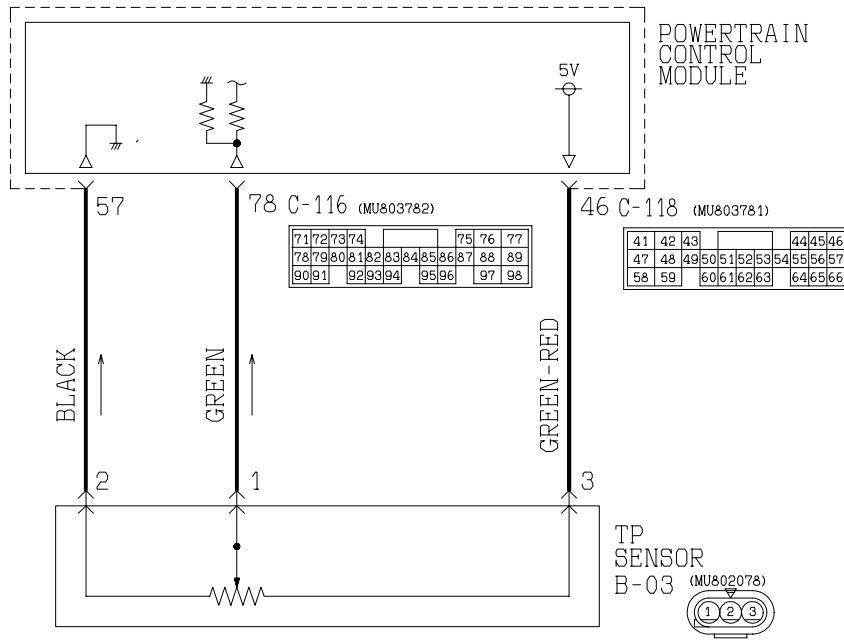
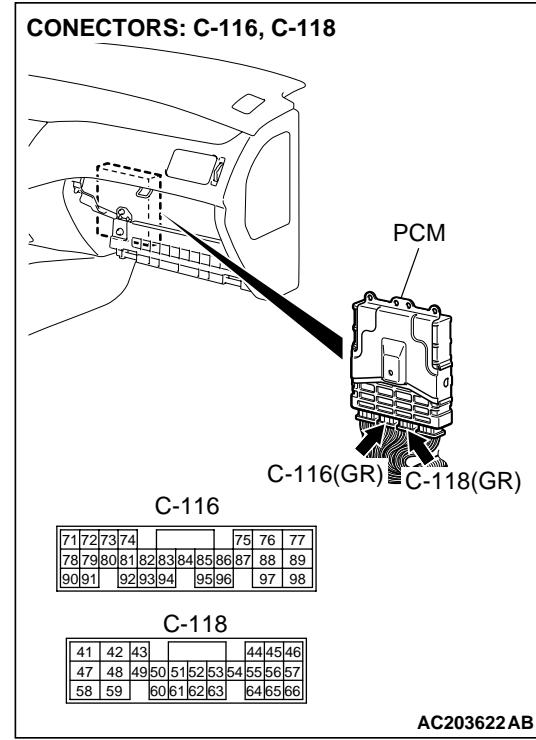
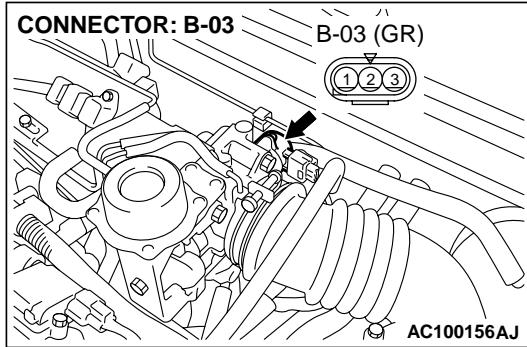


GROUP 23Ac

# DIAGNOSTIC TROUBLE CODE PROCEDURES

**DTC 11: TP Sensor System (Short Circuit)****TP Sensor System Circuit**

AC100485AD



**CIRCUIT OPERATION**

- When the throttle valve shaft rotates from the idle position to the fully opened position, the resistance between the TP sensor output terminal (terminal 1) and ground terminal (terminal 2) increases according to the degree of rotation.
- With the ignition switch in the "ON" position, voltage at pin 78 increases from approximately 0.7 volt at closed throttle, to approximately 5 volts at wide open throttle.

**DTC SET CONDITIONS**

If the PCM output voltage is greater than 4.8 volts when the engine is idling, the output is judged to be too high and DTC 11 is set.

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

- Malfunction of the TP sensor circuit.
- Damaged harness or connector.
- Malfunction of the PCM.

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, check data list item 11: TP Sensor.**** CAUTION**

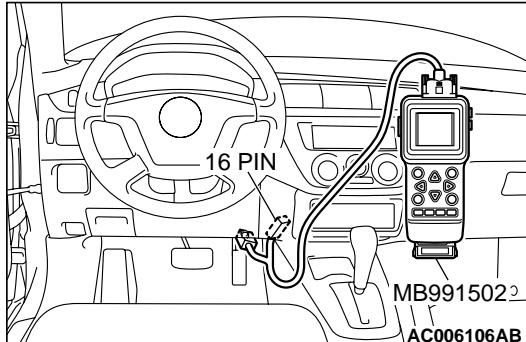
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

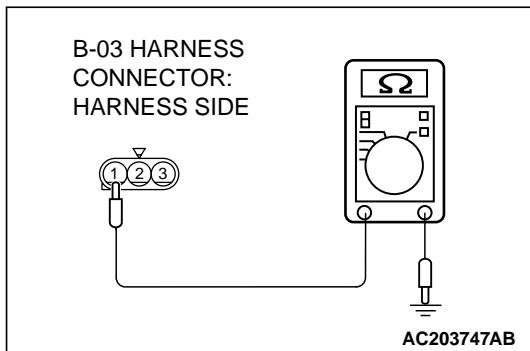
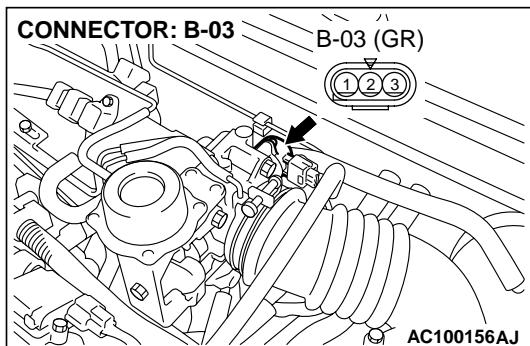
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to the data reading mode for item 11, TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
  - With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 335 and 935 mV at idle, and between 4,400 and 5,300 mV in the full-open position?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.





**STEP 2. Measure the TP sensor output voltage at TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground by backprobing.

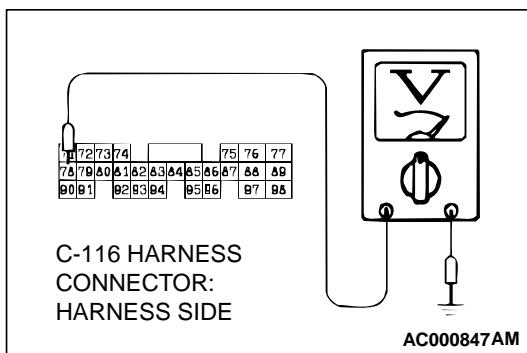
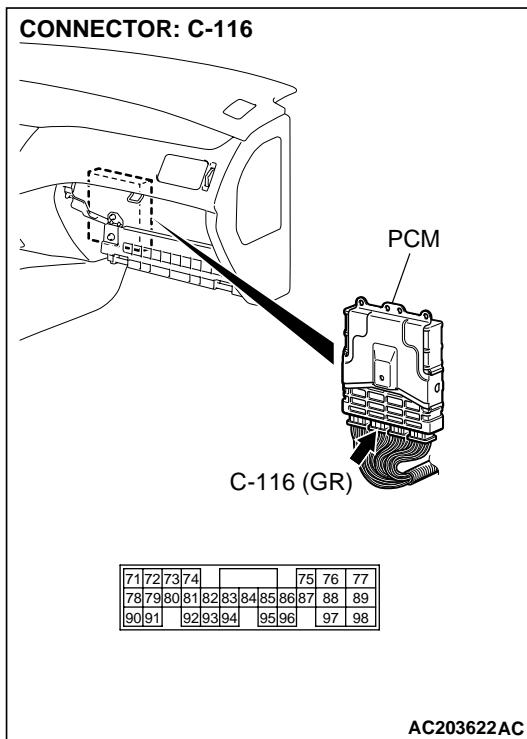
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, the voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 3.

**NO :** Go to Step 8.



**STEP 3. Measure the TP sensor output voltage at PCM connector C-116 by backprobing.**

- (1) Do not disconnect connector C-116.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 78 and ground by backprobing.

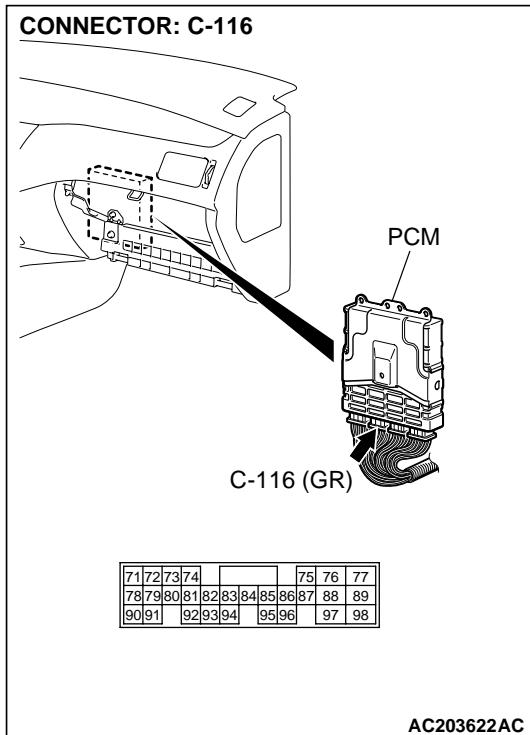
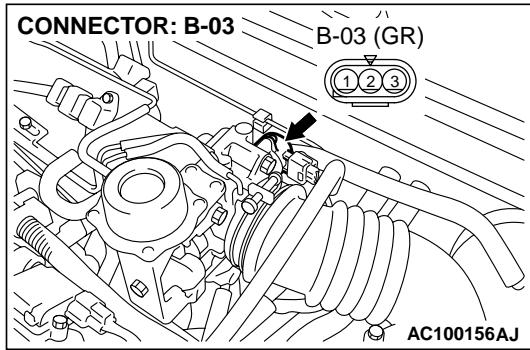
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 4.

**NO :** Go to Step 6.



**STEP 4. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 5.

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

---

**STEP 5. Using scan tool MB991502, check data list item 11: TP Sensor.**

**⚠ 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 11, TP Sensor.

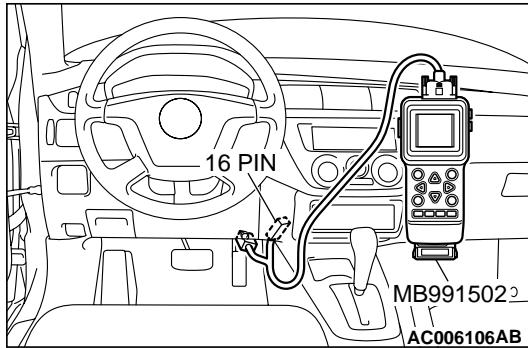
- With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
- With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.

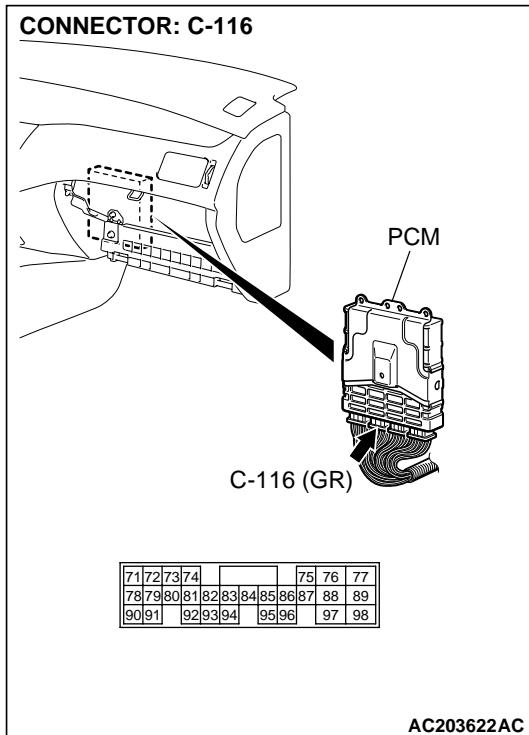
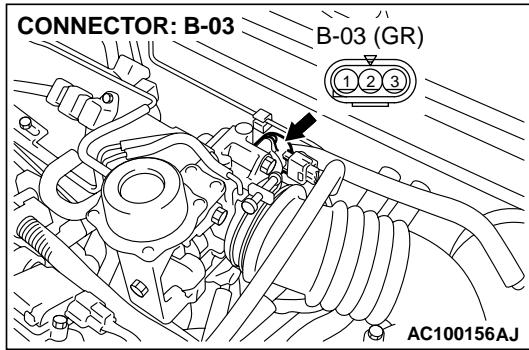
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 335 and 935 mV at idle, and between 4,400 and 5,300 mV in the full-open position?**

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

**NO :** Replace the PCM.

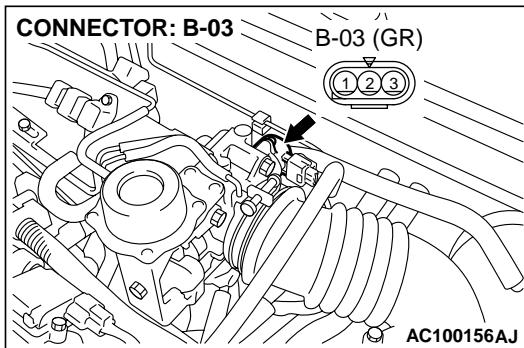




**STEP 6. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

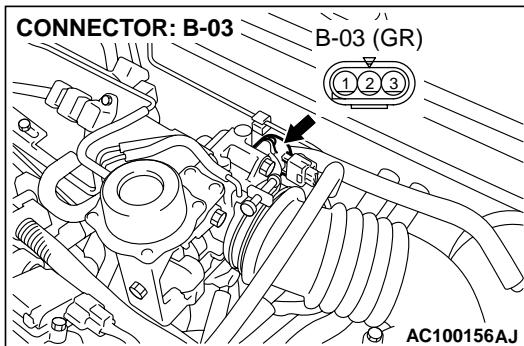
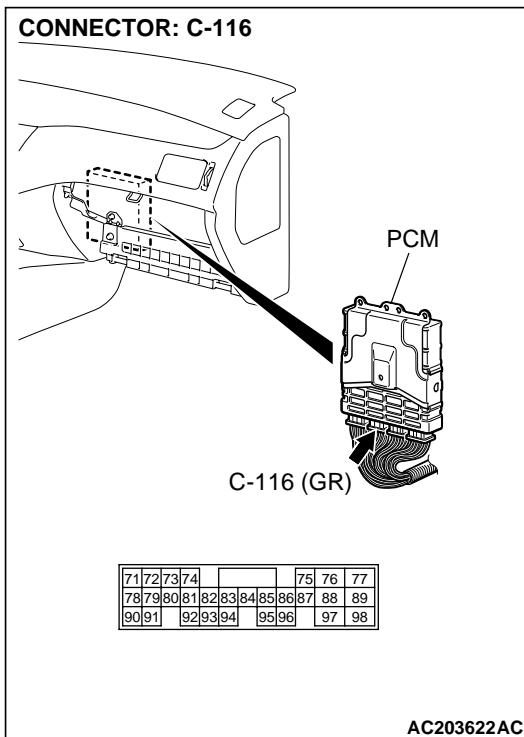


**STEP 7. Check the harness for damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.

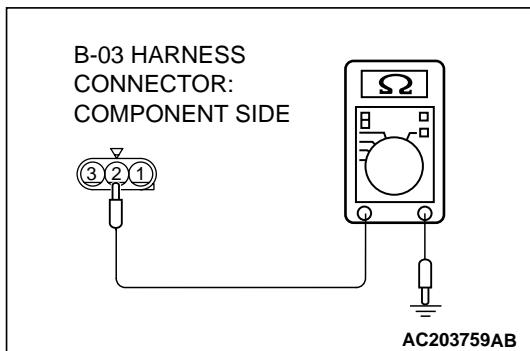
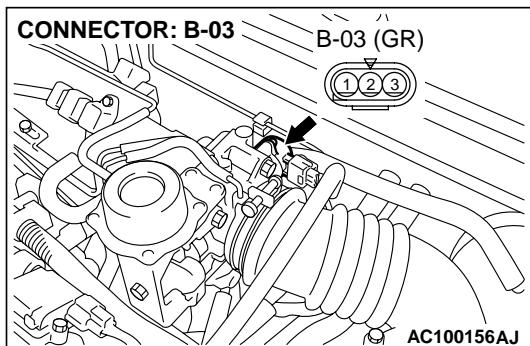


**STEP 8. Check TP sensor connector B-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 9.

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




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**STEP 9. Check the resistance of the ground circuit at TP sensor connector B-03.**

(1) Disconnect TP sensor connector B-03 and measure at the harness side.

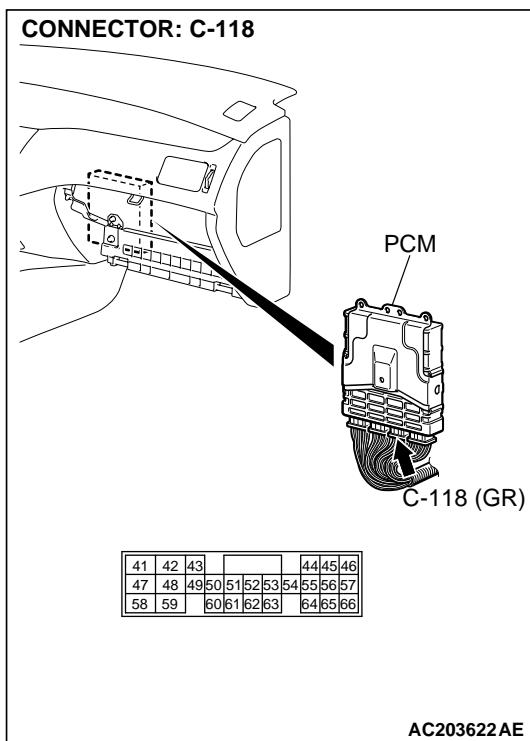
(2) Check the resistance between terminal 2 and ground.

- The resistance should measure less than 2 ohms.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 12.

**NO :** Go to Step 10.



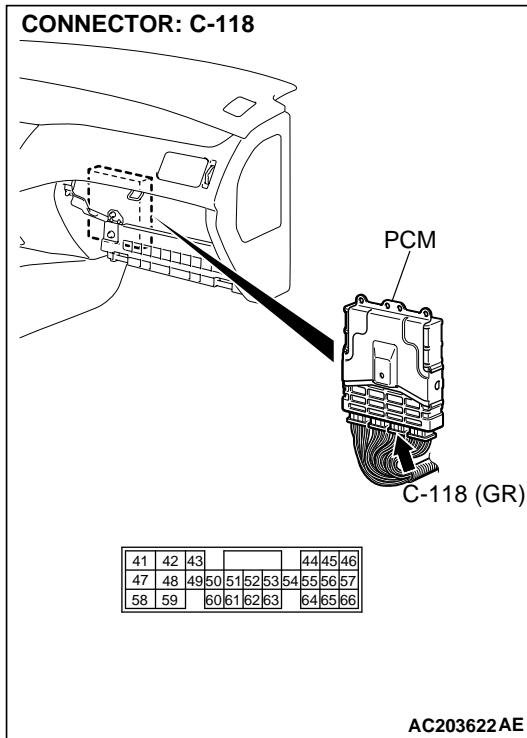
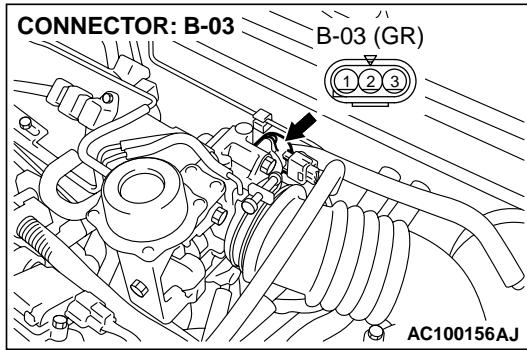

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**STEP 10. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 11.

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

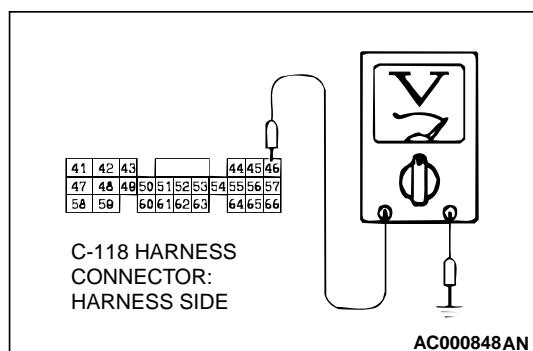
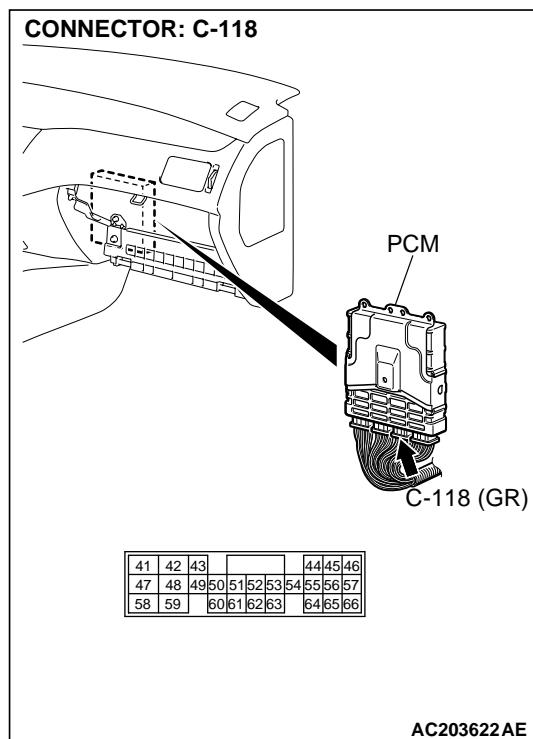


**STEP 11. Check the harness for an open circuit or damage between TP sensor connector B-03 terminal 2 and PCM connector C-118 terminal 57.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.



**STEP 12. Measure the power supply voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 46 and ground by backprobing.

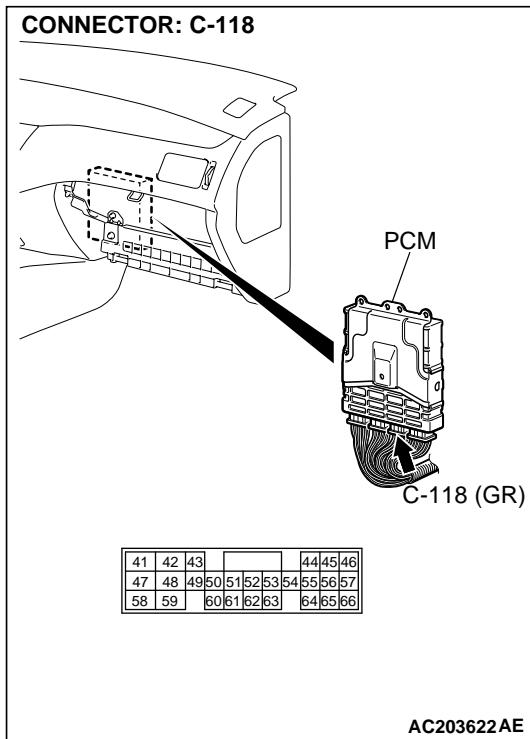
- The voltage should measure between 4.9 and 5.1 volts.

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

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

**YES :** Go to Step 15.

**NO :** Go to Step 13.

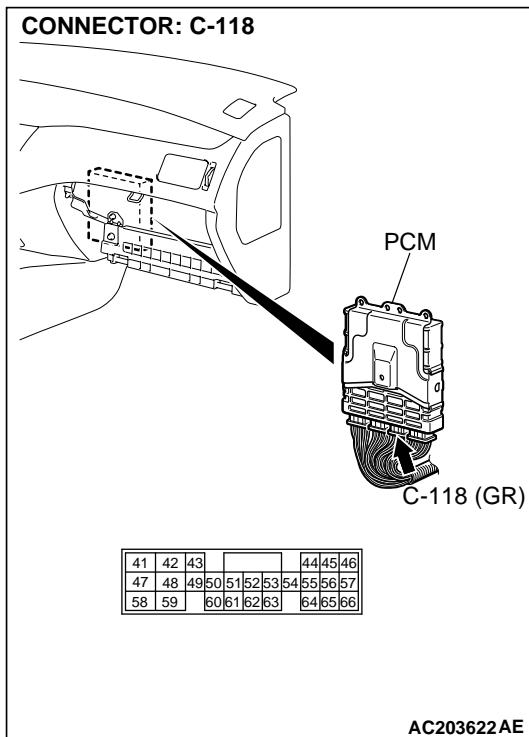
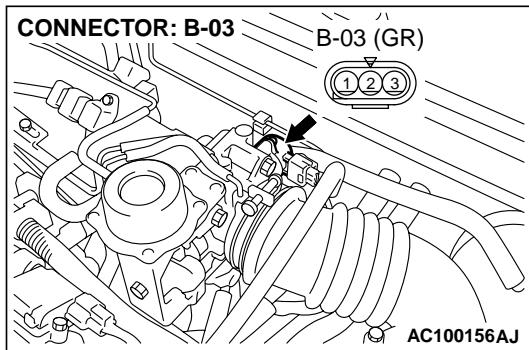


**STEP 13. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 14.

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

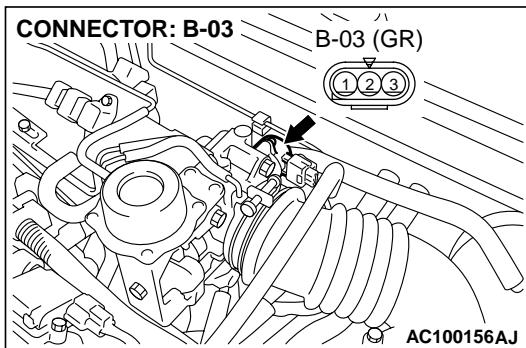


**STEP 14. Check the harness for damage between TP sensor connector B-03 terminal 3 and PCM connector C-118 terminal 46.**

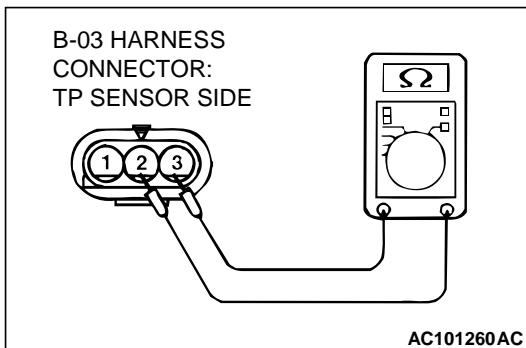
**Q: Is the harness wire in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.

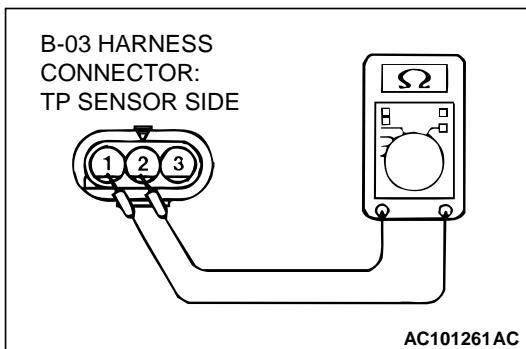
**STEP 15. Check the TP sensor.**

- (1) Disconnect connector B-03 and measure at the TP sensor side.



- (2) Measure the resistance between TP sensor connector terminals 2 and 3.

**Specified resistance: 2.0 – 4.0 kΩ**



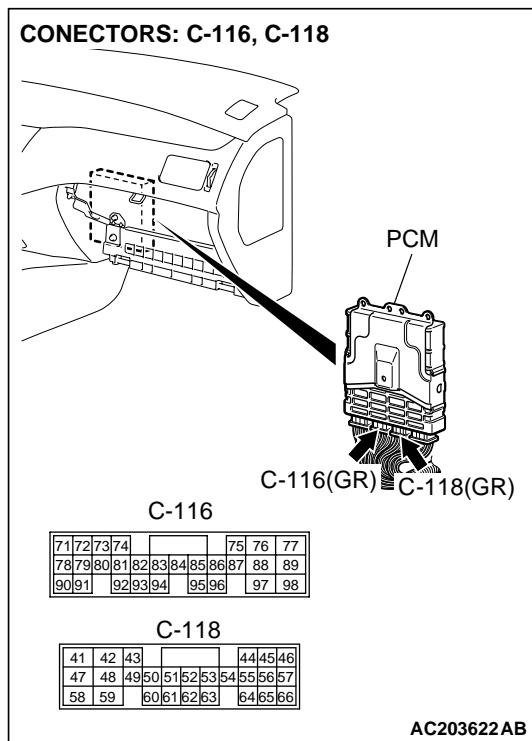
- (3) Measure the resistance between TP sensor connector terminals 1 and 2.

- (4) Move the throttle valve from the idle position to the full-open position.
- The resistance should change smoothly in proportion to the opening angle of the throttle valve.

**Q: Does the resistance change smoothly between 2.0 – 4.0 kΩ in proportion to the opening angle of the throttle valve?**

**YES :** Go to Step 16.

**NO :** Replace the TP sensor. Refer to GROUP 13A, Throttle Body Assembly [P.13Aa-28](#).



**STEP 16. Check PCM connectors C-116 and C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 17.

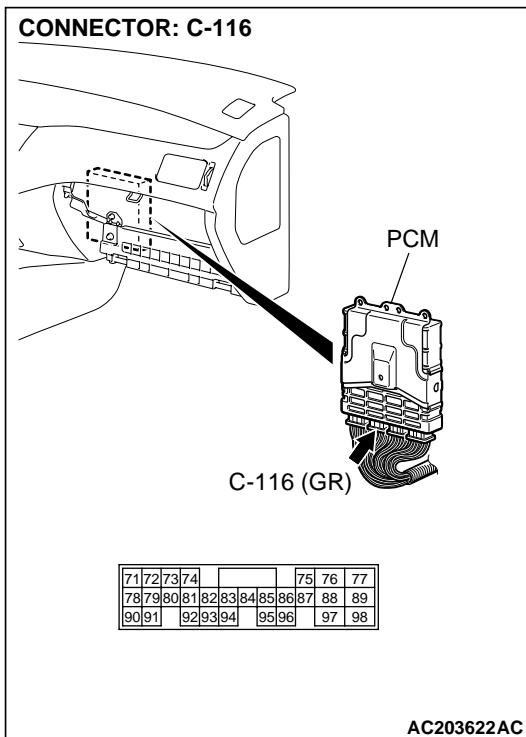
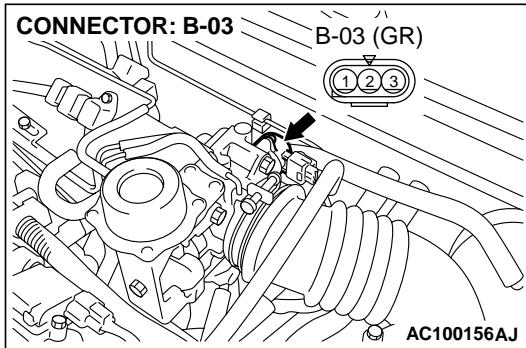
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

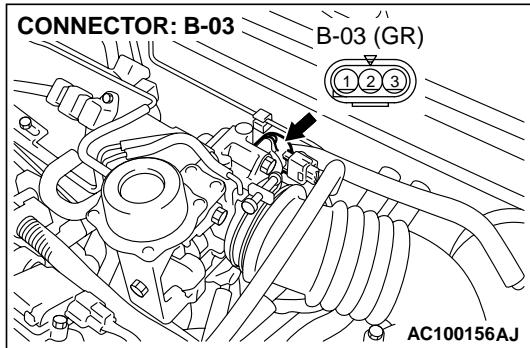
**STEP 17. Check the harness for damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.



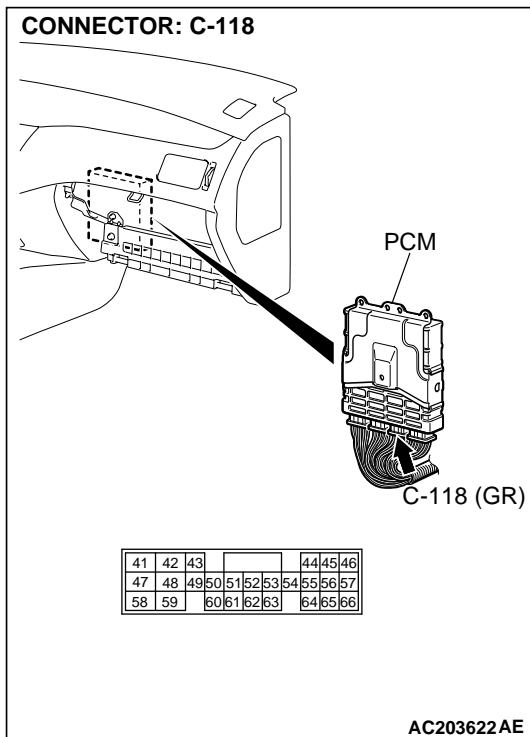


**STEP 18. Check the harness for damage between TP sensor connector B-03 terminal 2 and PCM connector C-118 terminal 57.**

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

**YES :** Adjust the TP sensor. Refer to GROUP 13A, On-vehicle Service – TP Sensor Adjustment [P.13Aa-12](#).

**NO :** Repair or replace the harness wire.



## DTC 12: TP Sensor System (Open Circuit)

### TP Sensor System Circuit

Refer to [P.23Ac-2](#).

### CIRCUIT OPERATION

Refer to [P.23Ac-2](#).

### DTC SET CONDITIONS

If the TP sensor output voltage is less than 0.2 volt when the engine is not at idle, the output is judged to be too low and DTC 12 is set.

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

- Malfunction of the TP sensor circuit.
- Damaged harness or connector.
- Malfunction of the PCM.

## DIAGNOSIS

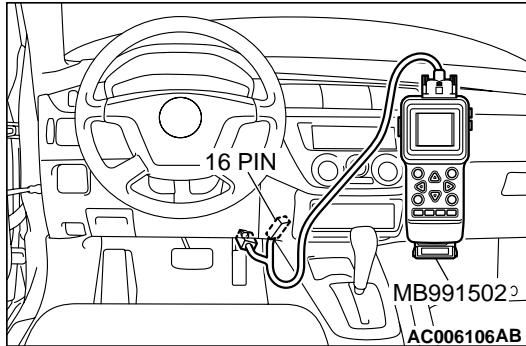
### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

### STEP 1. Using scan tool MB991502, check data list item 11: TP Sensor.

#### 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.

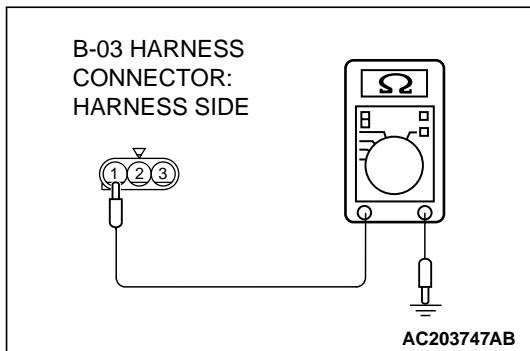
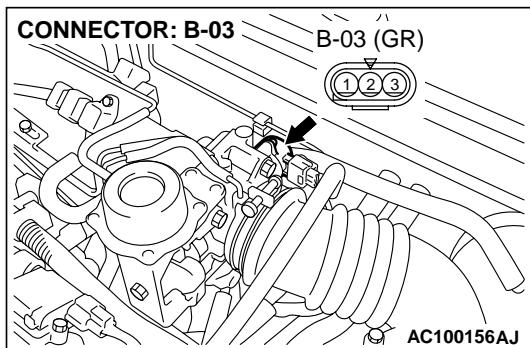


- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to the data reading mode for item 11, TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
  - With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 335 and 935 mV at idle, and between 4,400 and 5,300 mV in the full-open position?**

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

**NO :** Go to Step 2.



**STEP 2. Measure the TP sensor output voltage at the TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground by backprobing.

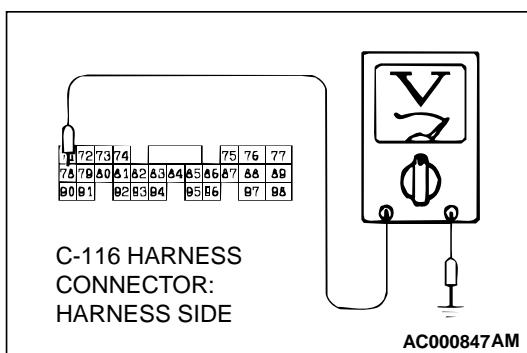
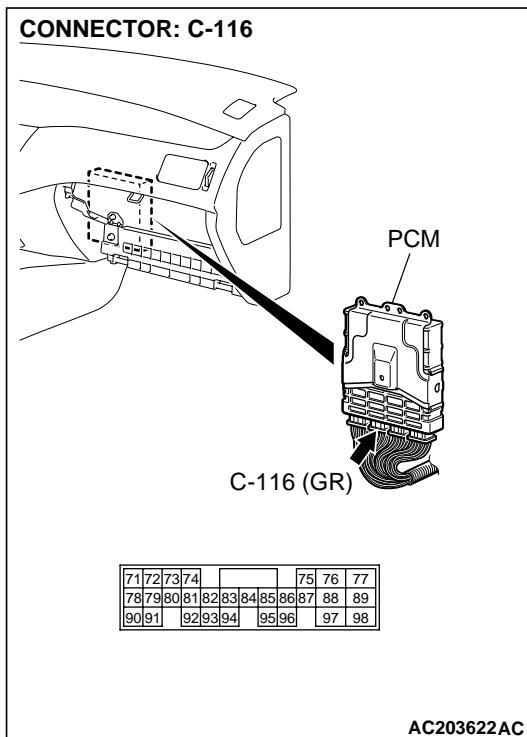
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, the voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 3.

**NO :** Go to Step 8.



**STEP 3. Measure the TP sensor output voltage at PCM connector C-116 by backprobing.**

- (1) Do not disconnect connector C-116.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 78 and ground by backprobing.

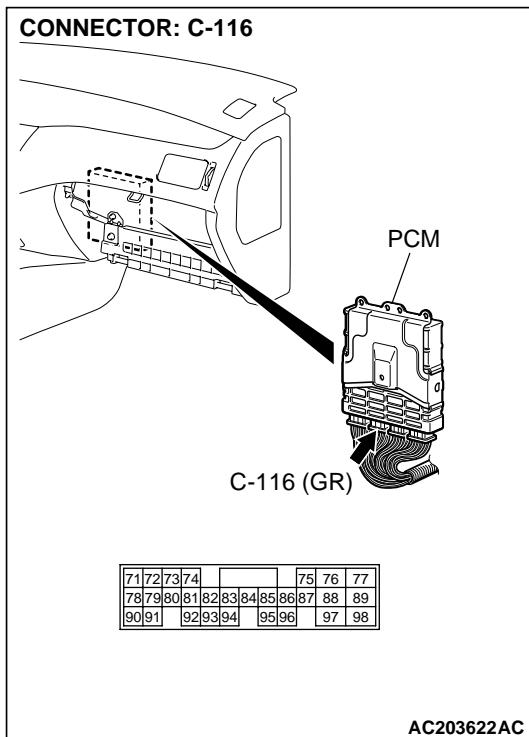
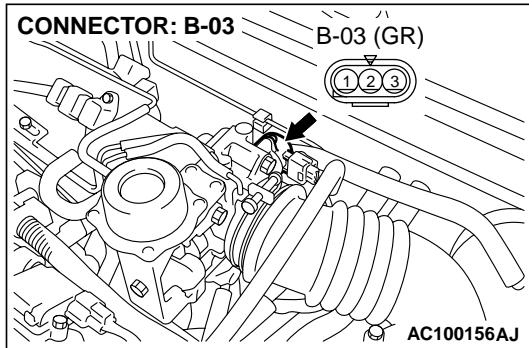
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 4.

**NO :** Go to Step 6.



**STEP 4. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 5.

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

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**STEP 5. Using scan tool MB991502, check data list item 11: TP Sensor.**

**⚠ CAUTION**

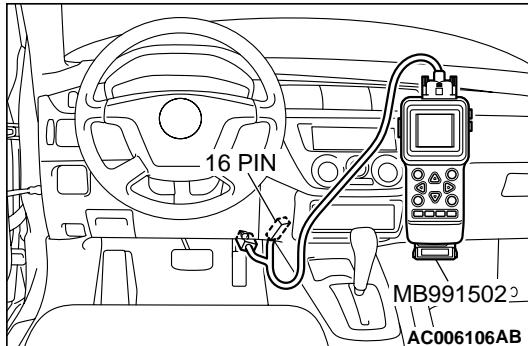
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

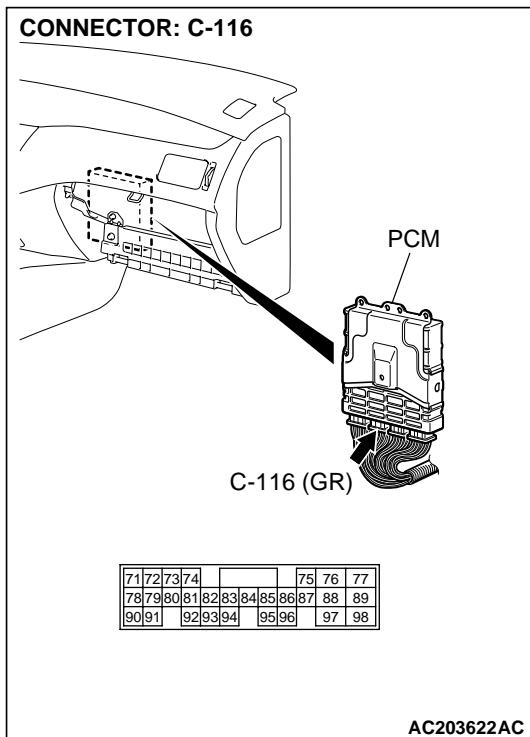
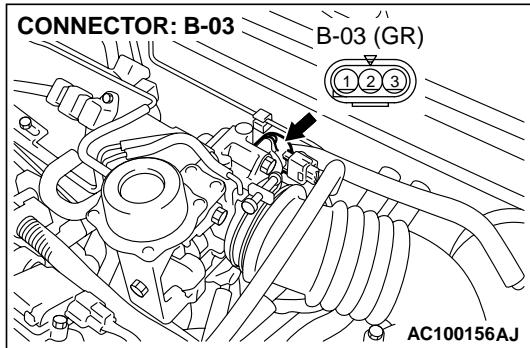
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to the data reading mode for item 11, TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
  - With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the sensor voltage between 335 and 935 mV at idle, and between 4,400 and 5,300 mV in the full-open position?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Replace the PCM.

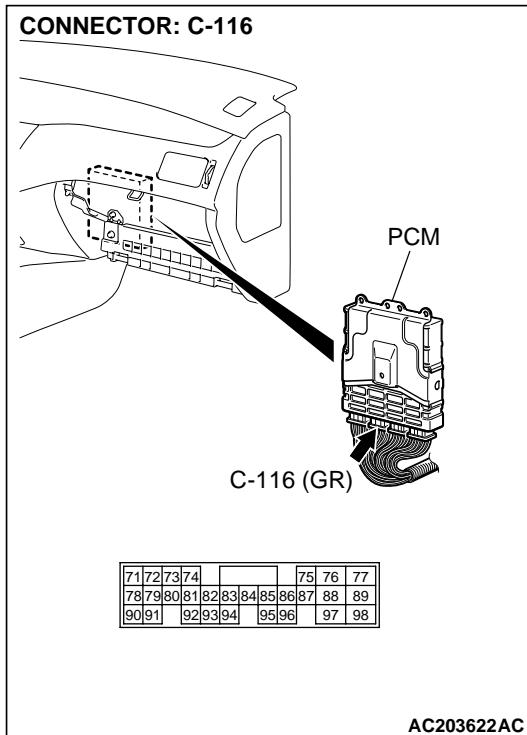
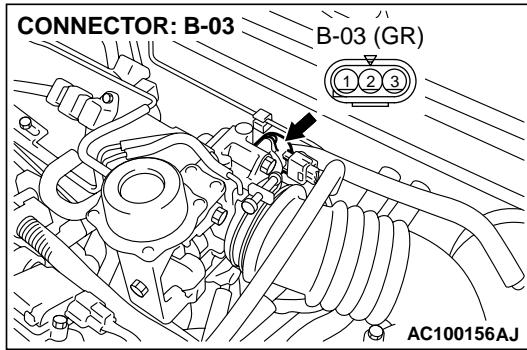




**STEP 6. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

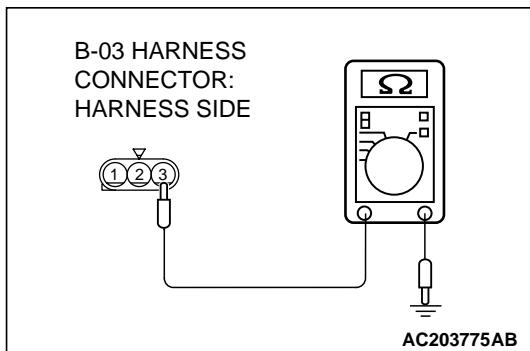
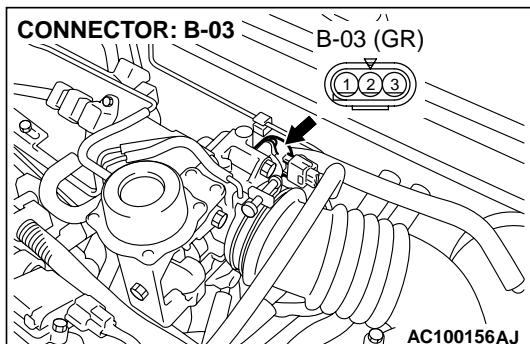


**STEP 7. Check the harness for open circuit or damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.



**STEP 8. Measure the power supply voltage from the PCM at the TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 3 and ground by backprobing.

- The voltage should measure between 4.9 and 5.1 volts.

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

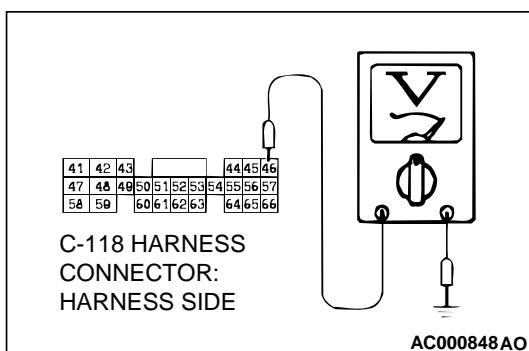
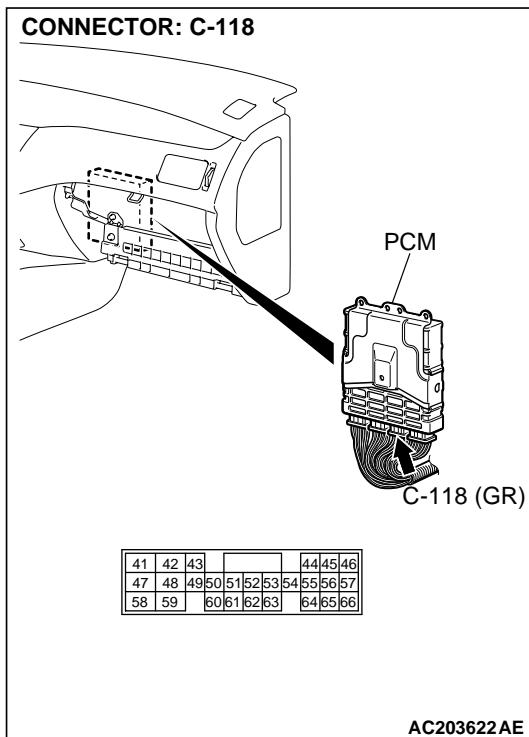
**Q: Is the measured voltage between 4.9 and 5.1 volts?**

- YES :** Go to Step 14.  
**NO :** Go to Step 9.

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**STEP 9. Measure the power supply voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Turn the ignition switch to the "ON" position.

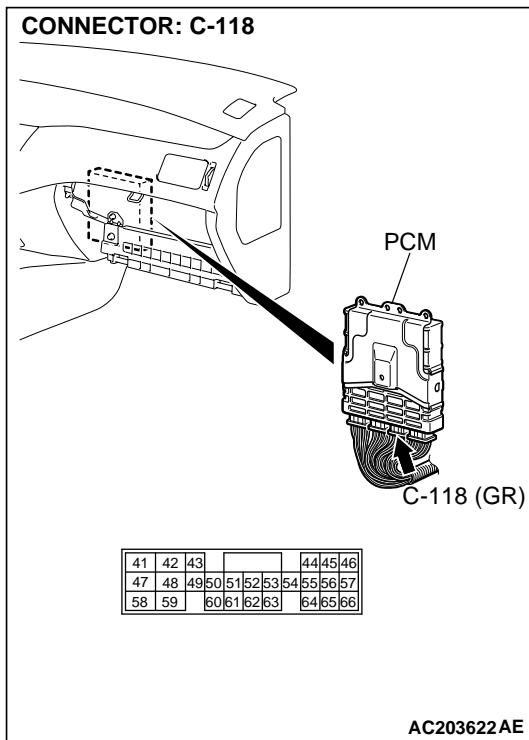
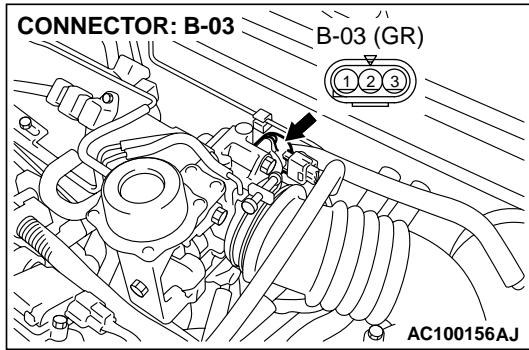


- (3) Measure the voltage between terminal 46 and ground by backprobing.
  - The voltage should measure between 4.9 and 5.1 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 10.

**NO :** Go to Step 12.

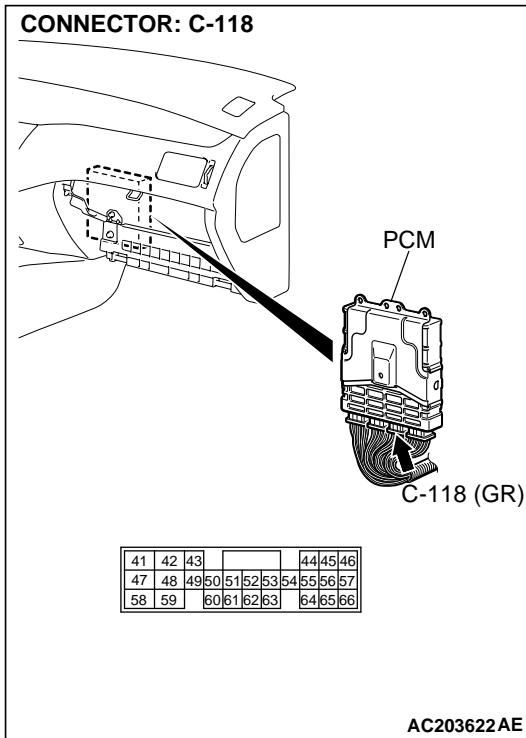
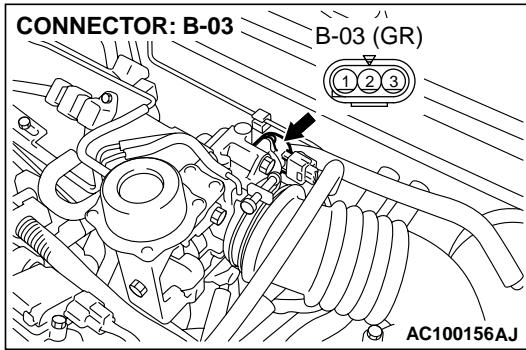


**STEP 10. Check TP sensor connector B-03 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 11.

**NO :** Repair or replace the defective components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

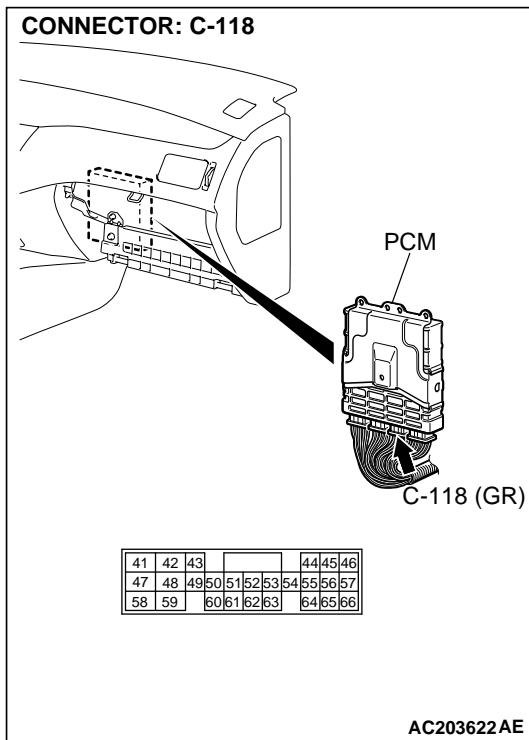
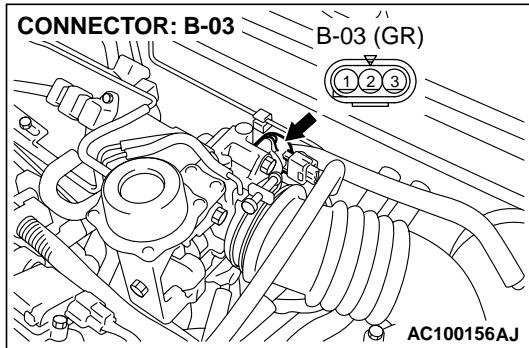


**STEP 11. Check the harness for open circuit or damage between TP sensor connector B-03 terminal 3 and PCM connector C-118 terminal 46.**

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

**YES :** Go to Step 5.

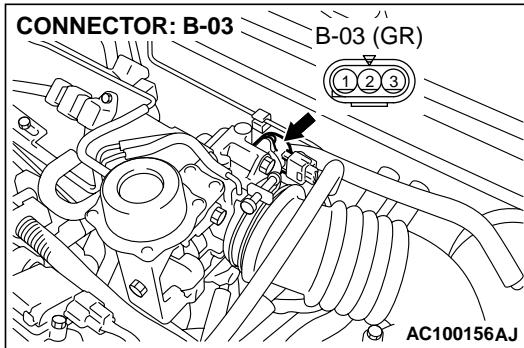
**NO :** Repair or replace the harness wire.



**STEP 12. Check TP sensor connector B-03 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 13.

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

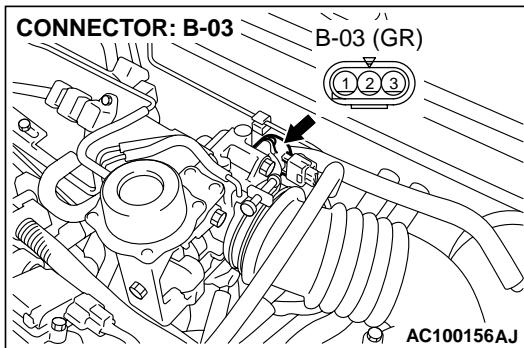
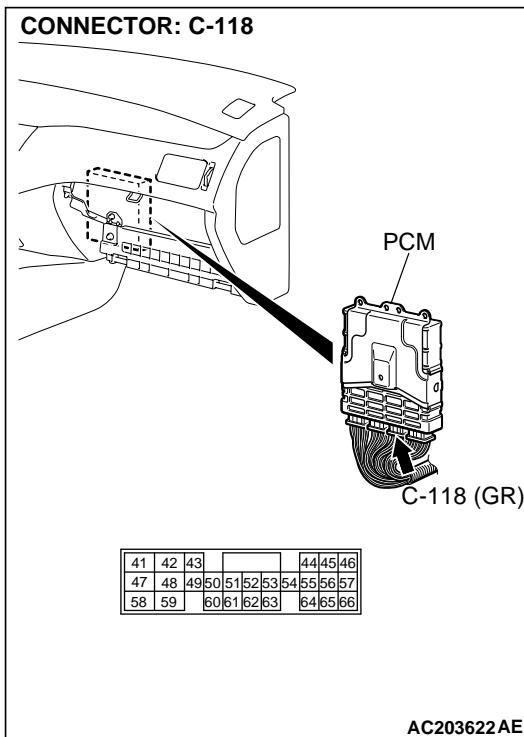


**STEP 13. Check the harness for a short circuit to ground between TP sensor connector B-03 terminal 3 and PCM connector C-118 terminal 46.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.

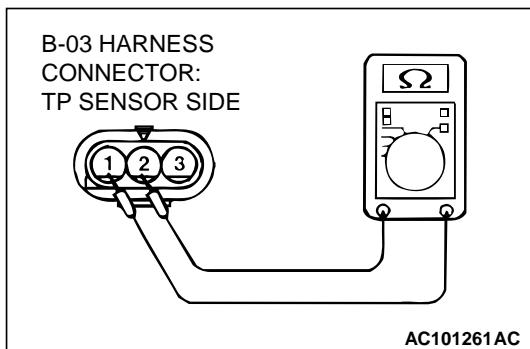
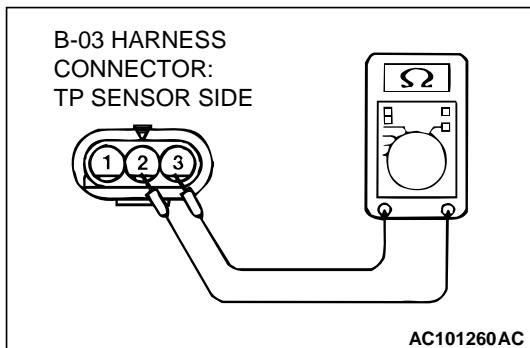
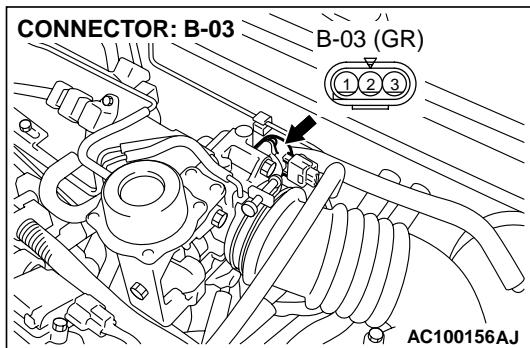


**STEP 14. Check TP sensor connector B-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 15.

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




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**STEP 15. Check the TP sensor.**

(1) Disconnect connector B-03 and measure at the TP sensor side.

(2) Measure the resistance between the TP sensor connector terminals 2 and 3.

**Specified resistance: 2.0 – 4.0 kΩ**

(3) Measure the resistance between the TP sensor connector terminals 1 and 2.

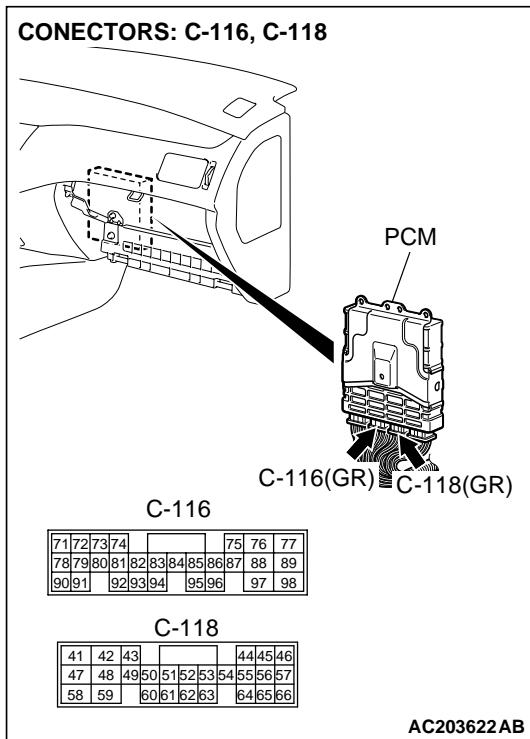
(4) Move the throttle valve from the idle position to the full-open position.

- The resistance should change smoothly in proportion to the opening angle of the throttle valve.

**Q: Does the resistance change smoothly between 2.0 – 4.0 kΩ in proportion to the opening angle of the throttle valve?**

**YES :** Go to Step 16.

**NO :** Replace the TP sensor. Refer to GROUP 13A, Throttle Body Assembly [P.13Aa-28](#).

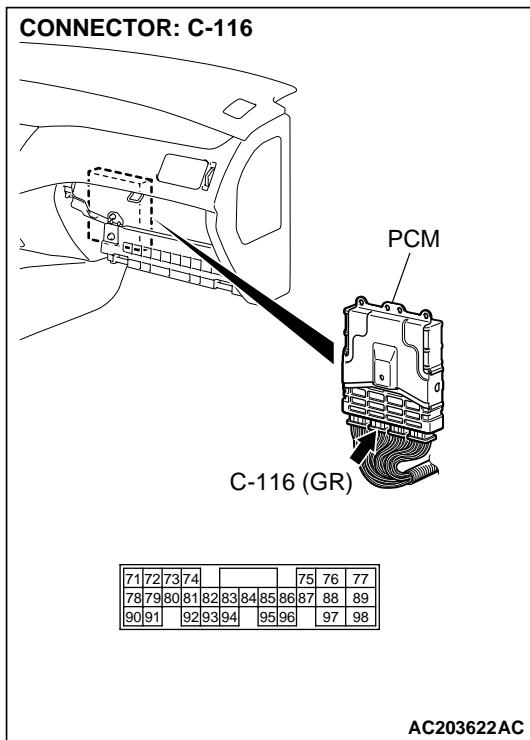
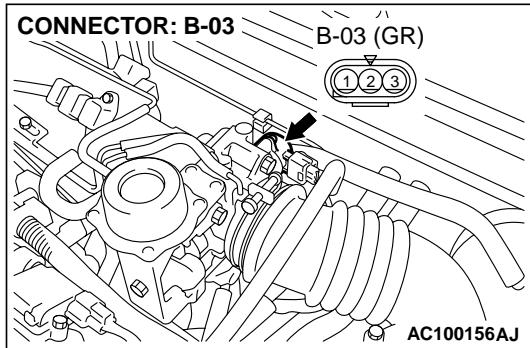


**STEP 16. Check PCM connectors C-116 and C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 17.

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



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**STEP 17. Check the harness for a short circuit to ground or damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.

---

**STEP 18. Check the TP sensor connector and harness for a short circuit to ground between the TP sensor and the auto-cruise control-ECU connector.**

**Q: Are the connector and harness wire in good condition?**

**YES :** Adjust the TP sensor. Refer to GROUP 13A, On-vehicle Service – TP Sensor Adjustment [P.13Aa-12](#).

**NO :** Repair or replace the damaged components.

**DTC 14: TP Sensor System (Maladjusted Sensor)****TP Sensor System Circuit**

Refer to P.23Ac-2.

**CIRCUIT OPERATION**

Refer to P.23Ac-2.

**DTC SET CONDITIONS**

If TP sensor output voltage is 0.2 volt or lower or if it is 1.2 volts or higher when the engine is idling, the TP sensor adjustment is judged to be incorrect and diagnostic trouble code number "14" is output.

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

- Malfunction of the TP sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, read the A/T diagnostic trouble code.****CAUTION**

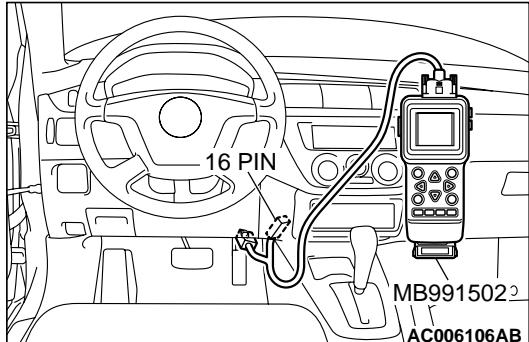
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

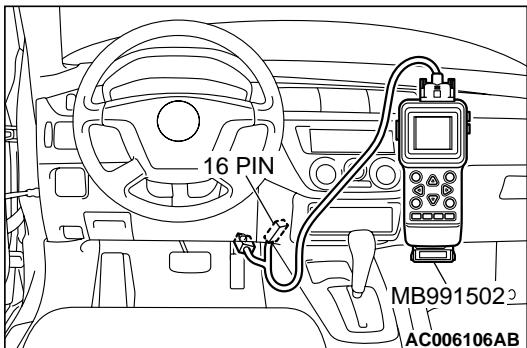
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the A/T DTC 11 or 12 set?**

**YES :** Refer to P.23Ac-2, DTC 11: TP Sensor System (Short Circuit), P.23Ac-18 DTC 12: TP Sensor System (Open Circuit).

**NO :** Go to Step 2.





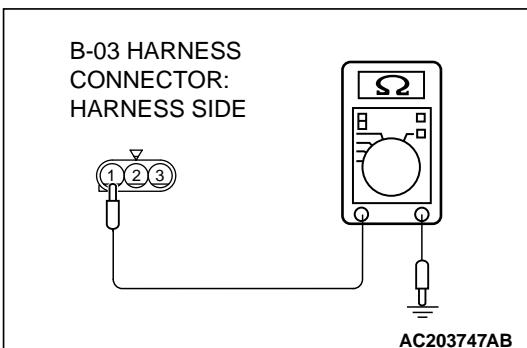
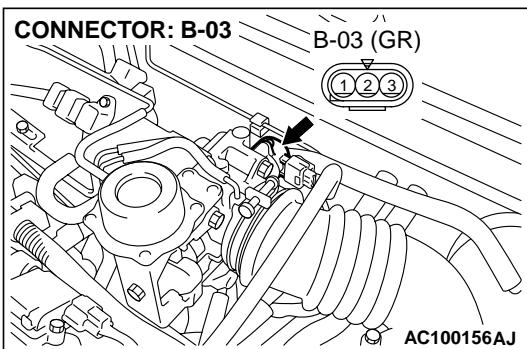
**STEP 2. Using scan tool MB991502, check data list item 11: TP Sensor.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 11: TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
  - With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 335 and 935 mV at idle, and between 4,400 and 5,300 mV in the full-open position?**

**YES :** It can be assumed that this malfunction is intermittent.  
Refer to GROUP 00, How to Use Troubleshooting/  
Inspection Service Points – How to Cope with  
Intermittent Malfunction P.00-6.

**NO :** Go to Step 3.



**STEP 3. Measure the TP sensor output voltage at TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to "ON" position.

(3) Measure the voltage between terminal 1 and ground by backprobing.

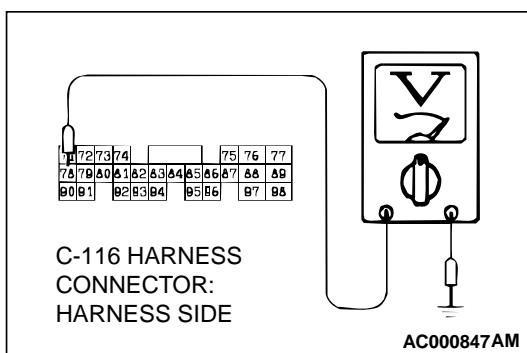
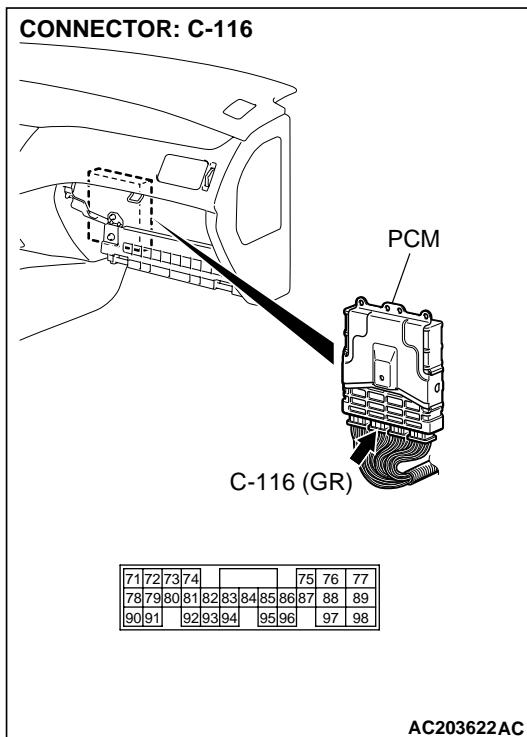
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 4.

**NO :** Go to Step 9.



**STEP 4. Check the TP sensor output voltage at PCM connector C-116 by backprobing.**

- (1) Do not disconnect connector C-116.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 78 and ground by backprobing.

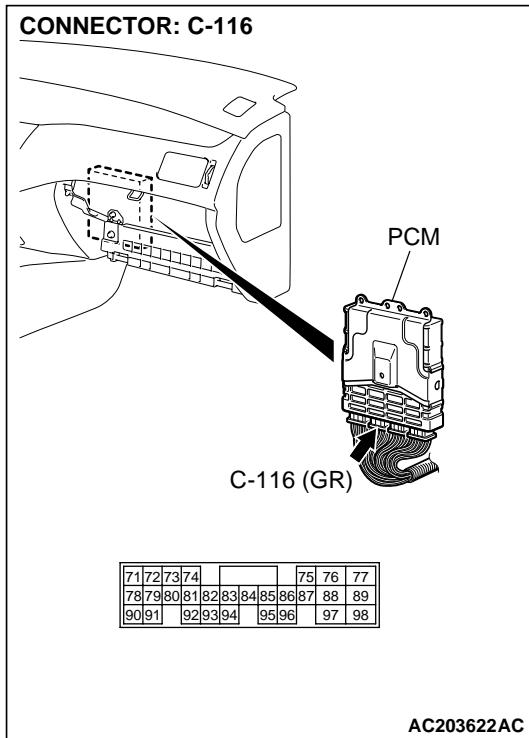
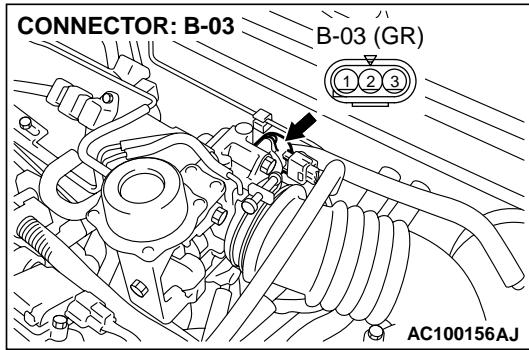
- With the throttle valve in the idle position, voltage should measure between 0.335 and 0.935 volt.
- With the throttle valve in the full-open position, voltage should measure between 4.4 and 5.3 volts.

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

**Q: Is the measured voltage between 0.335 and 0.935 volt at idle, and between 4.4 and 5.3 volts in the full-open position?**

**YES :** Go to Step 5.

**NO :** Go to Step 7.



**STEP 5. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 6.

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

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**STEP 6. Using scan tool MB991502, check data list item 11:  
TP Sensor.**

**⚠ 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 "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 11:  
TP Sensor.

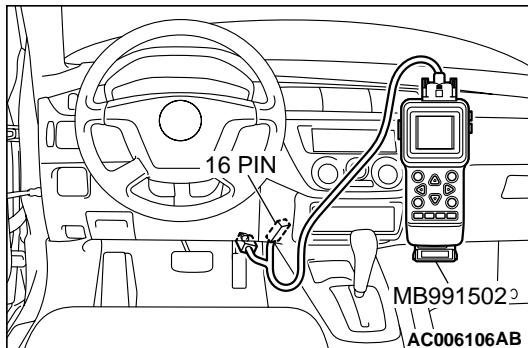
- With the throttle valve in the idle position, voltage should measure between 335 and 935 mV.
- With the throttle valve in the full-open position, voltage should measure between 4,400 and 5,300 mV.

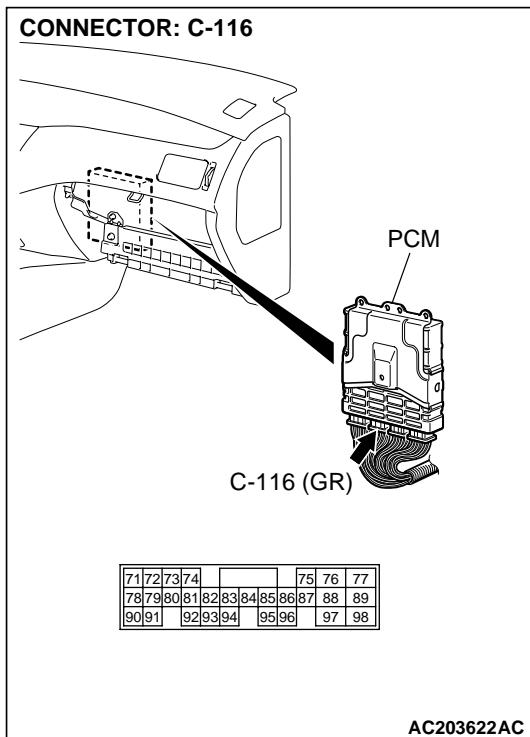
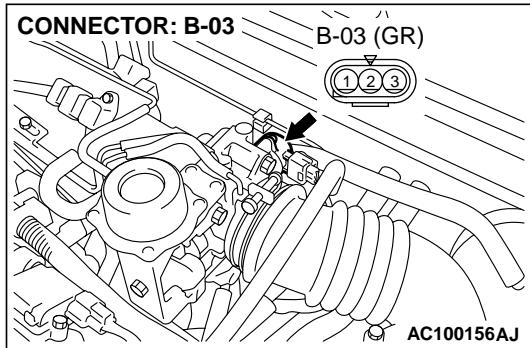
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 335 and 935 mV at  
idle, and between 4,400 and 5,300 mV in the full-open  
position?**

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

**NO :** Replace the PCM.

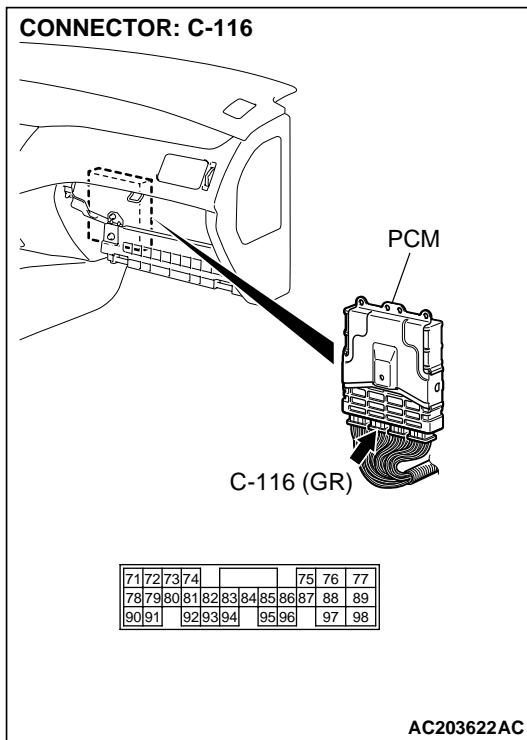
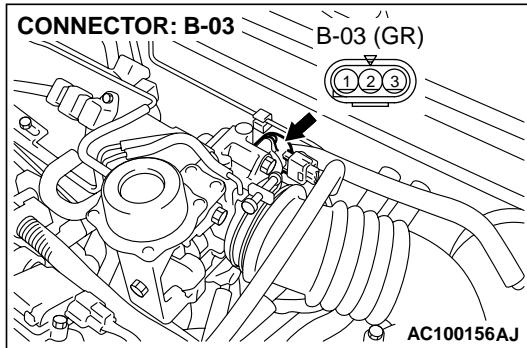




**STEP 7. Check TP sensor connector B-03 and PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**  
**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 8.

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

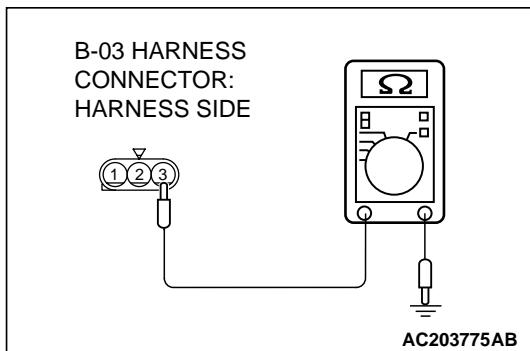
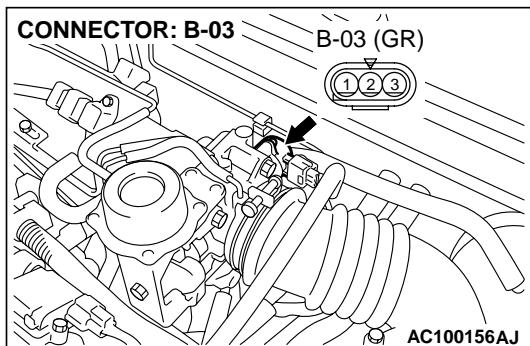


**STEP 8. Check the harness for open circuit or damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.



**STEP 9. Measure the power supply voltage from the PCM at the TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 3 and ground by backprobing.

- Voltage should measure between 4.9 and 5.1 volts.

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

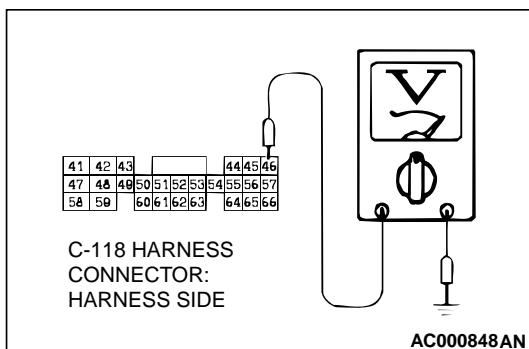
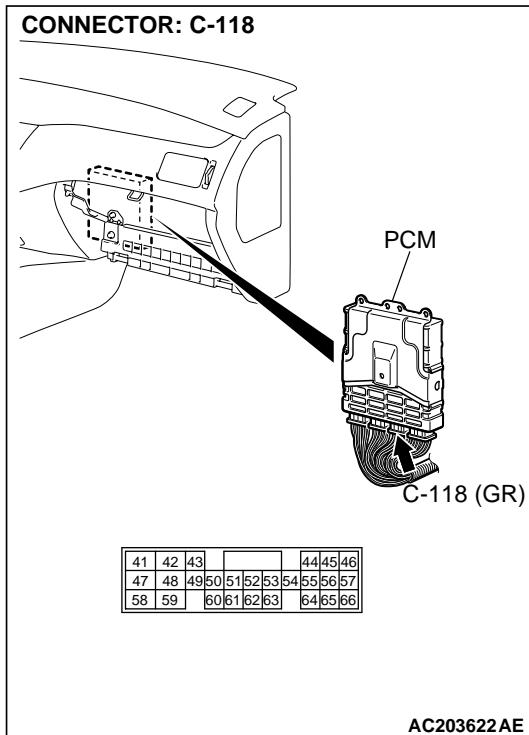
**Q: Is the measured voltage between 4.9 and 5.1 volts?**

- YES :** Go to Step 15.  
**NO :** Go to Step 10.

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**STEP 10. Measure the power supply voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Turn the ignition switch to the "ON" position.

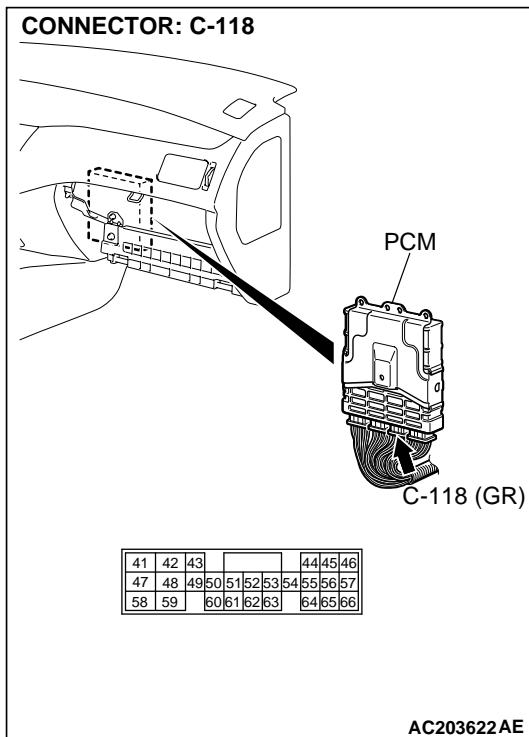
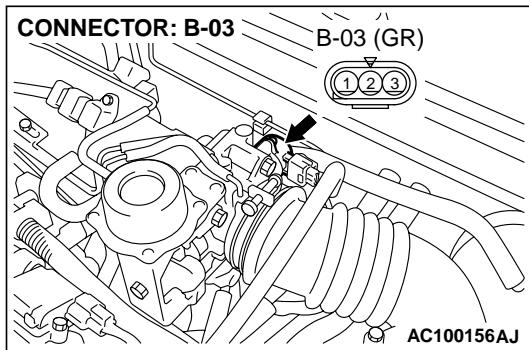


- (3) Measure the voltage between terminal 46 and ground by backprobing.
  - The voltage should measure between 4.9 and 5.1 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 11.

**NO :** Go to Step 13.

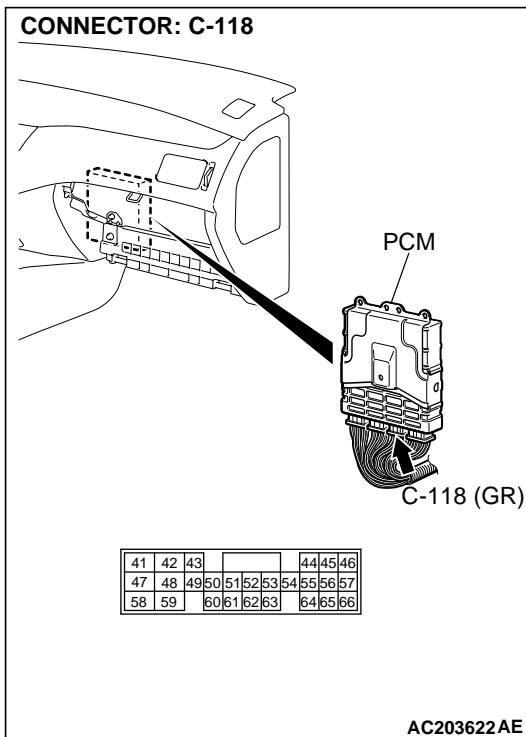
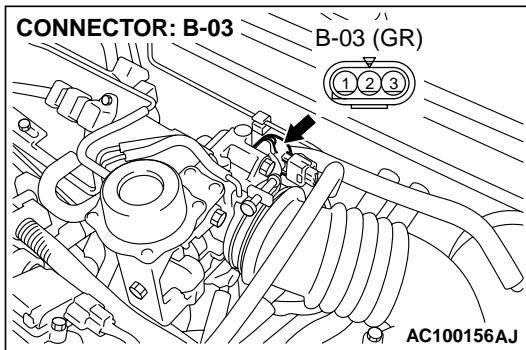


**STEP 11. Check TP sensor connector B-03 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 12.

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

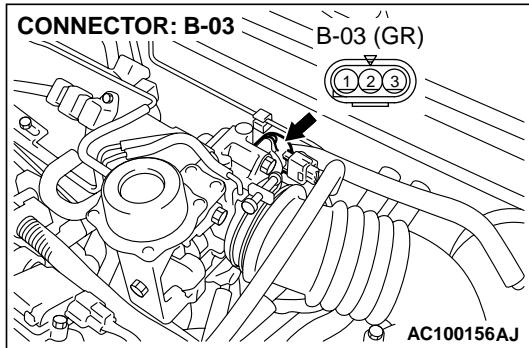


**STEP 12. Check the harness for open circuit or damage between TP sensor connector B-03 terminal 3 and PCM connector C-118 terminal 46.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.

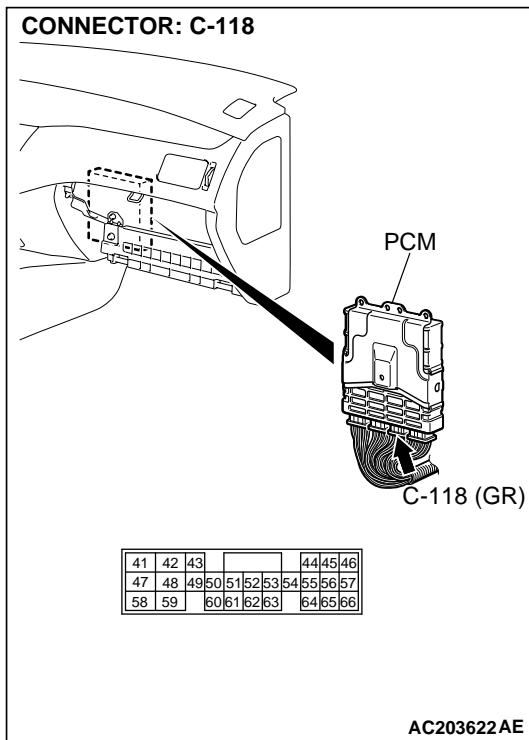


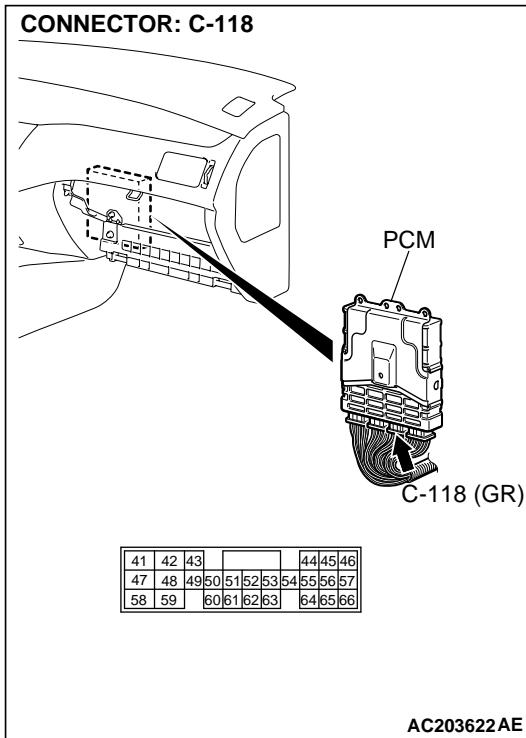
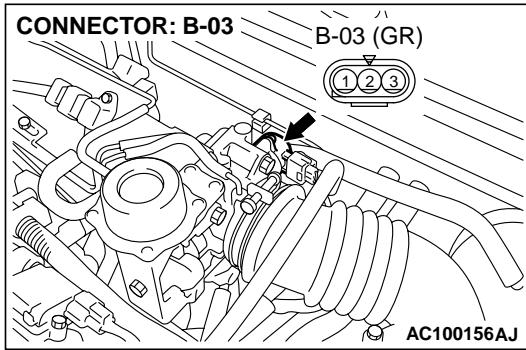
**STEP 13. Check TP sensor connector B-03 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 14.

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



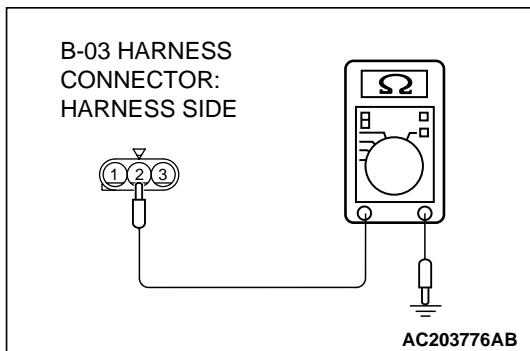
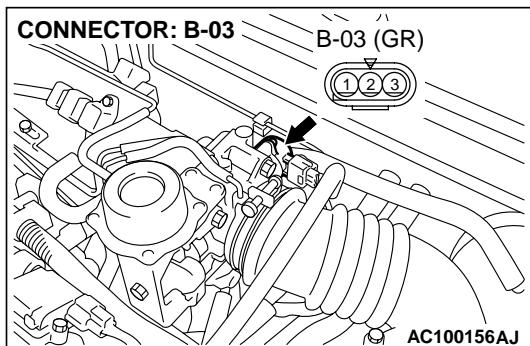


**STEP 14. Check harness for short circuit to ground between TP sensor connector B-03 terminal 3 and PCM connector C-118 terminal 46.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.



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**STEP 15. Measure the ground voltage at TP sensor connector B-03 by backprobing.**

- (1) Do not disconnect connector B-03.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 2 and ground by backprobing.

- The voltage should measure 0.5 volt or less.

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

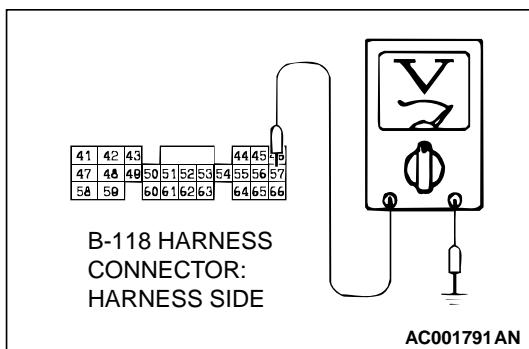
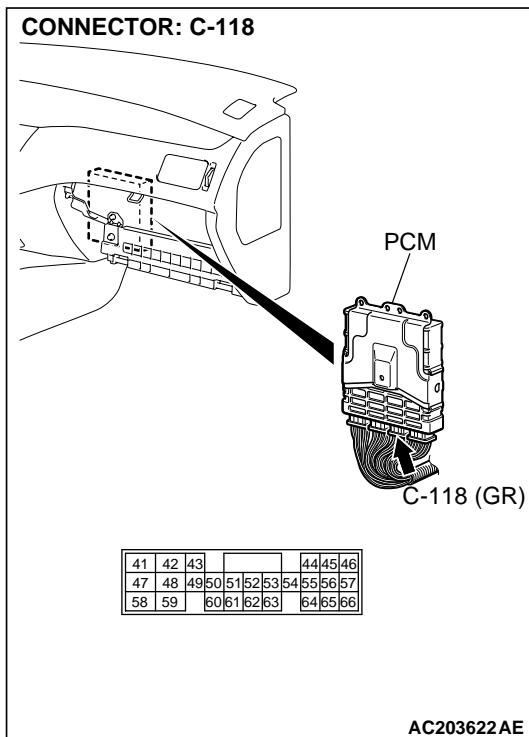
**Q: Is the measured voltage 0.5 volt or less?**

**YES** : Go to Step 20.

**NO** : Go to Step 16.

**STEP 16. Measure the ground voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal 57 and ground by backprobing.

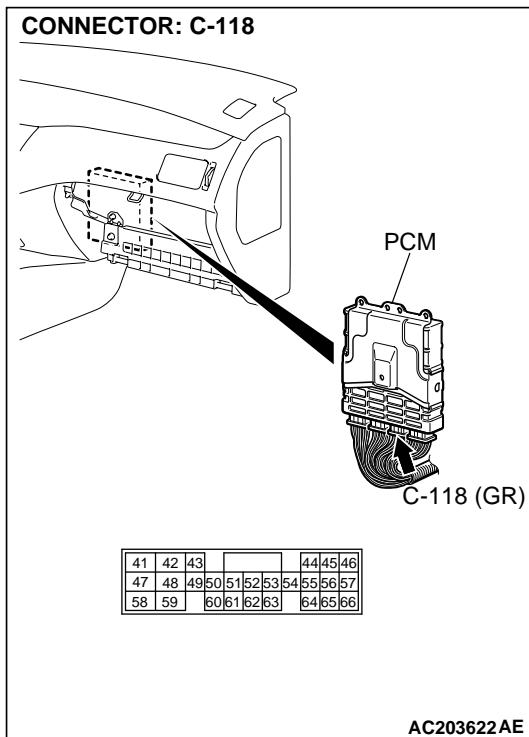
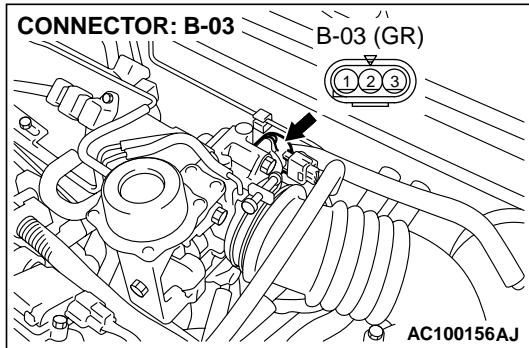
- The voltage should measure 0.5 volt or less.

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

**Q: Is the measured voltage 0.5 volt or less?**

**YES :** Go to Step 17.

**NO :** Go to Step 19.

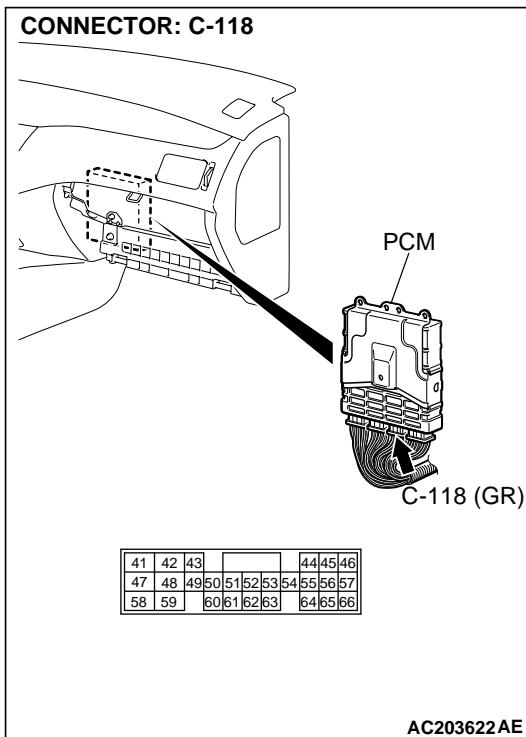
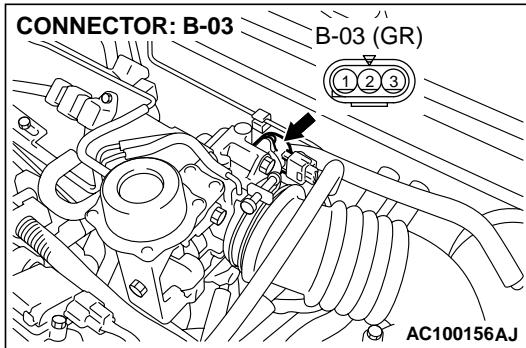


**STEP 17. Check TP sensor connector B-03 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors in good condition?**

**YES :** Go to Step 18.

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

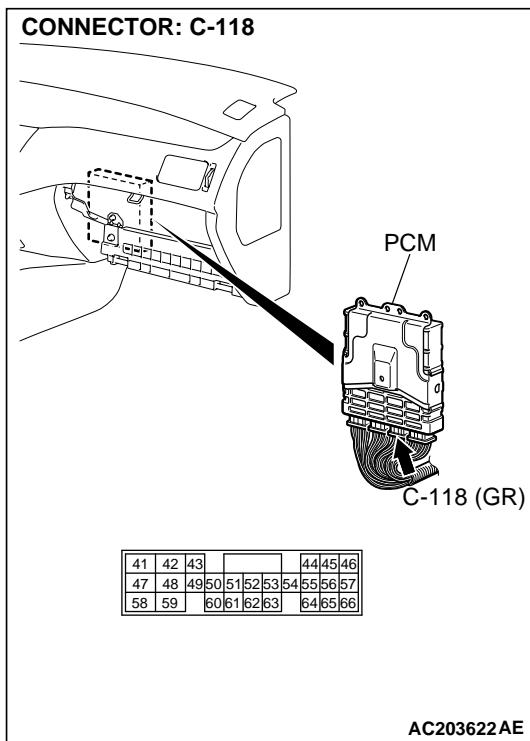


**STEP 18. Check the harness for open circuit or damage between TP sensor connector B-03 terminal 2 and PCM connector C-118 terminal 57.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.



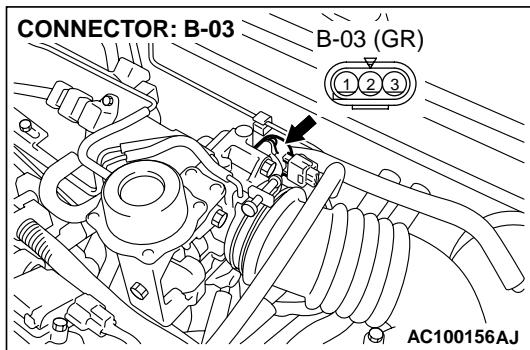
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**STEP 19. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 6.

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



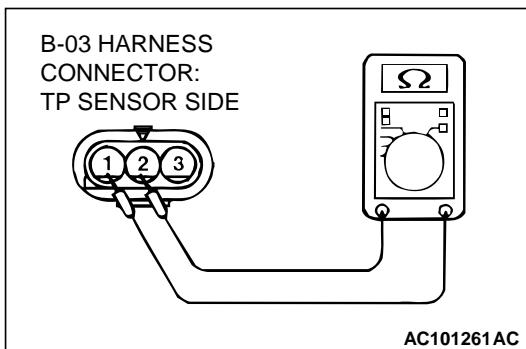
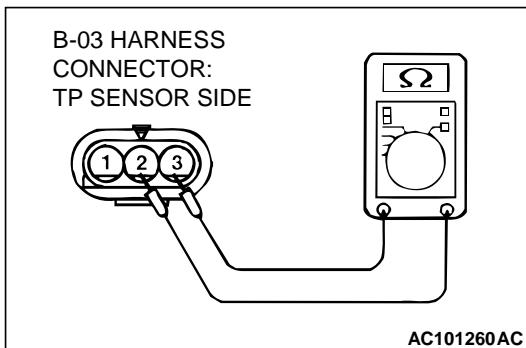
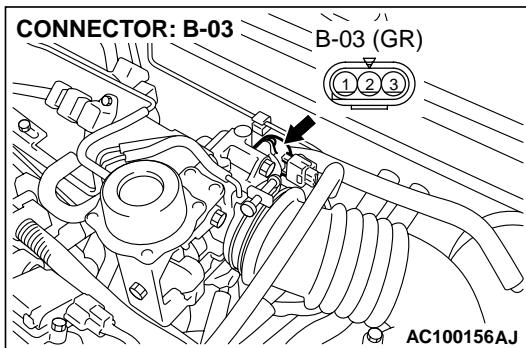
---

**STEP 20. Check TP sensor connector B-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 21.

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




---

**STEP 21. Check the TP sensor.**

- (1) Disconnect connector B-03 and measure at the TP sensor side.

- (2) Measure the resistance between the TP sensor connector terminals 2 and 3.

**Standard value: 2.0 – 4.0 kΩ**

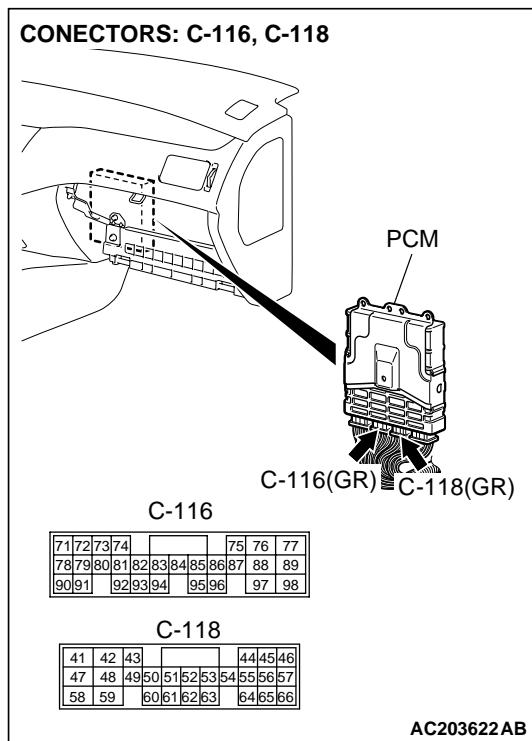
- (3) Measure the resistance between the TP sensor connector terminals 1 and 2.

- (4) Move the throttle valve from the idle position to the full-open position.
- The resistance should change smoothly in proportion to the opening angle of the throttle valve.

**Q: Does the resistance change smoothly between 2.0 – 4.0 kΩ in proportion to the opening angle of the throttle valve?**

**YES :** Go to Step 22.

**NO :** Replace the TP sensor. Refer to GROUP 13A, Throttle Body Assembly [P.13Aa-28](#).

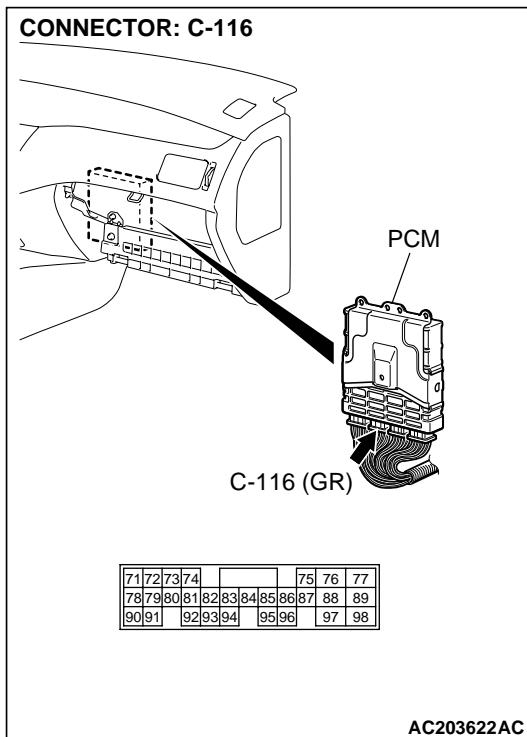
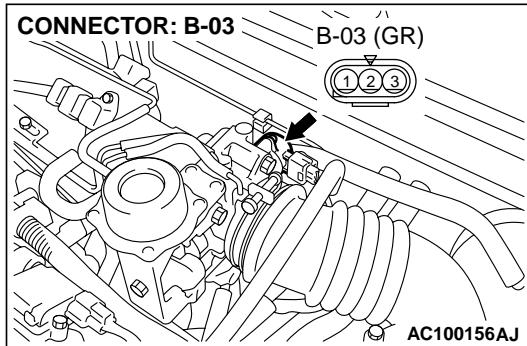


**STEP 22. Check PCM connectors C-118 and C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 23.

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




---

**STEP 23. Check harness for a short circuit to ground or damage between TP sensor connector B-03 terminal 1 and PCM connector C-116 terminal 78.**

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

**YES :** Go to Step 24.

**NO :** Repair or replace the harness wire.

---

**STEP 24. Check the TP sensor connector and harness for a short circuit to ground between the TP sensor and the auto-cruise control-ECU connector.**

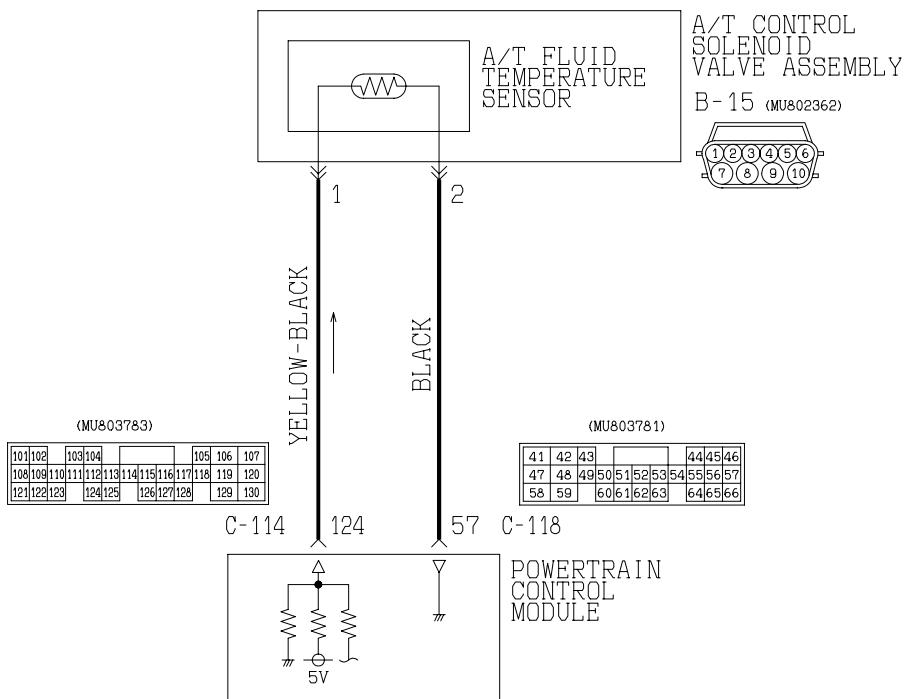
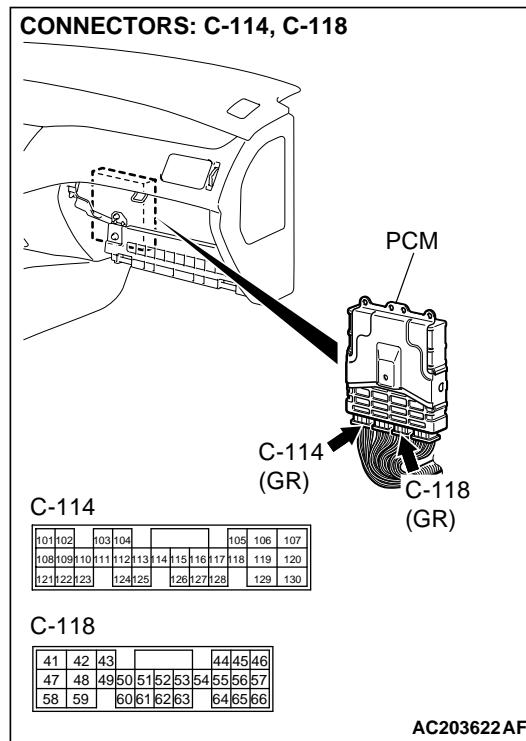
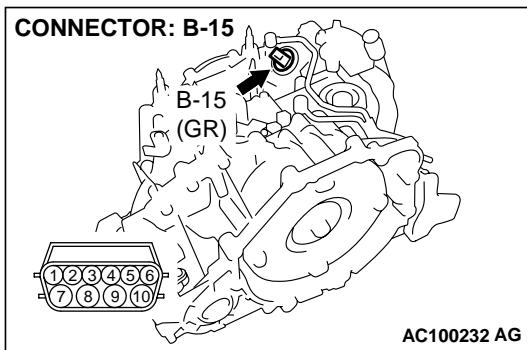
**Q: Are the connector and harness wire in good condition?**

**YES :** TP adjustment. Refer to GROUP 13A, On-vehicle Service – TP Sensor Adjustment [P.13Aa-12](#).

**NO :** Repair or replace the damaged components.

## DTC 15: A/T Fluid Temperature Sensor System (Open Circuit)

A/T Fluid Temperature Sensor System Circuit

W2J01M01AA  
AC100486AB**CIRCUIT OPERATION**

- The PCM (terminal 124) applies 5 volts to the A/T fluid temperature sensor output terminal (terminal 1).

- The A/T fluid temperature sensor circuit is grounded to the PCM (terminal 57).

- When the A/T fluid temperature is cold, the A/T fluid temperature sensor resistance is high. When the A/T fluid temperature is hot, the A/T fluid temperature sensor resistance is low.

## DTC SET CONDITIONS

If the A/T fluid temperature sensor output voltage is greater than 4.5 volts after driving for 10 minutes or more (if the A/T fluid temperature does not increase), there is an open circuit in the A/T fluid temperature sensor and DTC 15 is set.

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

- Malfunction of the A/T fluid temperature sensor circuit
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

### STEP 1. Using scan tool MB991502, check data list item 15: A/T Fluid Temperature Sensor.

#### 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.
- (3) Set scan tool MB991502 to the data reading mode for item 15, A/T Fluid Temperature Sensor.

- When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

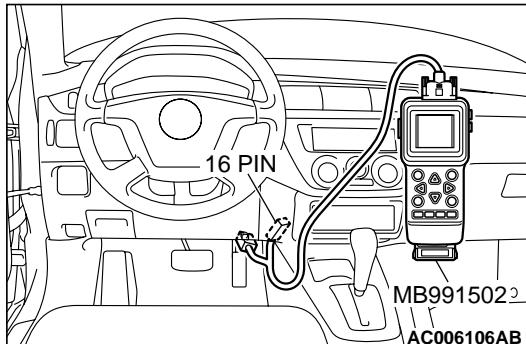
*NOTE: Set scan tool MB991502 to data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the A/T Fluid Temperature Sensor.*

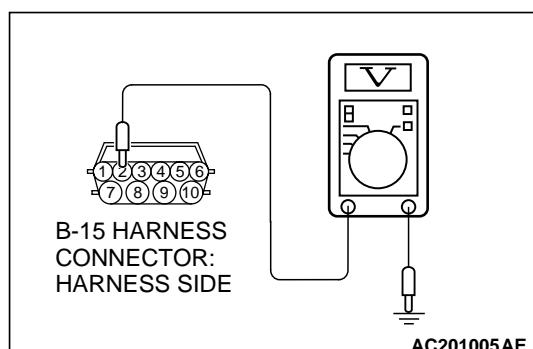
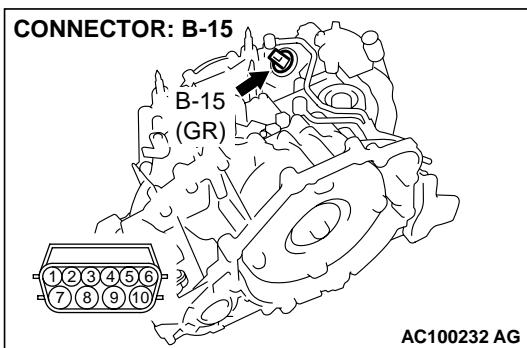
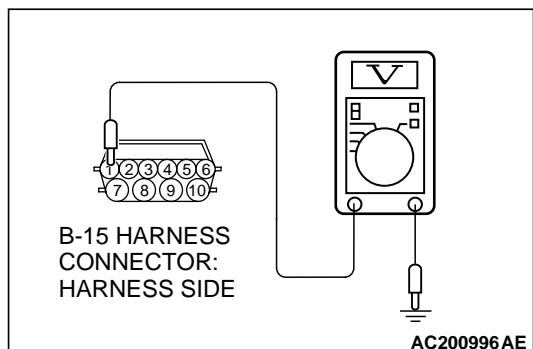
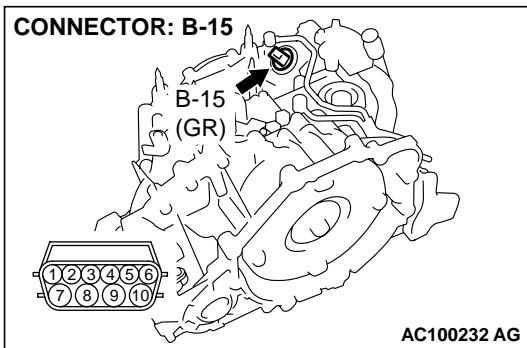
- When the engine is warm: 70 to 80°C (158 to 176°F)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.






---

**STEP 2. Measure the sensor output voltage at the A/T control solenoid valve assembly connector B-15 by backprobing.**

- (1) Do not disconnect connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground by backprobing.

- When A/T fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

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

**Q: Is the measured voltage within the specified range?**

- YES :** Go to Step 6.  
**NO :** Go to Step 3.

---

**STEP 3. Measure the ground voltage at the A/T control solenoid valve assembly connector B-15 by backprobing.**

- (1) Do not disconnect connector B-15.
- (2) Turn the ignition switch to the "ON" position.

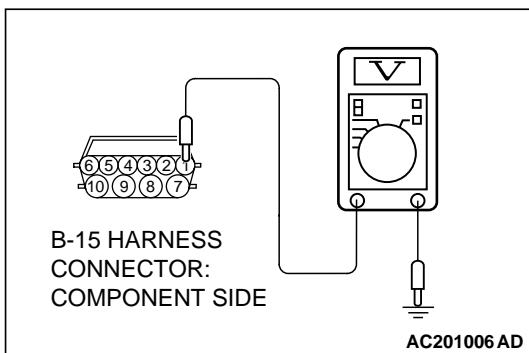
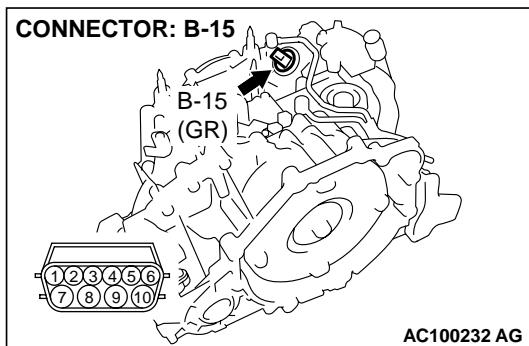
- (3) Measure the voltage between terminal 2 and ground by backprobing.

- The voltage should measure 0.5 volt or less.

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

**Q: Is the measured voltage 0.5 volt or less?**

- YES :** Go to Step 4.  
**NO :** Go to Step 7.



**STEP 4. Check the sensor output voltage at A/T control solenoid valve assembly connector B-15.**

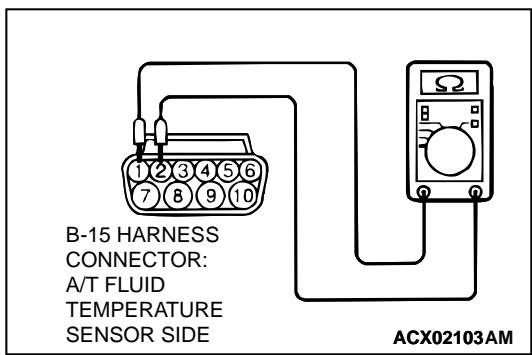
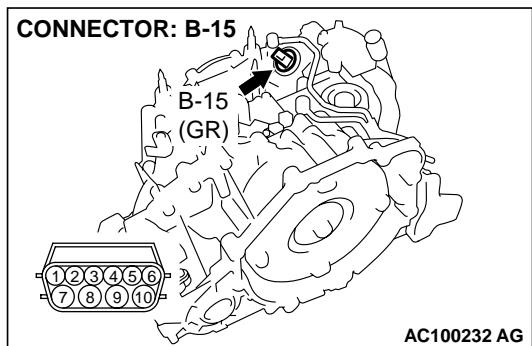
- (1) Disconnect connector B-15 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground.
  - The voltage should measure between 4.5 and 4.9 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

**YES :** Go to Step 5.

**NO :** Go to Step 9.



**STEP 5. Check the A/T fluid temperature sensor at A/T control solenoid valve assembly connector B-15.**

(1) Disconnect connector B-15 and measure at the sensor side.

(2) Measure the resistance between terminal 1 and 2.

- When A/T fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kΩ.
- When A/T fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kΩ.
- When A/T fluid temperature is 40°C (104°F), resistance should be between 3.4 and 4.2 kΩ.
- When A/T fluid temperature is 60°C (140°F), resistance should be between 1.9 and 2.2 kΩ.
- When A/T fluid temperature is 80°C (176°F), resistance should be between 1.0 and 1.2 kΩ.
- When A/T fluid temperature is 100°C (212°F), resistance should be between 0.57 and 0.69 kilohm.

**Q: Is the measured resistance within the specified range?**

**YES :** Go to Step 6.

**NO :** Replace the A/T fluid temperature sensor. Refer to GROUP 23B, Transaxle [P.23B-8](#).

---

**STEP 6. Using scan tool MB991502, check data list item 15:  
A/T Fluid Temperature Sensor.**

**⚠ 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.
- (3) Set scan tool MB991502 to data reading mode for item 15, A/T Fluid Temperature Sensor.

- When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

*NOTE: Set scan tool MB991502 to data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the A/T Fluid Temperature Sensor.*

- When the engine is warm: 70 to 80°C (158 to 176°F)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

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

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-6](#).

**NO :** Replace the PCM.

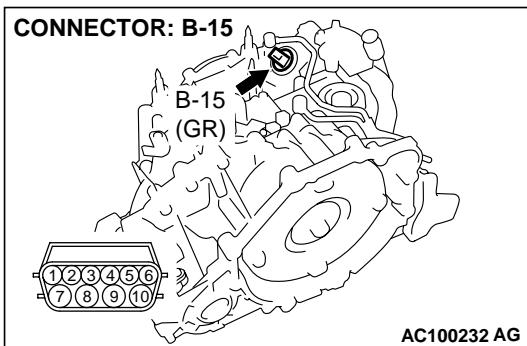
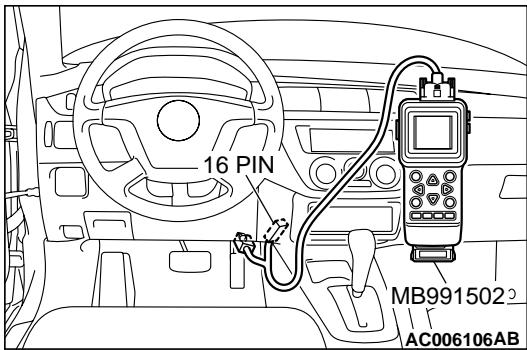
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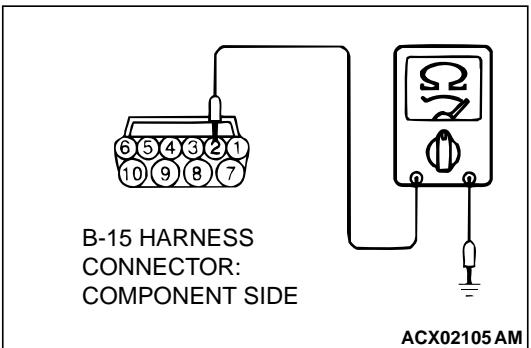
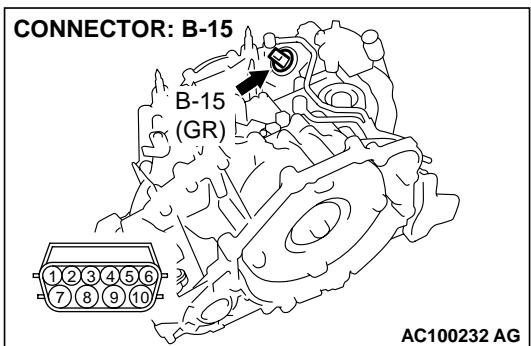
**STEP 7. Check A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 8.

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





**STEP 8. Measure the resistance of the ground circuit at A/T control solenoid valve assembly connector B-15.**

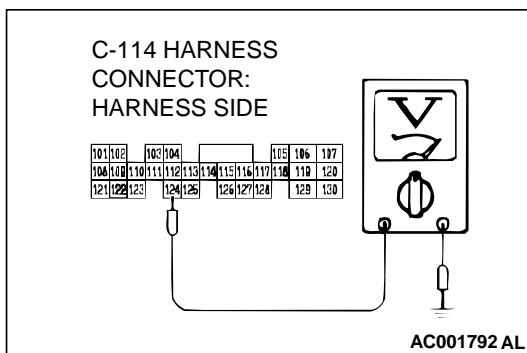
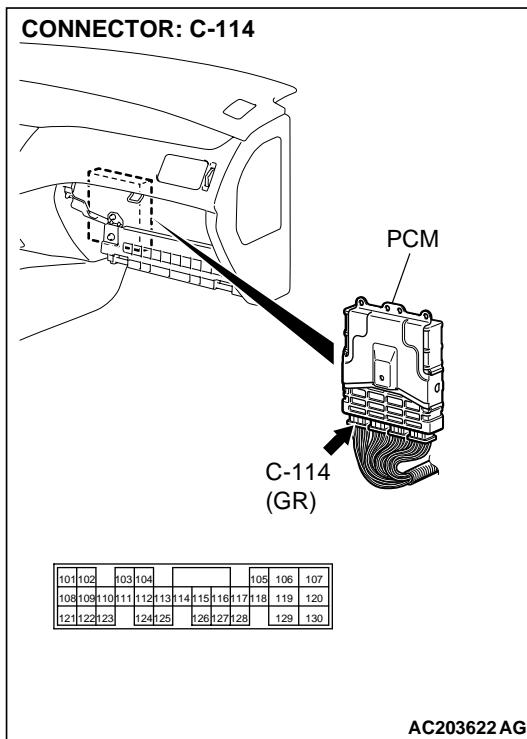
(1) Disconnect connector B-15 and measure at the harness side.

(2) Measure the resistance between terminal 2 and ground.  
• The resistance should measure less than 2 ohms.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 5.

**NO :** Go to Step 12.



**STEP 9. Measure the sensor output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 124 and ground by backprobing.

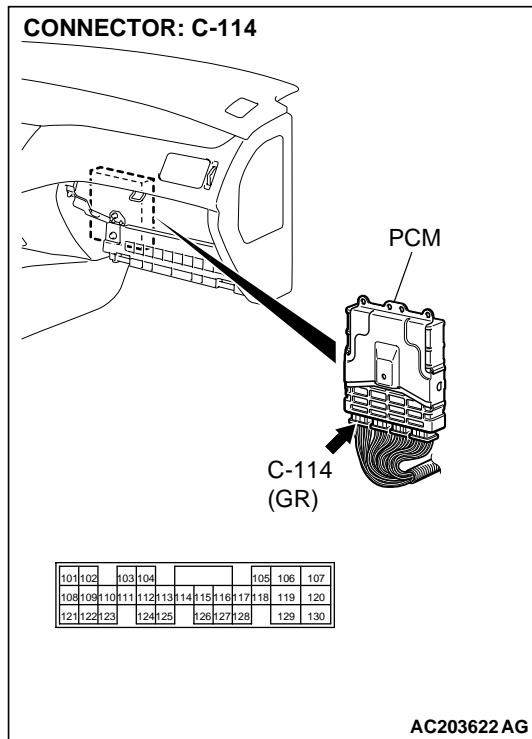
- When A/T fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

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

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 6.

**NO :** Go to Step 10.



**STEP 10. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 11.

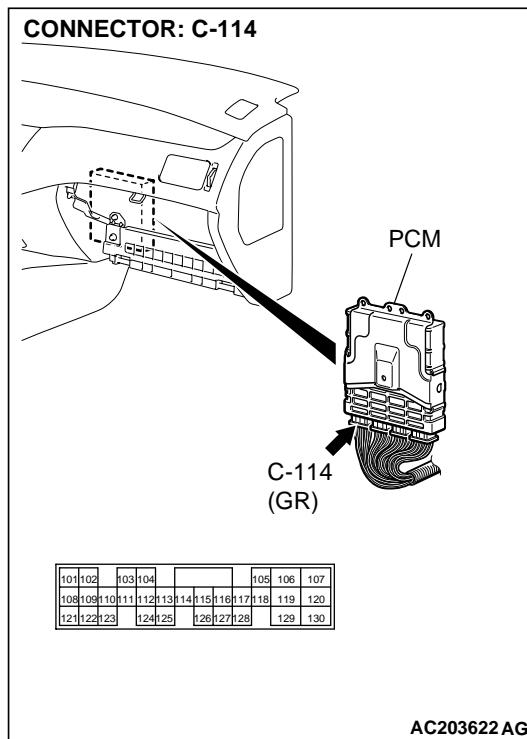
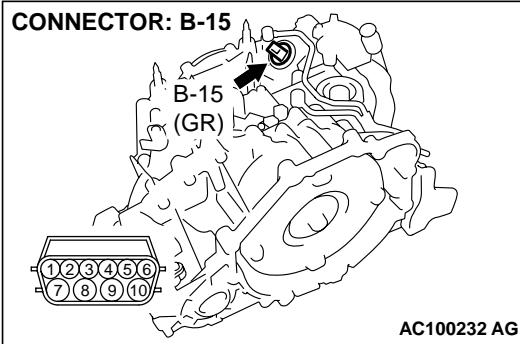
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

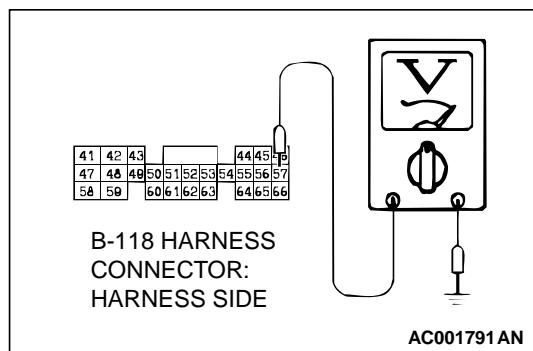
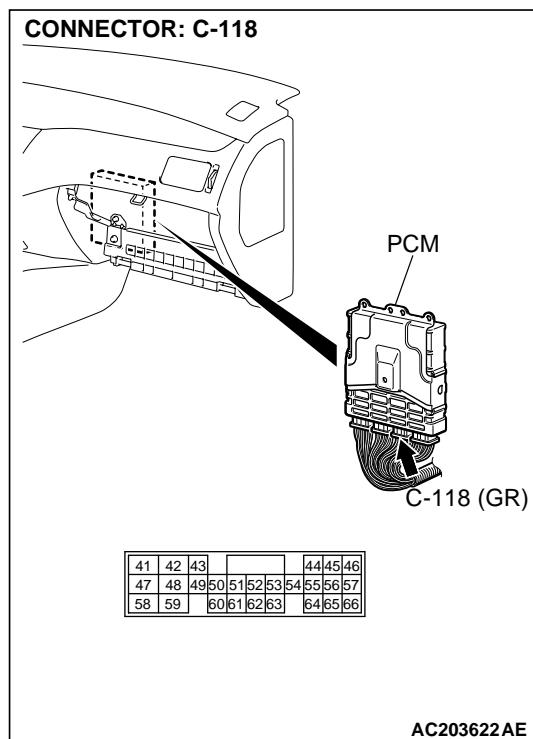
**STEP 11. Check the harness for open circuit or short circuit to ground between A/T control solenoid valve connector B-15 terminal 1 and PCM connector C-114 terminal 124.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.





**STEP 12. Measure the ground voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 57 and ground by backprobing.

- Voltage should measure 0.5 volt or less.

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

**Q: Is the measured voltage within the specified range?**

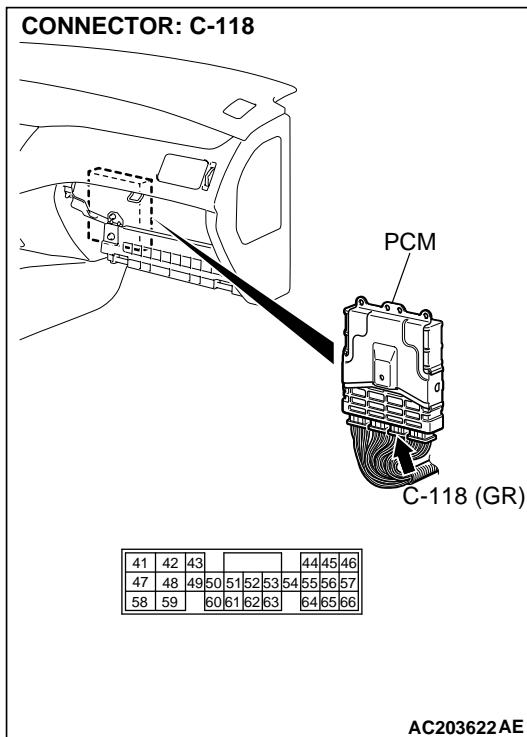
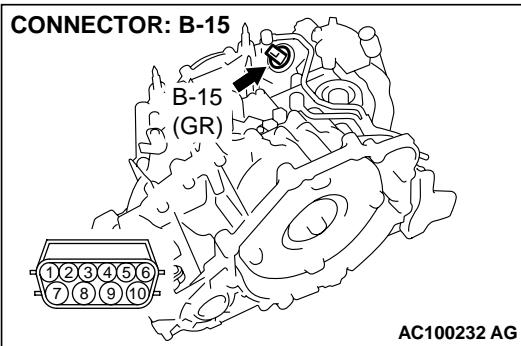
**YES :** Go to Step 13.

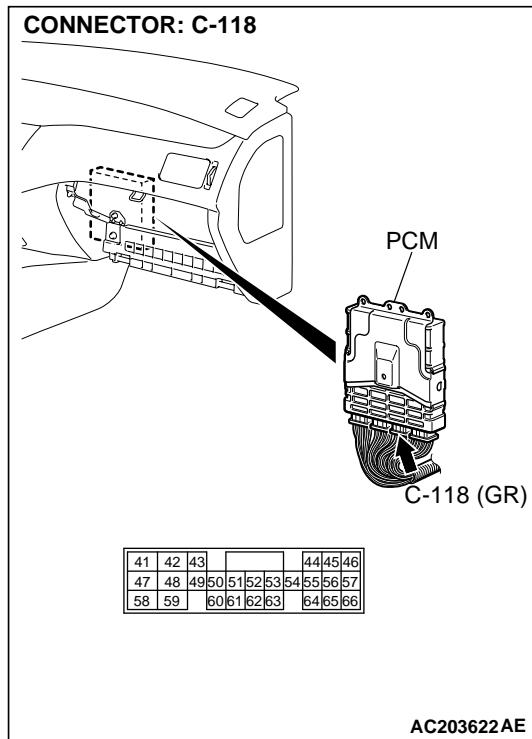
**NO :** Go to Step 14.

**STEP 13. Check the harness for open circuit or damage between A/T control solenoid valve connector B-15 terminal 2 and PCM connector C-118 terminal 57.**  
**Q: Is the harness wire in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.





**STEP 14. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 6.

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

## DTC 16: A/T Fluid Temperature Sensor System (Short Circuit)

**A/T Fluid Temperature Sensor System Circuit**  
Refer to [P.23Ac-56](#).

**CIRCUIT OPERATION**  
Refer to [P.23Ac-56](#).

### DTC SET CONDITIONS

If the A/T fluid temperature sensor output detects the voltage which corresponds to 0 volt for more than one second, there is a short in the A/T fluid temperature sensor circuit and DTC 16 is set.

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

- Malfunction of the A/T fluid temperature sensor circuit
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, check data list item 15:  
A/T Fluid Temperature Sensor.**

**⚠ 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.
- (3) Set scan tool MB991502 to data reading mode for item 15, A/T Fluid Temperature Sensor.

- When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

*NOTE: Set scan tool MB991502 to data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the A/T Fluid Temperature Sensor.*

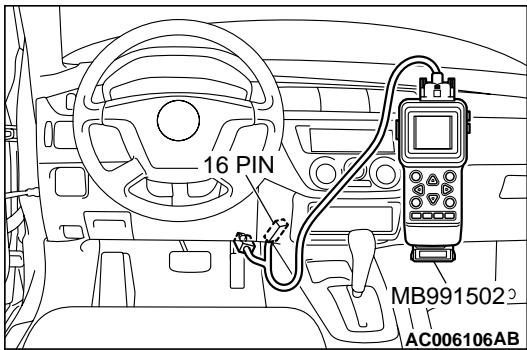
- When the engine is warm: 70 to 80°C (158 to 176°F)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

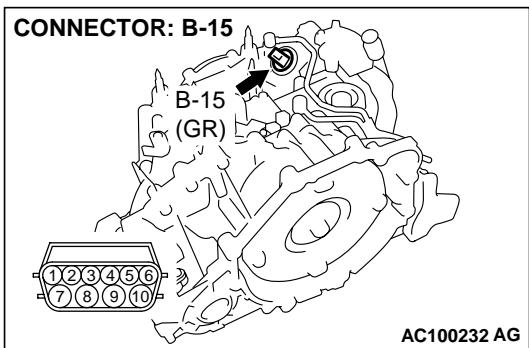
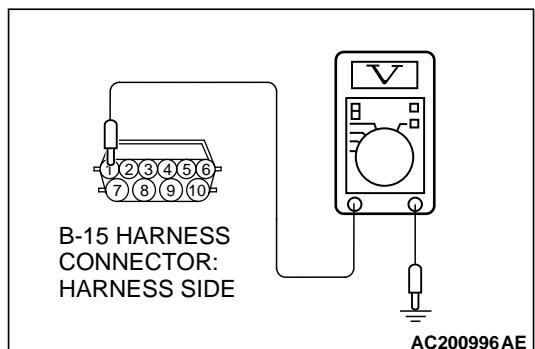
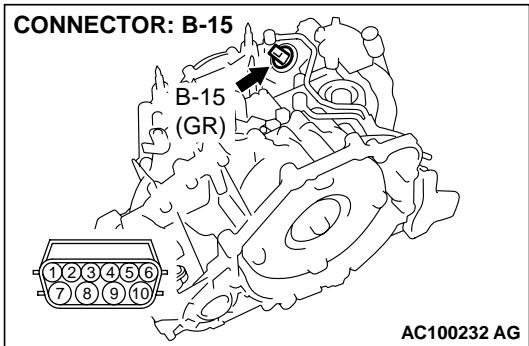
**Q: Is the sensor operating properly?**

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

Refer to GROUP 00, How to Use Troubleshooting/  
Inspection Service Points – How to Cope with  
Intermittent Malfunction [P.00-6](#).

**NO :** Go to Step 2.





**STEP 2. Measure the sensor output voltage at the A/T control solenoid valve assembly connector B-15 by backprobing.**

- (1) Do not disconnect connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground by backprobing.

- When A/T fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

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

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 6.

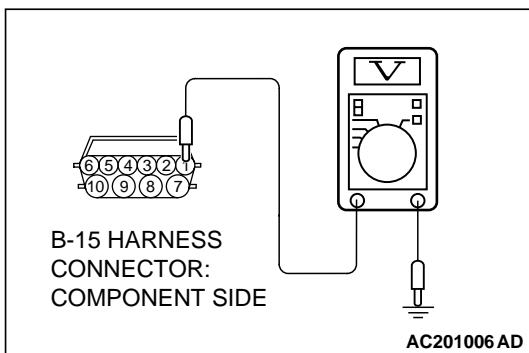
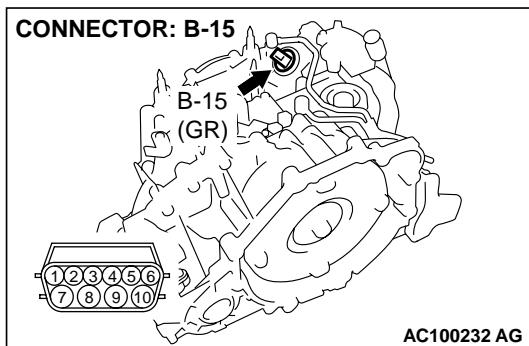
**NO :** Go to Step 3.

**STEP 3. Check A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 4.

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



**STEP 4. Check the sensor output voltage at A/T control solenoid valve assembly connector B-15.**

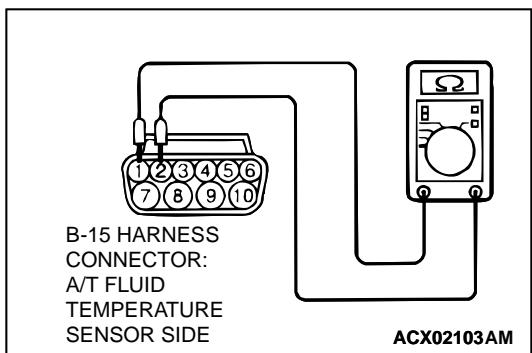
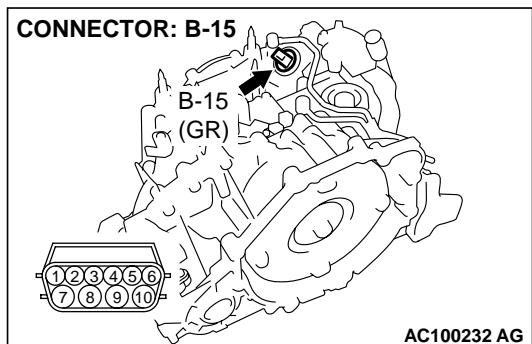
- (1) Disconnect connector B-20 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 1 and ground.
  - The voltage should measure between 4.5 and 4.9 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

**YES :** Go to Step 5.

**NO :** Go to Step 7.



**STEP 5. Check the A/T fluid temperature sensor at A/T control solenoid valve assembly connector B-15.**

(1) Disconnect connector B-15 and measure at the sensor side.

(2) Measure the resistance between terminal 1 and 2.

- When A/T fluid temperature is 0°C (32°F), resistance should be between 16.7 and 20.5 kΩ.
- When A/T fluid temperature is 20°C (68°F), resistance should be between 7.3 and 8.9 kΩ.
- When A/T fluid temperature is 40°C (104°F), resistance should be between 3.4 and 4.2 kΩ.
- When A/T fluid temperature is 60°C (140°F), resistance should be between 1.9 and 2.2 kΩ.
- When A/T fluid temperature is 80°C (176°F), resistance should be between 1.0 and 1.2 kΩ.
- When A/T fluid temperature is 100°C (212°F), resistance should be between 0.57 and 0.69 kΩ.

**Q: Is the measured resistance within the specified range?**

**YES :** Go to Step 6.

**NO :** Replace the A/T fluid temperature sensor. Refer to GROUP 23B, Transaxle [P.23B-8](#).

---

**STEP 6. Using scan tool MB991502, check data list item 15:  
A/T Fluid Temperature Sensor.**

**⚠ 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.
- (3) Set scan tool MB991502 to data reading mode for item 15, A/T Fluid Temperature Sensor.

- When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

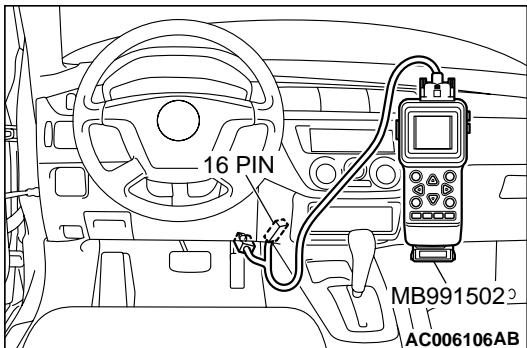
*NOTE: Set scan tool MB991502 to data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the A/T Fluid Temperature Sensor.*

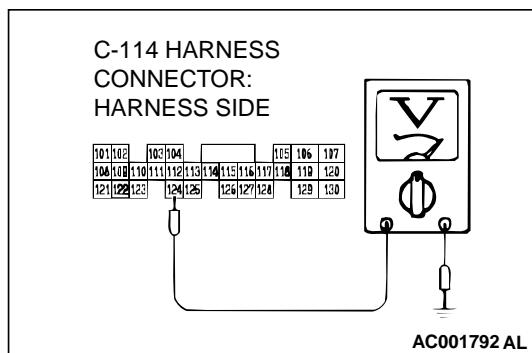
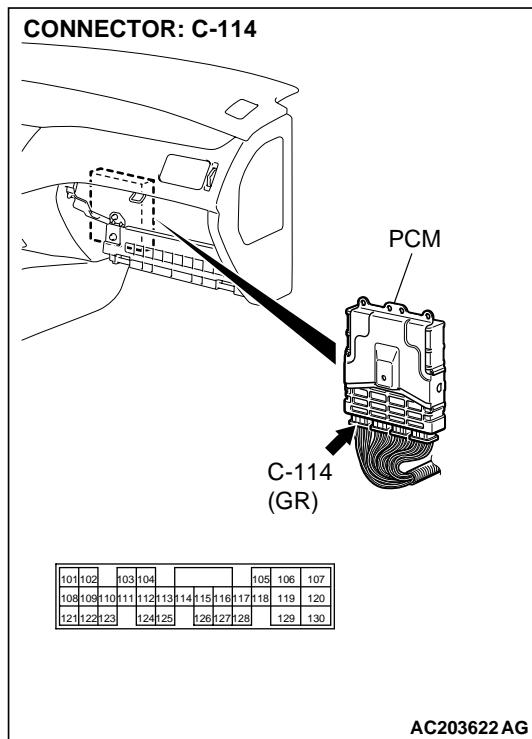
- When the engine is warm: 70 to 80°C (158 to 176°F)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Replace the PCM.





**STEP 7. Measure the sensor output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 124 and ground by backprobing.

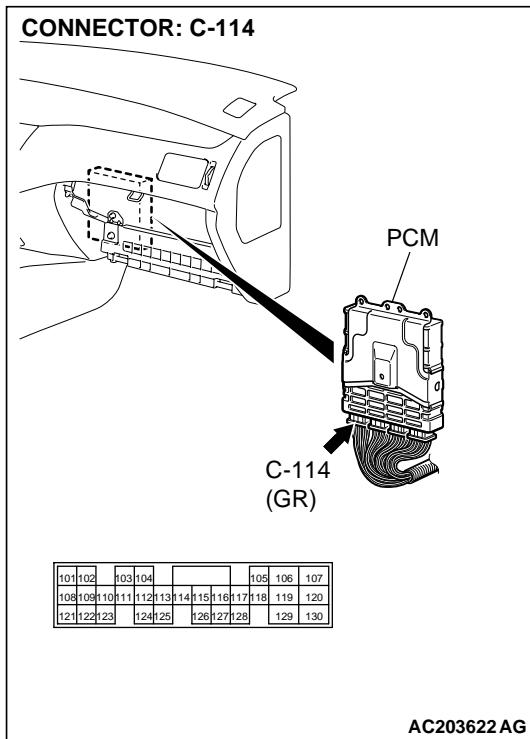
- When A/T fluid temperature is 20°C (68°F), voltage should measure between 3.8 and 4.0 volts.
- When A/T fluid temperature is 40°C (104°F), voltage should measure between 3.2 and 3.4 volts.
- When A/T fluid temperature is 80°C (176°F), voltage should measure between 1.7 and 1.9 volts.

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

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 6.

**NO :** Go to Step 8.

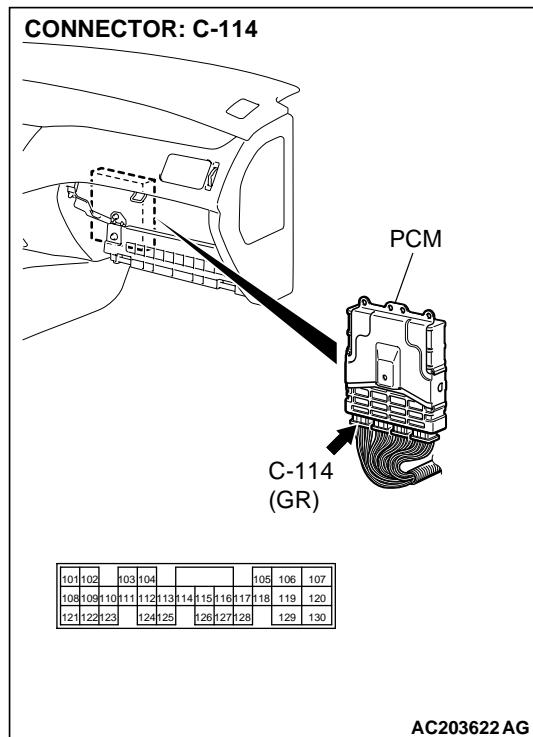
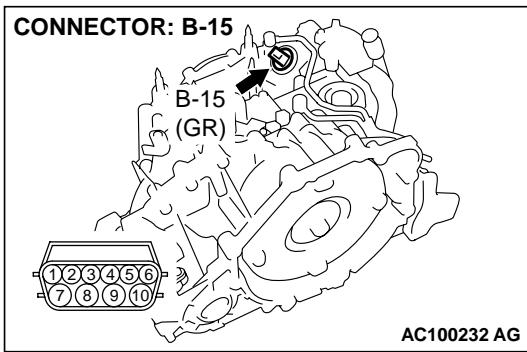


**STEP 8. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 9.

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



**STEP 9. Check the harness for a short circuit to ground between A/T control solenoid valve connector B-15 terminal 1 and PCM connector C-114 terminal 124.**

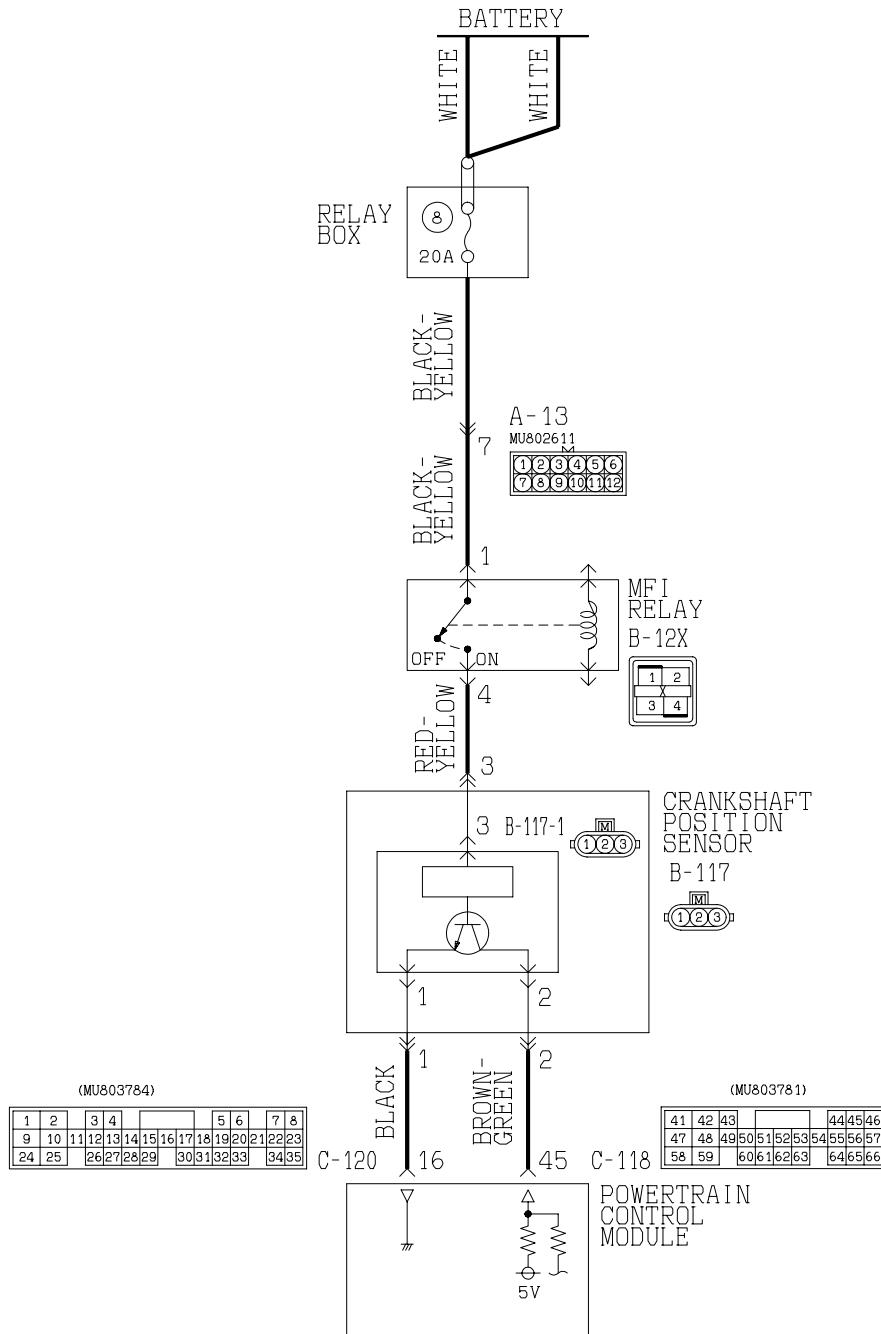
**Q: Is the harness wire in good condition?**

**YES :** Go to Step 6.

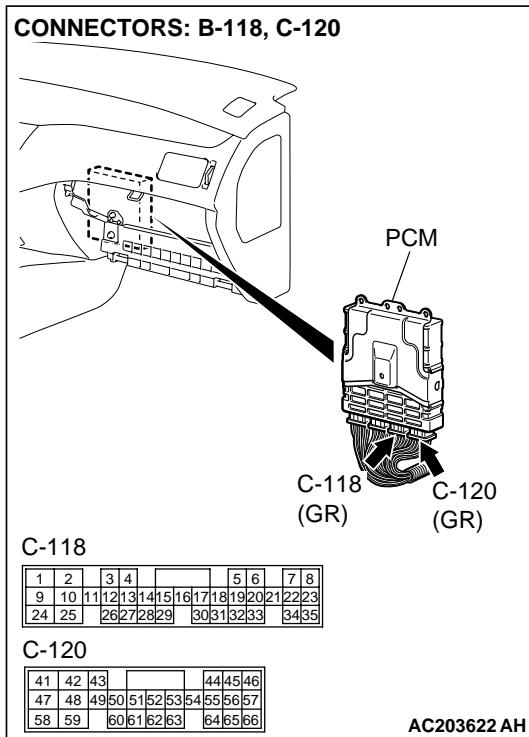
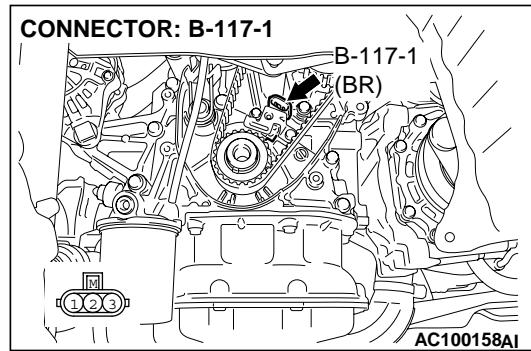
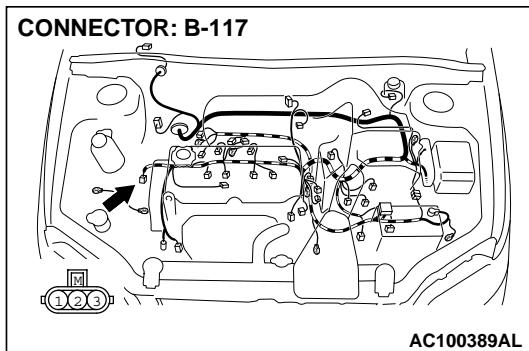
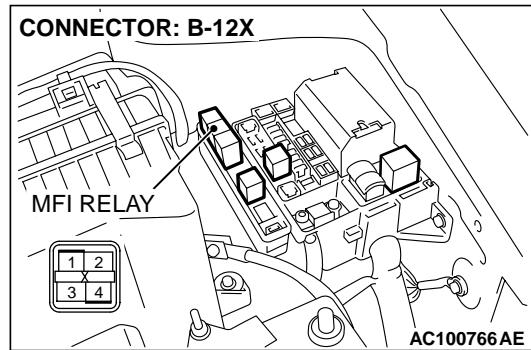
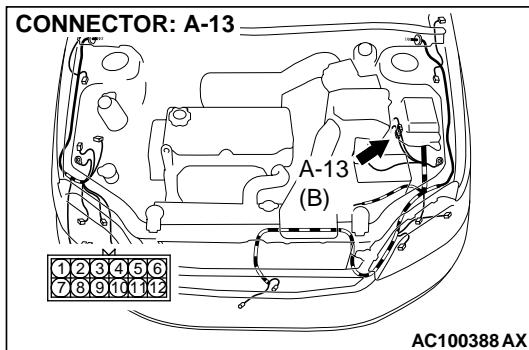
**NO :** Repair or replace the harness wire.

## DTC 21: Crankshaft Position Sensor System

Crankshaft Position Sensor System Circuit



AC104136 AC



## CIRCUIT OPERATION

The crankshaft position sensor power is supplied from the MFI relay (terminal 4) to the crankshaft position sensor (terminal 3). The crankshaft position sensor (terminal 1) is grounded by the PCM (terminal 16). The PCM (terminal 45) supplies 5 volts to the crankshaft position sensor output (terminal 2). The crankshaft position sensor detects the crank angle (position) of each cylinder, and converts that data to pulse signals that are sent to the PCM.

## DTC SET CONDITIONS

If the crankshaft position sensor does not detect an output pulse for more than 5 seconds while driving more than 25 km/h (16 mph), it is judged that there is an open circuit in the crankshaft position sensor and DTC 21 is set.

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

- Malfunction of the crankshaft position sensor circuit
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

### STEP 1. Using scan tool MB991502, check data list item 21: Crankshaft Position Sensor.

#### CAUTION

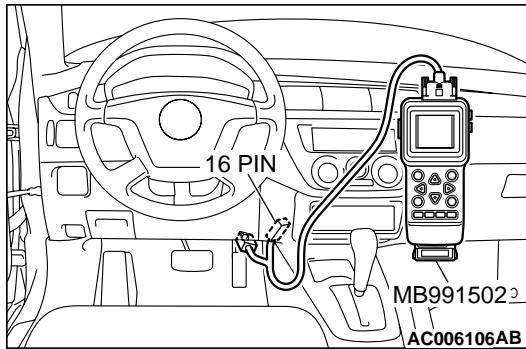
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

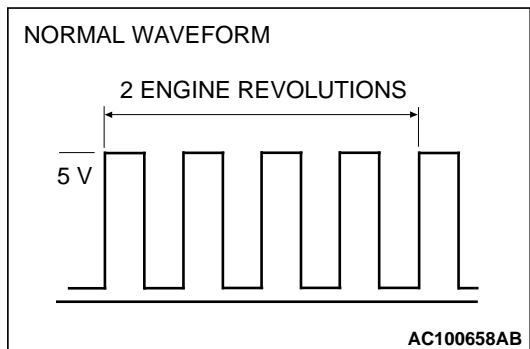
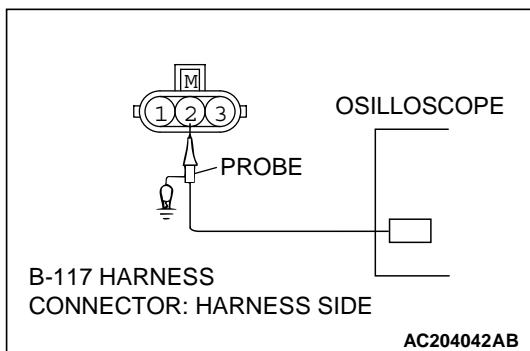
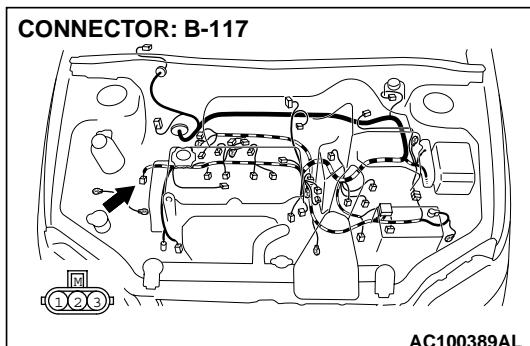
- (1) Connect scan tool MB991502 to the data link connector.
- (2) With the gear selector lever in the "P" position, start the engine and run at idle.
- (3) Set scan tool MB991502 to data reading mode for item 21, Crankshaft Position Sensor.
  - When the accelerator pedal is not depressed (throttle valve is fully closed) the display on scan tool MB991502 should be "600 to 900 r/min."
  - With the accelerator pedal depressed, the engine speed display on scan tool MB991502 should increase according to engine speed.

**Q: Does the engine speed display increase according to engine speed when the accelerator pedal is depressed?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.





**STEP 2. Using the oscilloscope, check the waveform at crankshaft position sensor connector B-117.**

(1) Do not disconnect connector B-117.

(2) Connect an oscilloscope probe between crankshaft position sensor connector B-117 terminal 2 and ground by backprobing.

(3) With the gear selector lever in the "P" position, start the engine and run at idle.

(4) Check the waveform.

- The waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts or more and the minimum value 0.6 volts or less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 3.

**NO :** Go to Step 5.

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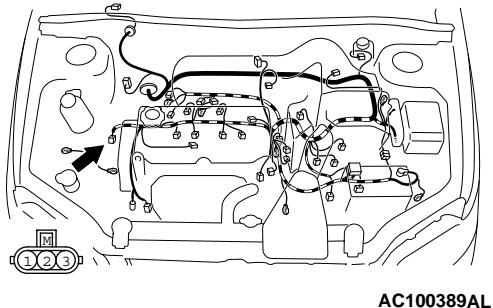
**STEP 3. Check crankshaft position sensor connector B-117 and PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

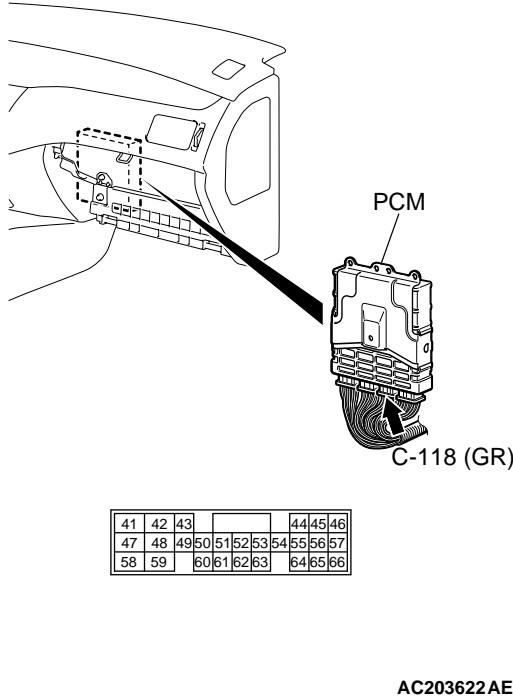
**YES :** Go to Step 4.

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

**CONNECTOR: B-117**



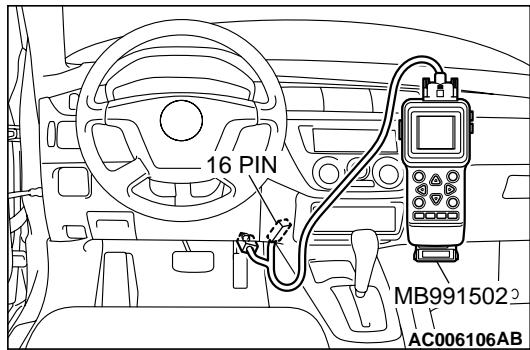
**CONNECTOR: C-118**



**STEP 4. Using scan tool MB991502, check data list item 21: Crankshaft Position Sensor.**

**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) With the gear selector lever in the "P" position, start the engine and run at idle.
- (3) Set scan tool MB991502 to data reading mode for item 21, Crankshaft Position Sensor.

- When the accelerator pedal is not depressed (throttle valve is fully closed) the display on scan tool MB991502 should be "600 to 900 r/min."
- With the accelerator pedal depressed, the engine speed display on scan tool MB991502 should increase according to engine speed.

**Q: Does the engine speed display increase according to engine speed when the accelerator pedal is depressed?**

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

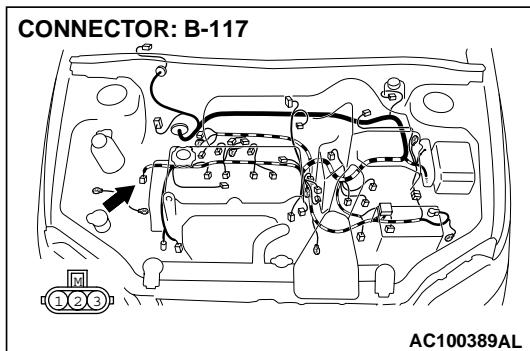
**NO :** Replace the PCM.

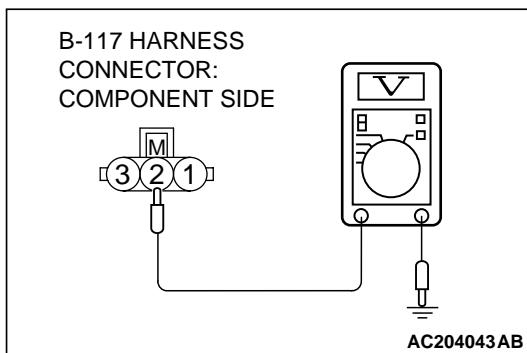
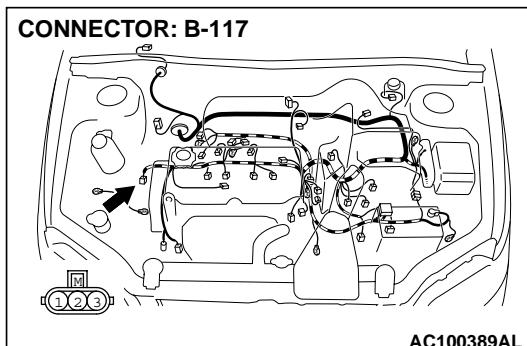
**STEP 5. Check crankshaft position sensor connector B-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 6.

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





**STEP 6. Measure the sensor output voltage at crankshaft position sensor connector B-117.**

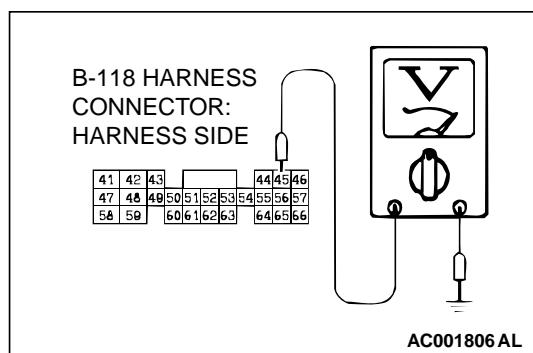
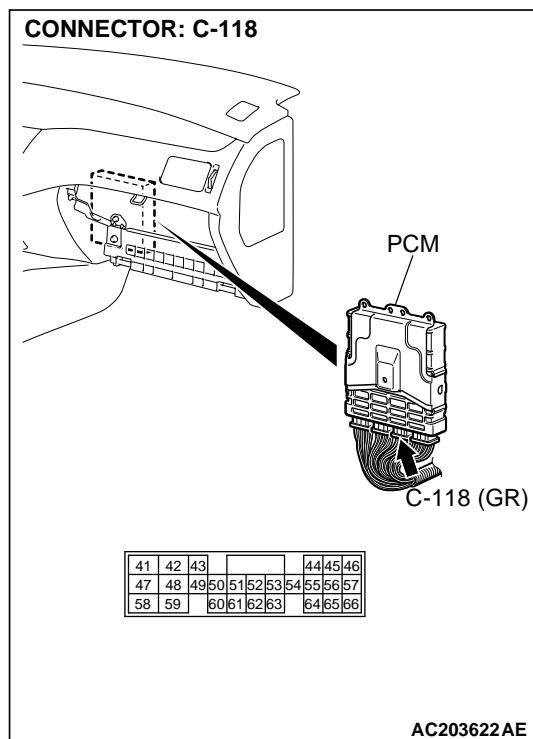
- (1) Disconnect connector B-117 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 2 and ground.
  - The voltage should measure between 4.9 and 5.1 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** Go to Step 12.

**NO :** Go to Step 7.



**STEP 7. Measure the sensor output voltage at PCM connector C-118 by backprobing.**

- (1) Do not disconnect connector C-118.
- (2) Disconnect connector B-117 at the crankshaft position sensor.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between terminal 45 and ground by backprobing.

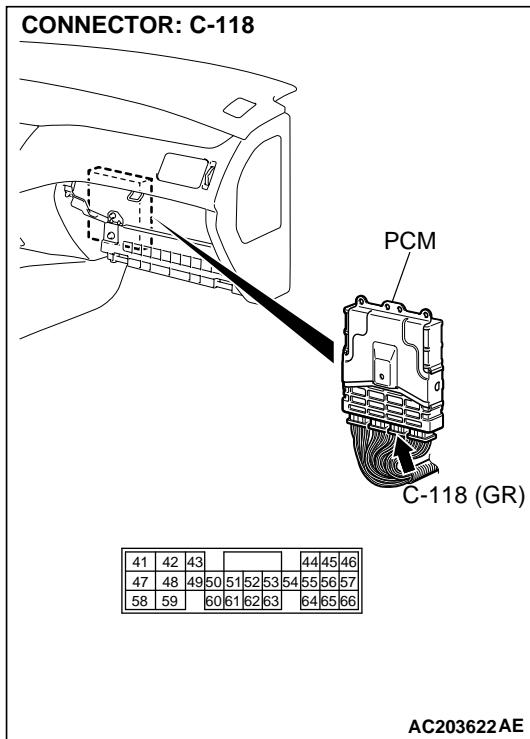
- Voltage should measure between 4.9 and 5.1 volts.

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

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

**YES :** Go to Step 8.

**NO :** Go to Step 10.

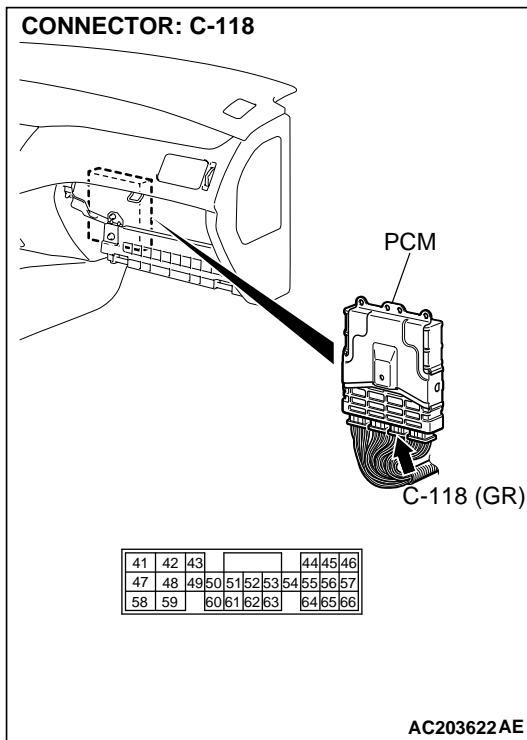
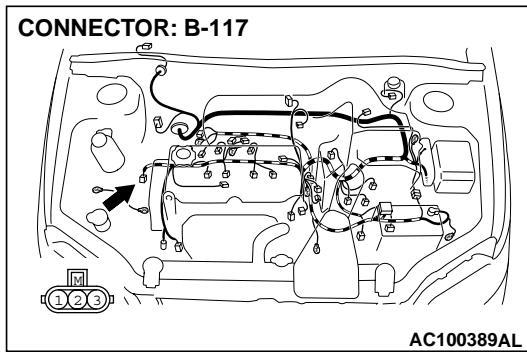


**STEP 8. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 9.

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

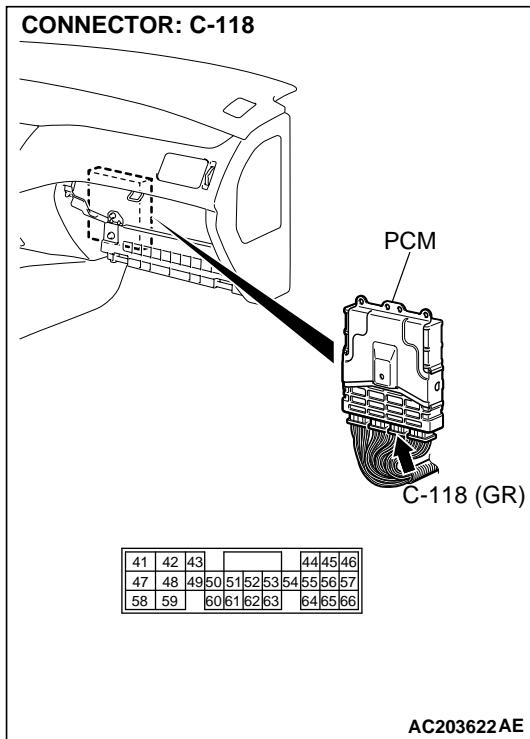


**STEP 9. Check the harness for open circuit between crankshaft position sensor connector B-117 terminal 2 and PCM connector C-118 terminal 45.**

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

**YES : Go to Step 4.**

**NO : Repair or replace the harness wire.**

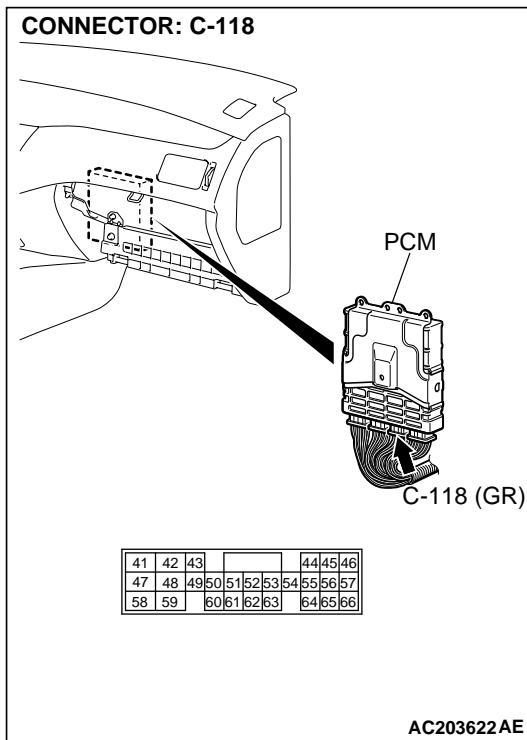
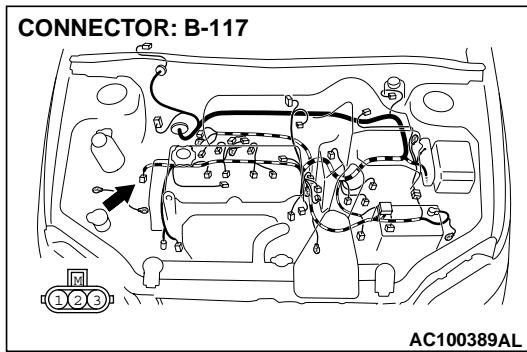


**STEP 10. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 11.

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

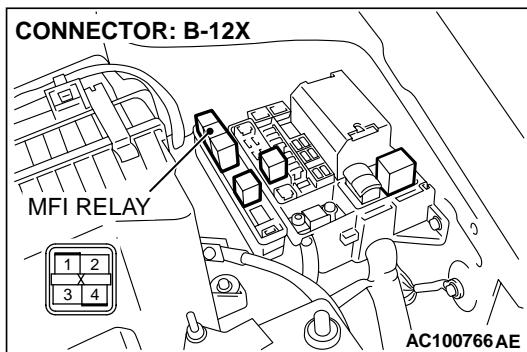
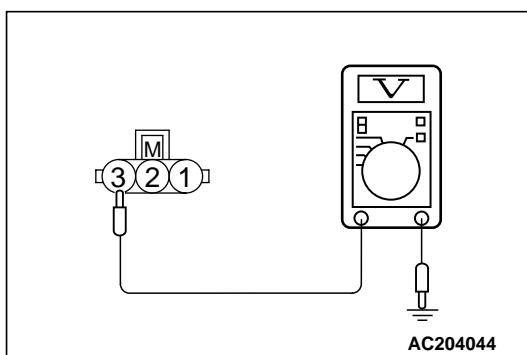
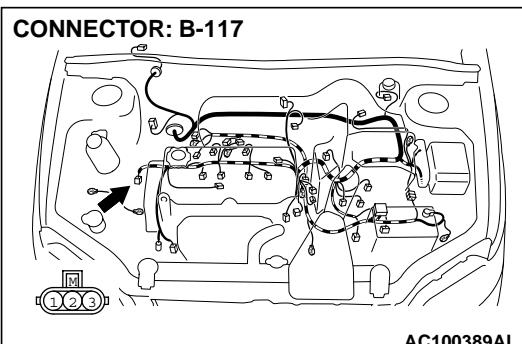


**STEP 11. Check the harness for a short circuit to ground between crankshaft position sensor connector B-117 terminal 2 and PCM connector C-118 terminal 45.**

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

**YES :** Go to Step 4.

**NO :** Repair or replace the harness wire.



**STEP 12. Measure the power supply voltage at crankshaft position sensor connector B-117.**

- (1) Disconnect connector B-117 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 3 and ground.
  - The voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

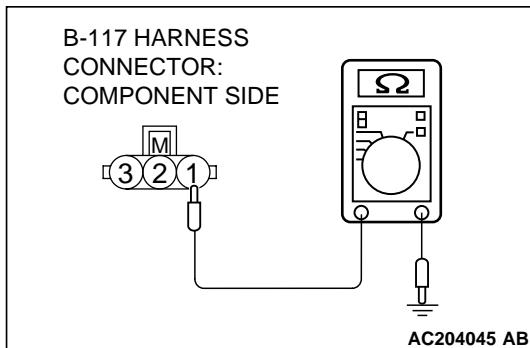
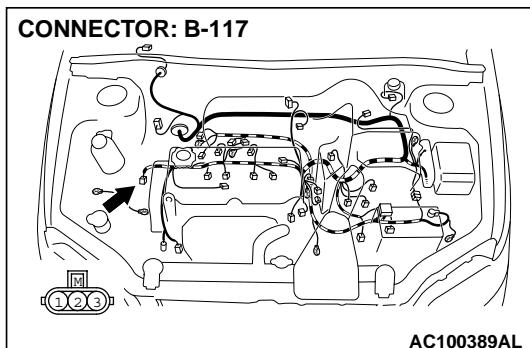
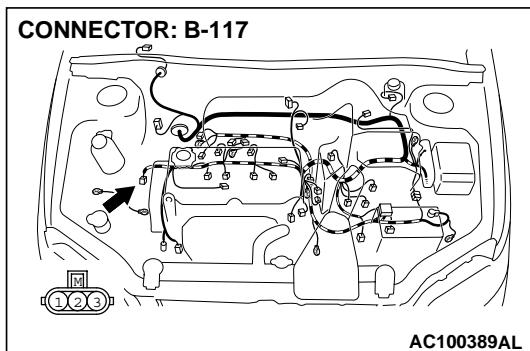
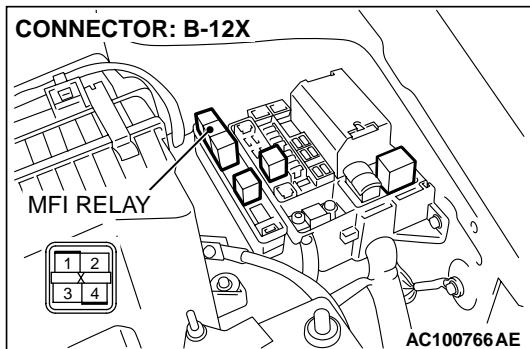
**Q: Is the measured voltage battery positive voltage?**

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

**STEP 13. Check MFI relay connector B-12X in the engine component relay box for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

- YES** : Go to Step 14.  
**NO** : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).



**STEP 14. Check the harness for open circuit or short circuit to ground between MFI relay connector B-12X terminal 4 in the engine component relay box and crankshaft position sensor connector B-117 terminal 3.**

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

**YES :** Go to Step 4.

**NO :** Repair or replace the harness wire.

**STEP 15. Measure the resistance of the ground circuit at crankshaft position sensor connector B-117.**

(1) Disconnect connector B-117 and measure at the harness side.

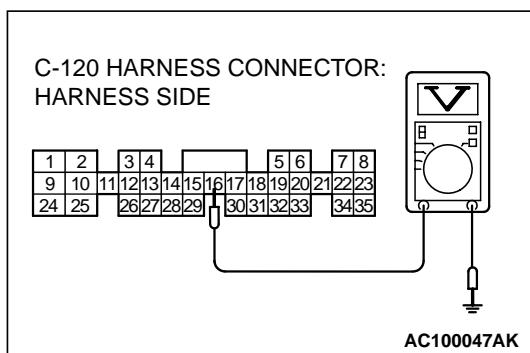
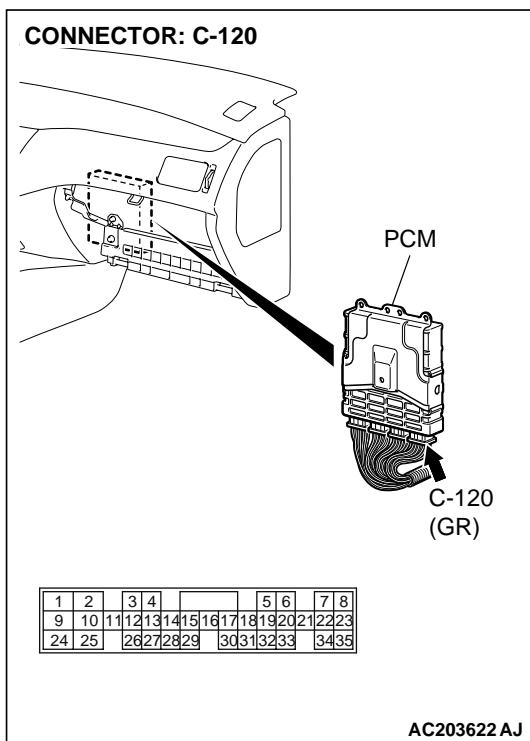
(2) Measure the resistance between terminal 1 and ground.

- The resistance should measure less than 2 ohms.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 21.

**NO :** Go to Step 16.



**STEP 16. Measure the ground voltage at PCM connector C-120 by backprobing.**

- (1) Do not disconnect connector C-120.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 16 and ground by backprobing.

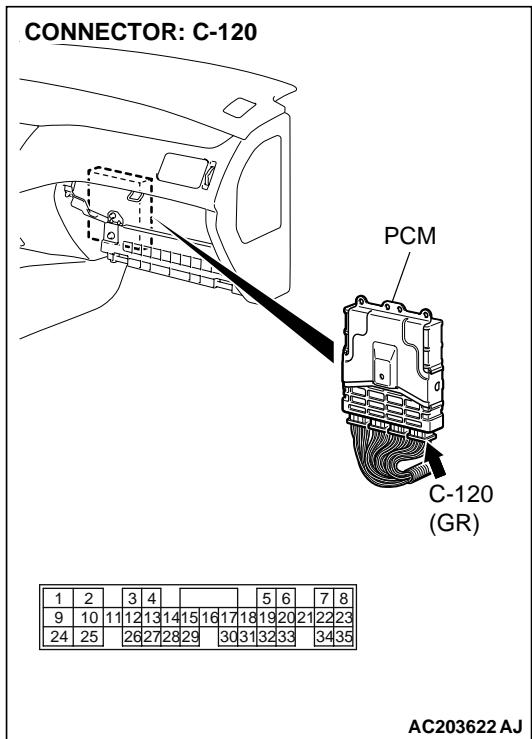
- The voltage should measure 0.5 volt or less.

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

**Q: Is the measured voltage 0.5 volt or less?**

**YES :** Go to Step 17.

**NO :** Go to Step 19.

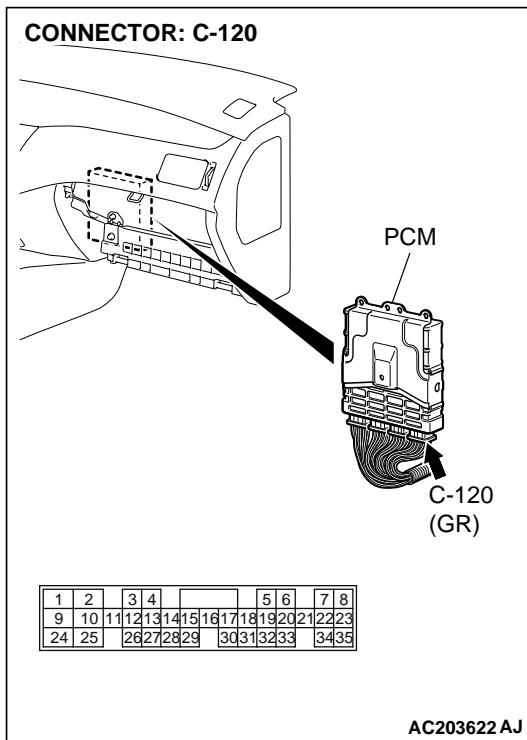
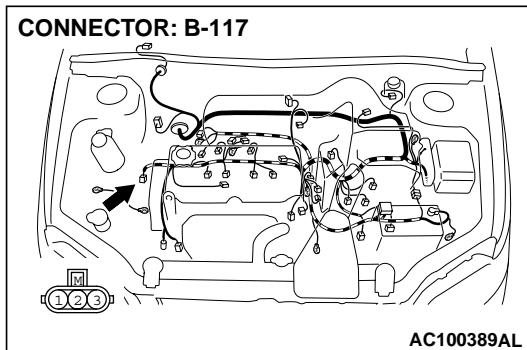


**STEP 17. Check PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 18.

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

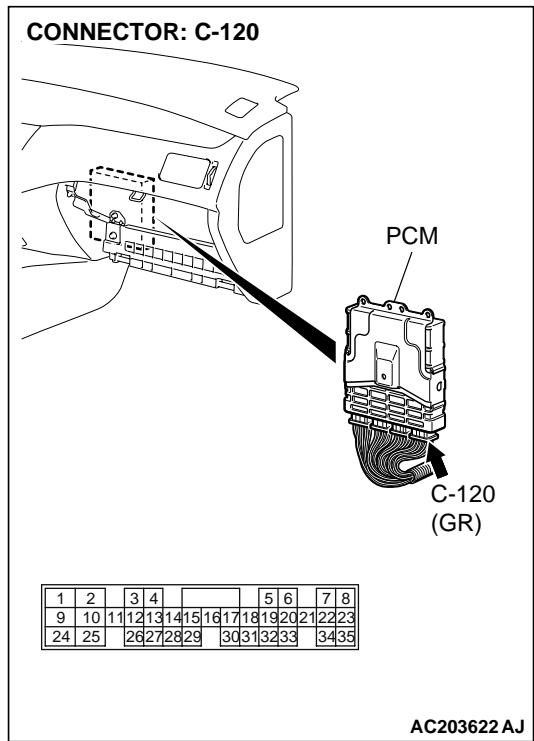


**STEP 18. Check the harness for open circuit or damage between crankshaft position sensor connector B-117 terminal 1 and PCM connector C-120 terminal 16.**

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

**YES :** Go to Step 4.

**NO :** Repair or replace the harness wire.

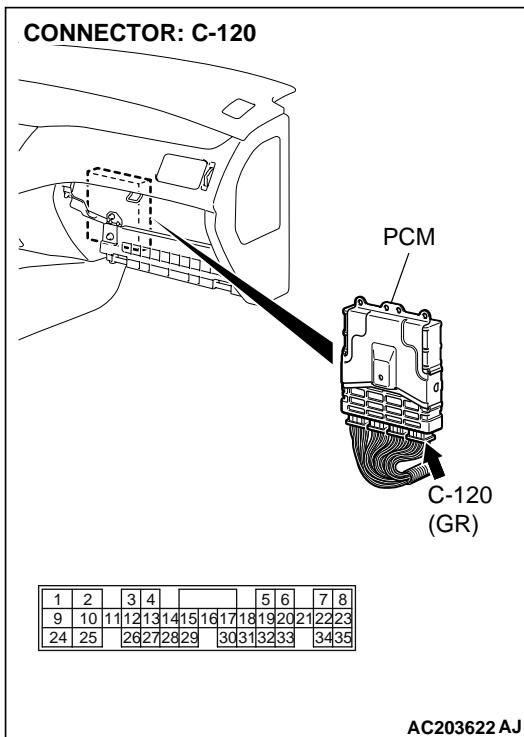
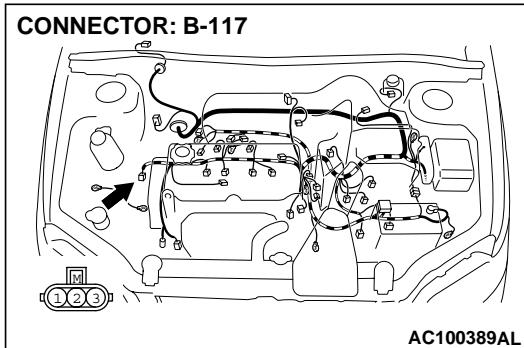


**STEP 19. Check PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 20.

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

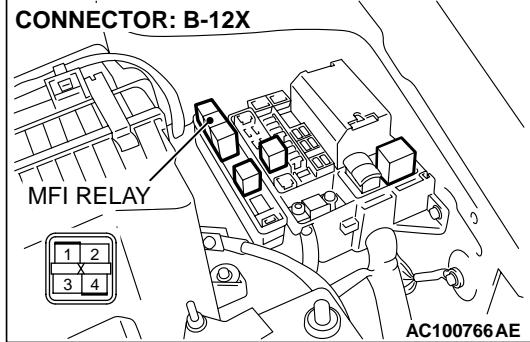
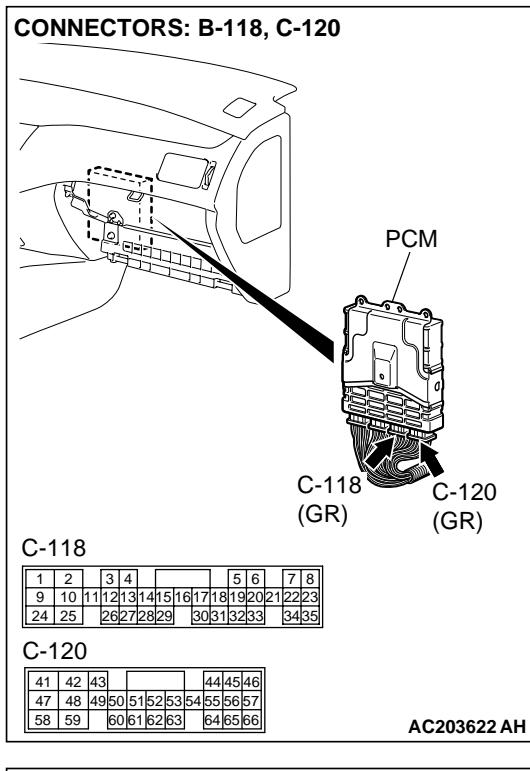


**STEP 20. Check the harness for a short circuit to ground between crankshaft position sensor connector B-117 terminal 1 and PCM connector C-120 terminal 16.**

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

**YES :** Go to Step 4.

**NO :** Repair or replace the harness wire.



**STEP 21. Check PCM connectors C-120 and C-118, and MFI relay connector B-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 22.

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

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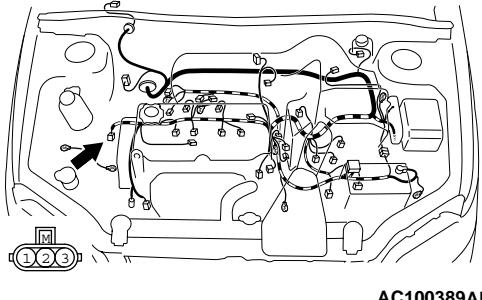
**STEP 22. Check the harness for damage between crankshaft position sensor connector B-117 terminal 1 and PCM connector C-120 terminal 16.**

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

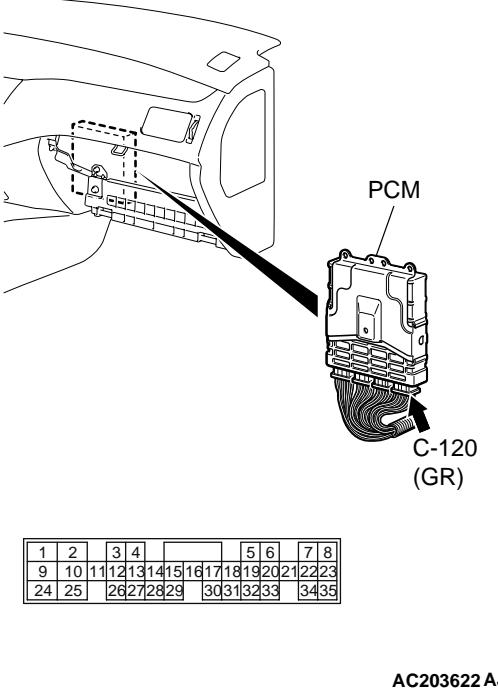
**YES :** Go to Step 23.

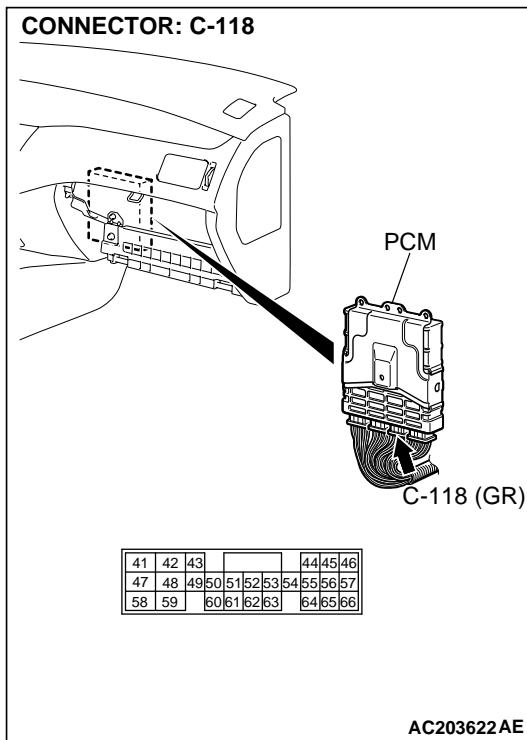
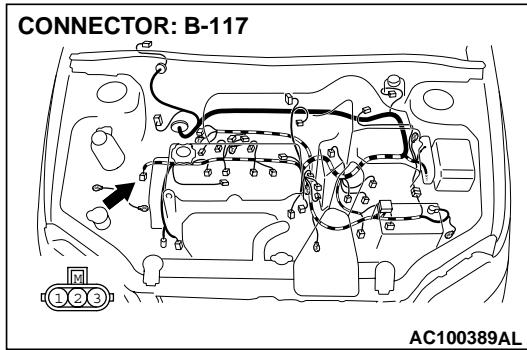
**NO :** Repair or replace the harness wire.

**CONNECTOR: B-117**



**CONNECTOR: C-120**





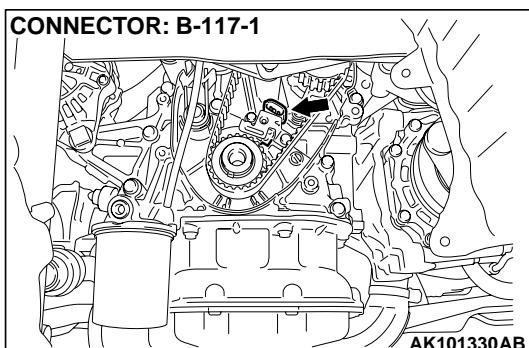
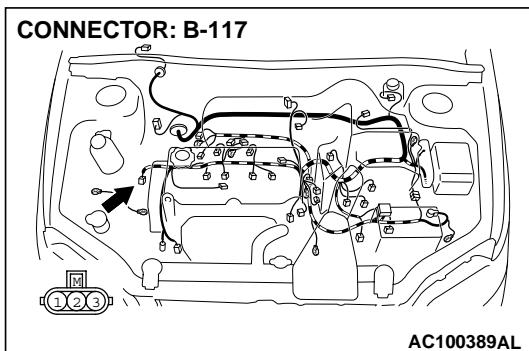
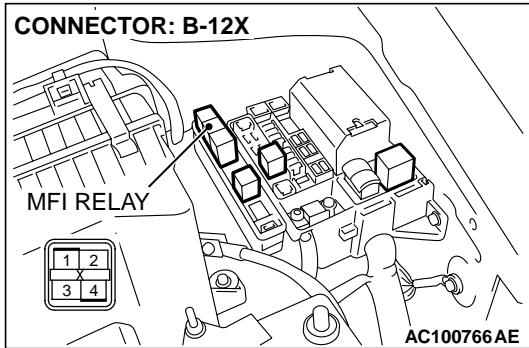
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**STEP 23. Check the harness for damage between crankshaft position sensor connector B-117 terminal 2 and PCM connector C-118 terminal 45.**

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

**YES :** Go to Step 24.

**NO :** Repair or replace the harness wire.



**STEP 24. Check the harness for damage between MFI relay connector B-12X terminal 4 in the engine component relay box and crankshaft position sensor connector B-117 terminal 3.**

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

**YES :** Go to Step 25.

**NO :** Repair or replace the harness wire.

**STEP 25. Check connector B-117-1 for damage.**

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

**YES :** Go to Step 26.

**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

**STEP 26. Check the crankshaft angle sensing blade.**

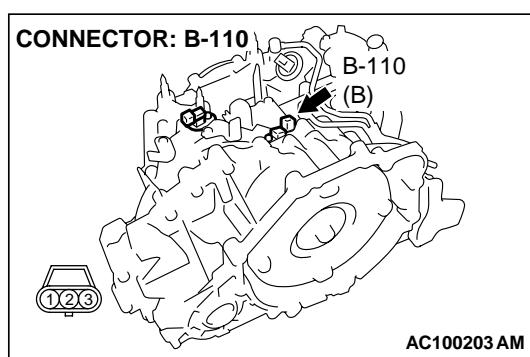
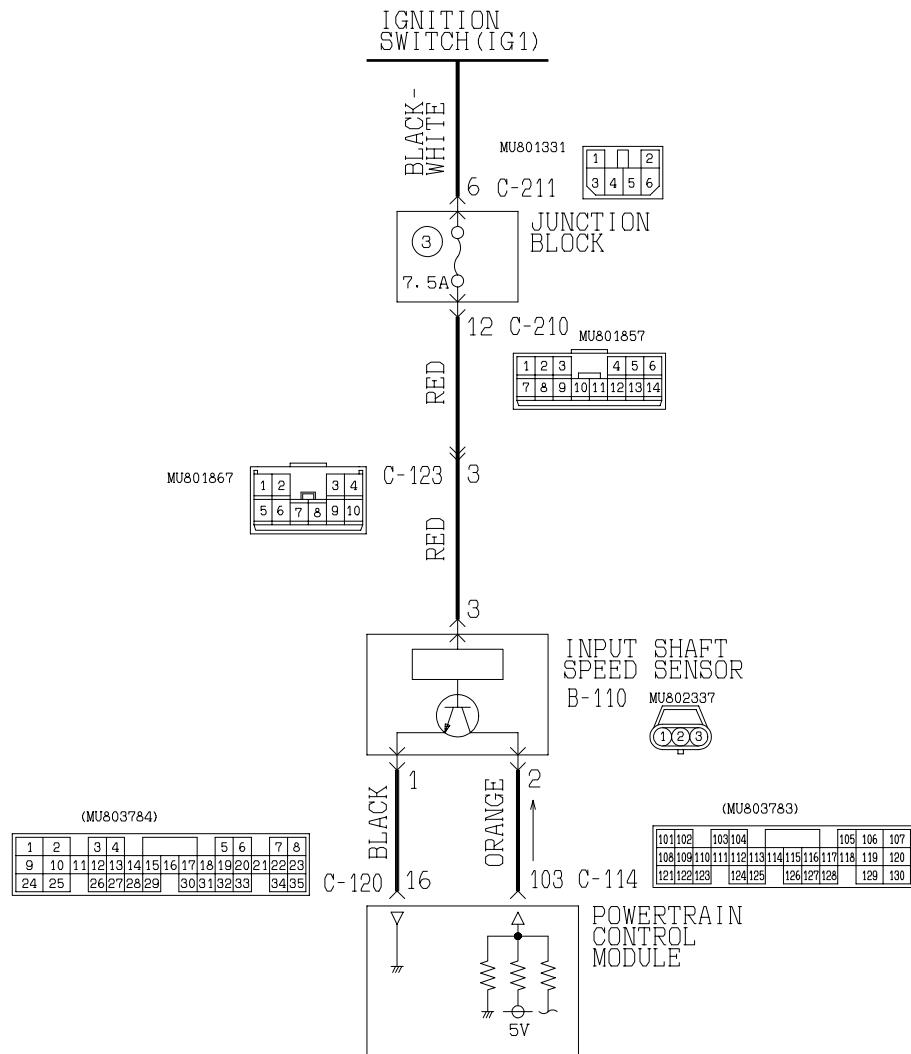
**Q: Is the crankshaft angle sensing blade in good condition?**

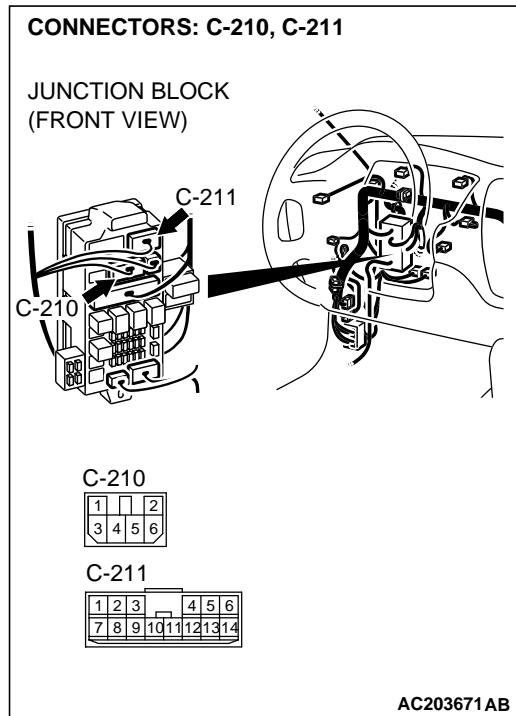
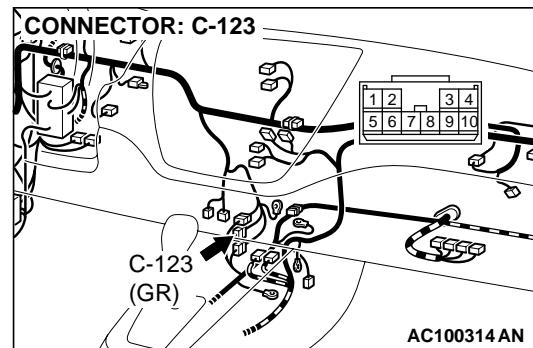
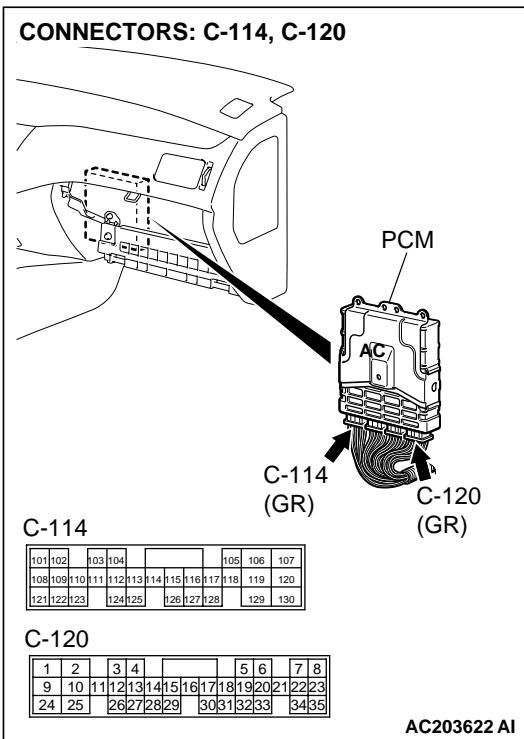
**YES :** Replace the crankshaft position sensor. Refer to GROUP 16, Ignition System – Crankshaft Position Sensor Removal and Installation.P.16-36

**NO :** Replace the crankshaft angle sensing blade.

## DTC 22: Input Shaft Speed Sensor System

Input Shaft Position Sensor System Circuit





### CIRCUIT OPERATION

- The input shaft speed sensor generates  $0 \leftrightarrow 5$  volts pulse signal when the input shaft rotates. The pulse signal frequency increases with a rise in input shaft speed.
- The input shaft speed sensor is connected to the PCM (terminals 16 and 103) via the input shaft speed sensor connector (terminals 1 and 2).

- The PCM detects the input shaft speed by the signal input to terminal 103.
- The input shaft speed sensor generates the pulse signal as the teeth of the underdrive clutch retainer pass the magnetic tip of the sensor.

**DTC SET CONDITIONS**

If no output pulse is detected from the input shaft speed sensor for one second or more while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, it is judged that an open circuit or short circuit in the input shaft speed sensor circuit. If DTC 22 is set consecutively four times, the transaxle is locked into 3rd gear or 2nd gear as a fail-safe measure.

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

- Malfunction of the input shaft speed sensor
- Malfunction of the underdrive clutch retainer
- Damaged harness or connector
- Malfunction of the PCM

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, check data list item 22: Input Shaft Speed Sensor.**** CAUTION**

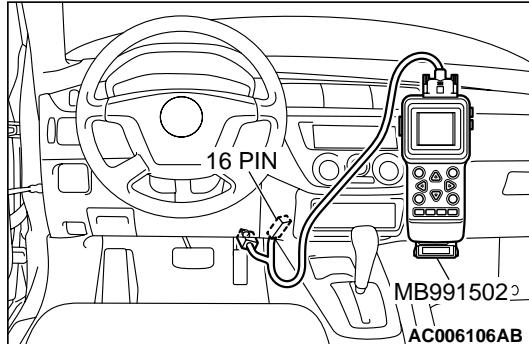
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

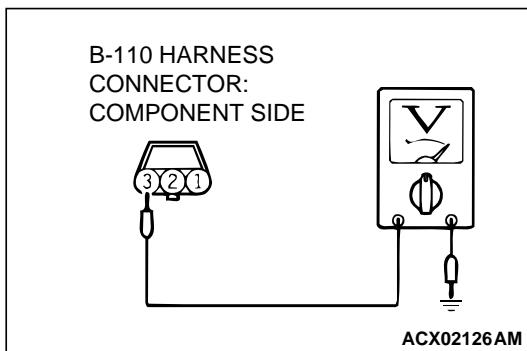
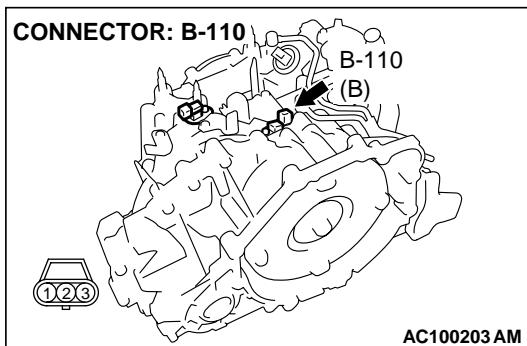
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991502 to data reading mode for item 22, Input Shaft Speed Sensor.
  - When driving at constant speed of 50 km/h (31 mph), the display should be "1,600 – 1,900 r/min." (Gear range: 3rd gear)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

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

**NO :** Go to Step 2.





**STEP 2. Measure the power supply voltage at the input shaft speed sensor connector B-110.**

- (1) Disconnect connector B-110 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 3 and ground.

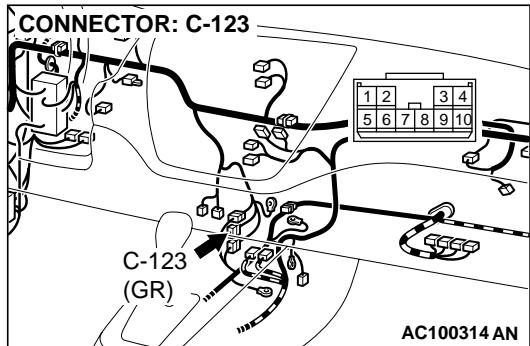
- The voltage should measure battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.

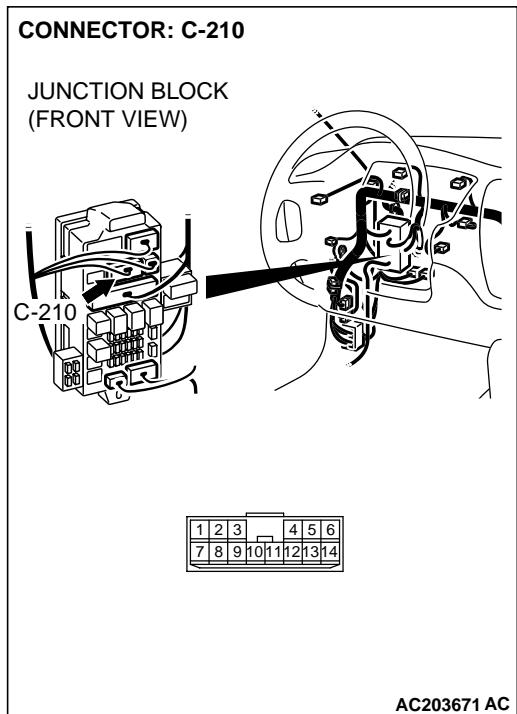


**STEP 3. Check intermediate connector C-123 and junction block connector C-210 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 4.

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

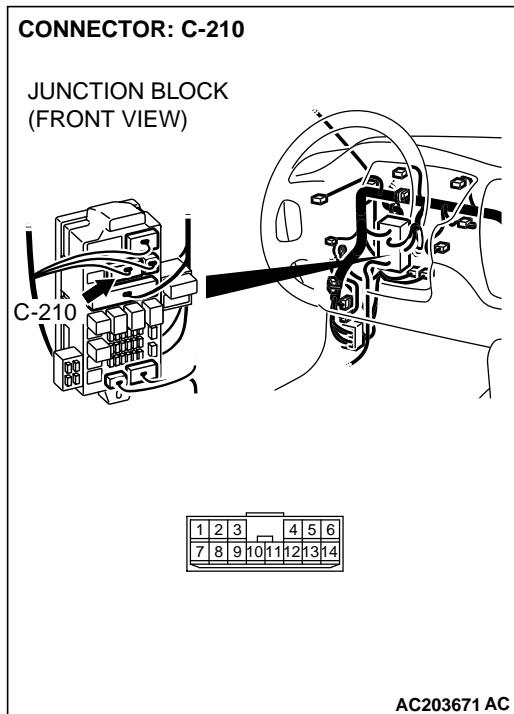
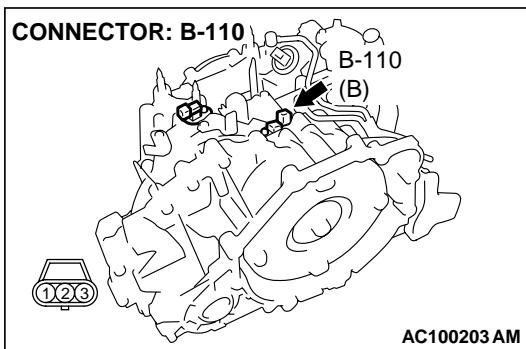


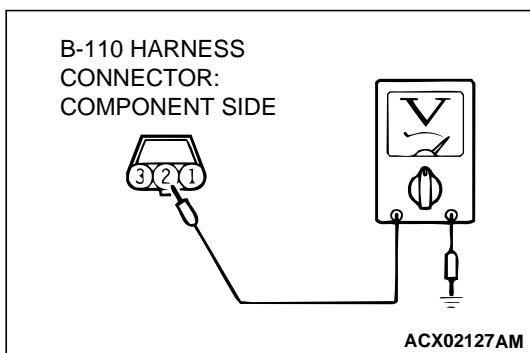
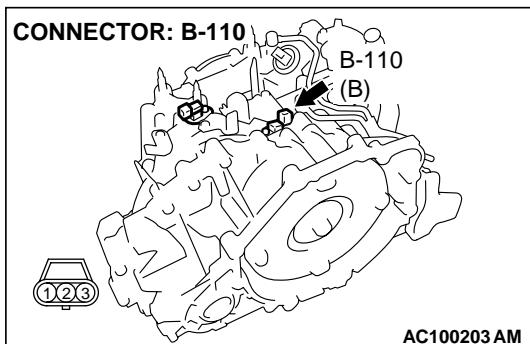
**STEP 4. Check the harness for open circuit or short circuit to ground between the input shaft speed sensor connector B-110 terminal 3 and the junction block connector C-210 terminal 12.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.





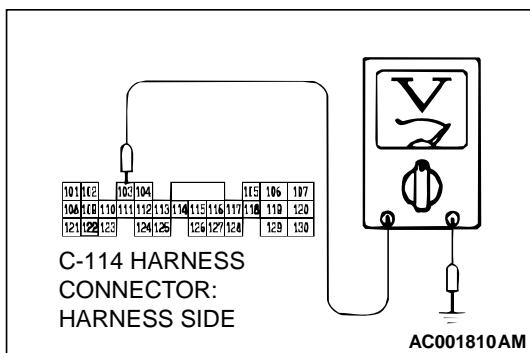
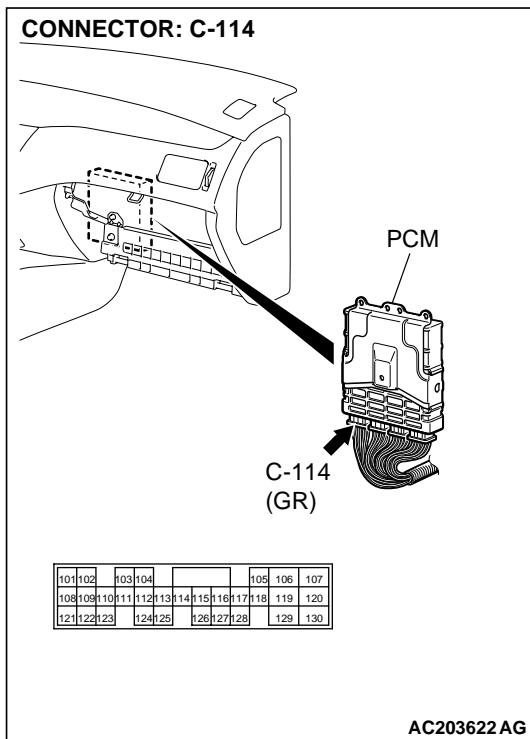
**STEP 5. Measure the PCM to speed sensor output voltage at the input shaft speed sensor connector B-110.**

- (1) Disconnect connector B-110 from the speed sensor and measure voltage at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 2 and ground.
  - The voltage should measure between 4.5 and 4.9 volts.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

- YES :** Go to Step 11.  
**NO :** Go to Step 6.



**STEP 6. Measure the PCM output voltage to the speed sensor at the PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Disconnect connector B-110 at the input shaft speed sensor.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between PCM terminal 103 and ground by backprobing.

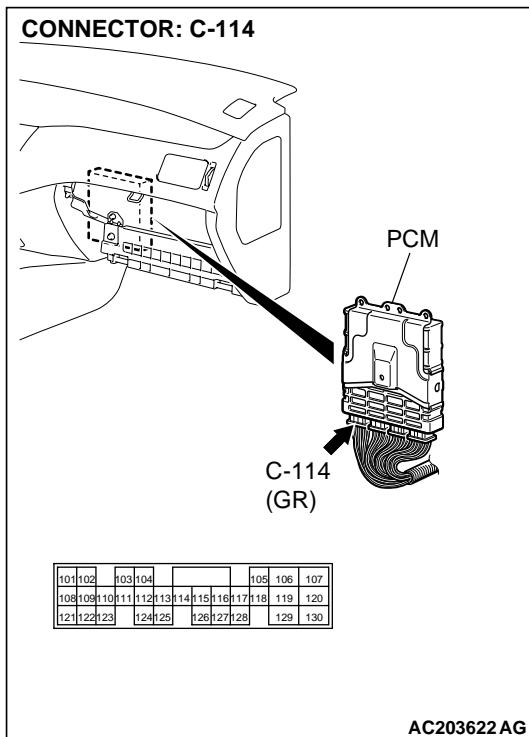
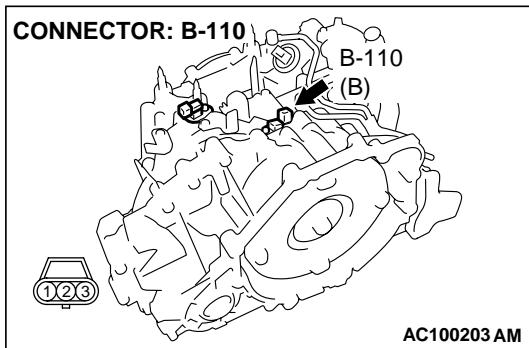
- The voltage should measure between 4.5 and 4.9 volts.

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

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

**YES :** Go to Step 7.

**NO :** Go to Step 9.

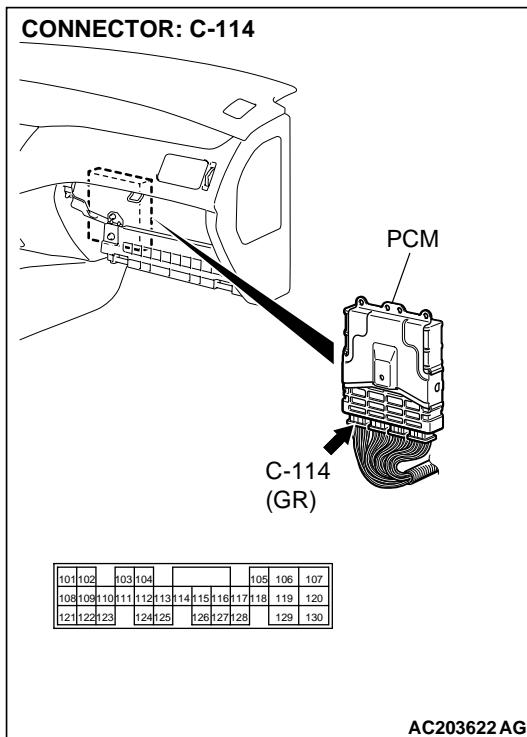
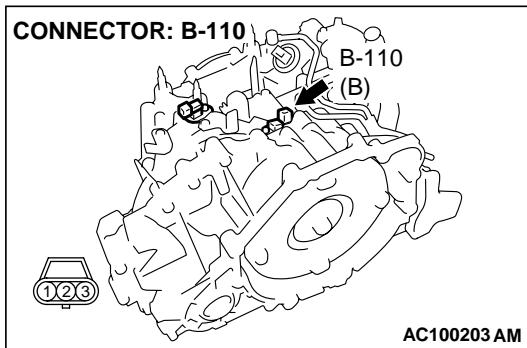


**STEP 7. Check input shaft speed sensor connector B-110 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors in good condition?**

**YES :** Go to Step 8.

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

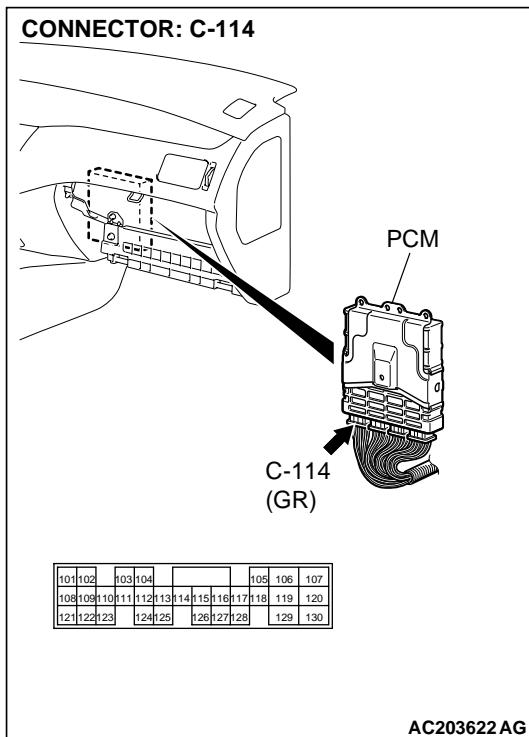
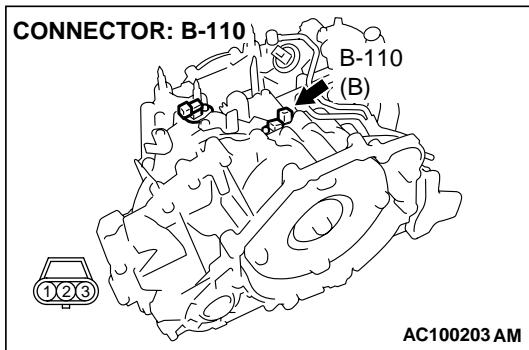


**STEP 8. Check the harness for open circuit or damage between input shaft speed sensor connector B-110 terminal 2 and PCM connector C-114 terminal 103.**

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

**YES :** Go to Step 19.

**NO :** Repair or replace the harness wire.

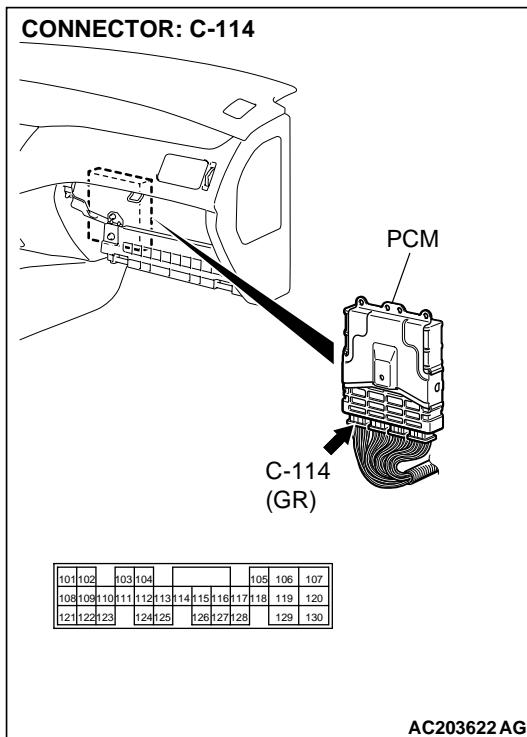
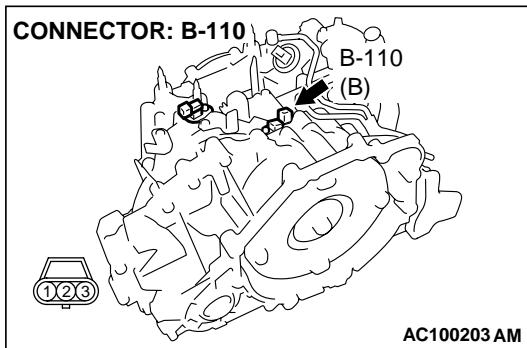


**STEP 9. Check input shaft speed sensor connector B-110 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damages components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

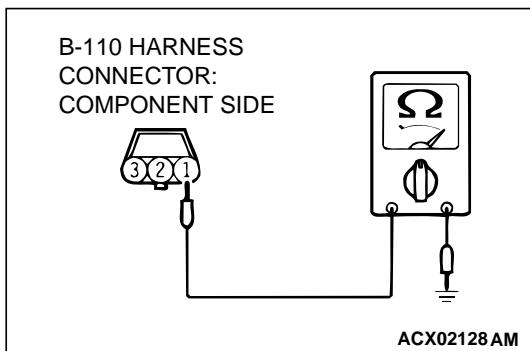
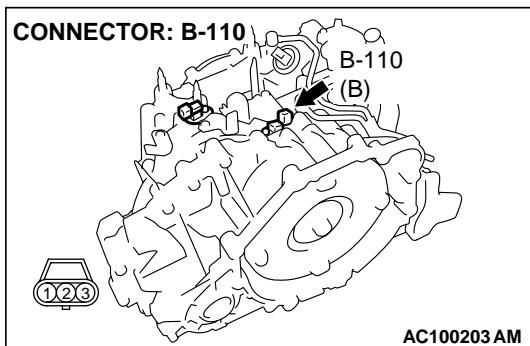


**STEP 10. Check the harness for short circuit to ground between input shaft speed sensor connector B-110 terminal 2 and PCM connector C-114 terminal 103.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.



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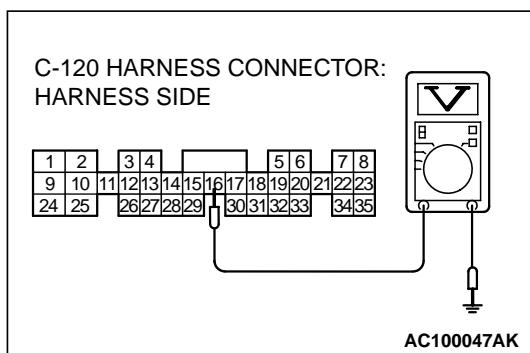
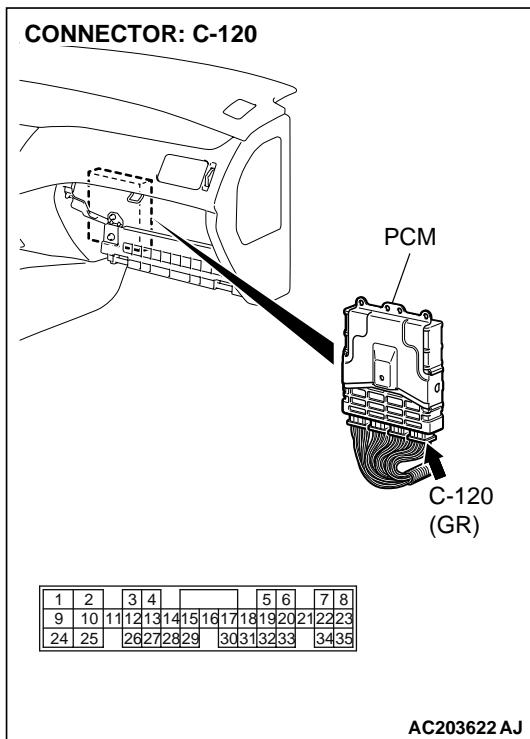
**STEP 11. Measure the ground circuit for resistance at the input shaft speed sensor connector B-110.**

- (1) Disconnect connector B-110 from the speed sensor and measure at the harness side.

- (2) Measure the resistance between terminal 1 and ground.  
• The resistance should measure less than 2 ohms.

**Q: Is the measured resistance less than 2 ohms?**

- YES :** Go to Step 16.  
**NO :** Go to Step 12.



**STEP 12. Measure the resistance at the PCM connector C-120 by backprobing.**

- (1) Do not disconnect connector C-120.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the resistance between terminal 16 and ground by backprobing.

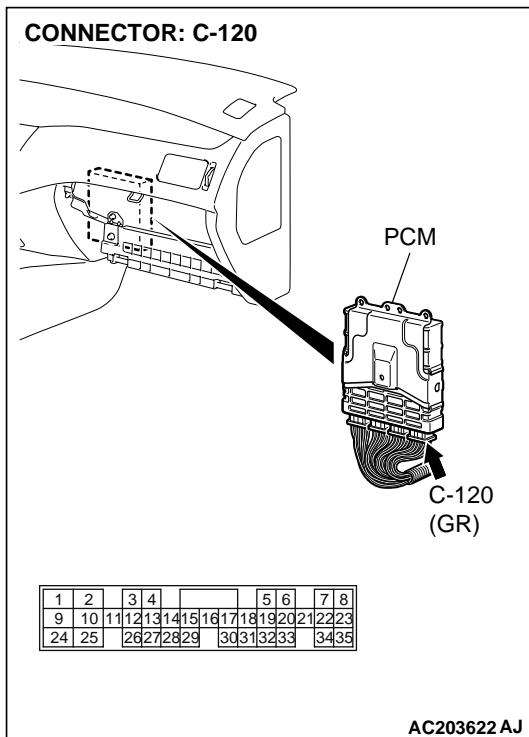
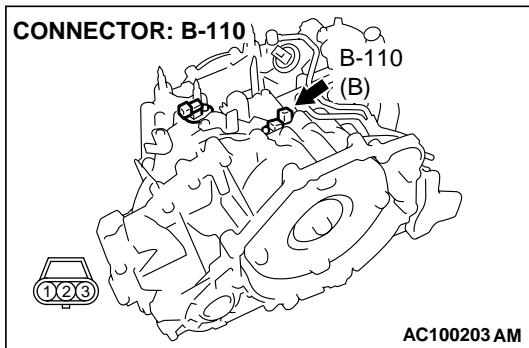
- The resistance should measure less than 2 ohms.

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

**Q: Is the measured resistance less than 2 ohms?**

**YES :** Go to Step 13.

**NO :** Go to Step 15.

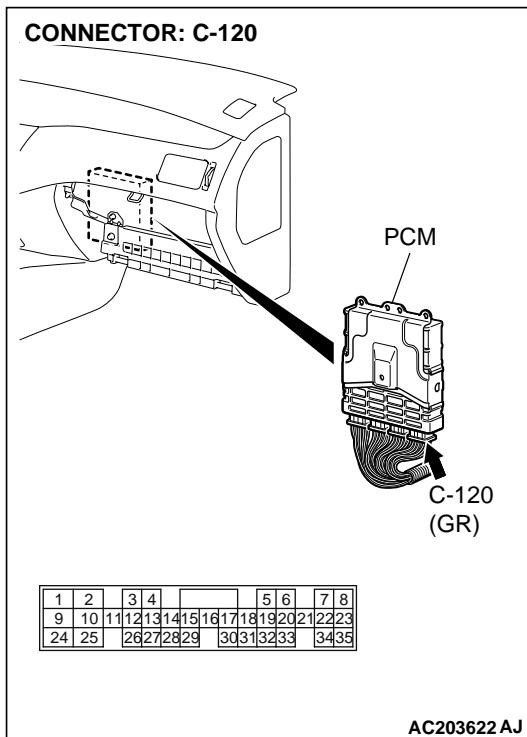
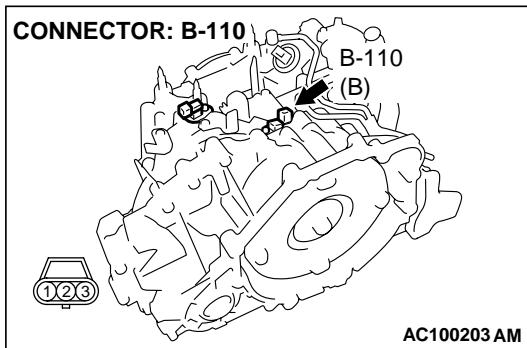


**STEP 13.** Check input shaft speed sensor connector B-110 and PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Are the connectors and terminals in good condition?

**YES :** Go to Step 14.

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

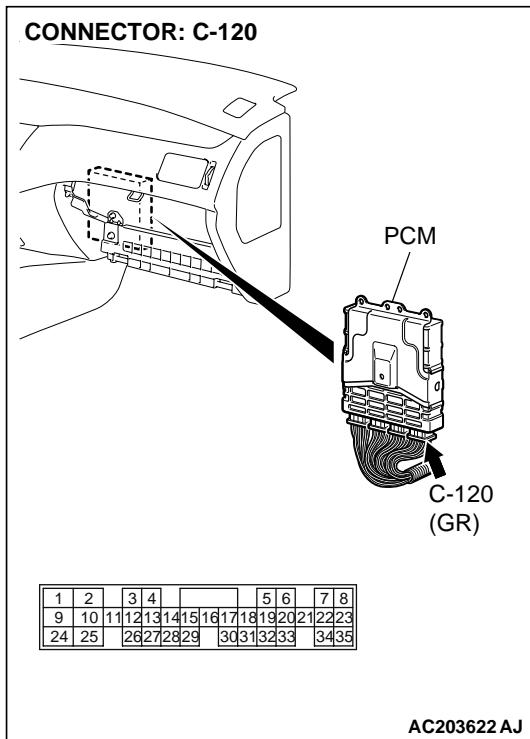


**STEP 14. Check the harness for open circuit or damage between input shaft speed sensor harness side connector B-110 terminal 1 and PCM connector C-120 terminal 16.**

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

**YES :** Go to Step 16.

**NO :** Repair or replace the harness wire.

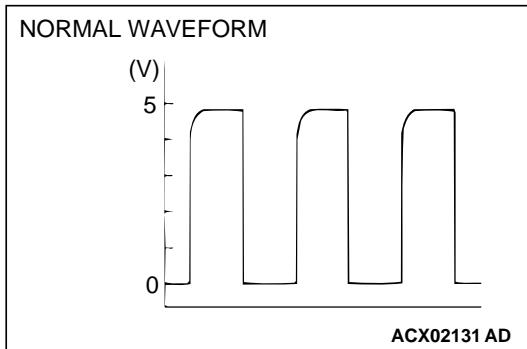
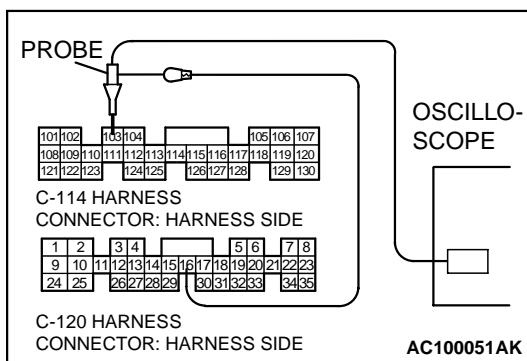
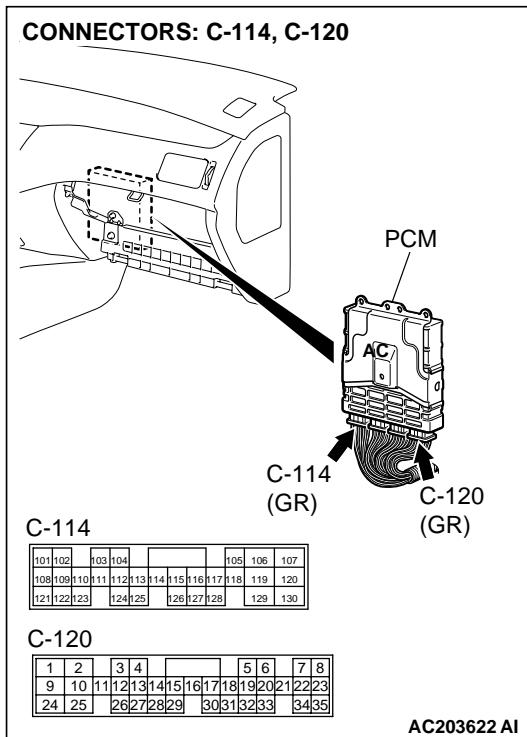


**STEP 15. Check PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Replace the PCM.

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



**STEP 16. Using the oscilloscope, check the input shaft speed sensor waveform at PCM connectors C-120 and 4 by backprobing.**

(1) Do not disconnect connectors C-120 and C-114.

(2) Connect an oscilloscope probe to PCM connector C-120 terminal 16 and to PCM connector C-114 terminal 103 by backprobing.

(3) Start the engine and drive the vehicle at constant speed of 50 km/h (31 mph). (Gear range: 3rd gear)

(4) Check the input shaft speed sensor waveform.

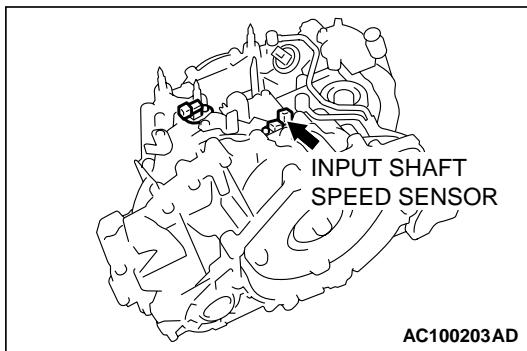
- The input shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volt and less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 19.

**NO :** Go to Step 17.

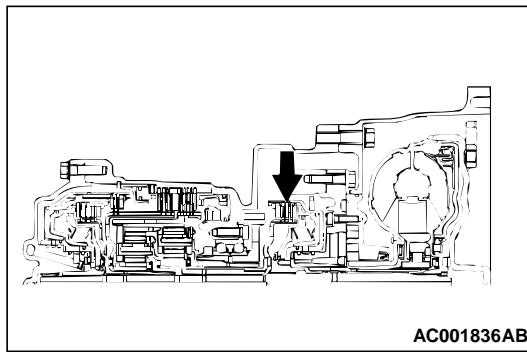
**STEP 17. Replace the input shaft speed sensor.**

- (1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle [P.23B-8](#).
- (2) Test drive the vehicle.
- (3) Check for A/T DTC.

**Q: Is A/T DTC 22 set?**

**YES :** Go to Step 18.

**NO :** The procedure is complete.

**STEP 18. Replace the underdrive clutch retainer.**

- (1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft [P.23B-47](#).
- (2) Test drive the vehicle.
- (3) Check for A/T DTC.

**Q: Is A/T DTC 22 set?**

**YES :** An A/T DTC may have set due to external radio frequency (RFI) possibility caused by cellular phone activity, or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.

**STEP 19. Using scan tool MB991502, check data list item 22: Input Shaft Speed Sensor.****⚠ CAUTION**

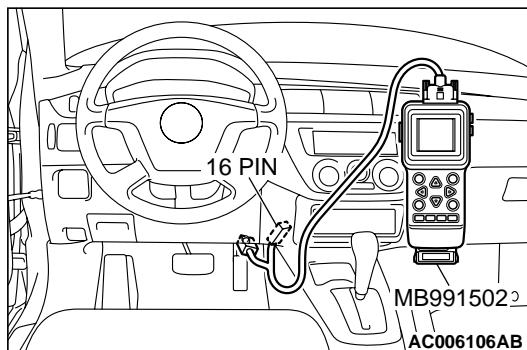
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991502 to data reading mode for item 22, Input Shaft Speed Sensor.
  - When driving at constant speed of 50 km/h (31 mph), the display should be "1,600 – 1,900 r/min." (Gear range: 3rd gear)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

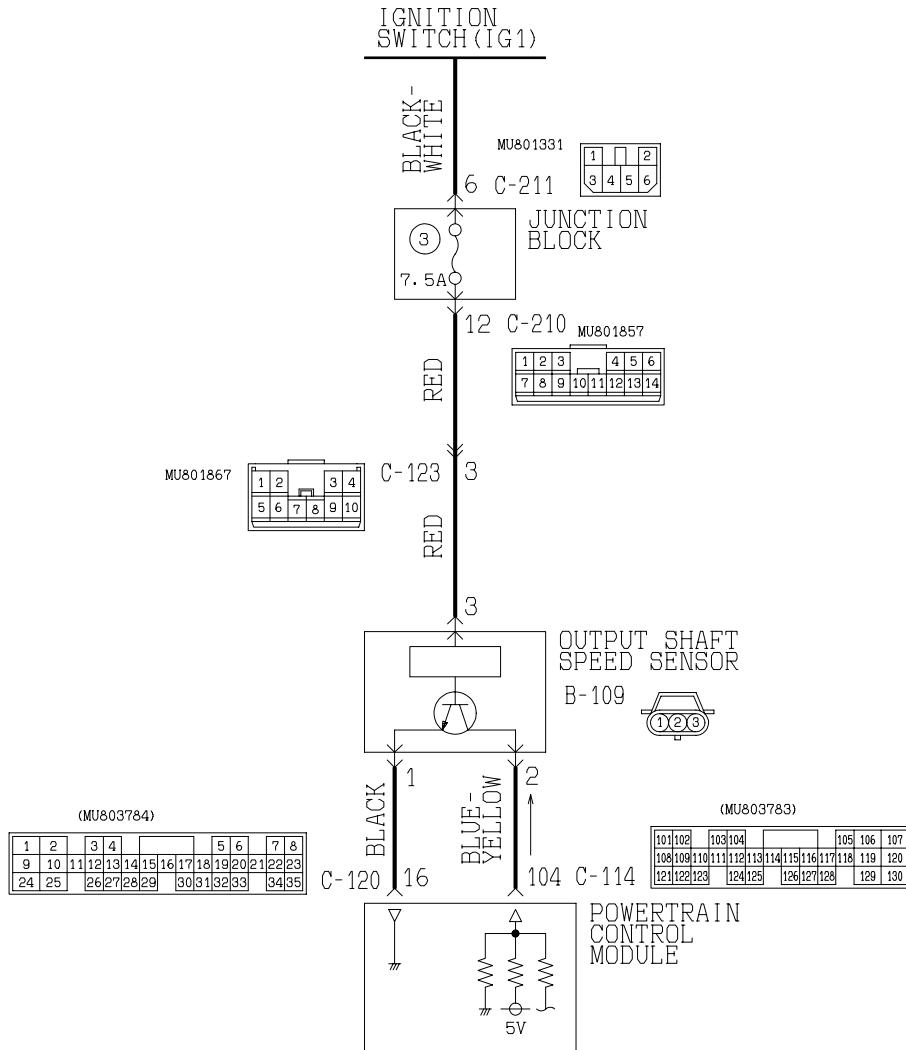
**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-6](#).

**NO :** Replace the PCM.

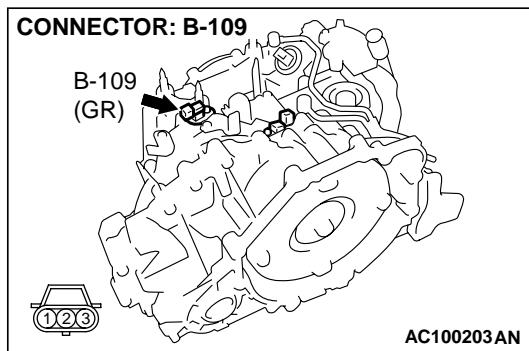


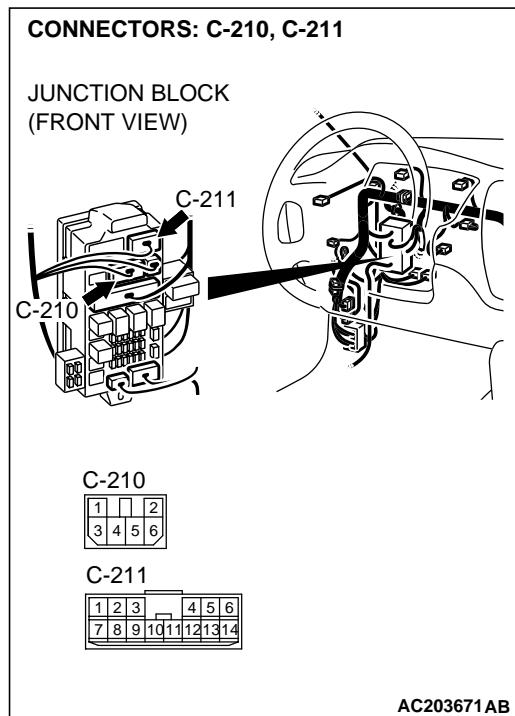
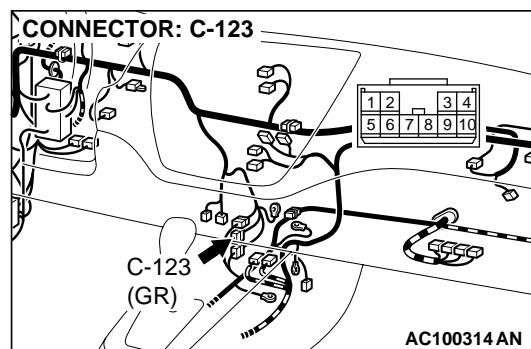
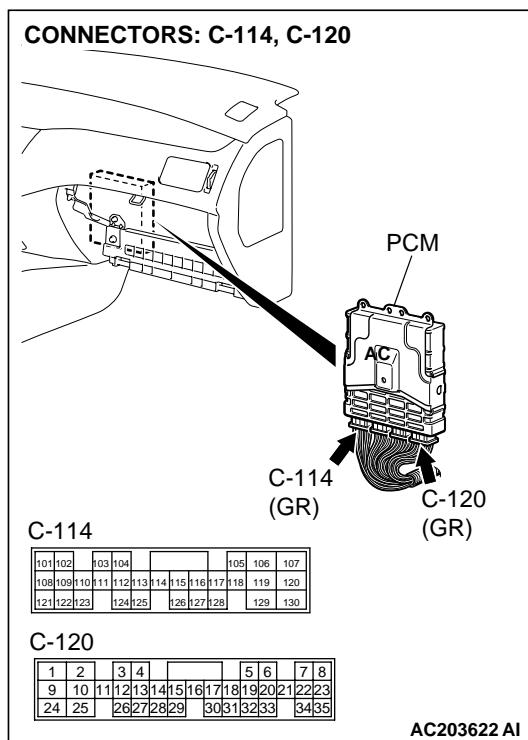
## DTC 23: Output Shaft Speed Sensor System

## **Output Shaft Speed Sensor System Circuit**



W2J01M04AA  
AC100489AB





### CIRCUIT OPERATION

- The output shaft speed sensor generates a  $0 \leftrightarrow 5$  volt pulse signal when the output shaft rotates. The pulse signal frequency increases with a rise output shaft speed.
- The output shaft speed sensor is connected to the PCM (terminals 16 and 104) via the output shaft speed sensor connector (terminals 1 and 2).

- The PCM detects the output shaft speed by the signal input to terminal 104.
- The output shaft speed sensor generates the pulse signal as the teeth of the transfer drive gear pass the magnetic tip of the sensor.

**DTC SET CONDITIONS**

If the output signal from the output shaft speed sensor has been lost for one second or more while the vehicle is being driven, it is judged that an open or short circuit exists in the output shaft speed sensor circuit and DTC 23 is set.

If DTC 23 is set consecutively four times, the transaxle is locked into 2nd or 3rd gear as a fail-safe measure.

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

- Malfunction of the output shaft speed sensor
- Malfunction of the transfer drive gear or driven gear
- Damaged harness or connector
- Malfunction of the PCM

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, check data list item 23: Output Shaft Speed Sensor.**** CAUTION**

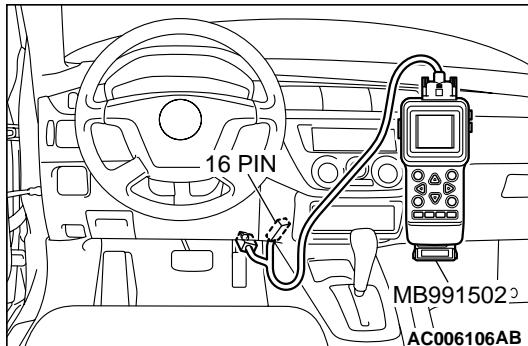
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

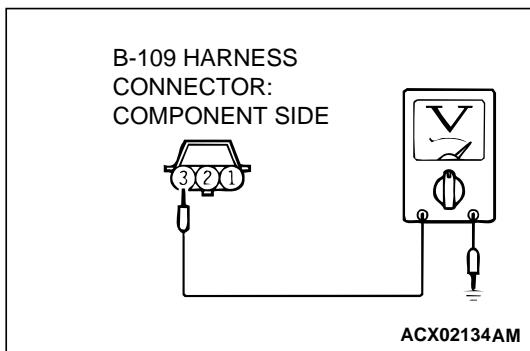
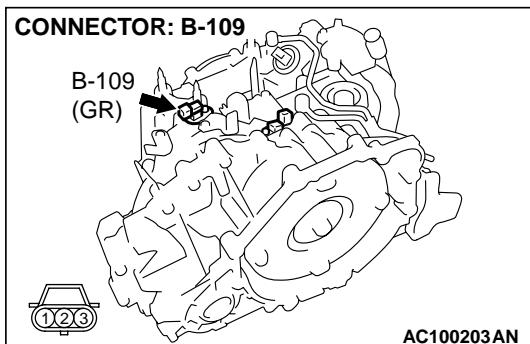
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991502 to the data reading mode for item 23, Output Shaft Speed Sensor.
  - When driving at a constant speed of 50km/h (31mph), the display should be "1,600 – 1,900 r/min." (Gear range: 3rd gear)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the sensor within the specified range?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.





**STEP 2. Measure the power supply voltage at the output shaft speed sensor connector B-109.**

- (1) Disconnect connector B-109 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 3 and ground.

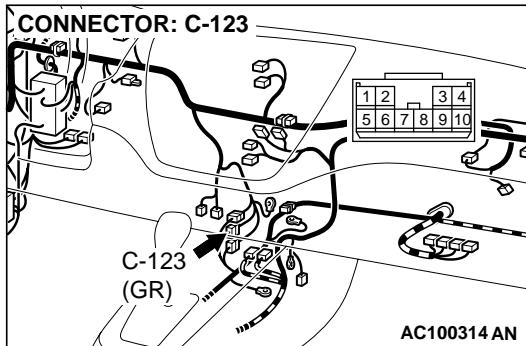
- The voltage should measure battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.

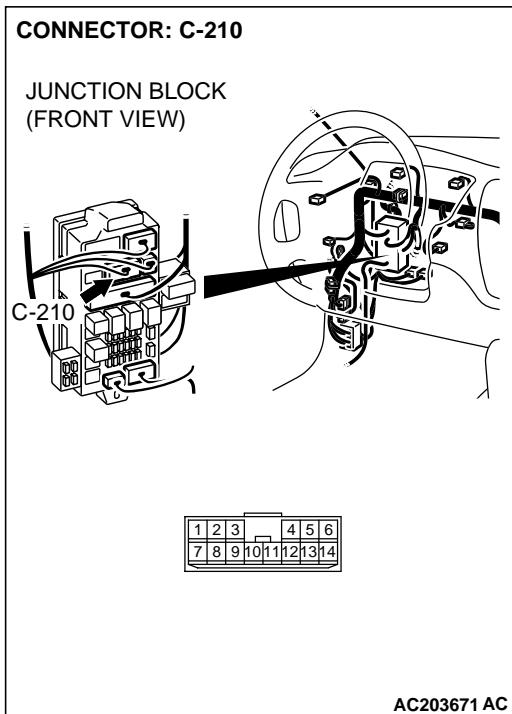


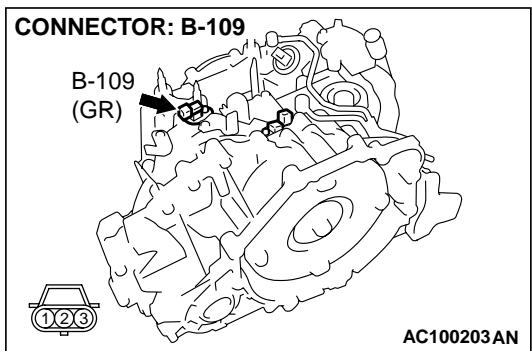
**STEP 3. Check intermediate connector C-123 and junction block connector C-210 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 4.

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



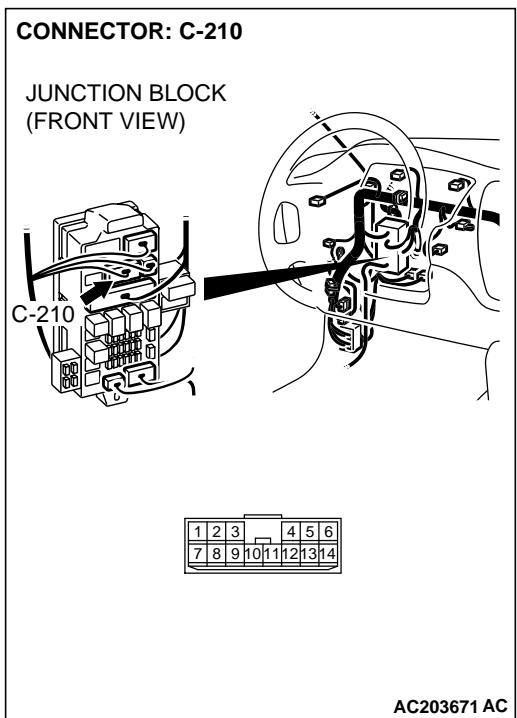


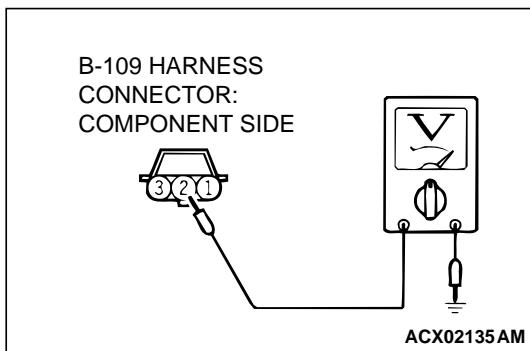
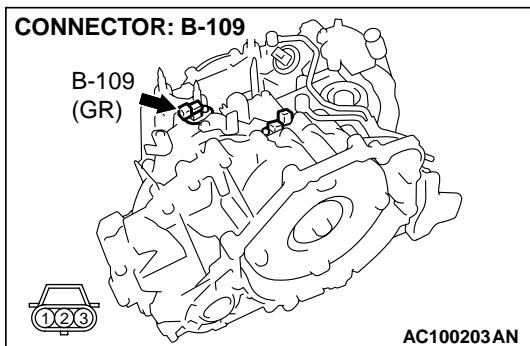
**STEP 4. Check the harness for open circuit or short circuit to ground between the output shaft speed sensor connector B-109 terminal 3 and the junction block connector C-210 terminal 12.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.





**STEP 5. Measure the PCM to speed sensor output voltage at the output shaft speed sensor connector B-109.**

- (1) Disconnect connector B-109 from the speed sensor and measure voltage at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 2 and ground.

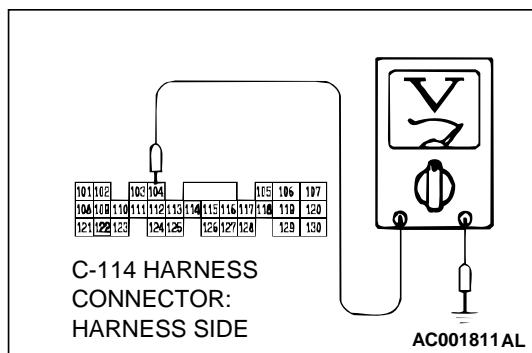
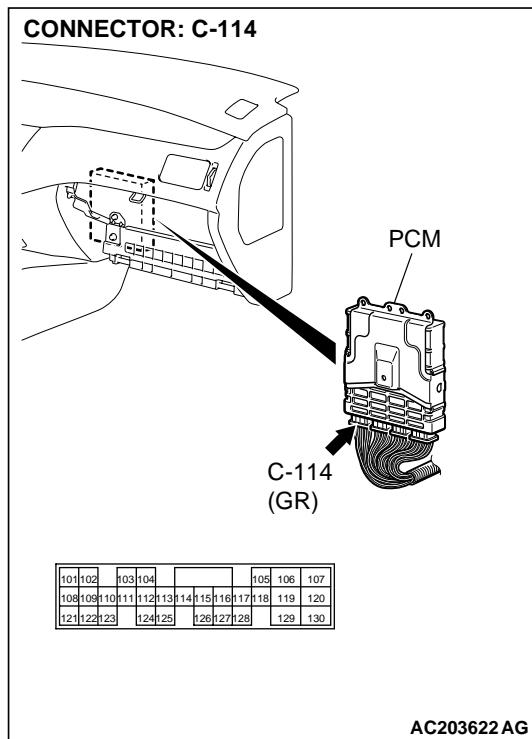
- The voltage should measure between 4.5 and 4.9 volts.

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

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

**YES :** Go to Step 11.

**NO :** Go to Step 6.



**STEP 6. Measure the PCM output voltage to the speed sensor at the PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Disconnect connector B-109 at the output shaft speed sensor.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between PCM terminal 104 and ground by backprobing.

- The voltage should measure between 4.5 and 4.9 volts.

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

**Q: Is the measured voltage between 4.5 and 4.9 volts?**

**YES :** Go to Step 7.

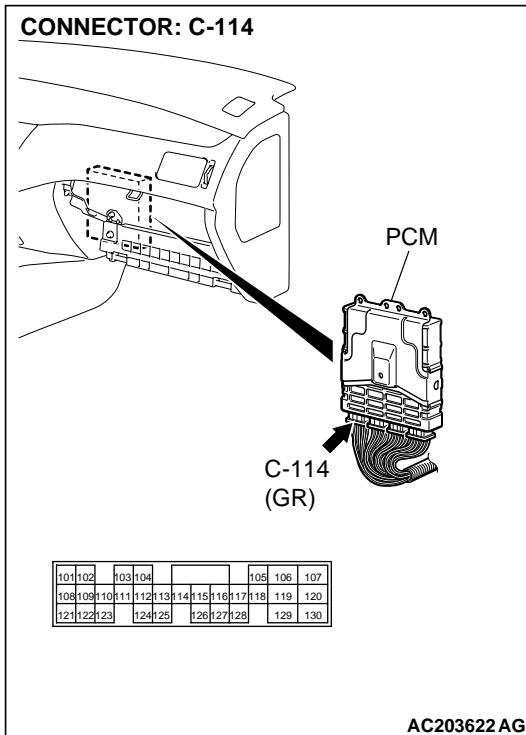
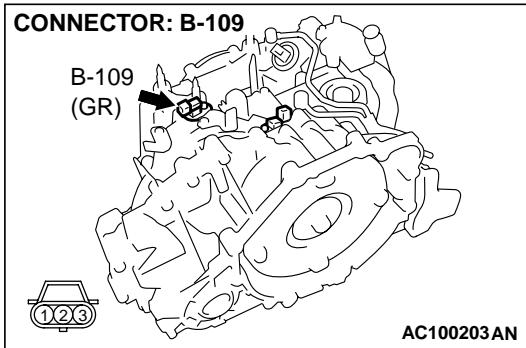
**NO :** Go to Step 9.

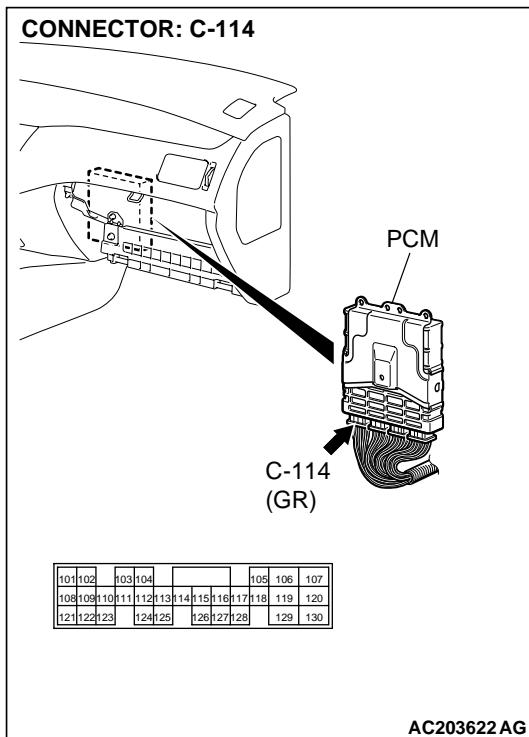
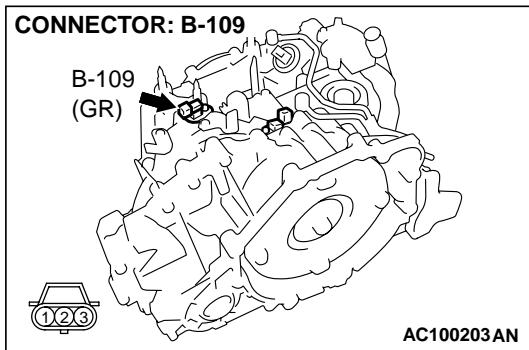
**STEP 7. Check output shaft speed sensor connector B-109 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors in good condition?**

**YES :** Go to Step 8.

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



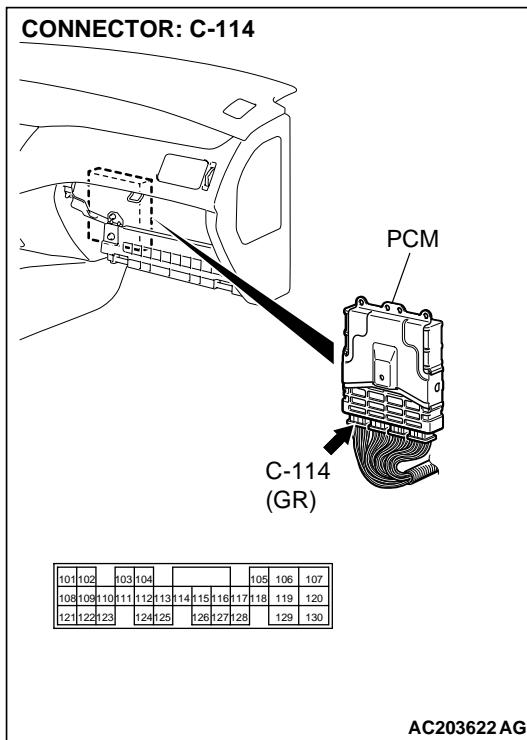
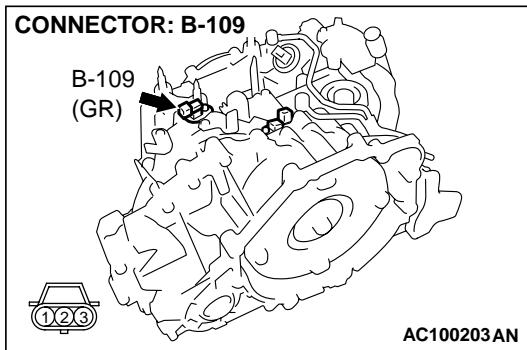


**STEP 8. Check the harness for open circuit or damage between output shaft speed sensor connector B-109 terminal 2 and PCM connector C-114 terminal 104.**

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

**YES :** Go to Step 19.

**NO :** Repair or replace the harness wire.

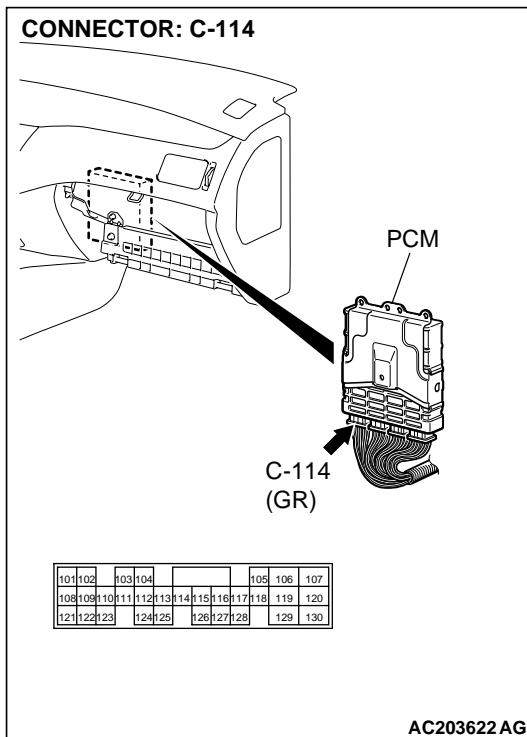
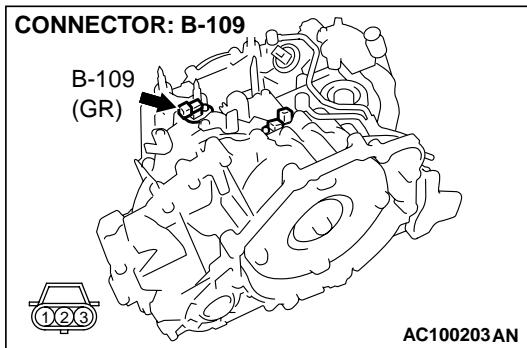


**STEP 9. Check output shaft speed sensor connector B-109 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

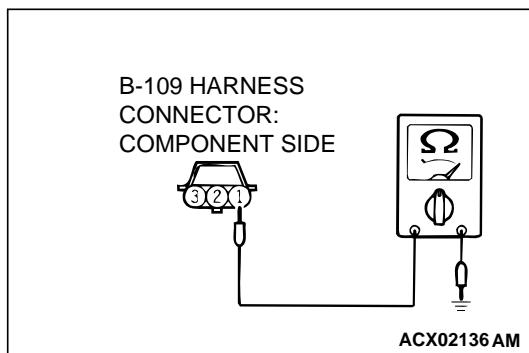
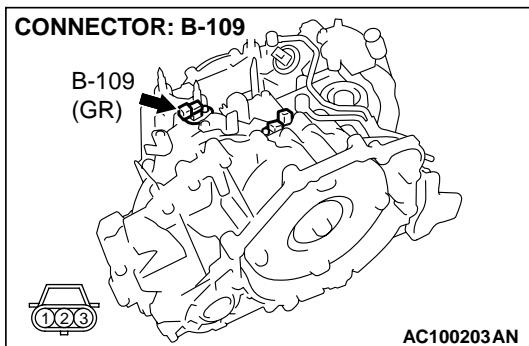
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).



**STEP 10. Check the harness for short circuit to ground between output shaft speed sensor connector B-109 terminal 2 and PCM connector C-114 terminal 104.**  
**Q: Is the harness wire in good condition?**

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.



**STEP 11. Measure the ground circuit for resistance at the output shaft speed sensor connector B-109.**

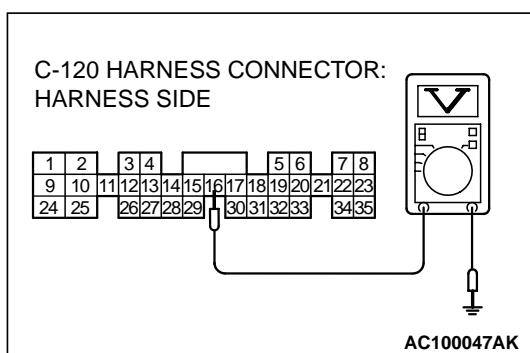
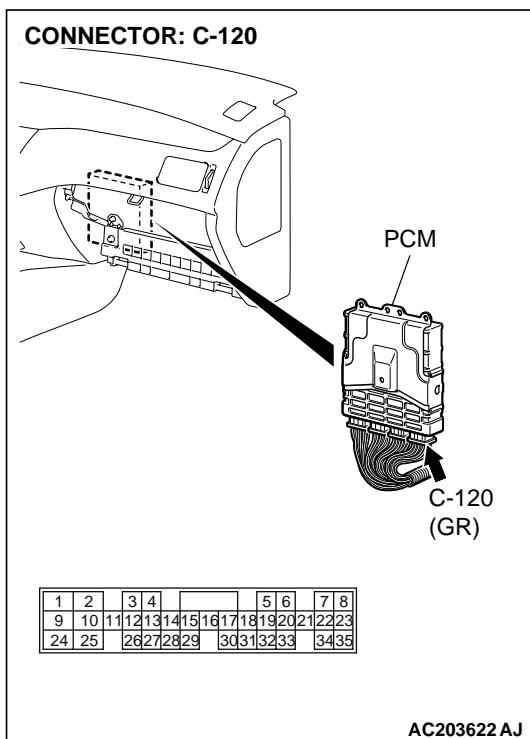
(1) Disconnect connector B-109 from the speed sensor and measure at the harness side.

(2) Measure the resistance between terminal 1 and ground.  
• The resistance should measure less than 2 ohms.

**Q: Is the measured resistance less than 2 ohms?**

**YES :** Go to Step 16.

**NO :** Go to Step 12.



**STEP 12. Measure the resistance at the PCM connector C-120 by backprobing.**

- (1) Do not disconnect connector C-120.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the resistance between terminal 16 and ground by backprobing.

- The resistance should measure less than 2 ohms.

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

**Q: Is the measured resistance less than 2 ohms?**

**YES :** Go to Step 13.

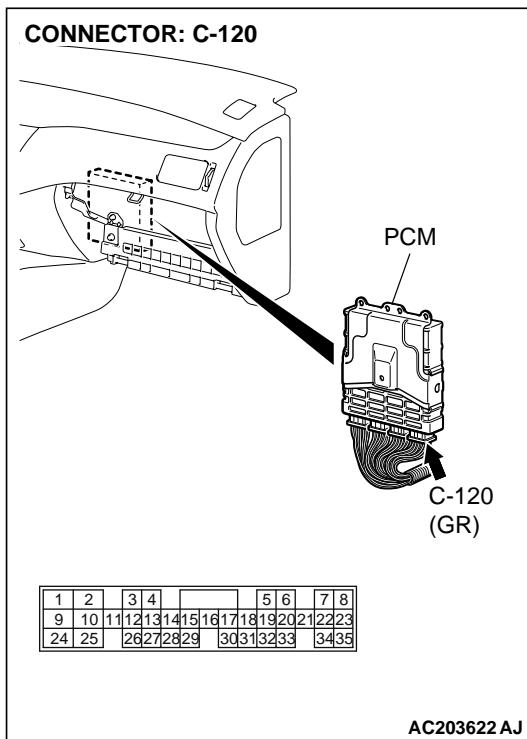
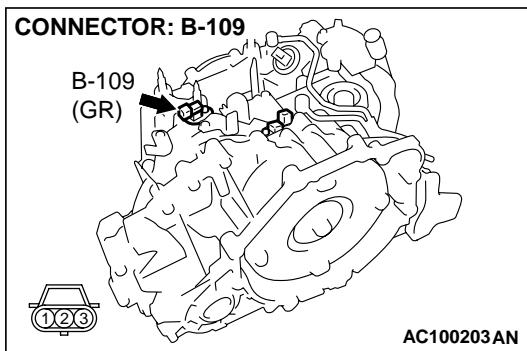
**NO :** Go to Step 15.

**STEP 13. Check output shaft speed sensor connector B-109 and PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 14.

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

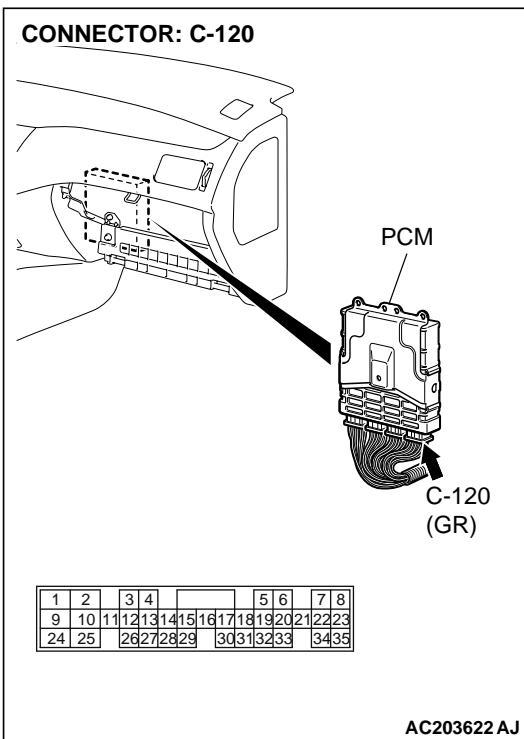
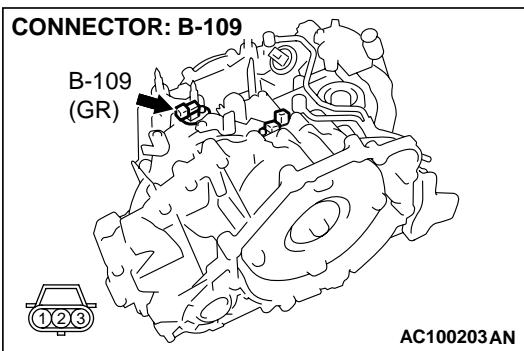


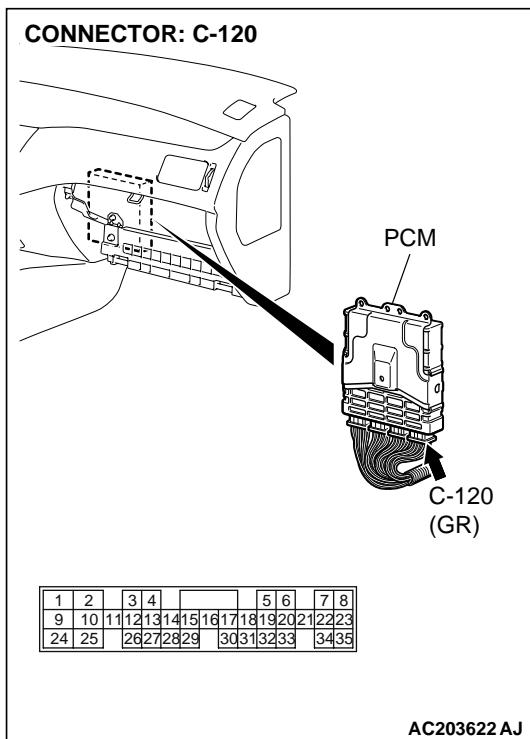
**STEP 14. Check the harness for open circuit or damage between output shaft speed sensor harness side connector B-109 terminal 1 and PCM connector C-120 terminal 16.**

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

**YES :** Go to Step 16.

**NO :** Repair or replace the harness wire.



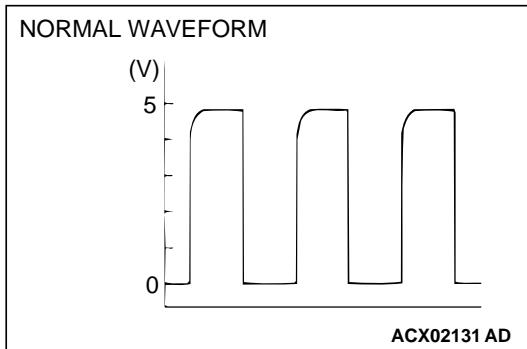
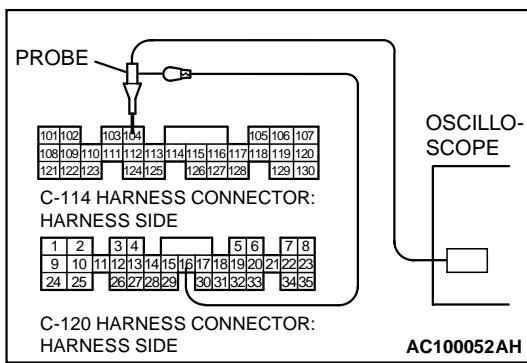
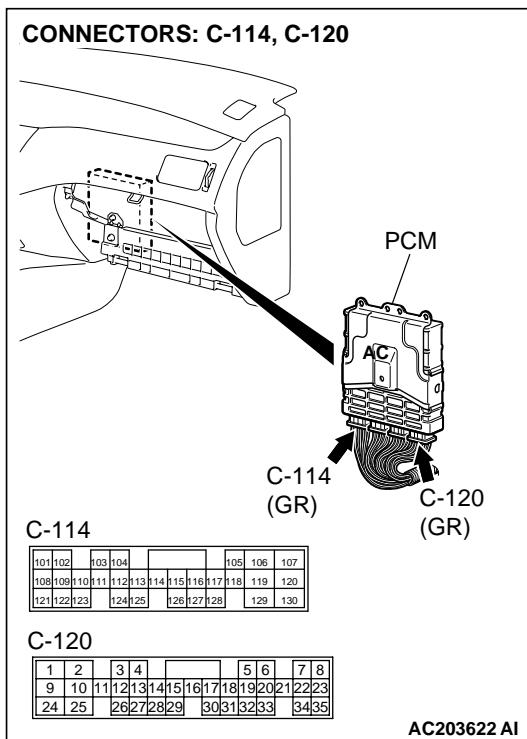


**STEP 15. Check PCM connector C-120 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Replace the PCM.

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



**STEP 16. Using the oscilloscope, check the output shaft speed sensor waveform at PCM connectors C-120 and C-114 by backprobing.**

- (1) Do not disconnect connectors C-120 and C-114.

- (2) Connect an oscilloscope probe to PCM connector C-120 terminal 16 and to PCM connector C-114 terminal 104 by backprobing.

- (3) Start the engine and drive the vehicle at constant speed of 50 km/h (31 mph). (Gear range: 3rd gear)

- (4) Check the output shaft speed sensor waveform.

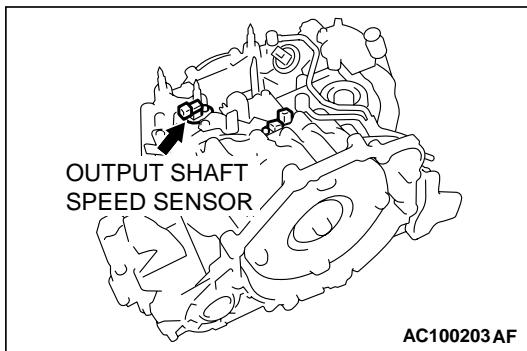
- The output shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volt and less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 19.

**NO :** Go to Step 17.

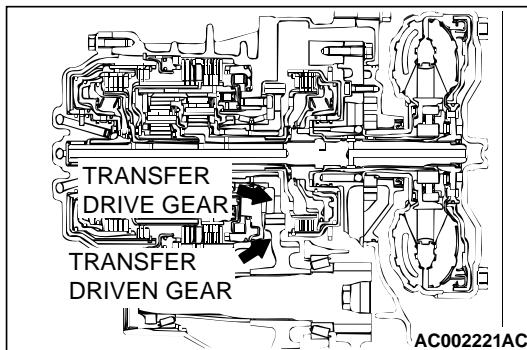
**STEP 17. Replace the output shaft speed sensor.**

- (1) Replace the output shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-8.
- (2) Test drive the vehicle.
- (3) Check for A/T DTC.

**Q: Is A/T DTC 23 set?**

**YES :** Go to Step 18.

**NO :** The procedure is complete.

**STEP 18. Replace the transfer drive gear or driven gear.**

- (1) Replace the transfer drive gear or driven gear. Refer to GROUP 23B, Transaxle , Output Shaft .
- (2) Test drive the vehicle.
- (3) Check for A/T DTC.

**Q: Is A/T DTC 23 set?**

**YES :** An A/T DTC may have set due to external radio frequency (RFI) possibility caused by cellular phone activity, or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.

**STEP 19. Using scan tool MB991502, check data list item 23: Output Shaft Speed Sensor.****CAUTION**

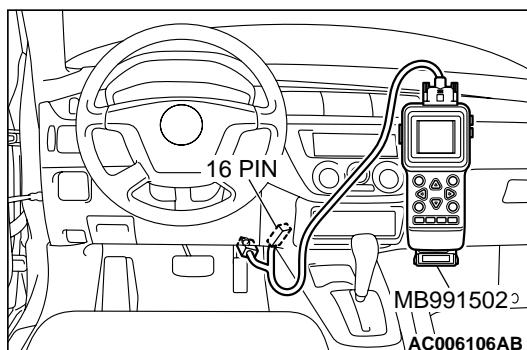
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991502 to data reading mode for item 23, Output Shaft Speed Sensor.
  - When driving at constant speed of 50 km/h (31 mph), the display should be "1,600 – 1,900 r/min." (Gear range: 3rd gear)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

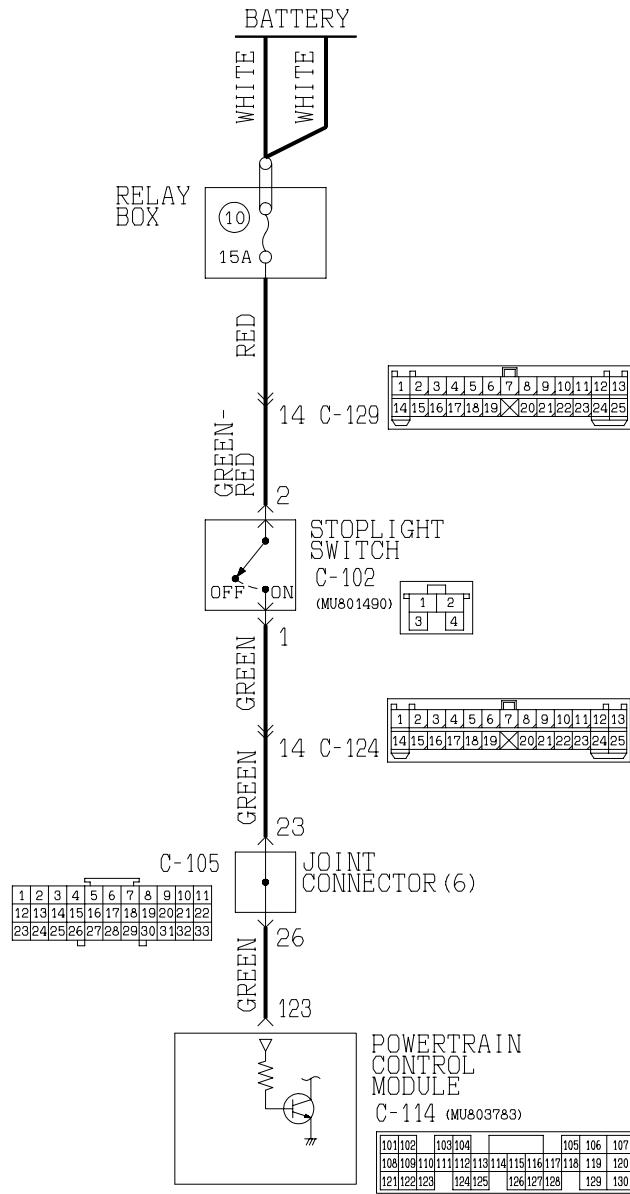
**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Replace the PCM.

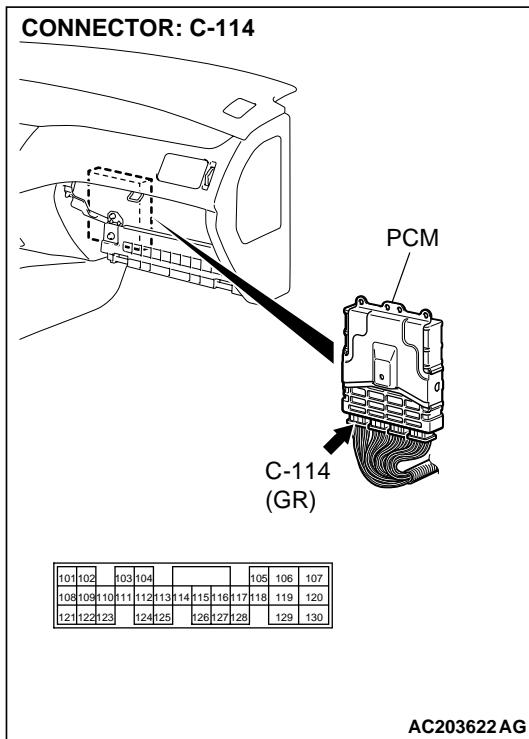
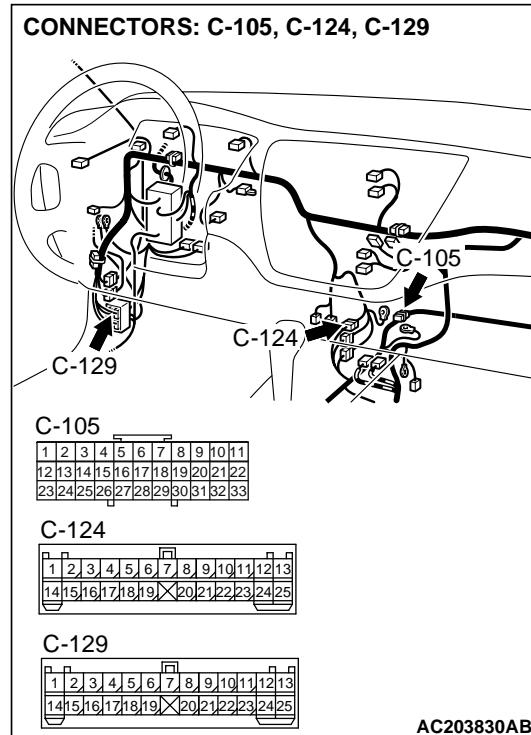
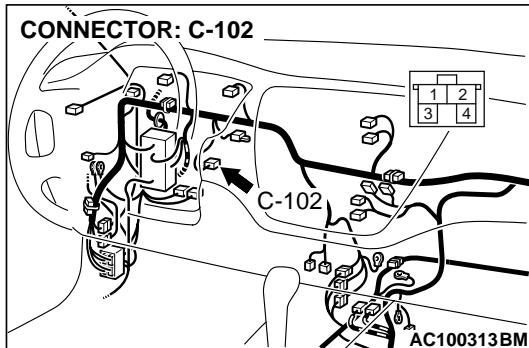


## DTC 26: Stoplight Switch System

Stoplight Switch System Circuit



AC100490AC



## CIRCUIT OPERATION

- Battery positive voltage is supplied to the stoplight switch (terminal 2).
- When the brake pedal is depressed, battery positive voltage is applied to the PCM (terminal 123).

## DTC SET CONDITIONS

If the stoplight switch is on for five minutes or more while driving above 50 km/h (31 mph), it is judged there is a short circuit in the stoplight switch and DTC 26 is set.

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

- Malfunction of the stoplight switch circuit

- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

### STEP 1. Check the brake pedal height.

Refer to GROUP 35A, On-vehicle Service – Brake Pedal Check and Adjustment [P.35A-15](#).

#### Q: Is the height adjusted properly?

**YES** : Go to Step 2.

**NO** : Adjust the brake pedal to the proper height.

### STEP 2. Using scan tool MB991502, check data list item 26: Stoplight Switch.

#### **CAUTION**

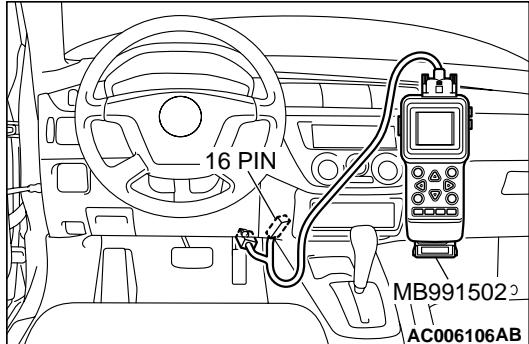
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

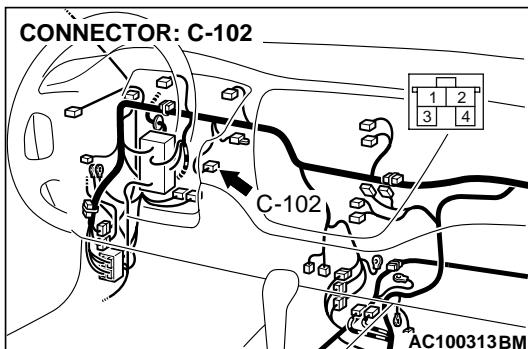
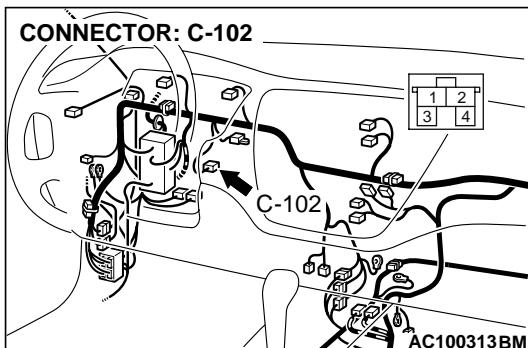
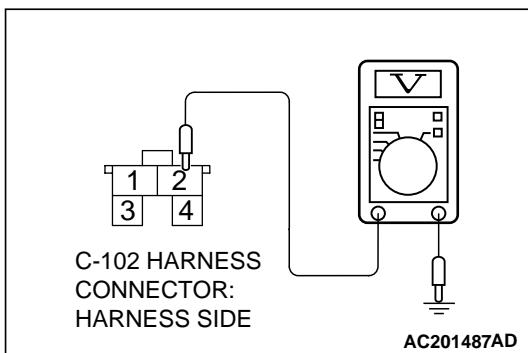
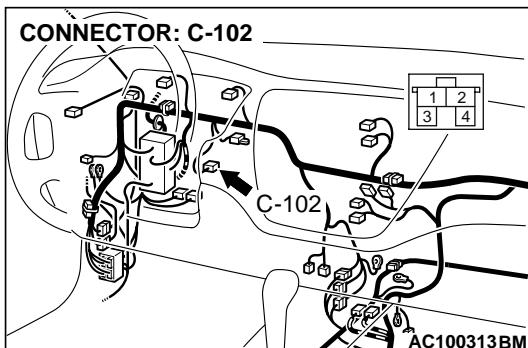
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 26, Stoplight Switch.
  - When the brake pedal is depressed, the display on scan tool MB991502 should be "ON."
  - When the brake pedal is not depressed, the display on scan tool MB991502 should be "OFF."
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

#### Q: Is the switch operating properly?

**YES** : If can be assumed that this malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-6](#).

**NO** : Go to Step 3.





**STEP 3. Measure the stoplight switch power supply voltage at connector C-102 by backprobing.**

- (1) Remove the stoplight switch from the mounting bracket.
- (2) Do not disconnect connector C-102.

- (3) Measure the voltage between terminal 2 and ground by backprobing.

- The voltage should measure battery positive voltage.

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 6.

**NO :** Go to step 4.

**STEP 4. Check stoplight switch connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 5.

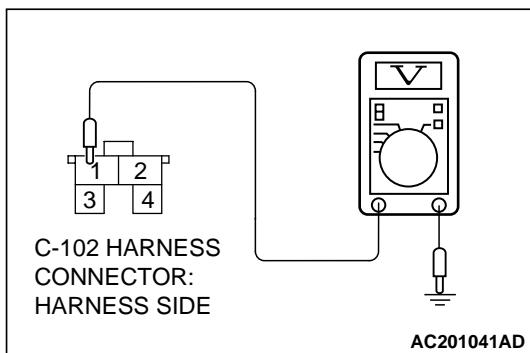
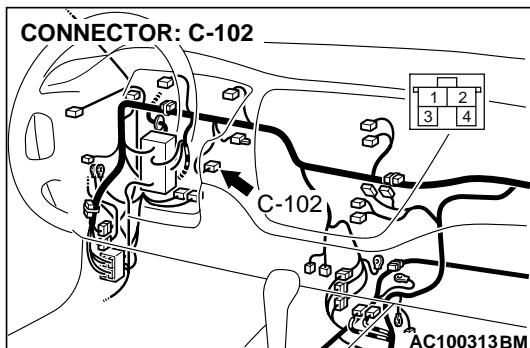
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**STEP 5. Check the harness for damage between stoplight switch connector C-102 terminal 2 and the power supply fuse.**

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

**YES :** Go to Step 6.

**NO :** Repair or replace the harness wire.



**STEP 6. Measure the stoplight switch output voltage to the PCM at connector C-102 by backprobing.**

- (1) Remove the stoplight switch from the mounting bracket.
- (2) Do not disconnect connector C-102.

- (3) Measure the voltage between terminal 1 and ground by backprobing.

- When the switch button is out (closed circuit), voltage should equal battery positive voltage.
- When the switch button is depressed (open circuit), voltage should measure less than 1.0 volt.

**Q: Is the measured voltage battery positive voltage with the switch button released (closed circuit), and less than 1.0 volt with the switch button depressed (open circuit)?**

**YES :** Go to Step 8.

**NO :** Go to Step 7.

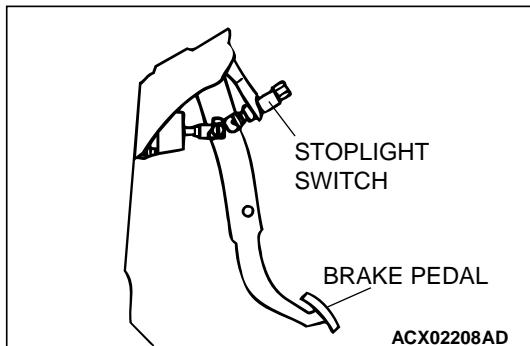
**STEP 7. Check the stoplight switch.**

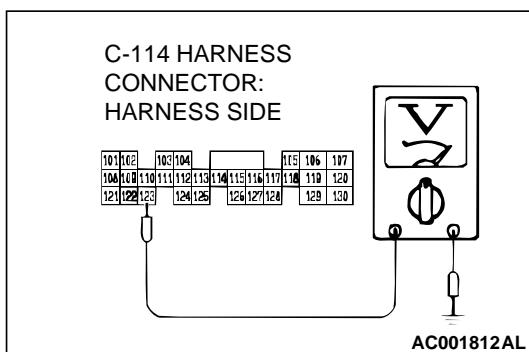
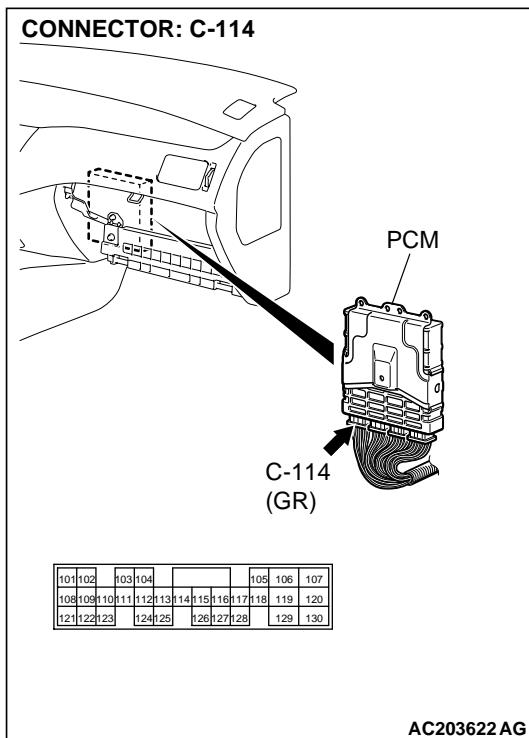
Refer to GROUP 35A, On-vehicle Service – Stoplight Switch Check [P.35A-28](#).

**Q: Does the stoplight switch pass the checks?**

**YES :** Go to Step 8.

**NO :** Replace the stoplight switch. Refer to GROUP 35A, Brake Pedal [P.35A-27](#).





**STEP 8. Measure the stoplight switch output voltage at the PCM connector C-114 by backprobing.**

- (1) Install the stoplight switch into the mounting bracket if it was removed.
- (2) Do not disconnect connector C-114.

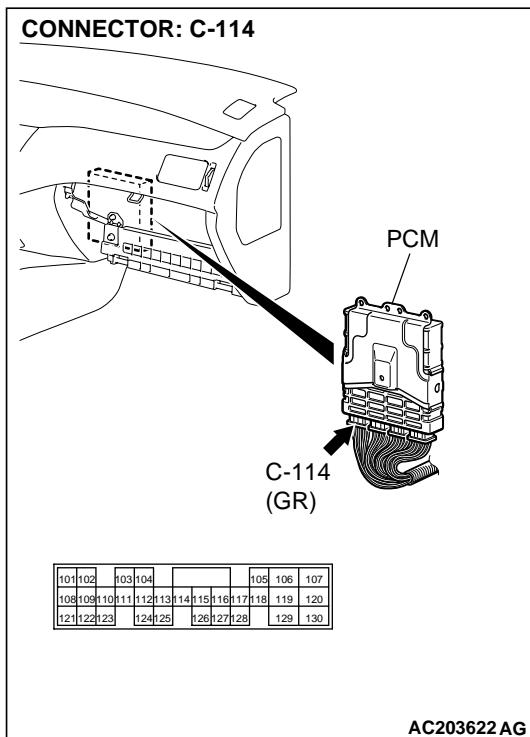
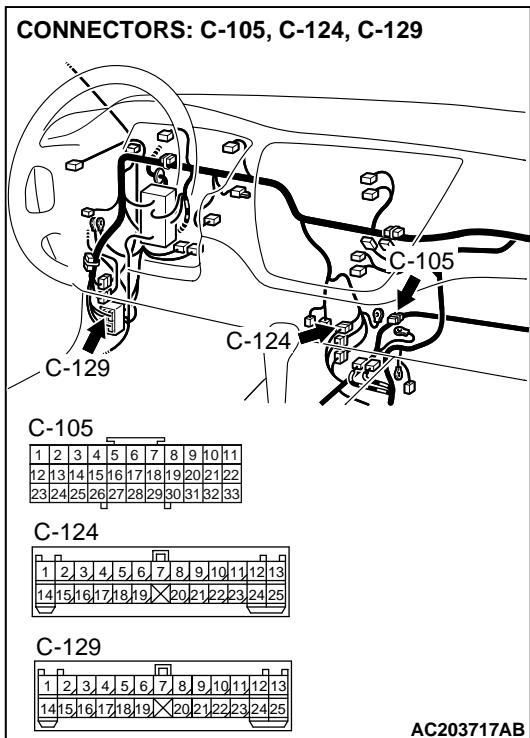
(3) Measure the voltage between terminal 123 and ground by backprobing.

- When the brake pedal is depressed, voltage should measure battery positive voltage.
- When the brake pedal is not depressed, voltage should measure less than 1.0 volt.

**Q: Is the measured voltage battery positive voltage with the brake pedal depressed (closed circuit), and less than 1.0 volt with the brake pedal released (open circuit)?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

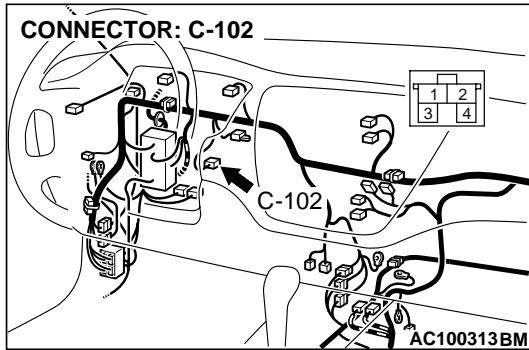


**STEP 9. Check PCM connector C-114, joint connector C-105 and intermediate connector C-124 and C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

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

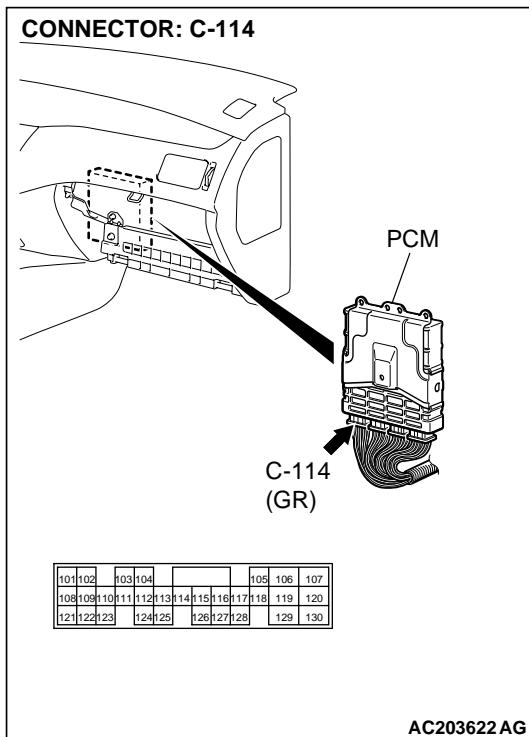


**STEP 10. Check the harness for damage between stoplight switch connector C-102 terminal 1 and PCM connector C-114 terminal 123.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.



**STEP 11. Using scan tool MB991502, check data list item 26: Stoplight Switch.**

**⚠ CAUTION**

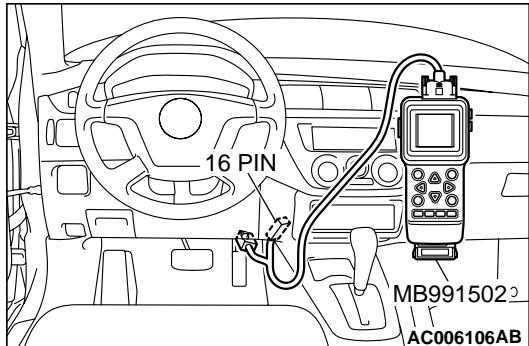
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

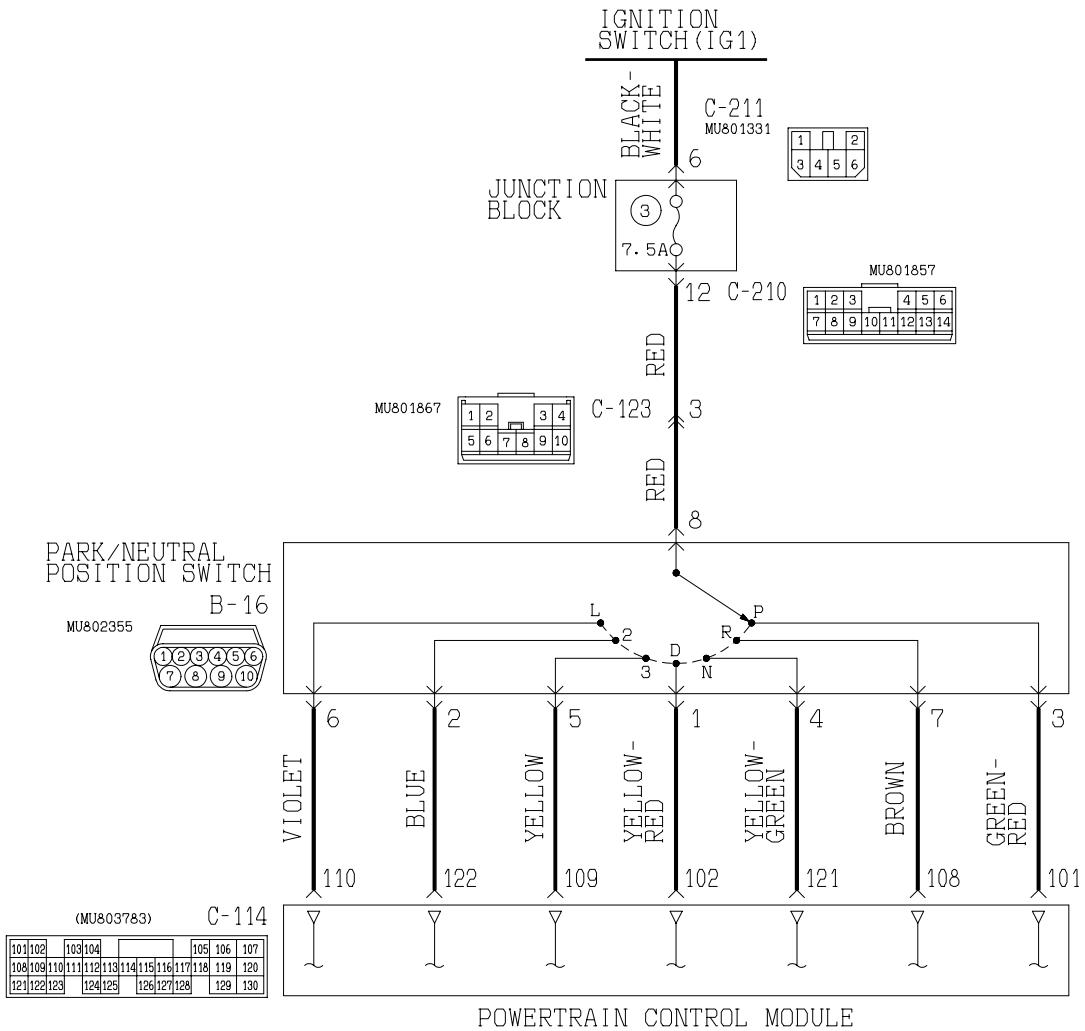
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 26, Stoplight Switch.
  - When the brake pedal is depressed, the display on scan tool MB991502 should be "ON."
  - When the brake pedal is not depressed, the display on scan tool MB991502 should be "OFF."
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

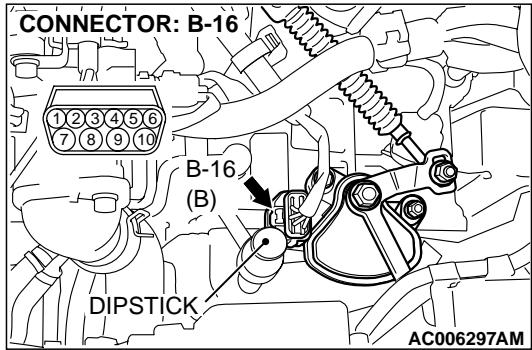
**YES :** If can be assumed that this malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-6](#).

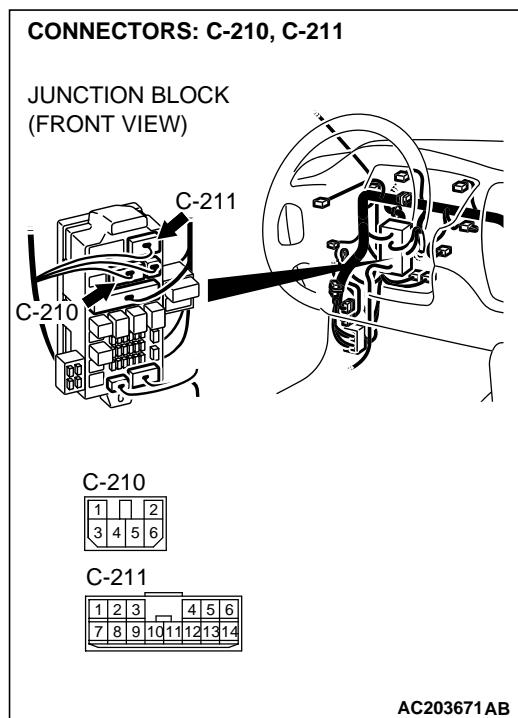
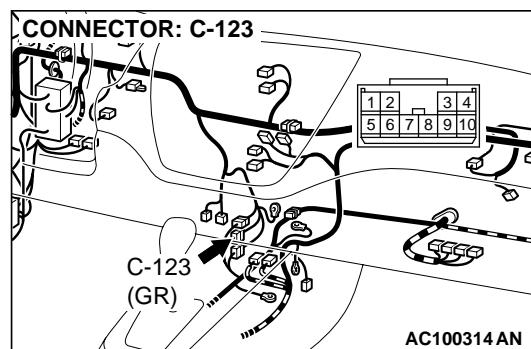
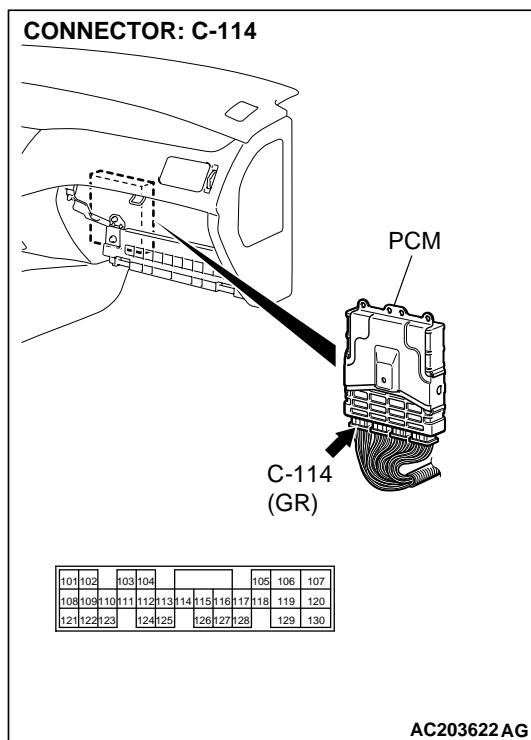
**NO :** Replace the PCM.



**DTC 27: Park/Neutral Position Switch System (Open Circuit)****Park/Neutral Position Switch System Circuit**

W2J01M06AA  
AC100491AB





### CIRCUIT OPERATION

- Battery positive voltage is applied to the Park/Neutral position switch (terminal 8) when the ignition switch is turned "ON."
- Battery positive voltage is applied to the PCM (terminal 101) when the selector lever is in the "P" range. The PCM judges that the selector lever is in the "P" range when the battery positive voltage is applied.

- Battery positive voltage is applied to the PCM terminal 108 (121, 102, 109, 122 or 110) when the selector lever is in the "R" range ("N," "D," "3," "2" or "L" range). The PCM judges that the selector lever is in the "R" range ("N," "D," "3," "2" or "L" range) when the battery positive voltage is applied.

**DTC SET CONDITIONS**

If the PCM detects no Park/Neutral position switch input signal from any selector position for a continuous period of thirty seconds or more, it is judged that there is an open circuit in the Park/Neutral position switch and DTC 27 is set.

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

- Malfunction of the Park/Neutral position switch
- Malfunction of the ignition switch
- Damaged harness or connector
- Malfunction of the PCM

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.**** CAUTION**

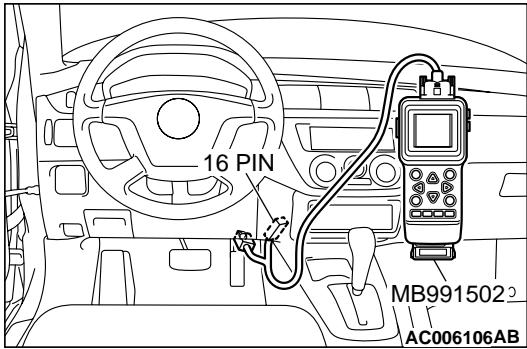
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

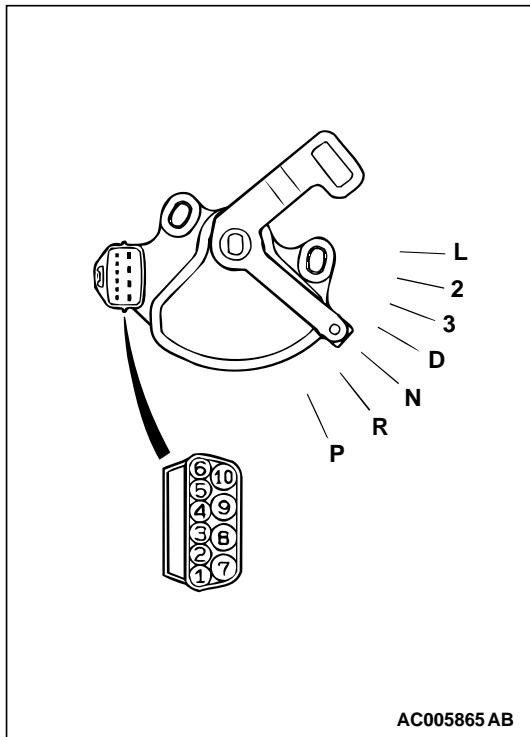
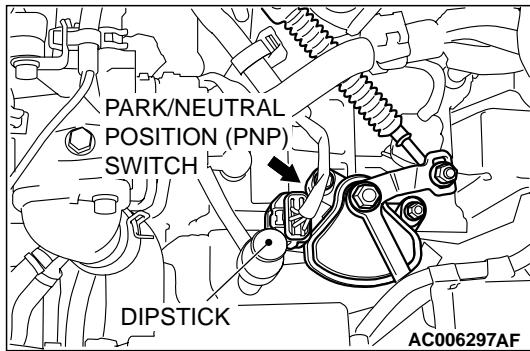
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 61, Park/Neutral Position Switch.
  - Move the selector lever to "P," "R," "N," "D," "3," "2," "L" positions and confirm that the selected selector lever positions match the positions shown on scan tool MB991502.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** When the selector lever position does not match any of the positions shown on scan tool MB991502: Go to Step 2. When the selector lever position does not match the "P" position on scan tool MB991502: Go to Step 6. When the selector lever position does not match the "R" position on scan tool MB991502: Go to Step 12. When the selector lever position does not match the "N" position on scan tool MB991502: Go to Step 17. When the selector lever position does not match the "D" position on scan tool MB991502: Go to Step 22. When the selector lever position does not match the "3" position on scan tool MB991502: Go to Step 27. When the selector lever position does not match the "2" position on scan tool MB991502: Go to Step 32. When the selector lever position does not match the "L" position on scan tool MB991502: Go to Step 37.





### STEP 2. Check the Park/Neutral position switch.

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Does the resistance measure less than 2 ohms for each selector position?**

**YES :** Go to Step 3.

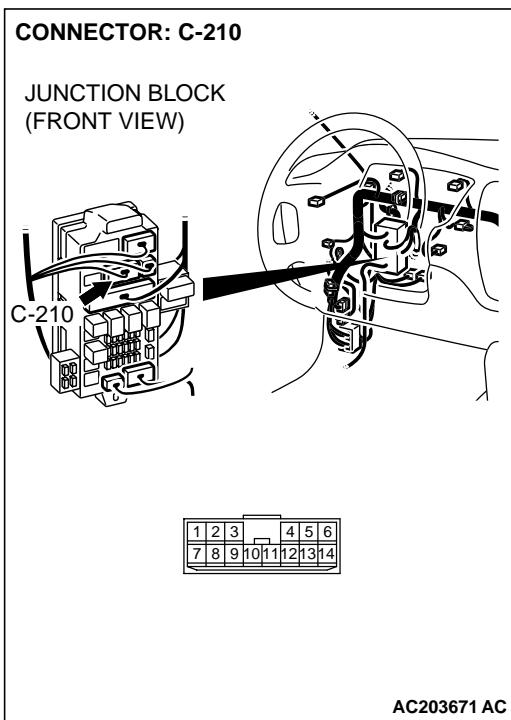
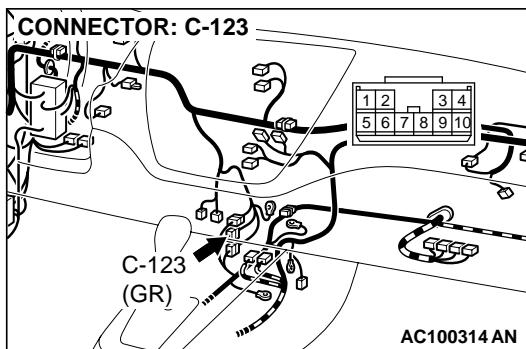
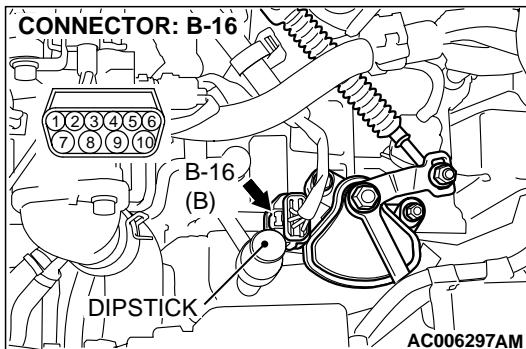
**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

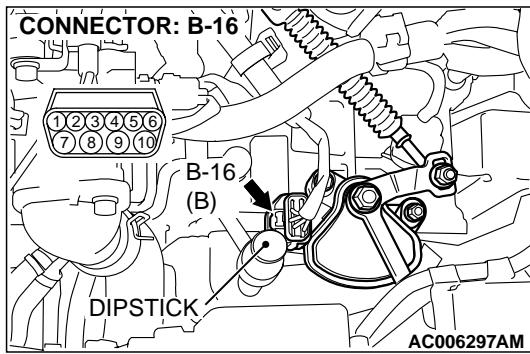
**STEP 3. Check Park/Neutral position switch connector B-16, intermediate connector C-123 and junction block connector C-210 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 4.

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

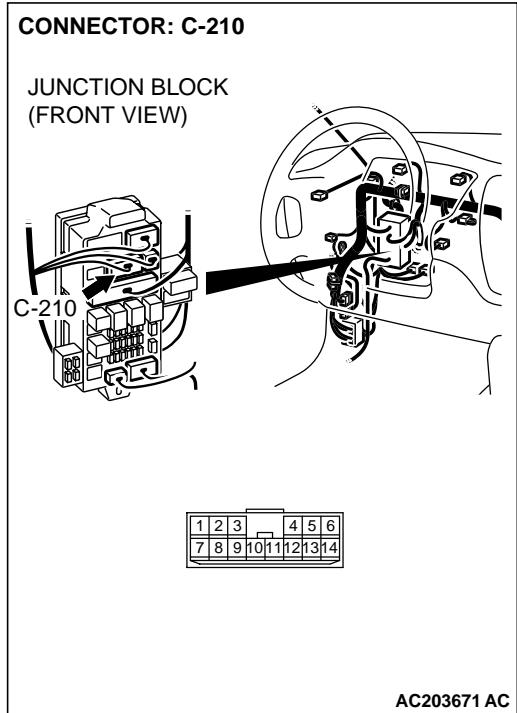




**STEP 4. Check harness for open or short circuit to ground between Park/Neutral position switch connector B-16 terminal 8 and junction block connector C-210 terminal 12.**  
**Q: Is the harness wire in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.



---

**STEP 5. Using scan tool MB991502, check data list item 61:Park/Neutral Position Switch.**

**⚠ CAUTION**

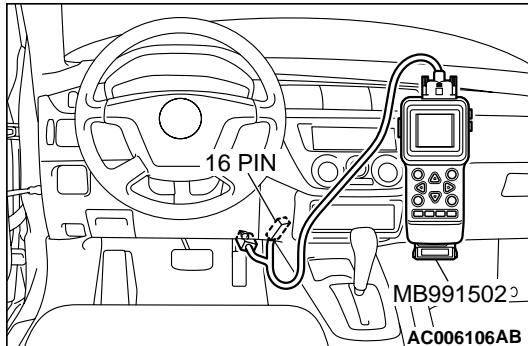
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

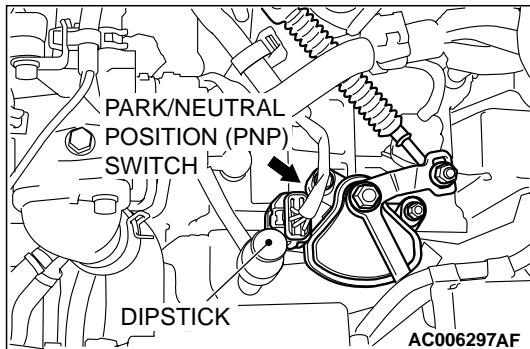
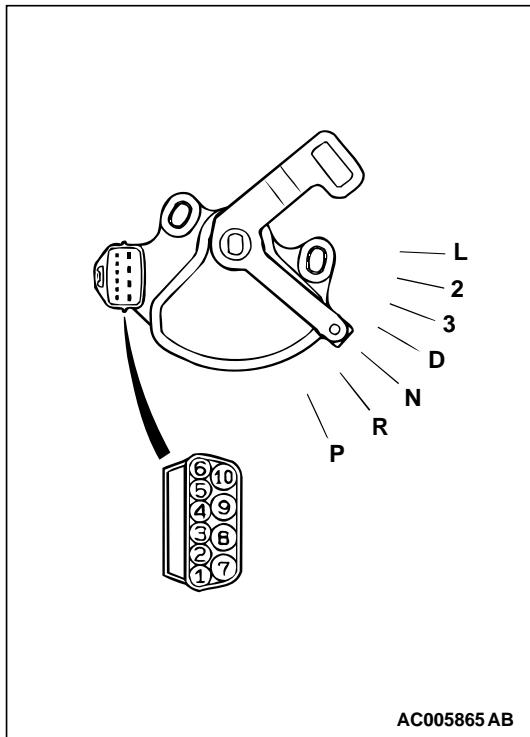
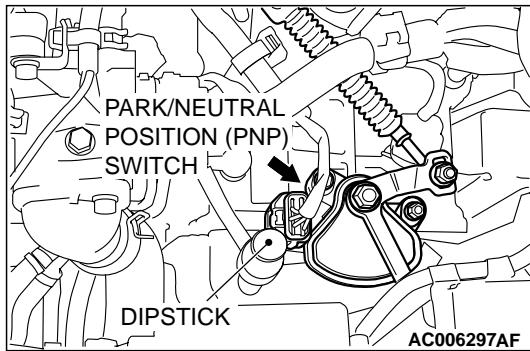
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 61, Park/Neutral Position Switch.
  - Move the selector lever to "P," "R," "N," "D," "3," "2," "L" positions and confirm that the selected selector lever positions match the positions shown on scan tool MB991502.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

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

**NO :** Replace the PCM.






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**STEP 6. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Does the resistance measure less than 2 ohms for each selector position?**

**YES :** Go to Step 7.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

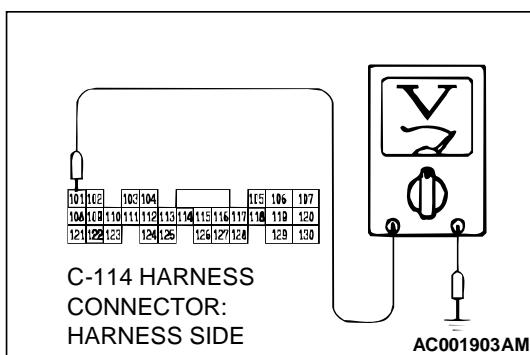
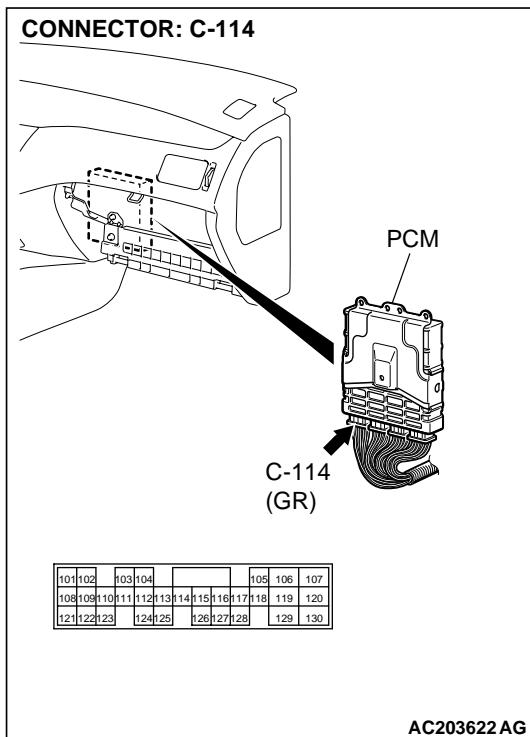
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**STEP 7. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 8.

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



**STEP 8. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "P" position.

- (4) Measure the voltage between terminal 101 and ground by backprobing.

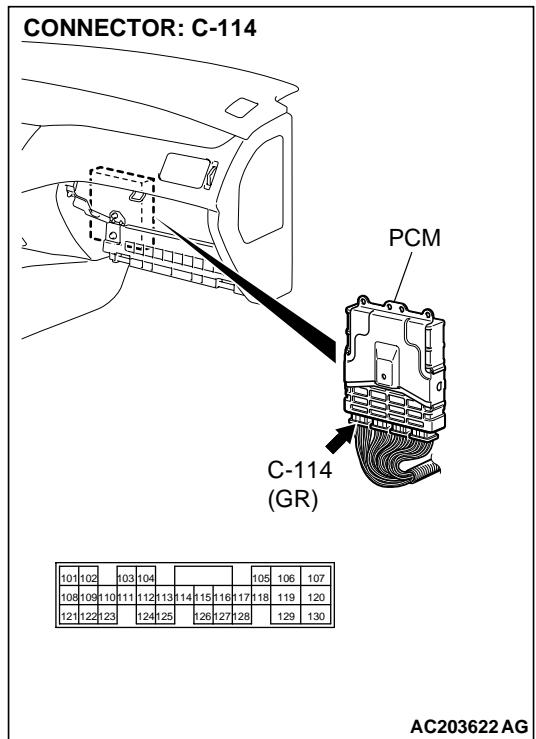
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

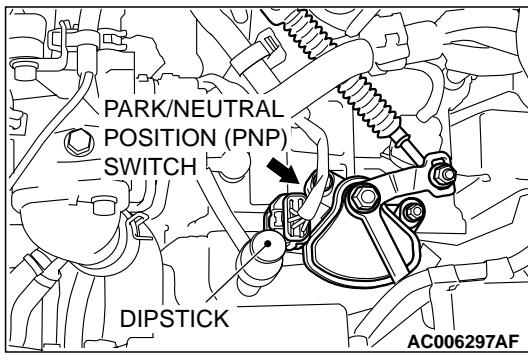


**STEP 9. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 10.

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

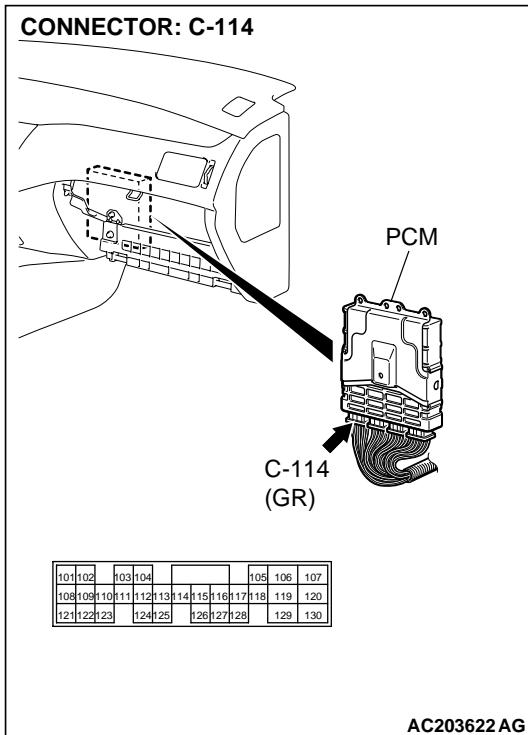


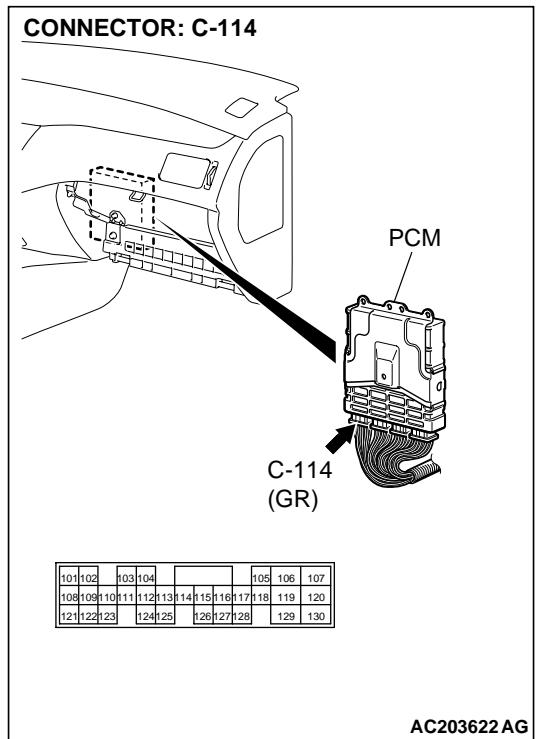
**STEP 10. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 3 and PCM connector C-114 terminal 101.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.



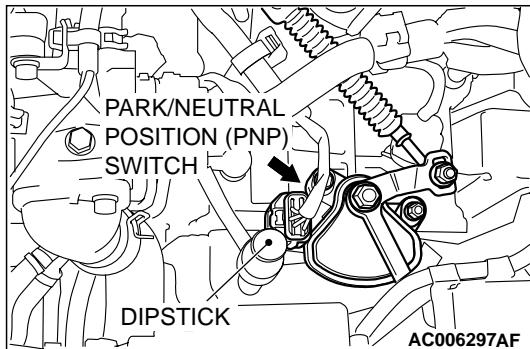
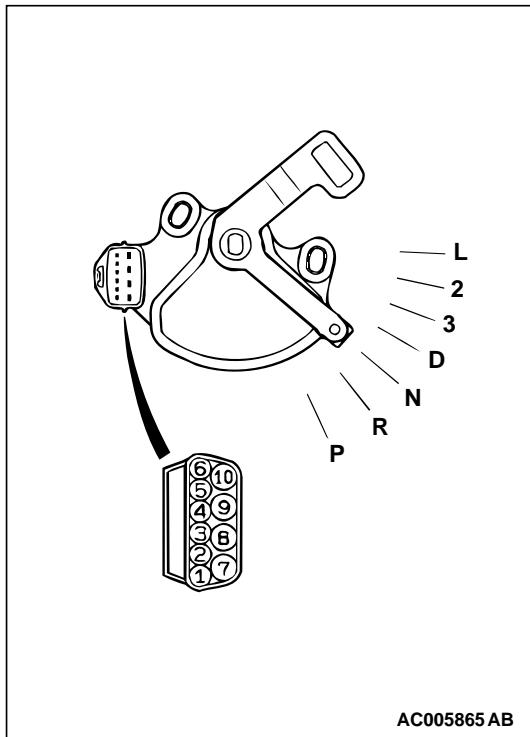
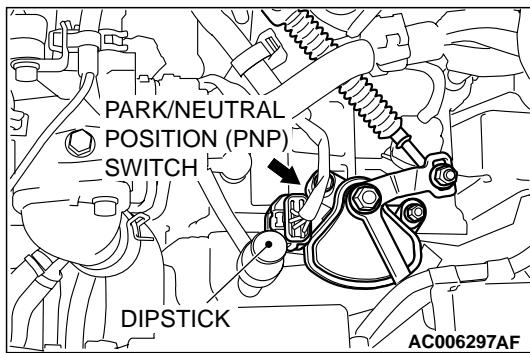


**STEP 11. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 5.

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



#### STEP 12. Check the Park/Neutral position switch.

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

Q: Is the measured resistance less than 2 ohms for each selector position?

YES : Go to Step 13.

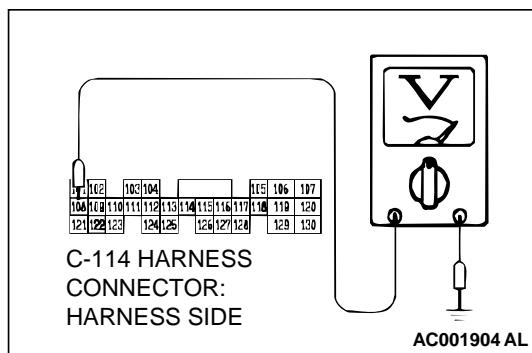
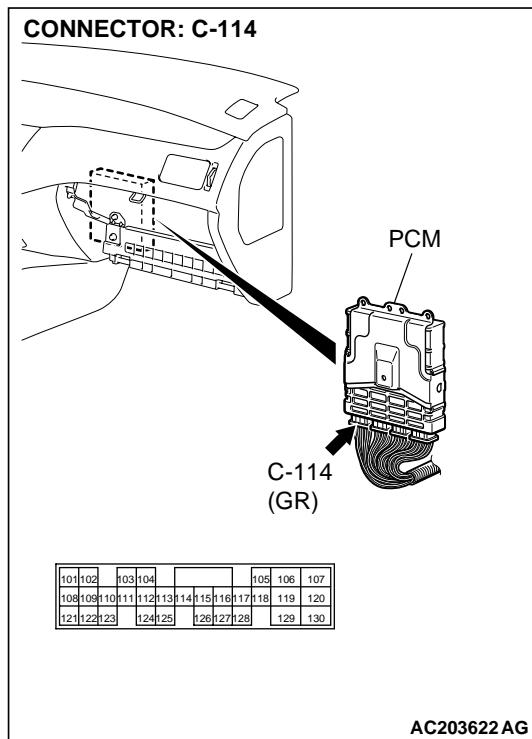
NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

#### STEP 13. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 14.

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



**STEP 14. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "R" position.

- (4) Measure the voltage between terminal 108 and ground by backprobing.

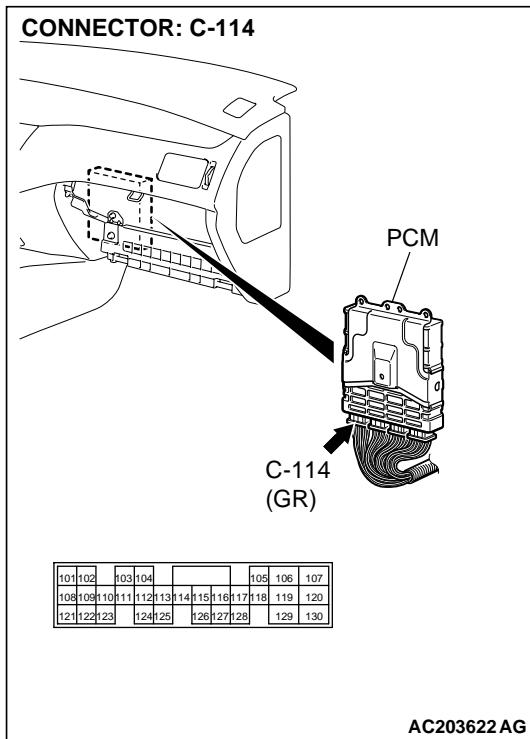
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 15.

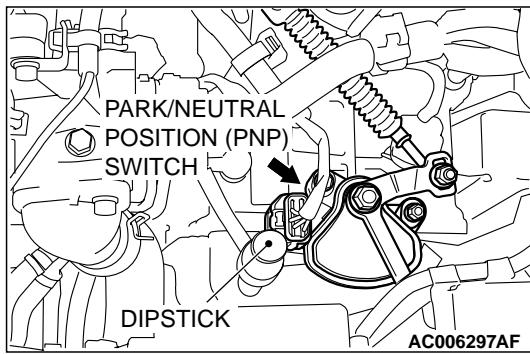


**STEP 15. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 16.

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

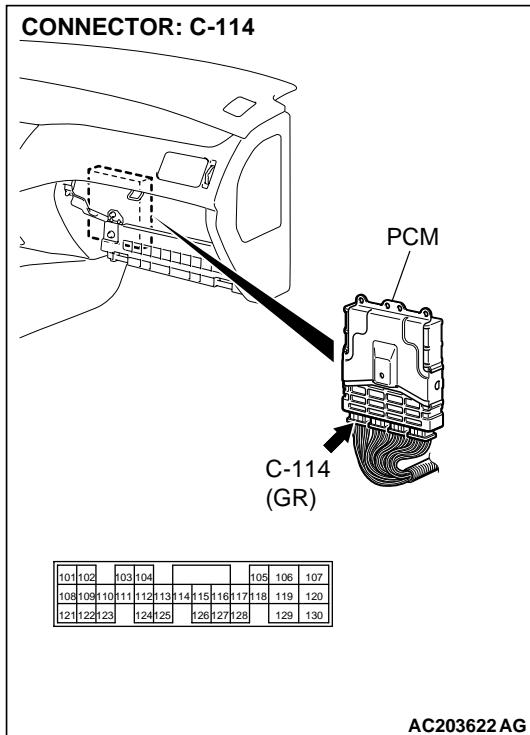


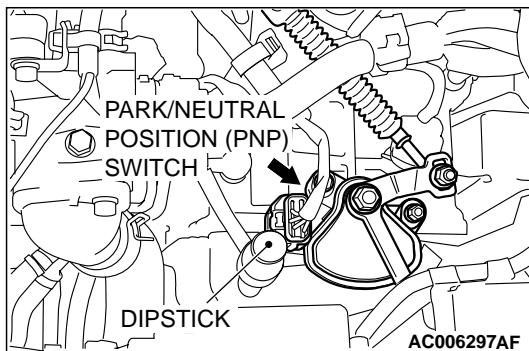
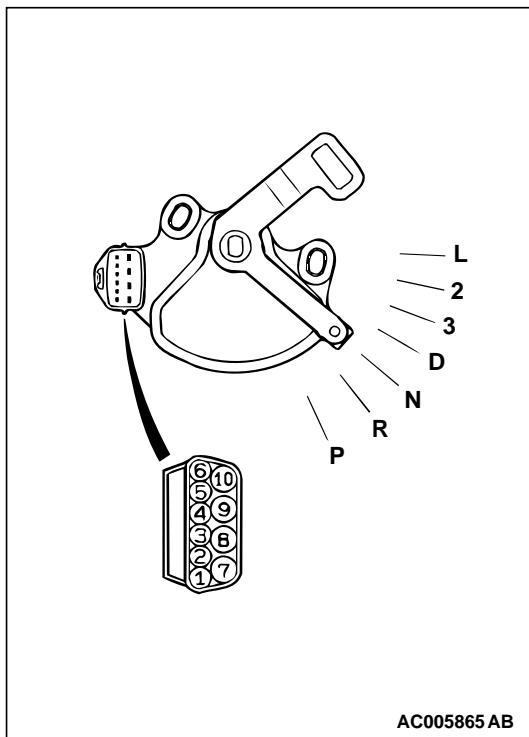
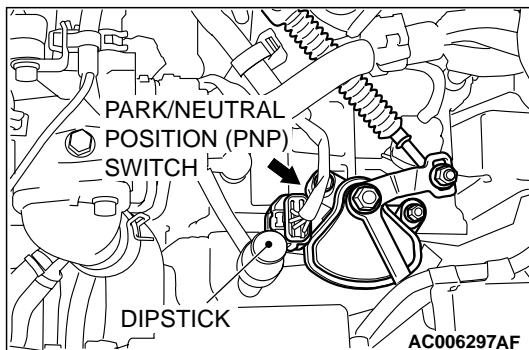
**STEP 16. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 7 and PCM connector C-114 terminal 108.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.






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**STEP 17. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Is the measured resistance less than 2 ohms for each selector position?**

**YES :** Go to Step 18.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

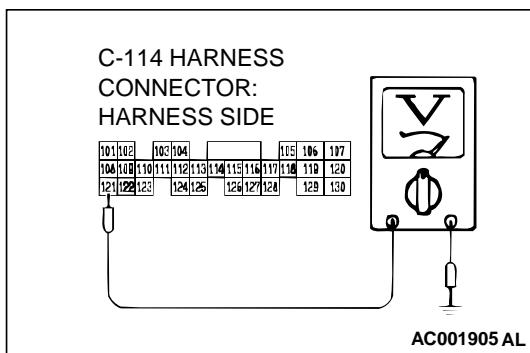
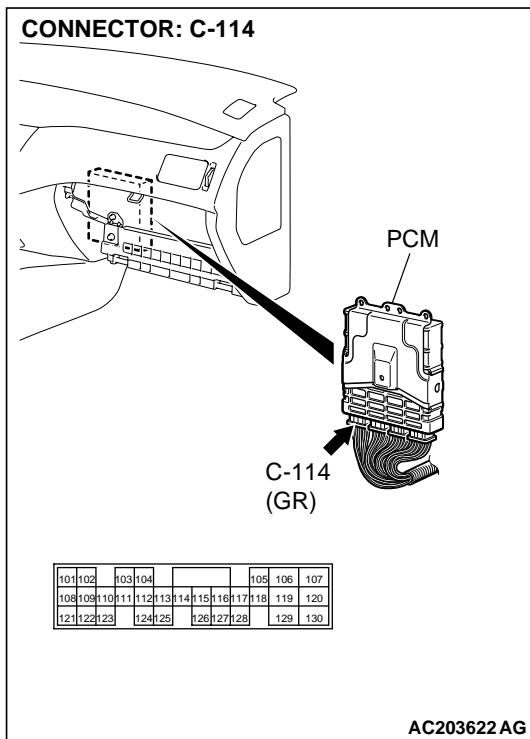
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**STEP 18. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 19.

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



**STEP 19. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "N" position.

- (4) Measure the voltage between terminal 121 and ground by backprobing.

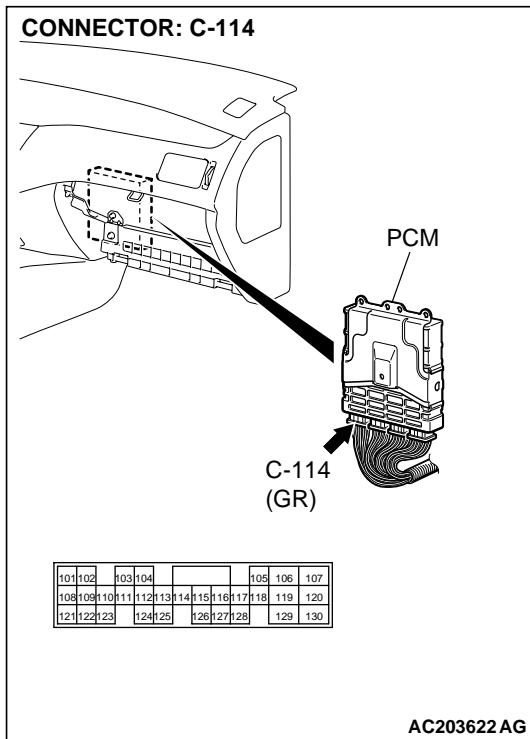
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 20.

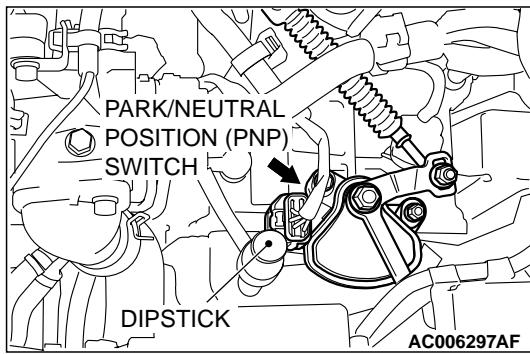


**STEP 20. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 21.

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

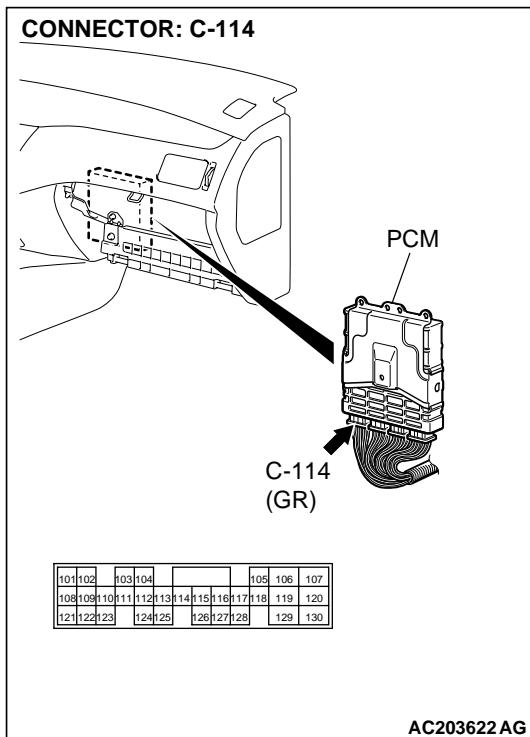


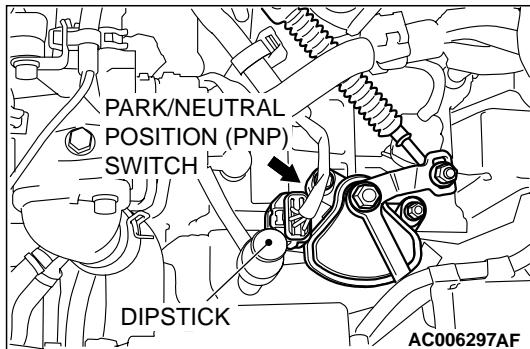
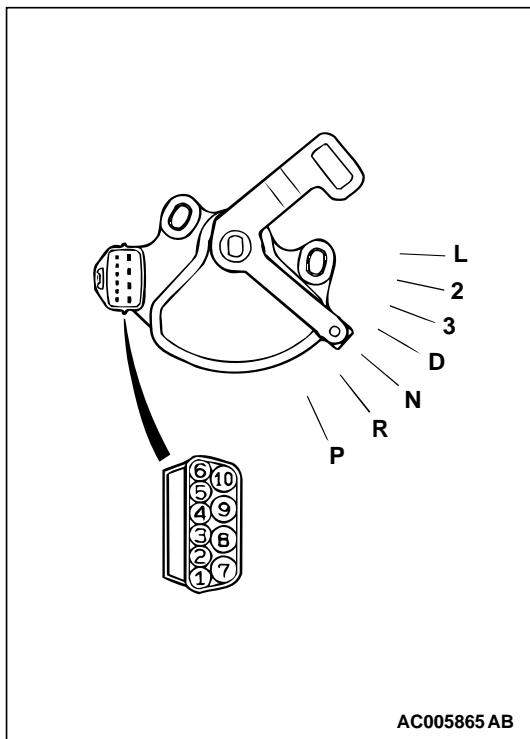
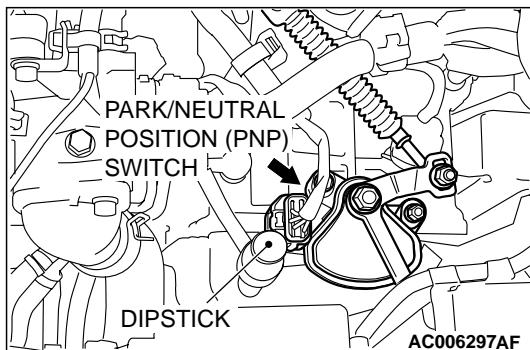
**STEP 21. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 4 and PCM connector C-114 terminal 121.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.






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**STEP 22. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Is the measured resistance less than 2 ohms for each selector position?**

**YES :** Go to Step 23.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

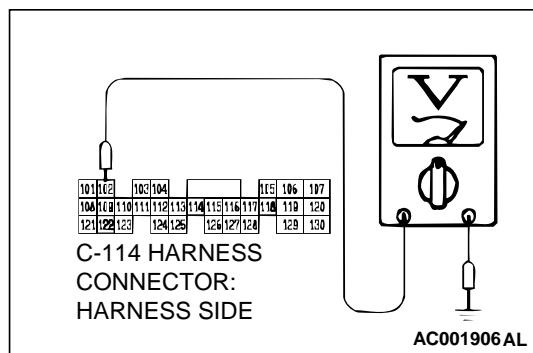
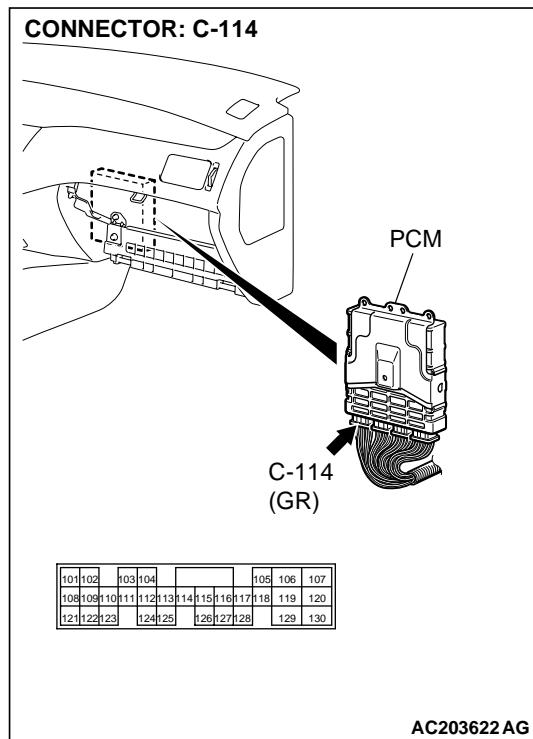
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**STEP 23. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 24.

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



**STEP 24. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "D" position.

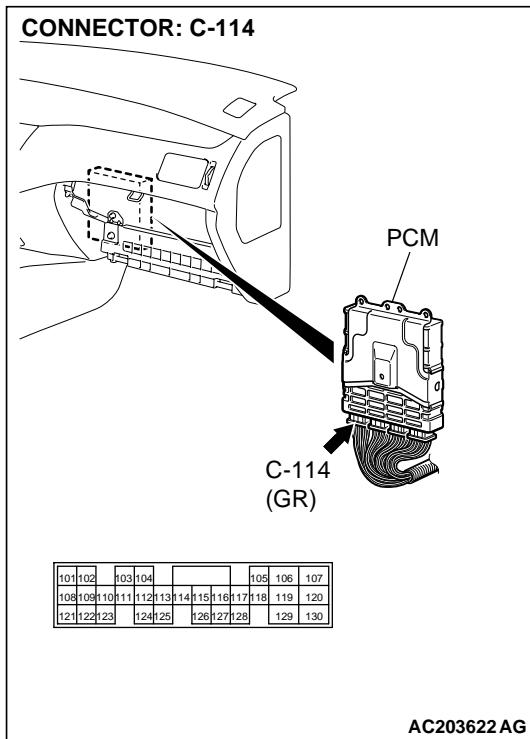
- (4) Measure the voltage between terminal 102 and ground by backprobing.

- The voltage should equal battery voltage (approximately 12 volts).

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

**Q: Does the voltage measure battery positive voltage?**

- YES :** Go to Step 11.  
**NO :** Go to Step 25.

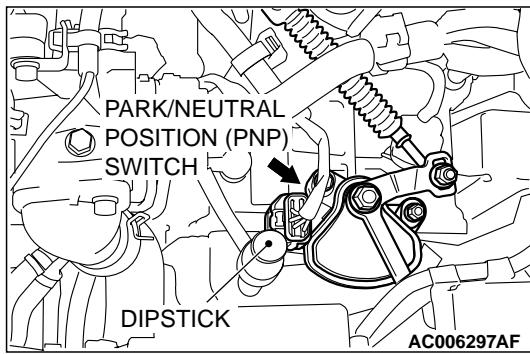


**STEP 25. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 26.

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

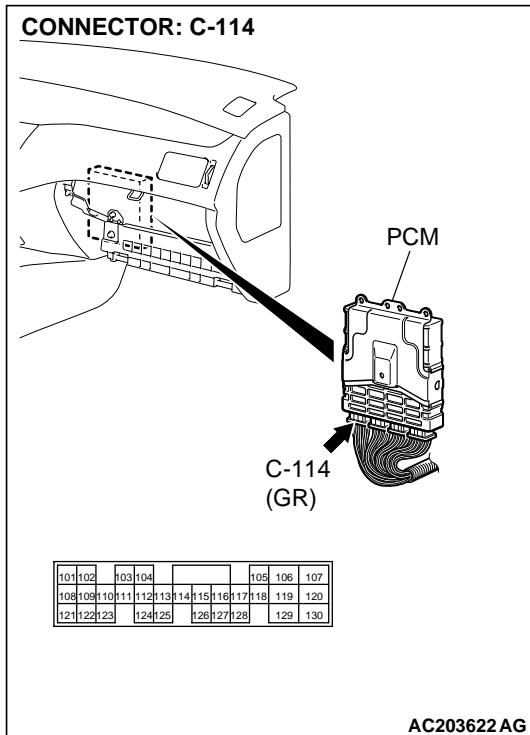


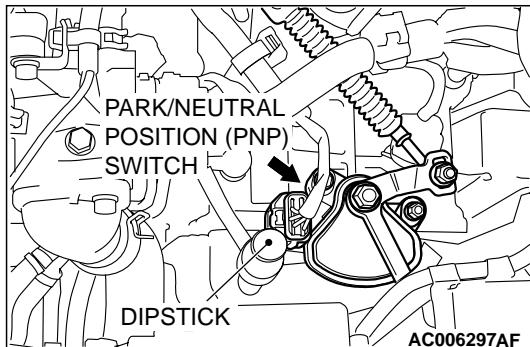
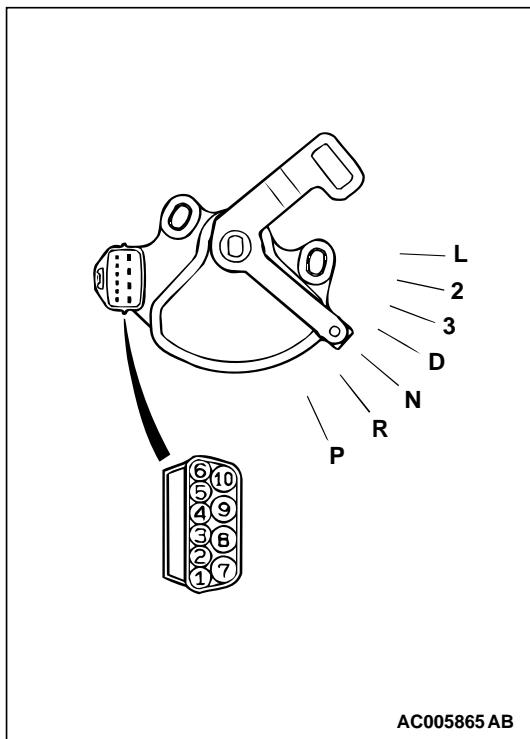
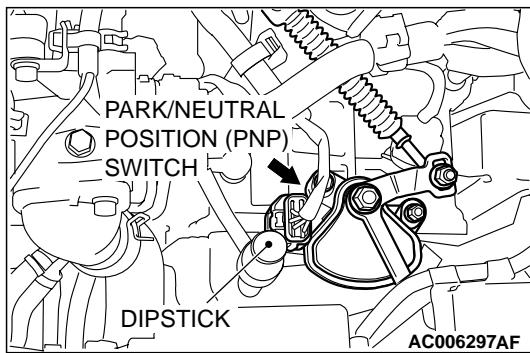
**STEP 26. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 1 and PCM connector C-114 terminal 102.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.






---

**STEP 27. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Is the measured resistance less than 2 ohms for each selector position?**

**YES :** Go to Step 28.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

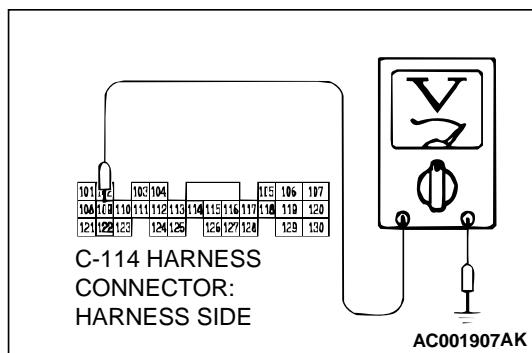
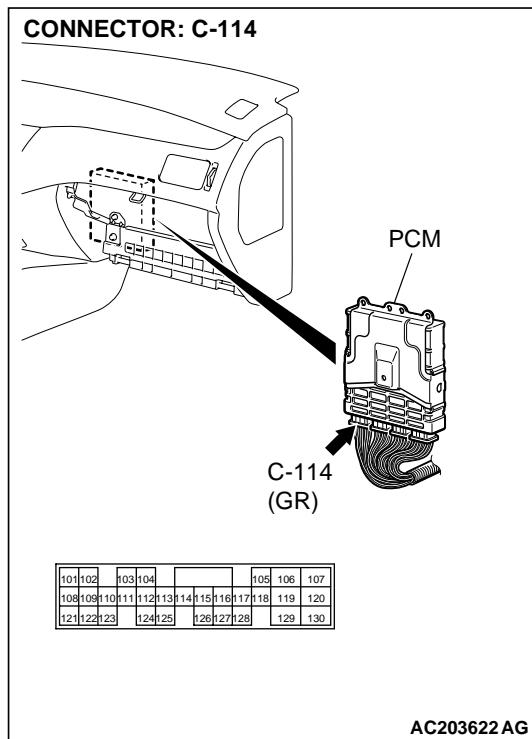
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**STEP 28. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 29.

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



**STEP 29. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "3" position.

- (4) Measure the voltage between terminal 109 and ground by backprobing.

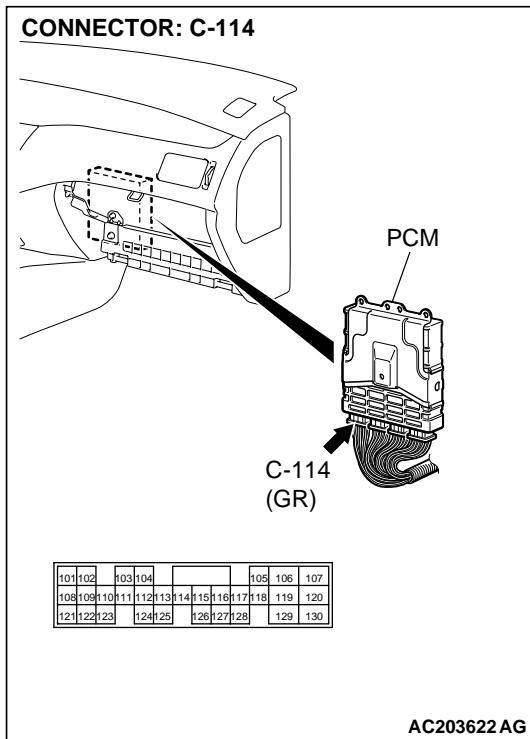
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 30.

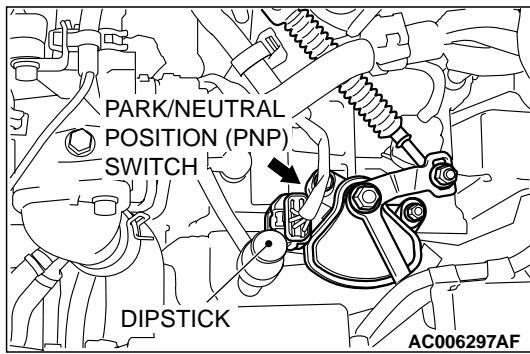


**STEP 30. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 31.

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

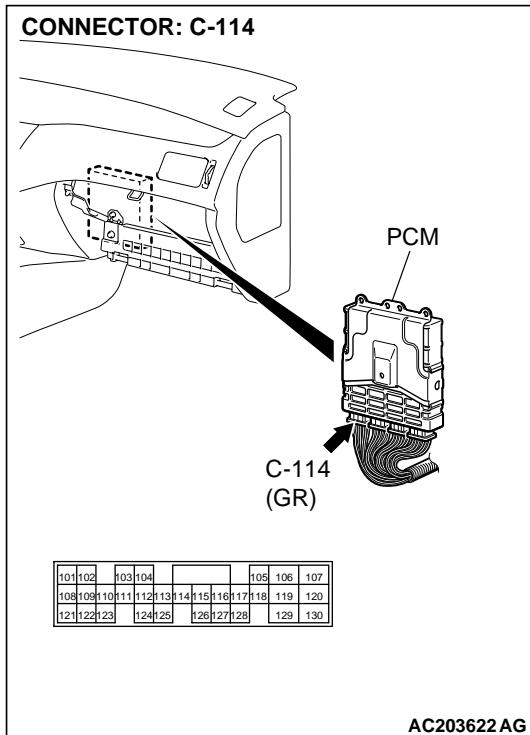


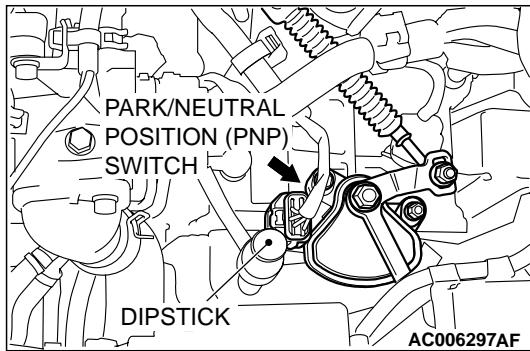
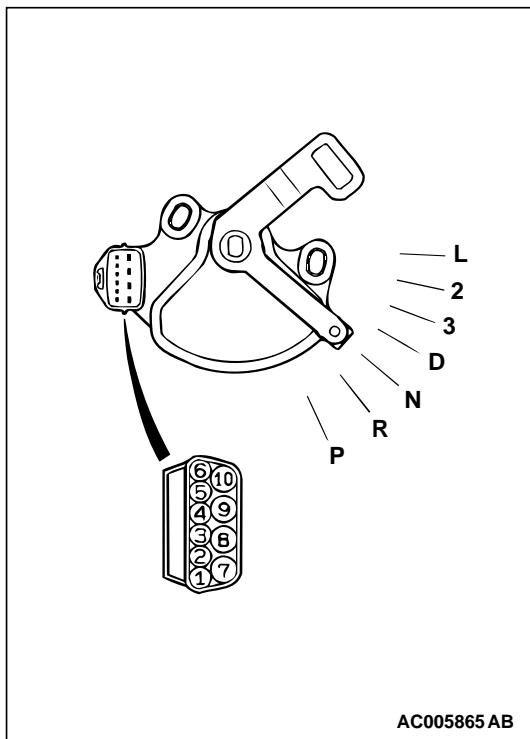
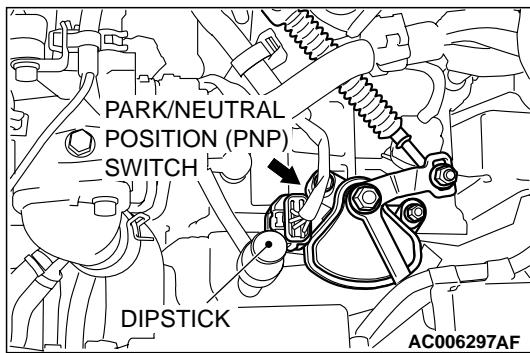
**STEP 31. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 5 and PCM connector C-114 terminal 109.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.






---

**STEP 32. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Is the measured resistance less than 2 ohms for each selector position?**

**YES :** Go to Step 33.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

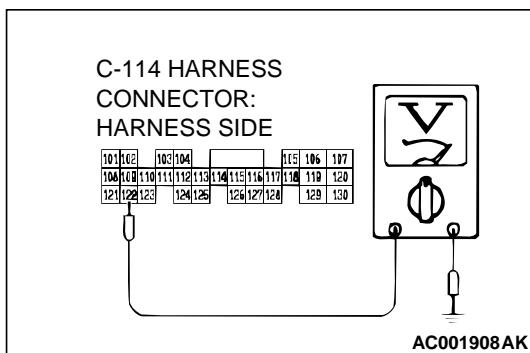
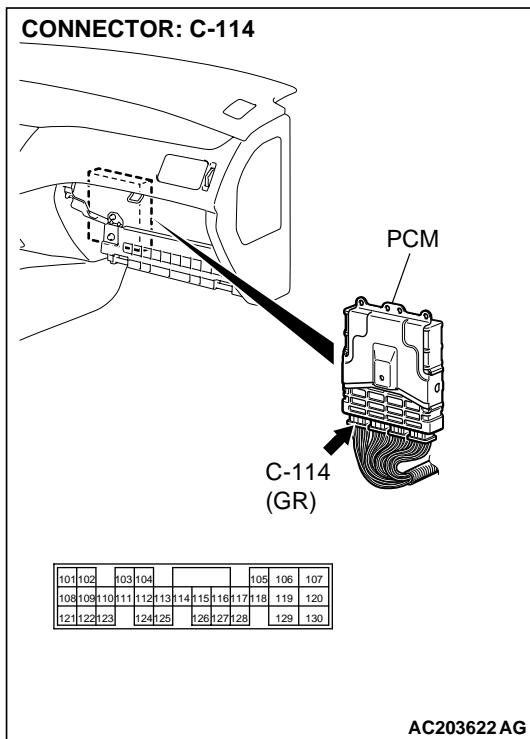
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**STEP 33. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 34.

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



**STEP 34. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "2" position.

- (4) Measure the voltage between terminal 122 and ground by backprobing.

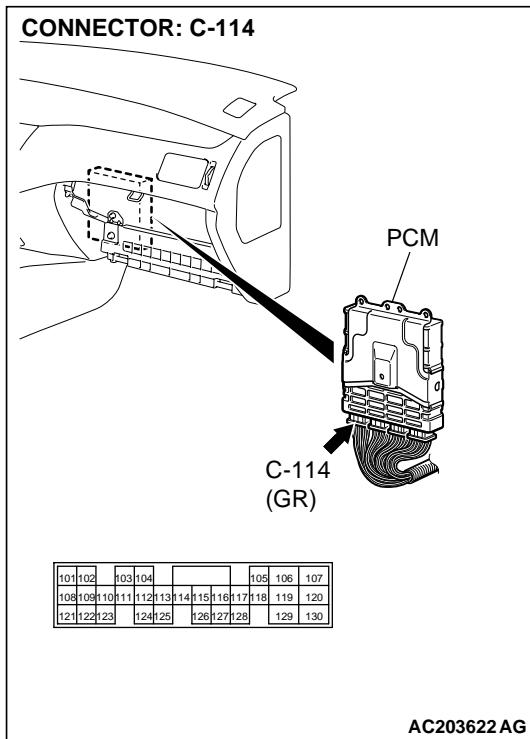
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 35.

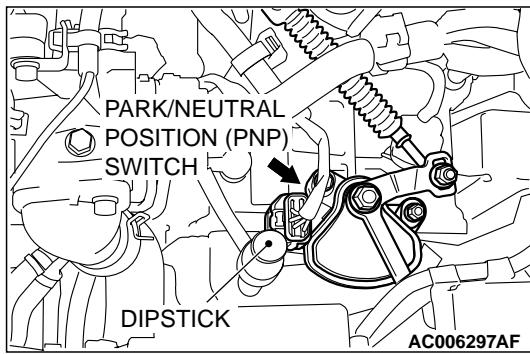


**STEP 35. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 36.

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

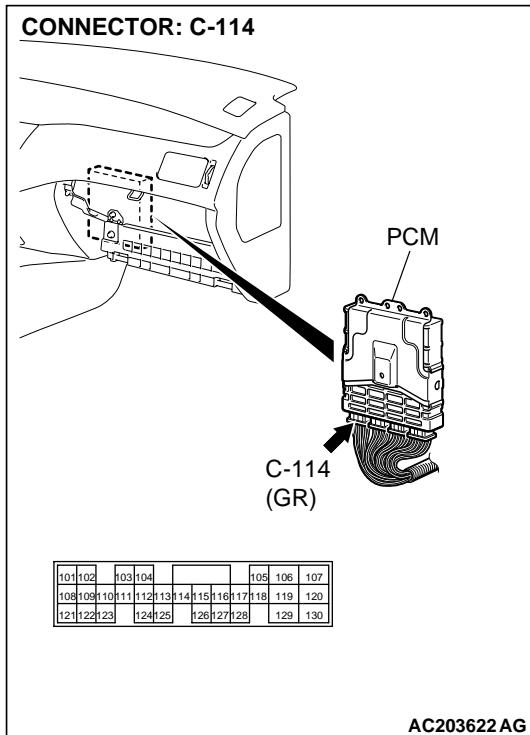


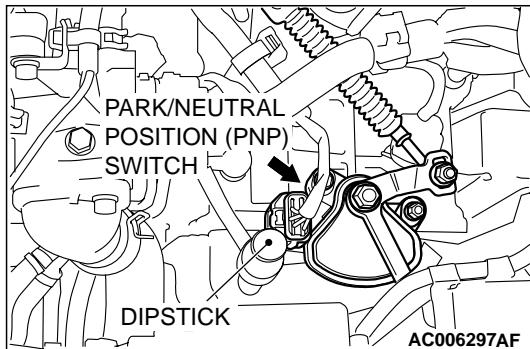
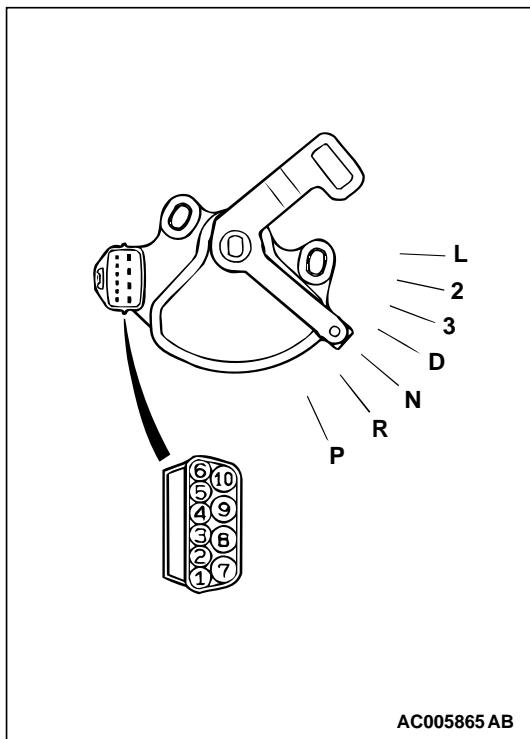
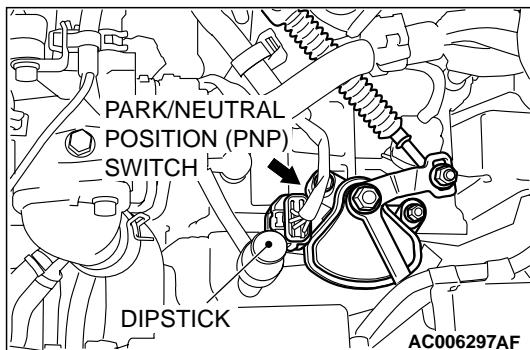
**STEP 36. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 2 and PCM connector C-114 terminal 122.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.






---

**STEP 37. Check the Park/Neutral position switch.**

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	

**Q: Is the measured resistance less than 2 ohms for each selector position?**

**YES :** Go to Step 38.

**NO :** Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

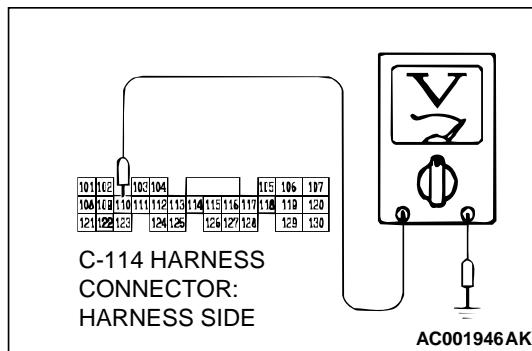
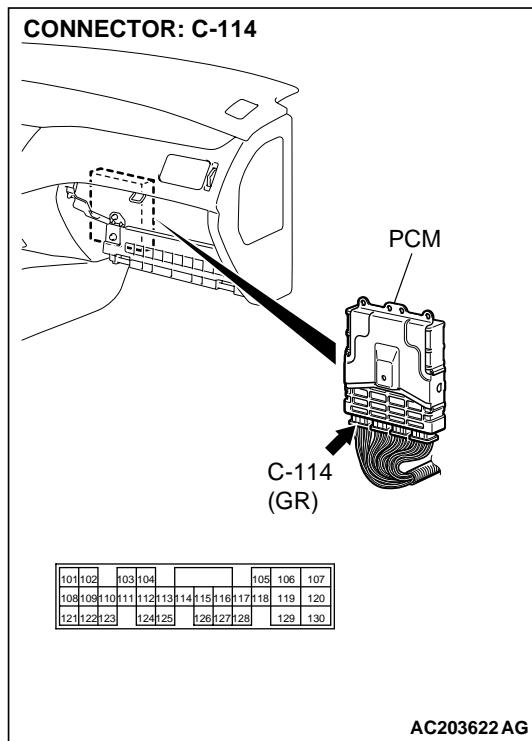
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**STEP 38. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 39.

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



**STEP 39. Measure the Park/Neutral position switch output voltage at PCM connector C-114 by backprobing.**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.
- (3) Move the selector lever to the "L" position.

- (4) Measure the voltage between terminal 110 and ground by backprobing.

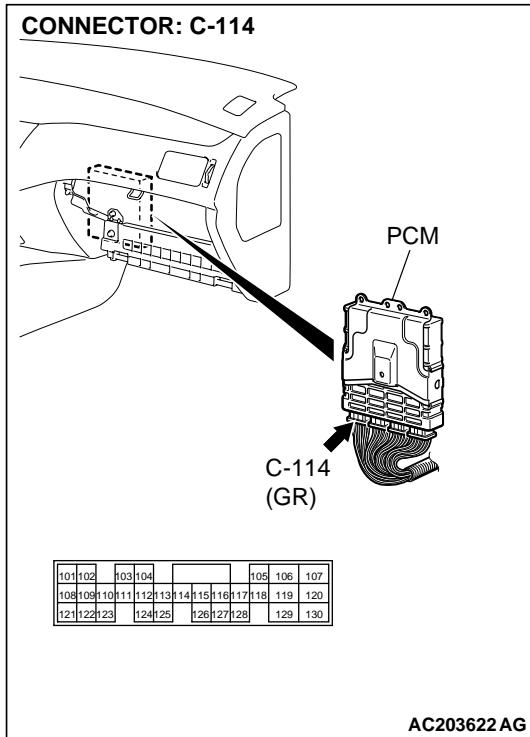
- The voltage should measure battery positive voltage.

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

**Q: Does the voltage measure battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 40.

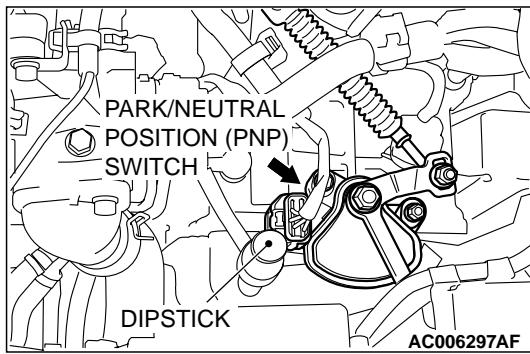


**STEP 40. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 41.

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

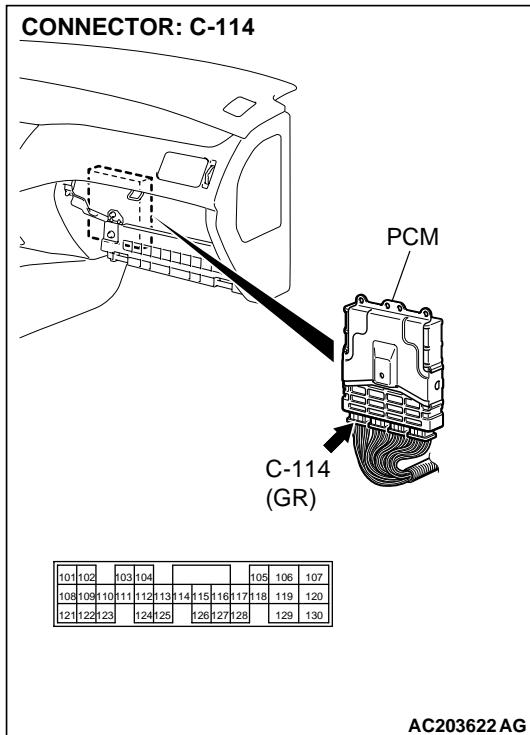


**STEP 41. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 6 and PCM connector C-114 terminal 110.**

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

**YES :** Go to Step 5.

**NO :** Repair or replace the harness wire.



### DTC 28: Park/Neutral Position Switch System (Short Circuit)

**Park/Neutral Position Switch System Circuit**  
Refer to P.23Ac-147.

**CIRCUIT OPERATION**  
Refer to P.23Ac-147.

#### DTC SET CONDITIONS

If the PCM detects more than one park/neutral position switch input signal for thirty seconds, it is determined that there is a short circuit in the Park/Neutral position switch and DTC 28 is set.

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

- Malfunction of the Park/Neutral position switch
- Malfunction of the ignition switch
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

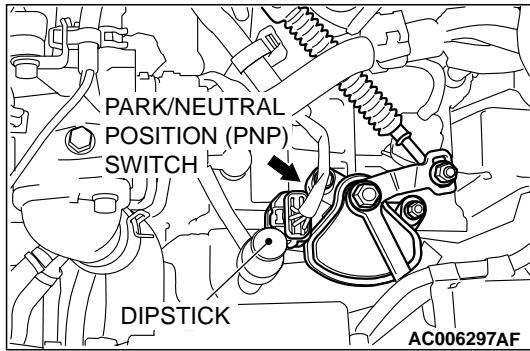
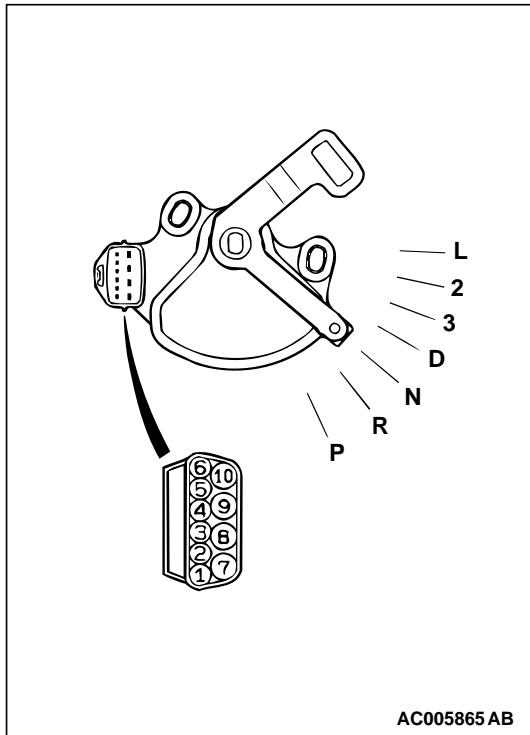
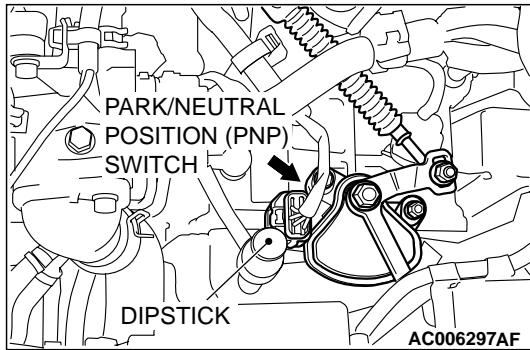
### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

### STEP 1. Check the Park/Neutral position switch.

Measure the resistance between the terminals for each selector position as indicated in the table above.

SELECTOR POSITION	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
R	7 – 8	
N	4 – 8, 9 – 10	
D	1 – 8	
3	5 – 8	
2	2 – 8	
L	6 – 8	



Q: Is the measured resistance less than 2 ohms for each selector position?

YES : Go to Step 2.

NO : Replace the Park/Neutral position switch. Refer to GROUP 23B, Transaxle [P.23B-8](#).

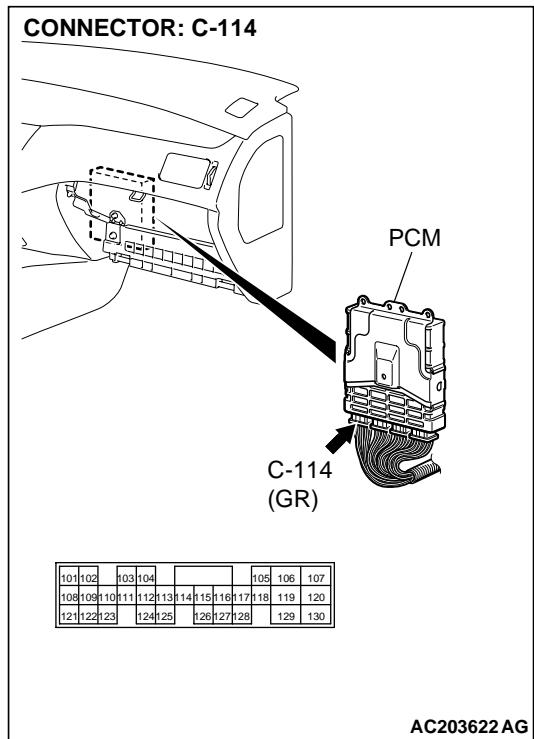
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**STEP 2. Check Park/Neutral position switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

Q: Are the connector and terminals in good condition?

YES : Go to Step 3.

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

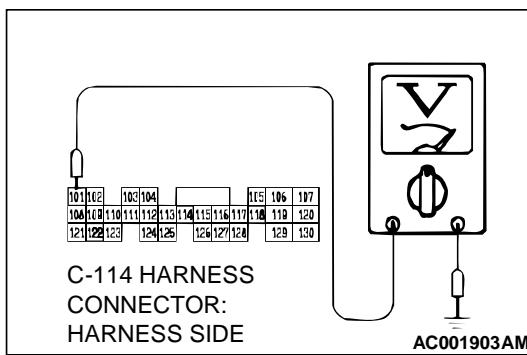
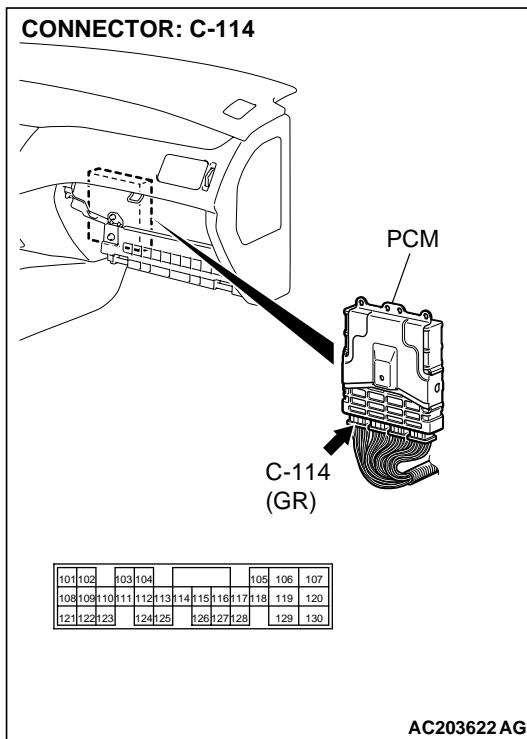


**STEP 3. Check PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 4.

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




---

**STEP 4. Measure the switch output voltage at PCM connector C-114 by backprobing. ("P" position)**

- (1) Do not disconnect connector C-114.
- (2) Turn the ignition switch to the "ON" position.

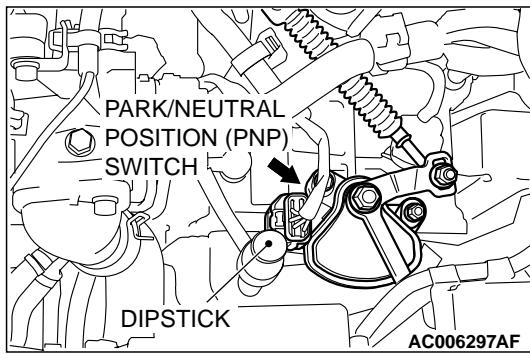
- (3) Measure the voltage between terminal 101 and ground by backprobing.

- When selector lever position is "P," voltage should measure battery positive voltage.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 6.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 5.

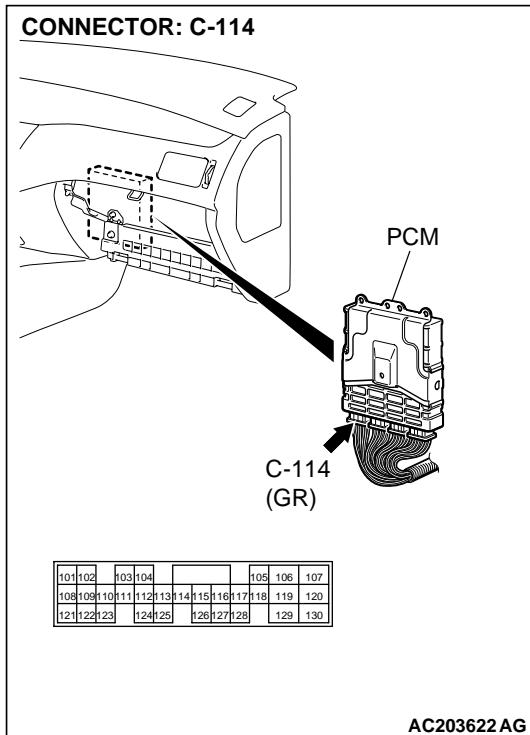


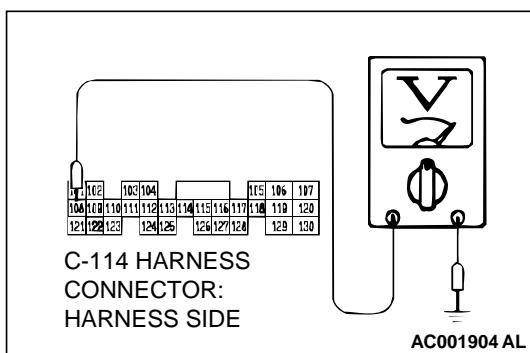
**STEP 5. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 3 and PCM connector C-114 terminal 101.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





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**STEP 6. Measure the switch output voltage at PCM connector C-114 by backprobing. ("R" position)**

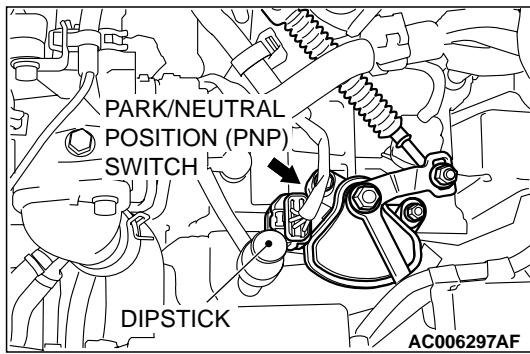
Measure the voltage between terminal 108 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," When selector lever position is "P," voltage should measure battery positive voltage.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 8.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 7.

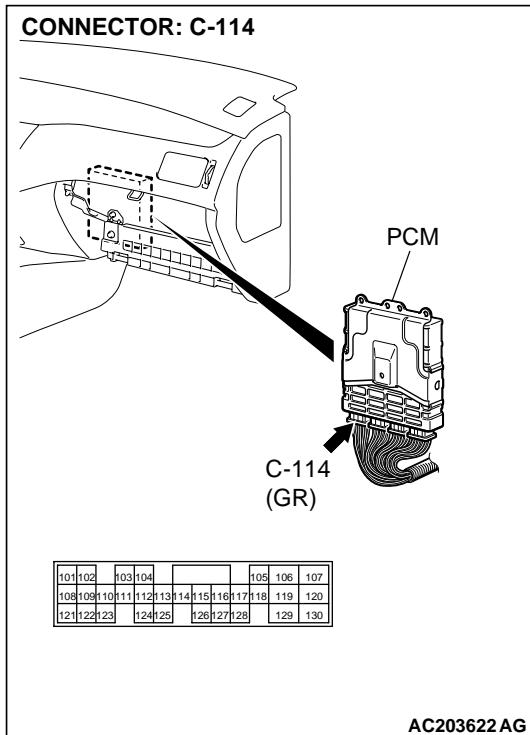


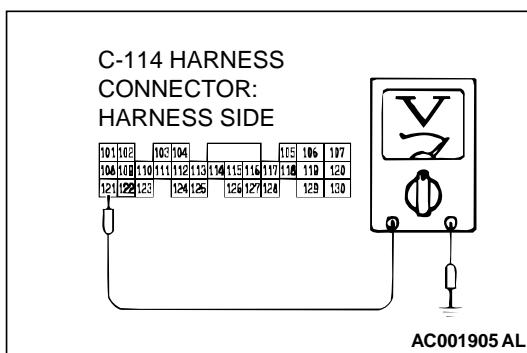
**STEP 7. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 7 and PCM connector C-114 terminal 108.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





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**STEP 8. Measure the switch output voltage at PCM connector C-114 by backprobing. ("N" position)**

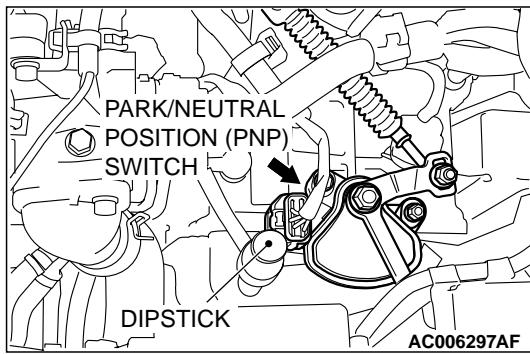
Measure the voltage between terminal 121 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure battery positive voltage.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 10.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 9.

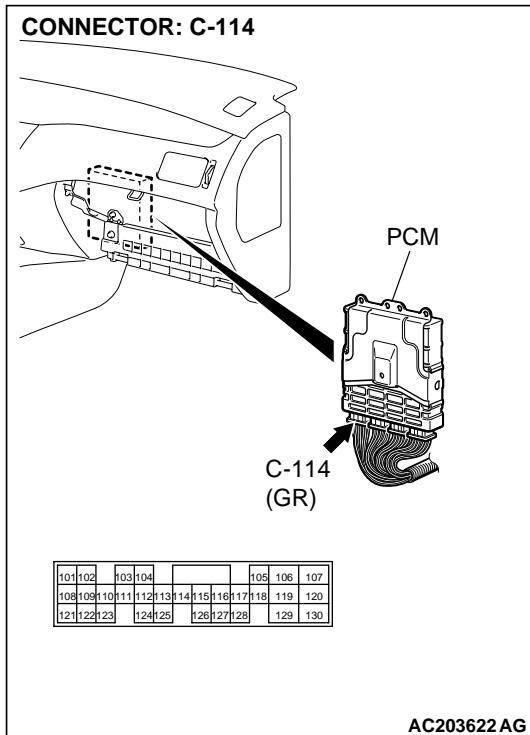


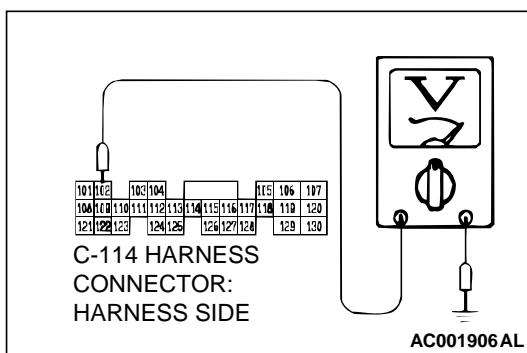
**STEP 9. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 4 and PCM connector C-114 terminal 121.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





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**STEP 10. Measure the switch output voltage at PCM connector C-114 by backprobing. ("D" position)**

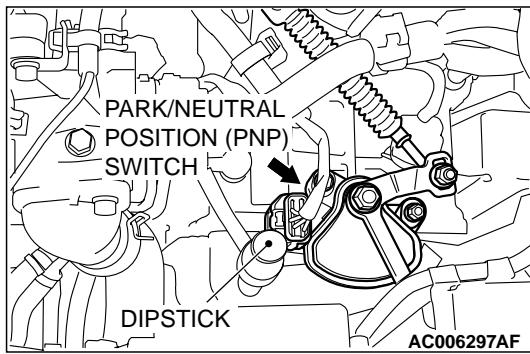
Measure the voltage between terminal 102 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure battery positive voltage.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 12.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 11.

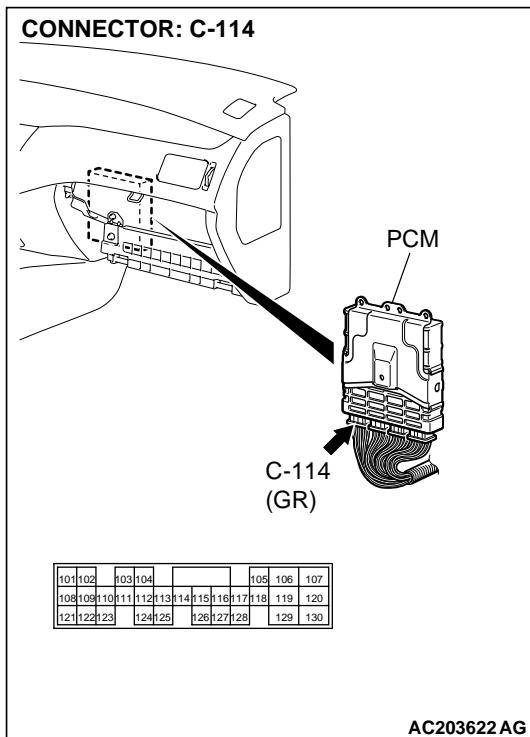


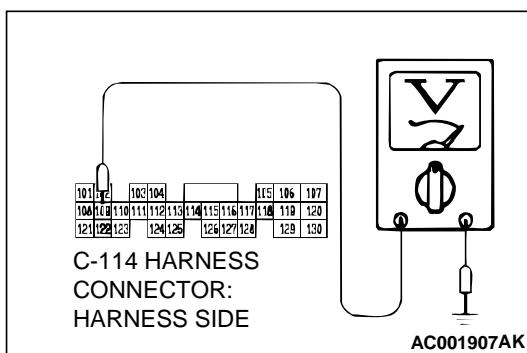
**STEP 11. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 1 and PCM connector C-114 terminal 102.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





---

**STEP 12. Measure the switch output voltage at PCM connector C-114 by backprobing. ("3" position)**

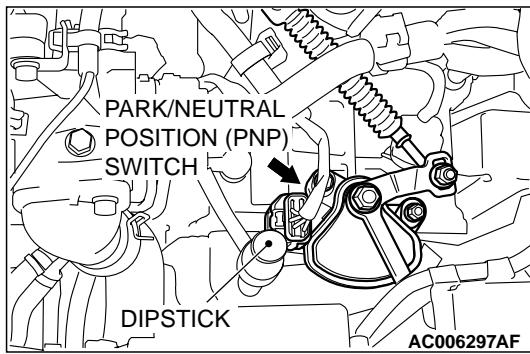
Measure the voltage between terminal 109 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure battery positive voltage.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 14.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 13.

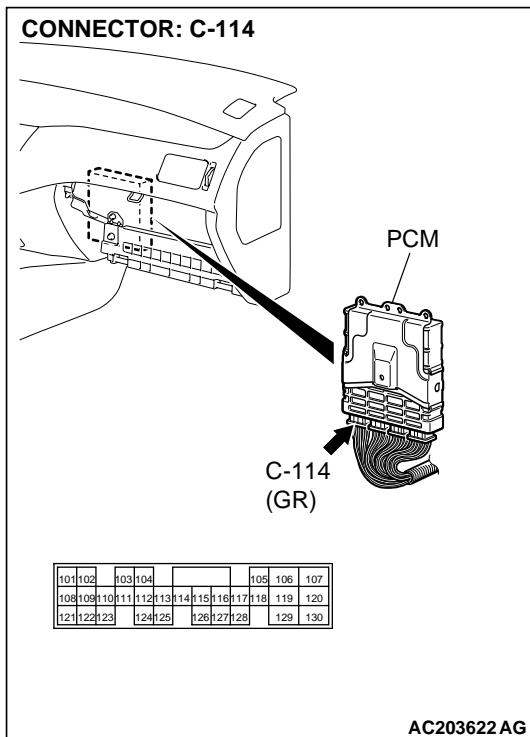


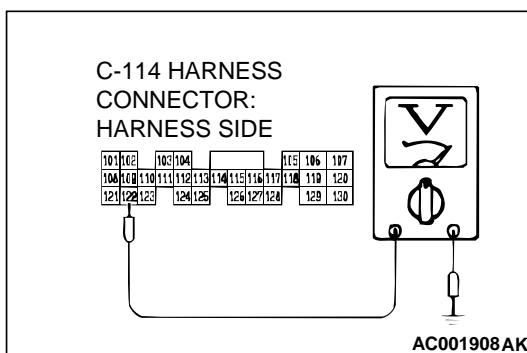
**STEP 13. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 5 and PCM connector C-114 terminal 109.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





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**STEP 14. Measure the switch output voltage at PCM connector C-114 by backprobing. ("2" position)**

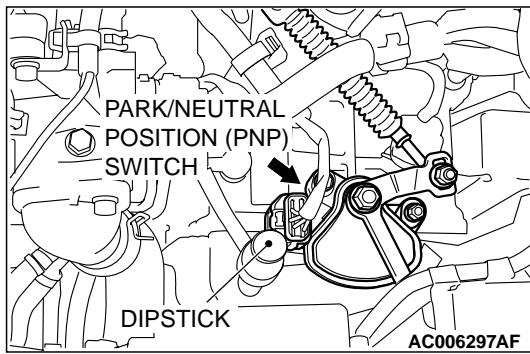
Measure the voltage between terminal 122 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure battery positive voltage.
- When selector lever position is "L," voltage should measure 0.5 volt or less.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 16.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 15.

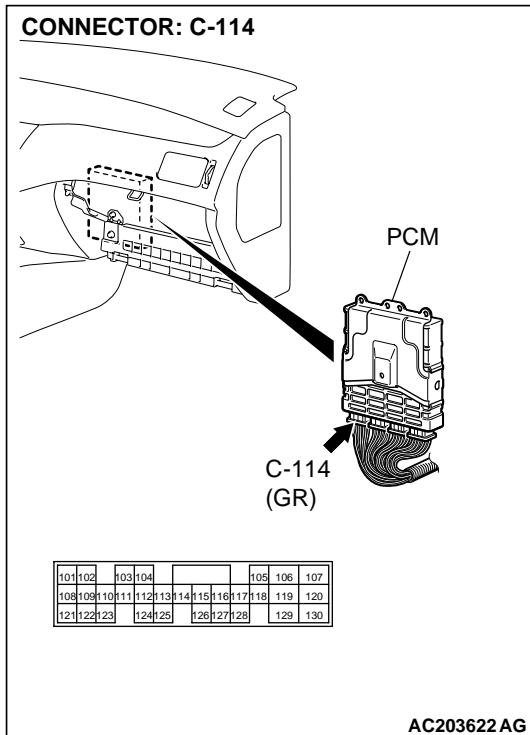


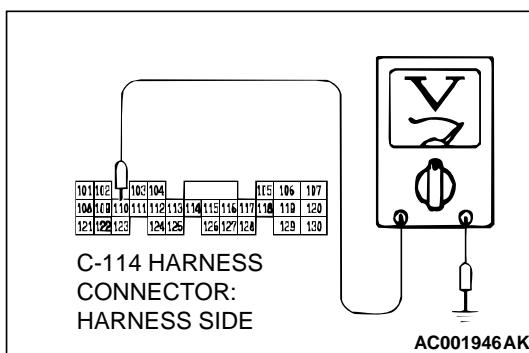
**STEP 15. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 2 and PCM connector C-114 terminal 122.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





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**STEP 16. Measure the switch output voltage at PCM connector C-114 by backprobing. ("L" position)**

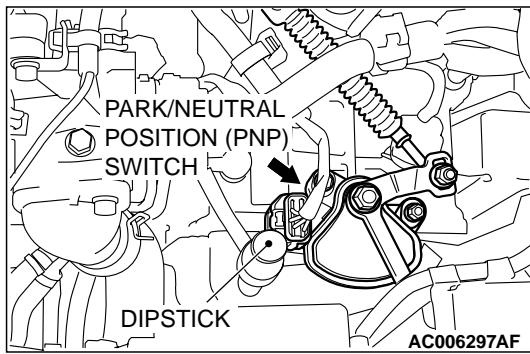
Measure the voltage between terminal 110 and ground by backprobing.

- When selector lever position is "P," voltage should measure 0.5 volt or less.
- When selector lever position is "R," voltage should measure 0.5 volt or less.
- When selector lever position is "N," voltage should measure 0.5 volt or less.
- When selector lever position is "D," voltage should measure 0.5 volt or less.
- When selector lever position is "3," voltage should measure 0.5 volt or less.
- When selector lever position is "2," voltage should measure 0.5 volt or less.
- When selector lever position is "L," voltage should measure battery positive voltage.

**Q: Is the measured voltage within the specified range?**

**YES :** Go to Step 18.

**NO :** Turn the ignition switch to the "LOCK" (OFF) position.  
Go to Step 17.

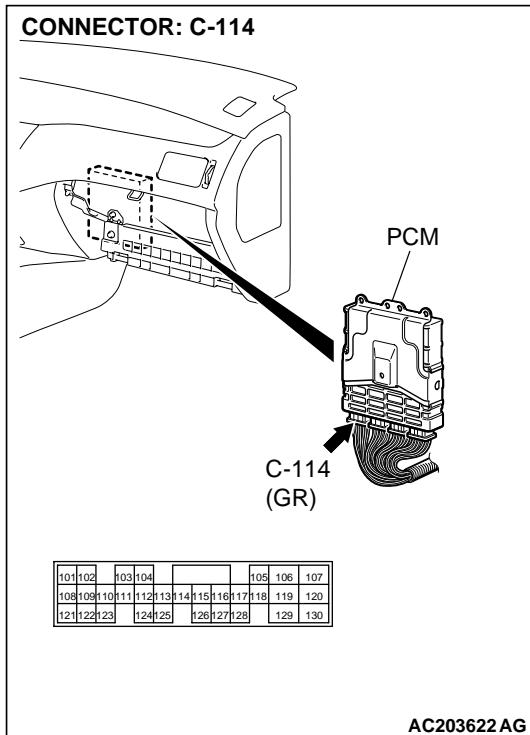


**STEP 17. Check harness for open circuit or short circuit to ground between Park/Neutral position switch connector B-16 terminal 6 and PCM connector C-114 terminal 110.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.



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**STEP 18. Using scan tool MB991502, check data list item 61: Park/Neutral Position Switch.**

**⚠ CAUTION**

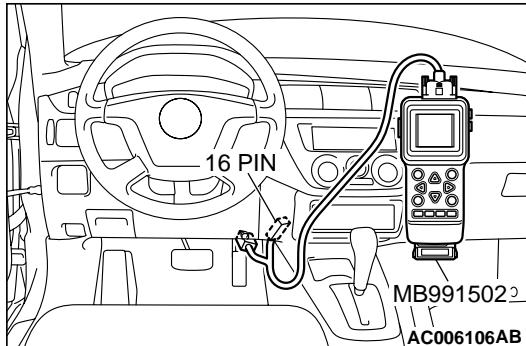
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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 data reading mode for item 61: Park/Neutral Position Switch.
  - Move the selector lever to "P," "R," "N," "D," "3," "2," "L" positions and confirm that the selected selector lever positions match the positions shown on scan tool MB991502.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

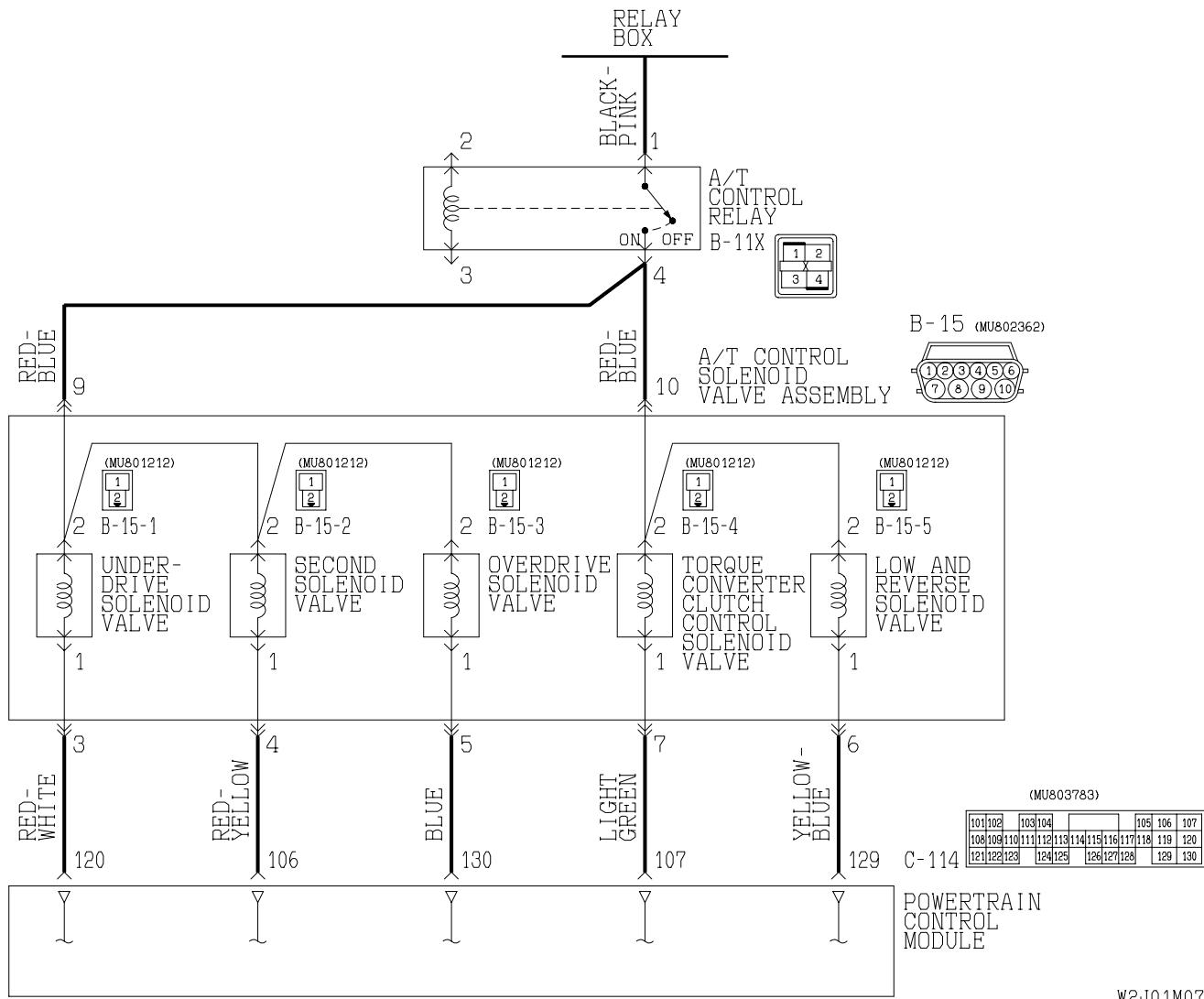
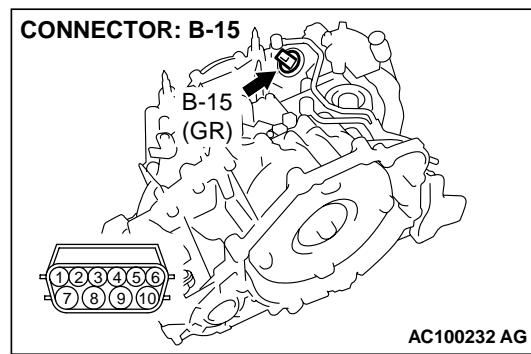
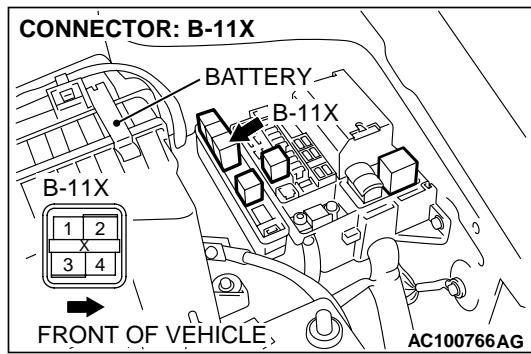
**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-6](#).

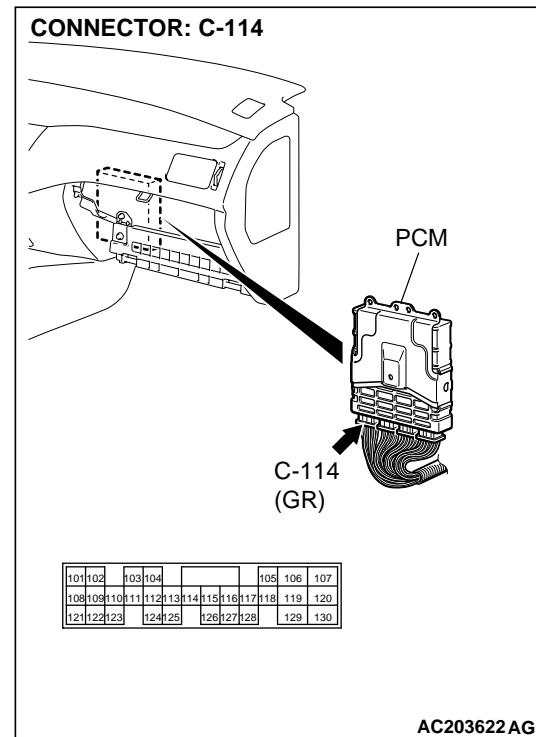
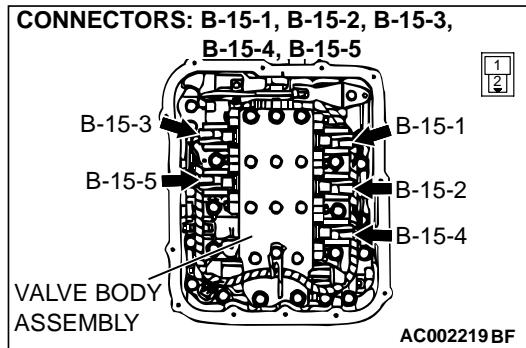
**NO :** Replace the PCM.



## DTC 31: Low-Reverse Solenoid Valve System

Solenoid Valve System Circuit

W2J01M07AA  
AC100492AC



### CIRCUIT OPERATION

- The A/T control relay supplies battery positive voltage to the solenoid valve assembly (terminals 9 and 10).
- The solenoid valve closes when energized (on), and opens when not energized (off). The PCM energizes the solenoid valve based on input data from sensors such as the Throttle Position Sensor, Park/Neutral Position Switch, Stoplight Switch, Input Shaft Speed Sensor, Output Shaft Speed Sensor, and A/T Fluid Temperature Sensor.
- The PCM provides the ground to energize the solenoid. The amount of time that the circuit is grounded is displayed on scan tool MB991502 in percent.

- When the solenoid is energized or de-energized, fluid passes through the valve body and transaxle passages to apply and release components.

### DTC SET CONDITIONS

If the resistance value for the low-reverse solenoid valve circuit is greater than  $3.5 \Omega$ (open) or less than  $2.6 \Omega$ (short) for 4 seconds, DTC 31 is set. The transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the low-reverse solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

### DIAGNOSIS

#### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, check actuator test item 01: Low-Reverse Solenoid Valve.**

**⚠ 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 actuator test mode for item 01, Low-Reverse Solenoid Valve.

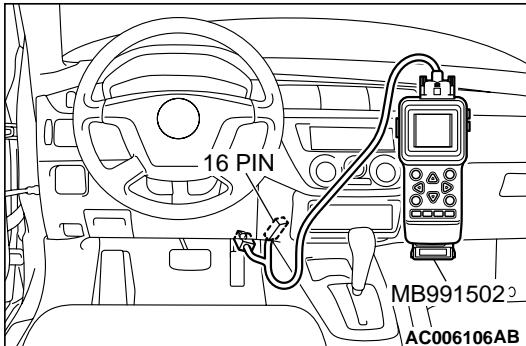
- An audible clicking or buzzing should be heard when the low-reverse solenoid valve is energized.

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

**Q: Is the solenoid valve operating properly?**

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

**NO :** Go to Step 2.




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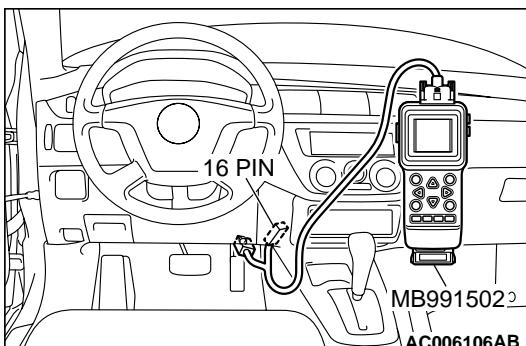
**STEP 2. Using scan tool MB991502, read the A/T diagnostic trouble code.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs.)**

**YES :** Refer to [P.23Ac-268](#) DTC 54: A/T Control Relay System.

**NO :** Go to Step 3.




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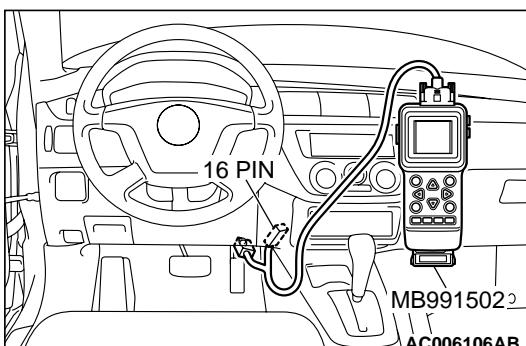
**STEP 3. Using scan tool MB991502, read the A/T diagnostic trouble code.**

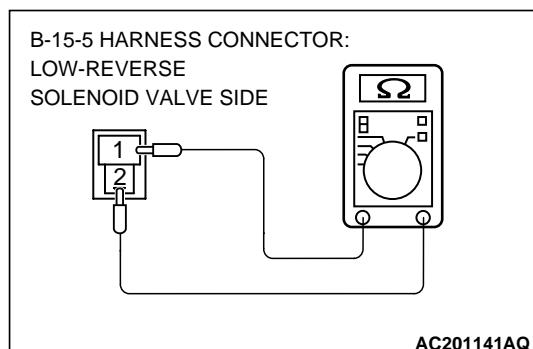
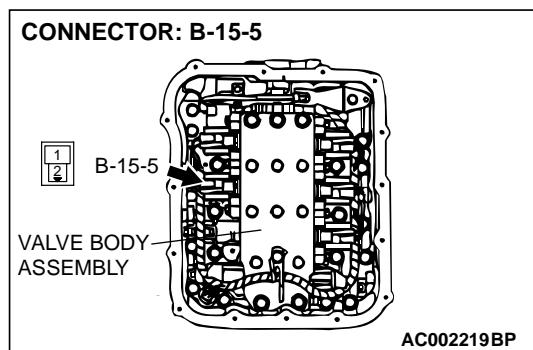
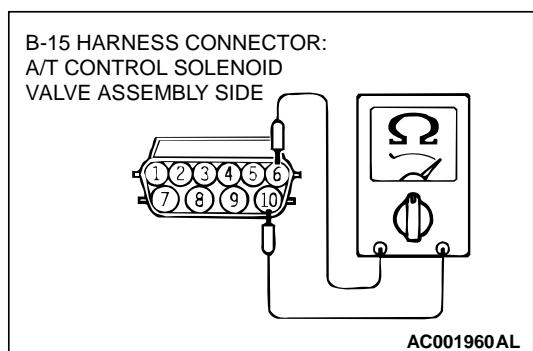
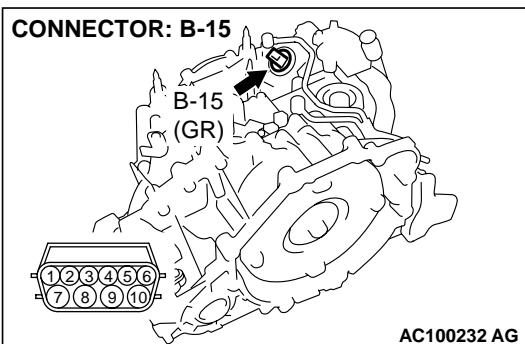
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 36 set?**

**YES :** Go to Step 8.

**NO :** Go to Step 4.





**STEP 4. Measure the low-reverse solenoid valve resistance at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect connector B-15 and measure at the solenoid valve side.

- (2) Measure the resistance between solenoid valve assembly connector B-15 terminals 6 and 10.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.

**STEP 5. Measure the solenoid valve resistance at the low-reverse solenoid valve assembly inside the transaxle.**

- (1) Disconnect connector B-15-5 and measure at the solenoid valve side.

- (2) Measure the resistance between low-reverse solenoid valve terminals 1 and 2.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Replace the harness wire between A/T control solenoid valve assembly connector B-15 and the solenoid valves.

**NO :** Replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-61.

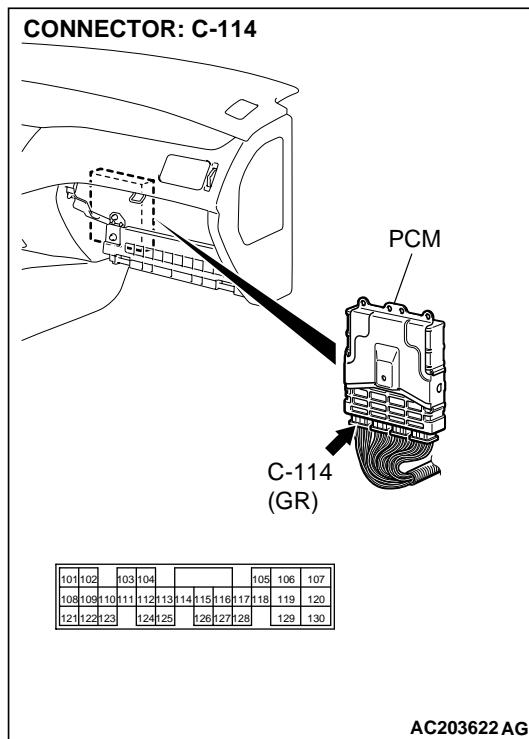
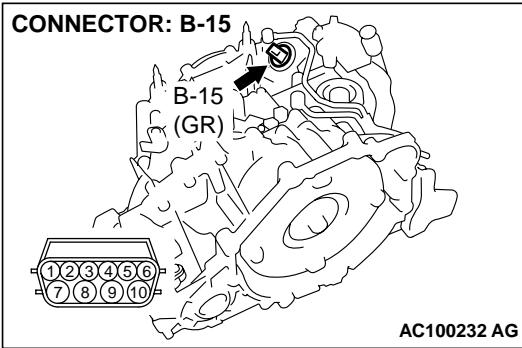
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**STEP 6. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

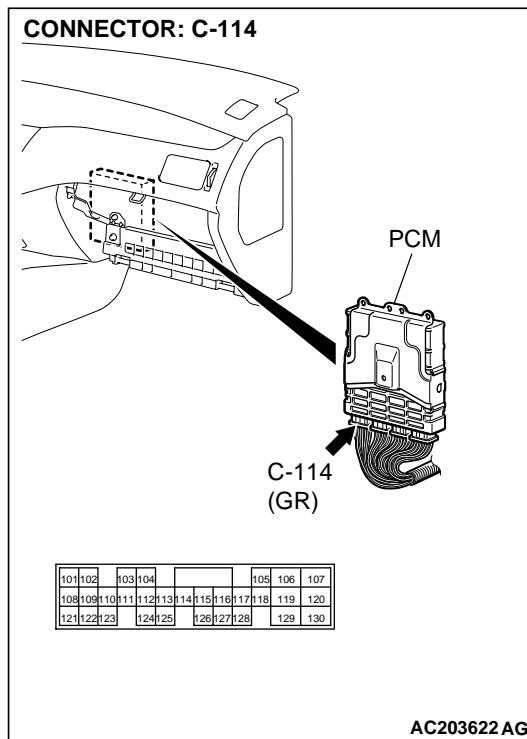
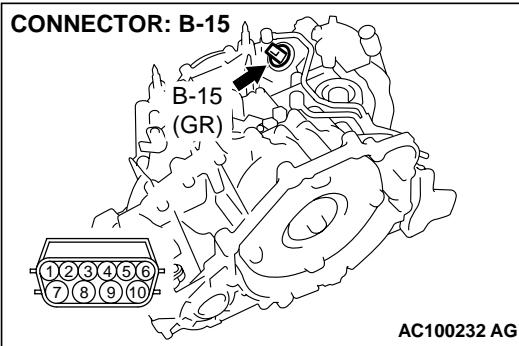


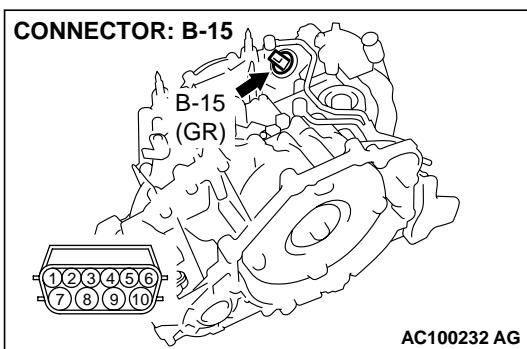
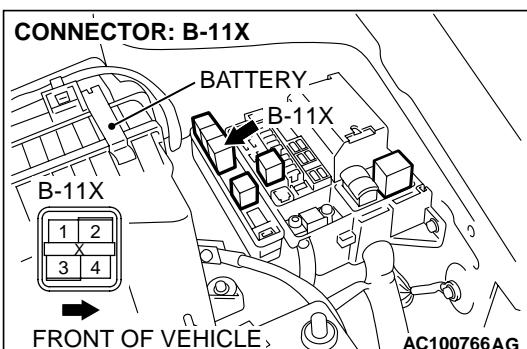
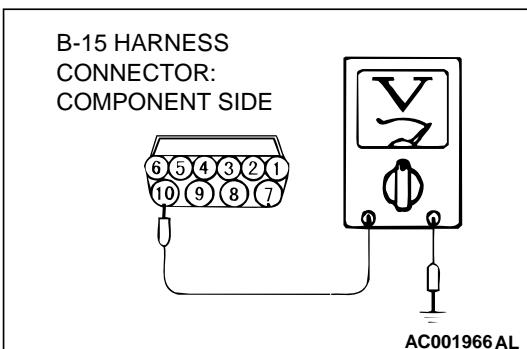
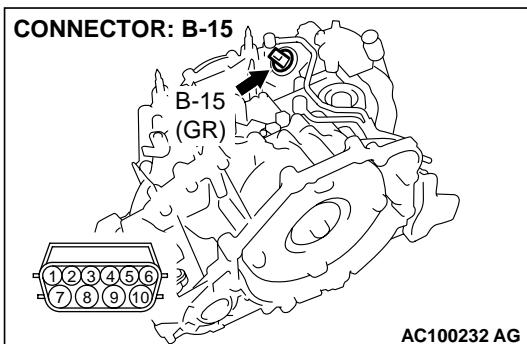
**STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 terminal 6 and PCM connector C-114 terminal 129.**

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

**YES :** Replace the PCM.

**NO :** Repair or replace the harness wire.






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**STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect solenoid valve assembly harness connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between harness connector B-15 terminal 10 and ground.

- The voltage should equal battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

---

**STEP 9. Check A/T control relay connector B-11X in the engine component relay box and A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

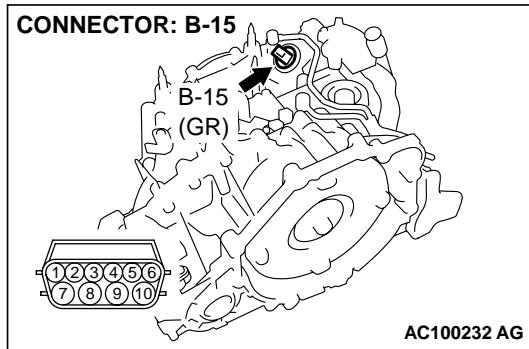
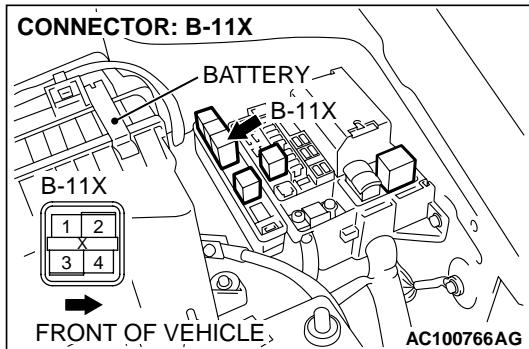
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

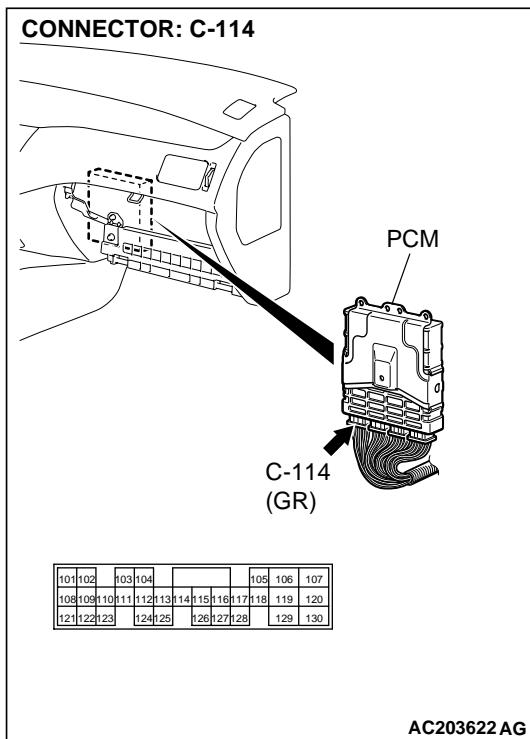
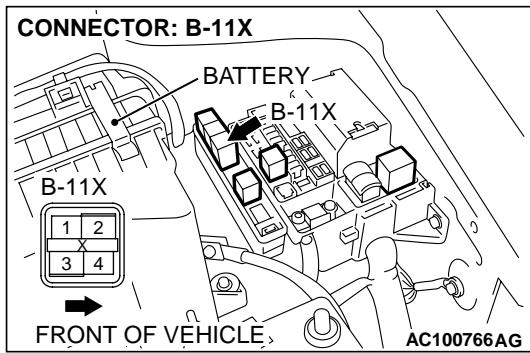
**STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-11X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-15 terminal 10.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.





**STEP 11.** Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Are the connectors and terminals in good condition?

**YES :** Go to Step 12.

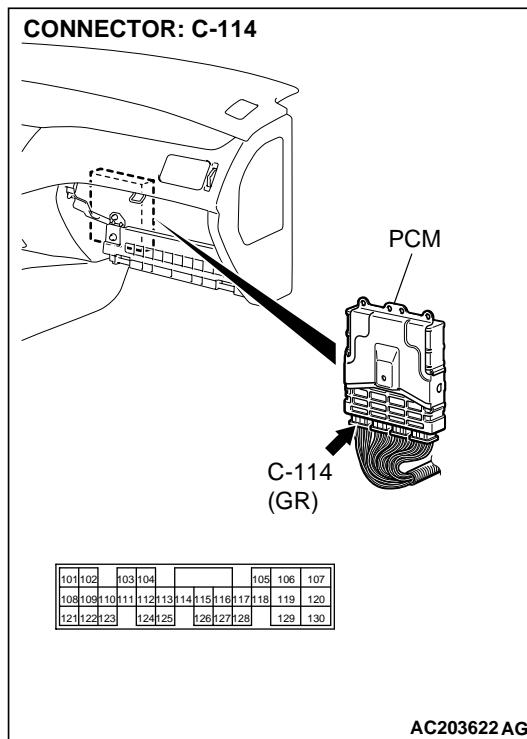
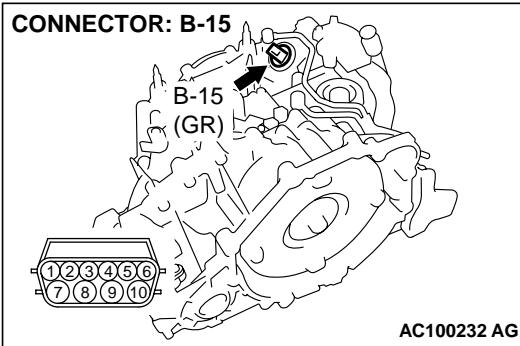
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

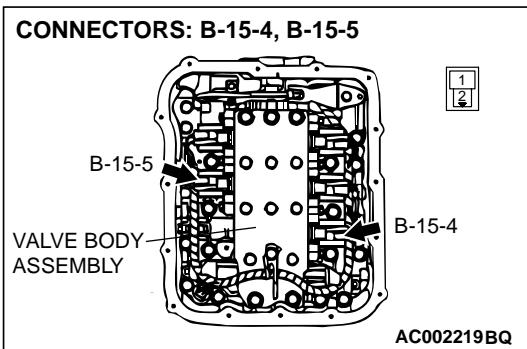
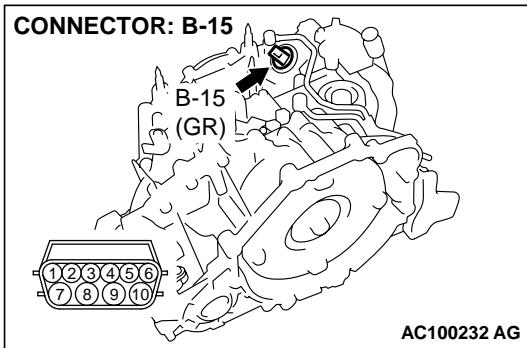
**STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 6 and 7) and PCM connector C-114 (terminals 107 and 129).**

**Q: Are the harness wires in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the harness wire.





**STEP 13.** Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 6, 7, and 10) and solenoid valve connectors B-15-4 and B-15-5.

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

**YES :** Replace the PCM.

**NO :** Replace the harness wire.

## DTC 32: Underdrive Solenoid Valve System

### Solenoid Valve System Circuit

Refer to P.23Ac-200.

### CIRCUIT OPERATION

Refer to P.23Ac-200.

### DTC SET CONDITIONS

If the resistance value for the underdrive solenoid valve circuit is greater than  $3.5\ \Omega$  (open) or less than  $2.6\ \Omega$  (short) for 4 seconds, DTC 32 is set. The transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the underdrive solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, check actuator test item 02: Underdrive Solenoid Valve.**

**⚠ CAUTION**

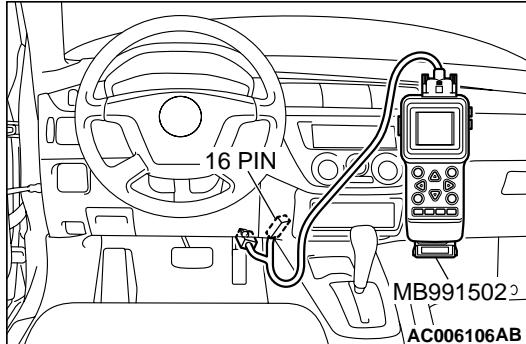
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (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 actuator test mode for item 02, Underdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the underdrive solenoid valve is energized.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the solenoid valve operating properly?**

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

**NO :** Go to Step 2.




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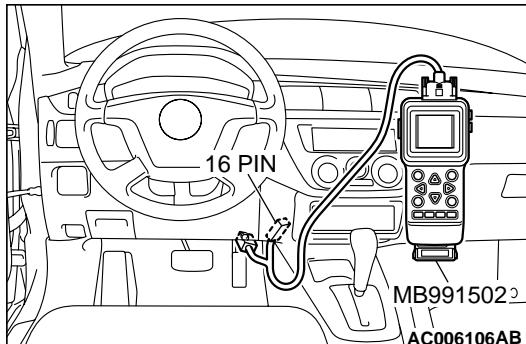
**STEP 2. Using scan tool MB991502, read the A/T diagnostic trouble code.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs.)**

**YES :** Refer to [P.23Ac-268](#) DTC 54: A/T Control Relay System.

**NO :** Go to Step 3.




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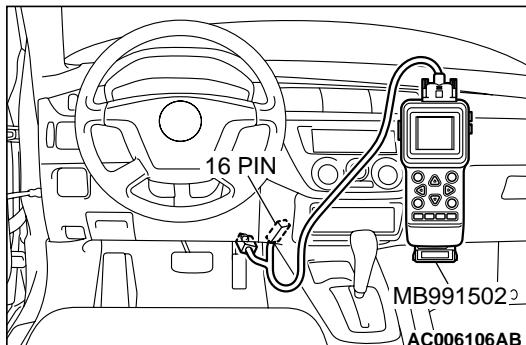
**STEP 3. Using scan tool MB991502, read the A/T diagnostic trouble code.**

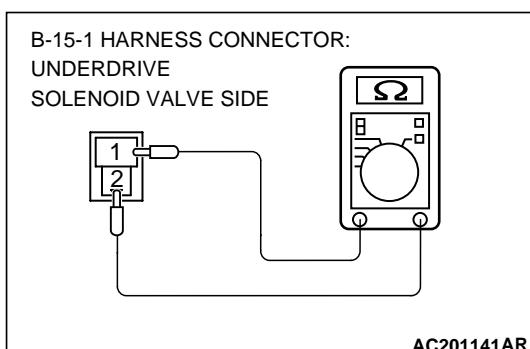
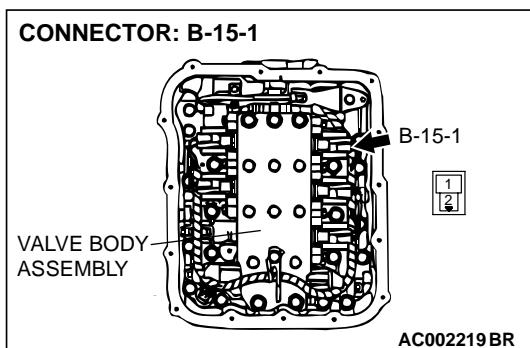
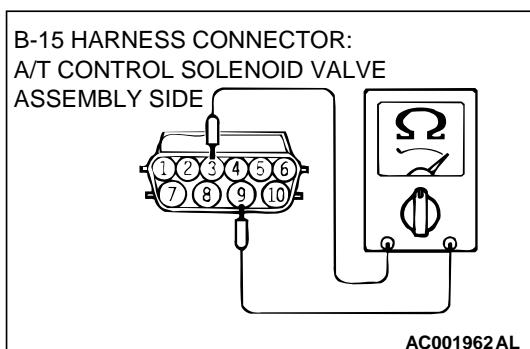
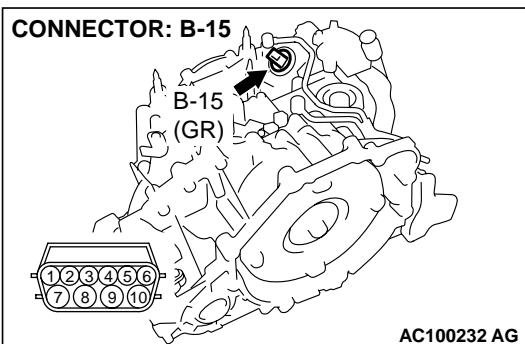
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Are DTC 33 and DTC 34 set? (Multiple DTCs may be set.)**

**YES :** Go to Step 8.

**NO :** Go to Step 4.





**STEP 4. Measure the underdrive solenoid valve resistance at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect connector B-15 and measure at the solenoid valve side.

- (2) Measure the resistance between solenoid valve assembly connector B-15 terminals 3 and 9.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.

**STEP 5. Measure the solenoid valve resistance at the underdrive solenoid valve assembly inside the transaxle.**

- (1) Disconnect connector B-15-1 and measure at the solenoid valve side.

- (2) Measure the resistance between Underdrive solenoid valve terminals 1 and 2.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Replace the harness wire between A/T control solenoid valve assembly connector B-15 and the solenoid valves.

**NO :** Replace the Underdrive solenoid valve. Refer to GROUP 23B, Valve Body [P.23B-61](#).

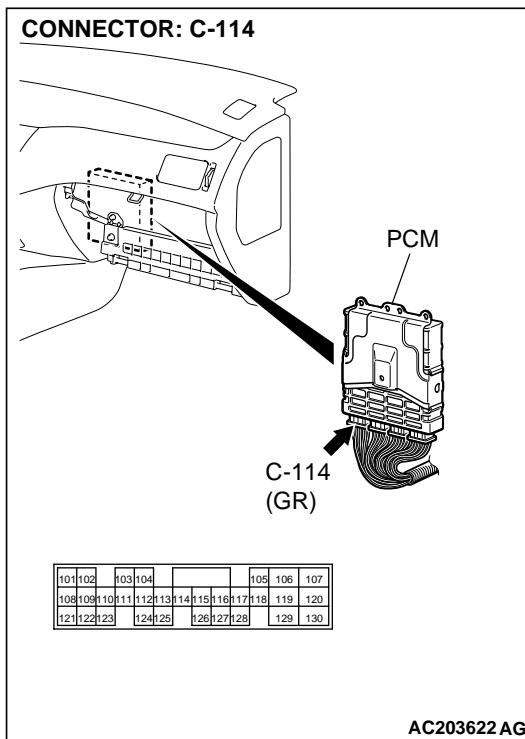
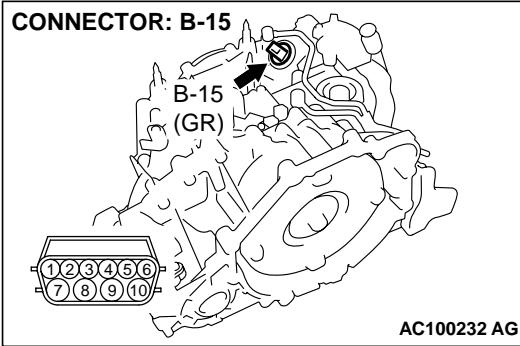
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**STEP 6. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

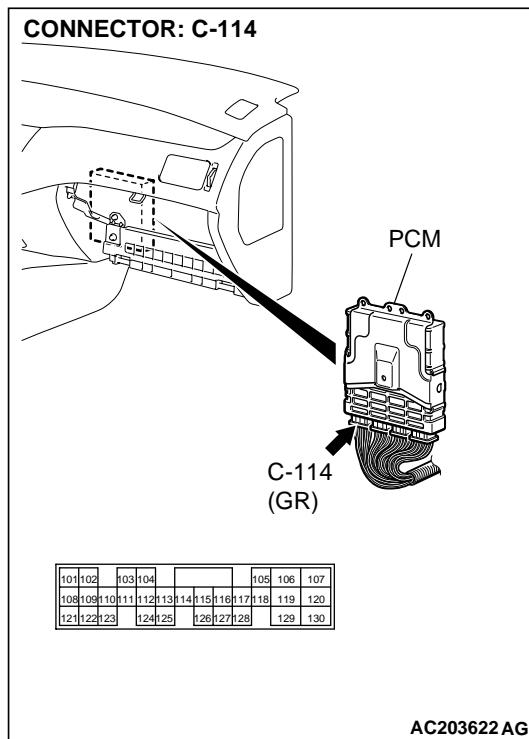
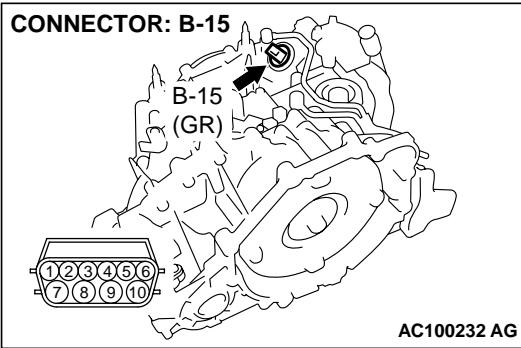


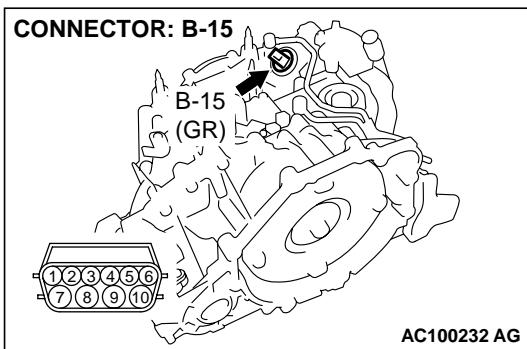
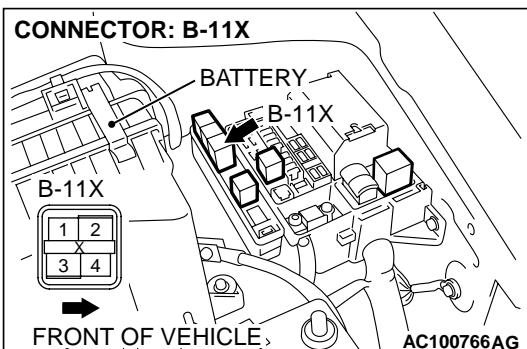
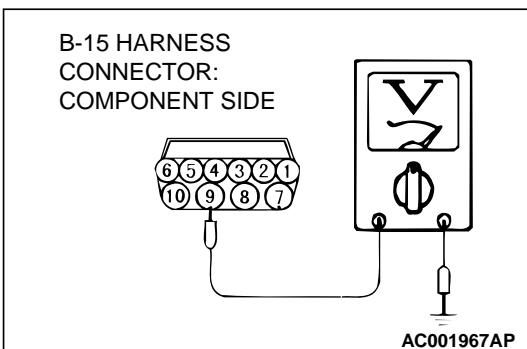
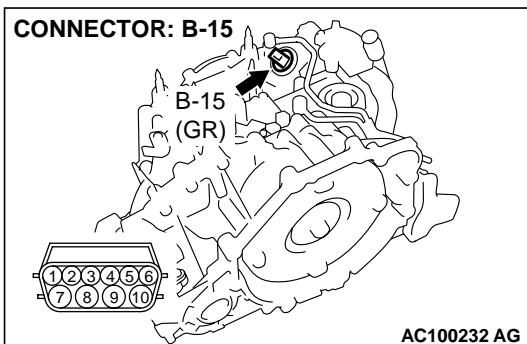
**STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 terminal 3 and PCM connector C-114 terminal 120.**

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

**YES :** Replace the PCM.

**NO :** Repair or replace the harness wire.






---

**STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect solenoid valve assembly harness connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between harness connector B-15 terminal 9 and ground.

- The voltage should equal battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

---

**STEP 9. Check A/T control relay connector B-11X in the engine component relay box and A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

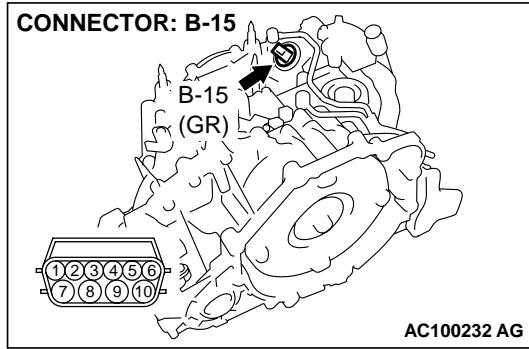
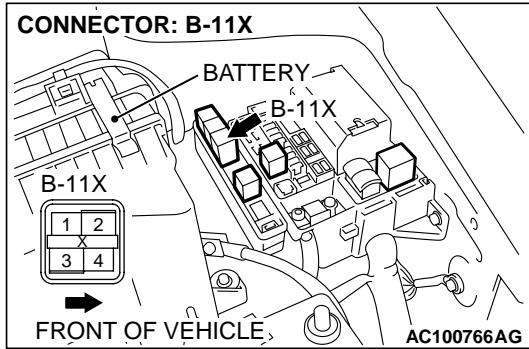
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**STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-11X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-15 terminal 9.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.

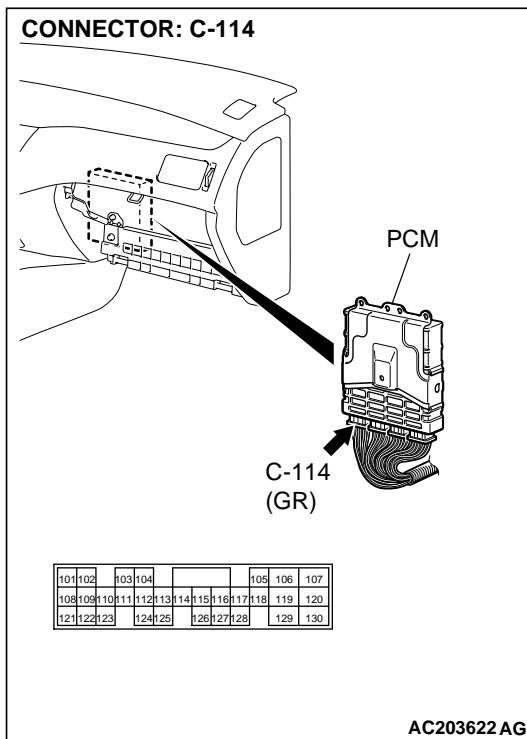
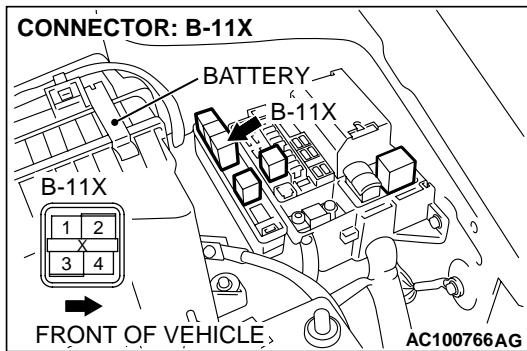


**STEP 11. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 12.

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

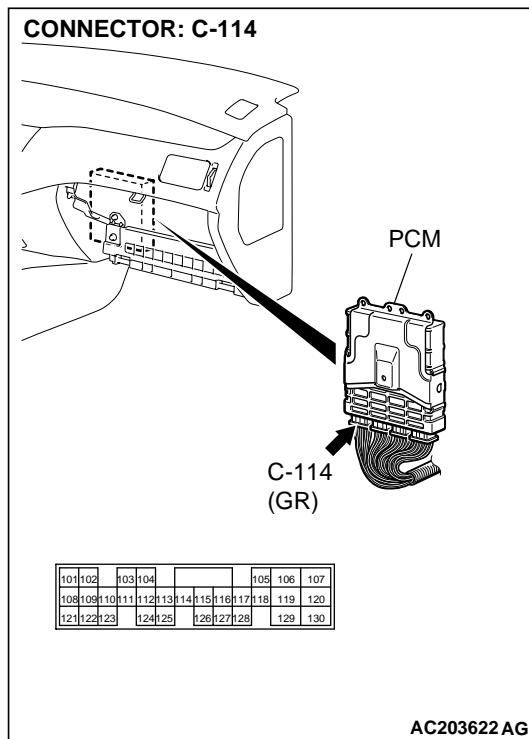
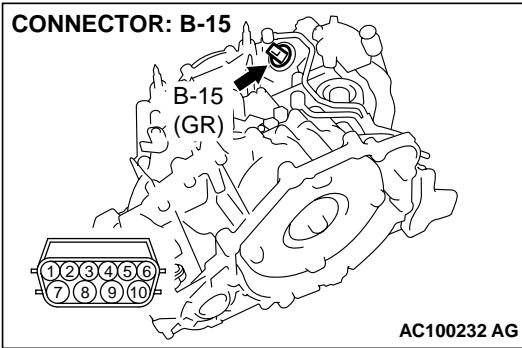


**STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4 and 5) and PCM connector C-114 (terminals 106, 120 and 130).**

**Q: Are the harness wires in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the harness wire.

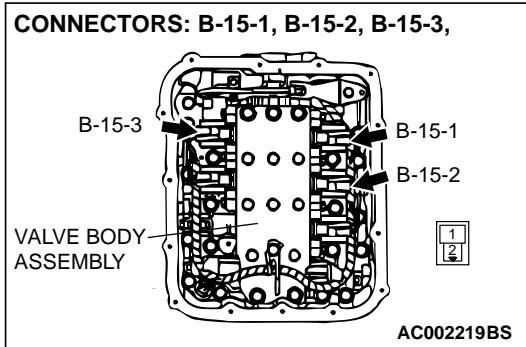
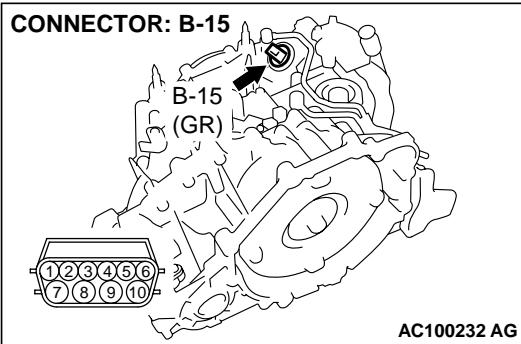


**STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-15-1, B-15-2 and B-15-3.**

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

**YES :** Replace the PCM.

**NO :** Replace the harness wire.



## DTC 33: Second Solenoid Valve System

### Solenoid Valve System Circuit

Refer to P.23Ac-200.

### CIRCUIT OPERATION

Refer to P.23Ac-200.

### DTC SET CONDITIONS

If the resistance value for the second solenoid valve circuit is greater than  $3.5 \Omega$  (open) or less than  $2.6 \Omega$  (short) for 4 seconds, DTC 33 is set. The transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the second solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

---

**STEP 1. Using scan tool MB991502, check actuator test item 03: Second Solenoid Valve.**

**⚠ 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 actuator test mode for item 03, Second Solenoid Valve.

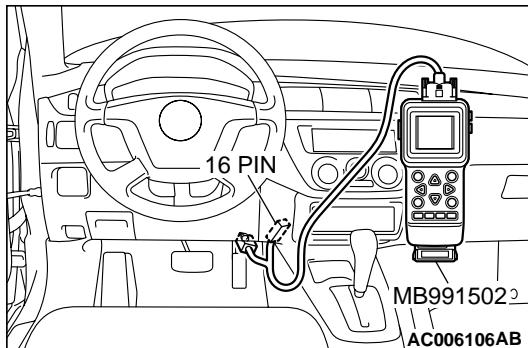
- An audible clicking or buzzing should be heard when the second solenoid valve is energized.

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

**Q: Is the solenoid valve operating properly?**

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

**NO :** Go to Step 2.




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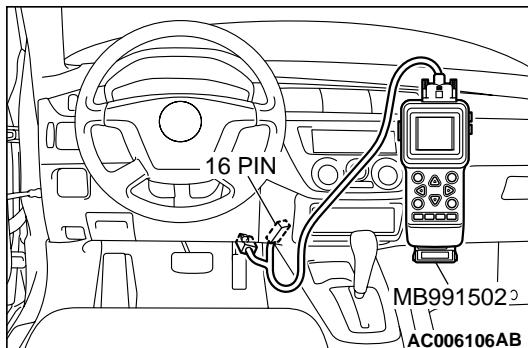
**STEP 2. Using scan tool MB991502, read the A/T diagnostic trouble code.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs.)**

**YES :** Refer to [P.23Ac-268](#) DTC 54: A/T Control Relay System.

**NO :** Go to Step 3.




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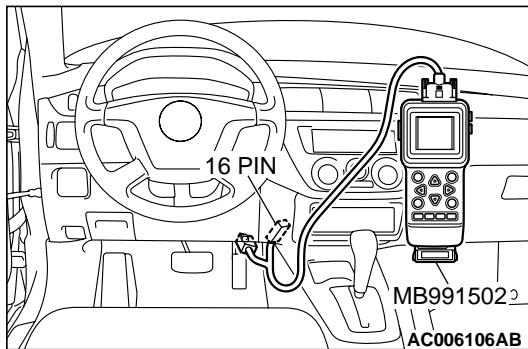
**STEP 3. Using scan tool MB991502, read the A/T diagnostic trouble code.**

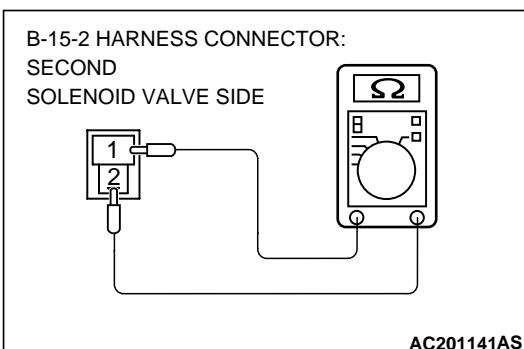
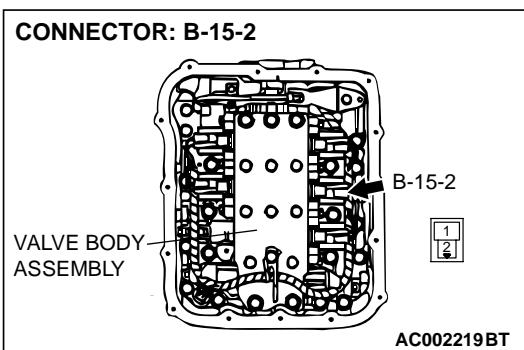
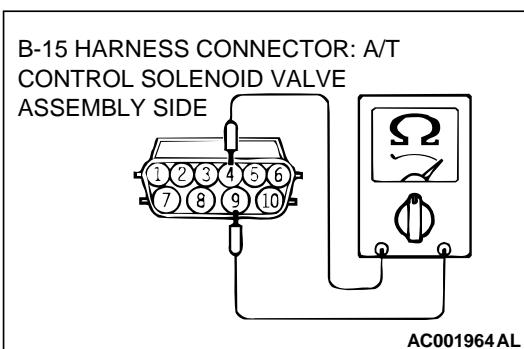
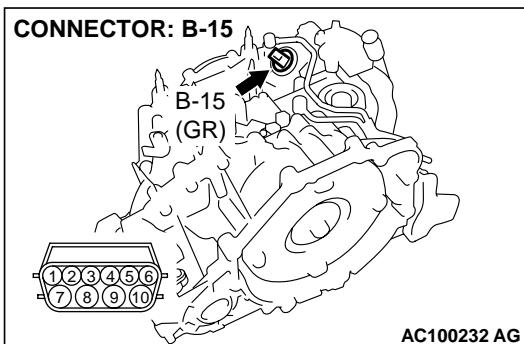
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Are DTC 32 and DTC 34 set? (Multiple DTCs may be set.)**

**YES :** Go to Step 8.

**NO :** Go to Step 4.






---

**STEP 4. Measure the Second solenoid valve resistance at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect connector B-15 and measure at the solenoid valve side.

- (2) Measure the resistance between solenoid valve assembly connector B-15 terminals 4 and 9.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.

---

**STEP 5. Measure the solenoid valve resistance at the second solenoid valve assembly inside the transaxle.**

- (1) Disconnect connector B-15-2 and measure at the solenoid valve side.

- (2) Measure the resistance between Second solenoid valve terminals 1 and 2.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Replace the harness wire between A/T control solenoid valve assembly connector B-15 and the solenoid valves.

**NO :** Replace the Second solenoid valve. Refer to GROUP 23B, Valve Body P.23B-61.

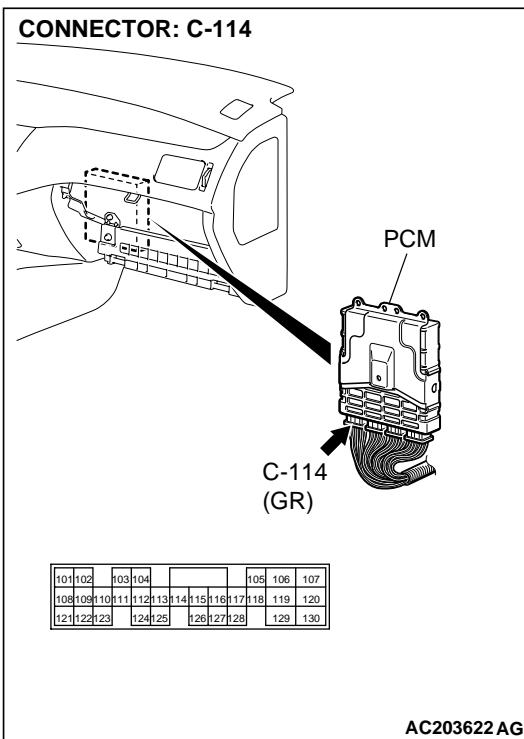
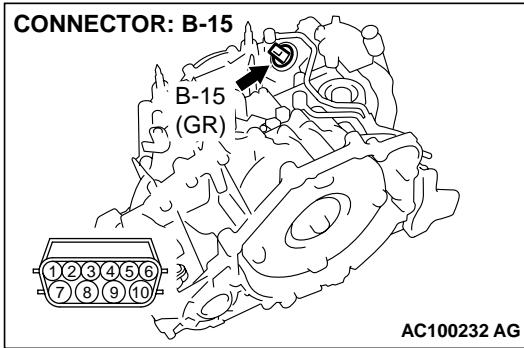
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**STEP 6. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

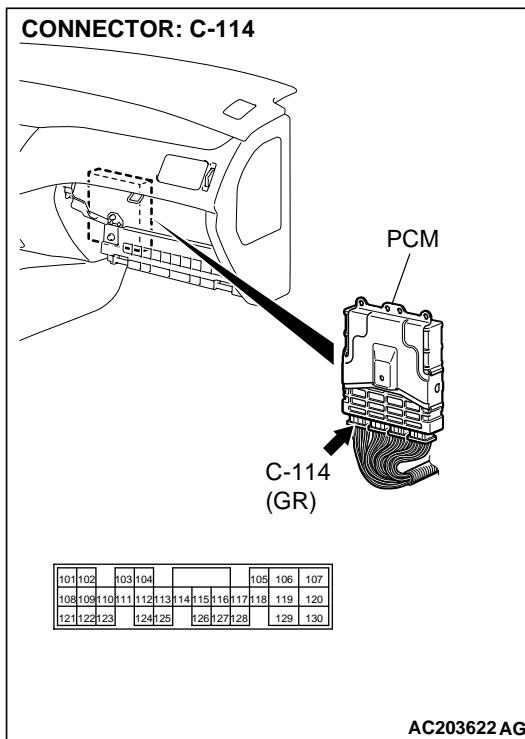
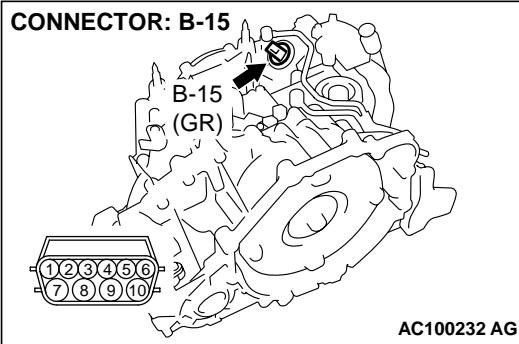


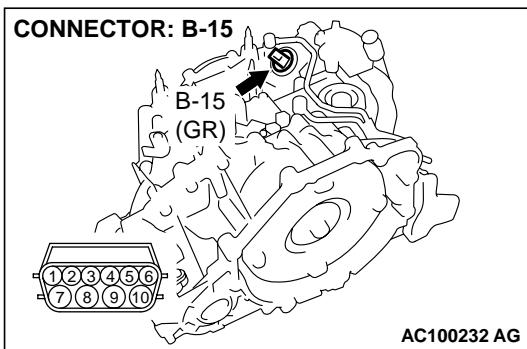
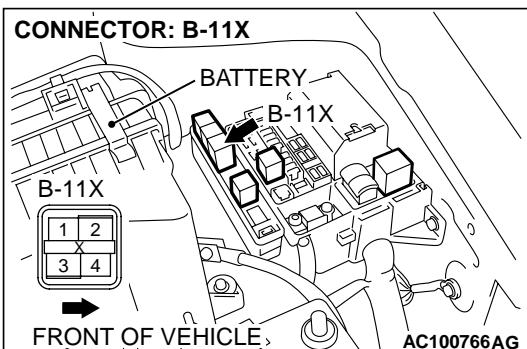
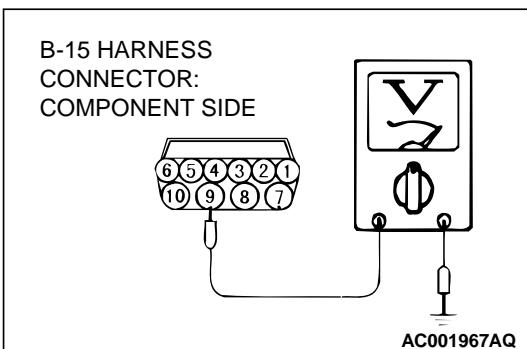
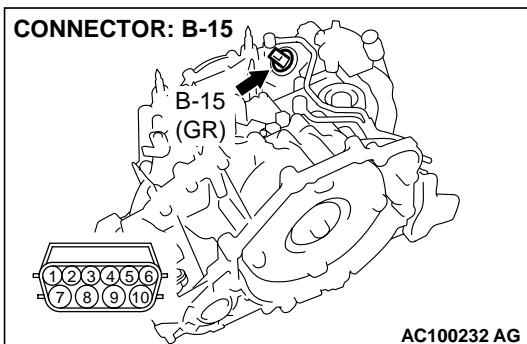
**STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 terminal 4 and PCM connector C-114 terminal 106.**

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

**YES :** Replace the PCM.

**NO :** Repair or replace the harness wire.






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**STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect solenoid valve assembly harness connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between harness connector B-15 terminal 9 and ground.

- The voltage should equal battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

---

**STEP 9. Check A/T control relay connector B-11X in the engine component relay box and A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

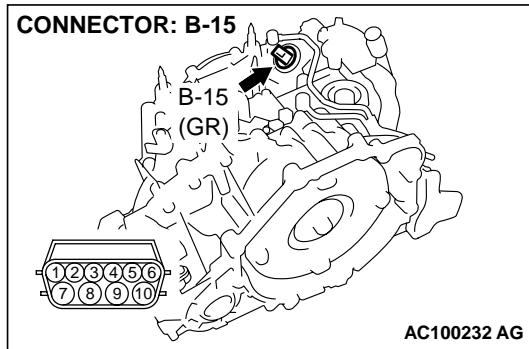
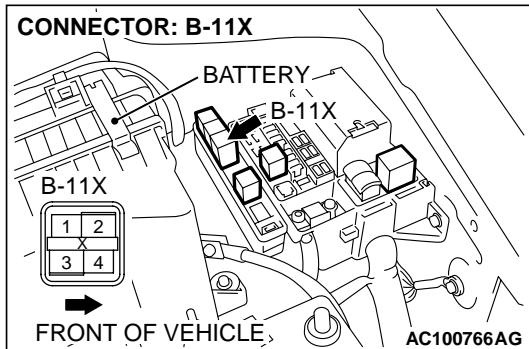
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

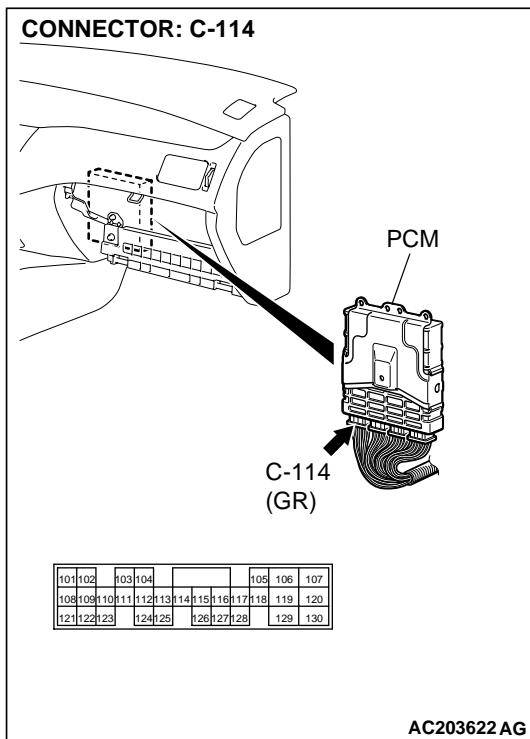
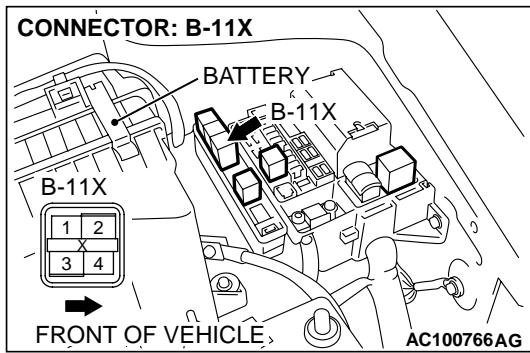
**STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-11X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-15 terminal 9.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.





**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 12.

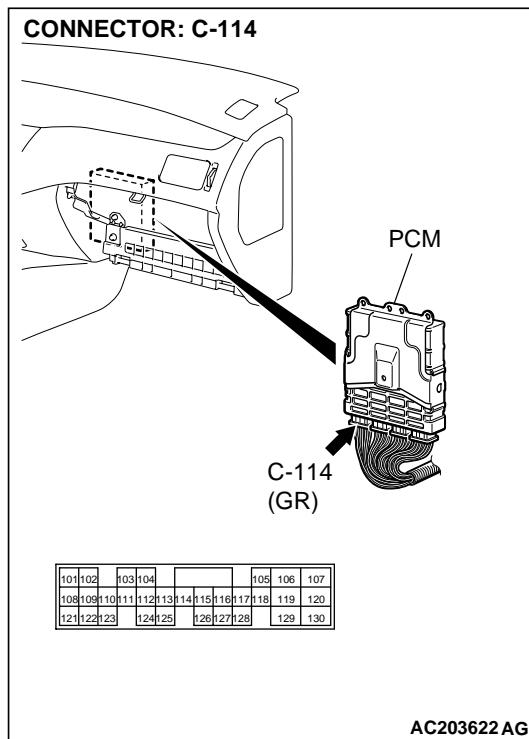
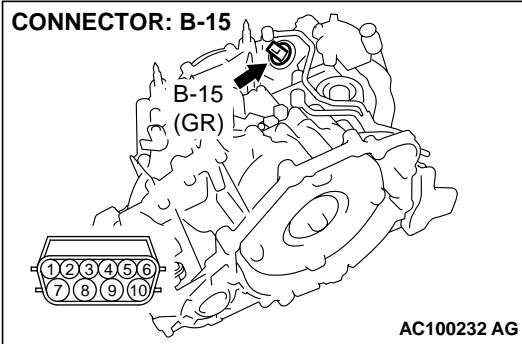
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

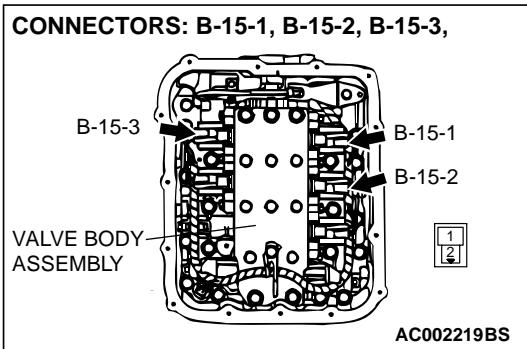
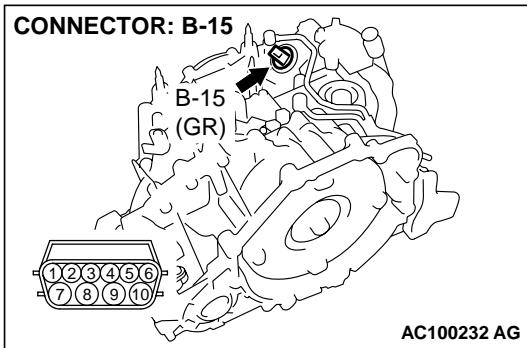
**STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4 and 5) and PCM connector C-114 (terminals 106, 120 and 130).**

**Q: Are the harness wires in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the harness wire.





**STEP 13.** Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-15-1, B-15-2 and B-15-3.

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

**YES :** Replace the PCM.

**NO :** Replace the harness wire.

## DTC 34: Overdrive Solenoid Valve System

### Solenoid Valve System Circuit

Refer to P.23Ac-200.

### CIRCUIT OPERATION

Refer to P.23Ac-200.

### DTC SET CONDITIONS

If the resistance value for the overdrive solenoid valve circuit is greater than  $3.5\ \Omega$  (open) or less than  $2.6\ \Omega$  (short) for 4 seconds, DTC 34 is set. The transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the overdrive solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

## DIAGNOSIS

### Required Special Tool:

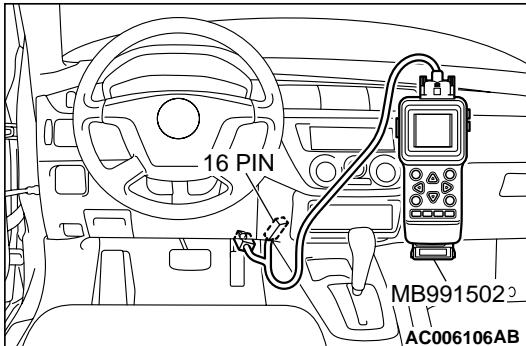
- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, check actuator test item 04: Overdrive Solenoid Valve.**

**⚠ 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 actuator test mode for item 04, Overdrive Solenoid Valve.

- An audible clicking or buzzing should be heard when the overdrive solenoid valve is energized.

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

**Q: Is the solenoid valve operating properly?**

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

**NO :** Go to Step 2.

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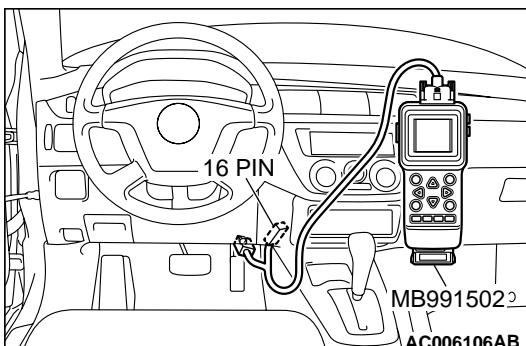
**STEP 2. Using scan tool MB991502, read the A/T diagnostic trouble code.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs.)**

**YES :** Refer to [P.23Ac-268](#) DTC 54: A/T Control Relay System.

**NO :** Go to Step 3.




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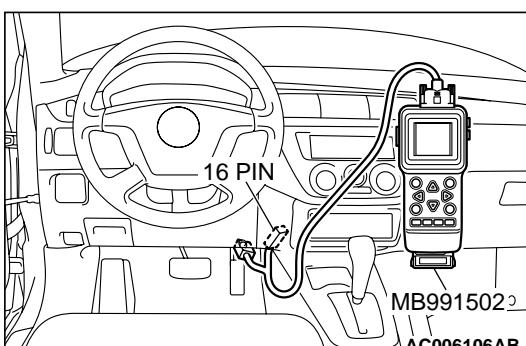
**STEP 3. Using scan tool MB991502, read the A/T diagnostic trouble code.**

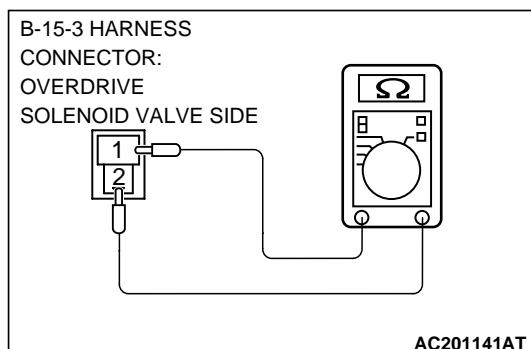
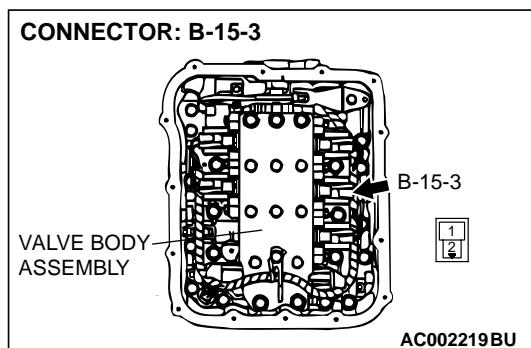
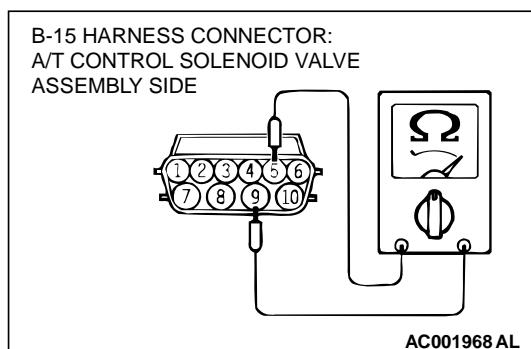
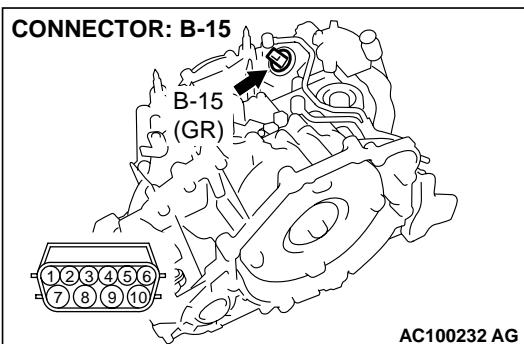
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Are DTC 32 and DTC 33 set? (Multiple DTCs may be set.)**

**YES :** Go to Step 8.

**NO :** Go to Step 4.





**STEP 4. Measure the Overdrive solenoid valve resistance at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect connector B-15 and measure at the solenoid valve side.

- (2) Measure the resistance between solenoid valve assembly connector B-15 terminals 5 and 9.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.

**STEP 5. Measure the solenoid valve resistance at the overdrive solenoid valve assembly inside the transaxle.**

- (1) Disconnect connector B-15-3 and measure at the solenoid valve side.

- (2) Measure the resistance between Overdrive solenoid valve terminals 1 and 2.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

**YES :** Replace the harness wire between A/T control solenoid valve assembly connector B-15 and the solenoid valves.

**NO :** Replace the Overdrive solenoid valve. Refer to GROUP 23B, Valve Body [P.23B-61](#).

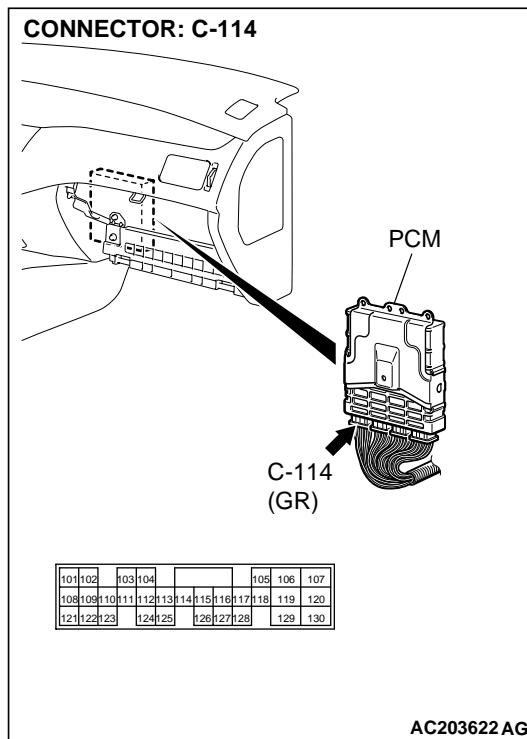
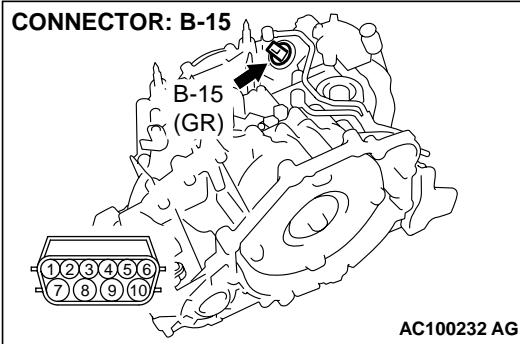
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**STEP 6. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

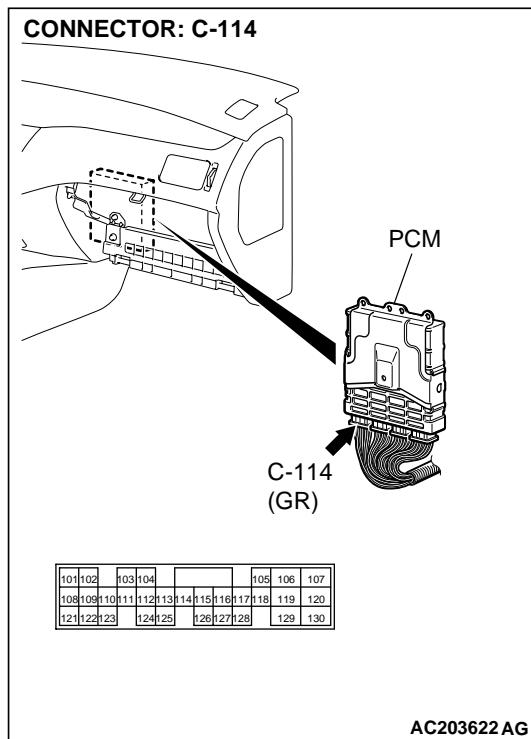
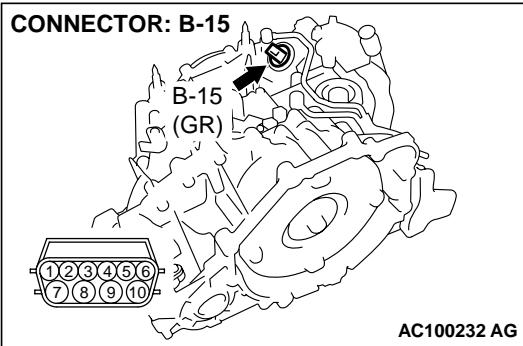


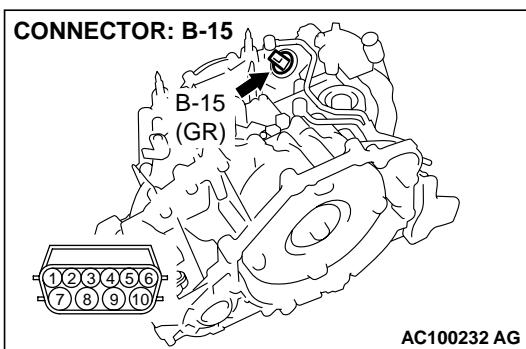
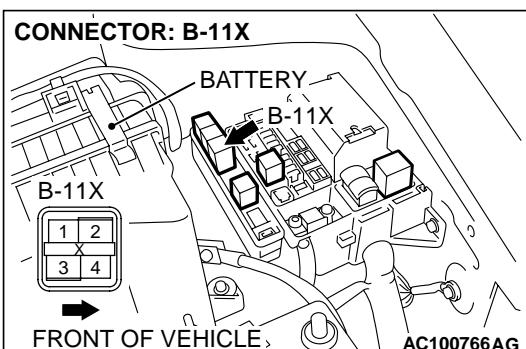
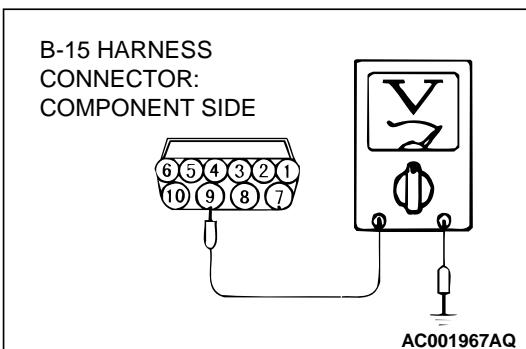
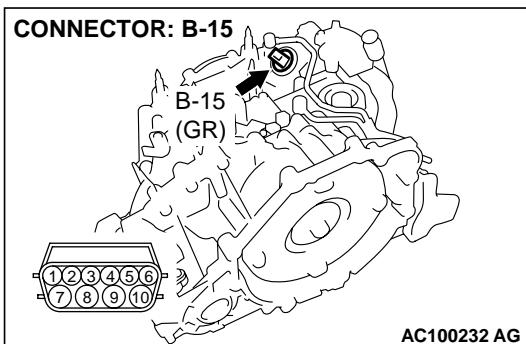
**STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 terminal 5 and PCM connector C-114 terminal 130.**

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

**YES :** Replace the PCM.

**NO :** Repair or replace the harness wire.






---

**STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect solenoid valve assembly harness connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between harness connector B-15 terminal 9 and ground.

- The voltage should equal battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

---

**STEP 9. Check A/T control relay connector B-11X in the engine component relay box and A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

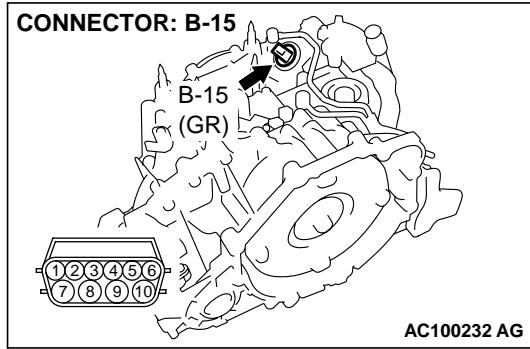
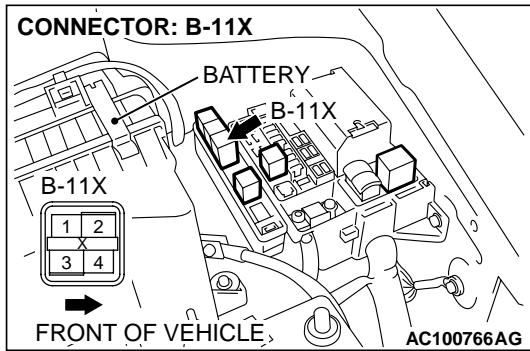
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**STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-11X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-15 terminal 9.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.

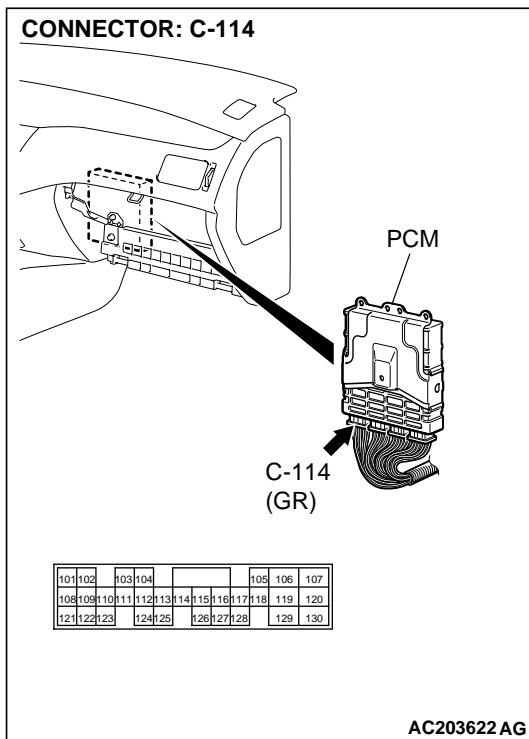
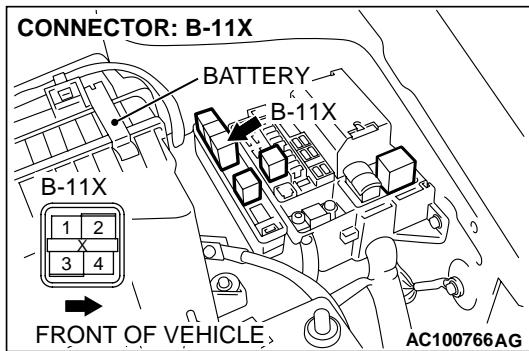


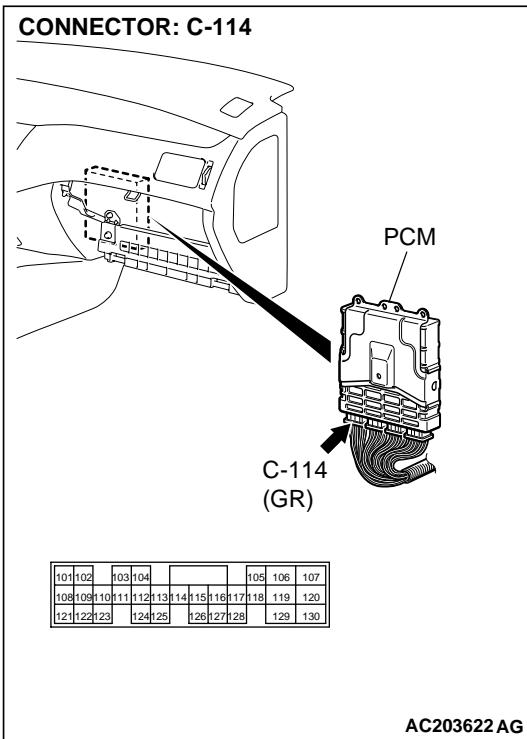
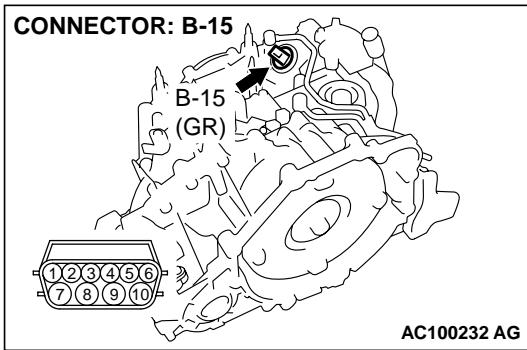
**STEP 11. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 12.

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





**STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4 and 5) and PCM connector C-114 (terminals 106, 120 and 130).**

**Q: Are the harness wires in good condition?**

**YES :** Go to Step 13.

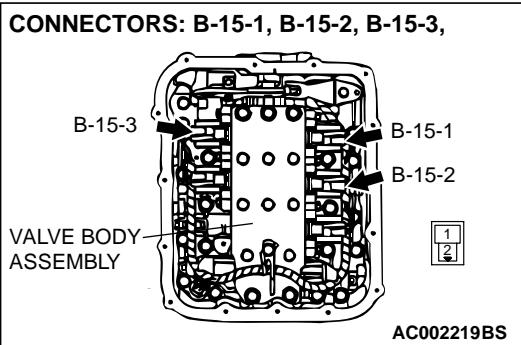
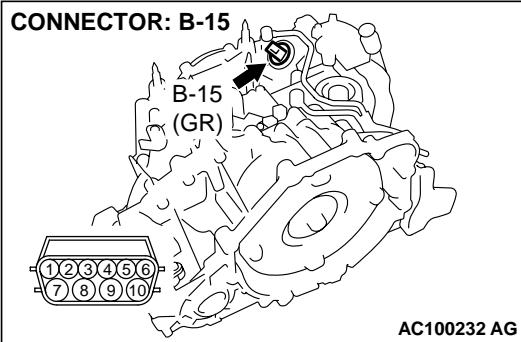
**NO :** Repair or replace the harness wire.

**STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 3, 4, 5, and 9) and solenoid valve connectors B-15-1, B-15-2 and B-15-3.**

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

**YES :** Replace the PCM.

**NO :** Replace the harness wire.



## DTC 36: Torque Converter Clutch Solenoid Valve System

### Solenoid Valve System Circuit

Refer to P.23Ac-200.

### CIRCUIT OPERATION

Refer to P.23Ac-200.

### DTC SET CONDITIONS

If the resistance value of the torque converter clutch solenoid valve circuit is greater than  $3.5\ \Omega$  or less than  $2.6\ \Omega$  for 4 seconds, DTC 36 is set. The transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the torque converter clutch solenoid valve
- Damaged harness or connector
- Malfunction of the PCM

### DIAGNOSIS

#### Required Special Tool:

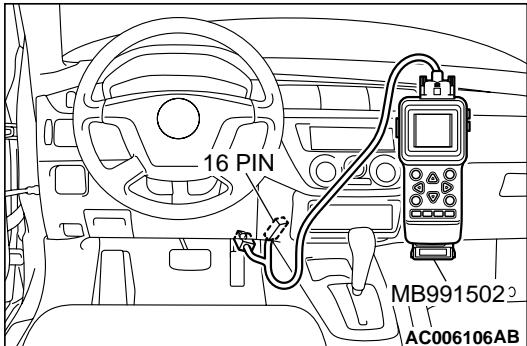
- MB991502: Scan Tool (MUT-II)

---

**STEP 1. Using scan tool MB991502, check actuator test item 06: Torque Converter Clutch Solenoid Valve.**

**⚠ 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 actuator test mode for item 06, Torque Converter Clutch Solenoid Valve.

- An audible clicking or buzzing should be heard when the torque converter clutch solenoid valve is energized.

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

**Q: Is the solenoid valve operating properly?**

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

**NO :** Go to Step 2.

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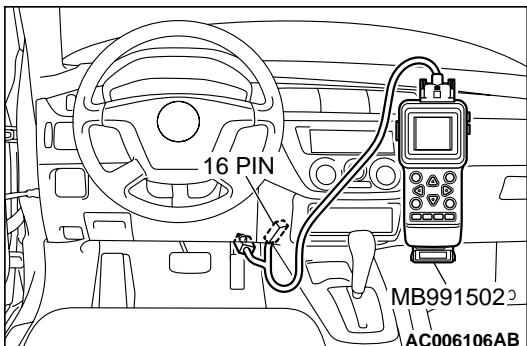
**STEP 2. Using scan tool MB991502, read the A/T diagnostic trouble code.**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs.)**

**YES :** Refer to [P.23Ac-268](#) DTC 54: A/T Control Relay System.

**NO :** Go to Step 3.




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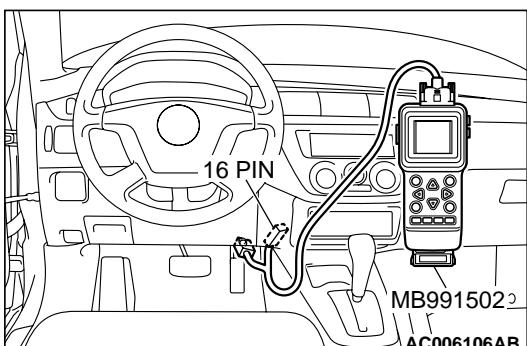
**STEP 3. Using scan tool MB991502, read the A/T diagnostic trouble code.**

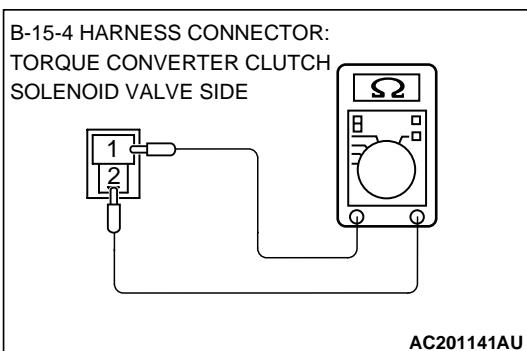
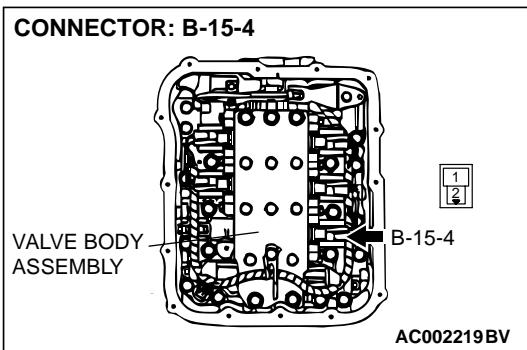
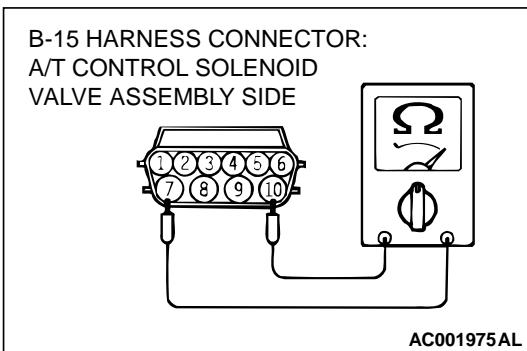
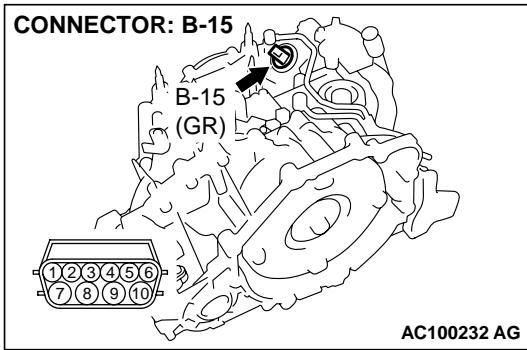
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 31 set?**

**YES :** Go to Step 8.

**NO :** Go to Step 4.





**STEP 4. Measure the torque converter clutch solenoid valve resistance at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect connector B-15 and measure at the solenoid valve side.

- (2) Measure the resistance between solenoid valve assembly connector B-15 terminals 7 and 10.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

- YES :** Go to Step 6.  
**NO :** Go to Step 5.

**STEP 5. Measure the solenoid valve resistance at the torque converter clutch solenoid valve assembly inside the transaxle.**

- (1) Disconnect connector B-15-4 and measure at the solenoid valve side.

- (2) Measure the resistance between torque converter clutch solenoid valve terminals 1 and 2.

**Resistance value: 2.7–3.4 Ω [at 20°C (68°F)]**

**Q: Is the measured resistance 2.7–3.4 Ω [at 20°C (68°F)]?**

- YES :** Replace the harness wire between A/T control solenoid valve assembly connector B-15 and the solenoid valves.

- NO :** Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body [P.23B-61](#).

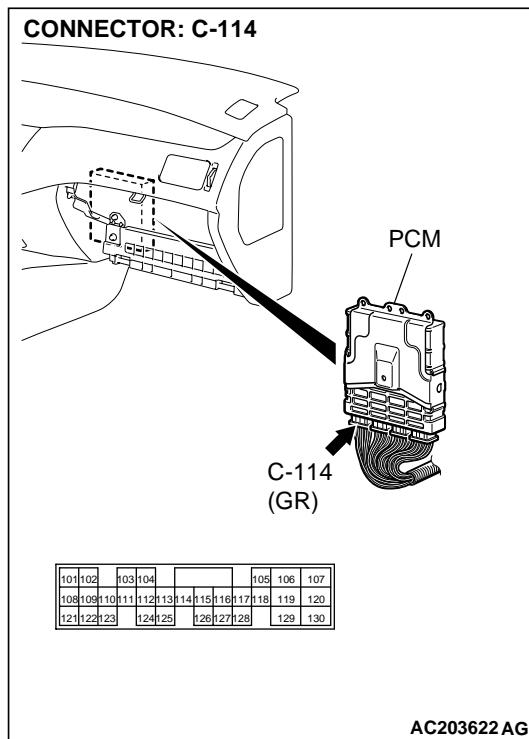
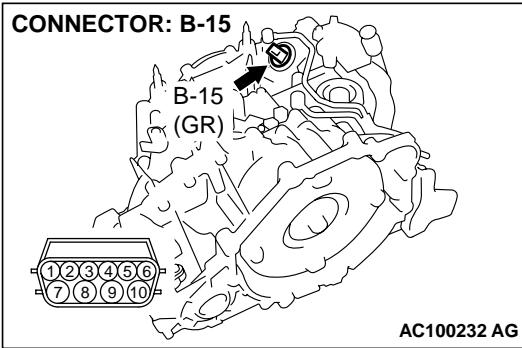
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**STEP 6. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 7.

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

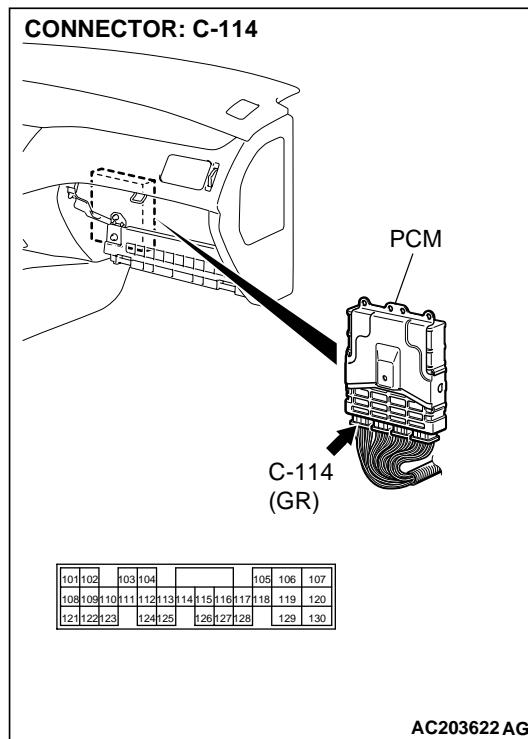
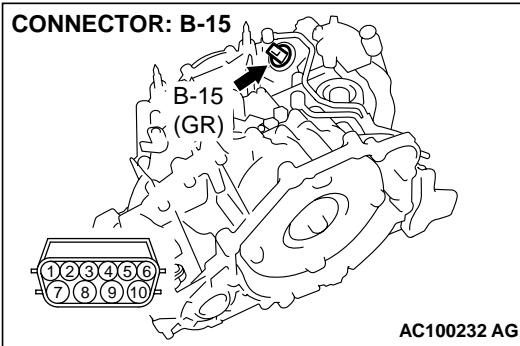


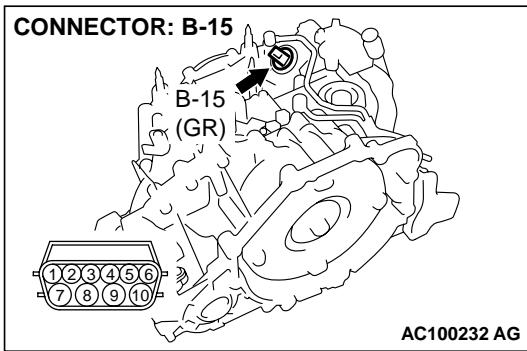
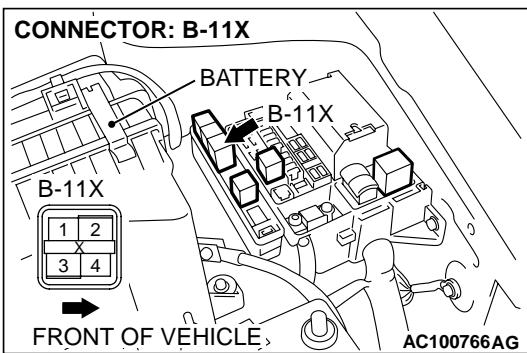
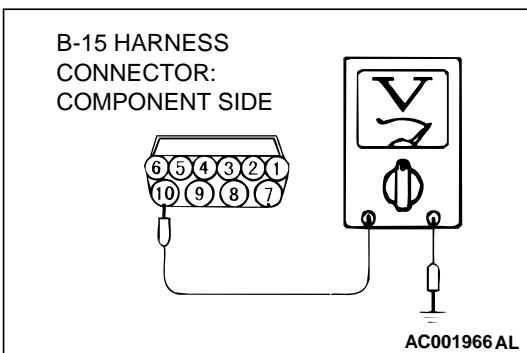
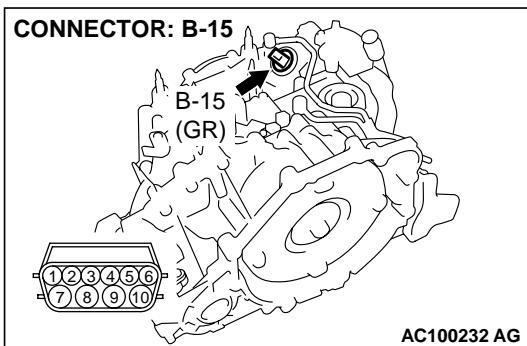
**STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 terminal 7 and PCM connector C-114 terminal 107.**

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

**YES :** Replace the PCM.

**NO :** Repair or replace the harness wire.






---

**STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector B-15.**

- (1) Disconnect solenoid valve assembly harness connector B-15.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between harness connector B-15 terminal 10 and ground.

- The voltage should equal battery positive voltage.

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

**Q: Is the measured voltage battery positive voltage?**

**YES :** Go to Step 11.

**NO :** Go to Step 9.

---

**STEP 9. Check A/T control relay connector B-11X in the engine component relay box and A/T control solenoid valve assembly connector B-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

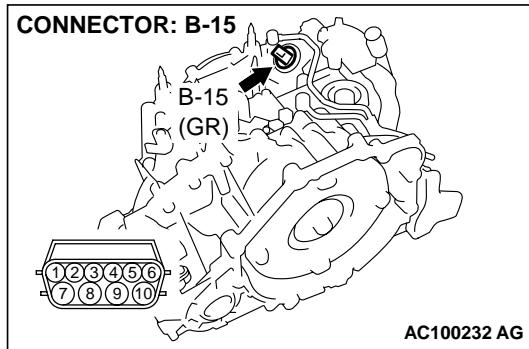
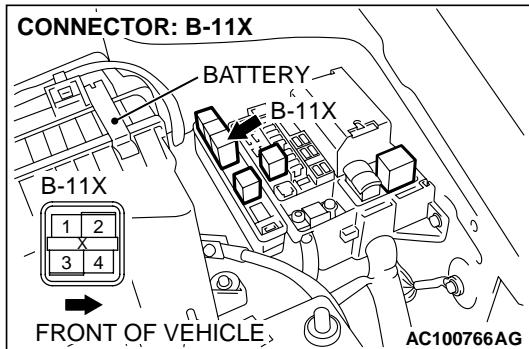
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

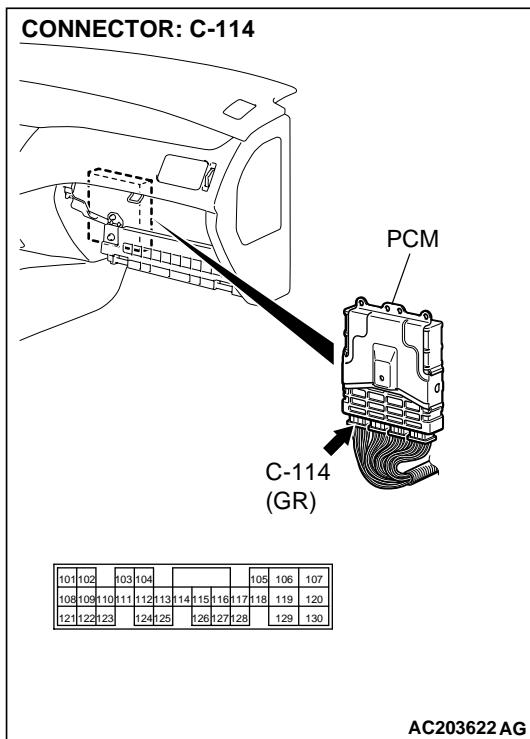
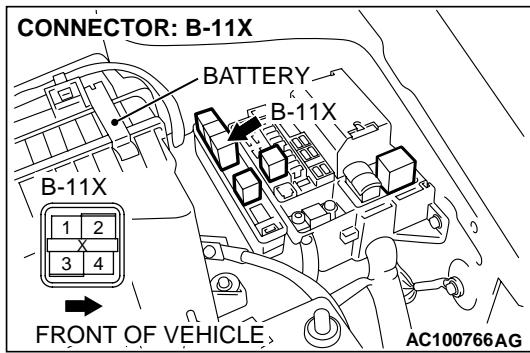
**STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control relay connector B-11X terminal 4 in the engine component relay box and A/T control solenoid valve assembly connector B-15 terminal 10.**

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

**YES :** Go to Step 11.

**NO :** Repair or replace the harness wire.





**STEP 11.** Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Are the connectors and terminals in good condition?

**YES :** Go to Step 12.

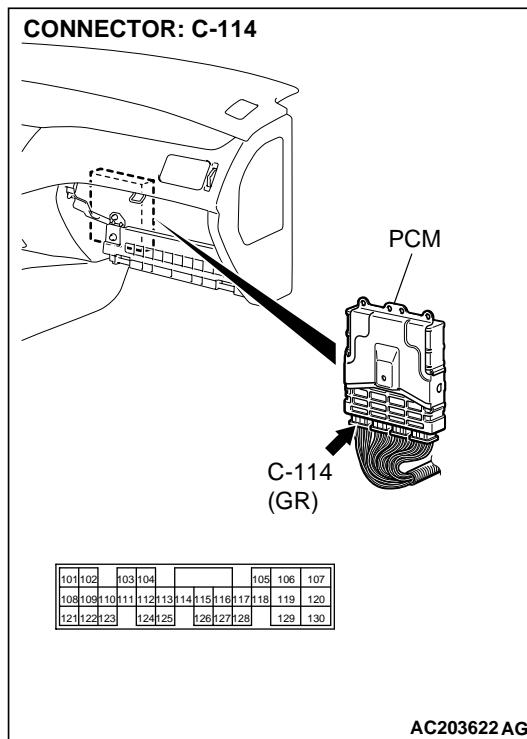
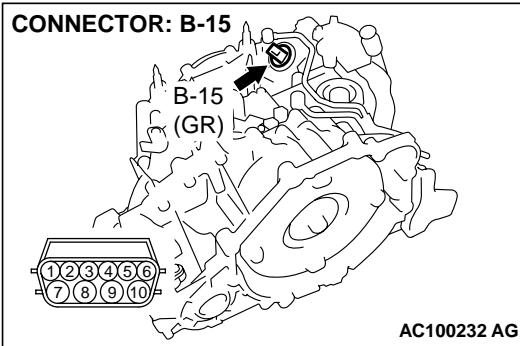
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 6 and 7) and PCM connector C-114 (terminals 107 and 129).**

**Q: Are the harness wires in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the harness wire.

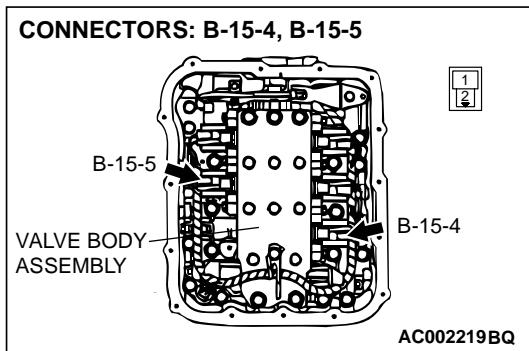
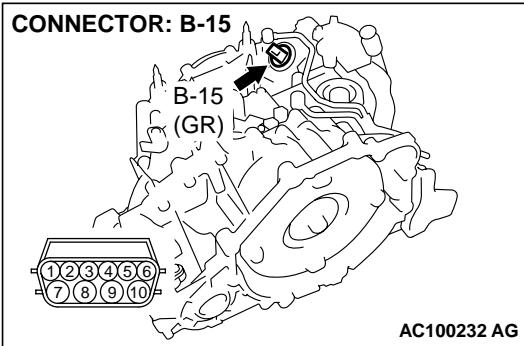


**STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector B-15 (terminals 6, 7, and 10) and solenoid valve connectors B-15-4 and B-15-5.**

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

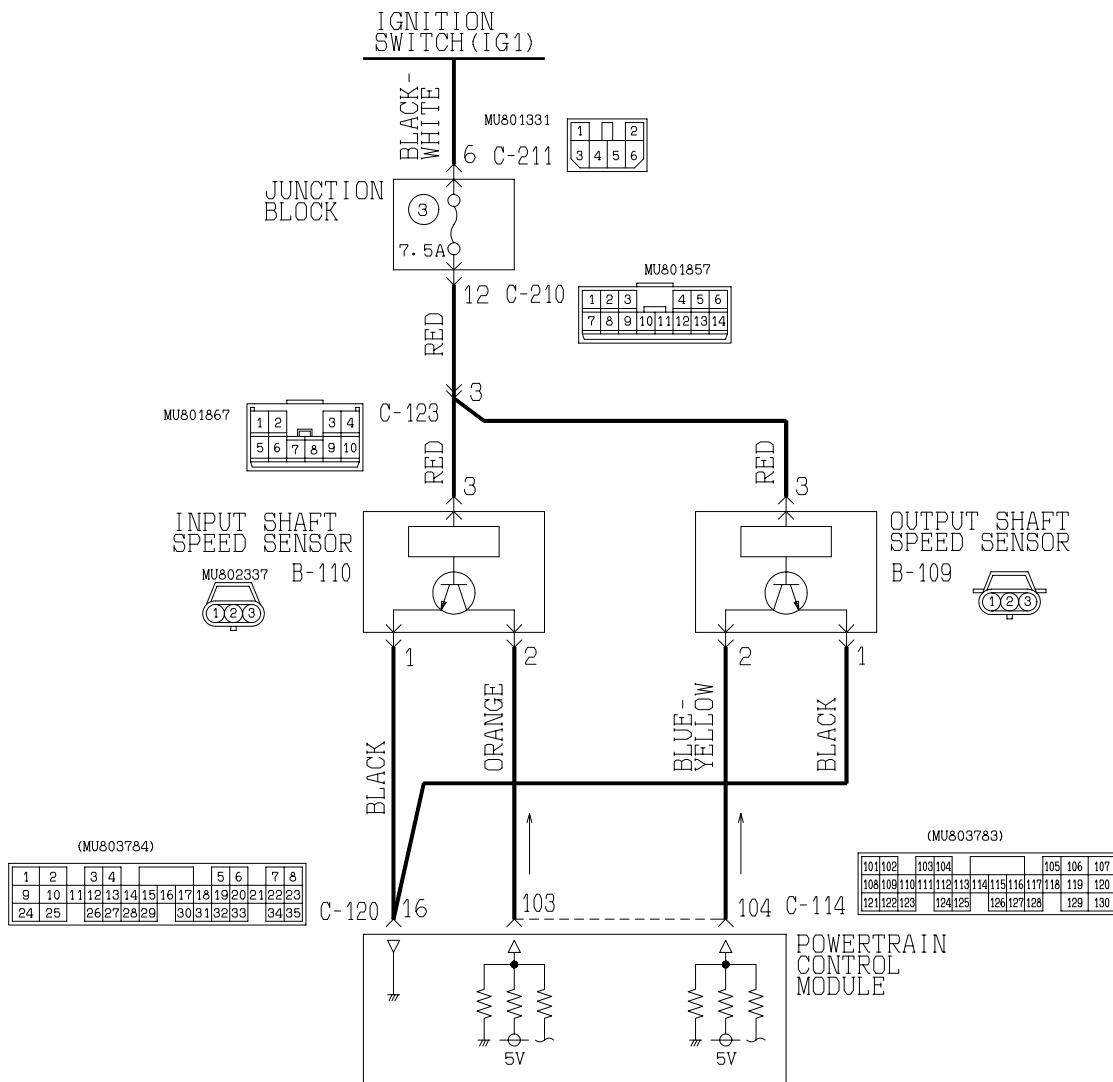
**YES :** Replace the PCM.

**NO :** Replace the harness wire.

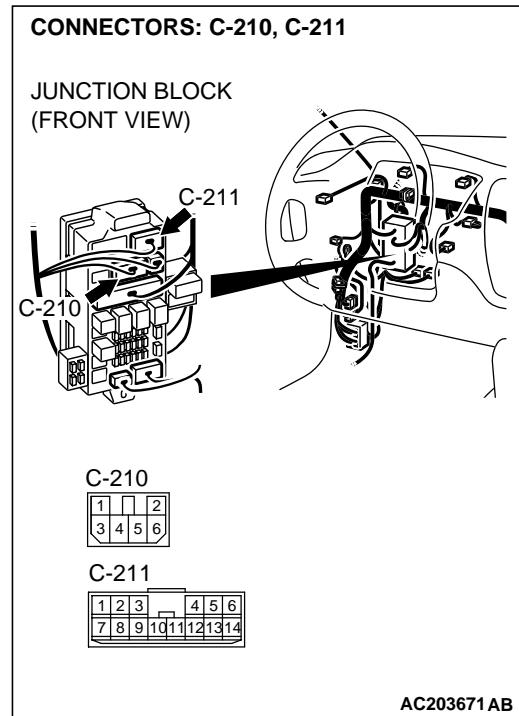
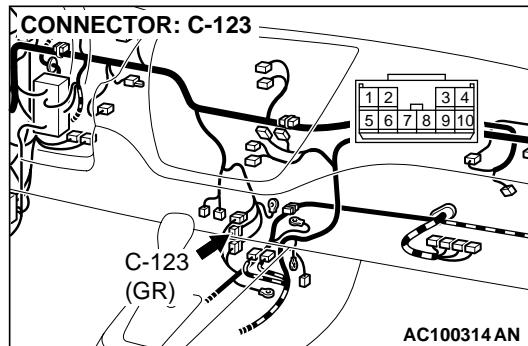
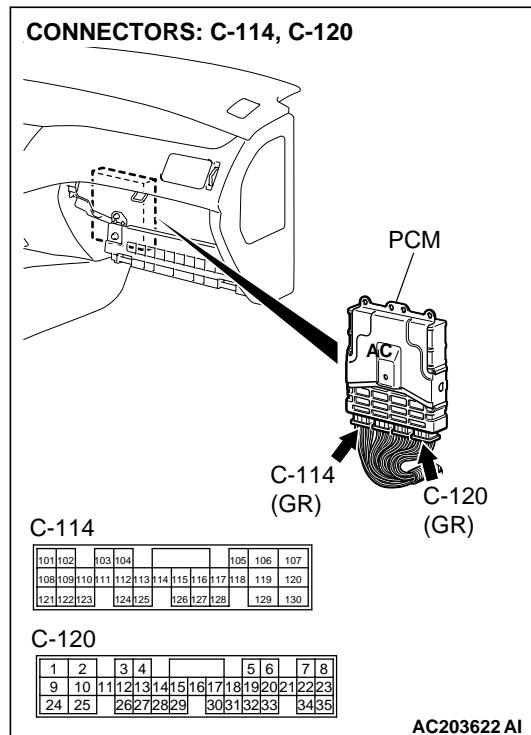
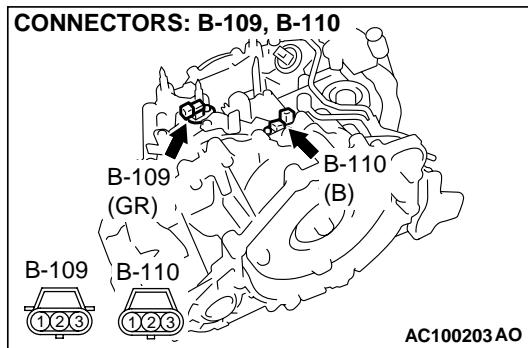


- DTC 41: 1st Gear Incorrect Ratio  
DTC 42: 2nd Gear Incorrect Ratio  
DTC 43: 3rd Gear Incorrect Ratio  
DTC 44: 4th Gear Incorrect Ratio  
DTC 46: Reverse Gear Incorrect Ratio**

**Input Shaft Speed Sensor and Output Shaft Speed Sensor System Circuit**



W2J01M08AA  
AC100493AB



### CIRCUIT OPERATION

- The input shaft speed sensor generates a pulsed signal of  $0 \leftrightarrow 5$  volts. The pulsed signal frequency increases with an increase in the input shaft speed.
- The PCM (terminal 103) continuously monitors the input shaft speed signal.

- The output shaft speed sensor generates a pulsed signal of  $0 \leftrightarrow 5$  volts. The pulsed signal frequency increases with an increase in the output shaft speed.
- The PCM (terminal 104) continuously monitors the output shaft speed signal.

**DTC SET CONDITIONS**

If the PCM receives a signal (multiplied by the 1st gear ratio) from the output shaft speed sensor that is not the same as the signal received from the input shaft speed sensor (while driving with the transaxle in 1st gear), DTC 41 is set. If DTC 41 is set four times, the transaxle is locked into 3rd gear as a fail-safe measure.

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

- Malfunction of the input shaft speed sensor
- Malfunction of the output shaft speed sensor
- Malfunction of the PCM

- Malfunction of the underdrive clutch retainer
- Malfunction of the transfer drive gear or driven gear
- Malfunction of the low-reverse brake system (DTC 41 or DTC 46)
- Malfunction of the underdrive clutch system (DTC 41, DTC 42, or DTC 43)
- Malfunction of the second brake system (DTC 42 or DTC 44)
- Malfunction of the overdrive clutch system (DTC 43 or DTC 44)
- Malfunction of the reverse clutch system (DTC 46)
- Electrical noise generated

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, read the A/T diagnostic trouble code.**** CAUTION**

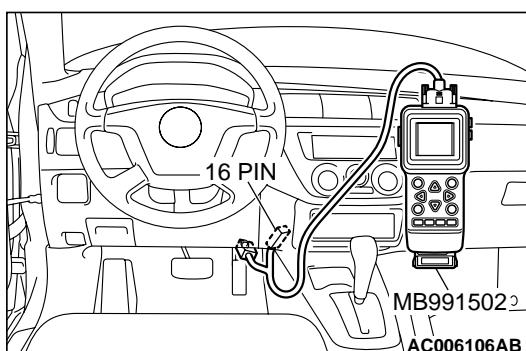
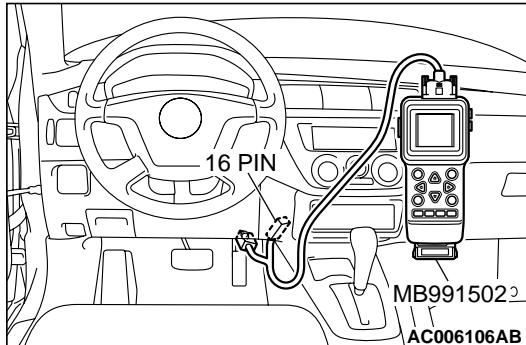
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 22 or DTC 23 set?**

**YES :** Refer to [P.23Ac-100](#), DTC 22: Input Shaft Speed Sensor System, or refer to [P.23Ac-119](#), DTC 23: Output Shaft Speed Sensor System.

**NO :** Go to Step 2.

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

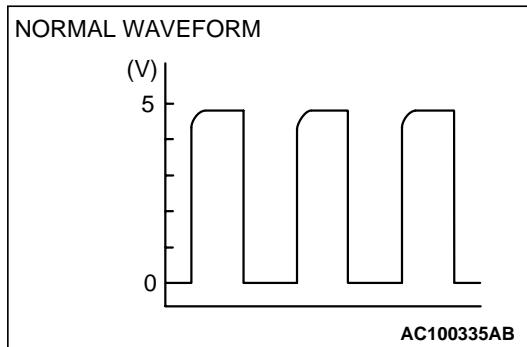
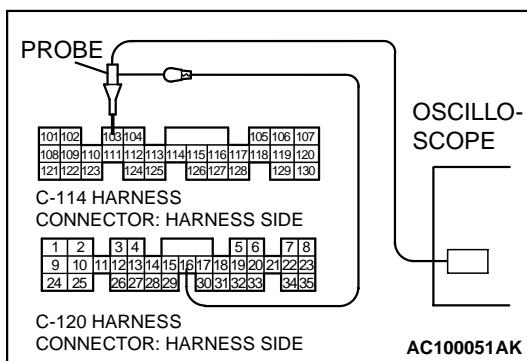
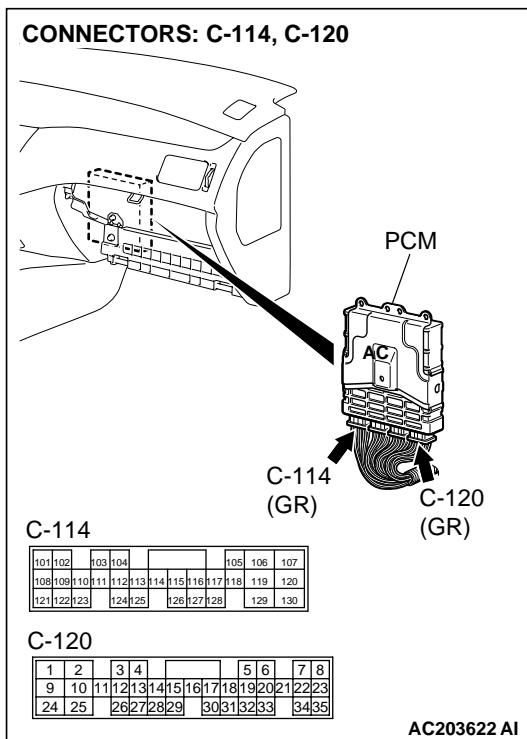
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to actuator test mode for following items:

- a. item 01: Low-reverse Solenoid Valve
  - b. item 02: Underdrive Solenoid Valve
  - c. item 03: Second Solenoid Valve
  - d. item 04: Overdrive Solenoid Valve
- An audible clicking or buzzing should be heard when each solenoid valve is energized.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Are the solenoid valves operating properly?**

**YES :** Go to Step 3.

**NO :** Replace the defective solenoid valves. Refer to GROUP 23B, Valve Body [P.23B-61](#).



**STEP 3. Using the oscilloscope, check the input shaft speed sensor waveform at PCM connectors C-120 and C-114 by backprobing.**

- (1) Do not disconnect connectors C-120 or C-114.

- (2) Connect an oscilloscope probe to PCM connector C-120 terminal 16 and to PCM connector C-114 terminal 103 by backprobing.
- (3) Start the engine and drive the vehicle at constant speed of 50 km/h (31 mph). (Gear range: 3rd gear)

- (4) Check the input shaft speed sensor waveform.

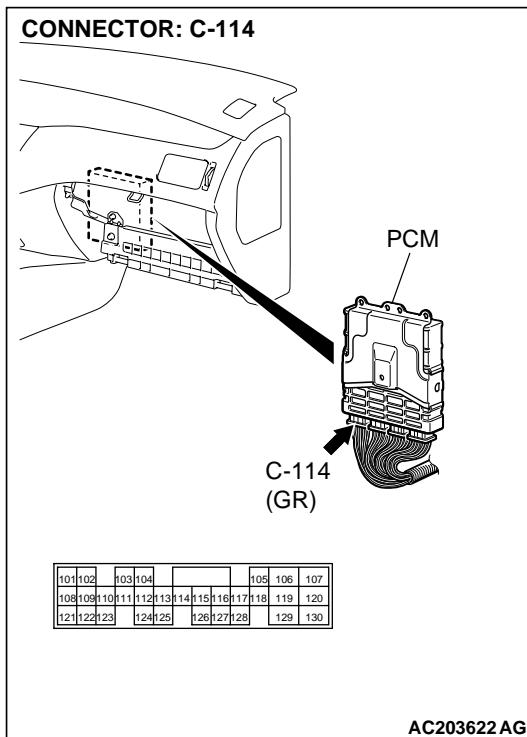
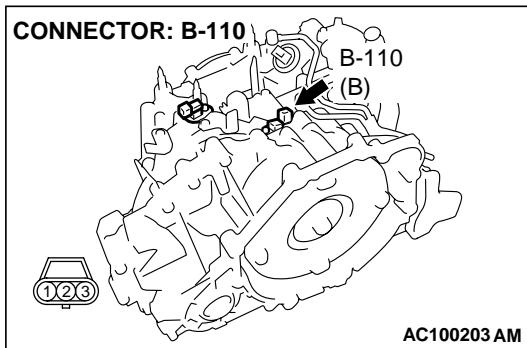
- The input shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volt and less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 8.

**NO :** Go to Step 4.

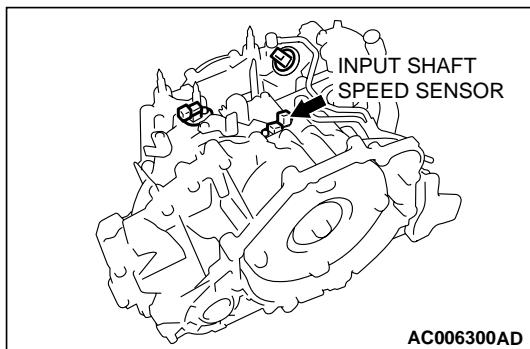
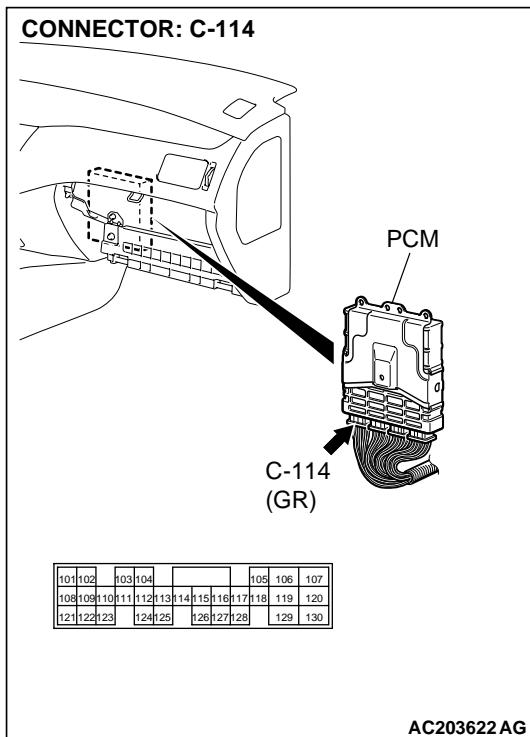
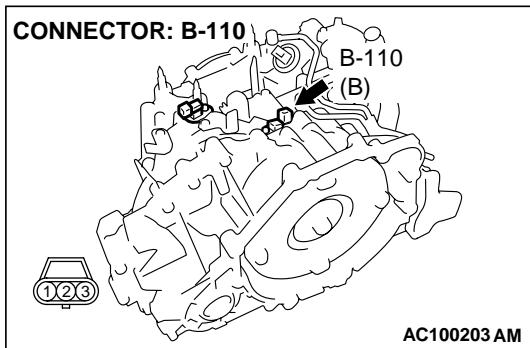


**STEP 4. Check input shaft speed sensor connector B-110 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 5.

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




---

**STEP 5. Check the harness for damage between input shaft speed sensor connector B-110 terminal 2 and PCM connector C-114 terminal 103.**

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

**YES :** Go to Step 6.

**NO :** Repair the damaged wire.

---

**STEP 6. Replace the input shaft speed sensor.**

- (1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-8.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** Go to Step 7.

**NO :** The procedure is complete.

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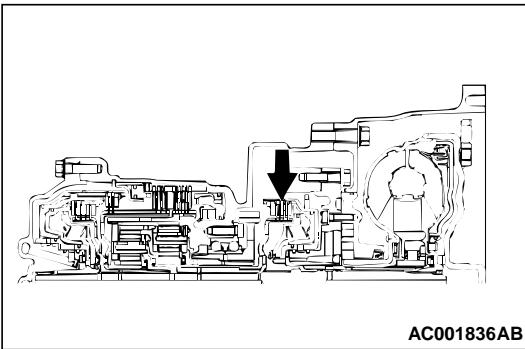
**STEP 7. Replace the underdrive clutch retainer.**

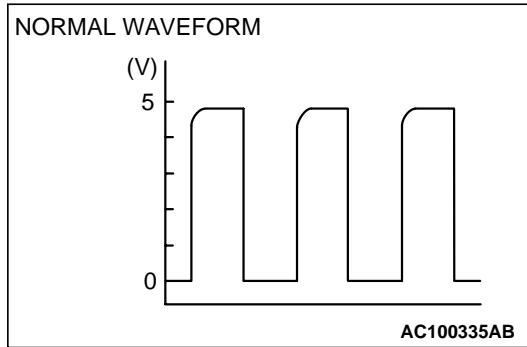
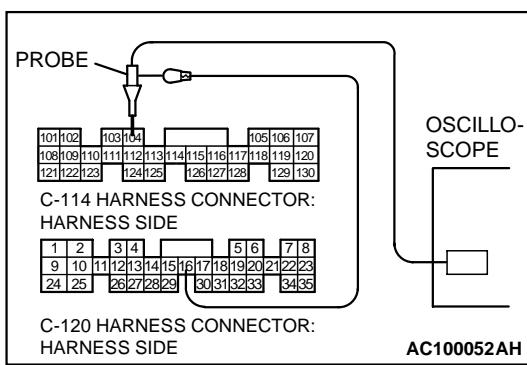
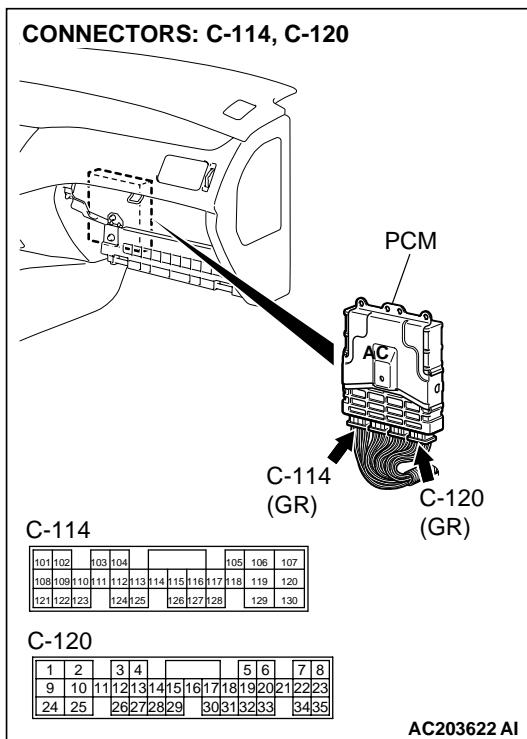
- (1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft [P.23B-45](#).
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** An A/T DTC may have set due to external radio frequency (RFI) possibly caused by cellular phone activity, or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.





**STEP 8. Using the oscilloscope, check the output shaft speed sensor waveform at PCM connectors C-120 and C-114 by backprobing.**

- (1) Do not disconnect connectors C-120 or C-114.

- (2) Connect an oscilloscope probe to PCM connector C-120 terminal 16 and to PCM connector C-114 terminal 104 by backprobing.
- (3) Start the engine and drive the vehicle at a constant speed of 50 km/h (31 mph). (Gear range: 3rd gear)

- (4) Check the output shaft speed sensor waveform.

- The input shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volt and less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 13.

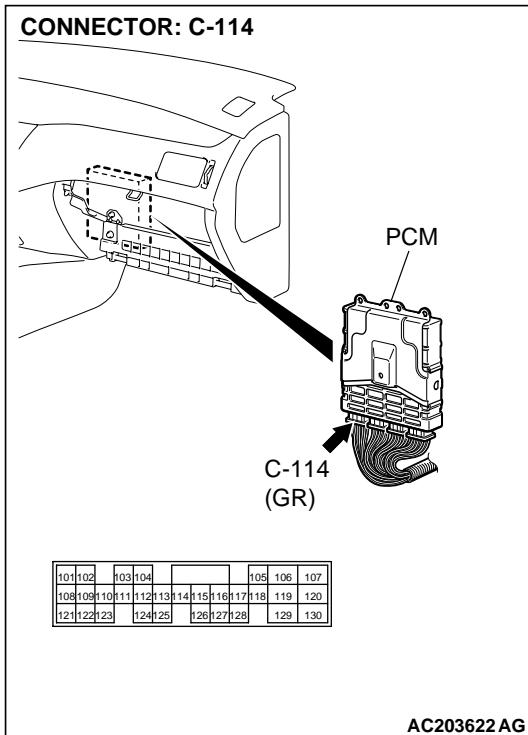
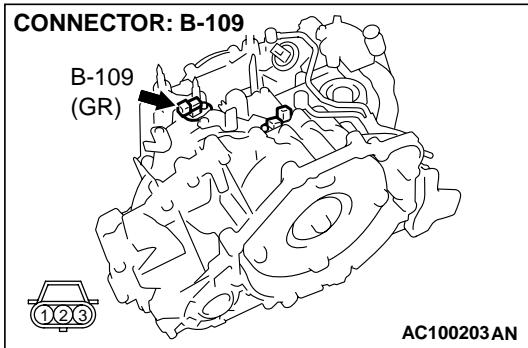
**NO :** Go to Step 9.

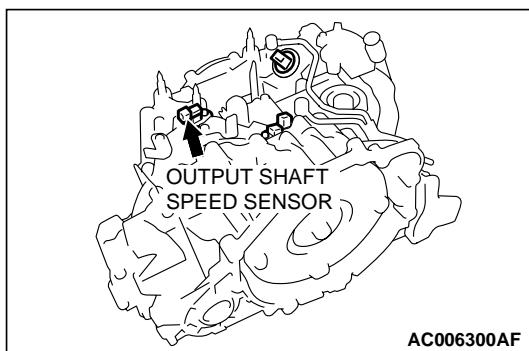
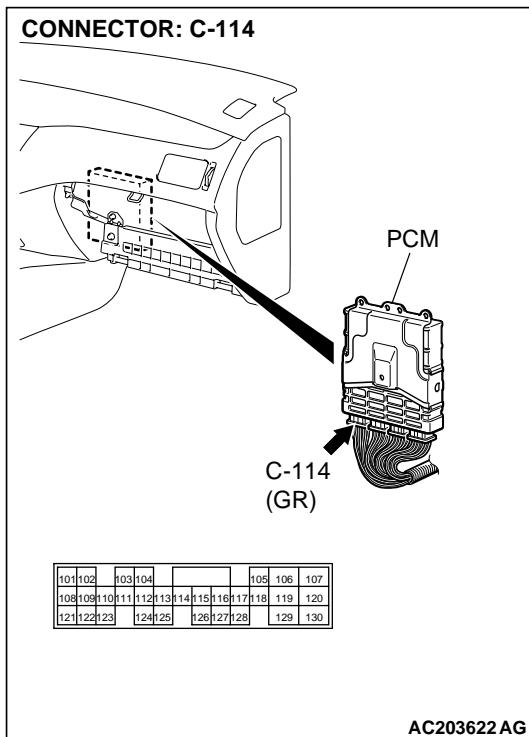
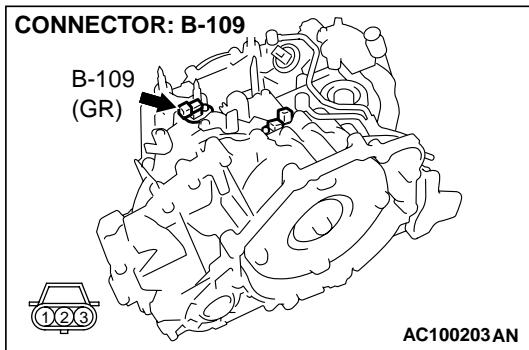
**STEP 9. Check output shaft speed sensor connector B-109 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 10.

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





**STEP 10. Check the harness for damage between output shaft speed sensor connector B-109 terminal 2 and PCM connector C-114 terminal 104.**

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

**YES :** Go to Step 11.

**NO :** Repair the damaged harness wire.

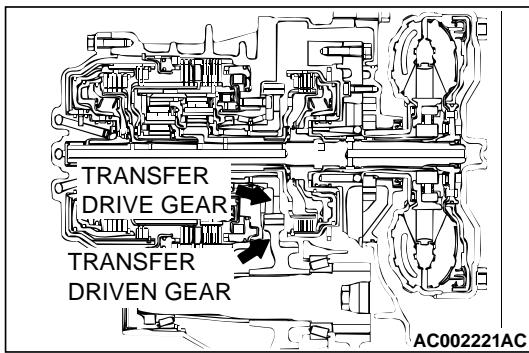
**STEP 11. Replace the output shaft speed sensor.**

- (1) Replace the output shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-8.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** Go to Step 12.

**NO :** The procedure is complete.

**STEP 12. Replace the transfer drive gear or driven gear.**

- (1) Replace the transfer drive gear or driven gear. Refer to GROUP 23B, Transaxle P.23B-8, Output Shaft P.23B-56.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** An A/T DTC may have set due to external radio frequency interference (RFI) possibly caused by cellular phone activity, or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.

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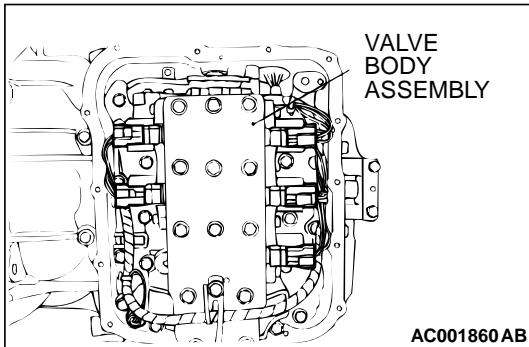
**STEP 13. Replace the PCM.**

- (1) Replace the PCM.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** Go to Step 14.

**NO :** The procedure is complete.



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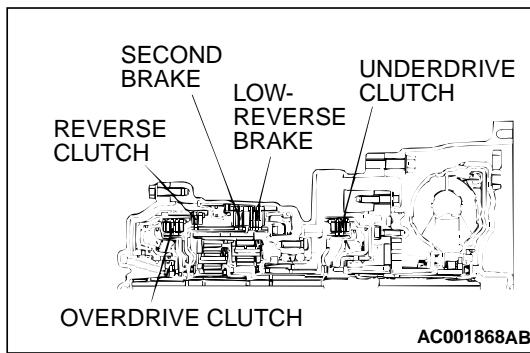
**STEP 14. Replace the valve body.**

- (1) Replace the transaxle valve body. Refer to GROUP 23B, Transaxle P.23B-8.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Were any A/T DTCs set?**

**YES :** Go to Step 15.

**NO :** The procedure is complete.

**STEP 15. Overhaul the A/T.**

(1) Replace the following parts.

- If DTC 41, DTC 42, or DTC 43 are set individually or in a group, replace the underdrive clutch. Refer to GROUP 23B, Underdrive Clutch and Input Shaft [P.23B-45](#).
- If DTC 43 or DTC 44 are set individually or in a group, replace the overdrive clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch [P.23B-47](#).
- If DTC 46 is set, replace the reverse clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch [P.23B-47](#).
- If DTC 41 or DTC 46 are set individually or in a group, replace the low-reverse brake. Refer to GROUP 23B, Transaxle [P.23B-8](#).
- If DTC 42 or DTC 44 are set individually or in a group, replace the second brake. Refer to GROUP 23B, Transaxle [P.23B-8](#).
- If DTC 41 is set, replace the one-way clutch. Refer to GROUP 23B, Planetary Gear [P.23B-54](#).

(2) Test drive the vehicle.

(3) Check for A/T diagnostic trouble code.

**Q: Are any A/T DTCs set again?**

**YES :** An A/T DTC may have set due to external radio frequency interference (RFI) possibly caused by cellular phone activity, or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.

**DTC 52: Torque Converter Clutch System****DTC SET CONDITIONS**

If the input shaft speed sensor signal is abnormal and the drive duty rate for the torque converter clutch solenoid valve is 100 percent for a period of more than 4 seconds, it is judged that there is a problem in the torque converter clutch system and DTC 52 is set.

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

- Malfunction of the torque converter clutch solenoid valve
- Malfunction of the input shaft speed sensor
- Malfunction of the underdrive clutch retainer
- Malfunction of the valve body
- Damaged harness or connector
- Malfunction of the PCM
- Malfunction of the torque converter

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

- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, read the A/T diagnostic trouble code.**

**⚠ CAUTION**

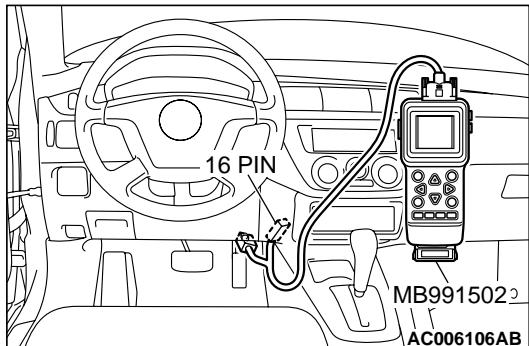
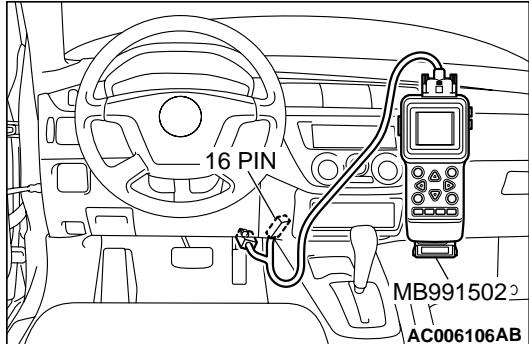
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T diagnostic trouble code.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is DTC 22 set?**

**YES :** Refer to [P.23Ac-100](#), DTC 22: Input Shaft Speed Sensor System.

**NO :** Go to Step 2.



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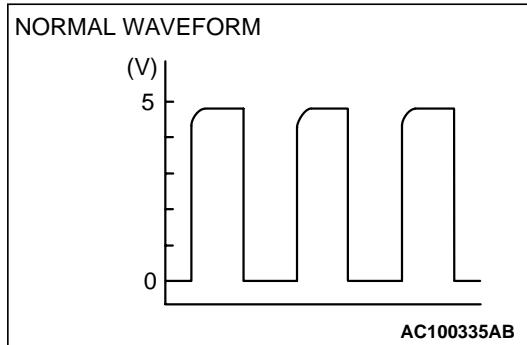
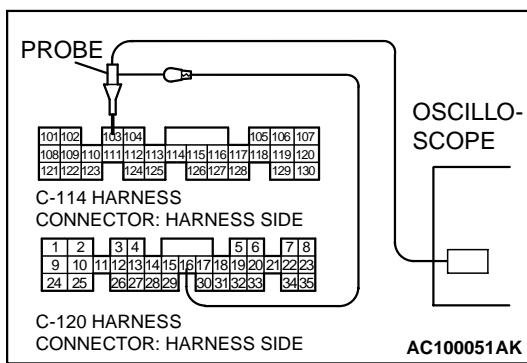
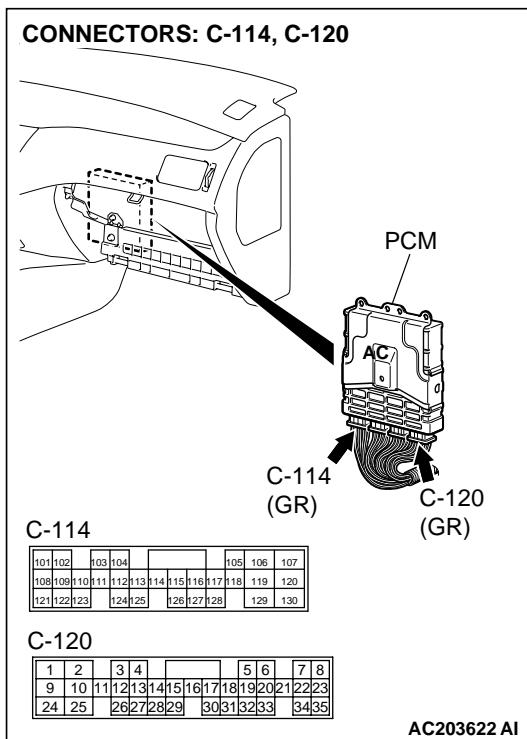
**STEP 2. Using scan tool MB991502, check actuator test item 06: Torque Converter Clutch Solenoid Valve.**

- (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 actuator test mode for item 06, Torque Converter Clutch Solenoid Valve.
  - An audible clicking or buzzing should be heard when the torque converter clutch solenoid valve is energized.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the solenoid valve operating properly?**

**YES :** Go to Step 3.

**NO :** Replace the torque converter clutch solenoid valve.  
Refer to GROUP 23B, Valve Body [P.23B-61](#).



**STEP 3. Using the oscilloscope, check the input shaft speed sensor waveform at PCM connectors C-114 and C-120 by backprobing.**

- (1) Do not disconnect connectors C-120 or C-114.

- (2) Connect an oscilloscope probe to PCM connector C-120 terminal 16 and PCM connector C-114 terminal 103 by backprobing.
- (3) Start the engine and drive the vehicle at a constant speed of 50 km/h (31 mph). (Gear range: 3rd gear)

- (4) Check the waveform.

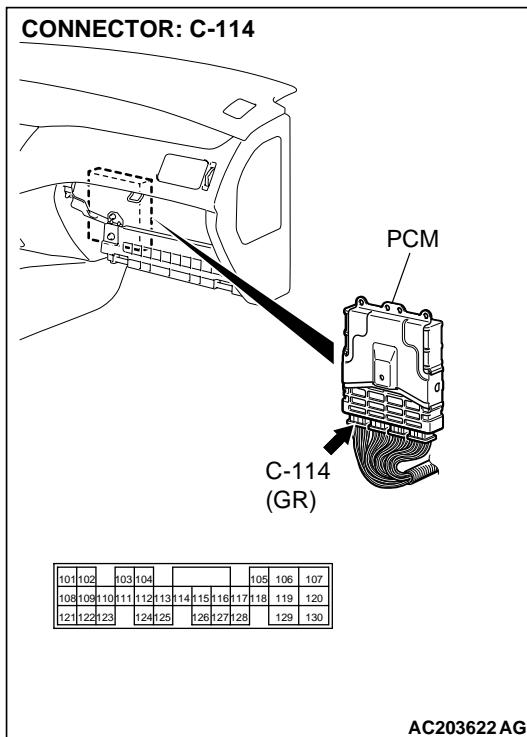
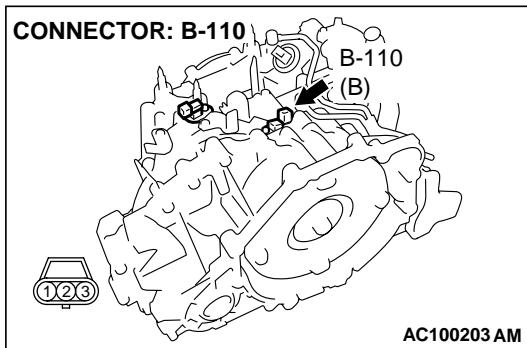
- The input shaft speed sensor waveform should show a pattern similar to the illustration. The maximum value should be 4.8 volts and more and the minimum value 0.8 volt and less. The output waveform should not contain electrical noise.

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

**Q: Is the waveform normal?**

**YES :** Go to Step 8.

**NO :** Go to Step 4.

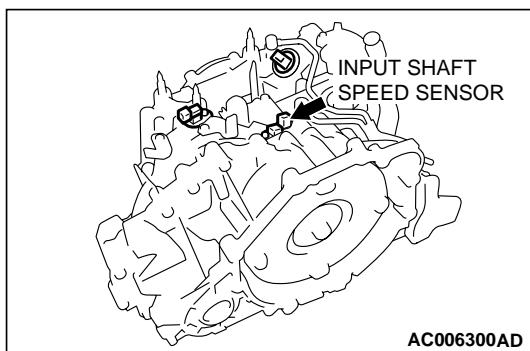
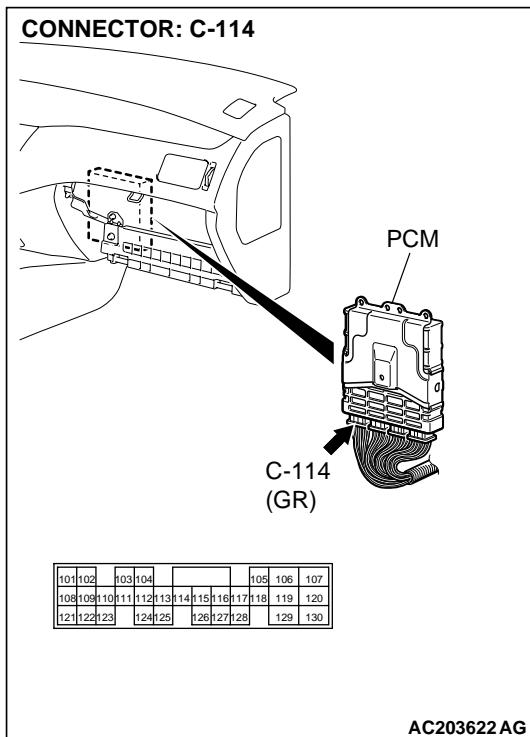
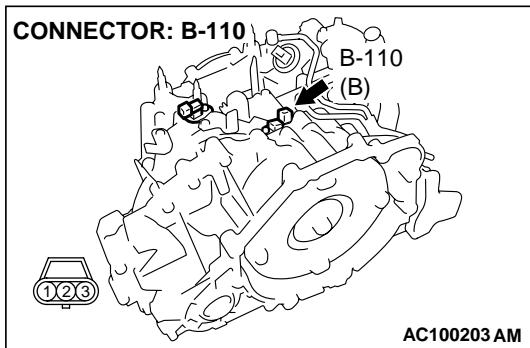


**STEP 4. Check input shaft speed sensor connector B-110 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Go to Step 5.

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




---

**STEP 5. Check the harness for damage between input shaft speed sensor connector B-110 terminal 2 and PCM connector C-114 terminal 103.**

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

**YES** : Go to Step 6.

**NO** : Repair the damaged harness wire.

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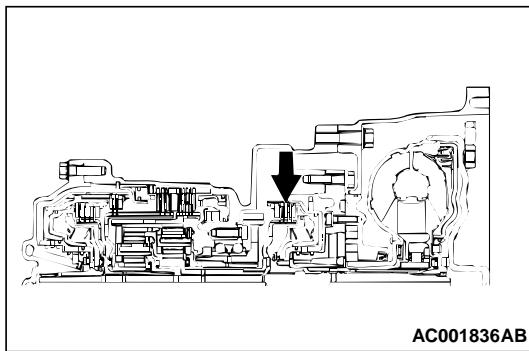
**STEP 6. Replace the input shaft speed sensor.**

- (1) Replace the input shaft speed sensor. Refer to GROUP 23B, Transaxle P.23B-8.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is DTC 52 set?**

**YES** : Go to Step 7.

**NO** : The procedure is complete.

**STEP 7. Replace the underdrive clutch retainer.**

- (1) Replace the underdrive clutch retainer. Refer to GROUP 23B, Underdrive Clutch and Input Shaft [P.23B-45](#).
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is DTC 52 set?**

**YES :** The A/T DTC may have set due to external radio frequency interference (RFI) possibly caused by cellular phone activity or aftermarket components installed on the vehicle.

**NO :** The procedure is complete.

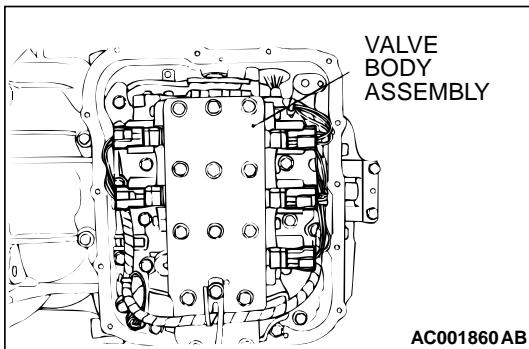
**STEP 8. Replace the PCM.**

- (1) Replace the PCM.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is A/T DTC 52 set?**

**YES :** Go to Step 9.

**NO :** The procedure is complete.

**STEP 9. Replace the valve body.**

- (1) Replace the valve body. Refer to GROUP 23B, Transaxle [P.23B-8](#).
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is DTC 52 set?**

**YES :** Replace the torque converter. Refer to GROUP 23B, Transaxle [P.23B-8](#).

**NO :** The procedure is complete.

**DTC 53: Torque Converter Clutch is Stuck On****DTC SET CONDITIONS**

If the torque converter clutch remains engaged for a continuous period of ten seconds or more when the PCM is attempting to disengage the torque converter clutch, DTC 53 is set.

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

- Malfunction of the torque converter clutch solenoid valve
- Malfunction of the valve body
- Damaged harness or connector
- Malfunction of the PCM

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

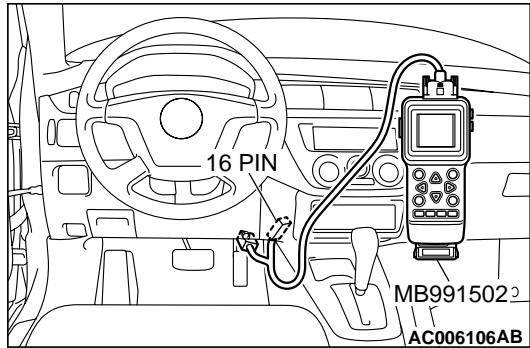
- MB991502: Scan Tool (MUT-II)

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**STEP 1. Using scan tool MB991502, check data list item 52:  
Amount of Torque Converter Clutch Slippage.**

**⚠ 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 drive the vehicle at a constant speed of 60km/h (37 mph). (Gear range: 3rd gear)
- (3) Set scan tool MB991502 to the data reading mode for item 52, Amount of Torque Converter Clutch Slippage.
  - Driving at a constant speed of 60 km/h (37 mph), the display should be "-10 to 10 r/min."
  - If the accelerator pedal is released, the display on the scan tool changes. (50 km/h (31 mph) and less).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the torque converter clutch slippage within the specified range?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.

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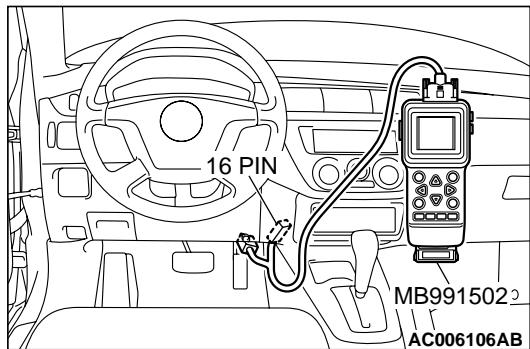
**STEP 2. Using scan tool MB991502, check actuator test item 06: Torque Converter Clutch Solenoid Valve.**

- (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 actuator test mode for item 06, Torque Converter Clutch Solenoid Valve.
  - An audible clicking or buzzing should be heard when the torque converter clutch solenoid valve is energized.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the solenoid valve operating properly?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.



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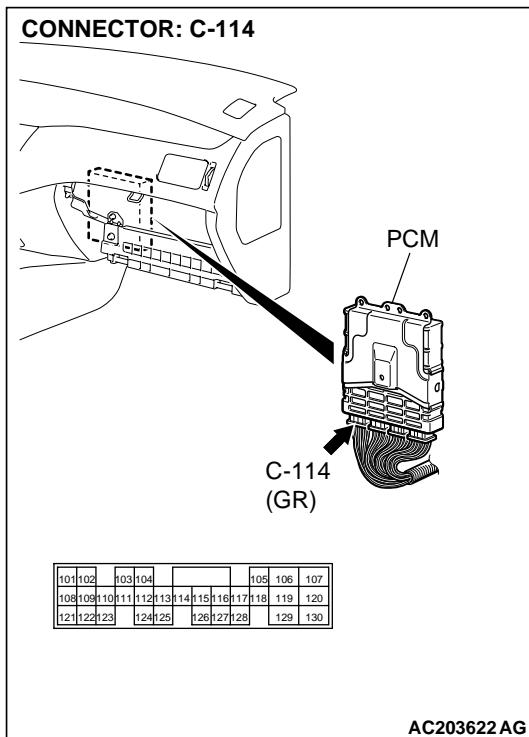
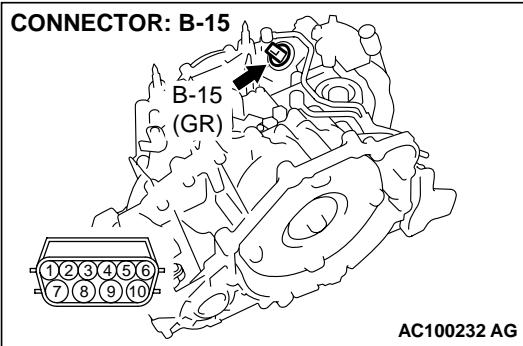
**STEP 3. Check the harness for a short circuit to ground between A/T control solenoid valve assembly connector B-15 and PCM connector C-114.**

- (1) Disconnect A/T control solenoid valve assembly connector B-15 and PCM connector C-114.
- (2) Check for continuity between the A/T control solenoid valve assembly connector B-15 terminal 7 and ground.
- (3) The measurement should indicate an open circuit.

**Q: Does continuity exist?**

**YES :** Go to Step 4.

**NO :** Repair the harness short to ground.



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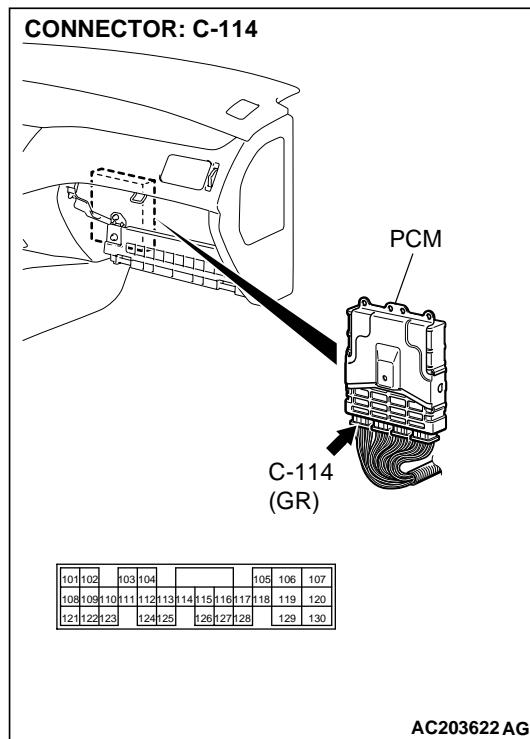
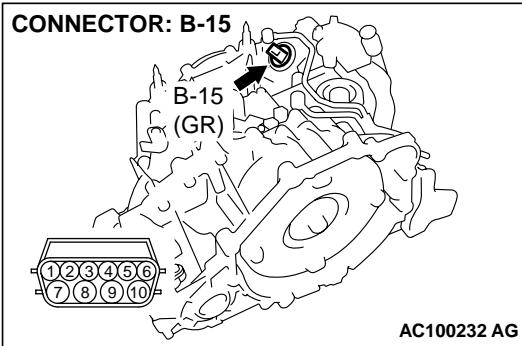
**STEP 4. Check A/T control solenoid valve assembly connector B-15 and PCM connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors and terminals in good condition?**

**YES :** Replace the torque converter clutch solenoid valve.

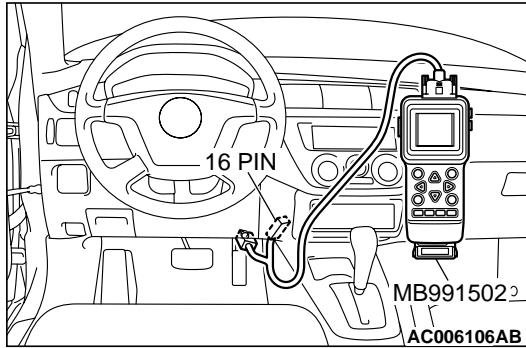
Refer to GROUP 23B, Valve Body [P.23B-61](#).

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



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**STEP 5. Using scan tool MB991502, check data list item 52:  
Amount of Torque Converter Clutch Slippage. (Second  
check)**



- (1) Connect scan tool MB991502 to the data link connector.
- (2) Start the engine and drive the vehicle at a constant speed of 60km/h (37 mph). (Gear range: 3rd gear)
- (3) Set scan tool MB991502 to data reading mode for item 52, Amount of Torque Converter Clutch Slippage.
  - Driving at a constant speed of 60 km/h (37 mph), the display should be "-10 to 10 r/min."
  - If the accelerator pedal is released, the display on the scan tool changes. (50 km/h (31 mph) and less).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the torque converter clutch slippage within the specified range?**

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

**NO :** Go to Step 6.

---

**STEP 6. Replace the PCM.**

- (1) Replace the PCM.
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is DTC 53 set?**

**YES :** Go to Step 7.

**NO :** The procedure is complete.

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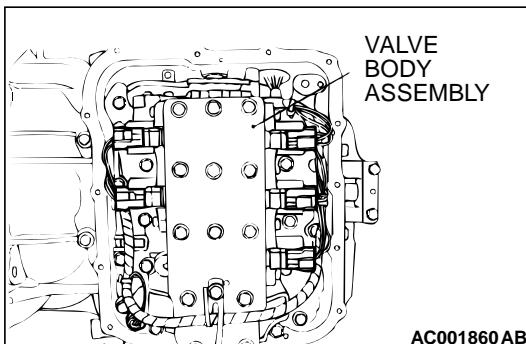
**STEP 7. Replace the valve body.**

- (1) Replace the valve body. Refer to GROUP 23B, Transaxle [P.23B-8](#).
- (2) Test drive the vehicle.
- (3) Check for A/T diagnostic trouble code.

**Q: Is DTC 53 set?**

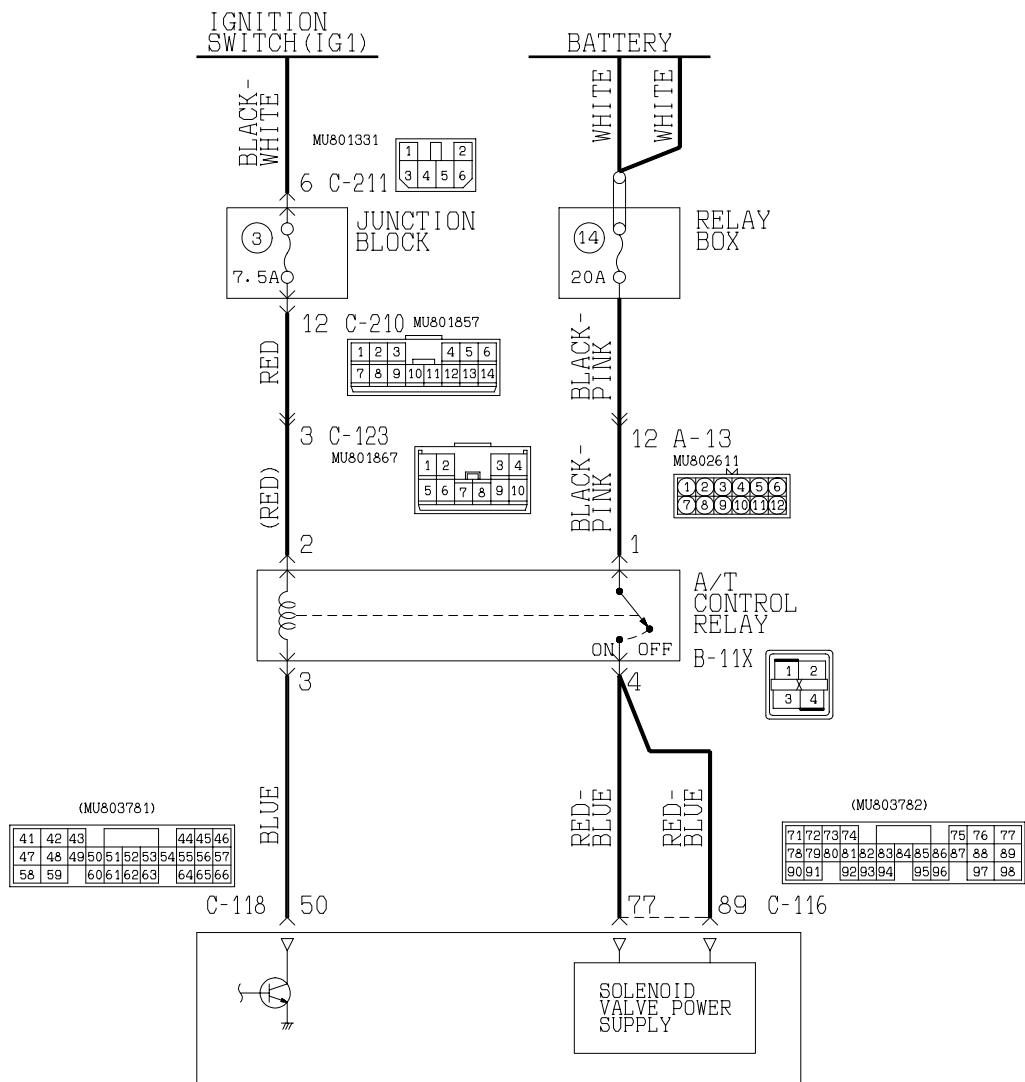
**YES :** Replace the Torque Converter. Refer to GROUP 23B,  
Transaxle [P.23B-8](#).

**NO :** The procedure is complete.

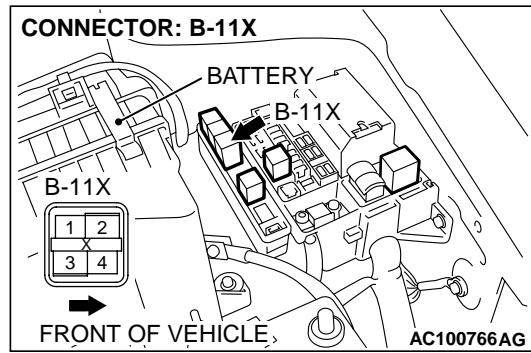
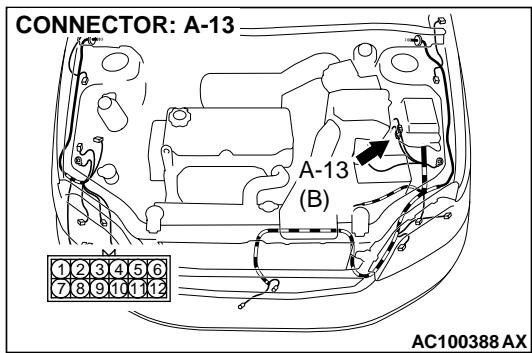


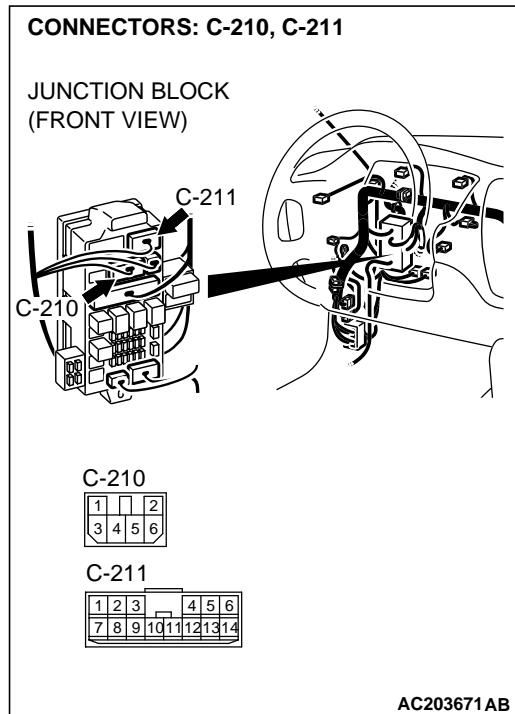
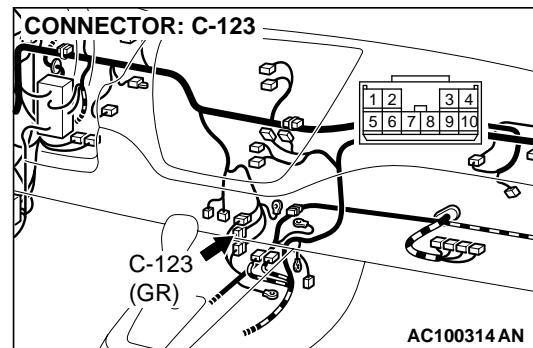
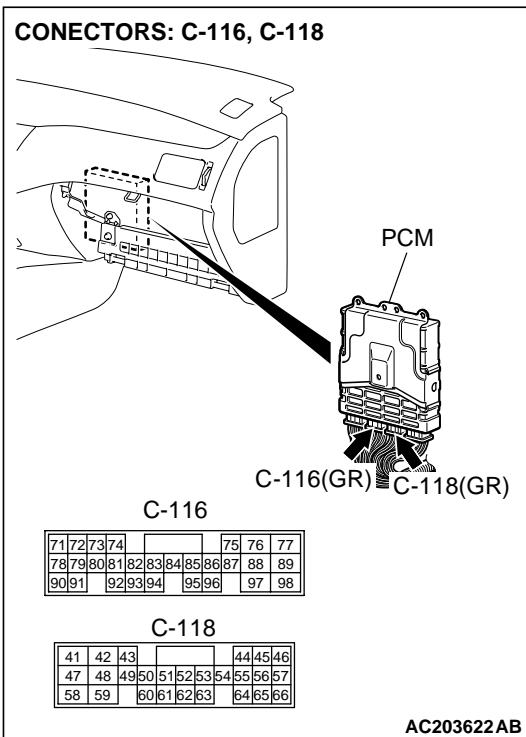
## DTC 54: A/T Control Relay System

A/T Control Relay System Circuit



AC100494AC





### CIRCUIT OPERATION

- A/T control relay (terminal 4) receives the battery positive voltage through a dedicated 20 amp fuse.

- When the ignition switch is turned to the "ON" position, the PCM (terminal 50) receives battery voltage from the ignition switch. The PCM (terminal 50) applies voltage to energize the A/T control relay (terminal 3). With the A/T control relay energized, system voltage is applied to the PCM (terminals 77 and 89).

**DTC SET CONDITIONS**

If the A/T control relay voltage is less than 7 volts at the PCM (terminals 77 and 89) when the ignition switch is in the "ON" position DTC 54 will be set. The transaxle is locked into the 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

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

- Malfunction of the A/T control relay
- Damaged harness or connector
- Malfunction of the PCM

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

- MB991502: Scan Tool (MUT-II)

**STEP 1. Using scan tool MB991502, check data list item 54: A/T Control Relay Output Voltage.**** CAUTION**

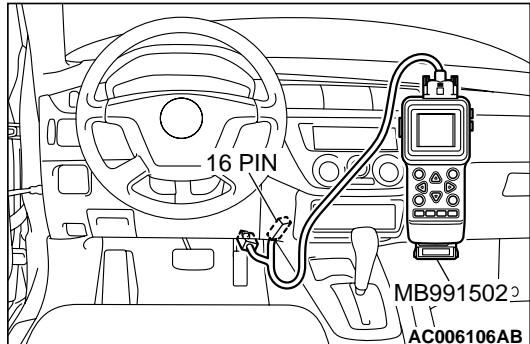
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

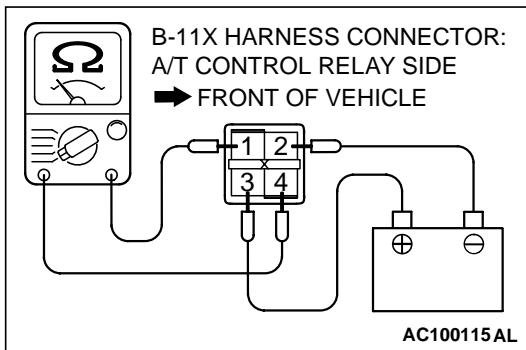
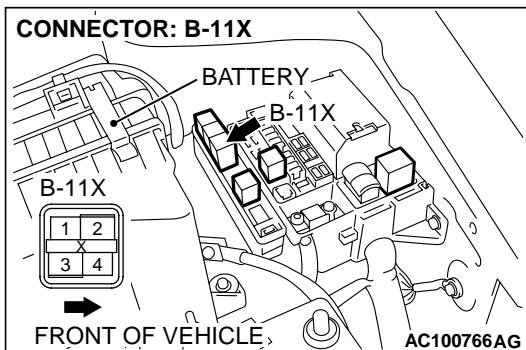
- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991502 to data reading mode for item 54, A/T Control Relay Output Voltage.
  - The voltage should equal battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage equal battery positive voltage?**

**YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Go to Step 2.






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**STEP 2. Check the A/T control relay.**

- (1) Remove the A/T control relay from the engine component relay box connector B-11X.

- (2) Using jumper wires, connect terminal 3 to the positive battery terminal, and terminal 2 to the negative battery terminal.

- (3) Measure the resistance between terminals 1 and 4 of the A/T control relay.
  - The resistance should measure less than 2 ohms.
  - Disconnect the jumper wires. The resistance between terminals 1 and 4 should measure over limits (open circuit).

**Q: Does the resistance measure less than 2 ohms when the relay is energized, and open circuit when the relay is de-energized?**

**YES :** Go to Step 3.

**NO :** Replace the A/T control relay.

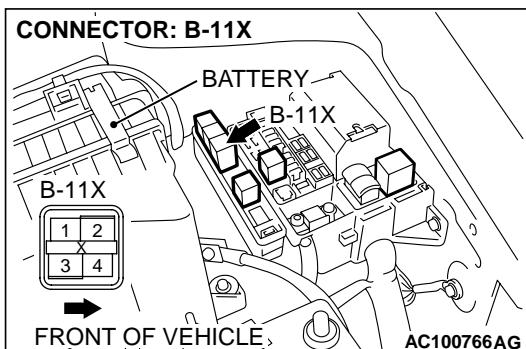
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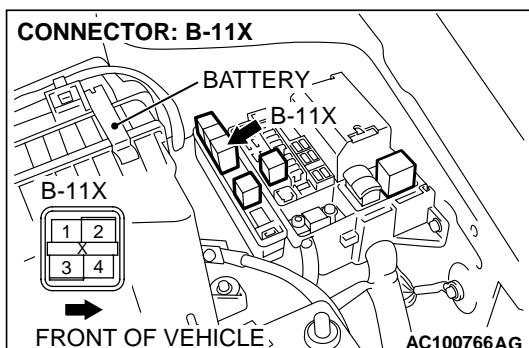
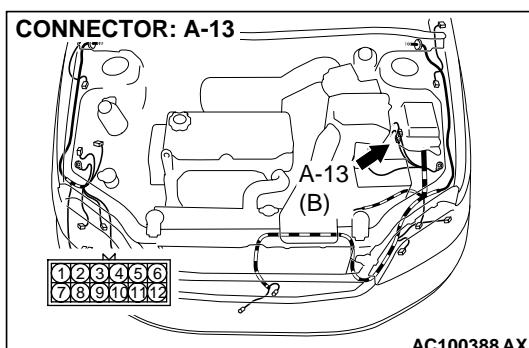
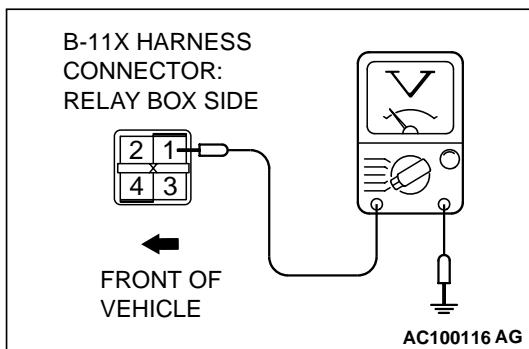
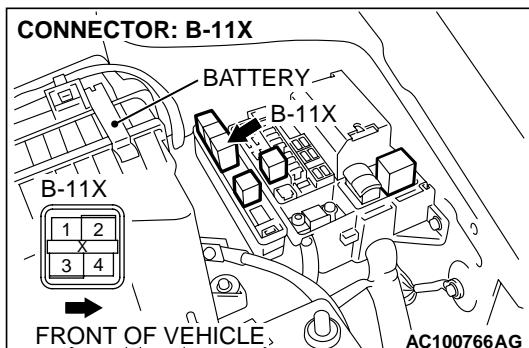
**STEP 3. Check A/T control relay socket B-11X in the engine compartment relay box for loose, corroded or damaged terminals, or terminals pushed back in the socket.**

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

**YES :** Go to Step 4.

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






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**STEP 4. Measure the supply voltage at A/T control relay connector B-11X in the engine component relay box.**

(1) Disconnect the A/T control relay.

(2) Measure the voltage between terminal 1 and ground.

- The measured voltage should equal battery positive voltage.

**Q: Is the measured voltage equal to battery positive voltage?**

- YES :** Go to Step 7.  
**NO :** Go to Step 5.

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**STEP 5. Check intermediate connector A-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

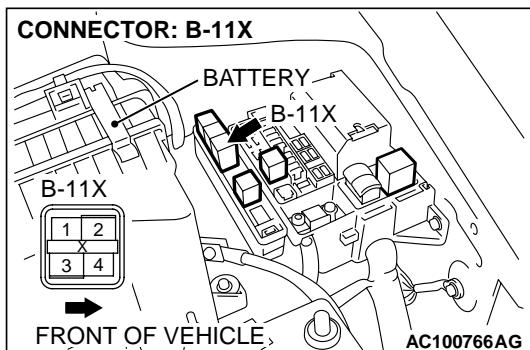
- YES :** Go to Step 6.  
**NO :** Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

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**STEP 6. Check the harness for open circuit or short circuit to ground between A/T control relay connector B-11X terminal 1 in the engine component relay box and battery.**

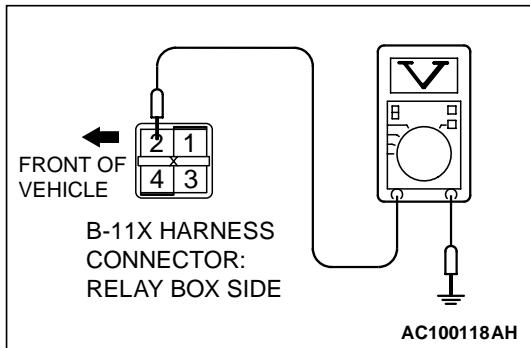
**Q: Is the harness wire in good condition?**

- YES :** Go to Step 18.  
**NO :** Repair or replace the harness wire.



**STEP 7. Measure the supply voltage at A/T control relay connector B-11X in the engine component relay box.**

- (1) Disconnect the A/T control relay.
- (2) Turn the ignition switch to the "ON" position.

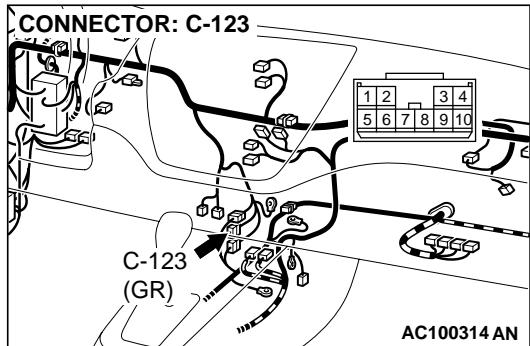


- (3) Measure the voltage between terminal 2 and ground.
  - The measured voltage should equal battery positive voltage.

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

**Q: Is the measured voltage equal to battery positive voltage?**

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

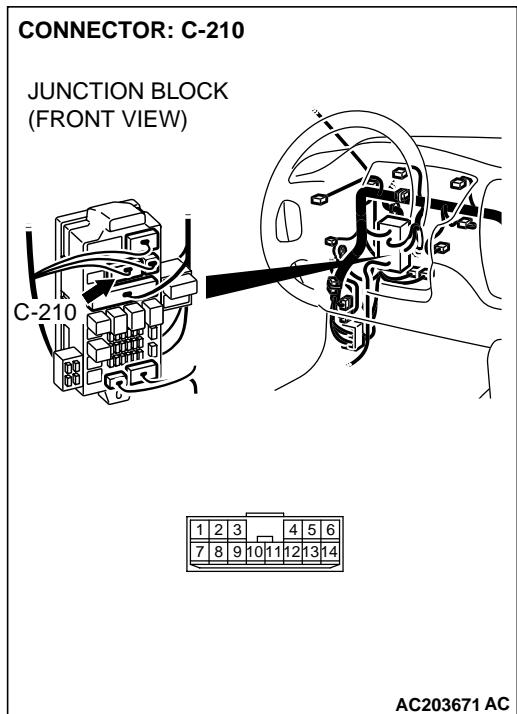


**STEP 8. Check intermediate connector C-123 and junction block connector C-210 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connectors in good condition?**

**YES :** Go to Step 9.

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

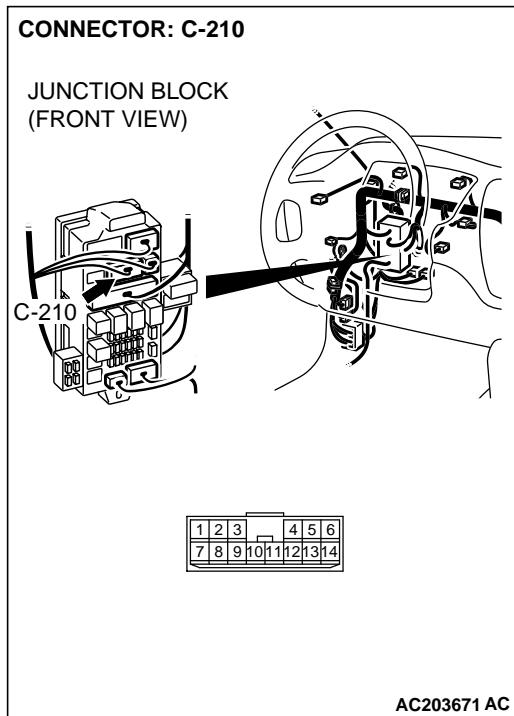
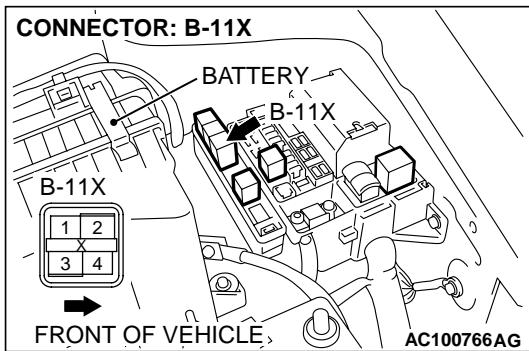


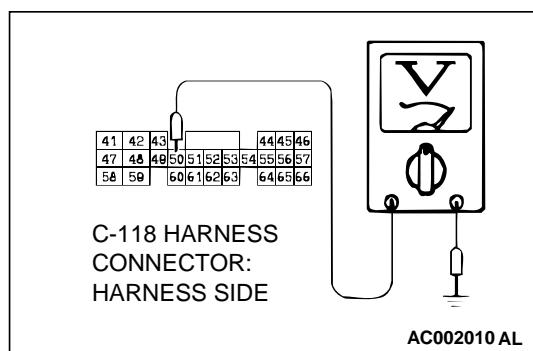
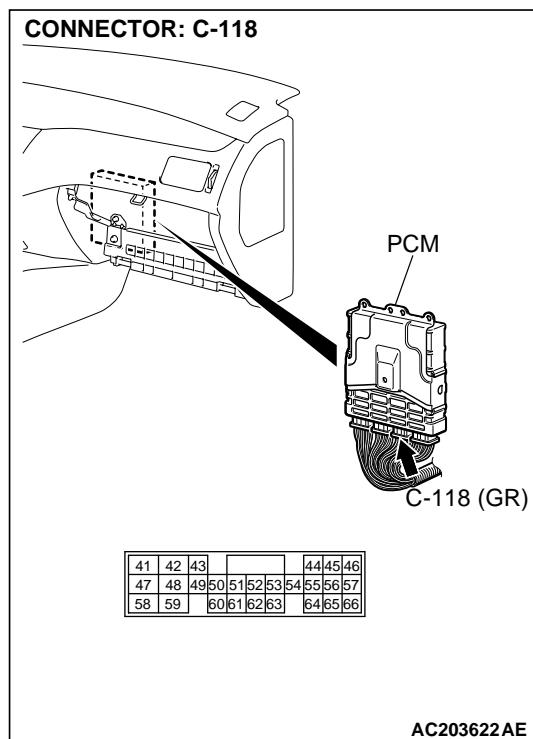
**STEP 9. Check the harness for open circuit or short circuit to ground between A/T control relay connector B-11X terminal 2 in the engine component relay box and junction block connector C-210 terminal 12.**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.





**STEP 10. Measure the supply voltage at PCM connector C-118 by backprobing.**

(1) Do not disconnect connector C-118.

(2) Measure the voltage between terminal 50 and ground by backprobing.

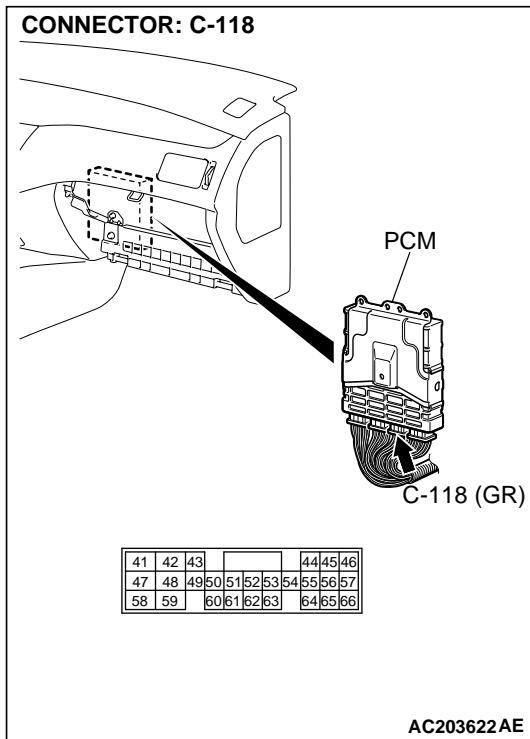
- The measured voltage should equal battery positive voltage.

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

**Q: Does the measured voltage equal battery positive voltage?**

**YES :** Go to Step 14.

**NO :** Go to Step 11.

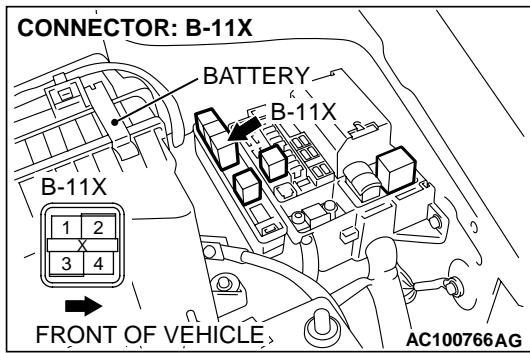


**STEP 11. Check PCM connector C-118 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 12.

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

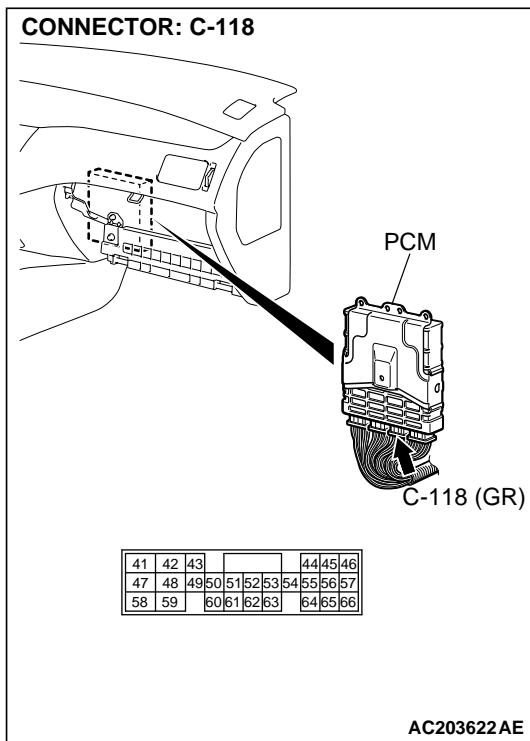


**STEP 12. Check harness for open circuit or damage between A/T control relay connector B-11X terminal 3 in the engine component relay box and PCM connector C-118 terminal 50.**

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

**YES :** Go to Step 13.

**NO :** Repair or replace the harness wire.



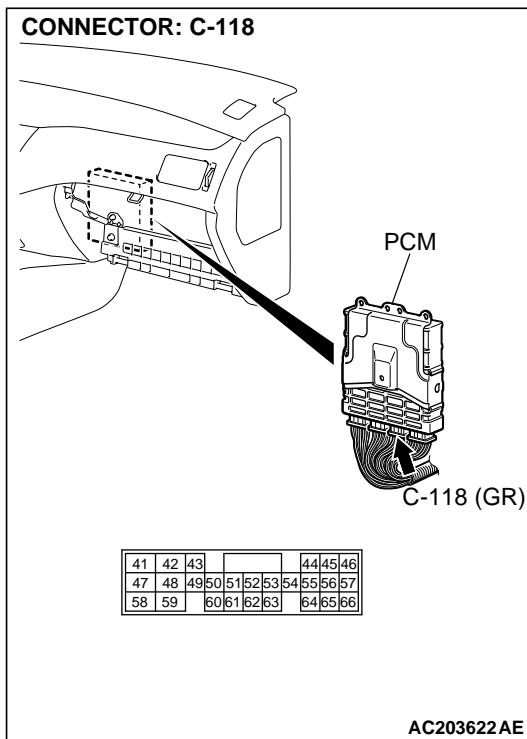
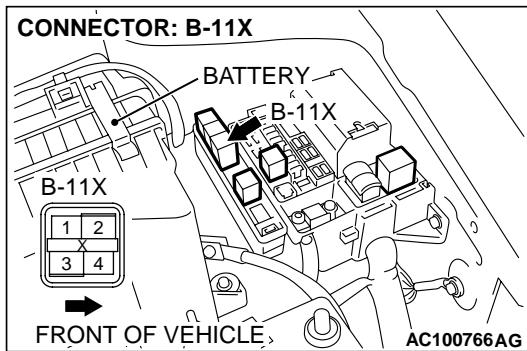
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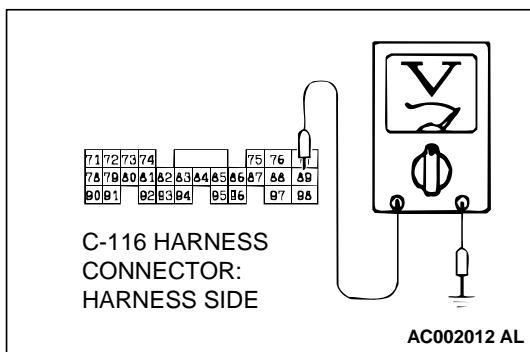
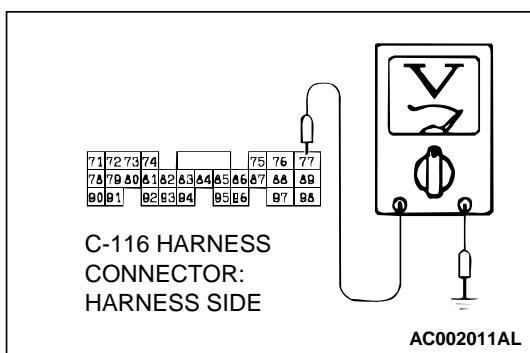
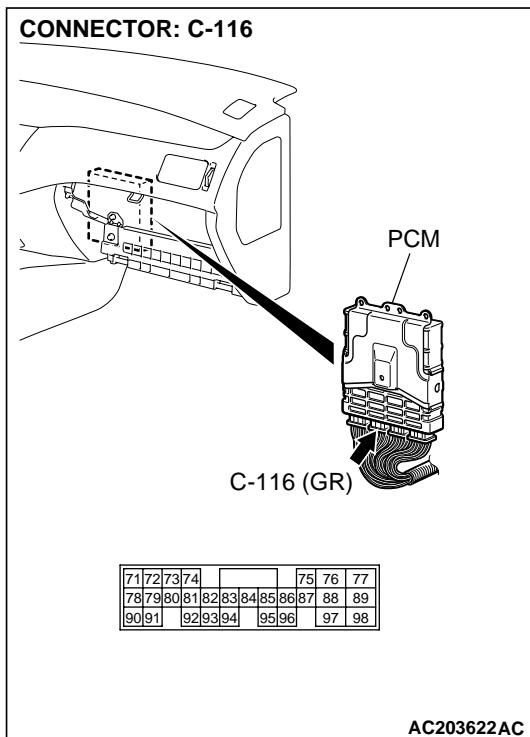
**STEP 13. Check harness for short circuit to ground between A/T control relay connector B-11X terminal 3 in the engine component relay box and PCM connector C-118 terminal 50.**

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

**YES :** Go to Step 14.

**NO :** Repair or replace the harness wire.





**STEP 14. Measure the A/T control relay output voltage at PCM connector C-116 by backprobing.**

- (1) Do not disconnect connector C-116.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 77 and ground by backprobing.

- The measured voltage should equal battery positive voltage.

- (4) Measure the voltage between terminal 89 and ground by backprobing.

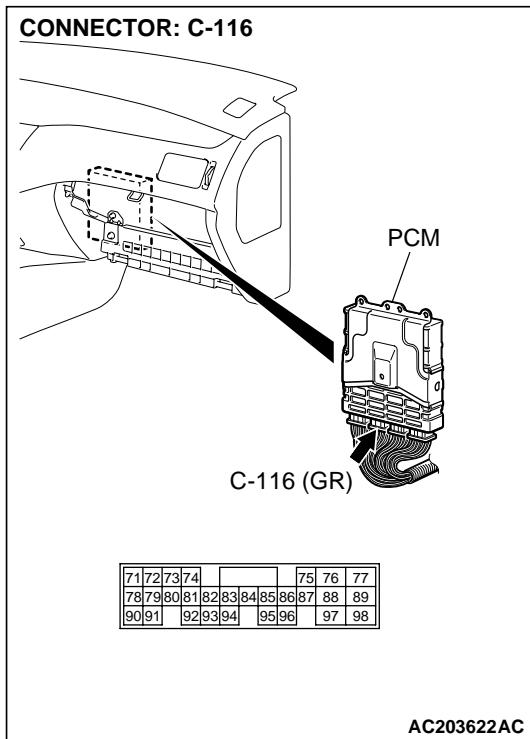
- The measured voltage should equal battery positive voltage.

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

**Q: Is the measured voltage equal to battery positive voltage between terminal 77 and ground, and between terminal 89 and ground?**

**YES :** Go to Step 18.

**NO :** Go to Step 15.

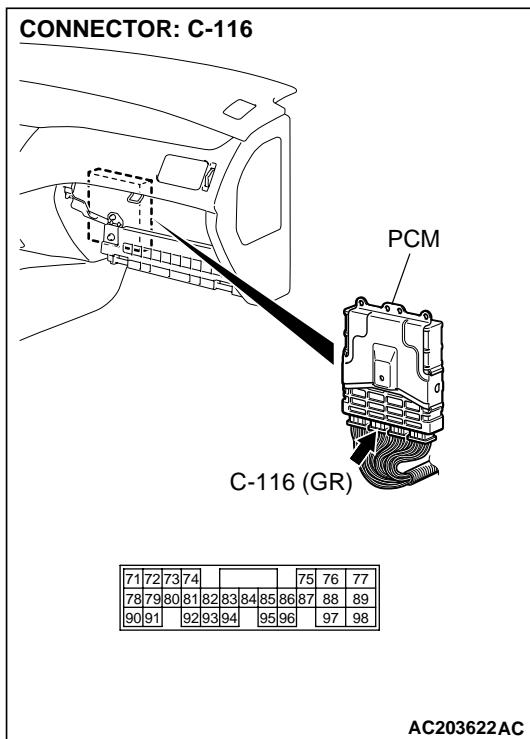
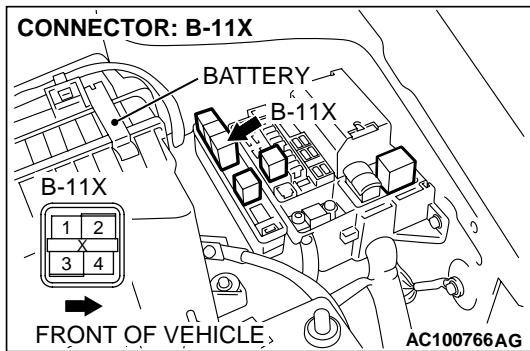


**STEP 15. Check PCM connector C-116 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are the connector and terminals in good condition?**

**YES :** Go to Step 16.

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



**STEP 16. Check harness for open circuit or damage between A/T control relay connector B-11X (terminal 4) in the engine component relay box and PCM connector C-116 (terminals 77 and 89).**

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

**YES :** Go to Step 17.

**NO :** Repair or replace the harness wire.

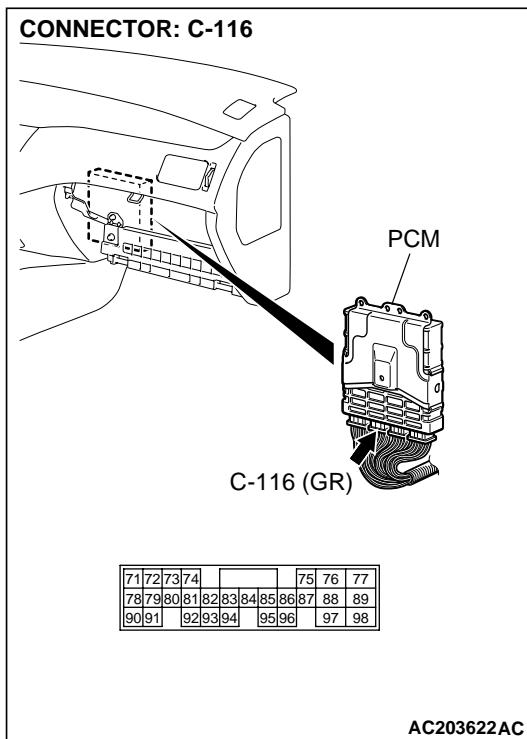
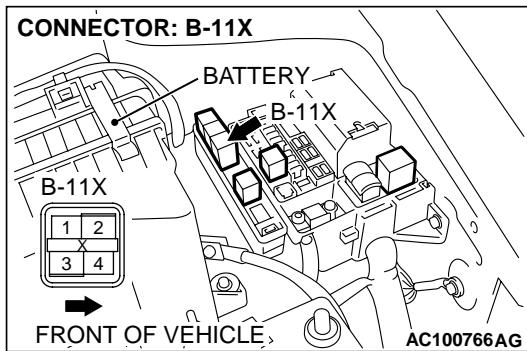
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**STEP 17. Check harness for short circuit to ground between A/T control relay connector B-11X (terminal 4) in the engine component relay box and PCM connector C-116 (terminals 77 and 89).**

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

**YES :** Go to Step 18.

**NO :** Repair or replace the harness wire.



**STEP 18. Using scan tool MB991502, check data list item 54: A/T control relay output 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 data reading mode for item 54, A/T Control Relay Output Voltage.
  - The voltage should equal battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the measured voltage equal battery positive voltage?**

**YES :** It can be that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.

**NO :** Replace the PCM.

