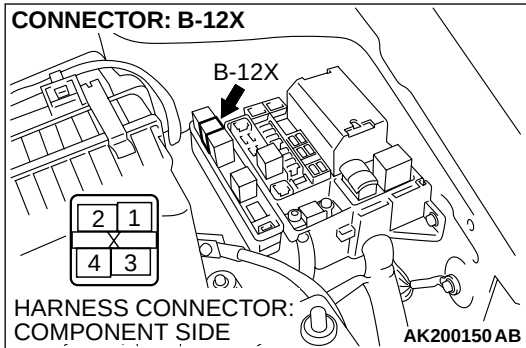
NO : Replace the idle air control motor. Then go to Step 14.

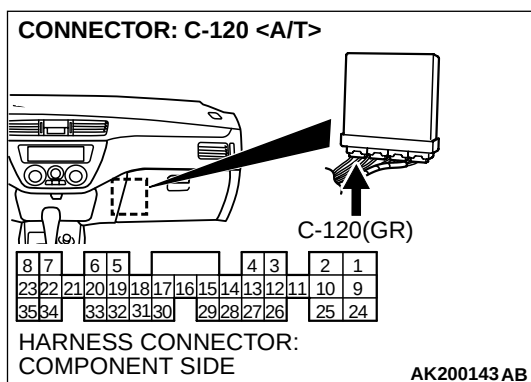
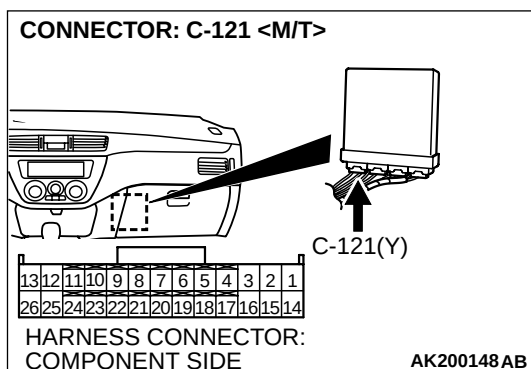
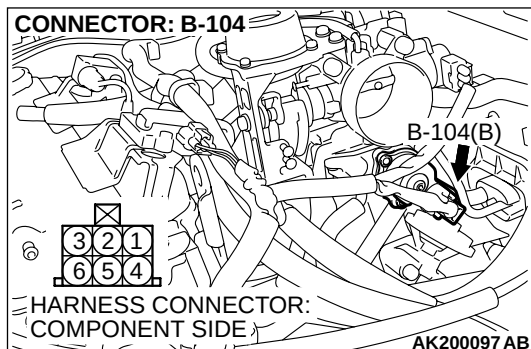
STEP 12. Check for harness damage between MFI relay connector B-12X (terminal No. 4) and idle air control motor connector B-104 (terminals No. 2, No. 5).

Q: Is the harness wire in good condition?

YES : Go to Step 13.

NO : Repair it. Then go to Step 14.





STEP 13. Check for harness damage between idle air control motor connector B-104 and ECM connector C-121 <M/T> or PCM connector C-120 <A/T>.

- Idle air control motor connector B-104 (terminal No. 1) and ECM connector C-121 (terminal No. 4) <M/T> or PCM connector C-120 (terminal No. 14) <A/T>.
- Idle air control motor connector B-104 (terminal No. 3) and ECM connector C-121 (terminal No. 17) <M/T> or PCM connector C-120 (terminal No. 28) <A/T>.
- Idle air control motor connector B-104 (terminal No. 4) and ECM connector C-121 (terminal No. 5) <M/T> or PCM connector C-120 (terminal No. 15) <A/T>.
- Idle air control motor connector B-104 (terminal No. 6) and ECM connector C-121 (terminal No. 18) <M/T> or PCM connector C-120 (terminal No. 29) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

NO : Repair it. Then go to Step 14.

STEP 14. Test the OBD-II drive cycle.

- Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- Check the diagnostic trouble code (DTC).

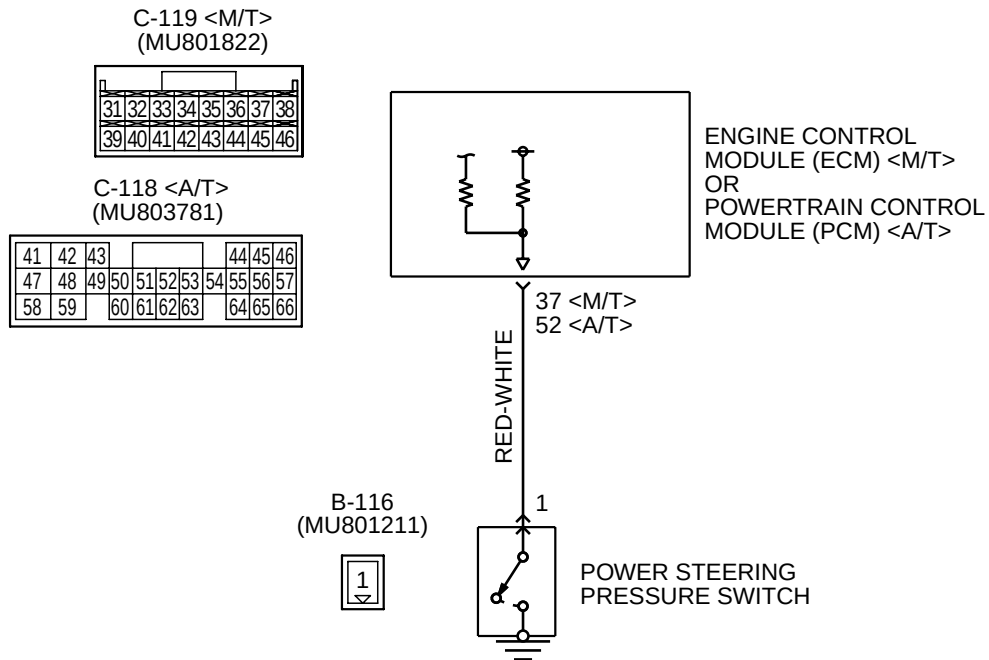
Q: Is DTC P0507 set?

YES : Retry the troubleshooting.

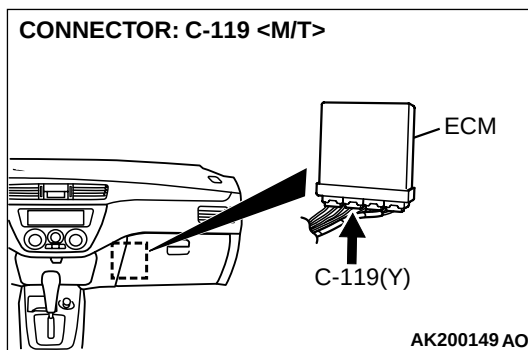
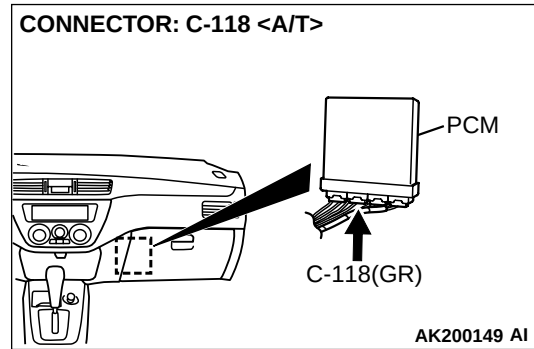
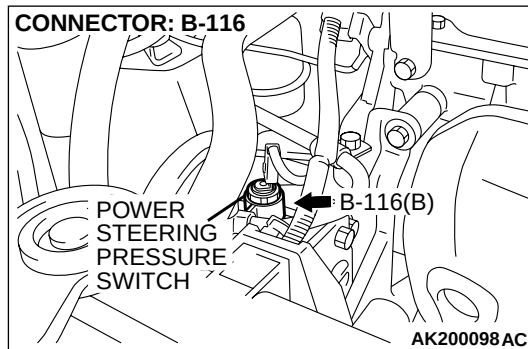
NO : The inspection is complete.

DTC P0551: Power Steering Pressure Sensor Circuit Range/Performance

Power Steering Pressure Switch Circuit



AK304163



CIRCUIT OPERATION

- A battery positive voltage is applied to the power steering pressure switch output terminal (terminal No. 1) from the ECM (terminal No. 37) <M/T> or PCM (terminal No. 52) <A/T> via the resistor in the ECM <M/T> or PCM <A/T>.

TECHNICAL DESCRIPTION

- The power steering pressure switch converts the existence of a power steering load into a high/low voltage, and inputs it into the ECM <M/T> or PCM <A/T>.
- When the steering wheel is turned, hydraulic pressure rises. The power steering pressure switch closes, and the applied battery positive voltage will be grounded. With this, the power steering pressure switch output voltage will fluctuate between 12 volts and 0 volt.
- While driving with the steering wheel held straight, the power steering pressure switch turns "OFF".

- The ECM <M/T> or PCM <A/T> checks whether the power steering pressure switch turns "OFF" or "ON" during driving.

DESCRIPTIONS OF MONITOR METHODS

- If the power steering pressure switch is constantly ON in spite of repeating the prescribed (stop-and-go) driving pattern, a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

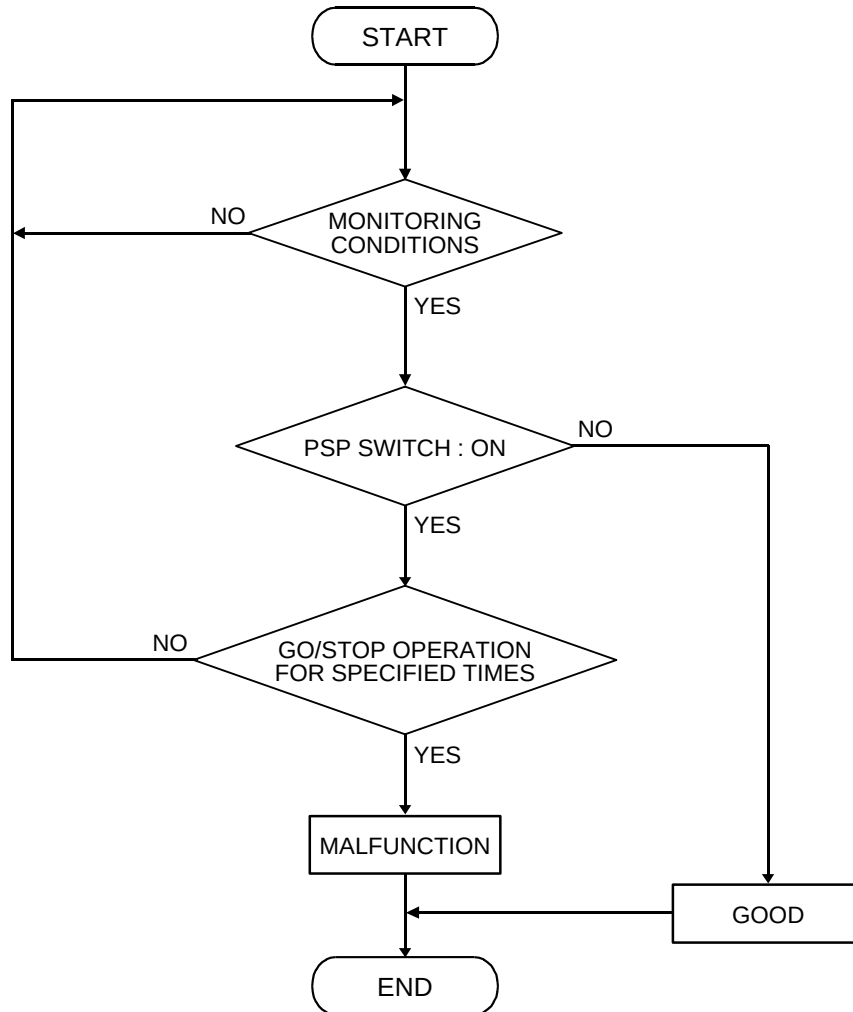
- Not applicable

Sensor (The sensor below is determined to be normal)

- Engine coolant temperature sensor

DTC SET CONDITIONS

Logic Flow Chart



AK302333

Check Conditions

- Engine coolant temperature is higher than 18°C (64°F).
- Drive for 4 seconds or more with the vehicle speed is 50 km/h (31 mph) or more. Stop the vehicle [vehicle speed is 1.5 km/h (0.93 mph) or less]. Repeat 10 times or more.

Judgment Criteria

- Power steering pressure switch continues to be "ON".

OBD-II DRIVE CYCLE PATTERN

None.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Power steering pressure switch failed.
- Open or shorted power steering pressure switch circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check data list item 27: Power Steering Pressure Switch.**⚠ CAUTION**

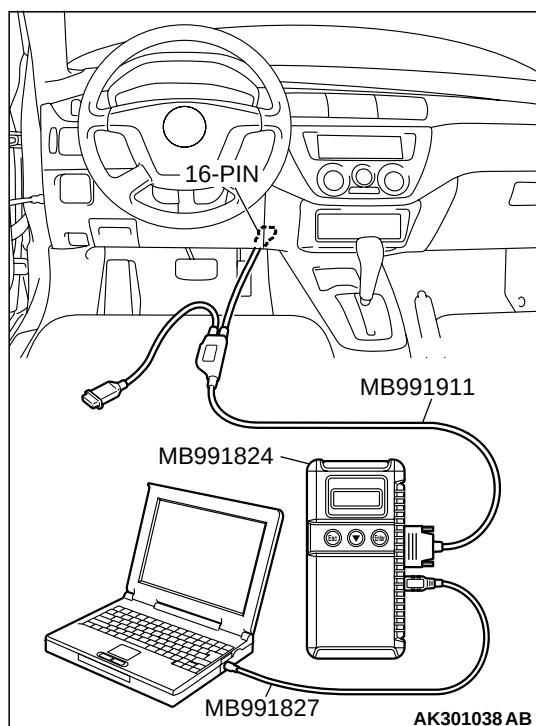
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

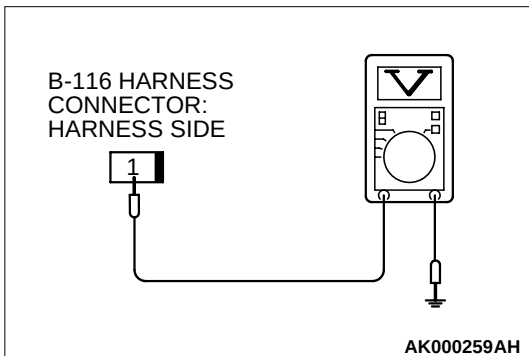
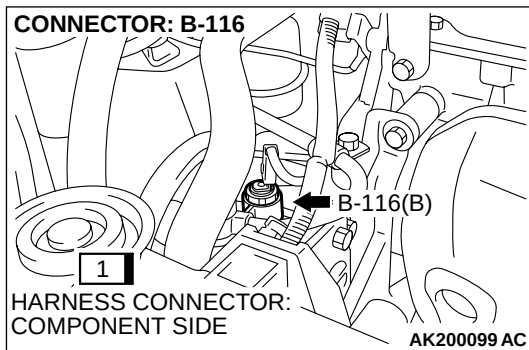
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991958 to the data reading mode for item 27, Power Steering Pressure Switch.
 - If the steering wheel is stopped while idling, "OFF" will be displayed.
 - If the steering wheel is steered while idling, "ON" will be displayed.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.





STEP 2. Measure the power supply voltage at power steering pressure switch connector B-116 by backprobing.

(1) Do not disconnect connector B-116.

(2) Start the engine and run at idle.

(3) Measure the voltage between terminal No. 1 and ground by backprobing.

- When steering wheel is stationary, voltage should measure battery positive voltage.
- When steering wheel is turned, voltage should measure 1 volt or less.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 3.

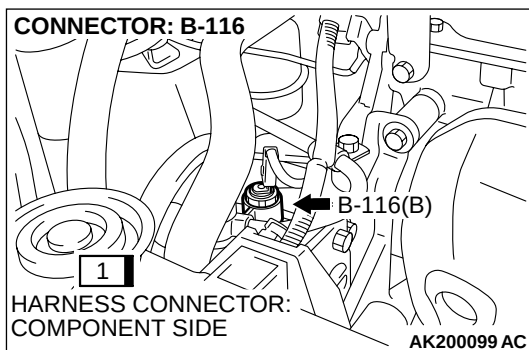
NO : Go to Step 5.

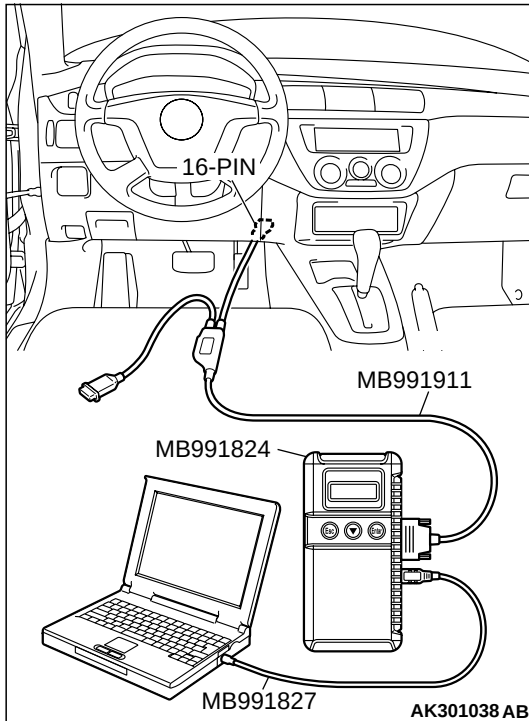
STEP 3. Check harness connector B-116 at power steering pressure switch for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.





STEP 4. Using scan tool MB991958, check data list item 27: Power Steering Pressure Switch.

⚠ CAUTION

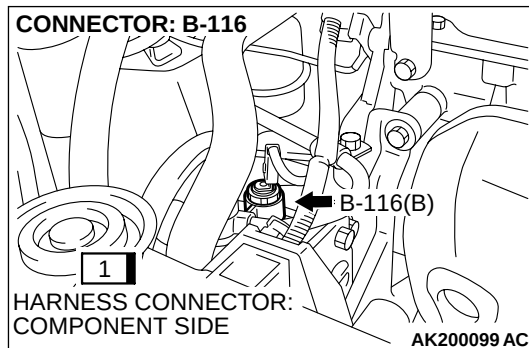
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991958 to the data reading mode for item 27, Power Steering Pressure Switch.
 - If the steering wheel is stopped while idling, "OFF" will be displayed.
 - If the steering wheel is steered while idling, "ON" will be displayed.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Replace the ECM or PCM. Then go to Step 14.

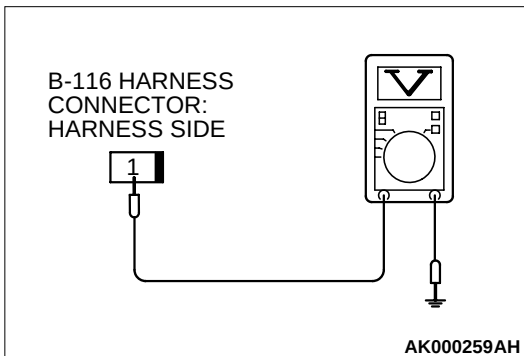
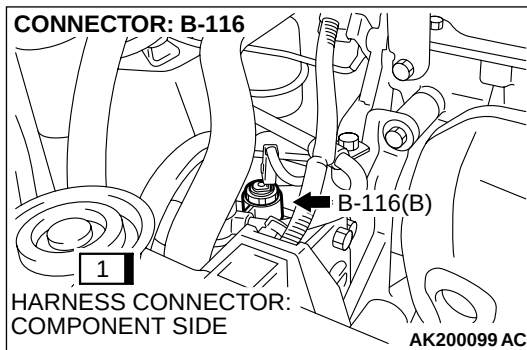


STEP 5. Check harness connector B-116 at power steering pressure switch for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.



STEP 6. Measure the power supply voltage at power steering pressure switch harness side connector B-116.

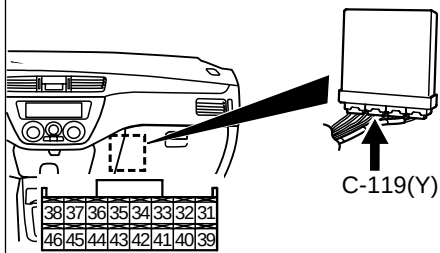
- (1) Disconnect connector B-116 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 1 and ground.
 - Voltage should be battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

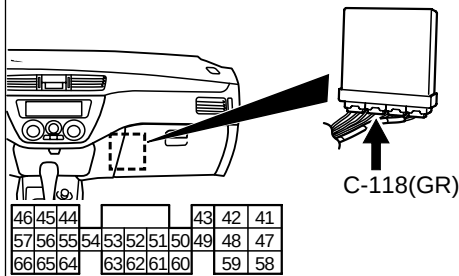
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 11.

NO : Go to Step 7.

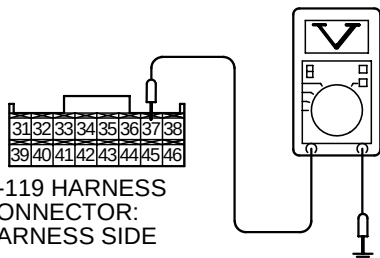
CONNECTOR: C-119 <M/T>HARNESS CONNECTOR:
COMPONENT SIDE

AK200140AB

CONNECTOR: C-118 <A/T>HARNESS CONNECTOR:
COMPONENT SIDE

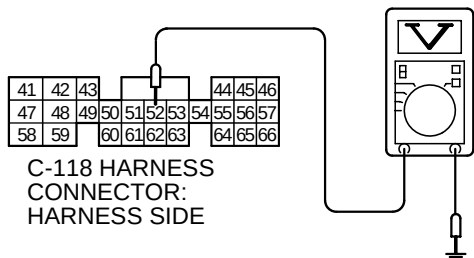
AK200141AB

<M/T>

C-119 HARNESS
CONNECTOR:
HARNESS SIDE

AK000308AG

<A/T>

C-118 HARNESS
CONNECTOR:
HARNESS SIDE

AK000309AJ

STEP 7. Measure the power supply voltage at ECM connector C-119 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect the ECM connector C-119 <M/T> or PCM connector C-118 <A/T>.
- (2) Disconnect the power steering pressure switch connector B-116.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between terminal No. 37 <M/T> or No. 52 <A/T> and ground by backprobing.

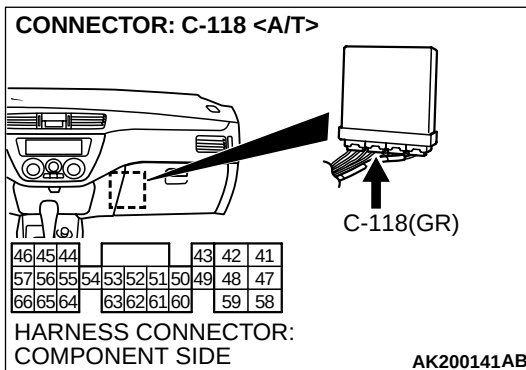
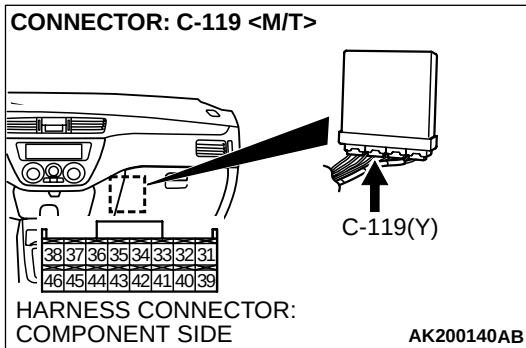
- Voltage should be between battery positive voltage.

- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?**YES :** Go to Step 8.**NO :** Go to Step 9.

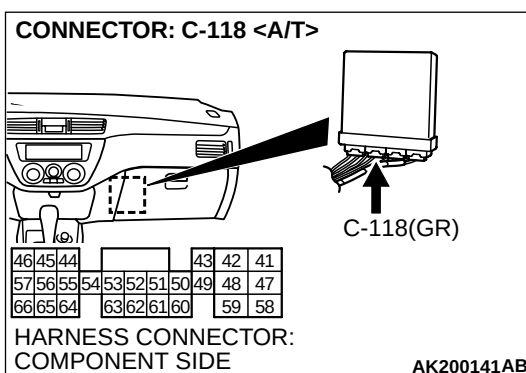
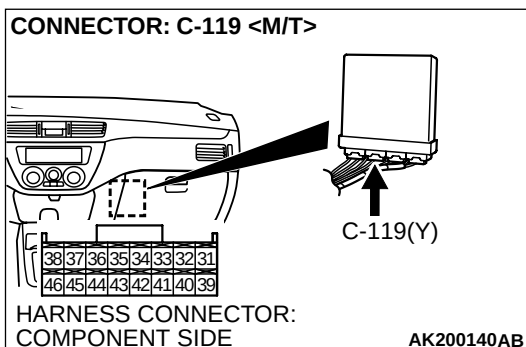
STEP 8. Check harness connector C-119 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

- YES :** Repair harness wire between power steering pressure switch connector B-116 (terminal No. 1) and ECM connector C-119 (terminal No. 37) <M/T> or PCM connector C-118 (terminal No. 52) <A/T> because of open circuit. Then go to Step 14.
- NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.



STEP 9. Check harness connector C-119 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

- YES :** Go to Step 10.
- NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.

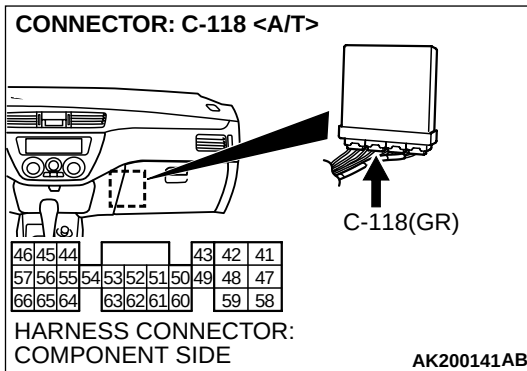
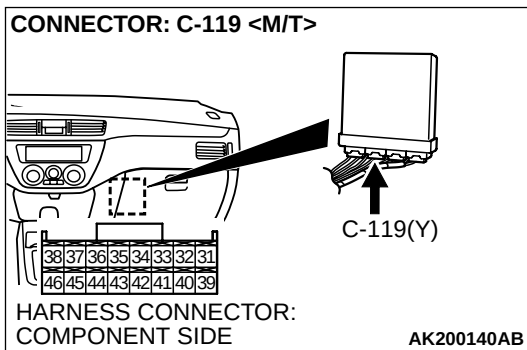
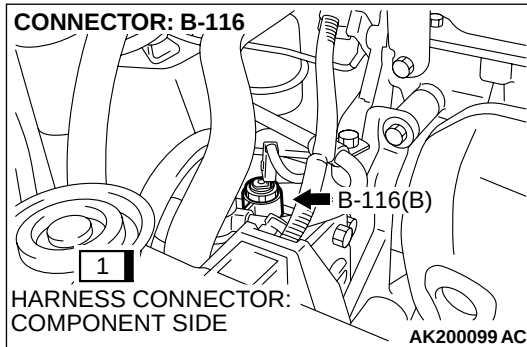


STEP 10. Check for short circuit to ground between power steering pressure switch connector B-116 (terminal No. 1) and ECM connector C-119 (terminal No. 37) <M/T> or PCM connector C-118 (terminal No. 52) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

NO : Repair it. Then go to Step 14.



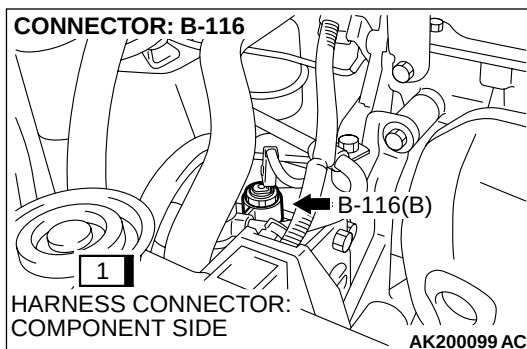
STEP 11. Replace the power steering pressure switch.

- (1) Replace the power steering pressure switch.
- (2) Retest the system.
- (3) Check the diagnostic trouble code (DTC).

Q: Is DTC P0551 set?

YES : Go to Step 12.

NO : Go to Step 14.



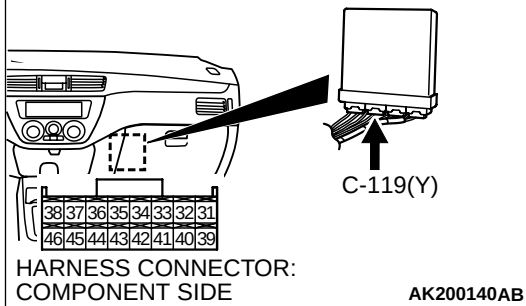
STEP 12. Check harness connector C-119 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

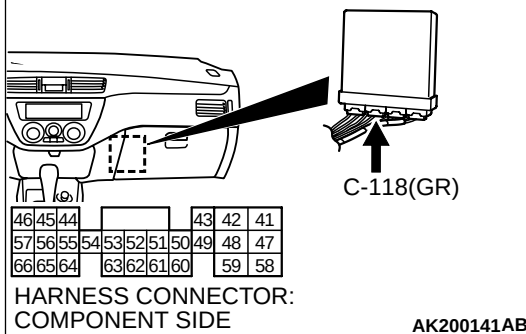
YES : Go to Step 13.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 14.

CONNECTOR: C-119 <M/T>



CONNECTOR: C-118 <A/T>

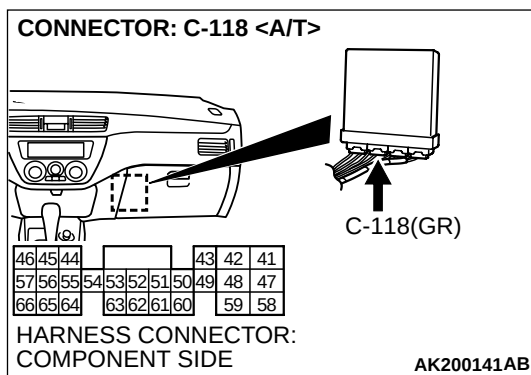
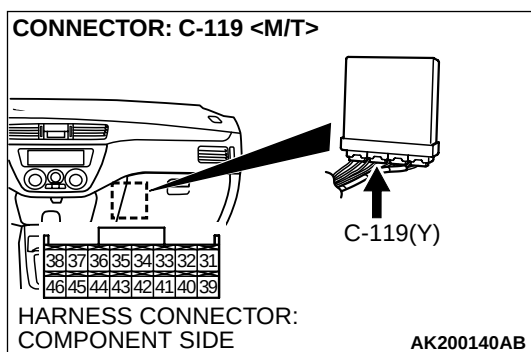
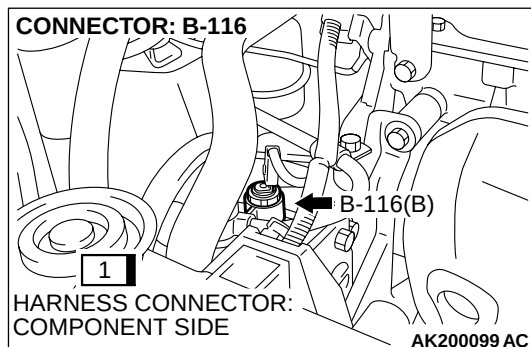


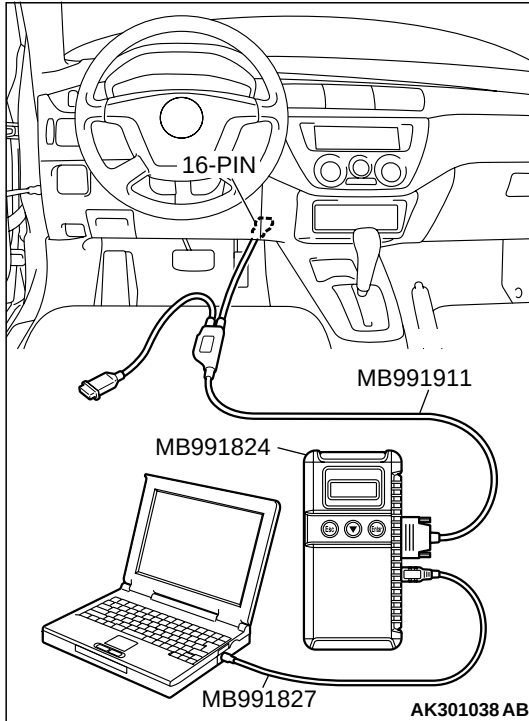
STEP 13. Check for harness damage between power steering pressure switch connector B-116 (terminal No. 1) and ECM connector C-119 (terminal No. 37) <M/T> or PCM connector C-118 (terminal No. 52) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 14.

NO : Repair it. Then go to Step 14.





STEP 14. Using scan tool MB991958, check data list item 27: Power Steering Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991958 to the data reading mode for item 27, Power Steering Pressure Switch.
 - If the steering wheel is stopped while idling, "OFF" will be displayed.
 - If the steering wheel is steered while idling, "ON" will be displayed.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

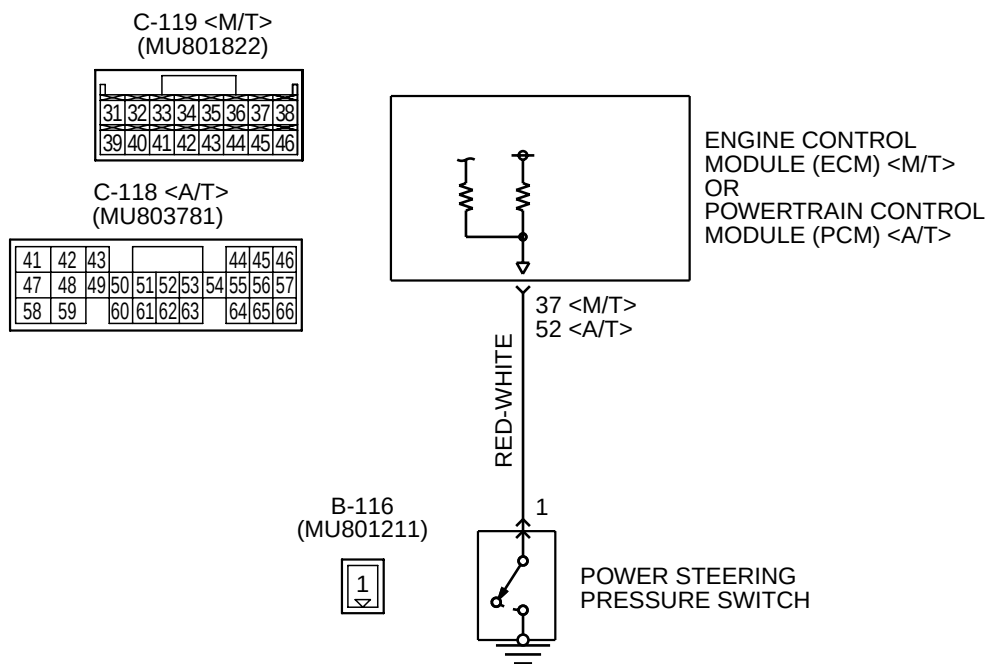
Q: Is the switch operating properly?

YES : The procedure is complete.

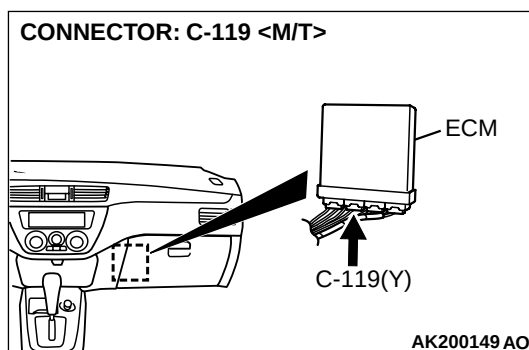
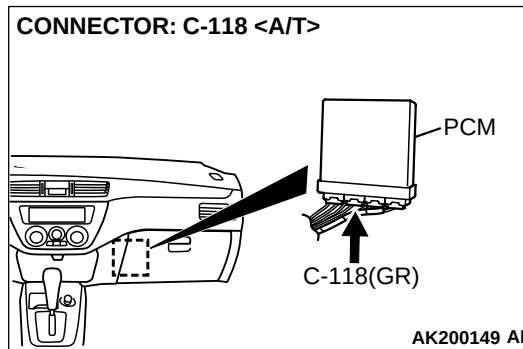
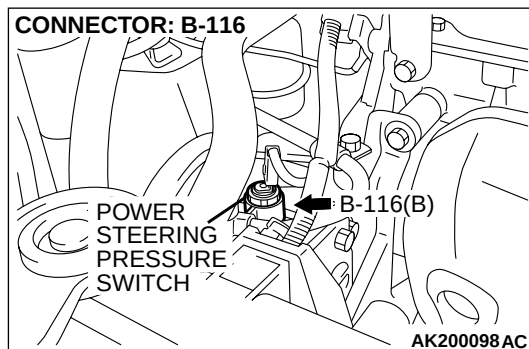
NO : Repeat the troubleshooting.

DTC P0554: Power Steering Pressure Sensor Circuit Intermittent

Power Steering Pressure Switch Circuit



AK304163



CIRCUIT OPERATION

- A battery positive voltage is applied to the power steering pressure switch output terminal (terminal No. 1) from the ECM (terminal No. 37) <M/T> or PCM (terminal No. 52) <A/T> via the resistor in the ECM <M/T> or PCM <A/T>.

TECHNICAL DESCRIPTION

- The power steering pressure switch converts the existence of a power steering load into a high/low voltage, and inputs it into the ECM <M/T> or PCM <A/T>.
- When the steering wheel is turned, hydraulic pressure rises. The power steering pressure switch closes, and the applied battery positive voltage will be grounded. With this, the power steering pressure switch output voltage will fluctuate between 12 volts and 0 volt.
- While driving with the steering wheel held straight, the power steering pressure switch turns "OFF".

- The ECM <M/T> or PCM <A/T> checks whether the power steering pressure switch turns "OFF" or "ON" during driving.

DESCRIPTIONS OF MONITOR METHODS

- Power steering pressure switch changes from off to on more than 10 times for 1 second.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

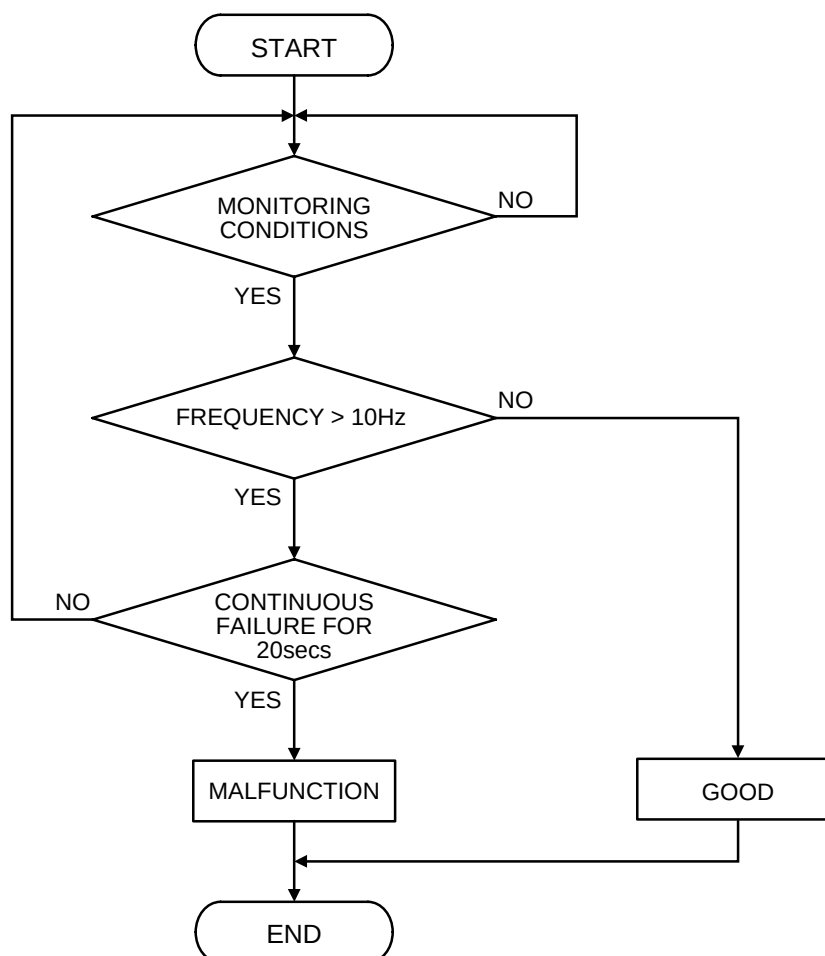
- Not applicable

Sensor (The sensor below is determined to be normal)

- Engine coolant temperature sensor

DTC SET CONDITIONS

Logic Flow Chart



AK302334

Check Conditions

- Engine coolant temperature is higher than 18°C (64°F).
- Vehicle speed is higher than 50 km/h (31 mph).

Judgment Criteria

- The ON/OFF frequency of a power steering pressure switch is 10 Hz or more for 20 seconds.

OBD-II DRIVE CYCLE PATTERN

None.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Power steering pressure switch failed.
- Air entered to power steering system.
- Open or shorted power steering pressure switch circuit, or connector damage.
- ECM <M/T> or PCM <A/T> failed.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check data list item 27: Power Steering Pressure Switch.

⚠ CAUTION

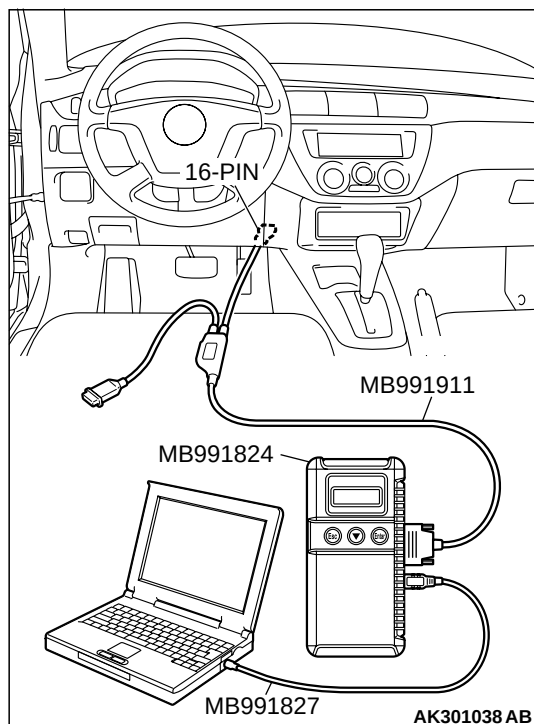
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991958 to the data reading mode for item 27, Power Steering Pressure Switch.
 - If the steering wheel is stopped while idling, "OFF" will be displayed.
 - If the steering wheel is steered while idling, "ON" will be displayed.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.



STEP 2. Check the power steering fluid level.

Refer to GROUP 37A, On-Vehicle Service - Fluid Level Check [P.37A-19](#).

Q: Are there any abnormalities?

YES : Go to Step 3.

NO : Repair it. Then go to Step 7.

STEP 3. Check the power steering pressure switch.

Refer to GROUP 37A, On-Vehicle Service - Power Steering Pressure Switch Check [P.37A-22](#).

Q: Are there any abnormalities?

YES : Go to Step 4.

NO : Replace the power steering pressure switch. Then go to Step 7.

STEP 4. Check the oil pump pressure .

Refer to GROUP 37A, On-Vehicle Service - Oil Pump Pressure Test [P.37A-4](#).

Q: Are there any abnormalities?

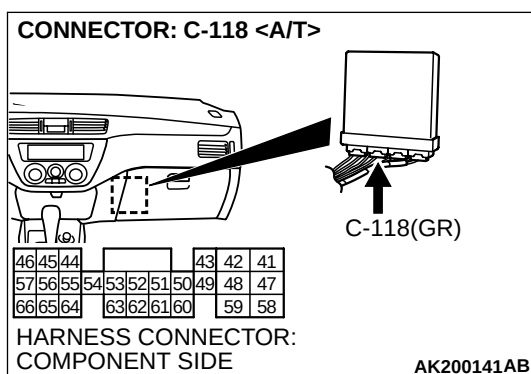
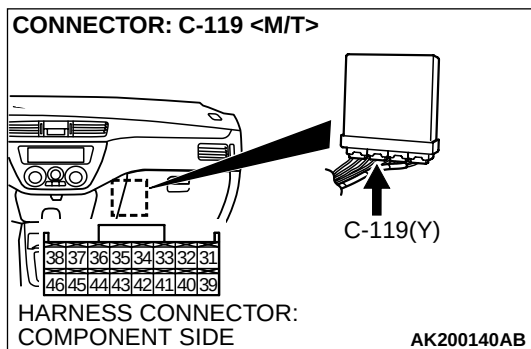
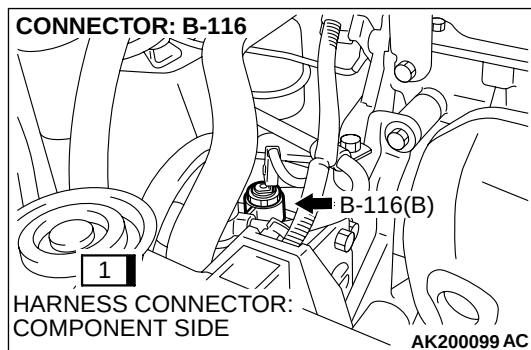
YES : Go to Step 5.

NO : Repair it. Then go to Step 7.

STEP 5. Check harness connector B-116 at the power steering pressure switch and harness connector C-119 at ECM <M/T> or connector C-118 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

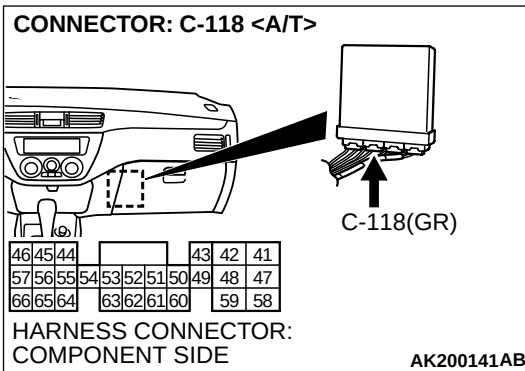
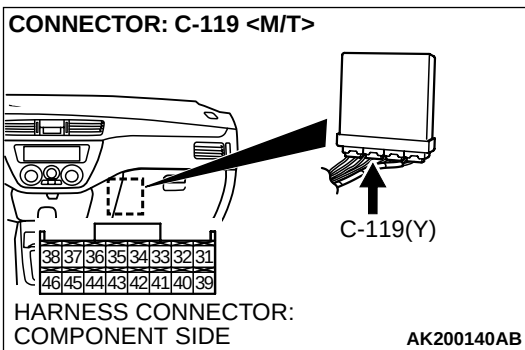
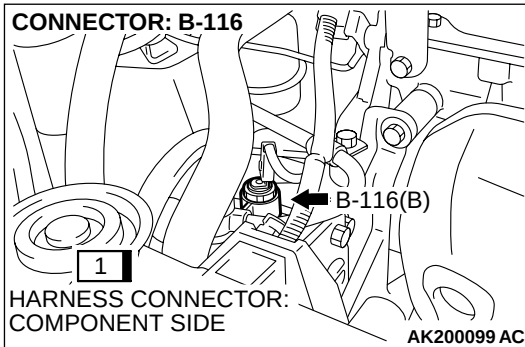


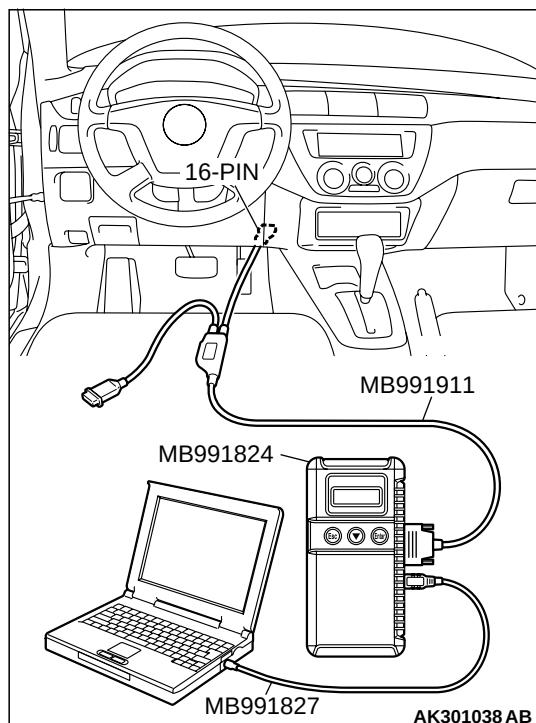
STEP 6. Check for harness damage between power steering pressure switch connector B-116 (terminal No. 1) and ECM connector C-119 (terminal No. 37) <M/T> or PCM connector C-118 (terminal No. 52) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM <M/T> or PCM <A/T>. Then go to Step 7.

NO : Repair it. Then go to Step 7.





STEP 7. Using scan tool MB991958, check data list item 27: Power Steering Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991958 to the data reading mode for item 27, Power Steering Pressure Switch.
 - If the steering wheel is stopped while idling, "OFF" will be displayed.
 - If the steering wheel is steered while idling, "ON" will be displayed.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

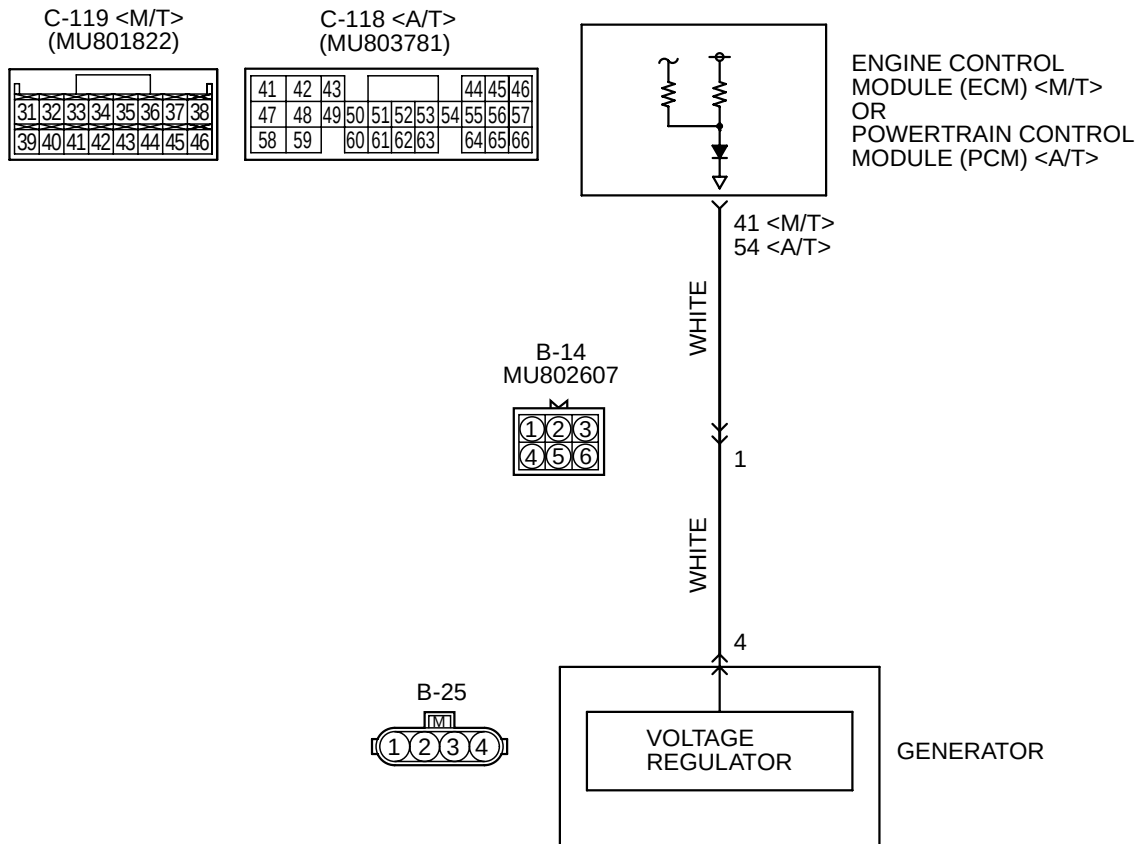
Q: Is the switch operating properly?

YES : The procedure is complete.

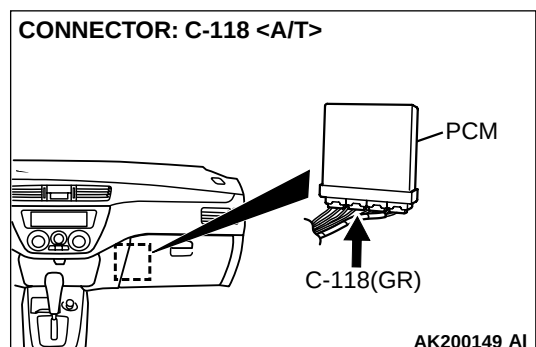
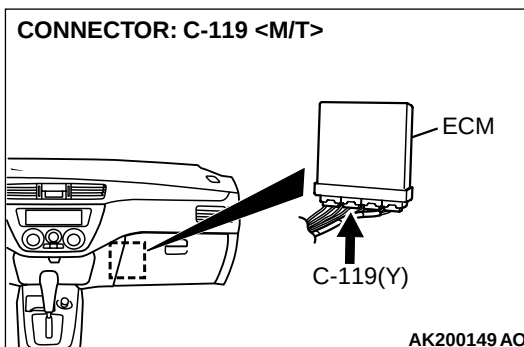
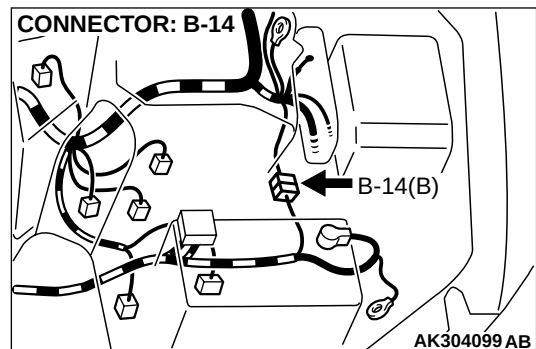
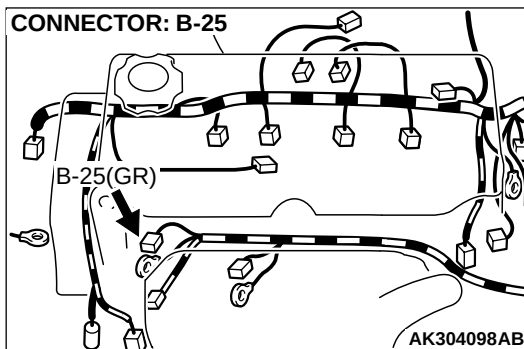
NO : Repeat the troubleshooting.

DTC P0622: Generator FR Terminal Circuit Malfunction

Generator Circuit



AK100037



CIRCUIT OPERATION

- The ECM (terminal No. 41) <M/T> or PCM (terminal No. 54) <A/T> apply a battery positive voltage into the generator FR terminal No. 4 via resistance inside the unit.

TECHNICAL DESCRIPTION

- When the generator field coils are controlled, the generator FR terminal inputs signal to the ECM <M/T> or PCM <A/T>.
- The ECM <M/T> or PCM <A/T> detects the generator output with the input signal, and controls the idle air control motor according to the generator output.

DTC SET CONDITIONS**Check Conditions**

- Engine speed is higher than 50 r/min.

Judgement Criteria

- Input voltage from the generator FR terminal has continued to be approximately battery positive voltage for 20 seconds.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set area:)

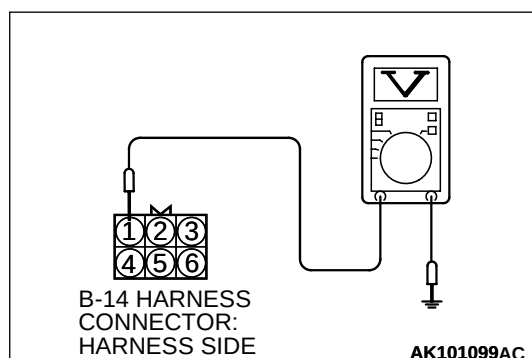
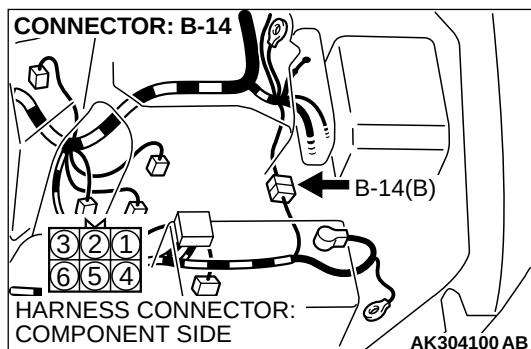
- Open circuit in generator FR terminal circuit.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Measure the voltage at generator intermediate connector B-14 by backprobing.

- (1) Do not disconnect connector B-14.
- (2) Start the engine and run at idle.



- (3) Measure the voltage between terminal No. 1 and ground by backprobing.

NOTE: Vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.

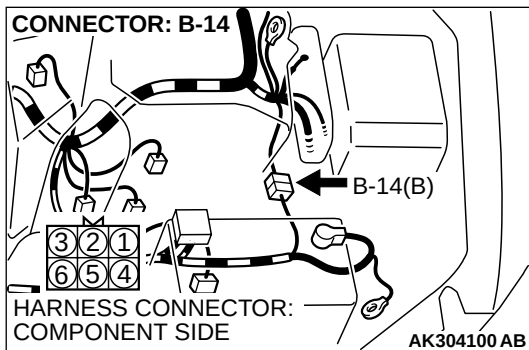
- a. Engine: warming up
- b. Radiator fan: stopped
- c. Headlight switch: OFF to ON
- d. Rear defogger switch: OFF to ON
- e. Stoplight switch: OFF to ON
 - Voltage should be drops.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 2.

NO : Go to Step 4.



STEP 2. Check harness connector B-14 at generator intermediate harness connector for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 11.

STEP 3. Check the trouble symptoms.

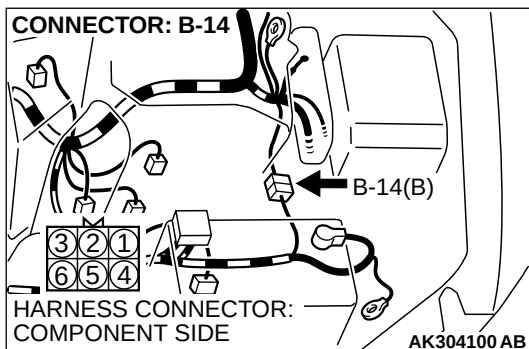
(1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

(2) Check the diagnostic trouble code (DTC).

Q: Is DTC P0622 set?

YES : Replace the ECM or PCM. Then go to Step 11.

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

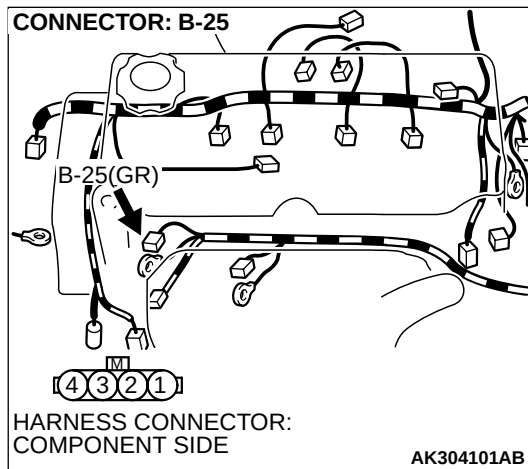


STEP 4. Check harness connector B-14 at generator intermediate connector for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 11.

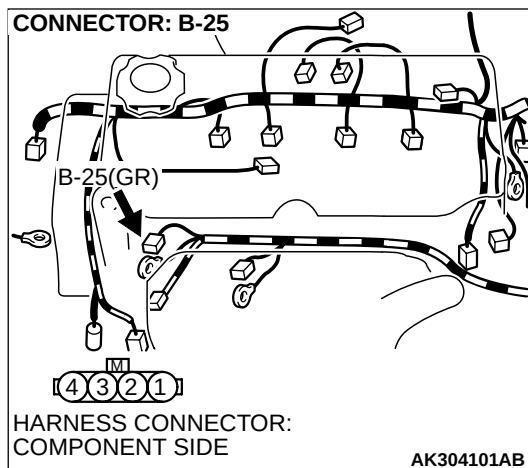


STEP 5. Check harness connector B-25 at generator connector for damage.

Q: Is the harness connector in good condition?

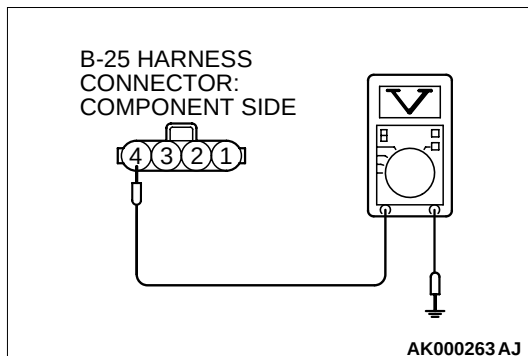
YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 11.



STEP 6. Measure the voltage at generator harness side connector B-25.

- (1) Disconnect connector B-25 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal No. 4 and ground.
 - Voltage should be battery positive voltage.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 9.

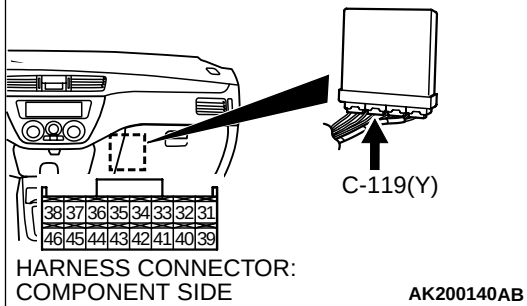
NO : Go to Step 7.

STEP 7. Check harness connector C-119 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

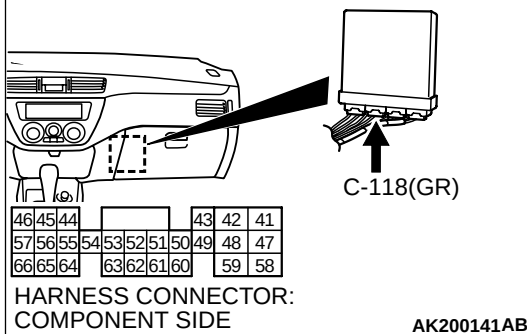
YES : Go to Step 8.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 11.

CONNECTOR: C-119 <M/T>



CONNECTOR: C-118 <A/T>

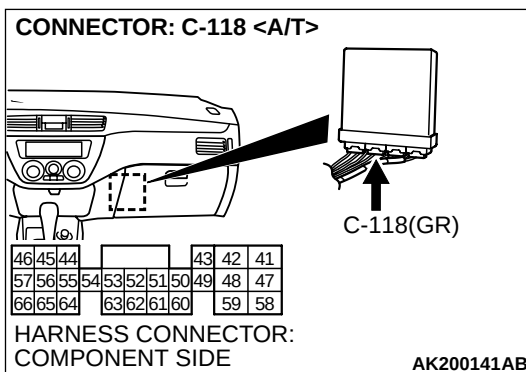
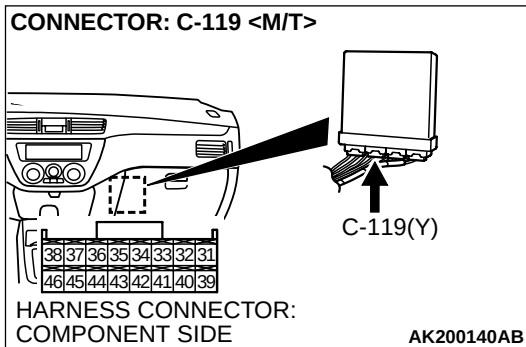
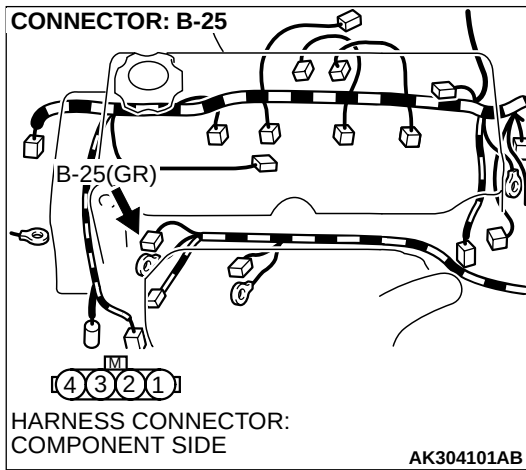


STEP 8. Check for open circuit and short circuit to ground between generator connector B-25 (terminal No. 4) and ECM connector C-119 (terminal No. 41) <M/T> or PCM connector C-118 (terminal No. 54) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 11.

NO : Repair it. Then go to Step 11.

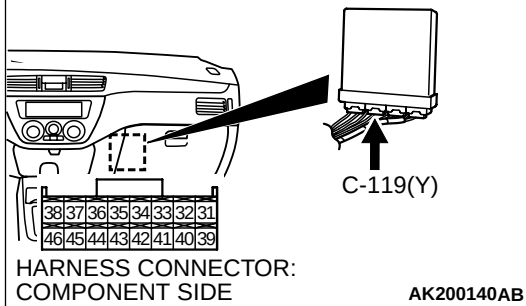


STEP 9. Check harness connector C-119 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.
Q: Is the harness connector in good condition?

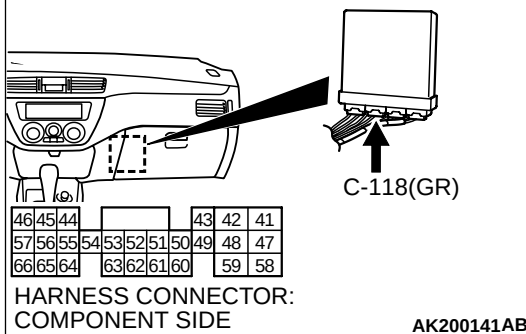
YES : Go to Step 10.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 11.

CONNECTOR: C-119 <M/T>



CONNECTOR: C-118 <A/T>

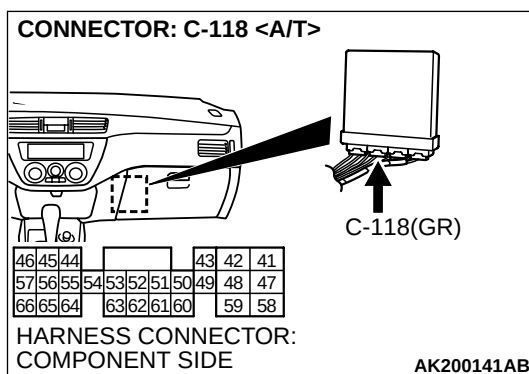
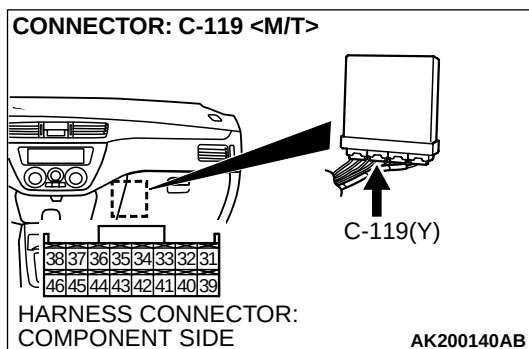
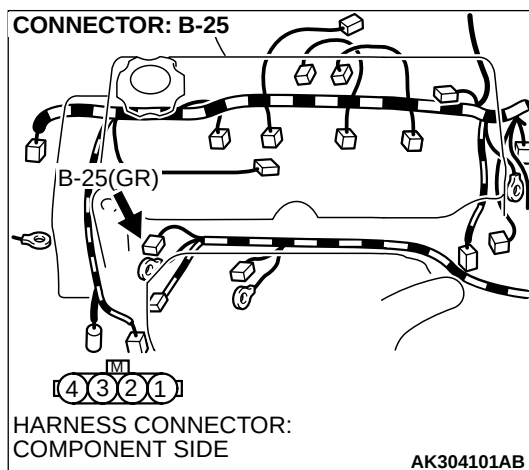


STEP 10. Check for harness damage between generator connector B-25 (terminal No. 4) and ECM connector C-119 (terminal No. 41) <M/T> or PCM connector C-118 (terminal No. 54) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the generator. Then go to Step 11.

NO : Repair it. Then go to Step 11.



STEP 11. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

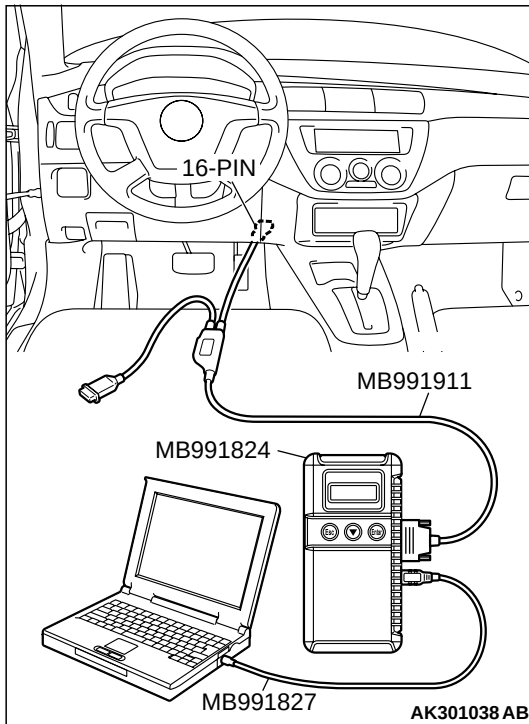
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P0622 set?

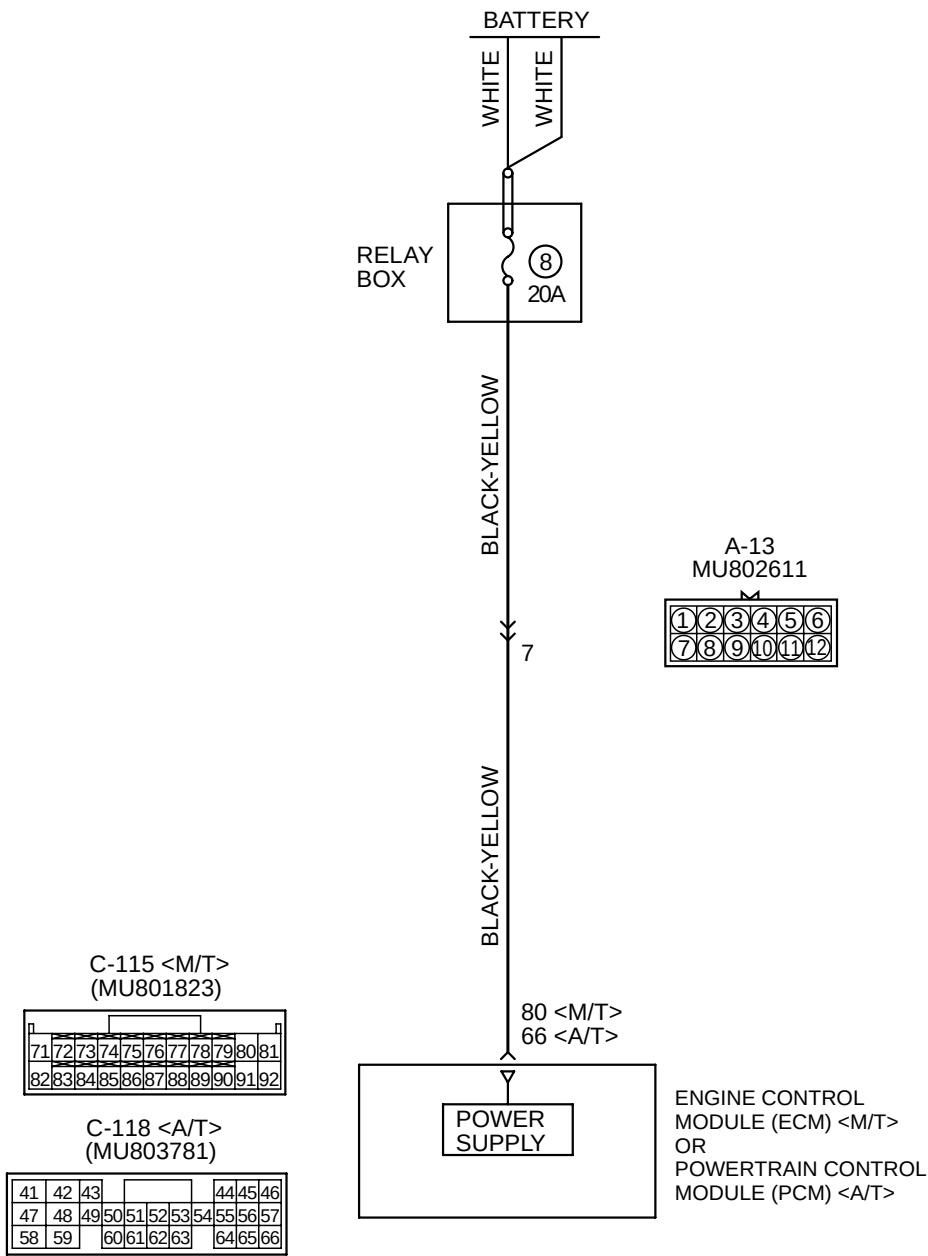
YES : Retry the troubleshooting.

NO : The inspection is complete.

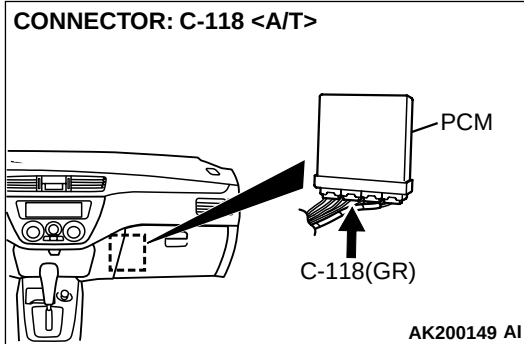
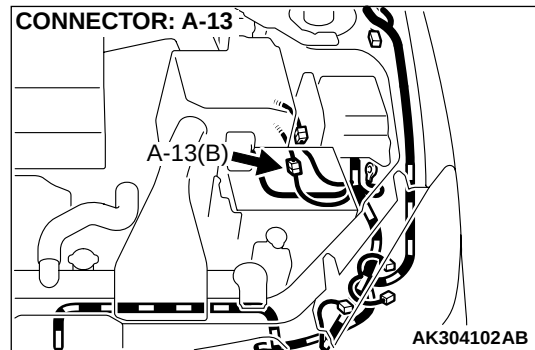
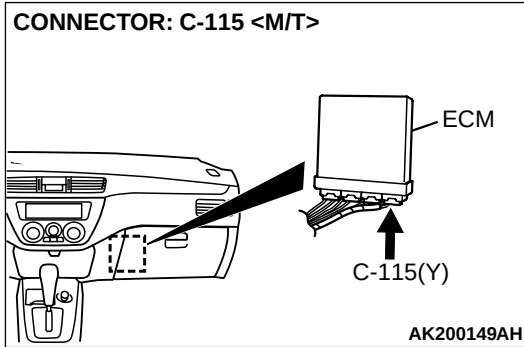


DTC P1603: Battery Backup Line Malfunction

Battery Backup Circuit



AK304168



TECHNICAL DESCRIPTION

- The ECM <M/T> or PCM <A/T> is checks the open circuit of battery backup line.

NOTE: When the system detects an open circuit in the battery backup line, it makes 1 failure judgment of other diagnostic trouble codes (DTCs).

DESCRIPTIONS OF MONITOR METHODS

- An open circuit is detected by monitoring the voltage of the battery backup line.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

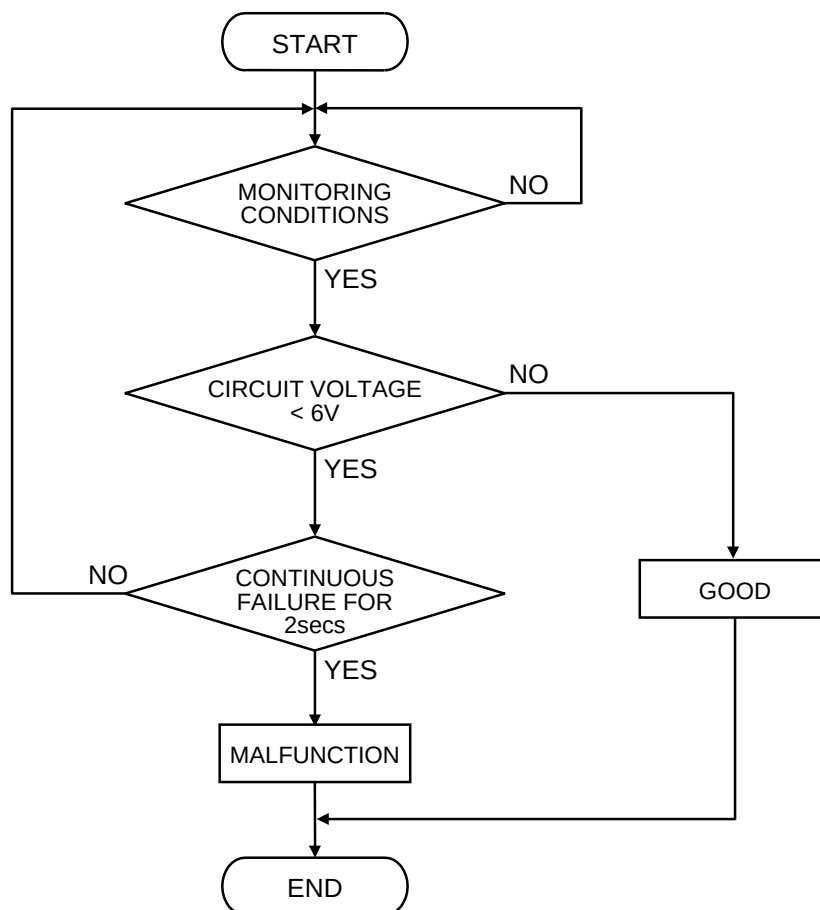
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302335

Check Conditions

- Starting sequence was completed.
- Battery positive voltage is higher than 10 volts.

Judgement Criteria

- Battery backup line voltage has continued to be 6 volts or lower for 2 seconds.

OBD-II DRIVE CYCLE PATTERN

None.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Open or shorted battery backup line, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

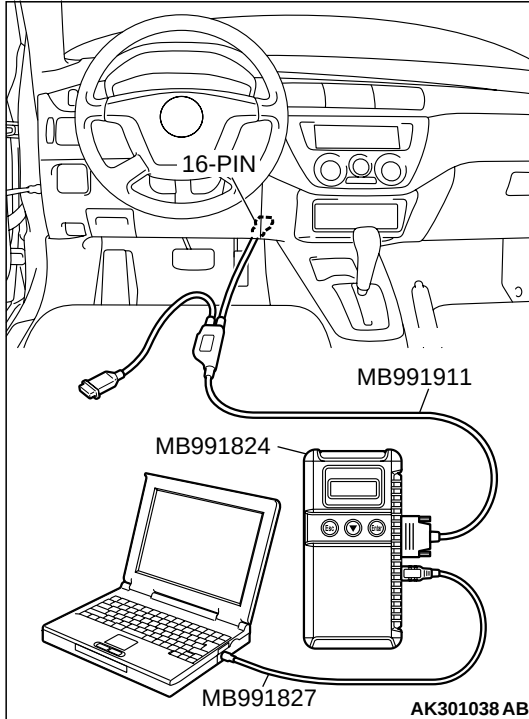
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

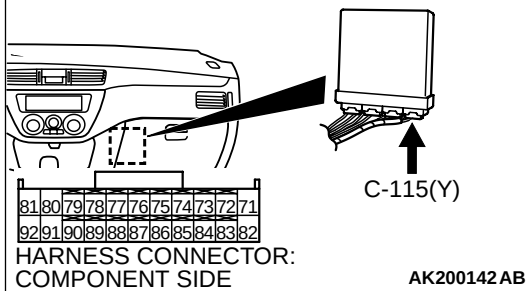
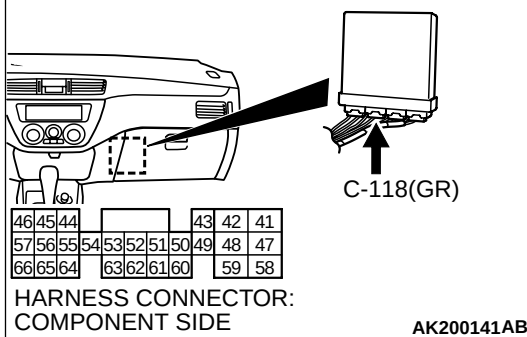
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Erase the DTC.
- (4) Start the engine and run it at idle.
- (5) Read the DTC.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1603 set?

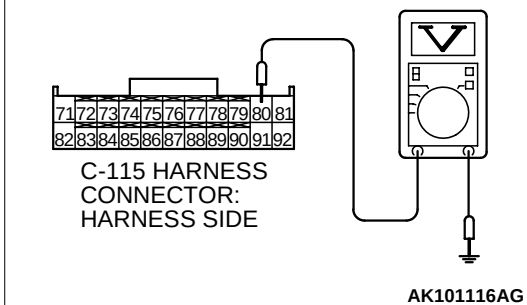
YES : Go to Step 2.

NO : The procedure is complete.

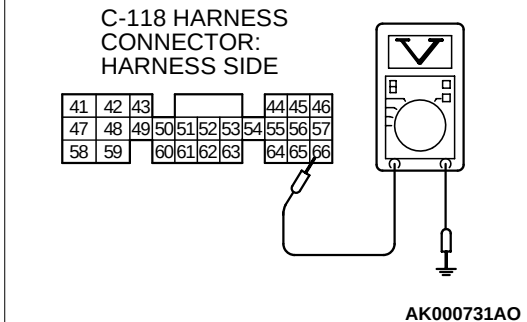


CONNECTOR: C-115 <M/T>**CONNECTOR: C-118 <A/T>**

<M/T>



<A/T>



STEP 2. Measure the backup power supply voltage at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect the ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.

- (2) Measure the voltage between terminal No. 80 <M/T> or No. 66 <A/T> and ground by backprobing.

- Voltage should be battery positive voltage.

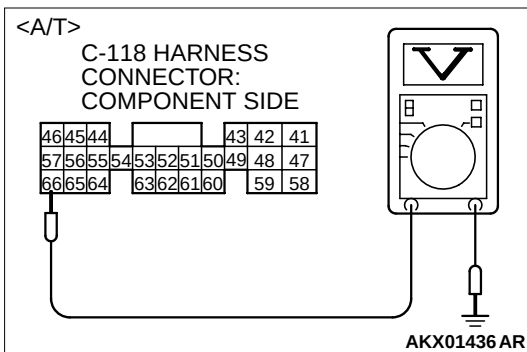
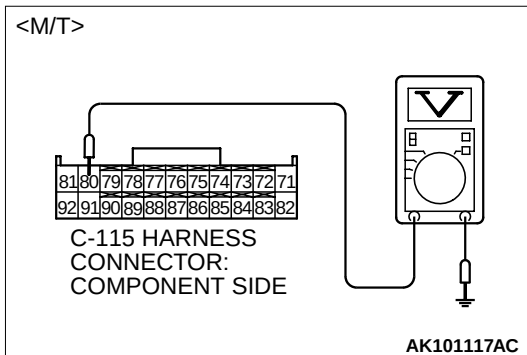
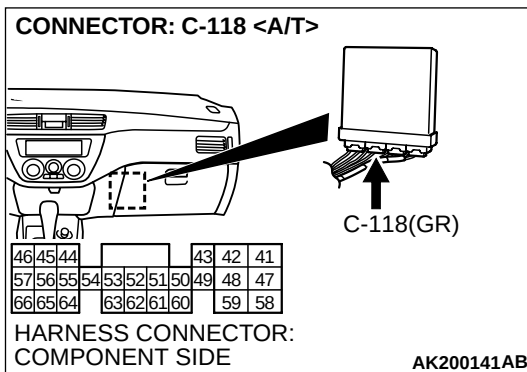
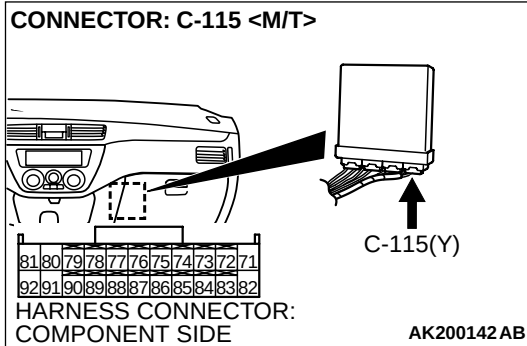
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 5.

NO : Go to Step 3.

STEP 3. Measure the backup power supply voltage at ECM harness side connector C-115 <M/T> or PCM harness side connector C-118 <A/T>.

(1) Disconnect the ECM connector C-115 <M/T> or PCM connector C-118 <A/T> and measure at the harness side.



(2) Measure the voltage between terminal No. 80 <M/T> or No. 66 <A/T> and ground.

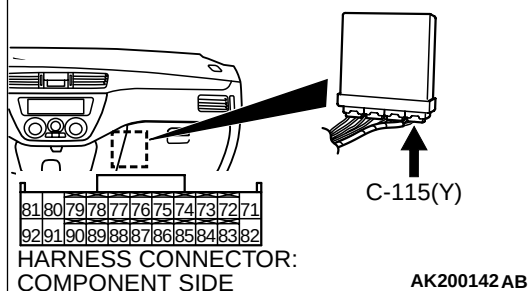
- Voltage should be battery positive voltage.

Q: Is battery positive voltage (approximately 12 volts) present?

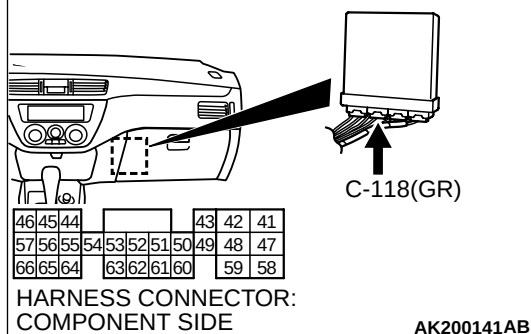
YES : Go to Step 4.

NO : Check connector A-13 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector are in good condition, repair harness wire between relay box (fuse 8) and ECM connector C-115 <M/T> (terminal No. 80) or PCM connector C-118 <A/T> (terminal No. 66) because of open circuit or short circuit to ground. Then go to Step 6.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



STEP 4. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Check connector A-13 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection

P.00E-2. If intermediate connector are in good condition, repair harness wire between relay box (fuse 8) and ECM connector C-115 <M/T> (terminal No. 80) or PCM connector C-118 <A/T> (terminal No. 66) because of harness damage. Then go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection **P.00E-2.** Then go to Step 6.

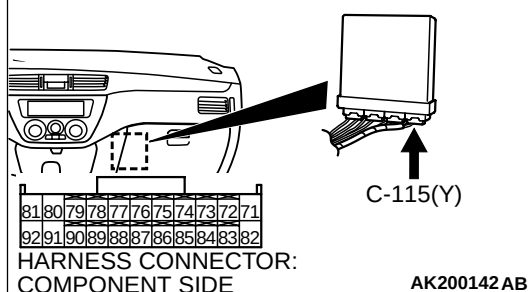
STEP 5. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

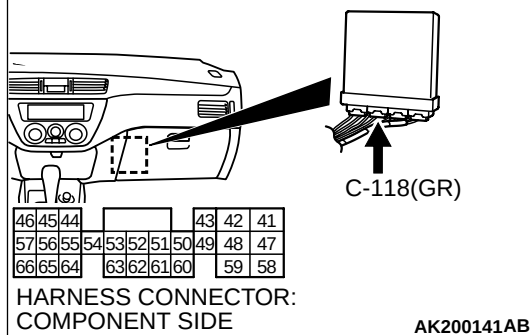
YES : Replace the ECM or PCM. Then go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection **P.00E-2.** Then go to Step 6.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



STEP 6. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

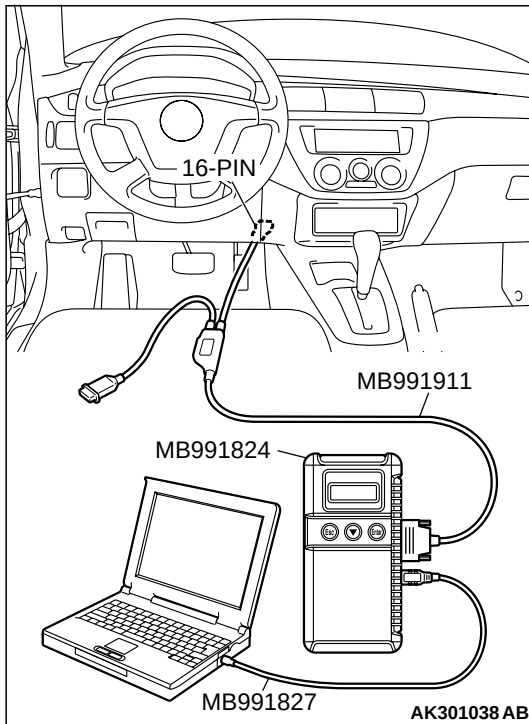
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P1603 set?

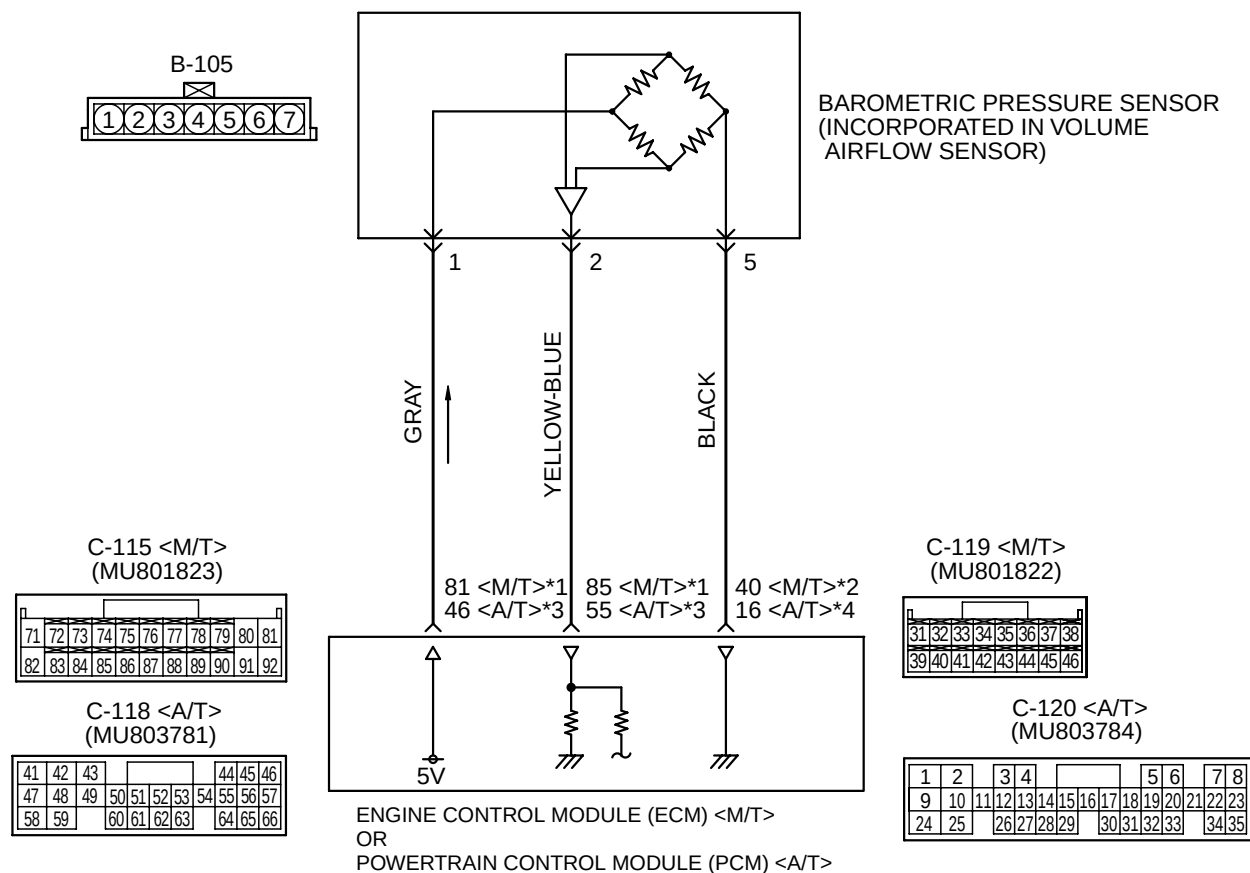
YES : Retry the troubleshooting.

NO : The inspection is complete.



DTC P2227: Barometric Pressure Circuit Range/Performance Problem

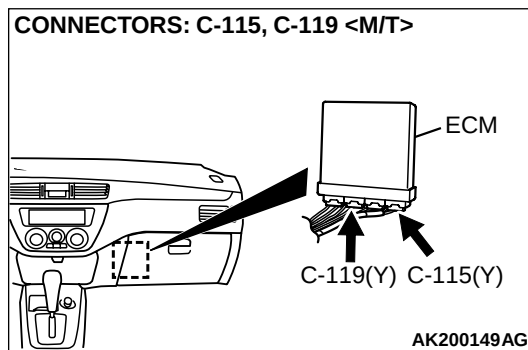
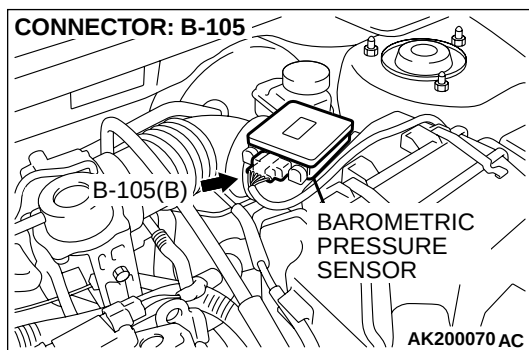
Barometric Pressure Sensor Circuit

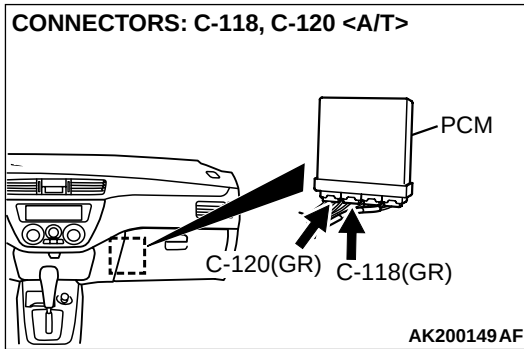


NOTE

- *1: ECM connector C-115 <M/T>
- *2: ECM connector C-119 <M/T>
- *3: PCM connector C-118 <A/T>
- *4: PCM connector C-120 <A/T>

AK304169





CIRCUIT OPERATION

- A 5-volt voltage is supplied to the barometric pressure sensor power terminal (terminal No. 1) from the ECM (terminal No. 81) <M/T> or PCM (terminal No. 46) <A/T>. The ground terminal (terminal No. 5) is grounded with ECM (terminal No. 40) <M/T> or PCM (terminal No. 16) <A/T>.
- A voltage that is proportional to the atmospheric pressure is sent to the ECM (terminal No. 85) <M/T> or PCM (terminal No. 55) <A/T> from the barometric pressure sensor output terminal (terminal No. 2).

TECHNICAL DESCRIPTION

- The barometric pressure sensor outputs a voltage which corresponds to the barometric pressure.
- The ECM <M/T> or PCM <A/T> checks whether this voltage is within a specified range.

DESCRIPTIONS OF MONITOR METHODS

- If the barometric pressure sensor output does not change during a specified period (15 warm-up cycles*), the barometric pressure sensor is determined to be stuck with faulty output.

NOTE:

*:Make sure that the engine coolant temperature is 72°C (162°F) or higher during each of the 15 times of driving. Also, during each of the 15 times of driving, make sure that after the engine has been started, the engine coolant temperature has increased for 23°C (41°F) or higher.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

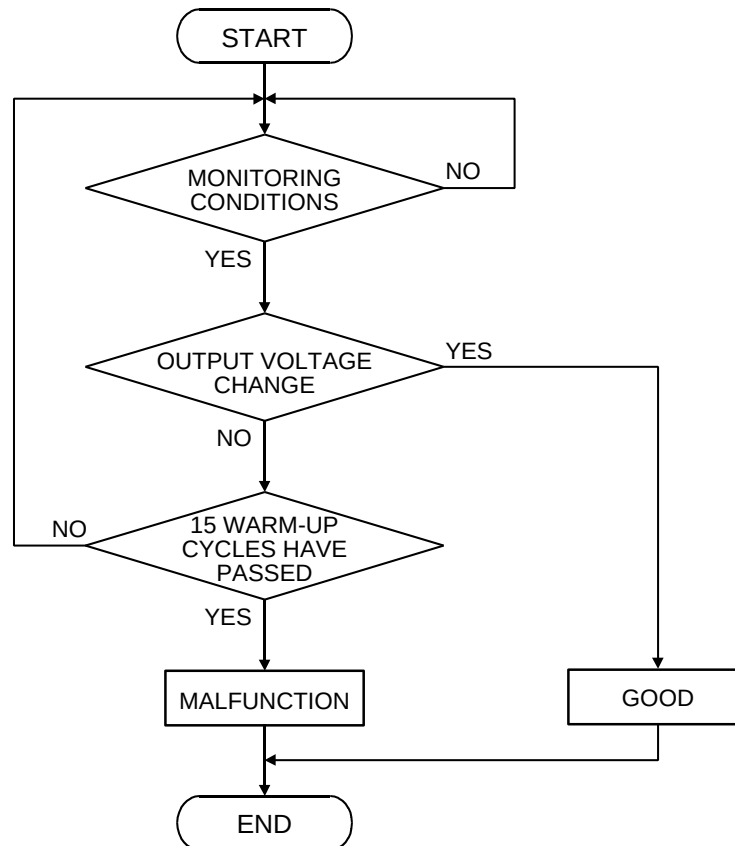
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302336

Check Conditions

- Barometric pressure is lower than 76 kPa (22.4 in.Hg).

Judgement Criteria

- During 15 times of driving, the changes in the sensor output voltage should measure 0.015 volt [equivalent to 0.4 kPa (0.12 in.Hg)] or less.
- Make sure that the engine coolant temperature is 72°C (162°F) or higher during each of the 15 times of driving. Also, during each of the 15 times of driving, make sure that after the engine has been started, the engine coolant temperature has increased for 23°C (41°F) or higher.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Barometric pressure sensor failed.
- Open or shorted barometric pressure sensor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).

⚠ CAUTION

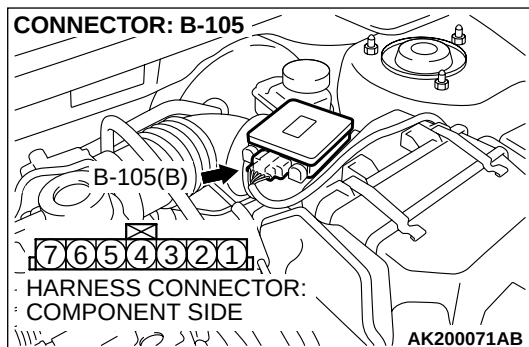
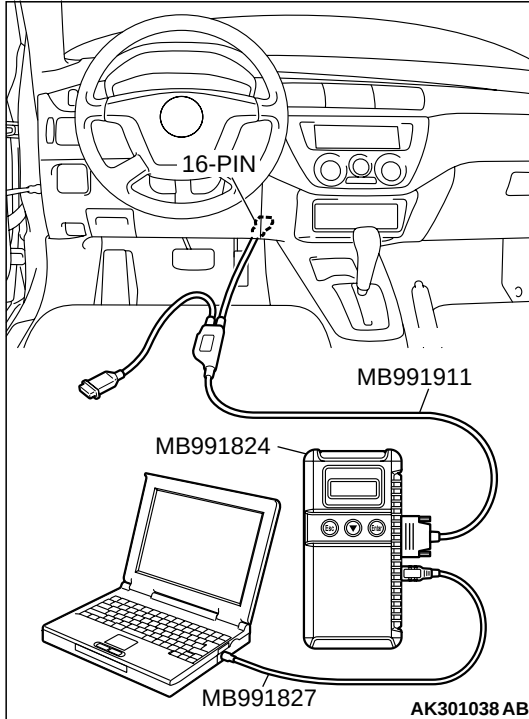
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC P2228 set?

YES : Refer to, DTC P2228 – Barometric Pressure Circuit Low Input [P.13A-684](#).

NO : Go to Step 2.

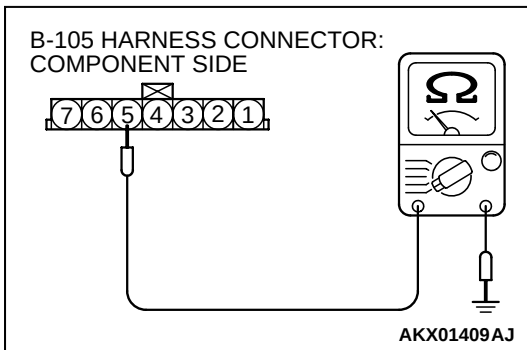
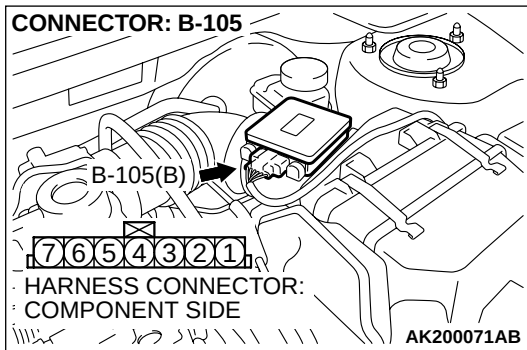


STEP 2. Check harness connector B-105 at the barometric pressure sensor for damage.

Q: Is the connector in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 9.



STEP 3. Check for continuity at barometric pressure sensor harness side connector B-105.

(1) Disconnect connector B-105 and measure at the harness side.

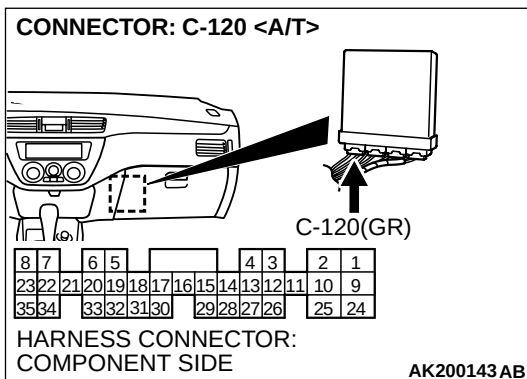
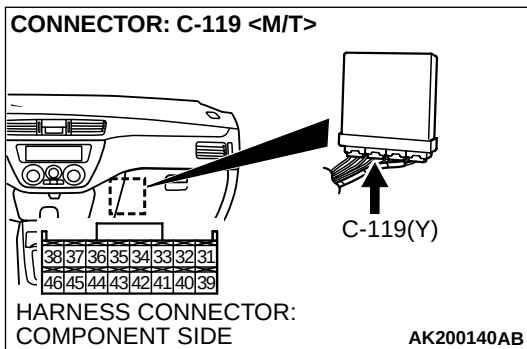
(2) Check for the continuity between terminal No. 5 and ground.

- Should be less than 2 ohms.

Q: Does continuity exist?

YES : Go to Step 6.

NO : Go to Step 4.



STEP 4. Check harness connector C-119 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

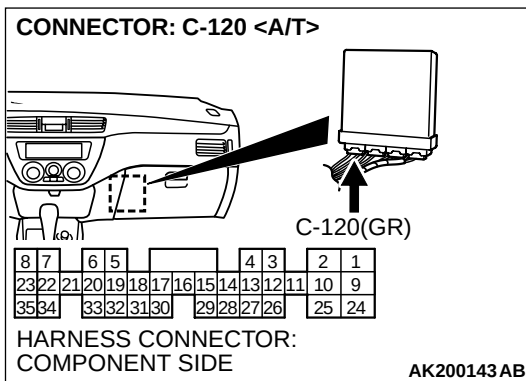
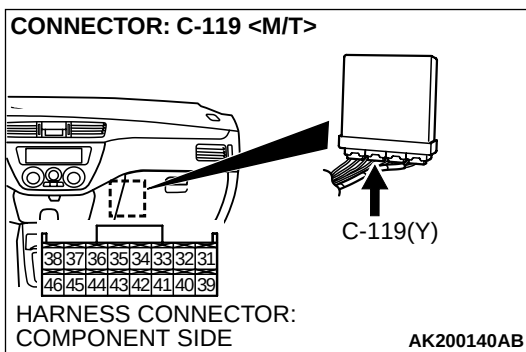
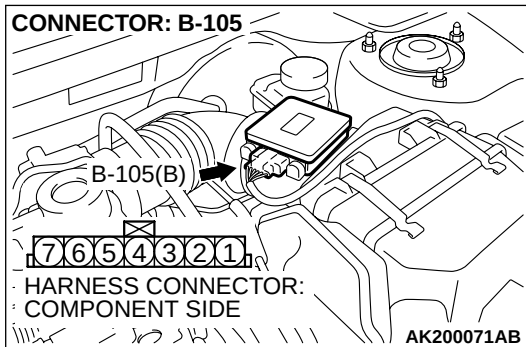
YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 9.

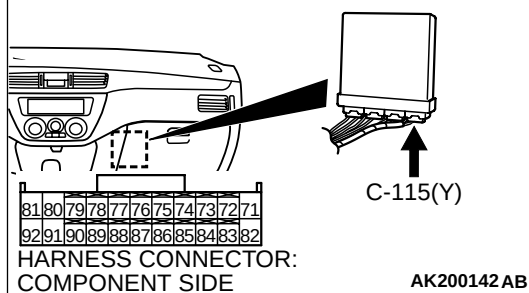
STEP 5. Check for open circuit and harness damage between barometric pressure sensor connector B-105 (terminal No. 5) and ECM connector C-119 (terminal No. 40) <M/T> or PCM connector C-120 (terminal No. 16) <A/T>.
Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 9.

NO : Repair it. Then go to Step 9.



CONNECTOR: C-115 <M/T>



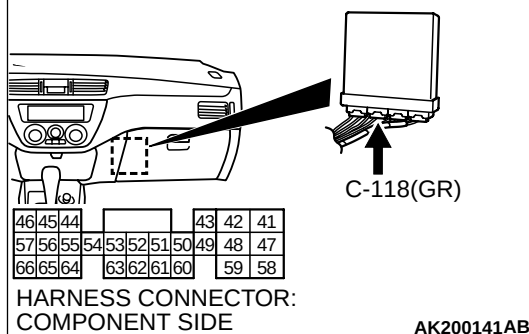
STEP 6. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 7.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 9.

CONNECTOR: C-118 <A/T>

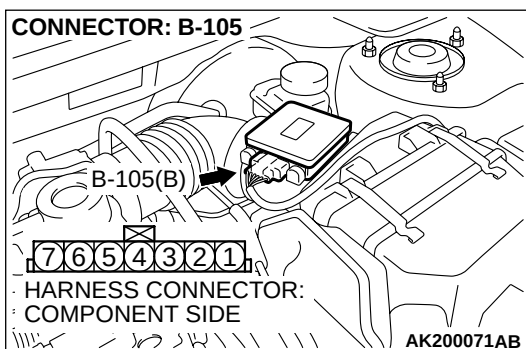
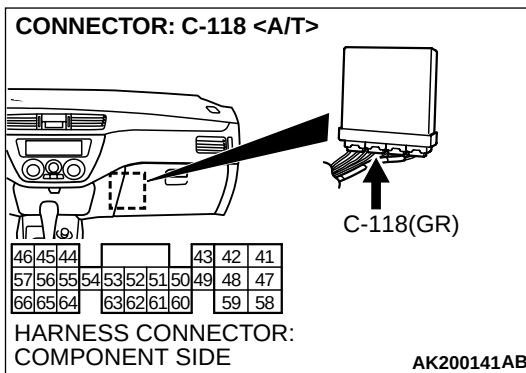
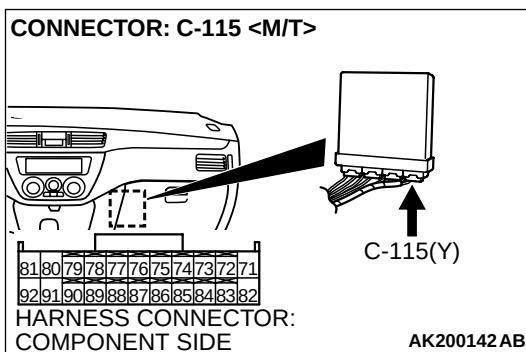
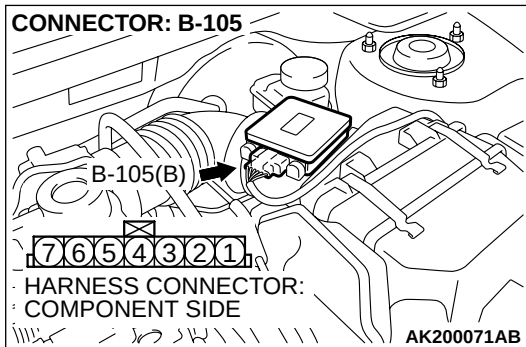


STEP 7. Check for open circuit and harness damage between barometric pressure sensor connector B-105 and ECM connector C-115 <M/T> or PCM connector C-118 <A/T>.

Q: Is the harness wire in good condition?

YES : Go to Step 8.

NO : Repair it. Then go to Step 9.



STEP 8. Replace the barometric pressure sensor.

- (1) Replace the barometric pressure sensor.
- (2) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- (3) Check the diagnostic trouble code (DTC).

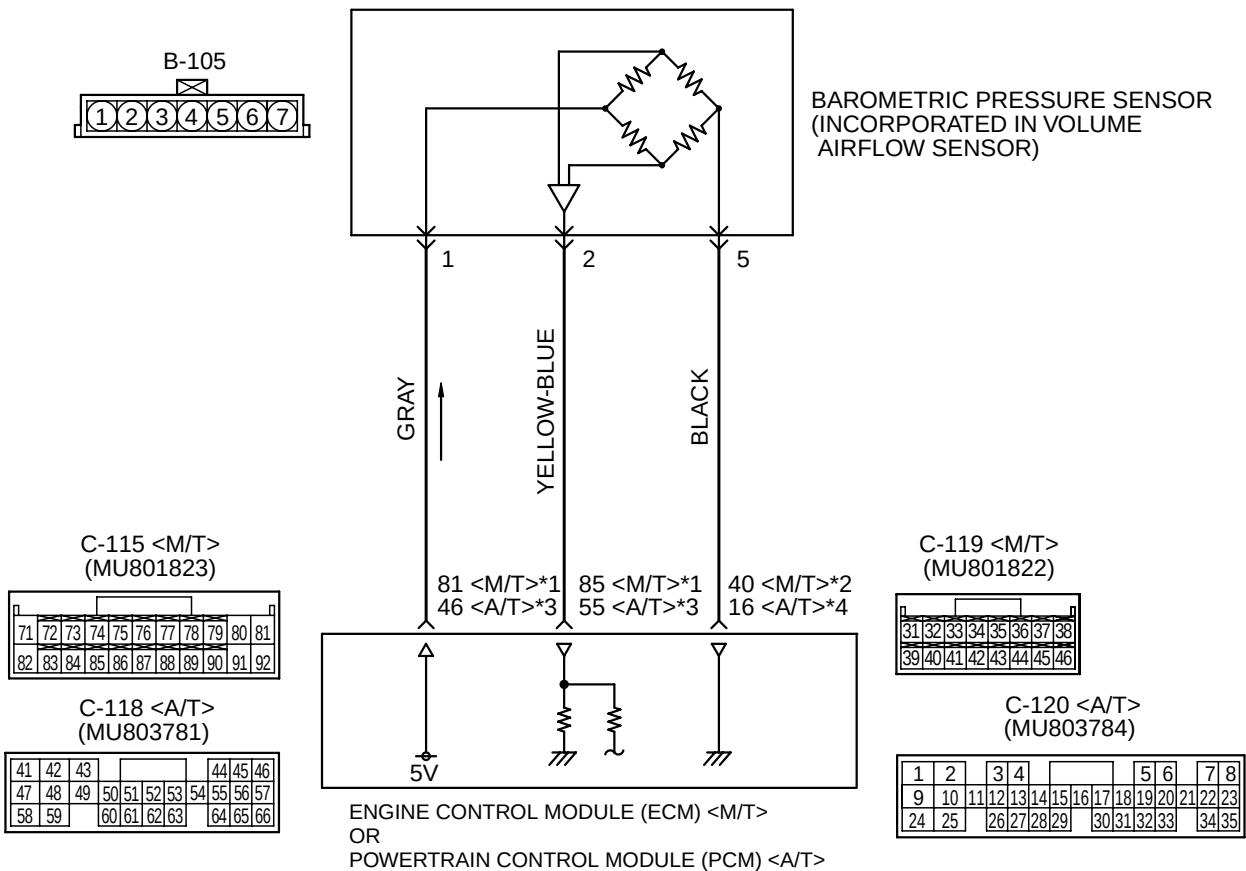
Q: Is DTC P2227 set?

YES : Replace the ECM or PCM. Then go to Step 9.

NO : The procedure is complete.

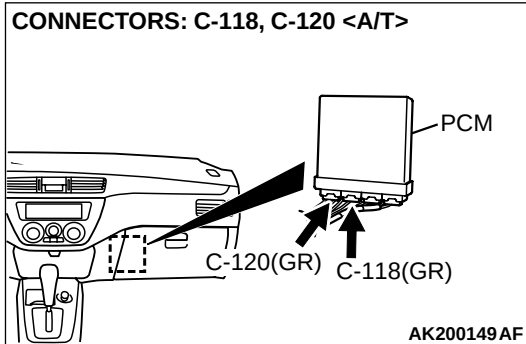
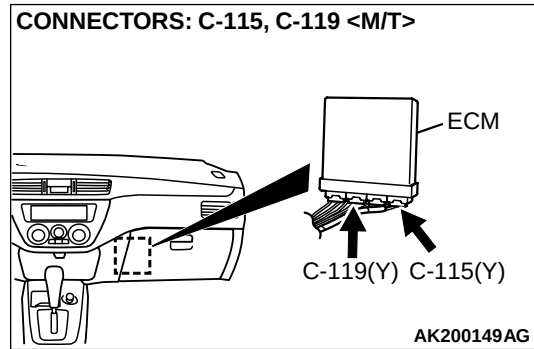
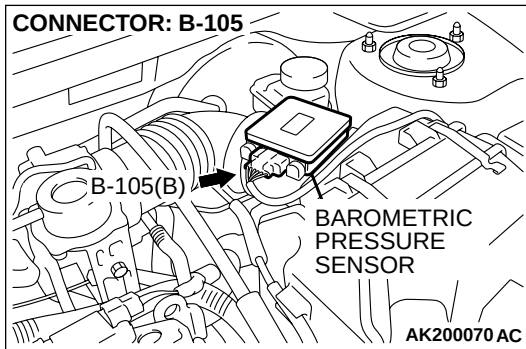
STEP 9. Test the OBD-II drive cycle.

- (1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).
- (2) Check the diagnostic trouble code (DTC).

Q: Is DTC P2227 set?**YES** : Retry the troubleshooting.**NO** : The inspection is complete.**DTC P2228: Barometric Pressure Circuit Low Input****Barometric Pressure Sensor Circuit****NOTE**

- *1: ECM connector C-115 <M/T>
- *2: ECM connector C-119 <M/T>
- *3: PCM connector C-118 <A/T>
- *4: PCM connector C-120 <A/T>

AK304169



CIRCUIT OPERATION

- A 5-volt voltage is supplied to the barometric pressure sensor power terminal (terminal No. 1) from the ECM (terminal No. 81) <M/T> or PCM (terminal No. 46) <A/T>. The ground terminal (terminal No. 5) is grounded with ECM (terminal No. 40) <M/T> or PCM (terminal No. 16) <A/T>.
- A voltage that is proportional to the atmospheric pressure is sent to the ECM (terminal No. 85) <M/T> or PCM (terminal No. 55) <A/T> from the barometric pressure sensor output terminal (terminal No. 2).

TECHNICAL DESCRIPTION

- The barometric pressure sensor outputs a voltage which corresponds to the barometric pressure.
- The ECM <M/T> or PCM <A/T> checks whether this voltage is within a specified range.

DESCRIPTIONS OF MONITOR METHODS

- If the barometric pressure sensor output is out of the actual predictable atmospheric pressure range [lower than 49 kPa (14.5 in.Hg)], a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

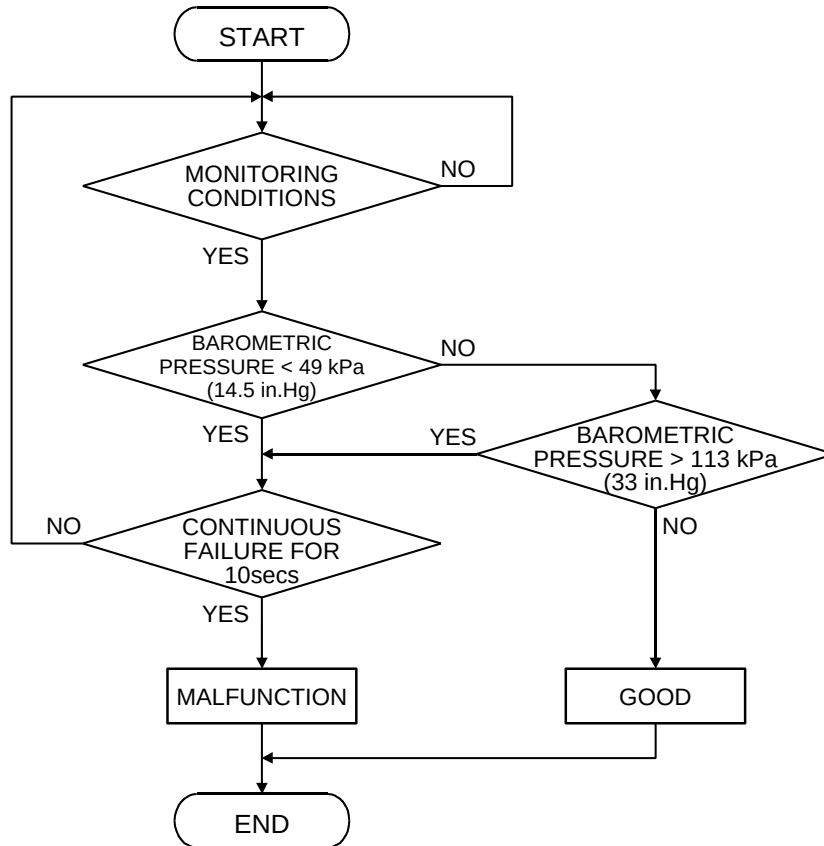
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302337

Check Conditions

- 2 seconds or more have passed since the starting sequence was completed.
- Battery positive voltage is higher than 8 volts.

Judgement Criteria

- Barometric pressure sensor output signal has continued to be approximately 49 kPa (14.5 in.Hg) or lower (approximately 15,000 ft above sea level) for 10 seconds.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Barometric pressure sensor failed.
- Open or shorted barometric pressure sensor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check data list item 25: Barometric Pressure Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the data reading mode for item 25, Barometric Pressure Sensor.
 - When altitude is 0 m (0 foot), 101 kPa (29.8 in.Hg).
 - When altitude is 600 m (1,969 feet), 95 kPa (28.1 in.Hg).
 - When altitude is 1,200 m (3,937 feet), 88 kPa (26.0 in.Hg).
 - When altitude is 1,800 m (5,906 feet), 81 kPa (23.9 in.Hg).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

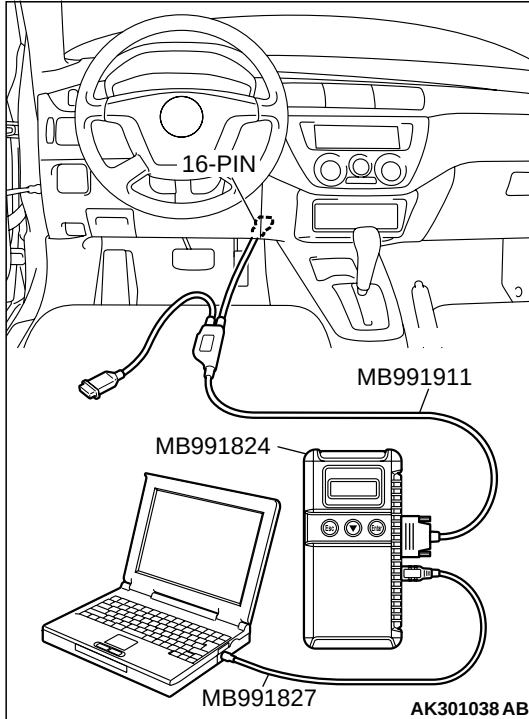
Q: Is the sensor operating properly?

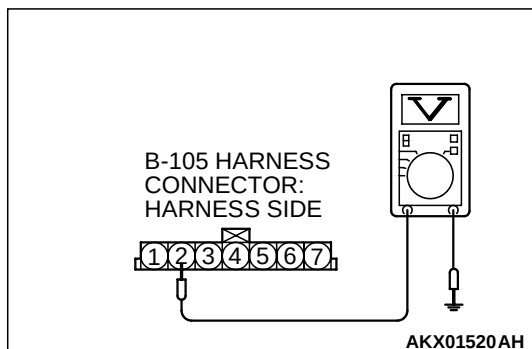
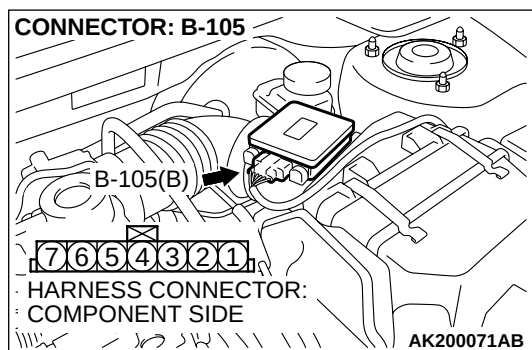
YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.



**STEP 2. Measure the sensor output voltage at barometric pressure sensor connector B-105 by backprobing.**

- (1) Do not disconnect connector B-105.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 2 and ground by backprobing.

- When altitude is 0 m (0 foot), voltage should be 3.7 and 4.3 volts.
- When altitude is 600 m (1,969 feet), voltage should be 3.4 and 4.0 volts.
- When altitude is 1,200 m (3,937 feet), voltage should be 3.2 and 3.8 volts.
- When altitude is 1,800 m (5,906 feet), voltage should be 2.9 and 3.5 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

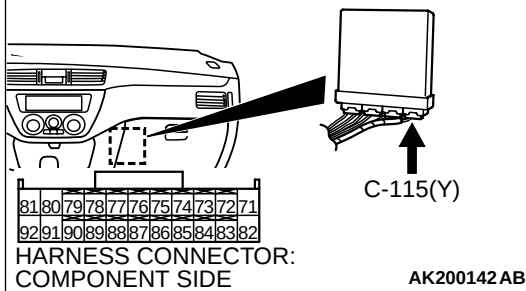
YES : Go to Step 3.

NO : Go to Step 7.

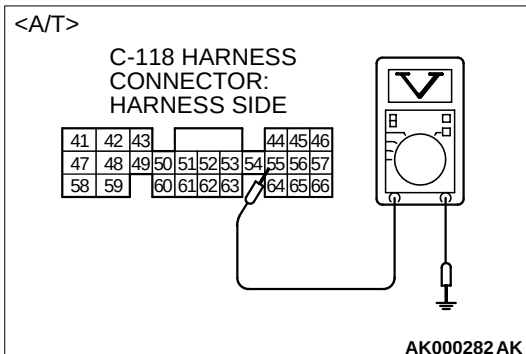
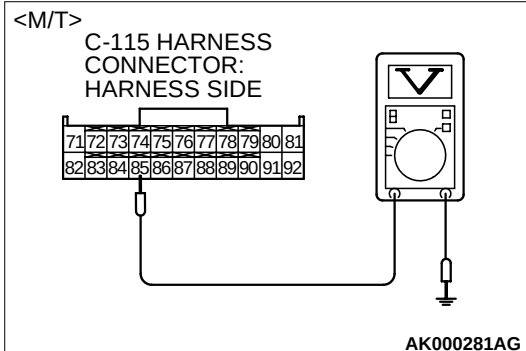
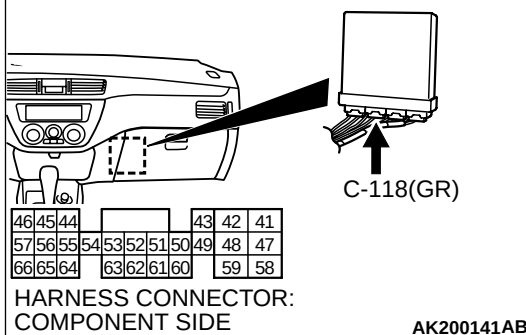
STEP 3. Measure the sensor output voltage at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect connector C-115 <M/T> or C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



- (3) Measure the voltage between terminal No. 85 <M/T> or terminal No. 55 <A/T> and ground by backprobing.
 - When altitude is 0 m (0 foot), voltage should be 3.7 and 4.3 volts.
 - When altitude is 600 m (1,969 feet), voltage should be 3.4 and 4.0 volts.
 - When altitude is 1,200 m (3,937 feet), voltage should be 3.2 and 3.8 volts.
 - When altitude is 1,800 m (5,906 feet), voltage should be 2.9 and 3.5 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 4.

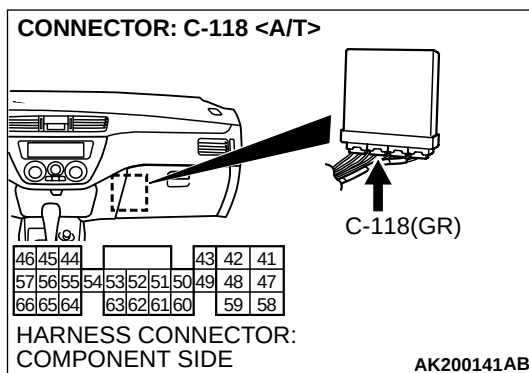
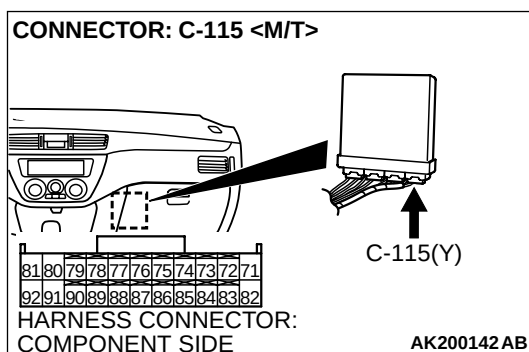
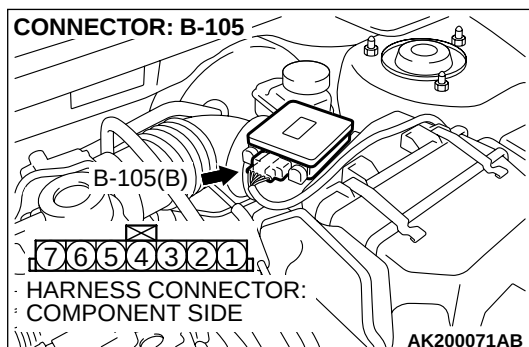
NO : Go to Step 6.

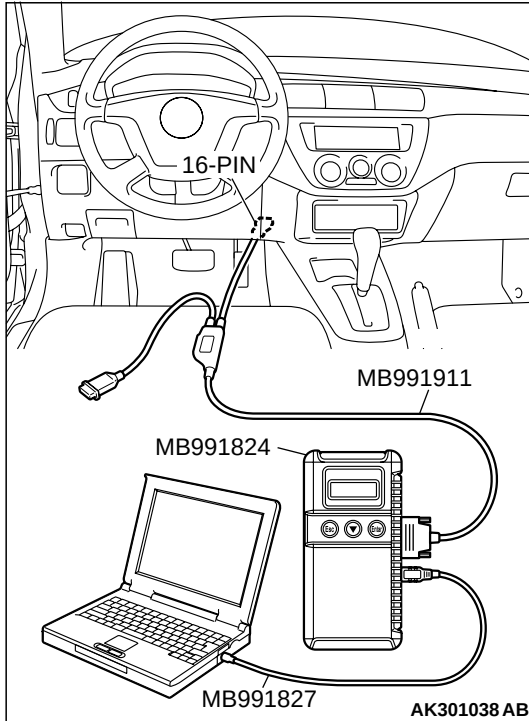
STEP 4. Check harness connector B-105 at the barometric pressure sensor and harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.





STEP 5. Using scan tool MB991958, check data list item 25: Barometric Pressure Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the data reading mode for item 25, Barometric Pressure Sensor.
 - When altitude is 0 m (0 foot), 101 kPa (29.8 in.Hg).
 - When altitude is 600 m (1,969 feet), 95 kPa (28.1 in.Hg).
 - When altitude is 1,200 m (3,937 feet), 88 kPa (26.0 in.Hg).
 - When altitude is 1,800 m (5,906 feet), 81 kPa (23.9 in.Hg).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points [P.00-6](#).

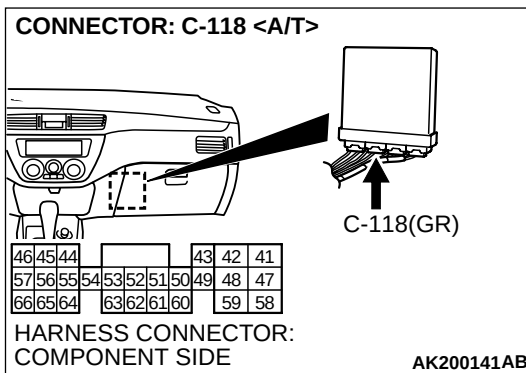
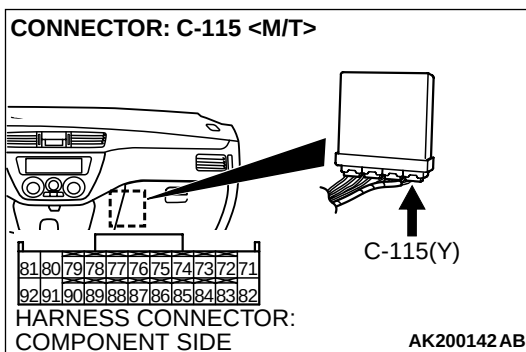
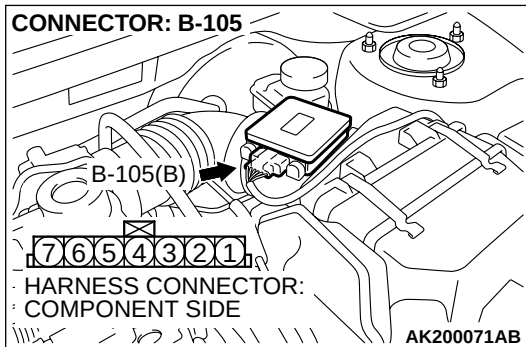
NO : Replace the ECM or PCM. Then go to Step 18.

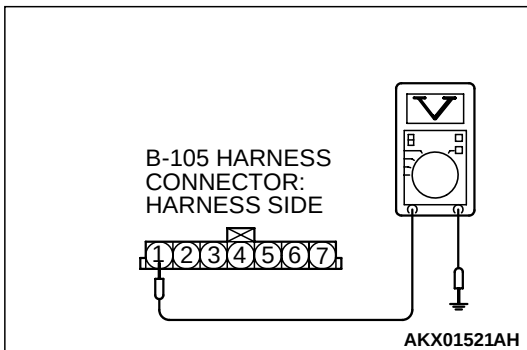
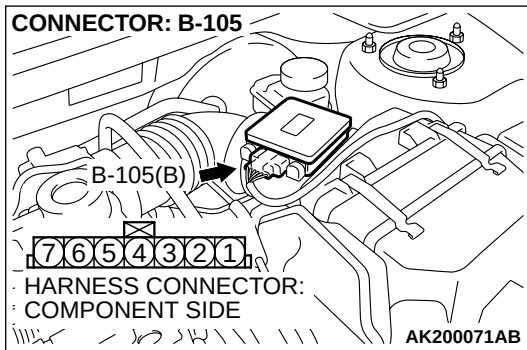
STEP 6. Check harness connector B-105 at the barometric pressure sensor and harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Repair harness wire between barometric pressure sensor connector B-105 (terminal No. 2) and ECM connector C-115 (terminal No. 85) <M/T> or PCM connector C-118 (terminal No. 55) <A/T> because of open circuit or harness damage. Then go to Step 18.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.





STEP 7. Measure the sensor supply voltage at barometric pressure sensor connector B-105 by backprobing.

- (1) Do not disconnect connector B-105.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 1 and ground by backprobing.

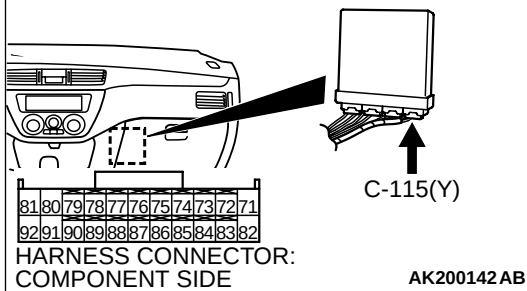
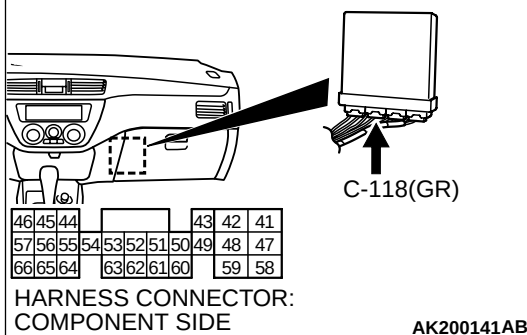
- Voltage should be between 4.8 and 5.2 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

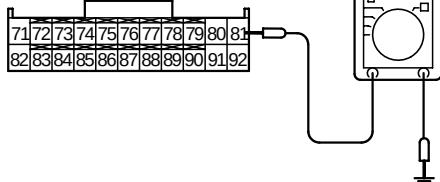
Q: Is the measured voltage between 4.8 and 5.2 volts?

YES : Go to Step 12.

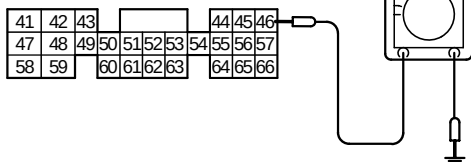
NO : Go to Step 8.

CONNECTOR: C-115 <M/T>**CONNECTOR: C-118 <A/T>**

<M/T>

C-115 HARNESS
CONNECTOR:
HARNESS SIDE

<A/T>

C-118 HARNESS
CONNECTOR:
HARNESS SIDE

STEP 8. Measure the sensor supply voltage at ECM connector C-115 <M/T> or PCM connector C-118 <A/T> by backprobing.

- (1) Do not disconnect connector C-115 <M/T> or C-118 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 81 <M/T> or No. 46 <A/T> and ground by backprobing.

- Voltage should be between 4.8 and 5.2 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.8 and 5.2 volts?

YES : Go to Step 9.

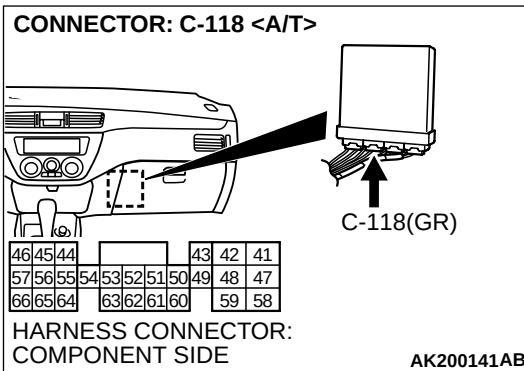
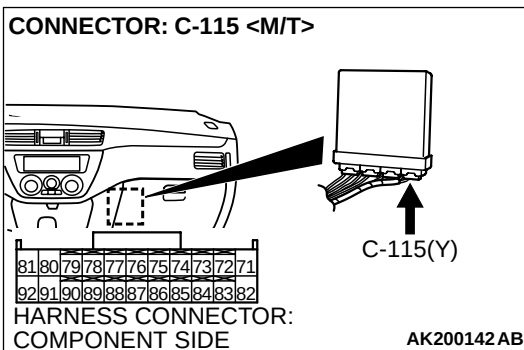
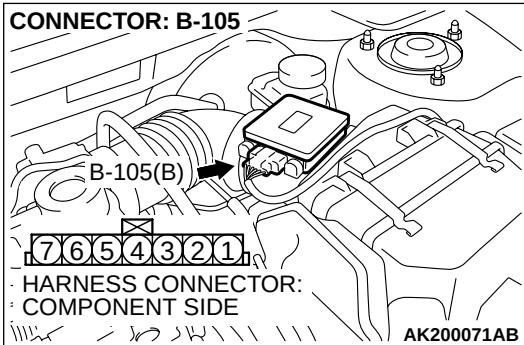
NO : Go to Step 10.

STEP 9. Check harness connector B-105 at the barometric pressure sensor and harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Repair harness wire between barometric pressure sensor connector B-105 (terminal No. 1) and ECM connector C-115 (terminal No. 81) <M/T> or PCM connector C-118 (terminal No. 46) <A/T> because of open circuit or harness damage. Then go to Step 18.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.

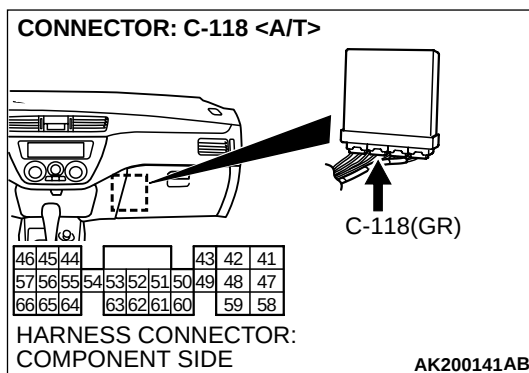
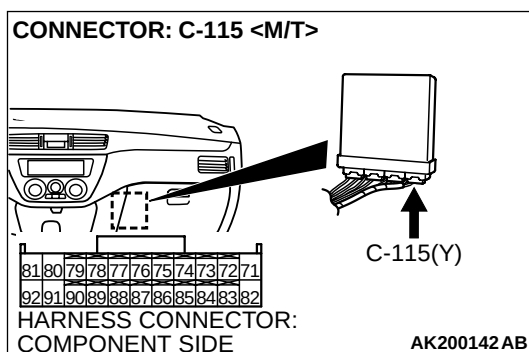
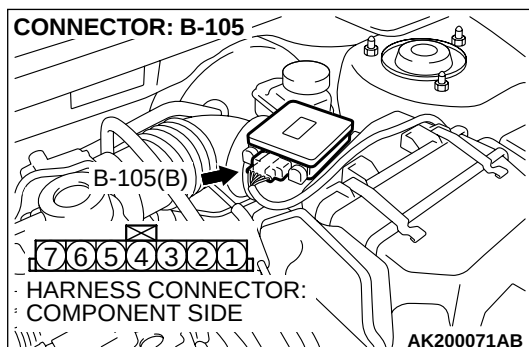


STEP 10. Check harness connector B-105 at the barometric pressure sensor and harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 11.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.

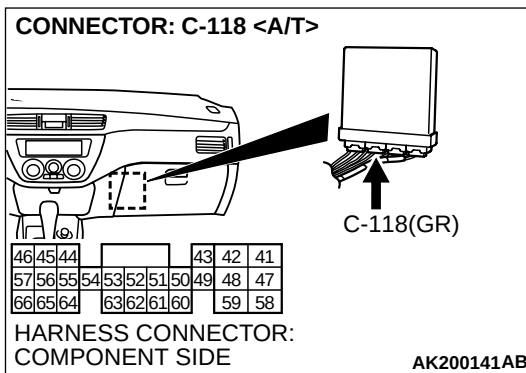
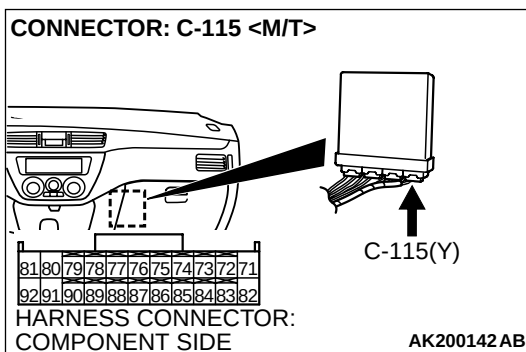
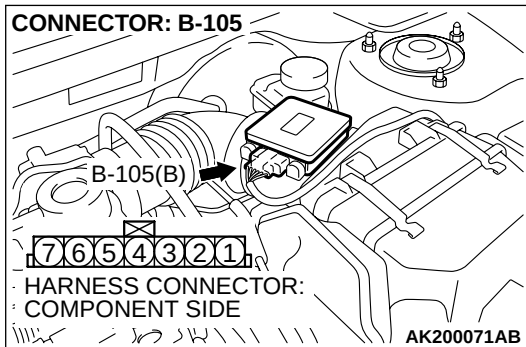


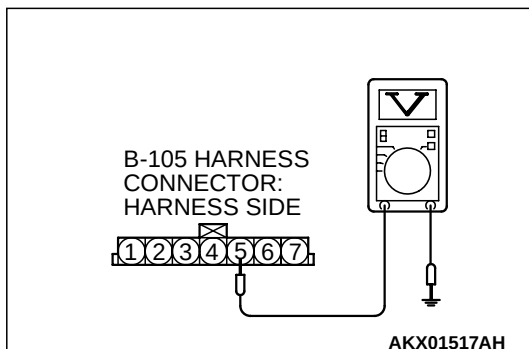
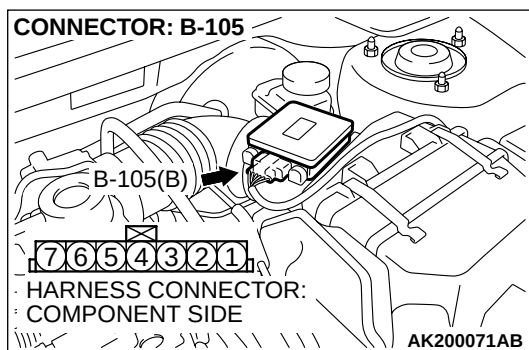
STEP 11. Check for short circuit to ground between barometric pressure sensor connector B-105 (terminal No. 1) and ECM connector C-115 (terminal No. 81) <M/T> or PCM connector C-118 (terminal No. 46) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 18.

NO : Repair it. Then go to Step 18.



**STEP 12. Measure the ground voltage at barometric pressure sensor connector B-105 by backprobing.**

- (1) Do not disconnect connector B-105.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 5 and ground by backprobing.

- Voltage should be 0.5 volt or less.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 15.

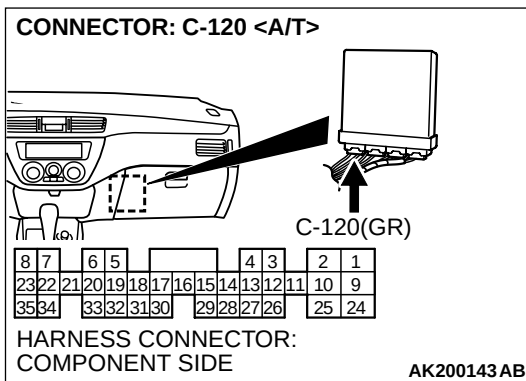
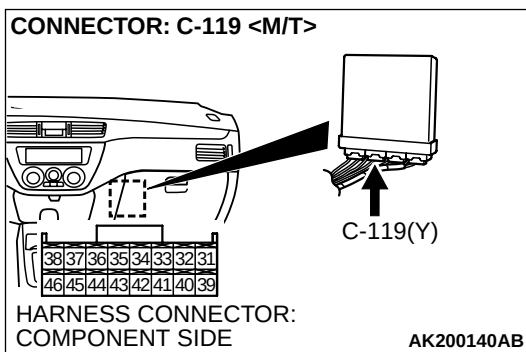
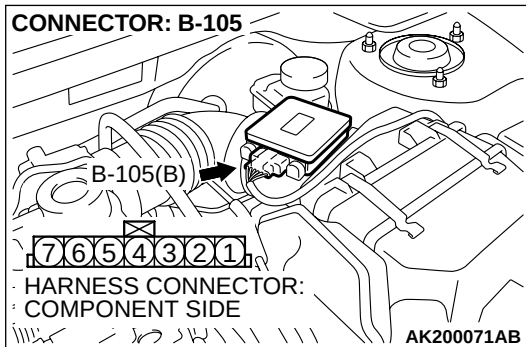
NO : Go to Step 13.

STEP 13. Check harness connector B-105 at the barometric pressure sensor and harness connector C-119 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 14.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.

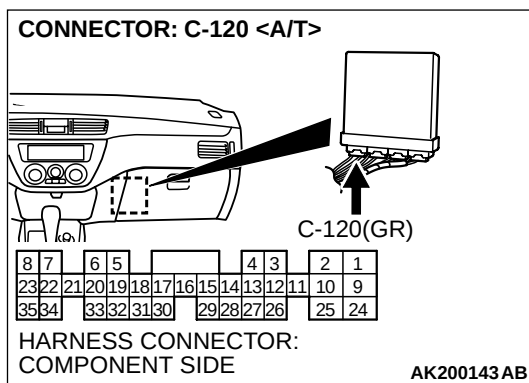
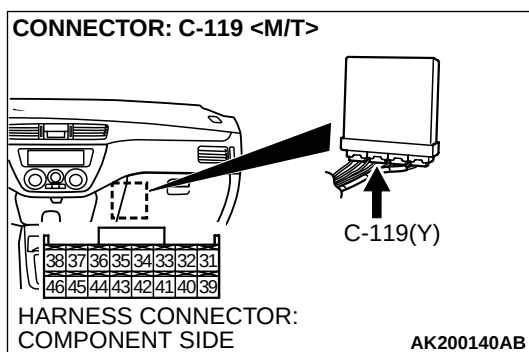
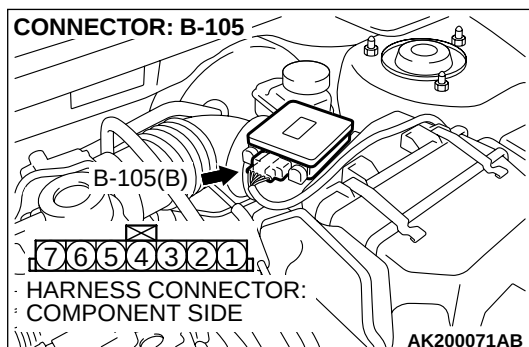


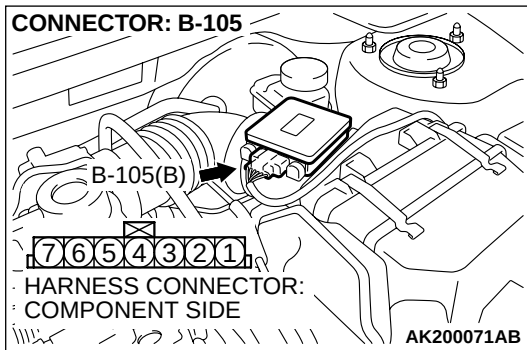
STEP 14. Check for harness damage between barometric pressure sensor connector B-105 (terminal No. 5) and ECM connector C-119 (terminal No. 40) <M/T> or PCM connector C-120 (terminal No. 16) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 18.

NO : Repair it. Then go to Step 18.



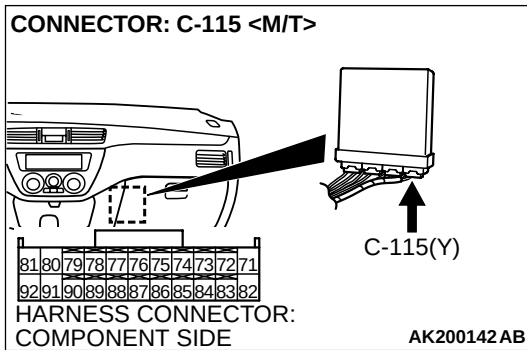


STEP 15. Check harness connector B-105 at barometric pressure sensor for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 16.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.

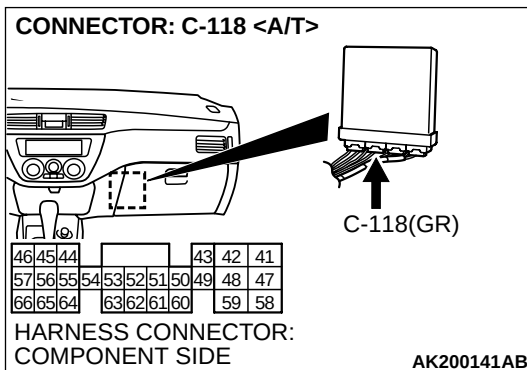


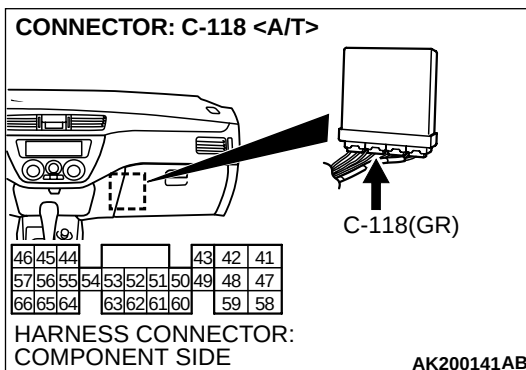
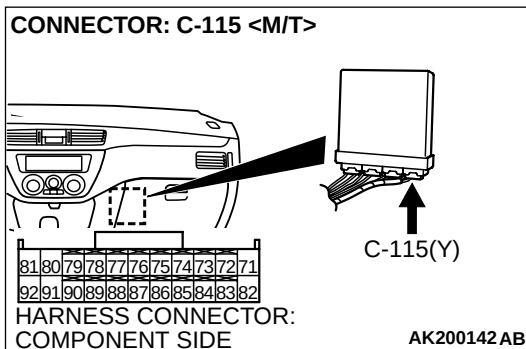
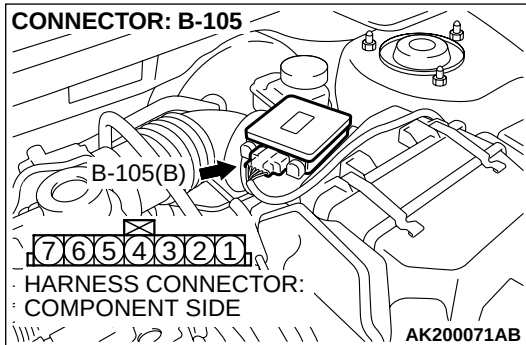
STEP 16. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 17.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 18.





STEP 17. Check for short circuit to ground and harness damage between barometric pressure sensor connector B-105 (terminal No. 2) and ECM connector C-115 (terminal No. 85) <M/T> or PCM connector C-118 (terminal No. 55) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the volume airflow sensor. Then go to Step 18.

NO : Repair it. Then go to Step 18.

STEP 18. Test the OBD-II drive cycle.

(1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

(2) Check the diagnostic trouble code (DTC).

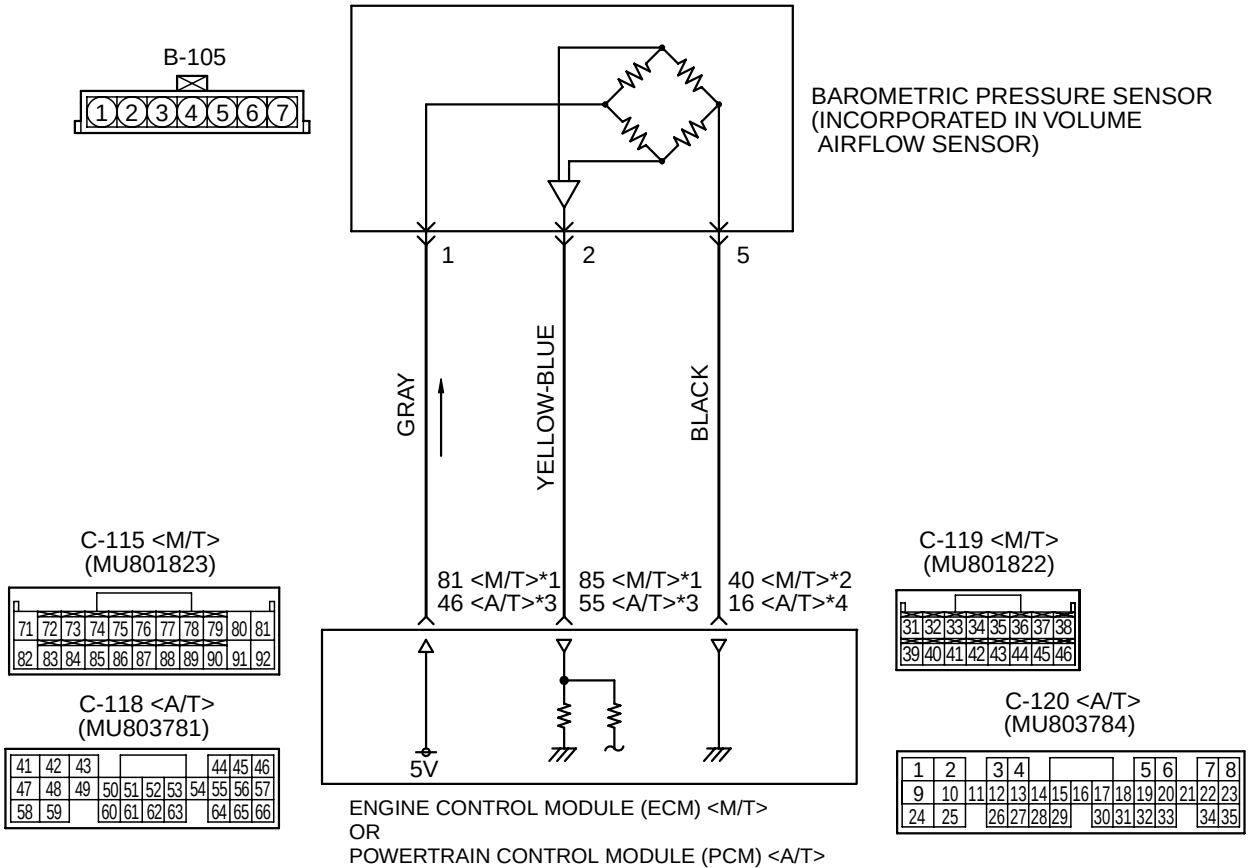
Q: Is DTC P2228 set?

YES : Retry the troubleshooting.

NO : The inspection is complete.

DTC P2229: Barometric Pressure Circuit High Input

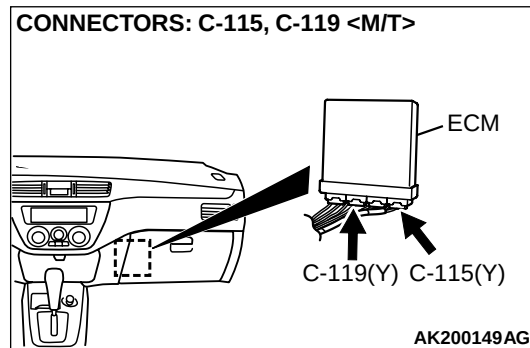
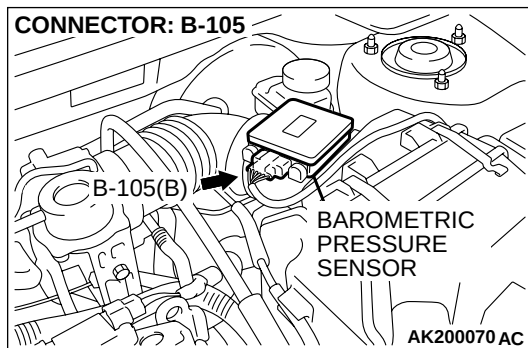
Barometric Pressure Sensor Circuit

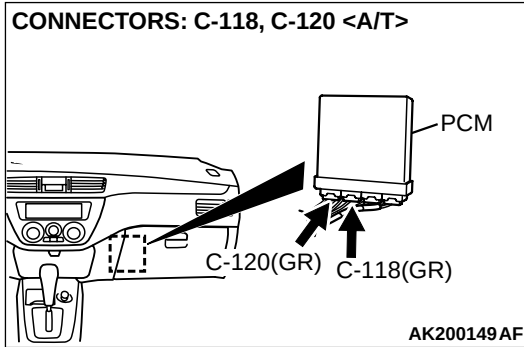


NOTE

- *1: ECM connector C-115 <M/T>
- *2: ECM connector C-119 <M/T>
- *3: PCM connector C-118 <A/T>
- *4: PCM connector C-120 <A/T>

AK304169





CIRCUIT OPERATION

- A 5-volt voltage is supplied to the barometric pressure sensor power terminal (terminal No. 1) from the ECM (terminal No. 81) <M/T> or PCM (terminal No. 46) <A/T>. The ground terminal (terminal No. 5) is grounded with ECM (terminal No. 40) <M/T> or PCM (terminal No. 16) <A/T>.
- A voltage that is proportional to the atmospheric pressure is sent to the ECM (terminal No. 85) <M/T> or PCM (terminal No. 55) <A/T> from the barometric pressure sensor output terminal (terminal No. 2).

TECHNICAL DESCRIPTION

- The barometric pressure sensor outputs a voltage which corresponds to the barometric pressure.
- The ECM <M/T> or PCM <A/T> checks whether this voltage is within a specified range.

DESCRIPTIONS OF MONITOR METHODS

- If the barometric pressure sensor output is out of the actual predictable atmospheric pressure range [higher than 113 kPa (33 in.Hg)], a malfunction is determined to have occurred.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (Other monitor and Sensor)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

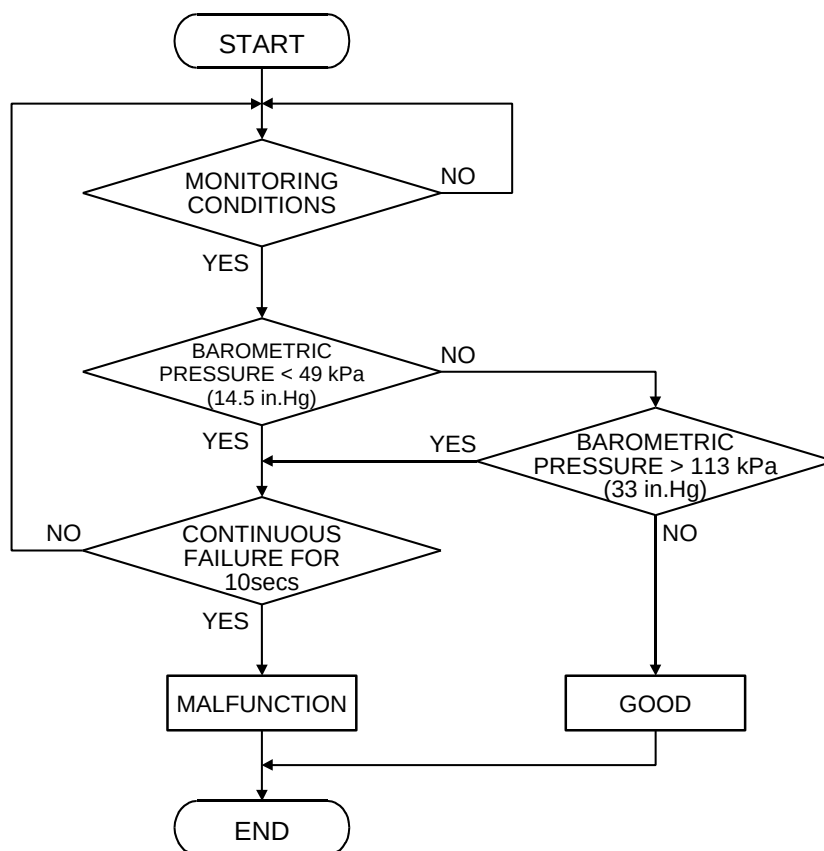
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

DTC SET CONDITIONS

Logic Flow Chart



AK302338

Check Conditions

- 2 seconds or more have passed since the starting sequence was completed.
- Battery positive voltage is higher than 8 volts.

Judgement Criteria

- Barometric pressure sensor output signal has continued to be approximately 113 kPa (33 in.Hg) or higher (approximately 4,000 ft below sea level) for 10 seconds.

OBD-II DRIVE CYCLE PATTERN

Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Barometric pressure sensor failed.
- Open or shorted barometric pressure sensor circuit, or connector damage.
- ECM failed. <M/T>
- PCM failed. <A/T>

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991911: Main Harness B

STEP 1. Using scan tool MB991958, check data list item 25: Barometric Pressure Sensor.**⚠ CAUTION**

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the data reading mode for item 25, Barometric Pressure Sensor.
 - When altitude is 0 m (0 foot), 101 kPa (29.8 in.Hg).
 - When altitude is 600 m (1,969 feet), 95 kPa (28.1 in.Hg).
 - When altitude is 1,200 m (3,937 feet), 88 kPa (26.0 in.Hg).
 - When altitude is 1,800 m (5,906 feet), 81 kPa (23.9 in.Hg).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

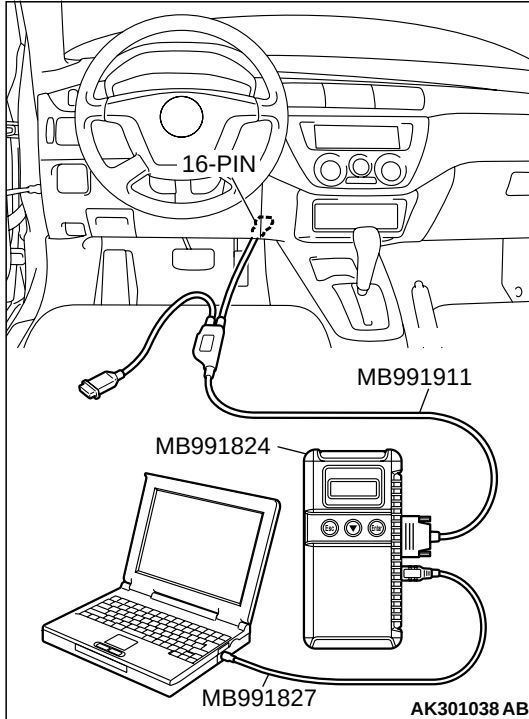
Q: Is the sensor operating properly?

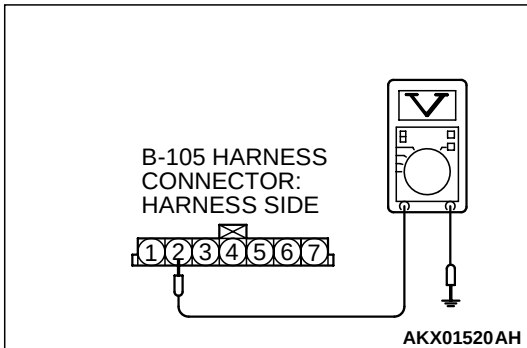
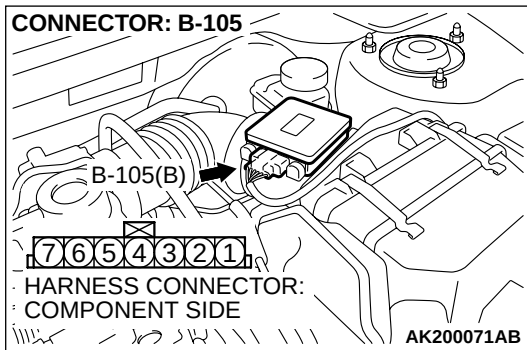
YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Go to Step 2.





STEP 2. Measure the sensor output voltage at barometric pressure sensor connector B-105 by backprobing.

- (1) Do not disconnect connector B-105.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 2 and ground by backprobing.

- When altitude is 0 m (0 foot), voltage should be 3.7 and 4.3 volts.
- When altitude is 600 m (1,969 feet), voltage should be 3.4 and 4.0 volts.
- When altitude is 1,200 m (3,937 feet), voltage should be 3.2 and 3.8 volts.
- When altitude is 1,800 m (5,906 feet), voltage should be 2.9 and 3.5 volts.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage within the specified range?

YES : Go to Step 3.

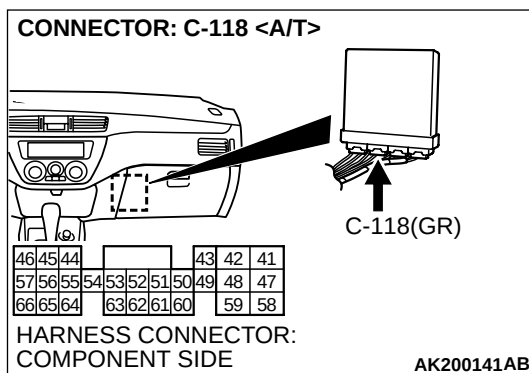
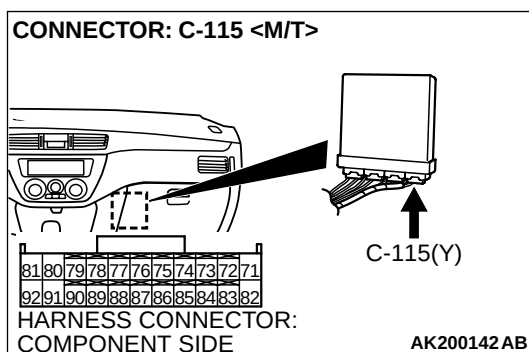
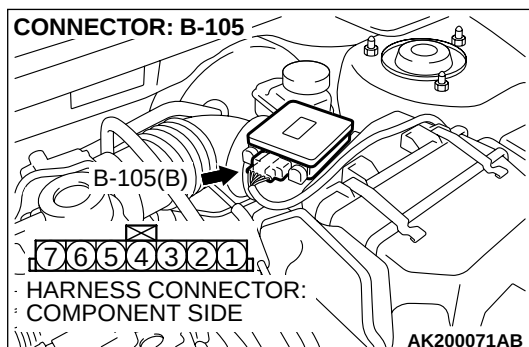
NO : Go to Step 5.

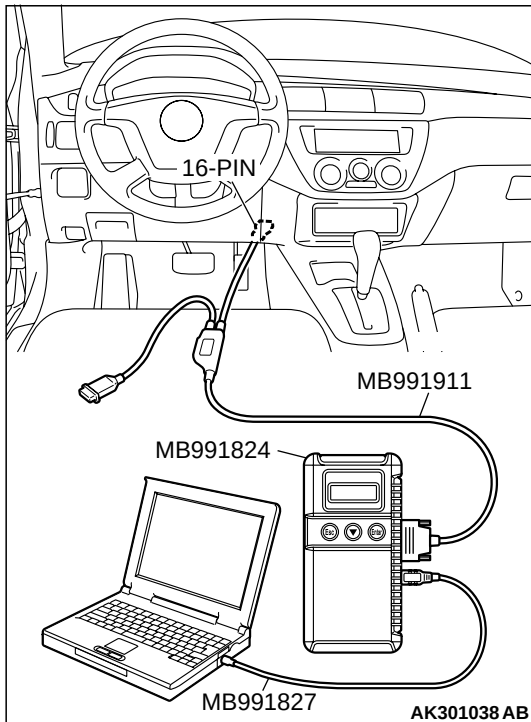
STEP 3. Check harness connector B-105 at the barometric pressure sensor and harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.





STEP 4. Using scan tool MB991958, check data list item 25: Barometric Pressure Sensor.

⚠ CAUTION

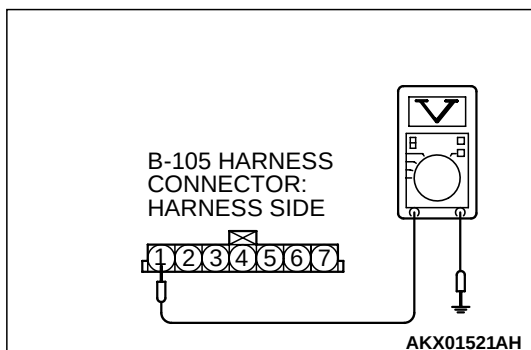
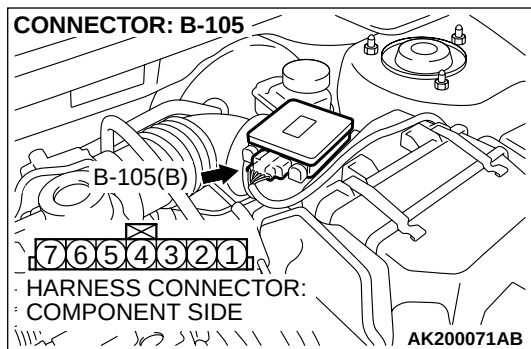
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to the data reading mode for item 25, Barometric Pressure Sensor.
 - When altitude is 0 m (0 foot), 101 kPa (29.8 in.Hg).
 - When altitude is 600 m (1,969 feet), 95 kPa (28.1 in.Hg).
 - When altitude is 1,200 m (3,937 feet), 88 kPa (26.0 in.Hg).
 - When altitude is 1,800 m (5,906 feet), 81 kPa (23.9 in.Hg).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

NO : Replace the ECM or PCM. Then go to Step 12.



STEP 5. Measure the sensor supply voltage at barometric pressure sensor connector B-105 by backprobing.

- (1) Do not disconnect connector B-105.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 1 and ground by backprobing.
 - Voltage should be between 4.8 and 5.2 volts.

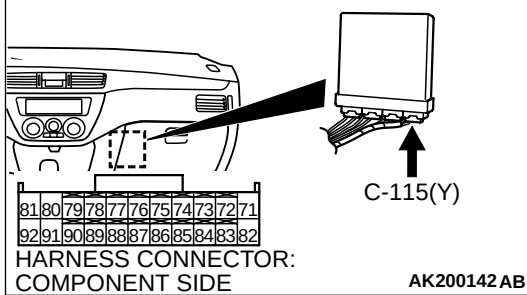
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.8 and 5.2 volts?

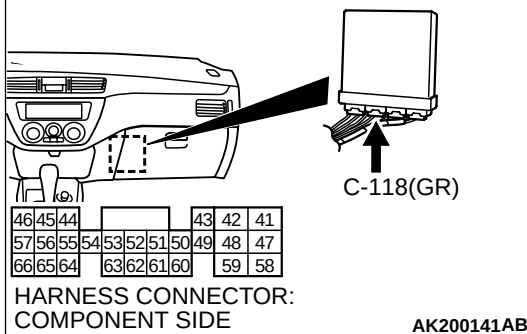
YES : Go to Step 7.

NO : Go to Step 6.

CONNECTOR: C-115 <M/T>



CONNECTOR: C-118 <A/T>



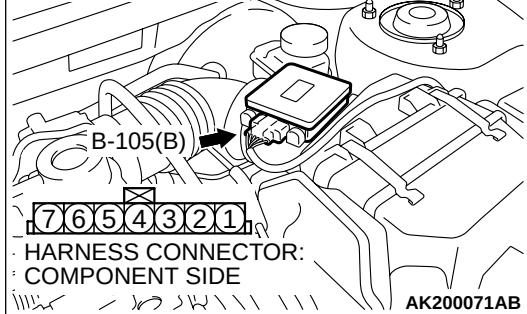
STEP 6. Check harness connector C-115 at ECM <M/T> or harness connector C-118 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

CONNECTOR: B-105



STEP 7. Measure the ground voltage at barometric pressure sensor connector B-105 by backprobing.

(1) Do not disconnect connector B-105.

(2) Turn the ignition switch to the "ON" position.

(3) Measure the voltage between terminal No. 5 and ground by backprobing.

- Voltage should be 0.5 volt or less.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

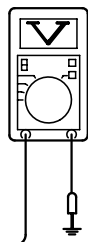
Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 10.

NO : Go to Step 8.

B-105 HARNESS
CONNECTOR:
HARNESS SIDE

1	2	3	4	5	6	7
---	---	---	---	---	---	---



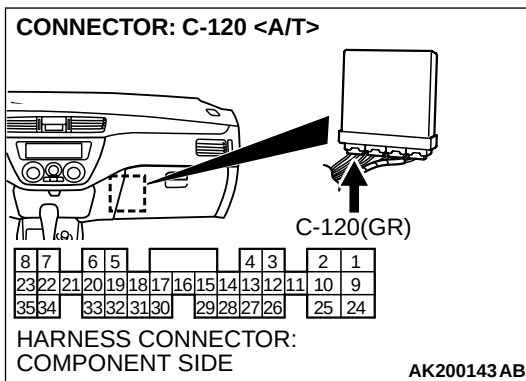
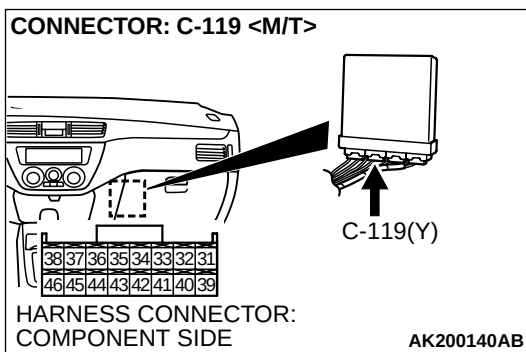
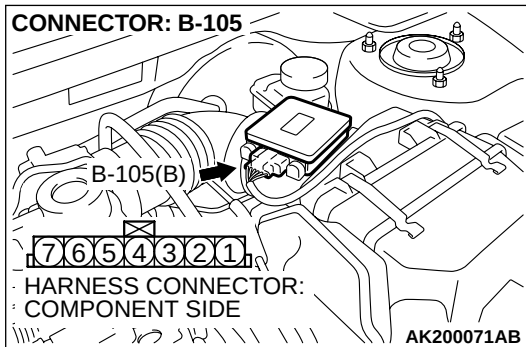
AKX01517AH

STEP 8. Check harness connector B-105 at the barometric pressure sensor and harness connector C-119 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 9.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

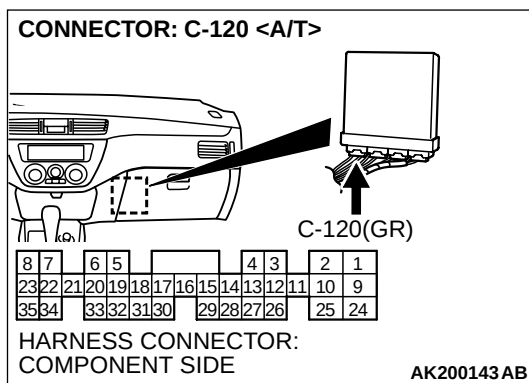
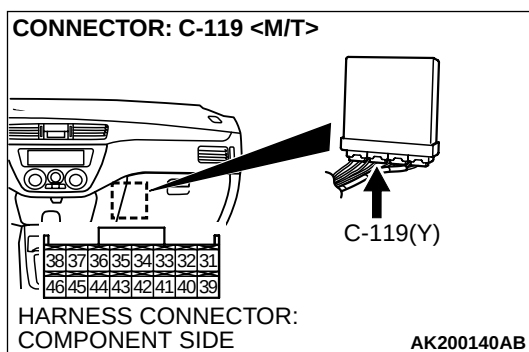
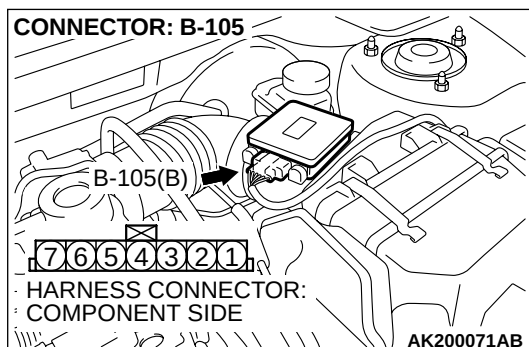


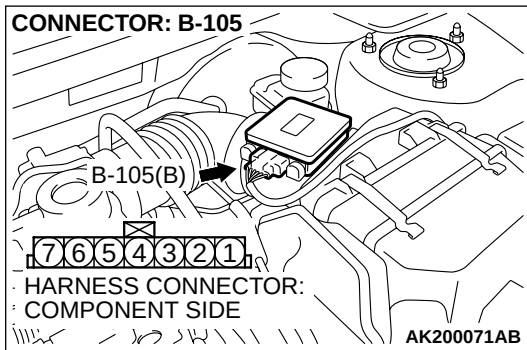
STEP 9. Check for open circuit between barometric pressure sensor connector B-105 (terminal No. 5) and ECM connector C-119 (terminal No. 40) <M/T> or PCM connector C-120 (terminal No. 16) <A/T>.

Q: Is the harness wire in good condition?

YES : Replace the ECM or PCM. Then go to Step 12.

NO : Repair it. Then go to Step 12.



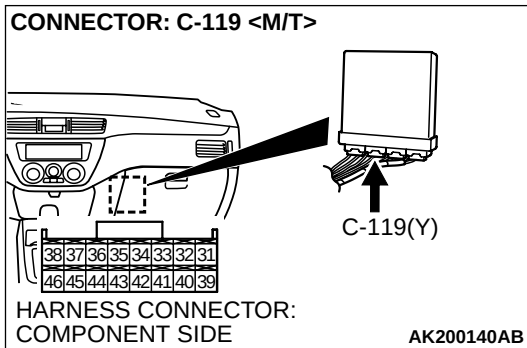


STEP 10. Check harness connector B-105 at barometric pressure sensor for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 11.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.

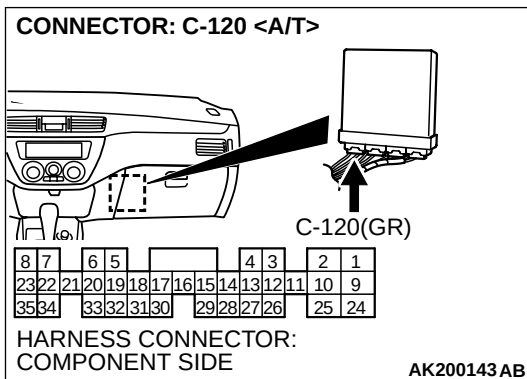


STEP 11. Check harness connector C-119 at ECM <M/T> or harness connector C-120 at PCM <A/T> for damage.

Q: Is the connector in good condition?

YES : Replace the volume airflow sensor. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 12.



STEP 12. Test the OBD-II drive cycle.

(1) Carry out a test drive with the drive cycle pattern. Refer to Diagnostic Function – OBD-II Drive Cycle – Procedure 6 – Other Monitor [P.13A-6](#).

(2) Check the diagnostic trouble code (DTC).

Q: Is DTC P2229 set?

YES : Retry the troubleshooting.

NO : The inspection is complete.

Continue