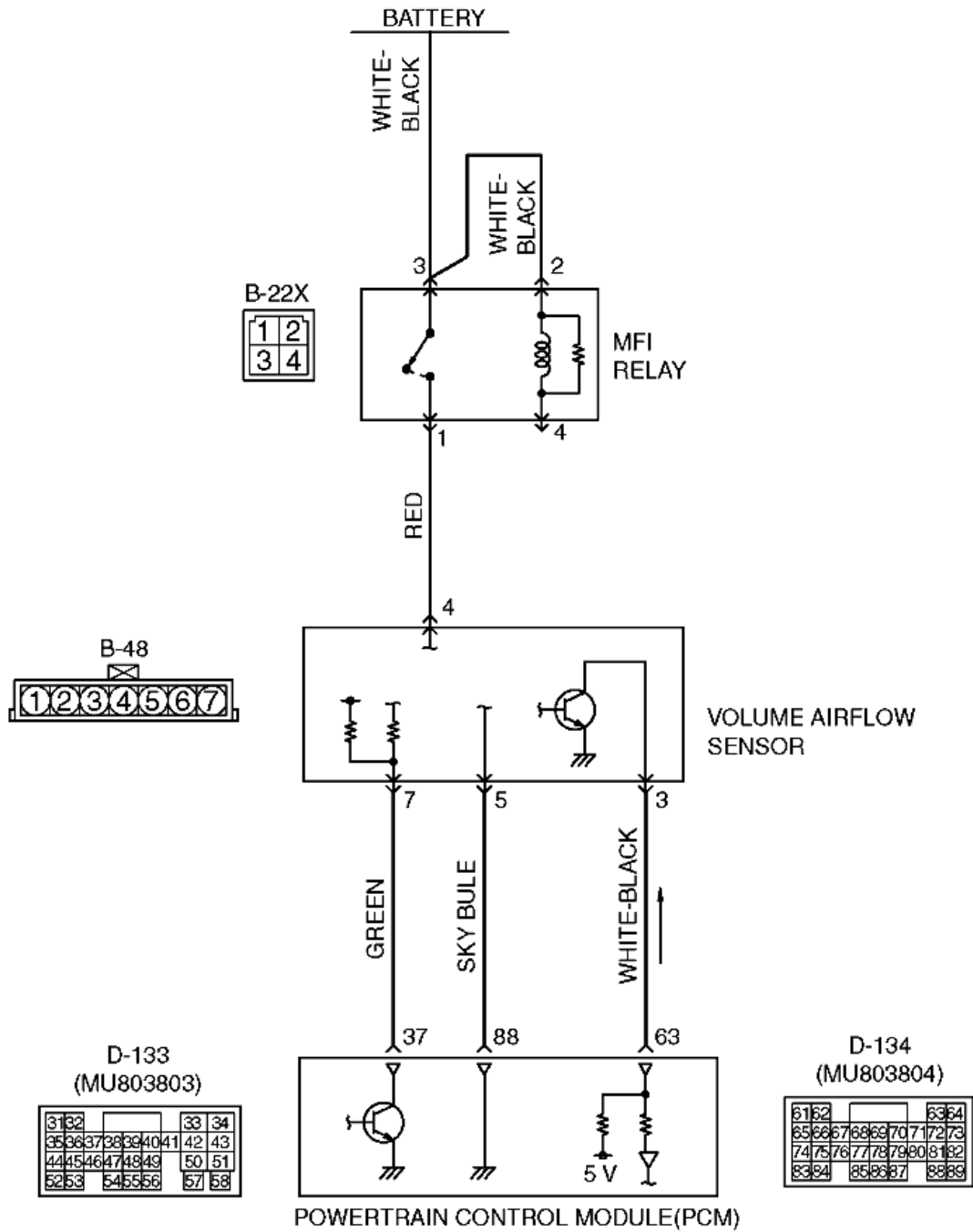
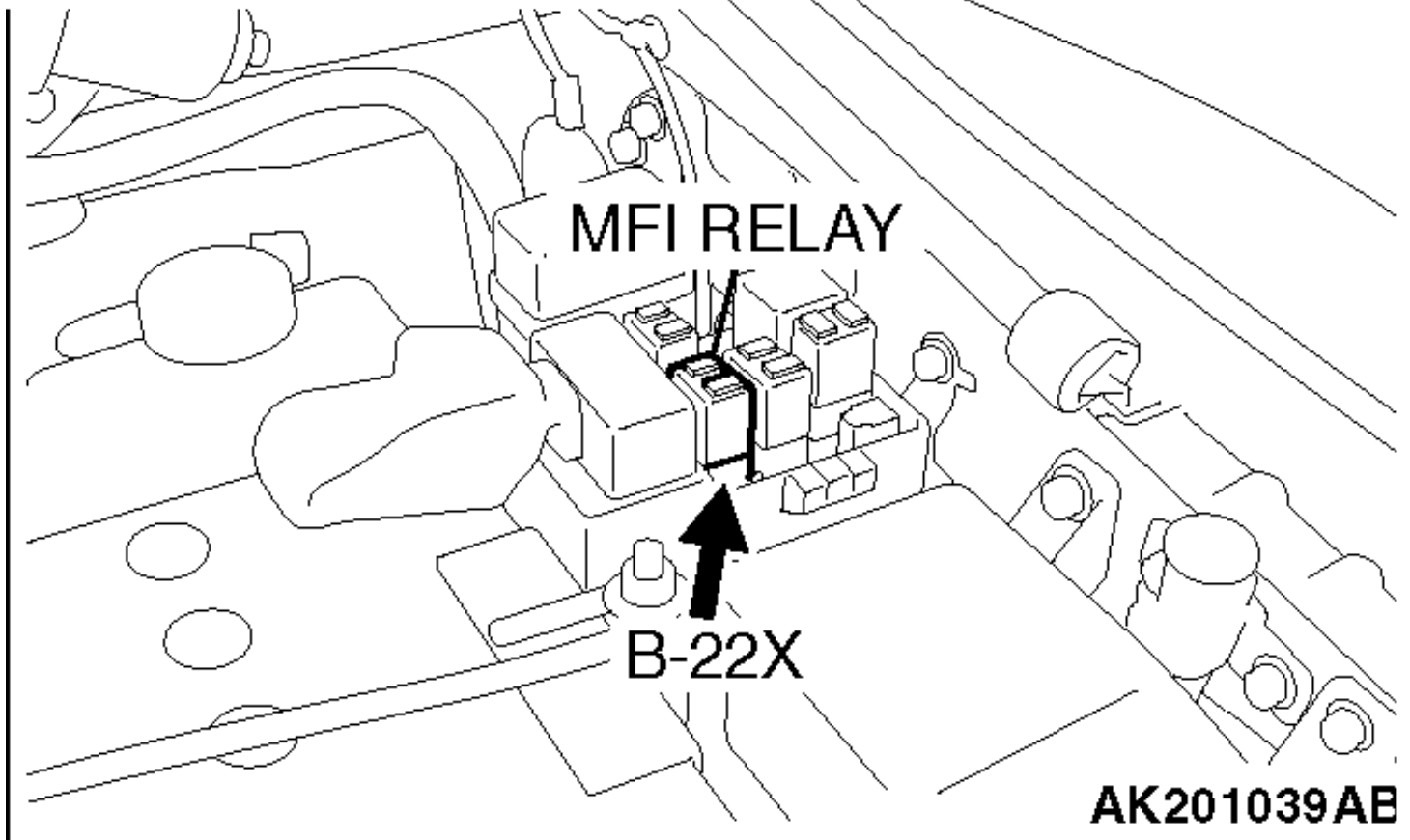


Volume Airflow Sensor Circuit

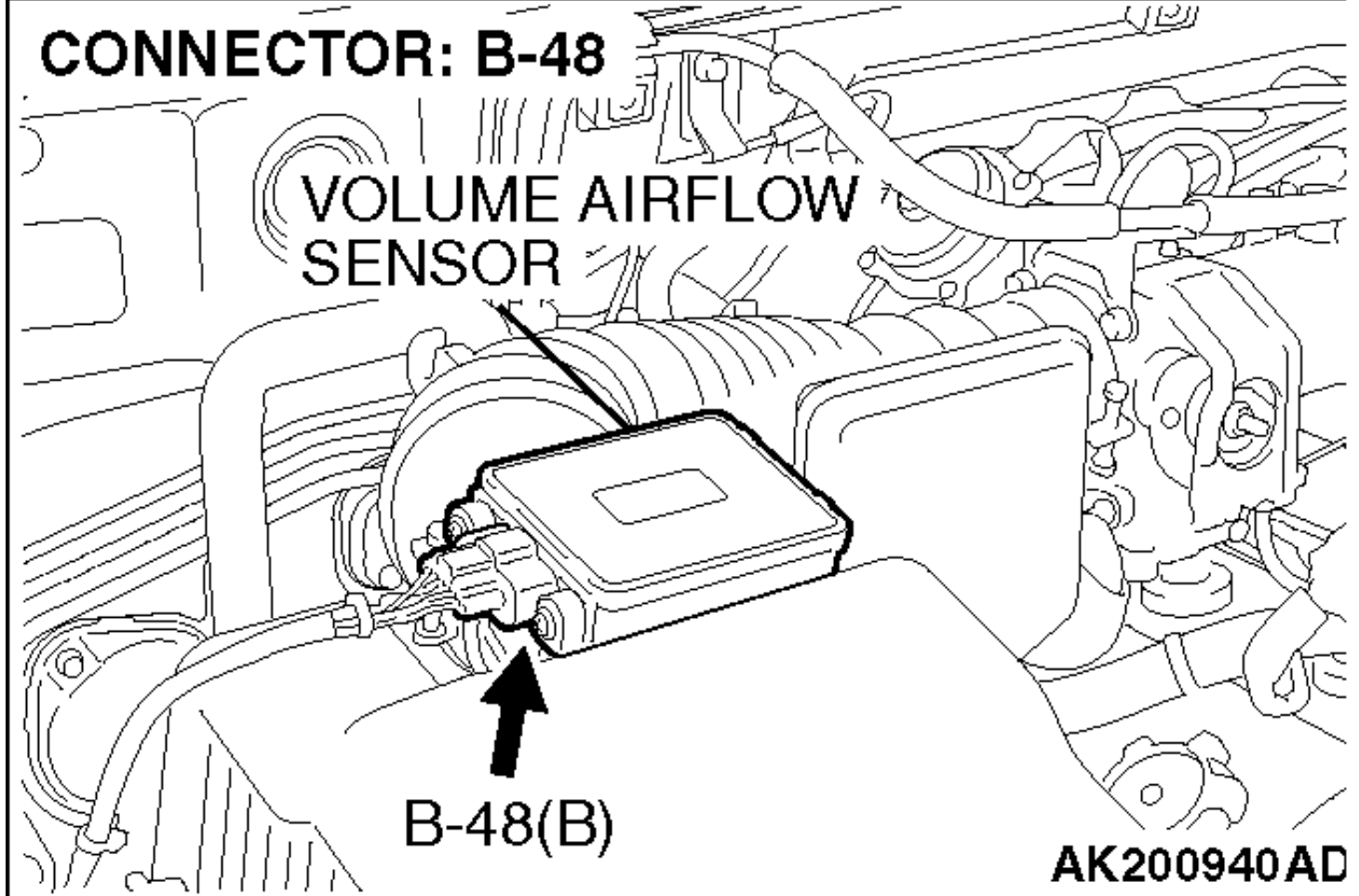


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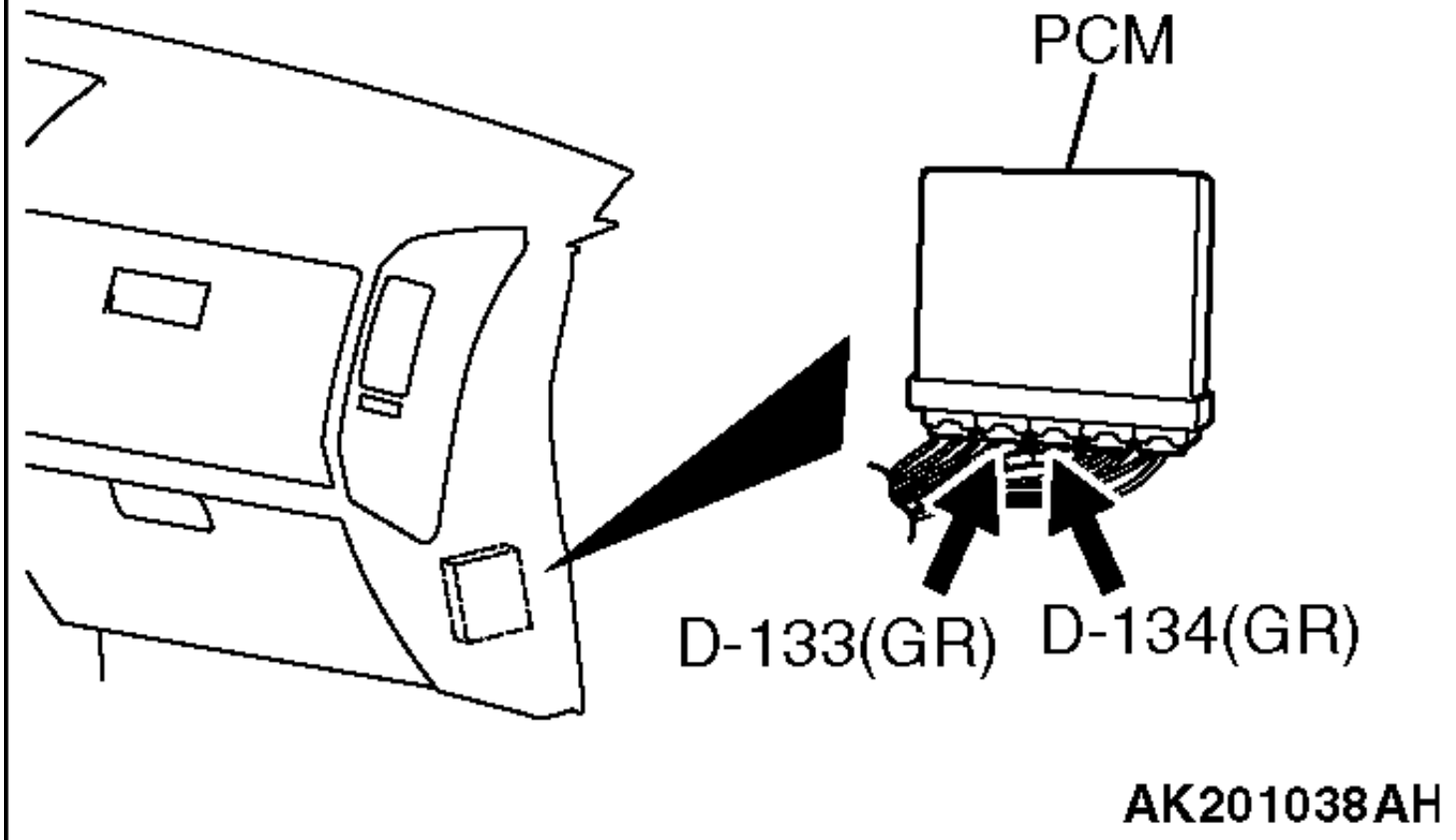
CONNECTOR: B-22X



CONNECTOR: B-48



CONNECTORS: D-133, D-134



CIRCUIT OPERATION

- The volume airflow sensor power is supplied from the MFI relay (terminal No. 1), and the ground is provided on the PCM (terminal No. 88).
- 5-volt power is applied to the volume airflow sensor output terminal (terminal No. 3) from the PCM (terminal No. 63). The volume airflow sensor generates a pulse signal when the output terminal and ground are opened/closed (opened/short).

TECHNICAL DESCRIPTION

- While the engine is running, the volume airflow sensor outputs a pulse signal which corresponds to the volume of air flow.
- The PCM checks whether the frequency of this signal output by the volume airflow sensor while the engine is running is at or above the set value.

DTC SET CONDITIONS

Check Conditions

Engine speed is higher than 500 r/min.

Judgement Criteria

- Volume airflow sensor output frequency has continued to be 3.3 Hz or lower for 2 seconds.

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

- Volume airflow sensor failed.
- Open or shorted volume airflow sensor circuit, or loose connector.
- PCM failed.
- Air leak between volume airflow sensor and throttle body.

DIAGNOSIS

Required Special Tool:

- MB991502: Scan Tool (MUT-II)
- MB991958: Scan Tool (MUT-III Sub Assembly)

MB991824: V.C.I.

MB991827: USB Cable

MB991911: Main Harness B

STEP 1. Using scan tool MB991502 or MB991958, check data list item 12: Volume Airflow Sensor.

CAUTION

To prevent damage to scan tool MB991502 or MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502 or MB991958.

- (1) Connect scan tool MB991502 or MB991958 to the data link connector.
- (2) Start the engine and run at idle.
- (3) Set scan tool MB991502 or MB991958 to the data reading mode for item 12, Volume Airflow Sensor.
- (4) Warm up the engine to normal operating temperature: 80°C to 95°C (176°F to 203°F).

- The standard value during idling should be 10 Hz or more.
- When the engine is revved, the frequency should increase according to the increase in engine speed.

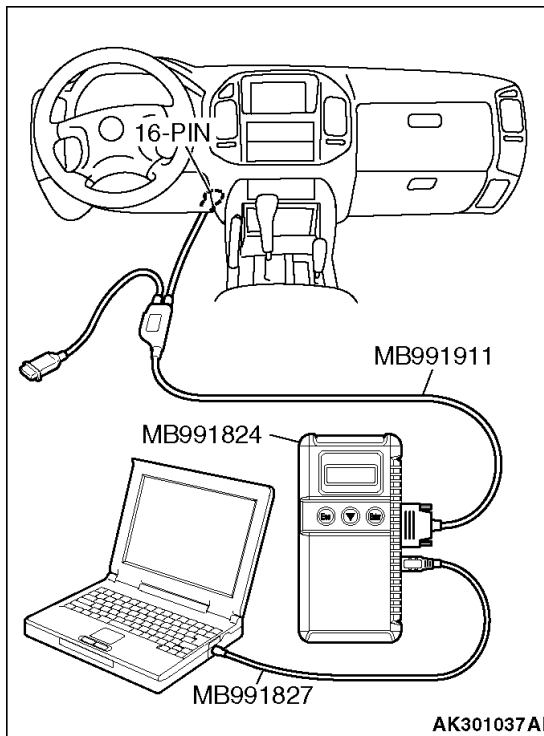
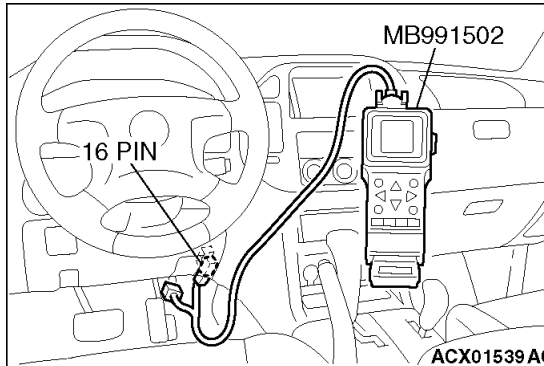
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

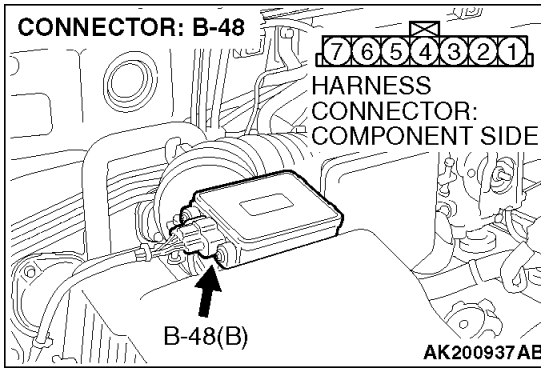
YES: It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points



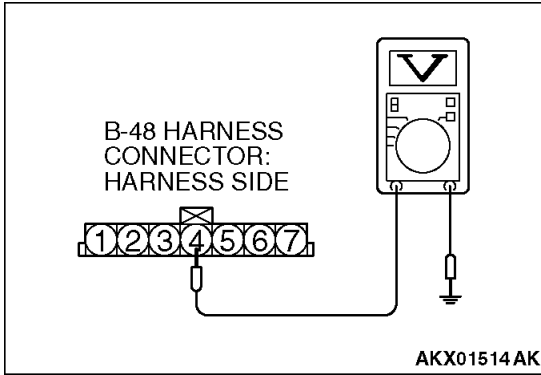
NO: Go to Step 2.



STEP 2. Measure the power supply voltage at volume airflow sensor connector B-48 by backprobing.



- (1) Do not disconnect the connector B-48.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal No.4 and ground by backprobing.

• Voltage should be battery positive voltage.

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

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

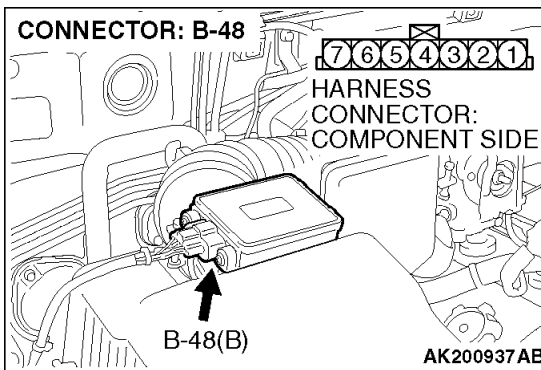
YES: Go to Step 5.



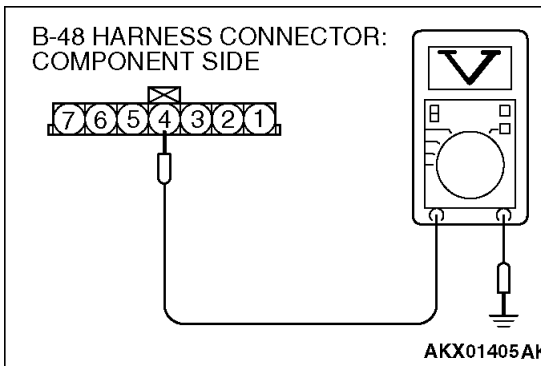
NO: Go to Step 3.



STEP 3. Measure the power supply voltage at volume airflow sensor harness side connector B-48.



- (1) Disconnect the connector B-48 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.



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

• Voltage should be battery positive voltage.

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

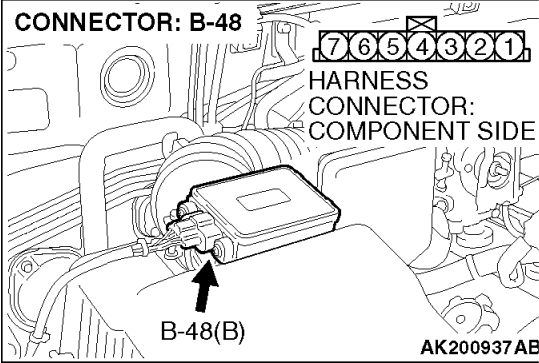



Q: Is battery positive voltage (approximately 12 volts) present?

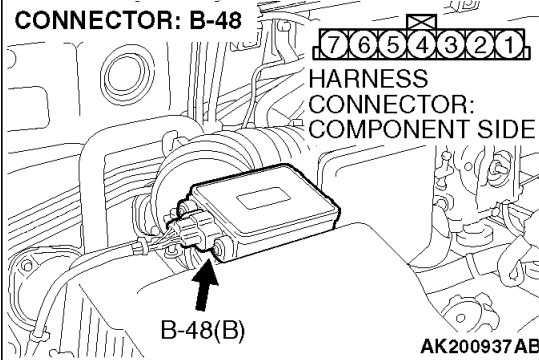



YES: Go to Step 4.



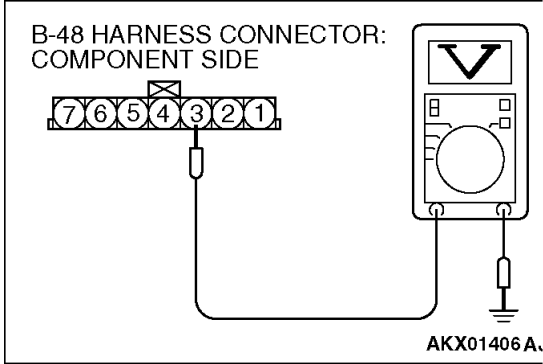
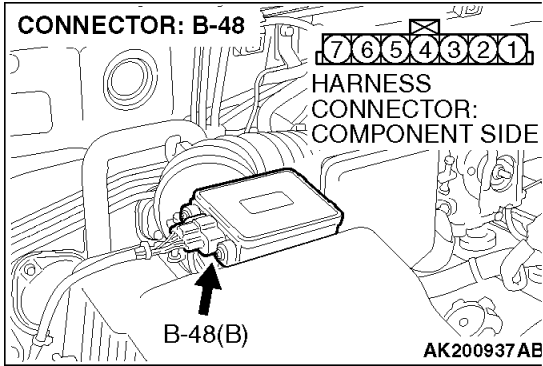
NO: Repair harness wire between MFI relay connector B-22X (terminal No. 1) and volume airflow sensor connector B-48 (terminal No. 4) because of open circuit or short circuit to ground. Then go to Step 13.



	<p>STEP 4. Check connector B-48 at the volume airflow sensor for damage.</p>
	<p>Q: Is the connector in good condition?</p> <p>YES: Repair harness wire between MFI relay connector B-22X (terminal No. 1) and volume airflow sensor connector B-48 (terminal No. 4) because of harness damage. Then go to Step 13.</p>  <p>NO: Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection</p>  <p>. Then go to Step 13.</p> 

	<p>STEP 5. Check connector B-48 at volume airflow sensor for damage.</p>
	<p>Q: Is the connector in good condition?</p> <p>YES: Go to Step 6.</p>  <p>NO: Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection</p>  <p>. Then go to Step 13.</p> 

	<p>STEP 6. Measure the sensor supply voltage at volume airflow sensor harness side connector B-48.</p>
	<p>(1) Disconnect the connector B-48 and measure at the harness side. (2) Turn the ignition switch to the "ON" position.</p>



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

• Voltage should be between 4.8 and 5.2 volts.

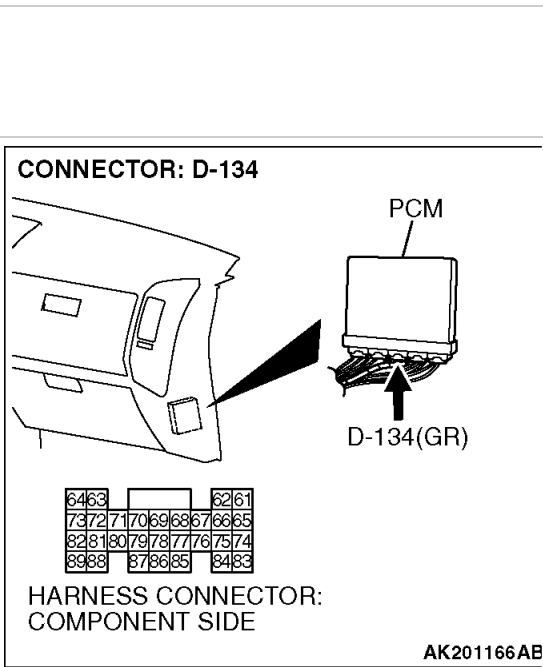
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.8 and 5.2 volts?

YES: Go to Step 9.



NO: Go to Step 7.



STEP 7. Check connector D-134 at PCM for damage.

Q: Is the harness connector in good condition?

YES: Go to Step 8.



NO: Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection

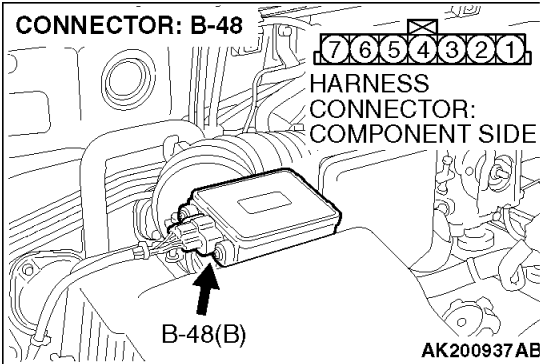


. Then go to Step 13.



STEP 8. Check for short circuit to ground between volume airflow sensor connector B-48 (terminal No. 3) and PCM connector D-134 (terminal No. 63).

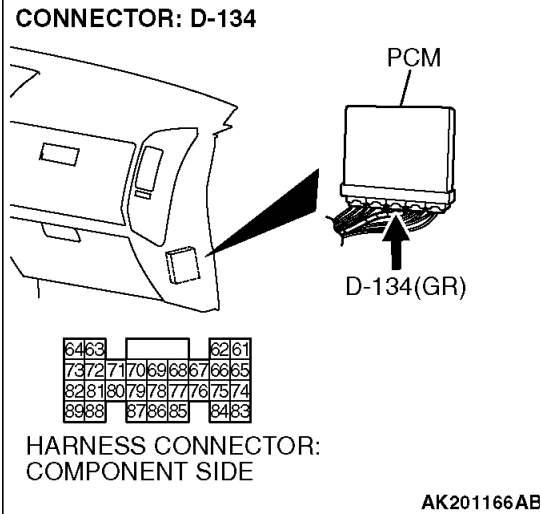
Q: Is the harness wire in good condition?



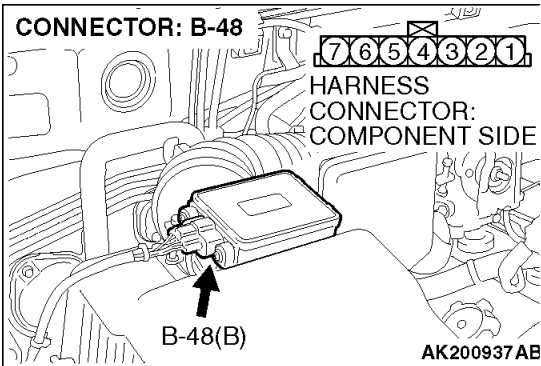
YES: Replace the PCM. Then go to Step 13.



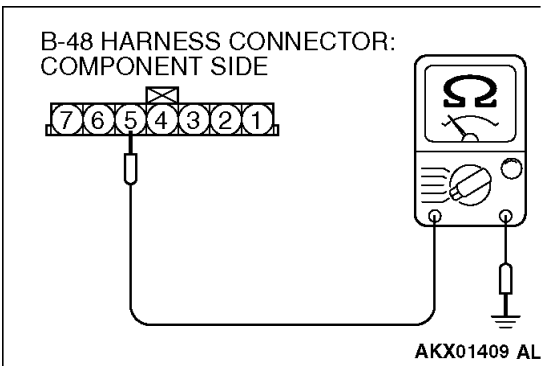
NO: Repair it. Then go to Step 13.



STEP 9. Check the continuity at volume airflow sensor harness side connector B-48.



(1) Disconnect the connector B-48 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 12.

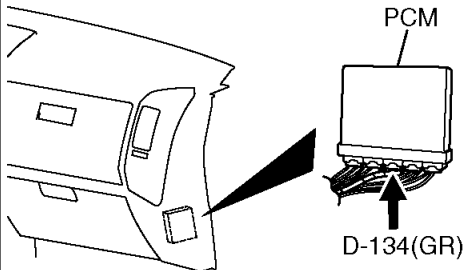


NO: Go to Step 10.



STEP 10. Check connector D-134 at PCM for damage.

CONNECTOR: D-134



6463		6261
7372	7170	6968
6766	6564	8281
8079	7877	7675
7489	8887	8685
8483		

HARNESS CONNECTOR:
COMPONENT SIDE

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Q: Is the connector in good condition?

YES: Go to Step 11.



NO: Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection

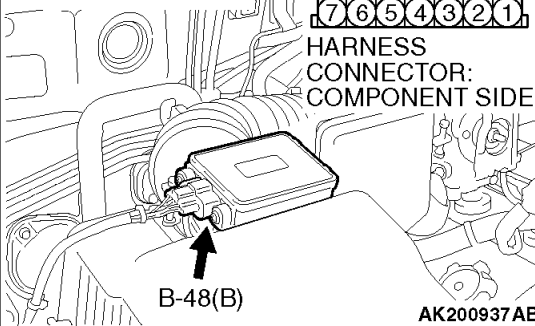


. Then go to Step 13.



STEP 11. Check for open circuit and harness damage between volume airflow sensor connector B-48 (terminal No. 5) and PCM connector D-134 (terminal No. 88).

CONNECTOR: B-48



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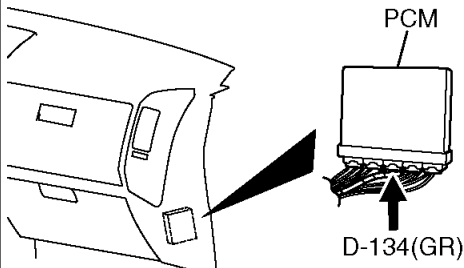
Q: Is the harness wire in good condition?

YES: Replace the PCM. Then go to Step 13.



NO: Repair it. Then go to Step 13.



CONNECTOR: D-134

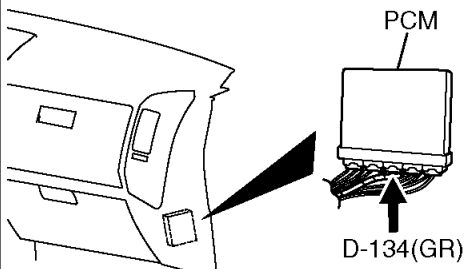
6463		6261
7372	7170	6968
6766	65	
8281	8079	7877
7675	74	
8988	8786	85
8483		

HARNESS CONNECTOR:
COMPONENT SIDE

AK201166AB

STEP 12. Check connector D-134 at PCM for damage.**Q: Is the connector in good condition?****YES:** Replace the volume airflow sensor. Then go to Step 13.**NO:** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection

. Then go to Step 13.

**CONNECTOR: D-134**

6463		6261
7372	7170	6968
6766	65	
8281	8079	7877
7675	74	
8988	8786	85
8483		

HARNESS CONNECTOR:
COMPONENT SIDE

AK201166AB

STEP 13. Test the OBD-II drive cycle.

(1) Carry out a test drive with the drive cycle pattern. Refer to GROUP 13A, Diagnostic Function - OBD-II Drive Cycle - Pattern 20



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

Q: Is DTC P0102 set?**YES:** Retry the troubleshooting.**NO:** The inspection is complete.

