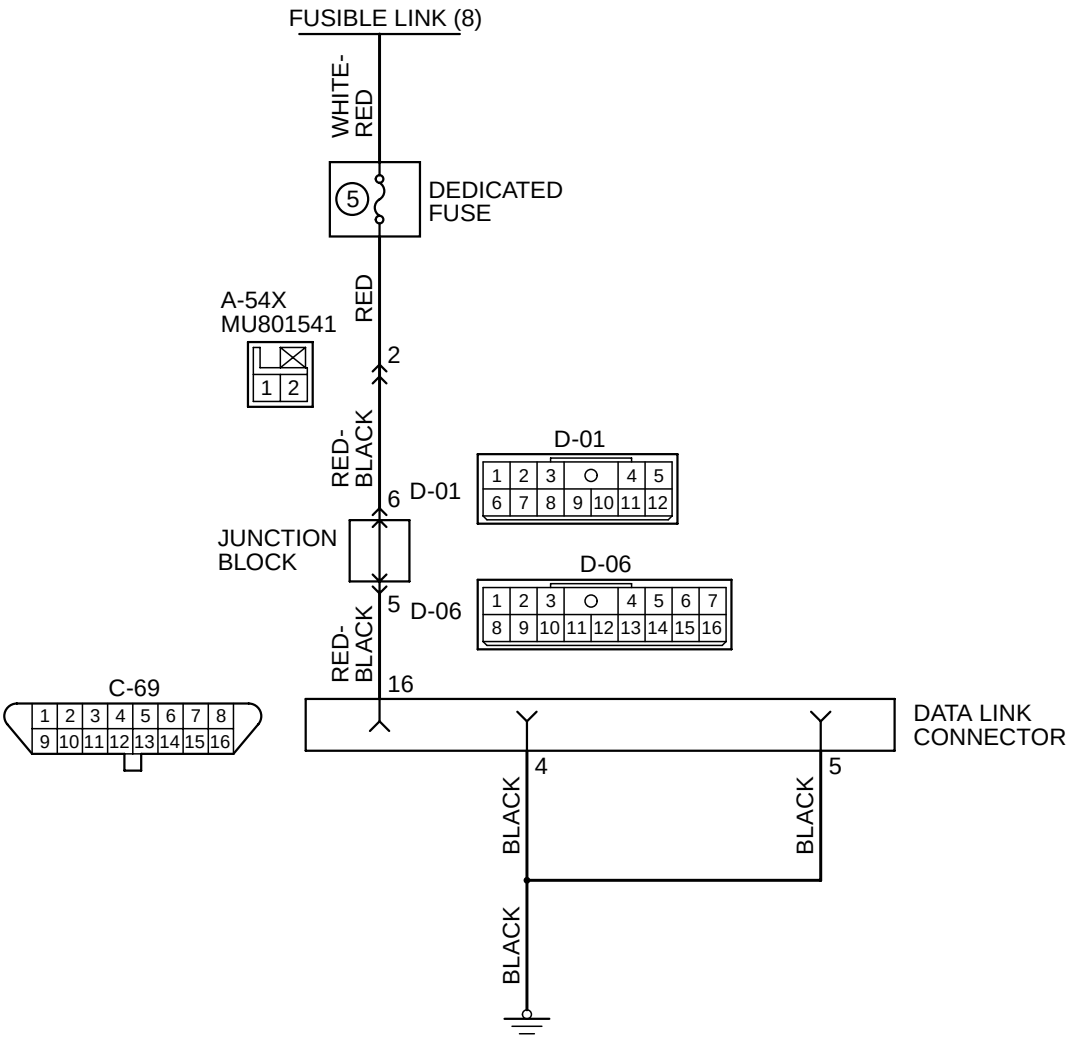
GROUP 13Ad

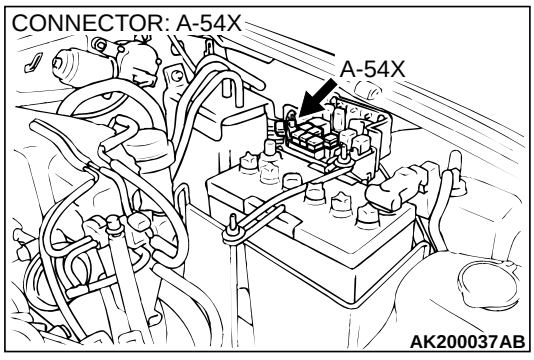
SYMPTOM PROCEDURES

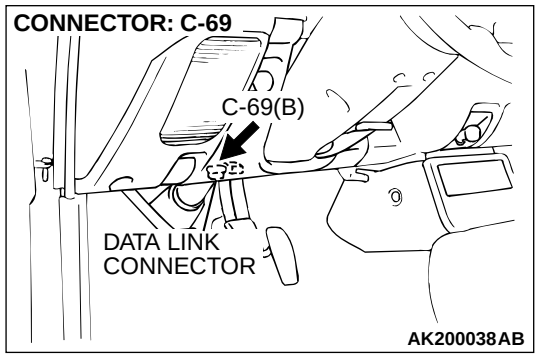
INSPECTION PROCEDURE 1: Communication with Scan Tool Is Not Possible. (Comunication with All Systems Is Not Possible.)

Data Link Connector Circuit

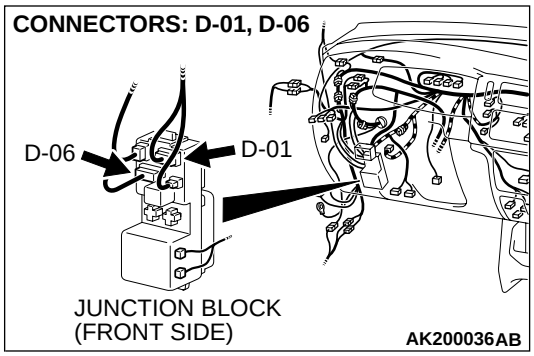


AK200452





TSB Revision



CIRCUIT OPERATION

- A battery positive voltage is applied on the data link connector power terminal (terminal No. 16). The ground terminals (terminals No. 4, No. 5) are grounded to the vehicle body.

COMMENT

- The cause is probably a defect in power supply system (including ground) for the on-board diagnostic test mode line.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the data link connector.
- Damaged harness wire.

DIAGNOSIS

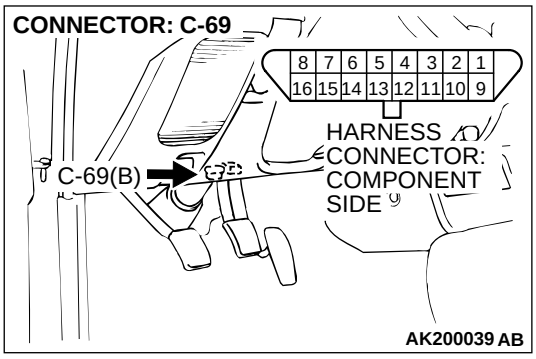
STEP 1. Measure the power supply voltage at data link connector C-69.

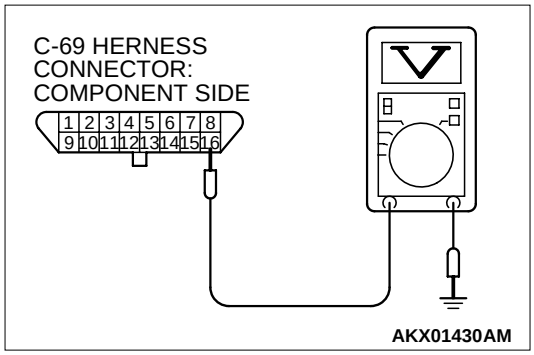
(1) Measure voltage between terminal No. 16 and ground.
- Voltage should be battery positive voltage.

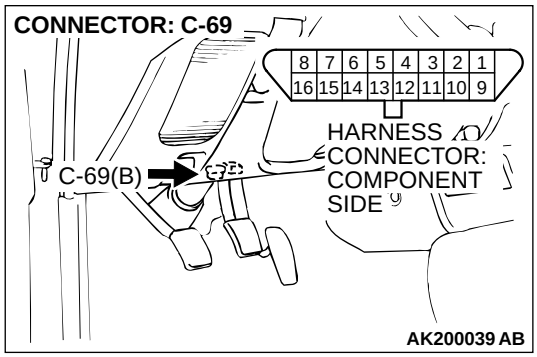
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to step 2.

NO : Check harness connectors D-01 and D-06 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector D-01 and D-06 are in good condition, repair an open circuit between fusible link (8) and data link connector C-69 (terminal No. 16). Then confirm that the malfunction symptom is eliminated.







STEP 2. Check for continuity at data link connector C-69.

(1) Check for the continuity between terminals No. 4, No. 5 and ground.
- Should be less than 2 ohms.

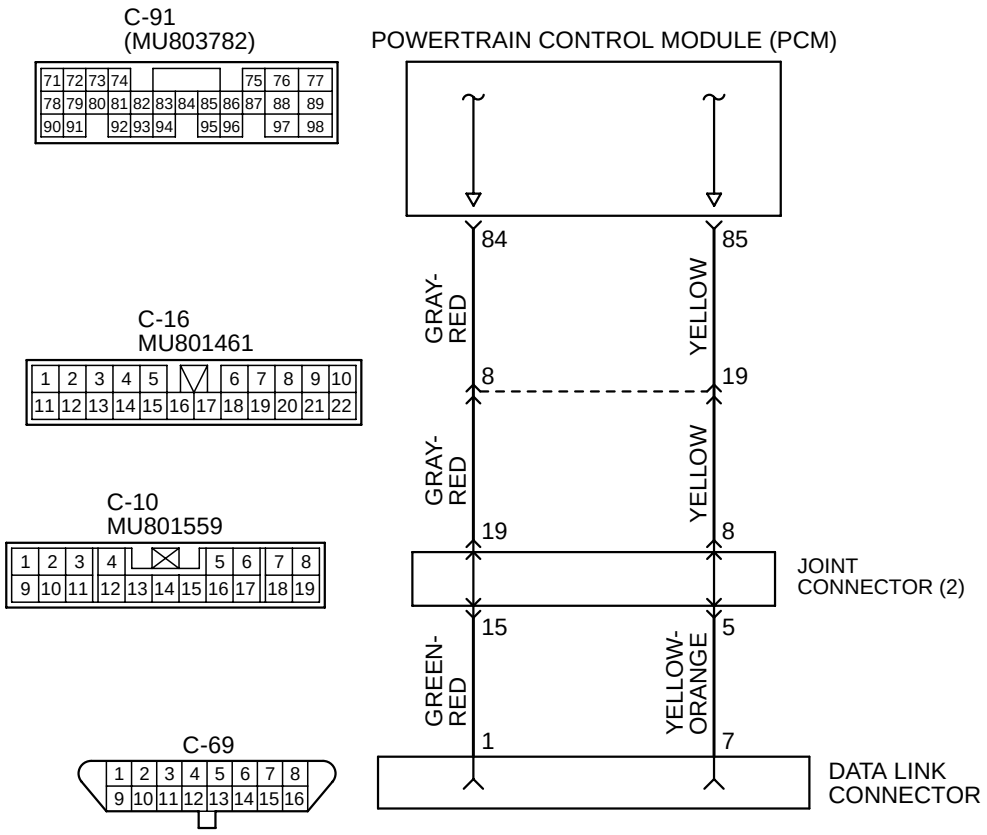
Q: Does continuity exist?

YES : Replace the scan tool. Then confirm that the malfunction symptom is eliminated.

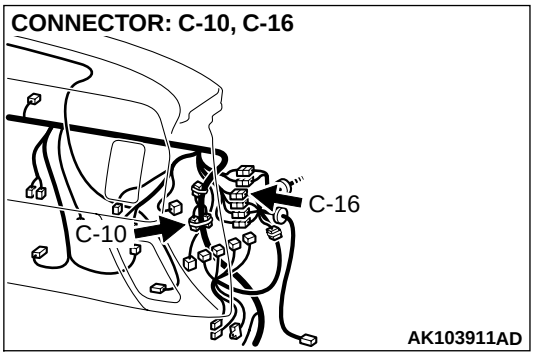
NO : Repair an open circuit or harness damage between data link connector C-69 (terminals No. 4, No. 5) and ground. Then confirm that the malfunction symptom is eliminated.

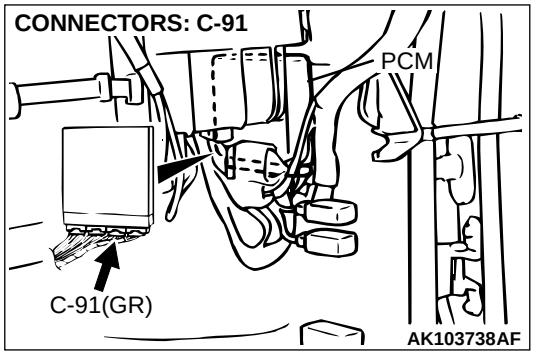
INSPECTION PROCEDURE 2: Scan Tool Communication with PCM Is Not Possible.

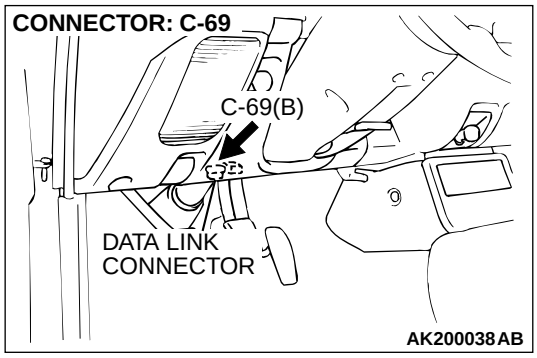
Data Link Connector Circuit



AK000622







CIRCUIT OPERATION

- A diagnostic output is made from the PCM (terminal No. 85) to the diagnostic output terminal (terminal No. 7) of the data link connector.
- When diagnostic test mode control terminal (terminal No. 1) of the data link connector is grounded, the PCM (terminal No. 84) changes to the diagnostic test mode.

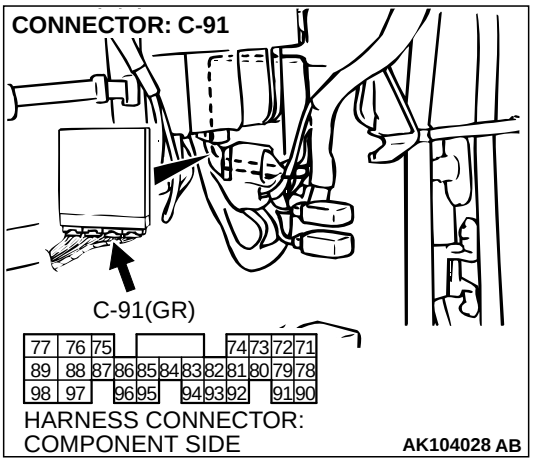
COMMENT

- No power supply to PCM.
- Defective ground circuit of PCM.
- Defective PCM.
- Improper communication line between PCM and scan tool.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of PCM power supply circuit.
- Malfunction of the PCM.
- Open circuit between PCM and data link connector.

DIAGNOSIS



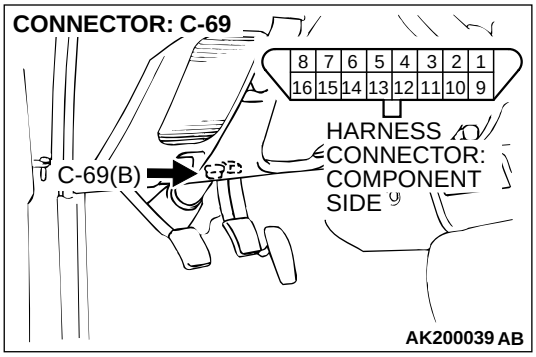
STEP 1. Check harness connector C-91 at PCM for damage.

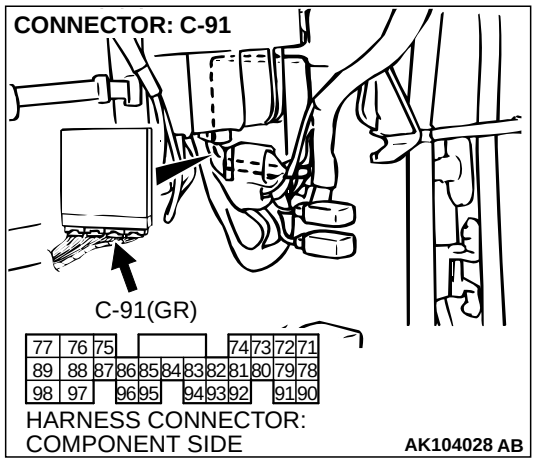
Q: Is the harness connector in good condition?

YES : Go to Step 2.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

TSB Revision





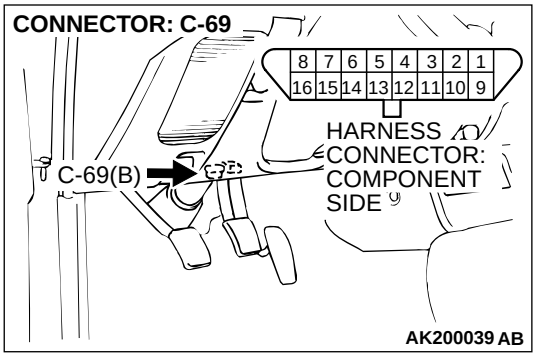
STEP 2. Check for open circuit, short circuit to ground and harness damage between data link connector C-69 (terminal No. 1) and PCM connector C-91 (terminal No. 84).

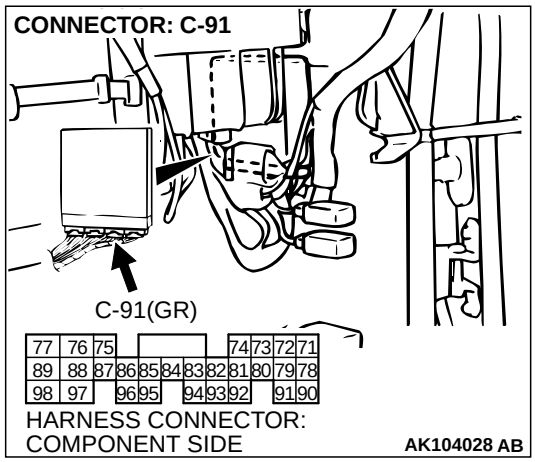
NOTE: Check harness after checking intermediate connectors C-10 and C-16. If intermediate connector C-10 and C-16 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then check that the malfunction is eliminated.

Q: Is the harness wire in good condition?

YES : Go to Step 3.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.





STEP 3. Check for open circuit, short circuit to ground and harness damage between data link connector C-69 (terminal No. 7) and PCM connector C-91 (terminal No. 85).

NOTE: Check harness after checking intermediate connectors C-10 and C-16. If intermediate connector C-10 and C-16 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then check that the malfunction is eliminated.

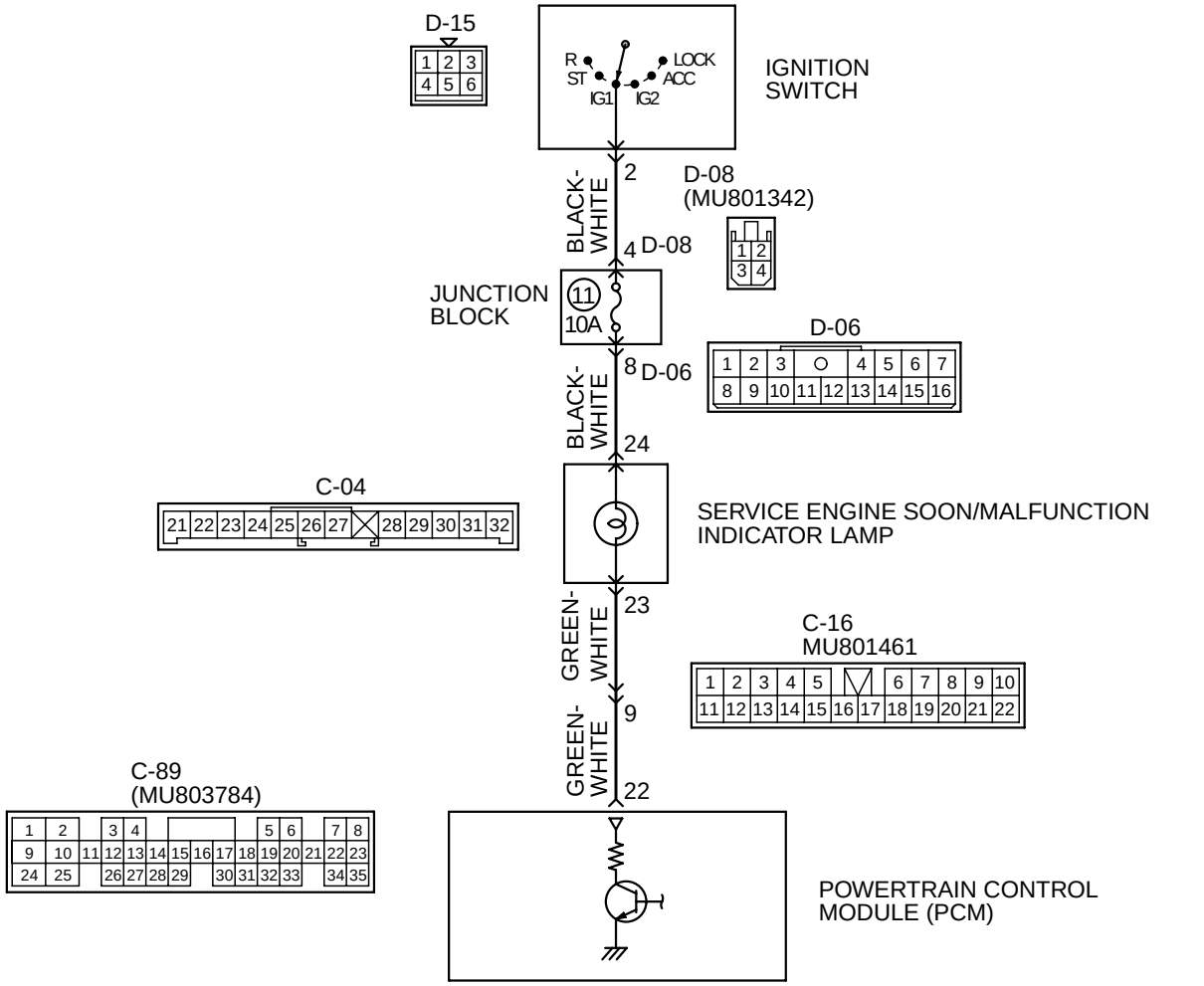
Q: Is the harness wire in good condition?

YES : Refer to, INSPECTION PROCEDURE 28 – Power Supply System and Ignition Switch-IG System P.13Ad-76.

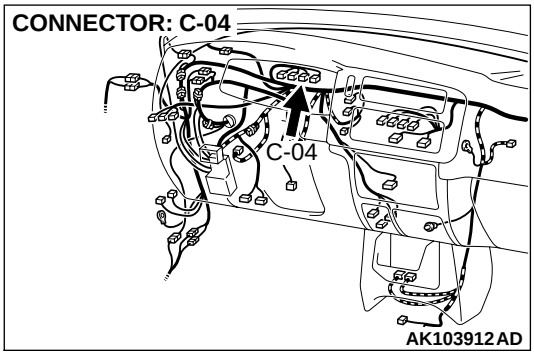
NO : Repair it. Then confirm that the malfunction symptom is eliminated.

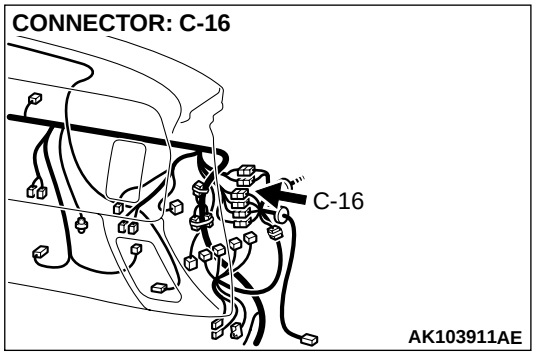
INSPECTION PROCEDURE 3: The Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Does Not Illuminate Right after the Ignition Switch Is Turned to the "ON" Position.

Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Circuit

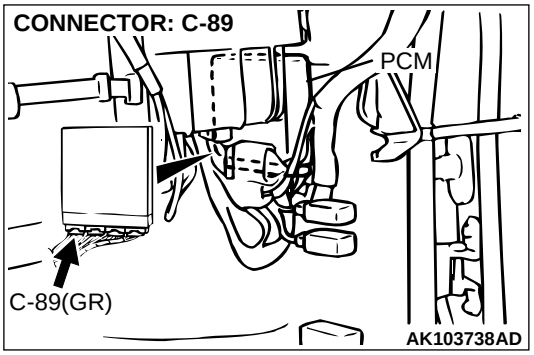


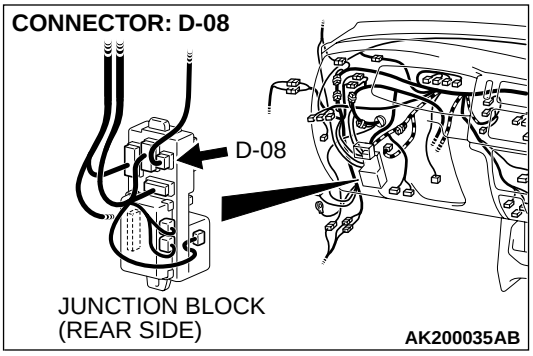
AK200453

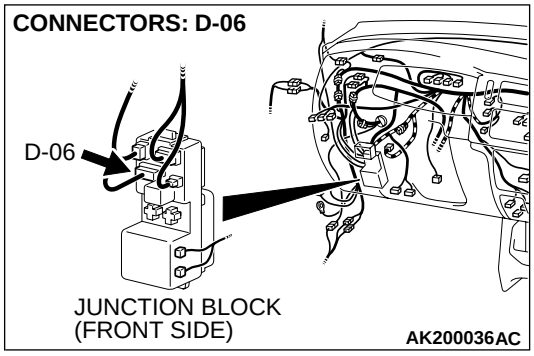


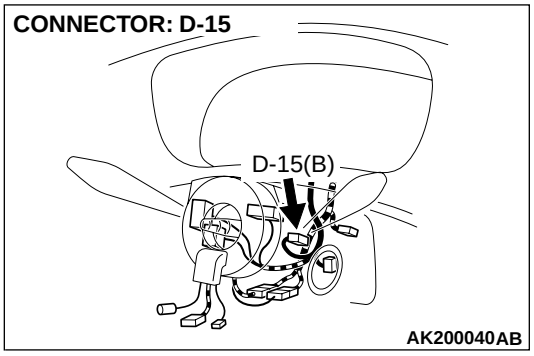


TSB Revision









CIRCUIT OPERATION

- The malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) power is supplied from the ignition switch.
- The PCM controls the ground of the malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) by turning the power transistor in the PCM ON and OFF.

COMMENT

- The PCM causes the malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) to illuminate for 5 seconds immediately after the ignition switch is turned to the "ON" position occurred.

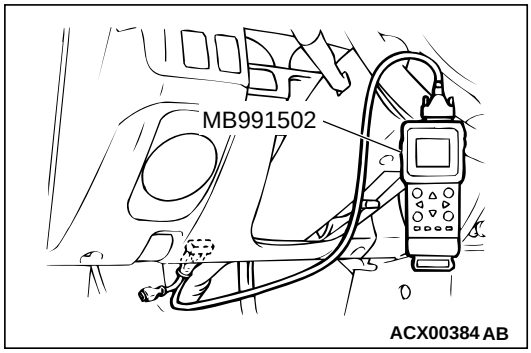
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Burnt-out bulb.
- Defective malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) circuit.
- Malfunction of the PCM.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 16: Power Supply Voltage.



⚠ 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) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to the data reading mode for item 16, Power Supply Voltage.
- 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?

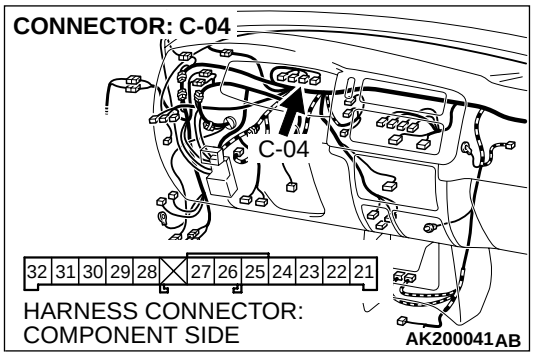
YES : Go to Step 2.
NO : Refer to INSPECTION PROCEDURE 28 – Power Supply System and Ignition Switch-IG System P.13Ad-76.

STEP 2. Check the burned-out bulb.

Q: Is the valve normal?

YES : Go to step 3.
NO : Replace the bulb. Then confirm that the malfunction symptom is eliminated.

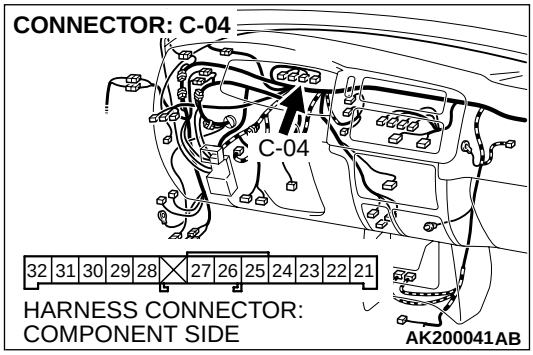
STEP 3. Check harness connector C-04 at the combination meter for damage.



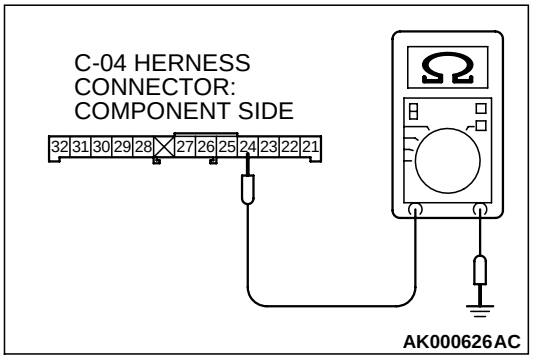
Q: Is the harness connector in good condition?

YES : Go to step 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

STEP 4. Measure the power supply voltage at combination meter harness side connector C-04.



(1) Disconnect the connector C-04 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal No. 24 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 5.

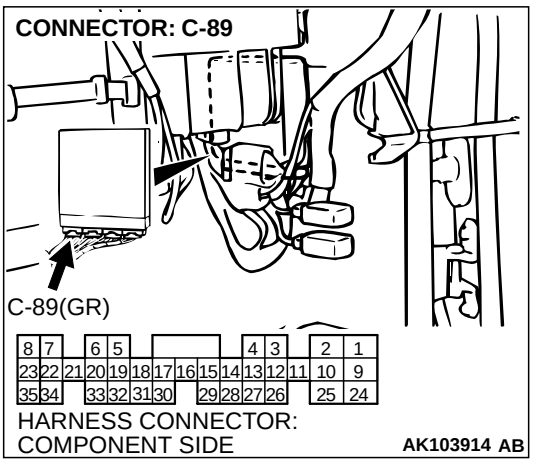
NO : Check harness connectors D-06 and D-08 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connectors D-06 and D-08 are in good condition, repair it because of open circuit between ignition switch connector D-15 (terminal No. 2) and combination meter connector C-04 (terminal No. 24). Then confirm that the malfunction symptom is eliminated.

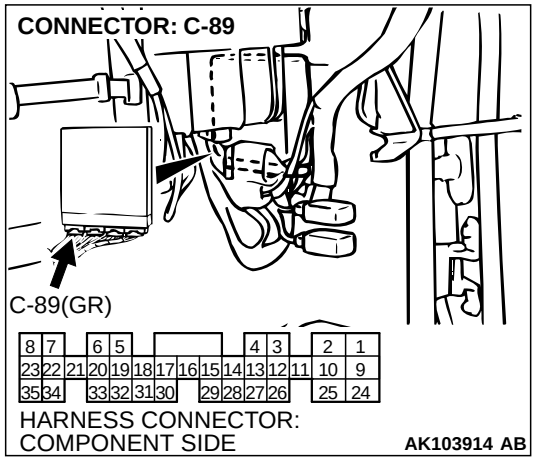
STEP 5. Check harness connector C-89 at the PCM for damage.

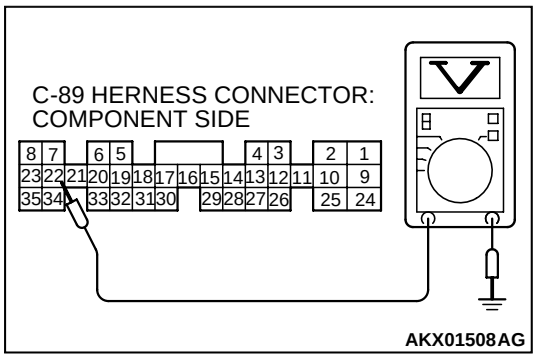
Q: Is the harness connector in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.







STEP 6. Measure the power supply voltage at PCM connector C-89.

(1) Disconnect the connector C-89 and measure at the harness side.

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

(3) Measure the voltage between terminal No. 22 and ground.
- Voltage should be battery positive voltage.

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

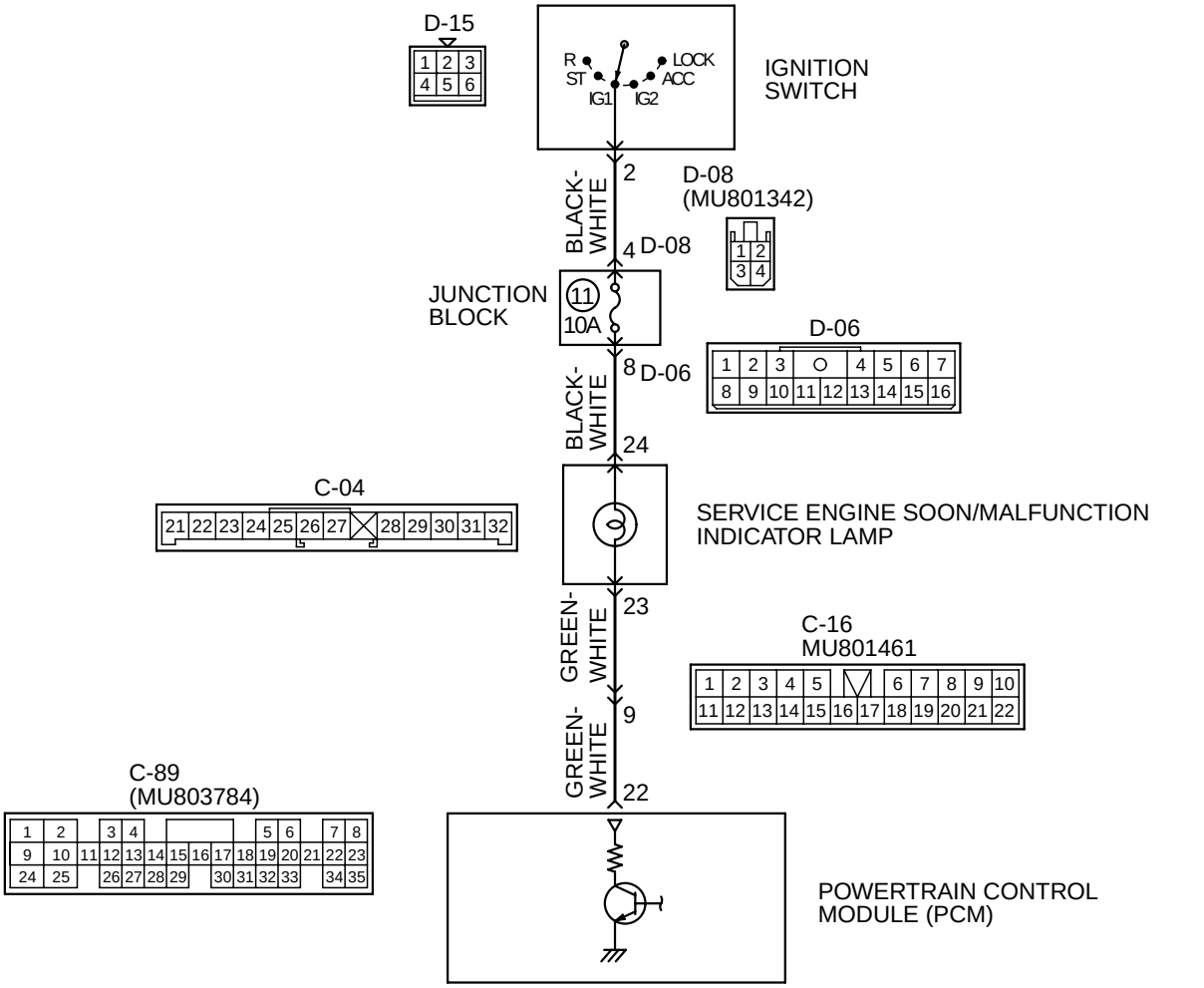
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

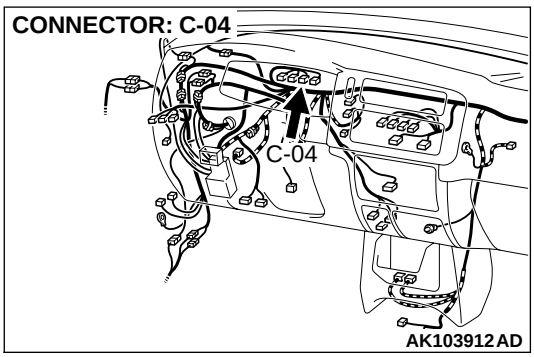
NO : Check harness connector C-16 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector C-16 is in good condition, repair an open circuit between combination meter connector C-04 (terminal No. 23) and PCM connector C-89 (terminal No. 22). Then confirm that the malfunction symptom is eliminated.

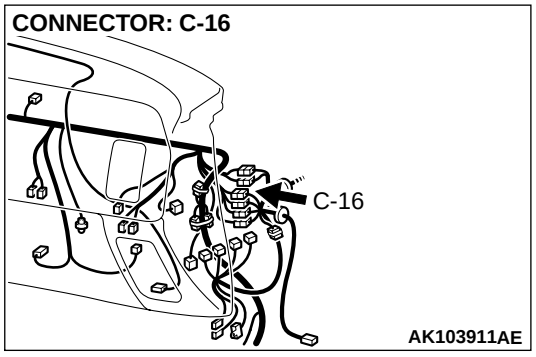
INSPECTION PROCEDURE 4: The Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Remains Illuminated and Never Goes Out.

Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Circuit

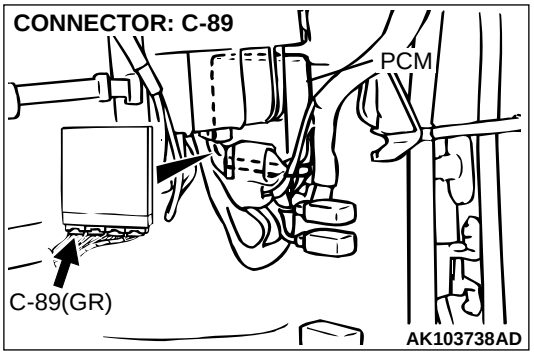


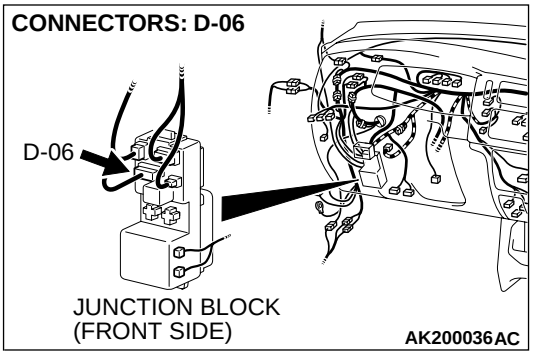
AK200453

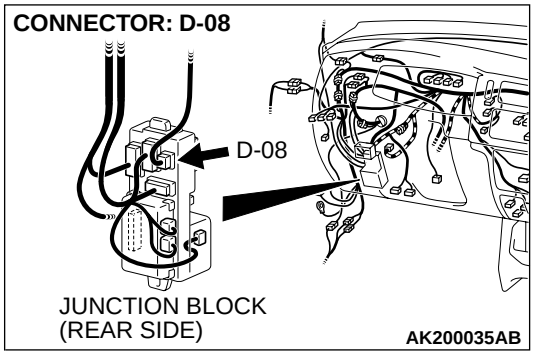


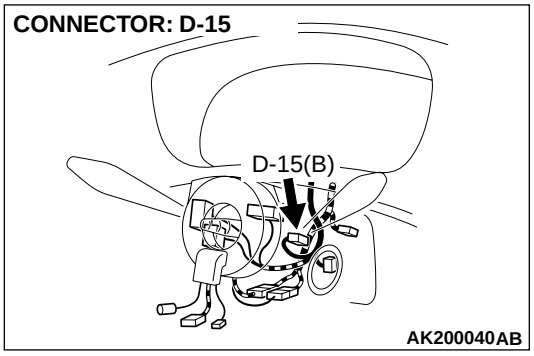


TSB Revision









CIRCUIT OPERATION

- The malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) power is supplied from the ignition switch.
- The PCM controls the ground of the malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) by turning the power transistor in the PCM ON and OFF.

COMMENT

- In cases such as the above, the cause is probably that the PCM is detecting a problem in a sensor or actuator, or that one of the malfunctions listed at right has probably occurred.

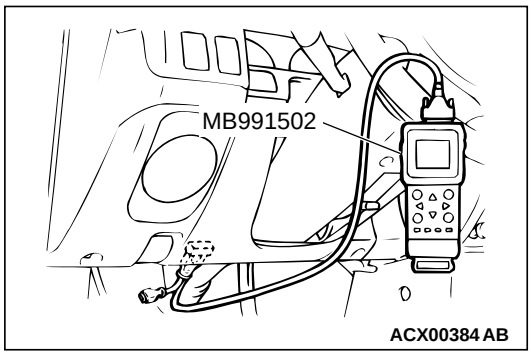
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Short-circuit between the malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) and PCM.
- Malfunction of the PCM.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

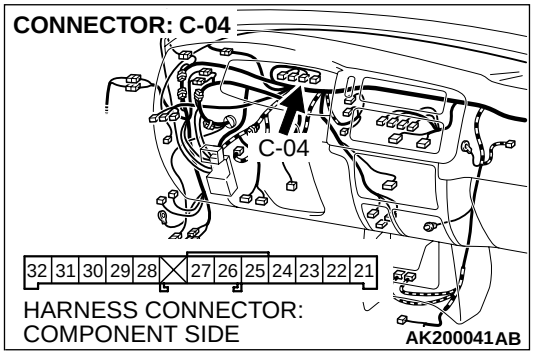
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

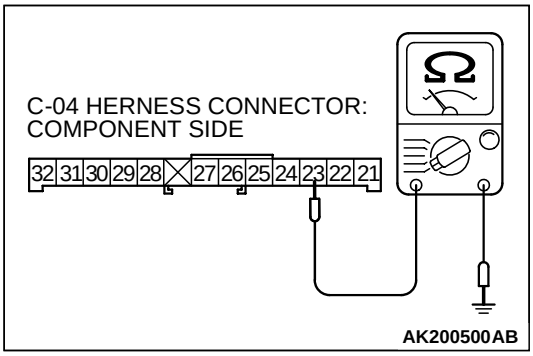
Q: Is DTC set?

YES : Refer to GROUP 13A Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step. 2.

TSB Revision





STEP 2. Check for continuity at combination meter harness side connector C-04.

(1) Disconnect the connector C-04 and measure at the harness side.

(2) Check for the continuity between terminal No. 23 and ground.
- Should be open loop.

Q: Does continuity exist?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

NO : Check harness connector C-16 at the intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector C-16 is in good condition, repair a short circuit to ground between combination meter connector C-04 (terminal No. 23) and PCM connector C-89 (terminal No. 22). Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 5: Cranks, Won't Start

Cranks, Won't Start Circuit
- Refer to, Ignition circuit P.13Ad-100.

CIRCUIT OPERATION
- Refer to, Ignition circuit P.13Ad-100.

COMMENT
- In cases such as the above, the cause is probably no spark, fuel delivery, or fuel quality problems. In addition, foreign materials (water, kerosene, etc.) may be mixed with the fuel.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the ignition system.
- Malfunction of the fuel pump system.
- Malfunction of the injector system.
- Malfunction of the PCM.
- Contaminated fuel.
- Malfunction of the immobilizer system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Measure the battery positive voltage.

(1) Measure the battery positive voltage during cranking.
- The voltage should remain greater than 8 volts while the engine is cranked.

Q: Dose the voltage remain greater than 8 volts while the engine is cranked?

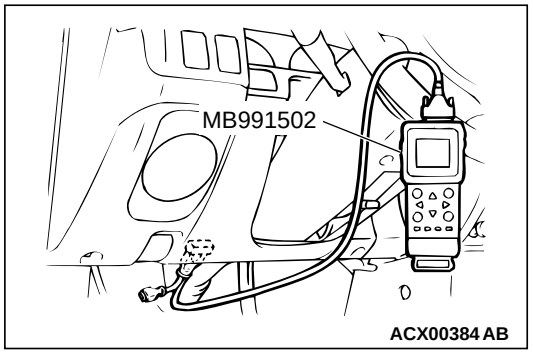
YES : Go to Step 2.
NO : Check the battery. Refer to GROUP 54, Battery – Battery Check P.54-4. Then confirm that the malfunction symptom is eliminated.

STEP 2. Check the timing belt for breaks.

Q: Is the timing belt good condition?

YES : Go to Step 3.
NO : Replace timing belt. Then confirm that the malfunction symptom is eliminated.

STEP 3 Using scan tool MB991502, check data list.



⚠ CAUTION

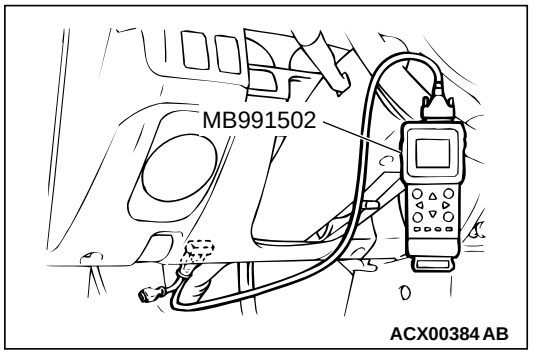
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data List. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 16: Power Supply Voltage.
  b. Item 22: Crankshaft Position Sensor.
  c. Item 21: Engine Coolant Temperature Sensor.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 4.
NO : Repair or replace.Then confirm that the malfunction symptom is eliminated.

STEP 4. Using scan tool MB991502, check actuator test.

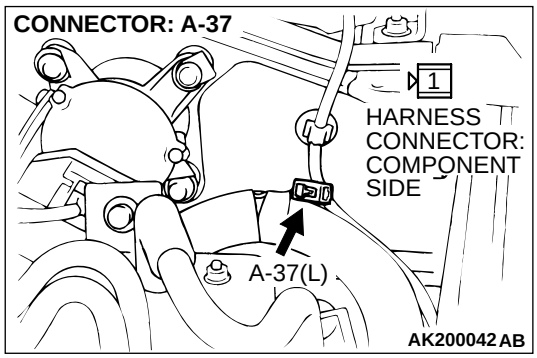


(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 07: Fuel pump.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 5.
NO : Repair or replace.Then confirm that the malfunction symptom is eliminated.

STEP 5. Check the ignition system.



(1) Connect the tachometer to engine speed detection connector A-37 (terminal No. 1).
(2) Crank the engine.
  • The tachometer should indicate cranking speed.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the cranking speed normal?

YES : Go to Step 6.
NO : Refer to INSPECTION PROCEDURE 31 – Ignition Circuit System P.13Ad-100.

STEP 6. Check the ignition timing.

(1) Check the ignition timing at cranking.

Standard value: 5° BTDC ± 3°

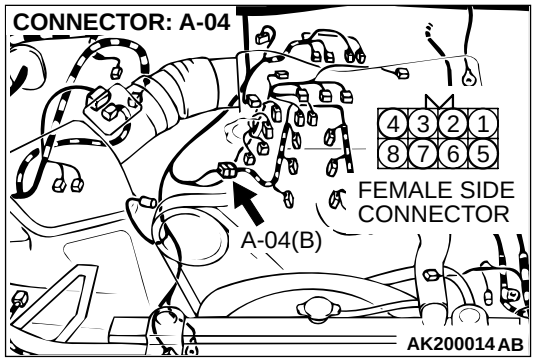
Q: Is the ignition timing normal?

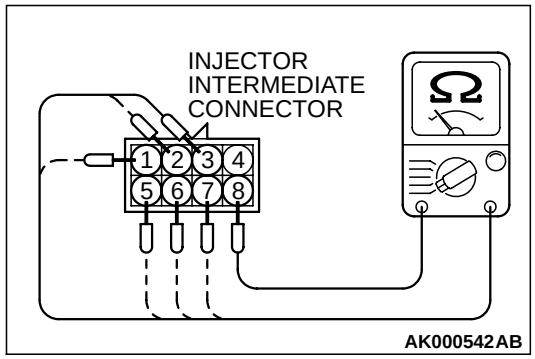
YES : Go to Step 7.
NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

TSB Revision

STEP 7. Measure the injector resistance at injector intermediate connector A-04.

(1) Disconnect the injector intermediate connector A-04.

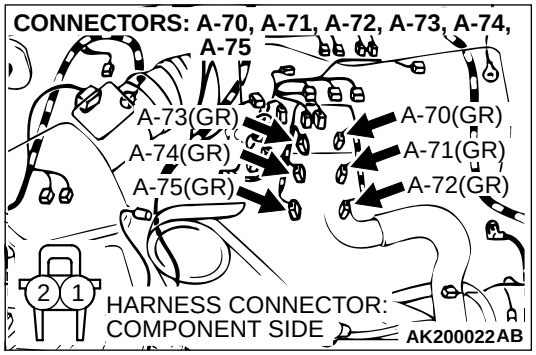




(2) Measure the resistance between each male connector side terminal.
   a. Measure the resistance between terminal No. 8 and No. 3 when measuring No. 1 cylinder injector
   b. Measure the resistance between terminal No. 8 and No. 2 when measuring No. 2 cylinder injector
   c. Measure the resistance between terminal No. 8 and No. 1 when measuring No. 3 cylinder injector
   d. Measure the resistance between terminal No. 8 and No. 7 when measuring No. 4 cylinder injector
   e. Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector
   f. Measure the resistance between terminal No. 8 and No. 5 when measuring No. 6 cylinder injector
   - Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

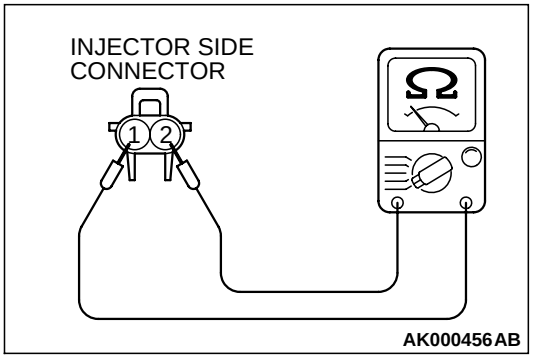
Q: Is the resistance normal?

YES : Go to Step 10.
NO : Go to Step 8.



STEP 8. Check the injector.

(1) Disconnect the injector connector, which deviates from the standard value at Step 7.



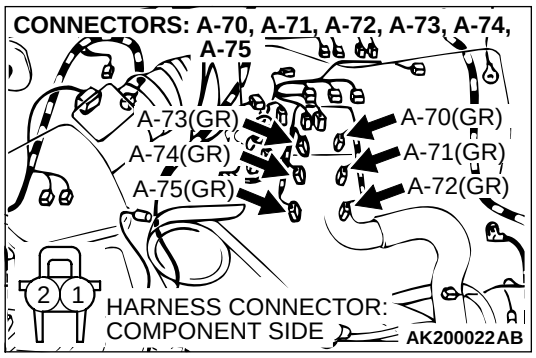
(2) Measure the resistance between injector side connector terminal No. 1 and No. 2.

Standard value: 13 – 16 ohms [at 20°C (68°F)]

Q: Is the resistance between 13 and 16 ohms [at 20°C (68°F)]?

YES : Go to Step 9.

NO : Replace the injector. Then confirm that the malfunction symptom is eliminated.



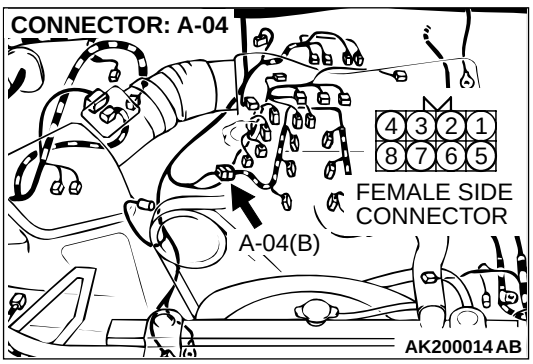
STEP 9. Check harness connector A-70 or A-71 or A-72 or A-73 or A-74 or A-75 at injector for damage.

Check the injector connector, which deviates from the standard value at Step 7.

Q: Is the harness connector in good condition?

YES : Repair harness wire between injector intermediate connector and injector connector because of harness damage. Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

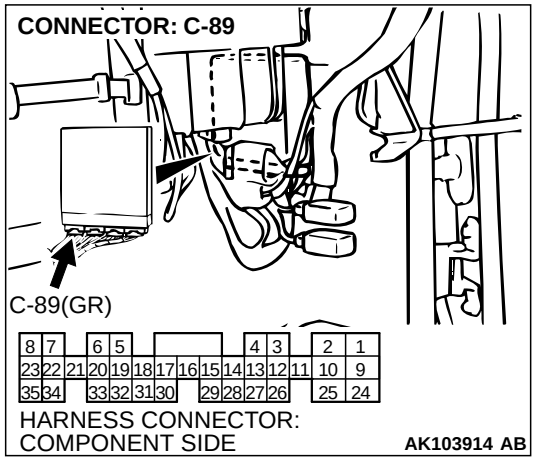


STEP 10. Check harness connector A-04 at injector intermediate connector for damage.

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 confirm that the malfunction symptom is eliminated.

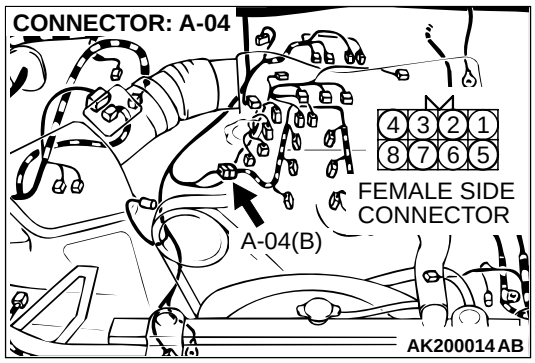


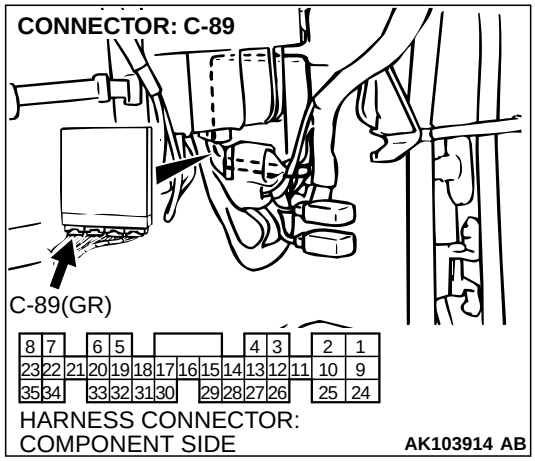
STEP 11. Check harness connector C-89 at PCM for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.





STEP 12. Check for harness damage between injector intermediate connector A-04 and PCM connector C-89.

a. Check the harness wire between injector intermediate connector A-04 (terminal No. 3) and PCM connector C-89 (terminal No. 1) when checking No. 1 cylinder injector.

b. Check the harness wire between injector intermediate connector A-04 (terminal No. 2) and PCM connector C-89 (terminal No. 9) when checking No. 2 cylinder injector.

c. Check the harness wire between injector intermediate connector A-04 (terminal No. 1) and PCM connector C-89 (terminal No. 24) when checking No. 3 cylinder injector.

d. Check the harness wire between injector intermediate connector A-04 (terminal No. 7) and PCM connector C-89 (terminal No. 2) when checking No. 4 cylinder injector.

e. Check the harness wire between injector intermediate connector A-04 (terminal No. 6) and PCM connector C-89 (terminal No. 10) when checking No. 5 cylinder injector.

f. Check the harness wire between injector intermediate connector A-04 (terminal No. 5) and PCM connector C-89 (terminal No. 25) when checking No. 6 cylinder injector.

Q: Is the harness wire in good condition?

YES : Check the following items, and repair or replace the defective items.

a. Check the ignition coil, spark plugs, spark plug cables.

b. Check if the injectors are clogged.

c. Check if fuel is contaminated.

d. Check compression.

Then confirm that the malfunction symptom is eliminated.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 6: Fires Up and Dies.

COMMENT

- In such cases as the above, the cause is usually improper air/fuel mixture. It is possible, though less likely, that the spark plugs are generating sparks but the sparks are weak.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the ignition system.
- Malfunction of the injector system.
- Contaminated fuel.
- Poor compression.
- Malfunction of the PCM.
- Malfunction of the immobilizer system.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Measure the battery positive voltage.

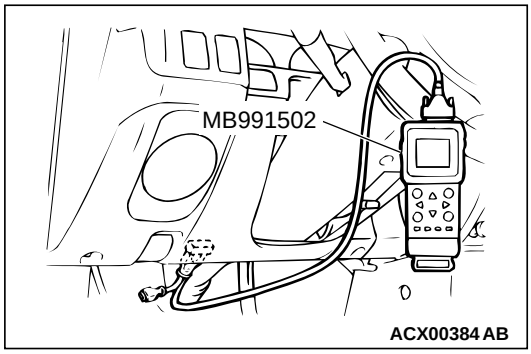
(1) Measure the battery positive voltage during cranking.
- The voltage should remain greater than 8 volts while the engine is cranked.

Q: Dose the voltage remain greater than 8 volts while the engine is cranked?

YES : Go to Step 2.
NO : Refer to GROUP 54, Battery – Battery Check P.54-4.

STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

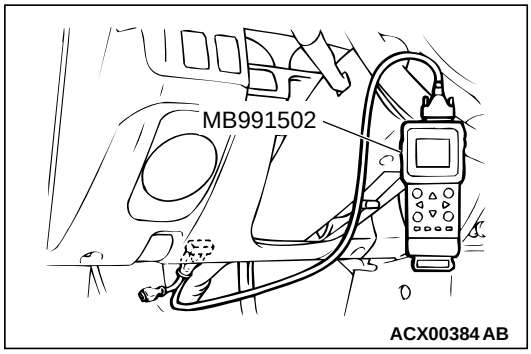


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 3.

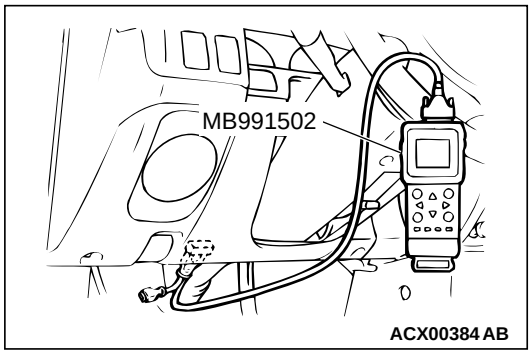
STEP 3. Using scan tool MB991502, check actuator test.



(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
   a. Item 07: Fuel Pump.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 4.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 4. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 21: Engine Coolant Temperature Sensor.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 5.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 5. Check the engine start-ability.

Depress the accelerator pedal slightly, and start the engine.

Q: Is the start ability good?

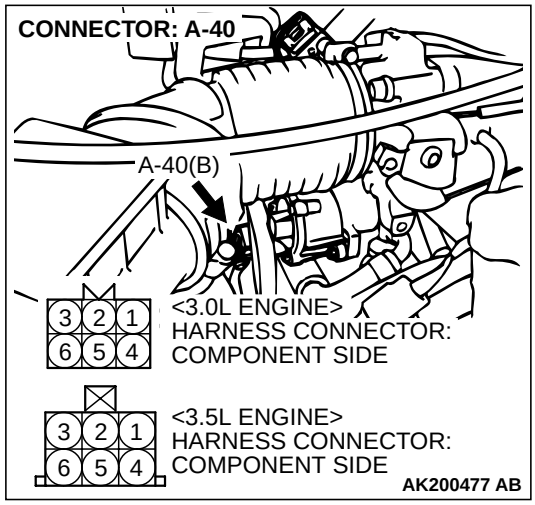
YES : Go to Step 6.
NO : Go to Step 7.

STEP 6. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: If necessary, you can disconnect the engine coolant temperature sensor connector and connect the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below.

(2) Check that the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
  • An operation sound is heard.



Q: Did you hear the operation sound?

YES : Carry out the following cleaning or adjustment.
  a. Refer to GROUP 13A, On - vehicle Service - Clean the throttle valve area P.13Aa-12.
  b. Refer to GROUP 13A, On-vehicle Service – Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

NO : Refer to GROUP 13A DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .

STEP 7. Check the ignition timing.

(1) Check the ignition timing at cranking.

Standard value: 5° BTDC ± 3°

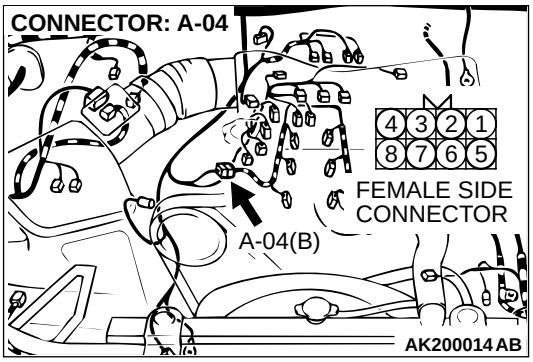
Q: Is the ignition timing normal?

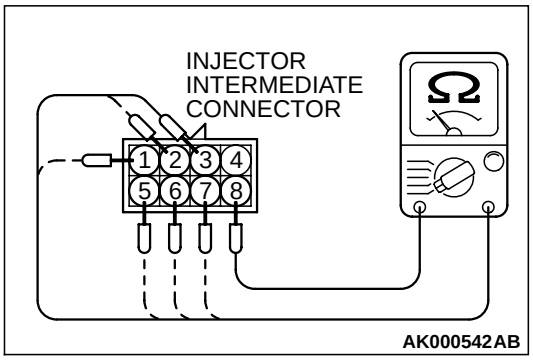
YES : Go to Step 8.

NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

STEP 8. Measure the right bank injector resistance at injector intermediate connector A-04.

(1) Disconnect the injector intermediate connector A-04.





(2) Measure the resistance between each male connector side terminal.

a. Measure the resistance between terminal No. 8 and No. 3 when measuring No. 1 cylinder injector

b. Measure the resistance between terminal No. 8 and No. 2 when measuring No. 2 cylinder injector

c. Measure the resistance between terminal No. 8 and No. 1 when measuring No. 3 cylinder injector

d. Measure the resistance between terminal No. 8 and No. 7 when measuring No. 4 cylinder injector

e. Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector

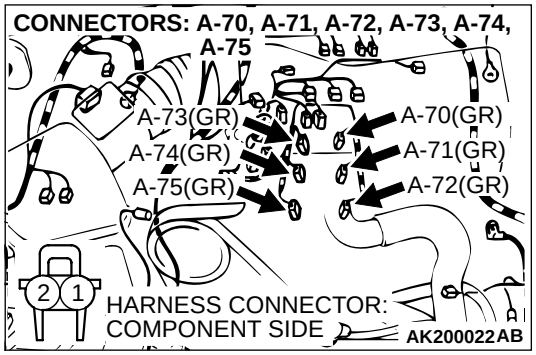
f. Measure the resistance between terminal No. 8 and No. 5 when measuring No. 6 cylinder injector

- Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

Q: Is the resistance normal?

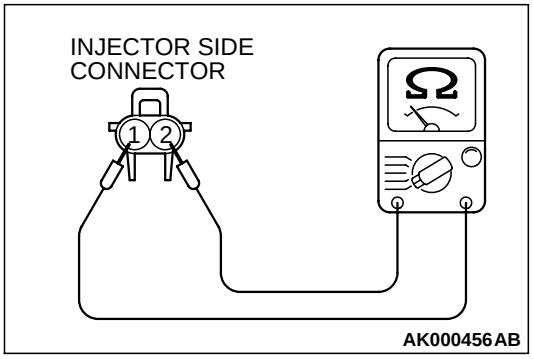
YES : Go to Step 11.

NO : Go to Step 9.



STEP 9. Check the injector.

(1) Disconnect the injector connector, which deviates from the standard value at Step 8.



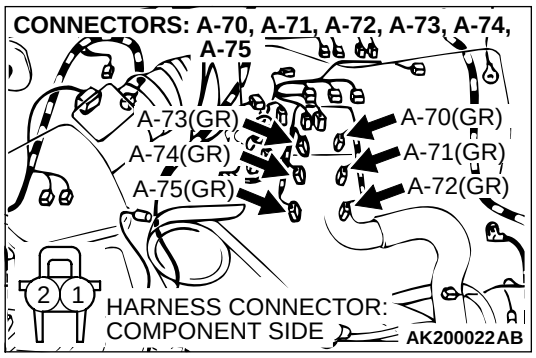
(2) Measure the resistance between injector side connector terminal No. 1 and No. 2.

Standard value: 13 – 16 ohms [at 20°C (68°F)]

Q: Is the resistance between 13 and 16 ohms [at 20°C (68°F)]?

YES : Go to Step 10.

NO : Replace the injector.Then confirm that the malfunction symptom is eliminated.



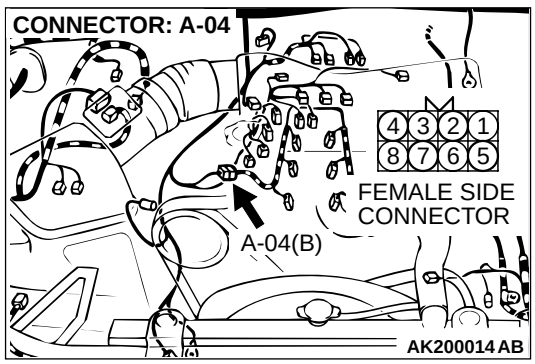
STEP 10. Check harness connector A-70 or A-71 or A-72 or A-73 or A-74 or A-75 at injector for damage.

Check the injector connector, which deviates from the standard value at Step 8.

Q: Is the harness connector in good condition?

YES : Repair harness wire between injector intermediate connector and injector connector because of harness damage. Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

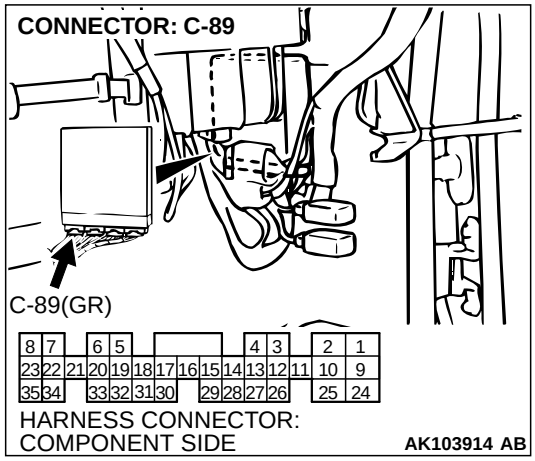


STEP 11. Check harness connector A-04 at injector intermediate connector for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

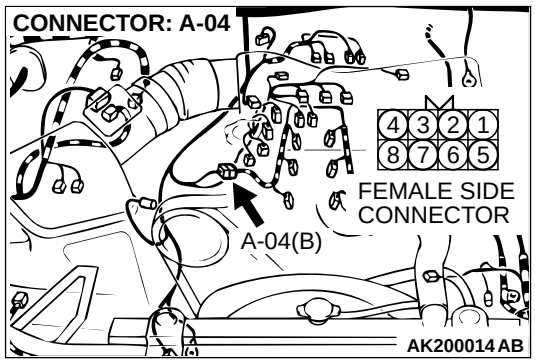


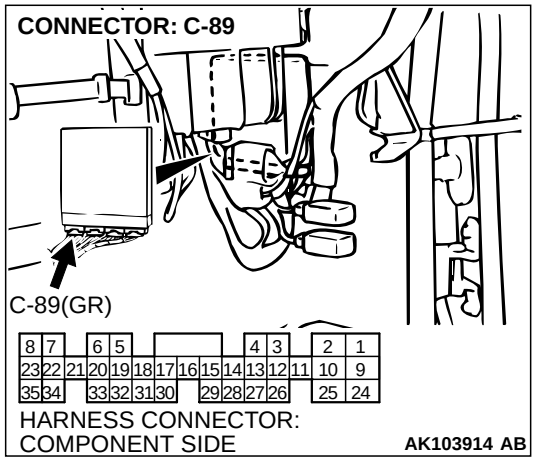
STEP 12. Check harness connector C-89 at PCM for damage.

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 confirm that the malfunction symptom is eliminated.





STEP 13. Check for harness damage between injector connector and PCM connector.

a. Check the harness wire between injector intermediate connector A-04 (terminal No. 3) and PCM connector C-89 (terminal No. 1) when checking No. 1 cylinder injector.

b. Check the harness wire between injector intermediate connector A-04 (terminal No. 2) and PCM connector C-89 (terminal No. 9) when checking No. 2 cylinder injector.

c. Check the harness wire between injector intermediate connector A-04 (terminal No. 1) and PCM connector C-89 (terminal No. 24) when checking No. 3 cylinder injector.

d. Check the harness wire between injector intermediate connector A-04 (terminal No. 7) and PCM connector C-89 (terminal No. 2) when checking No. 4 cylinder injector.

e. Check the harness wire between injector intermediate connector A-04 (terminal No. 6) and PCM connector C-89 (terminal No. 10) when checking No. 5 cylinder injector.

f. Check the harness wire between injector intermediate connector A-04 (terminal No. 5) and PCM connector C-89 (terminal No. 25) when checking No. 6 cylinder injector.

Q: Is the harness wire in good condition?

YES : Check the following items, and repair or replace the defective items.

a. Check the ignition coil, spark plugs, spark plug cables.

b. Check if the injectors are clogged.

c. Check compression pressure.

d. Check fuel lines for clogging.

e. Check if the foreign materials (water, kerosene, etc.) got into fuel.

Then confirm that the malfunction symptom is eliminated.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 7: Hard Starting

COMMENT

- In cases such as the above, the cause is usually either weak spark, improper air-fuel mixture or low compression.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the ignition system.
- Malfunction of the injector system.
- Poor fuel quality. (Contamination)
- Poor compression.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Measure the battery positive voltage.

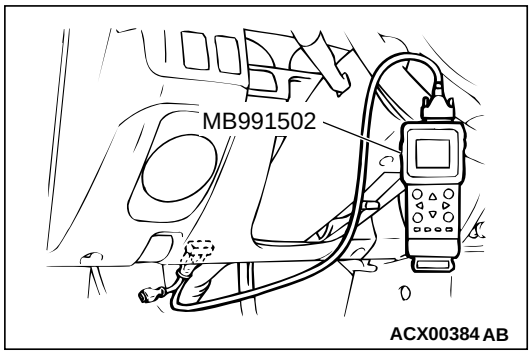
(1) Measure the battery positive voltage during cranking.
- The voltage should remain greater than 8 volts while the engine is cranked.

Q: Dose the voltage remain greater than 8 volts while the engine is cranked?

YES : Go to Step 2.
NO : Refer to GROUP 54, Battery – Battery Check P.54-4.

STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

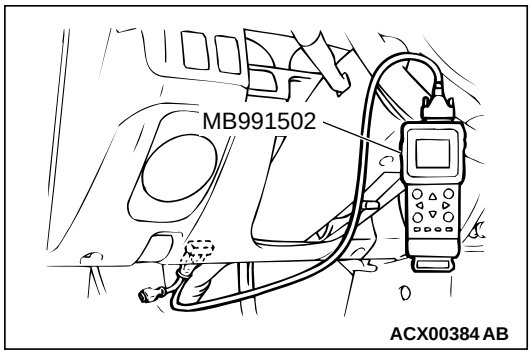


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch the "LOCK" (OFF) position.

Q: Is DTC set?

YES : Refer to GROUP 13A Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 3.

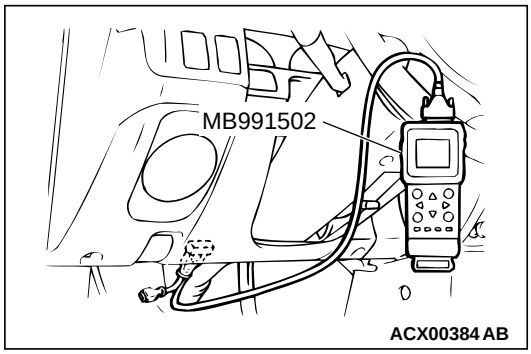
STEP 3. Using scan tool MB991502, check actuator test.



(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A Actuator Test Reference Table P.13Ab-41.
   a. Item 07: Fuel Pump.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 4.
NO : Repair or Replace. Then confirm that the malfunction symptom is eliminated.



STEP 4. Using scan tool MB991502, check data list.

(1) Turn the ignition switch the "ON" position.

(2) Check the following items in the data list. Refer to GROUP 13A Data List Reference Table P.13Ab-28.

a. Item 21: Engine Coolant Temperature Sensor.

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

Q: Is the sensor operating properly?

YES : Go to Step 5.

NO : Repair or Replace. Then confirm that the malfunction symptom is eliminated.

STEP 5. Check the ignition timing.

(1) Check the ignition timing at cranking.

Standard value: 5° BTDC ± 3°

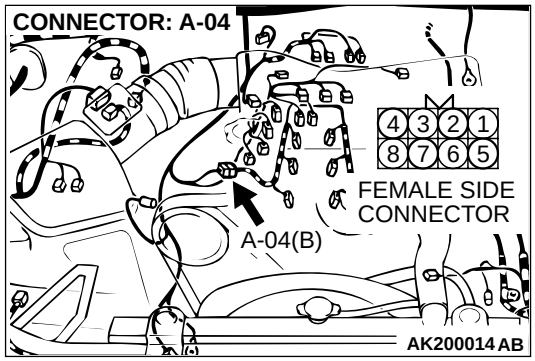
Q: Is the ignition timing normal?

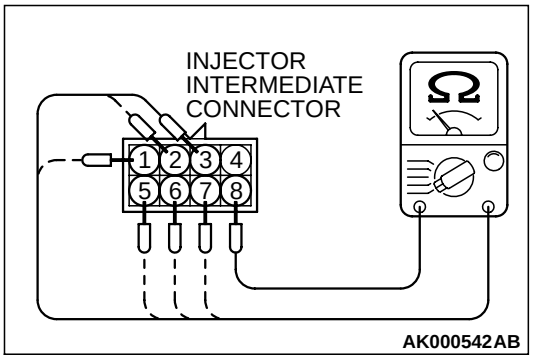
YES : Go to Step 6.

NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

STEP 6. Measure the right bank injector resistance at injector intermediate connector A-04.

(1) Disconnect the injector intermediate connector A-04.

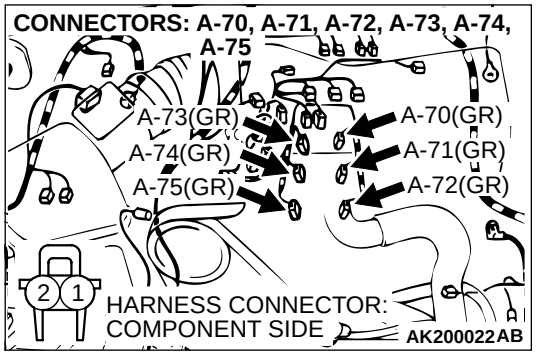




(2) Measure the resistance between each male connector side terminal.
   a. Measure the resistance between terminal No. 8 and No. 3 when measuring No. 1 cylinder injector
   b. Measure the resistance between terminal No. 8 and No. 2 when measuring No. 2 cylinder injector
   c. Measure the resistance between terminal No. 8 and No. 1 when measuring No. 3 cylinder injector
   d. Measure the resistance between terminal No. 8 and No. 7 when measuring No. 4 cylinder injector
   e. Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector
   f. Measure the resistance between terminal No. 8 and No. 5 when measuring No. 6 cylinder injector
   - Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

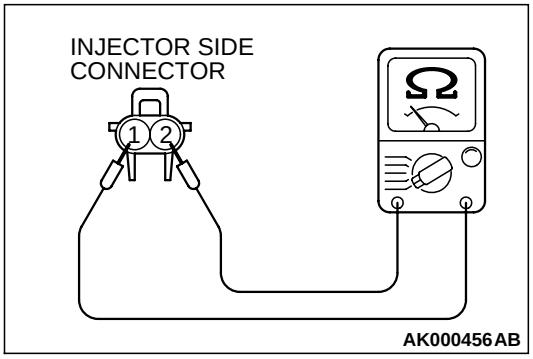
Q: Is the resistance normal?

YES : Go to Step 9.
NO : Go to Step 7.



STEP 7. Check the injector.

(1) Disconnect the injector connector, which deviates from the standard value at Step 6.



(2) Measure the resistance between injector side connector terminal No. 1 and No. 2.

Standard value: 13 – 16 ohms [at 20°C (68°F)]

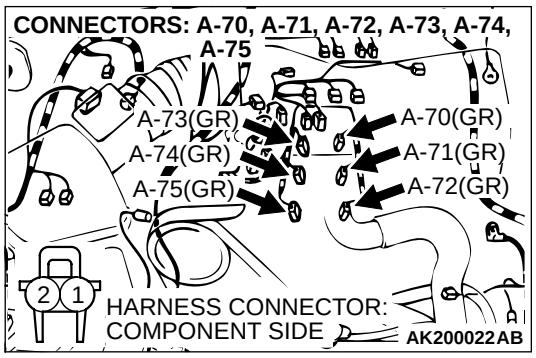
Q: Is the resistance between 13 and 16 ohms [at 20°C (68°F)]?

YES : Go to Step 8.

NO : Replace the injector. Then confirm that the malfunction symptom is eliminated.

STEP 8. Check harness connectors A-70, A-71, A-72, A-73, A-74 or A-75 at injector for damage.

Check the injector connector, which deviates from the standard value at Step 6.



Q: Is the harness connector in good condition?

YES : Repair harness wire between injector intermediate connector and injector connector because of harness damage. Then confirm that the malfunction symptom is eliminated.

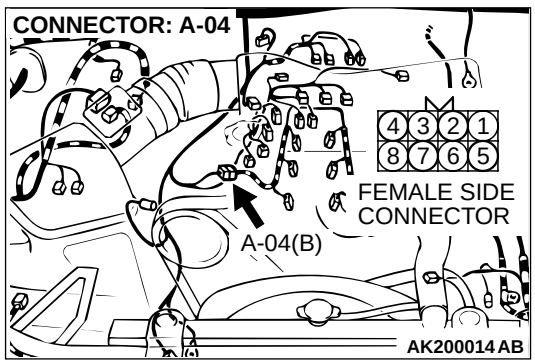
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

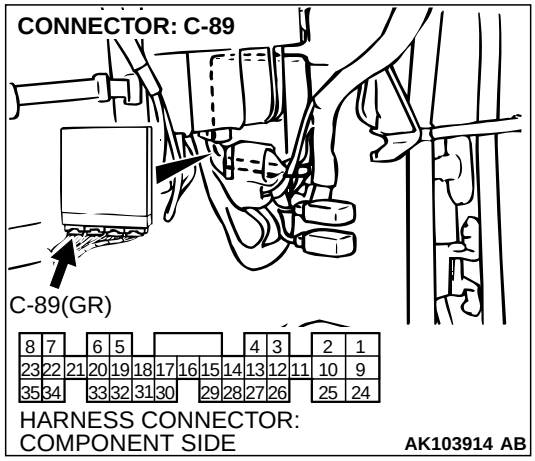
STEP 9. Check harness connector A-04 at the injector intermediate connector for damage.

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 confirm that the malfunction symptom is eliminated.



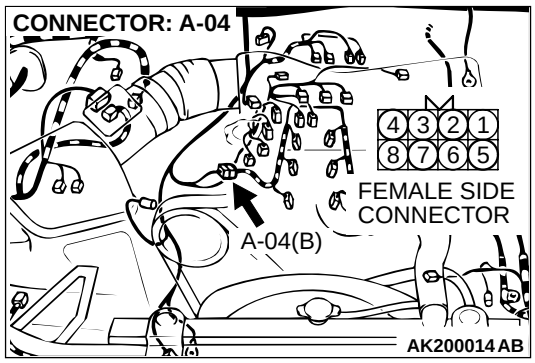


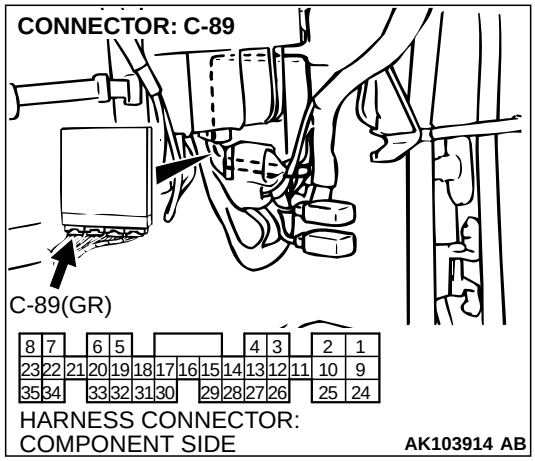
STEP 10. Check the harness connector C-89 at the PCM for damage.

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 confirm that the malfunction symptom is eliminated.





STEP 11. C Check for harness damage between injector intermediate connector A-04 and PCM connector C-89.

a. Check the harness wire between injector intermediate connector A-04 (terminal No. 3) and PCM connector C-89 (terminal No. 1) when checking No. 1 cylinder injector.

b. Check the harness wire between injector intermediate connector A-04 (terminal No. 2) and PCM connector C-89 (terminal No. 9) when checking No. 2 cylinder injector.

c. Check the harness wire between injector intermediate connector A-04 (terminal No. 1) and PCM connector C-89 (terminal No. 24) when checking No. 3 cylinder injector.

d. Check the harness wire between injector intermediate connector A-04 (terminal No. 7) and PCM connector C-89 (terminal No. 2) when checking No. 4 cylinder injector.

e. Check the harness wire between injector intermediate connector A-04 (terminal No. 6) and PCM connector C-89 (terminal No. 10) when checking No. 5 cylinder injector.

f. Check the harness wire between injector intermediate connector A-04 (terminal No. 5) and PCM connector C-89 (terminal No. 25) when checking No. 6 cylinder injector.

Q: Is the harness wire in good condition?

YES : Check the following items, and repair or replace the defective items.

a. Check the ignition coil, spark plugs, spark plug cables.

b. Check if the injectors are clogged.

c. Check the compression pressure.

d. Check if the foreign materials (water, kerosene, etc.) got into fuel.

Then confirm that the malfunction symptom is eliminated.

NO : Repair it.Then confirm that the malfunction symptom is eliminated.

TSB Revision

INSPECTION PROCEDURE 8: Unstable Idle (Rough Idle, Hunting).

COMMENT

- In cases such as the above, the cause is probably the air/fuel mixture or idle air control motor. Other systems affecting idle quality include the ignition system and compression.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the ignition system.
- Malfunction of air/fuel ratio control system.
- Malfunction of the IAC system.
- Malfunction of the evaporative emission purge solenoid system.
- Poor compression pressure.
- Vacuum leak.
- Malfunction of the EGR solenoid system.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Check if the battery terminal is disconnected.

Q: Has the battery terminal been disconnected lately?

YES : Start the engine and let it run at idle for approximate 10 minutes after engine warm up.Then, if a malfunction occurs, go to Step 2.

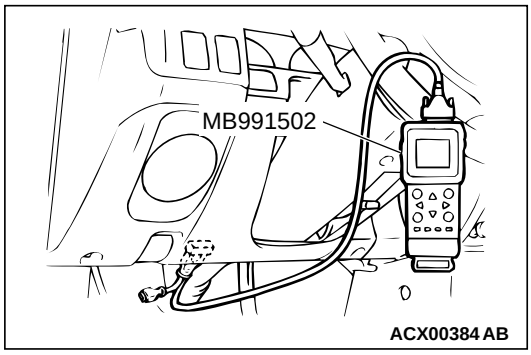
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ CAUTION

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

(1) Connect scan tool MB991502 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 3.

STEP 3. Check the engine idling state.

Q: Is it hunting remarkably?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check the following items.

(1) Carry out the following cleaning or adjustment.
   a. Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area P.13Aa-12.
   b. Refer to GROUP 13A, On-vehicle Service – Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

(2) After cleaning or adjusting, confirm that the malfunction symptom is eliminated.

Q: Is the malfunction symptom resolved?

YES : The check is completed.

NO : Check the following items, and repair or replace the defective items.
   a. Broken intake manifold gasket.
   b. Broken air intake hose.
   c. Broken vacuum hose.
   d. Positive crankcase ventilation valve does not operate.

Then confirm that the malfunction symptom is eliminated.

STEP 5. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: Disconnecting the engine coolant temperature sensor connector and connecting the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below is also okay.

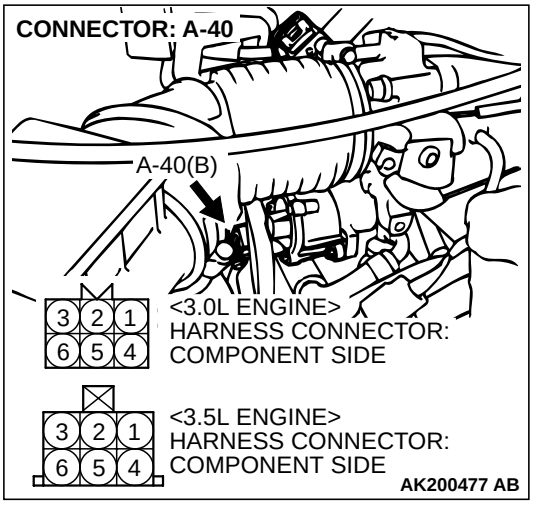
(2) Check the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
   - An operation sound is heard.

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

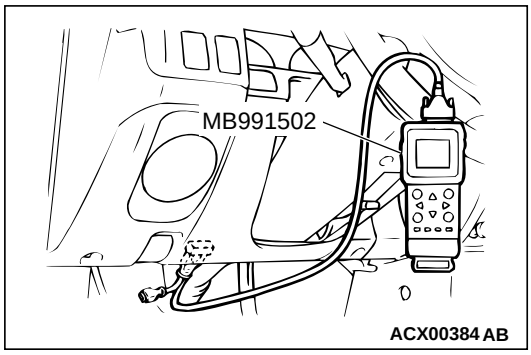
Q: Did you hear the operation sound?

YES : Go to Step 6.

NO : Refer to GROUP 13A, DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .



STEP 6. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.



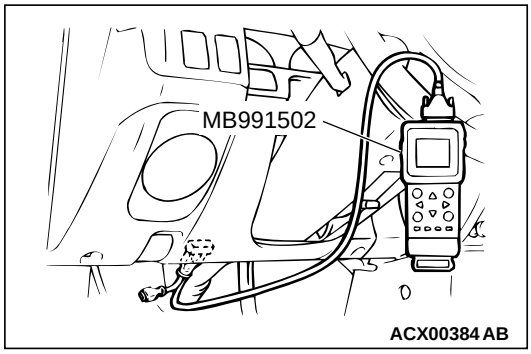
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Items 01, 02, 03, 04, 05, 06: Injector.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 7.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.

STEP 7. Using scan tool MB991502, check data list.

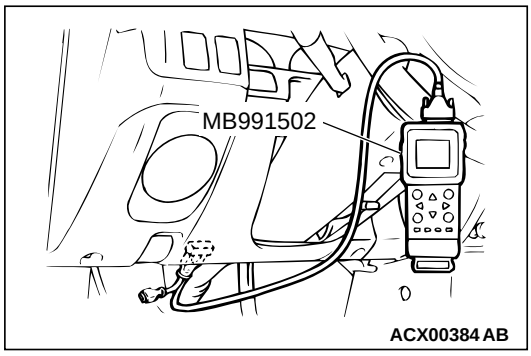


(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 13: Intake Air Temperature Sensor.
  b. Item 25: Barometric Pressure Sensor.
  c. Item 21: Engine Coolant Temperature Sensor.
  d. Item 69: Right Bank Heated Oxygen Sensor (rear)
  e. Item 39: Right Bank Heated Oxygen Sensor (front)
  f. Item 59: Left Bank Heated Oxygen Sensor (rear)
  g. Item 11: Left Bank Heated Oxygen Sensor (front)
  h. Item 27: Power Steering Pressure Switch.
  i. Item 28: A/C Switch
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 8.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

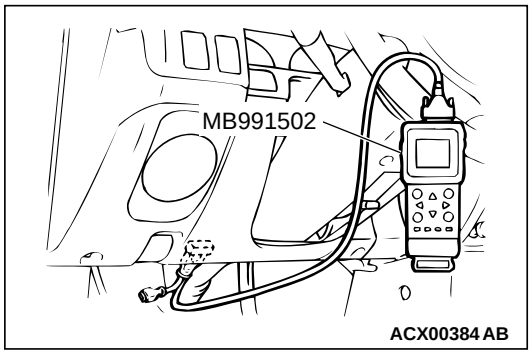
STEP 8. Using scan tool MB991502, check actuator test.



(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 08: Evaporative Emission Purge Solenoid.
  b. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 9.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

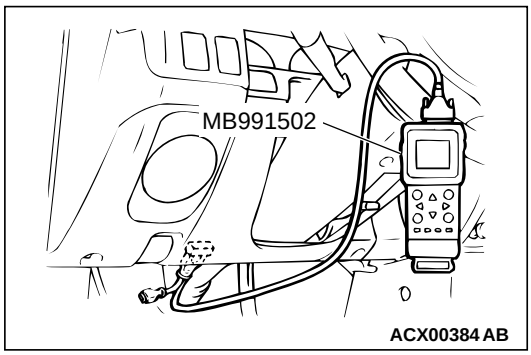


STEP 9. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 45: Idle Air Control Motor Position.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 10.
NO : Adjust the basic idle speed. Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment P.13Aa-14.



STEP 10. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 39: Right Bank Heated Oxygen Sensor (front)
   b. Item 11: Left Bank Heated Oxygen Sensor (front)
   - Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has been warmed.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 12.
NO : Go to Step 11.

STEP 11. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
   a. Vacuum leak.
      - Broken intake manifold gasket.
      - Broken air intake hose.
      - Broken vacuum hose.
      - Positive crankcase ventilation valve does not operate.
   b. Injector clogged.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 12. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check the purge control system.
c. Check compression pressure.
d. Check if the foreign materials (water, kerosene, etc.) got into fuel.
e. Check the EGR control system.
Then confirm that the malfunction symptom is eliminated.

NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 9: Idle speed is high (improper idle speed).

COMMENT
- In such cases as the above, the cause is probably that the intake air volume during idle is too great.

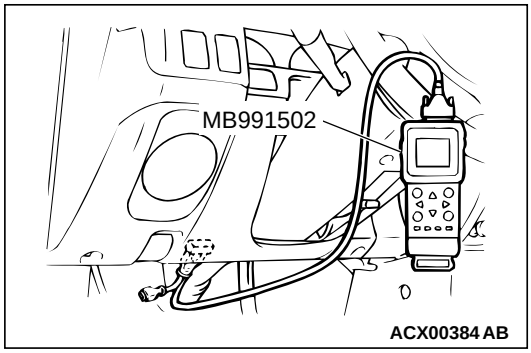
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the IAC system.
- Malfunction of the throttle body.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

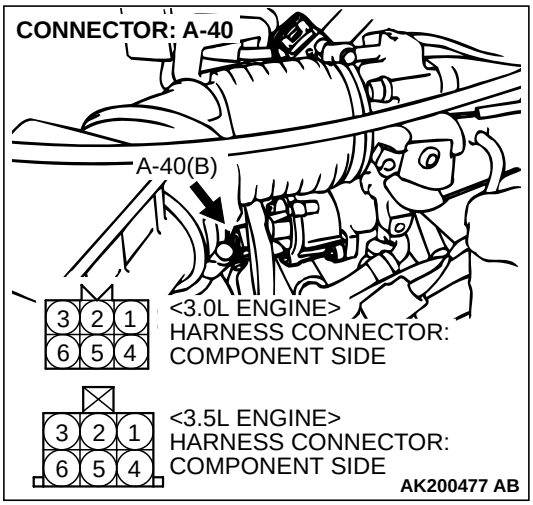


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 2.



STEP 2. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: Disconnecting the engine coolant temperature sensor connector and connecting the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below is also okay.

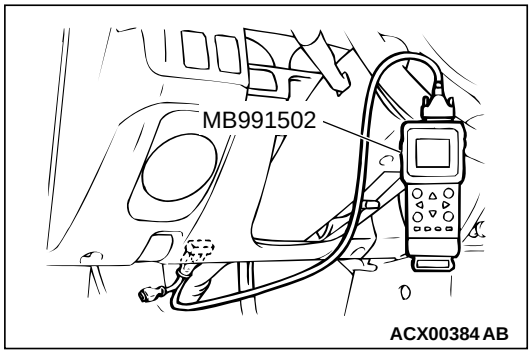
(2) Check the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
- An operation sound should be heard.

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

Q: Did you hear the operation sound?

YES : Go to Step 3.

NO : Refer to GROUP 13A, DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .



STEP 3. Using scan tool MB991502, check data list.

⚠ 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) Turn the ignition switch to the "ON" position.

(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
a. Item 21: Engine Coolant Temperature Sensor.
b. Item 28: A/C Switch.

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

Q: Are they operating properly?

YES : Go to Step 4.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 4. Adjust the basic idle speed.
Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment for the adjustment procedure P.13Aa-14.

Standard value: 700 ± 50 r/min

Q: Is the Idle speed normal?

YES : Carry out the following cleaning or adjustment.
a. Refer to GROUP 13A, On-vehicle Service - Clean the throttle valve area P.13Aa-12.
b. Refer to GROUP 13A, On-vehicle Service - Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

NO : The check is completed.

INSPECTION PROCEDURE 10: Idle Speed Is Low (Improper Idle Speed).

COMMENT
- In cases such as the above, the cause is probably that the intake air volume during idle is too small.

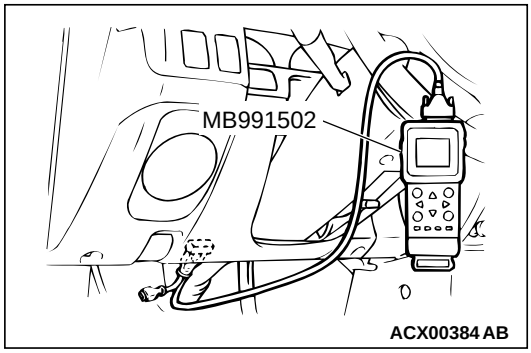
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the IAC system.
- Malfunction of the throttle body.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

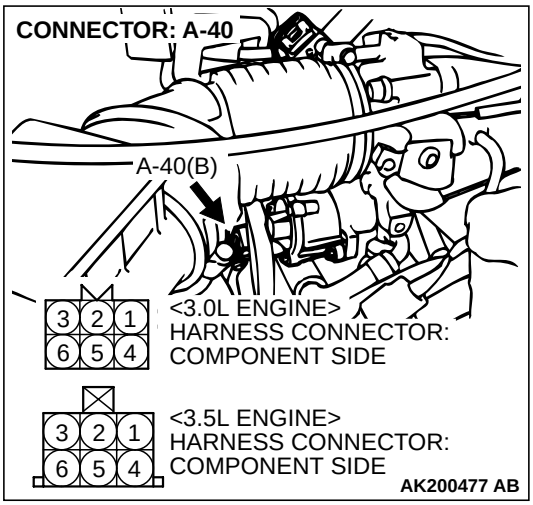


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 2.



STEP 2. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: If necessary, you can disconnect the engine coolant temperature sensor connector and connect the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below.

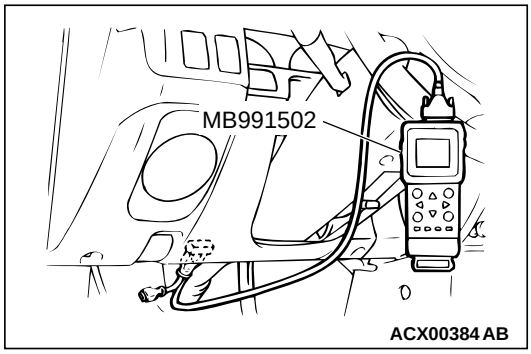
(2) Check that the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
- An operation sound should be heard.

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

Q: Did you hear the operation sound?

YES : Go to Step 3.

NO : Refer toGROUP 13A DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-494 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-504 .



STEP 3. Using scan tool MB991502, check data list.

⚠ 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) Turn the ignition switch to the "ON" position.

(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.

a. Item 21: Engine Coolant Temperature Sensor.

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

Q: Are they operating properly?

YES : Go to Step 4.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 4. Adjust the basic idle speed.
Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment for the adjustment procedure P.13Aa-14.

Standard value: 700 ± 50 r/min

Q: Is the idle speed normal?

YES : Carry out the following cleaning or adjustment.
a. Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area P.13Aa-12.
b. Refer to GROUP 13A, On-vehicle Service – Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

NO : The check is completed.

INSPECTION PROCEDURE 11: When the engine is cold, it stalls at idle (die out).

COMMENT
- In such cases as the above, the air/fuel mixture may be inappropriate when the engine is cold.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the IAC system.
- Malfunction of the throttle body.
- Malfunction of the injector system.
- Malfunction of the ignition system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

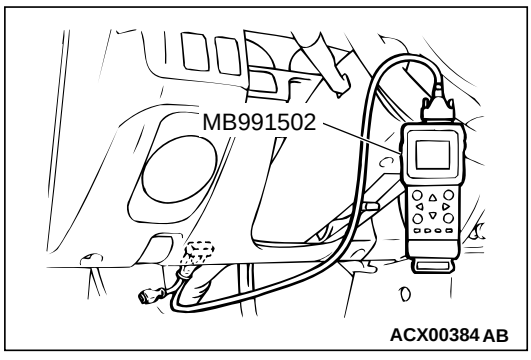
STEP 1. Check if the battery terminal is disconnected.

Q: Has the battery terminal been disconnected lately?

YES : Start the engine and let it run at idle for approximate 10 minutes after engine warm up. Then, if a malfunction occurs, go to step 2.

NO : Go to Step 2.

STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).



⚠ 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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 3.

STEP 3. Checking by operating the accelerator pedal.

Q: Does the engine stall right after the accelerator pedal is released?

YES : Carry out the following cleaning or adjustment.

a. Refer to GROUP 13A, On-vehicle Service - Clean the throttle valve area P.13Aa-12.

b. Refer toGROUP 13A, On-vehicle Service - Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

NO : Go to Step 4.

STEP 4. Check the engine idling.

Q: Is the idling good enough after warm up?

YES : Go to Step 5.

NO : Refer to, INSPECTION PROCEDURE 8 – Unstable Idle (Rough Idle, Hunting) P.13Ad-31.

STEP 5. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: If necessary, you can disconnect the engine coolant temperature sensor connector and connect the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below.

(2) Check the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).

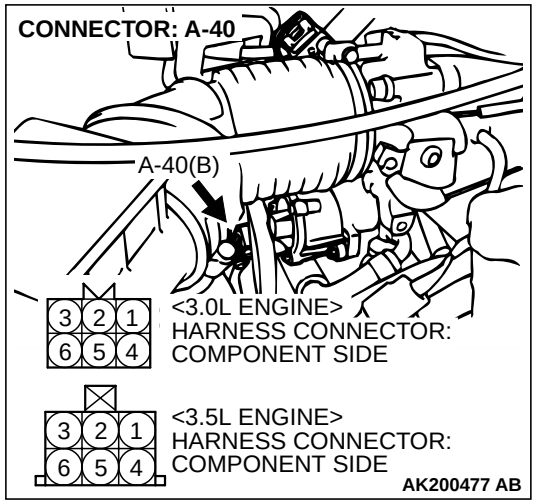
- An operation sound should be heard.

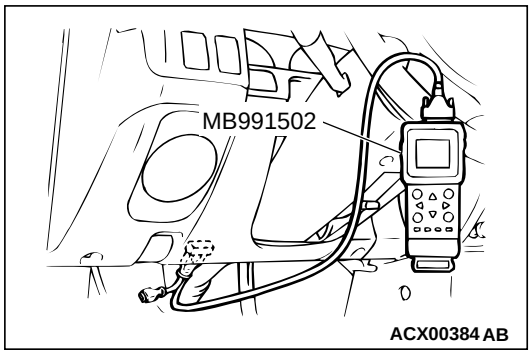
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Did you hear the operation sound?

YES : Go to Step 6.

NO : Refer to GROUP 13A DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .





STEP 6. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.

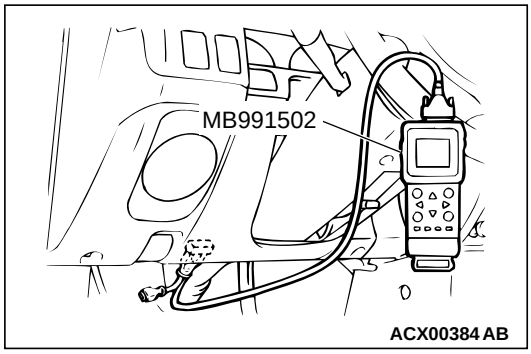
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Items 01, 02, 03, 04, 05, 06: Injector.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 7.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.



STEP 7. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 21: Engine Coolant Temperature Sensor.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 8.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 8. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Go to Step 9.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 9. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check compression pressure.
c. Check the engine oil viscosity.
Then confirm that the malfunction symptom is eliminated.

NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 12: When the Engine Is Hot, It Stalls at Idle (Die Out).

COMMENT
- In cases such as the above, the ignition system, air/fuel mixture, idle air control motor or compression pressure may be faulty. In addition, if the engine suddenly stalls, the cause may also be a loose connector.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the ignition system.
- Malfunction of air/fuel ratio control system.
- Malfunction of the IAC system.
- Vacuum leak.
- Improper connector contact.

DIAGNOSIS

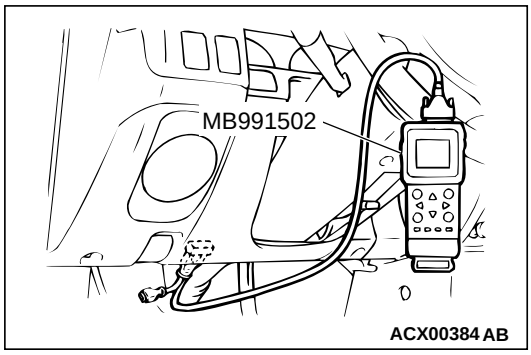
Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Check if the battery terminal is disconnected.

Q: Has the battery terminal been disconnected lately?

YES : Start the engine and let it run at idle for approximate 10 minutes after engine warm up. Then, if a malfunction occurs, go to step 2.

NO : Go to Step 2.



STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).

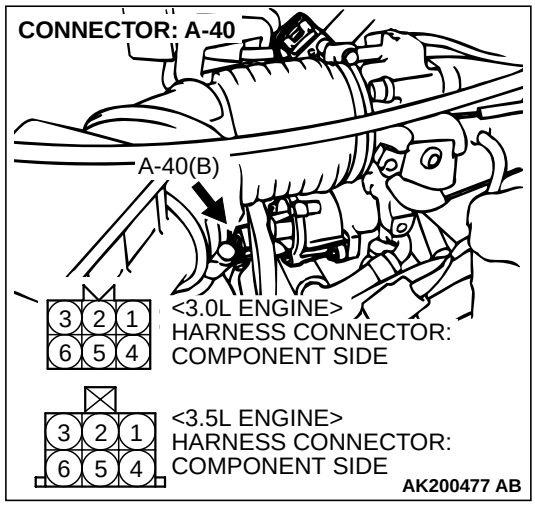
⚠ CAUTION

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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 3.



STEP 3. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

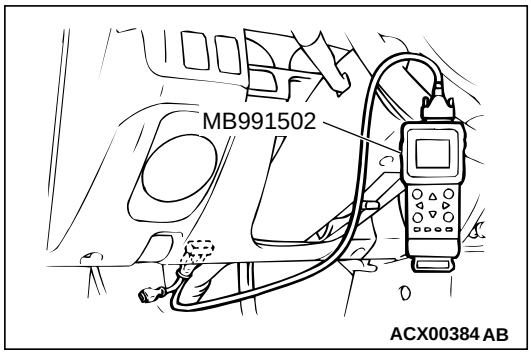
NOTE: If necessary, you can disconnect the engine coolant temperature sensor connector and connect the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below.

(2) Check that the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
- An operation sound should be heard.

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

Q: Did you hear the operation sound?

YES : Go to Step 4.
NO : Refer to GROUP 13A DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .



STEP 4. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.

⚠ 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) Turn the ignition switch to the "ON" position.
(3) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Items 01, 02, 03, 04, 05, 06: Injector.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 5.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.

STEP 5. Checking by operating the accelerator pedal.

Q: Does the engine stall right after the accelerator pedal is released?

YES : Carry out the following cleaning or adjustment.
  a. Refer to GROUP 13A, On-vehicle Service - Clean the throttle valve area P.13Aa-12 .
  b. Refer to GROUP 13A, On-vehicle Service - Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

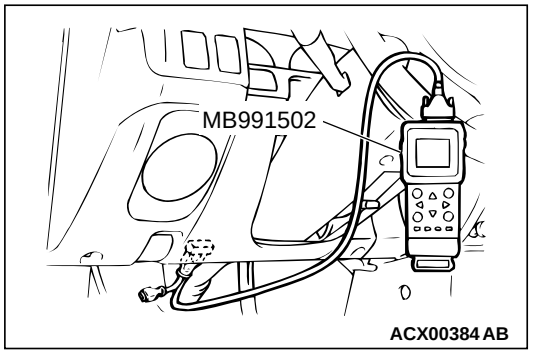
NO : Go to Step 6.

STEP 6. Engine stall reproduction test.

Q: Is it easy to reproduce the engine stall?

YES : Go to Step 7.
NO : Check if the following signals change suddenly by wiggling the circuit harness and connectors.
  a. Crankshaft position sensor signal.
  b. Volume air flow sensor signal.
  c. Injector drive signal.
  d. Primary and secondary ignition signal.
  e. Fuel pump drive signal.
  f. PCM power supply voltage.

Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 7. Using scan tool MB991502, check data list.

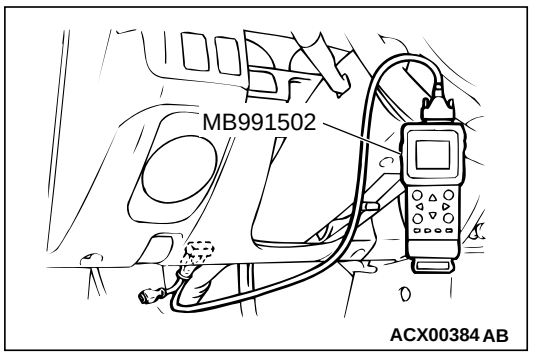
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 13: Intake Air Temperature Sensor.
  b. Item 25: Barometric Pressure Sensor.
  c. Item 21: Engine Coolant Temperature Sensor.
  d. Item 69: Right Bank Heated Oxygen Sensor (rear)
  e. Item 39: Right Bank Heated Oxygen Sensor (front)
  f. Item 59: Left Bank Heated Oxygen Sensor (rear)
  g. Item 11: Left Bank Heated Oxygen Sensor (front)
  h. Item 27: Power Steering Pressure Switch.
  i. Item 28: A/C Switch.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 8.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

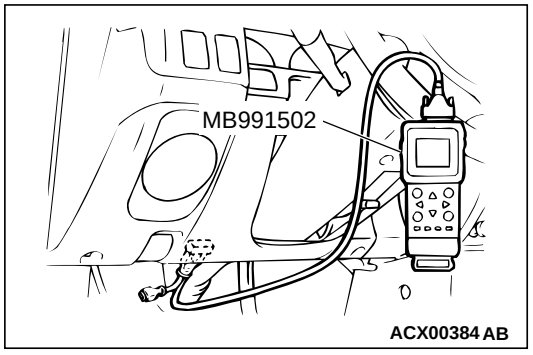


STEP 8. Using scan tool MB991502, check actuator test.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer toGROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 9.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 9. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 39: Right Bank Heated Oxygen Sensor (front)
  b. Item 11: Left Bank Heated Oxygen Sensor (front)
  • Fluctuates between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has been warmed.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 12.
NO : Go to Step 10.

STEP 10. Check the fuel pressure.

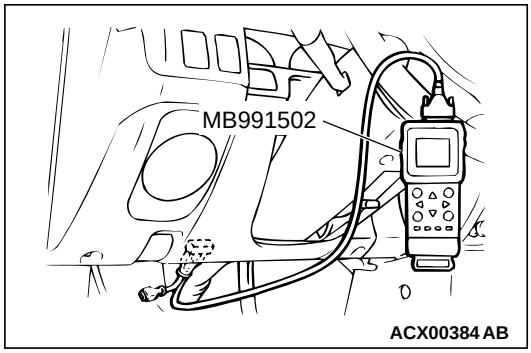
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Go to Step 11.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 11. Using scan tool MB991502, check data list.



⚠ 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) Turn the ignition switch to the "ON" position.

(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.

a. Item 45: Idle Air Control Motor Position.

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

Q: Is the actuator operating properly?

YES : Check the following items, and repair or replace the defective items.

a. Vacuum leak.

- Broken intake manifold gasket.
- Broken air intake hose.
- Broken vacuum hose.
- Positive crankcase ventilation valve does not operate.

b. Injector clogged.

Then confirm that the malfunction symptom is eliminated.

NO : Adjusting the basic idle speed. Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment P.13Aa-14.

STEP 12. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5.
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5.

Q: Is the ignition timing normal?

YES : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check if the injectors are clogged.
c. Check compression pressure.
d. Check if the foreign materials (water, kerosene, etc.) got into fuel.
Then confirm that the malfunction symptom is eliminated.

NO : Check that the crankshaft position sensor and timing cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 13: The Engine Stalls when Accelerating (Pass Out).

COMMENT
- In case such as the above, the cause is probably misfiring due to a weak spark, or an inappropriate air/fuel mixture when the accelerator pedal.

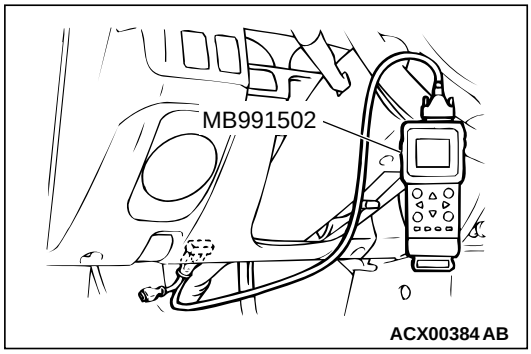
TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Vacuum leak.
- Malfunction of the ignition system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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.

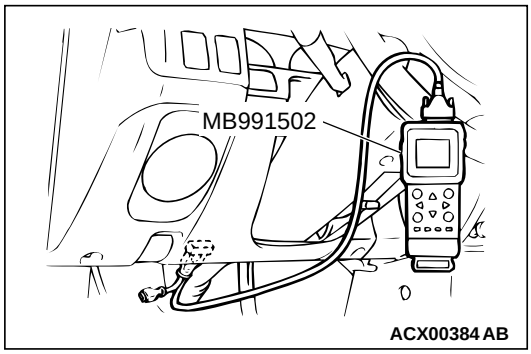


(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 2.



STEP 2. Using scan tool MB991502, check actuator test.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Check the following items, and repair or replace the defective items.
  a. Check the ignition coil, spark plugs, spark plug cables.
  b. Check for vacuum leaks.
    - Broken intake manifold gasket.
    - Broken or disconnected vacuum hose.
    - Improper operation of the PCV valve.
    - Broken air intake hose.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 14: The engine stalls when decelerating.

COMMENT

- The intake air volume may be insufficient due to a defective idle air control motor system.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the IAC system.

DIAGNOSIS

Required Special Tool:

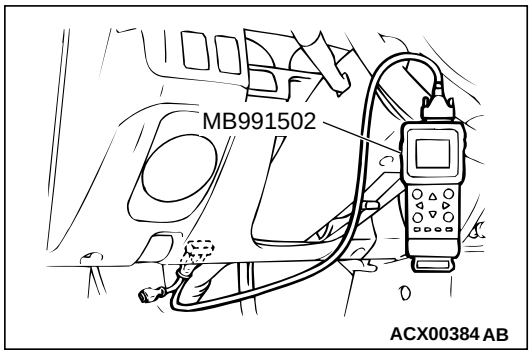
- MB991502: Scan Tool (MUT-II)

STEP 1. Check if the battery terminal is disconnected

Q: Has the battery terminal been disconnected lately?

YES : Start the engine and let it run at idle for approximate 10 minutes after engine warm up. Then if a malfunction occurs, go to step 2.

NO : Go to Step 2.



STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).

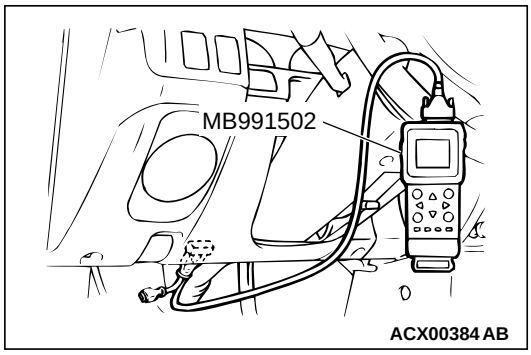
⚠ CAUTION

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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 3.

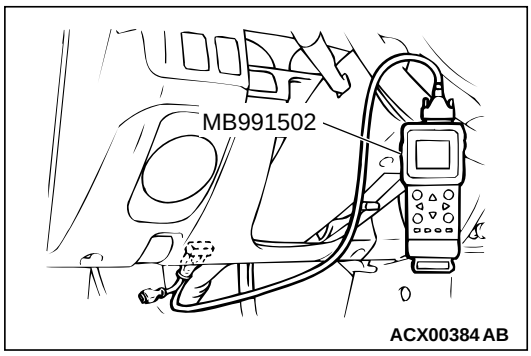


STEP 3. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 14: Throttle Position Sensor.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 4.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

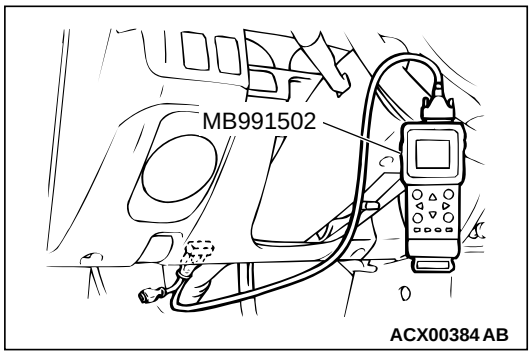


STEP 4. Using scan tool MB991502, check actuator test.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 5.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 5. Using scan tool MB991502, check data list item 45: Idle Air Control Position.

(1) Start the engine and run at idle.
(2) Set scan tool MB991502 to the data reading mode for item 45, Idle Air Control Position.
  a. The idle air control motor should drop to the 0 – 2 position during deceleration (from 1,000 r/min or more).
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operation properly?

YES : Check the following items, and repair, replace, clean or adjust the defective sections.
  a. Check the ignition coil, spark plugs, spark plug cables.
  b. Refer to GROUP 13A, On-vehicle Service - Check the throttle valve area P.13Aa-12 .
  c. Refer to GROUP 13A, On-vehicle Service - Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

Then confirm that the malfunction symptom is eliminated.

NO : Refer to, GROUP 23A, Automatic Transaxle Diagnosis – Diagnostic Trouble Code Chart P.23Ab-28.

INSPECTION PROCEDURE 15: Hesitation, sag or stumble.

COMMENT

- In cases such as the above, the ignition system, air/fuel mixture or compression pressure may be defective.

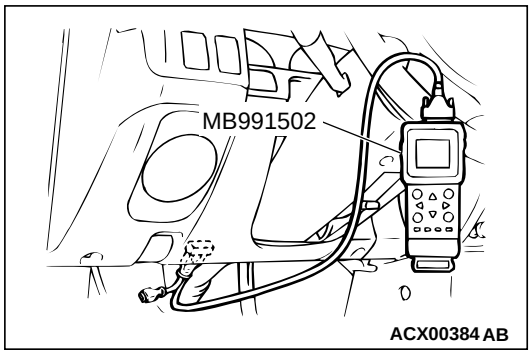
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the ignition system.
- Malfunction of air/fuel ratio control system.
- Malfunction of the fuel supply system.
- Malfunction of the EGR solenoid system.
- Poor compression pressure.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

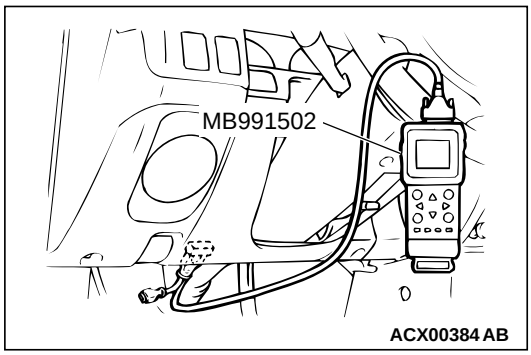
⚠ CAUTION

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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 2.



STEP 2. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.

(1) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 01, 02, 03, 04, 05, 06: Injector.
(2) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

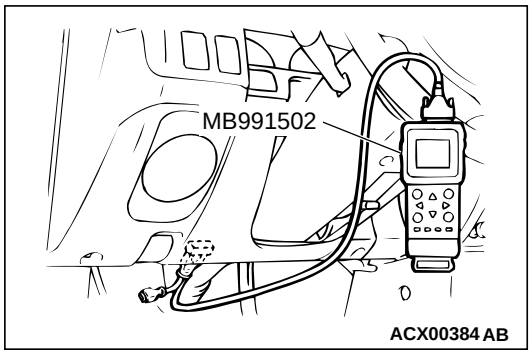
YES : Go to Step 3.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.

STEP 3. Check the ignition timing.

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Go to Step 4.
NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.



STEP 4. Using scan tool MB991502, check data list and actuator test.

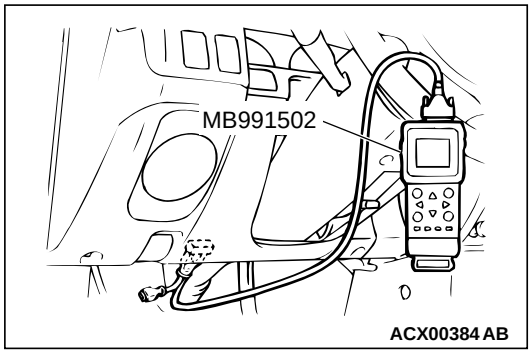
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 13: Intake Air Temperature Sensor.
   b. Item 25: Barometric pressure Sensor.
   c. Item 21: Engine Coolant Temperature Sensor.
   d. Item 14: Throttle Position Sensor.
   e. Item 69: Right Bank Heated Oxygen Sensor (rear)
   f. Item 39: Right Bank Heated Oxygen Sensor (front)
   g. Item 59: Left Bank Heated Oxygen Sensor (rear)
   h. Item 11: Left Bank Heated Oxygen Sensor (front)
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 5.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

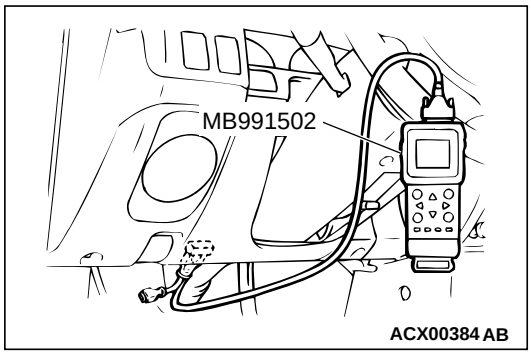


STEP 5. Using scan tool MB991502, check actuator test.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
   a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 6.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 6. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 39: Right Bank Heated Oxygen Sensor (front)
   b. Item 11: Left Bank Heated Oxygen Sensor (front)
   • Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has warmed-up.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check the fuel pressure.
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
a. Vacuum leak.
- Broken intake manifold gasket.
- Broken air intake hose.
- Broken vacuum hose.
- Positive crankcase ventilation valve does not operate.

b. Injector clogged.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 8. Check the fuel pressure.
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check the EGR system.
c. Check compression pressure.
d. Check the fuel filter or fuel line for clogging.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

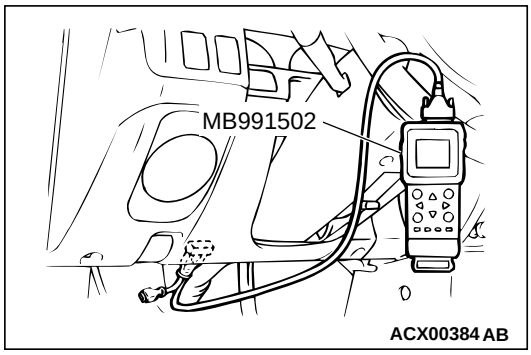
INSPECTION PROCEDURE 16: Acceleration shock.

COMMENT
- There may be an ignition leak accompanying the increase in the spark plug demand voltage during acceleration.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the ignition system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check for occurrence of ignition leak.
Then confirm that the malfunction symptom is eliminated.

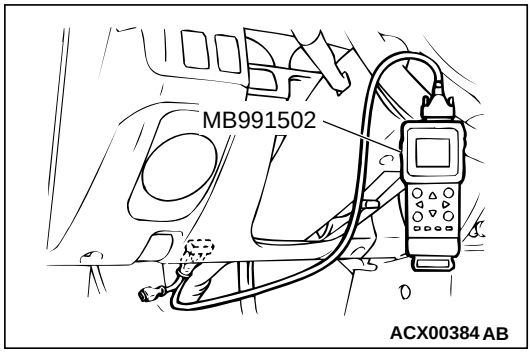
INSPECTION PROCEDURE 17: Deceleration Shock

COMMENT
- There may be a sudden change in air flow through the IAC, causing the vehicle to decelerate rapidly for an instant.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the IAC system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

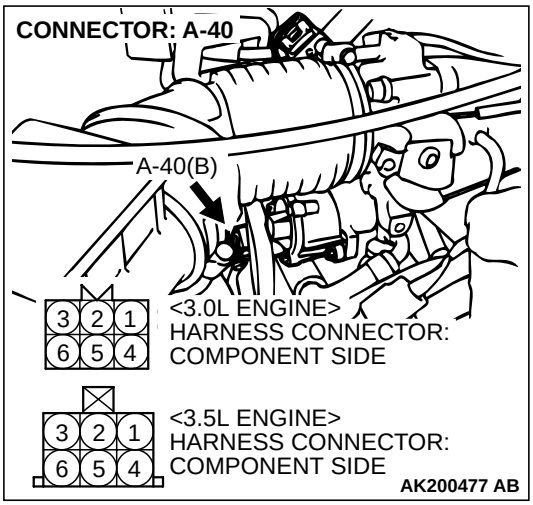
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

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

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go To Step 2.



STEP 2. Check the idle air control (IAC) motor operation sound.

(1) Check that the engine coolant temperature is 20°C (68°F) or below.

NOTE: If necessary, you can disconnect the engine coolant temperature sensor connector and connect the harness side of the connector to another engine coolant temperature sensor that is at 20°C (68°F) or below.

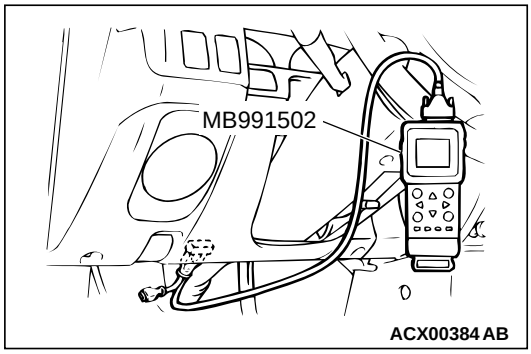
(2) Check the operation sound of the IAC motor can be heard after the ignition is switched to the "ON" position (but without starting the engine).
- An operation sound should heard.

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

Q: Did you hear the operation sound?

YES : Go to Step 3.

NO : Refer to GROUP 13A, DTC P0506 – Idle Control System RPM Lower Than Expected <3.0L Engine>P.13Ac-494 or DTC P0506 – Idle Control System RPM Lower Than Expected <3.5L Engine>P.13Ac-504 , DTC P0507 – Idle Control System RPM Higher Than Expected <3.0L Engine>P.13Ac-514 or DTC P0507 – Idle Control System RPM Higher Than Expected <3.5L Engine>P.13Ac-524 .



STEP 3. Using scan tool MB991502, check data list.

⚠ 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) Turn the ignition switch to the "ON" position.

(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 14: Throttle Position Sensor.

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

Q: Is the sensor operating properly?

YES : Carry out the following cleaning or adjustment.
   a. Refer to GROUP 13A, On-vehicle Service - Clean the throttle valve area P.13Aa-12.
   b. Refer to GROUP 13A, On-vehicle Service - Fixed SAS Adjustment <3.0L Engine>P.13Aa-14 .

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 18: Poor acceleration.

COMMENT

- Defective ignition system, abnormal air/fuel ratio, poor compression pressure, etc. are suspected.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

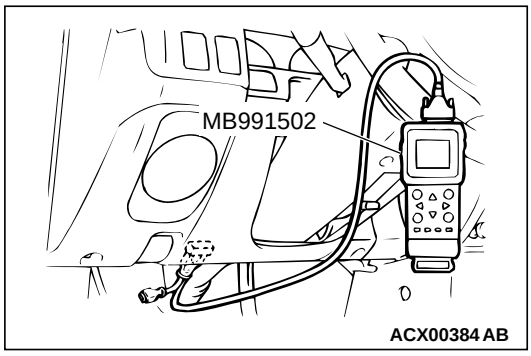
- Malfunction of the ignition system.
- Malfunction of air/fuel ratio control system.
- Malfunction of the fuel supply system.
- Poor compression pressure.
- Clogged exhaust system.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).



⚠ CAUTION

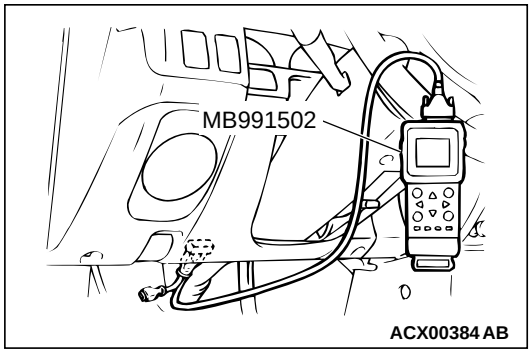
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

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

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.



(1) Turn the ignition switch to the "ON" position.
(2) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Table P.13Ab-41.
  a. Items 01, 02, 03, 04, 05, 06: Injector.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

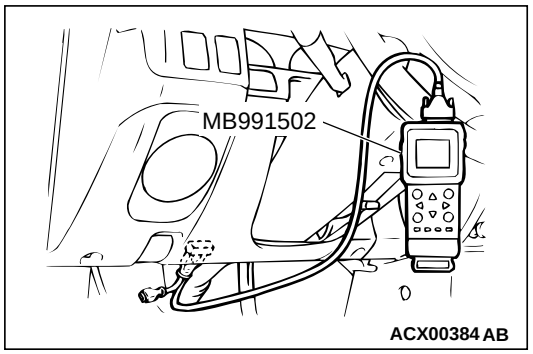
YES : Go to Step 3.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.

STEP 3. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Go to Step 4.
NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.

STEP 4. Using scan tool MB991502, check data list.



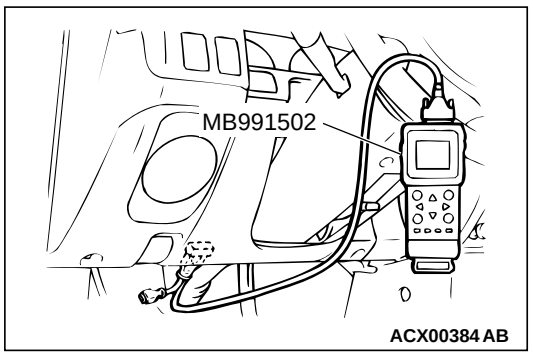
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
  a. Item 13: Intake Air Temperature Sensor.
  b. Item 25: Barometric Pressure Sensor.
  c. Item 21: Engine Coolant Temperature Sensor.
  d. Item 14: Throttle Position Sensor.
  e. Item 69: Right Bank Heated Oxygen Sensor (rear)
  f. Item 39: Right Bank Heated Oxygen Sensor (front)
  g. Item 59: Left Bank Heated Oxygen Sensor (rear)
  h. Item 11: Left Bank Heated Oxygen Sensor (front)
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 5.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

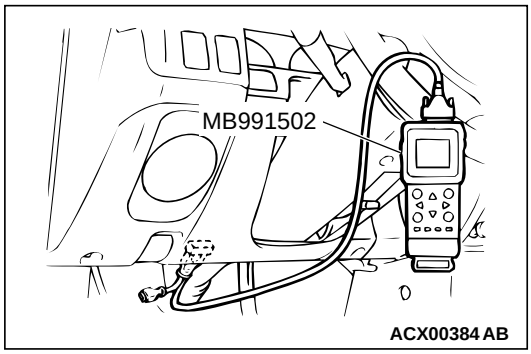
STEP 5. Using scan tool MB991502, check actuator test.



(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 6.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 6. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 39: Right Bank Heated Oxygen Sensor (front)
   b. Item 11: Left Bank Heated Oxygen Sensor (front)
   - Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has been warmed.

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

Q: Is the sensor operating properly?

YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
   a. Vacuum leak.
      - Broken intake manifold gasket.
      - Broken air intake hose.
      - Broken vacuum hose.
      - Positive crankcase ventilation valve does not operate.
   b. Injector clogged.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 8. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
   a. Check the ignition coil, spark plugs, spark plug cables.
   b. Check compression pressure.
   c. Check the fuel filter or fuel line for clogging.
   d. Broken air intake hose.
   e. Clogged air cleaner.
   f. Clogged exhaust system.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 19: Surge.

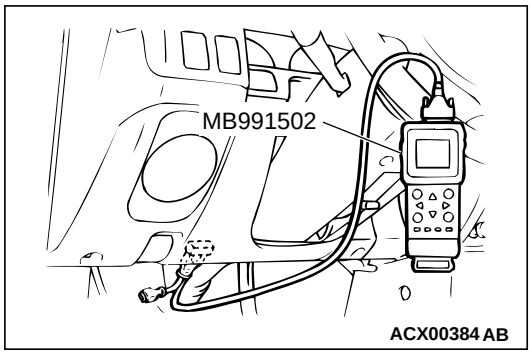
COMMENT
- Defective ignition system, abnormal air/fuel ratio, etc. are suspected.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of the ignition system.
- Malfunction of air/fuel ratio control system.
- Malfunction of the EGR solenoid system.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

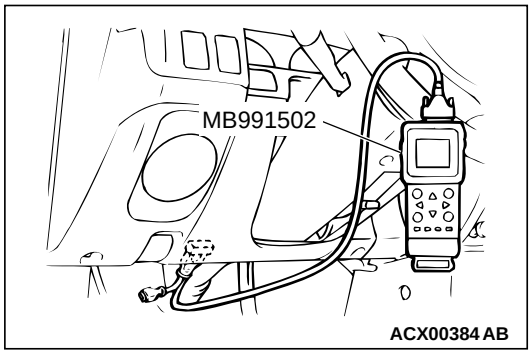


⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.
(1) Connect scan tool MB991502 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the DTC.
(4) Turn the ignition switch to the "ON" position.

Q: Is DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 2.

STEP 2. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.



(1) Turn the ignition switch to the "ON" position.
(2) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
  a. Items 01, 02, 03, 04, 05, 06: Injector.
(3) Turn the ignition switch to the "ON" position.

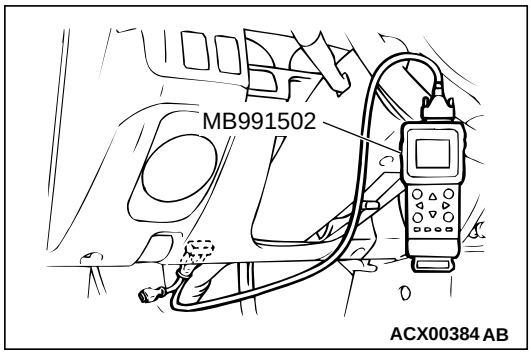
Q: Is the actuator operating properly?

YES : Go to Step 3.
NO : Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit P.13Ac-313.

STEP 3. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Go to Step 4.
NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.



STEP 4. Using scan tool MB991502, check data list and actuator test.

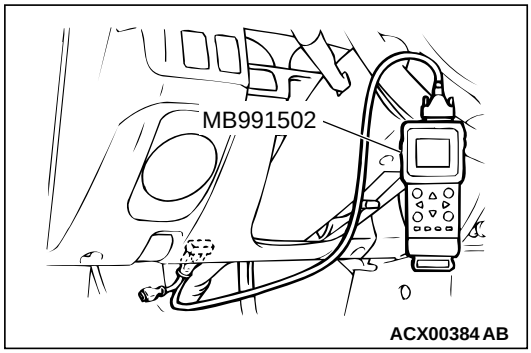
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 13: Intake Air Temperature Sensor.
   b. Item 25: Barometric pressure Sensor.
   c. Item 21: Engine Coolant Temperature Sensor.
   d. Item 14: Throttle Position Sensor.
   e. Item 69: Right Bank Heated Oxygen Sensor (rear)
   f. Item 39: Right Bank Heated Oxygen Sensor (front)
   g. Item 59: Left Bank Heated Oxygen Sensor (rear)
   h. Item 11: Left Bank Heated Oxygen Sensor (front)
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 5.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

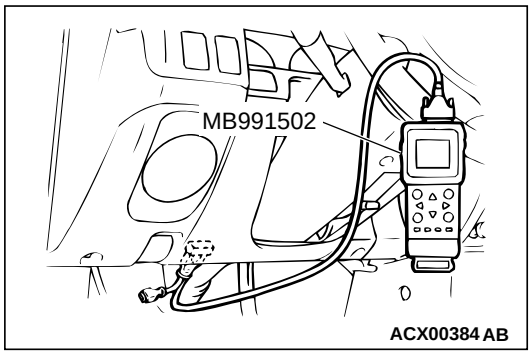


STEP 5. Using scan tool MB991502, check actuator test.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table P.13Ab-41.
   a. Item 10: EGR Solenoid.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the actuator operating properly?

YES : Go to Step 6.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 6. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 39: Right Bank Heated Oxygen Sensor (front)
   b. Item 11: Left Bank Heated Oxygen Sensor (front)
   • Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has been warmed.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check the fuel pressure.
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
a. Vacuum leak.
- Broken intake manifold gasket.
- Broken air intake hose.
- Broken vacuum hose.
- Positive crankcase ventilation valve does not operate.

b. Injector clogged.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 8. Check the fuel pressure.
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Check the following items, and repair or replace the defective items.
a. Check the ignition coil, spark plugs, spark plug cables.
b. Check the EGR system.

Then confirm that the malfunction symptom is eliminated.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 20: Knocking

COMMENT
- Incase such as the above, the heat value of the spark plug may be inappropriate or low fuel quality.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Inappropriate heat value of the spark plug.

DIAGNOSIS

STEP 1. Check the following items.
Carry out the following items, and repair or replace the defective items.
a. Check the spark plugs.
b. Fuel quality, octane level.
c. Check if the foreign materials (water, kerosene, etc.)

Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 21: Dieseling.

COMMENT
- Fuel leakage from injectors is suspected, or carbon build up.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Fuel leakage from injectors.

DIAGNOSIS

STEP 1. Check the injectors for fuel leakage.
Replace the leaking injector. Then confirm that the malfunction symptom is eliminated.

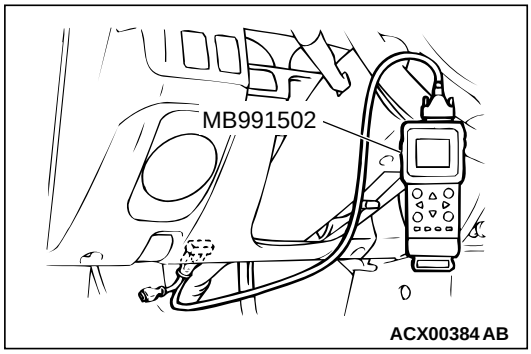
INSPECTION PROCEDURE 22: Too high CO and HC concentration when idling

COMMENT
- Abnormal air/fuel ratio is suspected.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Malfunction of air/fuel ratio control system.
- Deteriorated catalyst.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)



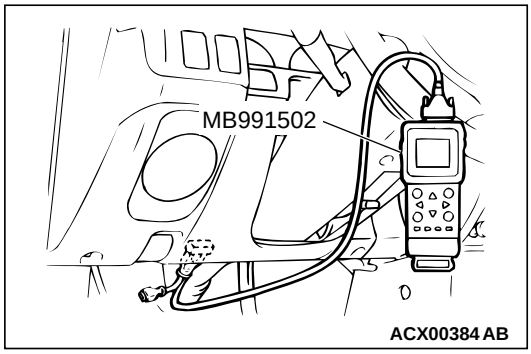
STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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) 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 set?
YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.
NO : Go to Step 2.

STEP 2. Check the ignition timing.
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>
Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?
YES : Go to Step 3.
NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.



STEP 3. Using scan tool MB991502, check data list.

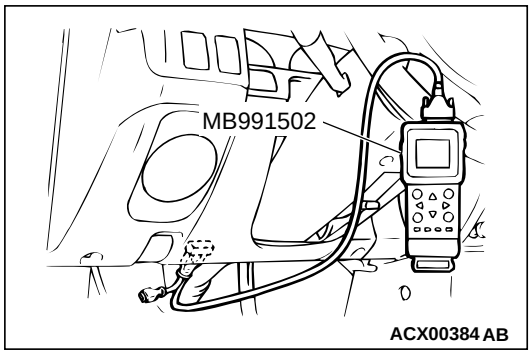
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 21: Engine Coolant Temperature Sensor.
   b. Item 13: Intake Air Temperature Sensor.
   c. Item 25: Barometric pressure Sensor.
   d. Item 69: Right Bank Heated Oxygen Sensor (rear)
   e. Item 39: Right Bank Heated Oxygen Sensor (front)
   f. Item 59: Left Bank Heated Oxygen Sensor (rear)
   g. Item 11: Left Bank Heated Oxygen Sensor (front)
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are they operating properly?

YES : Go to Step 4.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 4. Using scan tool MB991502, check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items of the data list. Refer to, Data List Reference Table P.13Ab-28.
   a. Item 39: Right Bank Heated Oxygen Sensor (front)
   b. Item 11: Left Bank Heated Oxygen Sensor (front)
   • Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while idling after the engine has been warmed.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Replace the heated oxygen sensor (front). Then confirm that the malfunction symptom is eliminated. If not resolved, go to step 6.
NO : Go to Step 5.

STEP 5. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Go to Step 6.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 6. Check the following items.

(1) Check the following items, and repair or replace the defective items.
   a. Check the injectors for fuel leakage.
   b. Check the ignition coil, spark plugs, spark plug cables.
   c. Check compression pressure.
   d. Check the positive crank case ventilation system.
   e. Check the evaporative emission control system.
   f. Check the EGR system.

(2) Then check the malfunction symptom.

Q: Is the malfunction symptom is eliminated.

YES : The check is completed.

NO : Replace the catalytic converter. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 23: Transient, Mass Emission Tailpipe Test Failure.

COMMENT

- The test is failed when the air/fuel ratio is not controlled to the ideal air/fuel ratio. This occurs due to the feedback control by heated oxygen sensor signals, insufficient EGR flow rate, or deteriorated catalyst.

NOTE: If the three-way catalyst temperature is low when checking the exhaust gas, the three-way catalyst cannot sufficiently clean the emissions. Warm up the engine sufficiently before checking the exhaust, and check immediately.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of air/fuel ratio control system.
- Malfunction of the EGR system.
- Deteriorated catalyst.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)

STEP 1. Check the exhaust gas with the engine at normal operating temperature.

Q: After enough warm up, was the exhaust gas checked enough?

YES : Go to Step 2.

NO : Check it again after enough warm up.

STEP 2. Check the following items.

(1) Check the following items.

a. Check all vacuum hoses and connectors.

b. Check electrical wires and connectors for obvious problems.

c. Check the exhaust system for missing or damaged parts.

Q: Are they normal?

YES : Go to Step 3.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 3. Check the drivability.

(1) Check if the malfunction symptom described on the symptom chart is occurring.

Q: Is the drivability normal?

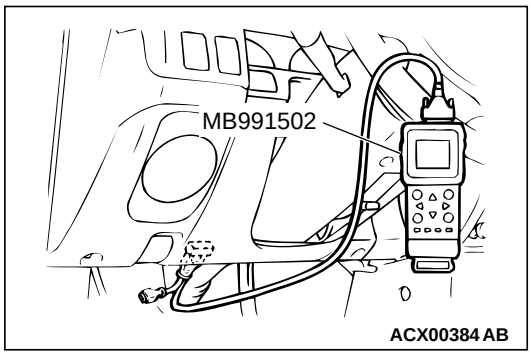
YES : Go to Step 4.

NO : Refer to GROUP 13A, Trouble Symptom Chart P.13Ab-25.

STEP 4. Using scan tool MB991502, read the diagnostic trouble code (DTC).

⚠ 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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Go to Step 5.

STEP 5. Check the ignition timing.

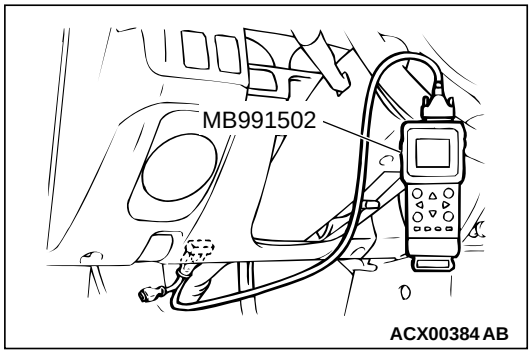
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check P.11A-5. <3.0L Engine>

Refer to GROUP 11C, On-vehicle Service – Ignition Timing Check P.11C-5. <3.5L Engine>

Q: Is the ignition timing normal?

YES : Go to Step 6.

NO : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.



STEP 6. Using scan tool MB991502, check data list.

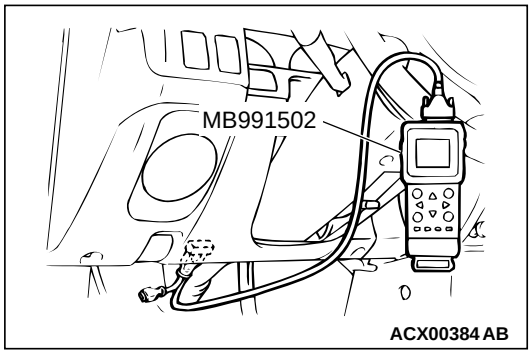
⚠ CAUTION

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) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13Ab-28.
   a. Item 21: Engine Coolant Temperature Sensor.
   b. Item 13: Intake Air Temperature Sensor.
   c. Item 25: Barometric pressure Sensor.
   d. Item 69: Right Bank Heated Oxygen Sensor (rear)
   e. Item 59: Left Bank Heated Oxygen Sensor (rear)
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 7.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

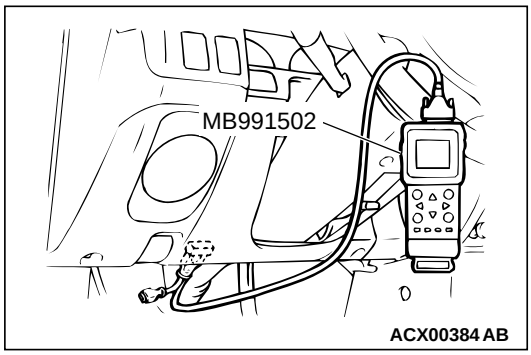


STEP 7. Using scan tool MB991502, check data list item 39: Right Bank heated oxygen sensor (front).

(1) Start the engine and run at idle.
(2) Set scan tool MB991502 to the data reading mode for item 39, Right Bank Heated Oxygen Sensor (front).
   • Warm up the engine. When the engine is decelerated suddenly from 4000 r/min, the output voltage should increase from 200 millivolts or less to 600 – 1000 millivolts in a few seconds.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 8.
NO : Refer to GROUP 13A, DTC P0130 – Heated Oxygen Sensor Circuit (bank 1, sensor 1) P.13Ac-122, DTC P0131 – Heated Oxygen Sensor Circuit low voltage (bank 1, sensor 1) P.13Ac-132, DTC P0132 – Heated Oxygen Sensor Circuit High Voltage (bank 1, sensor 1) P.13Ac-138, P0133 – Heated Oxygen Sensor Circuit Slow Response (bank 1, sensor 1) P.13Ac-142, P0134 – Heated Oxygen Sensor Circuit No Activity Detected (bank 1, sensor 1) P.13Ac-145.



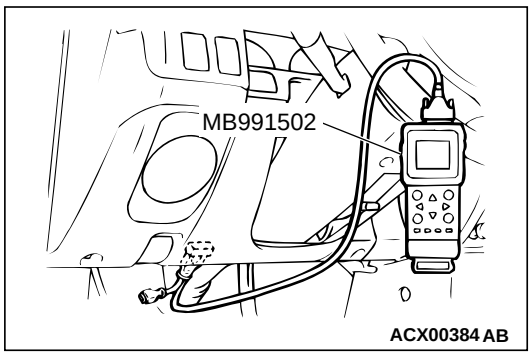
STEP 8. Using scan tool MB991502, check data list item 11: Left Bank Heated oxygen sensor (front).

(1) Start the engine and run at idle.
(2) Set scan tool MB991502 to the data reading mode for item 11, Left Bank Heated Oxygen Sensor (front).
- Output voltage should measure 0.6 – 1.0 volt when sudden revving.

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

Q: Is the sensor operating properly?

YES : Go to Step 9.
NO : Refer to GROUP 13A, DTC P0150 – Heated Oxygen Sensor Circuit (bank 2, sensor 1) P.13Ac-196, DTC P0151 – Heated Oxygen Sensor Circuit low voltage (bank 2, sensor 1) P.13Ac-206, DTC P0152 – Heated Oxygen Sensor Circuit High Voltage (bank 2, sensor 1) P.13Ac-212, P0153 – Heated Oxygen Sensor Circuit Slow Response (bank 2, sensor 1) P.13Ac-216, P0154 – Heated Oxygen Sensor Circuit No Activity Detected (bank 2, sensor 1) P.13Ac-219.



STEP 9. Using scan tool MB991502, check data list item 39: Right Bank Heated oxygen sensor (front).

(1) Start the engine and run at idle.
(2) Set scan tool MB991502 to the data reading mode for item 39, Right Bank Heated Oxygen Sensor (front).
- Voltage should fluctuate between 0 – 0.4 volt and 0.6 – 1.0 volt while after the engine has been warmed.

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

Q: Is the sensor operating properly?

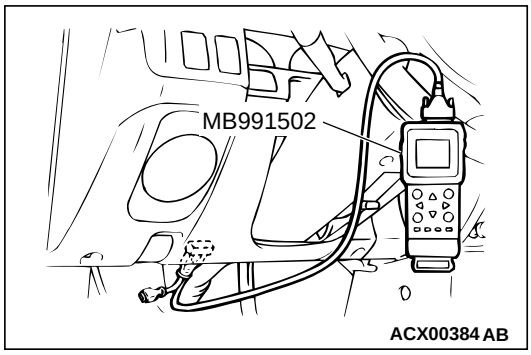
YES : Go to Step 10.
NO : Go to Step 12.

STEP 10. Check the EGR system.

Refer to GROUP 17, Emission Control System – EGR System Check P.17-98.

Q: Is the EGR system normal?

YES : Go to Step 11.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 11. Using scan tool MB991502, check data list item 69: Right Bank Heated oxygen sensor (rear).

⚠ CAUTION

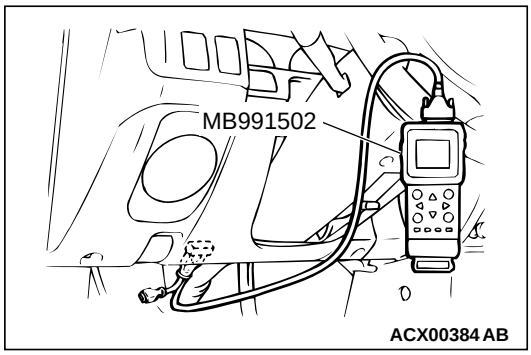
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(1) Connect scan tool MB991502 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991502 to the data reading mode for item 69, Right Bank Heated Oxygen Sensor (rear).
- Average voltage should measure 0.6 volt or less, when idling.

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

Q: Is the sensor operating properly?

YES : Go to Step 16.
NO : Replace the right bank heated oxygen sensor (front). Then confirm that the malfunction symptom is eliminated.



STEP 12. Using scan tool MB991502, check data list item 11: Left Bank Heated oxygen sensor (front).

(1) Start the engine and run at idle.
(2) Set scan tool MB991502 to the data reading mode for item 11, Left Bank Heated Oxygen Sensor (front).
- Warm up the engine. When the engine is decelerated suddenly from 4000 r/min, the output voltage should increase from 200 millivolts or less to 600 – 1000 millivolts in a few seconds.

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

Q: Is the sensor operating properly?

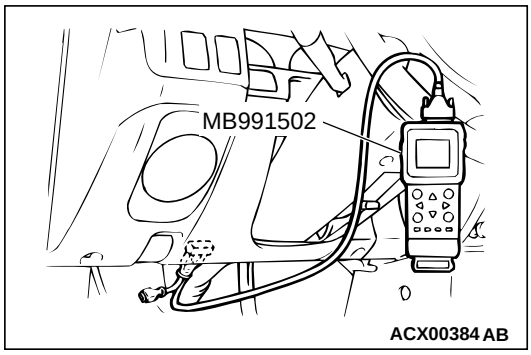
YES : Go to Step 13.
NO : Go to Step 15.

STEP 13. Check the EGR system.

Refer to GROUP 17, Emission Control System – EGR System Check P.17-98.

Q: Is the EGR system normal?

YES : Go to Step 14.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.



STEP 14. Using scan tool MB991502, check data list item 59: Left Bank Heated oxygen sensor (rear).

⚠ 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) Start the engine and run at idle.
(3) Set scan tool MB991502 to the data reading mode for item 59, Left Bank Heated Oxygen Sensor (rear).
- Average voltage should measure 0.6 volt or less, when idling.

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

Q: Is the sensor operating properly?

YES : Go to Step 16.
NO : Replace the left bank heated oxygen sensor (front). Then confirm that the malfunction symptom is eliminated.

STEP 15. Check the fuel pressure.

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13Aa-15.

Q: Is the fuel pressure normal?

YES : Go to Step 16.
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 16. Check the following items.

(1) Check the following items, and repair or replace the defective items.
   a. Check the injectors for fuel leakage.
   b. Check the ignition coil, spark plugs, spark plug cables.
   c. Check compression pressure.
   d. Check the positive crankcase ventilation system.
   e. Check the evaporative emission control system.
(2) Then check the malfunction symptom.

Q: Is the malfunction symptom eliminated?

YES : The check is completed.
NO : Replace the catalytic converter. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 24: Purge Flow Test of the Evaporative Emission Canister Failure.

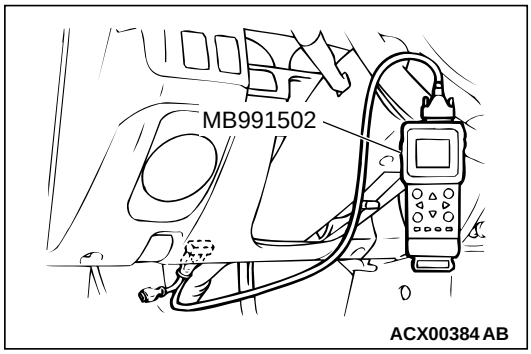
COMMENT
- The test fails when the purge line or purge port is clogged or if the evaporative emission purge solenoid fails.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Purge line or purge port is clogged.
- Malfunction of the evaporative emission purge solenoid.
- Evaporative emission canister is clogged.

DIAGNOSIS

Required Special Tool:
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, read the diagnostic trouble code (DTC).



⚠ 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) 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 set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13Ab-21.

NO : Refer to GROUP 17, Emission Control System – Purge Control System Check (Purge Flow Check) P.17-94.

INSPECTION PROCEDURE 25: Pressure Test of the Evaporative System Failure.

COMMENT
- The test fails if there is a leak from the fuel tank or vapor line.

TROUBLESHOOTING HINTS (The most likely causes for this case:)
- Loose fuel tank filler tube cap.
- Broken seal in fuel tank, vapor line evaporative emission canister.

DIAGNOSIS

STEP 1. Check the evaporative emission purge solenoid
Refer to GROUP 17, Emission Control System – Evaporative Emission Purge Solenoid Check P.17-95.

Q: Is the evaporative emission purge solenoid normal?

YES : Go to Step 2.

NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

STEP 2. Check the evaporative emission ventilation solenoid.

Refer to GROUP 17, Emission Control System – Evaporative Emission Ventilation Solenoid Check P.17-96.

Q: Is the evaporative emission ventilation solenoid normal?

YES : Check the following items, and repair or replace the defective items.

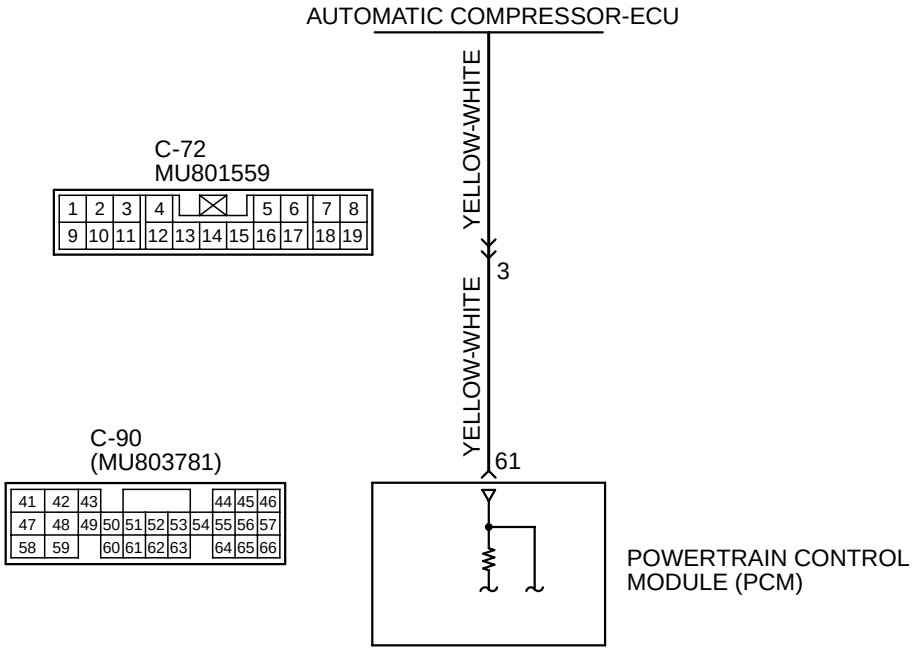
a. Check for leaks from the vapor line or evaporative emission canister.

b. Check for leaks from the fuel tank.

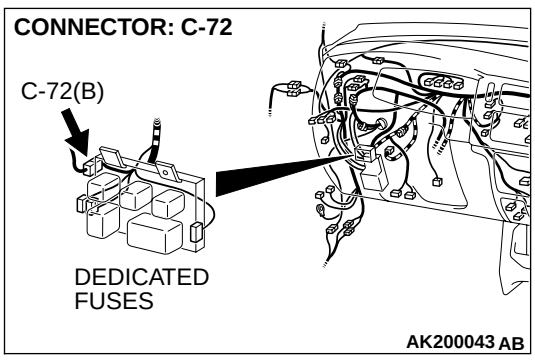
Then confirm that the malfunction symptom is eliminated.

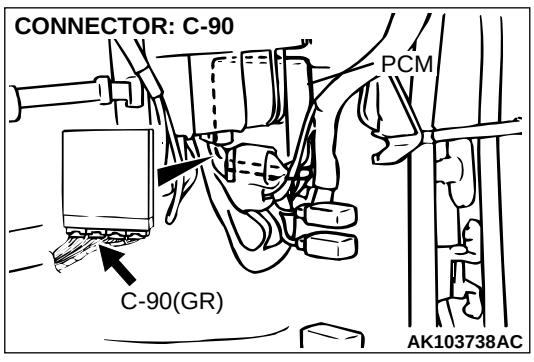
NO : Repair or replace. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 26: Incorrect Idle Speed When the A/C is Operating (A/C Switch 2 Signal)



AK102611





TSB Revision

CIRCUIT OPERATION

- The PCM increases the engine idle speed by driving the IAC motor when the automatic compressor-ECU sends a "A/C on" signal to the module.
- The automatic compressor-ECU detects how the air conditioning is applying load to the engine, and converts the information to a voltage signal (High voltage = low load, Low voltage = high load). This voltage signal is called "A/C switch 2 signal." The PCM receives this A/C switch 2 signal from the automatic compressor-ECU through terminal No. 61, and determines the idle-up speed according to the high or low air conditioning load.

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

- Malfunction of the A/C control system.
- Open or shorted circuit, or improper connector contact.
- PCM failed.

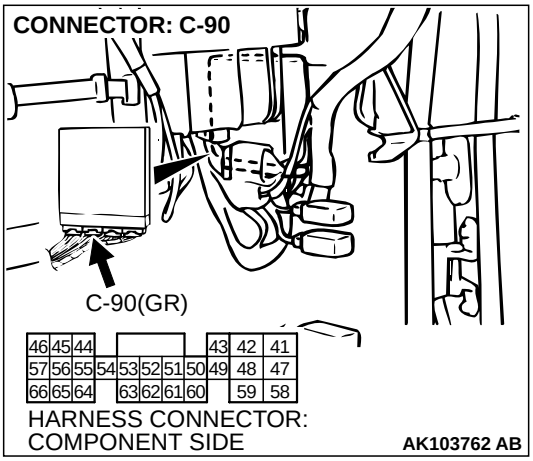
DIAGNOSIS

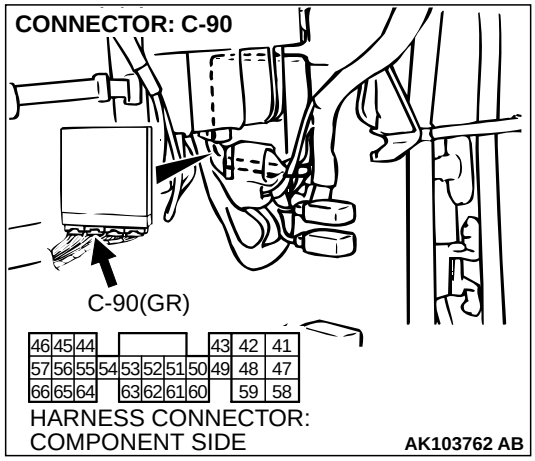
STEP 1. Check harness connector C-90 at PCM for damage.

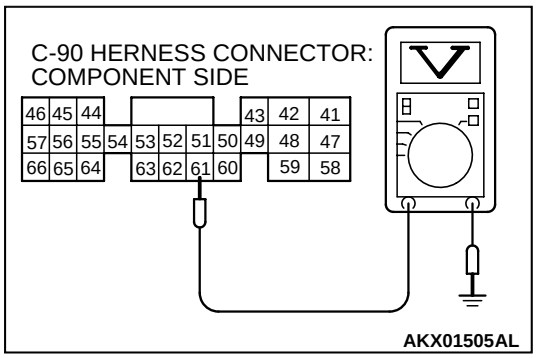
Q: Is the harness connector in good condition?

YES : Go to Step 2.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.







STEP 2. Measure the output voltage at PCM harness side connector C-90.

(1) Disconnect the connector C-90 and measure at the harness side.
(2) Start the engine and run at idle.
(3) Turn the A/C switch "ON."
(4) Measure the voltage between terminal No. 61 and ground.
- If atmospheric air temperature is 15°C (59°F) or less, the voltage should measure 1 volt or less.
- If atmospheric air temperature is 18°C (65.4°F) or more, the voltage should measure battery positive voltage.

(5) Turn the A/C switch "OFF."
(6) Turn the ignition switch to the "LOCK" (OFF) position.

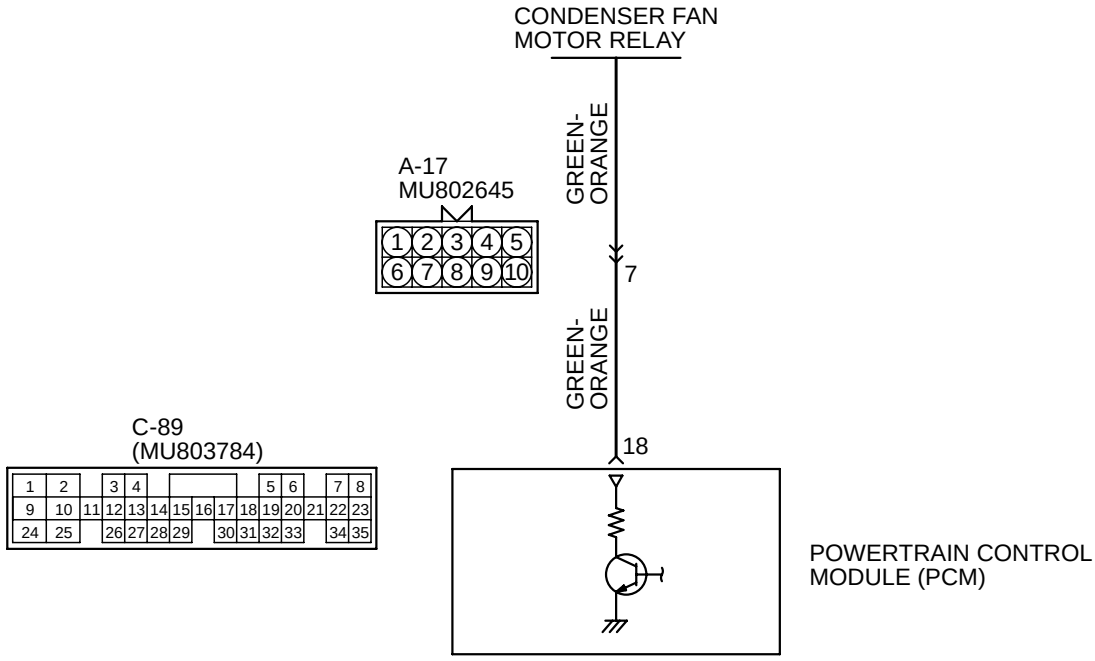
Q: Is the measured voltage within the specified range?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

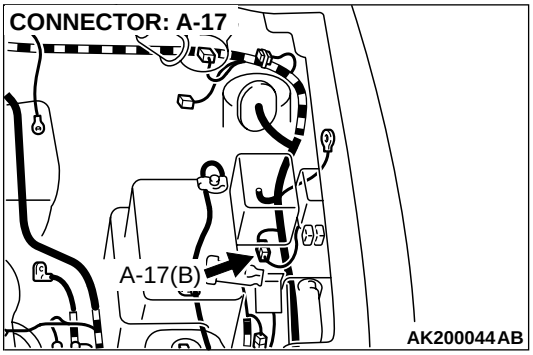
NO : Refer to GROUP 55, Introduction to Heater, Air Conditioning and Ventilation Diagnosis P.55-5.

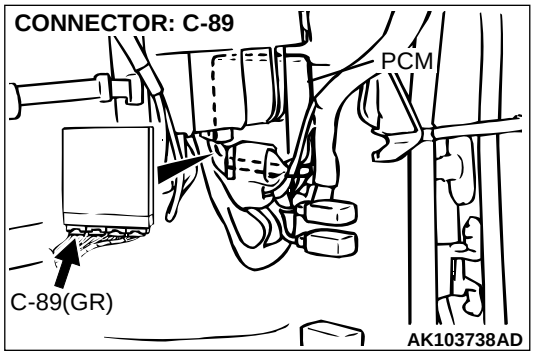
INSPECTION PROCEDURE 27: A/C condenser fan is inoperative

A/C Condenser Fan Circuit



AK000629





CIRCUIT OPERATION

- The battery positive voltage is applied on the PCM (terminal No. 18) from the condenser fan motor relay.
- When the PCM switches on its power transistor, the condenser fan motor relay coil is energized, causing current to flow in the circuit.

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

- Malfunction of the condenser fan motor relay.
- Malfunction of the condenser fan motor.
- Improper connector contact, open or short-circuited harness wire.
- PCM failed.

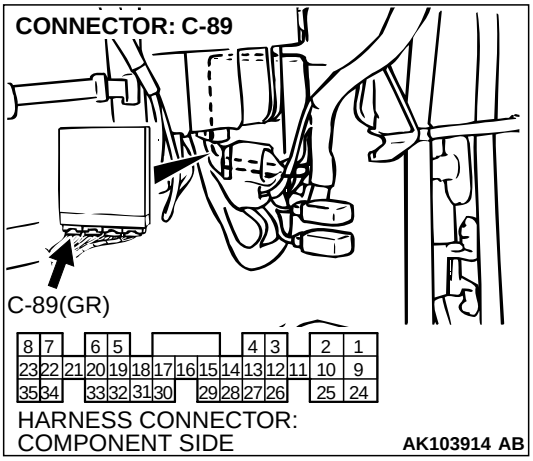
DIAGNOSIS

STEP 1. Check harness connector C-89 at PCM for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 2.

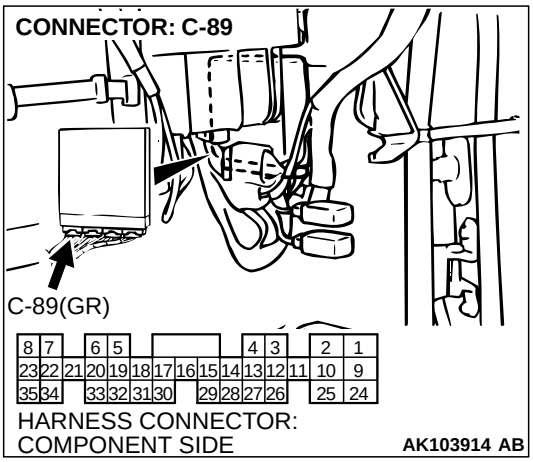
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

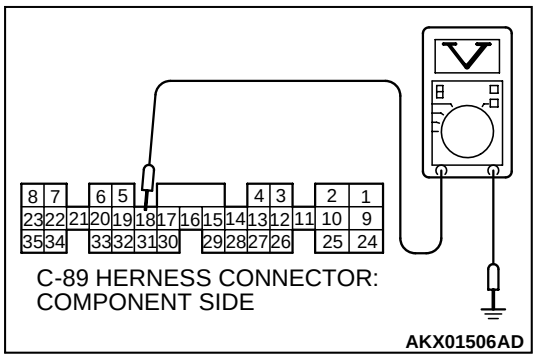


STEP 2. Measure the output voltage at PCM harness side connector C-89.

(1) Disconnect the connector C-89 and measure at the harness side.

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





(3) Measure the voltage between terminal No. 18 and ground.
- Voltage should be battery positive voltage.

(4) Check the condenser fan condition.
- When the terminal No. 18 is disconnected, the fan should step.
- When the terminal No. 18 is grounded by the jumper cable, the fan should run.

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

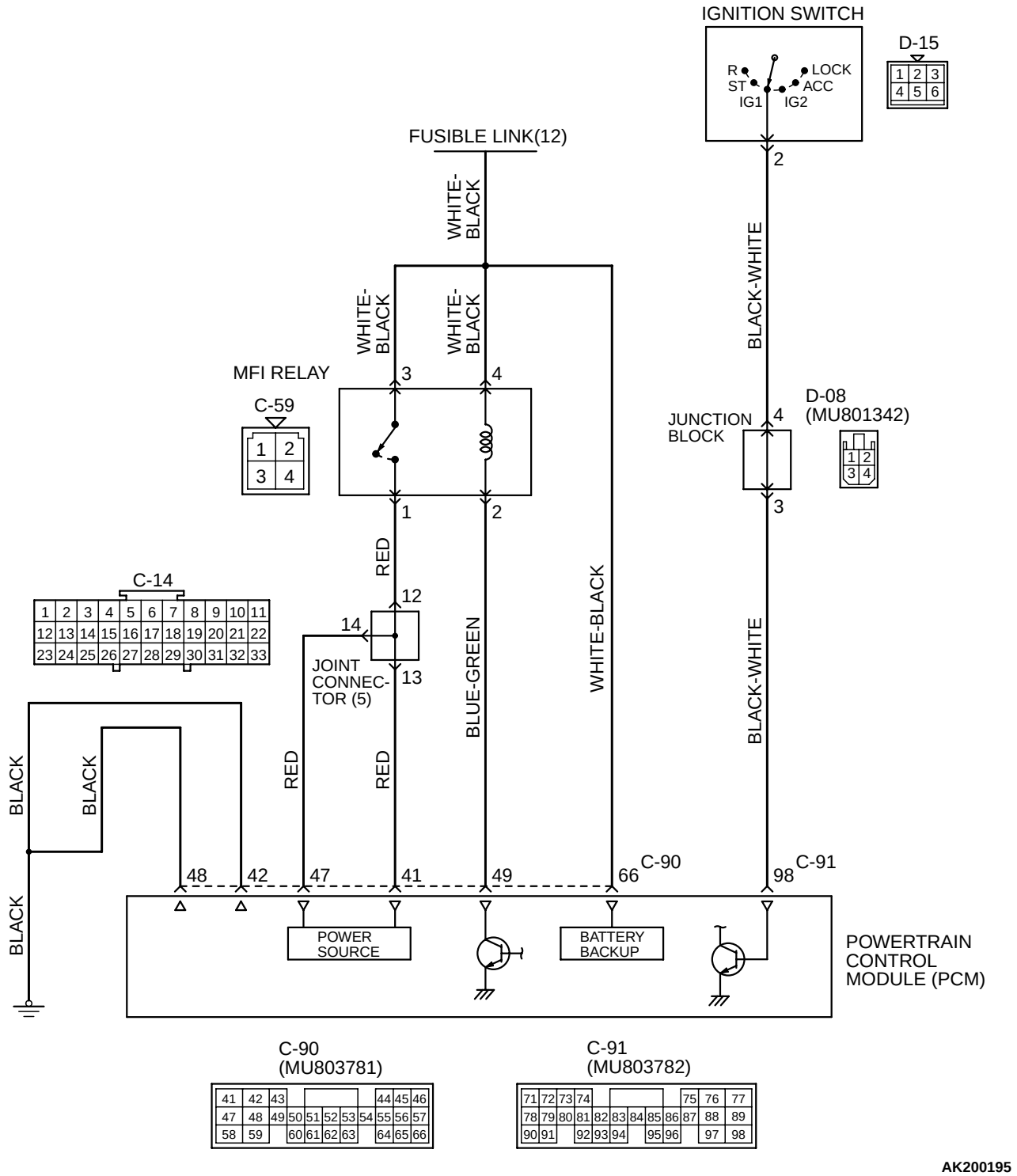
Q: Is the voltage and fan condition normal?

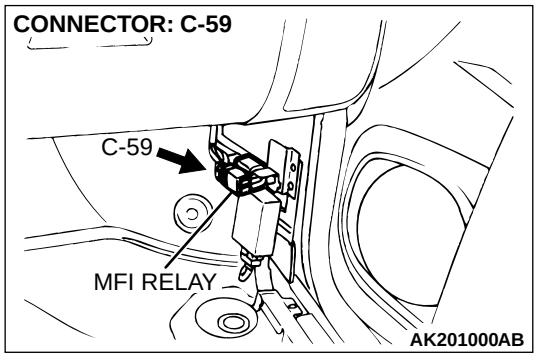
YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

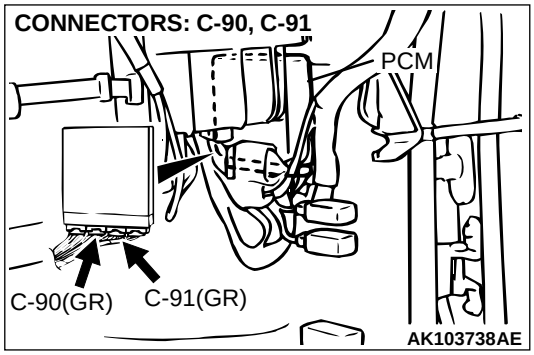
NO : Refer to GROUP 55, Introduction to Heater, Air Conditioning and Ventilation Diagnosis P.55-5.

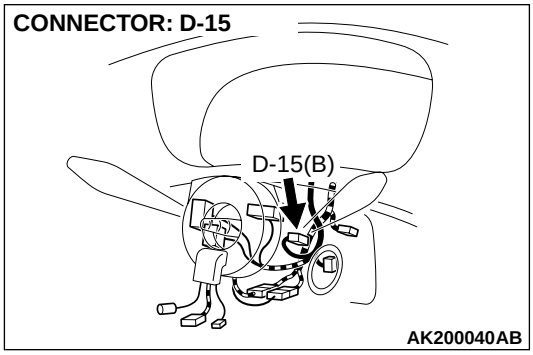
INSPECTION PROCEDURE 28: Power supply system and ignition switch-IG system.

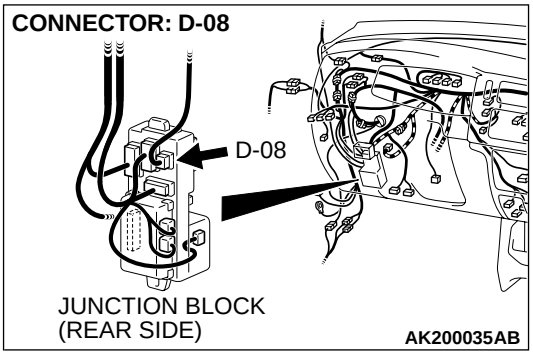
Power Supply and Ignition Switch-IG Circuit

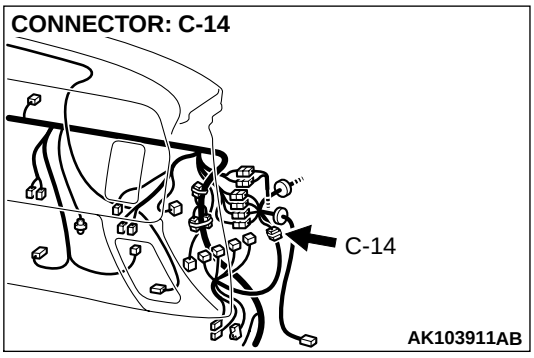












CIRCUIT OPERATION

- Battery positive voltage is applied to the MFI relay (terminals No. 3, No. 4).
- When the ignition switch is turned to the "ON" position, the battery positive voltage is applied to the PCM (terminal No. 98).
- When the battery positive voltage is applied, the PCM turns the power transistor in the PCM "ON" and grounds the MFI relay coil. With this, the MFI relay turns "ON" and the battery positive voltage is supplied to the PCM (terminals No. 41, No. 47) from the MFI relay (terminal No. 1).
- Battery positive voltage is constantly supplied to the PCM (terminal No. 66) as the backup power.
- The PCM (terminals No. 42, No. 48) is grounded to the vehicle body.

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

- Malfunction of the ignition switch.
- Malfunction of the MFI relay.
- Improper connector contact, open circuit or short-circuited harness wire.
- Disconnected PCM ground wire.
- Malfunction of the PCM.

TSB Revision

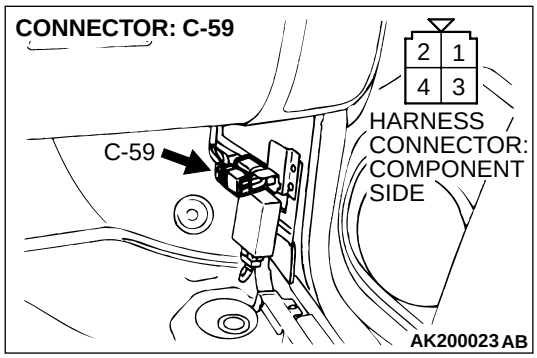
DIAGNOSIS

STEP 1. Check harness connector C-59 at MFI relay for damage.

Q: Is the harness connector in good condition?

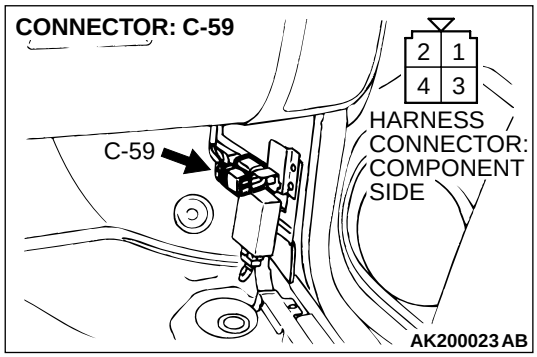
YES : Go to Step 2.

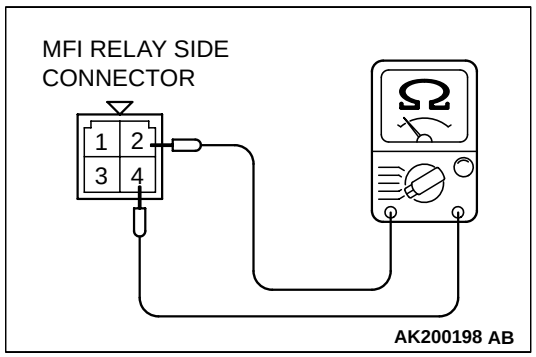
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.



STEP 2. Check the MFI relay

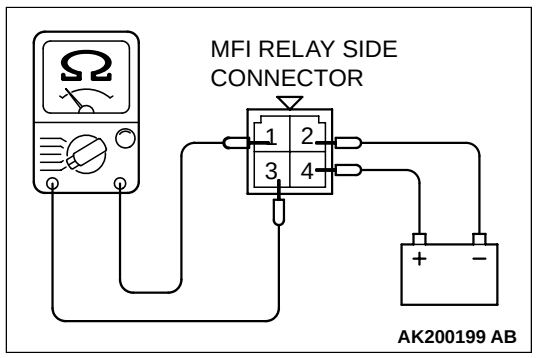
(1) Remove the MFI relay.





(2) Check for continuity between the MFI relay terminal No. 2 and No. 4.
- There should be continuity (approximately 70 ohms)

(3) Use jumper wires to connect MFI relay terminal No. 4 to the positive battery terminal and terminal No. 2 to the negative battery terminal.



(4) Check for continuity between the MFI relay terminal No. 1 and No. 3 while connecting and disconnecting the jumper wire at the negative battery terminal.
- Should be less than 2 ohms. (Negative battery terminal connected)
- Should be open loop. (Negative battery terminal disconnected)

(5) Install the MFI relay.

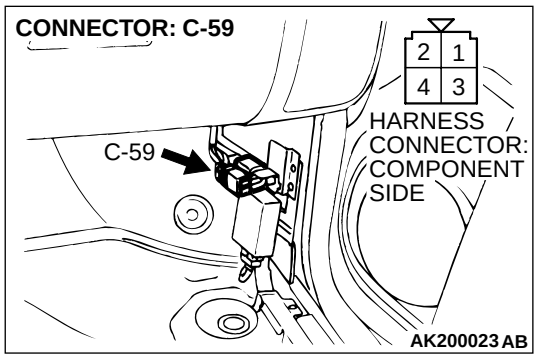
Q: Is the measured voltage within the specified range?

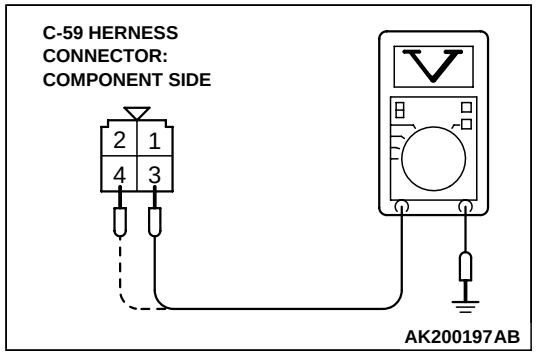
YES : Go to Step 3.

NO : Replace the MFI relay. Then confirm that the malfunction symptom is eliminated.

STEP 3. Measure the power supply voltage at MFI relay harness side connector C-59.

(1) Disconnect the connector C-59 and measure at the harness side.





(2) Measure the voltage between terminals No. 3, No. 4 and ground.
- Voltage should be battery positive voltage.

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

YES : Go to Step 4.

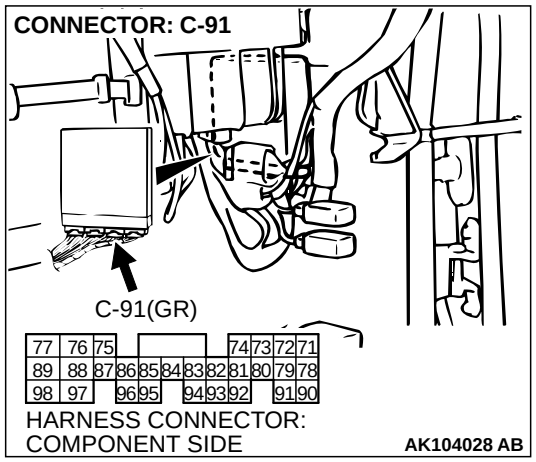
NO : Repair harness wire between fusible link (12) and MFI relay connector C-59 (terminals No. 3, No. 4). Then confirm that the malfunction symptom is eliminated.

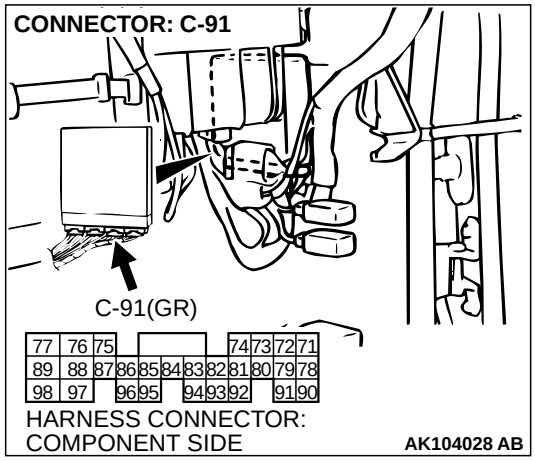
STEP 4. Check harness connector C-91 at PCM for damage.

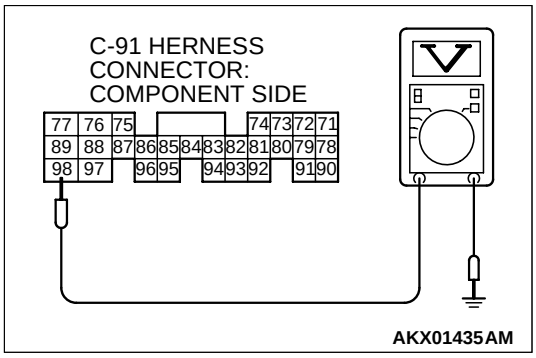
Q: Is the harness connector in good condition?

YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.







STEP 5. Measure the ignition switch-IG signal voltage at PCM harness side connector C-91.

(1) Disconnect the connector C-91 and measure at the harness side.

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

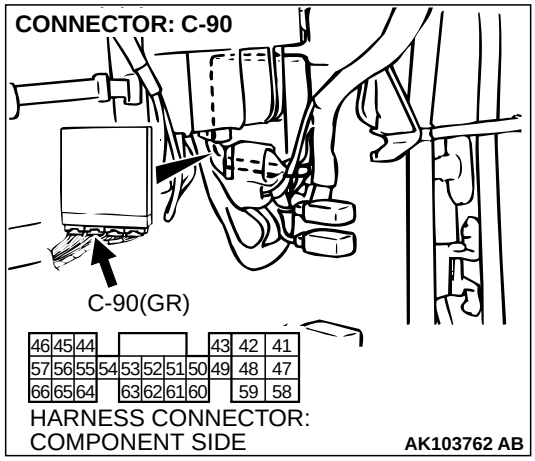
(3) Measure the voltage between terminal No. 98 and ground.
- Voltage should be battery positive voltage.

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

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

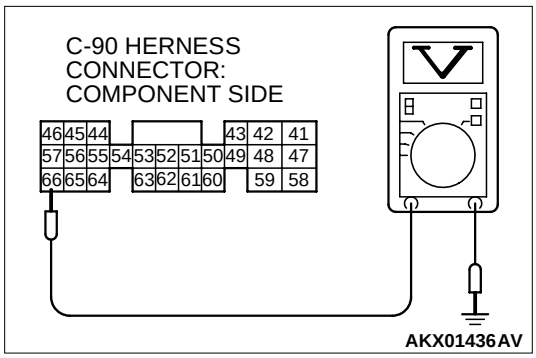
YES : Go to Step 6.

NO : Check harness connector D-08 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connectors D-08 is in good condition, repair harness wire between ignition switch connector D-15 (terminal No. 2) and PCM connector C-91 (terminal No. 98). Then confirm that the malfunction symptom is eliminated.



STEP 6. Measure the backup power supply voltage at PCM harness side connector C-90.

(1) Disconnect the connector C-90 and measure at the harness side.

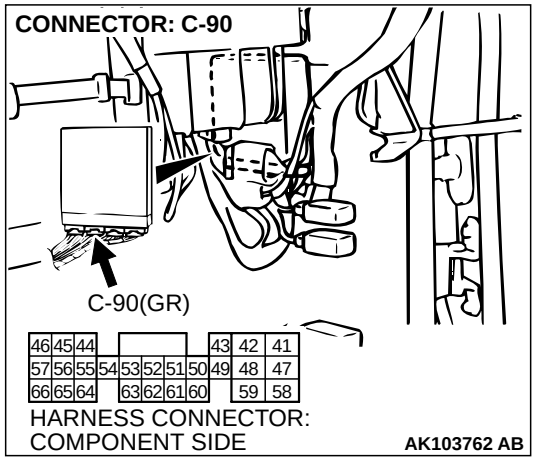


(2) Measure the voltage between terminal No. 66 and ground.
- Voltage should be battery positive voltage.

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

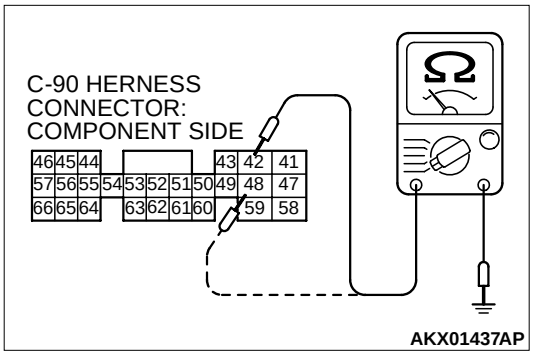
YES : Go to Step 7.

NO : Repair harness wire between fusible link (12) and PCM connector C-90 (terminal No. 66). Then confirm that the malfunction symptom is eliminated.



STEP 7. Check for continuity at PCM harness side connector C-90.

(1) Disconnect the connector C-90 and measure at the harness side.

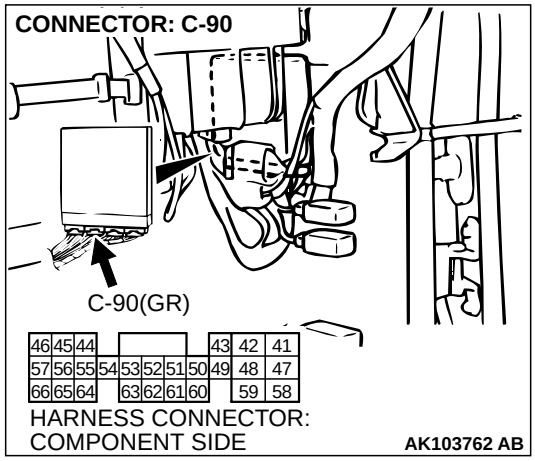


(2) Check for the continuity between terminals No. 42, No. 48 and ground.
- Should be less than 2 ohms.

Q: Does continuity exist?

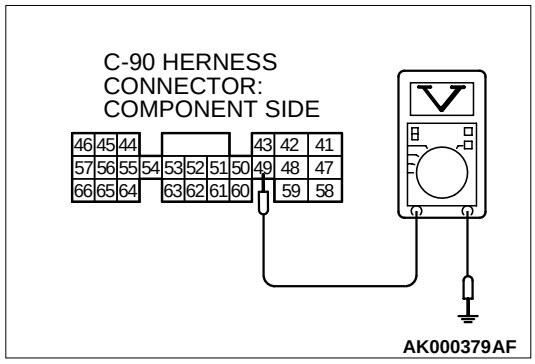
YES : Go to Step 8.

NO : Repair harness wire between PCM connector C-90 (terminals No. 42, No. 48) and ground. Then confirm that the malfunction symptom is eliminated.



STEP 8. Measure the power supply voltage at PCM harness side connector C-90.

(1) Disconnect the connector C-90 and measure at the harness side.

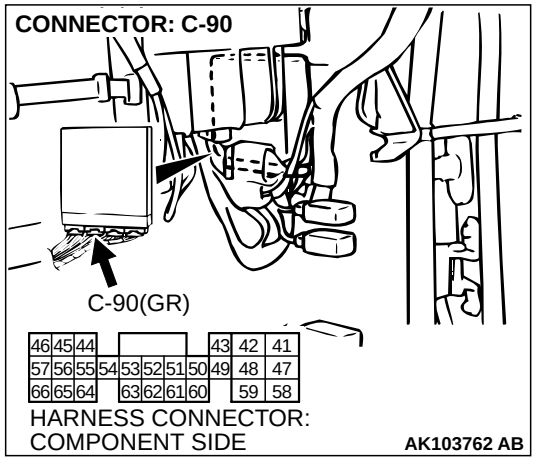


(2) Measure the voltage between terminal No. 49 and ground.
- Voltage should be battery positive voltage.

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

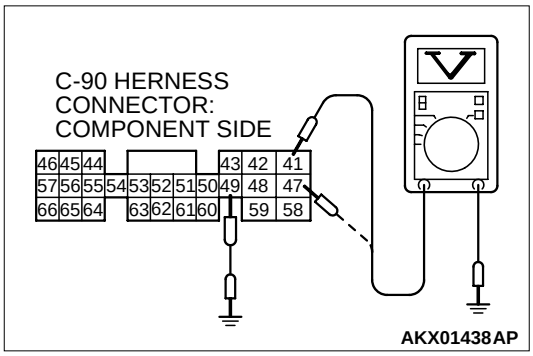
YES : Go to Step 9.

NO : Repair harness wire between MFI relay connector C-59 (terminal No. 2) and PCM connector C-90 (terminal No. 49). Then confirm that the malfunction symptom is eliminated.



STEP 9. Measure the power supply voltage at PCM harness side connector C-90.

(1) Disconnect the connector C-90 and measure at the harness side.



(2) Using a jumper wire, connect terminal No. 49 to ground.
(3) Measure the voltage between terminals No. 41, No. 47 and ground.
- Voltage should be battery positive voltage.

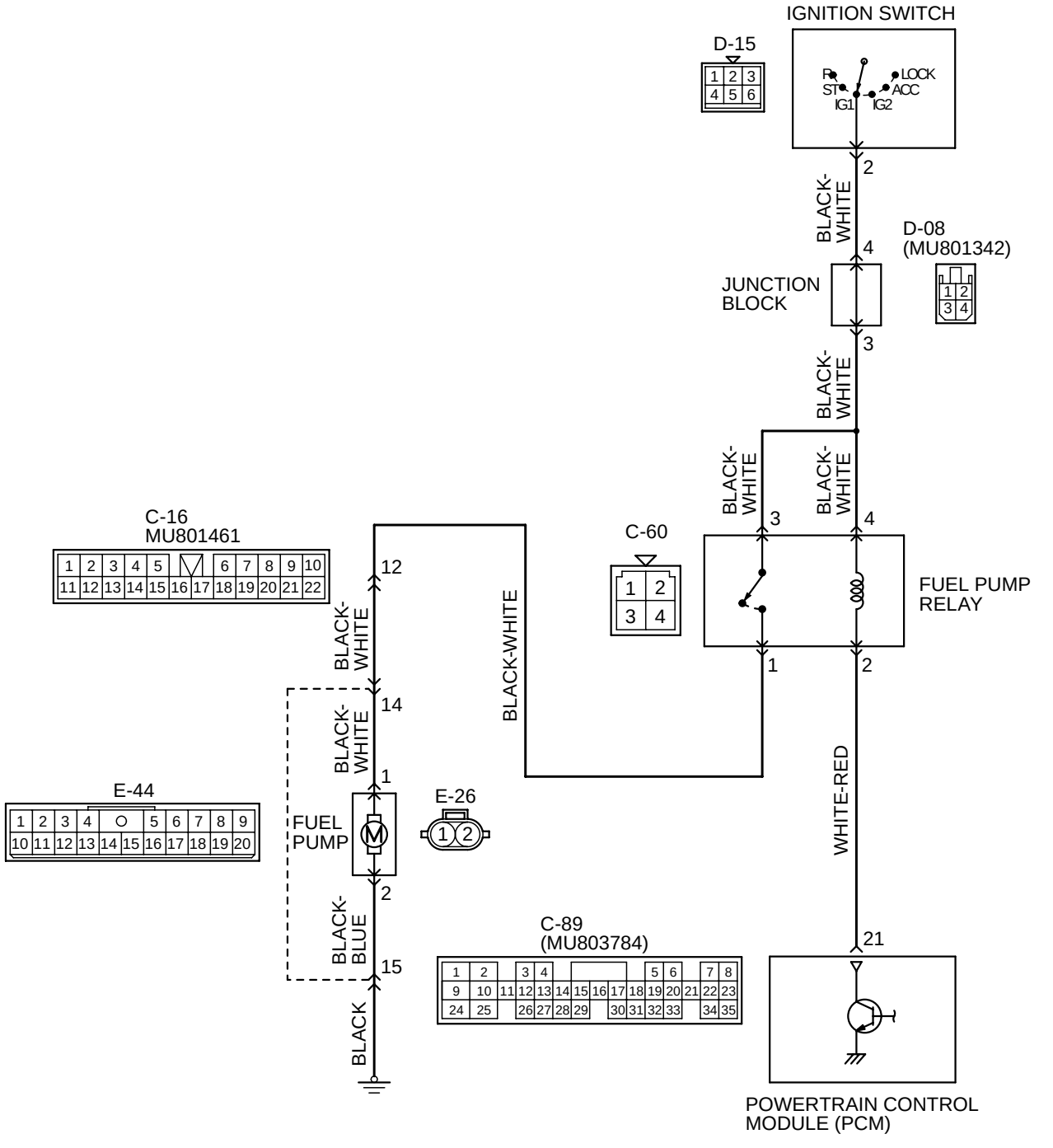
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

NO : Check harness connector C-14 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector C-14 is in good condition, repair harness wire between MFI relay connector C-59 (terminal No. 1) and PCM connector C-90 (terminals No. 41, No. 47). Then confirm that the malfunction symptom is eliminated.

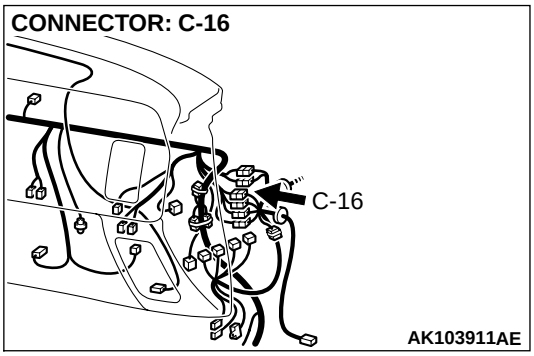
INSPECTION PROCEDURE 29: Fuel pump system.

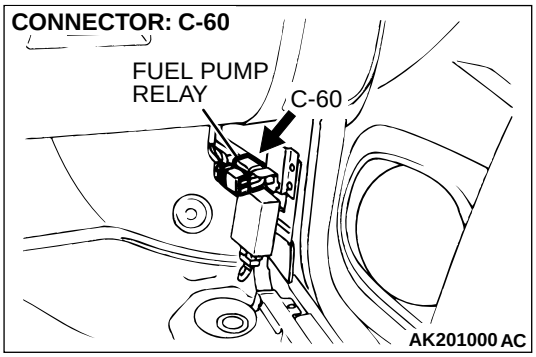
Fuel Pump Circuit

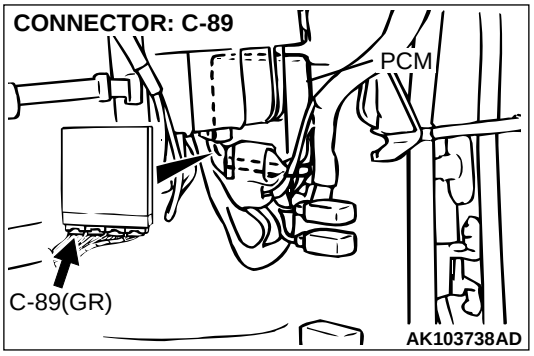


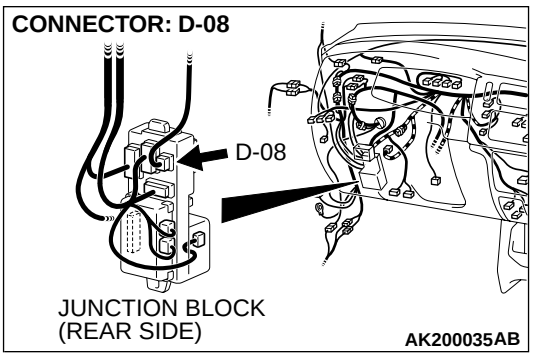
AK200196

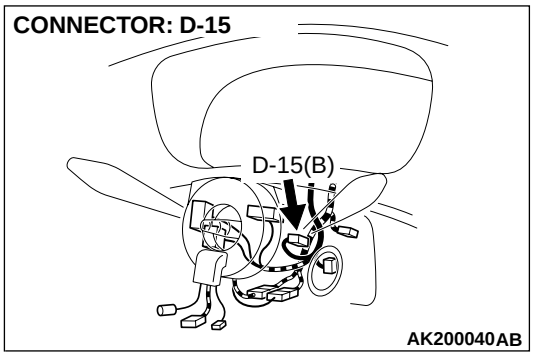
TSB Revision

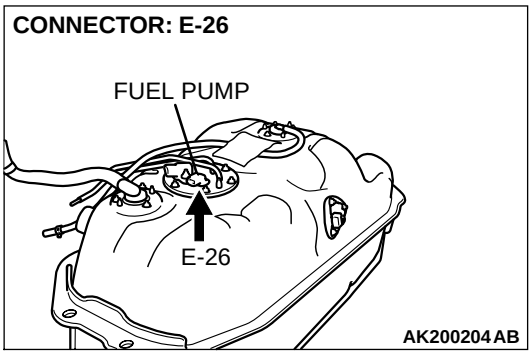


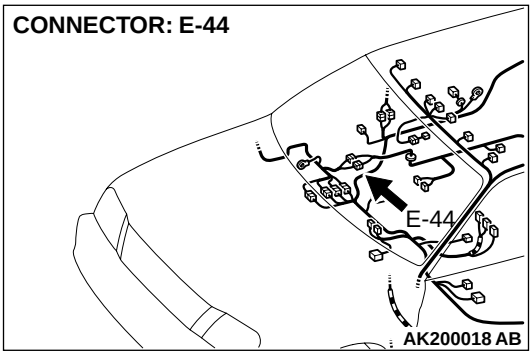












CIRCUIT OPERATION

- A battery positive voltage is applied on the fuel pump relay (terminals No. 3, No. 4) from the ignition switch-IG.
- During cranking and while the engine is running, the PCM turns the power transistor in the PCM "ON" to ground the fuel pump relay coil. With this, the fuel pump relay turns "ON" and the battery positive voltage is supplied to the fuel pump from the fuel pump relay (terminal No. 1).

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

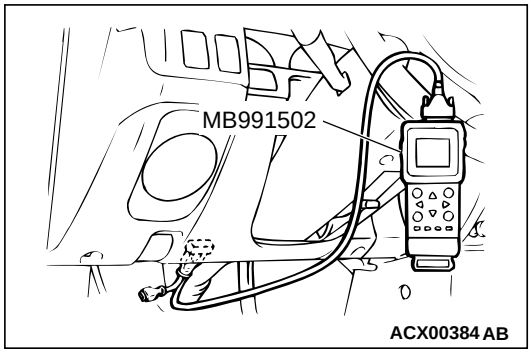
- Malfunction of the fuel pump relay.
- Malfunction of the fuel pump.
- Improper connector contact, open or short-circuited harness wire.
- Malfunction of the PCM.

TSB Revision

DIAGNOSIS

Required Special Tool:
- MB991502:Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check actuator test item 07: Fuel Pump.



⚠ 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) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991502 to the actuator test mode for item 07, Fuel Pump.
- An operation sound of the fuel pump should be heard.

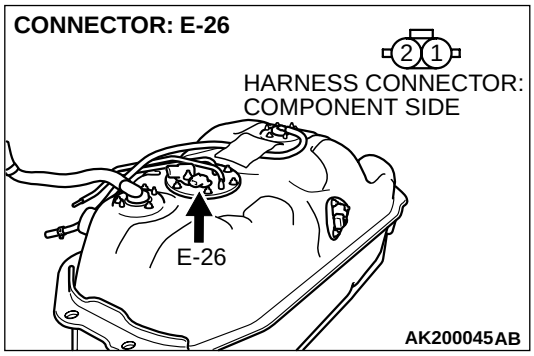
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the fuel pump operating properly?

YES : That this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-6.

NO : Go to Step 2.

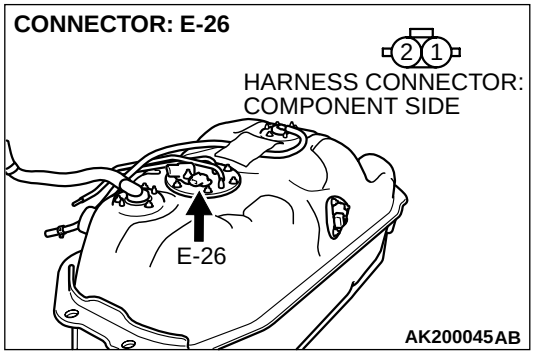
STEP 2. Check harness connector E-26 at fuel pump for damage.



Q: Is the harness connector in good condition?

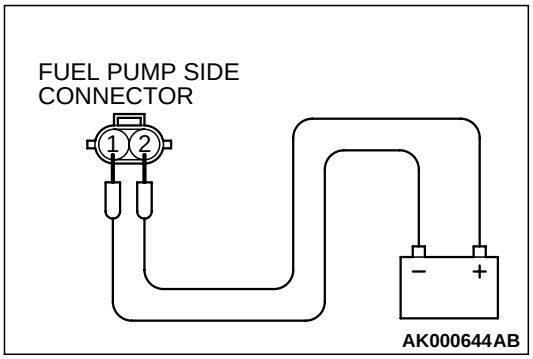
YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.



STEP 3 Check the fuel pump operation.

(1) Disconnect fuel pump connector E-26.

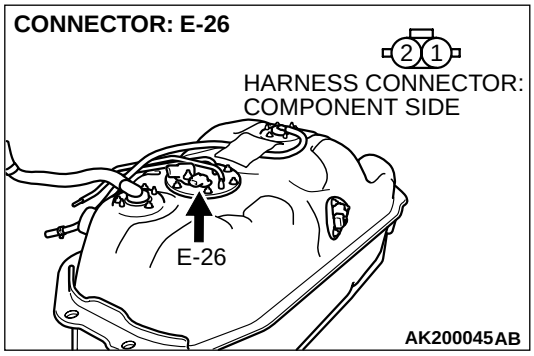


(2) Use jumper wires to connect fuel pump connector terminal No. 1 to the positive battery terminal and terminal No. 2 to the negative battery terminal.
- An operating sound of the fuel pump should be heard.

Q: Is the fuel pump operating properly?

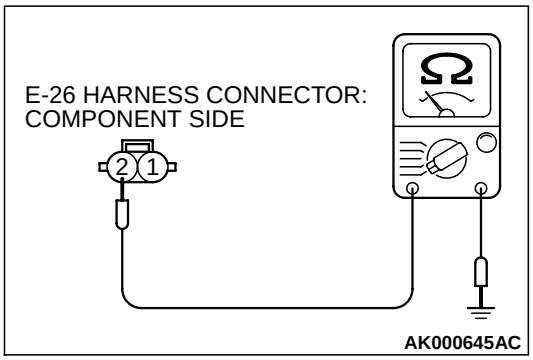
YES : Go to Step 4.

NO : Replace the fuel pump. Then confirm that the malfunction symptom is eliminated.



STEP 4. Check for continuity at fuel pump harness side connector E-26.

(1) Disconnect the connector E-26 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 5.

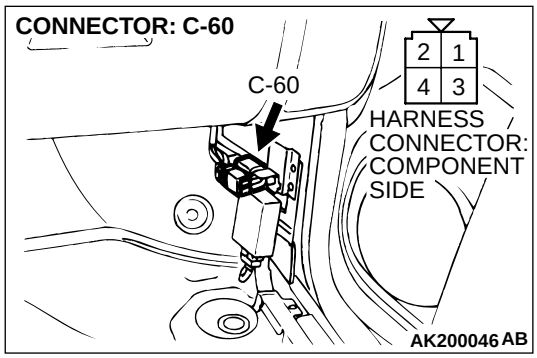
NO : Check harness connector E-44 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector E-44 is in good condition, repair harness wire between fuel pump connector E-26 (terminal No. 2) and ground. Then confirm that the malfunction symptom is eliminated.

STEP 5. Check harness connector C-60 at fuel pump relay for damage.

Q: Is the harness connector in good condition?

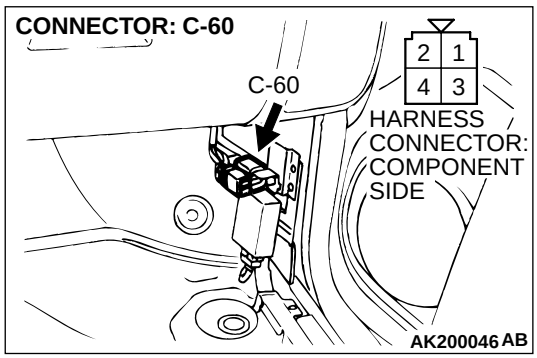
YES : Go to Step 6.

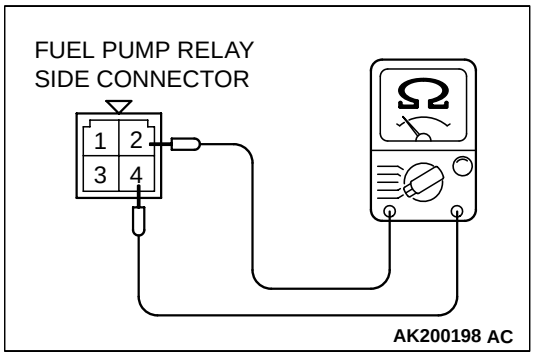
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.



STEP 6. Check the fuel pump relay

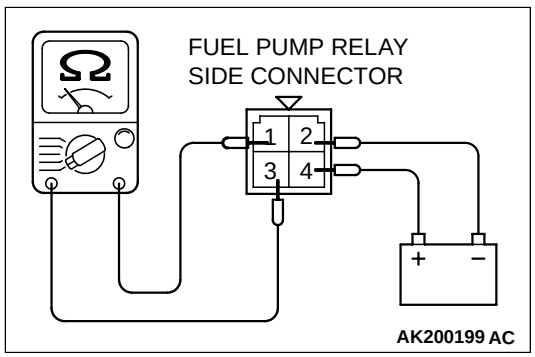
(1) Remove the fuel pump relay.





(2) Check for continuity between the fuel pump relay terminal No. 2 and No. 4.
- There should be continuity (approximately 70 ohms)

(3) Use jumper wires to connect fuel pump relay terminal No. 4 to the positive battery terminal and terminal No. 2 to the negative battery terminal.



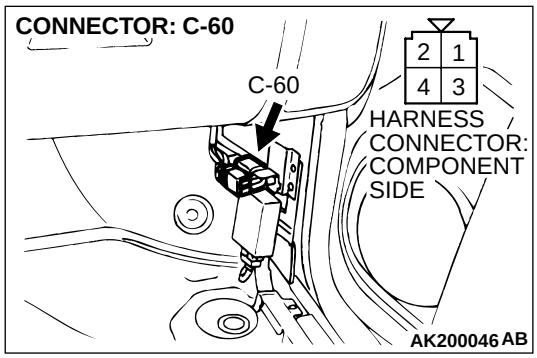
(4) Check for continuity between the fuel pump relay terminal No. 1 and No. 3 while connecting and disconnecting the jumper wire at the negative battery terminal.
- Should be less than 2 ohms. (Negative battery terminal connected)
- Should be open loop. (Negative battery terminal disconnected)

(5) Install the fuel pump relay.

Q: Is the resistance normal?

YES : Go to Step 7.

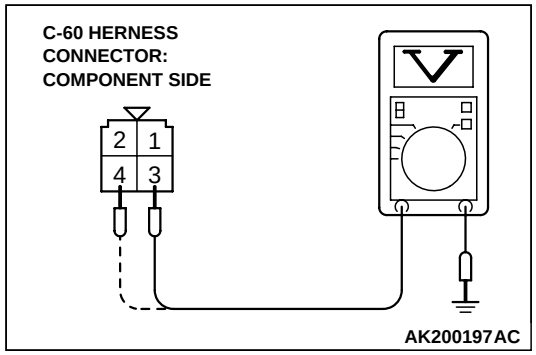
NO : Replace the fuel pump relay. Then confirm that the malfunction symptom is eliminated



STEP 7. Measure the power supply voltage at fuel pump relay connector C-60.

(1) Disconnect the connector C-60 and measure at the harness side.

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



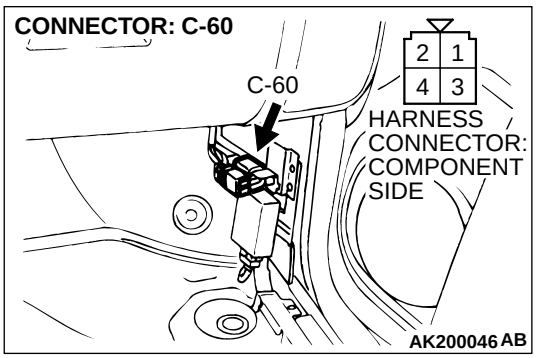
(3) Measure the voltage between terminals No. 3, No. 4 and ground.
- Voltage should be battery positive voltage.

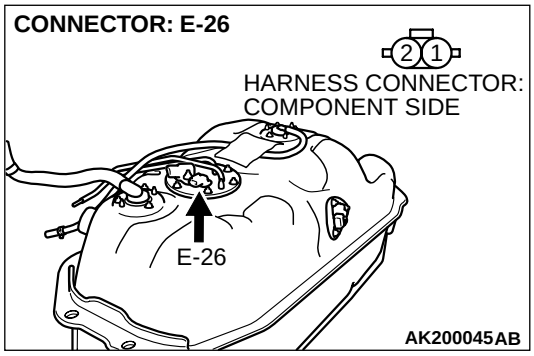
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 8.

NO : Check harness connector D-08 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection P.00E-2. If intermediate connector D-08 is in good condition, repair harness wire between ignition switch connector D-15 (terminal No. 2) and fuel pump relay connector C-60 (terminals No. 3, No. 4). Then confirm that the malfunction symptom is eliminated.





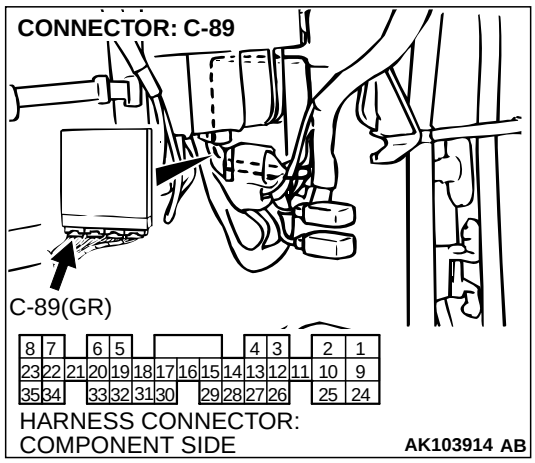
STEP 8. Check for open circuit and short circuit to ground and harness damage between fuel pump relay connector C-60 (terminal No. 1) and fuel pump connector E-26 (terminal No. 1).

NOTE: Check harness after checking intermediate connectors C-16 and E-44. If intermediate connectors C-16 and E-44 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then check that the malfunction is eliminated.

Q: Is the harness wire in good condition?

YES : Go to Step 9.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.



STEP 9. Check harness connector C-89 at PCM for damage.

Q: Is the harness connector in good condition?

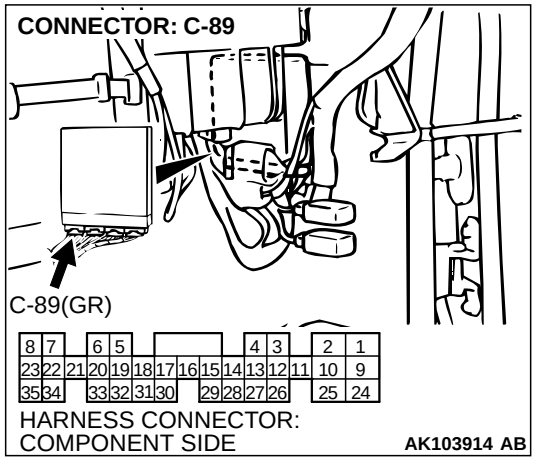
YES : Go to Step 10.

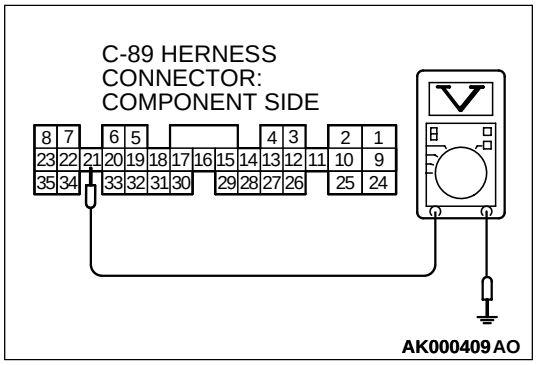
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

STEP 10. Measure the power supply voltage at PCM connector C-89.

(1) Disconnect the connector C-89 and measure at the harness side.

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





(3) Measure the voltage between terminal No. 21 and ground.
- Voltage should be battery positive voltage.

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

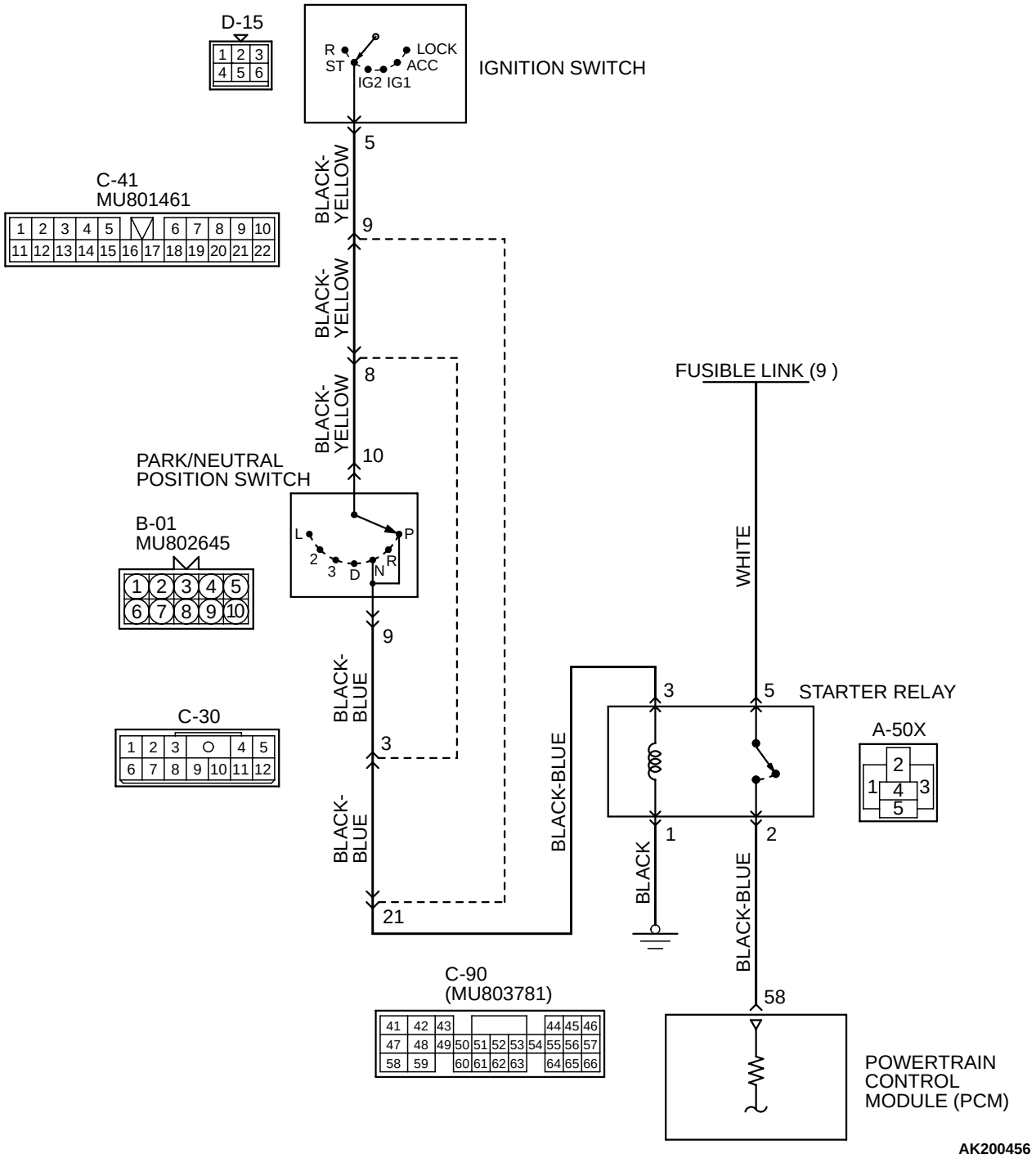
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

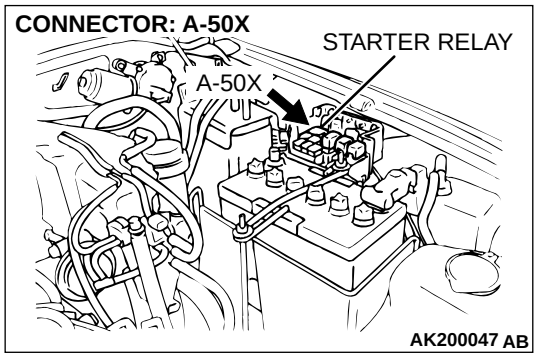
NO : Repair harness wire between fuel pump relay connector C-60 (terminal No. 2) and PCM connector C-89 (terminal No. 21). Then confirm that the malfunction symptom is eliminated.

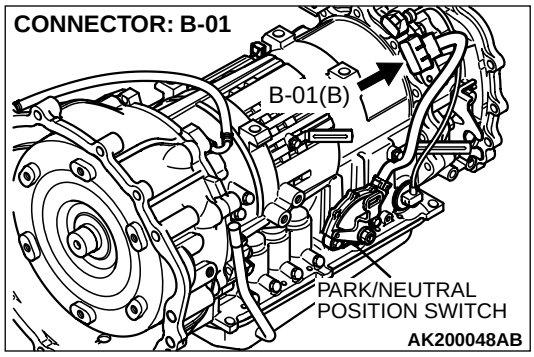
INSPECTION PROCEDURE 30: Ignition Switch-ST System and Park/Neutral Position Switch System.

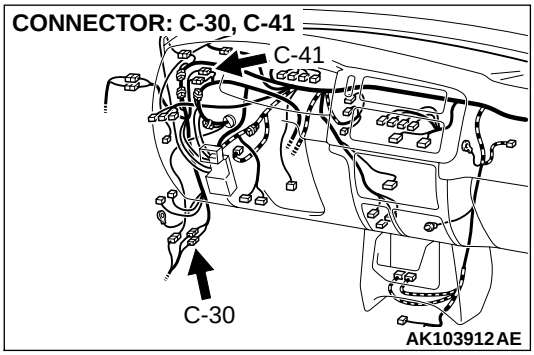
Ignition Switch-ST and Park/Neutral Position Switch Circuit

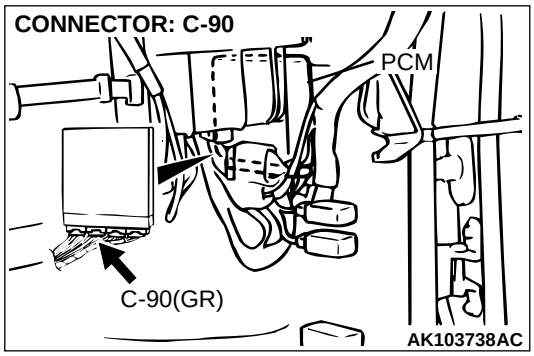


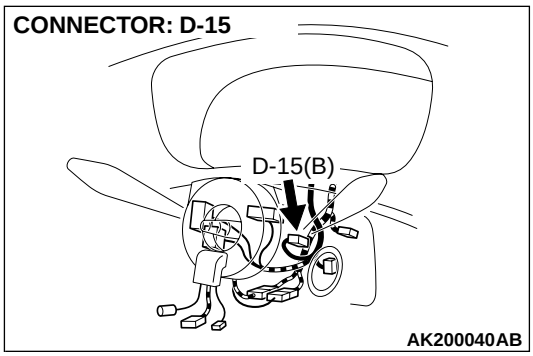
TSB Revision











COMMENT

- If the selector lever is moved to "P" or "N" range and the ignition switch is turned to "START" position, battery positive voltage is supplied to PCM (terminal No. 58) through the starter relay. Because of this, the PCM detects that the engine is cranking.

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

- Malfunction of the ignition switch.
- Malfunction of the park/neutral position switch.
- Improper connector contact, open circuit or short-circuit in the harness wire.
- Malfunction of the starter relay
- Malfunction of the PCM.

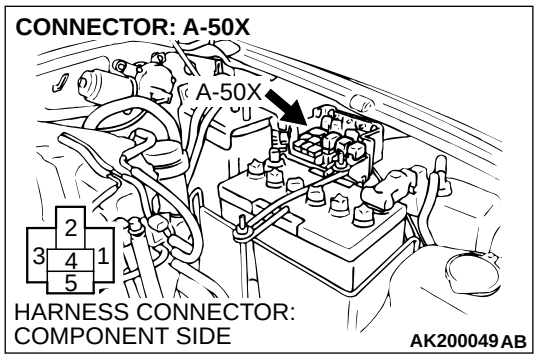
DIAGNOSIS

STEP 1. Check connector A-50X at starter relay for damage.

Q: Is the connector in good condition?

YES : Go to Step 2.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.Then confirm that the malfunction symptom is eliminated.



STEP 2. Check the starter relay.

Refer to GROUP 16, Starting System – On-vehicle Service – Starter relay check P.16-22.

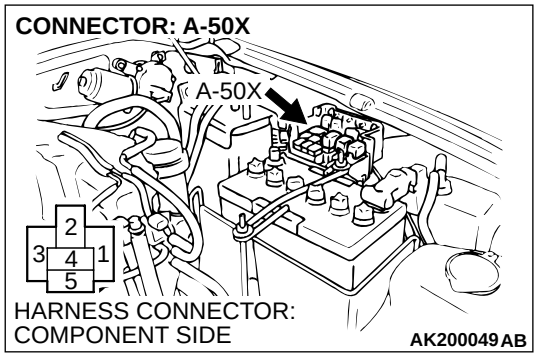
Q: Are there any abnormalities?

YES : Go to Step 3.

NO : Repair or replace it. Then confirm that the malfunction symptom is eliminated.

STEP 3. Measure the power supply voltage at starter relay connector A-50X.

(1) Disconnect the connector A-50X and measure at the harness side.



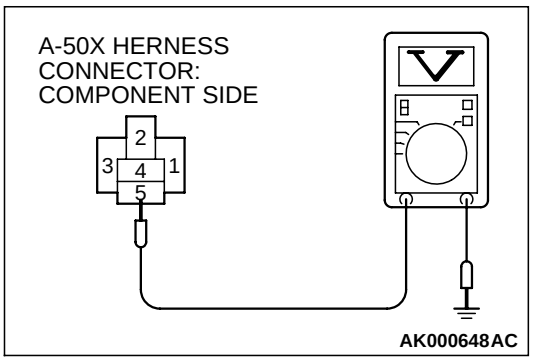
(2) Measure the voltage between terminal No. 5 and ground.

- Voltage should be battery positive voltage.

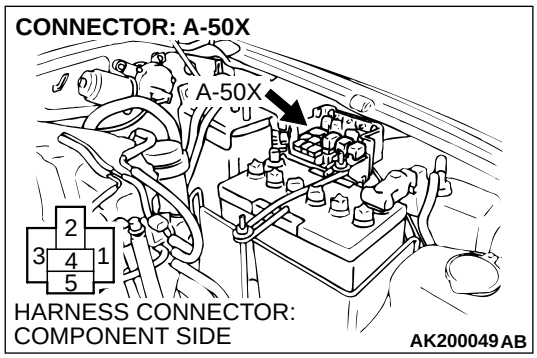
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 4.

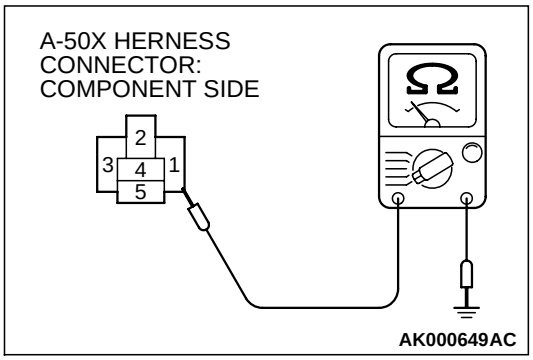
NO : Repair harness wire between fusible link (9) and starter relay connector A-50X (terminal No. 5) because of open circuit. Then confirm that the malfunction symptom is eliminated.



STEP 4. Check for continuity at starter relay harness side connector A-50X.



(1) Disconnect the connector A-50X and measure at the harness side.



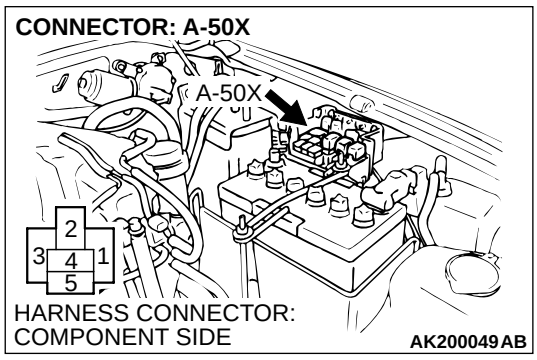
(2) Check for the continuity between terminal No. 1 and ground.
- Should be less than 2 ohms.

Q: Does continuity exist?

YES : Go to Step 5.

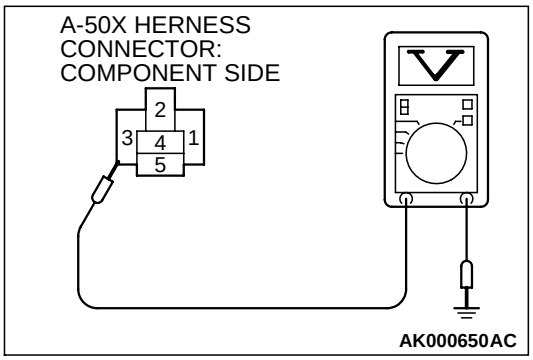
NO : Repair harness wire between starter relay connector A-50X (terminal No. 1) and ground. Then confirm that the malfunction symptom is eliminated.

STEP 5. Measure the power supply voltage at starter relay connector A-50X.



(1) Disconnect the connector A-50X and measure at the harness side.

(2) Turn the ignition switch to the "START" position.



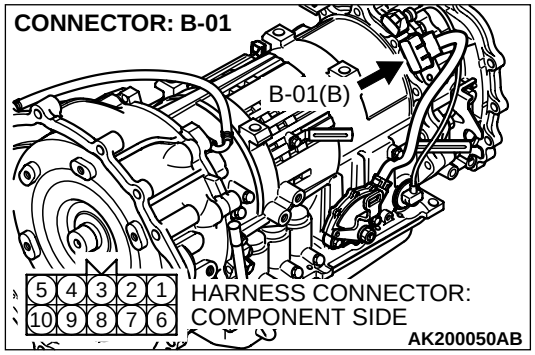
(3) Measure the voltage between terminal No. 3 and ground.
- Voltage should be battery positive voltage. (Selector lever P or N range)

(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 : Go to Step 6.



STEP 6. Check connector B-01 at park/neutral position switch for damage.

Q: Is the 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 confirm that the malfunction symptom is eliminated.

STEP 7. Check the park/neutral position switch.

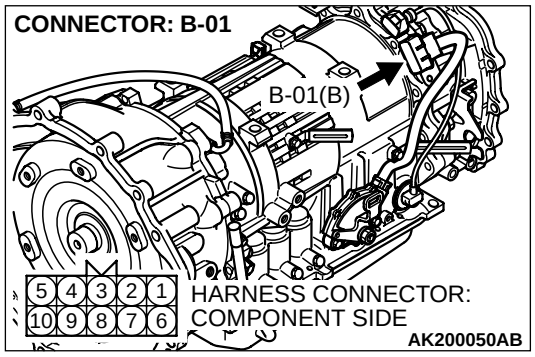
Refer to GROUP 23A, On-vehicle Service – Essential Service – Park/neutral position switch continuity check P.23Aa-21.

Q: Are there any abnormalities?

YES : Go to Step 8.

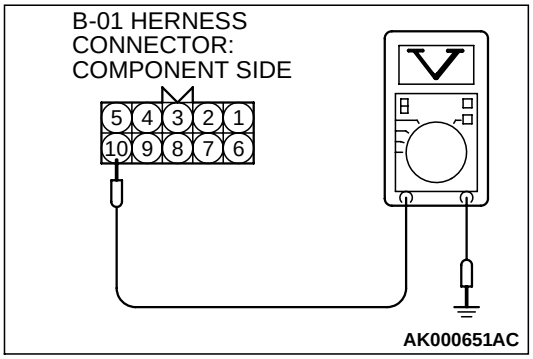
NO : Repair or replace it. Then confirm that the malfunction symptom is eliminated.

STEP 8. Measure the power supply voltage at park/neutral position switch connector B-01.



(1) Disconnect the connector B-01 and measure at the harness side.

(2) Turn the ignition switch to the "START" position.



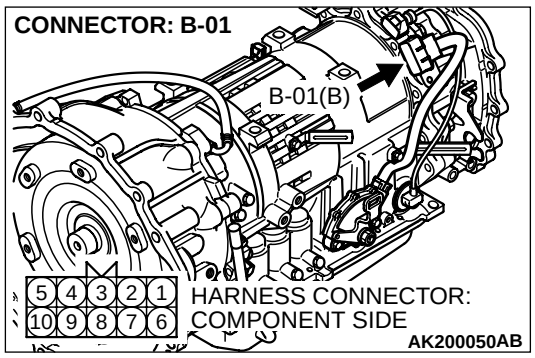
(3) Measure the voltage between terminal No. 10 and ground.
- Voltage should be battery positive voltage.

(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 : Check connector C-30 and C-41 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 ignition switch connector D-15 (terminal No. 5) and park/neutral position switch connector B-01 (terminal No. 10) because of open circuit. Then confirm that the malfunction symptom is eliminated.



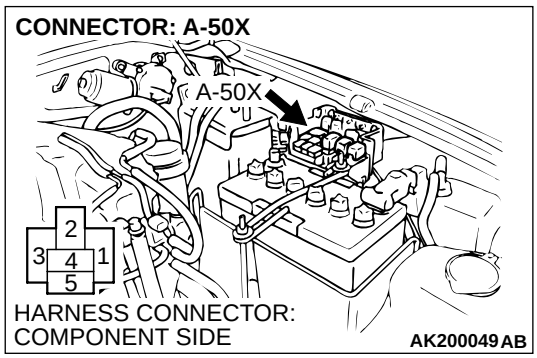
STEP 9. Check for open circuit and short circuit to ground and harness damage between park/neutral position switch connector B-01 (terminal No. 9) and starter relay connector A-50X (terminal No. 3).

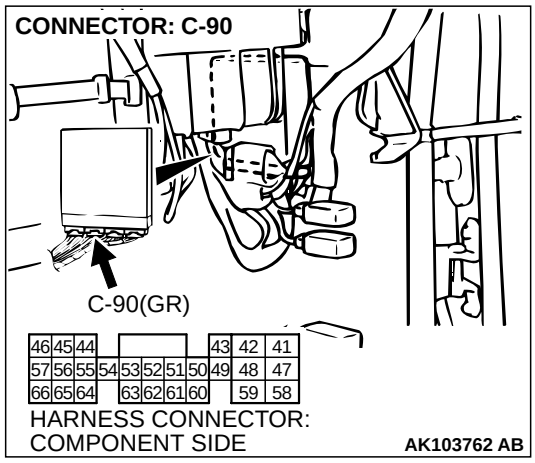
NOTE: Check harness after checking intermediate connector C-30 and C-41. If intermediate connector are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

Q: Is the harness wire in good condition?

YES : Go to Step 10.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.





STEP 10. Check connector C-90 at PCM for damage.

Q: Is the connector in good condition?

YES : Go to Step 11.

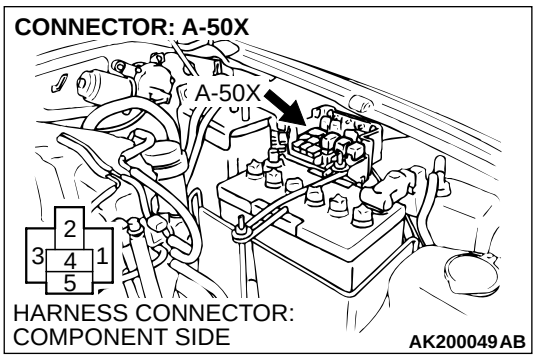
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

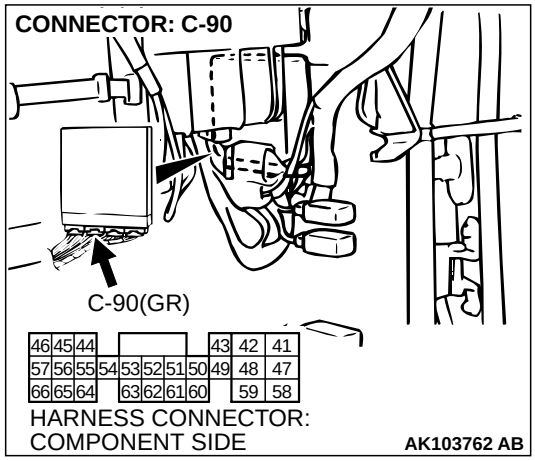
STEP 11. Check for open circuit and short circuit to ground and harness damage between starter relay connector A-50X (terminal No. 2) and PCM connector C-90 (terminal No. 58).

Q: Is the harness wire in good condition?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

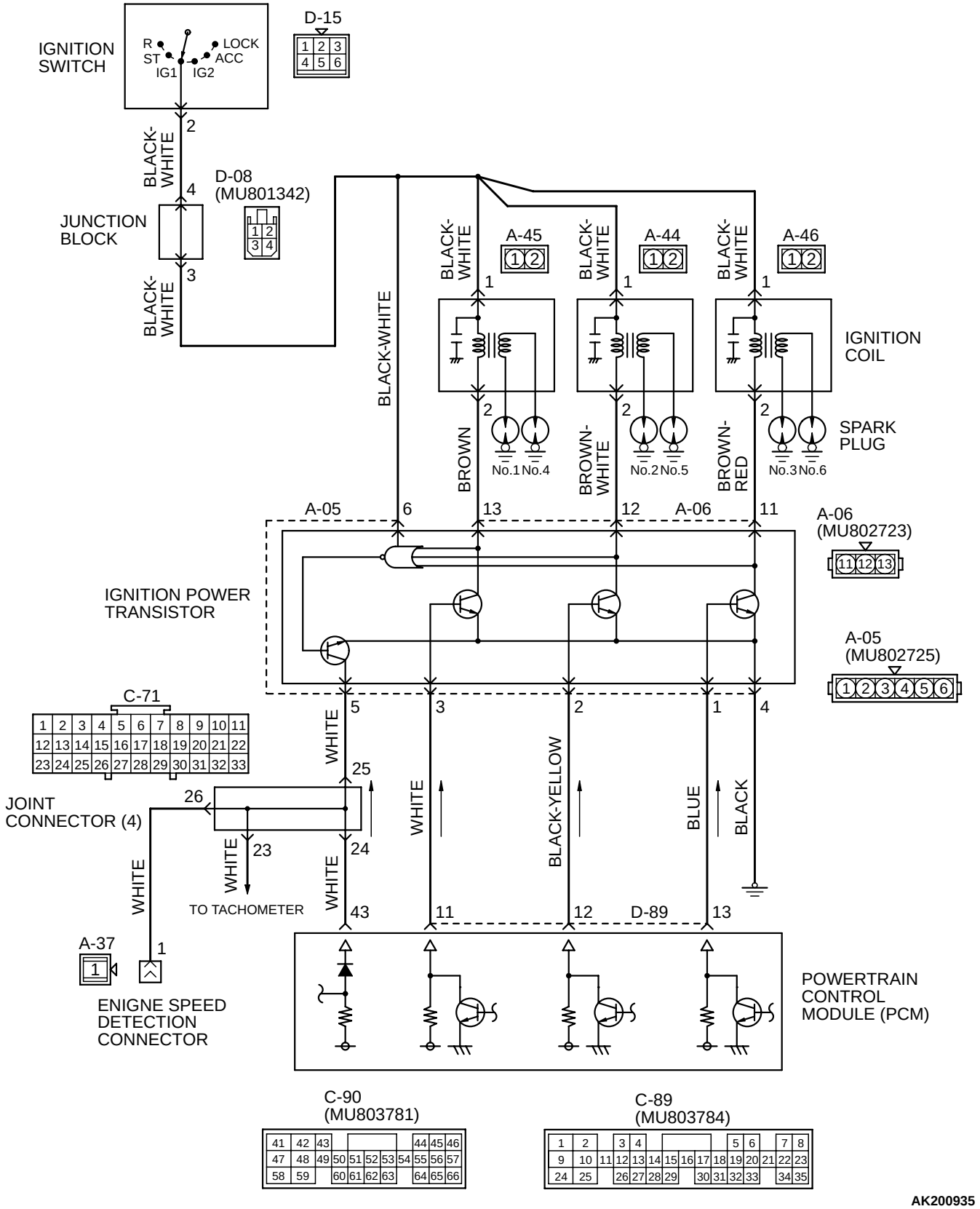
NO : Repair it. Then confirm that the malfunction symptom is eliminated.





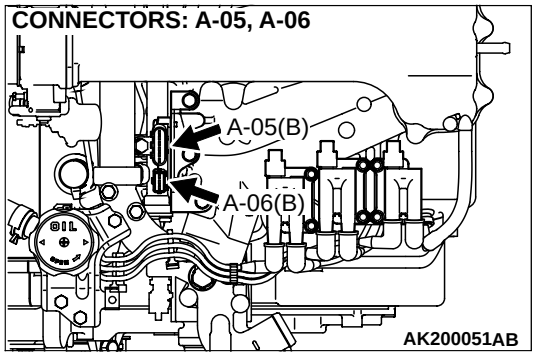
INSPECTION PROCEDURE 31: Ignition Circuit System.

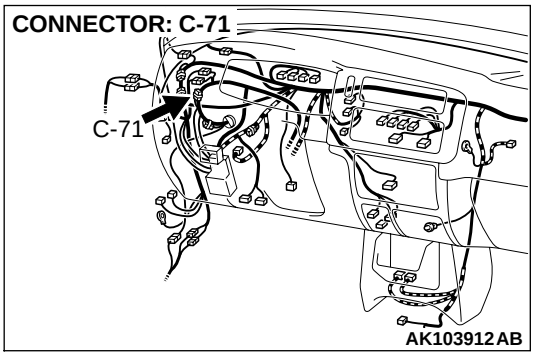
Ignition Circuit

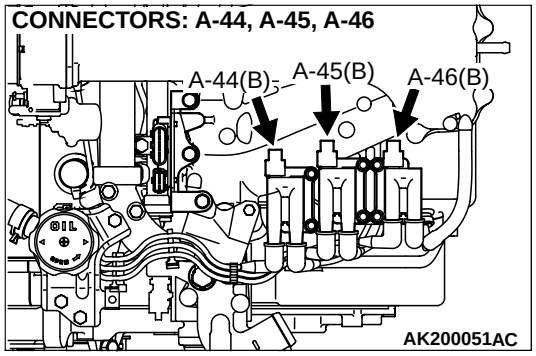


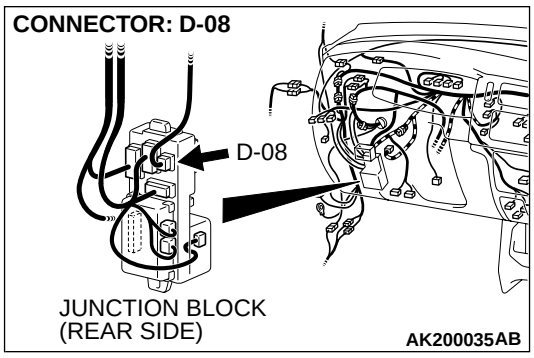
AK200935

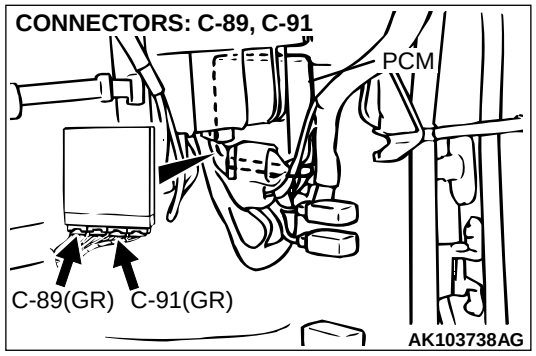
TSB Revision

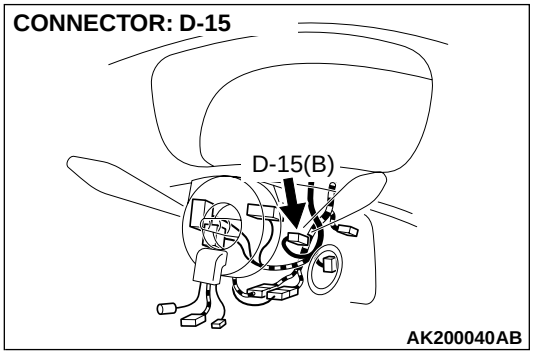


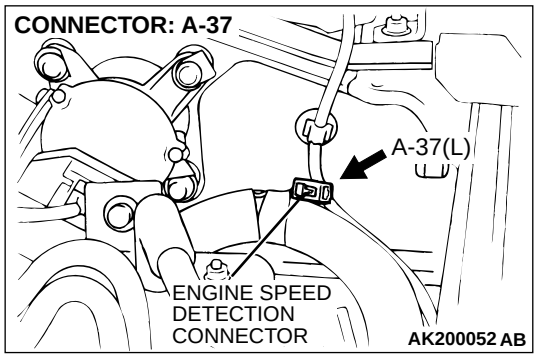












COMMENT

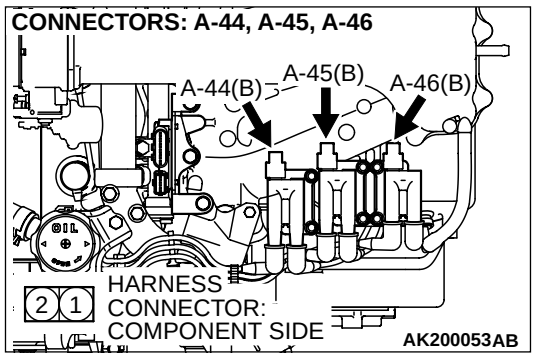
- The battery positive voltage is applied on the ignition coil by the ignition switch-IG.
- When the PCM turns the power transistor in the PCM "OFF," battery positive voltage is applied on the ignition power transistor (terminals No. 1, No. 2 and No. 3), and the ignition power transistor turns "ON."
- When the ignition power transistor turns "ON", the ignition coil's primary circuit is grounded by the ignition power transistor terminal No. 4. Then the primary current flows to the ignition coil.

TSB Revision

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the ignition coil.
- Malfunction of the ignition power transistor.
- Improper connector contact, open circuit or short-circuited harness wire.
- Malfunction of the PCM.

DIAGNOSIS



STEP 1. Check harness connectors A-44, A-45, A-46 at ignition coil for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 2.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

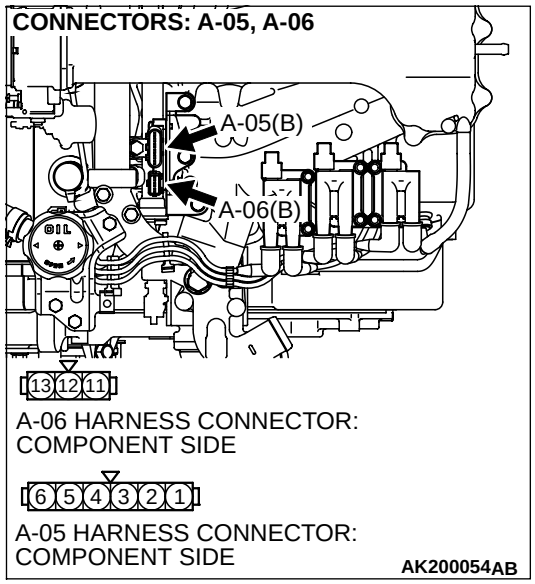
STEP 2. Check the ignition coil.

Refer to GROUP 16, Ignition System – Ignition Coil Check P.16-31.

Q: Are there any abnormalities?

YES : Go to Step 3.

NO : Replace the ignition coil. Then confirm that the malfunction symptom is eliminated.



STEP 3. Check harness connectors A-05, A-06 at ignition power transistor for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 4.

NO : Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

STEP 4. Check the ignition power transistor.
Refer to GROUP 16, Ignition System – Ignition Coil Power Transistor Continuity Check P.16-31.

Q: Are there any abnormalities?

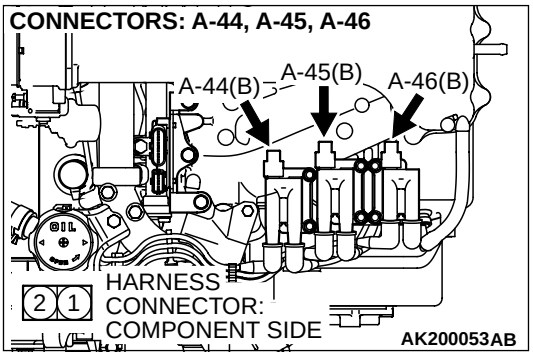
YES : Go to Step 5.

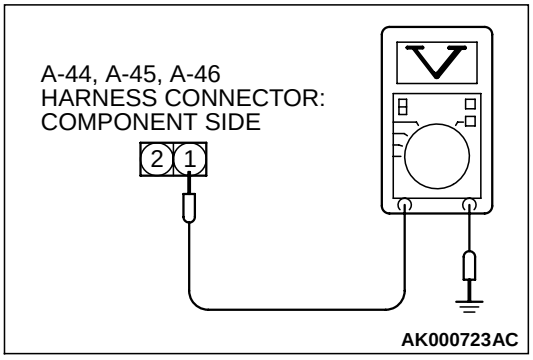
NO : Replace the ignition power transistor. Then confirm that the malfunction symptom is eliminated.

STEP 5. Measure the power supply voltage at ignition coil connectors A-44, A-45, A-46.

(1) Disconnect the connectors A-44, A-45, A-46 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.

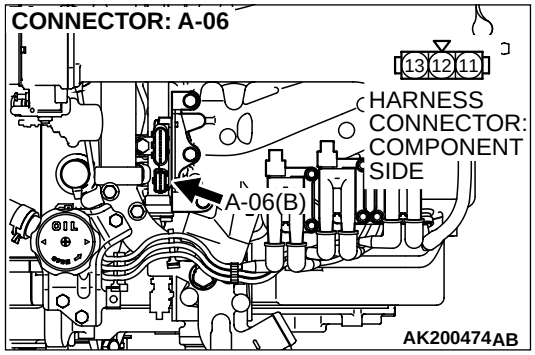
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

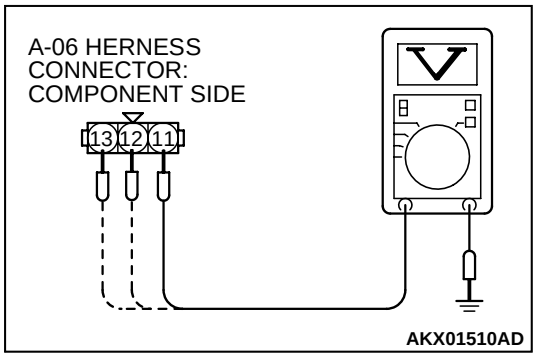
YES : Go to Step 6.

NO : Check harness connector D-08 at intermediate connector for damage, and repair or replace as required. Refer to 00E, Harness Connector Inspection P.00E-2. If intermediate connector D-08 is in good condition, repair harness wire between ignition switch connector D-15 (terminal No. 2) and ignition coil connectors A-44, A-45, A-46 (terminal No. 1). Then confirm that the malfunction symptom is eliminated.

STEP 6. Measure the power supply voltage at ignition power transistor connector A-06.



(1) Disconnect the connector A-06 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminals No. 11, No. 12, No. 13 and ground.
- Voltage should be battery positive voltage.

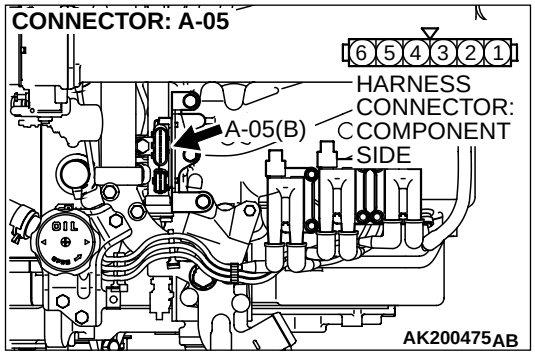
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

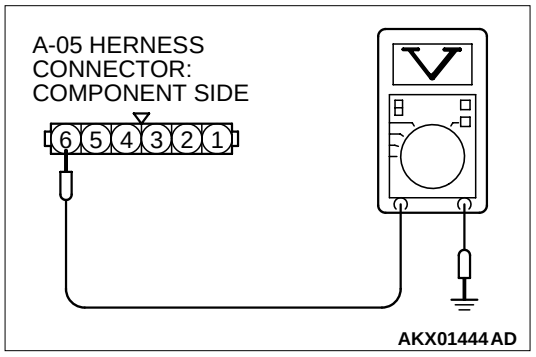
YES : Go to Step 7.

NO : Repair harness wire between ignition coil connectors A-44, A-45, A-46 (terminal No. 2) and ignition power transistor connector A-06 (terminals No. No. 11, No. 12, No. 13). Then confirm that the malfunction symptom is eliminated.

STEP 7. Measure the power supply voltage at ignition power transistor connector A-05.



(1) Disconnect the connector A-05 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal No. 6 and ground.
- Voltage should be battery positive voltage.

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

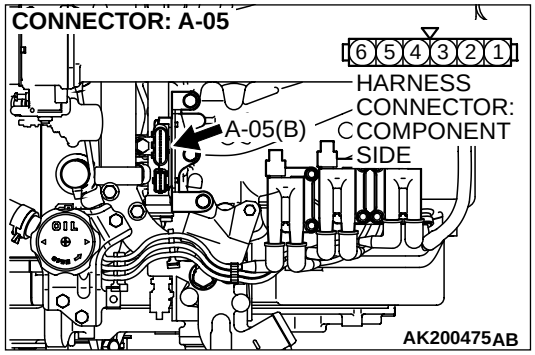
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 8.

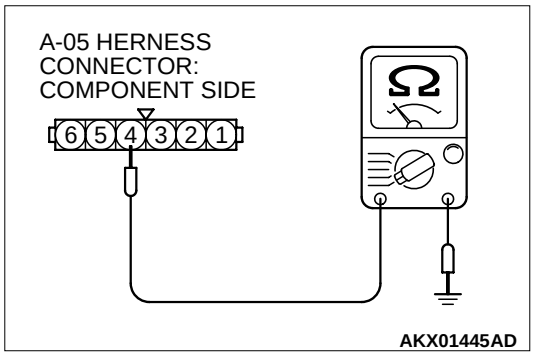
NO : Check harness connector D-08 at intermediate connector for damage, and repair or replace as required. Refer to 00E, Harness Connector Inspection P.00E-2. If intermediate connector D-08 is in good condition, repair harness wire between ignition switch connector D-15 (terminal No. 2) and ignition power transistor connector A-05 (terminal No. 6). Then confirm that the malfunction symptom is eliminated.

TSB Revision

STEP 8. Check for continuity at ignition power transistor harness side connector A-05.



(1) Disconnect the connector A-05 and measure at the harness side.



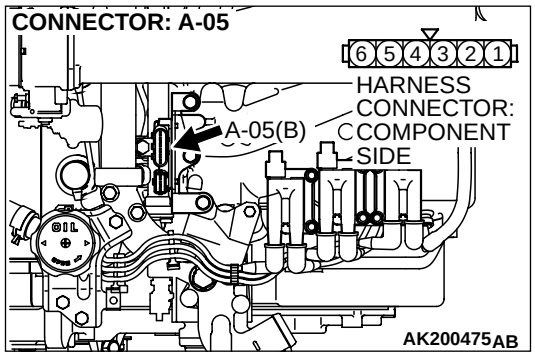
(2) Check for the continuity between terminal No. 4 and ground.
- Should be less than 2 ohms.

Q: Does continuity exist?

YES : Go to Step 9.

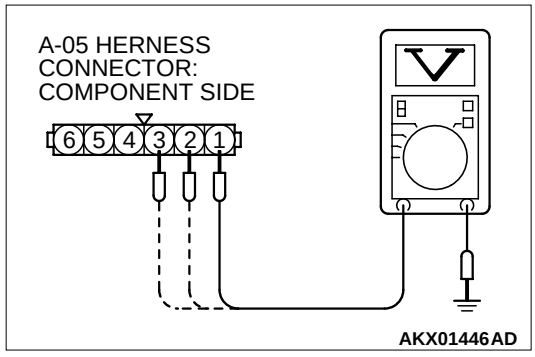
NO : Repair harness wire between ignition power transistor connector A-05 (terminal No. 4) and ground. Then confirm that the malfunction symptom is eliminated.

STEP 9. Measure the circuit at ignition power transistor connector A-05.



(1) Disconnect the connector A-05 and measure at the harness side.

(2) Crank the engine.



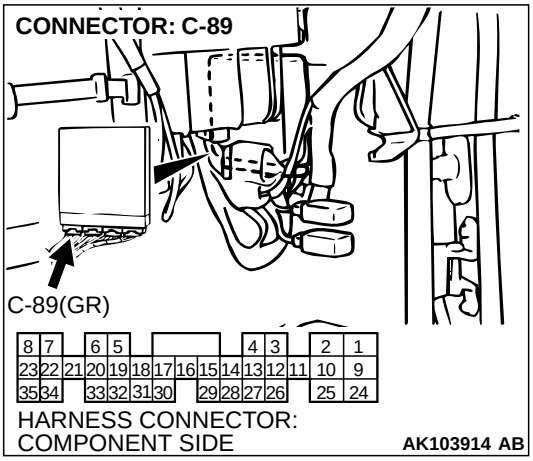
(3) Measure the voltage between terminals No. 1, No. 2, No. 3 and ground.
- Voltage should be between 0.5 and 4.0 volts.

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

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

YES : Go to Step 12.

NO : Go to Step 10.

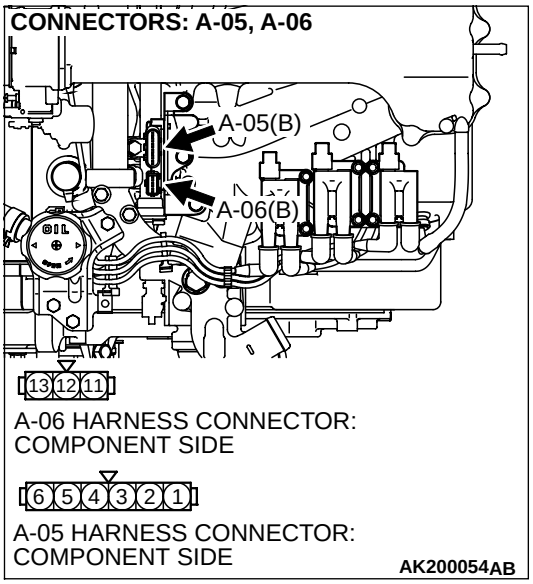


STEP 10. Check harness connector C-89 at PCM for damage.

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 confirm that the malfunction symptom is eliminated.

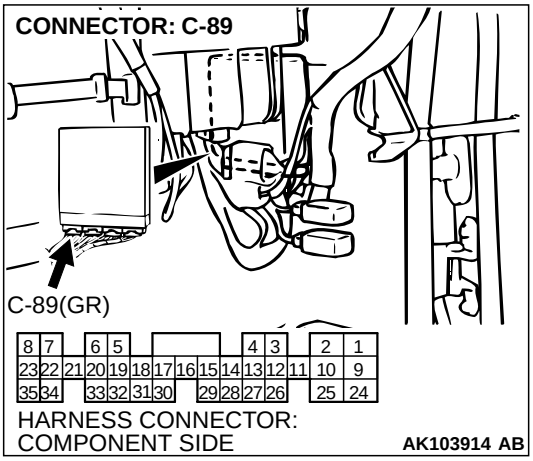


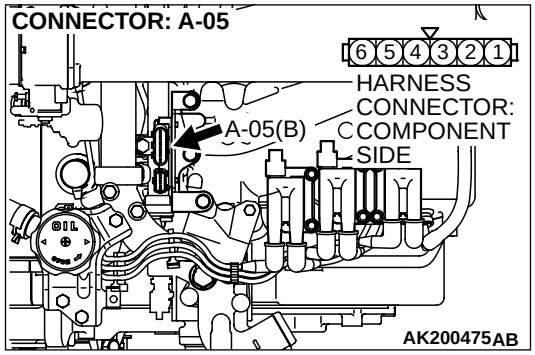
STEP 11. Check for open circuit between ignition power transistor connector A-05 (terminals No. 1, No. 2, No. 3) and PCM connector C-89 (terminals No. 11, No. 12, No. 13).

Q: Is the harness wire in good condition?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.

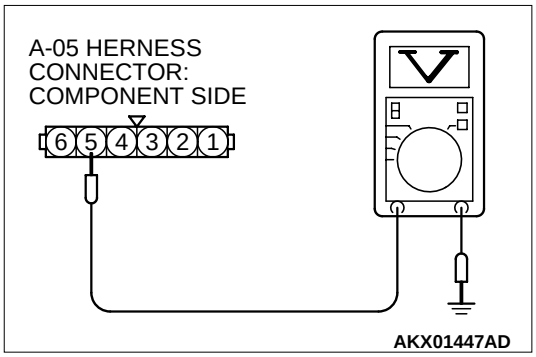




STEP 12. Measure the circuit at ignition power transistor connector A-05.

(1) Disconnect the connector A-05 and measure at the harness side.

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



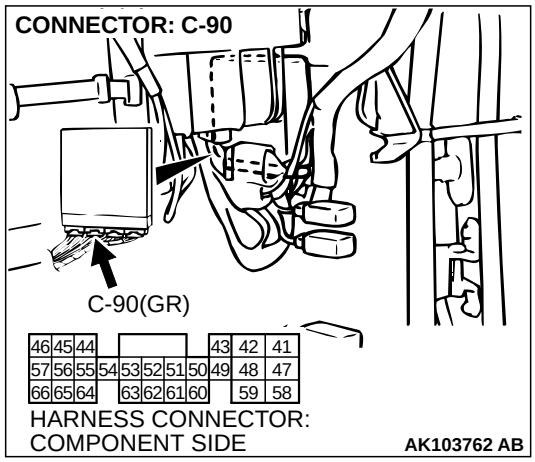
(3) Measure the voltage between terminal No. 5 and ground.
- Voltage should be 4 volts or more.

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

Q: Is the measured voltage 4 volts or more?

YES : Replace the ignition power transistor. Then confirm that the malfunction symptom is eliminated.

NO : Go to Step 13.

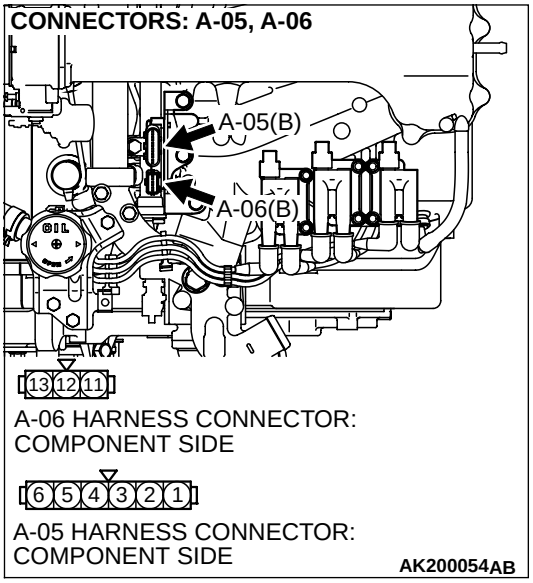


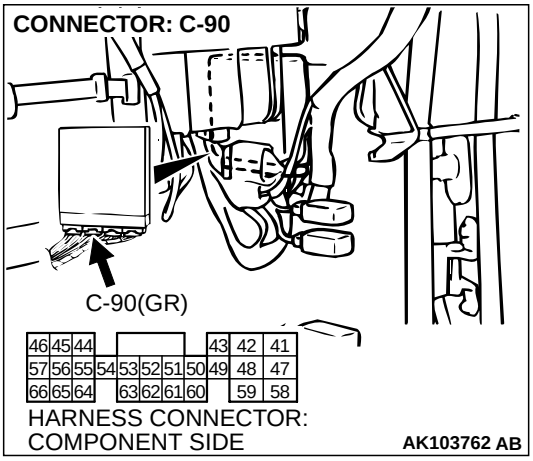
STEP 13. Check harness connector C90 at PCM for damage.

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 confirm that the malfunction symptom is eliminated.





STEP 14. Check for open circuit between ignition power transistor connector A-05 (terminal No. 5) and PCM connector C-90 (terminal No. 43).

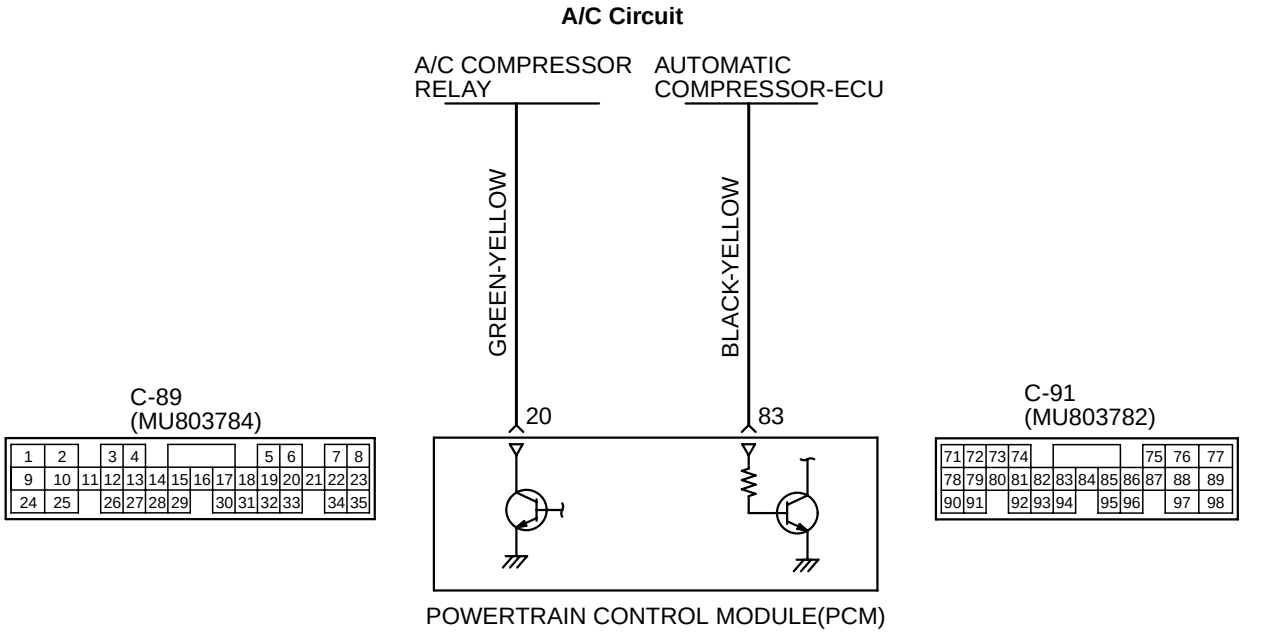
NOTE: Check harness after checking intermediate connector C-71. If intermediate connector is damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

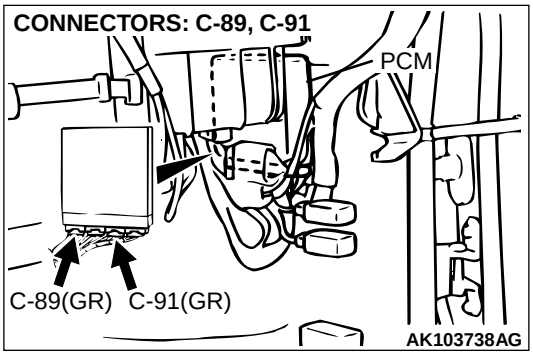
Q: Is the harness wire in good condition?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

NO : Repair it. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 32: A/C system.





COMMENT

- When the A/C is "ON," the battery positive voltage is applied on the PCM (terminal No. 83) from the A/C compressor-ECU.
  When battery positive voltage is applied to the PCM, the PCM turns "ON" the power transistor in the PCM. The PCM delays A/C engagement momentarily while it increases idle r/min. Then the A/C compressor clutch relay coil will be energized.
  With this, the A/C compressor clutch relay turns "ON," and the A/C compressor clutch functions.

TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the A/C control system.
- Malfunction of the A/C switch.
- Improper connector contact, open circuit or short-circuited harness wire.
- Malfunction of the PCM.

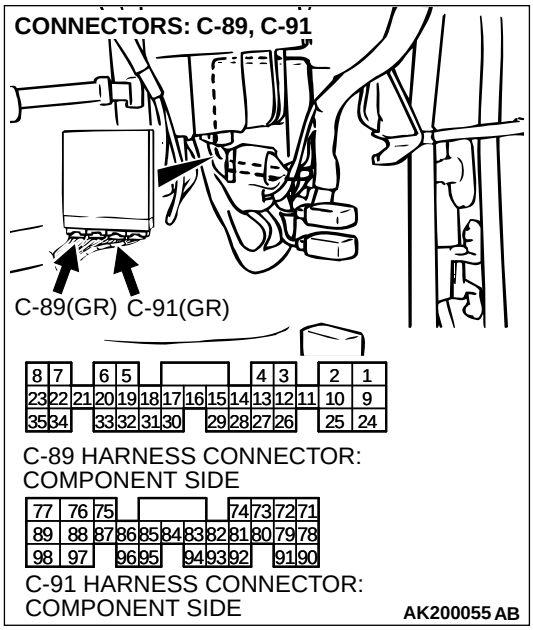
DIAGNOSIS

STEP 1. Check harness connector C-89, C91 at PCM for damage.

Q: Is the harness connector in good condition?

YES : Go to Step 2.

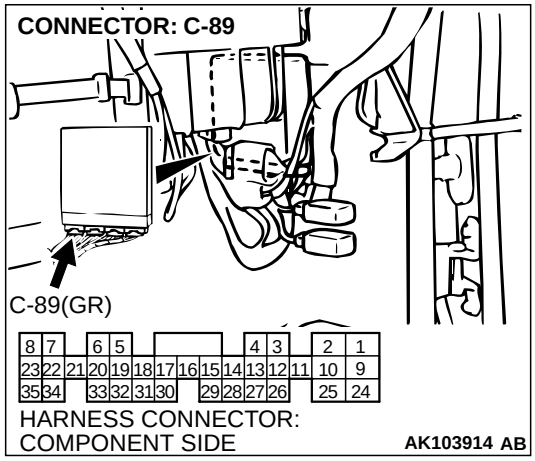
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then confirm that the malfunction symptom is eliminated.

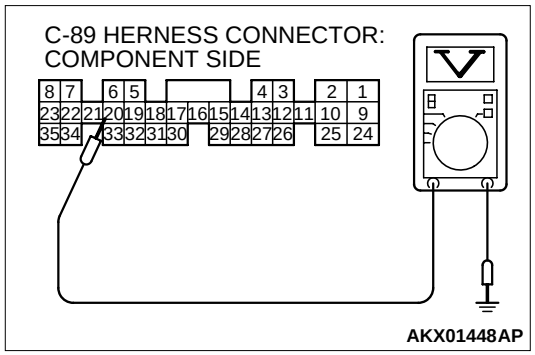


STEP 2. Check the circuit at PCM connector C-89.

(1) Disconnect the connectors C-89 and measure at the harness side.

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





(3) Measure the voltage between terminal No. 20 and ground.
- Voltage should be battery positive voltage.

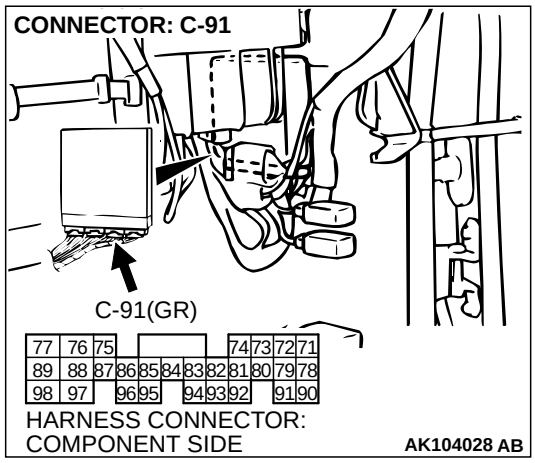
(4) Using a jumper wire, connect terminal No. 20 to ground.
- A/C compressor relay should turn "ON".

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

Q: Is the voltage and A/C compressor relay condition normal?

YES : Go to Step 3.

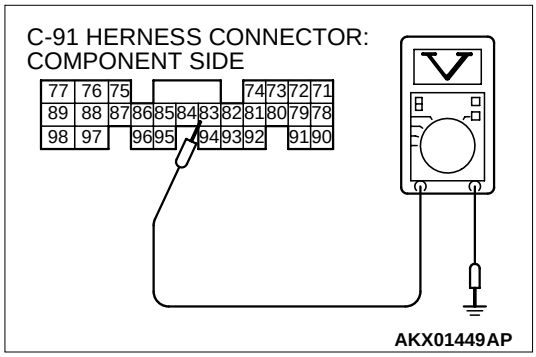
NO : Refer to GROUP 55, Diagnosis – Introduction To Heater, Air Conditioning And Ventilation Diagnosis P.55-5. Then confirm that the malfunction symptom is eliminated.



STEP 3. Check the circuit at PCM connector C-91.

(1) Disconnect the connectors C-91 and measure at the harness side.

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



(3) Measure the voltage between terminal No. 83 and ground.
- Voltage should be 1 volt or less when the A/C switch is "OFF".
- Voltage should be battery positive voltage when the A/C switch is "ON".

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

Q: Is the measured voltage within the specified range?

YES : Replace the PCM. Then confirm that the malfunction symptom is eliminated.

NO : Refer to GROUP 55, Diagnosis – Introduction To Heater, Air Conditioning And Ventilation Diagnosis P.55-5.

NOTES