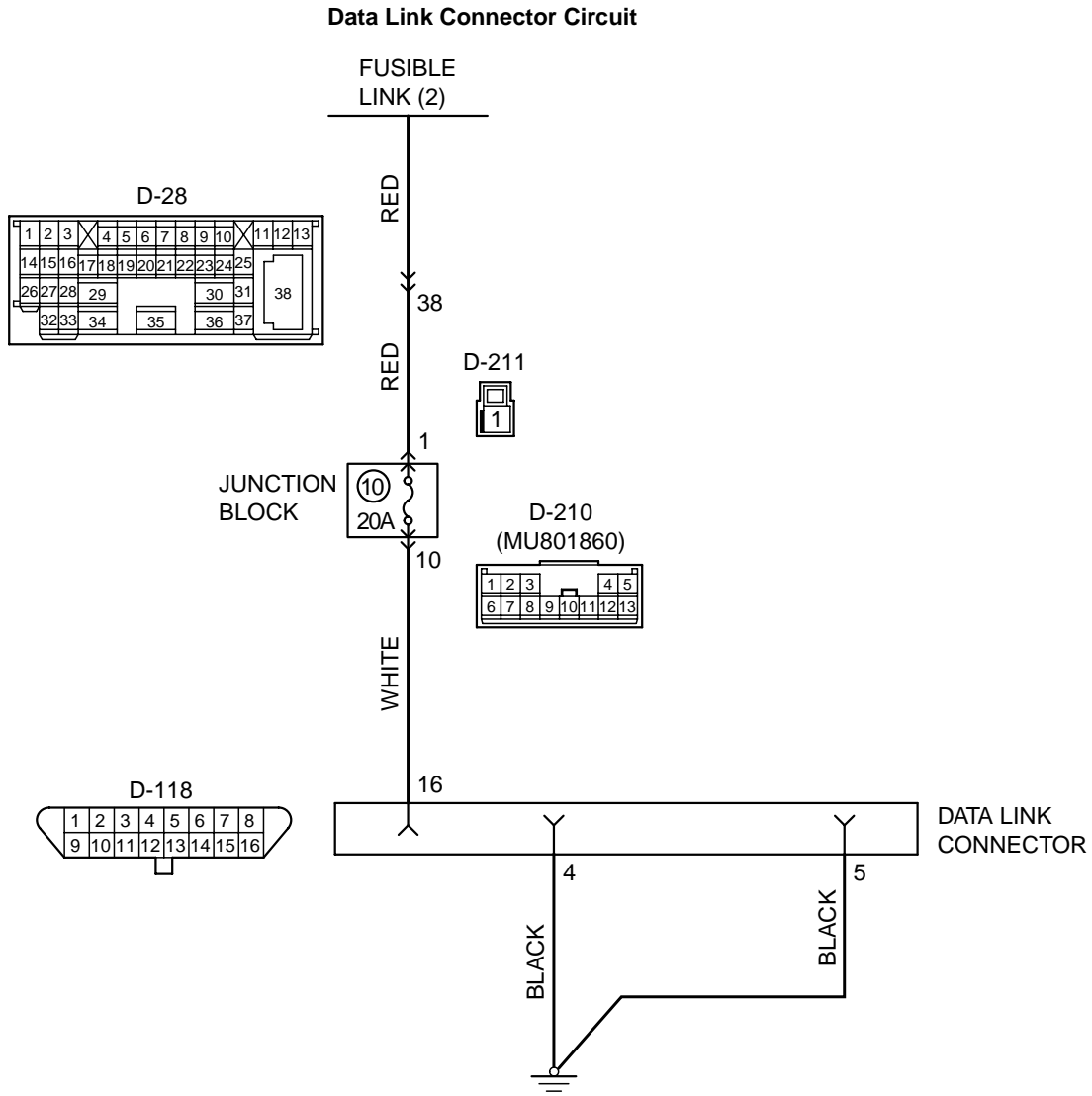


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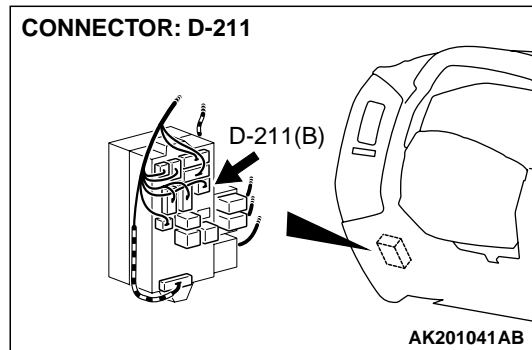
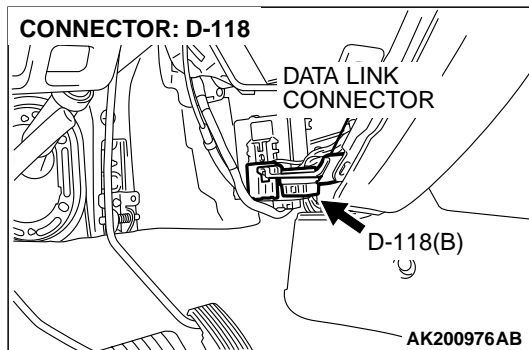
GROUP 13Ad

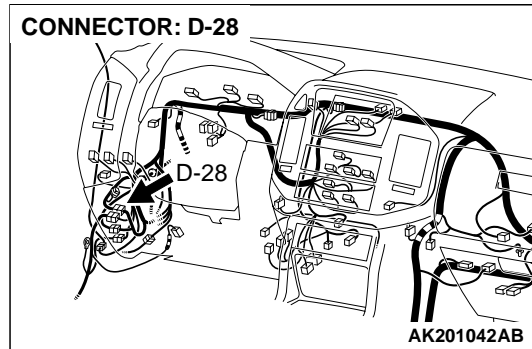
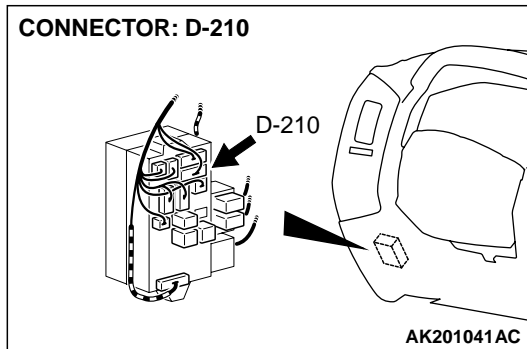
# SYMPTOM PROCEDURES

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



AK201152





**CIRCUIT OPERATION**

- A battery positive voltage is applied on the data link connector power terminal (terminal No. 16). The ground terminals (terminal 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**

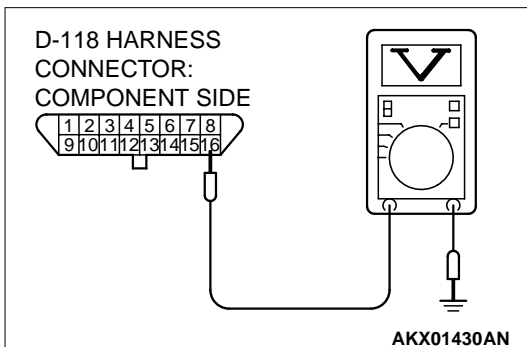
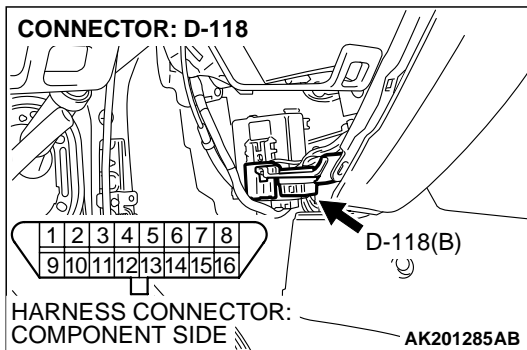
**STEP 1. Measure the power supply voltage at data link connector D-118.**

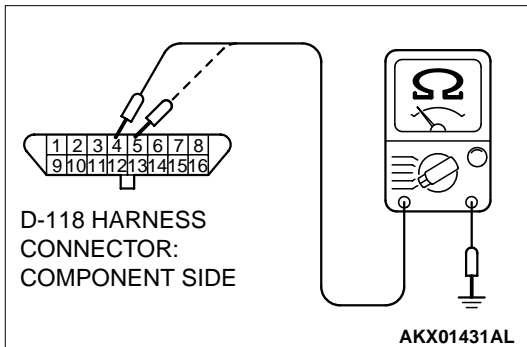
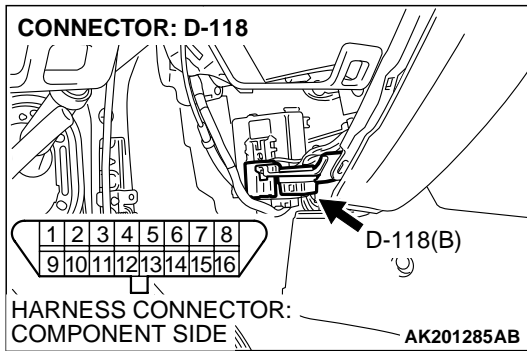
- (1) Measure voltage between terminal No. 16 and ground.
- Voltage should be battery positive voltage.

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

**YES :** Go to step 2.

**NO :** Check harness connectors D-210, D-211, D-28 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-210, D-211, D-28 are in good condition, repair an open circuit between fusible link (2) and data link connector D-118 (terminal No. 16). Then confirm that the malfunction symptom is eliminated.





**STEP 2. Check the continuity at data link connector D-118.**

(1) Check for the continuity between terminal No. 4, No. 5 and ground.

- Should be less than 2 ohms.

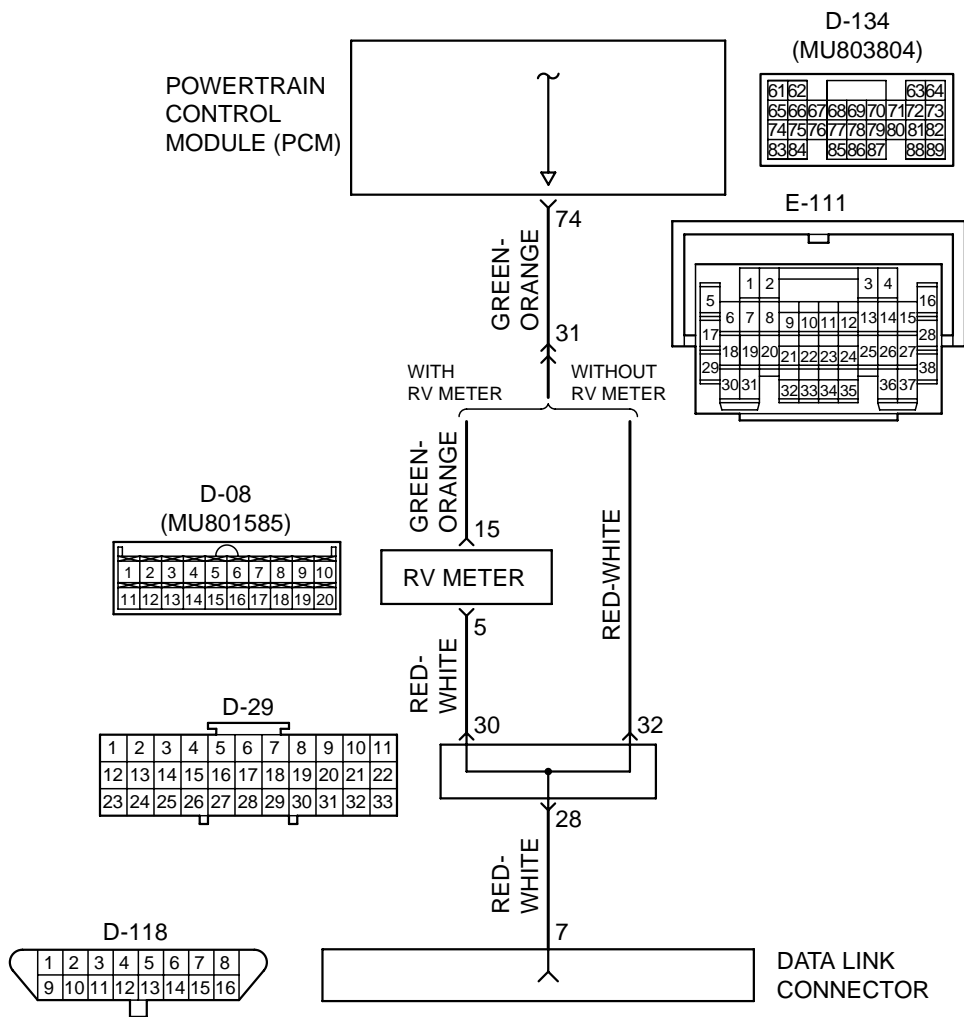
**Q: Is the continuity normal?**

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

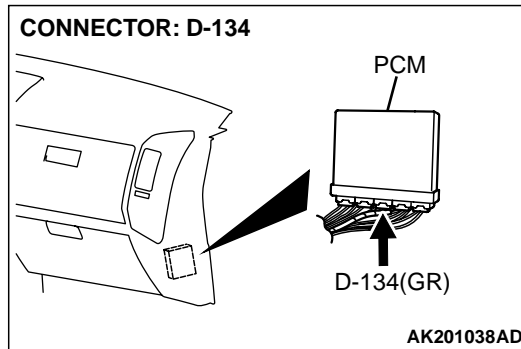
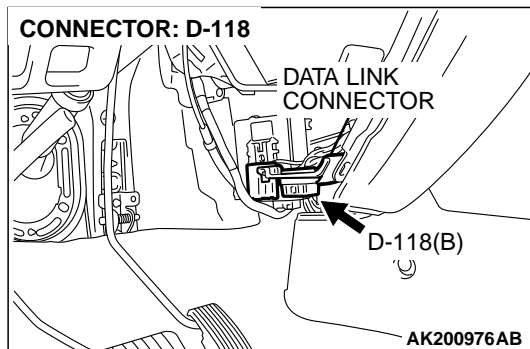
**NO :** Repair an open circuit or harness damage between data link connector D-118 (terminal No. 4, No. 5) and ground. Then confirm that the malfunction symptom is eliminated.

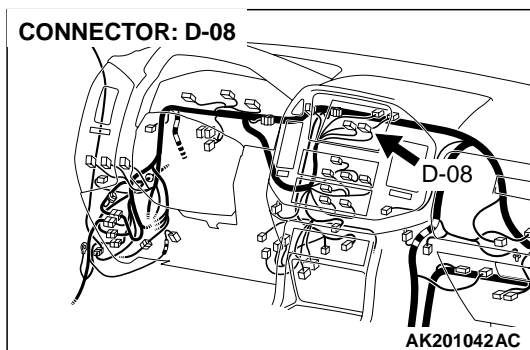
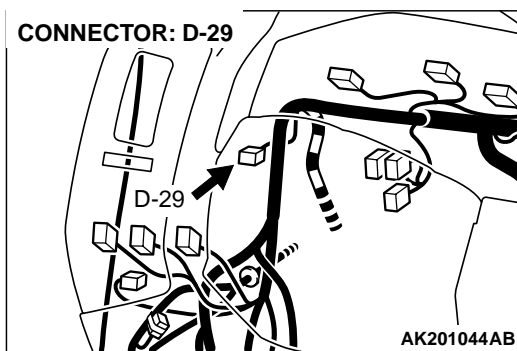
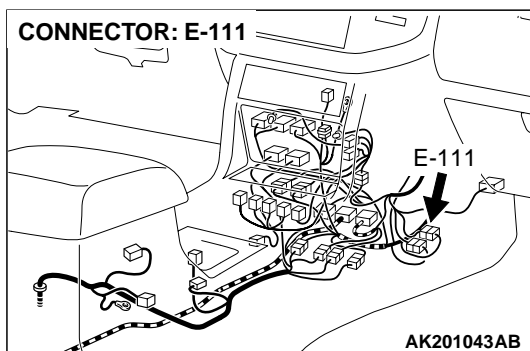
INSPECTION PROCEDURE 2: Scan Tool Communication with PCM Is Not Possible.

Data Link Connector Circuit



AK201153





**CIRCUIT OPERATION**

- A diagnostic output is made from the PCM (terminal No. 74) to the diagnostic output terminal (terminal No. 7) of the data link connector.

**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.

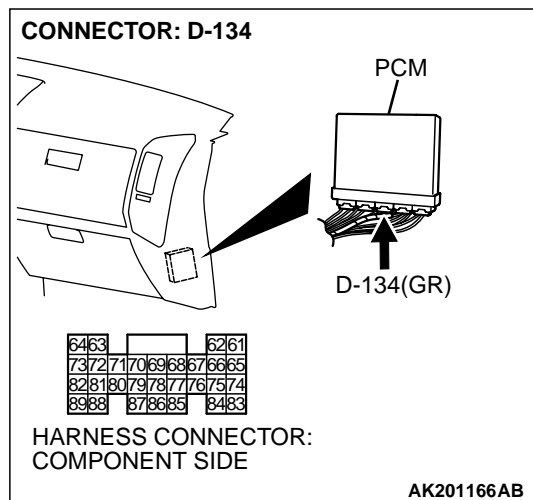
**DIAGNOSIS**

**STEP 1. Check harness connector D-134 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.



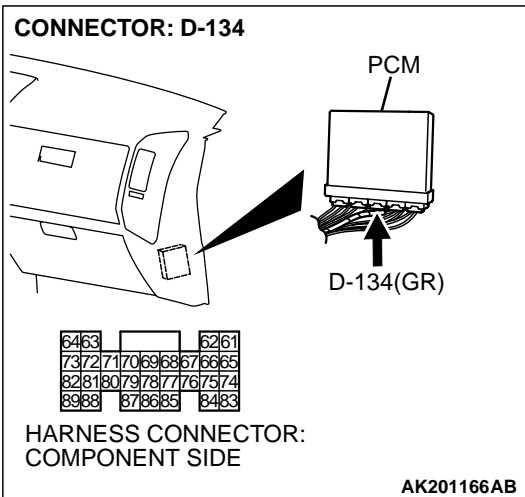
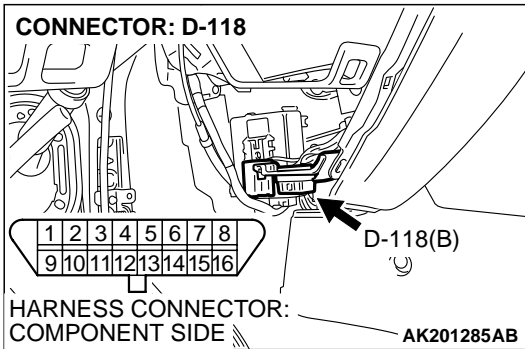
**STEP 2.** Check for open circuit, short circuit to ground and harness damage between data link connector D-118 (terminal No. 7) and PCM connector D-134 (terminal No. 74).

*NOTE:* Check harness after checking intermediate connectors D-210, D-08 and E-111. If intermediate connector D-210, D-08 and E-111 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?

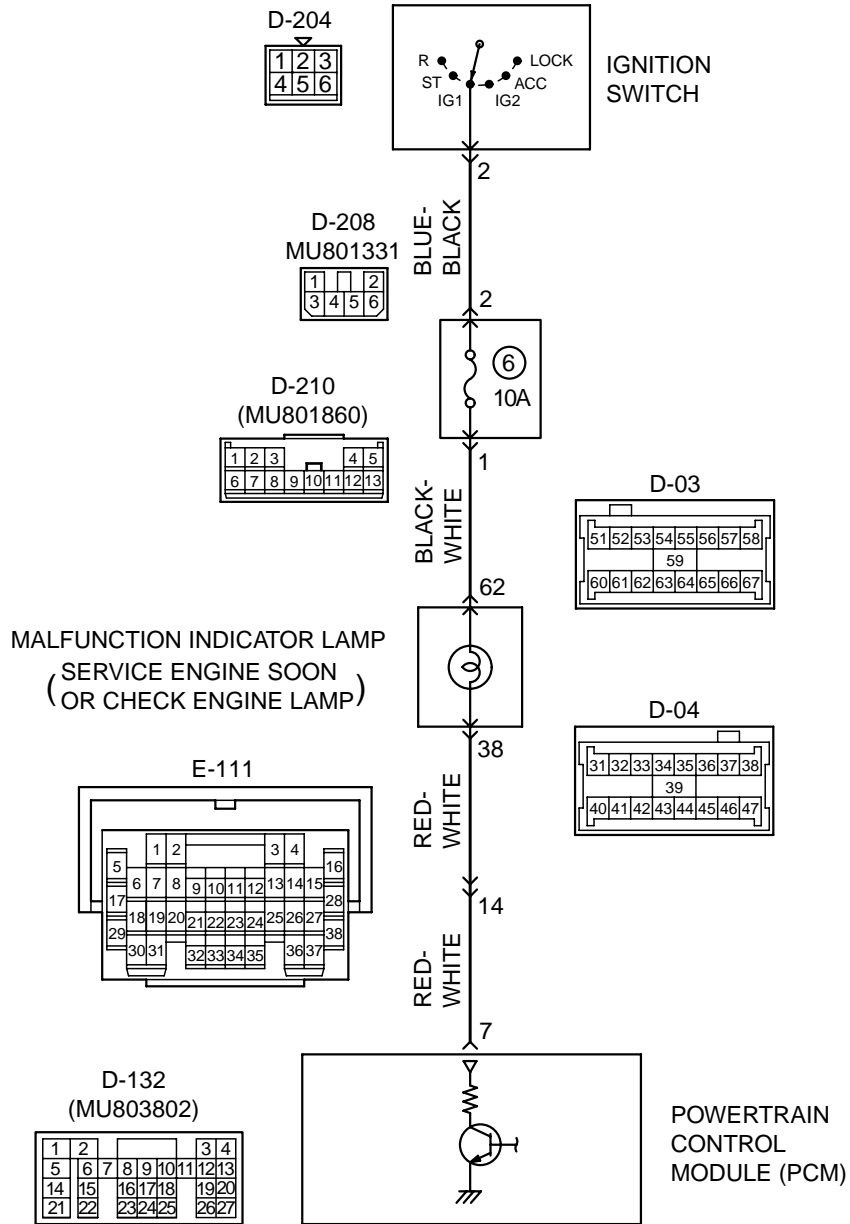
**YES :** Refer to INSPECTION PROCEDURE 28 – Power Supply System and Ignition Switch-IG System P.13Ad-75.

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



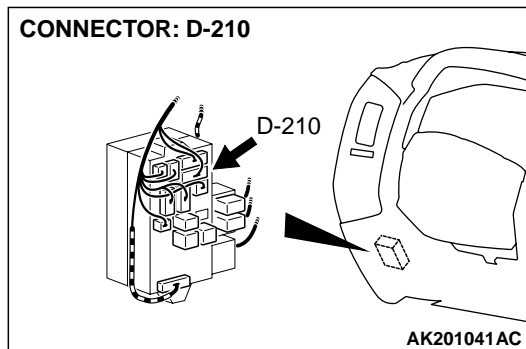
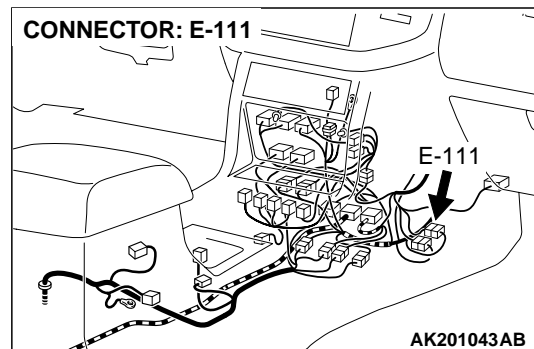
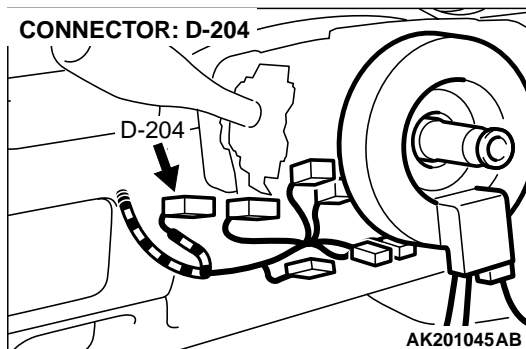
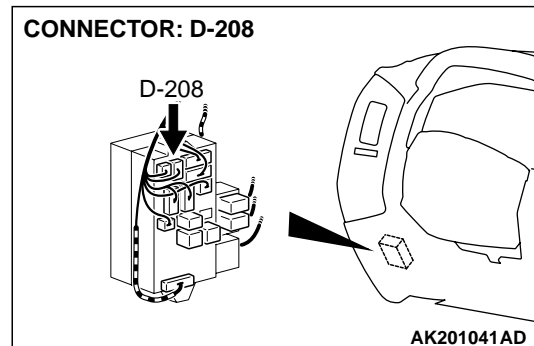
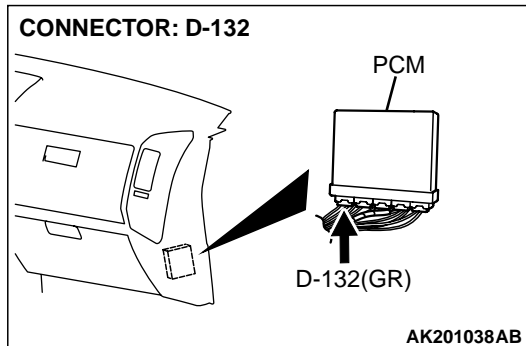
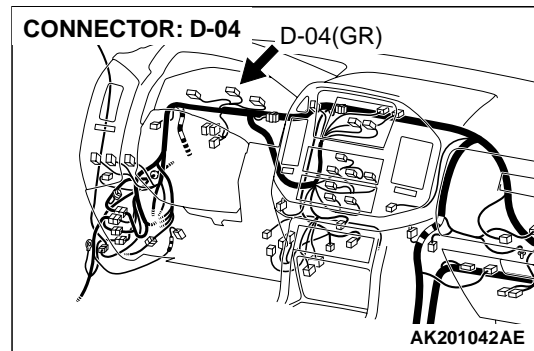
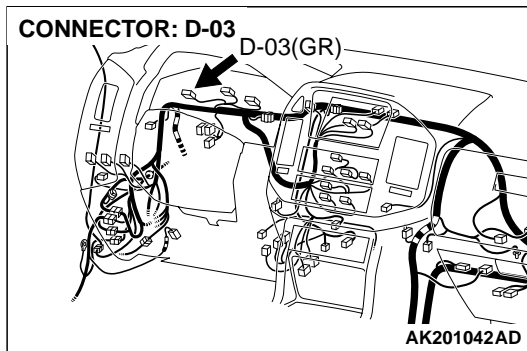
**INSPECTION PROCEDURE 3: The Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Does Not Illuminate Right after the Ignition Switch Is Turned to the "ON" Position.**

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



AK201154





### 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 20 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**

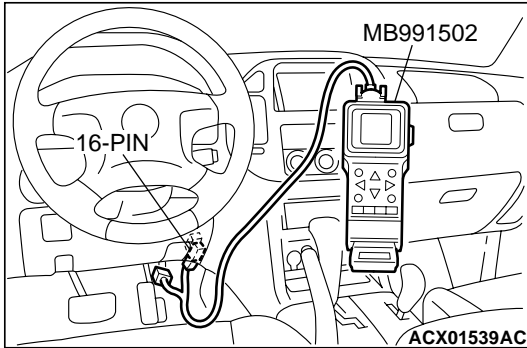
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-75.](#)



**STEP 2. Check the burned-out bulb.**

**Q: Is the valve normal?**

**YES :** Go to step 3.

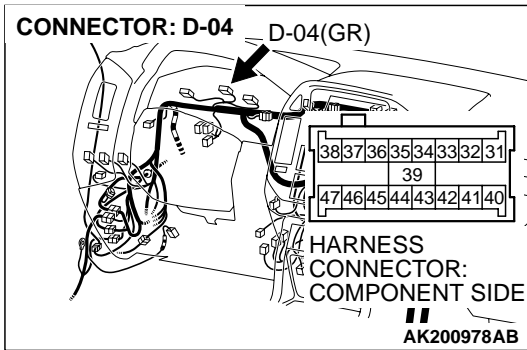
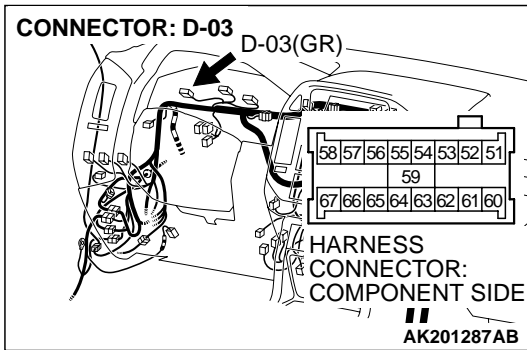
**NO :** Replace the bulb. Then confirm that the malfunction symptom is eliminated.

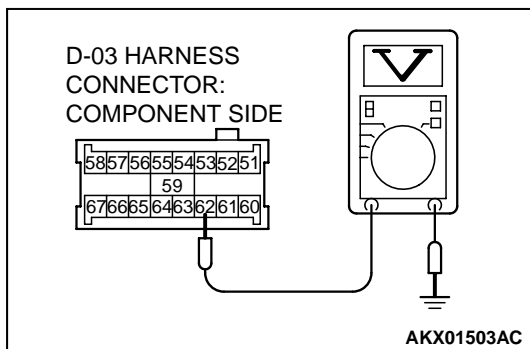
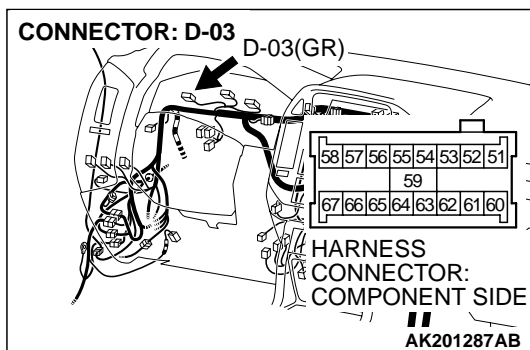
**STEP 3. Check harness connector D-03, D-04 at the combination meter for damage.**

**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 D-03.**

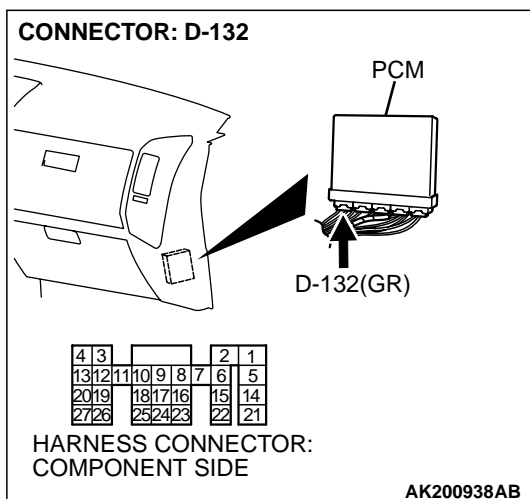
- (1) Disconnect the connector D-03 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 62 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-210 and D-208 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-210 and D-208 are in good condition, repair it because of open circuit between ignition switch connector D-204 (terminal No. 2) and combination meter connector D-03 (terminal No. 62). Then confirm that the malfunction symptom is eliminated.

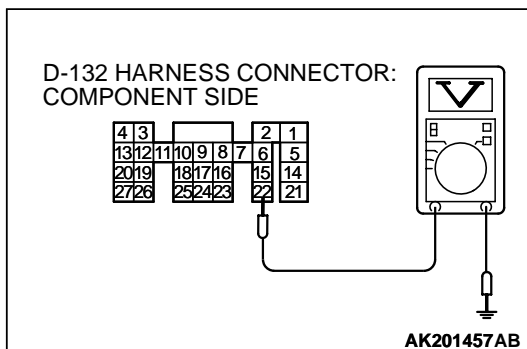
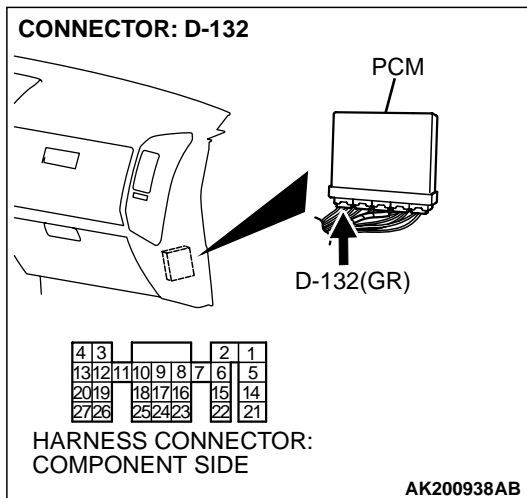


**STEP 5. Check harness connector D-132 at the PCM for damage.**

**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 D-132.**

- (1) Disconnect the connector D-132 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 7 and ground.
  - Voltage should be battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

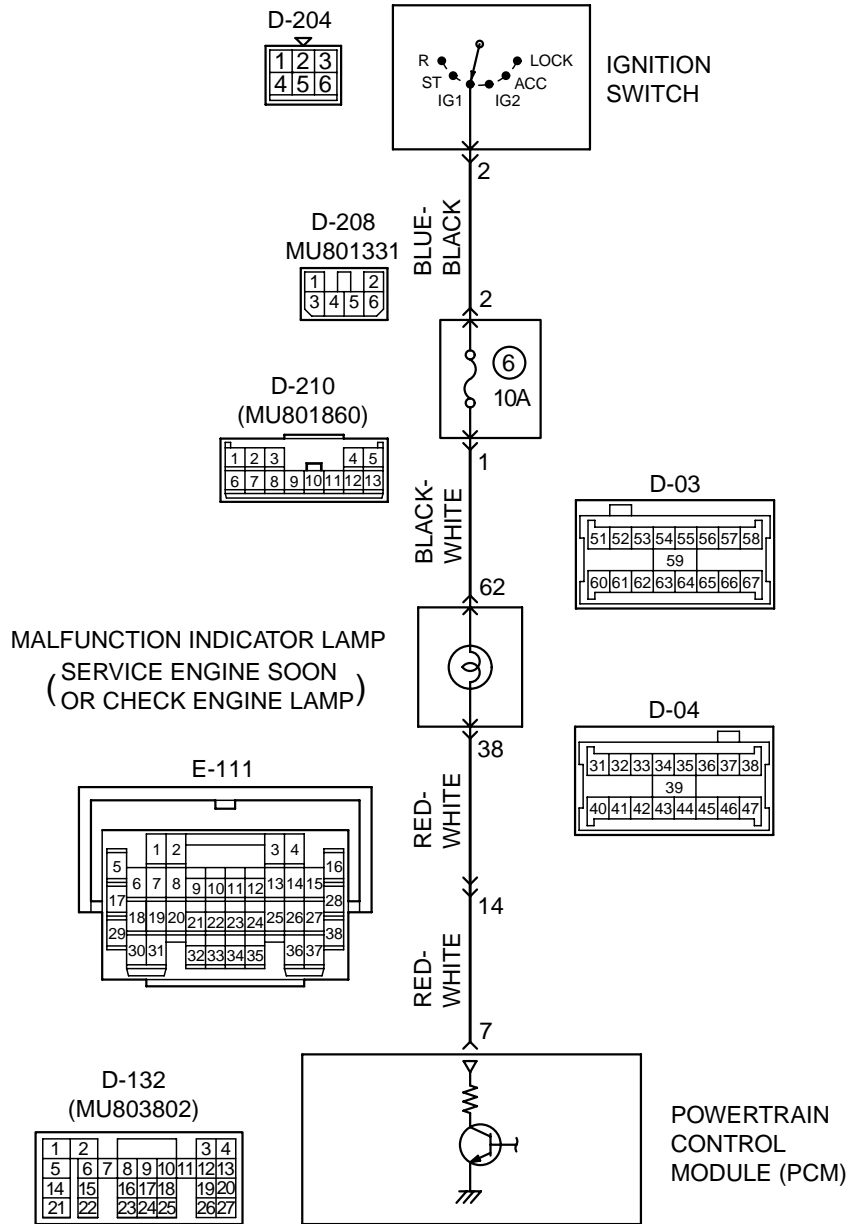
**Q: Is battery positive voltage (approximately 12 volts) present?**

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

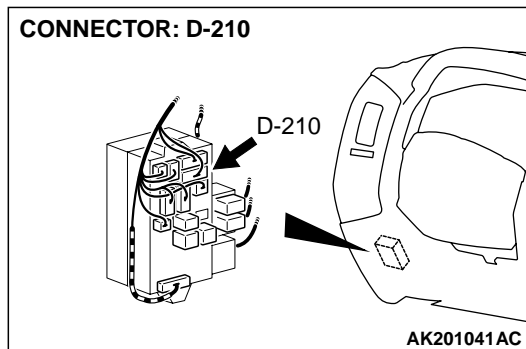
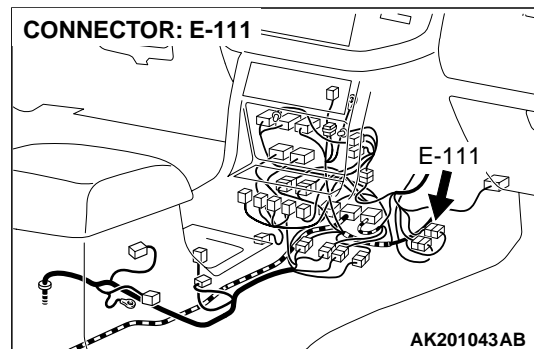
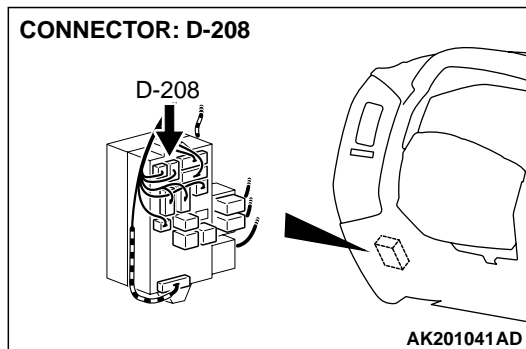
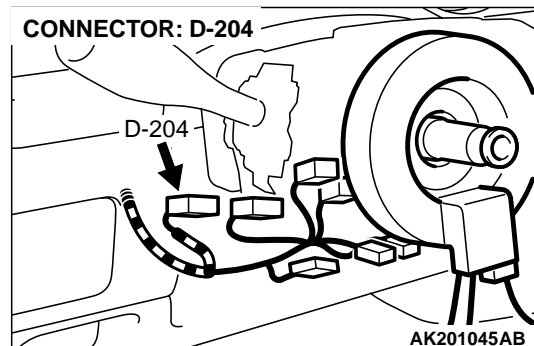
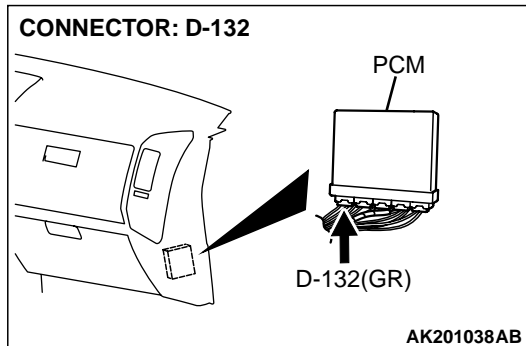
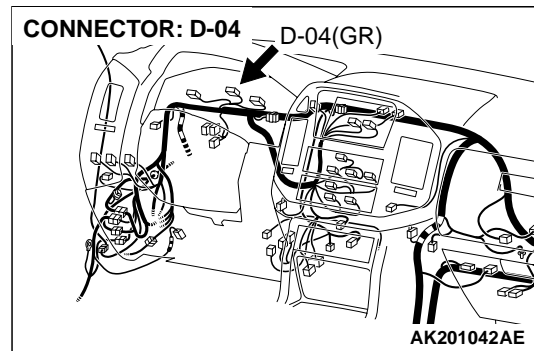
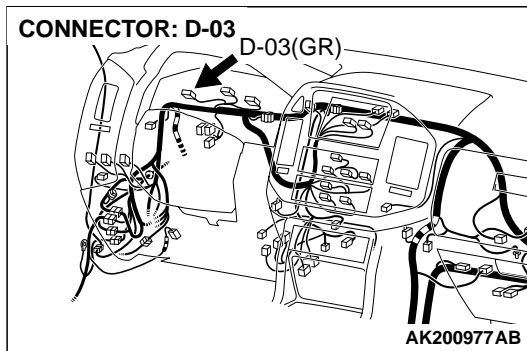
**NO :** Check harness connectors E-111 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connectors E-111 is in good condition, repair an open circuit between combination meter connector D-04 (terminal No. 38) and PCM connector D-132 (terminal No. 7). 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



AK201154



### 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**

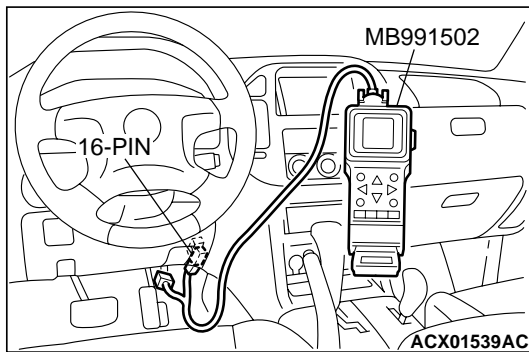
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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.

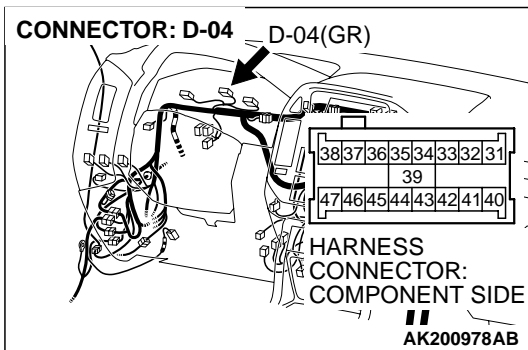
**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO** : Go to Step. 2.







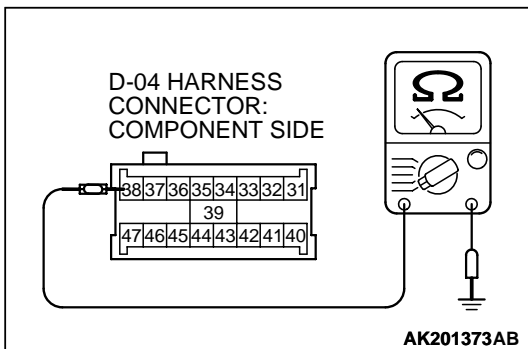
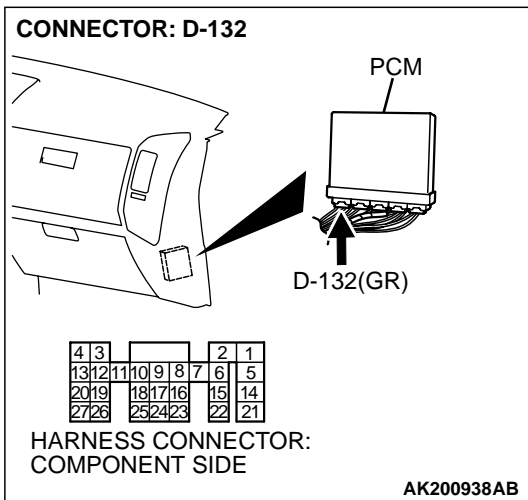
**STEP 2. Check the continuity at combination meter harness side connector D-04.**

- (1) Disconnect the connector D-04 and measure at the harness side.
- (2) Disconnect the PCM connector D-132.
- (3) Check for the continuity between terminal No. 38 and ground.
  - Should be open loop.

**Q: Is the continuity normal?**

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

**NO :** Check harness connector E-111 at the intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connectors E-111 is in good condition, repair a short circuit to ground between combination meter connector D-04 (terminal No. 38) and PCM connector D-132 (terminal No. 7). 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-99](#).

**CIRCUIT OPERATION**

- Refer to Ignition circuit [P.13Ad-99](#).

**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 Tools:**

- MB991502: Scan Tool (MUT-II)
- MB991348: Test Harness

**STEP 1. Check the battery positive voltage.**

- (1) Measure the battery positive voltage during cranking.
- The voltage should be 8 volts or more.

**Q: Is the voltage normal?**

**YES** : Go to Step 2.

**NO** : Check the battery. Refer to GROUP 54A, Battery – Battery Check [P.54A-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, read the diagnostic trouble code (DTC).****⚠ CAUTION**

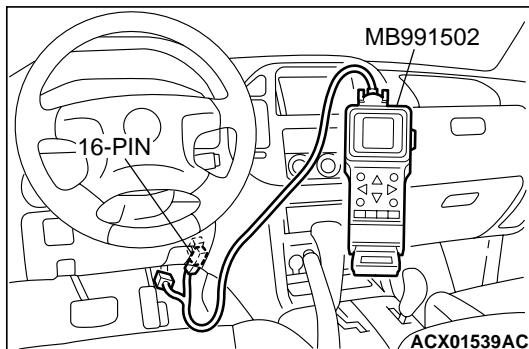
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

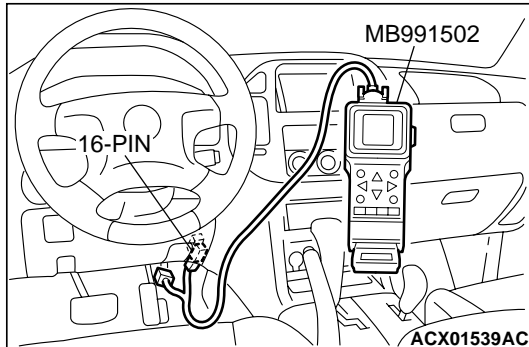
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-2](#).

**NO** : Go to Step 4.



**STEP 4. Using scan tool MB991502, check data list.****⚠ CAUTION**

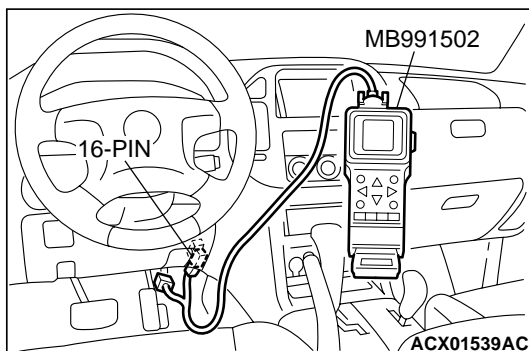
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-29.
  - 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 5.

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

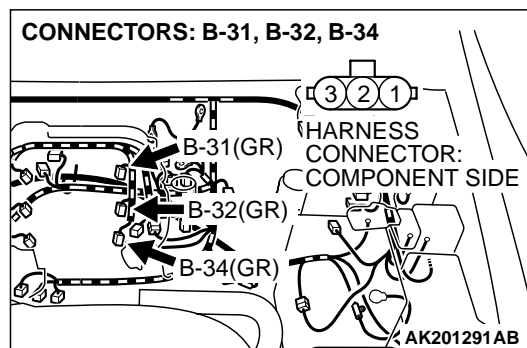
**STEP 5. Using scan tool MB991502, check actuator test.**

- (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-42.
  - 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 6.

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

**STEP 6. Check the ignition system.**

- (1) Connect the timing light to terminal No. 1 of the ignition coil connector B-31, B-32 or B-34 in order.
- (2) Crank the engine.
  - The timing light flashes.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Does the timing light flash?**

**YES** : Go to Step 7.

**NO** : Refer to INSPECTION PROCEDURE 30 – Ignition Circuit System P.13Ad-99.

**STEP 7. Check the ignition timing.**

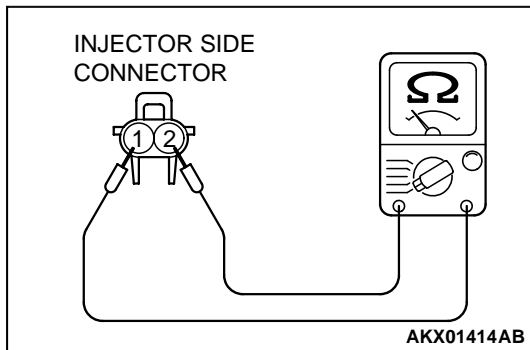
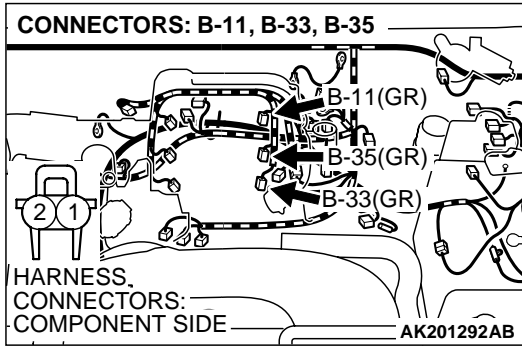
- (1) Check the ignition timing at cranking.

**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. Check the left bank injector.**

(1) Disconnect the left bank injector connector B-11, B-33, B-35.

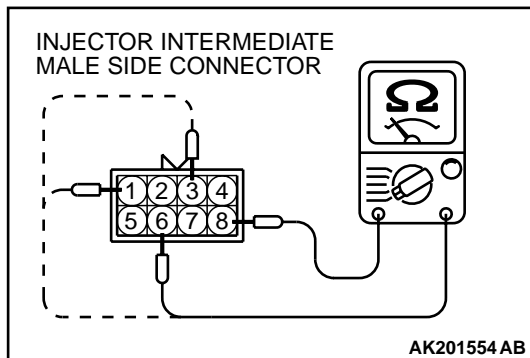
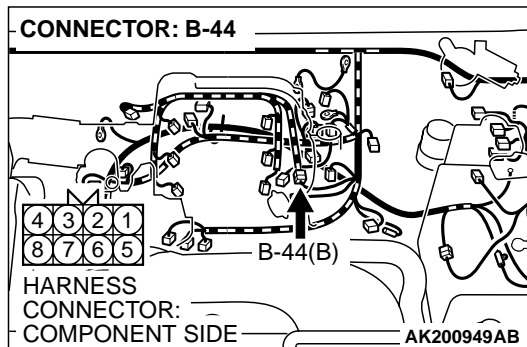
(2) Measure the resistance between each injector side connector terminal No. 1 and No. 2.

**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 faulty injector. Then confirm that the malfunction symptom is eliminated.



**STEP 9. Check the right bank injector resistance at injector intermediate connector B-44.**

(1) Disconnect the injector intermediate connector B-44.

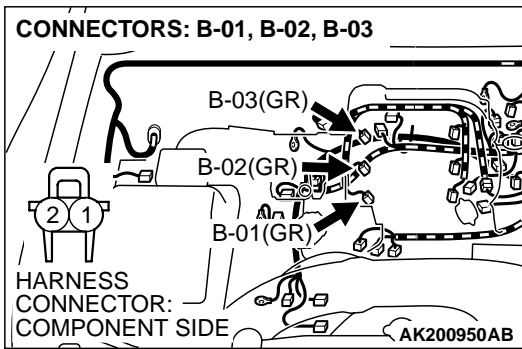
(2) Measure the resistance between each male connector side terminal.

- 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. 1 when measuring No. 3 cylinder injector.
- c. Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector.
  - Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

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

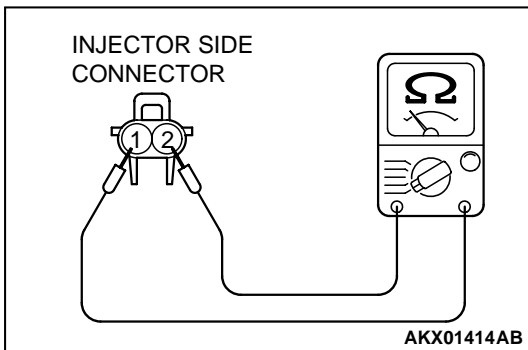
**YES :** Go to Step 12.

**NO :** Go to Step 10.



**STEP 10. Check the right bank injector.**

- (1) Remove the intake manifold.
- (2) Disconnect the right bank injector connector, which deviates from the standard value at Step 8.

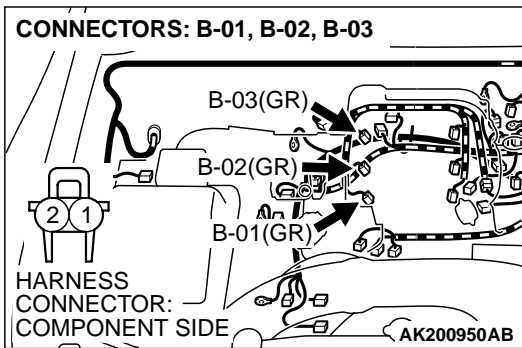


- (3) Measure the resistance between injector side connector terminal No. 1 and No. 2.

**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 11.
- NO :** Replace the injector. Then confirm that the malfunction symptom is eliminated.

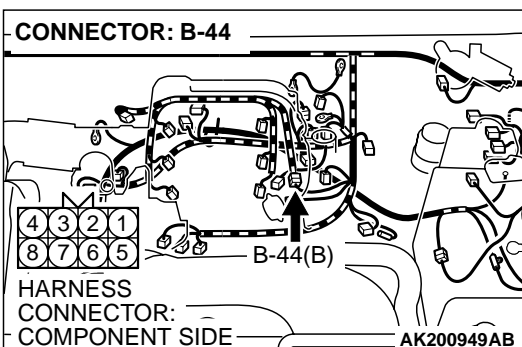


**STEP 11. Check harness connector B-01 or B-02 or B-03 at right bank injector for damage.**

- (1) Check the injector connector, which deviates from the standard value at Step 9.

**Q: Is the harness connector in good condition?**

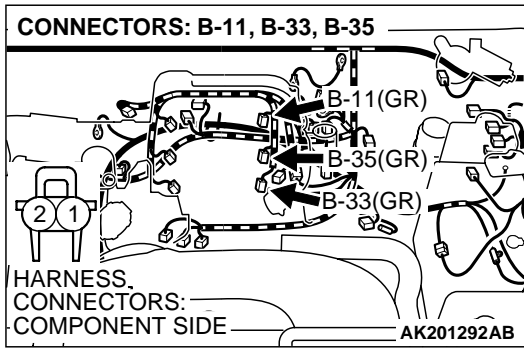
- YES :** Repair harness wire between injector intermediate connector and right bank injector connector because of harness damage. Then confirm that the malfunction symptom is eliminated.
- NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then confirm that the malfunction symptom is eliminated.



**STEP 12. Check harness connector B-44 at injector intermediate connector 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.

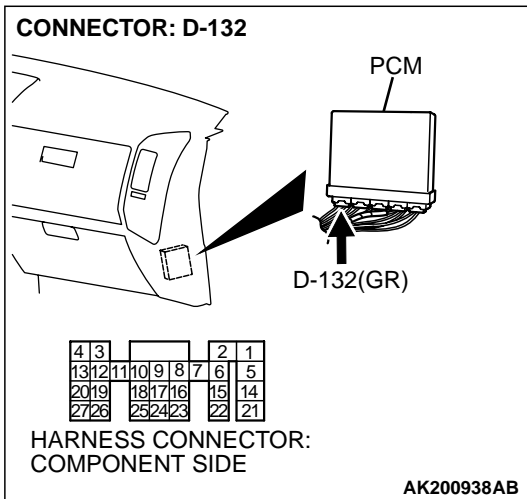


**STEP 13. Check harness connector B-11, B-33, B-35 at left bank injector for damage.**

**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.

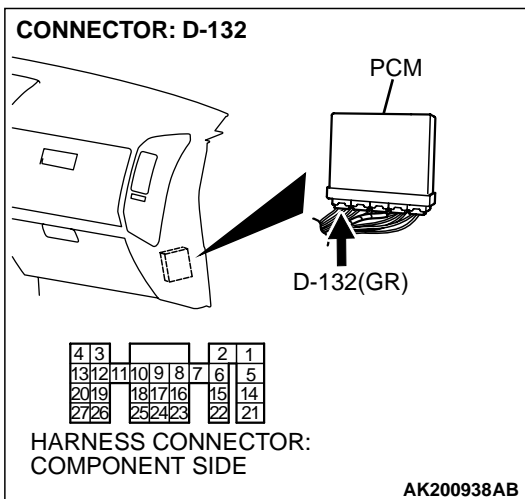
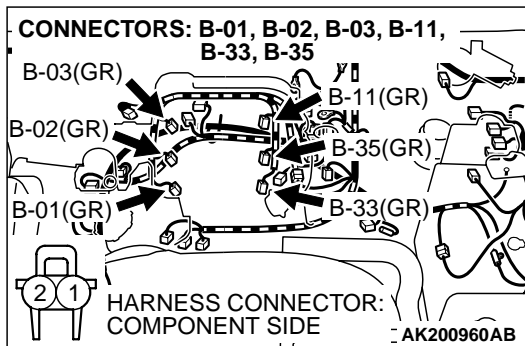


**STEP 14. Check harness connector D-132 at PCM for damage.**

**Q: Is the harness connector in good condition?**

**YES :** Go to Step 15.

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



### STEP 15. Check for harness damage between injector connector and PCM connector.

- Check the harness wire between injector connector B-01 (terminal No. 2) and PCM connector D-132 (terminal No. 1) when checking No. 1 cylinder injector.
- Check the harness wire between injector connector B-33 (terminal No. 2) and PCM connector D-132 (terminal No. 5) when checking No. 2 cylinder injector.
- Check the harness wire between injector connector B-02 (terminal No. 2) and PCM connector D-132 (terminal No. 14) when checking No. 3 cylinder injector.
- Check the harness wire between injector connector B-35 (terminal No. 2) and PCM connector D-132 (terminal No. 21) when checking No. 4 cylinder injector.
- Check the harness wire between injector connector B-03 (terminal No. 2) and PCM connector D-132 (terminal No. 2) when checking No. 5 cylinder injector.
- Check the harness wire between injector connector B-11 (terminal No. 2) and PCM connector D-132 (terminal No. 6) 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.

- Check the ignition coil, spark plugs, spark plug cables.
- Check if the injectors are clogged.
- Check if fuel is contaminated.
- Check compression.

Then confirm that the malfunction symptom is eliminated.

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

## INSPECTION PROCEDURE 6: Starts 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.
- Dirtiness around throttle valve.
- Malfunction of the EGR valve.
- 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 be 8 volts or more.

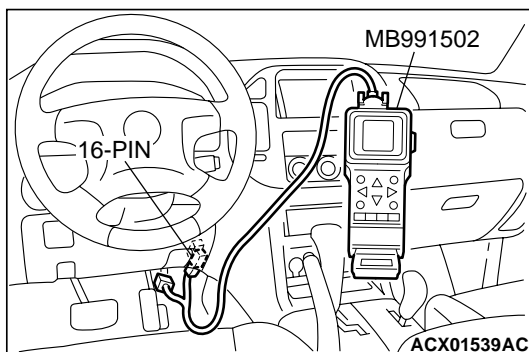
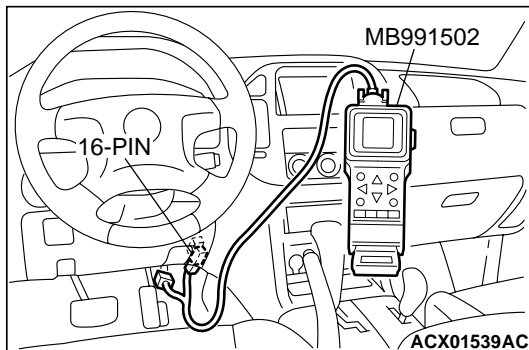
**Q: Dose the voltage remain greater than 8 volts while the engine is cranked?****YES** : Go to Step 2.**NO** : Refer to GROUP 54A, Battery – Battery Check [P.54A-4](#).**STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).****⚠ CAUTION**

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

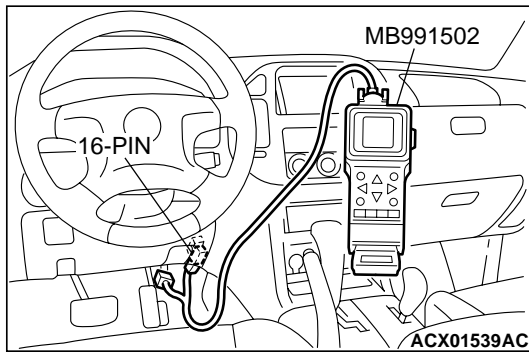
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC set?****YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-2](#).**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-42](#).
  - 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.**

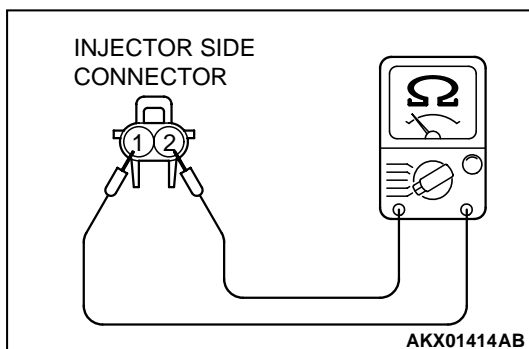
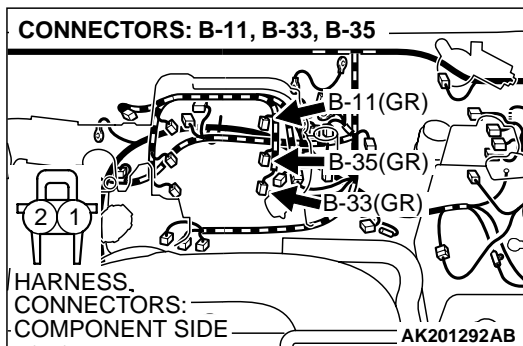
- (1) Turn the ignition switch to the "ON" position.
- (2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table [P.13Ab-29](#).
  - a. Item 21: Engine Coolant Temperature Sensor.
  - b. Item 18: Cranking signal (ignition switch - ST)
- (3) Turn the ignition switch 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. Inspection of throttle body (throttle valve area) for dirtiness.****Q: Is the throttle valve area dirty?****YES** : Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).**NO** : Go to Step 6.**STEP 6. Check the ignition timing.**

- (1) Check the ignition timing at cranking.

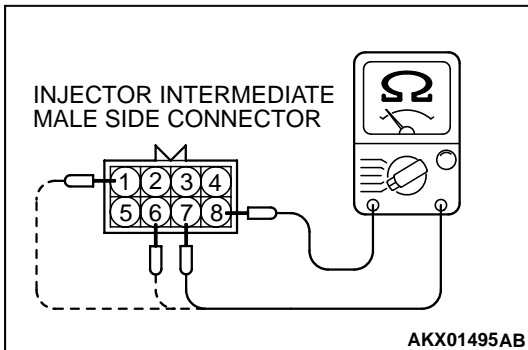
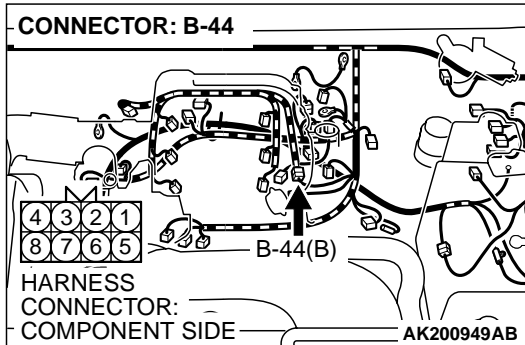
**Standard value: 5° BTDC ± 3°****Q: Is the ignition timing normal?****YES** : Go to Step 7.**NO** : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.**STEP 7. Check the left bank injector.**

- (1) Disconnect the left bank injector connector B-11, B-33, B-35.



- (2) Measure the resistance between each 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 faulty injector. Then confirm that the malfunction symptom is eliminated.



**STEP 8. Check the right bank injector resistance at injector intermediate connector B-44.**

(1) Disconnect the injector intermediate connector B-44.

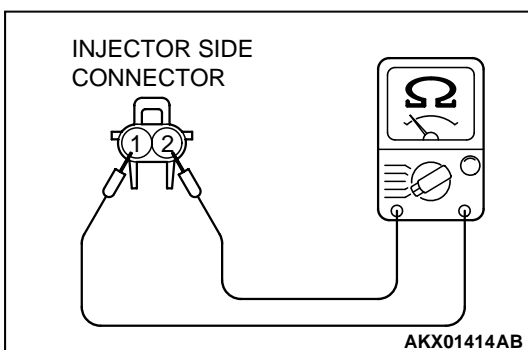
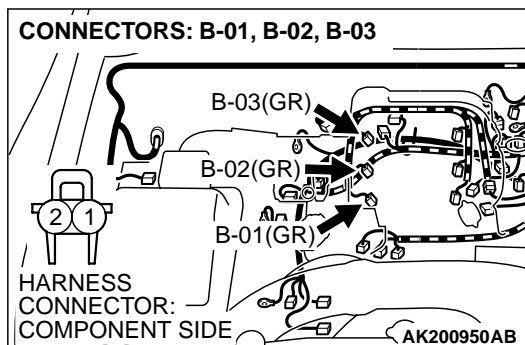
(2) Measure the resistance between each male connector side terminal.

- Measure the resistance between terminal No. 8 and No. 3 when measuring No. 1 cylinder injector.
- Measure the resistance between terminal No. 8 and No. 1 when measuring No. 3 cylinder injector.
- Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector.
  - Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

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

**YES :** Go to Step 11.

**NO :** Go to Step 9.



**STEP 9. Check the right bank injector.**

(1) Remove the intake manifold.

(2) Disconnect the right bank injector connector, which deviates from the standard value at Step 9.

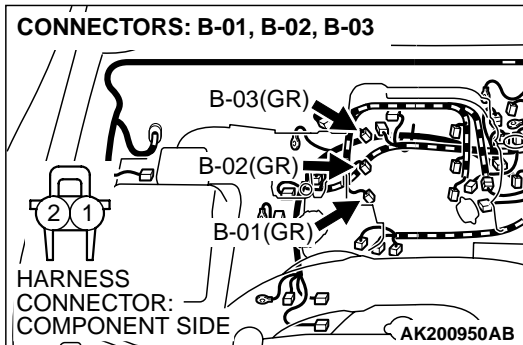
(3) Measure the resistance between injector side connector terminal No. 1 and No. 2.

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

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

**YES :** Go to Step 10.

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



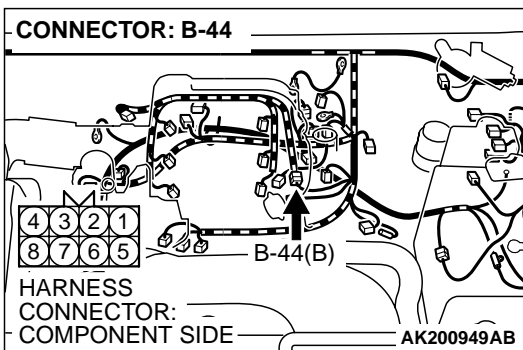
**STEP 10. Check harness connector B-01 or B-02 or B-03 at right bank injector for damage.**

(1) Check the injector connector, which deviates from the standard value at Step 9.

**Q: Is the harness connector in good condition?**

**YES :** Repair harness wire between injector intermediate connector and right bank 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.

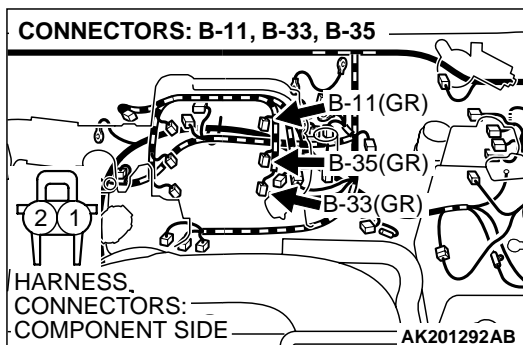


**STEP 11. Check harness connector B-44 at injector intermediate connector for damage.**

**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.

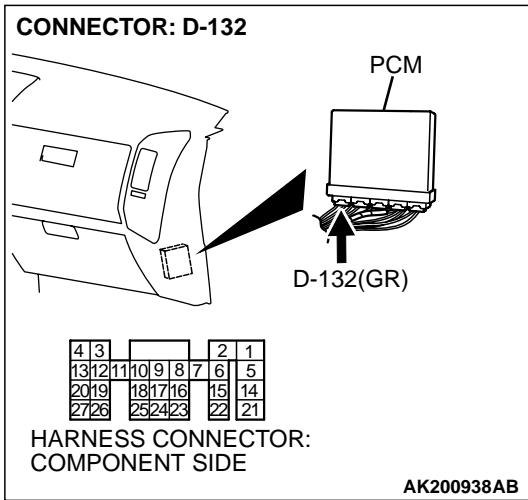


**STEP 12. Check harness connector B-11, B-33, B-35 at left bank injector for damage.**

**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.

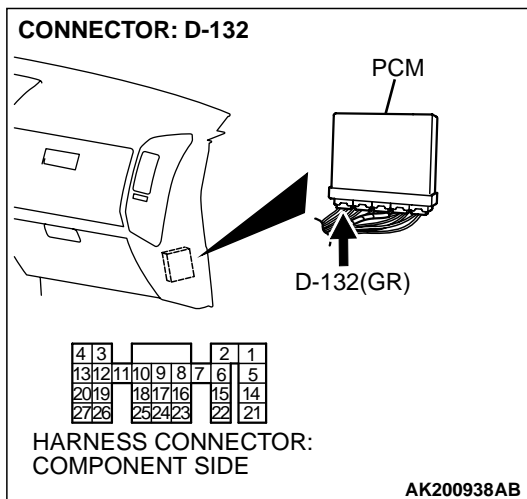
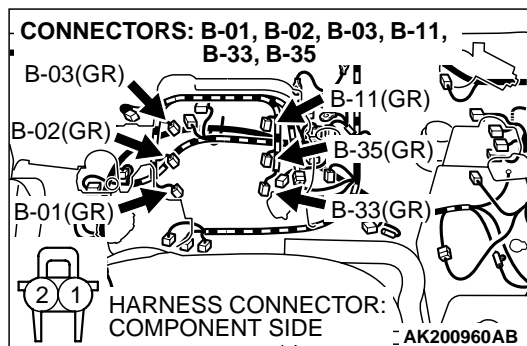


**STEP 13. Check harness connector D-132 at PCM for damage.**

**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 harness damage between injector connector and PCM connector.**

- Check the harness wire between injector connector B-01 (terminal No. 2) and PCM connector D-132 (terminal No. 1) when checking No. 1 cylinder injector.
- Check the harness wire between injector connector B-33 (terminal No. 2) and PCM connector D-132 (terminal No. 5) when checking No. 2 cylinder injector.
- Check the harness wire between injector connector B-02 (terminal No. 2) and PCM connector D-132 (terminal No. 14) when checking No. 3 cylinder injector.
- Check the harness wire between injector connector B-35 (terminal No. 2) and PCM connector D-132 (terminal No. 21) when checking No. 4 cylinder injector.
- Check the harness wire between injector connector B-03 (terminal No. 2) and PCM connector D-132 (terminal No. 2) when checking No. 5 cylinder injector.
- Check the harness wire between injector connector B-11 (terminal No. 2) and PCM connector D-132 (terminal No. 6) 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.

- Check the ignition coil, spark plugs, spark plug cables.
- Check if the injectors are clogged.
- Check compression pressure.
- Check fuel lines for clogging.
- Check if the foreign materials (water, kerosene, etc.) got into fuel.
- Check the EGR valve.

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.
- Dirtiness around throttle valve.
- Malfunction of the EGR valve.

## DIAGNOSIS

## Required Special Tool:

- MB991502: Scan Tool (MUT-II)

**STEP 1. Check the battery positive voltage.**

- (1) Measure the battery positive voltage during cranking.
  - The voltage is 8 volts or more.

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

**YES** : Go to Step 2.

**NO** : Refer to GROUP 54A, Battery – Battery check [P.54A-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-22](#).

**NO** : Go to Step 3.

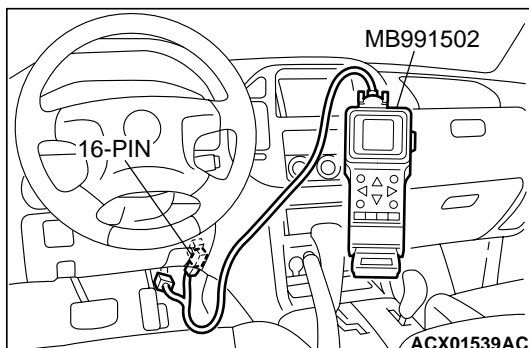
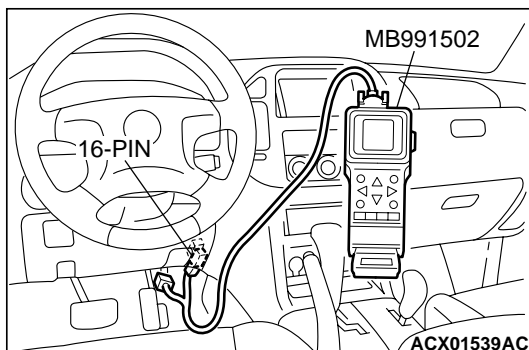
**STEP 3. Using scan tool MB991502, check actuator test.**

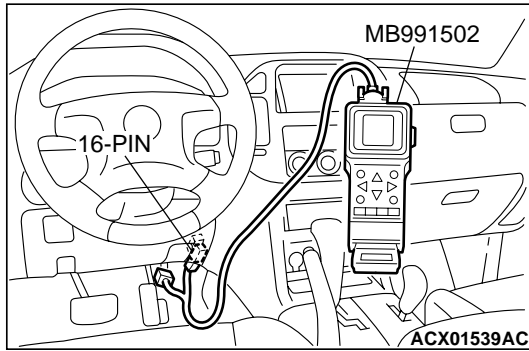
- (1) Turn the ignition switch to the "ON" position.
- (2) Check the following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table [P.13Ab-42](#).
  - a. Item 07: Fuel Pump.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**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.**

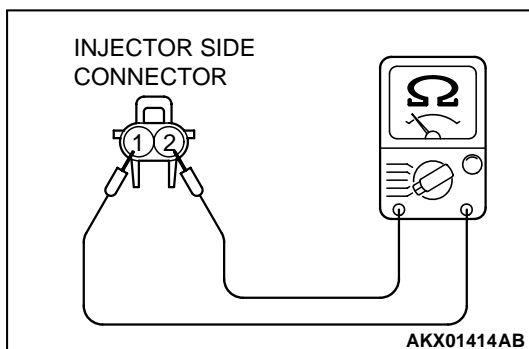
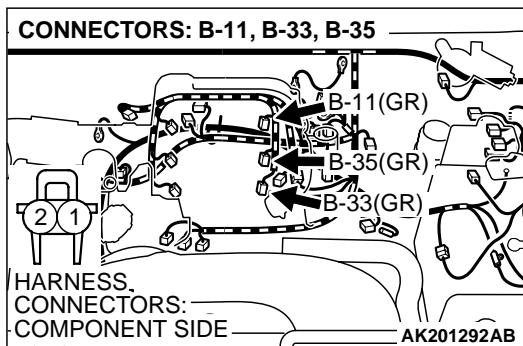
- (1) Turn the ignition switch the "ON" position.
- (2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table [P.13Ab-29](#).
  - a. Item 21: Engine Coolant Temperature Sensor.
  - b. Item 18: Cranking signal (ignition switch-ST).
- (3) Turn the ignition switch the "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. Inspection of throttle body (throttle valve area) for dirtiness.****Q: Is the throttle valve area dirty?****YES** : Refer to GROUP 13A, On-vehicle service – Clean the throttle valve area [P.13Aa-11](#).**NO** : Go to Step 6.**STEP 6. Check the ignition timing.**

- (1) Check the ignition timing at cranking.

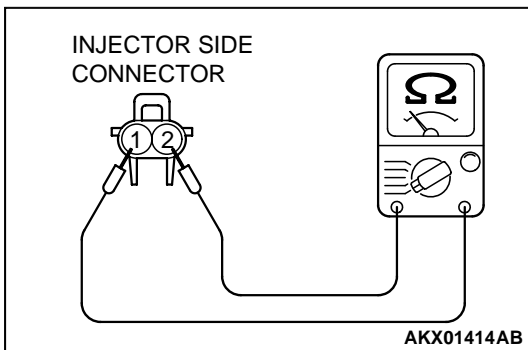
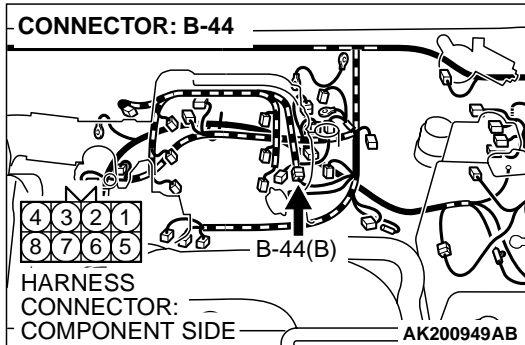
**Standard value: 5° BTDC ± 3°****Q: Is the ignition timing normal?****YES** : Go to Step 7.**NO** : Check that the crankshaft position sensor and timing belt cover are in the correct position. Then confirm that the malfunction symptom is eliminated.**STEP 7. Check the left bank injector.**

- (1) Disconnect the left bank injector connector B-11, B-33, B-35.



- (2) Measure the resistance between each 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 faulty injector. Then confirm that the malfunction symptom is eliminated.



**STEP 8. Check the right bank injector resistance at injector intermediate connector B-44.**

(1) Disconnect the injector intermediate connector B-44.

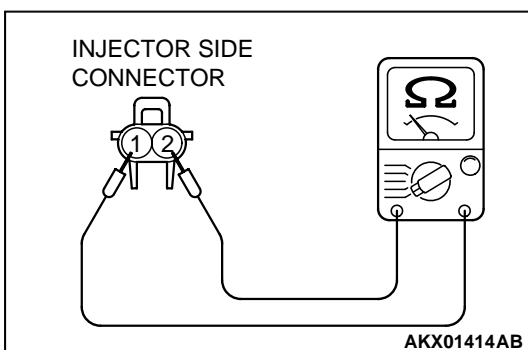
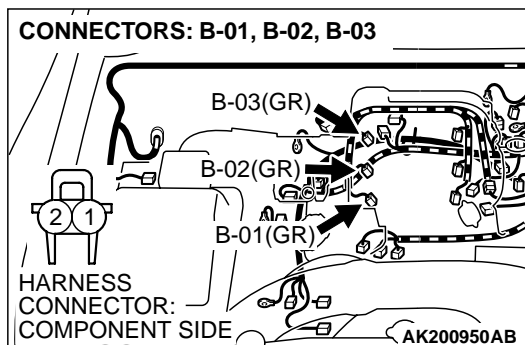
(2) Measure the resistance between each male connector side terminal.

- Measure the resistance between terminal No. 8 and No. 3 when measuring No. 1 cylinder injector.
- Measure the resistance between terminal No. 8 and No. 1 when measuring No. 3 cylinder injector.
- Measure the resistance between terminal No. 8 and No. 6 when measuring No. 5 cylinder injector.
  - Resistance should be between 13 and 16 ohms [at 20°C (68°F)].

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

**YES :** Go to Step 11.

**NO :** Go to Step 9.



**STEP 9. Check the right bank injector.**

(1) Remove the intake manifold.

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

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

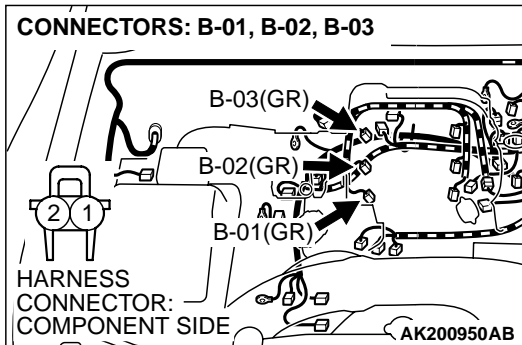
**Standard value: 13 – 16 ohms [at 20°C (68°F)]**

**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.





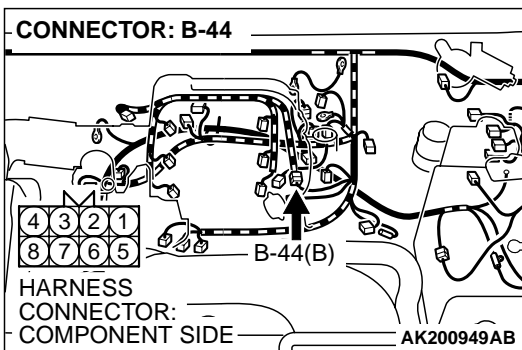
**STEP 10. Check harness connector B-01 or B-02 or B-03 at right bank injector for damage.**

(1) Check the injector connector, which deviated from the standard value listed in Step 7.

**Q: Is the harness connector in good condition?**

**YES :** Repair harness wire between injector intermediate connector and right bank 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.

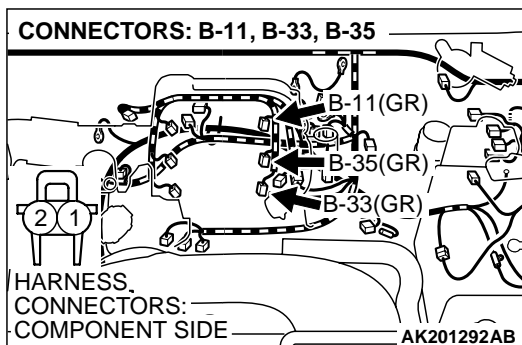


**STEP 11. Check harness connector B-44 at the injector intermediate connector for damage.**

**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.

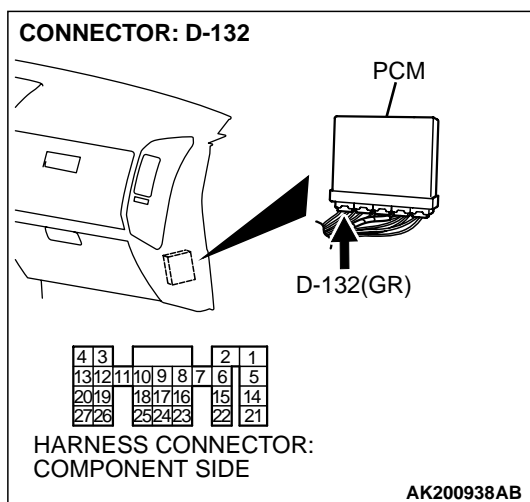


**STEP 12. Check harness connector B-11, B-33, B-35 at the left bank injector for damage.**

**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.

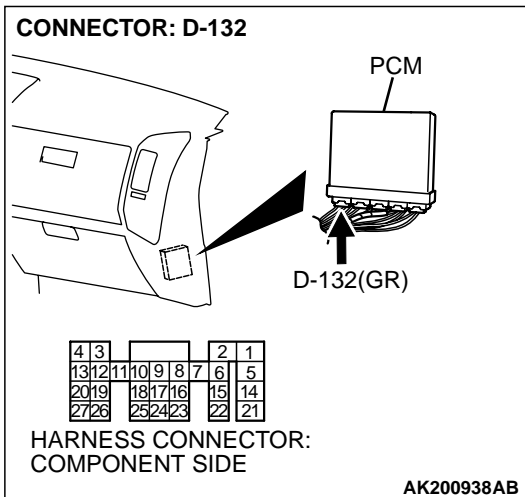
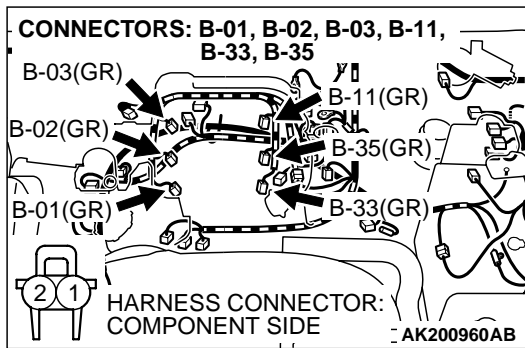


**STEP 13. Check the harness connector D-132 at the PCM for damage.**

**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 harness damage between injector connector and PCM connector.**

- Check the harness wire between injector connector B-01 (terminal No. 2) and PCM connector D-132 (terminal No. 1) when checking No. 1 cylinder injector.
- Check the harness wire between injector connector B-33 (terminal No. 2) and PCM connector D-132 (terminal No. 5) when checking No. 2 cylinder injector.
- Check the harness wire between injector connector B-02 (terminal No. 2) and PCM connector D-132 (terminal No. 14) when checking No. 3 cylinder injector.
- Check the harness wire between injector connector B-35 (terminal No. 2) and PCM connector D-132 (terminal No. 21) when checking No. 4 cylinder injector.
- Check the harness wire between injector connector B-03 (terminal No. 2) and PCM connector D-132 (terminal No. 2) when checking No. 5 cylinder injector.
- Check the harness wire between injector connector B-11 (terminal No. 2) and PCM connector D-132 (terminal No. 6) 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.

- Check the ignition coil, spark plugs, spark plug cables.
- Check if the injectors are clogged.
- Check the compression pressure.
- Check if the foreign materials (water, kerosene, etc.) got into fuel.
- Check the EGR valve.

Then confirm that the malfunction symptom is eliminated.

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

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

**COMMENT**

- In cases such as the above, the cause is probably the air/fuel mixture or electronic control throttle valve system. 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 electronic control throttle valve system.
- Malfunction of the evaporative emission purge solenoid system.
- Malfunction of the EGR valve.
- Poor compression pressure.
- Vacuum leak.

**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-2](#).

**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.
  - a. Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).
- (2) After cleaning, confirm that the malfunction symptom is eliminated.

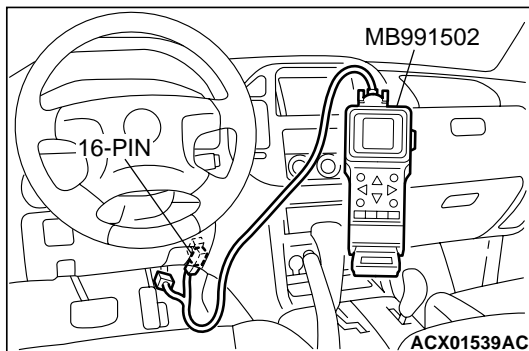
**Q: Is the malfunction symptom resolved?**

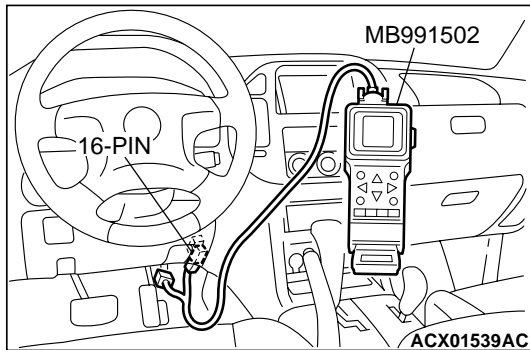
**YES :** The check is completed.

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

**⚠ CAUTION**

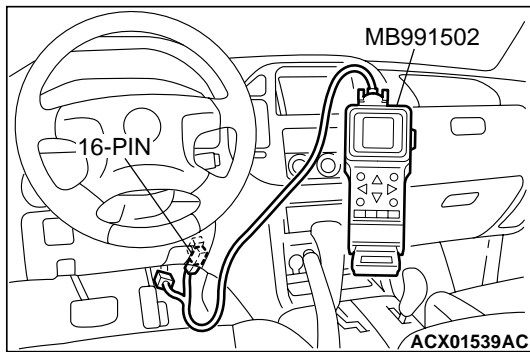
**To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

- (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-42](#).
  - a. Item 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 6.

**NO :** Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit [P.13Ac-318](#).



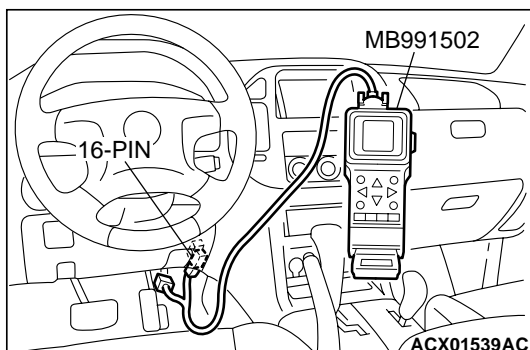
**STEP 6. Using scan tool MB991502, check data list.**

- (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-29](#).
  - 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 7.

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



**STEP 7. 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-42](#).
  - a. Item 08: Evaporative Emission Purge Solenoid.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the actuator 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-13](#).

**Q: Is the fuel pressure normal?**

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

- 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 9. Check the ignition timing.**

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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 valve.

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 electronic control throttle valve 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-22](#).
- NO** : Go to Step 2.

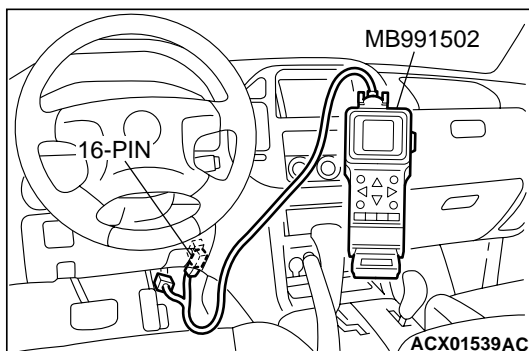
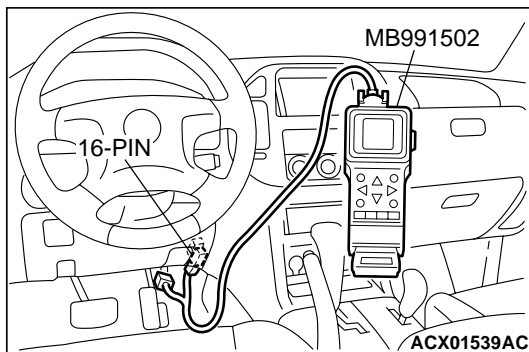
**STEP 2. Using scan tool MB991502, check data list.****⚠ CAUTION**

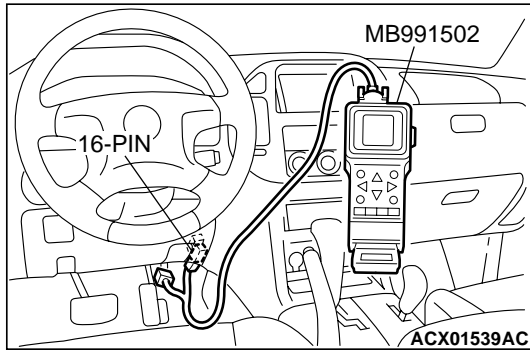
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-29](#).
  - 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 3.
- NO** : Repair or replace. Then confirm that the malfunction symptom is eliminated.



**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-42](#).
  - a. Item 08: Evaporative Emission Purge Solenoid.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the actuator operating properly?**

**YES** : Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).

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

**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 electronic control throttle valve 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**

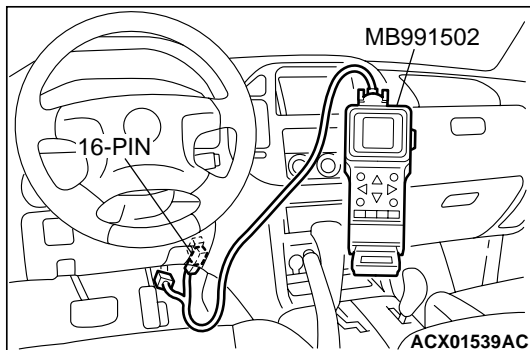
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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.

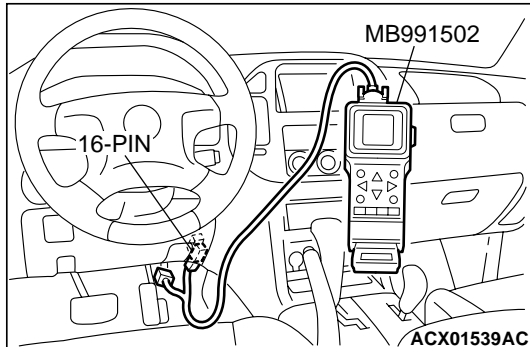
**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO** : Go to Step 2.





**STEP 2. 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-29](#).
  - a. Item 21: Engine Coolant Temperature Sensor.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the sensor operating properly?**

**YES** : Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).

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

**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 electronic control throttle valve system.
- Malfunction of the throttle body.
- Malfunction of the injector system.
- Malfunction of the ignition system.

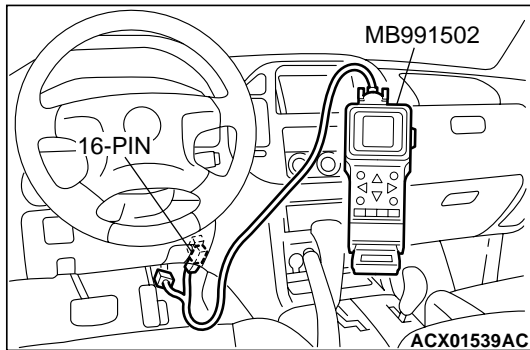
**DIAGNOSIS****Required Special Tool:**

- 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-22](#).

**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 :** Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).

**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-35](#).

**STEP 5.** Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.

**⚠ CAUTION**

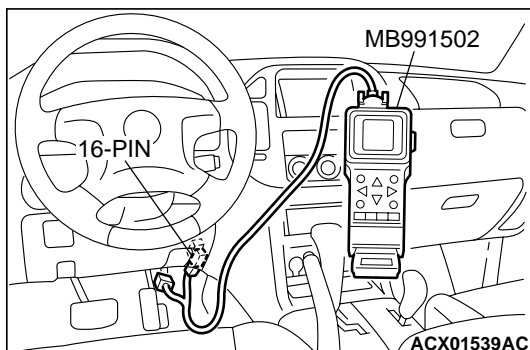
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

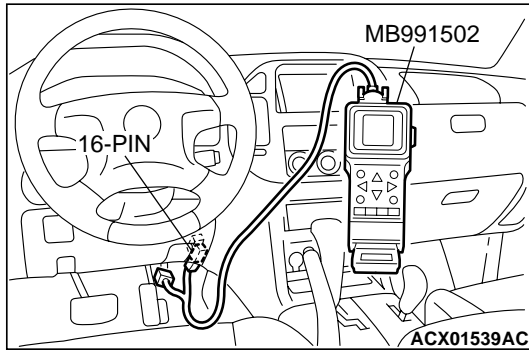
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table [P.13Ab-42](#).
  - a. Item 01, 02, 03, 04, 05, 06: Injector.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the actuator operating properly?**

**YES :** Go to Step 6.

**NO :** Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 - Injector Circuit [P.13Ac-318](#).



**STEP 6. 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-29](#).
  - 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 7.**NO :** Repair or replace. Then confirm that the malfunction symptom is eliminated.**STEP 7. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**Q: Is the fuel pressure normal?****YES :** Go to Step 8.**NO :** Repair or replace. Then confirm that the malfunction symptom is eliminated.**STEP 8. Check the ignition timing.**

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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.
- d. Check the EGR valve.

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, electronic control throttle valve system 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 electronic control throttle valve system.
- Malfunction of the EGR valve.
- 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**

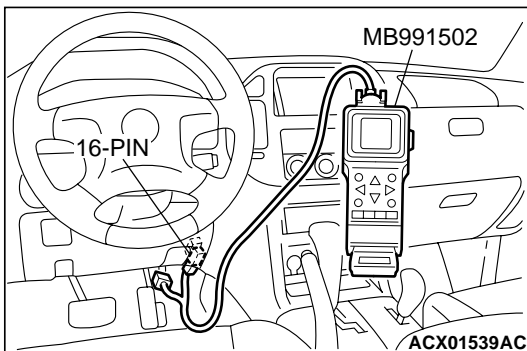
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-22](#).

**NO :** Go to Step 3.

**STEP 3. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.****⚠ CAUTION**

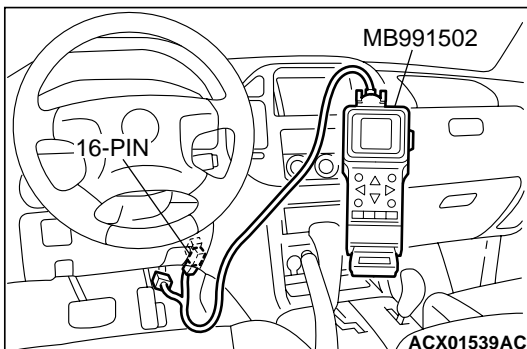
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-42](#).
  - a. Item 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 4.

**NO :** Refer to GROUP 13A, DTC P0201, P0202, P0203, P0204, P0205, P0206 – Injector Circuit [P.13Ac-318](#).

**STEP 4. Checking by operating the accelerator pedal.****Q: Does the engine stall right after the accelerator pedal is released?**

**YES :** Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Ac-318](#).

**NO :** Go to Step 5.

**STEP 5. Engine stall reproduction test.****Q: Is it easy to reproduce the engine stall?****YES :** Go to Step 6.**NO :** Check if the following signals change suddenly by wiggling the circuit harness and connectors.

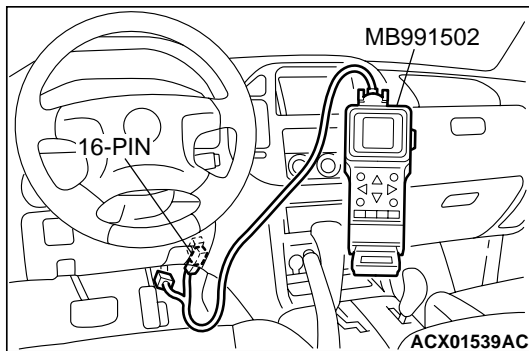
- a. Crankshaft position sensor signal.
- b. Volume airflow sensor signal.
- c. Injector drive signal.
- d. Primary and secondary ignition signal.
- e. Fuel pump drive signal.
- f. PCM power supply voltage.

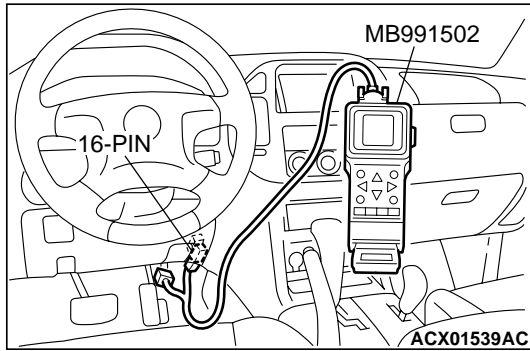
Repair or replace. Then confirm that the malfunction symptom is eliminated.

**STEP 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-29.
  - 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.
  - j. Item 68: EGR valve (stepper motor).
  - k. Item 79: Throttle position sensor (main).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Are they 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.**

- (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-29](#).
  - a. Item 39: Right Bank Heated Oxygen Sensor (front).
  - b. Item 11: Left Bank Heated Oxygen Sensor (front).
    - Fluctuates between 0 – 0.4 volts 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 9.**NO** : Go to Step 8.**STEP 8. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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 9. Check the ignition timing.**

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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.
- e. Check the EGR valve.

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.
- Malfunction of emission control system.

**DIAGNOSIS****Required Special Tool:**

- MB991502: Scan Tool (MUT-II)

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

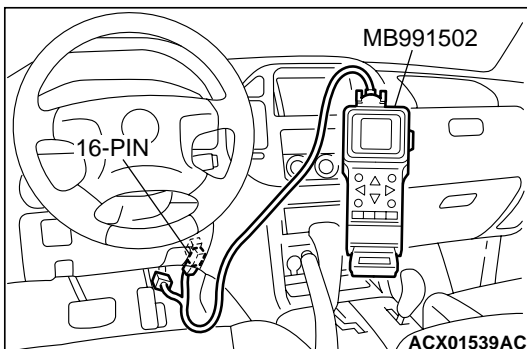
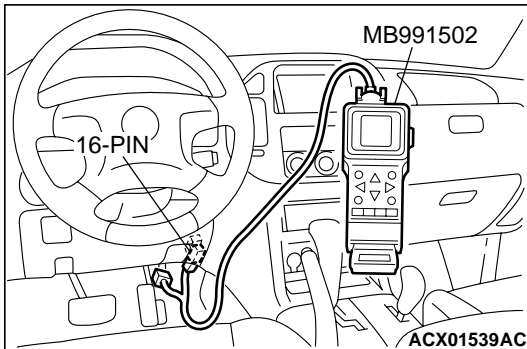
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-22](#).

**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-42](#).
  - a. Item 08: Evaporative Emission Purge 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.
- c. Check the EGR valve.

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 the electronic control throttle valve system.

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

- Malfunction of the electronic control throttle valve 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.

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

**Q: Is DTC set?**

**YES :** Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO :** Go to Step 3.

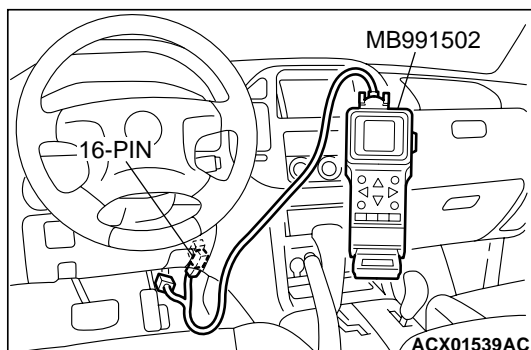
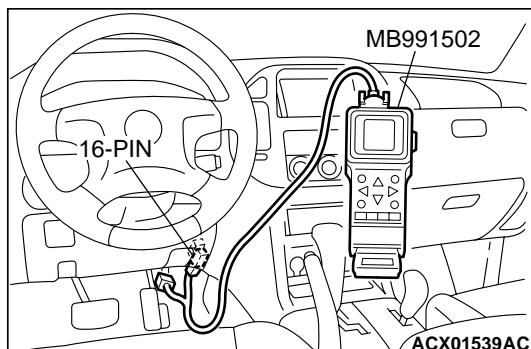
**STEP 3. Using scan tool MB991502, check data list.**

- Turn the ignition switch to the "ON" position.
- Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table [P.13Ab-29](#).
  - Item 79: Throttle Position Sensor (main).
  - Item 14: Throttle Position Sensor (sub).
  - Item 78: Accelerator Pedal Position Sensor (main).
  - Item 77: Accelerator Pedal Position Sensor (sub).
- 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. Inspection of throttle body (throttle valve area) for dirtiness.****Q: Is the throttle valve area dirty?**

**YES** : Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area [P.13Aa-11](#).

**NO** : Check the following items, and repair, replace or clean the defective sections.

- a. Check the ignition coil, spark plugs, spark plug cables.
- b. Check the EGR valve.

Then confirm that the malfunction symptom is eliminated.

**INSPECTION PROCEDURE 15: Hesitation, sag or stumble.****COMMENT**

- In cases such as the above, the ignition system, air/fuel mixture, electronic control throttle valve system 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 electronic control throttle valve system.
- Malfunction of the fuel supply system.
- Malfunction of the EGR 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**

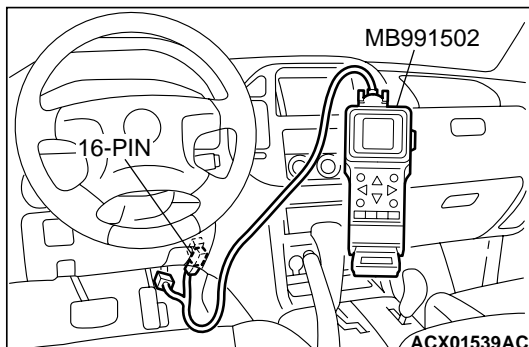
**To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

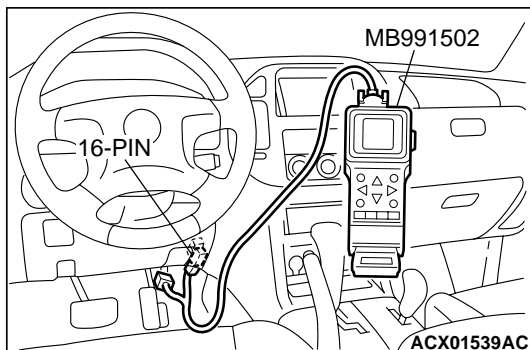
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-2](#).

**NO** : Go to Step 2.






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**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-42](#).
  - 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-318](#).

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**STEP 3. Check the ignition timing.**

- (1) Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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.

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

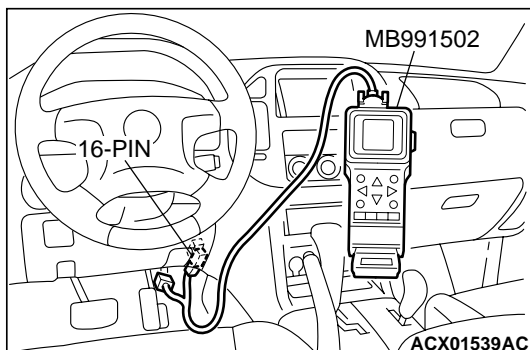
**To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

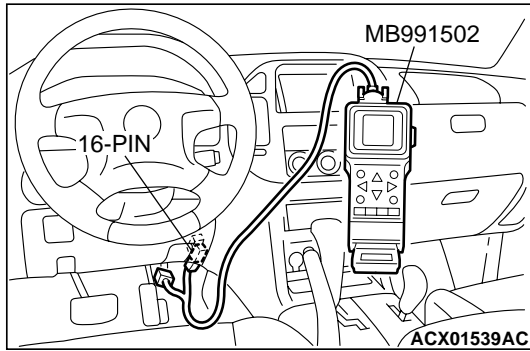
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table [P.13Ab-29](#).
  - a. Item 13: Intake Air Temperature Sensor.
  - b. Item 25: Barometric pressure 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).
- (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 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-29](#).
  - 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 volts and 0.6 – 1.0 volts 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 7.**NO** : Go to Step 6.**STEP 6. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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 7. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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 or the electronic control throttle valve system failed.

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

- Malfunction of the ignition system.
- Malfunction of the electronic control throttle valve 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.

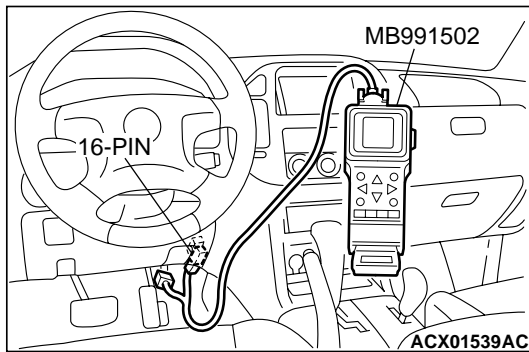
**Q: Is DTC set?**

**YES :** Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**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 throttle valve, causing the vehicle to decelerate rapidly for an instant.

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

- Malfunction of the electronic control throttle valve system.

**DIAGNOSIS****Required Special Tool:**

- MB991502: Scan Tool (MUT-II)

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

**⚠ CAUTION**

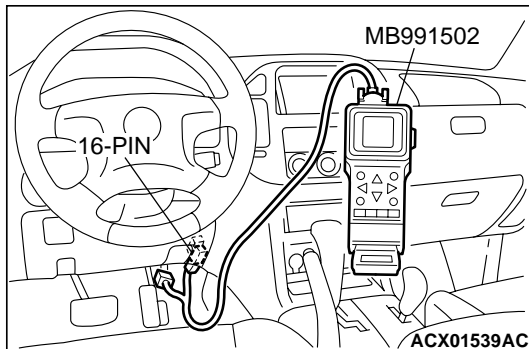
**To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

- (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-22](#).

**NO :** Refer to GROUP 13A, On-vehicle Service – Clean the throttle valve area.



**INSPECTION PROCEDURE 18: Poor acceleration.****COMMENT**

- Defective ignition system, abnormal air/fuel ratio, the electronic control throttle valve system, 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 electronic control throttle valve 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.

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

**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO** : Go to Step 2.

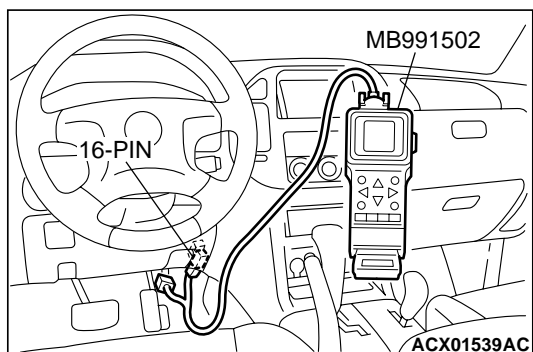
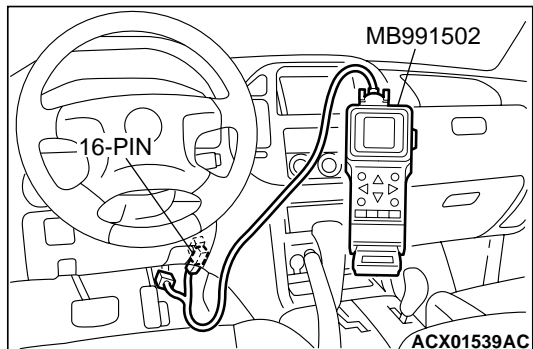
**STEP 2. Using scan tool MB991502, check actuator test items 01, 02, 03, 04, 05, 06: Injector.**

- Turn the ignition switch to the "ON" position.
- Check following items in the actuator test. Refer to Actuator Test Table [P.13Ab-42](#).
  - Item 01, 02, 03, 04, 05, 06: Injector.
- 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-318](#).



**STEP 3. Check the ignition timing.**

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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**

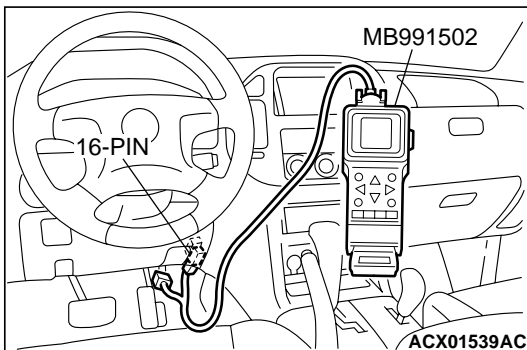
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-29](#).
  - 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).
- (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.

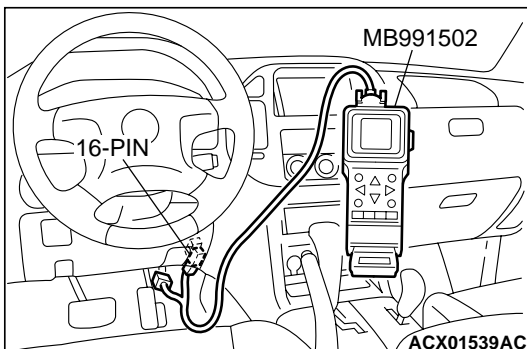
**STEP 5. Using scan tool MB991502, check data list.**

- (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-29](#).
  - 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 volts and 0.6 – 1.0 volts 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 7.

**NO** : Go to Step 6.



**STEP 6. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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 7. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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. Check the EGR system.
- e. Broken air intake hose.
- f. Clogged air cleaner.
- g. 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, the electronic control throttle valve system failed, 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 electronic control throttle valve system.
- Malfunction of the EGR 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.

- Connect scan tool MB991502 to the data link connector.
- Turn the ignition switch to the "ON" position.
- Read the DTC.
- Turn the ignition switch to the "ON" position.

**Q: Is DTC set?**

**YES :** Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO :** Go to Step 2.

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

- Turn the ignition switch to the "ON" position.
- Check following items in the actuator test. Refer to GROUP 13A, Actuator Test Reference Table [P.13Ab-42](#).
  - Item 01, 02, 03, 04, 05, 06: Injector.
- 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-318](#).

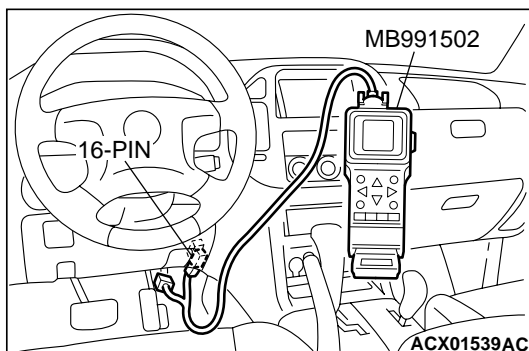
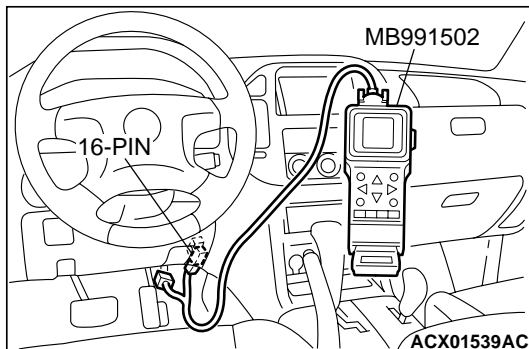
**STEP 3. Check the ignition timing.**

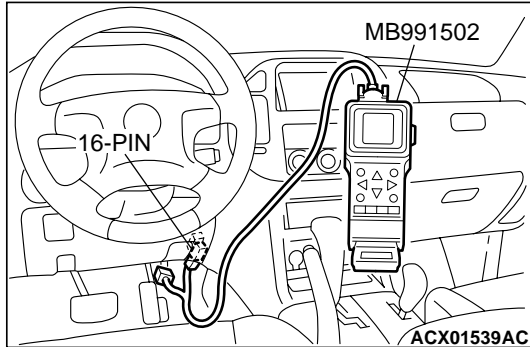
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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**

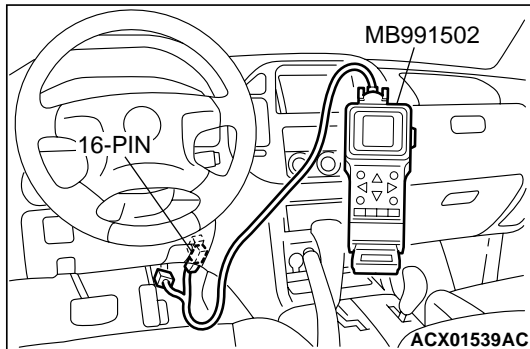
**To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

- (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-29](#).
  - 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).
- (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 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-29](#).
  - 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 volts and 0.6 – 1.0 volts 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 7.

**NO :** Go to Step 6.

**STEP 6. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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 7. Check the fuel pressure.**

Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test [P.13Aa-13](#).

**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

- In case such as the above, the cause is probably that the detonation control is defective or the heat value of the spark plug is inappropriate.

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

- Defective knock sensor.
- Incorrect heat value of the spark plug.

## DIAGNOSIS

## Required Special Tool:

- MB991502: Scan Tool (MUT-II)

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

**CAUTION**

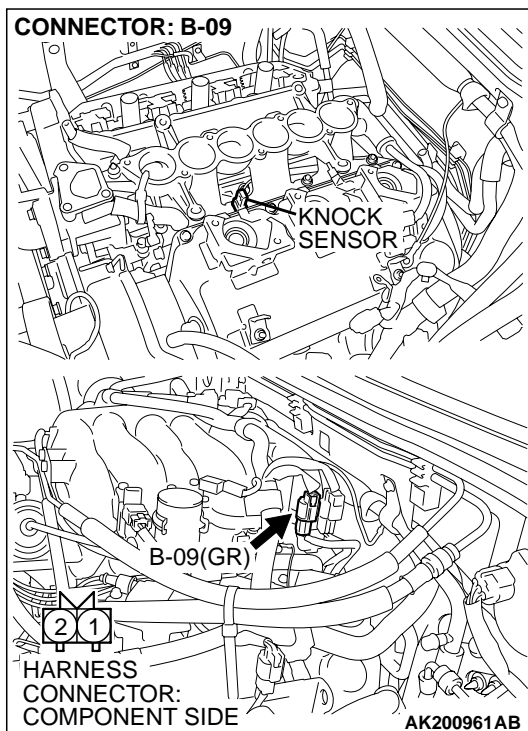
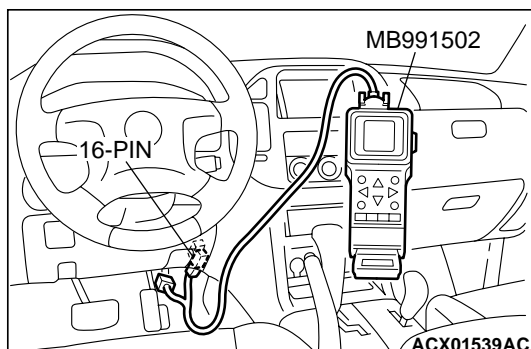
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-22](#).

**NO :** Go to Step 2.

**STEP 2. Check the ignition timing.**

- (1) The ignition timing should retard more when knock sensor connector B-09 is disconnected than when it is connected.

**Q: When the knock sensor connector B-09 was disconnected, was the ignition timing delayed?**

**YES :** Check 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.) got into fuel.

Then confirm that the malfunction symptom is eliminated.

**NO :** Refer to GROUP 13A, DTC P0325 – Knock Sensor Circuit [P.13Ac-354](#).

**INSPECTION PROCEDURE 21: Dieseling (Run-on).****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.

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

**Q: Is DTC set?**

**YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).

**NO** : Go to Step 2.

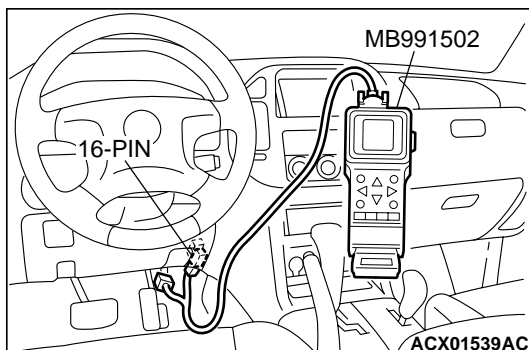
**STEP 2. Check the ignition timing.**

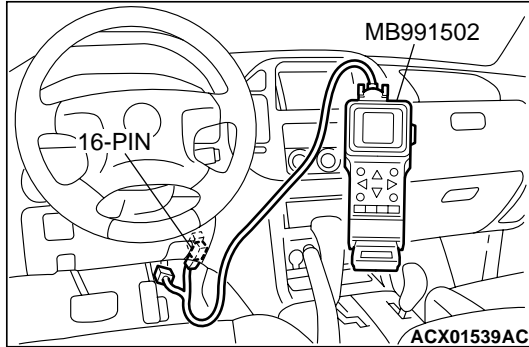
Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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**

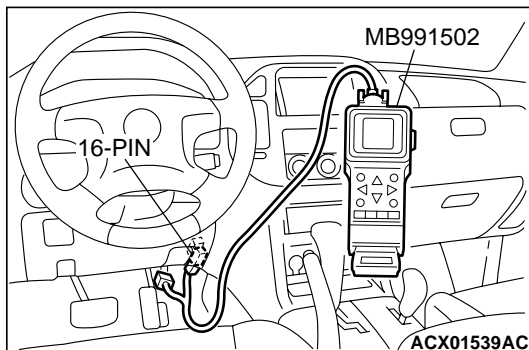
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-29](#).
  - 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 GROUP 13A, Data List Reference Table [P.13Ab-29](#).
  - 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 volts and 0.6 – 1.0 volts 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-13](#).

**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 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.

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

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**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)

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**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 driveability.**

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

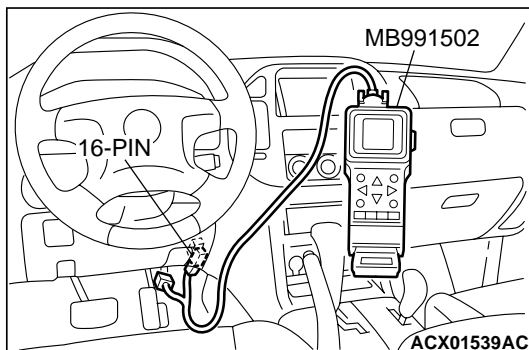
**Q: Is the driveability normal?****YES** : Go to Step 4.**NO** : Refer to GROUP 13A, Trouble Symptom Chart [P.13Ab-26](#).**STEP 4. Using scan tool MB991502, read the diagnostic trouble code (DTC).****⚠ CAUTION**

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

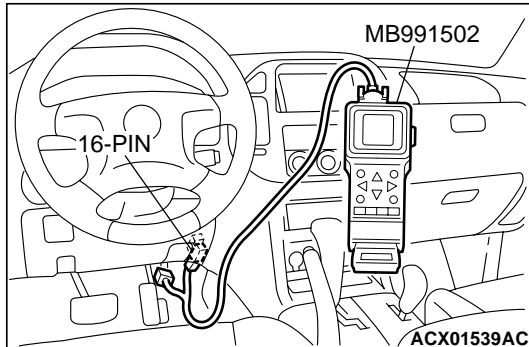
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Read the DTC.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC set?****YES** : Refer to GROUP 13A, Diagnostic Trouble Code Chart [P.13Ab-22](#).**NO** : Go to Step 5.**STEP 5. Check the ignition timing.**

Refer to GROUP 11A, On-vehicle Service – Ignition Timing Check [P.11A-6](#).

**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**

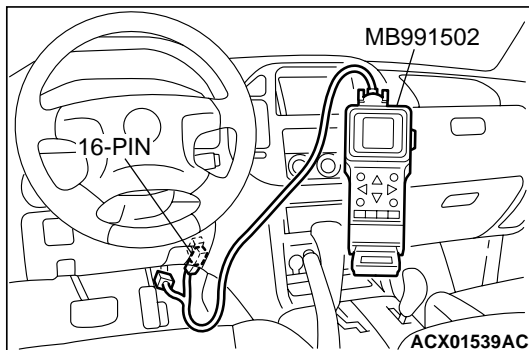
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-29.
  - 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.

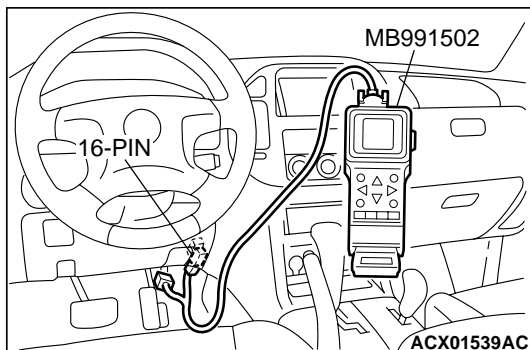
**STEP 7. Using scan tool MB991502, check data list item 39: Heated oxygen sensor bank 1, sensor 1 (right front).**

- (1) Start the engine and run at idle.
- (2) Set scan tool MB991502 to the data reading mode for item 39, Heated Oxygen Sensor bank 1, sensor 1 (right front).
  - Warm up the engine. When the engine is decelerated suddenly from 4,000 r/min, the output voltage should increase from 200 millivolts or less to 600 – 1,000 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-105, DTC P0131 - Heated Oxygen Sensor Low Voltage (bank 1, sensor 1) P.13Ac-120, DTC P0132 - Heated Oxygen Sensor Circuit High Voltage (bank 1, sensor 1) P.13Ac-126, DTC P0133 - Heated Oxygen Sensor Circuit Slow Response (bank 1, sensor 1) P.13Ac-130, DTC P0134 - Heated Oxygen Sensor Circuit No Activity Detected (bank 1, sensor 1) P.13Ac-133.




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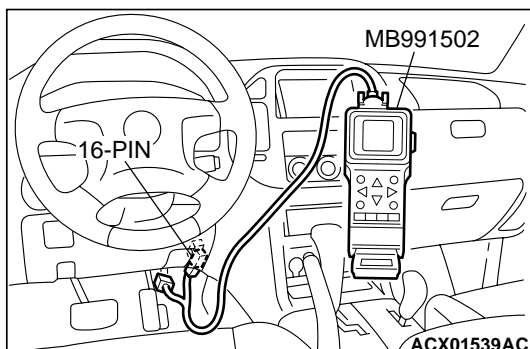
**STEP 8. Using scan tool MB991502, check data list item 11: Heated oxygen sensor bank 2, sensor 1 (left front).**

- (1) Start the engine and run at idle.
- (2) Set scan tool MB991502 to the data reading mode for item 11, Heated Oxygen Sensor bank 2, sensor 1 (left front).
  - Output voltage should be 0.6 – 1.0 volts 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-189](#), DTC P0151 - Heated Oxygen Sensor Circuit Low Voltage (bank 2, sensor 1) [P.13Ac-204](#), DTC P0152 - Heated Oxygen Sensor Circuit High Voltage (bank 2, sensor 1) [P.13Ac-210](#), DTC P0153 - Heated Oxygen Sensor Circuit Slow Response (bank 2, sensor 1) [P.13Ac-214](#), DTC P0154 - Heated Oxygen Sensor Circuit No Activity Detected (bank 2, sensor 1) [P.13Ac-217](#).




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**STEP 9. Using scan tool MB991502, check data list item 39: Heated oxygen sensor bank 1, sensor 1 (right front).**

- (1) Start the engine and run at idle.
- (2) Set scan tool MB991502 to the data reading mode for item 39, Heated Oxygen Sensor bank 1, sensor 1 (right front).
  - Voltage should fluctuate between 0 – 0.4 volts and 0.6 – 1.0 volts 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.

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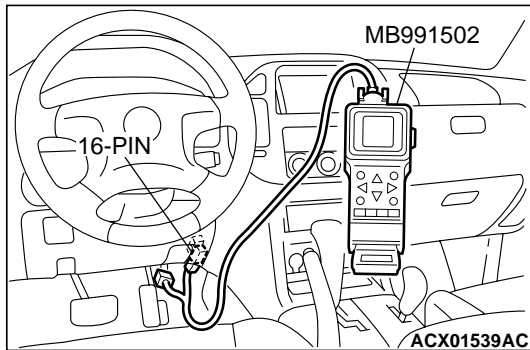
**STEP 10. Check the EGR system.**

Refer to GROUP 17, Emission Control System – General Description (EGR System) [P.17-63](#).

**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: Heated oxygen sensor bank 1, sensor 2 (right rear).**

**⚠ CAUTION**

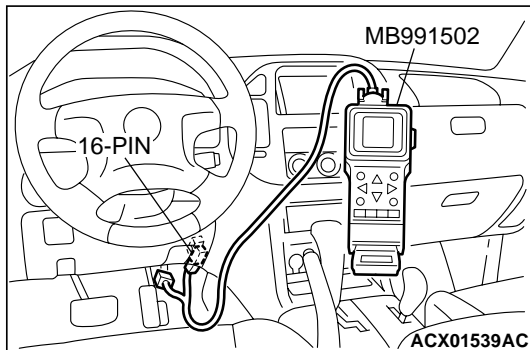
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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, Heated Oxygen Sensor bank 1, sensor 2 (right rear).
  - Average voltage should be 0.6 volts 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: Heated oxygen sensor bank 2, sensor 1 (left front).**

- (1) Start the engine and run at idle.
- (2) Set scan tool MB991502 to the data reading mode for item 11, Heated Oxygen Sensor bank 2, sensor 1 (left front).
  - Warm up the engine. When the engine is decelerated suddenly from 4,000 r/min, the output voltage should increase from 200 millivolts or less to 600 – 1,000 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.

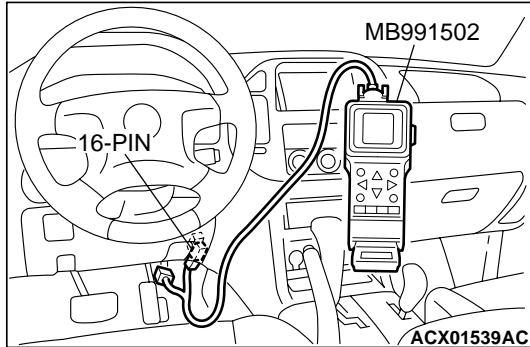
**STEP 13. Check the EGR system.**

Refer to GROUP 17, Emission Control System – General Description (EGR System) [P.17-63](#).

**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: Heated oxygen sensor bank 2, sensor 2 (left 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, Heated Oxygen Sensor bank 2, sensor 2 (left rear).
  - Average voltage should be 0.6 volts 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-13](#).

**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 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 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**

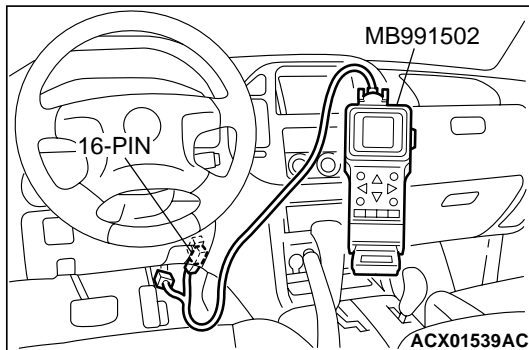
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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-22](#).

**NO :** Refer to GROUP 17, Emission Control System – Purge Control System Check (Purge Flow Check) [P.17-61](#).

**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.17-62](#).

**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.17-63](#).

**Q: Is the evaporative emission ventilation solenoid normal?**

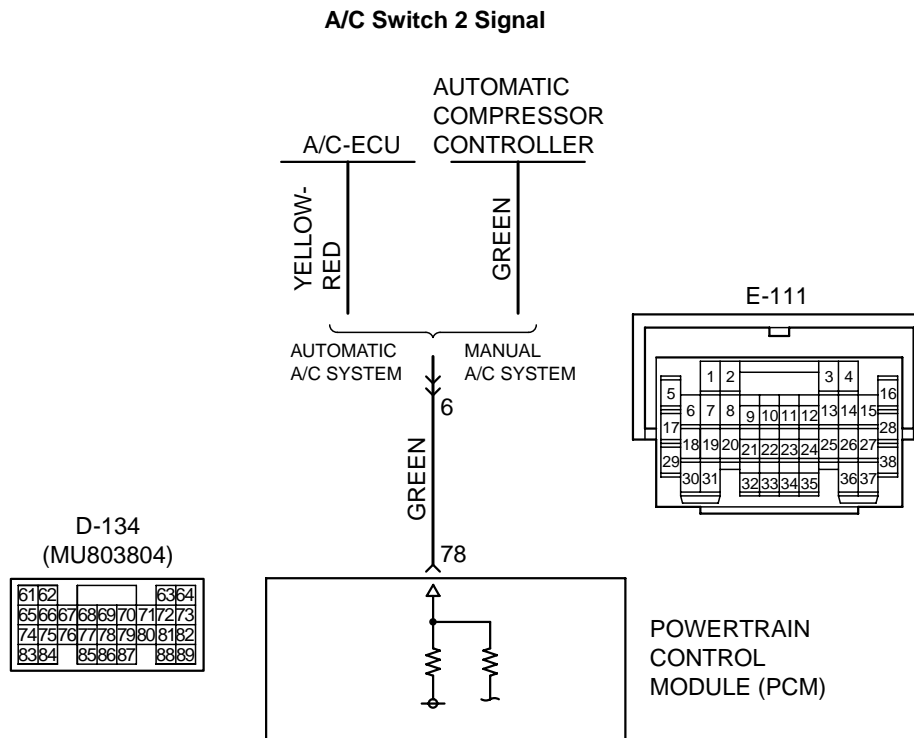
**YES :** Check the following items, and repair or replace the defective items.

- a. Check for leaks from the vapor line or evaporative emission canister.
- b. Check for leaks from the fuel tank.

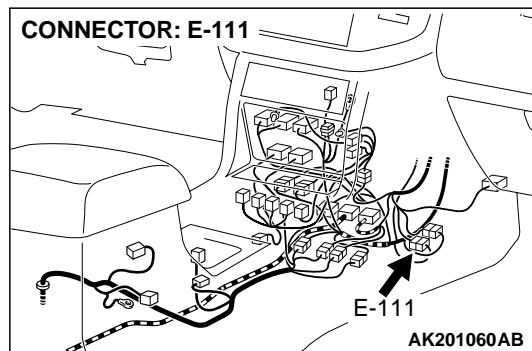
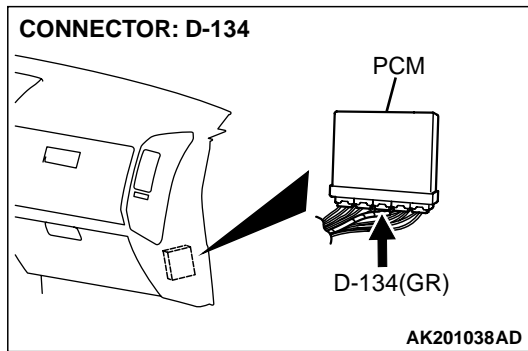
Then confirm that the malfunction symptom is eliminated.

**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)**



AK201155



**CIRCUIT OPERATION**

- The PCM increases the engine idle speed by driving the Throttle actuator control 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. 78, 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.

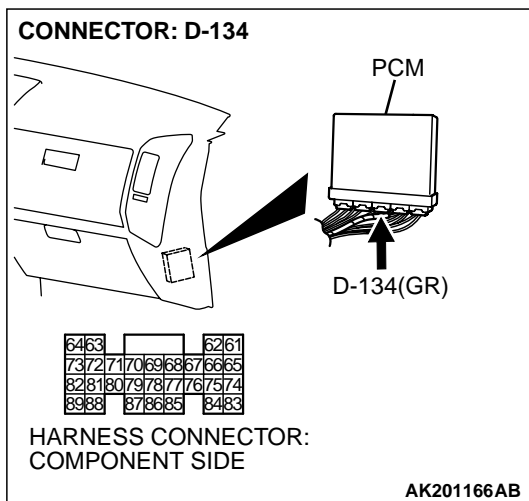
**DIAGNOSIS**

**STEP 1. Check harness connector D-134 at PCM for damage.**

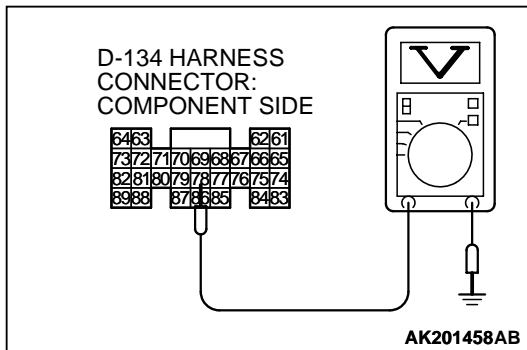
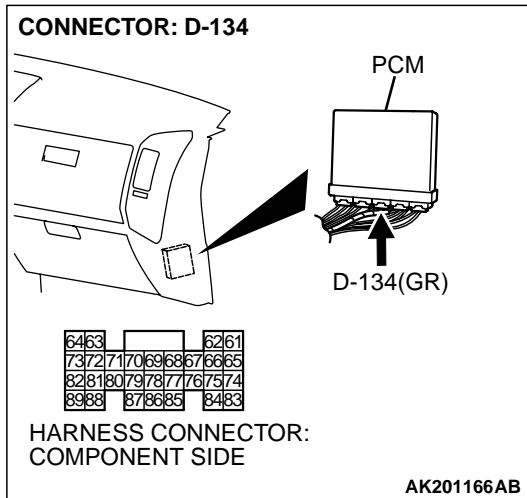
**Q: Is the harness connector in good condition?**

**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 D-134.**

- (1) Disconnect the connector D-134 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. 78 and ground.
  - If atmospheric air temperature is 15°C (59°F) or less, the voltage should be 1 volt or less.
  - If atmospheric air temperature is 18°C (65.4°F) or more, the voltage should be battery positive voltage.
- (5) Turn the A/C switch "OFF".
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the voltage normal?**

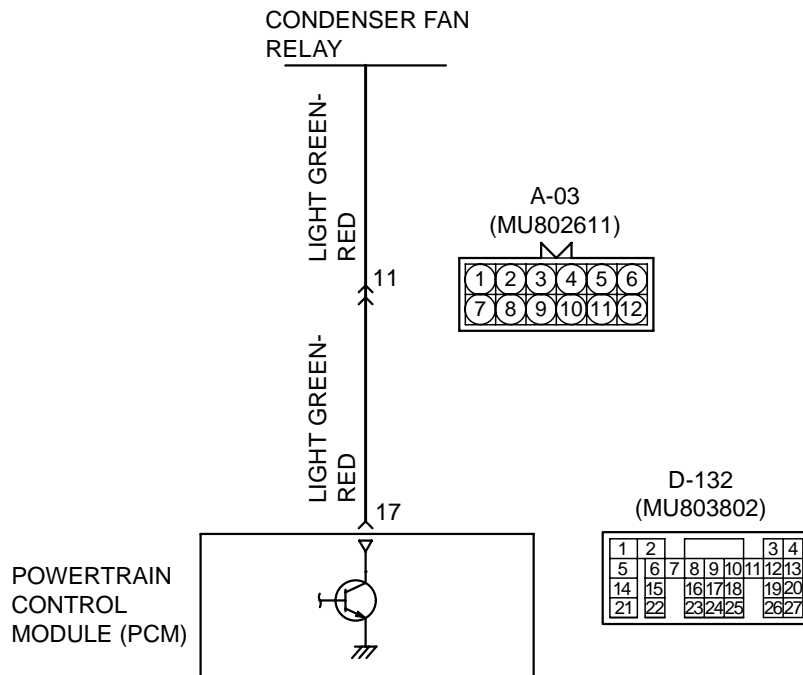
**YES :** Replace the PCM. Then confirm that the malfunction symptom is eliminated.

**NO :** Refer to GROUP 55, Introduction To Heater, Air Conditioning And Ventilation Diagnosis [P.55A-5](#).

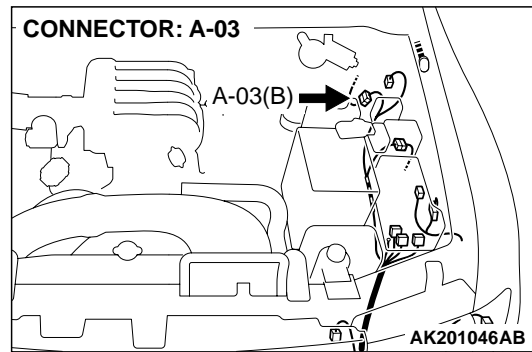
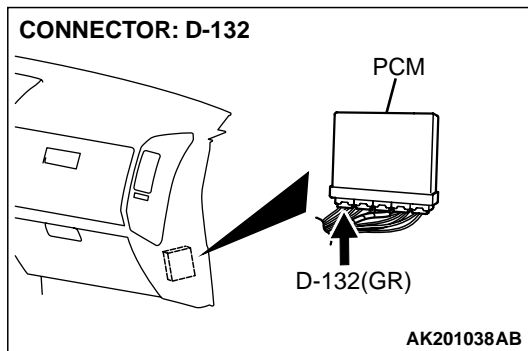


**INSPECTION PROCEDURE 27: A/C condenser fan is inoperative**

**A/C Condenser Fan Circuit**



AK201156



**CIRCUIT OPERATION**

- The battery positive voltage is applied on the PCM (terminal No. 17) 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.

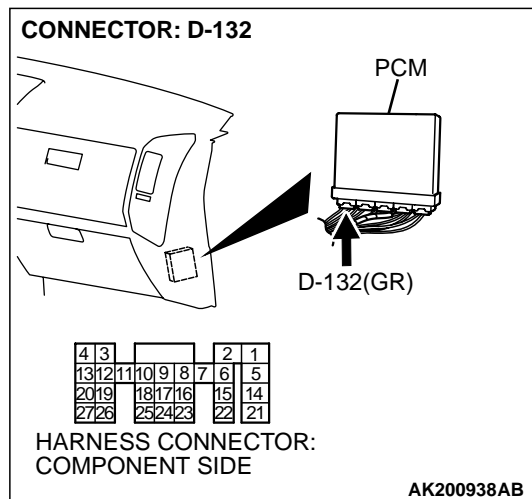
## DIAGNOSIS

**STEP 1. Check harness connector D-132 at PCM for damage.**

**Q: Is the harness connector in good condition?**

**YES :** Go to Step 2.

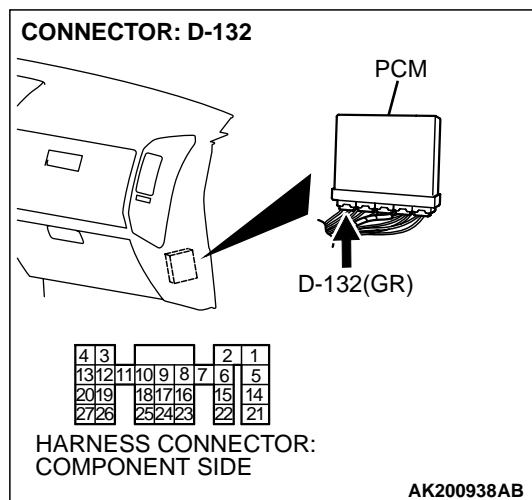
**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then confirm that the malfunction symptom is eliminated.



**STEP 2. Measure the output voltage at PCM harness side connector D-132.**

(1) Disconnect the connector D-132 and measure at the harness side.

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



(3) Measure the voltage between terminal No. 17 and ground.

- Voltage should be battery positive voltage.

(4) Check the condenser fan condition.

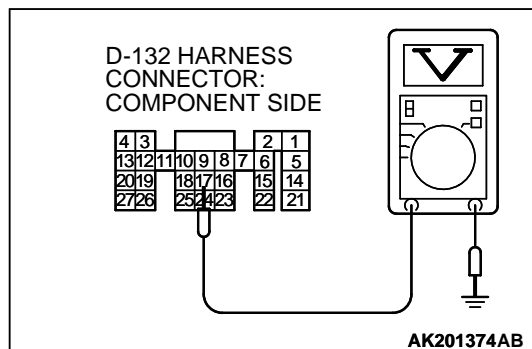
- When the terminal No. 17 is disconnected, the fan should stop.
- When the terminal No. 17 is grounded by the jumper cable, the fan should run.

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

**Q: Is the voltage and fan condition normal?**

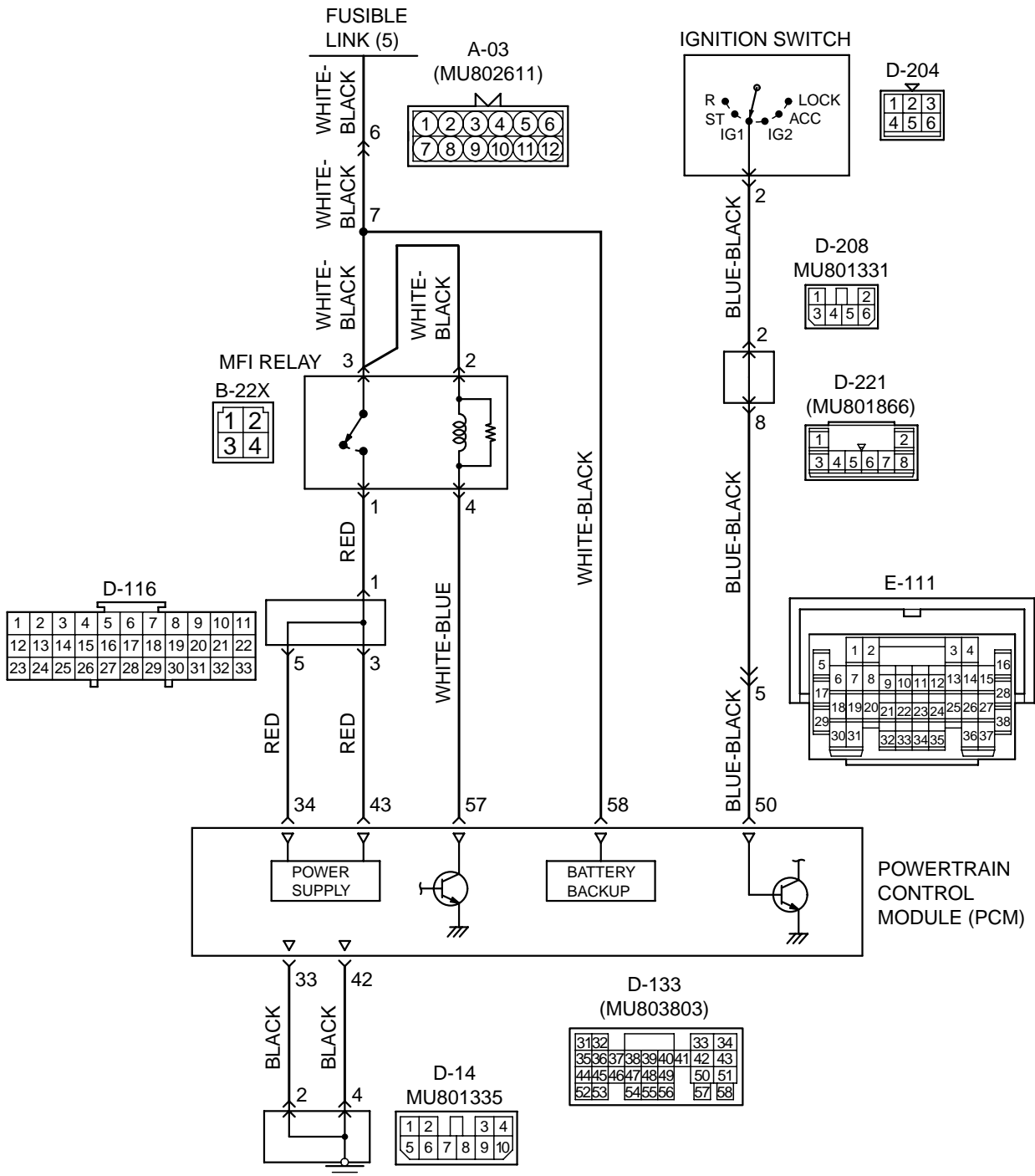
**YES :** Replace the PCM. Then confirm that the malfunction symptom is eliminated.

**NO :** Refer to GROUP 55, Introduction To Heater, Air Conditioning And Ventilation Diagnosis [P.55A-5](#).

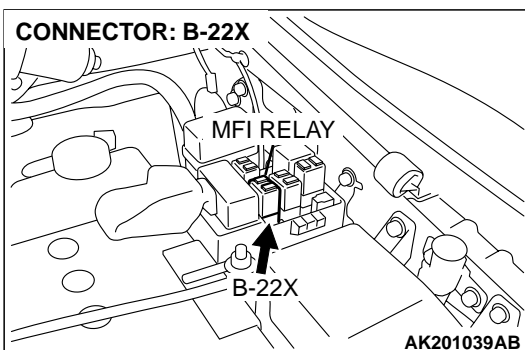
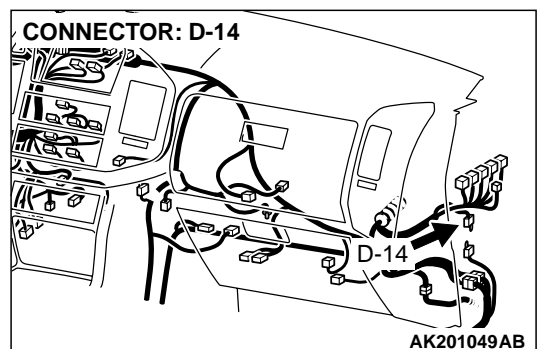
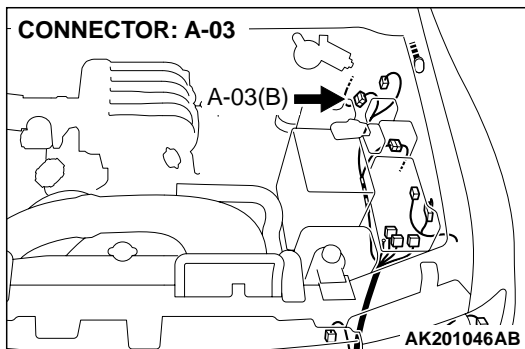
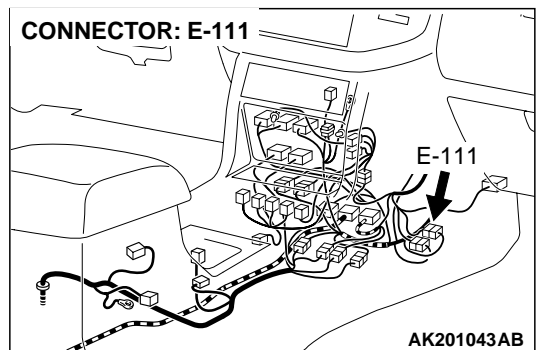
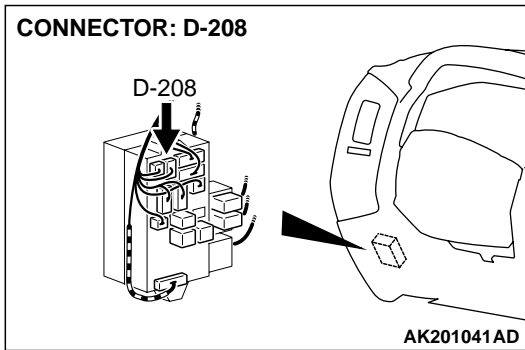
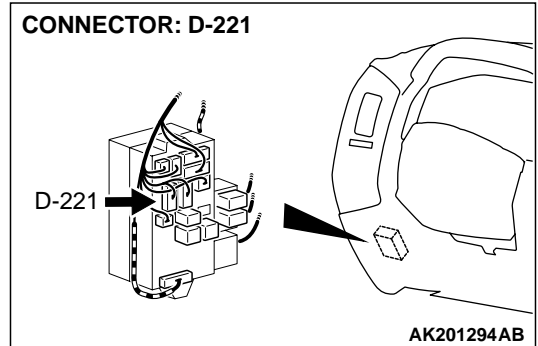
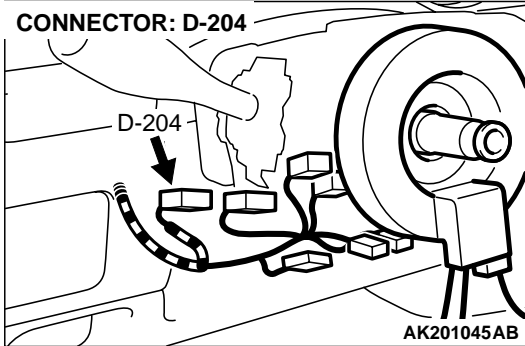
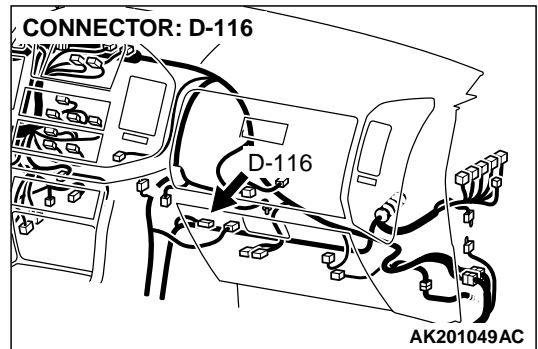
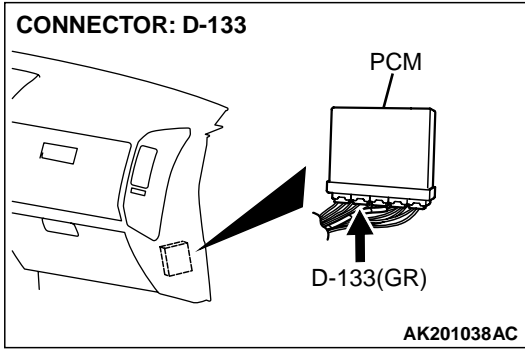


INSPECTION PROCEDURE 28: Power supply system and ignition switch-IG system.

Power Supply and Ignition Switch-IG Circuit



AK201157



**CIRCUIT OPERATION**

- Battery positive voltage is applied to the MFI relay (terminal No. 2, No. 3).
- When the ignition switch is turned to the "ON" position, the battery positive voltage is applied to the PCM (terminal No. 50).

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 (terminal No. 34, No. 43) from the MFI relay (terminal No. 1).

- Battery positive voltage is constantly supplied to the PCM (terminal No. 58) as the backup power.
- The or PCM (terminal No. 33, No. 42) 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.

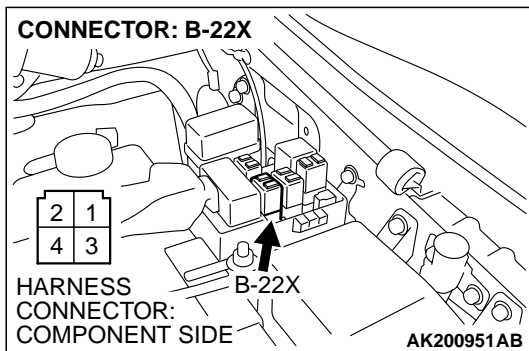
**DIAGNOSIS**

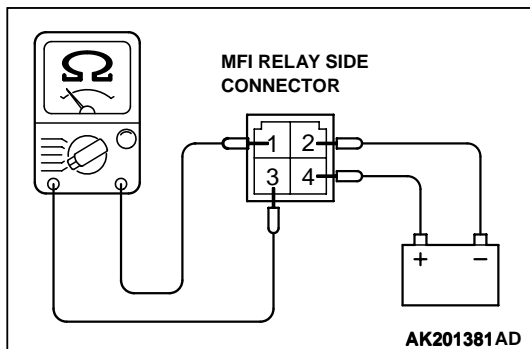
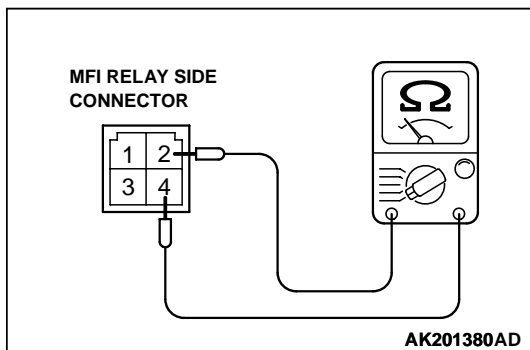
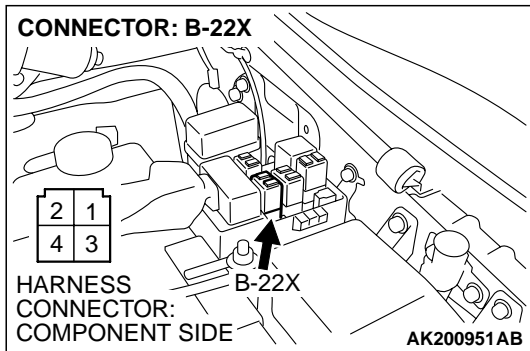
**STEP 1. Check harness connector B-22X at MFI relay for damage.**

**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. 2 to the positive battery terminal and terminal No. 4 to the negative battery terminal.

(4) Check the continuity between the MFI relay terminal No. 1 and No. 3 while connecting and disconnecting the jumper wire at the negative battery terminal.

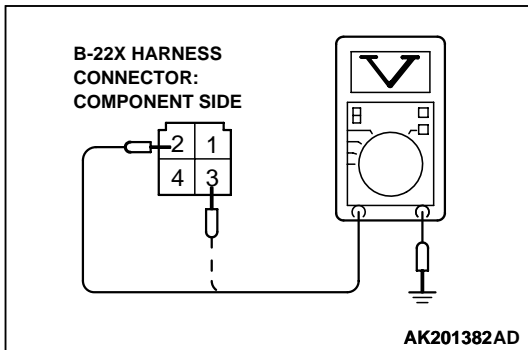
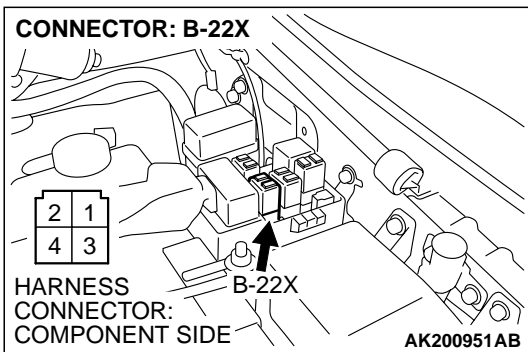
- Should be less than 2 ohms. (Negative battery terminal connected)
- Should be open loop. (Negative battery terminal disconnected)

(5) Install the MFI relay.

**Q: Is the resistance normal?**

**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 B-22X.**

(1) Disconnect the connector B-22X and measure at the harness side.

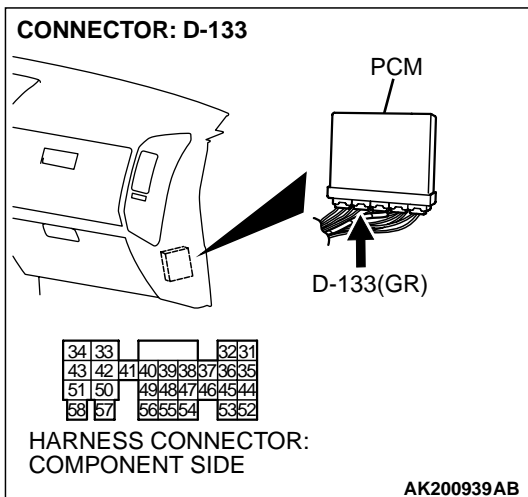
(2) Measure the voltage between terminal No. 2, No. 3 and ground.

- Voltage should be battery positive voltage.

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

**YES :** Go to Step 4.

**NO :** Check harness connector A-03 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector A-03 is in good condition, repair an open circuit between fusible link (5) and MFI relay connector B-22X (terminal No. 2, No. 3). Then confirm that the malfunction symptom is eliminated.

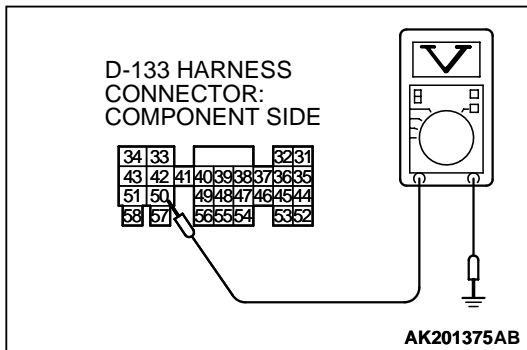
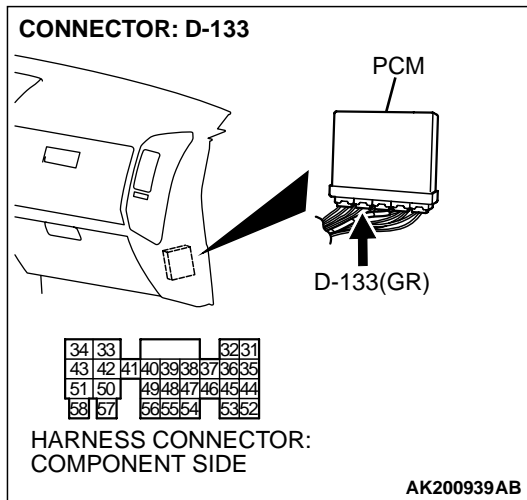


**STEP 4. Check harness connector D-133 at PCM for damage.**

**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 D-133.**

- (1) Disconnect the connector D-133 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

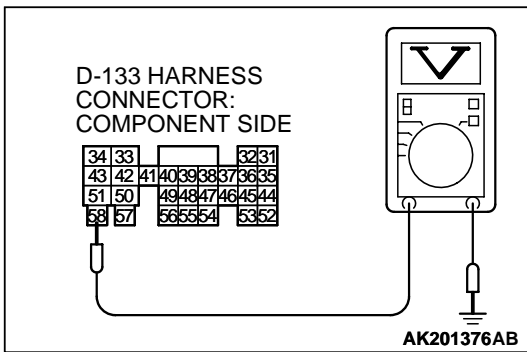
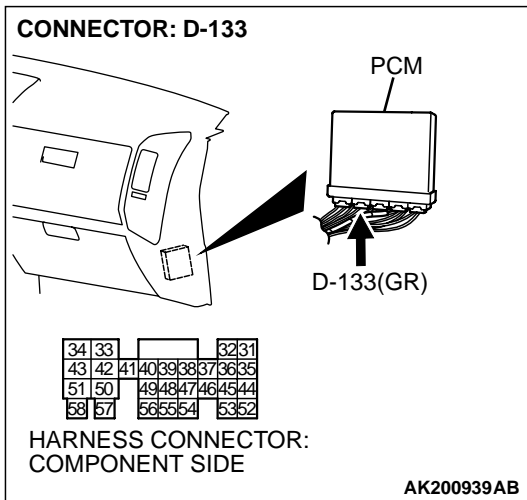
- (3) Measure the voltage between terminal No. 50 and ground.
  - Voltage should be battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 6.

**NO :** Check harness connector E-111, D-02, D-28 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-111, D-02, D-28 are in good condition, repair it because of open circuit between ignition switch connector D-204 (terminal No. 2) and PCM connector D-133 (terminal No. 50). Then confirm that the malfunction symptom is eliminated.





**STEP 6. Measure the backup power supply voltage at PCM harness side connector D-133.**

(1) Disconnect the connector D-133 and measure at the harness side.

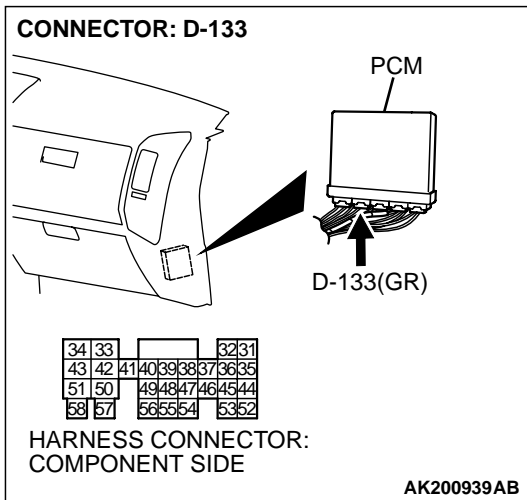
(2) Measure the voltage between terminal No.58 and ground.

- Voltage should be battery positive voltage.

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

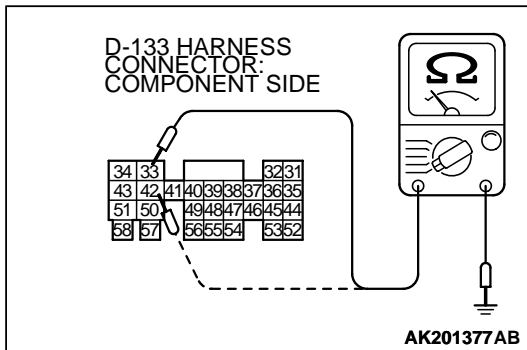
**YES :** Go to Step 7.

**NO :** Check harness connector A-03 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector A-03 is in good condition, repair an open circuit between fusible link (5) and PCM connector D-133 (terminal No. 58). Then confirm that the malfunction symptom is eliminated.



**STEP 7. Check the continuity at PCM harness side connector D-133.**

(1) Disconnect the connector D-133 and measure at the harness side.



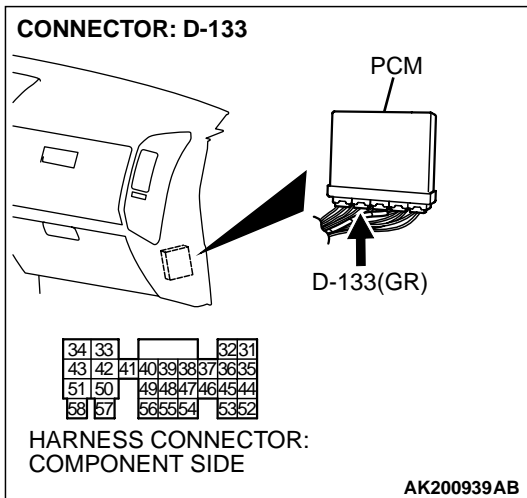
(2) Check for the continuity between terminal No. 33, No. 42 and ground.

- Should be less than 2 ohms.

**Q: Is the continuity normal?**

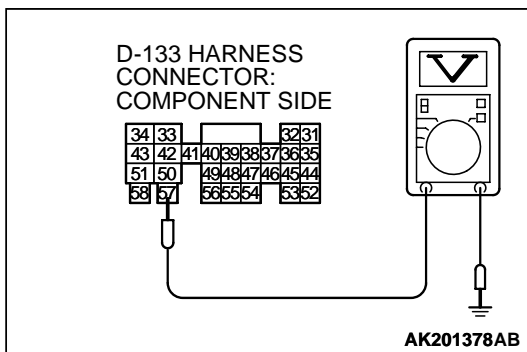
**YES :** Go to Step 8.

**NO :** Check harness connector D-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 D-14 is in good condition, repair an open circuit or harness damage between PCM connector D-133 (terminal No. 33, No. 42) and ground. Then confirm that the malfunction symptom is eliminated.



**STEP 8. Measure the power supply voltage at PCM harness side connector D-133.**

(1) Disconnect the connector D-133 and measure at the harness side.



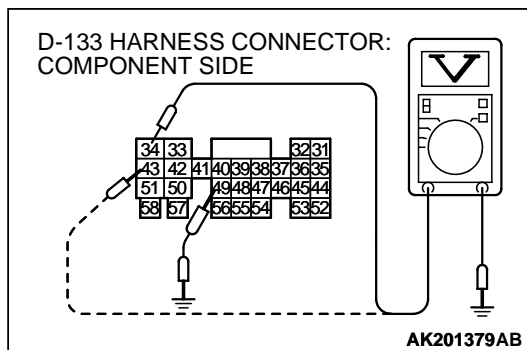
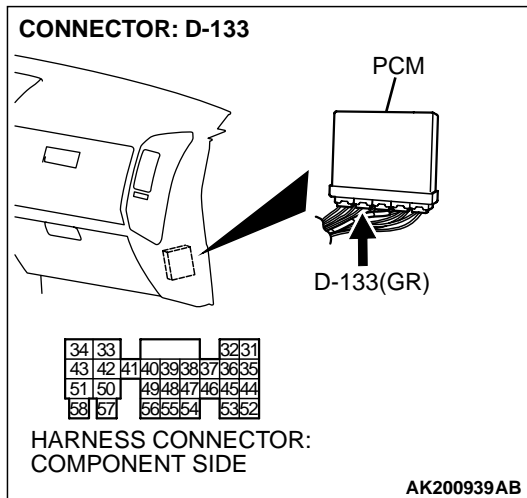
(2) Measure the voltage between terminal No.57 and ground.

- Voltage should be battery positive voltage.

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

**YES :** Go to Step 9.

**NO :** Repair an open circuit between MFI relay connector B-22X (terminal No. 4) and PCM connector D-133 (terminal No. 57). Then confirm that the malfunction symptom is eliminated.



**STEP 9. Measure the power supply voltage at PCM harness side connector D-133.**

- (1) Disconnect the connector D-133 and measure at the harness side.
- (2) Using a jumper wire, connect terminal No. 57 to ground.

- (3) Measure the voltage between terminal No. 34, No. 43 and ground.
  - Voltage should be battery positive voltage.

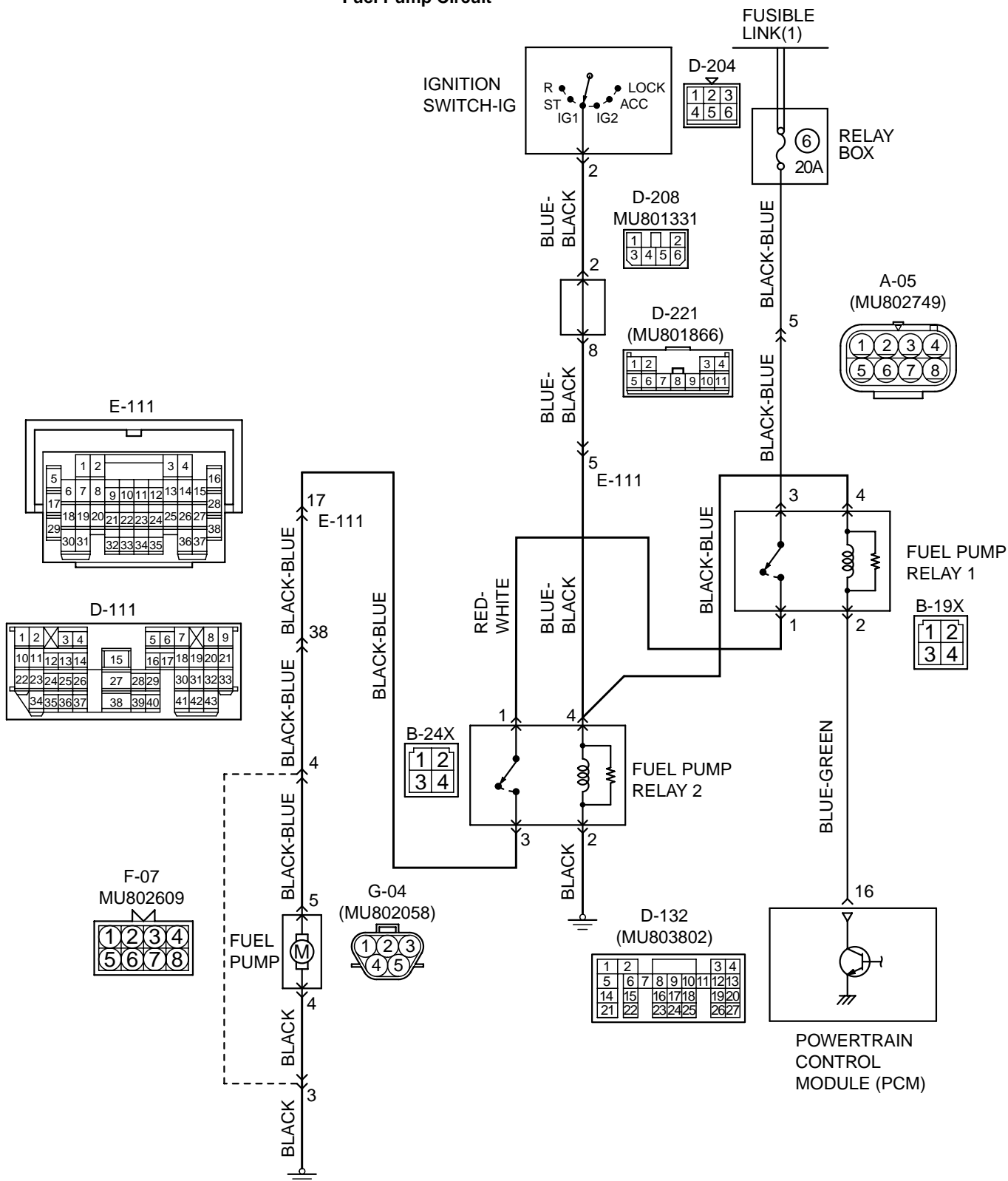
**Q: Is battery positive voltage (approximately 12 volts) present?**

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

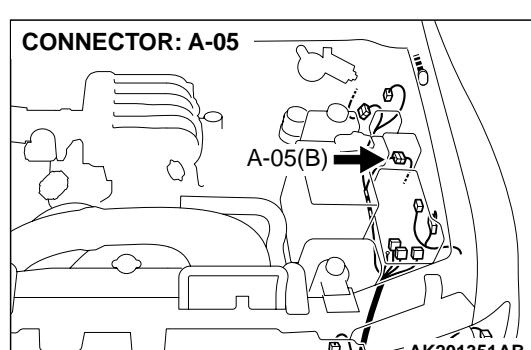
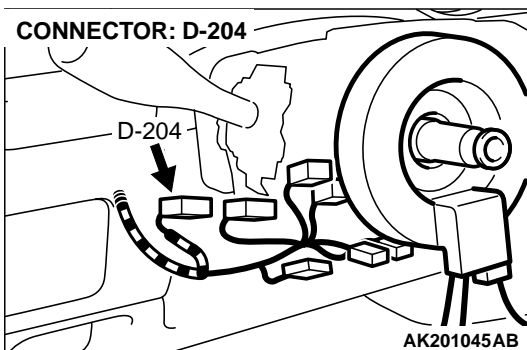
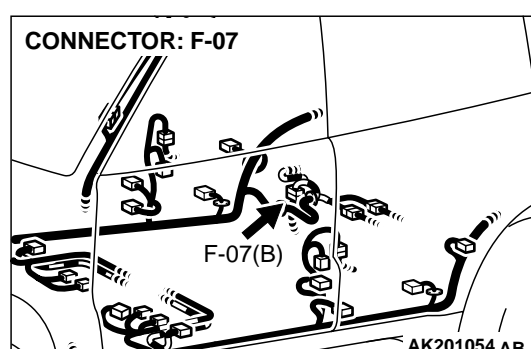
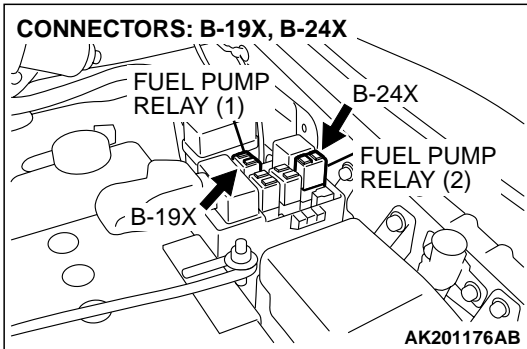
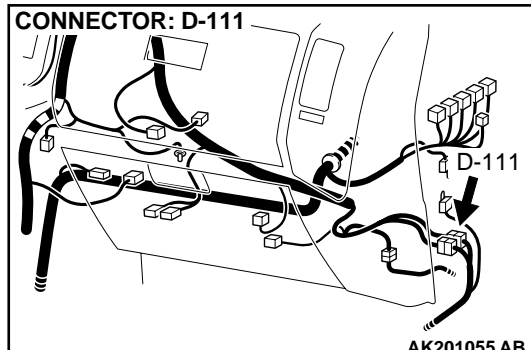
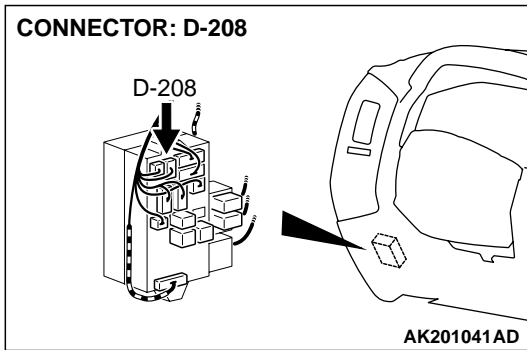
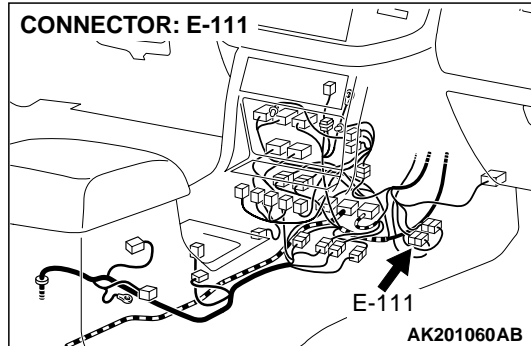
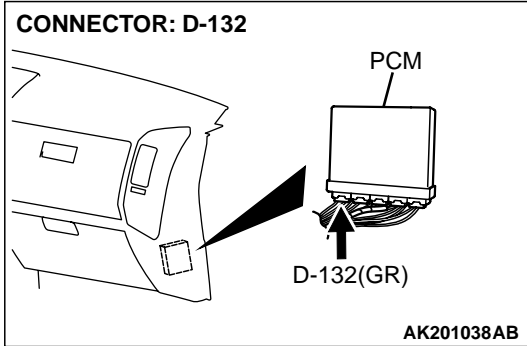
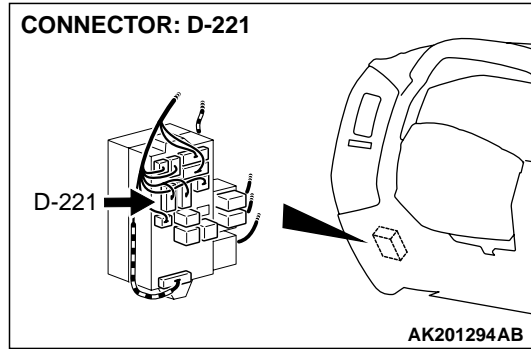
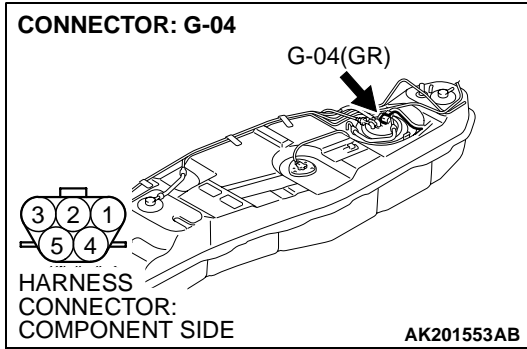
**NO :** Check harness connector D-116 at intermediate connector for damage, and repair or replace as required. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector D-116 is in good condition, repair an open circuit between MFI relay connector B-22X (terminal No. 1) and PCM connector D-133 (terminal No. 34, No. 43). Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 29: Fuel pump system.

Fuel Pump Circuit



AK201158



**CIRCUIT OPERATION**

- Battery positive voltage is applied to the fuel pump relay 2 (terminal No. 4) from the ignition switch-IG.  
Ground is provided through (terminal No. 2) to chassis ground.
- When the ignition switch is turned to the "ON" position, the fuel pump relay 2 turns ON.
- A battery positive voltage is applied on the fuel pump relay 1 (terminal No. 2) 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 1 coil. With this, the fuel pump relay 1 turns ON, and the battery positive voltage is supplied to the fuel pump from the fuel pump relay 1 (terminal No. 1), via fuel pump relay 2.

**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.

**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?**

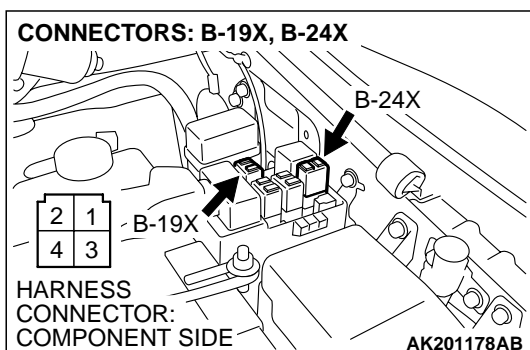
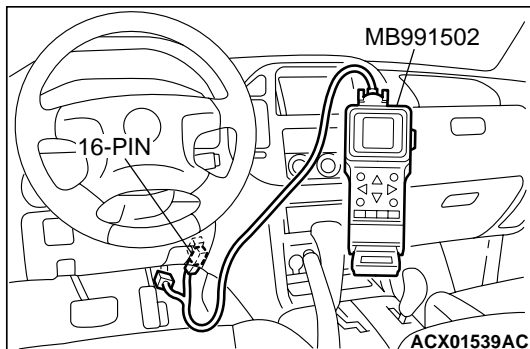
**YES :** That this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points [P.00-6](#).

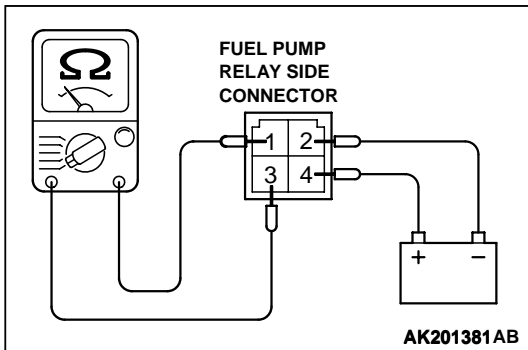
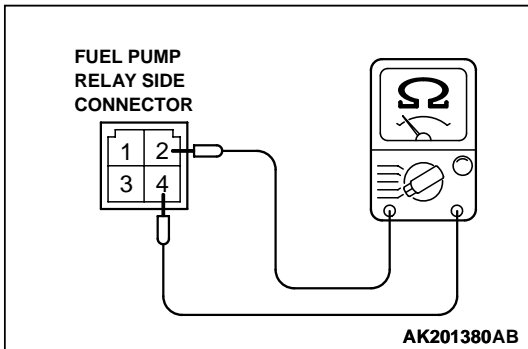
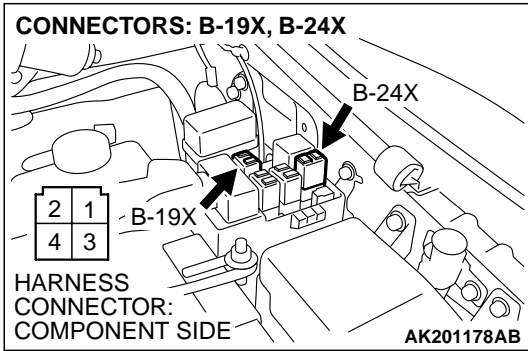
**NO :** Go to Step 2.

**STEP 2. Check connector B-19X at fuel pump relay 1 and connector B-24X at fuel pump relay 2 for damage.****Q: Is the connector in good condition?**

**YES :** Go to Step 3.

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



**STEP 3. Check the fuel pump relay 1 and 2.**

(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)

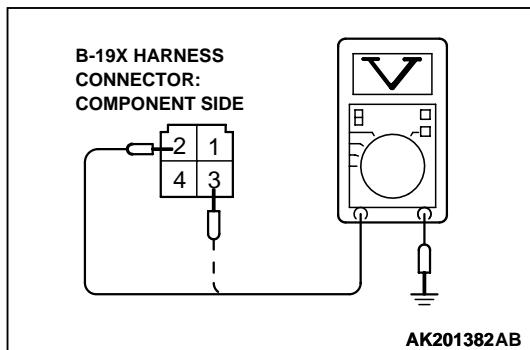
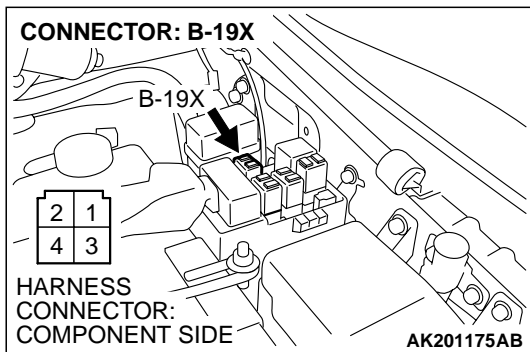
(5) Install the fuel pump relay.

**Q: Is the resistance normal?**

**YES** : Go to Step 4.

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





**STEP 4. Measure the power supply voltage at fuel pump relay 1 harness side connector B-19X.**

(1) Disconnect the connector B-19X and measure at the harness side.

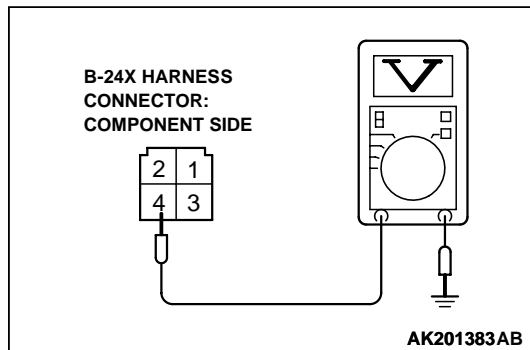
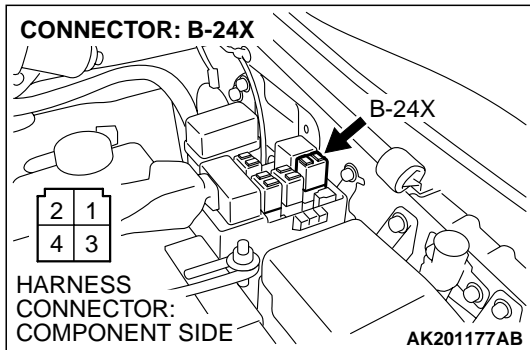
(2) Measure the voltage between terminal No. 3 and ground.

- Voltage should measure battery positive voltage.

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

**YES :** Go to Step 5.

**NO :** Check harness connector A-05 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connectors are in good condition, repair harness wire between fuse box (fuse 6) and fuel pump relay 1 connector B-19X (terminal No. 3) because of open circuit. Then confirm that the malfunction symptom is eliminated.



**STEP 5. Measure the power supply voltage at fuel pump relay 2 harness side connector B-24X.**

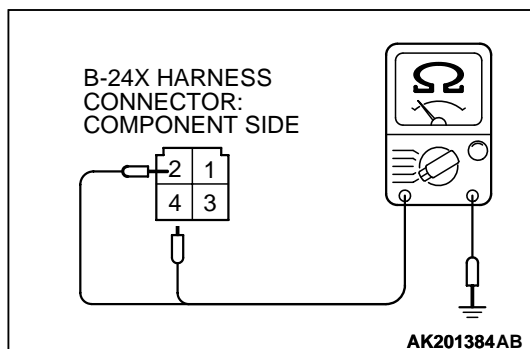
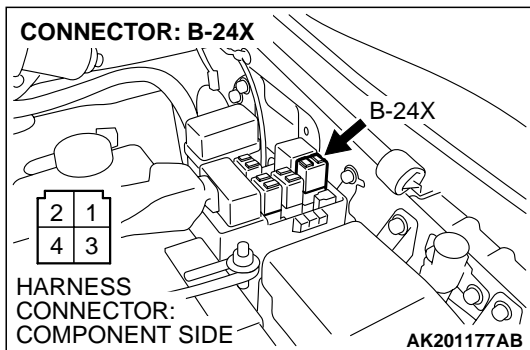
- (1) Disconnect the connector B-24X and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

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

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

**YES :** Go to Step 6.

**NO :** Check harness connectors D-208, D-221, E-111 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector is in good condition, repair harness wire between ignition switch connector D-204 (terminal No. 2) and fuel pump relay 2 connector B-24X (terminal No. 4) because of open circuit. Then confirm that the malfunction symptom is eliminated.



**STEP 6. Check for continuity at fuel pump relay 2 harness side connector B-24X.**

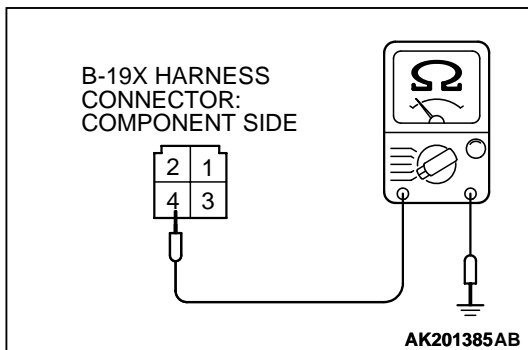
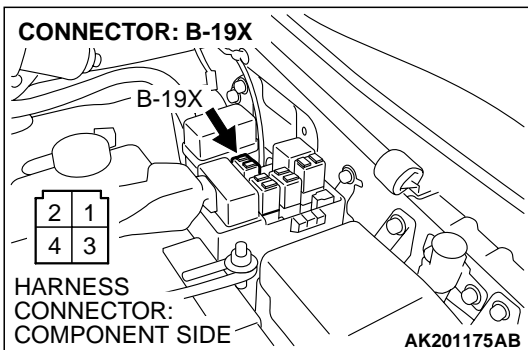
- (1) Disconnect the connector B-24X and measure at the harness side.

- (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 7.

**NO :** Repair harness wire between fuel pump relay 2 connector B-24X (terminal No. 2) and ground because of open circuit. Then confirm that the malfunction symptom is eliminated.



**STEP 7. Measure the power supply voltage at fuel pump relay 1 harness side connector B-19X.**

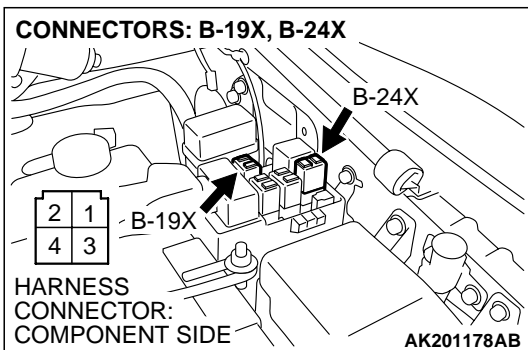
- (1) Disconnect the connector B-19X and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 4 and ground.
  - Voltage should measure battery positive voltage.

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

**YES :** Go to Step 8.

**NO :** Repair harness wire between fuel pump relay 1 connector B-19X (terminal No. 4) and fuel pump relay 2 connector B-24X (terminal No. 4) because of open circuit. Then confirm that the malfunction symptom is eliminated.



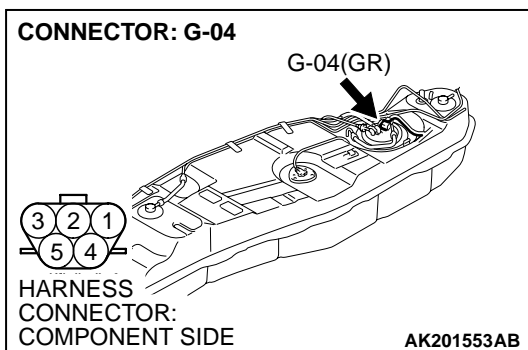
**STEP 8. Check for open circuit and short circuit to ground and harness damage between fuel pump relay 1 connector B-19X (terminal No. 1) and fuel pump relay 2 connector B-24X (terminal No. 1).**

*NOTE: Repair or replace them. After 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.

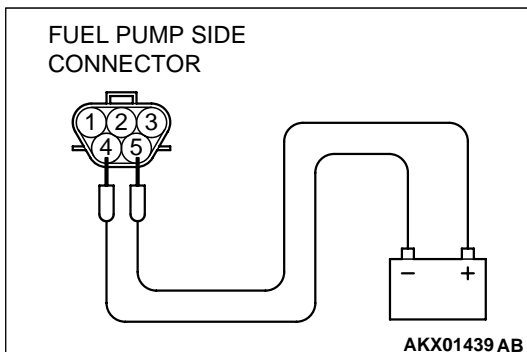
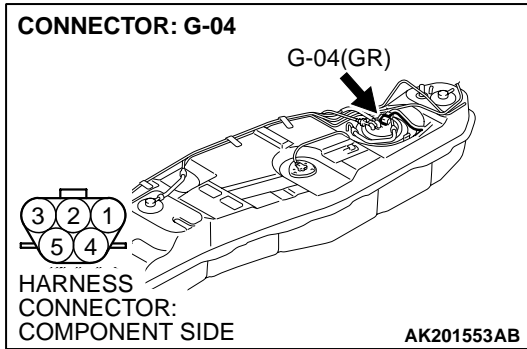


**STEP 9. Check connector G-04 at fuel pump for damage.**

**Q: Is the 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 fuel pump operation.**

(1) Disconnect fuel pump connector G-04.

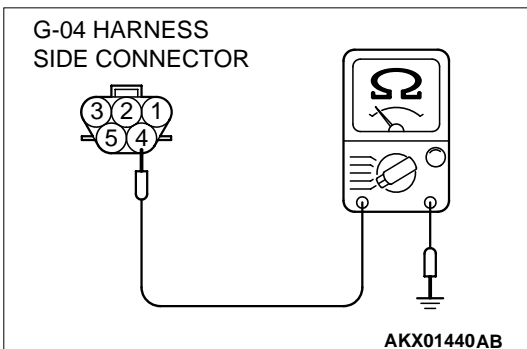
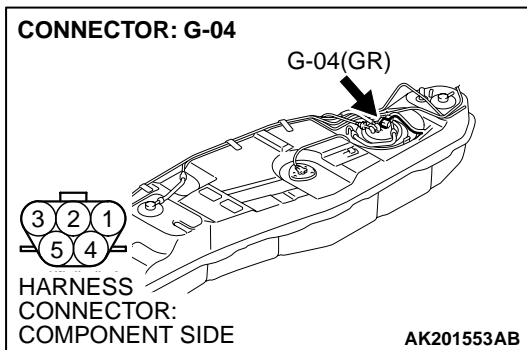
(2) Use jumper wires to connect fuel pump connector terminal No. 5 to the positive battery terminal and terminal No. 4 to the negative battery terminal.

- An operating sound of the fuel pump should be heard.

**Q: Is the fuel pump operating properly?**

**YES :** Go to Step 11.

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

**STEP 11. Check for continuity at fuel pump harness side connector G-04.**

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

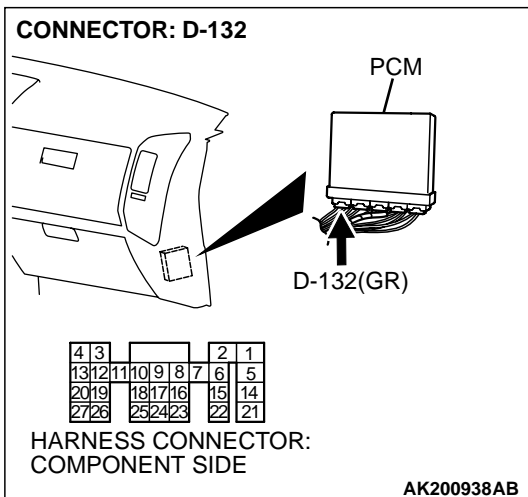
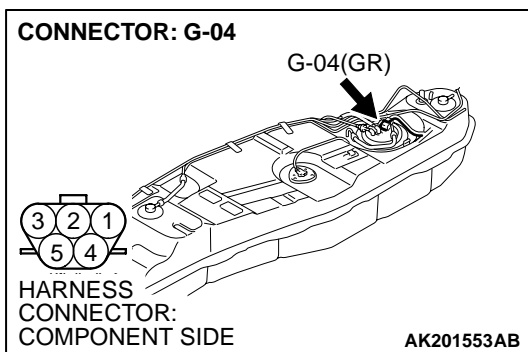
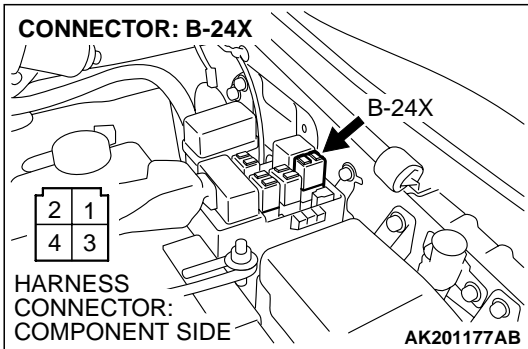
(2) Check for the continuity between terminal No. 4 and ground.

- Should be less than 2 ohms.

**Q: Does continuity exist?**

**YES :** Go to Step 12.

**NO :** Check harness connector F-07 at intermediate connector for damage, and repair or replace as required. Refer to, GROUP 00E, Harness Connector Inspection [P.00E-2](#). If intermediate connector is in good condition, repair harness wire damage between fuel pump connector G-04 (terminal No. 4) and ground because of open circuit or harness damage. Then confirm that the malfunction symptom is eliminated.



**STEP 12. Check for open circuit and short circuit to ground and harness damage between fuel pump relay 2 connector B-24X (terminal No. 3) and fuel pump connector G-04 (terminal No. 5).**

*NOTE: Check harness after checking intermediate connectors D-111, E-111, F-07. If intermediate connectors are damaged, repair or replace them. After 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 13.

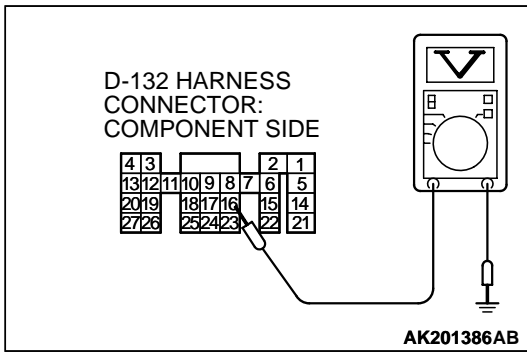
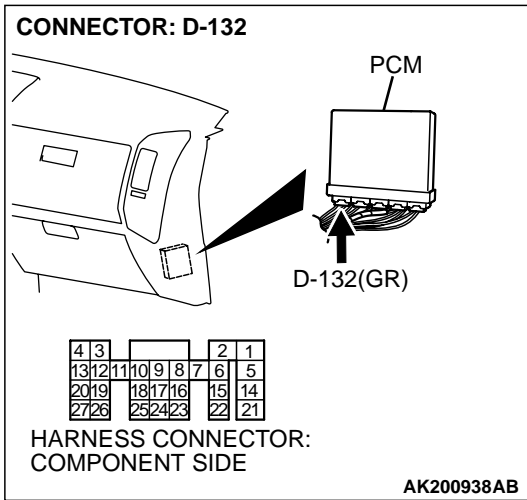
**NO :** Repair it. Then confirm that the malfunction symptom is eliminated.

**STEP 13. Check connector D-132 at PCM for damage.**

**Q: Is the 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. Measure the power supply voltage at PCM connector D-132.**

- (1) Disconnect the connector D-132 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

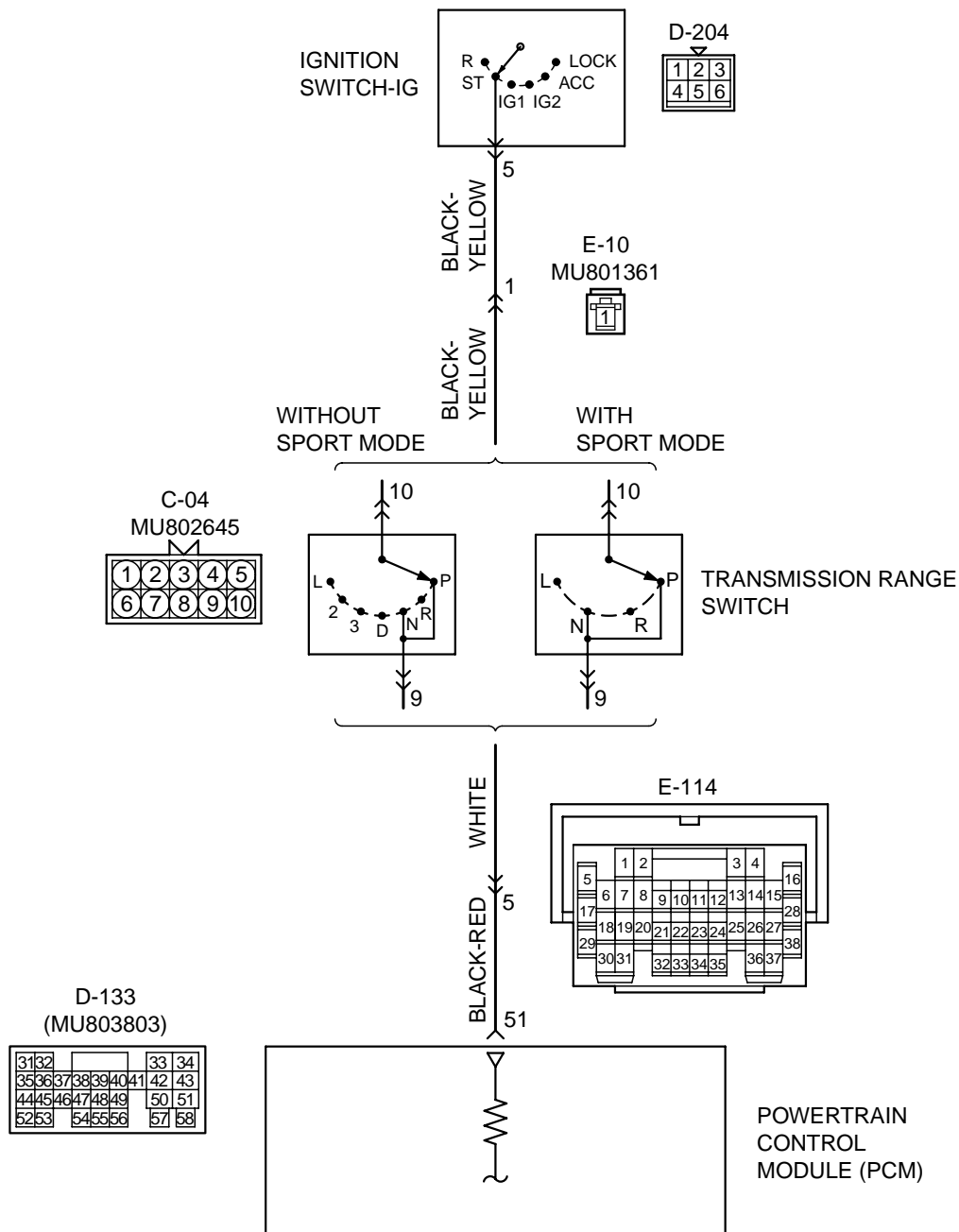
- (3) Measure the voltage between terminal No. 16 and ground.
  - Voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

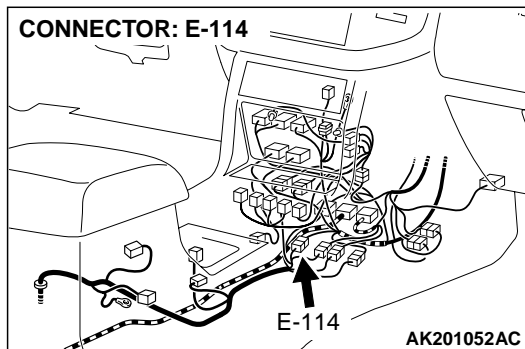
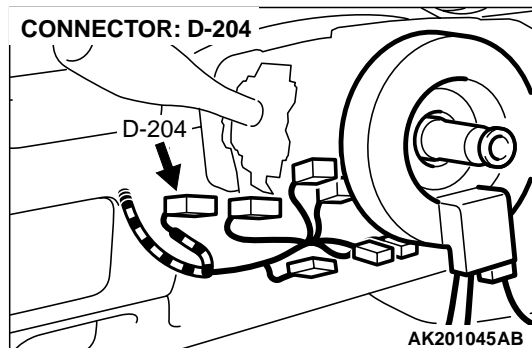
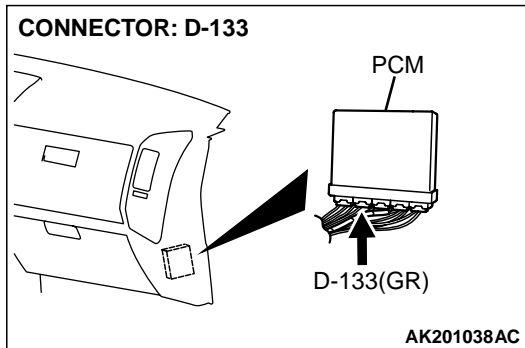
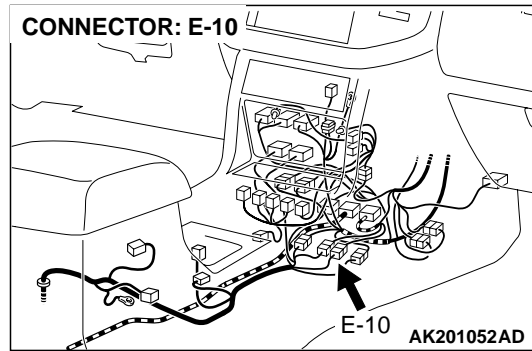
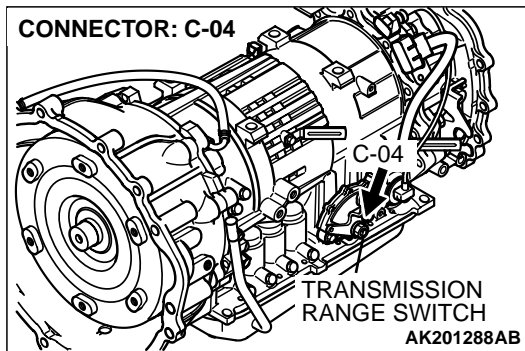
- YES :** Replace the PCM. Then confirm that the malfunction symptom is eliminated.
- NO :** Repair harness wire between fuel pump relay 1 connector B-19X (terminal No. 2) and PCM connector D-132 (terminal No. 16) because of open circuit. Then confirm that the malfunction symptom is eliminated.

INSPECTION PROCEDURE 30: Ignition Switch-ST System and Transmission Range Switch System

Ignition Switch-ST and Transmission Range Switch Circuit



AK201159

**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. 51) through the ignition switch and transmission range switch. Because of this, the PCM detects that the engine is cranking.
- The transmission range switch detects the transmission range (P, N or other ranges) and converts it to a voltage signal (high or low). Then the transmission range switch sends that signal to the PCM.

If the selector lever is moved to "P" or "N" range with the ignition switch turned on (except "START" position), continuity will exist between the PCM and ground through the transmission range switch and starter motor. The terminal voltage of the PCM will become low. If the selector lever is moved to the other ranges, continuity will be lost between the PCM and ground. The terminal voltage of the PCM will become high.

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

- Malfunction of the ignition switch.
- Malfunction of the transmission range switch.
- Improper connector contact, open circuit or short-circuit in the harness wire.
- Malfunction of the PCM.



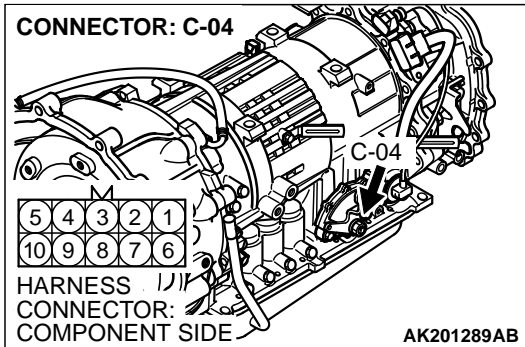
## DIAGNOSIS

### STEP 1. Check connector C-04 at transmission range switch 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 transmission range switch.

Refer to GROUP 23A, On-vehicle Service – Essential Service – Transmission Range Switch Continuity Check [P.23Aa-20](#).

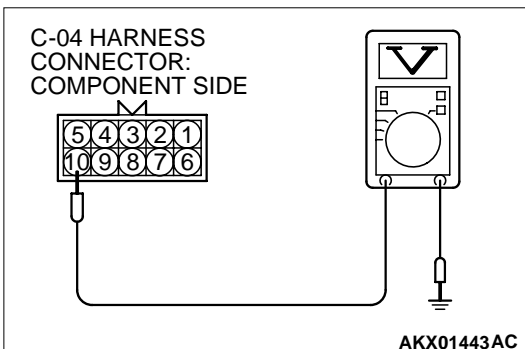
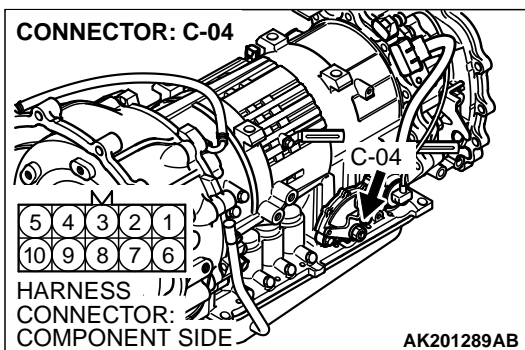
**Q: Are there any abnormalities?**

**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 transmission range switch connector C-04.

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

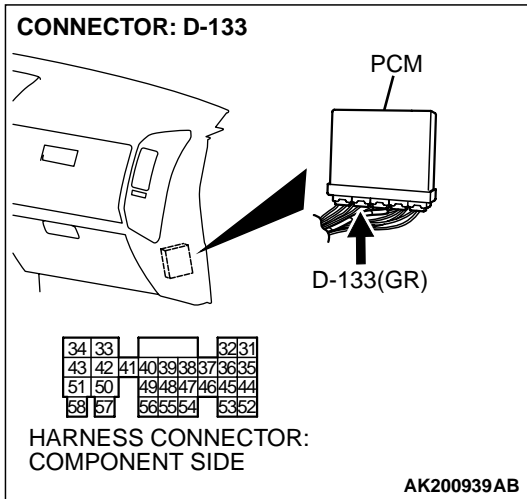


- (3) Measure the voltage between terminal No. 10 and ground.
  - Voltage should be battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 4.

**NO :** Check connector E-10 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-204 (terminal No. 5) and transmission range switch connector C-04 (terminal No. 10) because of open circuit. Then confirm that the malfunction symptom is eliminated.

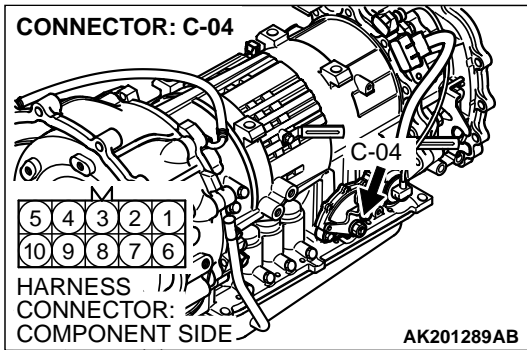


**STEP 4. Check connector D-133 at PCM for damage.**

**Q: Is the connector in good condition?**

**YES :** Go to Step 5.

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

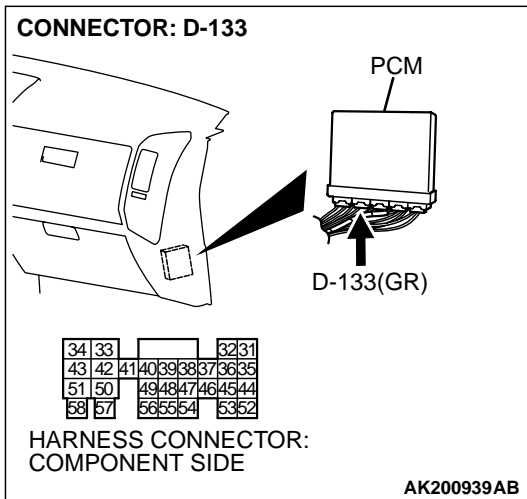


**STEP 5. Check for open circuit and short circuit to ground and harness damage between transmission range switch connector C-04 (terminal No. 9) and PCM connector D-133 (terminal No. 51).**

**Q: Is the harness wire in good condition?**

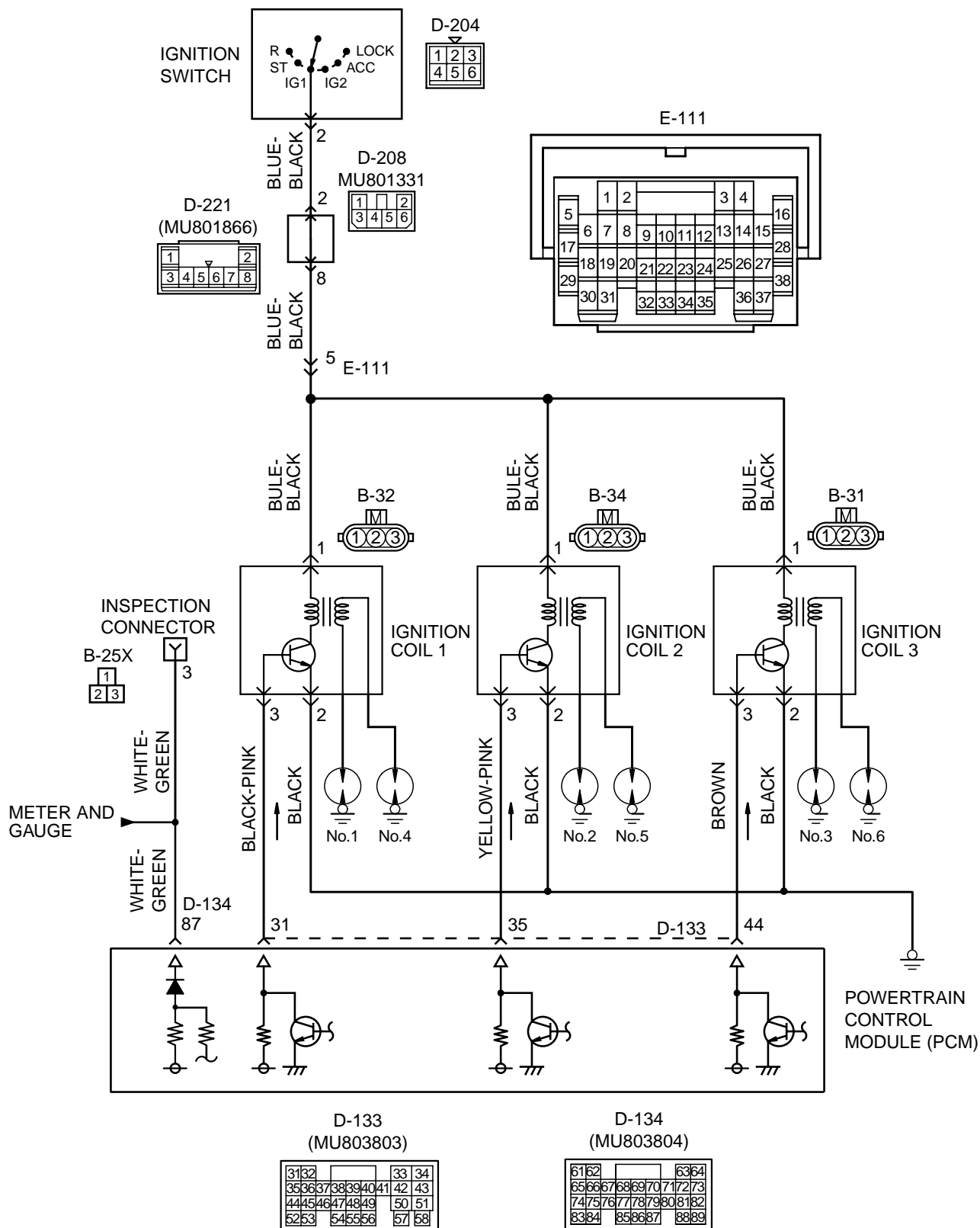
**YES :** Replace the PCM. Then confirm that the malfunction symptom is eliminated.

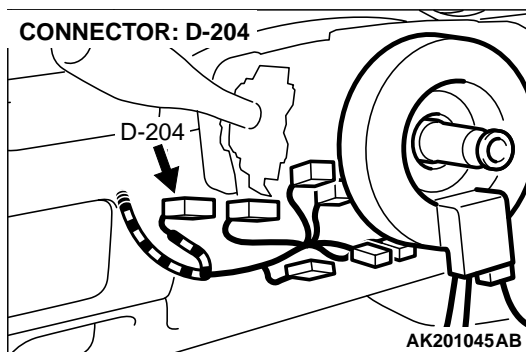
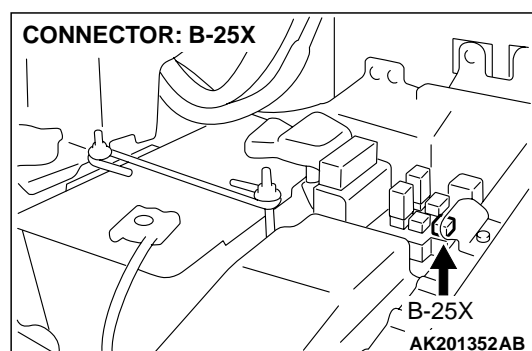
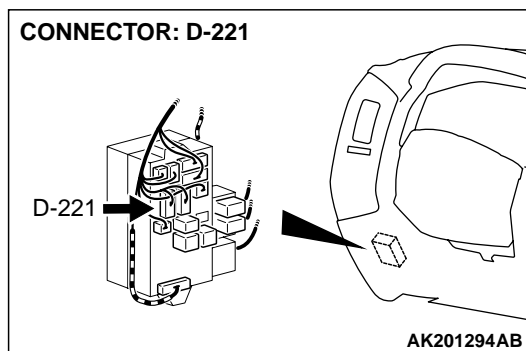
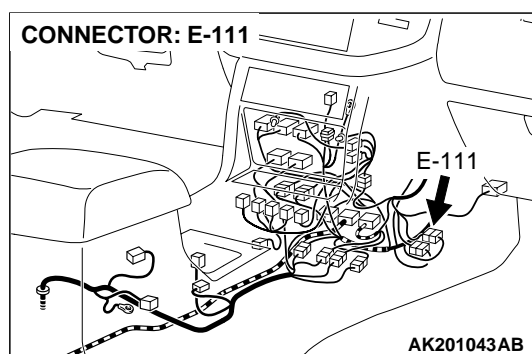
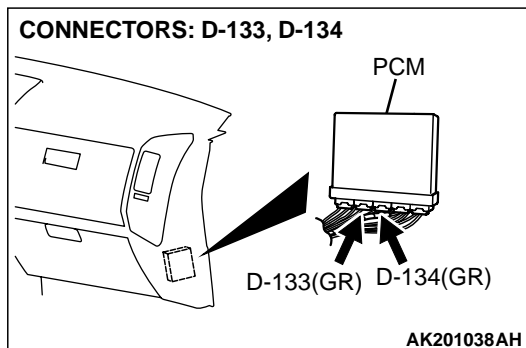
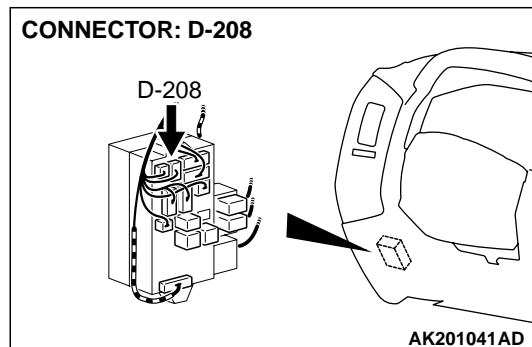
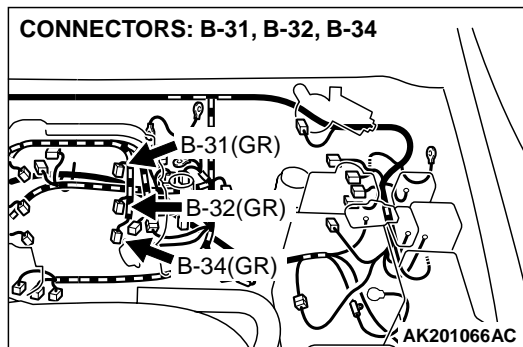
**NO :** Repair it. Then confirm that the malfunction symptom is eliminated.



INSPECTION PROCEDURE 31: Ignition Circuit System.

Ignition Circuit





### CIRCUIT OPERATION

- The ignition coil is energized by Battery positive voltage from the ignition switch.
- When the PCM turns off its internal power transistor, battery positive voltage is applied to the ignition power transistor (terminal No. 3) inside the ignition coil, causing the ignition power transistor to be turned on.
- If the ignition power transistor is turned on, the primary circuit of the ignition coil is energized by grounding the ignition coil through terminal No. 2, causing the primary current to flow to the ignition coil.

**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 the ignition coil.**

Refer to GROUP 16, Ignition System – On-vehicle service – Ignition Coil Check [P.16-29](#).

**Q: Are there any abnormalities?**

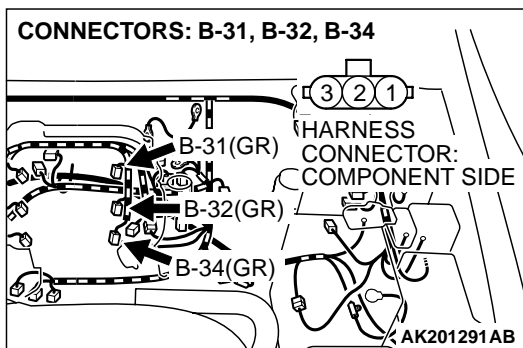
**YES** : Go to Step 2.

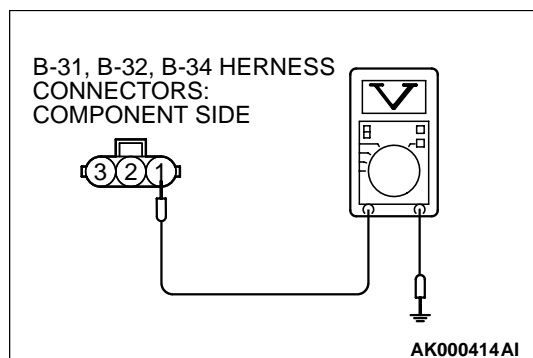
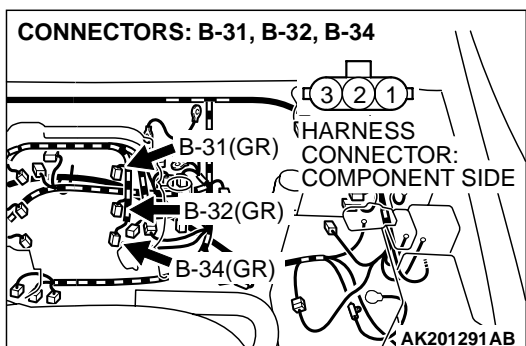
**NO** : Replace the ignition coil. Then confirm that the malfunction symptom is eliminated.

**STEP 2. Check harness connectors B-31, B-32, B-34 at ignition coil 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. Measure the power supply voltage at ignition coil connectors B-31, B-32, B-34.**

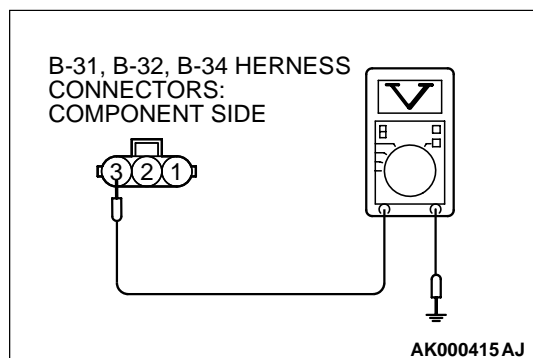
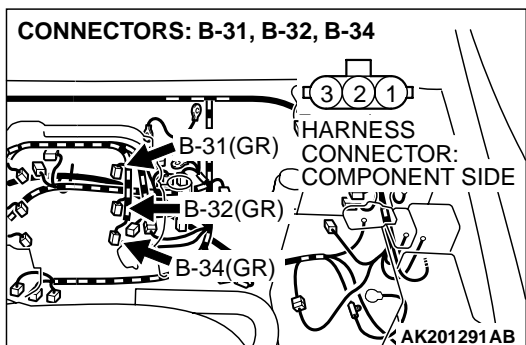
- (1) Disconnect the connector B-31, B-32, B-34 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 1 and ground.
  - Voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 4.

**NO :** Check the connectors D-208, D-221, E-111 at intermediate connectors 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-204 (terminal No. 2) and ignition coil connector B-31, B-32, B-34 (terminal No. 1) because of open circuit. Then confirm that the malfunction symptom is eliminated.



**STEP 4. Check the circuit at ignition coil harness side connectors B-31, B-32, B-34.**

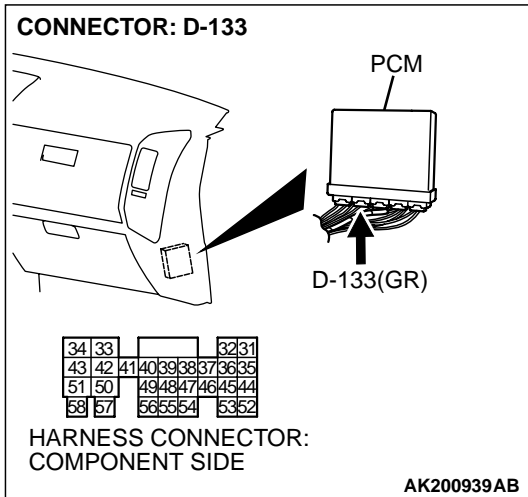
- (1) Disconnect the connectors B-31, B-32, B-34 and measure at the harness side.
- (2) Engine cranking.

- (3) Measure the voltage between terminal No. 3 and ground.
  - Voltage should measure 0.3 and 3.0 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 0.3 and 3.0 volts?**

**YES :** Go to Step 7.

**NO :** Go to Step 5.

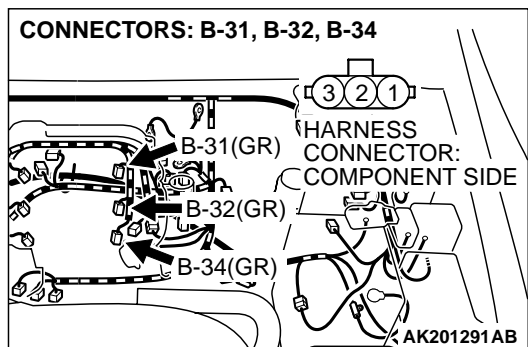


**STEP 5. Check connector D-133 at PCM for damage.**

**Q: Is the 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.



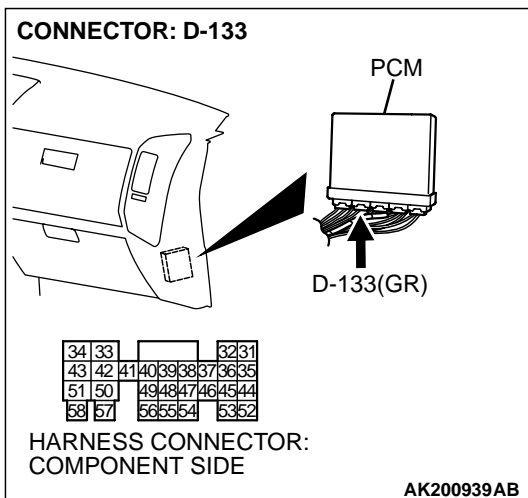
**STEP 6. Check for open circuit and short circuit to ground between ignition coil connector and PCM connector.**

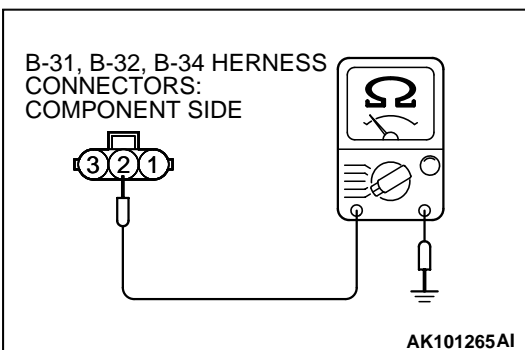
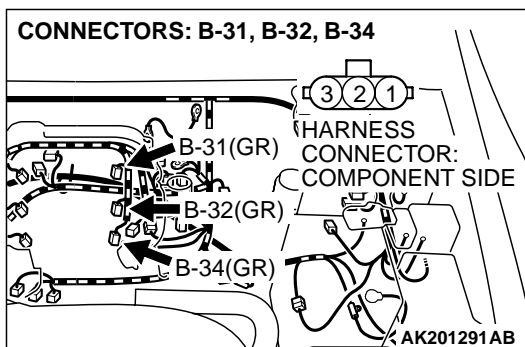
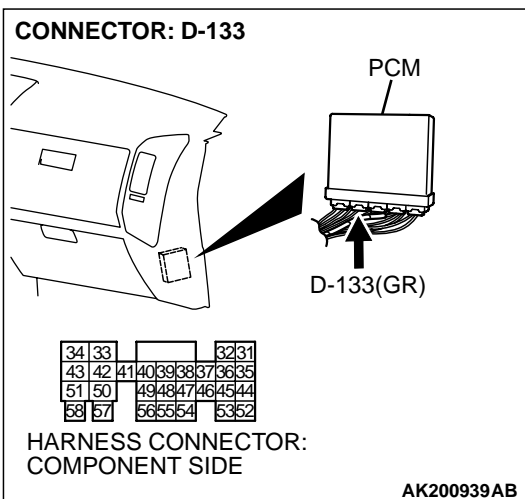
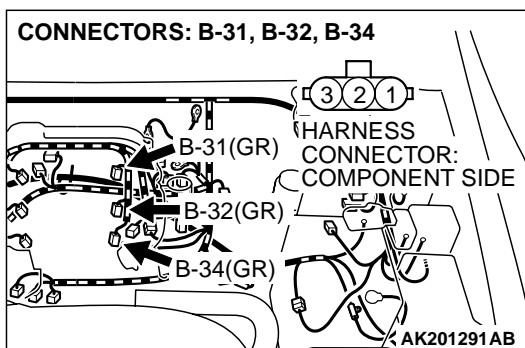
- Check the harness wire between ignition coil connector B-32 (terminal No. 3) and PCM connector D-133 (terminal No. 31) when checking ignition coil 1.
- Check the harness wire between ignition coil connector B-34 (terminal No. 3) and PCM connector D-133 (terminal No. 35) when checking ignition coil 2.
- Check the harness wire between ignition coil connector B-31 (terminal No. 3) and PCM connector D-133 (terminal No. 44) when checking ignition coil 3.

**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 7. Check for harness damage between ignition coil connector and PCM connector.**

- Check the harness wire between ignition coil connector B-32 (terminal No. 3) and PCM connector D-133 (terminal No. 31) when checking ignition coil 1.
- Check the harness wire between ignition coil connector B-34 (terminal No. 3) and PCM connector D-133 (terminal No. 35) when checking ignition coil 2.
- Check the harness wire between ignition coil connector B-31 (terminal No. 3) and PCM connector D-133 (terminal No. 44) when checking ignition coil 3.

**Q: Is the harness wire in good condition?**

**YES :** Go to Step 8.

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

**STEP 8. Check for continuity at ignition coil harness side connectors B-31, B-32, B-34.**

- Disconnect the connectors B-31, B-32, B-34 and measure at the harness side.

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

**Q: Does continuity exist?**

**YES :** Go to Step 9.

**NO :** Repair harness wire between ignition coil connectors B-31, B-32, B-34 (terminal No. 2) and ground because of open circuit or harness damage. Then confirm that the malfunction symptom is eliminated.

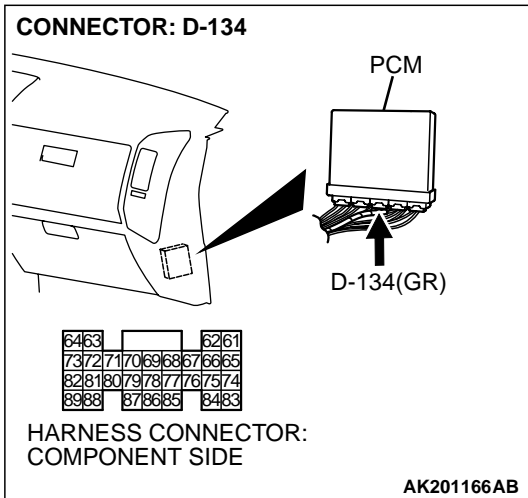
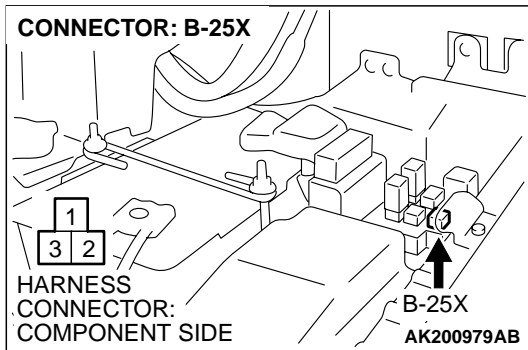


**STEP 9. Check connector B-25X at engine speed detection and connector D-134 at PCM for damage.**

**Q: Is the 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.

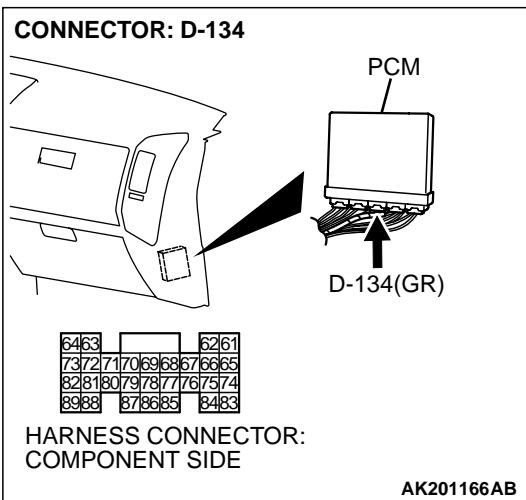
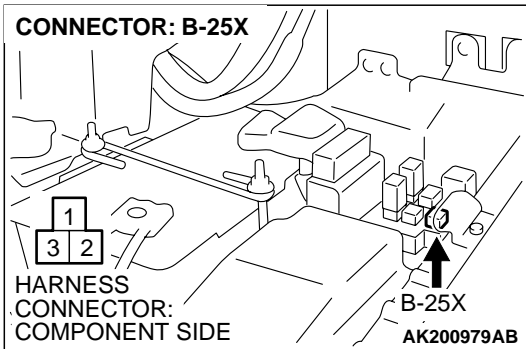


**STEP 10. Check for open circuit and short circuit to ground and harness damage between engine speed detection connector B-25X and PCM connector D-134 (terminal No. 87).**

**Q: Is the harness wire in good condition?**

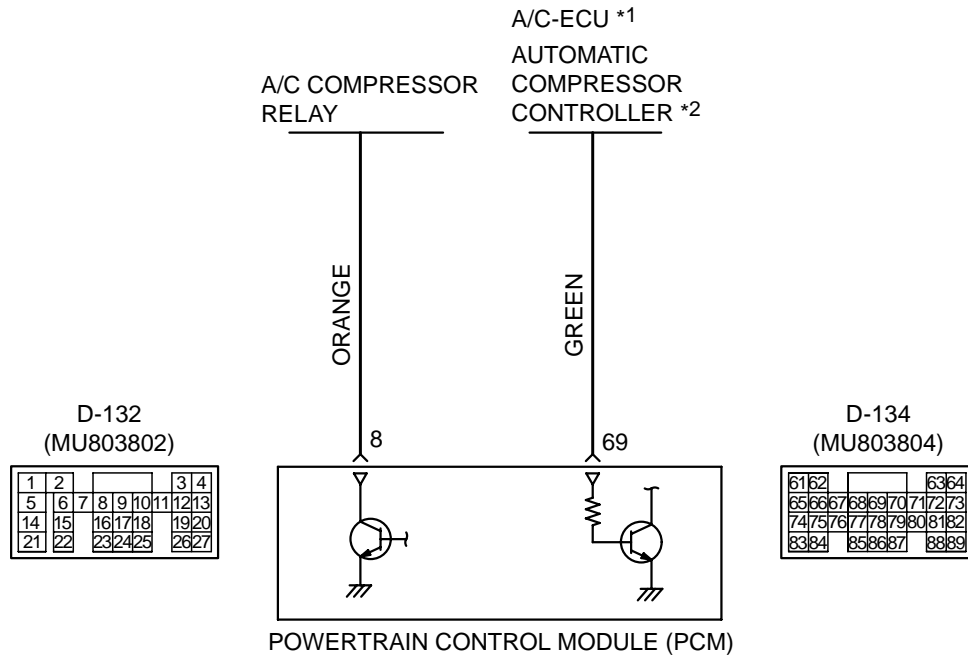
**YES :** Replace the PCM. Then confirm that the malfunction symptom is eliminated.

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



INSPECTION PROCEDURE 32: A/C system.

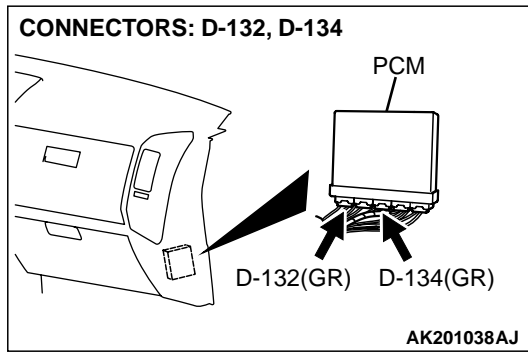
A/C Circuit



\*1 : AUTOMATIC A/C SYSTEM

\*2 : MANUAL A/C SYSTEM

AK201161



**COMMENT**

- When the A/C is "ON", the battery positive voltage is applied on the PCM (terminal No. 69) from the A/C belt lock-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 rpm. 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.

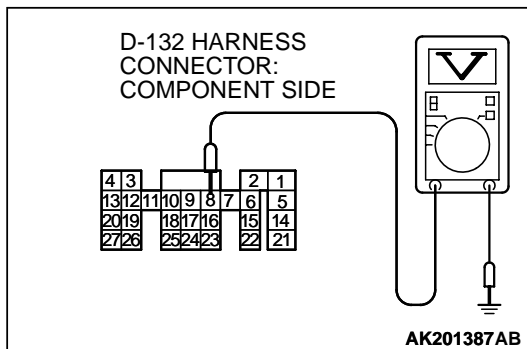
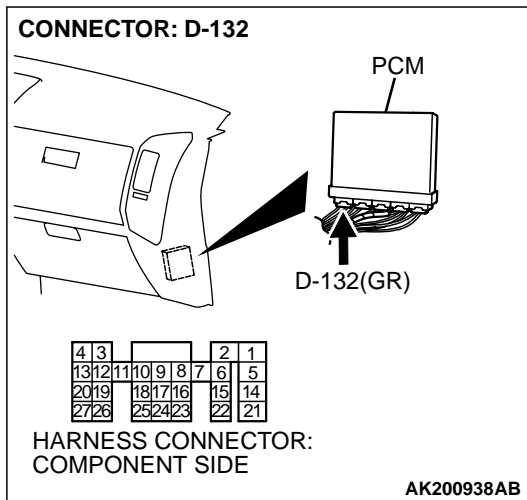
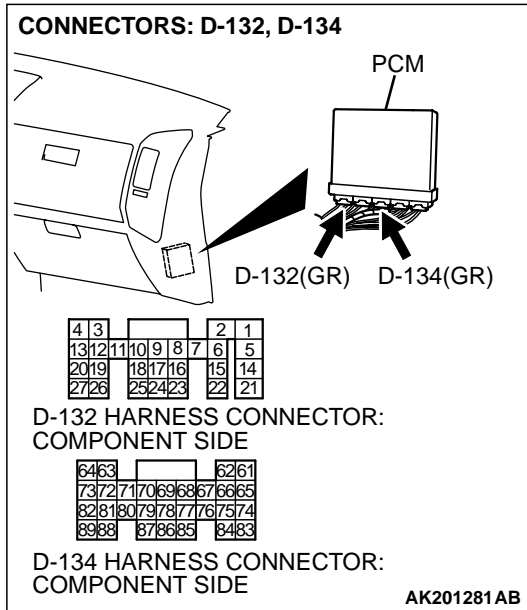
**DIAGNOSIS**

**STEP 1. Check harness connector D-132, D-134 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 D-132.**

(1) Disconnect the connectors D-132 and measure at the harness side.

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

(3) Measure the voltage between terminal No. 8 and ground.

- Voltage should be battery positive voltage.

(4) Using a jumper wire, connect terminal No. 8 to ground.

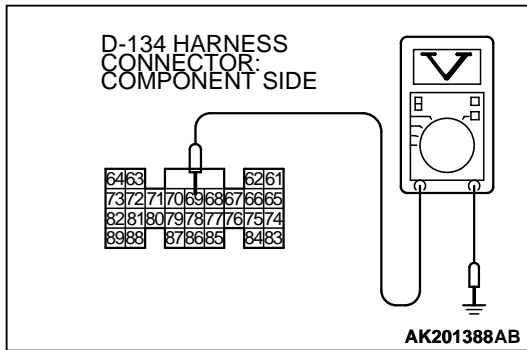
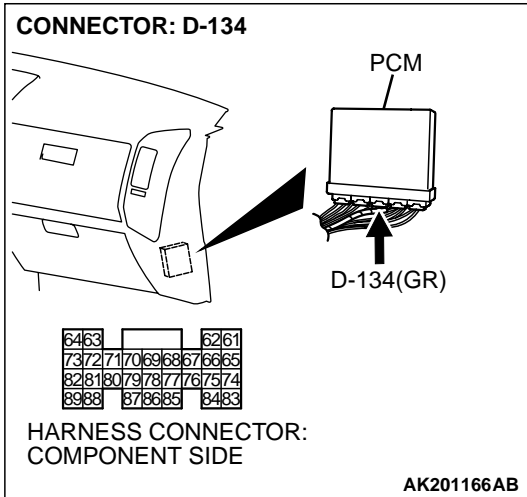
- A/C compressor relay should turn "ON".

(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.55A-5](#). Then confirm that the malfunction symptom is eliminated.



**STEP 3. Check the circuit at PCM connector D-134.**

- (1) Disconnect the connectors D-134 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal No. 69 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.

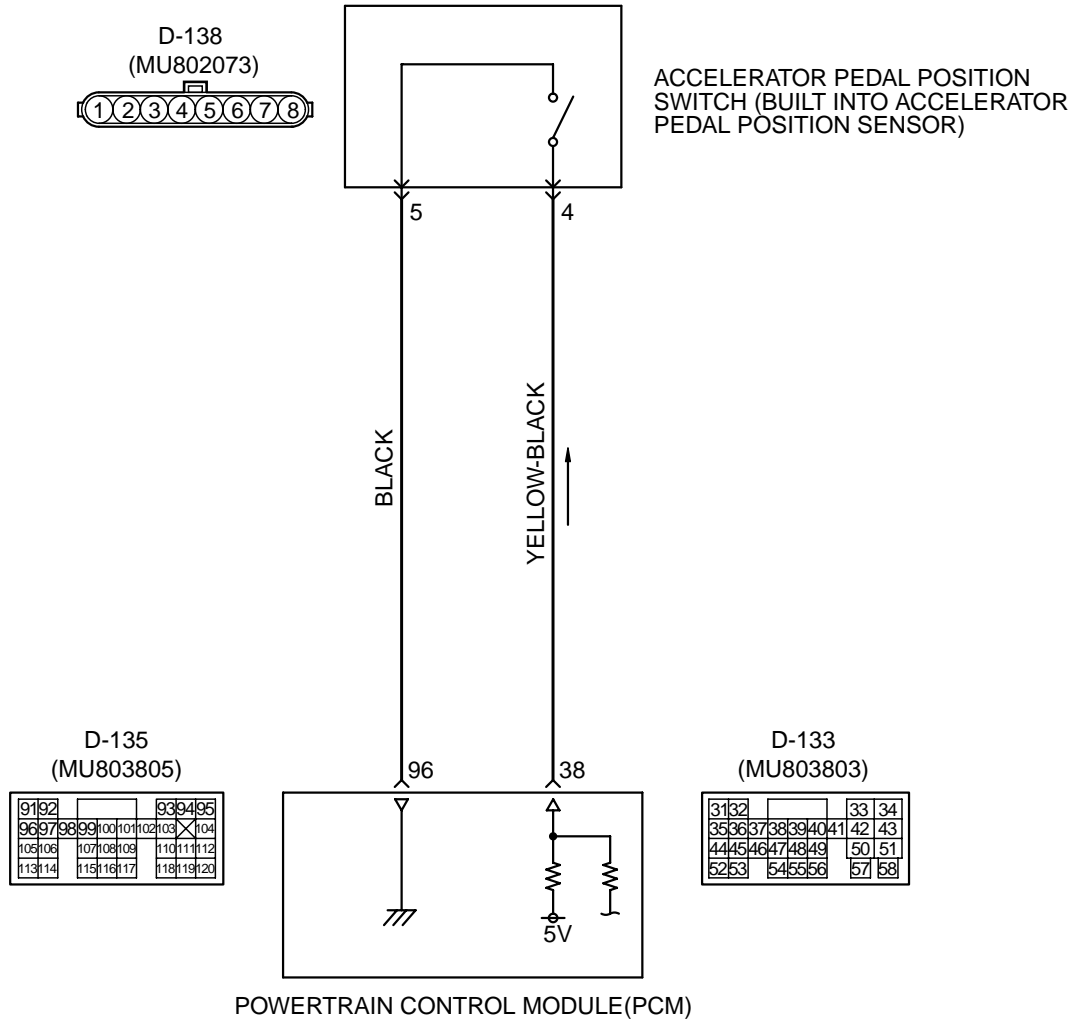
**Q: Is the voltage normal?**

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

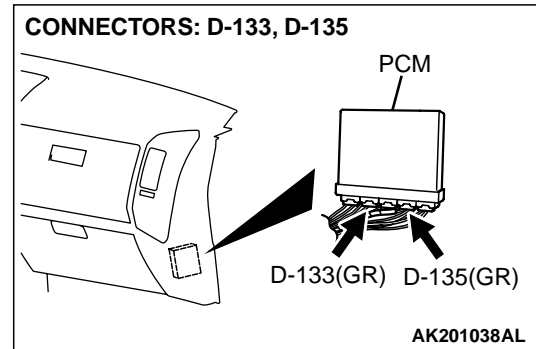
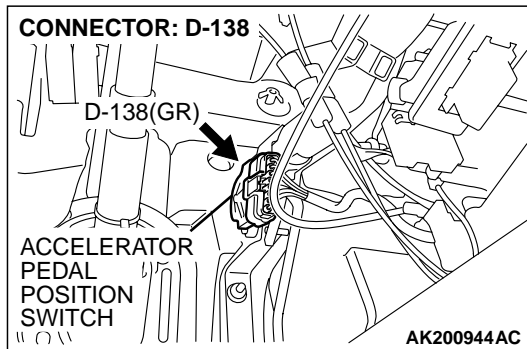
**NO :** Refer to GROUP 55, Diagnosis – Introduction To Heater, Air Conditioning And Ventilation Diagnosis [P.55A-5](#).

INSPECTION PROCEDURE 33: ACCELERATOR PEDAL POSITION SWITCH

Accelerator Pedal Position Switch Circuit



AK201165



CIRCUIT OPERATION

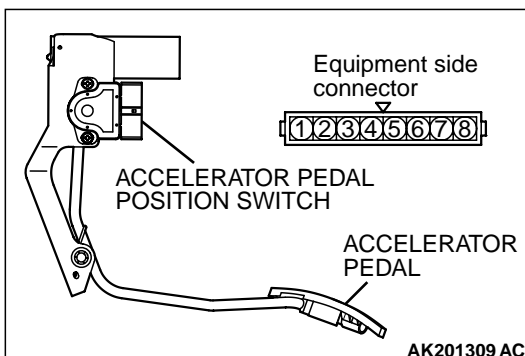
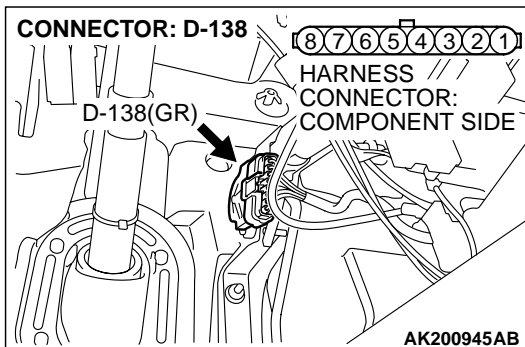
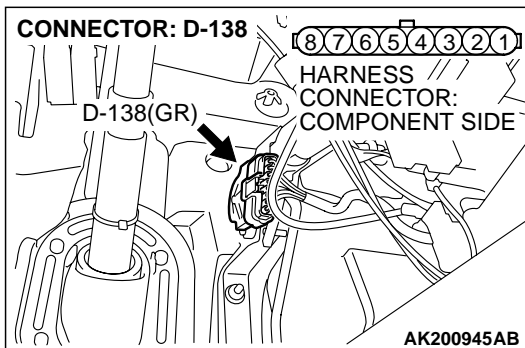
- A 5-volt voltage is applied on the accelerator pedal position switch output terminal (terminal No. 4) from the PCM (terminal No. 38) via the resistor in the PCM.
- The ground terminal (terminal No.5) is grounded with PCM (terminal No.96).

**COMMENT**

- Accelerator pedal position switch turns OFF when the amount of travel of the accelerator pedal exceeds the prescribed value.
- PCM uses the signal that is input by the accelerator pedal position switch for determining the abnormal characteristics of the accelerator pedal position sensor (sub).

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

- Accelerator pedal position switch failed.
- Open or shorted accelerator pedal position switch circuit, or loose connector.
- PCM failed.

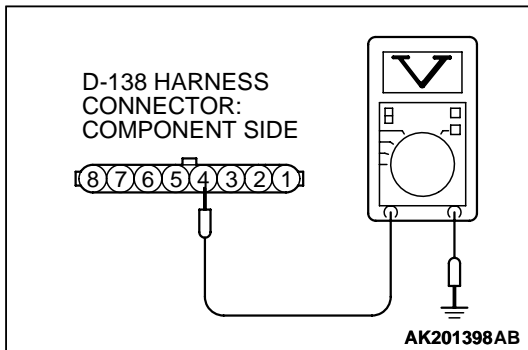
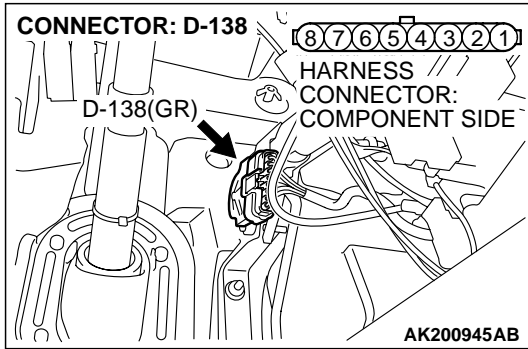
**DIAGNOSIS****STEP 1. Check connector D-138 at accelerator pedal position switch for damage.****Q: Is the connector in good condition?****YES :** Go to Step 3.**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then confirm that the malfunction symptom is eliminated.**STEP 2 Check the accelerator pedal position switch.**

(1) Disconnect the accelerator pedal position switch connector D-138.

(2) Check for continuity between the accelerator pedal position switch side connector terminal No. 4 and No. 5.

- There should be continuity when the accelerator pedal is not depressed. (400 ohms or less)
- There should be continuity when the accelerator pedal is depressed.

**Q: Is the continuity normal?****YES :** Go to Step 3.**NO :** Replace the accelerator pedal position sensor [P.17-6](#). After converting the accelerator pedal position sensor, adjust the accelerator pedal position sensor [P.13Aa-12](#). Confirm that the malfunction symptom is eliminated.



**STEP 3. Measure the switch supply voltage at accelerator pedal position switch connector D-138.**

(1) Disconnect the accelerator pedal position switch connector D-138.

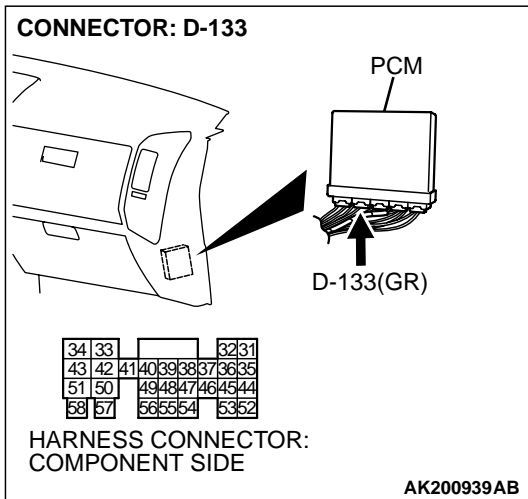
(2) Measure the voltage between terminal No. 4 and ground.

- Voltage should be 4 volts or more.

**Q: Is the voltage normal?**

**YES :** Go to Step 6.

**NO :** Go to Step 4.



**STEP 4. Check connector D-133 at PCM for damage.**

**Q: Is the connector in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Confirm that the malfunction system is eliminated.

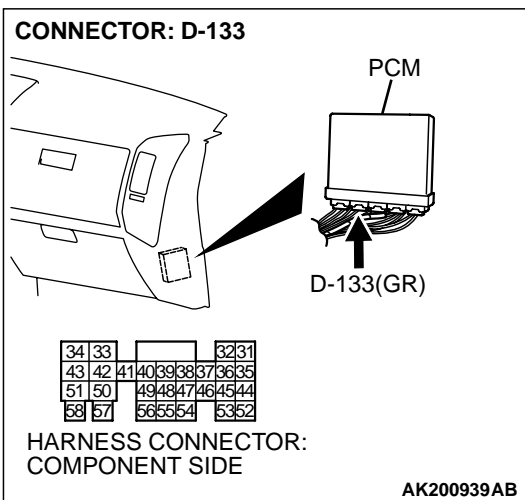
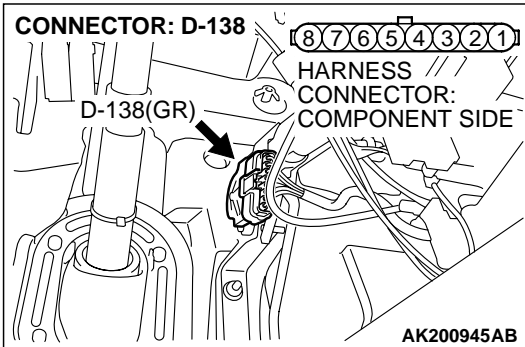


**STEP 5. Check for open circuit and short circuit to ground between accelerator pedal position switch connector D-138 (terminal No.4) and PCM connector D-133 (terminal No.38).**

**Q: Is the harness wire in good condition?**

**YES :** Replace the PCM. Confirm that the malfunction system is eliminated.

**NO :** Repair it. Confirm that the malfunction system is eliminated.



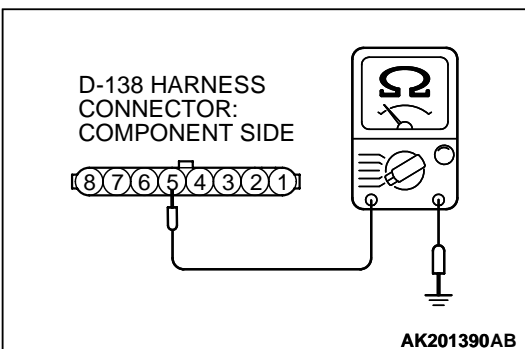
**STEP 6. Check the continuity at accelerator pedal position switch harness side connector D-138.**

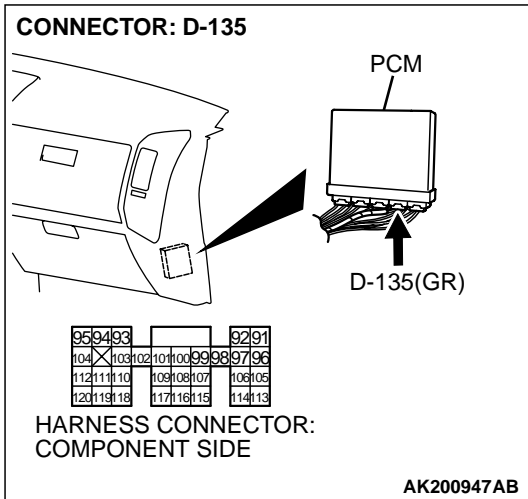
- (1) Disconnect the connector D-138 and measure at the harness side.
- (2) Check for the continuity between terminal No. 5 and ground.
  - Should be less than 2 ohms.

**Q: Is the continuity normal?**

**YES :** Go to Step 9.

**NO :** Go to Step 7.



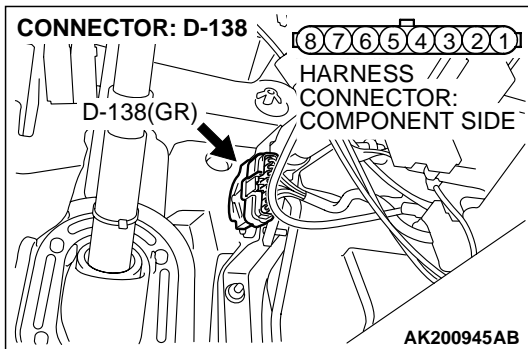


**STEP 7. Check connector D-135 at PCM for damage.**

**Q: Is the connector in good condition?**

**YES :** Go to Step 8.

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

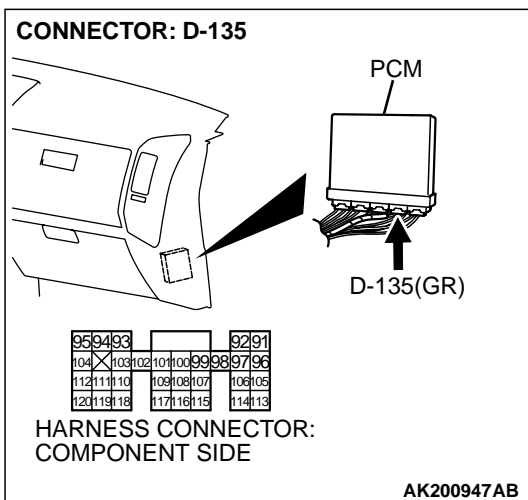


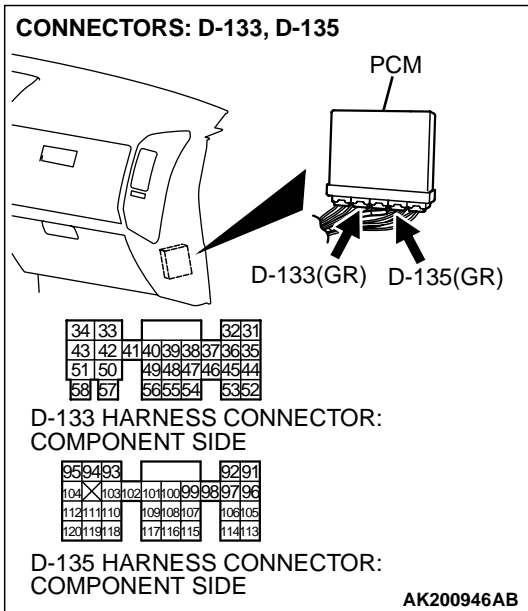
**STEP 8. Check for open circuit and harness damage between accelerator pedal position switch connector D-138 (terminal No. 5) and PCM connector D-135 (terminal No. 96).**

**Q: Is the harness wire in good condition?**

**YES :** Replace the PCM. Confirm that the malfunction system is eliminated.

**NO :** Repair it. Confirm that the malfunction system is eliminated.



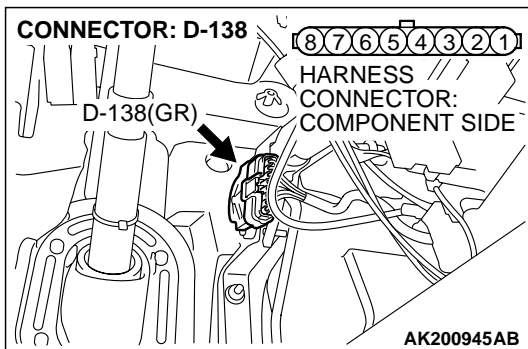


**STEP 9. Check connector D-133, D-135 at PCM for damage.**

**Q: Is the connector in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Confirm that the malfunction system is eliminated.

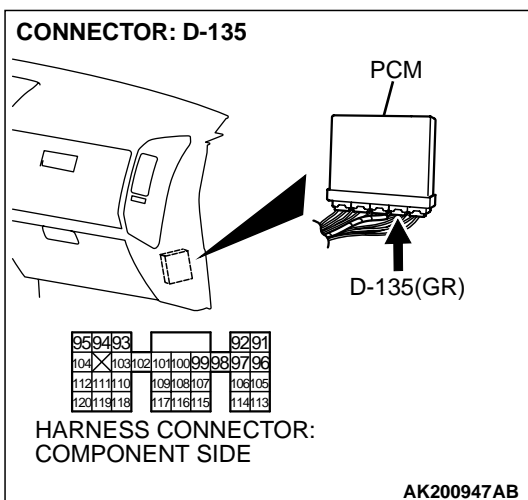


**STEP 10. Check for harness damage between accelerator pedal position switch connector D-138 (terminal No. 5) and PCM connector D-135 (terminal No. 96).**

**Q: Is the harness wire in good condition?**

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

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



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## NOTES