GROUP 17

ENGINE AND EMISSION CONTROL

CONTENTS

Continued on next page

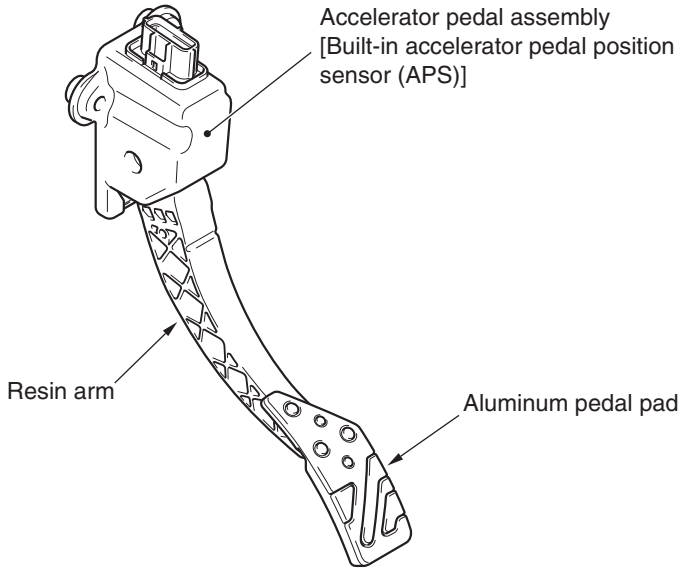
ENGINE CONTROL

GENERAL INFORMATION

M1171000100921

For the accelerator system, an electronic throttle valve control system is utilized, eliminating the accelerator cable.

CONSTRUCTION DIAGRAM



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ENGINE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION

M1171002000351

If there is a malfunction in the engine control system, the accelerator pedal or throttle body may be faulty.

TROUBLESHOOTING STRATEGY

M1171002100381

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find an engine control system fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify that the malfunction is eliminated.

SYMPTOM CHART

M1171002200429

Symptom	Inspection procedure	Reference page
Throttle valve will not fully open or close	1	P.17-4
Accelerator pedal operation not smooth (over acceleration)	2	P.17-5

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SYMPTOM PROCEDURES

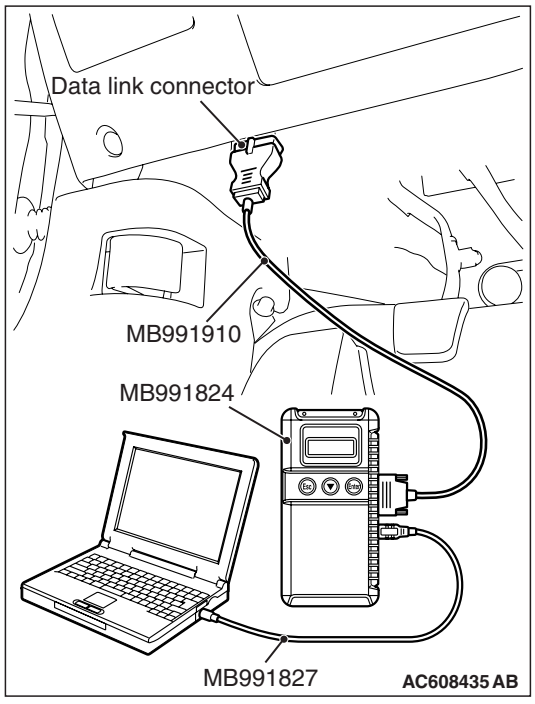
Inspection Procedure 1: Throttle Valve will not Fully Open or Close

COMMENT
The throttle body or accelerator pedal position sensor (APP sensor) is suspected.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of the throttle body.
- Malfunction of the APP sensor.
- Malfunction of the engine control module (ECM).

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

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

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Turn the power switch of special tool MB991824 to the "ON" position.

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

(7) Start the M.U.T.-III system on the personal computer.
(8) Turn the ignition switch to the "ON" position.
(9) Check for MFI system DTC. (Refer to GROUP 13A, MFI Diagnosis, Diagnostic Function –How to Read and Erase Diagnostic Trouble Codes P.13A-9).
(10) Turn the ignition switch to the "LOCK" (OFF) position, and then remove scan tool MB991958 in the reverse order of installation.

Q: Is any DTC set?

YES : Repair MFI system. (Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-44). Then go to Step 2.

NO : Go to Step 2.

STEP 2. Retest the system.

Q: Does the throttle valve fully open and close?

YES : The procedure is complete.
NO : Return to Step 1.

Inspection Procedure 2: Accelerator Pedal Operation not Smooth (Over Acceleration)

COMMENT

The accelerator pedal, its installation condition or the APP sensor is suspected.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the accelerator pedal.
- Incorrectly installed accelerator pedal.
- Malfunction of the APP sensor.

DIAGNOSIS

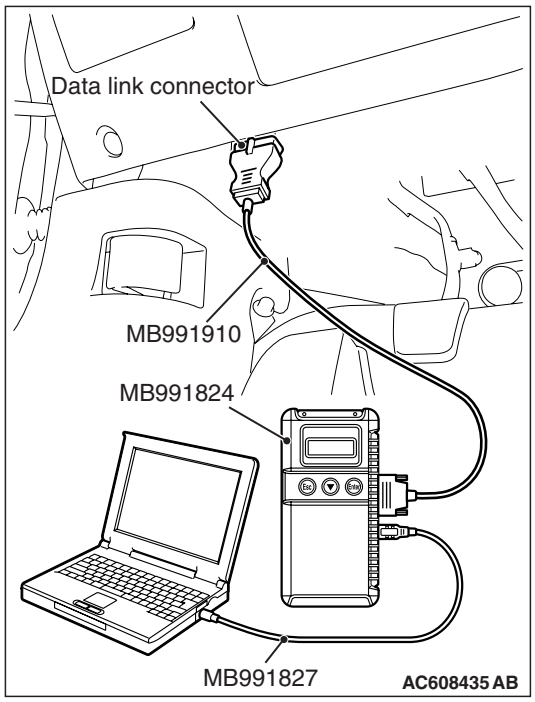
Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Check if the accelerator pedal is installed correctly.

Q: Is the accelerator pedal installed correctly?

YES : Go to Step 2.
NO : Remove and reinstall the accelerator pedal (Refer to P.17-8). Then go to Step 3.



STEP 2. Using scan tool MB991958, read the MFI system DTC.

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

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Turn the power switch of special tool MB991824 to the "ON" position.

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

(7) Start the M.U.T.-III system on the personal computer.
(8) Turn the ignition switch to the "ON" position.
(9) Check for MFI system DTC. (Refer to GROUP 13A, MFI Diagnosis, Diagnostic Function –How to Read and Erase Diagnostic Trouble Codes P.13A-9).
(10) Turn the ignition switch to the "LOCK" (OFF) position, and then remove scan tool MB991958 in the reverse order of installation.

Q: Is any DTC set?

YES : Repair MFI system (Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-44). Then go to Step 3.
NO : Go to Step 3.

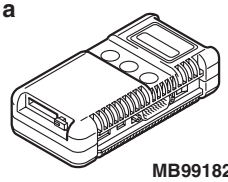
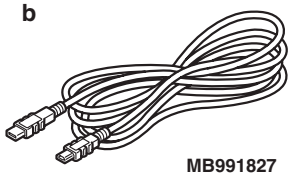
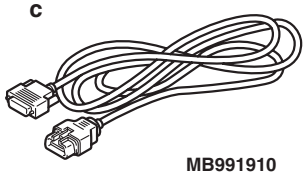
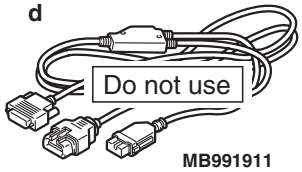
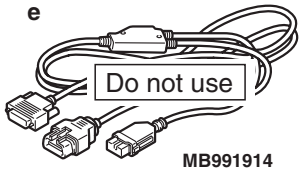
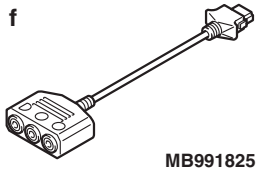
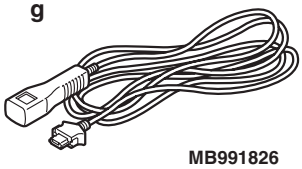
STEP 3. Retest the system.

Q: Does the accelerator pedal work normally?

YES : The procedure is complete.
NO : Return to Step 1.

SPECIAL TOOL

M1171000600142

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991914 f: MB991825 g: MB991826 Scan tool (M.U.T.-III sub assembly) a: Vehicle communication interface (V. C. I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III main harness C (for Daimler Chrysler models only) f: M.U.T.-III measurement adapter g: M.U.T.-III trigger harness	MB991824-KIT *NOTE: g: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Checking diagnostic trouble code (DTC)

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ACCELERATOR PEDAL

REMOVAL AND INSTALLATION

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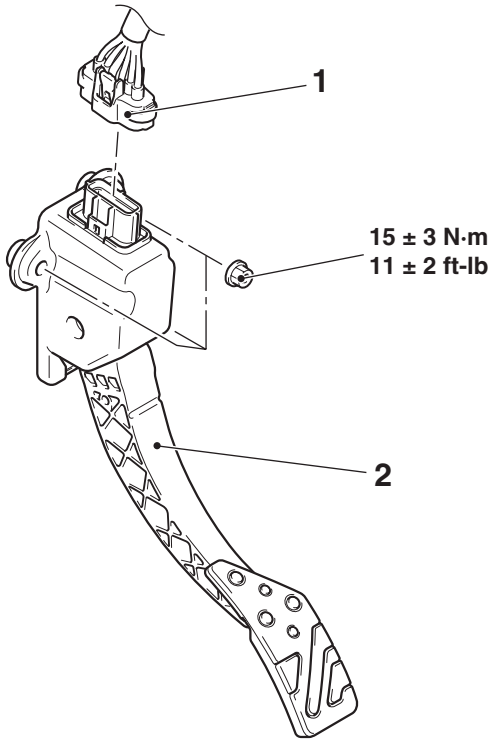
Pre-removal and post-installation operation
- Instrument Panel Cover Lower Removal and Installation (Refer to GROUP 52A, Instrument Lower Panel P.52A-8). <MR>



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Removal steps
1. Accelerator pedal position sensor connector
2. Accelerator pedal assembly

AUTO-CRUISE CONTROL

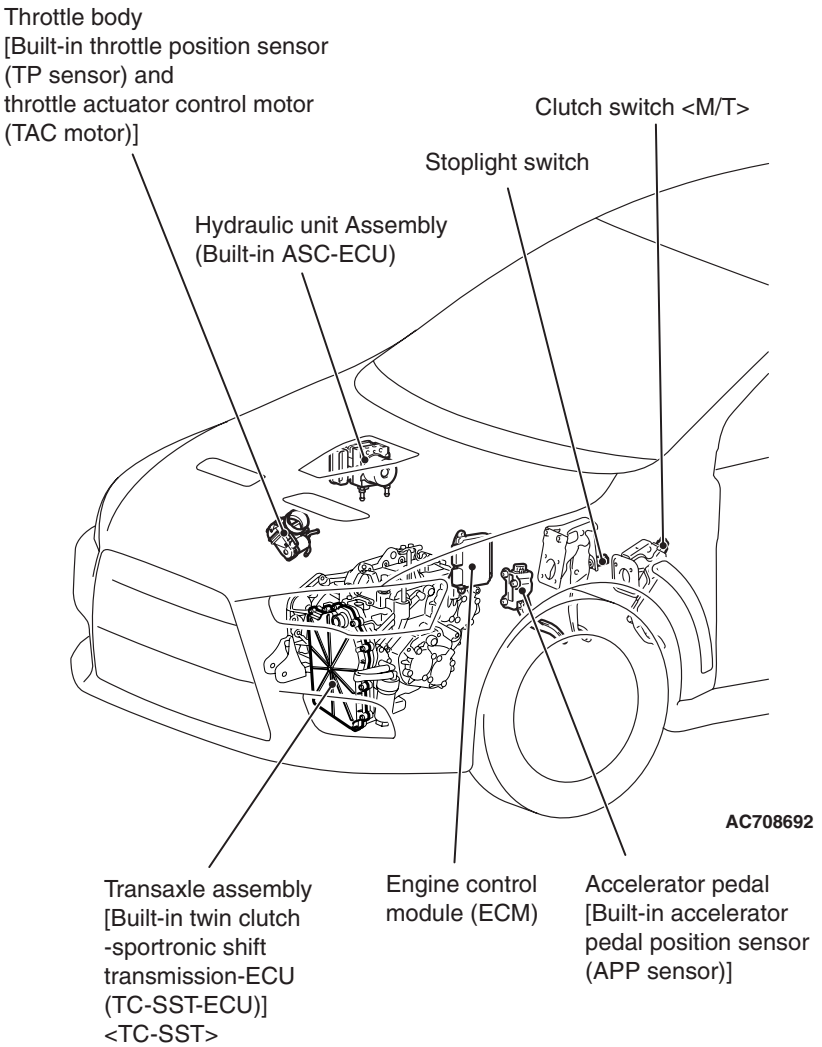
GENERAL INFORMATION

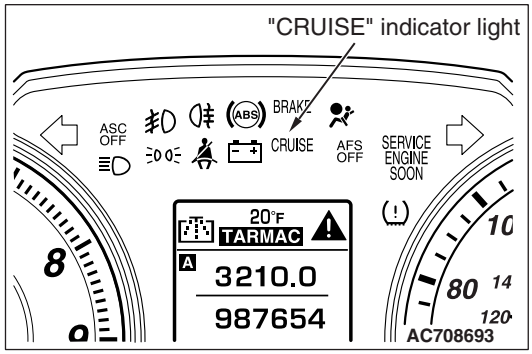
M1172000100742

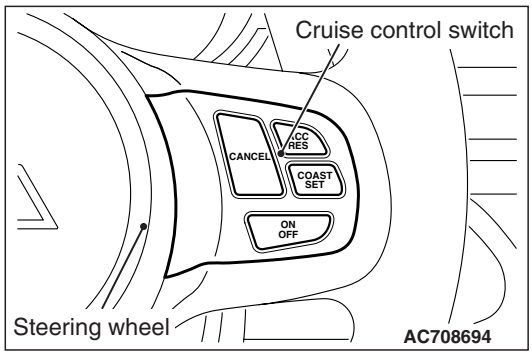
By using the cruise control system, the driver can drive at preferred speeds in a range of approximately 40 to 200 km/h (25 to 125 mph) without depressing the accelerator pedal.

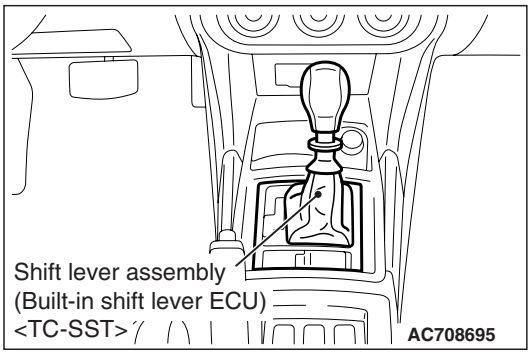
For this cruise control system, in conjunction with the electronic throttle valve control system, the engine control module (ECM) electronically controls the throttle valve.

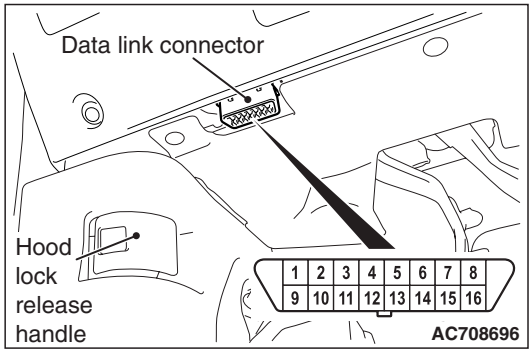
CONSTRUCTION DIAGRAM











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AUTO-CRUISE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION TO CRUISE CONTROL SYSTEM DIAGNOSIS

M1172003300358

The cruise control system allows driving without stepping on the accelerator pedal by setting a random speed between approximately 40 km/h (25 mph) and 200 km/h (125 mph). Malfunctions in this system can be investigated by the following methods.

CRUISE CONTROL SYSTEM DIAGNOSTIC TROUBLE CODES

The cruise control system consists of the ECM, control switches and sensors. The control switches and sensors monitor the state of the vehicle. The ECM controls the throttle valve opening angle in the throttle body in accordance with the input signals from the switches and sensors. If the ECM detects a malfunction on any of those components, the ECM estimates where the problem may be occurring, and will set a diagnostic trouble code (DTC). DTCs cover the cruise control switch, stoplight switch and ECM.

DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1172002000826

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will check most of the possible causes of a cruise control system malfunction.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any cruise control system DTC (Refer to P.17-10, Diagnostic Function –How to Read Diagnostic Trouble Codes).
4. If you cannot verify the condition and there are no cruise control system DTCs, the malfunction may be intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunctions P.00-15).
5. If you can verify the condition but there are no cruise control system DTCs, find the fault (Refer to P.17-38, Symptom Chart).
6. If there is an cruise control system DTC, record the number of the code, then erase the code (Refer to P.17-10, Diagnostic Function –How to Erase Diagnostic Trouble Codes).
7. Re-create the cruise control system DTC set conditions to see if the same cruise control system DTC will set again (Refer to P.17-10, Diagnostic Function –How to Read Diagnostic Trouble Codes).
   - If the same cruise control system DTC sets again, perform the diagnostic procedures for the set code (Refer to P.17-13, Diagnostic Trouble Code Chart).

DIAGNOSTIC FUNCTION

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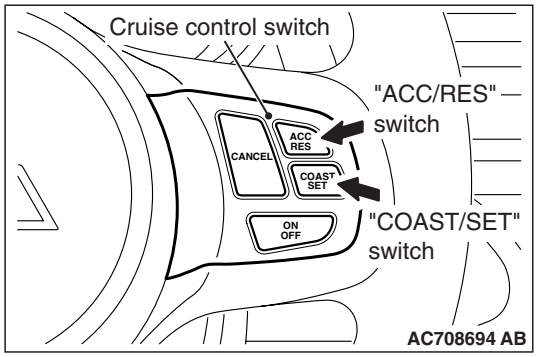
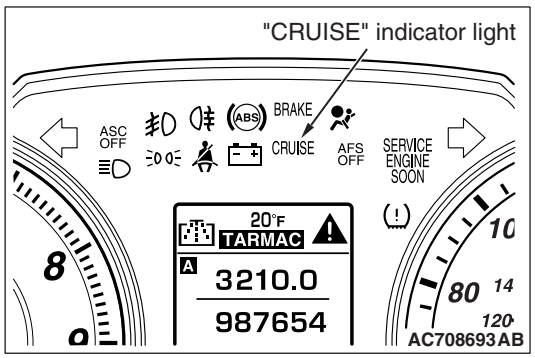
HOW TO READ DIAGNOSTIC TROUBLE CODES

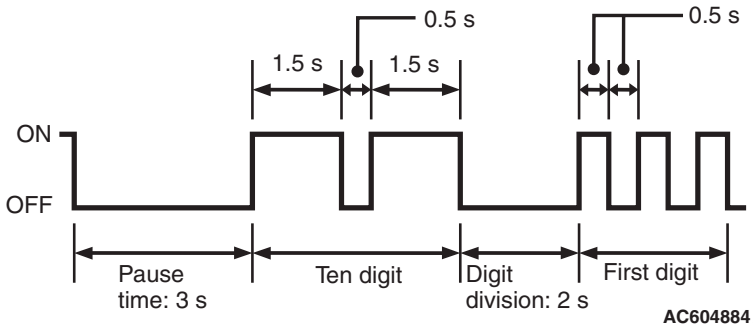
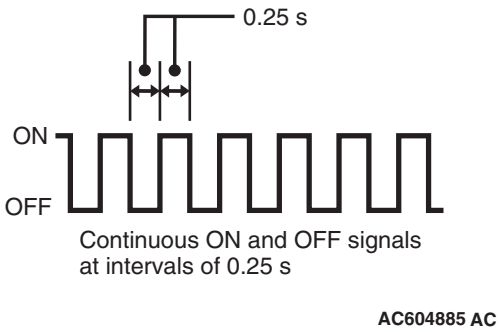


1. Turn the ignition switch to the "ON" position while press the "COAST/SET" switch. Then, within one second, release the "COAST/SET" switch and press the "ACC/RES" switch.



2. Read a DTC by observing the flash display pattern of the "CRUISE" indicator light in the combination meter.

Diagnostic result display method when using the "CRUISE" indicator light

When the DTC number 23 is set	When no DTC is set
	

NOTE: Other on-board diagnostic items are also output as voltage waveforms corresponding to DTC numbers.

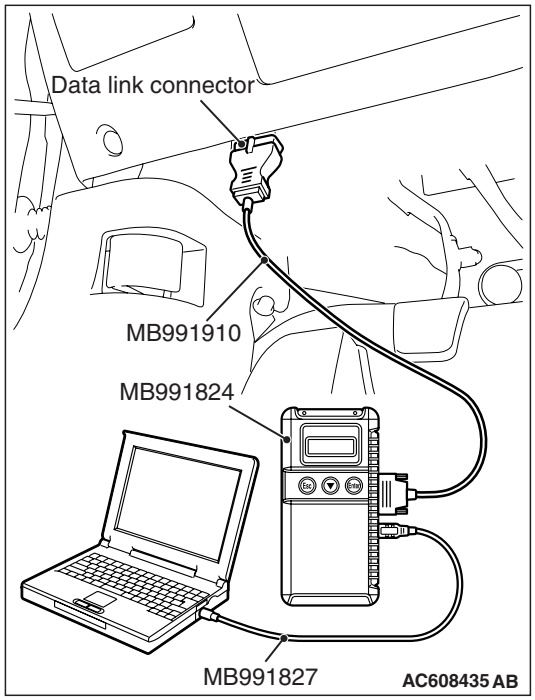
HOW TO ERASE DIAGNOSTIC TROUBLE CODES

Disconnect the negative (−) battery cable.

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III).

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ CAUTION

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

1. Start up the personal computer.
2. Connect special tool MB991827 to special tool MB991824 and the personal computer.
3. Connect special tool MB991910 to special tool MB991824.
4. Connect special tool MB991910 to the data link connector.
5. Turn the power switch of special tool MB991824 to the "ON" position.

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in green color.
6. Start the M.U.T.-III system on the personal computer.

   NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ DATA LIST

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select" from the start-up screen.
4. Select "From 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. "Select "AUTO CRUISE" from "System List", and press the "OK" button.

   NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.
6. Select the "MITSUBISHI."
7. Select the "Data List."

   NOTE: When the "Data List Reference Table" button is selected, the service data reference table is displayed, and the normal values can be checked.
8. Choose an appropriate item.
9. Turn the ignition switch to the "LOCK" (OFF) position.
10. Disconnect scan tool MB991958.

HOW TO DIAGNOSE THE CAN BUS LINE

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select the "CAN Bus Diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle which whose CAN bus lines will be diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
8. Press the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.
10. Turn the ignition switch to the "LOCK" (OFF) position.
11. Disconnect scan tool MB991958.

DIAGNOSTIC TROUBLE CODE CHART

M1172002200897

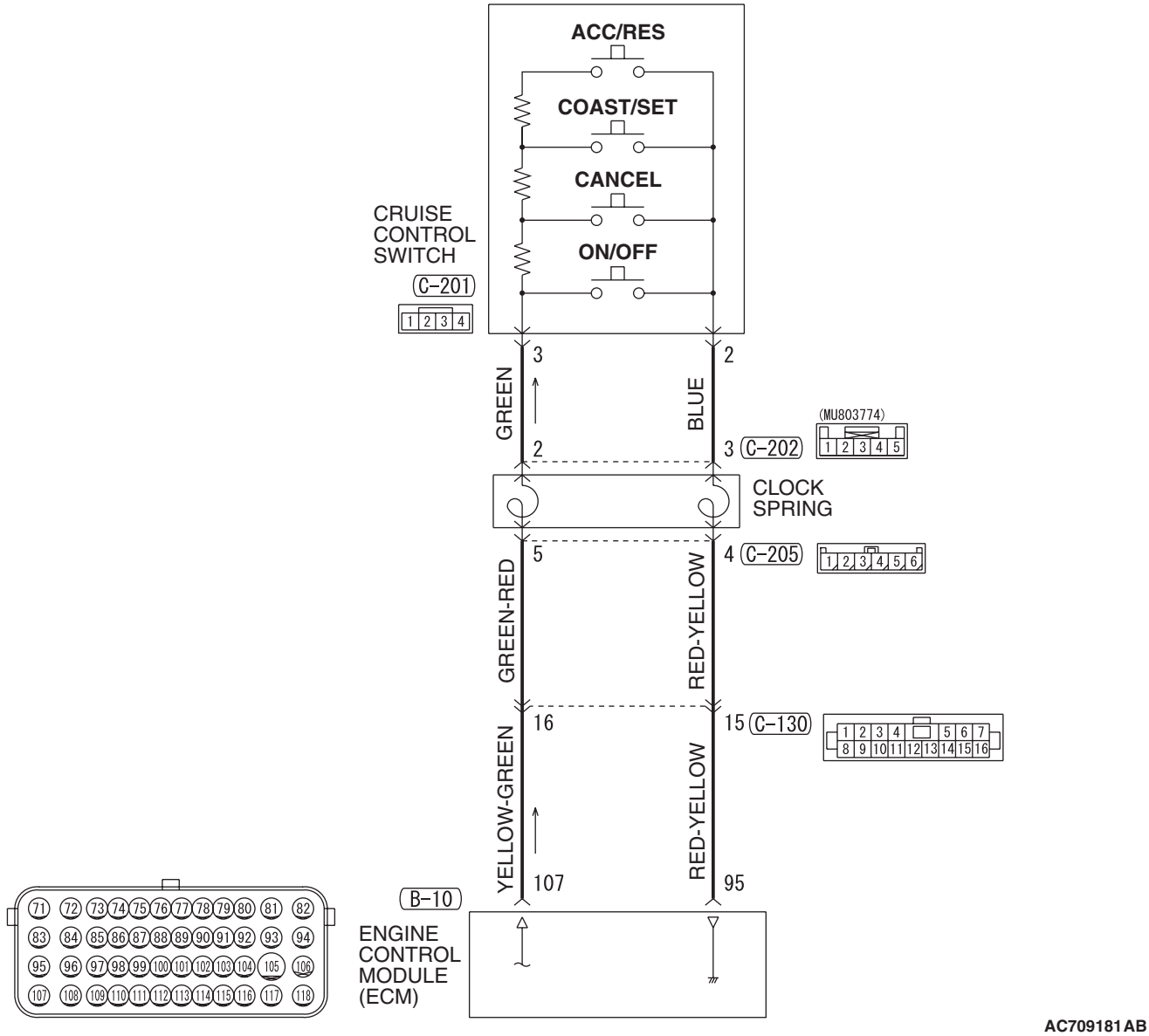
Check according to the inspection chart that is appropriate for the DTC.

DTC number	Inspection Item	Reference page
15	Cruise control switch system	P.17-14
22	Stoplight switch system	P.17-27
23	ECM and its related components	P.17-36

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 15: Cruise Control Switch System

Cruise Control Switch System Circuit



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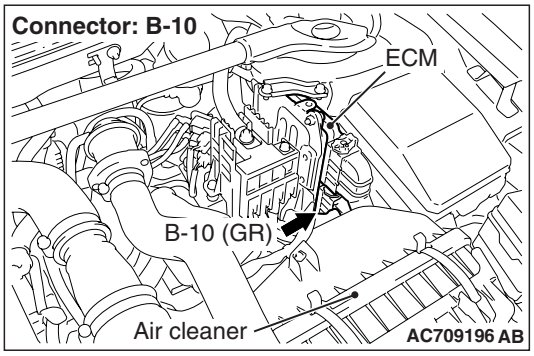

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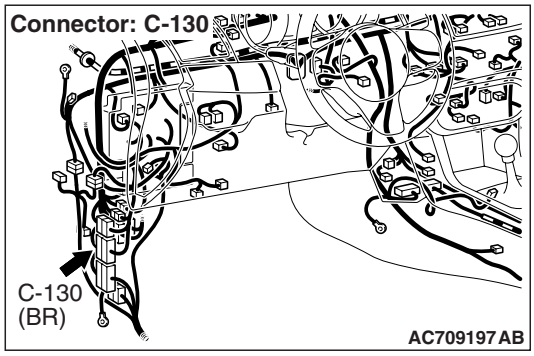

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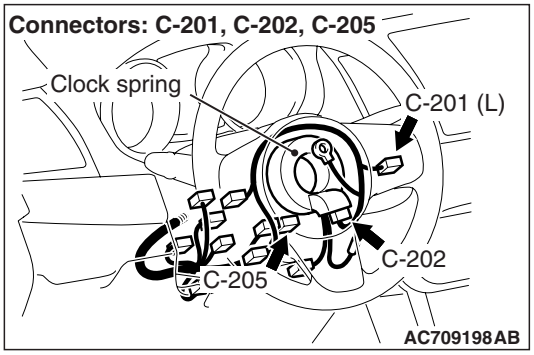


CIRCUIT OPERATION

This circuit judges the signals of each switch ("ON/OFF", "CANCEL", "COAST/SET" and "ACC/RES") of the cruise control switch. The ECM detects the state of the cruise control switch by sensing the voltages shown below.

- When all switches are released: 4.7 –5.0 volts
- When the "ON/OFF" switch is pressed: 0 –0.5 volt
- When the "CANCEL" switch is pressed: 1.0 –1.8 volts
- When the "COAST/SET" switch is pressed: 2.3 – 3.0 volts
- When the "ACC/RES" switch is pressed: 3.5 – 4.2 volts

DTC SET CONDITIONS

Check Condition

- The "CRUISE" indicator light illuminates.

JUDGMENT CRITERIA

- This DTC is set when the "COAST/SET" switch or "ACC/RES" switch is stuck to ON.

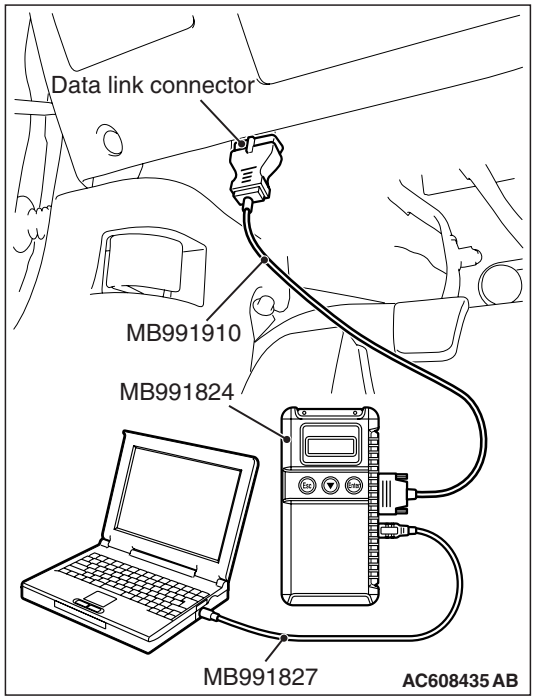
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged harness or connector.
- Malfunction of the cruise control switch.
- Malfunction of the clock spring.
- Malfunction of the ECM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB992110: Power Plant ECU Check Harness



STEP 1. Using scan tool MB991958, check the data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.

⚠ CAUTION

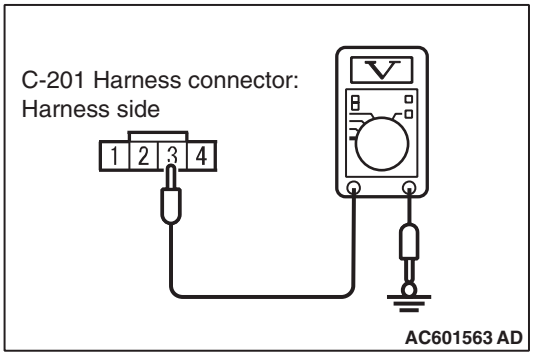
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF".
- Item 91: Resume switch.
  - When "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 20.
NO : Go to Step 2.

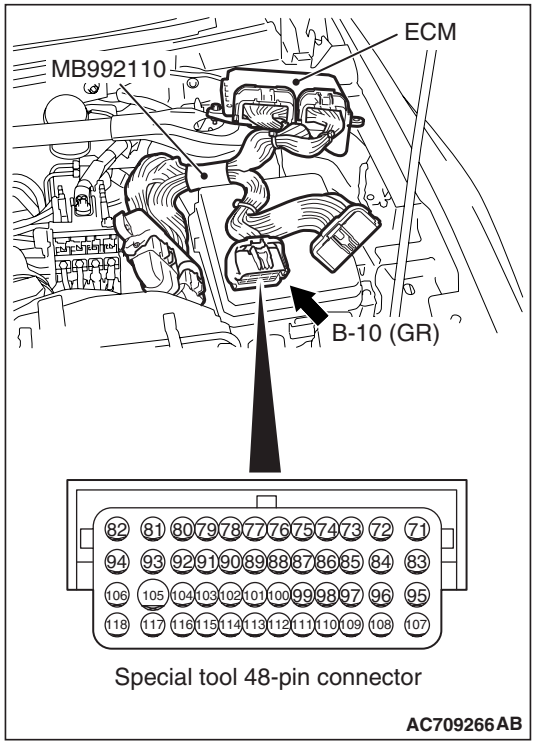


STEP 2. Measure the power supply voltage at cruise control switch connector C-201 by backprobing.

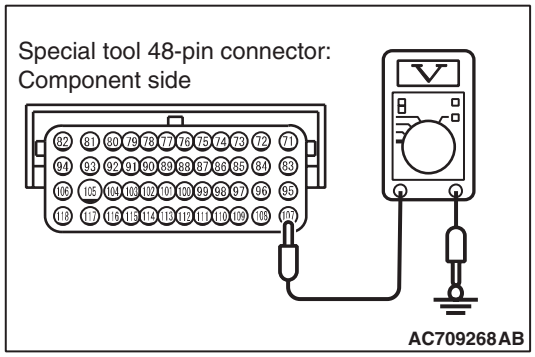
(1) With the harness connector, remove the cruise control switch (Refer to P.17-69).
(2) Connect the negative (−) battery cable.
(3) Do not disconnect cruise control switch connector C-201.
(4) Turn the ignition switch to the "ON" position.
(5) Do not operate the cruise control switch.
(6) Measure the power supply voltage between cruise control switch connector C-201 terminal number 3 and ground by backprobing.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.7 and 5.0 volts?

YES : Go to Step 10.
NO : Go to Step 3.



Special tool 48-pin connector
AC709266AB



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STEP 3. Measure the power supply voltage at ECM connector B-10.

(1) Remove the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920].
(2) Connect special tool MB992110 between the ECM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Do not operate the cruise control switch.
(5) Measure the power supply voltage between special tool 48-pin connector terminal number 107 (ECM connector B-10 terminal number 107) and ground.
(6) Turn the ignition switch to the "LOCK" (OFF) position.
(7) Disconnect special tool MB992110 between the ECM and the body-side harness connector.
(8) Install the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920].

Q: Is the measured voltage between 4.7 and 5.0 volts?

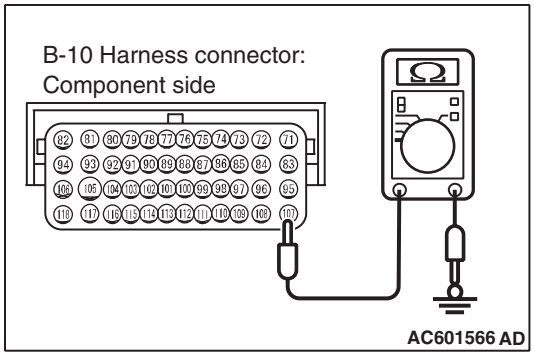
YES : Go to Step 6.
NO : Go to Step 4.

STEP 4. Check ECM connector B-10 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connector and terminals in good condition?

YES : Go to Step 5.
NO : Repair or replace the faulty connector. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.



STEP 5. Check the harness for short circuit to ground between the ECM connector B-10 terminal number 107 and the cruise control switch connector C-201 terminal number 3.

(1) Disconnect ECM connector B-10 and measure at the harness connector side.
(2) Turn the ignition switch to the "LOCK" (OFF) position.
(3) Measure the continuity between ECM connector B-10 terminal number 107 and ground.
(4) Reconnect ECM connector B-10.

Q: Is the measured continuity open circuit?

YES : Install the cruise control switch (Refer to P.17-69). Then go to Step 19.
NO : Go to Step 6.

STEP 6. Check intermediate connector C-130, cruise control switch connector C-201 and clock spring connectors C-202 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connectors and terminals in good condition?

YES : Go to Step 7.
NO : Repair or replace the faulty connector. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 7. Check the harness wire between ECM connector B-10 terminal number 107 and cruise control switch connector C-201 terminal number 3 for damage.

Q: Is the harness wires in good condition?

YES : Go to Step 8.
NO : Repair the damaged harness wire. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 8. Check the clock spring.

Refer to GROUP 52B, Driver's Air Bag Module Inspection P.52B-392.

Q: Is the clock spring in good condition?

YES : Go to Step 9.
NO : Replace the clock spring (Refer to GROUP 52B, Driver's Air Bag Module and Clock Spring P.52B-386). Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 9. Using scan tool MB991958, check data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.

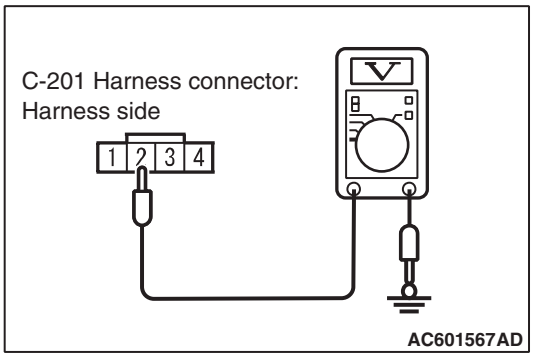
(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF".
- Item 91: Resume switch.
  - When "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

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.00-15). Install the cruise control switch (Refer to P.17-69).

NO : Return to Step 2.

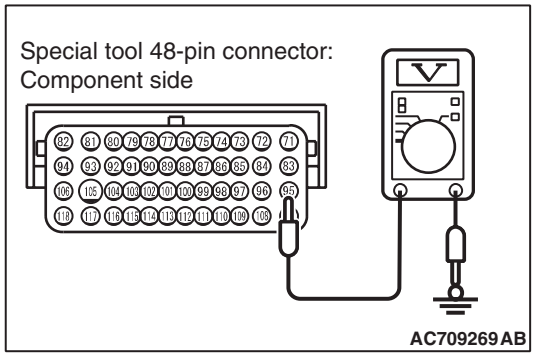


STEP 10. Measure the ground voltage at cruise control switch connector C-201 by backprobing.

(1) Do not disconnect cruise control switch connector C-201.
(2) Turn the ignition switch to the "ON" position.
(3) Press the "ON/OFF" switch.
(4) Measure the ground voltage between cruise control switch connector C-201 terminal number 2 and ground by backprobing.
(5) Release the "ON/OFF" switch.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.52 volt or less?

YES : Go to Step 17.
NO : Go to Step 11.



STEP 11. Measure the ground voltage at ECM connector B-10.

(1) Remove the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920].
(2) Connect special tool MB992110 between the ECM and the body-side harness connector.
(3) Turn the ignition switch to the "ON" position.
(4) Press the "ON/OFF" switch.
(5) Measure the ground voltage between special tool 48-pin connector terminal number 95 (ECM connector B-10 terminal number 95) and ground.
(6) Release the "ON/OFF" switch.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect special tool MB992110 between the ECM and the body-side harness connector.
(9) Install the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920].

Q: Is the measured voltage 0.52 volt or less?

YES : Go to Step 13.
NO : Go to Step 12.

STEP 12. Check ECM connector B-10 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connector and terminals in good condition?

YES : Install the cruise control switch (Refer to P.17-69). Then go to Step 19.
NO : Repair or replace the faulty connector. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 13. Check ECM connector B-10, intermediate connector C-130, cruise control switch connector C-201 and clock spring connectors C-202 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connectors and terminals in good condition?

YES : Go to Step 14.
NO : Repair or replace the faulty connector. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 14. Check the harness wire between ECM connector B-10 terminal number 95 and cruise control switch connector C-201 terminal number 2 for damage.

Q: Is the harness wires in good condition?

YES : Go to Step 15.
NO : Repair the damaged harness wire. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 15. Check the clock spring.
Refer to GROUP 52B, Driver's Air Bag Module Inspection P.52B-392.

Q: Is the clock spring in good condition?

YES : Go to Step 16.
NO : Replace the clock spring (Refer to GROUP 52B, Driver's Air Bag Module and Clock Spring P.52B-386). Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 16. Using scan tool MB991958, check data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.
(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF".

- Item 91: Resume switch.
  - When "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

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.00-15). Install the cruise control switch (Refer to P.17-69).
NO : Return to Step 2.

STEP 17. Check cruise control switch connector C-201 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connector and terminals in good condition?

YES : Go to Step 18.
NO : Repair or replace the faulty connector. Install the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 18. Check the cruise control switch.
(1) Remove the cruise control switch (Refer to P.17-69).
(2) Check the cruise control switch (Refer to P.17-67).

Q: Is the resistance within specifications?

YES : Install the cruise control switch (Refer to P.17-69). Then go to Step 19.
NO : Replace the cruise control switch (Refer to P.17-69). Then go to Step 21.

STEP 19. Using scan tool MB991958, check data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF".
- Item 91: Resume switch.
  - When "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 20.
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 21.

STEP 20. Read the DTC.

(1) Disconnect the negative (–) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (–) battery cable.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) After turning the cruise control system to ON, when 2 minutes or more has elapsed without operating the cruise control switches, read the diagnostic trouble code of the cruise control system (Refer to P.17-10).

Q: Is DTC 15 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 21.

NO : 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.00-15).

STEP 21. Using scan tool MB991958, check data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF".
- Item 91: Resume switch.
  - When "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 22.
NO : Return to Step 2.

STEP 22. Read the DTC.

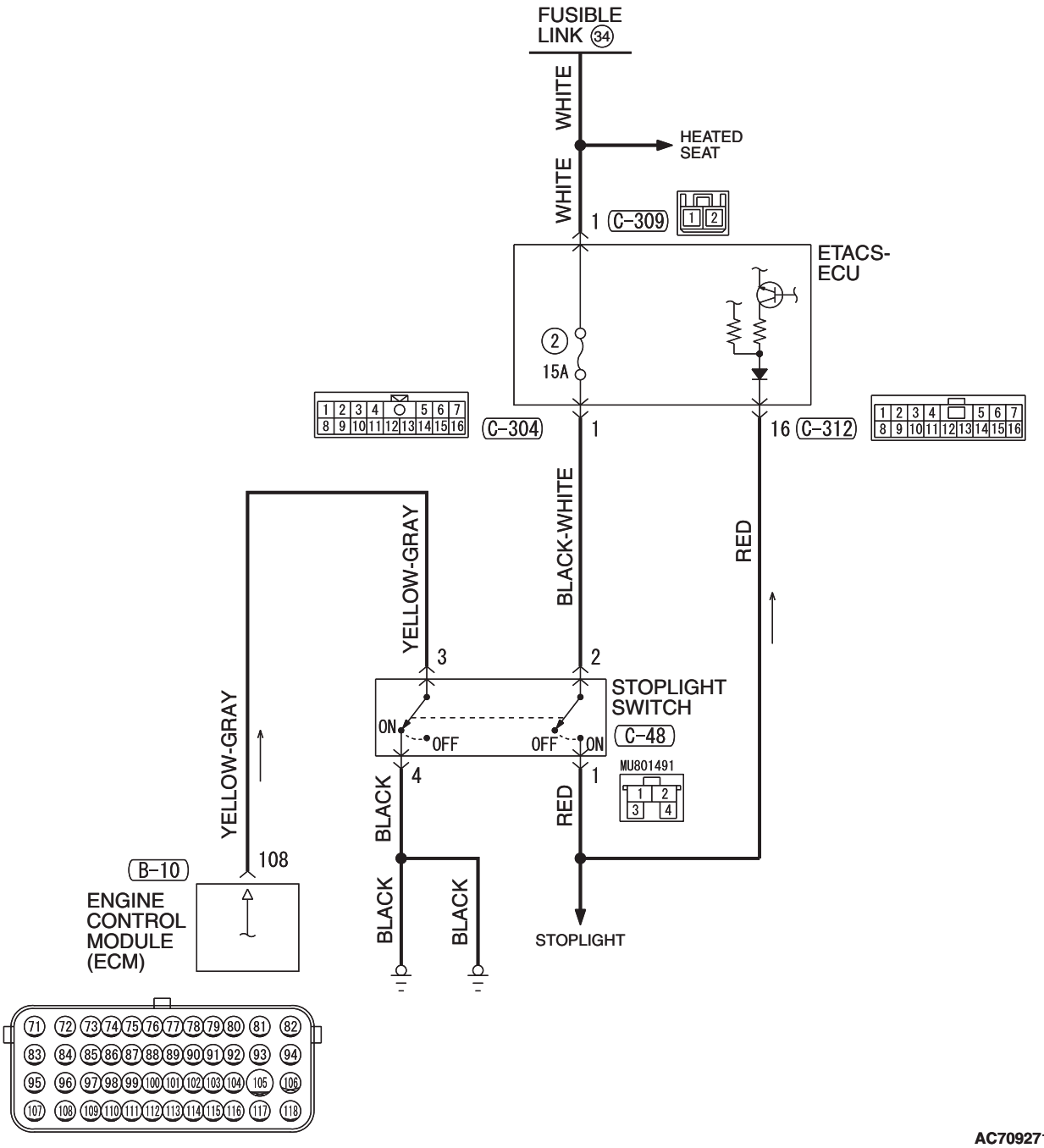
(1) Disconnect the negative (−) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (−) battery cable.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) After turning the cruise control system to ON, when 2 minutes or more has elapsed without operating the cruise control switches, read the diagnostic trouble code of the cruise control system (Refer to P.17-10).

Q: Is DTC 15 set?

YES : Return to Step 1.
NO : The procedure is complete.

DTC 22: Stoplight Switch System

Stoplight Switch System Circuit



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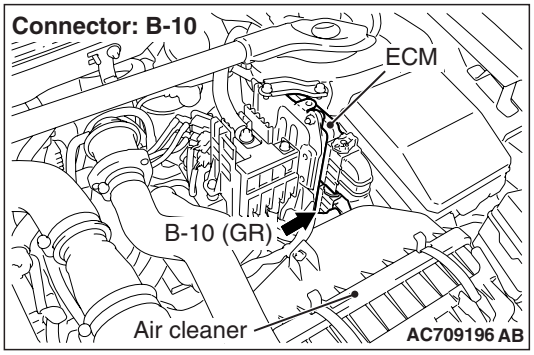
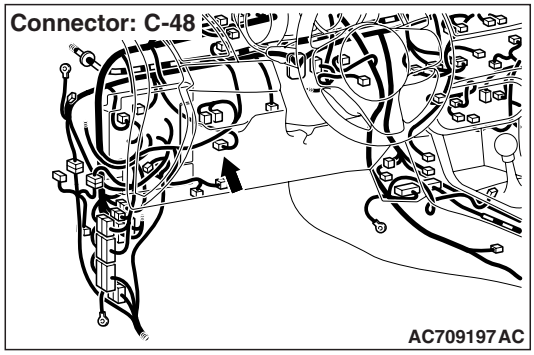
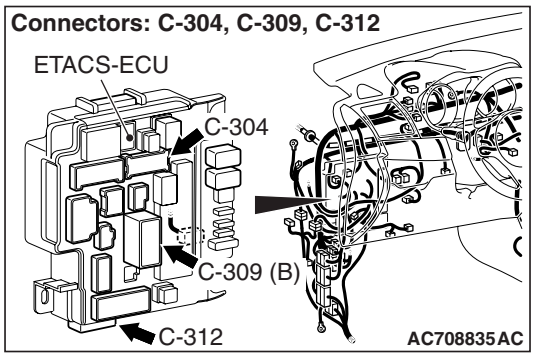






CIRCUIT OPERATION

- As for the stoplight switch, when the brake pedal is depressed, the stoplight switch ON signal is transmitted from the ETACS-ECU to the ECM via CAN bus line.
- As for the brake switch, when the brake pedal is depressed, battery positive voltage is supplied to the stoplight switch (terminal number 3), and when the brake pedal is not depressed, the voltage of ECM (terminal number 108) will indicate 0 volt.

DTC SET CONDITIONS

Check Condition

- The "CRUISE" indicator light illuminates.

JUDGMENT CRITERIA

- Open/short in stoplight switch circuit.
- Open circuit in the brake switch circuit (between ECM terminal number 108 and ground).
- Malfunction of CAN bus line.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of CAN bus system.
- Damaged harness or connector.
- Malfunction of the stoplight switch.
- Malfunction of the ETACS-ECU
- Malfunction of the ECM

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991223: Harness Set
- MB992006: Extra Fine Probe

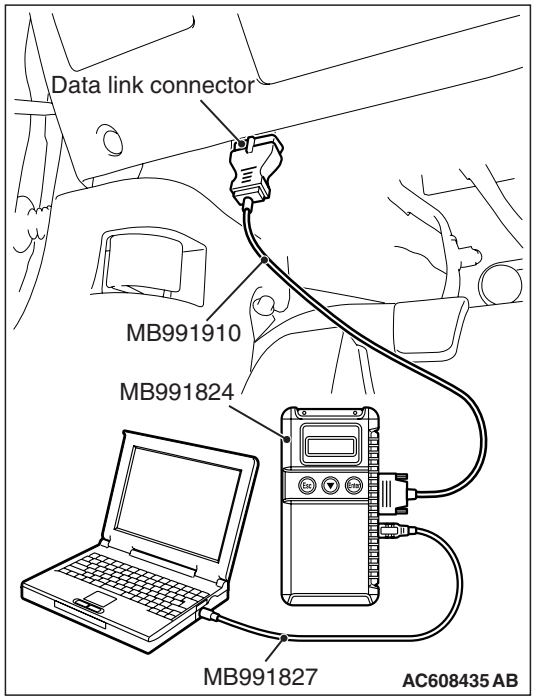
⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ CAUTION

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



(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 16.

STEP 2. Using scan tool MB991958, check data list item 74: Brake light switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 74: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 9.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, check ETACS system data list item 290: Brake light switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for ETACS system (Refer to GROUP 54A, ETACS –Data List Reference Table P.54A-630).
- Item 290: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 16 .
NO : Go to Step 4.

STEP 4. Check stoplight switch connector C-48 and ETACS-ECU connector C-304 and C-312 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

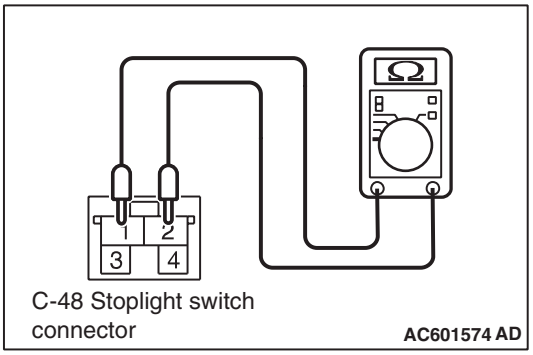
Q: Is the connectors and terminals in good condition?

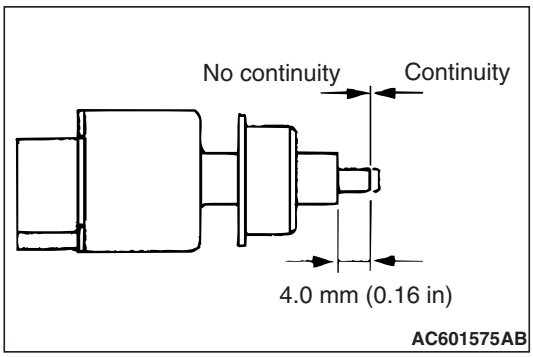
YES : Go to Step 5.
NO : Repair or replace the faulty connector. Then go to Step 16.

STEP 5. Check the harness wire between ETACS-ECU connector C-304 terminal number 1 and stoplight switch connector C-48 terminal number 2, between stoplight switch connector C-48 terminal number 1 and ETACS-ECU connector C-312 terminal number 16 for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 6.
NO : Repair the damaged harness wire. Then go to Step 16.



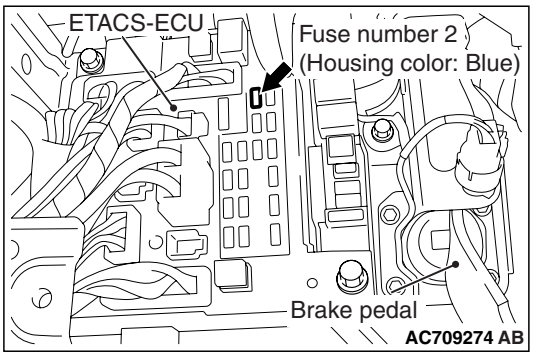


STEP 6. Check the stoplight switch.

(1) Remove the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25).
(2) Connect an ohmmeter to the stoplight switch between terminals number 1 and 2.
(3) Check for continuity between the terminal when the plunger of the stoplight switch is pushed in and when it is released.
(4) The stoplight switch is operating properly if the circuit is open between terminals number 1 and 2 when the plunger is pushed in to a depth of within 4.0 mm (0.16 inch) from the outer case edge surface, and if the resistance value is less than 2 ohms between terminals number 1 and 2 when it is released.

Q: Is the stoplight switch operating properly?

YES : Install the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25). Then go to Step 7.
NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25). Then go to Step 16.



STEP 7. Check fuse number 2 at the ETACS-ECU.

Q: Is the fuse in good condition?

YES : Go to Step 8.
NO : Replace the fuse. Then go to Step 16.

STEP 8. Using scan tool MB991958, check ETACS system data list item 290: Brake light switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for ETACS system (Refer to GROUP 54A, ETACS –Data List Reference Table P.54A-630).
- Item 290: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 9.
NO : Replace the ETACS-ECU (Refer to GROUP 54A, ETACS-ECU P.54A-676). Then go to Step 16.

STEP 9. Using scan tool MB991958, check data list item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

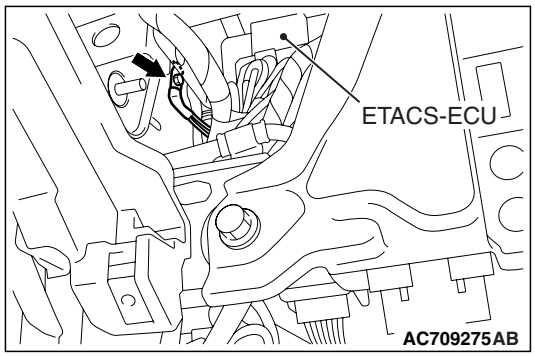
YES : Go to Step 15.
NO : Go to Step 10.

STEP 10. Check ECM connector B-10 and stoplight switch connector C-48 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.
NO : Repair or replace the faulty connector. Then go to Step 16.

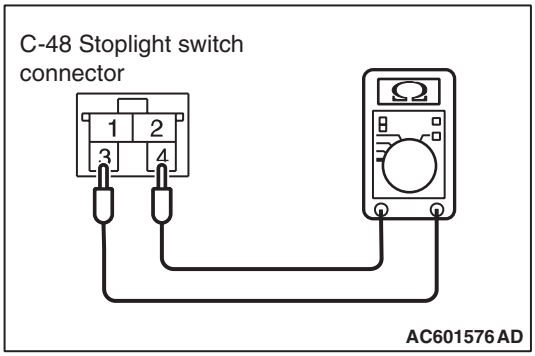


STEP 11. Check the harness wire between ECM connector B-10 terminal number 108 and stoplight switch connector C-48 terminal number 3, between stoplight switch connector C-48 terminal number 4 and ground for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 12.

NO : Repair the damaged harness wire. Then go to Step 16.



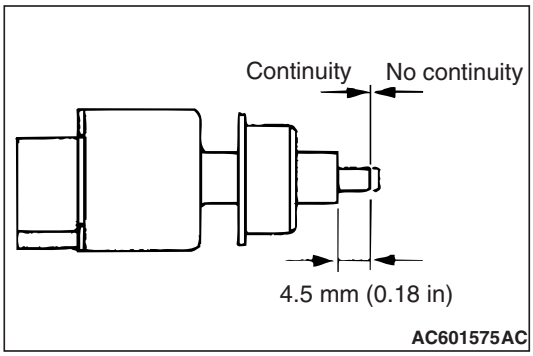
STEP 12. Check the stoplight switch.

(1) Remove the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25).

(2) Connect an ohmmeter to the stoplight switch between terminals number 3 and 4.

(3) Check for continuity between the terminals when the plunger of the stoplight switch is pushed in and when it is released.

(4) The stoplight switch is operating properly if the circuit is open between terminals number 3 and 4 when the plunger is released, and if resistance value is less than 2 ohms between terminals number 3 and 4 when the plunger is pushed in to a depth of within 4.5 mm (0.18 inch) from the outer case edge surface.



Q: Is the stoplight switch operating properly?

YES : Install the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25). Then go to Step 13.

NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-25). Then go to Step 16.

STEP 13. Using scan tool MB991958, check data list item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 14
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 16 .

STEP 14. Using scan tool MB991958, check data list item 74: Brake light switch and item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 74: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

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.00-15).
NO : Return to Step 2.

STEP 15. Read the DTC.

(1) Disconnect the negative (–) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (–) battery cable.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) With the cruise control switches not operated, depress the brake pedal for several seconds, and then read the DTC of the cruise control system (Refer to P.17-10).

Q: Is DTC 22 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 16 .
NO : 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.00-15).

STEP 16. Using scan tool MB991958, check data list item 74: Brake light switch and item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 74: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 17
NO : Return to Step 2.

STEP 17. Read the DTC.

(1) Disconnect the negative (−) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (−) battery cable.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) With the cruise control switches not operated, depress the brake pedal for several seconds, and then read the DTC of the cruise control system (Refer to P.17-10).

Q: Is DTC 22 set?

YES : Return to Step 1.
NO : The procedure is complete.

DTC 23: ECM and Its Related Component

DTC SET CONDITIONS

This DTC is set when there is an failure in the ECM and its related components.

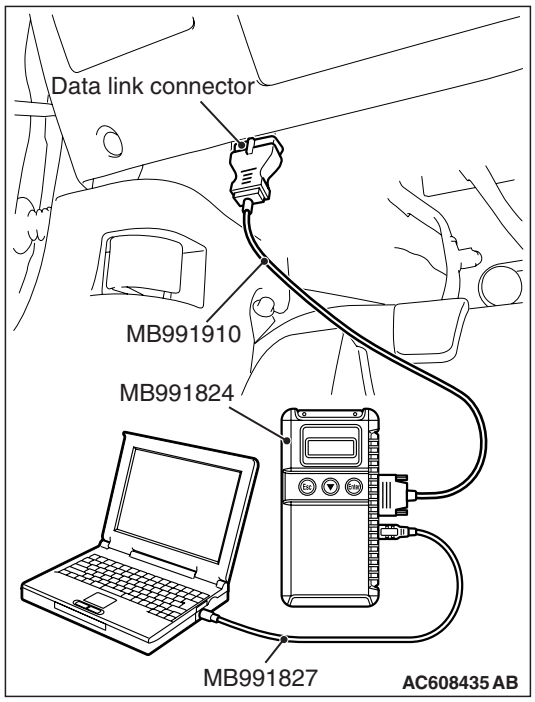
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the MFI system.
- Malfunction of the ECM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



STEP 1. Using scan tool MB991958, check for MFI system DTC.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13A, MFI Diagnosis –Diagnostic Function P.13A-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the MFI system (Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-44). Then go to Step 3.
NO : Go to Step 2.

STEP 2. Read the cruise control system DTC.

(1) Disconnect the negative (–) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (–) battery terminal.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) After turning the cruise control system to ON, when 2 minutes or more has elapsed without operating the cruise control switches, read the DTC of the cruise control system (Refer to P.17-10).

Q: Is DTC 23 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 3.
NO : 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.00-15).

STEP 3. Read the cruise control system DTC.
(1) Disconnect the negative (−) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (−) battery terminal.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light).
(4) After turning the cruise control system to ON, when 2 minutes or more has elapsed without operating the cruise control switches, read the DTC of the cruise control system (Refer to P.17-10).

Q: Is DTC 23 set?
YES : Return to Step 1.
NO : The procedure is complete.

SYMPTOM CHART

M1172002301091

Symptom		Inspection procedure number	Reference page
Communication with scan tool is not possible	Communication with the ECM only is impossible	–	GROUP 13A, MFI Diagnosis, Symptom Procedures – Inspection Procedure 1 P.13A-737
Cruise control is not cancelled.	When brake pedal is depressed	1	P.17-38
	When clutch pedal is depressed <M/T>	2	P.17-41
	When shift lever is moved to "N" position <TC-SST>	3	P.17-44
	When "CANCEL" switch is turned ON	4	P.17-47
Cruise control cannot be set ("COAST/SET" or "ACC/RES" switch operation is not available).		5	P.17-48
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.		6	P.17-53
When "ON/OFF" switch is turned ON, "CRUISE" indicator light inside combination meter does not illuminate. (However, cruise control system is normal).		7	P.17-56

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: When the Brake Pedal is Depressed, Cruise Control System is not Cancelled.

COMMENT
- Malfunction of CAN bus line.
- The stoplight switch circuit is suspected.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of CAN bus system.
- Damaged harness or connector.

TSB Revision

- Malfunction of the stoplight switch.
- Malfunction of the ETACS-ECU.
- Malfunction of the ECM.

DIAGNOSIS

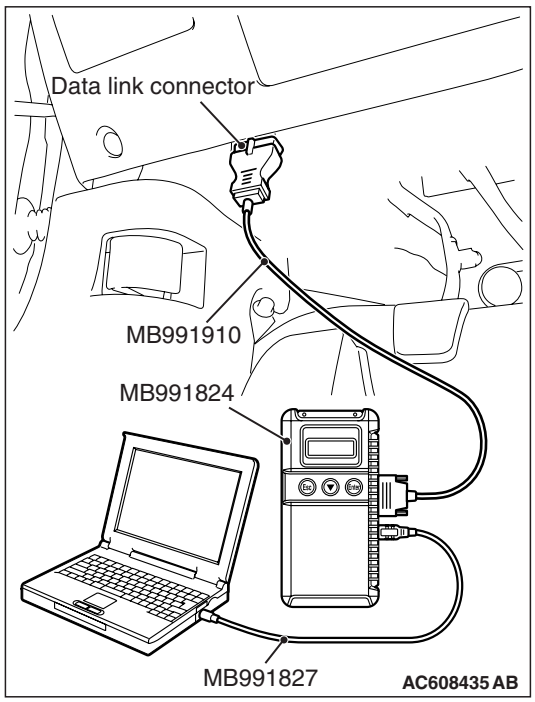
Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991223: Harness Set
- MB992006: Extra Fine Probe

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.



⚠ CAUTION

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 4.

STEP 2. Using scan tool MB991958, check data list item 74: Brake light switch and item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 74: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 3
NO : Refer to P.17-27, Diagnostic Trouble Code Procedures –DTC 22: Stoplight Switch System. Then go to Step 4.

STEP 3. Check the symptoms.

Q: When the brake pedal is depressed, cruise control system is cancelled?

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.00-15).
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 4.

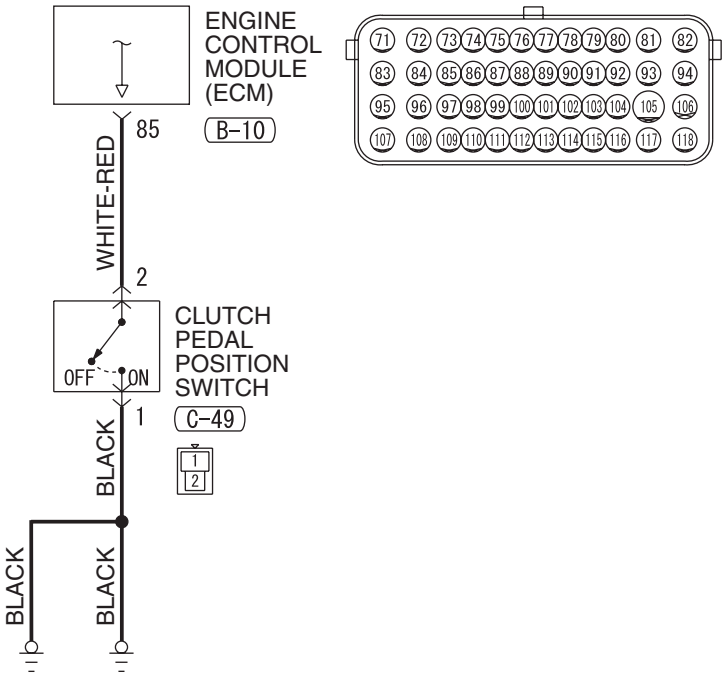
STEP 4. Check the symptoms.

Q: When the brake pedal is depressed, cruise control system is cancelled?

YES : The procedure is complete.
NO : Return to Step 1.

INSPECTION PROCEDURE 2: When the Clutch Pedal is Depressed, Cruise Control System is not Cancelled <M/T>.

Clutch Switch System Circuit



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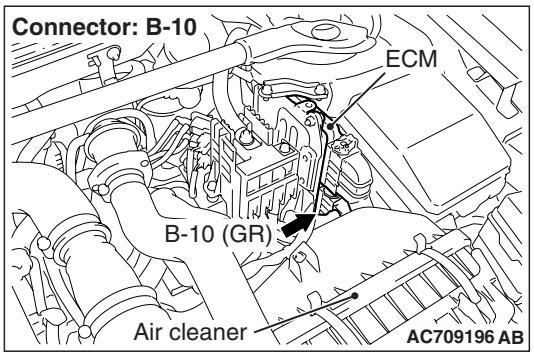

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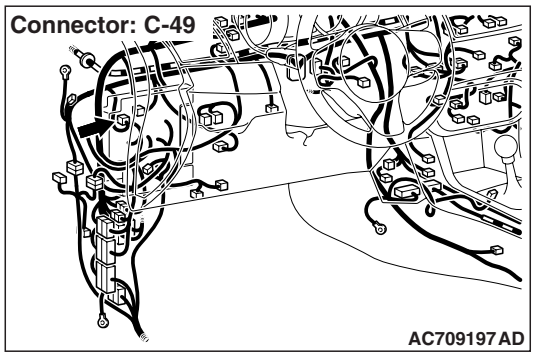

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CIRCUIT OPERATION

This circuit indicates the operation status of the clutch switch. When the clutch switch is ON (clutch pedal is depressed), the voltage of ECM terminal number 42 will indicate 0 volt.

COMMENT

The cause is probably a malfunction of the clutch switch circuit.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged harness or connector.
- Malfunction of the clutch switch.
- Malfunction of the ECM

DIAGNOSIS

Required Special Tools:

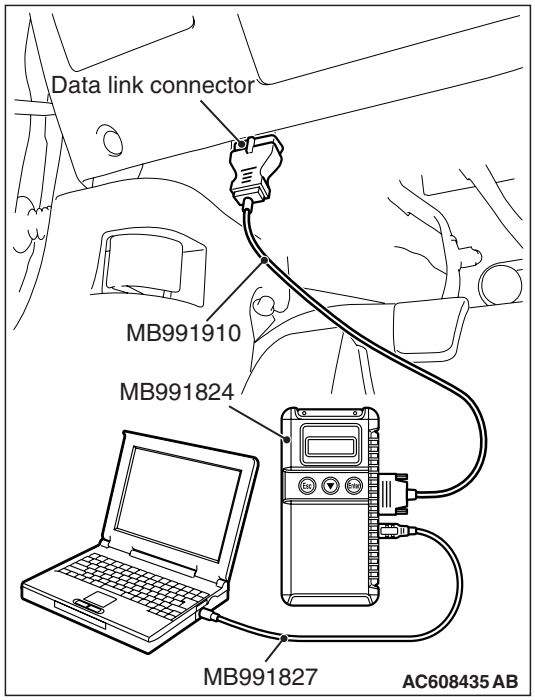
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable

TSB Revision

- MB991910: M.U.T.-III Main Harness A
- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Using scan tool MB991958, check data list item 78: Clutch switch.

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



(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 78: Clutch switch.
  - When the clutch pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the clutch pedal is released, the display on scan tool MB991958 should be "OFF".

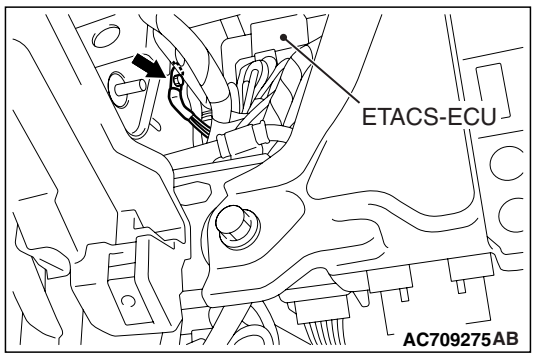
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?
YES : Go to Step 6.
NO : Go to Step 2.

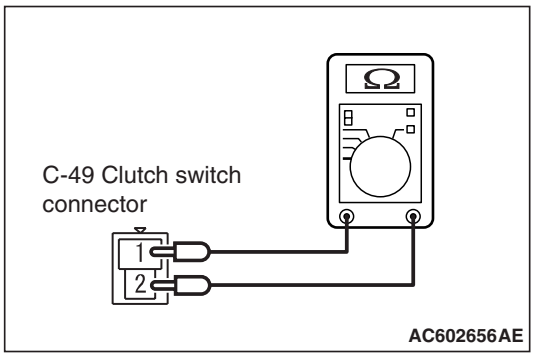
STEP 2. Check ECM connector B-10 and clutch switch connector C-49 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the connector and terminals in good condition?
YES : Go to Step 3.
NO : Repair or replace the faulty connector. Then go to Step 7.

STEP 3. Check the harness wire between ECM connector B-10 terminal number 85 and clutch switch connector C-49 terminal number 2, between clutch switch connector C-49 terminal number 1 and ground for damage.



Q: Is the harness wires in good condition?
YES : Go to Step 4.
NO : Repair the damaged harness wire. Then go to Step 7.



STEP 4. Check the clutch switch.

(1) Disconnect clutch switch connector C-49.

(2) Measure the continuity between the terminals.

Measurement condition	Terminal connector of tester	Specified condition
When clutch pedal is depressed.	1 –2	Continuity (less than 2 ohms)
When clutch pedal is not depressed.	1 –2	Open circuit

(3) Connect clutch switch connector C-49.

Q: Is the clutch switch operating properly?

YES : Go to Step 5.

NO : Replace the clutch switch (Refer to GROUP 21A, Clutch Pedal and Master Cylinder P.21A-4). Then go to Step 7.

STEP 5. Using scan tool MB991958, check data list item 78: Clutch switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).

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

(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).

- Item 78, Clutch switch.
  - When the clutch pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the clutch pedal is released, the display on scan tool MB991958 should be "OFF".

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

(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 6.

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 7.

STEP 6. Check the symptoms

Q: When the brake pedal is depressed, cruise control system is cancelled?

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.00-15).

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 7.

STEP 7. Check the symptoms.

Q: When the brake pedal is depressed, cruise control system is cancelled?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 3: When the Shift Lever is Moved to "N" Position, Cruise Control System is not Cancelled <TC-SST>.

CIRCUIT OPERATION

When the shift lever is in the "N" position, the signal is transmitted from the shift lever ECU to the ECM via CAN bus line.

COMMENT

- Malfunction of CAN bus line.
- Malfunction of shift lever system.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of CAN bus system.
- Damaged harness or connector.
- Malfunction of the shift lever system.
- Malfunction of the shift lever ECU.
- Malfunction of the ECM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

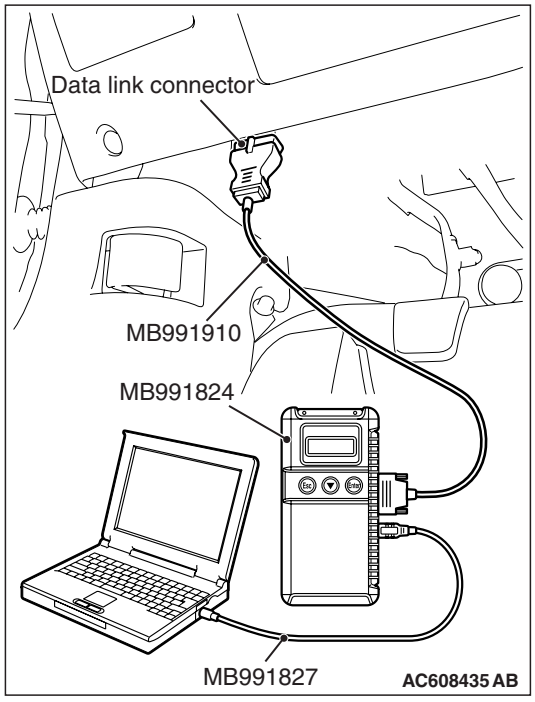
⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ CAUTION

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



(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.

STEP 2. Using scan tool MB991958, check the shift lever system data list item 01: Shift lever position.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for shift lever system (Refer to GROUP 22C, Diagnosis <Shift Lever> –Diagnostic Function P.22C-300).
  - Item 1: Shift lever position.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 3.
NO : Diagnose the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever> –Diagnosis Code Procedures –No.P198E, 198F: Lever Position Switch P.22C-304). Then go to Step 6.

STEP 3. Using scan tool MB991958, read the shift lever system diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for shift lever system diagnostic trouble code (Refer to GROUP 22C, Diagnosis <Shift Lever> –Diagnostic Function P.22C-300).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever> –Diagnosis Code Chart P.22C-302). Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check data list item 87: Neutral switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 87: Neutral switch.
  - When shift lever is at the "N" or "P" position, the display on scan tool MB991958 should be "ON".
  - When shift lever is other than "N" or "P" position, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 5.
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 6.

STEP 5. Check the symptoms.

Q: When the shift lever is moved to "N" position, cruise control system is cancelled?

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.00-15).
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 6.

STEP 6. Check the symptoms.

Q: When the shift lever is moved to "N" position, cruise control system is cancelled?

YES : The procedure is complete.
NO : Return to Step 1.

INSPECTION PROCEDURE 4: When the Cruise Control "CANCEL" Switch is Set to ON, Cruise Control System is not Cancelled.

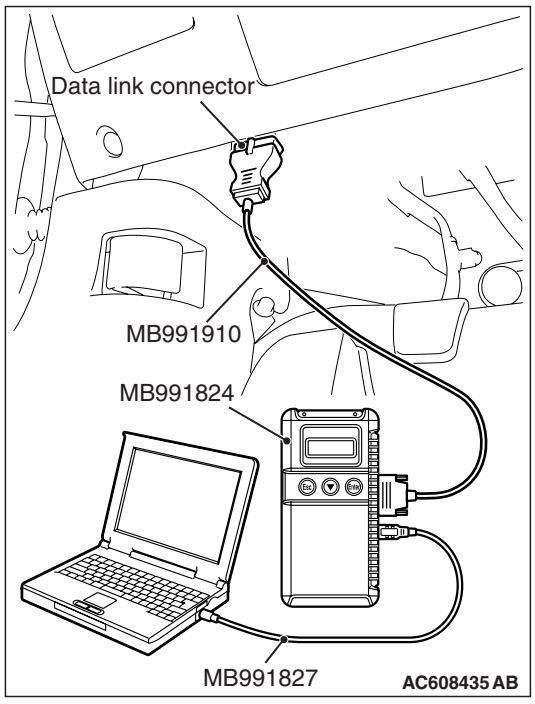
COMMENT

The cause is probably an open-circuit in the output circuit inside the "CANCEL" switch.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the cruise control switch.
- Malfunction of the ECM.

DIAGNOSTIC PROCEDURE



STEP 1. Using scan tool MB991958, check the data list item 75: Cancel switch.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 2.
NO : Refer to P.17-14, Diagnosis Code Procedures –DTC 15: Cruise Control Switch System. Then go to Step 3.

STEP 2. Retest the system.

Q: Does the cruise control "CANCEL" switch set to ON, cruise control system is cancelled?

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.00-15).

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 3.

STEP 3. Retest the system.

Q: Does the cruise control "CANCEL" switch set to ON, cruise control system is cancelled?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 5: Cruise Control Cannot be Set ("COAST/SET" or "ACC/RES" Switch Operation is not Available).

COMMENT

The fail-safe function is probably canceling cruise control system. In this case, checking the cruise control system, MFI system, TC-SST system <TC-SST>, shift lever system <TC-SST> and CAN bus line system DTCs. The scan tool MB991958 can also be used to check if the circuits of each input switch are normal or not by checking the input switch codes.

NOTE: Press the cruise control switches one by one securely. Otherwise, the cruise control system may not be started.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the CAN bus line system.
- Malfunction of the MFI system.
- Malfunction of the TC-SST system <TC-SST>.
- Malfunction of the shift lever system <TC-SST>.
- Malfunction of the cruise control switch.
- Malfunction of the stoplight switch.
- Malfunction of the clutch switch <M/T>.
- Malfunction of the TC-SST-ECU <TC-SST>.
- Malfunction of the shift lever ECU <TC-SST>.
- Malfunction of the ECM.

DIAGNOSIS

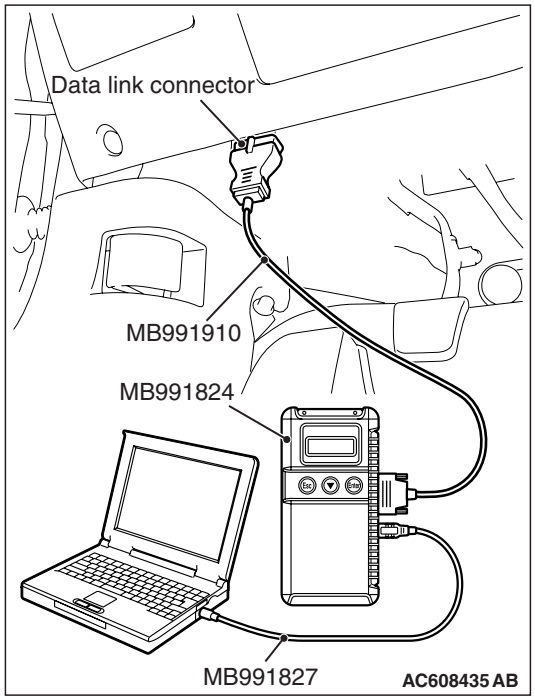
Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.



⚠ CAUTION

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 11.

STEP 2. Using scan tool MB991958, check for MFI system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13A, Diagnosis –Diagnostic Function P.13A-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the MFI system (Refer to GROUP 13A, Diagnosis –Diagnostic Trouble Code Chart P.13A-44). Then go to Step 11.
NO : Go to Step 5 <M/T>.
NO : Go to Step 3 <TC-SST>.

STEP 3. Using scan tool MB991958, check for TC-SST system DTC <TC-SST>.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for TC-SST system DTC (Refer to GROUP 22C, Diagnosis <TC-SST> –Diagnostic Function P.22C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the TC-SST system (Refer to GROUP 22C, Diagnosis <TC-SST> –Diagnostic Trouble Code Chart P.22C-10). Then go to Step 11.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check for shift lever system DTC <TC-SST>.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for shift lever system DTC (Refer to GROUP 22C, Diagnosis <shift lever> –Diagnostic Function P.22C-300).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever> –Diagnostic Trouble Code Chart P.22C-302). Then go to Step 11.
NO : Go to Step 5.

STEP 5. Check for DTC.

Read the cruise control system DTC (Refer to P.17-10).

Q: Is DTC set?

YES : Diagnose the cruise control system (Refer to P.17-13, Diagnostic Trouble Code Chart). Then go to Step 11.
NO : Go to Step 6.

STEP 6. Using scan tool MB991958, check data list item 75: Cancel switch, item 86: Main switch, item 91: Resume switch and item 92: Set switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 75: Cancel switch.
  - When "CANCEL" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
  - When "CANCEL" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- Item 86: Main switch.
  - When "ON/OFF" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
  - When "ON/OFF" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- Item 91: Resume switch.
  - When "ACC/RES" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
  - When "ACC/RES" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- Item 92: Set switch.
  - When "COAST/SET" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
  - When "COAST/SET" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 7.
NO : Refer to P.17-14, Diagnostic Trouble Code Procedures –DTC 15: Cruise Control Switch System. Then go to Step 11.

STEP 7. Using scan tool MB991958, check data list item 74: Brake light switch and item 89: Normally closed brake switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 74: Brake light switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".
- Item 89: Normally closed brake switch.
  - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 8 <M/T>.
YES : Go to Step 9 <TC-SST>.
NO : Refer to P.17-27, Diagnostic Trouble Code Procedures –DTC 22: Stoplight Switch System. Then go to Step 11.

STEP 8. Using scan tool MB991958, check data list item 78: Clutch switch <M/T>.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 78: Clutch switch.
  - When the clutch pedal is depressed, the display on scan tool MB991958 should be "ON".
  - When the clutch pedal is released, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 10.
NO : Refer to P.17-41, Symptom Procedures –Inspection Procedure 2. Then go to Step 11.

STEP 9. Using scan tool MB991958, check data list item 87: Neutral switch <TC-SST>.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 87: Neutral switch.
  - When shift lever is at the "N", "P", "R" position, the display on scan tool MB991958 should be "ON".
  - When shift lever is other than "N", "P", "R" position, the display on scan tool MB991958 should be "OFF".

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 10.
NO : Refer to P.17-44, Symptom Procedures –Inspection Procedure 3. Then go to Step 11.

STEP 10. Check the symptoms.

Q: Can cruise control be set (Is the "COAST/SET" or "ACC/RES" switch operation available)?

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.00-15).
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 11 .

STEP 11. Check the symptoms.

Q: Can cruise control be set (Is the "COAST/SET" or "ACC/REs" switch operation available)?

YES : The procedure is complete.
NO : Return to Step 1.

INSPECTION PROCEDURE 6: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed.

COMMENT

The wheel speed sensor signal (vehicle speed signal) or the MFI system is suspected.
The wheel speed sensor signal (vehicle speed signal) is transmitted from the ASC-ECU to the ECM via CAN bus line.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the CAN bus line system.
- Malfunction of the ASC system
- Malfunction of the MFI system
- Malfunction of the ECM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

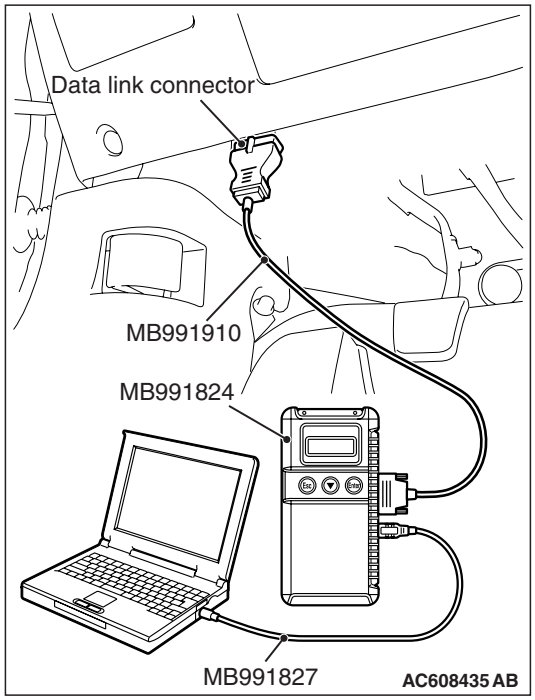
⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ CAUTION

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



(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.

STEP 2. Using scan tool MB991958, check for ASC system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for ASC system DTC (Refer to GROUP 35C, Diagnosis –Diagnostic Function P.35C-8).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the ASC system (Refer to GROUP 35C, Diagnosis –Diagnostic Trouble Code Chart P.35C-20). Then go to Step 6.
NO : Go to Step 3.

TSB Revision

STEP 3. Using scan tool MB991958, check for MFI system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13A, Diagnosis –Diagnostic Function P.13A-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the MFI system (Refer to GROUP 13A, Diagnosis –Diagnostic Trouble Code Chart P.13A-44). Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check data list item 4: Vehicle speed.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for cruise control system (Refer to P.17-10).
- Item 4: Vehicle speed.

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 5.
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 6.

STEP 5. Retest the system

Q: Does hunting occur?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 6.
NO : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15).

STEP 6. Retest the system

Q: Does hunting occur?

YES : Return to Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 7: When "ON/OFF" Switch is Turned ON, "CRUISE" Indicator Light Inside Combination Meter does not Illuminate (However, Cruise Control System is Normal).

CIRCUIT OPERATION

The ECM detects "ON/OFF" switch "ON" signal to illuminate the "CRUISE" indicator light on the combination meter.
The "CRUISE" indicator light illuminate signal is transmitted from the ECM to the combination meter via CAN bus line.

COMMENT

The CAN bus line between the ECM and the ETACS-ECU and between the ETACS-ECU and the combination meter may be defective.
The combination meter, ETACS-ECU or ECM may also be defective.

TROUBLESHOOTING HINTS

- Malfunction of CAN bus system.
- Damaged harness or connector.
- Malfunction of the combination meter.
- Malfunction of the ETACS-ECU
- Malfunction of the ECM

DIAGNOSIS

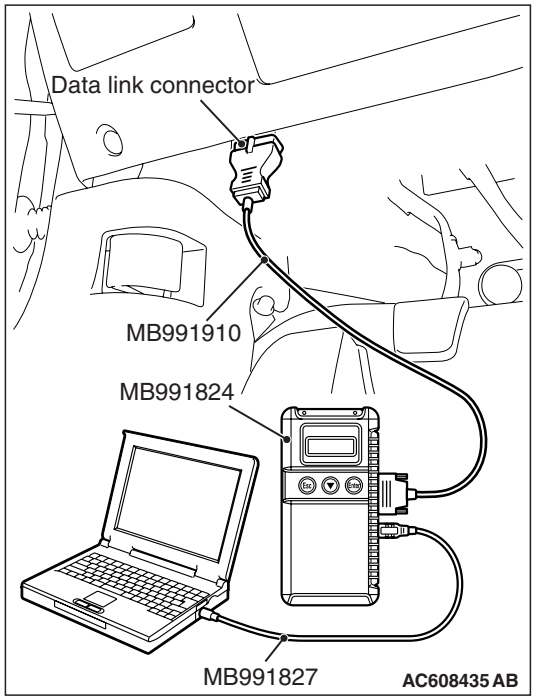
Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECM is replaced, ensure that the CAN bus lines are normal.**

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.



⚠ CAUTION

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-10).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.

STEP 2. Using scan tool MB991958, check for MFI system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13A, Diagnosis –Diagnostic Function P.13A-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U0141 set?

YES : Refer to GROUP 13A, Diagnosis, Diagnostic Trouble Code Procedures –DTC U0141: ETACS-ECU CAN Communication Time Out P.13A-727. Then go to Step 6 .
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, check for ETACS system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Check for ETACS system DTC (Refer to GROUP 54A, ETACS, Troubleshooting –Diagnostic Function P.54A-579).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U0155 set?

YES : Refer to GROUP 54A, ETACS, Troubleshooting, Diagnostic Trouble Code Procedures –DTC U0155: Combination Meter-ECU CAN Communication Time Out P.54A-601. Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the combination meter system data list item F7: Cruise control indicator.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-10).
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for combination meter system item F7: Cruise control indicator (Refer to GROUP 54A, Combination Meter –Data List Reference Table P.54A-78).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 5.
NO : Repair the combination meter system (Refer to GROUP 54A, Combination Meter, Troubleshooting, Symptom Procedures –Inspection Procedure 5: The combination meter light does not illuminate normally or the multi information display is not displayed normally P.54A-72). Then go to Step 6 .

STEP 5. Retest the system.

Q: Does the "CRUISE" indicator light illuminate when the "ON/OFF" switch is turned ON?

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.00-15).
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-920]. When the ECM is replaced, register the encrypted code (Refer to GROUP 42C, Diagnosis –ID Code Registration Judgment Table P.42C-9). Then go to Step 6.

STEP 6. Retest the system.

Q: Does the "CRUISE" indicator light illuminate when the "ON/OFF" switch is turned ON?

YES : The procedure is complete.
NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1172002401106

⚠ CAUTION

- **Driving tests always need two people: one driver and one observer.**
- **When shifting the shift lever to "D" range the brakes should be applied so that the vehicle does not move forward.**

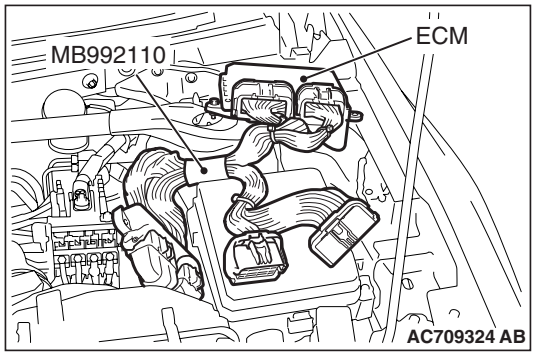
*NOTE: *:After the inspection is completed, disconnect the TP sensor connector, and then delete the DTC using scan tool MB991958 (Refer to GROUP 13A, Diagnostic Function –How to Read and Erase Diagnostic Trouble Code P.13A-9).*

Scan tool display	Item number	Inspection item		Inspection requirement		Normal condition
APP sensor (main)	11	Accelerator pedal position sensor (main)		Ignition switch: "ON"	Accelerator pedal: Released	900 –1,100 mV
					Accelerator pedal: Gradually depressed	Increases in response to the pedal depression stroke
					Accelerator pedal: Fully depressed	4,000 mV or more
Brake light switch	74	Stoplight switch		Brake pedal: Depressed		ON
				Brake pedal: Released		OFF
Cancel code	57	Cancel code		Ignition switch: "ON"		The cancel code, which set when the cruise control system was cancelled at the last time.
Cancel switch	75	Cruise control switch	CANCEL	"CANCEL" switch: Pressed		ON
				"CANCEL" switch: Released		OFF
Clutch switch	78	Clutch switch <M/T>		Clutch pedal: Depressed		ON
				Clutch pedal: Released		OFF
Cruise control	81	Cruise control system operation		Cruise control system: active		ON
				Cruise control system: Inactive		OFF
Main switch	86	Cruise control switch	ON/OFF	"ON/OFF" switch: Pressed		ON
				"ON/OFF" switch: Pressed again		OFF
Neutral switch	87	Shift lever position <TC-SST>		Shift lever: "N", "P", "R" position		ON
				Shift lever: Other than "N", "P", "R" position		OFF

Scan tool display	Item number	Inspection item		Inspection requirement		Normal condition
Normally closed brake switch	89	Stoplight switch (brake switch)		Brake pedal: Depressed		ON
				Brake pedal: Released		OFF
Resume switch	91	Cruise control switch	ACC/RES	"ACC/RES" switch: Pressed		ON
				"ACC/RES" switch: Released		OFF
Set switch	92	Cruise control switch	COAST/SET	"COAST/SET" switch: Pressed		ON
				"COAST/SET" switch: Released		OFF
TP sensor (main)	13	Throttle position sensor (main)*		• Remove the intake air hose at the throttle body. • Disconnect the TP sensor connector, and then connect terminals 3, 4, 5 and 6 with the use of the special tool: MB991658 (Test harness). • Ignition switch: "ON"	Fully close the throttle valve with your finger	300 –700 mV
					Fully open the throttle valve with your finger	4,000 mV or more
				No load		500 –660 mV
				A/C switch: "OFF" to "ON"		Voltage rises
				Shift lever: "N" to "D"		Voltage rises
Vehicle speed	4	Vehicle speed signal		Road test the vehicle		The speedometer and scan tool MB991958 display the same value.

ECM TERMINAL VOLTAGE REFERENCE CHART FOR CRUISE CONTROL SYSTEM OPERATION

M1172002700858

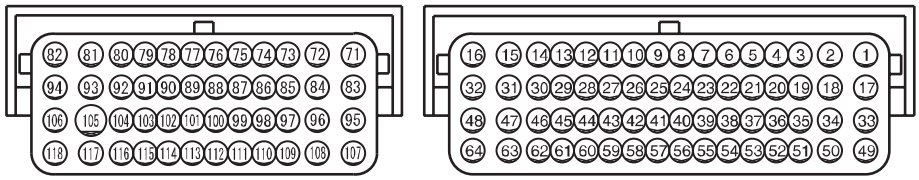


1. Disconnect all ECM connectors, and connect special tool MB992110 (Power plant ECU check harness) in between.
2. Measure the voltages between the check connector terminals of special tool MB992110 and ground terminals 81 or 93.

Special tool - Power plant ECU check harness (MB992110) connector: Component side

48-Pin connector
(ECM connector B-10)

64-Pin connector
(ECM connector B-09)



AC601589 AJ

Terminal number	Check item	Check condition		Normal condition
10	TP sensor (main)	• Remove the intake air hose at the throttle body • Disconnect the TP sensor, and then connect terminals 3, 4, 5 and 6 with the use of the special tool: MB991658 (Test harness). • Ignition switch: "ON"	Fully close the throttle valve with your finger	0.3 –0.7 V
			Fully open the throttle valve with your finger	4.0 V or more
11	TP sensor (sub)	• Remove the intake air hose at the throttle body • Disconnect the TP sensor, and then connect terminals 3, 4, 5 and 6 with the use of the special tool: MB991658 (Test harness). • Ignition switch: "ON"	Fully close the throttle valve with your finger	4.0 V or more
			Fully open the throttle valve with your finger	1.0 V or less
12	Power supply voltage applied to TP sensor	Ignition switch: "ON"		4.9 –5.1 V
15	TAC motor (+)	• Ignition switch: "ON" • Accelerator pedal: fully opened to fully closed		Decreases slightly (approx. 2 V) from battery voltage.
16	TAC motor (–)	• Ignition switch: "ON" • Accelerator pedal: fully closed to fully opened		Decreases slightly (approx. 2 V) from battery voltage.
74	APP sensor (main)	Ignition switch: "ON"	Release the accelerator pedal	0.9 –1.1 V
			Depress the accelerator pedal.	4.0 V or more
75	Power supply voltage applied to APP sensor (main)	Ignition switch: "ON"		4.9 –5.1 V
77	APP sensor (sub)	Ignition switch: "ON"	Release the accelerator pedal	0.4 –0.6 V
			Depress the accelerator pedal.	2 V or more

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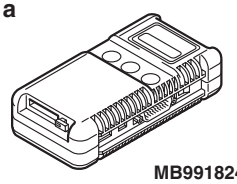
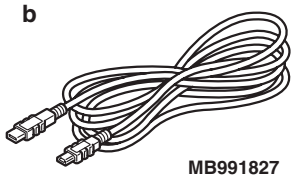
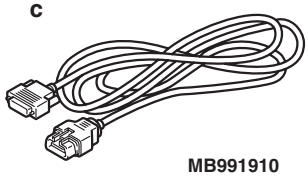
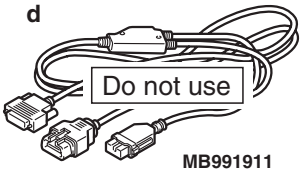
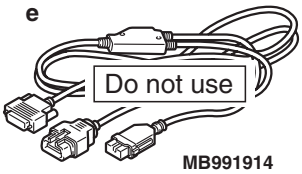
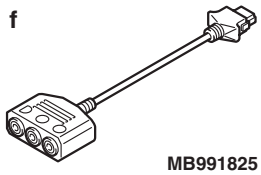
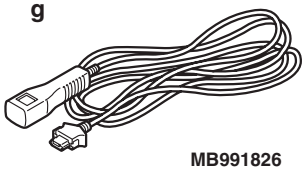
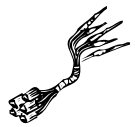
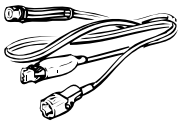
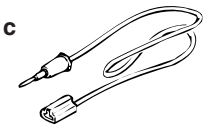
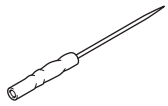
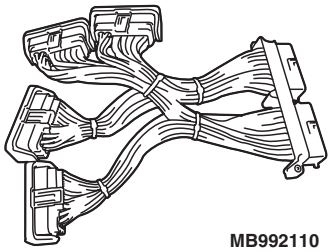
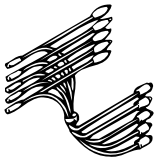
Terminal number	Check item	Check condition		Normal condition
78	Power supply voltage applied to APP sensor (sub)	Ignition switch: "ON"		4.9 –5.1 V
85	Clutch switch <M/T>	Ignition switch: "ON"	Depress the clutch pedal.	1V or less
			Release the clutch pedal.	Battery positive voltage
107	Cruise control switch power supply	Ignition switch: "ON"	All switches: Released	4.7 - 5.0 V
			"ON/OFF" switch: Pressed	0 - 0.5 V
			"CANCEL" switch: Pressed	1.0 - 1.8 V
			"COAST/SET" switch: Pressed	2.3 - 3.0 V
			"ACC/RES" switch: Pressed	3.5 - 4.2 V
108	Stoplight switch (brake switch)	Ignition switch: "ON"	Depress the brake pedal.	Battery positive voltage
			Release the brake pedal.	1V or less

SPECIAL TOOLS

M1172000600974

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  Do not use MB991911 e  Do not use MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991914 f: MB991825 g: MB991826 Scan tool (M.U.T.-III sub assembly) a: Vehicle communication interface (V. C. I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III main harness C (for Daimler Chrysler models only) f: M.U.T.-III measurement adapter g: M.U.T.-III trigger harness	MB991824-KIT *NOTE: g: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	⚠ **CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** • Checking DTC. • Checking data list.

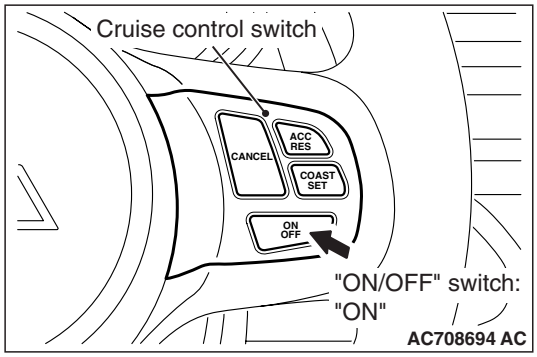
Tool	Tool number and name	Supersession	Application
a  b  c  d  DO NOT USE MB991223	MB991223 a: MB991219 b: MB991220 c: MB991221 d: MB991222 Harness set a: Test harness b: LED harness c: LED harness adaptor d: Probe	General service tools	Checking the continuity and measuring the voltage at the harness connector
 MB992006	MB992006 Extra fine probe	General service tool	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.
 MB992110	MB992110 Power plant ECU check harness	–	Measuring the terminal voltage at the ECM
 MB991658	MB991658 Test harness	–	Measuring the terminal voltage at the TP sensor

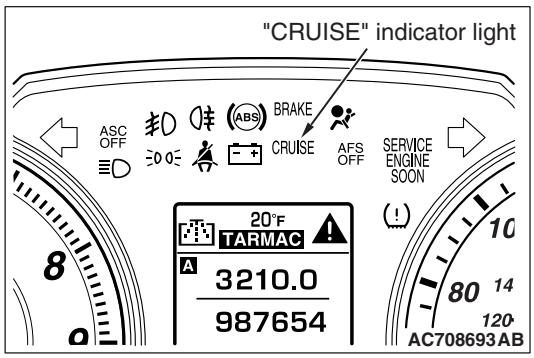
ON-VEHICLE SERVICE

CRUISE CONTROL SWITCH CHECK

M1172001200537

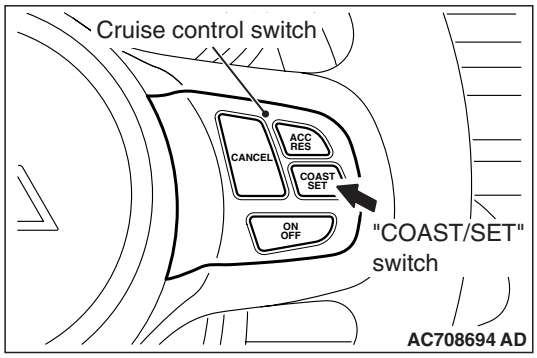
CRUISE CONTROL "ON/OFF" SWITCH CHECK





1. Check that the "CRUISE" indicator light within the combination meter illuminates when the "ON/OFF" switch is switched "ON".
2. Press the "ON/OFF" switch again, and check that the "CRUISE" indicator light within the combination meter goes out.

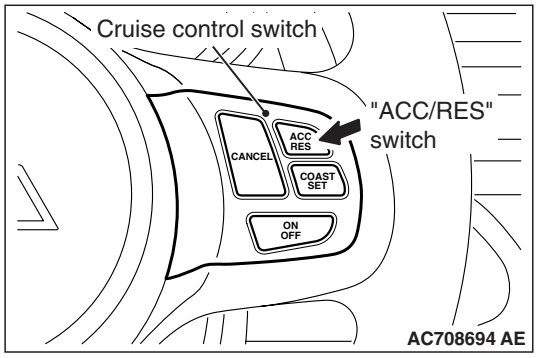
CRUISE CONTROL SETTING



1. Switch the "ON/OFF" switch to "ON".
2. Drive at the desired speed, above approximately 40 km/h (25 mph).
3. Push the "COAST/SET" switch.
4. Check to be sure that cruise control is activated when the "COAST/SET" switch is released.

   NOTE: If the vehicle speed decreases to approximately 15 km/h (9 mph) below the set speed because of climbing a hill for example, it is normal for the cruise control to be cancelled. When the vehicle speed becomes approximately 40 km/h (25 mph) or less, driving at constant speed will be cancelled even if the vehicle speed does not decrease approximately 15 km/h (9 mph) or more.

SPEED-INCREASE SETTING



1. Switch the "ON/OFF" switch to "ON".
2. Set to the desired speed, above approximately 40 km/h (25 mph).
3. Push the "ACC/RES" switch.
4. Check to be sure that acceleration continues while the "ACC/RES" switch is pushed, and that the speed at the time it was released becomes the constant driving speed.

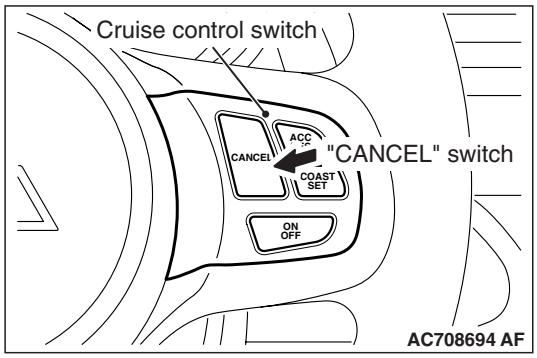
   NOTE: Acceleration can be continued even if the vehicle speed has passed the high-speed limit [approximately 200 km/h (125 mph)]. But the constant driving speed when the "ACC/RES" switch is released will be recorded as the high-speed limit.

SPEED-REDUCTION SETTING

1. Switch the "ON/OFF" switch to "ON".
2. Set to the desired speed, above approximately 40 km/h (25 mph).
3. Push the "COAST/SET" switch.
4. Check to be sure that deceleration continues while the "COAST/SET" switch is pushed, and that the speed at the time it was released becomes the constant driving speed.

   NOTE: When the vehicle speed reaches the low limit [approximately 40 km/h (25 mph)] during deceleration, the auto-cruise control will be cancelled.

RETURN TO THE SET SPEED BEFORE CANCELLATION AND CRUISE CONTROL CANCELLATION

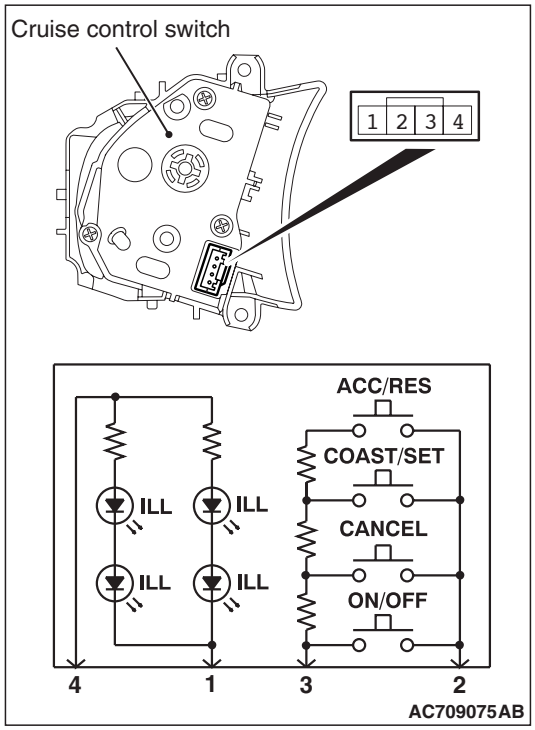


1. Switch the "ON/OFF" switch to "ON".
2. Set to the desired speed, above approximately 40 km/h (25 mph).
3. When any of the following operations are performed while at constant speed during auto-cruise control, check if normal driving is resumed and deceleration occurs.
   (1) The "CANCEL" switch is pushed.
   (2) The brake pedal is depressed.
4. At a vehicle speed of approximately 40 km/h (25 mph) or higher, check if when the "ACC/RES" switch is pushed, the vehicle speed returns to the speed before auto-cruise control driving was cancelled, and constant speed driving occurs.
5. When the "ON/OFF" switch is switched to "OFF" while driving at constant speed, check if normal driving is resumed and deceleration occurs.

CRUISE CONTROL SYSTEM COMPONENT CHECK

M1172001700941

CRUISE CONTROL SWITCH CHECK



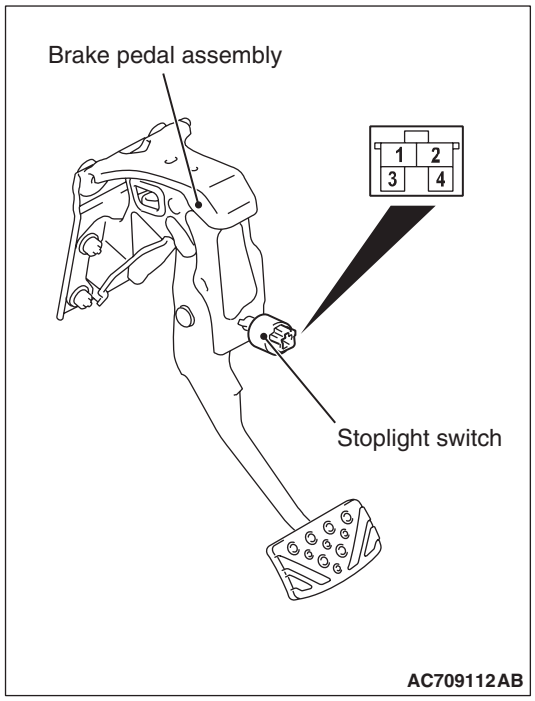
1. Remove the cruise control switch (Refer to P.17-69).
2. Measure the resistance between terminal number 2 and terminal number 3 when each of the "ON/OFF", "CANCEL", "COAST/SET" and "ACC/RES" switches is pressed. If the values measured at the time each switch is pressed correspond to those in the table below, the resistance values are correct.

Terminal connector of tester	Switch position	Specified condition
2 –3	All switches are released.	Open circuit
	"ON/OFF" switch is pressed	Continuity (less than 2 ohms)
	"CANCEL" switch is pressed	202.5 - 208 Ω
	"COAST/SET" switch is pressed	610.5 - 624.5 Ω
	"ACC/RES" switch is pressed	1838 - 1877 Ω

3. Check for continuity between the between terminal number 1 and terminal number 4 of the cruise control switch.

Terminal connector of tester	Specified condition
1 –4	Continuity (less than 2 ohms)

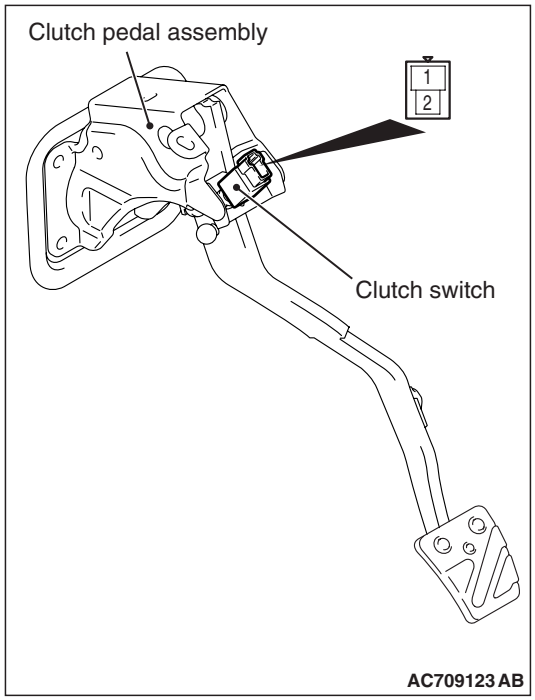
STOPLIGHT SWITCH CHECK



1. Disconnect the stoplight switch harness connector.
2. Check for continuity between the terminals of the switch.

Measurement condition	Terminal connector of tester	Specified condition
When brake pedal is depressed.	1 –2 (for stoplight switch)	Continuity (less than 2 ohms)
	3 –4 (for brake switch)	Open circuit
When brake pedal is not depressed.	1 –2 (for stoplight switch)	Open circuit
	3 –4 (for brake switch)	Continuity (less than 2 ohms)

CLUTCH SWITCH CHECK <M/T>



1. Disconnect the clutch switch harness connector.
2. Check for continuity between the terminals of the switch.

Measurement condition	Terminal connector of tester	Specified condition
When clutch pedal is depressed.	1 –2	Continuity (less than 2 ohms)
When clutch pedal is not depressed.	1 –2	Open circuit

THROTTLE ACTUATOR CONTROL MOTOR CHECK

Refer to GROUP 13A, On-vehicle Service –Throttle Actuator Control Motor Check P.13A-911.

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AUTO-CRUISE CONTROL SWITCH

REMOVAL AND INSTALLATION

M1172007600072

Refer to GROUP 37, Steering Wheel P.37-22.

EMISSION CONTROL <MFI - T/C>

GENERAL INFORMATION

M1173000101243

The emission control system consists of the following subsystems:

- Positive crankcase ventilation (PCV) system
- Evaporative emission system
- Exhaust emission control system

SERVICE SPECIFICATIONS

M1173000301098

Item	Standard value
Emission control system	
Evaporative emission purge solenoid coil resistance [at 20° C (68° F)] Ω	22 –26
Evaporative emission ventilation solenoid coil resistance [at 20° C (68° F)] Ω	17 –21
Purge flow cm^3/s (SCFH) [at 80 –95° C (176 –205° F) with sudden revving]	20 (2.5)

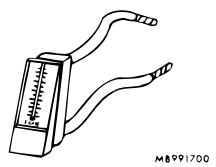
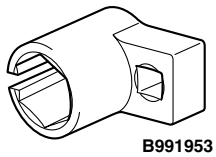
DIAGNOSIS

M1173000700231

SYMPTOM	PROBABLE CAUSE	REMEDY
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	Malfunction of the evaporative emission purge solenoid	Repair or replace
Rough idle or engine stalls	Vacuum hose disconnected or damaged.	Repair or replace
	Malfunction of the PCV valve	Replace
	Malfunction of the purge control system	Check the system; If there is a problem, check its component parts.
Excessive oil consumption	PCV line clogged	Check PCV system

SPECIAL TOOLS

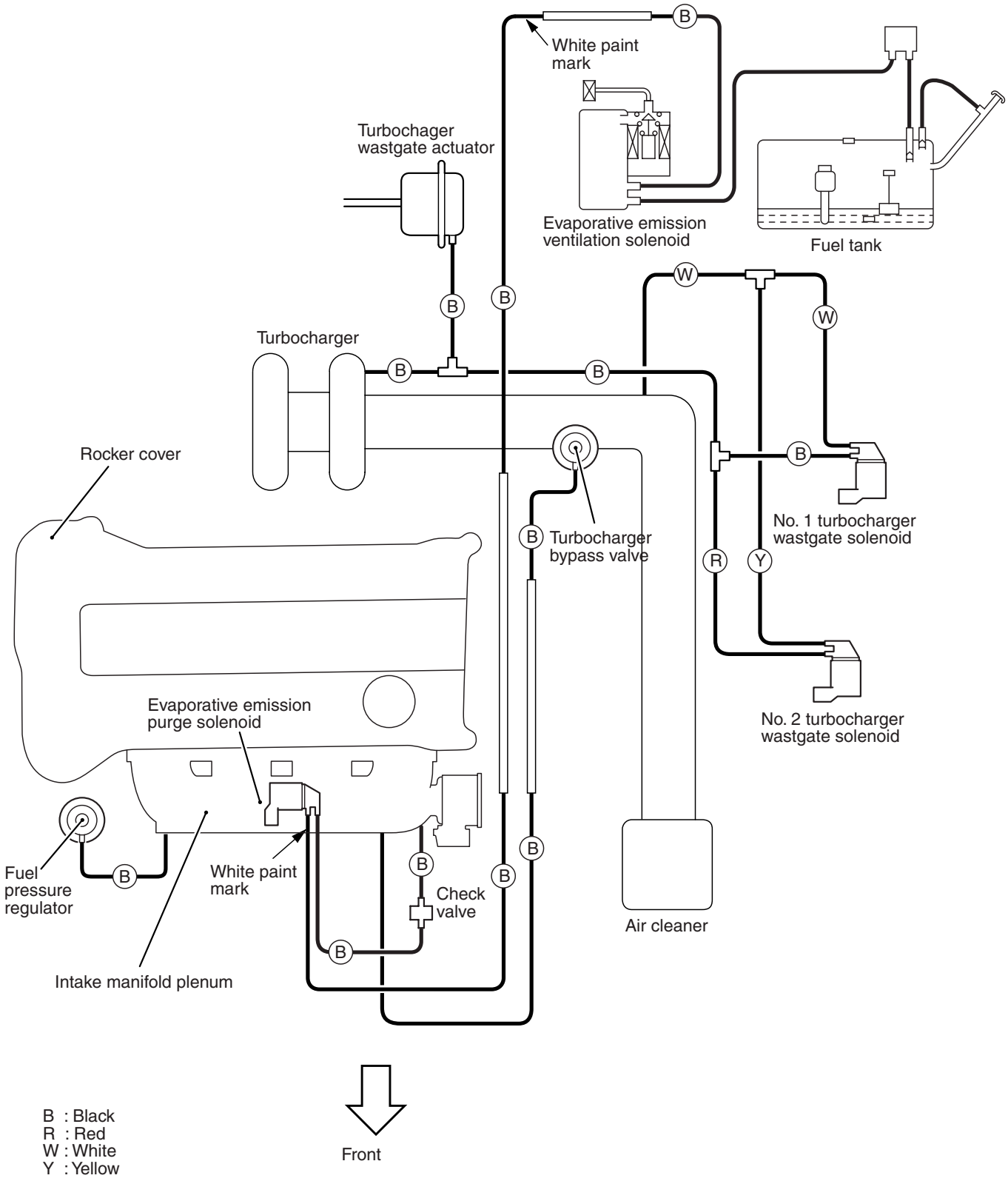
M1173000600773

Tool	Tool number and name	Supersession	Application
 MB991700	MB995061 Purge flow indicator	MLR6890A Part of MIT280220	Inspection of purge control system
 B991953	MB991953 Oxygen sensor wrench	MB991953-01	Removal and installation of heated oxygen sensor (rear)

VACUUM HOSES

VACUUM HOSE ROUTING

M1173000901346



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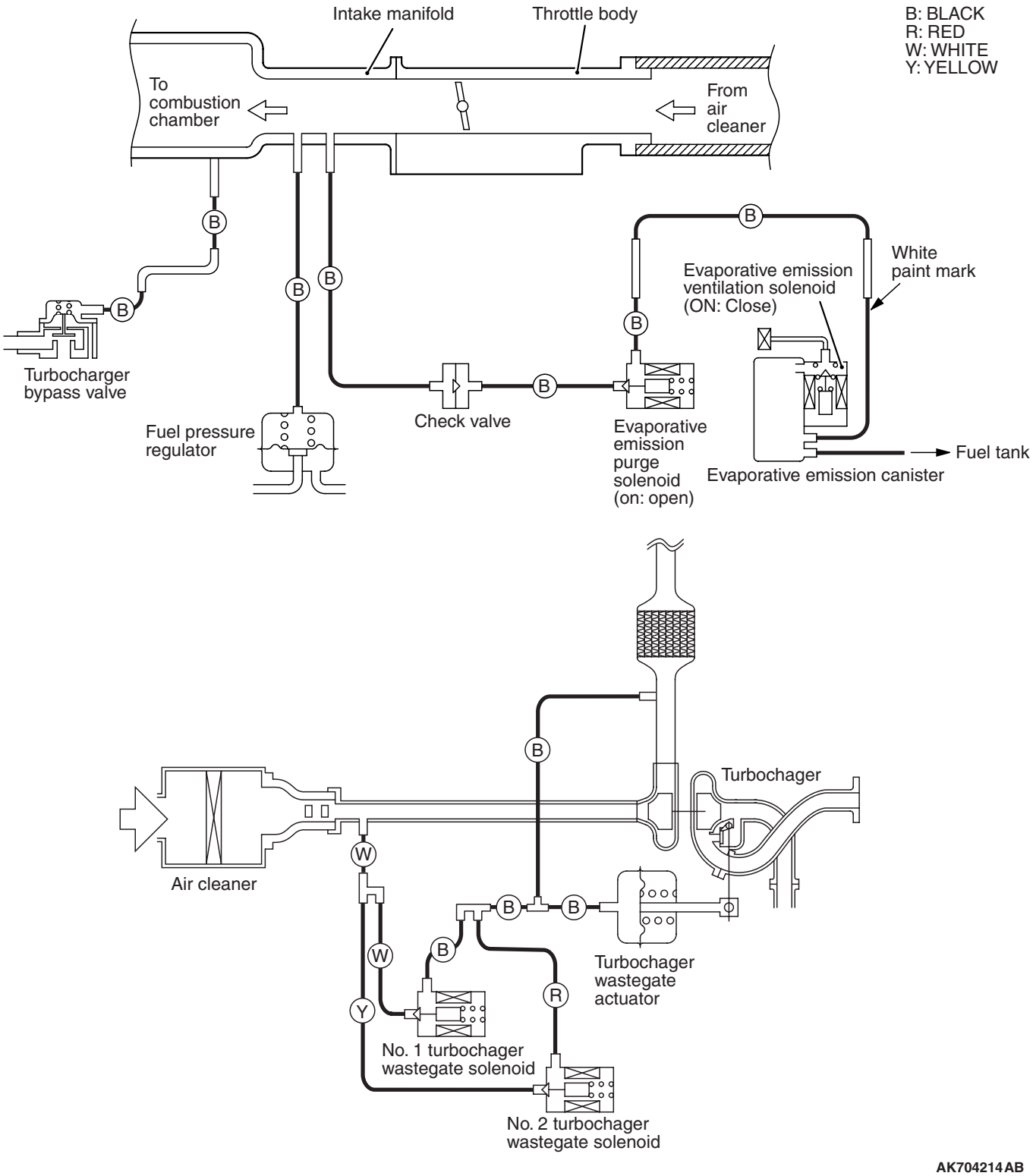
TSB Revision

VACUUM CIRCUIT DIAGRAM

M1173007100995



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TSB Revision

VACUUM HOSE INSTALLATION

M1173007200486

1. When connecting the vacuum hoses, they should be securely inserted onto the nipples.
2. Connect the hoses correctly, using the VACUUM HOSE ROUTING diagram as a guide.

VACUUM HOSE CHECK

M1173007300621

1. Using the VACUUM HOSE ROUTING diagram as a guide, check that the vacuum hoses are correctly connected.
2. Check the connection of the vacuum hoses, (removed, loose, etc.) and confirm that there are no sharp bends or damage.

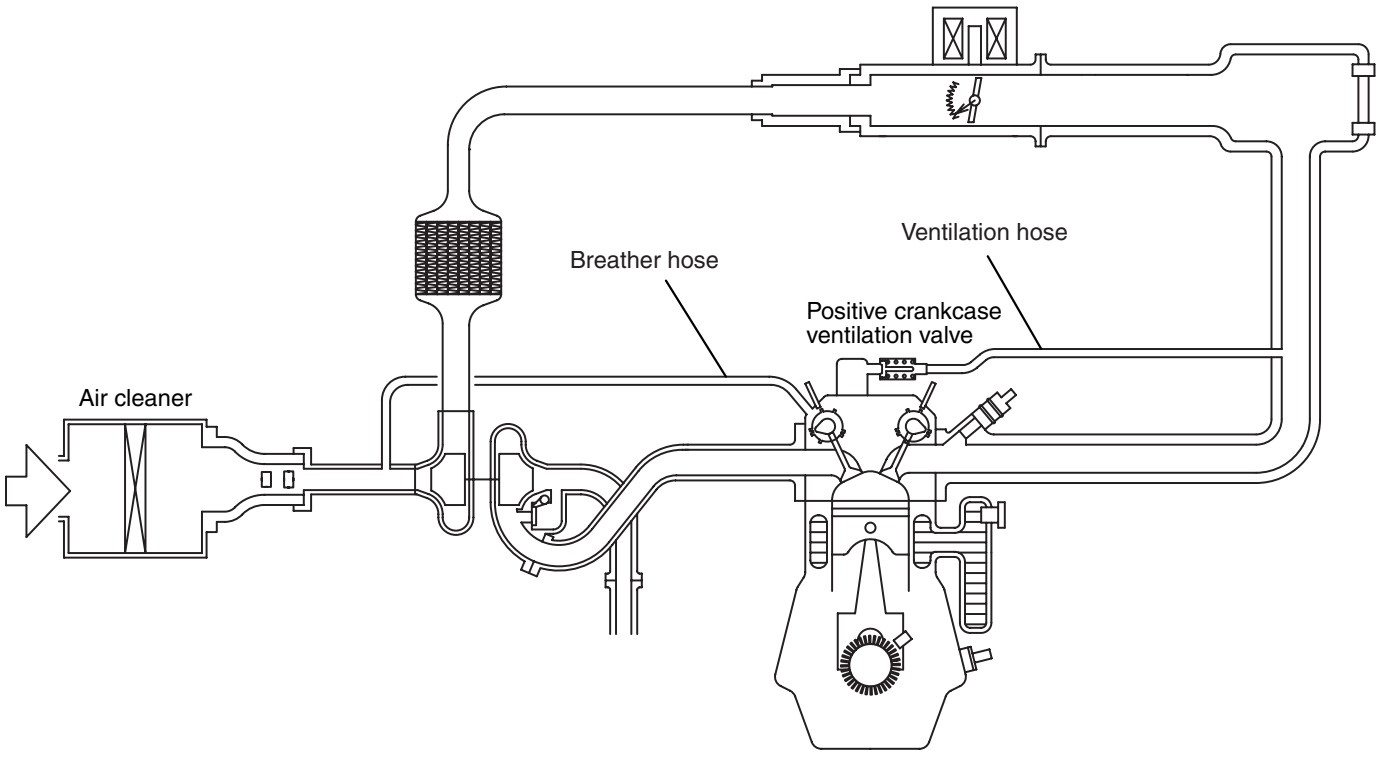
POSITIVE CRANKCASE VENTILATION SYSTEM

GENERAL INFORMATION (POSITIVE CRANKCASE VENTILATION SYSTEM)

M1173005001199

The positive crankcase ventilation (PCV) system prevents the escape of blow-by gases from inside the crankcase into the atmosphere.
Fresh air is sent from the air cleaner into the crankcase through the breather hose to be mixed with the blow-by gas inside the crankcase.
The blow-by gas inside the crankcase is drawn into the intake manifold through the PCV valve.
The PCV valve is designed to lift the plunger according to the intake manifold vacuum so as to regulate the flow of blow-by gas properly.
In other words, the blow-by gas flow is regulated during low load engine operation to maintain engine stability, while the flow is increased during high load operation to improve the ventilation performance.

SYSTEM DIAGRAM



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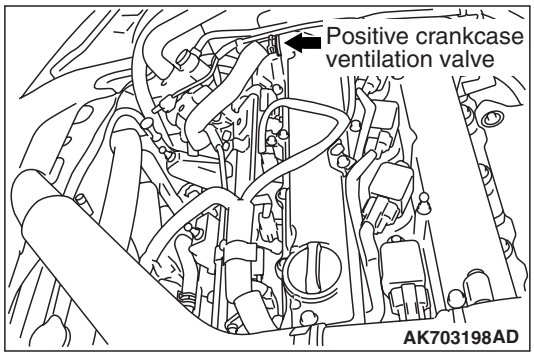
COMPONENT LOCATION

M1173007400833



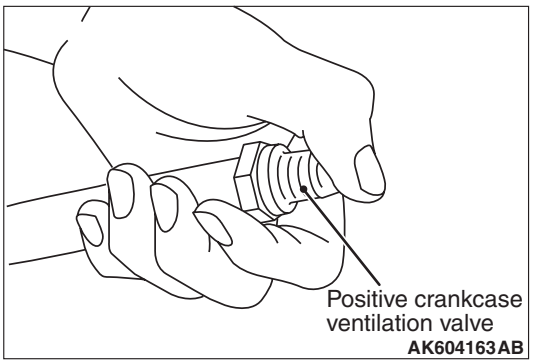
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM CHECK

M1173001100878

1. Remove the ventilation hose from the positive crankcase ventilation (PCV) valve.
2. Remove the PCV valve from the rocker cover.
3. Reinstall the PCV valve at the ventilation hose.
4. Start the engine and run at idle.
5. Place a finger at the opening of the PCV valve and check that vacuum of the intake manifold is felt.

   NOTE: At this moment, the plunger in the PCV valve moves back and forth.
6. If vacuum is not felt, clean the PCV valve or replace it.
7. Apply a small amount of new engine oil to the O-ring on the PCV valve, and tighten to the specified torque.

   Standard value: 2.5 ±0.4 N· m (22 in-lb)

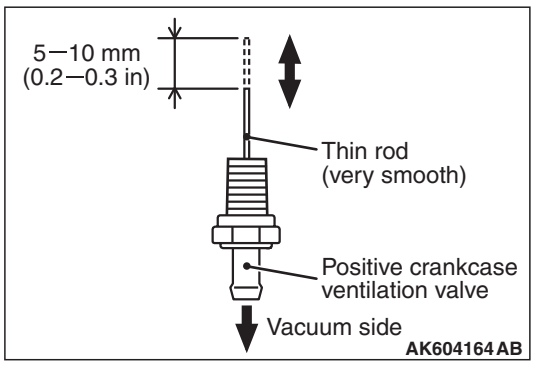


POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM CHECK

M1173001200808

1. Remove the ventilation hose from the positive crankcase ventilation (PCV) valve.
2. Remove the PCV valve from the rocker cover.
3. Hold the PCV valve with the vacuum side down. Insert a thin rod, and using light pressure, depress the end of the PCV valve spring by 5 –10 mm (0.2 –0.3 inch). Release pressure on the rod to see if the PCV valve spring will lift the rod to its original position.
4. If the rod returns quickly to its original position, the PCV valve is OK. If the stick does not return quickly, clean or replace the PCV valve.
5. Apply a small amount of new engine oil to the O-ring on the PCV valve, and tighten to the specified torque.

   Standard value: 2.5 ±0.4 N· m (22 in-lb)



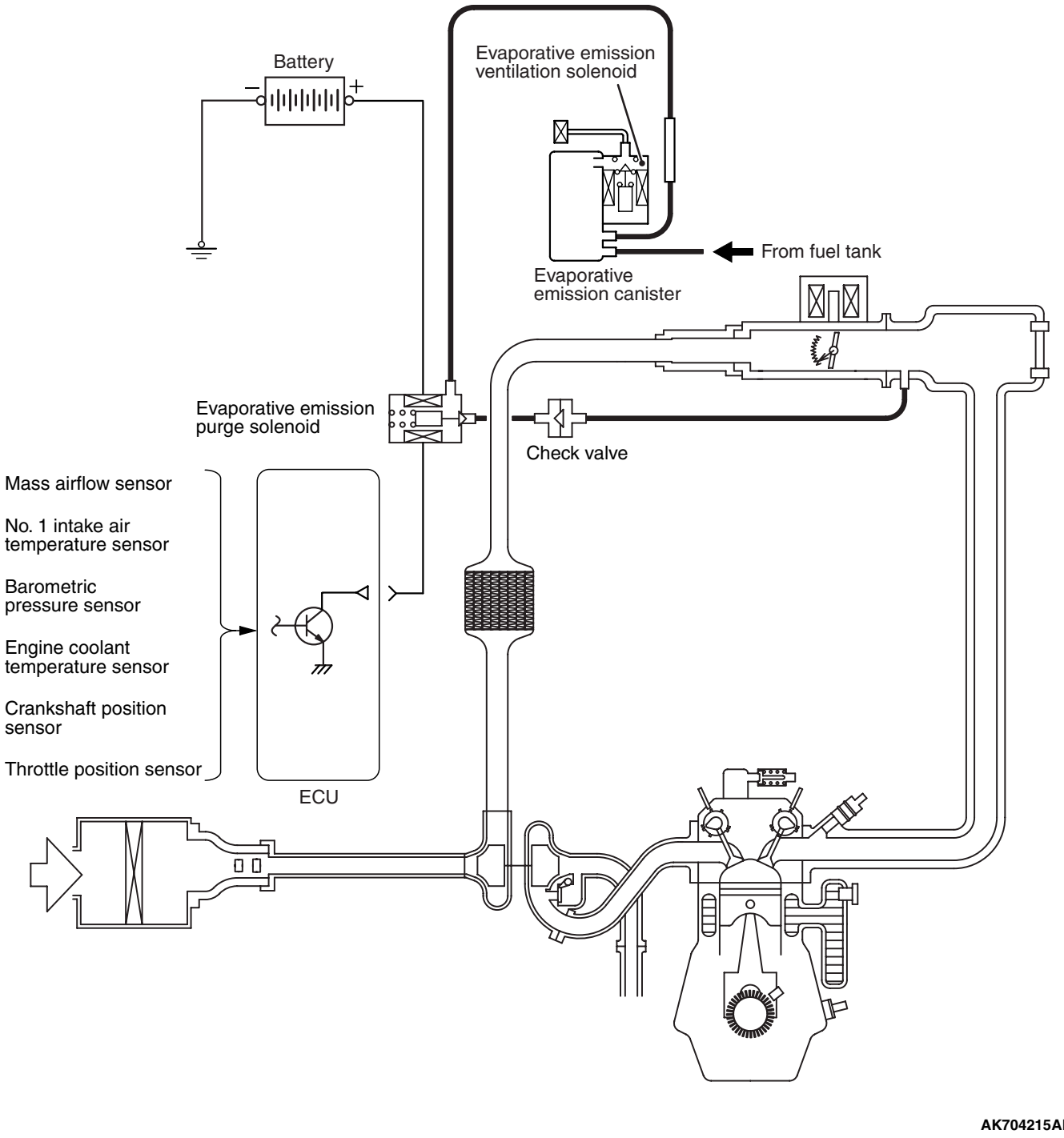
EVAPORATIVE EMISSION CONTROL SYSTEM

GENERAL INFORMATION (EVAPORATIVE EMISSION SYSTEM)

M1173005101389

The evaporative emission (EVAP) system prevents fuel vapors generated in the fuel tank from escaping into the atmosphere.
Fuel vapors from the fuel tank flow through the vapor pipe/hose to be stored temporarily in the EVAP canister.
When the vehicle is in operation, fuel vapors stored in the EVAP canister flow through the EVAP purge solenoid, purge port and intake manifold plenum to the combustion chamber.
When the engine coolant temperature is low or when the intake air quantity is small (when the engine is at idle, for example), the engine control module (ECM) brings the EVAP purge solenoid into the OFF state to shut off the fuel vapor flow to the intake manifold plenum. This ensures driveability when the engine is cold or running under low load and also stabilizes the emission level.
An EVAP ventilation solenoid is provided between the EVAP canister and atmosphere to monitor for OBD-II EVAP leaks. This solenoid is normally OFF. However, it turns ON when monitoring for OBD-II EVAP leaks and shuts off the atmosphere flow to the EVAP canister. Then the fuel tank differential pressure sensor monitors the fuel vapor pressure to detect OBD-II EVAP leaks. The fuel overflow limiter valve and the leveling valve prevent fuel from being overfilled. The fuel overflow limiter valve and the leveling valve prevents fuel leaks if the vehicle is rolled over in an accident.
The EVAP ventilation valve releases the air from the fuel tank through the EVAP canister into the atmosphere when the fuel tank pressure increases due to refueling, etc. The EVAP ventilation valve and the air filter supply the atmospheric air to the EVAP canister when the fuel tank pressure decreases.

SYSTEM DIAGRAM



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COMPONENT LOCATION

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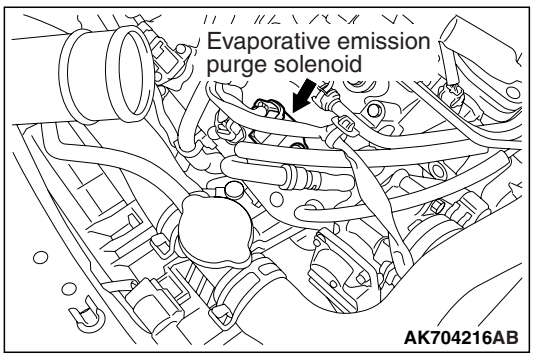
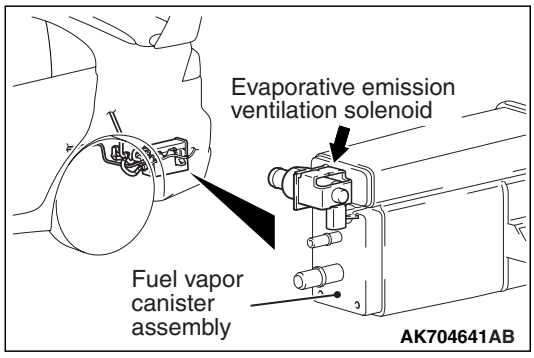
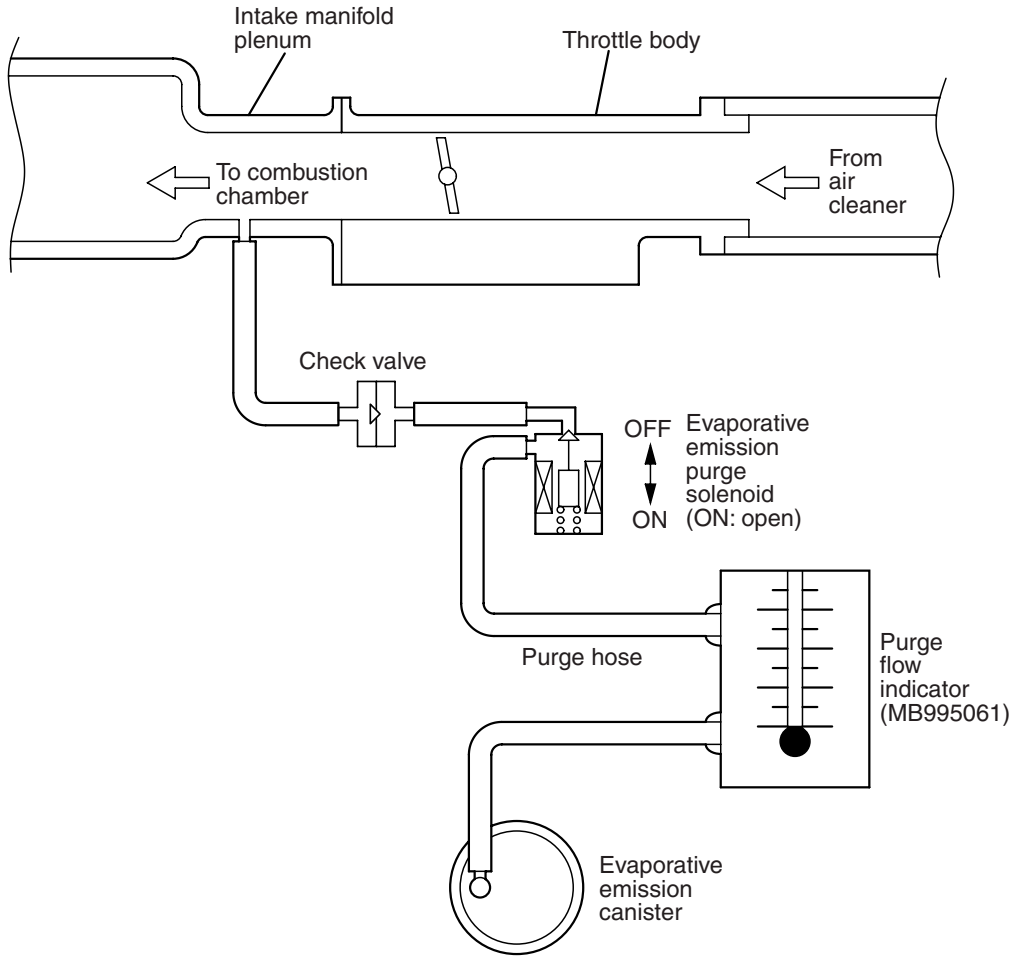




PURGE CONTROL SYSTEM CHECK (PURGE FLOW CHECK)

M1173001401258



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Required Special Tool:

- MB995061: Purge Flow Indicator

1. Disconnect the purge hose from the evaporative emission (EVAP) purge solenoid, and connect special tool MB995061 between the EVAP purge solenoid and the purge hose.

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2. Before inspection and adjustment, set the vehicle in the following conditions:
   - Engine coolant temperature: 80 –95° C (176 –203° F)
   - Lights, electric cooling fan and accessories: OFF
   - Transaxle: Neutral (P range on vehicles with TC-SST)
3. Run the engine at idle for more than four minutes.
4. Check the purge flow volume when engine is revved suddenly several times.

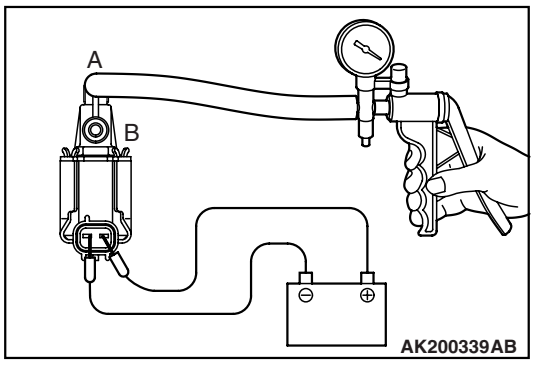
   Standard value: Momentarily 20 cm^3/s (2.5 SCFH) or more.
5. If the purge flow volume is less than the standard value, check it again with the vacuum hose disconnected from the EVAP canister. If the purge flow volume is less than the standard value, check the vacuum port and the vacuum hose for clogging. Also check the EVAP purge solenoid. If the purge flow volume is at the standard value, with the EVAP canister disconnected, replace the EVAP canister.

EVAPORATIVE EMISSION PURGE SOLENOID CHECK

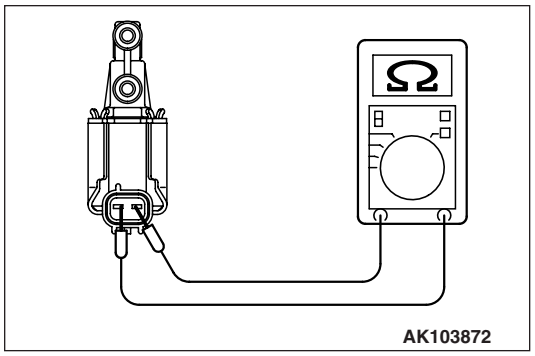
M1173001700773

1. Disconnect the vacuum hose (black, black with red paint mark) from the evaporative emission (EVAP) purge solenoid.

   NOTE: When disconnecting the vacuum hose, always place an identification mark so that it can be reconnected at its original position.
2. Disconnect the harness connector.
3. Connect a hand vacuum pump to nipple (A) of the EVAP purge solenoid (refer to the illustration at left).
4. As described in the chart below, check airtightness by applying a vacuum with voltage applied directly from the battery to the EVAP purge solenoid valve and without applying voltage.



Jumper wire	Nipple "B" state	Normal state
Connected	Opened	Negative pressure leaks
	Closed	Negative pressure maintained
Disconnected	Opened	Negative pressure maintained



5. Measure the resistance between the terminals of the EVAP purge solenoid.
   Standard value: 22 –26 Ω [at 20° C (68° F)]
6. Replace the solenoid if resistance is out of specification.

MASS AIRFLOW SENSOR CHECK

M1173050400213

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

No. 1 INTAKE AIR TEMPERATURE SENSOR CHECK

M1173008200412

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

BAROMETRIC PRESSURE SENSOR CHECK

M1173008000388

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100772

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

THROTTLE POSITION SENSOR CHECK

M1173050500038

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

CRANKSHAFT POSITION SENSOR CHECK

M1173008300419

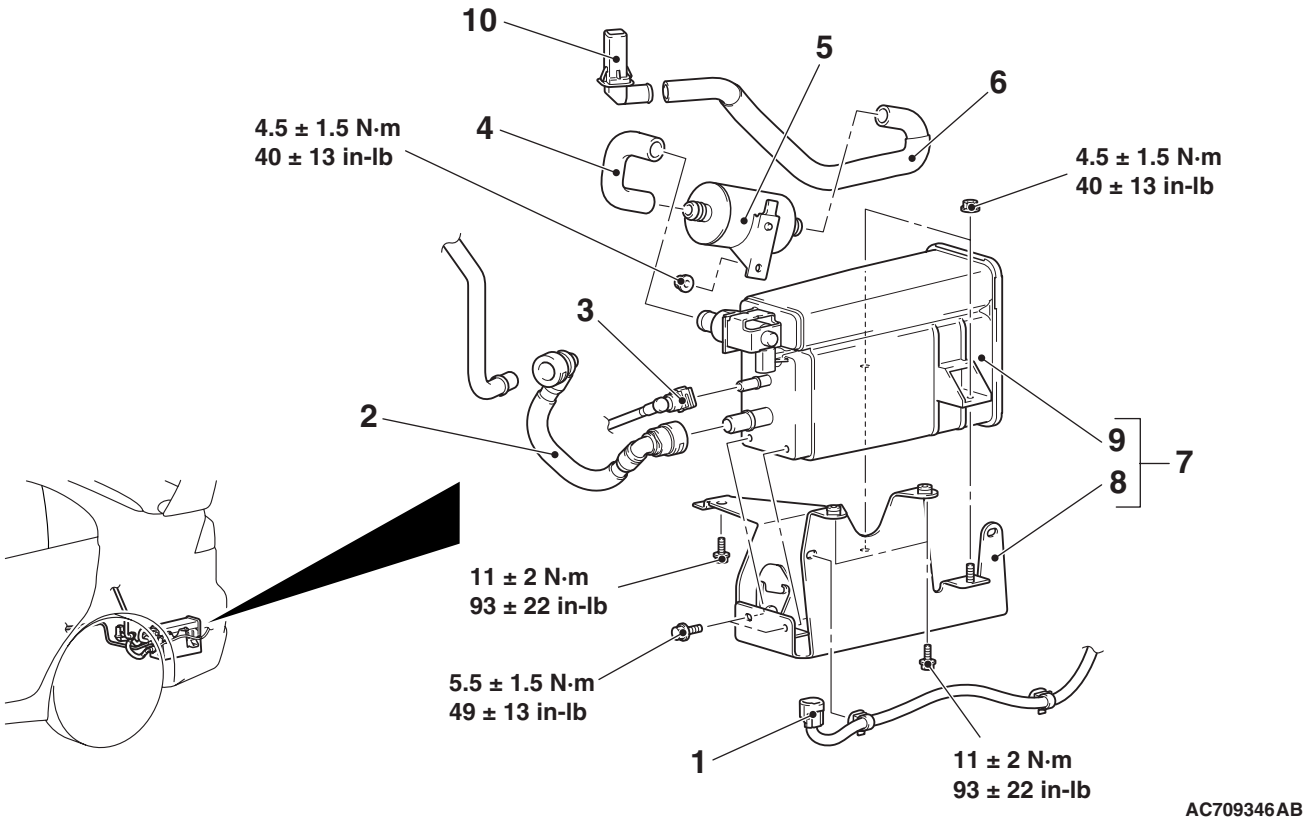
To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-44.

EVAPORATIVE EMISSION CANISTER AND FUEL TANK PRESSURE RELIEF VALVE

REMOVAL AND INSTALLATION

M1173004800520

Pre-removal and post-installation operation
- Rear Wheel Splash Shield Rear Removal and Installation (Refer to GROUP 42A, Splash Shield P.42A-13).



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Removal steps
1. Evaporative emission ventilation solenoid valve connector connection
2. Fuel vapor tube assembly
3. Fuel purge pipe assembly connection
4. Vent hose A

Removal steps (Continued)
5. Air filter
6. Vent hose B
7. Fuel vapor canister and bracket assembly
8. Fuel vapor canister bracket
9. Fuel vapor canister assembly
10. Vent pipe

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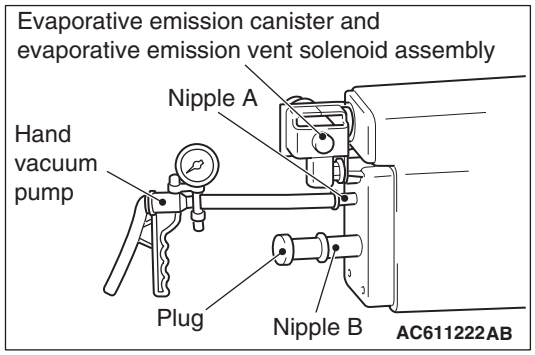
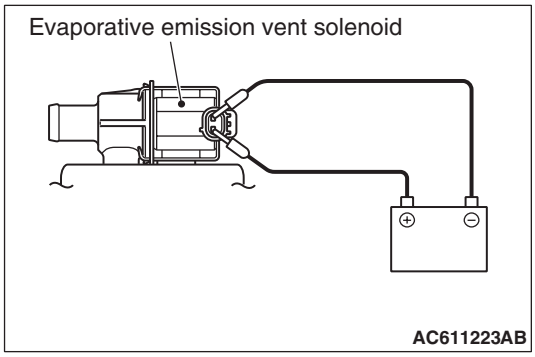
INSPECTION

M1173004900271

EVAPORATIVE EMISSION VENTILATION SOLENOID CHECK

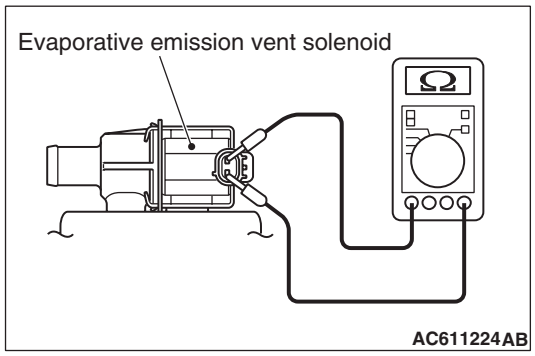


1. Connect a hand vacuum pump to nipple (A) of the evaporative emission canister and evaporative emission ventilation solenoid assembly.
2. Connect a plug to nipple (B) of the evaporative emission canister and evaporative emission ventilation solenoid assembly.



3. Check air tightness by applying a vacuum with voltage applied directly from the battery to the evaporative emission ventilation solenoid and without applying voltage.

Battery voltage	Normal condition
Applied	Vacuum maintained
Not applied	Vacuum leaks



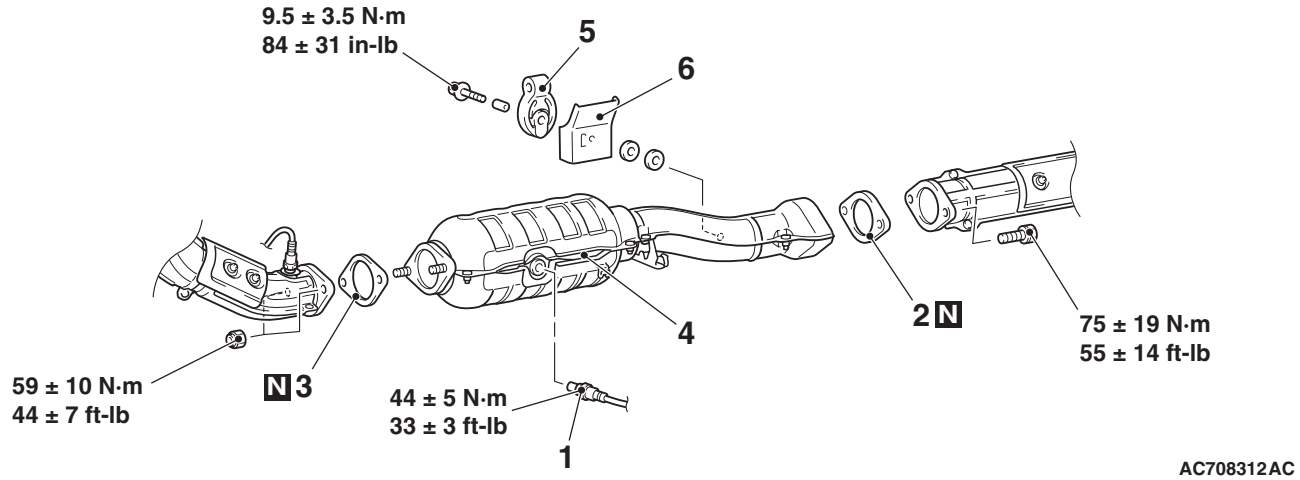
4. Measure the resistance between the terminals of the solenoid.

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

CATALYTIC CONVERTER

REMOVAL AND INSTALLATION

M1173003901248



Removal steps

<<A>> >>A<< 1. Heated oxygen sensor (Rear)
2. Exhaust pipe gasket
3. Exhaust pipe gasket
4. Catalytic converter assembly

Removal steps (Continued)

5. Exhaust muffler hanger
6. Exhaust muffler hanger protector

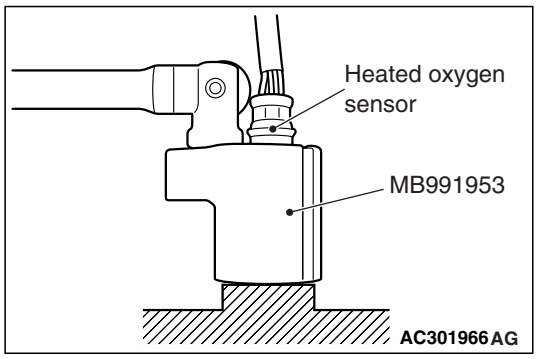
Required Special Tool:

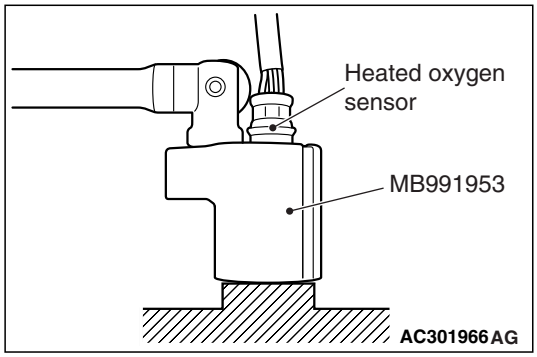
- MB991953: Oxygen Sensor Wrench

REMOVAL SERVICE POINT

<<A>> HEATED OXYGEN SENSOR (REAR) REMOVAL

Use special tool MB991953 to remove the heated oxygen sensor (rear).





INSTALLATION SERVICE POINT

>>A<< HEATED OXYGEN SENSOR (REAR) INSTALLATION

Tighten the heated oxygen sensor (rear) to the specified torque by using special tool MB991953.

Tightening torque: 44 ±5 N·m (33 ±3 ft-lb)