GROUP 17

ENGINE AND EMISSION CONTROL

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Continued on next page

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

⚠ *WARNING*

- ***Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).***
- ***Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.***
- ***MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.***

NOTE
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, driver's and passenger's (front) air bag modules, knee air bag module, side-airbag module, curtain air bag module, side impact sensors, seat belt pre-tensioners, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

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ENGINE CONTROL

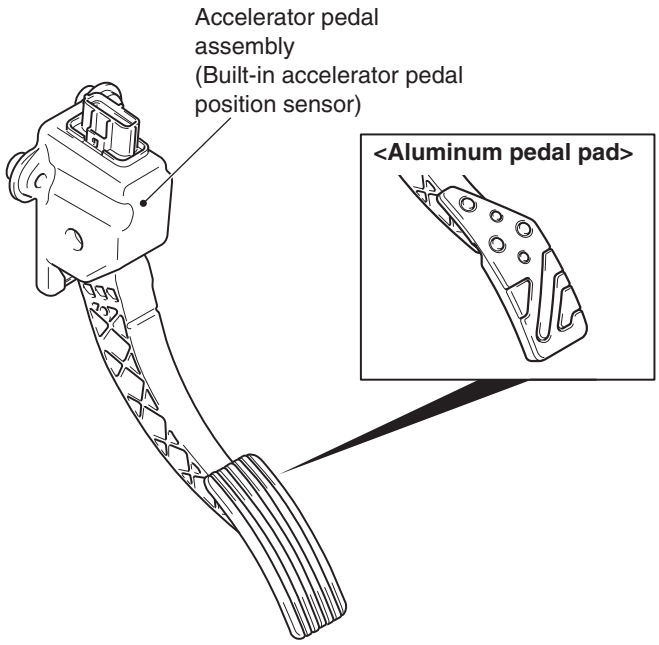
GENERAL INFORMATION

M1171000101333

For the accelerator system, an electronic throttle valve control system has been adopted, disposing of an accelerator cable. This system detects the accelerator pedal travel by using a accelerator pedal position sensor in the accelerator pedal assembly for electronic control of the throttle valve angle.

To the arm of accelerator pedal assembly, a resin arm is employed in order to reduce weight.
Also, the aluminium pedal pad has been adopted to enhance the sporty image <2.0L ENGINE Turbo.>

CONSTRUCTION DIAGRAM



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ENGINE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION

M1171002000362

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

TROUBLESHOOTING STRATEGY

M1171002100392

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

M1171002200430

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.17-6

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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 (APS) is suspected.

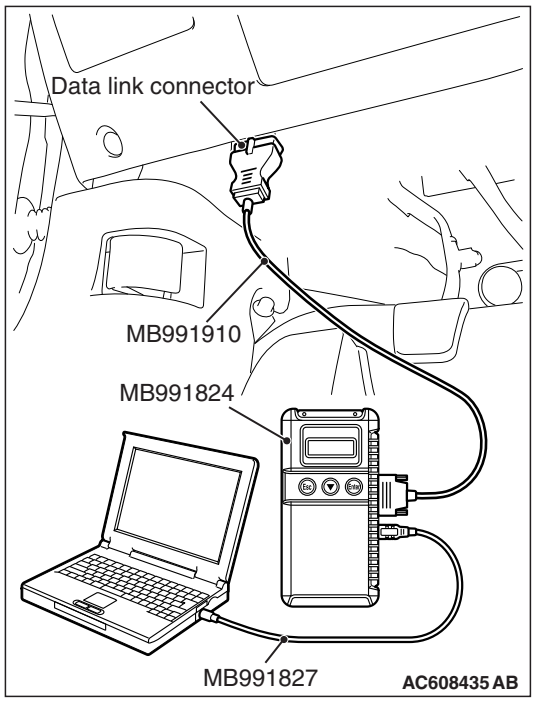
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the throttle body.
- Malfunction of the APS.
- 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, check 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 P.13A-12) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function P.13B-10) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE>.
(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 : Diagnose the MFI system (Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, Diagnosis – Diagnostic Trouble Code Chart P.13B-51) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE>. Then go to Step 3.
NO : Go to Step 2.

STEP 2. Retest the system.

Q: Does the throttle valve work with the accelerator pedal operation?

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.00-14.)
NO : Return to Step 1.

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STEP 3. Retest the system.

Q: Does the throttle valve work with the accelerator pedal operation?

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 accelerator pedal position sensor (APS) is suspected.

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

- Malfunction of the accelerator pedal.
- Incorrectly installed accelerator pedal.
- Malfunction of the APS.

DIAGNOSIS

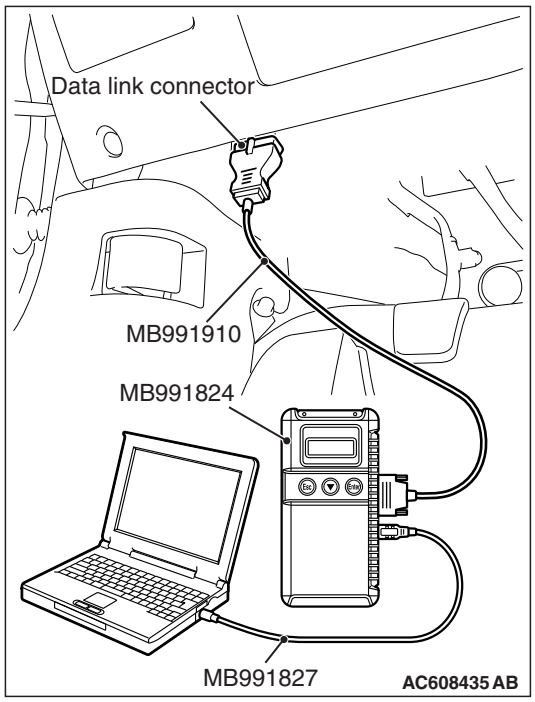
Required Special Tools:

- 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.17-9.) Then go to Step 4.



STEP 2. Using scan tool MB991958, check 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 P.13A-12) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function P.13B-10) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE>.
(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 : Diagnose the MFI system (Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, Diagnosis – Diagnostic Trouble Code Chart P.13B-51) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE>. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Retest the system.

Q: Does the accelerator pedal work normally?

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.00-14.)
NO : Return to Step 1.

STEP 4. Retest the system.

Q: Does the accelerator pedal work normally?

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

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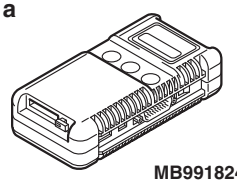
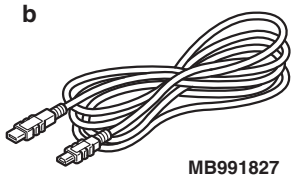
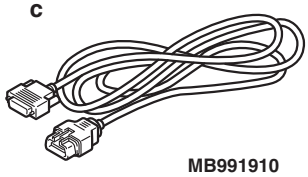
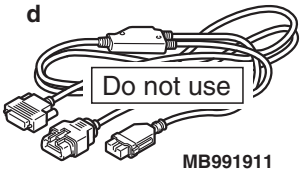
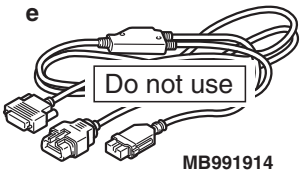
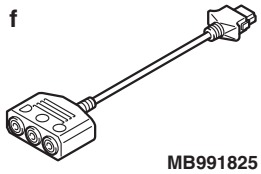
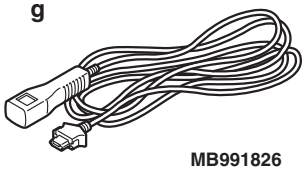
SPECIAL TOOL

M1171000600153

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 MFI system DTC

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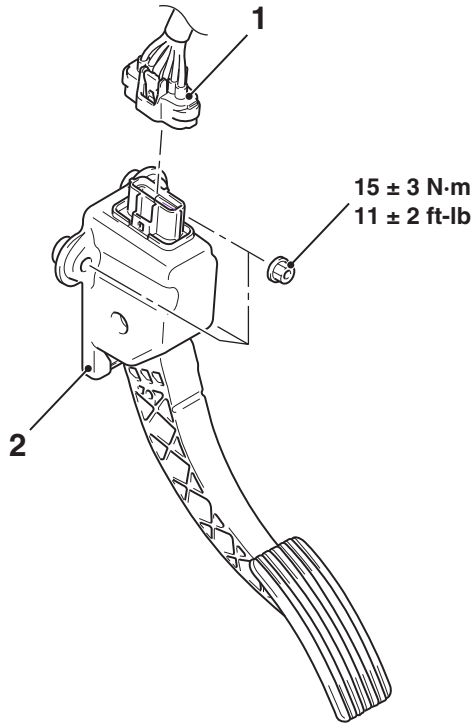
ACCELERATOR PEDAL

REMOVAL AND INSTALLATION

M1171003001067

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

<Vehicles without aluminum pedal pad>



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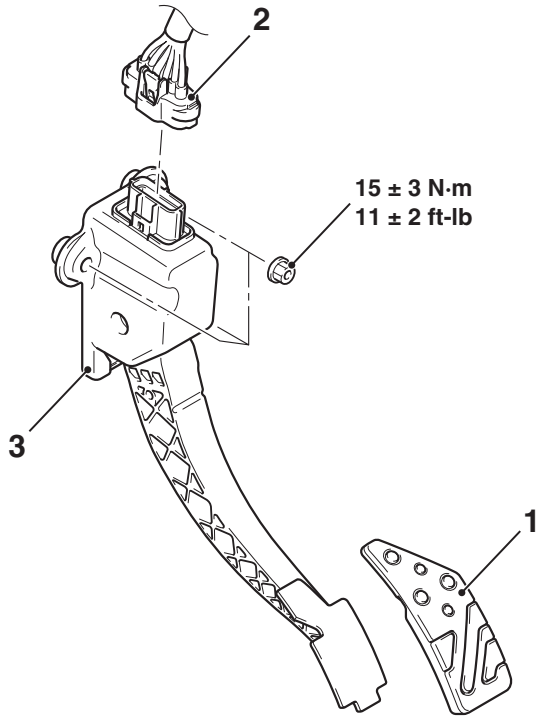
Removal steps
1. Accelerator pedal position sensor connector
2. Accelerator pedal assembly

<Vehicles with aluminum pedal pad>



AC806114AB

Removal steps
1. Accelerator pedal pad

Removal steps (Continued)
2. Accelerator pedal position sensor connector
3. Accelerator pedal assembly

CRUISE CONTROL

GENERAL INFORMATION

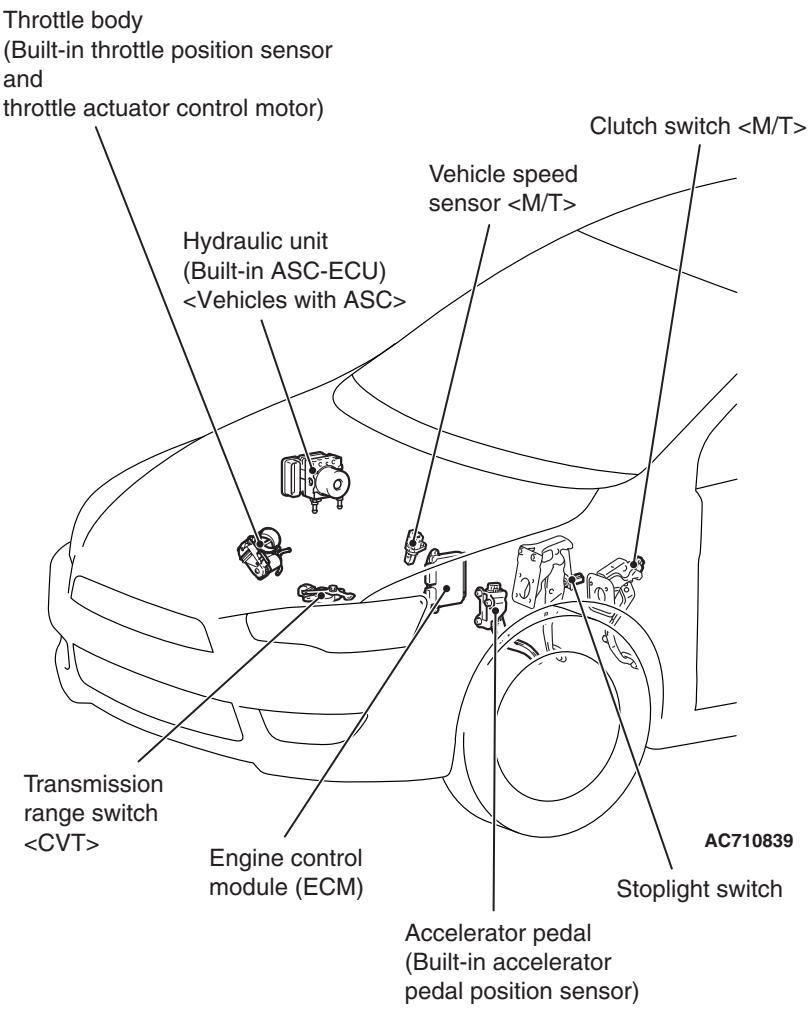
M1172000101381

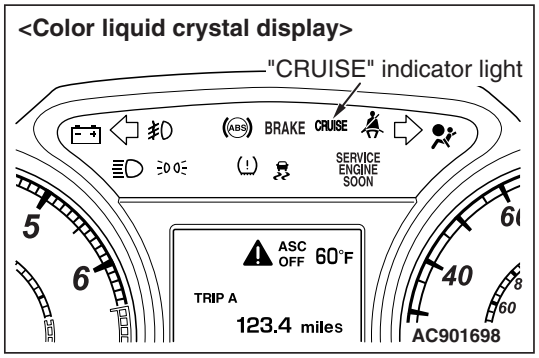
By using the cruise control system, the driver can drive at preferred speeds in a range of approximately 40 to 200 km/h (25 to 125 mph) without depressing the accelerator pedal.

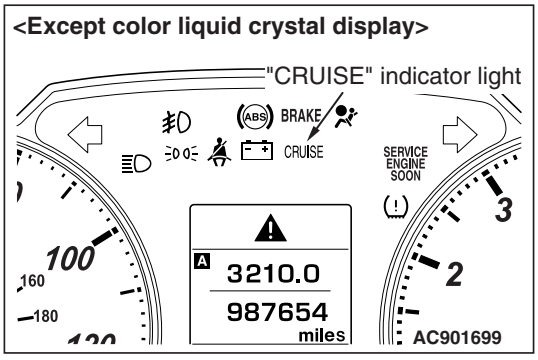
For this cruise control system, in conjunction with the electronic throttle valve control system, the engine control module (ECM) electronically controls the throttle valve.

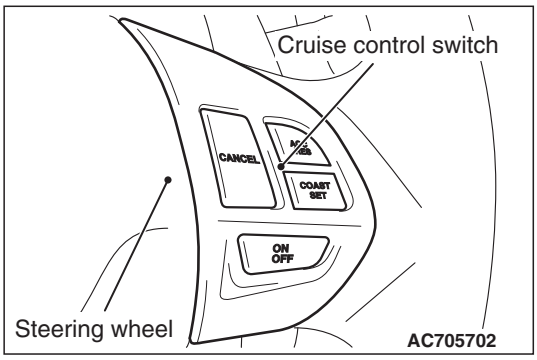
CONSTRUCTION DIAGRAM

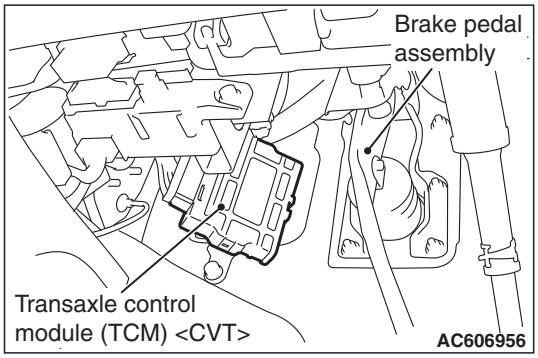
<2.0L ENGINE Non-turbo, 2.4L ENGINE>

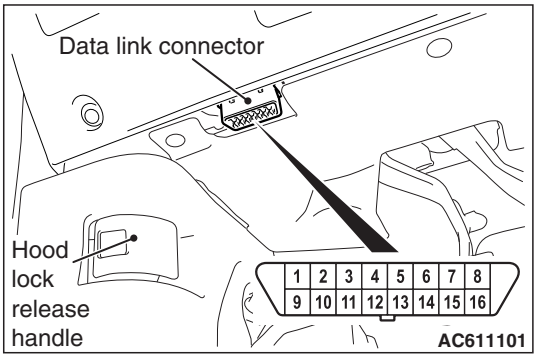

Throttle body
(Built-in throttle position sensor
and
throttle actuator control motor)
Clutch switch <M/T>
Vehicle speed
sensor <M/T>
Hydraulic unit
(Built-in ASC-ECU)
<Vehicles with ASC>
Transmission
range switch
<CVT>
Engine control
module (ECM)
Stoplight switch
Accelerator pedal
(Built-in accelerator
pedal position sensor)
AC710839


<Color liquid crystal display>
"CRUISE" indicator light
BRAKE
CRUISE
SERVICE
ENGINE
SOON
ASC
OFF
60°F
TRIP A
123.4 miles
AC901698


<Except color liquid crystal display>
"CRUISE" indicator light
BRAKE
CRUISE
SERVICE
ENGINE
SOON
3210.0
987654
miles
AC901699

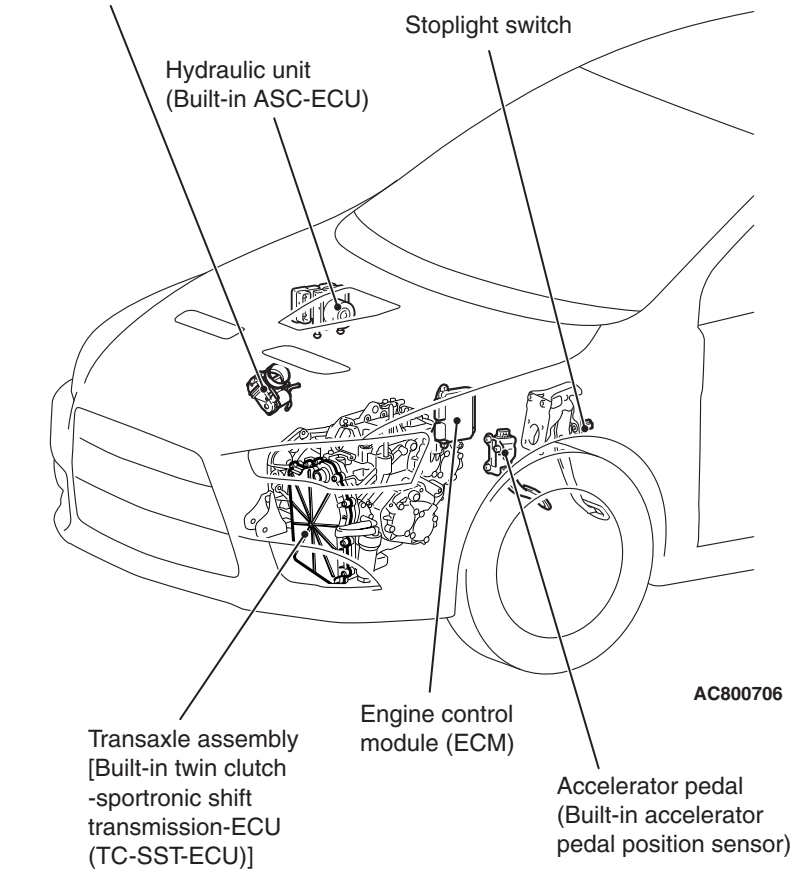

Cruise control switch
CANCEL
COAST
SET
ON
OFF
Steering wheel
AC705702

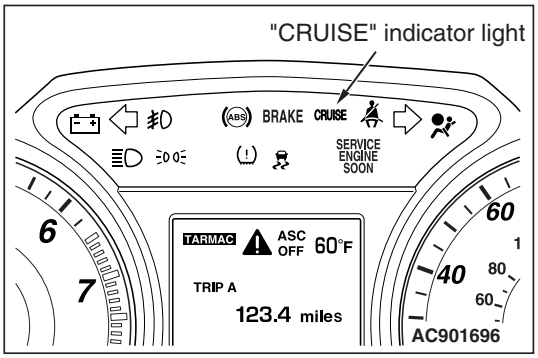

Brake pedal
assembly
Transaxle control
module (TCM) <CVT>
AC606956

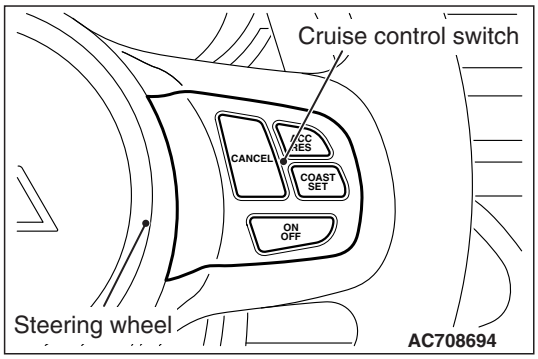

Data link connector
Hood
lock
release
handle
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
AC611101

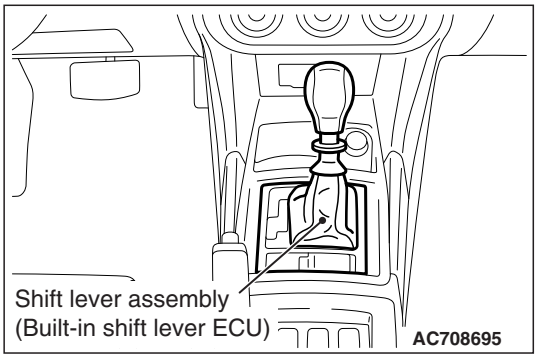
AC901700AB

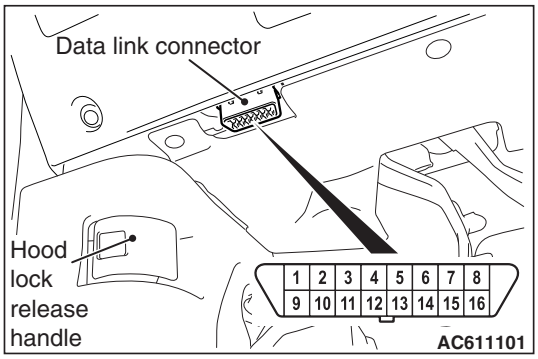
<2.0L ENGINE Turbo>











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TSB Revision

CRUISE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION TO CRUISE CONTROL SYSTEM DIAGNOSIS

M1172003300369

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 engine control module (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 control 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

M1172002000989

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will check most of the possible causes of an 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.17-14, Diagnostic Function – How to Read Diagnostic Trouble Codes.)
4. If you can verify the condition but no cruise control system DTCs are set, the malfunction may be intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.)
5. If you can verify the condition but there are no cruise control system DTCs, find the fault (Refer to P.17-42, Symptom Chart.)
6. If there is an cruise control system DTC, record the number of the code, then erase the code (Refer to P.17-14, 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.17-14, 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.17-17, Diagnostic Trouble Code Chart.)

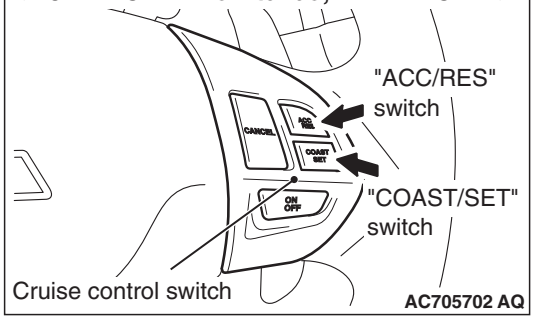
DIAGNOSTIC FUNCTION

M1172004900450

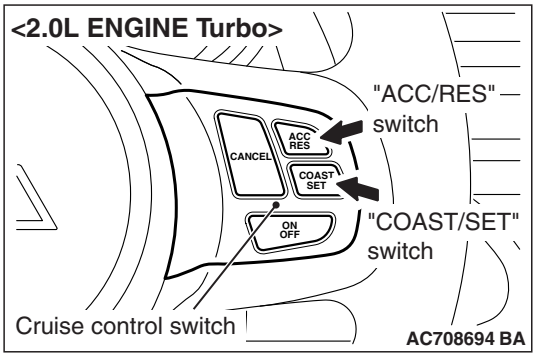
HOW TO READ DIAGNOSTIC TROUBLE CODES

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.

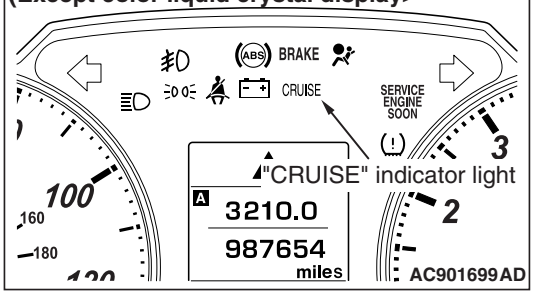
<2.0L ENGINE Non-turbo, 2.4L ENGINE>



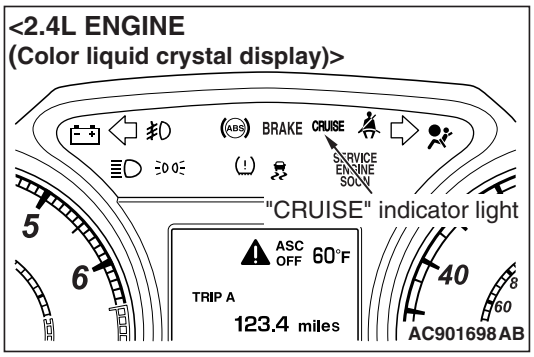
<2.0L ENGINE Turbo>



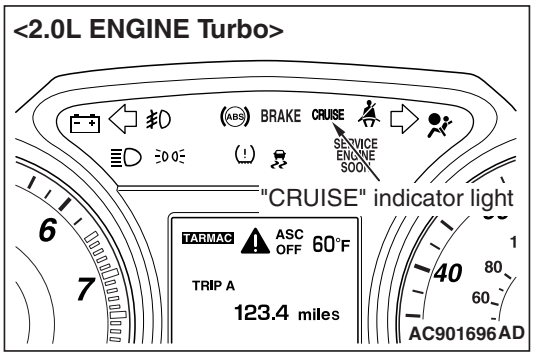
<2.0L ENGINE Non-turbo, 2.4L ENGINE
(Except color liquid crystal display>



<2.4L ENGINE
(Color liquid crystal display)>

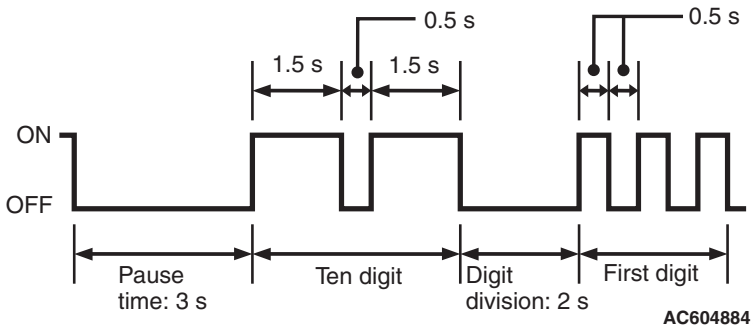
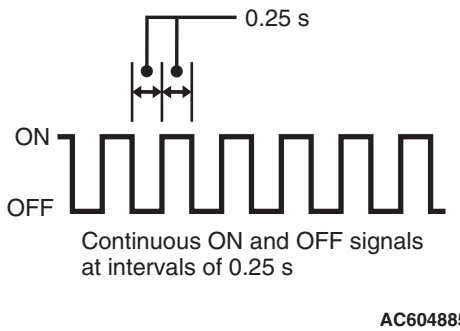


<2.0L ENGINE Turbo>



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 23 is set	When no DTC is set
	

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

HOW TO ERASE DIAGNOSTIC TROUBLE CODES

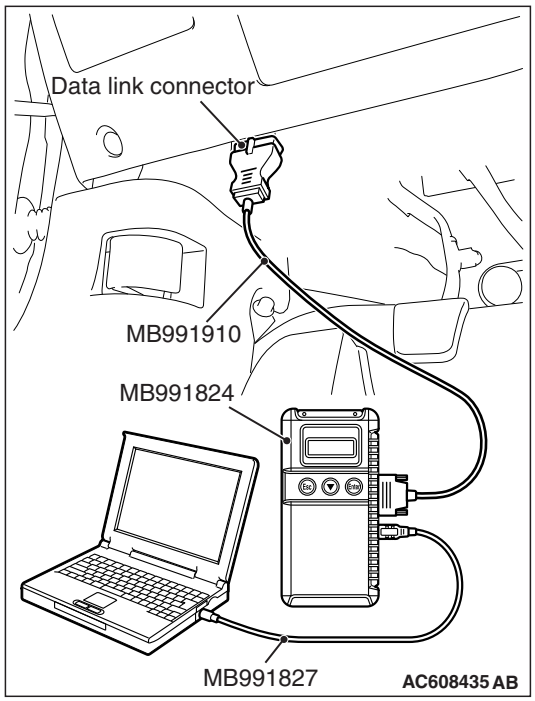
Disconnect the negative (–) battery cable.

TSB Revision

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.

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.

DIAGNOSTIC TROUBLE CODE (DTC) CHART

M1172002201414

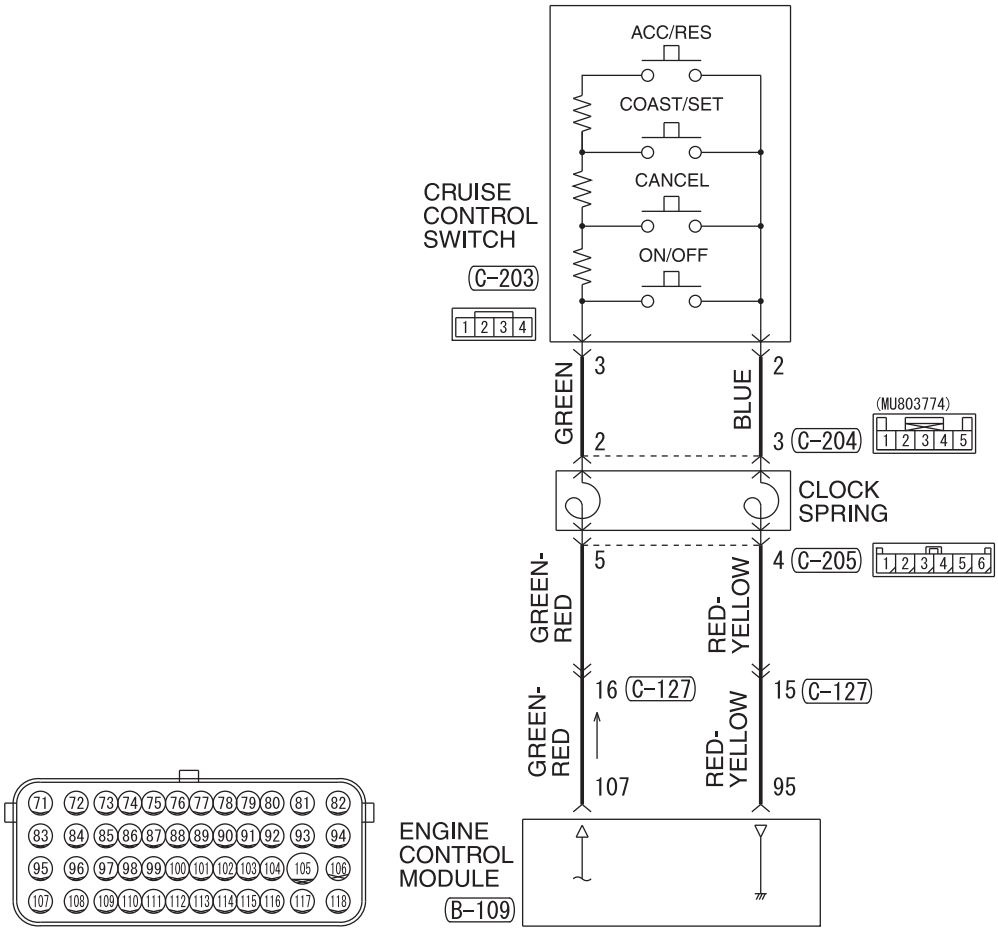
Check according to the inspection chart that is appropriate for the DTC.

DTC number	Inspection Item	Reference page
15	Cruise control switch system	P.17-18
22	Stoplight switch system	P.17-32
23	ECM and its related components	P.17-41

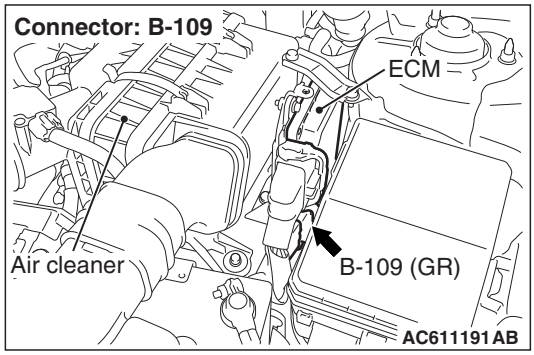
DIAGNOSTIC TROUBLE CODE PROCEDURES

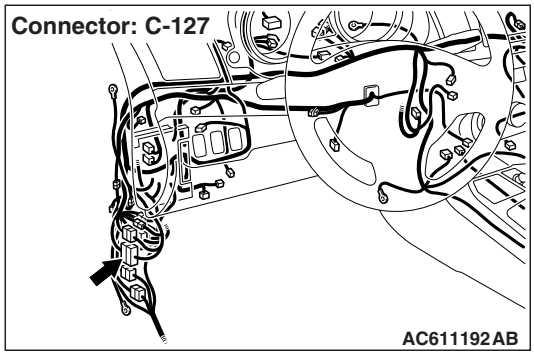
DTC 15: Cruise Control Switch System

Cruise Control Switch Circuit



AC803254 AB





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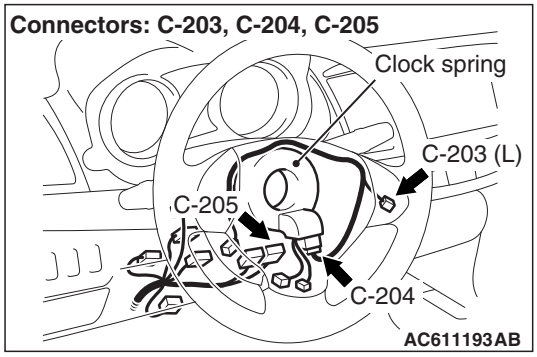


CIRCUIT OPERATION

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 ECM terminal voltage is different from the standard value.
- Or, this DTC is set when the "COAST/SET" switch or "ACC/RES" switch is stuck to ON.

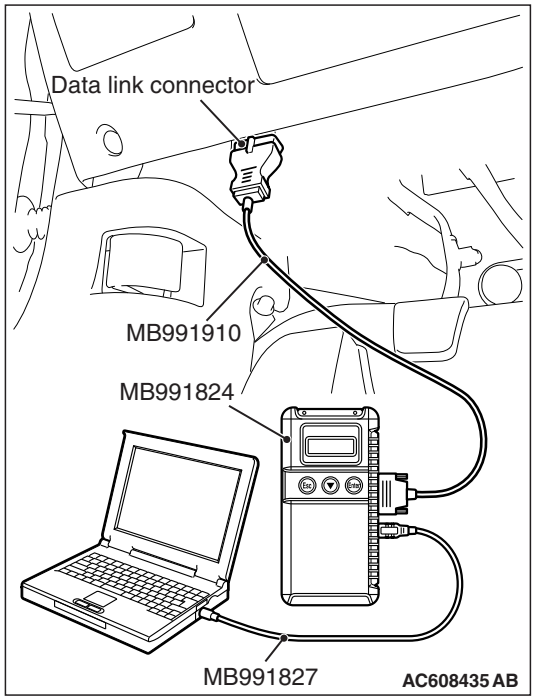
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

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

DIAGNOSIS PROCEDURE

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.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 25.
NO : Go to Step 2.

STEP 2. Measure the power supply voltage at cruise control switch connector C-203 by backprobing.

(1) Remove the cruise control switch from the steering wheel with the cruise control switch connector connected (Refer to P.17-89) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to P.17-89) <2.0L ENGINE Turbo.>
(2) Connect the negative (–) battery cable that was disconnected when the driver's air bag module was removed.
(3) Do not disconnect cruise control switch connector C-203.
(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-203 terminal number 3 and body ground by backprobing.

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

YES : Go to Step 14.
NO : Go to Step 3.

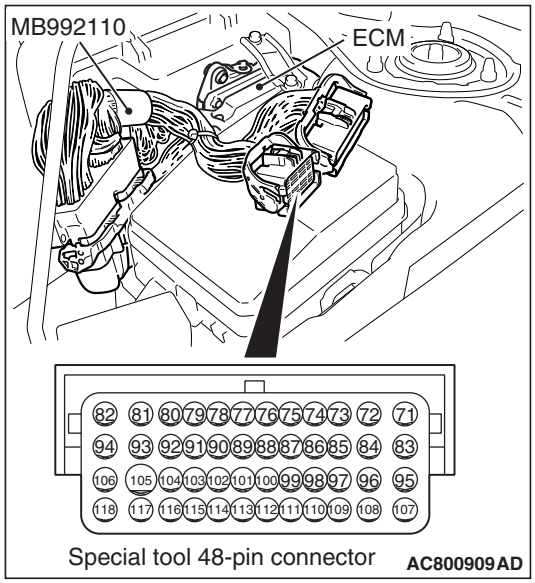
STEP 3. Measure the power supply voltage at ECM connector B-109.

(1) Disconnect the ECM connectors [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.>

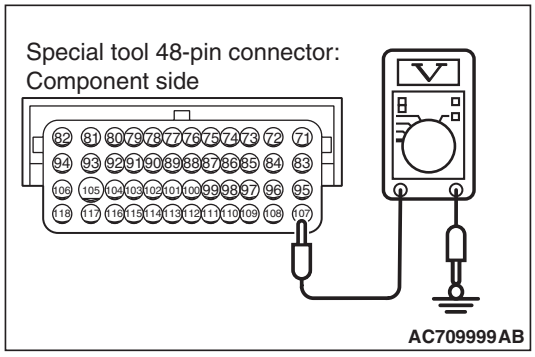
(2) Connect special tool MB992110 between the ECM and the body-side harness connector.

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

(4) Do not operate the cruise control switch.



Special tool 48-pin connector AC800909AD



(5) Measure the power supply voltage between special tool 48-pin connector terminal number 107 (ECM connector B-109 terminal number 107) and body ground.

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

YES : Go to Step 10.

NO : Go to Step 4.

STEP 4. Check ECM connector B-109 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 terminal in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 5. Check the harness wire for short circuit to body ground between the ECM connector B-109 terminal number 107 and the cruise control switch connector C-203 terminal number 3.

(1) Disconnect ECM connector B-109 and measure at the harness connector side [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.>
(2) Turn the ignition switch to the "LOCK" (OFF) position.
(3) Measure the continuity between ECM connector B-109 terminal number 107 and body ground.

Q: Is the measured continuity open circuit?

YES : Go to Step 24.
NO : Go to Step 6.

STEP 6. Check intermediate connector C-127, cruise control switch connector C-203, and clock spring connectors C-204 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 connector and terminal in good condition?

YES : Go to Step 7.
NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 7. Check the harness wire between ECM connector B-109 terminal number 107 and clock spring connector C-205 terminal number 5, and between clock spring connector C-204 terminal number 2 and cruise control switch connector C-203 terminal number 3, for damage.

- Check harness wire for short circuit and damage.

Q: Is the harness wire in good condition?

YES : Go to Step 8.
NO : Repair or replace the damaged harness wire. Then go to Step 26.

STEP 8. Check the clock spring.
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-425 <2.0L ENGINE Non-turbo and 2.4L ENGINE.>
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-433 <2.0L ENGINE Turbo.>

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 Modules and Clock Spring P.52B-419) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-427) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 9. Check the cruise control switch.
Refer to P.17-87.

Q: Is the cruise control switch in good condition?

YES : Go to Step 13.
NO : Replace the cruise control switch (Refer to P.17-89) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to P.17-89) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 10. Check ECM connector B-109, intermediate connector C-127, cruise control switch connector C-203, and clock spring connectors C-204 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 terminal in good condition?

YES : Go to Step 11.
NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 11. Check the harness wire between ECM connector B-109 terminal number 107 and clock spring connector C-205 terminal number 5, and between clock spring connector C-204 terminal number 2 and cruise control switch connector C-203 terminal number 3, for damage.

- Check harness wire for open circuit and damage.

Q: Is the harness wire in good condition?

YES : Go to Step 12.
NO : Repair or replace the damaged harness wire. Then go to Step 26.

STEP 12. Check the clock spring.
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-425 <2.0L ENGINE Non-turbo and 2.4L ENGINE.>
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-433 <2.0L ENGINE Turbo.>

Q: Is the clock spring in good condition?

YES : Go to Step 13.
NO : Replace the clock spring (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-419) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-427) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 13. 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.
(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 25.
NO : Go to Step 14.

STEP 14. Measure the ground voltage at cruise control switch connector C-203 by backprobing.

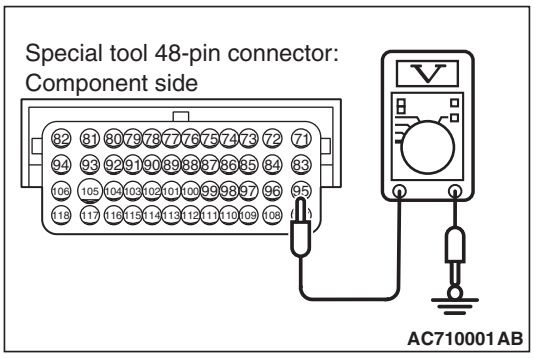
(1) Remove the cruise control switch from the steering wheel with the cruise control switch connector connected (Refer to P.17-89) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to P.17-89) <2.0L ENGINE Turbo.>
(2) Connect the negative (–) battery cable that was disconnected when the driver's air bag module was removed.
(3) Do not disconnect cruise control switch connector C-203.
(4) Turn the ignition switch to the "ON" position.
(5) Press and hold the "ON/OFF" switch, and measure the ground voltage between cruise control switch connector C-203 terminal number 2 and body ground by backprobing.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 20.
NO : Go to Step 15.

STEP 15. Measure the ground voltage at ECM connector B-109.

(1) Disconnect the ECM connectors [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.>
(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 and hold the "ON/OFF" switch, and measure the ground voltage between special tool 48-pin connector terminal number 95 (ECM connector B-109 terminal number 95) and body ground.



Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 17.
NO : Go to Step 16.

STEP 16. Check ECM connector B-109 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 terminal in good condition?

YES : Go to Step 24.
NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 17. Check intermediate connector C-127, cruise control switch connector C-203, and clock spring connectors C-204 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 terminal in good condition?

YES : Go to Step 18.
NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 18. Check the harness wire between ECM connector B-109 terminal number 95 and clock spring connector C-205 terminal number 4, and between clock spring connector C-204 terminal number 3 and cruise control switch connector C-203 terminal number 2, for damage.

- Check harness wire for open circuit and damage.

Q: Is the harness wire in good condition?

YES : Go to Step 19.
NO : Repair or replace the damaged harness wire. Then go to Step 26.

STEP 19. Check the clock spring.
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-425 <2.0L ENGINE Non-turbo and 2.4L ENGINE.>
Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-433 <2.0L ENGINE Turbo.>

Q: Is the clock spring in good condition?

YES : Go to Step 24.
NO : Replace the clock spring (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-419) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-427) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 20. Check ECM connector B-109, intermediate connector C-127, cruise control switch connector C-203, and clock spring connectors C-204 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 terminal in good condition?

YES : Go to Step 21.
NO : Repair or replace the damaged connector. Then go to Step 26.

STEP 21. Check the harness wire between ECM connector B-109 terminal number 95 and clock spring connector C-205 terminal number 4, and between clock spring connector C-204 terminal number 3 and cruise control switch connector C-203 terminal number 2, for damage.

- Check harness wire for short circuit and damage.

Q: Is the harness wire in good condition?

YES : Go to Step 22.

NO : Repair or replace the damaged harness wire. Then go to Step 26.

STEP 22. Check the clock spring.

Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-425 <2.0L ENGINE Non-turbo and 2.4L ENGINE.>

Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring Inspection P.52B-433 <2.0L ENGINE Turbo.>

Q: Is the clock spring in good condition?

YES : Go to Step 23.

NO : Replace the clock spring (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-419) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to GROUP 52B, Driver's Air Bag Modules and Clock Spring P.52B-427) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 23. Check the cruise control switch.

Refer to P.17-87.

Q: Is the cruise control switch in good condition?

YES : Go to Step 24.

NO : Replace the cruise control switch (Refer to P.17-89) <2.0L ENGINE Non-turbo and 2.4L ENGINE> or (Refer to P.17-89) <2.0L ENGINE Turbo.> Then go to Step 26.

STEP 24. 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.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 25.

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 26.

STEP 25. 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.17-14.)

Q: Is DTC 15 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 26.

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.00-14.)

STEP 26. 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.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 27.
NO : Return to Step 2.

STEP 27. Read the cruise control system DTC.

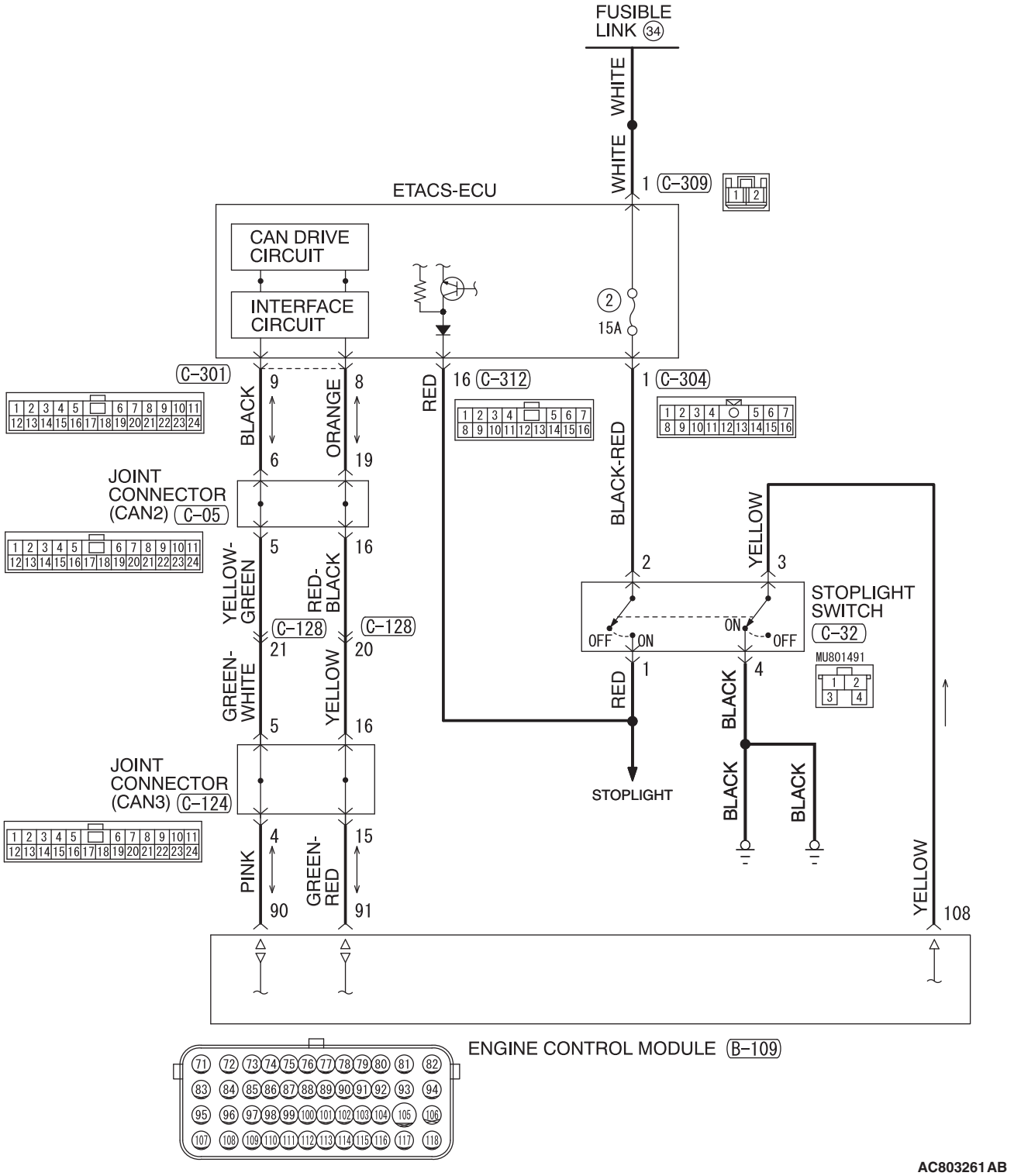
(1) Disconnect the negative (–) battery terminal, to erase the DTC of the cruise control system.
(2) Connect the negative (–) battery terminal.
(3) Turn the ignition switch to the "ON" position, and press the "ON/OFF" switch to turn the cruise control system to ON (turn on the "CRUISE" indicator light.)
(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.17-14.)

Q: Is DTC 15 set?

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

DTC 22: Stoplight Switch System

Stoplight Switch System Circuit <2.0L ENGINE Non-turbo, 2.4L ENGINE>



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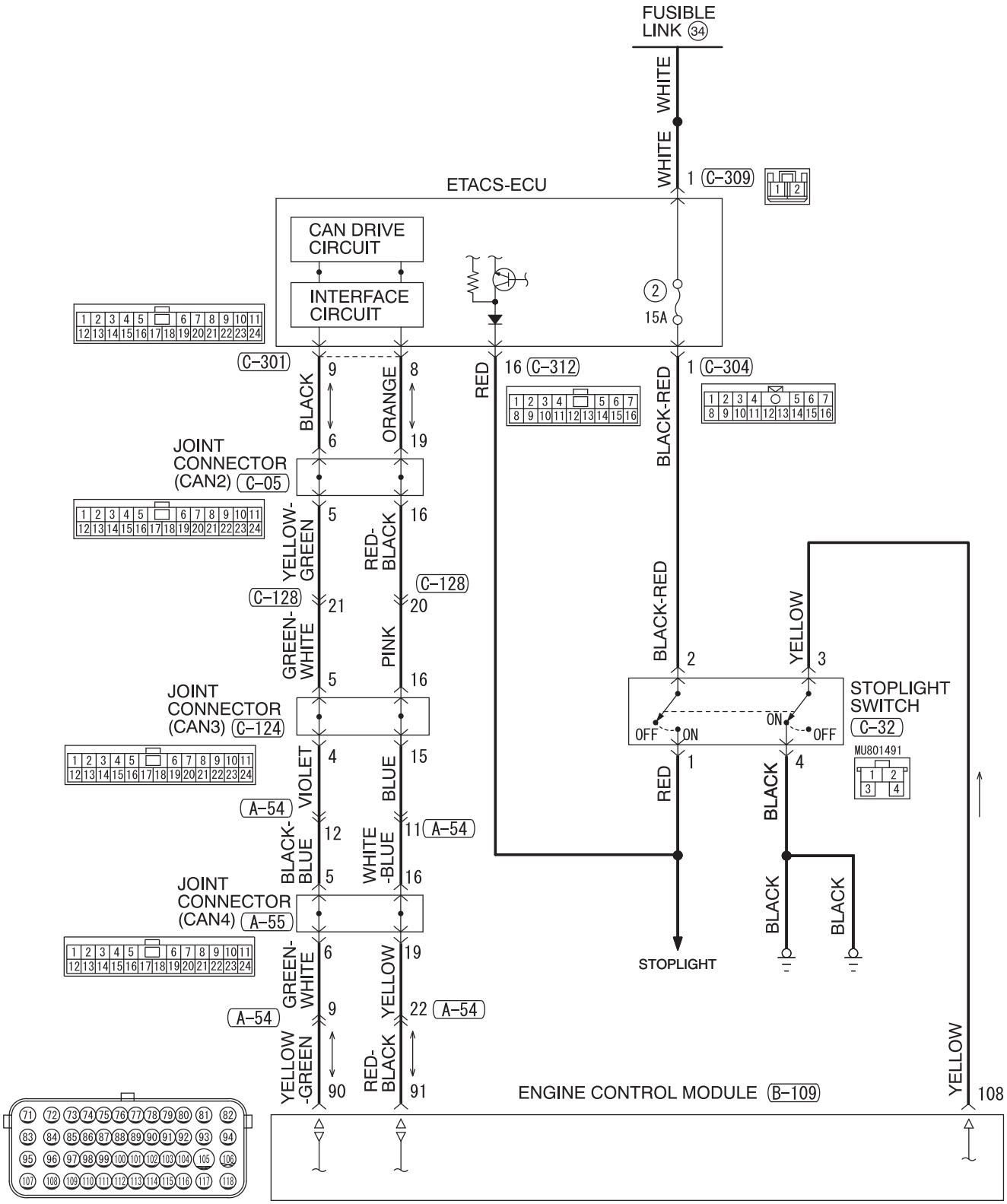
Stoplight Switch System Circuit <2.0L ENGINE Turbo>



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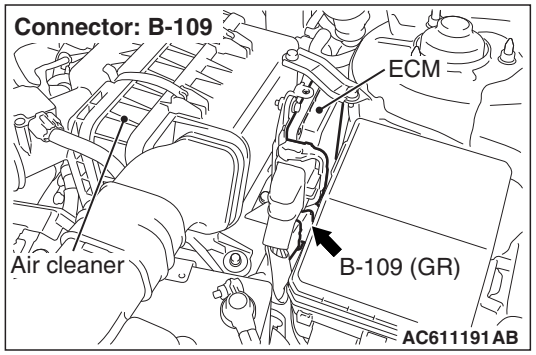
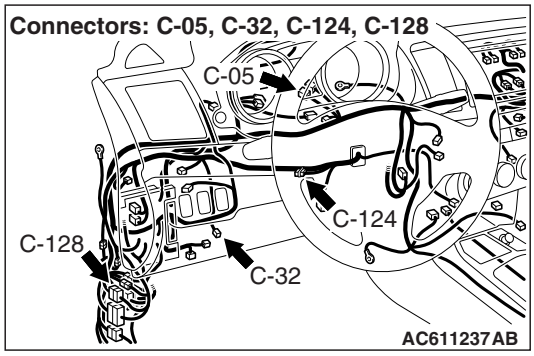
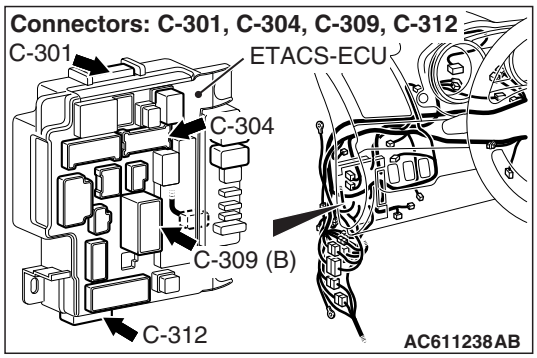






CIRCUIT OPERATION

- For the stoplight switch, two switches, a stoplight switch for the stoplight illumination and a brake switch exclusively for the cruise control system, are incorporated to improve the reliability.
- As for the stoplight switch, when the brake pedal is depressed/released, the stoplight switch ON/OFF signal is transmitted from the ETACS-ECU to the ECM via CAN bus line.
- As for the brake switch, the ECM connector B-109 terminal number 108 monitor the state of the brake switch. The brake switch turn ON/OFF when the brake pedal is depressed/released, and the input signal to the ECM connector B-109 terminal number 108 changes. According to this change, the ECM judges the state of the brake switch.

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 connector B-109 terminal number 108 and body 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

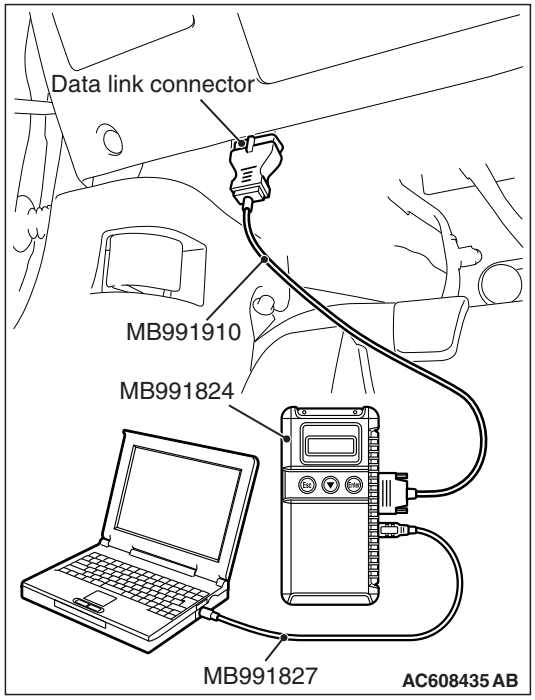
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?
YES : Go to Step 10.
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.17-14.)
(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, Troubleshooting – Data List Reference Table P.54A-726.)
- 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."

Q: Is the switch operating properly?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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-32, 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 connector and terminal in good condition?

YES : Go to Step 5.
NO : Repair or replace the damaged 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-32 terminal number 2, and between stoplight switch connector C-32 terminal number 1 and ETACS-ECU connector C-312 terminal number 16, for damage.

- Check harness wire for open/short circuit and damage.

Q: Is the harness wire in good condition?

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

STEP 6. Check fuse number 2 at the ETACS-ECU.

Q: Is the fuse in good condition?

YES : Go to Step 7.
NO : Check the stoplight system harness and replace the fuse. Then go to Step 16.

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STEP 7. Check the stoplight switch.
Refer to GROUP 35A, Brake Pedal, Inspection – Stoplight Switch Check P.35A-34.

Q: Is the stoplight switch operating properly?

YES : Go to Step 8.

NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-33.) 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.17-14.)
(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 – Troubleshooting – Data List Reference Table P.54A-726.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 9.

NO : Replace the ETACS-ECU (Refer to GROUP 54A, ETACS, ETACS-ECU P.54A-772.) Then go to Step 16.

STEP 9. 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 10.

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 10. 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 15.
NO : Go to Step 11.

STEP 11. Check ECM connector B-109 and stoplight switch connector C-32, 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 terminal in good condition?

YES : Go to Step 12.
NO : Repair or replace the damaged connector. Then go to Step 16.

STEP 12. Check the harness wire between ECM connector B-109 terminal number 108 and stoplight switch connector C-32 terminal number 3, and between stoplight switch connector C-32 terminal number 4 and body ground, for damage.

- Check harness wire for open/short circuit and damage.

Q: Is the harness wire in good condition?

YES : Go to Step 13.
NO : Repair or replace the damaged harness wire. Then go to Step 16.

STEP 13. Check the stoplight switch.

Refer to GROUP 35A, Brake Pedal, Inspection – Stoplight Switch Check P.35A-34.

Q: Is the stoplight switch operating properly?

YES : Go to Step 14.
NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal P.35A-33.) Then go to Step 16.

STEP 14. 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 15.
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 15. 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 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.17-14.)

Q: Is DTC 22 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.00-14.)

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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

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

STEP 17. 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 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.17-14.)

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.

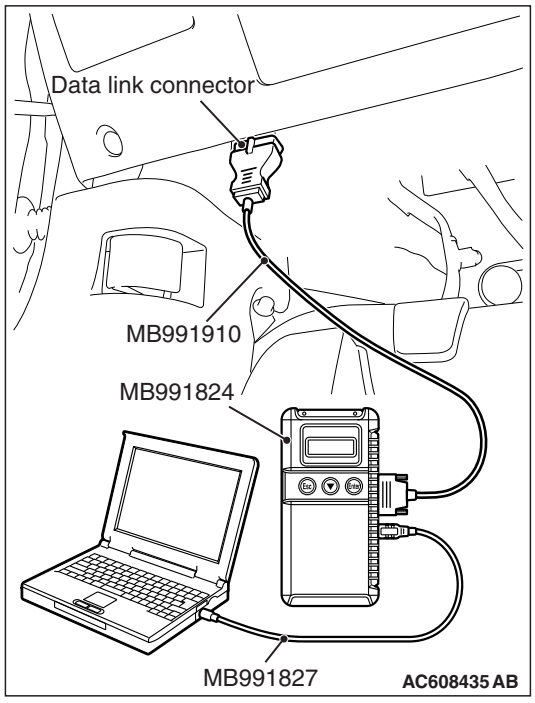
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

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

DIAGNOSIS PROCEDURE

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.17-14.)
(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-12) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function P.13B-10) <2.0L ENGINE Turbo>, or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE.>

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-51) <2.0L ENGINE Turbo>, or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE.> 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.17-14.)

Q: Is DTC 23 set?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.00-14.)

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.17-14.)

Q: Is DTC 23 set?

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

SYMPTOM CHART

M1172002301767

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Symptom		Inspection procedure number	Reference page
Communication with scan tool is not possible.	Communication with the ECM only is impossible. <2.0L ENGINE Non-turbo>	–	GROUP 13A, MFI Diagnosis, Symptom Procedures – Inspection Procedure 1 P.13A-823
	Communication with the ECM only is impossible. <2.0L ENGINE Turbo>	–	GROUP 13B, MFI Diagnosis, Symptom Procedures – Inspection Procedure 1 P.13B-705
	Communication with the ECM only is impossible. <2.4L ENGINE>	–	GROUP 13C, MFI Diagnosis, Symptom Procedures – Inspection Procedure 1 P.13C-816
When the brake pedal is depressed, cruise control is not cancelled.		1	P.17-44
When the clutch pedal is depressed, cruise control is not cancelled <M/T.>		2	P.17-46
When the selector lever is moved to "N" position, cruise control is not cancelled <CVT.>		3	P.17-50
When the shift lever is moved to "N" position, cruise control is not cancelled <TC-SST.>		4	P.17-52
When the "CANCEL" switch is pressed, cruise control is not cancelled.		5	P.17-55
Cruise control cannot be set (No response "COAST/SET" switch and "ACC/RES" switch is pressed) <2.0L ENGINE Non-turbo, 2.4L ENGINE.>		6	P.17-57
Cruise control cannot be set (No response "COAST/SET" switch and "ACC/RES" switch is pressed) <2.0L ENGINE Turbo.>		7	P.17-63
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed <M/T.>		8	P.17-68
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed <CVT.>		9	P.17-70
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed <TC-SST.>		10	P.17-73
When the "ON/OFF" switch is turned ON, "CRUISE" indicator light does not illuminate (However, cruise control system is normal.)		11	P.17-76

SYMPTOM PROCEDURES

Inspection Procedure 1: When the Brake Pedal is Depressed, Cruise Control 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.
- Malfunction of the stoplight switch.
- Malfunction of the ETACS-ECU.
- Malfunction of the ECM.

DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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

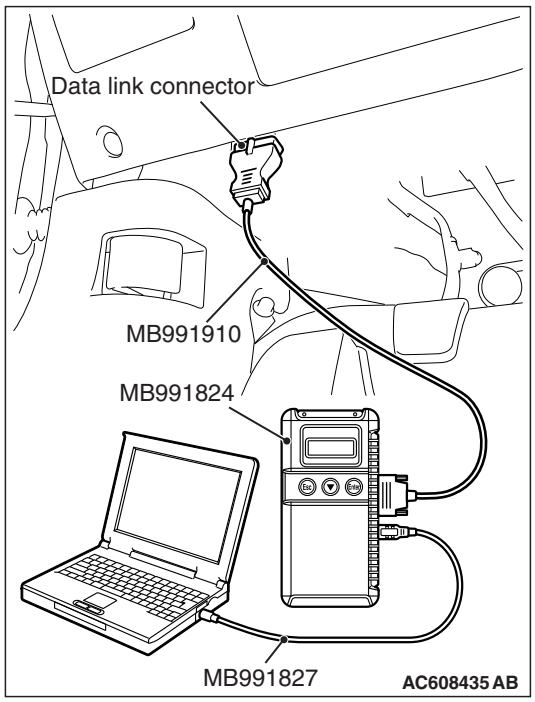
⚠ CAUTION

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 3
NO : Repair the stoplight switch system (Refer to P.17-32, 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, is the cruise control 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.00-14.)
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo>, or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.

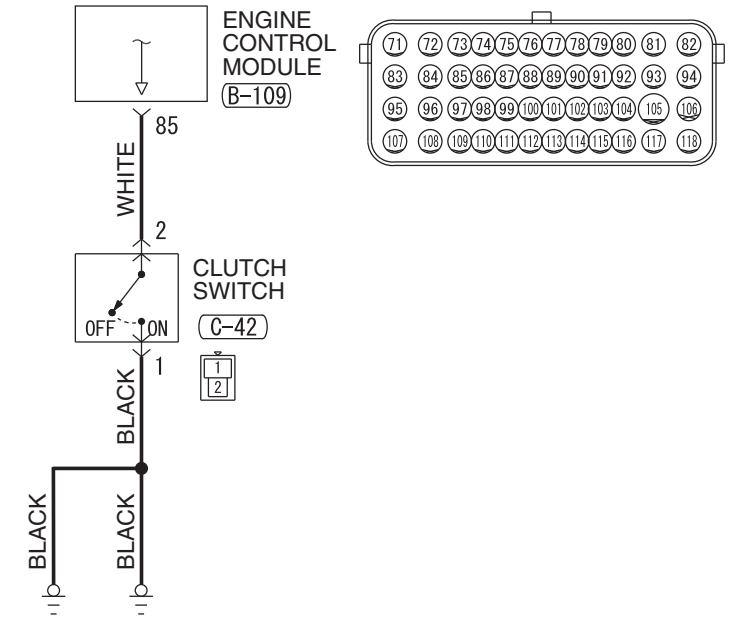
STEP 4. Check the symptoms.

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

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

Inspection Procedure 2: When the Clutch Pedal is Depressed, Cruise Control is not Cancelled <M/T.>

Clutch Switch System Circuit



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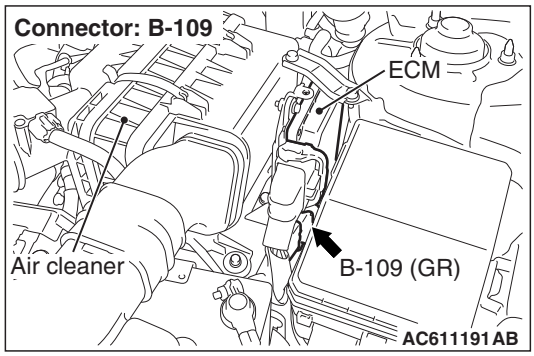

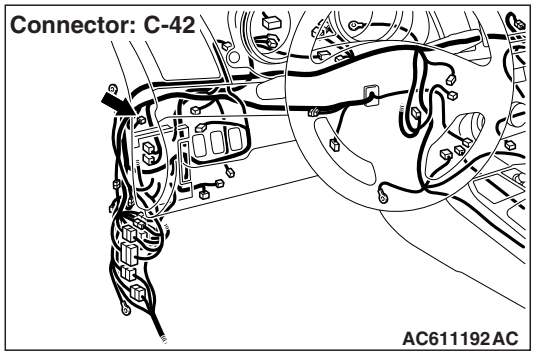

CIRCUIT OPERATION

- Terminal number 85 of the ECM connector B-109 monitors the clutch switch state.
- The clutch switch turns ON/OFF when the clutch pedal is depressed/released, and the input signal to the ECM changes. According to this change, the ECM judges the clutch switch status.

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 PROCEDURE

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

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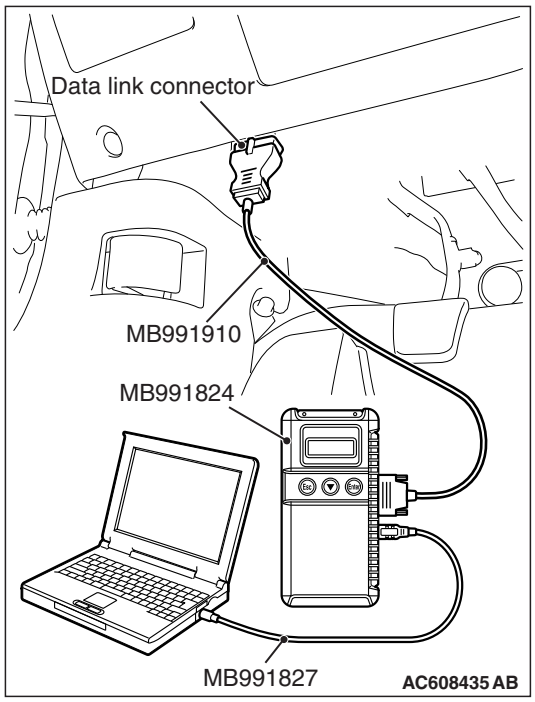


STEP 1. Using scan tool MB991958, check data list item 78: Clutch switch.

⚠ 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check ECM connector B-109 and clutch switch connector C-42, 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 terminal in good condition?

YES : Go to Step 3.
NO : Repair or replace the damaged connector. Then go to Step 7.

STEP 3. Check the harness wire between ECM connector B-109 terminal number 85 and clutch switch connector C-42 terminal number 2, and between clutch switch connector C-42 terminal number 1 and body ground, for damage.

- Check harness wire for open/short circuit and damage.

Q: Is the harness wires in good condition?

YES : Go to Step 4.
NO : Repair or replace the damaged harness wire. Then go to Step 7.

STEP 4. Check the clutch switch.

Refer to GROUP 21A, On-vehicle Service – Clutch Switch Check P.21A-4.

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-5.) 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.17-14.)
(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.17-14.)
- 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."

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-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 clutch pedal is depressed, is the cruise control 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.00-14.)

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 clutch pedal is depressed, is the cruise control cancelled?

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

Inspection Procedure 3: When the Selector Lever is Moved to "N" Position, Cruise Control is not Cancelled <CVT.>

CIRCUIT OPERATION

When the selector lever is operated, the selector lever position signal from the transmission range switch is sent to the TCM. ECM receives the selector lever position signal from the TCM via the CAN bus line.

COMMENT

- Malfunction of CAN bus line.
- Malfunction of CVT system.

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

- Malfunction of CAN bus system.
- Damaged harness or connector.
- Malfunction of CVT system.
- Malfunction of the transmission range switch.
- Malfunction of the TCM.
- Malfunction of the ECM.

DIAGNOSIS PROCEDURE

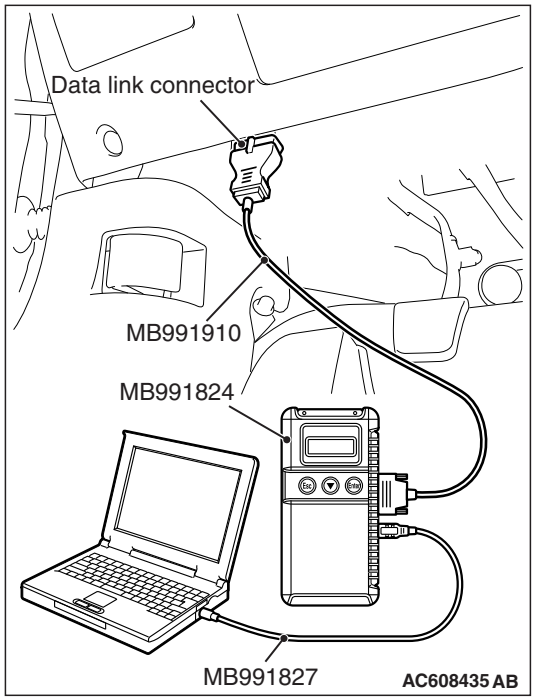
Required Special Tools:

- 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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 6.

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STEP 2. Using scan tool MB991958, check the CVT system data list item 49: Transmission range switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for CVT system (Refer to GROUP 23A, Diagnosis – Diagnostic Function P.23A-15.)
- Item 49: Transmission range switch.

Q: Is the switch operating properly?

YES : Go to Step 3.
NO : Repair the CVT system (Refer to GROUP 23A, Diagnosis, Diagnostic Trouble Code Procedures – DTC P0705: Malfunction of Transmission Range Switch P.23A-37.) Then go to Step 6.

STEP 3. Using scan tool MB991958, read the CVT system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for CVT system DTC (Refer to GROUP 23A, Diagnosis – Diagnostic Function P.23A-15.)

Q: Is any DTC set?

YES : Repair the CVT system (Refer to GROUP 23A, Diagnosis – Diagnostic Trouble Code Chart P.23A-30.) Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check data list item 88: Neutral switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 88: Neutral switch.
  - When selector lever is at the "P" and "N" position, the display on scan tool MB991958 should be "ON."
  - When selector lever is other than "P" and "N" position, the display on scan tool MB991958 should be "OFF."

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-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.

TSB Revision

STEP 5. Check the symptoms.

Q: When the selector lever is moved to "N" position, is the cruise control 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.00-14.)

NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 selector lever is moved to "N" position, is the cruise control cancelled?

YES : The procedure is complete.

NO : Return to Step 1.

Inspection Procedure 4: When the Shift Lever is Moved to "N" Position, Cruise Control is not Cancelled <TC-SST.>

CIRCUIT OPERATION

When the shift lever is in the "N" position, the "N" position 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 TC-SST-ECU.
- Malfunction of the ECM.

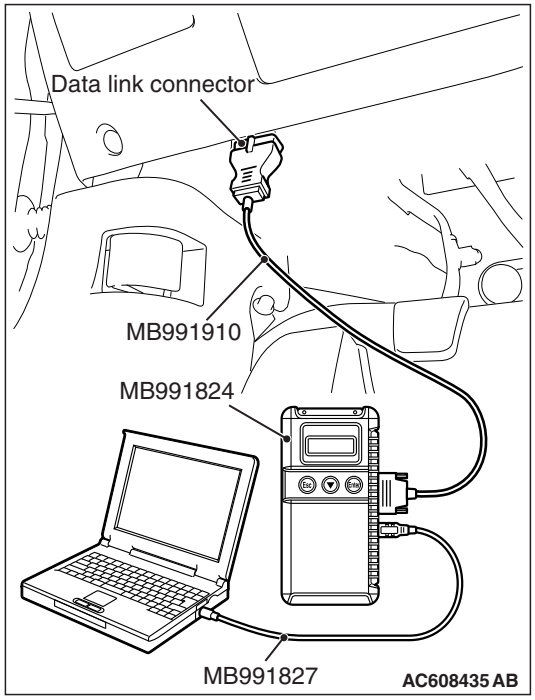
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 7.

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.17-14.)
(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-395.)
- Item 01: Shift lever position.

Q: Is the switch operating properly?
YES : Go to Step 3.
NO : Repair the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever>, Diagnostic Trouble Code Procedures – No.P198E, 198F: Lever Position Switch P.22C-399.) Then go to Step 7.

STEP 3. Using scan tool MB991958, read the shift lever system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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-395.)

Q: Is any DTC set?

YES : Repair the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever> – Diagnostic Trouble Code Chart P.22C-397.) Then go to Step 7.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, read the TC-SST system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for shift lever system DTC (Refer to GROUP 22C, Diagnosis <TC-SST> – Diagnostic Function P.22C-27.)

Q: Is any DTC set?

YES : Repair the TC-SST system (Refer to GROUP 22C, Diagnosis <TC-SST> – Diagnostic Trouble Code Chart P.22C-33.) Then go to Step 7.
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check data list item 88: Neutral switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 88: 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."

Q: Is the switch operating properly?

YES : Go to Step 6.
NO : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883.] 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 shift lever is moved to "N" position, is the cruise control 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.00-14.)

NO : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883.] 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 shift lever is moved to "N" position, is the cruise control cancelled?

YES : The procedure is complete.

NO : Return to Step 1.

Inspection Procedure 5: When the "CANCEL" Switch is Pressed, Cruise Control is not Cancelled.

COMMENT

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

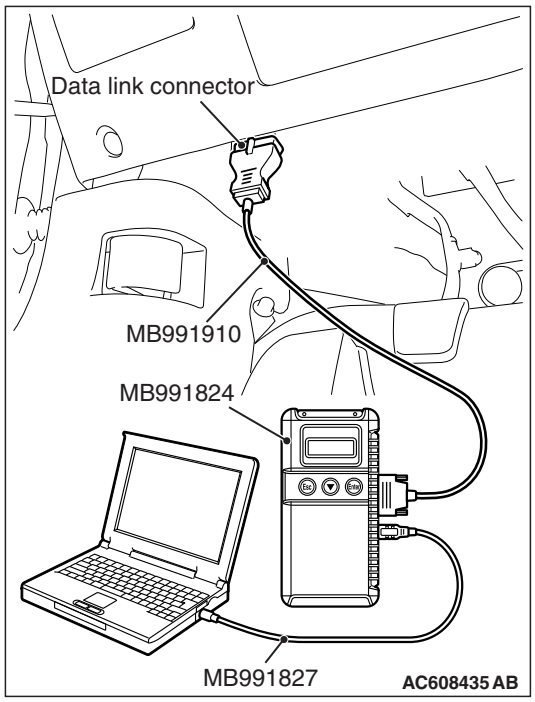
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

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

DIAGNOSIS PROCEDURE

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 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 2.
NO : Repair the cruise control switch system (Refer to P.17-18, Diagnostic Trouble Code Procedures – DTC 15: Cruise Control Switch System.) Then go to Step 3.

STEP 2. Check the symptoms.

Q: When the "CANCEL" switch is pressed, is the cruise control 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.00-14.)
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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. Check the symptoms.

Q: When the "CANCEL" switch is pressed, is the cruise control cancelled?

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

TSB Revision

Inspection Procedure 6: Cruise Control cannot be Set (No Response "COAST/SET" Switch and "ACC/RES" Switch is Pressed) <2.0L ENGINE Non-turbo, 2.4L ENGINE.>

COMMENT

- The fail-safe function is probably canceling cruise control system. In this case, checking the cruise control system, MFI system, CVT system <CVT> 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 data list.
- In addition, if the option coding data written into the ECM is not normal, the cruise control system does not work.

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.
- ECM option coding data error
- Malfunction of the MFI system.
- Malfunction of the CVT system <CVT.>
- Malfunction of the cruise control switch.
- Malfunction of the stoplight switch.
- Malfunction of the clutch switch <M/T.>
- Malfunction of the transmission. range switch <CVT.>
- Malfunction of the TCM <CVT.>
- Malfunction of the ECM.

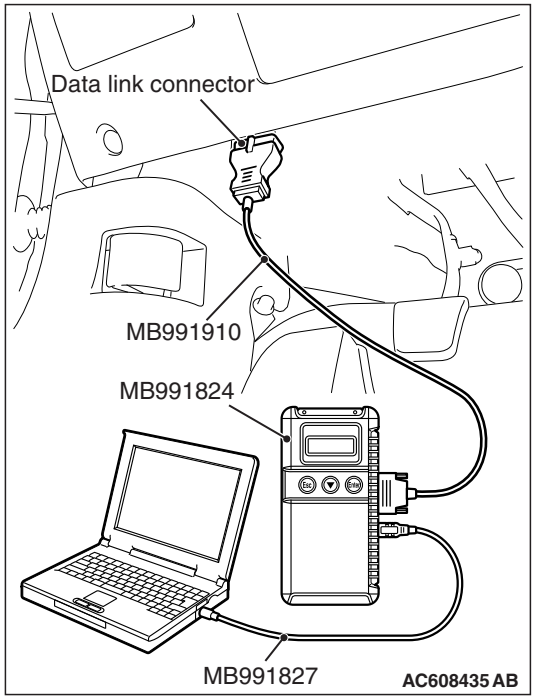
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 11.

STEP 2. Using scan tool MB991958, check for ECM option coding data.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for ECM option coding data (Refer to GROUP 00, Precautions Before Service – Coding List P.00-33.)

Q: Is the cruise control item of the ECM option coding data enabled?

YES : Go to Step 3.
NO : Set the ECM option coding data again. (Refer to GROUP 00, Precautions Before Service – Coding List P.00-33.) Then go to Step 11.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14).
(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-12) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE.>

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE.> Then go to Step 11.
NO : Go to Step 5 <M/T.>
NO : Go to Step 4 <CVT.>

STEP 4. Using scan tool MB991958, check for CVT system DTC <CVT.>

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for CVT system DTC (Refer to GROUP 23A, Diagnosis – Diagnostic Function P.23A-15.)

Q: Is any DTC set?

YES : Repair the CVT system (Refer to GROUP 23A, Diagnosis – Diagnostic Trouble Code Chart P.23A-30.) Then go to Step 11.
NO : Go to Step 5.

STEP 5. Check for 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.
(5) 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.17-14.)

Q: Is DTC set?

YES : Repair the cruise control system (Refer to P.17-17, 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.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 7.
NO : Repair the cruise control switch system (Refer to P.17-18, 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 8 <M/T.>
YES : Go to Step 9 <CVT.>
NO : Repair the stoplight switch system (Refer to P.17-32, 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 10.
NO : Repair the clutch switch system (Refer to P.17-46, Symptom Procedures – Inspection Procedure 2.) Then go to Step 11.

STEP 9. Using scan tool MB991958, check data list item 88: Neutral switch <CVT.>

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 88: Neutral switch.
  - When selector lever is at the "P" and "N" position, the display on scan tool MB991958 should be "ON."
  - When selector lever is other than "P" and "N" position, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 10.
NO : Repair the transmission range switch system (Refer to P.17-50, Symptom Procedures – Inspection Procedure 3.) Then go to Step 11.

STEP 10. Check the symptoms.

Q: Can cruise control be set?

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.00-14.)
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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?

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

Inspection Procedure 7: Cruise Control cannot be Set (No Response "COAST/SET" Switch and "ACC/RES" Switch is Pressed) <2.0L ENGINE Turbo.>

COMMENT

- The fail-safe function is probably canceling cruise control system. In this case, checking the cruise control system, MFI system, TC-SST system, shift lever system 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 data list.
- In addition, if the option coding data written into the ECM is not normal, the cruise control system does not work.

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.
- ECM option coding data error
- Malfunction of the MFI system.
- Malfunction of the TC-SST system.
- Malfunction of the shift lever system.
- Malfunction of the cruise control switch.
- Malfunction of the stoplight switch.
- Malfunction of the TC-SST-ECU.
- Malfunction of the shift lever ECU.
- Malfunction of the ECM.

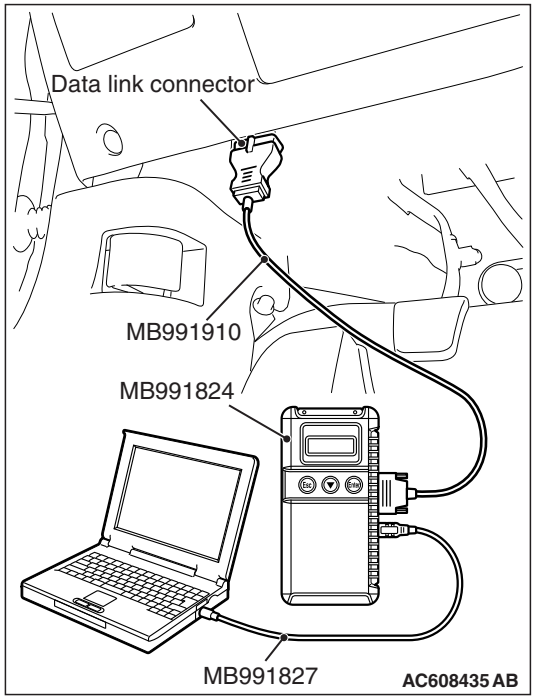
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 11.

STEP 2. Using scan tool MB991958, check for ECM option coding data.
(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for ECM option coding data (Refer to GROUP 00, Precautions Before Service – Coding List P.00-33.)

Q: Is the cruise control item of the ECM option coding data enabled?
YES : Go to Step 3.
NO : Set the ECM option coding data again. (Refer to GROUP 00, Precautions Before Service – Coding List P.00-33.) Then go to Step 11.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13B, Diagnosis – Diagnostic Function P.13B-10.)

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13B, Diagnosis – Diagnostic Trouble Code Chart P.13B-51.) Then go to Step 11.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check for TC-SST system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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-27.)

Q: Is any DTC set?

YES : Repair the TC-SST system (Refer to GROUP 22C, Diagnosis <TC-SST> – Diagnostic Trouble Code Chart P.22C-33.) Then go to Step 11.
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check for shift lever system DTC.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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-395.)

Q: Is any DTC set?

YES : Repair the shift lever system (Refer to GROUP 22C, Diagnosis <shift lever> – Diagnostic Trouble Code Chart P.22C-397.) Then go to Step 11.
NO : Go to Step 6.

STEP 6. Check for 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.
(5) 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.17-14.)

Q: Is DTC set?

YES : Repair the cruise control system (Refer to P.17-17, Diagnostic Trouble Code Chart.) Then go to Step 11.
NO : Go to Step 7.

STEP 7. 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.17-14.)
(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.17-14.)
- 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 the "ON/OFF" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ON/OFF" switch is pressed again, the display on scan tool MB991958 should be "OFF."
- Item 91: Resume switch.
  - When the "ACC/RES" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "ACC/RES" switch is released, the display on scan tool MB991958 should be "OFF."
- Item 92: Set switch.
  - When the "COAST/SET" switch is pressed, the display on scan tool MB991958 should be "ON."
  - When the "COAST/SET" switch is released, the display on scan tool MB991958 should be "OFF."

Q: Is the switch operating properly?

YES : Go to Step 8.
NO : Repair the cruise control switch system (Refer to P.17-18, Diagnostic Trouble Code Procedures – DTC 15: Cruise Control Switch System.) Then go to Step 11.

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STEP 8. 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.17-14.)
(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.17-14.)
- 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."

Q: Is the switch operating properly?

YES : Go to Step 9.
NO : Repair the stoplight switch system (Refer to P.17-32, Diagnostic Trouble Code Procedures – DTC 22: Stoplight Switch System.) Then go to Step 11.

STEP 9. Using scan tool MB991958, check data list item 88: Neutral switch.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 88: 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."

Q: Is the switch operating properly?

YES : Go to Step 10.
NO : Repair the shift lever system (Refer to P.17-52, Symptom Procedures – Inspection Procedure 4). Then go to Step 11.

STEP 10. Check the symptoms.

Q: Can cruise control be set?

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.00-14.)

NO : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883.] 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?

YES : The procedure is complete.

NO : Return to Step 1.

Inspection Procedure 8: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <M/T.>

COMMENT

The vehicle speed sensor or the throttle body is suspected.

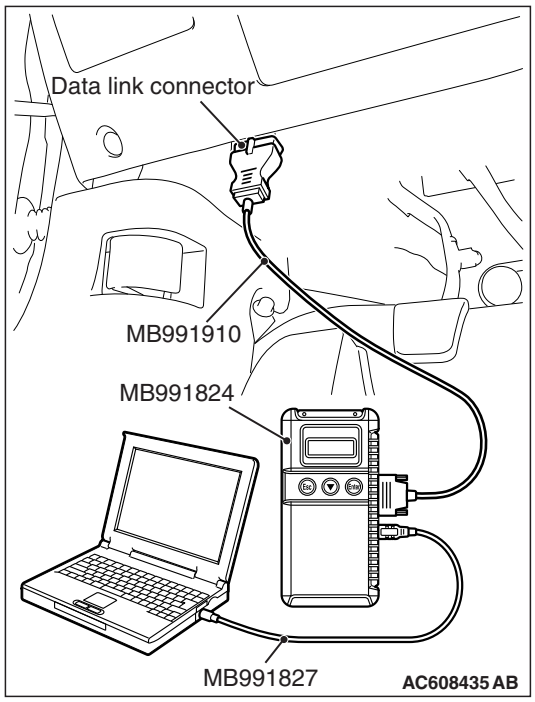
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the MFI system
- Malfunction of the vehicle speed sensor.
- Malfunction of the throttle body.
- Malfunction of the ECM.

DIAGNOSIS PROCEDURE

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.17-14.)
(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-12) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE.>

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE.> Then go to Step 4.
NO : Go to Step 2.

STEP 2. Using scan tool MB991958, check data list item 04: Vehicle speed.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 04: Vehicle speed.

Q: Is the check result satisfactory?

YES : Go to Step 3.
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 3. Check the symptoms.

Q: Does hunting occur?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.

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.00-14.)

STEP 4. Check the symptoms.

Q: Does hunting occur?

YES : Return to Step 1.

NO : The procedure is complete.

Inspection Procedure 9: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <CVT.>

COMMENT

- The secondary pulley speed sensor signal (vehicle speed signal) or the throttle body is suspected.
- The secondary pulley speed sensor signal (vehicle speed signal) is transmitted from the TCM to the ECM via CAN bus line.

NOTE: When the vehicle is driven with the low-speed gear in the sport mode, hunting occurs easily, however, this is not a failure.

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

- Malfunction of the CAN bus line system.
- Malfunction of the CVT system.
- Malfunction of the MFI system.
- Malfunction of the secondary pulley speed sensor.
- Malfunction of the throttle body.
- Malfunction of the TCM.
- Malfunction of the ECM.

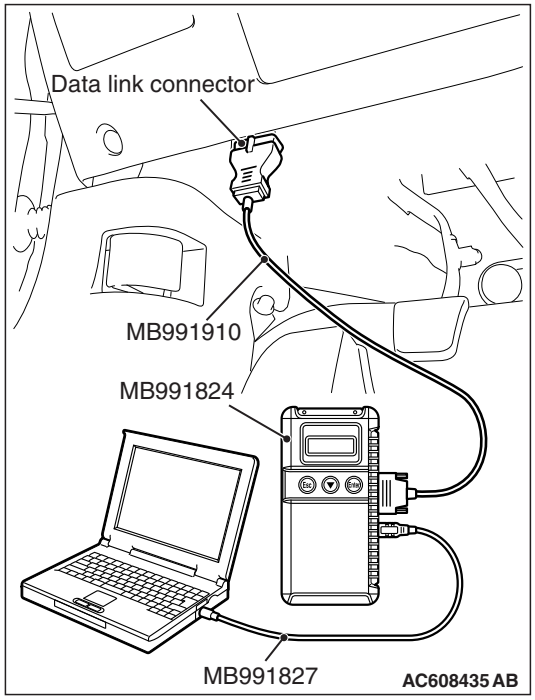
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 6.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for CVT system DTC (Refer to GROUP 23A, Diagnosis – Diagnostic Function P.23A-15.)

Q: Is any DTC set?

YES : Repair the CVT system (Refer to GROUP 23A, Diagnosis – Diagnostic Trouble Code Chart P.23A-30.) Then go to Step 6.
NO : Go to Step 3.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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-12) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE.>

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-50) <2.0L ENGINE Non-turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Trouble Code Chart P.13C-48) <2.4L ENGINE.> Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check data list item 04: Vehicle speed.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 04: Vehicle speed.

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-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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: Does hunting occur?

YES : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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.00-14.)

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STEP 6. Check the symptoms.

Q: Does hunting occur?

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

Inspection Procedure 10: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <TC-SST.>

COMMENT

- The wheel speed sensor signal (vehicle speed signal) or the throttle body 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 throttle body.
- Malfunction of the ECM.

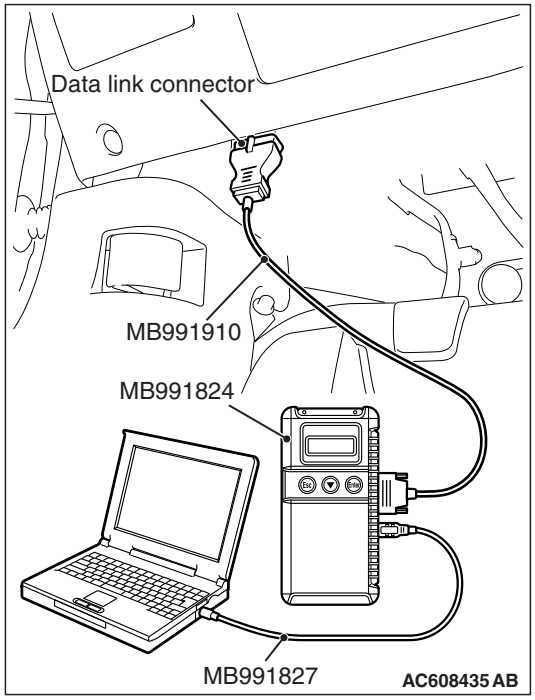
DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) 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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for ASC system DTC (Refer to GROUP 35C, Diagnosis – Diagnostic Function P.35C-14.)

Q: Is any DTC set?

YES : Repair the ASC system (Refer to GROUP 35C, Diagnosis – Diagnostic Trouble Code Chart P.35C-25.) Then go to Step 6.
NO : Go to Step 3.

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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system DTC (Refer to GROUP 13B, Diagnosis – Diagnostic Function P.13B-10.)

Q: Is any DTC set?

YES : Repair the MFI system (Refer to GROUP 13B, Diagnosis – Diagnostic Trouble Code Chart P.13B-51.) Then go to Step 6.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check data list item 04: Vehicle speed.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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.17-14.)
- Item 04: Vehicle speed.

Q: Is the check result satisfactory?

YES : Go to Step 5.
NO : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883.] 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: Does hunting occur?

YES : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883.] 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.00-14.)

STEP 6. Check the symptoms.

Q: Does hunting occur?

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

Inspection Procedure 11: When the "ON/OFF" Switch is Turned ON, "CRUISE" Indicator Light 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.
- 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 (THE MOST LIKELY CAUSES FOR THIS CASE:)

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

DIAGNOSIS PROCEDURE

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 diagnostic trouble code (DTC) may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9.)

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

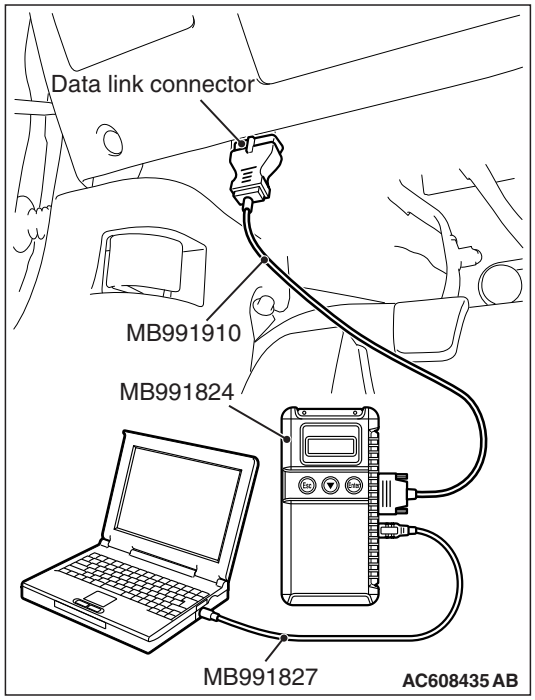
⚠ CAUTION

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.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line (Refer to P.17-14.)

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-17.) Then go to Step 6.



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

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(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-12) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function P.13B-10) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Function P.13C-11) <2.4L ENGINE.>

Q: Is DTC U0141 set?

YES : Repair the MFI system (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Procedures – DTC U0141: ETACS-ECU CAN Communication Time Out P.13A-814) <2.0L ENGINE Non-turbo>, (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Procedures – DTC U0141: ETACS-ECU CAN Communication Time Out P.13B-695) <2.0L ENGINE Turbo> or (Refer to GROUP 13C, MFI Diagnosis – Diagnostic Trouble Code Procedures – DTC U0141: ETACS-ECU CAN Communication Time Out P.13C-806) <2.4L ENGINE.> 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.17-14.)
(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-675.)

Q: Is DTC U0155 set?

YES : Repair the ETACS system (Refer to GROUP 54A, ETACS, Troubleshooting, Diagnostic Trouble Code Procedures – DTC U0155: Combination Meter-ECU CAN Communication Time Out P.54A-697.) Then go to Step 6.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the combination meter system actuator test item 7: Cruise indicator 1.

(1) Connect scan tool MB991958 to the data link connector (Refer to P.17-14.)
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to check the actuator test for combination meter system item 7: indicator 1 (Refer to GROUP 54A, Combination Meter, Troubleshooting – Actuator Teat Table P.54A-112.)

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-87.) Then go to Step 6.

STEP 5. Check the symptoms.

Q: When the "ON/OFF" switch is turned ON, is the "CRUISE" indicator light illuminated?

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.00-14.)
NO : Replace the ECM [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.> 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 "ON/OFF" switch is turned ON, is the "CRUISE" indicator light illuminated?

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

DATA LIST REFERENCE TABLE

M1172002401816

⚠ CAUTION

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

M.U.T.-III scan tool display	Item number	Inspection item	Inspection requirement		Normal condition
Brake light switch	74	Stoplight switch (for stoplight circuit)	Ignition switch: "ON"	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" switch)	Ignition switch: "ON"	"CANCEL" switch: Pressed	ON
				"CANCEL" switch: Released	OFF
Clutch switch	78	Clutch switch <M/T>	Ignition switch: "ON"	Clutch pedal: Depressed	ON
				Clutch pedal: Released	OFF
Cruise switch	81	Cruise control system operation	Cruise control system: active		ON
			Cruise control system: Inactive		OFF
Main switch	86	Cruise control switch ("ON/OFF" switch)	Ignition switch: "ON"	"ON/OFF" switch: Pressed	ON
				"ON/OFF" switch: Pressed again	OFF
Neutral switch	88	Transmission range switch <CVT> or Neutral switch <TC-SST>	Ignition switch: "ON"	Selector lever or shift lever: "N" or "P" position	ON
				Selector lever or shift lever: Other than "N" or "P" position	OFF
Normally closed brake switch	89	Stoplight switch (for Cruise control circuit)	Ignition switch: "ON"	Brake pedal: Depressed	ON
				Brake pedal: Released	OFF
Resume switch	91	Cruise control switch ("ACC/RES" switch)	Ignition switch: "ON"	"ACC/RES" switch: Pressed	ON
				"ACC/RES" switch: Released	OFF

M.U.T.-III scan tool display	Item number	Inspection item	Inspection requirement		Normal condition
Set switch	92	Cruise control switch ("COAST/SET" switch)	Ignition switch: "ON"	"COAST/SET" switch: Pressed	ON
				"COAST/SET" switch: Released	OFF
Vehicle speed	04	Vehicle speed signal	Road test the vehicle		The speedometer and scan tool MB991958 display the same value.

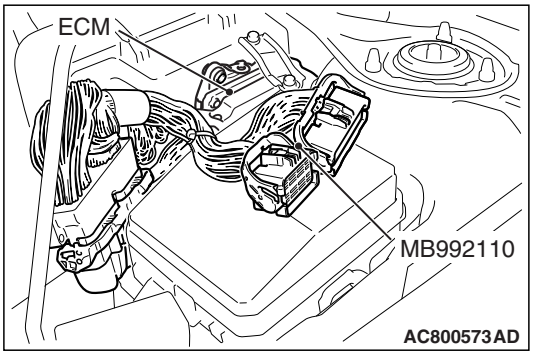
ECM TERMINAL VOLTAGE REFERENCE CHART FOR CRUISE CONTROL SYSTEM OPERATION

M1172002701549

Required Special Tool:

- MB992110: Power plant ECU check harness

Use special tool MB992110, check the ECM terminal voltage.

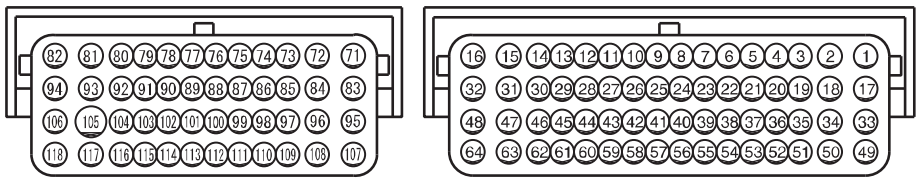


1. Disconnect the all ECM connectors, and connect special tool MB992110 in between [Refer to GROUP 13A, Engine Control Module (ECM) P.13A-985] <2.0L ENGINE Non-turbo>, [Refer to GROUP 13B, Engine Control Module (ECM) P.13B-883] <2.0L ENGINE Turbo> or [Refer to GROUP 13C, Engine Control Module (ECM) P.13C-972] <2.4L ENGINE.>
2. Measure the voltages between the check connector terminals of special tool MB992044 and ground terminals (ECM connector B-109 terminal number 81 or 93.)

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

48-Pin connector
(ECM connector B-109)

64-Pin connector
(ECM connector B-108)



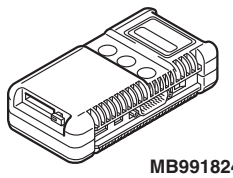
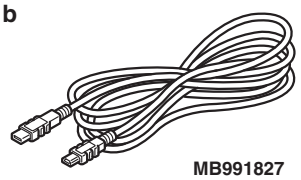
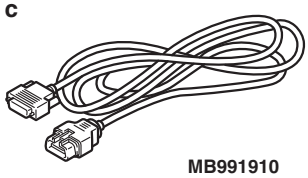
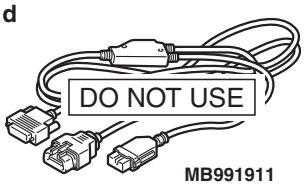
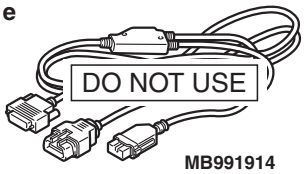
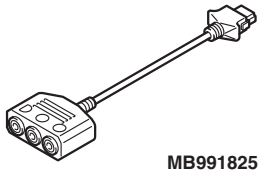
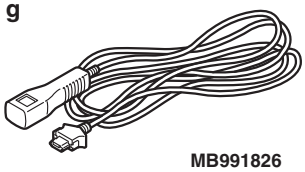
AC601589AL

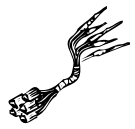
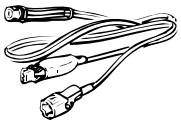
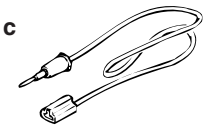
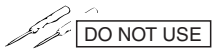
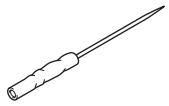
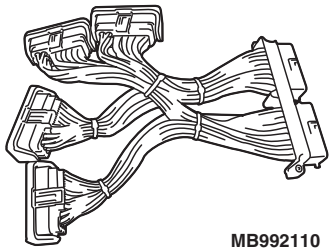
Terminal number	Check item	Check condition		Normal condition
85	Clutch switch <M/T>	Ignition switch: "ON"	Depress the clutch pedal.	1V or less
			Release the clutch pedal.	Battery positive voltage

Terminal number	Check item	Check condition		Normal condition
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 (for Cruise control circuit)	Ignition switch: "ON"	Depress the brake pedal.	Battery positive voltage
			Release the brake pedal.	1V or less
109	Vehicle speed sensor <M/T>	• Ignition switch: "ON" • Move the vehicle forward slowly		0 – 1 ⇔ 4 – 5 V (changes repeatedly)

SPECIAL TOOLS

M1172000601461

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 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 or C instead, the CAN communication does not function correctly.** 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

ON-VEHICLE SERVICE

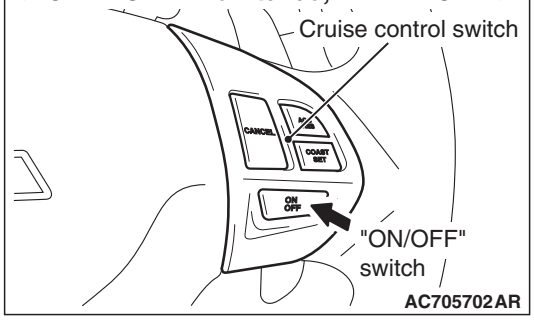
CRUISE CONTROL SYSTEM OPERATION CHECK

M1172001201132

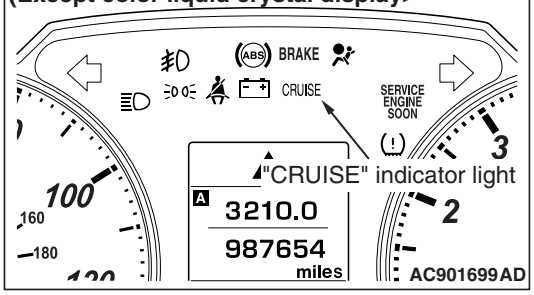
"ON/OFF" SWITCH CHECK

1. Turn the ignition switch to the "ON" position.

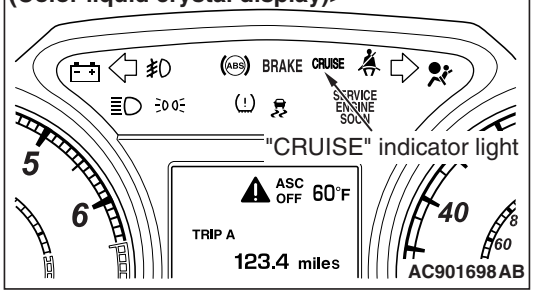
<2.0L ENGINE Non-turbo, 2.4L ENGINE>



<2.0L ENGINE Non-turbo, 2.4L ENGINE
(Except color liquid crystal display>



<2.4L ENGINE
(Color liquid crystal display)>



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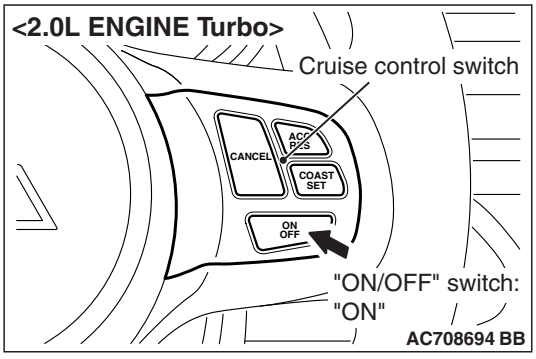
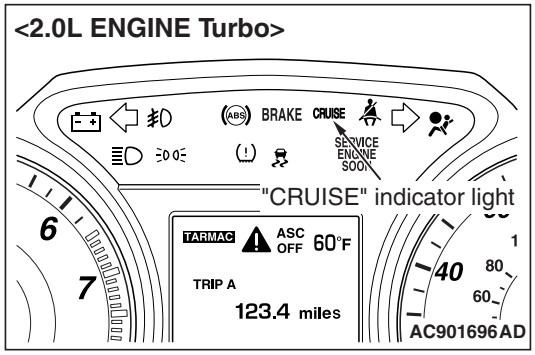


<2.0L ENGINE Turbo>



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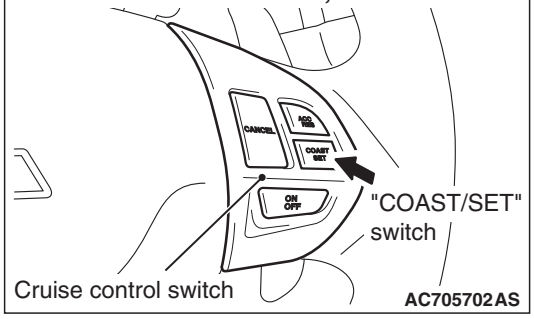
2. Check that the "CRUISE" indicator light within the combination meter illuminates when the "ON/OFF" switch is pressed (cruise control system: ON.)
3. Press the "ON/OFF" switch again (cruise control system: OFF), and check that the "CRUISE" indicator light within the combination meter goes out.

CRUISE CONTROL SETTING

1. Start the engine.
2. Press the "ON/OFF" switch (cruise control system: ON, "CRUISE" indicator light: illuminated.)
3. Drive at the desired speed, above approximately 40 km/h (25 mph.)
4. Press the "COAST/SET" switch.
5. Check to be sure that when the "COAST/SET" switch is released the speed is the constant speed.

   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 low-speed limit [approximately 40 km/h (25 mph)] or less, driving at constant speed will be cancelled even if the vehicle speed does not decrease 15 km/h (9 mph) or more.

<2.0L ENGINE Non-turbo, 2.4L ENGINE>



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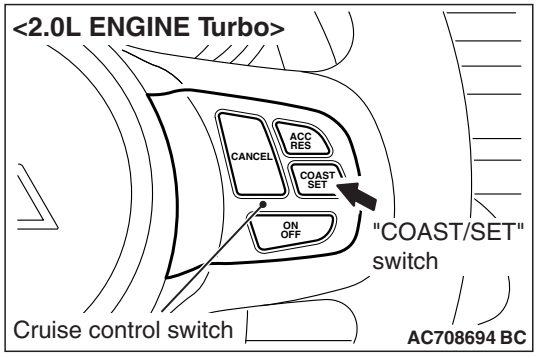

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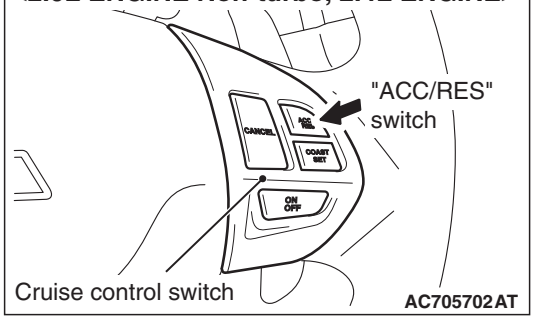

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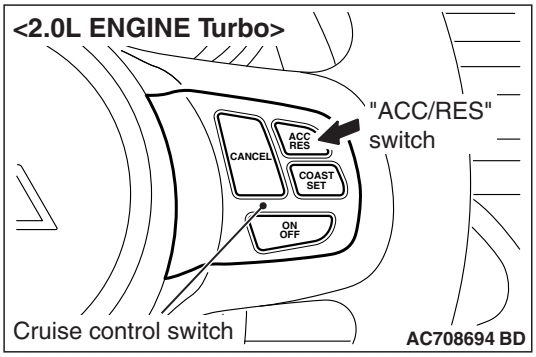

SPEED-INCREASE SETTING

1. Start the engine.
2. Press the "ON/OFF" switch (cruise control system: ON, "CRUISE" indicator light: illuminated.)
3. Set to the desired speed, above approximately 40 km/h (25 mph.)
4. Press the "ACC/RES" switch.
5. Check to be sure that acceleration continues while the "ACC/RES" switch is pressed, 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. Start the engine.
2. Press the "ON/OFF" switch (cruise control system: ON, "CRUISE" indicator light: illuminated.)
3. Set to the desired speed, above approximately 40 km/h (25 mph.)
4. Press the "COAST/SET" switch.
5. Check to be sure that deceleration continues while the "COAST/SET" switch is pressed, 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 cruise control will be cancelled.

RETURN TO THE SET SPEED BEFORE CANCELLATION AND CRUISE CONTROL CANCELLATION

1. Start the engine.
2. Press the "ON/OFF" switch (cruise control system: ON, "CRUISE" indicator light: illuminated.)
3. Set to the desired speed, above approximately 40 km/h (25 mph.)

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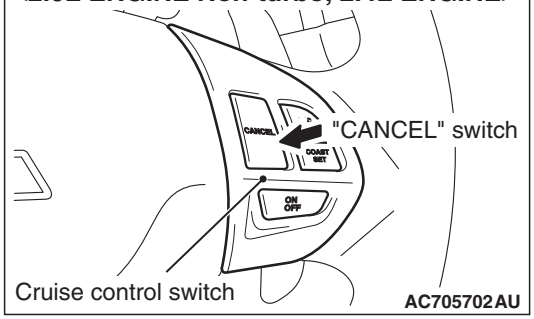

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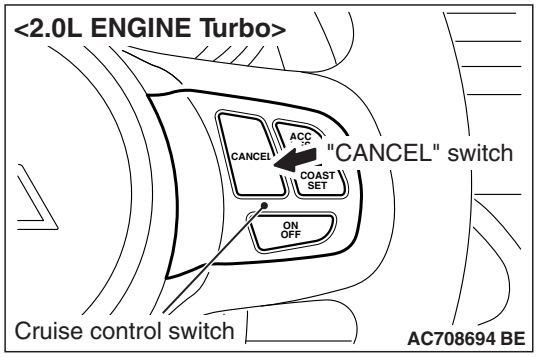


4. When any of the following operations are performed while at constant speed during cruise control, check if normal driving is resumed and deceleration occurs.
   (1) The "CANCEL" switch is pressed.
   (2) The brake pedal is depressed.
5. At a vehicle speed of approximately 40 km/h (25 mph) or higher,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

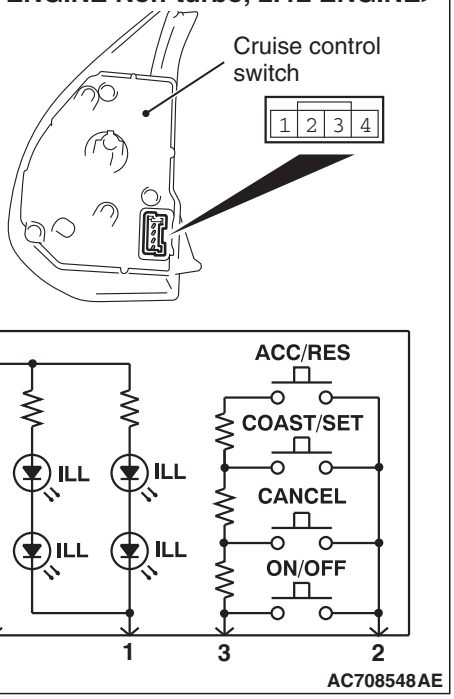
CRUISE CONTROL SYSTEM COMPONENT CHECK

M1172001701513

CRUISE CONTROL SWITCH CHECK

1. Remove the cruise control switch (Refer to P.17-89) <2.0L ENGINE Non-turbo, 2.4L ENGINE> or (Refer to P.17-89) <2.0L ENGINE Turbo.>

<2.0L ENGINE Non-turbo, 2.4L ENGINE>



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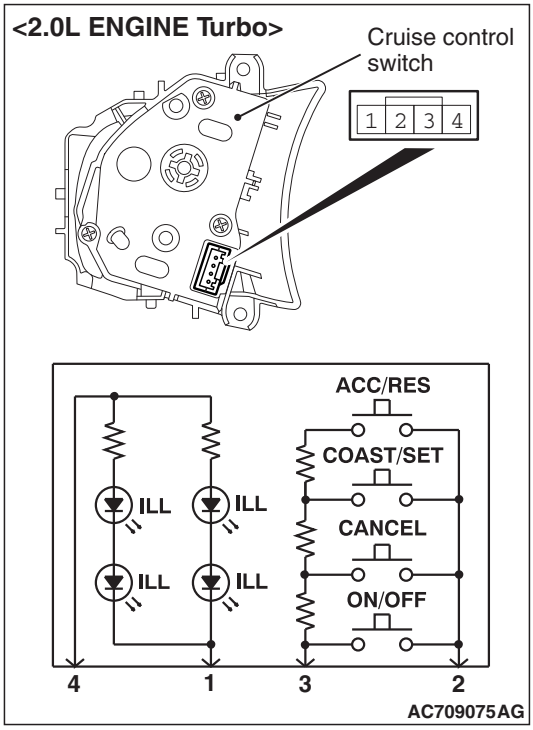


2. Measure the resistance between terminal number 2 and terminal number 3 when each of the "ON/OFF", "CANCEL", "COAST/SET" and "ACC/RES" switches is pressed. If the values measured at the time each switch is pressed correspond to those in the table below, the resistance values are correct.

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 that the cruise control switch illuminates when a positive battery terminal is connected to the connector terminal number 4, and terminal number 1 is grounded.

STOPLIGHT SWITCH CHECK

Refer to GROUP 35A, Brake Pedal, Inspection – Stoplight Switch Check P.35A-34.

CLUTCH SWITCH CHECK <M/T>

Refer to GROUP 21A, On-vehicle Service – Clutch Switch Check P.21A-4.

TRANSMISSION RANGE SWITCH ("N" POSITION) <CVT>

Refer to GROUP 23A, On-vehicle Service, Essential Service – Transmission Range Switch Continuity Check P.23A-141.

THROTTLE ACTUATOR CONTROL MOTOR

Refer to GROUP 13A, On-vehicle Service – Throttle Actuator Control Motor Check P.13A-975 <2.0L ENGINE Non-turbo.>
Refer to GROUP 13B, On-vehicle Service – Throttle Actuator Control Motor Check P.13B-872 <2.0L ENGINE Turbo.>
Refer to GROUP 13C, On-vehicle Service – Throttle Actuator Control Motor Check P.13C-963 <2.4L ENGINE.>

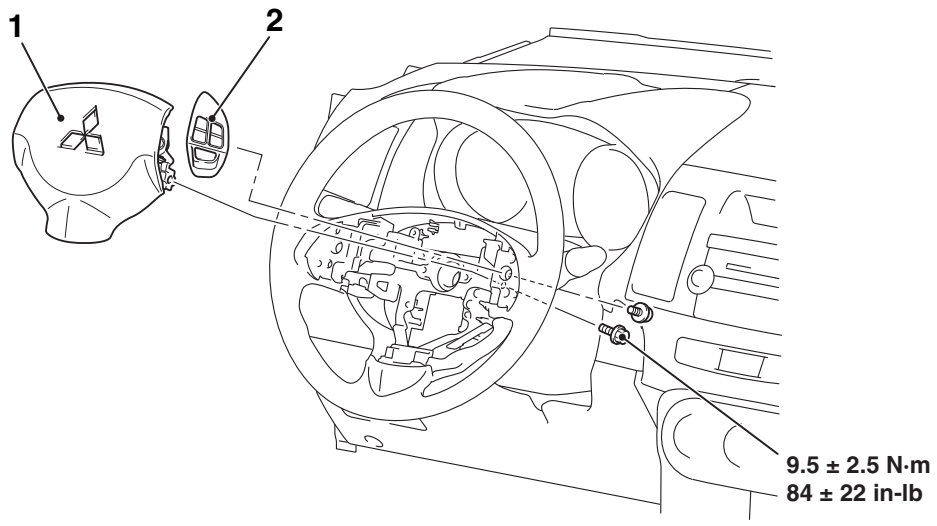
CRUISE CONTROL SWITCH

REMOVAL AND INSTALLATION <2.0L ENGINE NON-TURBO, 2.4L ENGINE>

M1172007600339

⚠ ***WARNING***

Before removing the driver's air bag module assembly, always refer to GROUP 52B, Service Precautions P.52B-26, and Driver's Air Bag Module and Clock Spring P.52B-419.



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Removal steps

1. Driver's air bag module (Refer to GROUP 52B, Driver's Air Bag Module and Clock Spring P.52B-427)
2. Cruise control switch

REMOVAL AND INSTALLATION <2.0L ENGINE TURBO>

M1172007600340

Since the cruise control switch is mounted on the spoke of the steering wheel garnish, refer to Steering Wheel for removal and installation (Refer to GROUP 37, Steering Wheel P.37-32.)

EMISSION CONTROL <MFI>

GENERAL INFORMATION

M1173000101038

The emission control system consists of the following subsystems:

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

SERVICE SPECIFICATIONS

M1173000301281

Item	Standard value
Emission control system	
Exhaust gas recirculation (EGR) valve (Stepper Motor) connector resistance <California> [at 20°C (68°F)] Ω	20 – 24
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)

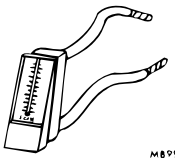
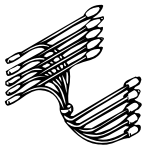
DIAGNOSIS

M1173000700242

SYMPTOM	PROBABLE CAUSE	REMEDY
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	The EGR valve (Stepper Motor) is not closed. <2.0L engine-California, 2.4L engine>	Repair or replace
	Malfunction of the evaporative emission purge solenoid	Repair or replace
Rough idle or engine stalls	The EGR valve (Stepper Motor) is not closed. <2.0L engine-California, 2.4L engine>	Repair or replace
	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.
Engine hesitates or poor acceleration	Malfunction of the EGR system	Check the system; If there is a problem, check its component parts.
Excessive oil consumption	PCV line clogged	Check PCV system
Poor fuel mileage	Malfunction of the EGR system	Check the system; If there is a problem, check its component parts.

SPECIAL TOOLS

M1173000601000

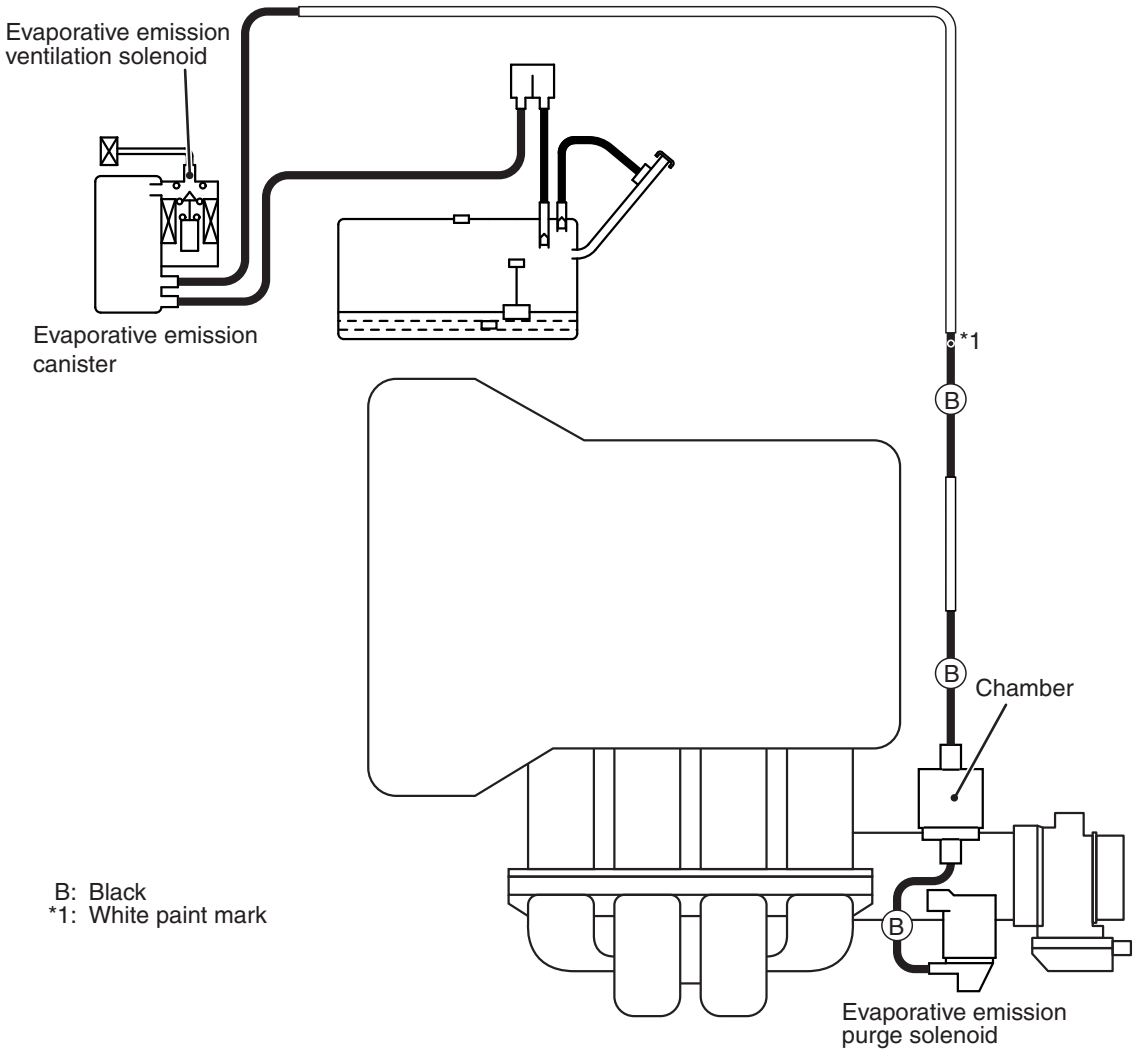
Tool	Tool number and name	Supersession	Application
	MB995061 Purge flow indicator	MLR6890A Part of MIT280220	Inspection of purge control system
	MB991658 Test harness set	Tool not available	Inspection of EGR valve (Stepper Motor)

VACUUM HOSES

VACUUM HOSE ROUTING

M1173000901885

<Non-turbo>



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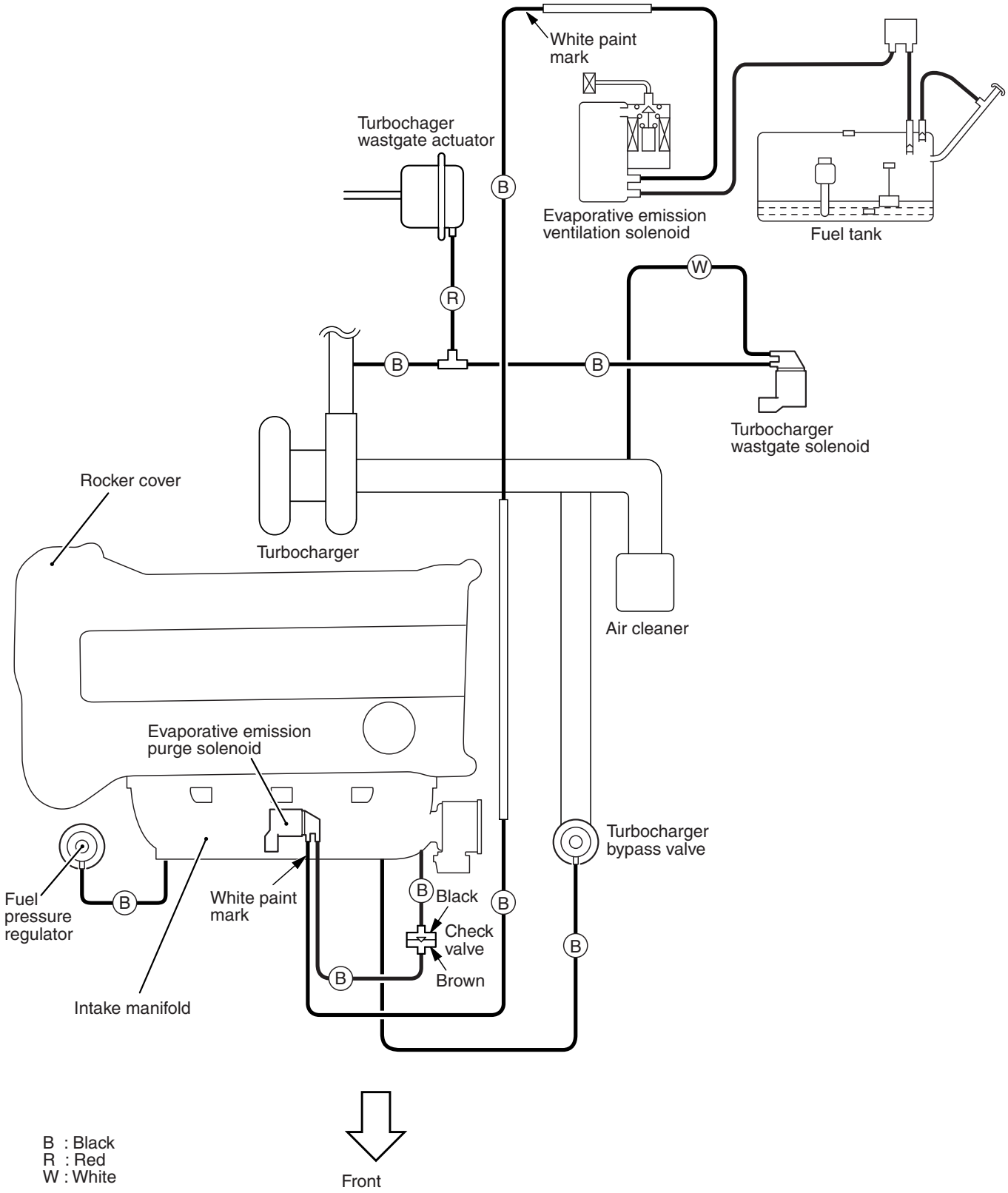

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TSB Revision

VACUUM CIRCUIT DIAGRAM

M1173007101169

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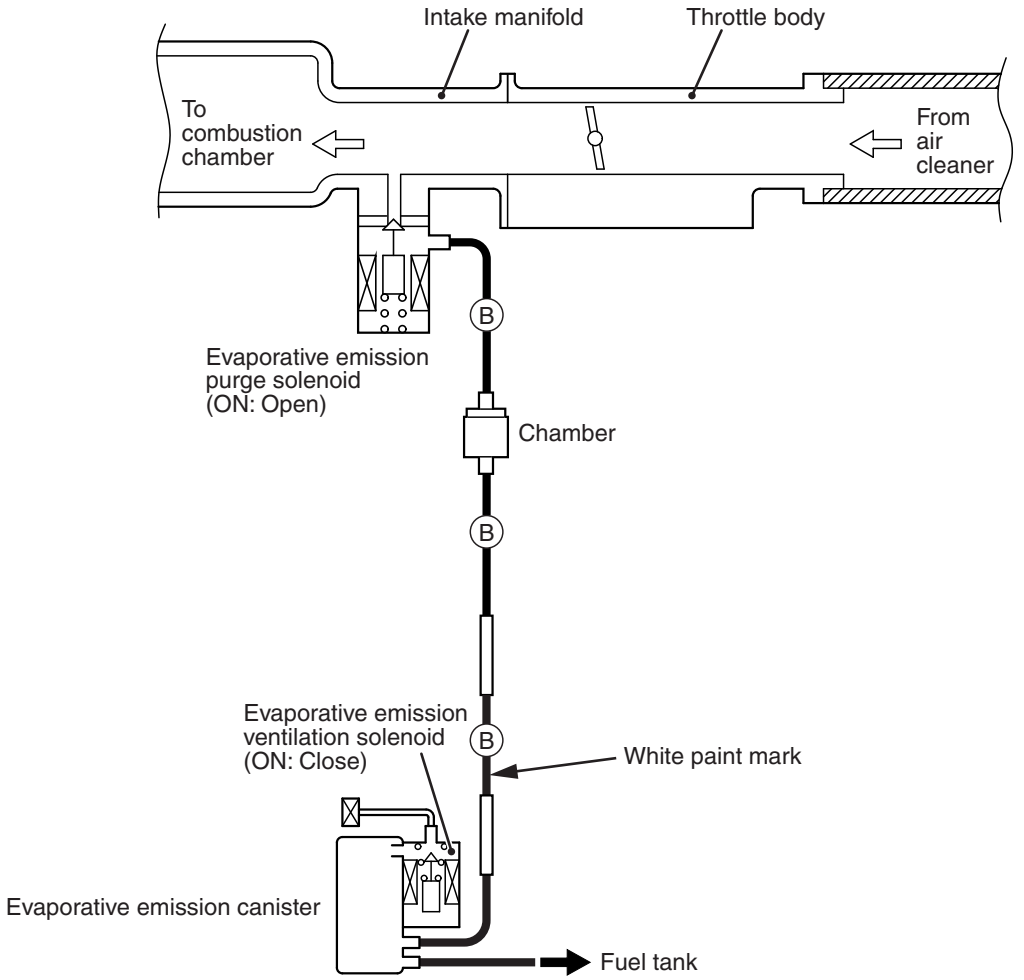

B: Black

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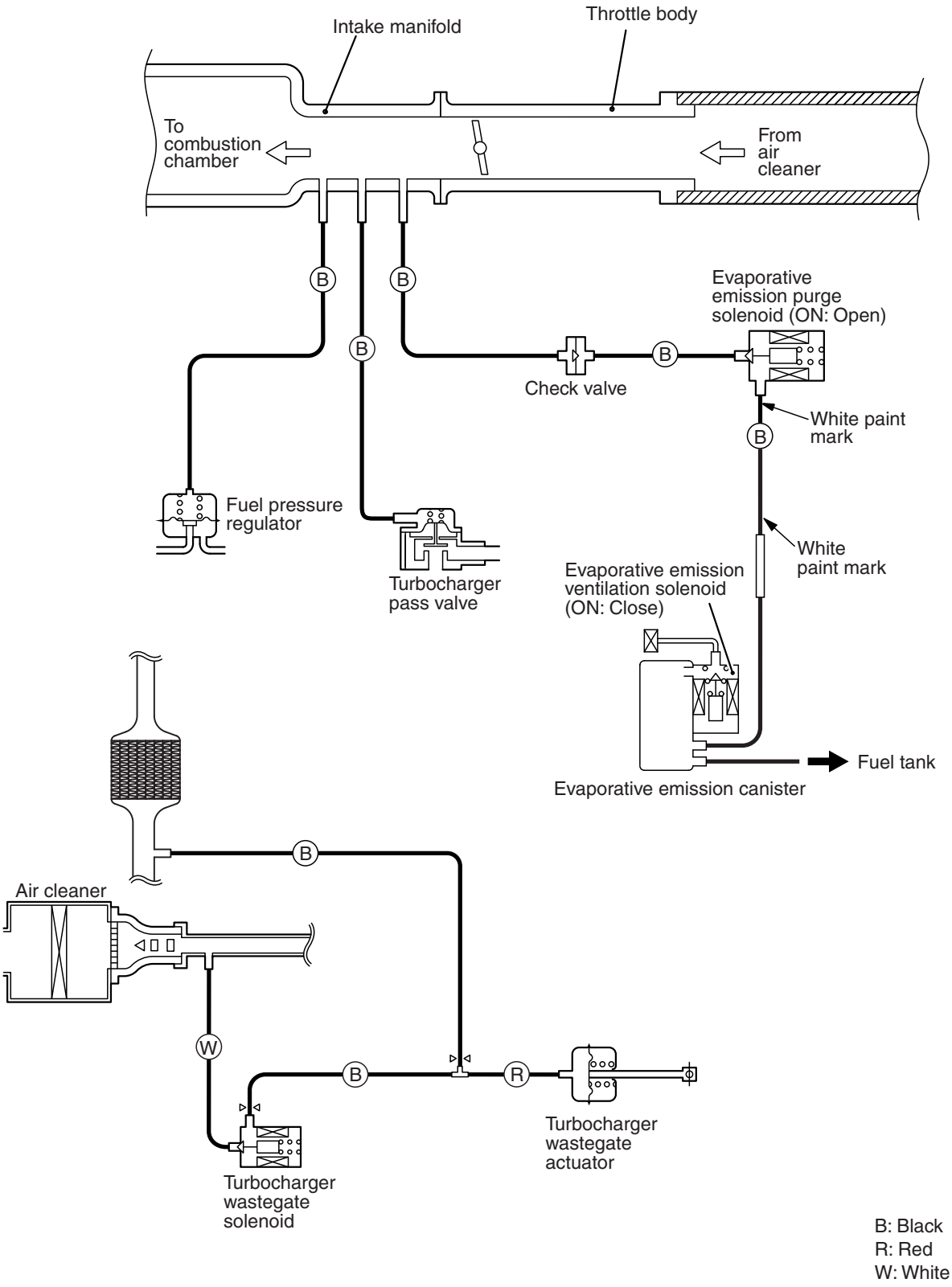

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TSB Revision

VACUUM HOSE INSTALLATION

M1173007200378

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

M1173007300739

1. Using the VACUUM HOSE ROUTING diagram as a guide, check that the vacuum hoses are correctly connected.
2. Check the connection condition of the vacuum hoses which can be removed, loosened, clogged possibly. And then check whether there are no folded and damaged vacuum hoses.

POSITIVE CRANKCASE VENTILATION SYSTEM

GENERAL INFORMATION (POSITIVE CRANKCASE VENTILATION SYSTEM)

M1173005001337

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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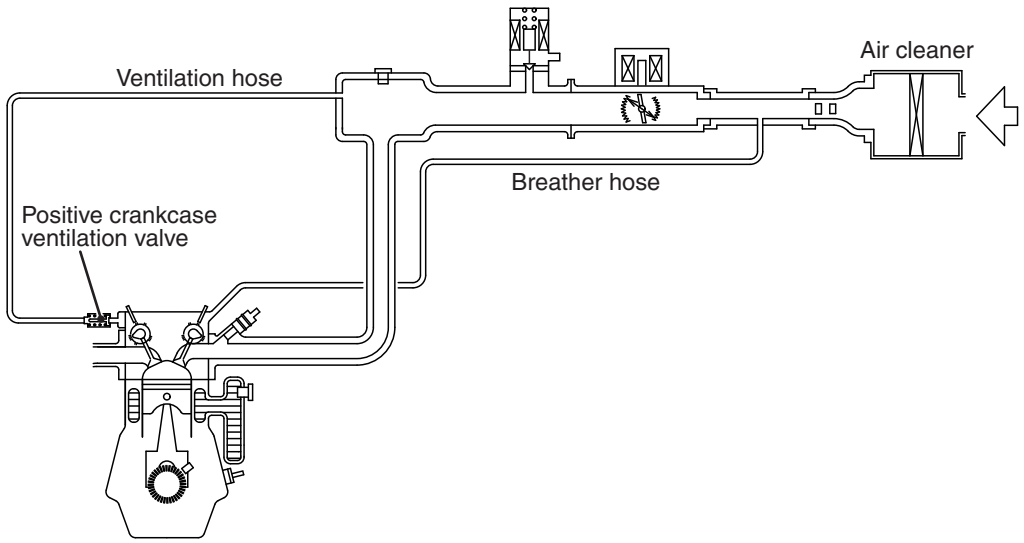

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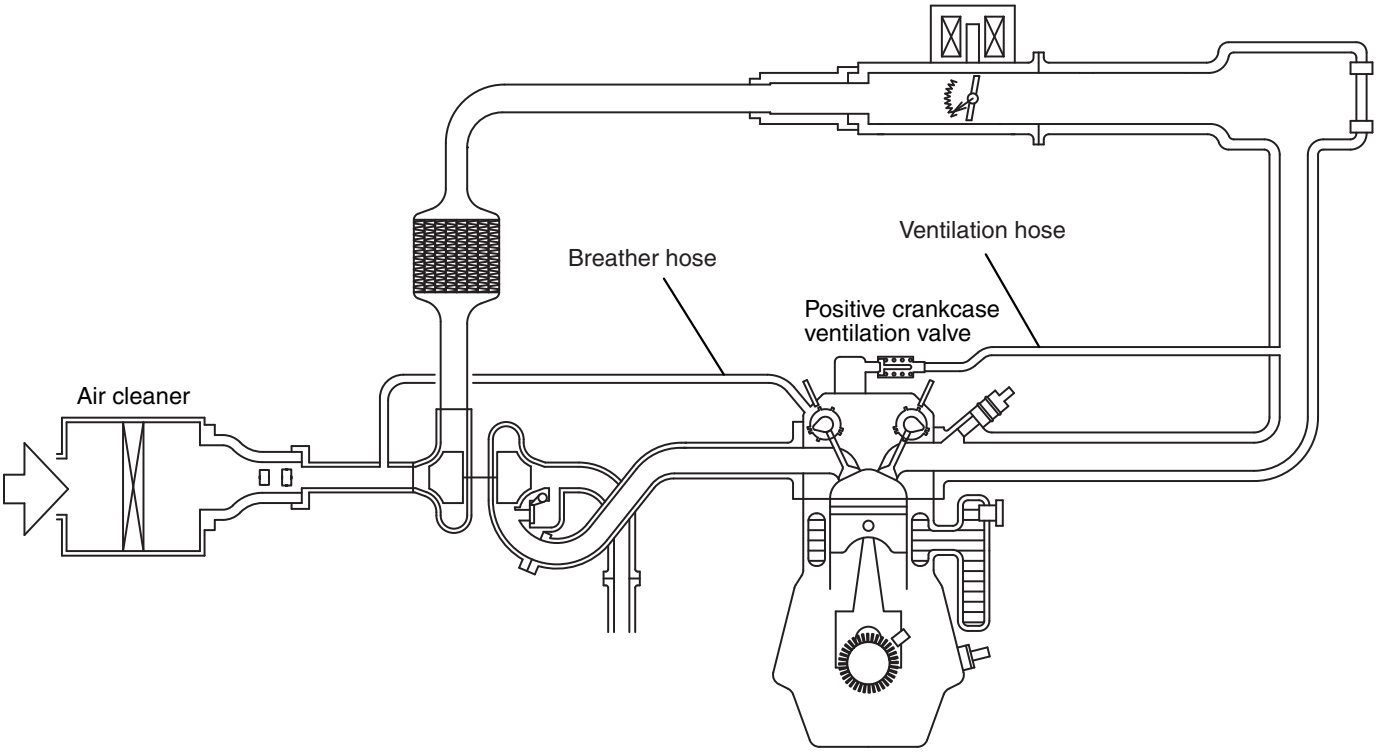

AK703398 AD

COMPONENT LOCATION

M1173007400952

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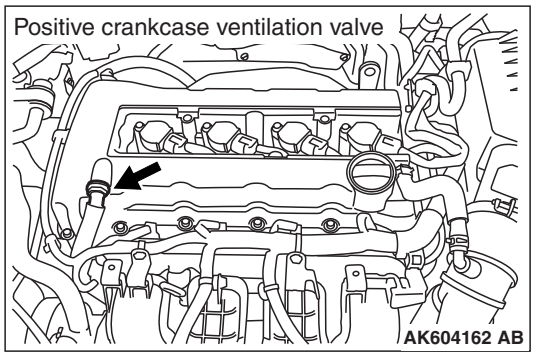

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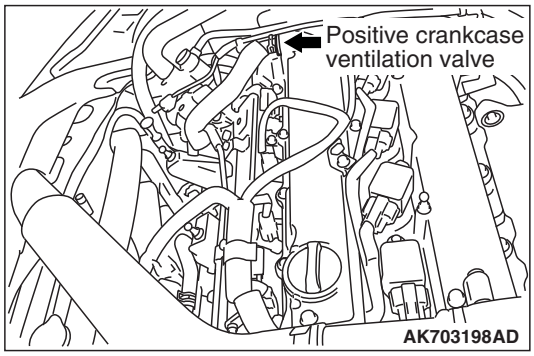


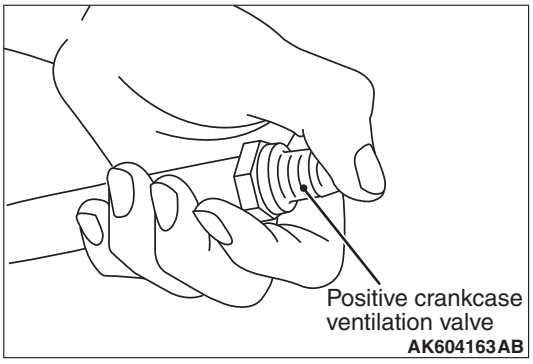
CRANKCASE VENTILATION SYSTEM CHECK

M1173001101150

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.

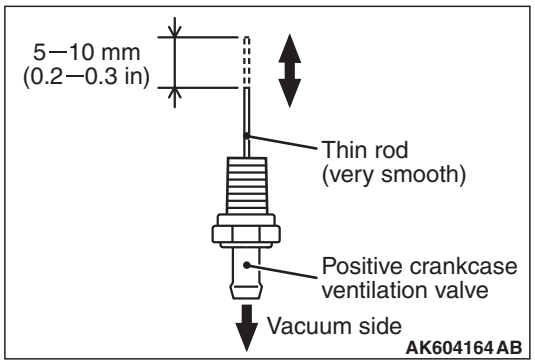
   Specified torque: 2.5 ± 0.4 N·m (22 ± 3 in-lb)



POSITIVE CRANKCASE VENTILATION (PCV) VALVE CHECK

M1173001201050

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.

   Specified torque: 2.5 ± 0.4 N·m (22 ± 3 in-lb)

EVAPORATIVE EMISSION CONTROL SYSTEM

GENERAL INFORMATION (EVAPORATIVE EMISSION SYSTEM)

M1173005101787

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. When the fuel tank inner pressure increases due to the fuel supply, air is released to the atmosphere from the fuel tank through the EVAP canister and air filter. When the inner pressure of the fuel tank decreases, air is supplied to the fuel tank through the air filter and EVAP canister.

SYSTEM DIAGRAM

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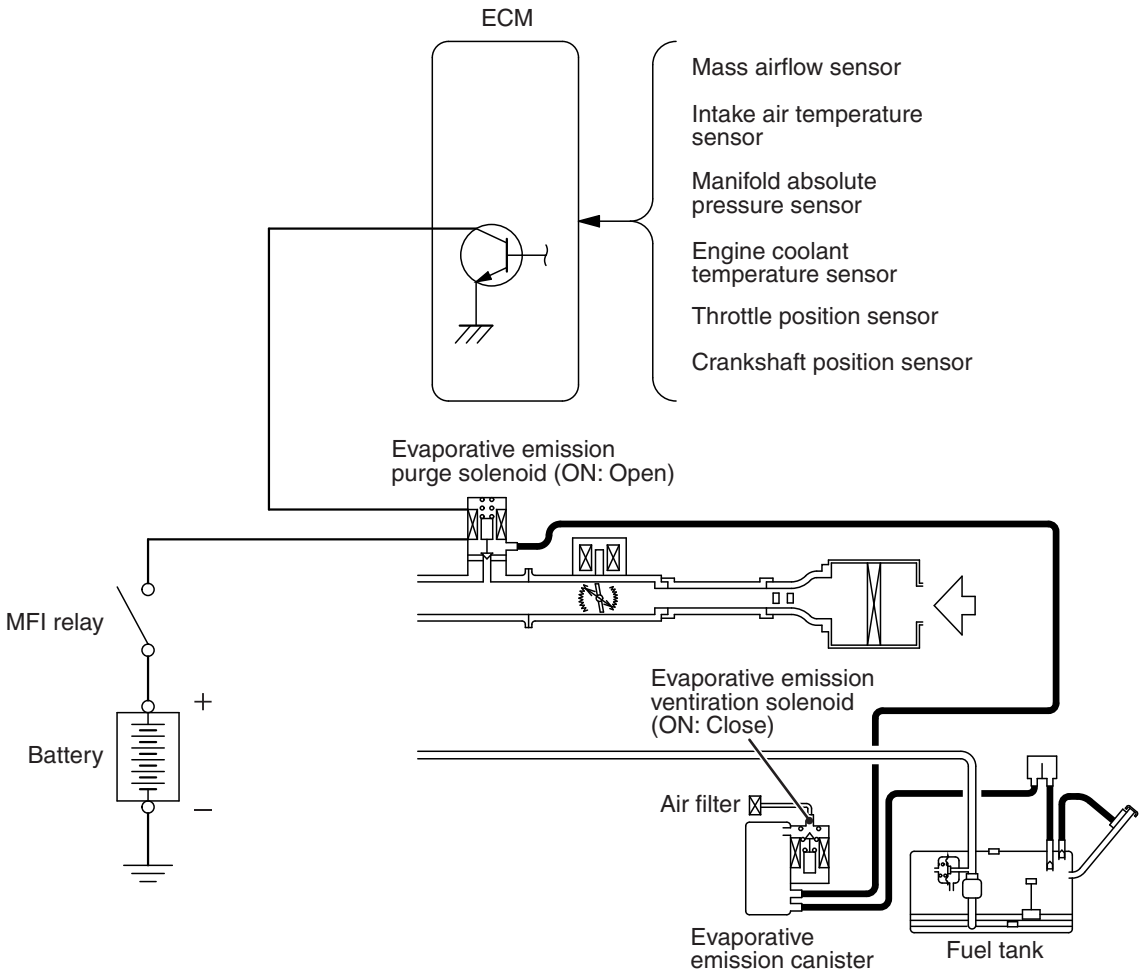

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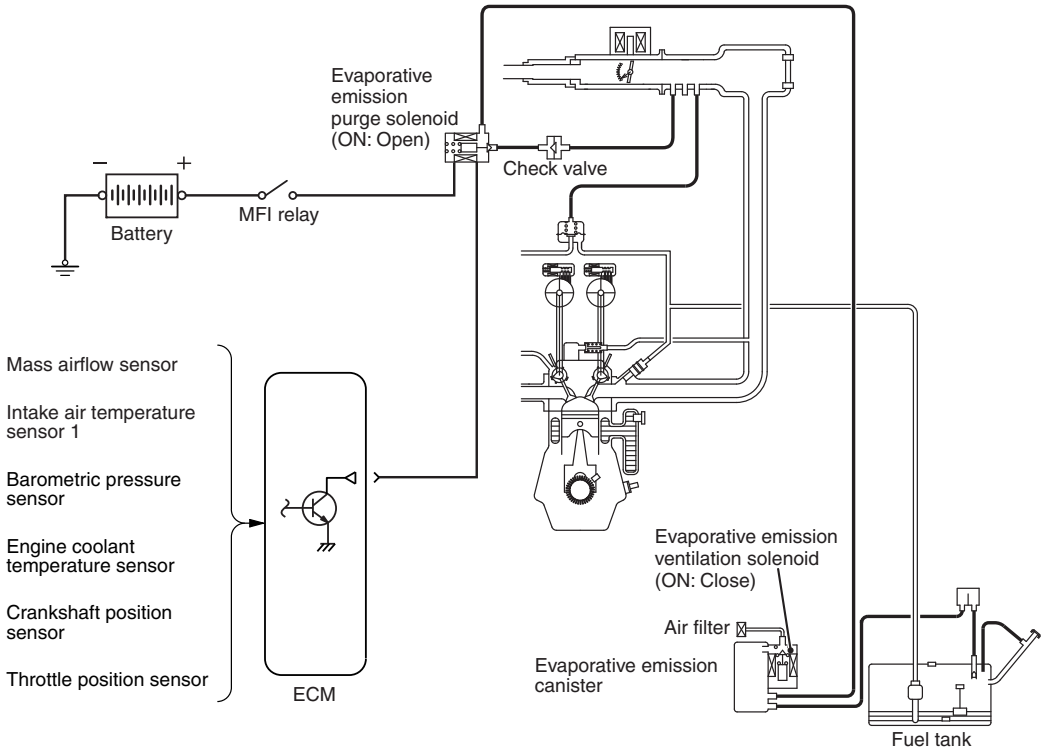

COMPONENT LOCATION

M1173007500896

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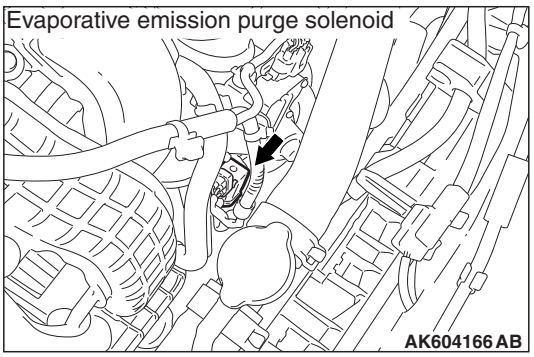

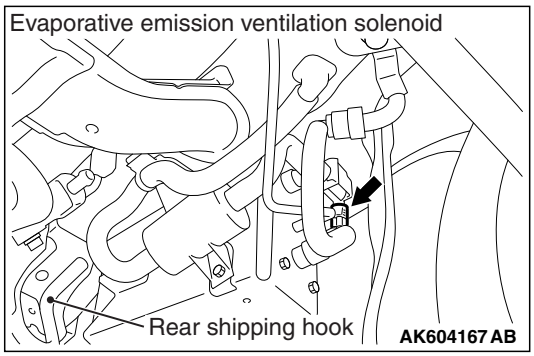

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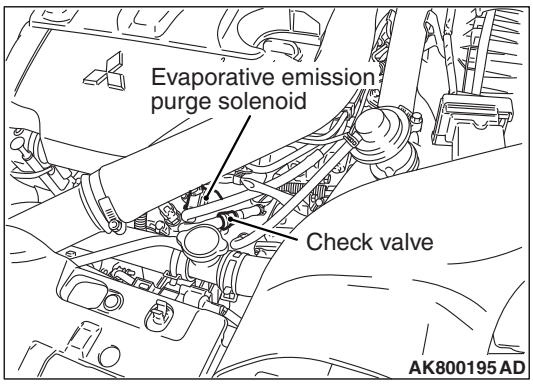
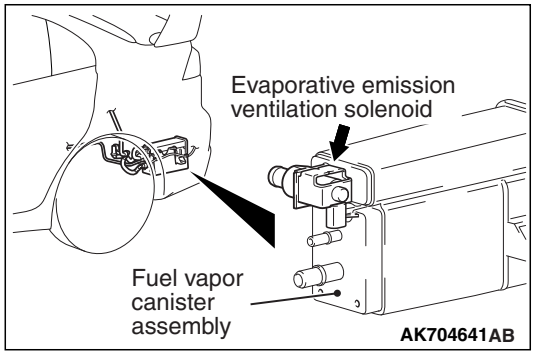


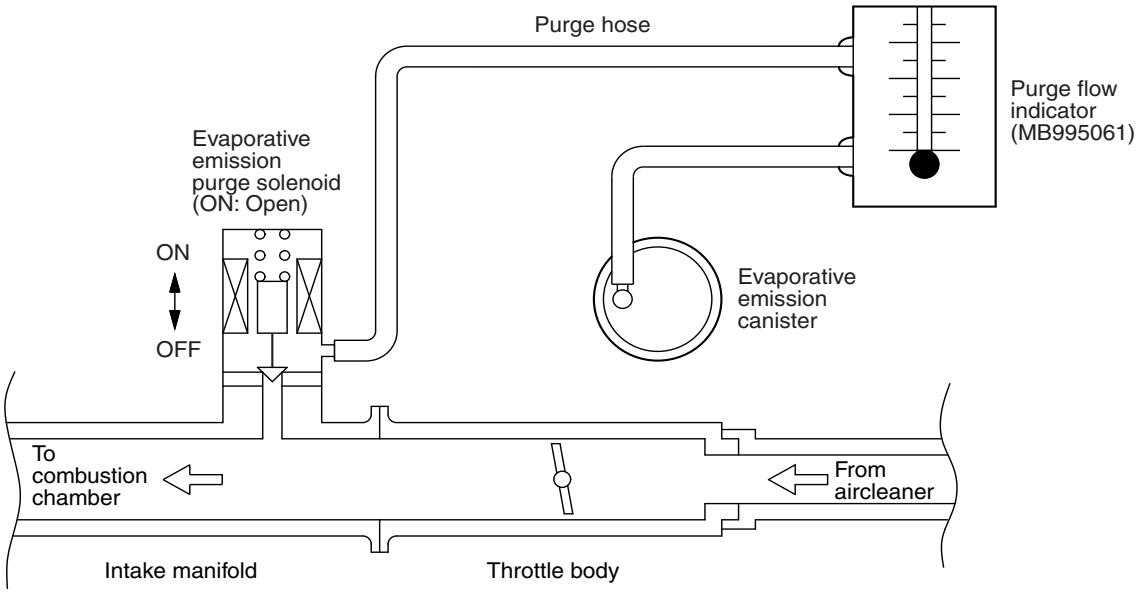


TSB Revision

PURGE CONTROL SYSTEM CHECK (PURGE FLOW CHECK)

M1173001401429

<Non-turbo>



AK604168 AB

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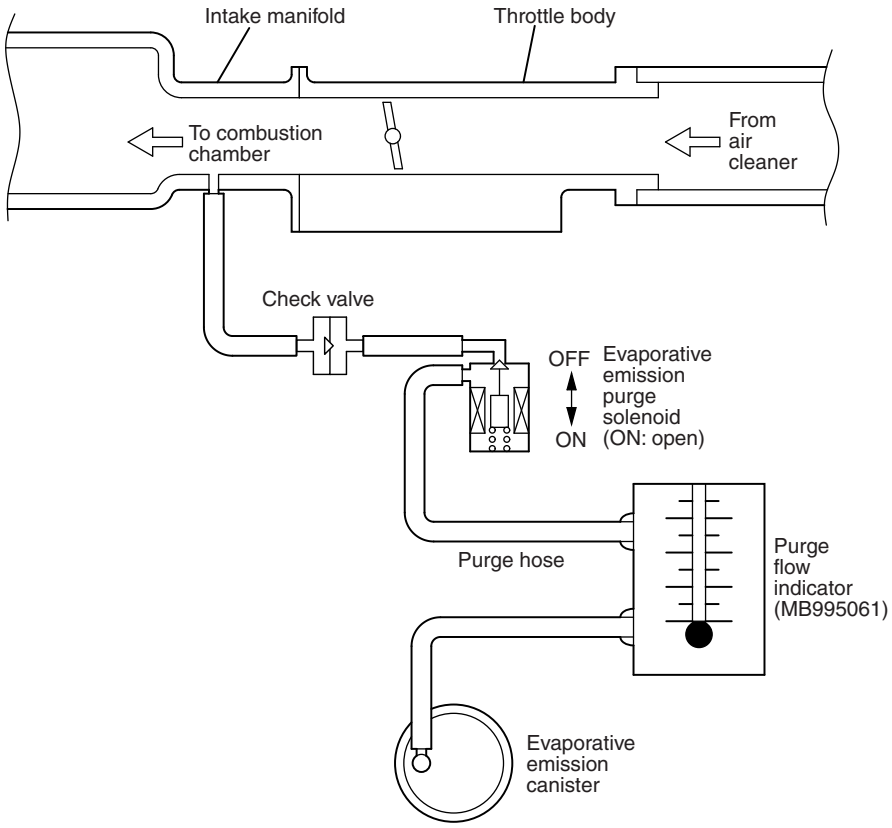

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TSB Revision

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.
2. Before inspection, 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 CVT and TC-SST)

   NOTE: Vehicles for Canada, the headlight, taillight, etc. remain lit even when the lighting switch is in "OFF" position but this is no problem for checks.
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, replace the EVAP canister.

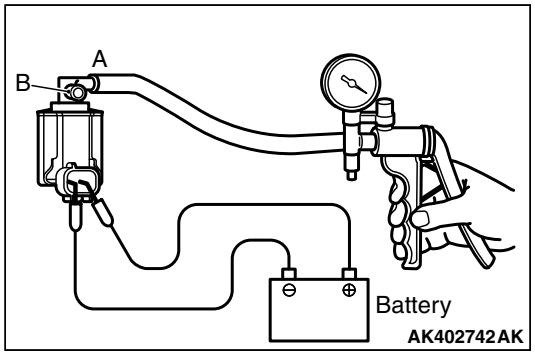
EVAPORATIVE EMISSION PURGE SOLENOID CHECK

M1173001700911

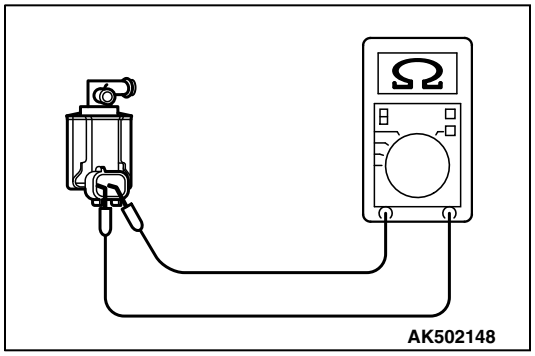
<Non-turbo>

1. Remove the inlet manifold from the evaporative emission (EVAP) purge solenoid valve.

   NOTE: When disconnecting the vacuum hose, always place an identification mark so that it can be reconnected at its original position.
2. Remove the EVAP purge solenoid valve from the intake manifold.
3. Disconnect the harness connector.
4. Connect a hand vacuum pump to nipple (A) of the EVAP purge solenoid (refer to the illustration at left).
5. 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.



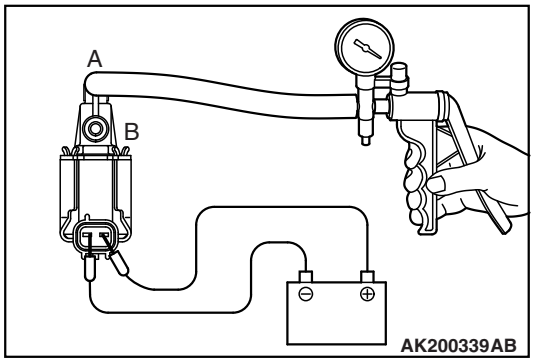
Jumper wire	Nipple "B" state	Normal state
Connected	Opened	Negative pressure leaks
	Closed	Negative pressure maintained
Disconnected	Opened	Negative pressure maintained


AK502148

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

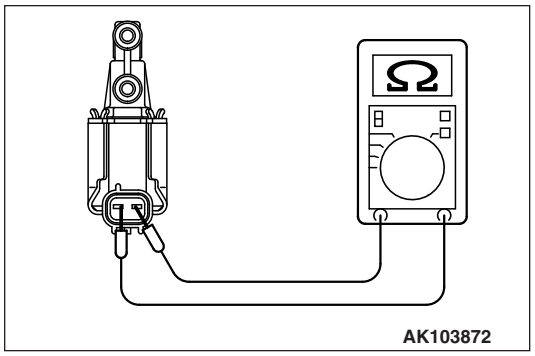
<Turbo>

1. Remove the vacuum hose from the 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.



AK200339AB

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

M1173050400280

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

INTAKE AIR TEMPERATURE SENSOR CHECK <Non-turbo>

M1173008200456

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

INTAKE AIR TEMPERATURE SENSOR 1 CHECK <Turbo>

M1173008200478

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

MANIFOLD ABSOLUTE PRESSURE SENSOR CHECK <Non-turbo>

M1173050000174

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

BAROMETRIC PRESSURE SENSOR CHECK <Turbo>

M1173008000399

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100824

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

THROTTLE POSITION SENSOR CHECK

M1173050500061

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

CRANKSHAFT POSITION SENSOR CHECK

M1173008300453

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.0L Engine Turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13B-51.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM <2.0 L ENGINE Non-turbo, 2.4 L ENGINE>

GENERAL INFORMATION (EXHAUST GAS RECIRCULATION SYSTEM) <2.0L ENGINE-CALIFORNIA, 2.4L ENGINE>

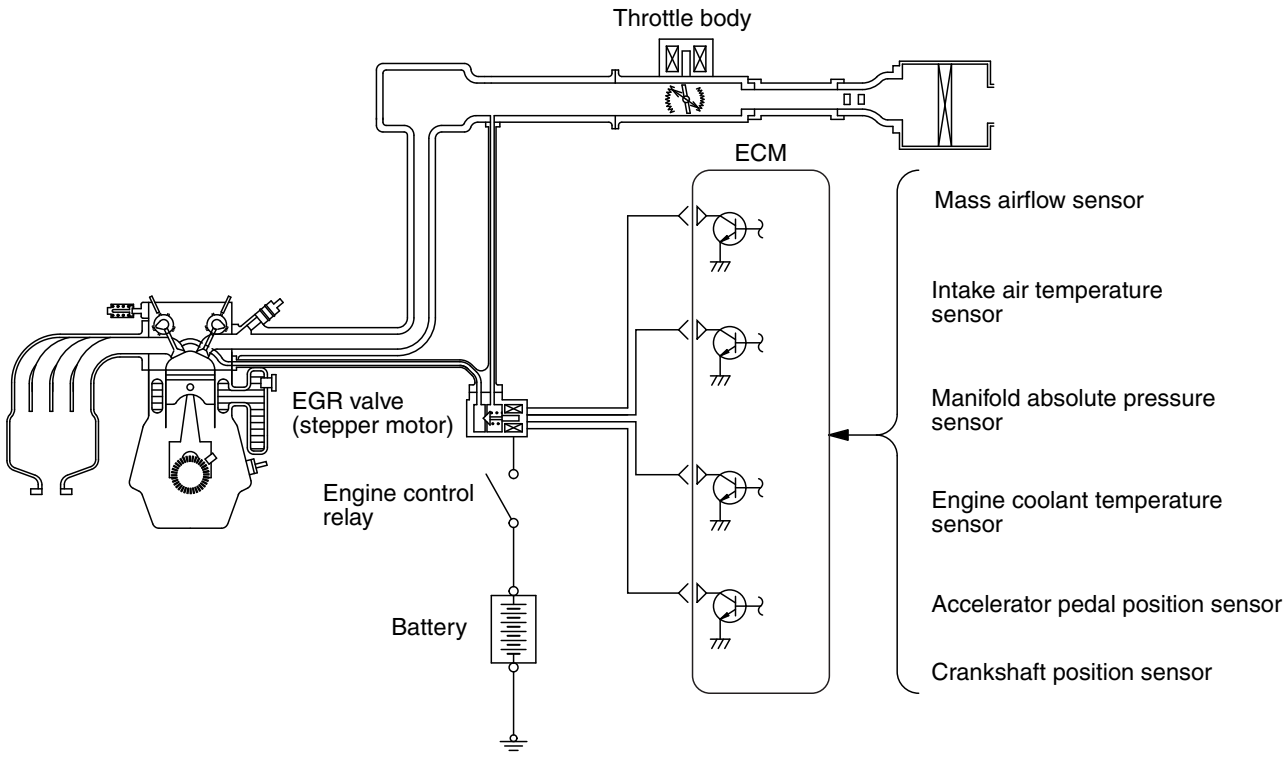
M1173005201104

The exhaust gas recirculation system (EGR) lowers the nitrogen oxides (NOx) emission level. When the air/fuel mixture combustion temperature is high, a large quantity of NOx is generated in the combustion chamber. Therefore, this system recirculates part of exhaust gas from the exhaust port of the cylinder head to the combustion chamber through the intake manifold to decrease the air/fuel mixture combustion temperature, resulting in reduction of NOx. The EGR flow rate is controlled by the EGR valve (Stepper Motor) for driveability quality.

OPERATION

When the engine coolant temperature is low, when the engine is at idle or when a wide open throttle operation is performed, the EGR valve (Stepper Motor) is kept closed, achieving no EGR. After warming up the engine, the EGR valve (Stepper Motor) can be opened by the engine control module (ECM). The ECM monitors the EGR system and illuminates the Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) to indicate that there is a malfunction.

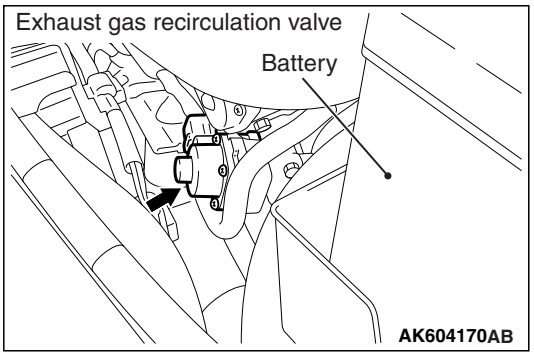
SYSTEM DIAGRAM



AK604169 AB

COMPONENT LOCATION

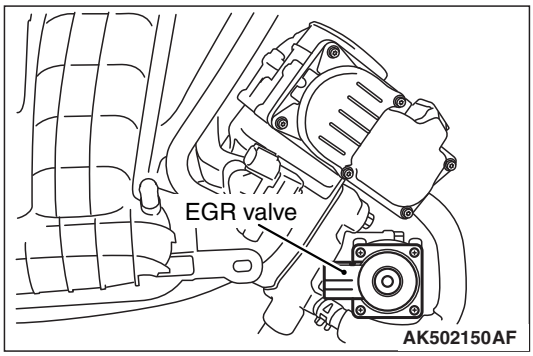
M1173007600570



EGR VALVE (STEPPER MOTOR) CHECK

M1173050200598

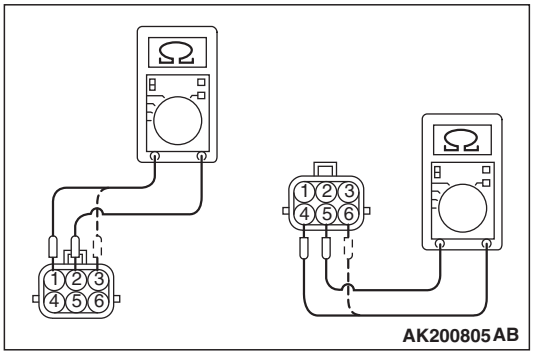
Required Special Tool:
MB991658: Test Harness Set



Checking the Operation Sound

1. Check that the operation sound of the stepper motor can be heard from the EGR valve when the ignition switch is turned ON (without starting the engine).
2. If the operation sound cannot be heard, inspect the drive circuit of the stepper motor.

NOTE: If the operation sound is not heard, and the circuit is normal, either the stepper motor or the ECM may have failed.



Checking the Coil Resistance

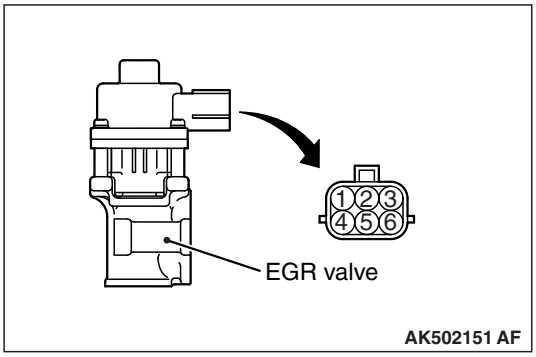
1. Remove the EGR valve.
2. Measure the resistance between terminal No. 2 and either terminal No. 1 or terminal No. 3 of the connector at the EGR valve.

   Standard value: 20 – 24 Ω [at 20°C (68°F)]
3. If the resistance is not within the standard, replace the EGR valve.
4. Measure the resistance between terminal No. 5 and either terminal No. 6 or terminal No. 4 of the connector at the EGR valve.

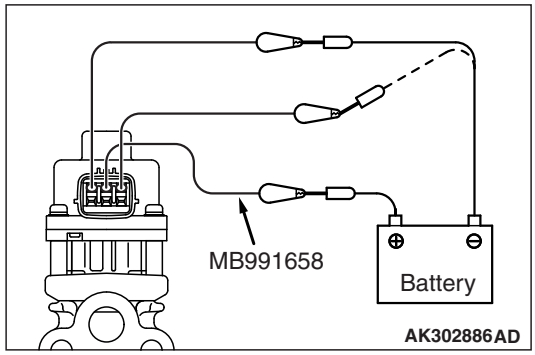
   Standard value: 20 – 24 Ω [at 20°C (68°F)]
5. If the resistance is not within the standard, replace the EGR valve.

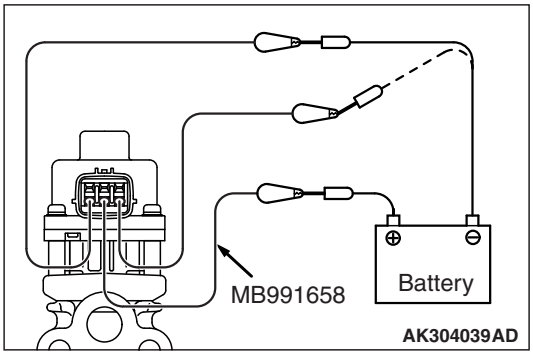
Operation Check

1. Remove the EGR valve.



2. Connect special tool MB991658 to the EGR valve.





3. Connect the battery positive (+) terminal to terminal No. 2.

⚠ CAUTION
Connecting battery voltage to the EGR valve for a long time could damage the coil.

4. Connect terminals 1 and 3 to the negative (-) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.
5. Connect the battery positive (+) terminal to terminal No. 5.

⚠ CAUTION
Connecting battery voltage to the EGR valve for a long time could damage the coil.

6. Connect terminals 4 and 6 to the negative (-) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.
7. If vibrations can be felt as a result of the test, the stepper motor is determined to be normal.
8. Using a new gasket, install the EGR valve by tightening its mounting bolts to the specified torque.

Tightening torque: 24 ± 3 N·m (212 ± 27 in-lb)

MASS AIRFLOW SENSOR CHECK

M1173050400291

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

INTAKE AIR TEMPERATURE SENSOR CHECK

M1173008200467

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

MANIFOLD ABSOLUTE PRESSURE SENSOR CHECK

M1173050000185

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100835

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

ACCELERATOR PEDAL POSITION SENSOR CHECK

M1173050600013

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

CRANKSHAFT POSITION SENSOR CHECK

M1173008300464

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine Non-turbo> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13A-50.

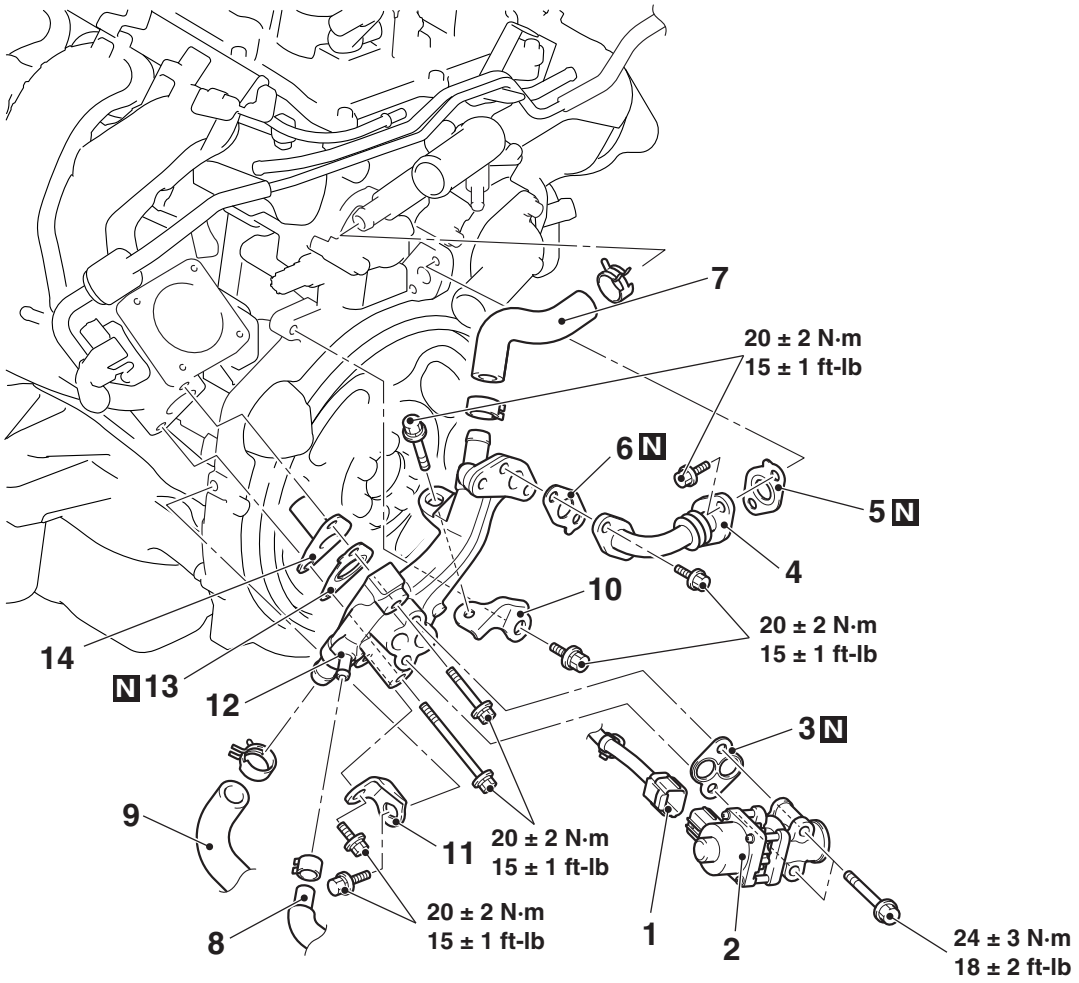
<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13C, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart P.13C-48.

REMOVAL AND INSTALLATION <2.0L ENGINE NON-TURBO (VEHICLES FOR CALIFORNIA), 2.4L ENGINE>

M1173010501167

Pre-removal Operation	Post-installation Operation
• Battery and Battery Tray Removal (Refer to GROUP 54A, Battery P.54A-10.) • Air Cleaner Assembly Removal (Refer to GROUP 15, Air Cleaner P.15-9.) • Engine Coolant Draining (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement P.14-25.) • CVT Filler Level Gauge and Filler Tube Assembly Removal (Refer to GROUP 23A, Transaxle Assembly P.23A-155.) <CVT>	• CVT Filler Level Gauge and Filler Tube Assembly Installation (Refer to GROUP 23A, Transaxle Assembly P.23A-155.) <CVT> • Engine Coolant Refilling (Refer to GROUP 14, On-vehicle Service – Engine Coolant Replacement P.14-25.) • Air Cleaner Assembly Installation (Refer to GROUP 15, Air Cleaner P.15-9.) • Battery and Battery Tray Installation (Refer to GROUP 54A, Battery P.54A-10.)



AC605404AD

Removal steps

1. EGR valve connector connection
2. EGR valve

>>**B**<< 3. EGR valve gasket

>>**A**<< 4. EGR valve pipe

>>**A**<< 5. EGR pipe gasket

>>**A**<< 6. EGR pipe gasket

Removal steps (Continued)

7. Cooling water line hose connection
8. Throttle body water return hose connection
9. Cooling water line hose connection

TSB Revision

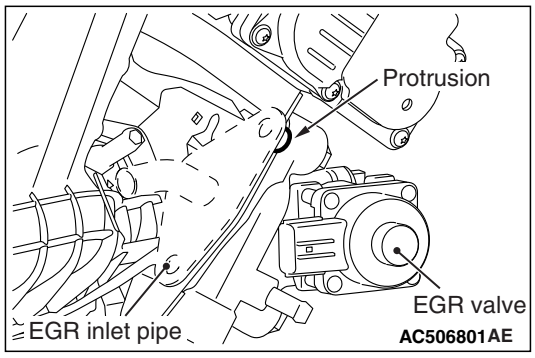
Removal steps (Continued)
- Throttle body assembly (Refer to GROUP 13A, Throttle Body Assembly P.13A-983) <2.0L ENGINE Non-turbo>
- Throttle body assembly (Refer to GROUP 13C, Throttle Body Assembly P.13C-971) <2.4L ENGINE>

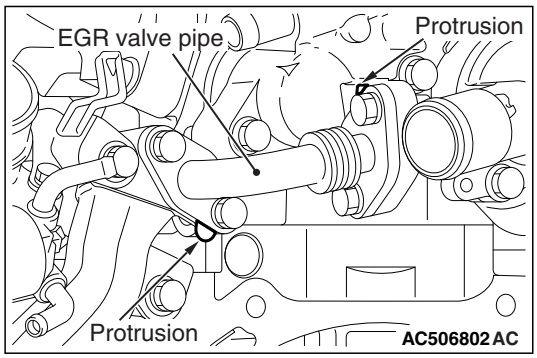
>>A<< 10. EGR support stay A
>>A<< 11. EGR support stay B
>>A<< 12. EGR valve support
>>A<< 13. EGR pipe gasket
14. EGR inlet pipe

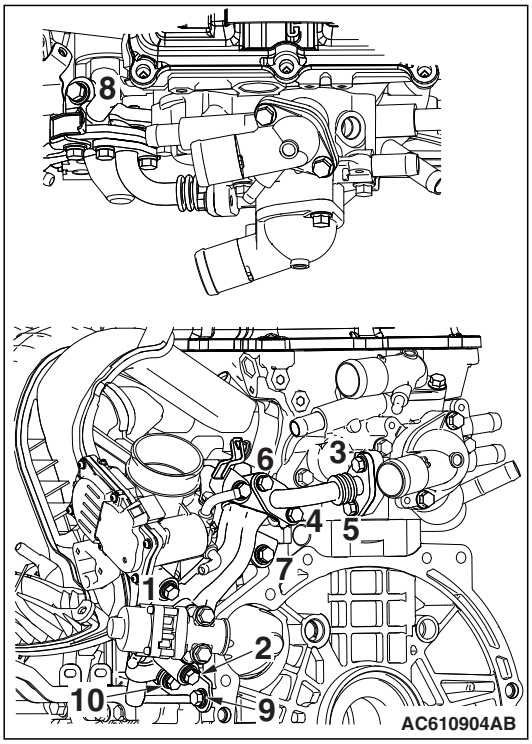
INSTALLATION SERVICE POINTS

>>A<< EGR PIPE GASKET/EGR VALVE SUPPORT/EGR SUPPORT STAY B/EGR SUPPORT STAY A/ EGR PIPE GASKET/EGR VALVE PIPE INSTALLATION

1. Temporarily tighten each part so that the protrusion of each gasket is positioned as illustrated.



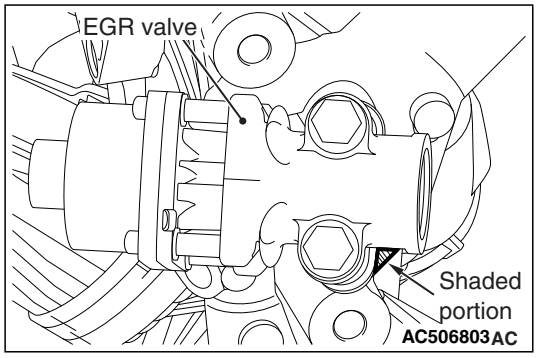




2. Tighten mounting bolts to the specified torque in the order of number shown in the figure.

Tightening torque: 20 ± 2 N·m (15 ± 1 ft-lb)

>>B<< EGR VALVE GASKET INSTALLATION

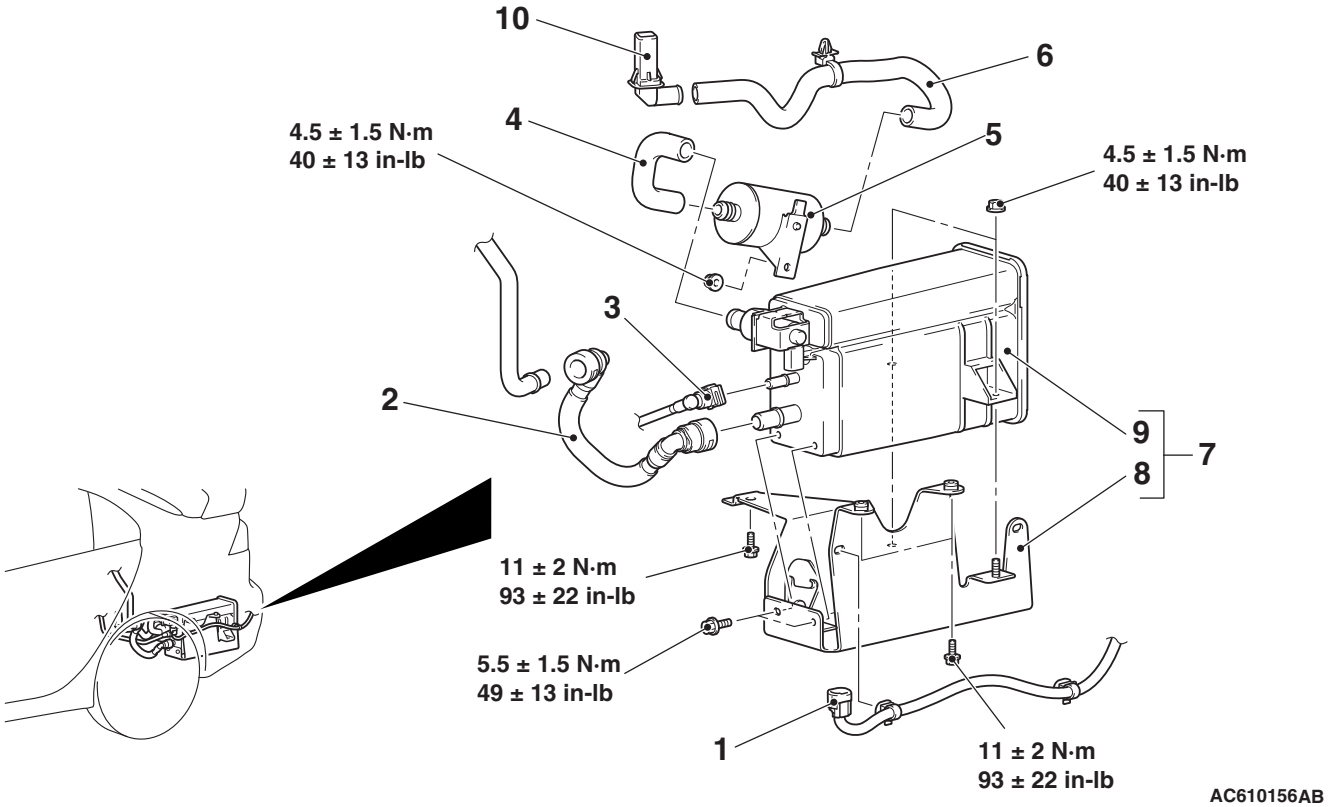


Install the EGR valve gasket so that its shaded portion is set as shown in the figure. Be sure to check which side of the gasket faces outside.

EVAPORATIVE EMISSION CANISTER AND FUEL TANK PRESSURE RELIEF VALVE

REMOVAL AND INSTALLATION

M1173004800531



Removal steps

1. Evaporative emission ventilation solenoid connector connection
2. Fuel vapor tube assembly
3. Fuel purge pipe assembly connection
4. Vent hose A
5. Air filter

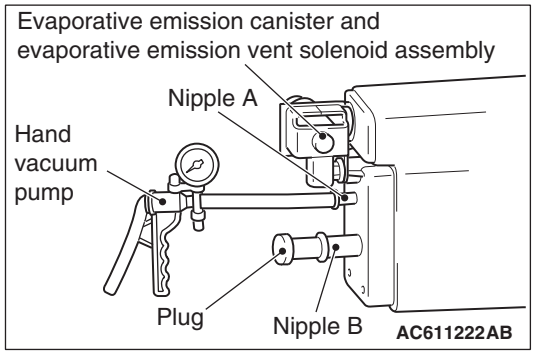
Removal steps (Continued)

6. Vent hose B
7. Fuel vapor canister and bracket assembly
8. Fuel vapor canister bracket
9. Fuel vapor canister assembly
10. Vent pipe

INSPECTION

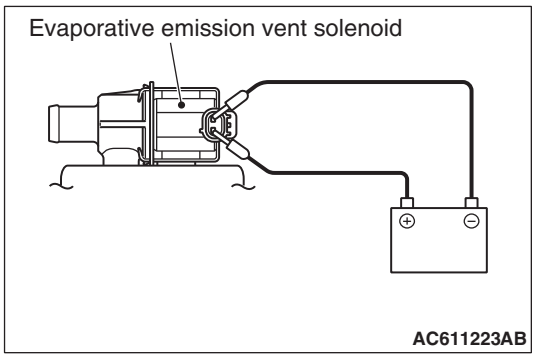
M1173004900282

EVAPORATIVE EMISSION VENTILATION SOLENOID CHECK



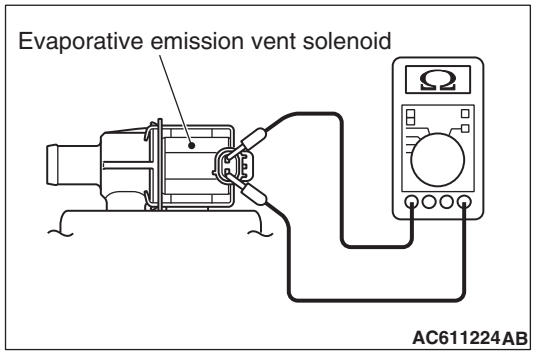
1. Connect a hand vacuum pump to nipple (A) of the evaporative emission canister and evaporative emission ventilation solenoid assembly.
2. Connect a plug to nipple (B) of the evaporative emission canister and evaporative emission ventilation solenoid assembly.

TSB Revision



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 <2.0L ENGINE NON-TURBO, 2.4L ENGINE>

M1173003901657

- The catalytic converter is integrated with the center exhaust pipe. The removal and installation is the same as the center exhaust pipe (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-30) <Except vehicles for California.>
- The catalytic converter is integrated with the front exhaust pipe and center exhaust pipe. The removal and installation is the same as the front exhaust pipe and center exhaust pipe (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-30) <Vehicles for California.>

REMOVAL AND INSTALLATION <2.0L ENGINE TURBO>

M1173003901646

Refer to GROUP 15, Exhaust Pipe, Main Muffler and Catalytic converter P.15-33.

NOTES