

GROUP 17

ENGINE AND EMISSION CONTROL

CONTENTS

ENGINE CONTROL	17-4	ON-VEHICLE SERVICE	17-6
GENERAL DESCRIPTION	17-4	ACCELERATOR CABLE CHECK AND ADJUSTMENT	17-6
ENGINE CONTROL SYSTEM DIAGNOSIS	17-4	ACCELERATOR CABLE AND PEDAL REMOVAL AND INSTALLATION .	17-7
INTRODUCTION TO ENGINE CONTROL SYSTEM DIAGNOSIS	17-4	REMOVAL AND INSTALLATION	17-7
ENGINE CONTROL SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY ...	17-4	ACCELERATOR PEDAL POSITION SENSOR <2.4L ENGINE>	17-9
SYMPTOM CHART	17-4	REMOVAL AND INSTALLATION <2.4L ENGINE>	17-9
SYMPTOM PROCEDURES	17-4		

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, air bag module, 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 (*).

AUTO-CRUISE CONTROL**<2.0L ENGINE>* 17-10****GENERAL DESCRIPTION 17-10****SPECIAL TOOLS 17-11****AUTO-CRUISE CONTROL SYSTEM
DIAGNOSIS 17-12**INTRODUCTION TO AUTO-CRUISE
CONTROL SYSTEM DIAGNOSIS 17-12AUTO-CRUISE CONTROL SYSTEM
DIAGNOSTIC TROUBLESHOOTING
STRATEGY 17-13AUTO-CRUISE CONTROL SYSTEM
DIAGNOSTIC TROUBLE CODE
DIAGNOSIS 17-13

DIAGNOSTIC TROUBLE CODE CHART 17-17

DIAGNOSTIC TROUBLE CODE

PROCEDURES 17-18

SYMPTOM CHART 17-67

SYMPTOM PROCEDURES 17-68

DATA LIST REFERENCE TABLE 17-112

CHECK AUTO-CRUISE CONTROL-ECU
TERMINALS 17-113**ON-VEHICLE SERVICE 17-115**AUTO-CRUISE CONTROL SWITCH
CHECK 17-115AUTO-CRUISE CONTROL SYSTEM
COMPONENT CHECK 17-117**AUTO-CRUISE CONTROL 17-120**

REMOVAL AND INSTALLATION 17-120

AUTO-CRUISE CONTROL**<2.4L ENGINE>* 17-123****GENERAL DESCRIPTION 17-123****SPECIAL TOOLS 17-124****AUTO-CRUISE CONTROL SYSTEM
DIAGNOSIS 17-125**INTRODUCTION TO AUTO-CRUISE
CONTROL SYSTEM DIAGNOSIS 17-125AUTO-CRUISE CONTROL SYSTEM
DIAGNOSTIC TROUBLESHOOTING
STRATEGY 17-126AUTO-CRUISE CONTROL SYSTEM
DIAGNOSTIC FUNCTION 17-126

DIAGNOSTIC TROUBLE CODE CHART 17-128

DIAGNOSTIC TROUBLE CODE

PROCEDURES 17-129

SYMPTOM CHART 17-169

SYMPTOM PROCEDURES 17-170

DATA LIST REFERENCE TABLE 17-197

ECM<M/T> OR PCM<A/T> TERMINAL
VOLTAGE REFERENCE CHART FOR
AUTO-CRUISE CONTROL SYSTEM
OPERATION 17-199**ON-VEHICLE SERVICE 17-201**AUTO-CRUISE CONTROL SWITCH
CHECK 17-201AUTO-CRUISE CONTROL SYSTEM
COMPONENT CHECK 17-202**AUTO-CRUISE CONTROL 17-204**

REMOVAL AND INSTALLATION 17-204

Continued on next page

EMISSION CONTROL	17-205	EXHAUST GAS RECIRCULATION (EGR) SYSTEM	17-220
GENERAL DESCRIPTION	17-205	GENERAL DESCRIPTION (EXHAUST GAS RECIRCULATION SYSTEM).	17-220
DIAGNOSIS	17-205	COMPONENT LOCATION.	17-222
SPECIAL TOOLS.	17-206	EXHAUST GAS RECIRCULATION SYSTEM CHECK.	17-223
VACUUM HOSES	17-206	VACUUM CONTROL VALVE CHECK.	17-224
VACUUM HOSE ROUTING.	17-206	EGR VALVE CHECK.	17-224
VACUUM CIRCUIT DIAGRAM	17-208	EGR PORT VACUUM CHECK.	17-225
VACUUM HOSE INSTALLATION	17-209	EGR VACUUM REGULATOR SOLENOID VALVE CHECK	17-225
VACUUM HOSE CHECK.	17-209	EGR VALVE (STEPPER MOTOR) CHECK.	17-226
POSITIVE CRANKCASE VENTILATION SYSTEM	17-210	EGR VALVE (STEPPER MOTOR) CLEANING.	17-228
GENERAL DESCRIPTION (POSITIVE CRANKCASE VENTILATION SYSTEM)	17-210	VOLUME AIRFLOW SENSOR CHECK.	17-228
COMPONENT LOCATION	17-211	MASS AIRFLOW SENSOR CHECK	17-228
POSITIVE CRANKCASE VENTILATION SYSTEM CHECK.	17-212	ENGINE COOLANT TEMPERATURE SENSOR CHECK.	17-228
POSITIVE CRANKCASE VENTILATION VALVE CHECK	17-212	CRANKSHAFT POSITION SENSOR CHECK.	17-228
EVAPORATIVE EMISSION CONTROL SYSTEM	17-213	REMOVAL AND INSTALLATION <2.0L ENGINE>	17-229
GENERAL DESCRIPTION (EVAPORATIVE EMISSION SYSTEM)	17-213	REMOVAL AND INSTALLATION <2.4L ENGINE>	17-229
COMPONENT LOCATION	17-215	EVAPORATIVE EMISSION CANISTER AND FUEL TANK PRESSURE RELIEF VALVE.	17-230
PURGE CONTROL SYSTEM CHECK (PURGE FLOW CHECK).	17-216	REMOVAL AND INSTALLATION.	17-230
EVAPORATIVE EMISSION PURGE SOLENOID CHECK.	17-218	INSPECTION	17-231
VOLUME AIRFLOW SENSOR CHECK.	17-219	CATALYTIC CONVERTER	17-231
MASS AIRFLOW SENSOR CHECK	17-219	GENERAL DESCRIPTION (CATALYTIC CONVERTER)	17-231
BAROMETRIC PRESSURE SENSOR CHECK	17-219	REMOVAL AND INSTALLATION.	17-231
ENGINE COOLANT TEMPERATURE SENSOR CHECK	17-219	SPECIFICATIONS	17-232
INTAKE AIR TEMPERATURE SENSOR CHECK	17-219	FASTENER TIGHTENING SPECIFICATIONS	17-232
FUEL TANK DIFFERENTIAL PRESSURE SENSOR CHECK	17-220	SERVICE SPECIFICATIONS	17-232
EVAPORATIVE EMISSION VENTILATION SOLENOID CHECK.	17-220		

ENGINE CONTROL

GENERAL DESCRIPTION

M1171000100318

A cable-type accelerator mechanical suspended-type pedal has been adopted.

ENGINE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION TO ENGINE CONTROL SYSTEM DIAGNOSIS

M1171002000276

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

ENGINE CONTROL SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1171002100303

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

M1171002200300

SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Throttle valve will not fully open or close <2.0L engine>	1	P.17-4
Throttle valve will not fully open or close <2.4L engine>	2	P.17-5
Accelerator pedal operation not smooth (over acceleration)	3	P.17-5

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Throttle Valve Will Not Fully Open or Close <2.0L engine>

DIAGNOSIS

STEP 1. Check the accelerator cable adjustment.

Q: Is the accelerator cable properly adjusted?

YES : Go to Step 2.

NO : Adjust the accelerator cable by referring to P.17-6, and then go to Step 4.

STEP 2. Check the return spring.

Q: Is the return spring damaged or deformed?

YES : Go to Step 3.

NO : Replace, then go to Step 4.

STEP 3. Check the throttle lever.

Q: Is the throttle lever damaged or deformed?

YES : Replace, then go to Step 4.

NO : There is no action to be taken.

STEP 4. Check symptom.

Q: Does the throttle valve fully open and close?

YES : This diagnosis is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 2: Throttle Valve will not Fully Open or Close <2.4L engine>

DIAGNOSIS

STEP 1. Check the accelerator cable adjustment.

Q: Is the accelerator cable properly adjusted?

YES : Go to Step 2.

NO : Adjust the accelerator cable by referring to [P.17-6](#), and then go to Step 3.

STEP 2. Check the accelerator pedal position sensor assembly.

Check that the lever of the accelerator pedal position sensor assembly moves smoothly by moving it by hand.

Q: Does the lever of the accelerator pedal position sensor assembly move smoothly?

YES : Go to Step 3.

NO : Replace the accelerator pedal position sensor assembly (Refer to [P.17-9](#)), then go to Step 3.

STEP 3. Retest the system.

Q: Does the throttle valve fully open and close?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 3: Accelerator Pedal Operation Not Smooth (Over Acceleration)

DIAGNOSIS

STEP 1. Check the accelerator pedal.

Q: Is the accelerator pedal loose?

YES : Tighten, then go to Step 4.

NO : Go to Step 2.

STEP 2. Check the accelerator cable wiring.

Q: Is the accelerator cable routing bent sharply?

YES : Repair, then go to Step 4.

NO : Go to Step 3.

STEP 3. Check the accelerator cable lubricant.

Q: Is the accelerator cable lubricated sufficiently?

YES : There is no action to be taken.

NO : Refill or replace the lubricant, then go to Step 4.

STEP 4. Check symptom.

Q: Does the accelerator pedal work normally?

YES : This diagnosis is complete.

NO : Go to Step 1.

ON-VEHICLE SERVICE

ACCELERATOR CABLE CHECK AND
ADJUSTMENT

M1171000900336

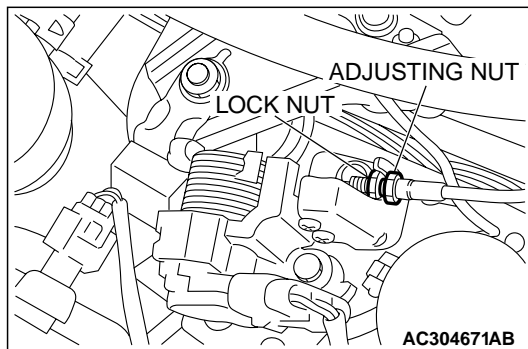
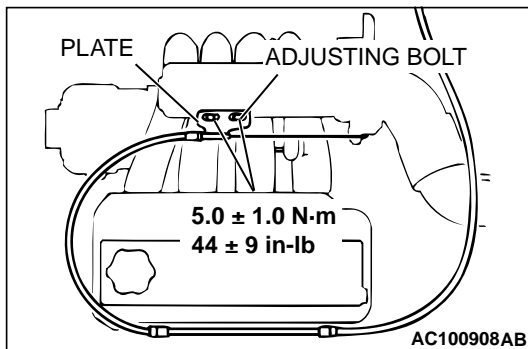
1. Turn off air conditioning and all lights. Inspect and adjust at no load.
2. Start engine and allow to idle until it reaches normal operating temperature.
3. Confirm the idle speed is at standard value.

Standard value:**700 ± 100 r/min <2.0L engine>****750 ± 100 r/min <2.4L engine>**

4. Stop the engine [ignition switch: "LOCK" (OFF) position].
5. Confirm there are no sharp bends in the accelerator cable.
6. Check the inner cable for correct slack.

Standard value: 1.0 – 2.0 mm (0.04 – 0.08 inch)

7. If there is too much slack or no slack, adjust play by the following procedures. <2.0L engine>
 - (1) Loosen the adjusting bolt to release the cable.
 - (2) Move the plate until the inner cable play is at the standard value, and then tighten the adjusting bolt to specified torque.

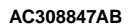
Tightening torque: 5.0 ± 1.0 N·m (44 ± 9 in-lb)

8. If there is too much slack or no slack, adjust play by the following procedures. <2.4L engine>
 - (1) Loosen the lock nut and fully close the throttle lever.
 - (2) Tighten the adjusting nut until just before the throttle lever starts to move.
 - (3) By loosening the adjusting nut one turn, the accelerator cable slack will be brought to the standard value.
 - (4) Fix the adjusting nut with the lock nut.
 - (5) After adjusting, check that the throttle lever is touching the stopper.

M1171001200374

<2.0L ENGINE>

5.0 ± 1.0 N·m
44 ± 9 in-lb



AC308848AB

**ACCELERATOR CABLE
ASSEMBLY REMOVAL STEPS**

1. INNER CABLE CONNECTION
(ACCELERATOR PEDAL SIDE)
2. INNER CABLE CONNECTION
(THROTTLE LEVER SIDE)
3. ACCELERATOR CABLE ASSEMBLY
4. BRACKET

**ACCELERATOR PEDAL
ASSEMBLY REMOVAL STEPS**

1. INNER CABLE CONNECTION
(ACCELERATOR PEDAL SIDE)
5. ACCELERATOR PEDAL ASSEMBLY

**ACCELERATOR PEDAL
ASSEMBLY REMOVAL STEPS**

6. PUSH-ON SPRING NUT
7. ACCELERATOR ARM AND PEDAL
PAD ASSEMBLY
8. BUSHING
9. SPRING
10. STOPPER
11. ACCELERATOR PEDAL BRACKET
12. ACCELERATOR ARM ASSEMBLY
13. PEDAL PAD
14. ACCELERATOR PEDAL STOPPER

>>A<<

INSTALLATION SERVICE POINT**>>A<< ACCELERATOR PEDAL PAD INSTALLATION**

Warm the peg of the accelerator pedal pad with a dryer before installing the pad.

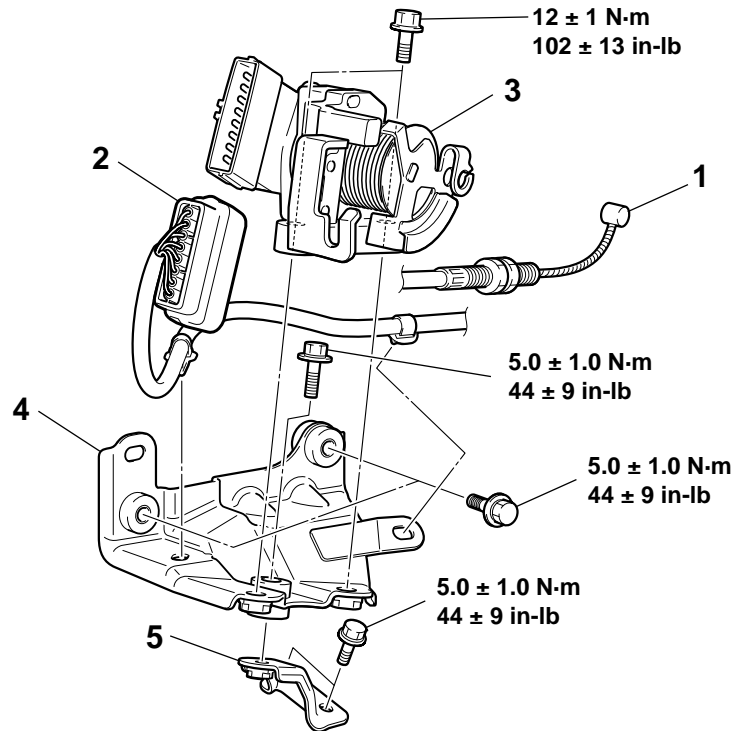
NOTE: If it is difficult to fit, apply soapy water to the peg lightly.

ACCELERATOR PEDAL POSITION SENSOR <2.4L ENGINE> REMOVAL AND INSTALLATION <2.4L ENGINE>

M1171001800042

Post-installation Operation

Adjust the Accelerator Cable (Refer to [P.17-6](#)).



AC305408AB

ASSEMBLY REMOVAL STEPS

1. INNER CABLE CONNECTION
2. ACCELERATOR PEDAL POSITION SENSOR CONNECTOR
3. ACCELERATOR PEDAL POSITION SENSOR ASSEMBLY

ASSEMBLY REMOVAL STEPS

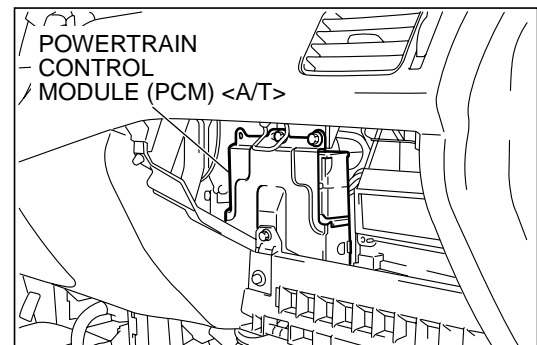
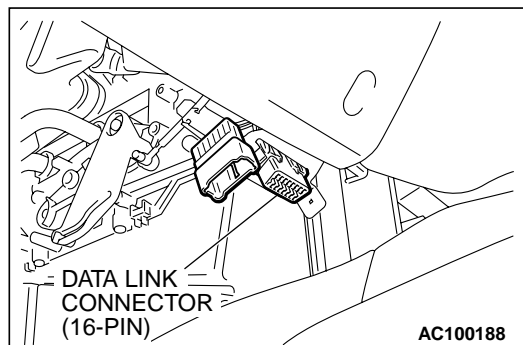
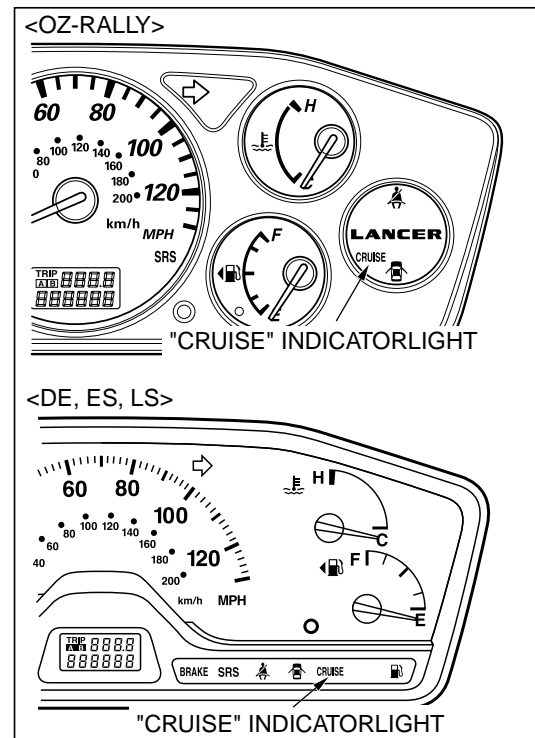
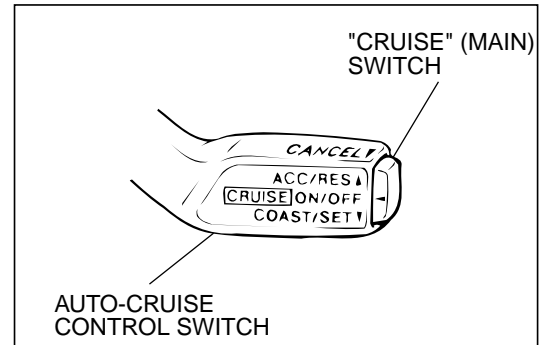
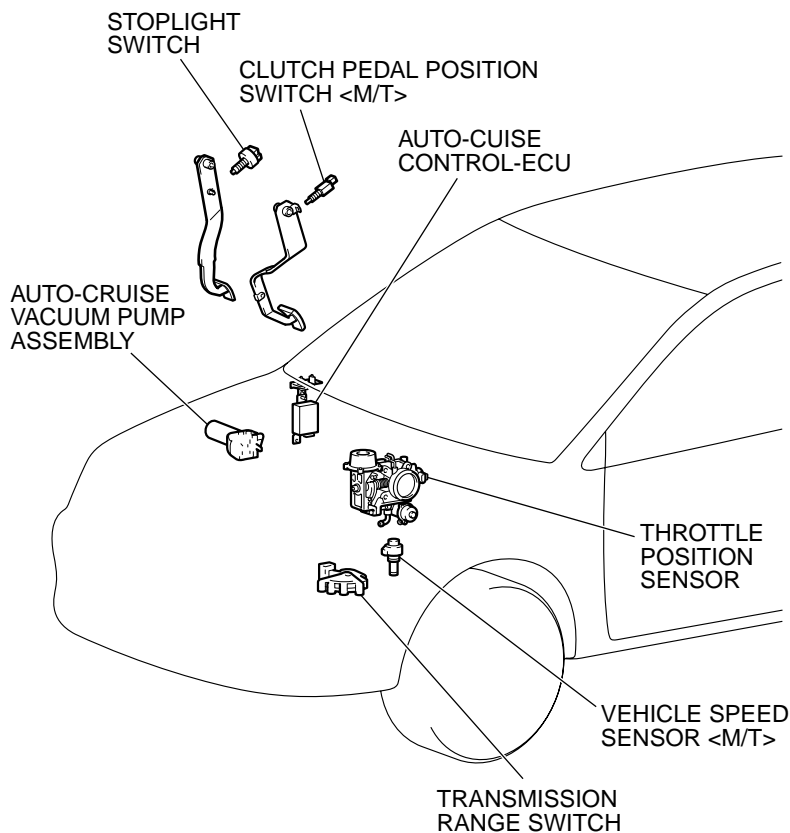
4. ACCELERATOR PEDAL POSITION SENSOR BRACKET
5. ACCELERATOR PEDAL POSITION SENSOR BRACKET SUPPORT

AUTO-CRUISE CONTROL <2.0L ENGINE>**GENERAL DESCRIPTION**

By using the auto-cruise control, the driver can drive at the desired speed [in a range of approximately 40 – 200 km/h (25 – 124 mph)] without depressing the accelerator pedal.

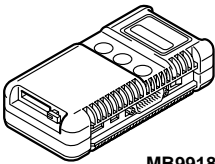
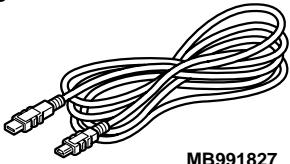

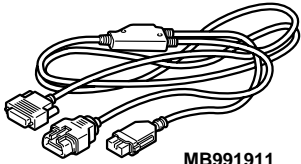
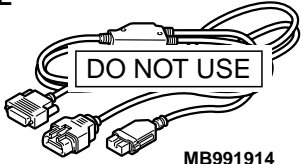
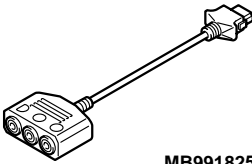
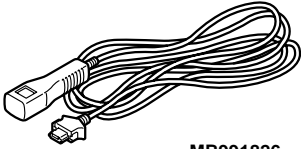
CONSTRUCTION DIAGRAM



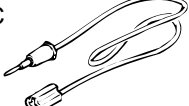

M1172000100333



SPECIAL TOOLS

M1172000600327

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>A</p>  <p>MB991824</p> <p>B</p>  <p>MB991827</p> <p>C</p>  <p>MB991910</p> <p>D</p>  <p>MB991911</p> <p>E</p>  <p>MB991914</p> <p>F</p>  <p>MB991825</p> <p>G</p>  <p>MB991826 MB991958</p>	<p>MB991958</p> <p>A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>MUT-III sub assembly</p> <p>A: Vehicle communication interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III trigger harness</p>	<p>MB991824-KIT</p> <p><i>NOTE: G: MB991826 MUT-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</i></p>	<p>Diagnostic trouble code check.</p> <p>CAUTION</p> <p>MUT-III Main Harness B (MB991911) should be used. MUT-III main harness A and C should not be used for this vehicle.</p>

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
    MB991223AD	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Inspection harness B: LED harness C: LED harness adapter D: Probe	General service tools	Checking the continuity and measuring the voltage at the harness connector

AUTO-CRUISE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION TO AUTO-CRUISE CONTROL SYSTEM DIAGNOSIS

M1172003300295

The auto-cruise control system allows driving without stepping on the accelerator pedal by setting a random speed between 40 km/h (25 mph) and 200 km/h (124 mph). Problems in this system can be investigated by the following methods.

Auto-cruise control system diagnostic trouble codes

The auto-cruise control system consists of the auto-cruise control-ECU, control switches, sensors, and vacuum pump. The control switches and sensors monitor the state of the vehicle. Based on input signals from those switches and sensors, the

auto-cruise control-ECU activates the vacuum pump. If the auto-cruise control-ECU detects a problem on any of those components, the ECU estimates where the problem may be occurring, and will output a diagnostic trouble code. Diagnostic trouble codes cover the throttle position sensor, auto-cruise control switch, vehicle speed sensor, auto-cruise control-ECU and vacuum pump.

AUTO-CRUISE CONTROL SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1172002000310

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

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any auto-cruise control system DTC.
4. If you can verify the condition and there are no auto-cruise control system DTCs, and the malfunction is intermittent, refer to GROUP 00, HOW TO USE TROUBLESHOOTING/INSPECTION SERVICE POINTS – How to Cope with Intermittent Malfunctions [P.00-6](#).

5. If you can verify the condition but there are no auto-cruise control system DTCs, or the system cannot communicate with the scan tool, check that the auto-cruise control system is operating properly.
 - If the auto-cruise control system is operating properly, refer to, Auto-cruise Control System Data List Reference Table.
 - If the auto-cruise control system is operating properly, refer to, Auto-cruise Control System Diagnostic Trouble Code Chart.
6. If there is an auto-cruise control system DTC, record the number of the code, then erase the code from vehicle memory using the scan tool.
7. Re-create the auto-cruise control system DTC set conditions to see if the same Auto-cruise Control System DTC will set again.
 - If the same Auto-cruise Control System DTC sets again, perform the diagnostic procedures for the set code. Refer to, Auto-cruise Control System Diagnostic Trouble Code Chart.

AUTO-CRUISE CONTROL SYSTEM DIAGNOSTIC TROUBLE CODE DIAGNOSIS

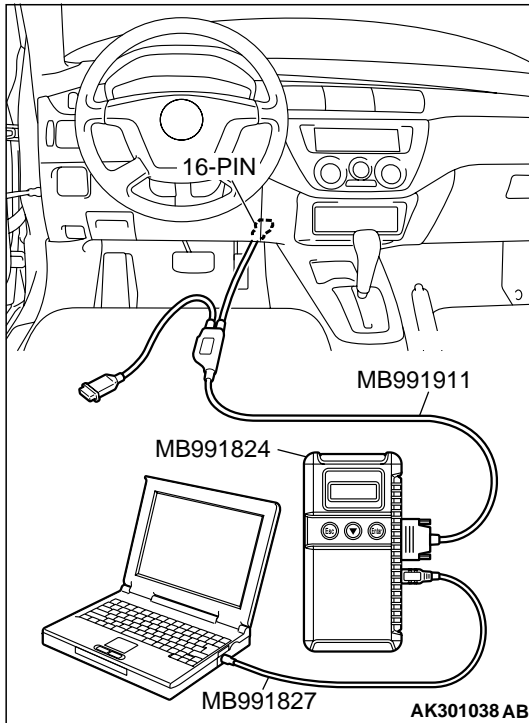
M1172002100317

Retrieving Auto-cruise Control System Diagnostic Trouble Codes.

Using scan tool MB991958

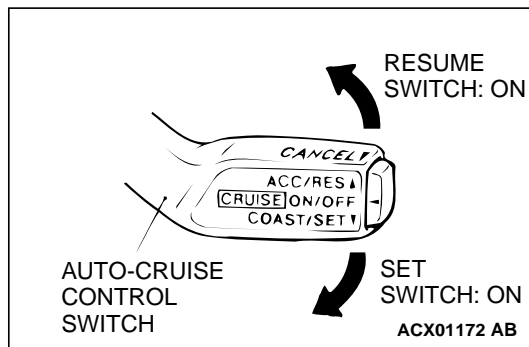
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B

**CAUTION**

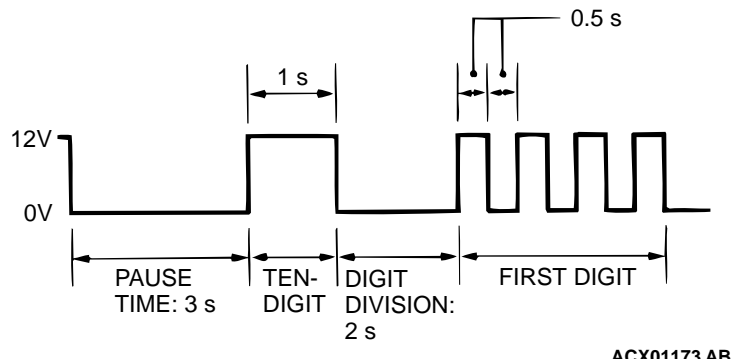
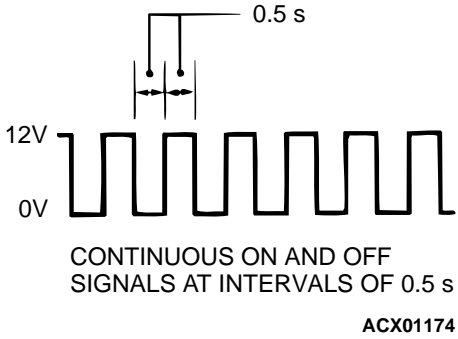
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Use scan tool MB991958 to check for auto-cruise control system diagnostic trouble codes.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991958.

**Using a Auto-cruise Control Indicator Light**

1. Turn the ignition switch to the "ON" position while holding the auto-cruise control switch in the "SET" position (down). Then, within one second, move the cruise control switch up to the "RES" position.
2. Read a diagnostic trouble code by observing the flash display pattern of the auto-cruise control indicator light in the combination meter.

DIAGNOSTIC RESULT DISPLAY METHOD WHEN USING THE AUTO-CRUISE CONTROL INDICATOR LIGHT

WHEN THE DIAGNOSTIC TROUBLE CODE NO.14 IS OUTPUT	WHEN NO DIAGNOSTIC TROUBLE CODE IS OUTPUT
 <p>12V 0V</p> <p>PAUSE TIME: 3 s</p> <p>TEN-DIGIT</p> <p>DIGIT DIVISION: 2 s</p> <p>FIRST DIGIT</p> <p>0.5 s</p> <p>ACX01173 AB</p>	 <p>12V 0V</p> <p>0.5 s</p> <p>CONTINUOUS ON AND OFF SIGNALS AT INTERVALS OF 0.5 s</p> <p>ACX01174 AB</p>

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

Erasing Diagnostic Trouble Codes

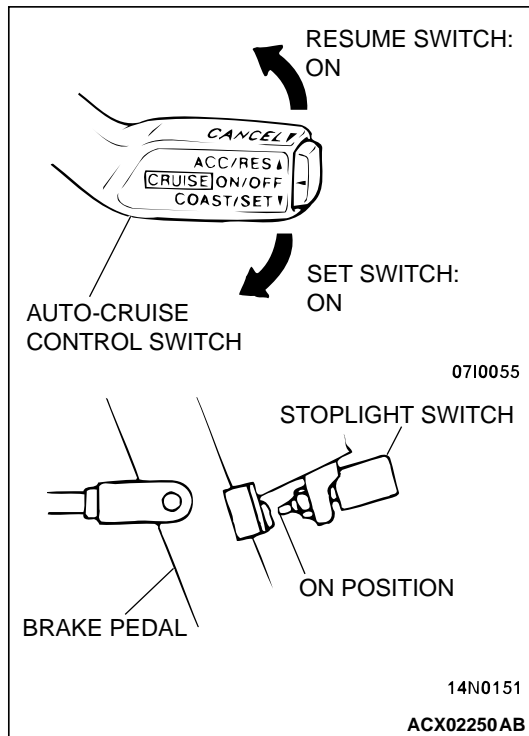
The diagnostic trouble codes can be erased by the following procedure.

NOTE: The diagnostic trouble code will not be erased even if the negative battery terminal is disconnected.

Using scan tool MB991958

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Use scan tool MB991958 to check for auto-cruise control system diagnostic trouble codes.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991958.

1. Turn the ignition switch to the "ON" position while holding the auto-cruise control switch in the "SET" (down) position. Then, within one second, move the cruise control switch up to the "RES" position.
2. Check to make sure the "CRUISE" light on the instrument panel is flashing.
3. Put the auto-cruise control switch in the "SET" (down) position. Depress the brake pedal and hold for five seconds or more. Release the brake pedal, auto-cruise control switch, then turn the ignition switch to the "LOCK" (OFF) position. The DTC(s) are now erased.

INSPECTION USING SCAN TOOL MB991502, DATA LIST

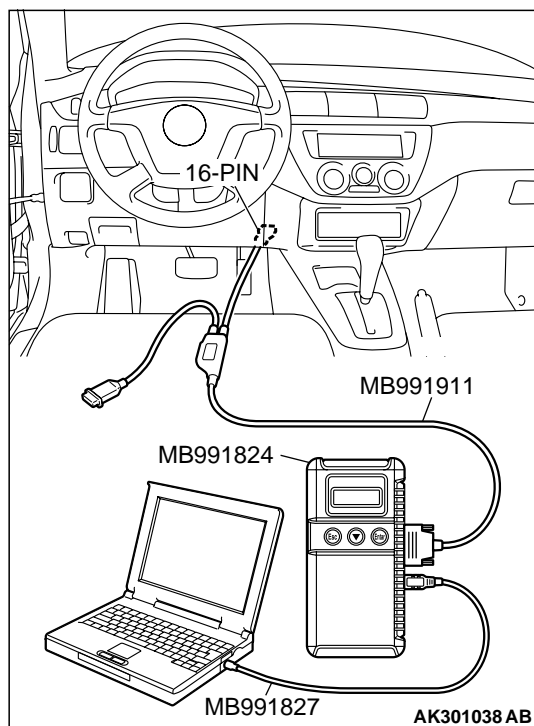
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B

⚠ 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.
2. Turn the ignition switch to the "ON" position.
3. Carry out inspection by means of the data list. If there is an abnormality, check and repair the chassis harnesses and components (Refer to P.17-112, Data List Reference Table).
4. Re-check using scan tool MB991958 and check to be sure that the abnormal input and output have returned to normal because of the repairs.
5. Erase the diagnostic trouble code(s).
6. Turn the ignition switch to the "LOCK" (OFF) position.
7. Disconnect scan tool MB991958 from the data link connector.
8. Start the engine again and do a test drive to confirm that the problem is eliminated.



DIAGNOSTIC TROUBLE CODE CHART

M1172002200336

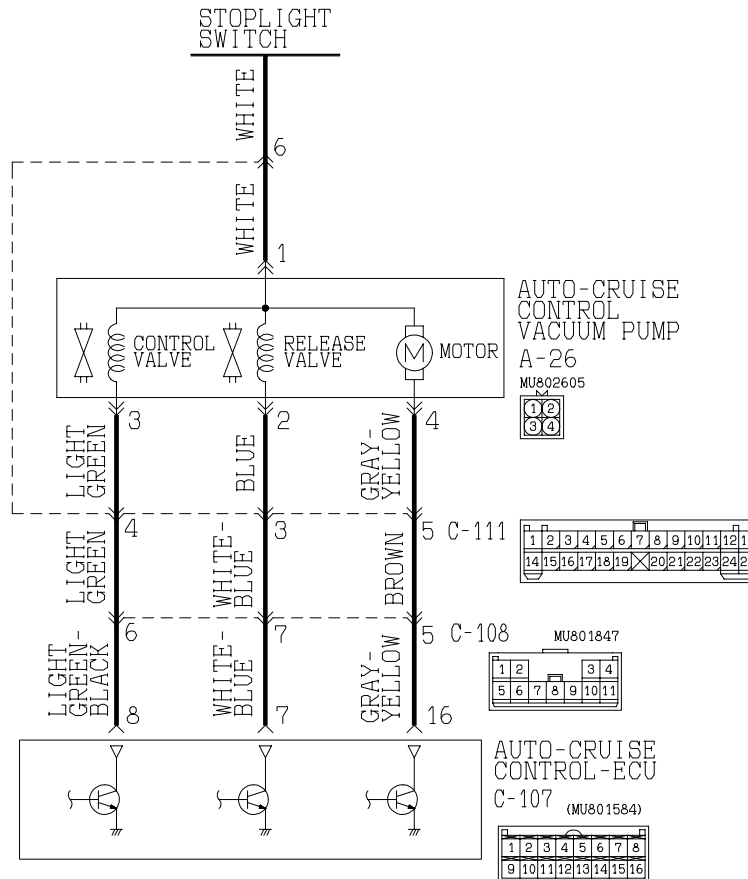
Check according to the inspection chart that is appropriate for the diagnostic trouble code.

DTC	INSPECTION ITEM	REFERENCE PAGE
11	Auto-cruise vacuum pump drive system	P.17-18
12	Vehicle speed signal system <M/T>	P.17-24
	Vehicle speed signal system <A/T>	P.17-26
14	Auto-cruise vacuum pump power supply system	P.17-28
15	Auto-cruise control switch system	P.17-43
16	Auto-cruise control-ECU system	P.17-52
17	Throttle position sensor and, idle position signal system <M/T>	P.17-53
	Throttle position sensor and, idle position signal system <A/T>	P.17-60

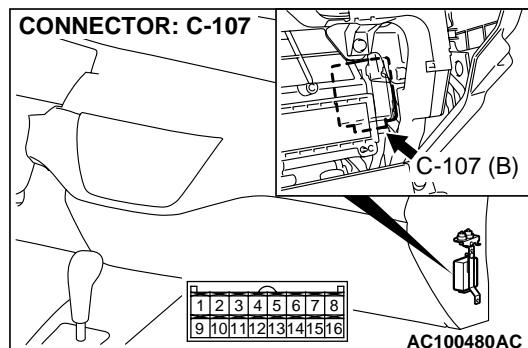
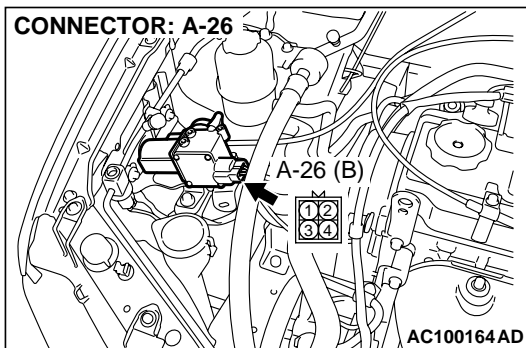
DIAGNOSTIC TROUBLE CODE PROCEDURES

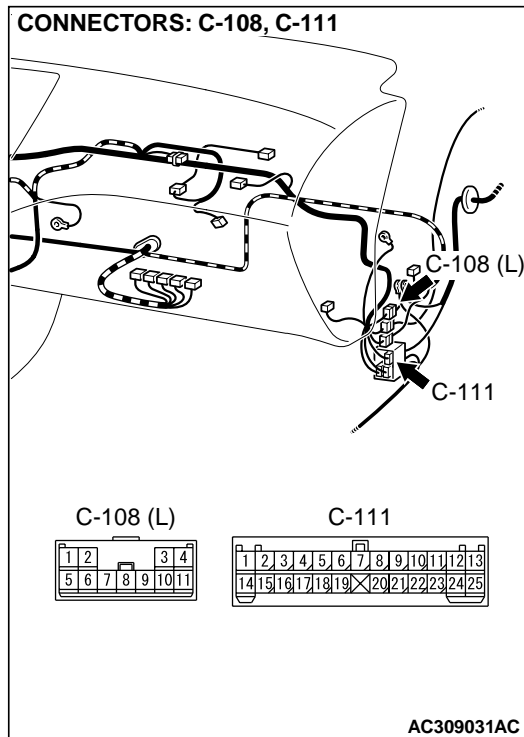
DTC 11: Auto-cruise Vacuum Pump Drive System

Auto-cruise Vacuum Pump Drive System Circuit



W2J09M05AA





CIRCUIT OPERATION

This circuit activates the vacuum pump used to accelerate/decelerate, set, and cancel the vehicle speed.

The auto-cruise control-ECU controls the control valve, release valve, and motor by turning the transistor in the ECU on and off.

DTC SET CONDITIONS

Any drive signal for the release valve, control valve or motor is not input to the auto-cruise control-ECU.

TROUBLESHOOTING HINTS

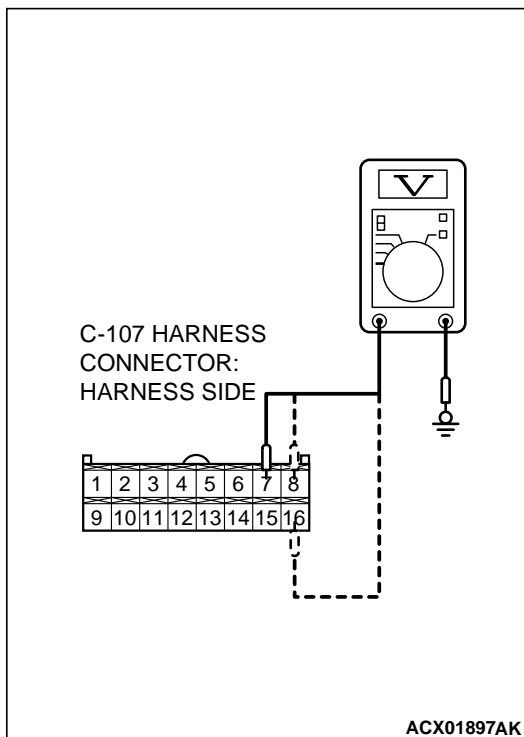
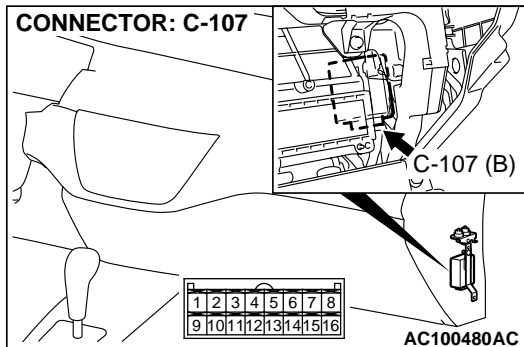
The most likely causes for this code to be set are:

- Malfunction of the auto-cruise vacuum pump.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set



STEP 1. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control main switch to the "ON" position.
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 7 and ground by backprobing.
 - voltage should measure battery positive voltage. [When decelerating with the "SET" switch while driving at constant speed (Release valve open).]
- (5) Measure the voltage between terminal 8 and ground by backprobing.
 - voltage should measure battery positive voltage. [When decelerating with the "SET" switch while driving at constant speed. (Control valve open).]
- (6) Measure the voltage between terminal 16 and ground by backprobing.
 - voltage should measure battery positive voltage. (When the motor is stopped during a constant road speed.)
- (7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that diagnostic trouble code 11 is not output. If diagnostic trouble code 11 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 11 is not output.

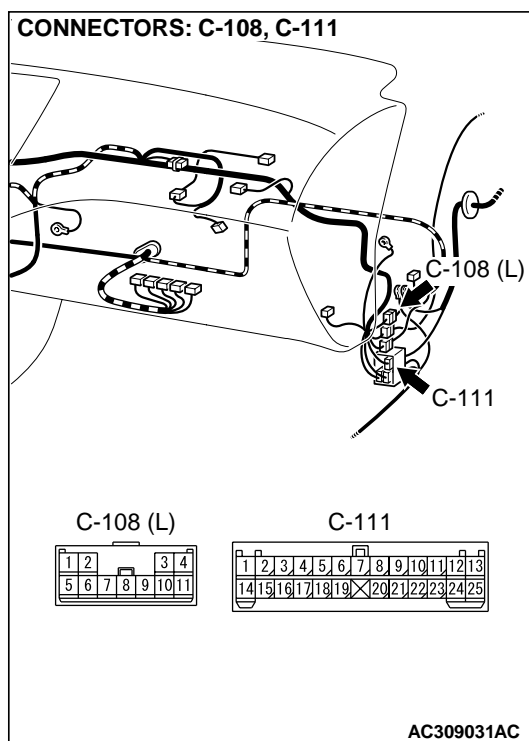
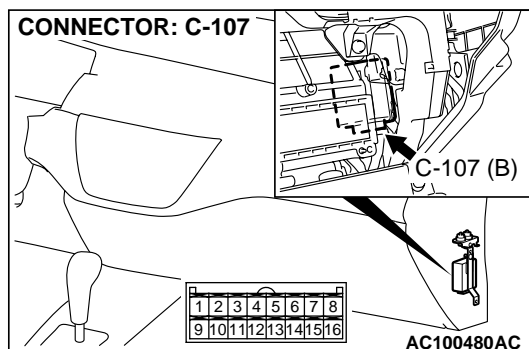
NO : Go to Step 2.

STEP 2. Check auto-cruise control-ECU connector C-107 and intermediate connector C-108, C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 3.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 11 is not output.

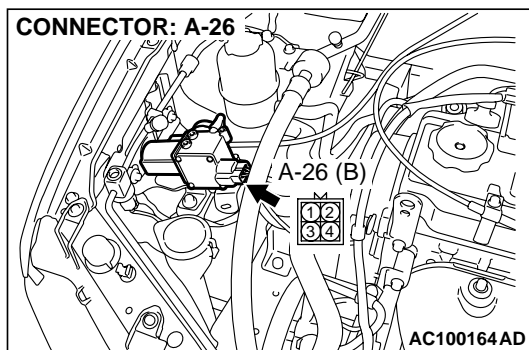


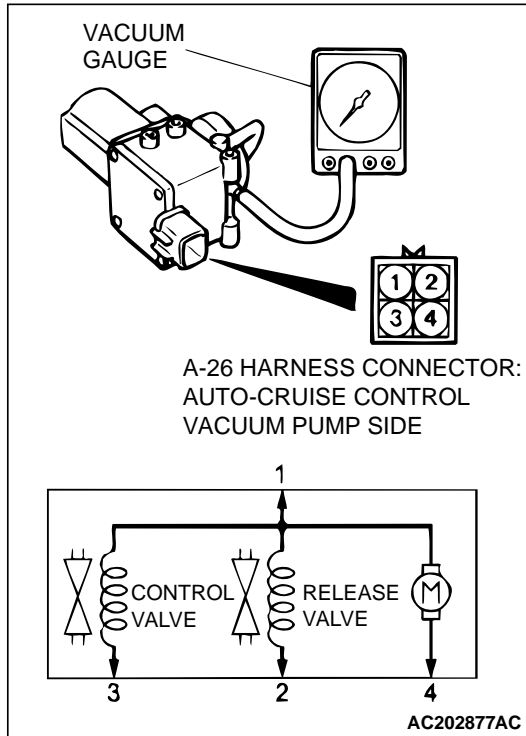
STEP 3. Check auto-cruise control vacuum pump connector A-26 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace connector. Refer to GROUP 00E Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 11 is not output.



**STEP 4. Check the auto-cruise control vacuum pump.**

- (1) Disconnect the vacuum hose from the auto-cruise control vacuum pump and connect a vacuum gauge to the vacuum pump.
- (2) Disconnect the vacuum pump connector.
- (3) Check the auto-cruise control vacuum pump and valves according to the following procedure:
 - a. Connect the positive battery terminal to auto-cruise control vacuum pump connector terminal 1, and the negative battery terminal to terminals 2, 3, and 4. The vacuum gauge should read 27 kPa (8.0 in Hg) or more.
 - b. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 2 is disconnected from the negative battery terminal while terminals 1, and 3 remain connected.
 - c. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 3 is disconnected from the negative battery terminal while terminals 1, and 2 remain connected.

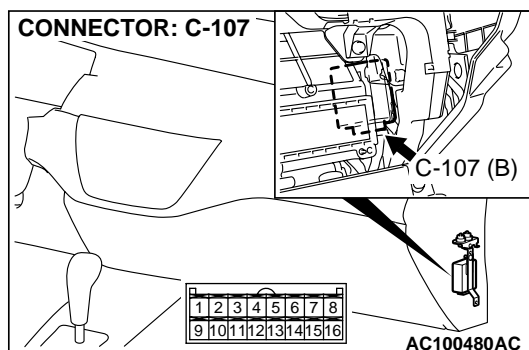
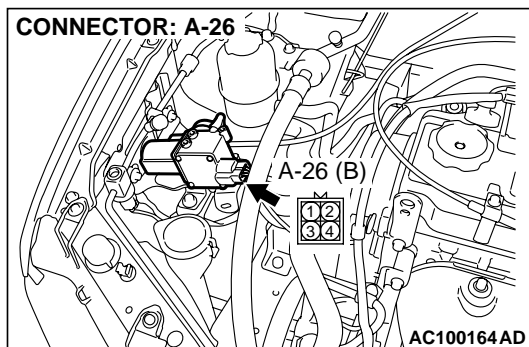
Q: Are all of the above values satisfied?**YES :** Go to Step 5.**No :** Replace the auto-cruise control vacuum pump. (Refer to [P.17-120.](#)) Then check that diagnostic trouble code 11 is not output.

STEP 5. Check the harness wires between auto-cruise control vacuum pump connector A-26 terminal 2, 3, 4 and auto-cruise control-ECU connector C-107 terminal 7, 8, 16 for damage.

Q: Are the harness wires in good condition?

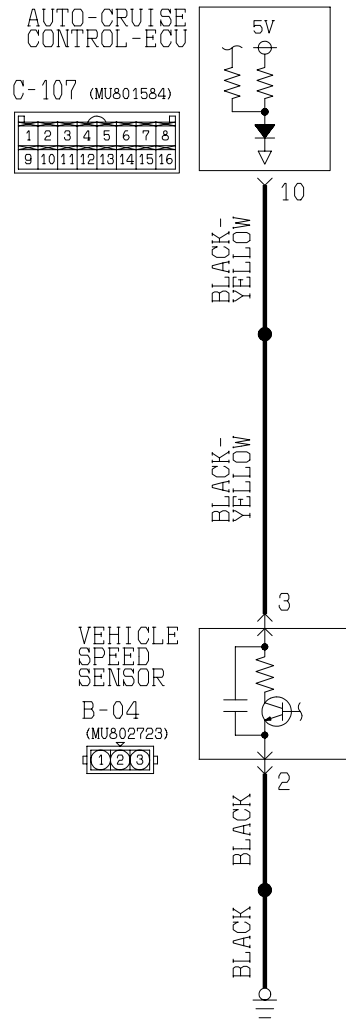
YES : Check that diagnostic trouble code 11 is not output. If diagnostic trouble code 11 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#)). Then check that diagnostic trouble code 11 is not output.

NO : Repair the harness wire and then check that diagnostic trouble code 11 is not output.

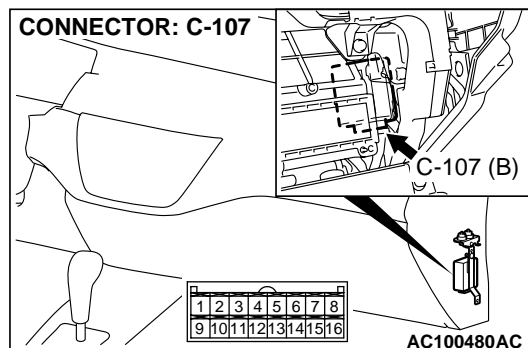
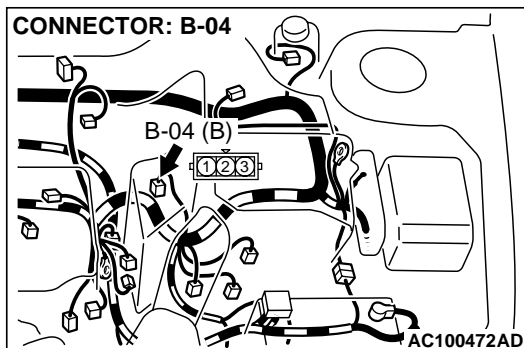


DTC 12: Vehicle Speed Signal System <M/T>

Vehicle Speed Signal System Circuit



AC308932

**CIRCUIT OPERATION**

This circuit checks the operation of the vehicle speed sensor.

When the vehicle moves forward and reverses, the sensor turns ON and OFF repeatedly.

DTC SET CONDITIONS

The vehicle speed signals from the vehicle speed sensor are not input to the auto-cruise control-ECU when the vehicle speed is 40 km/h (25 mph) or more.

TROUBLESHOOTING HINTS

The most likely causes for this code to be set are:

- Malfunction of the vehicle speed sensor.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the speedometer.

Q: Does the speedometer work normally?

YES : Go to Step 2.

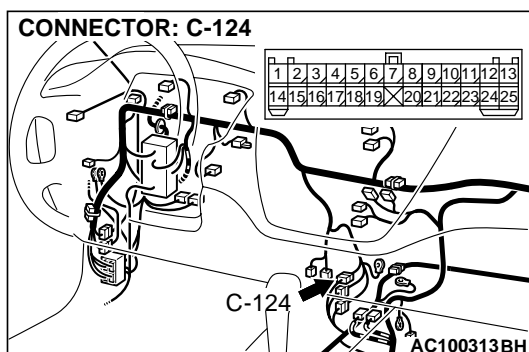
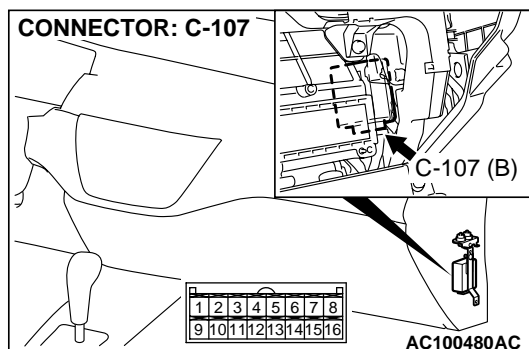
NO : Check the speedometer circuit and repair or replace as required. (Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46.](#))

STEP 2. Check the harness wire between auto-cruise control-ECU connector C-107 terminal 10 and intermediate connector C-124 terminal 25 for damage.

Q: Is the harness wire in good condition?

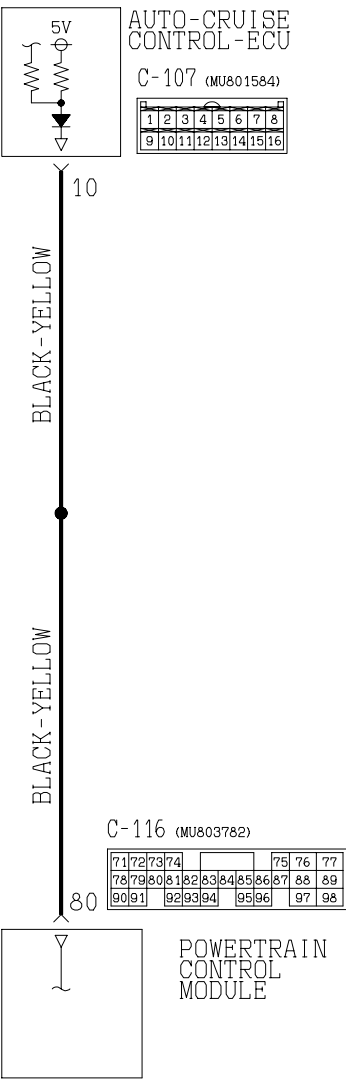
YES : Check that diagnostic trouble code 12 is not output. If diagnostic trouble code 12 is output, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 12 is not output.

NO : Repair the harness wire and then check that diagnostic trouble code 12 is not output.

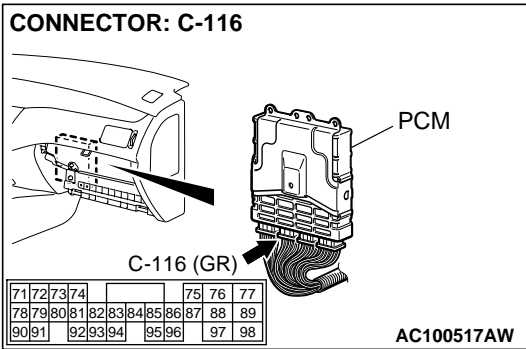
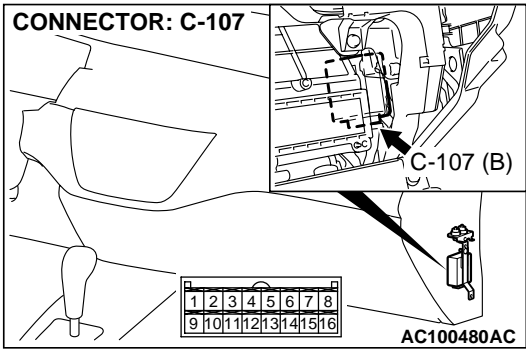


DTC 12: Vehicle Speed Signal System <A/T>

Vehicle Speed Signal System Circuit



W2J09M08AA



CIRCUIT OPERATION

This circuit checks the vehicle speed signal. When the vehicle moves forward and reverses, the sensor turns ON and OFF repeatedly.

DTC SET CONDITIONS

The vehicle speed signals from the PCM are not input to the auto-cruise control-ECU when the vehicle speed is 40 km/h (25 mph) or more.

TROUBLESHOOTING HINTS

The most likely causes for this code to be set are:

- Malfunction of the output shaft speed sensor.
- Malfunction of the PCM.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the speedometer.

Q: Does the speedometer work normally?

YES : Go to Step 2.

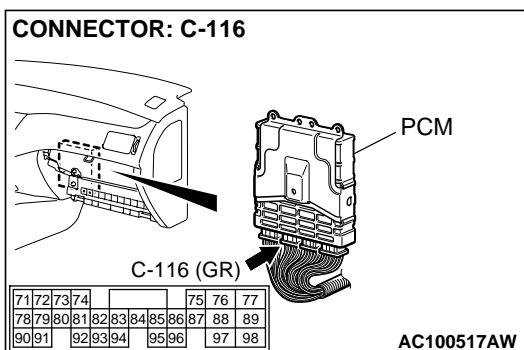
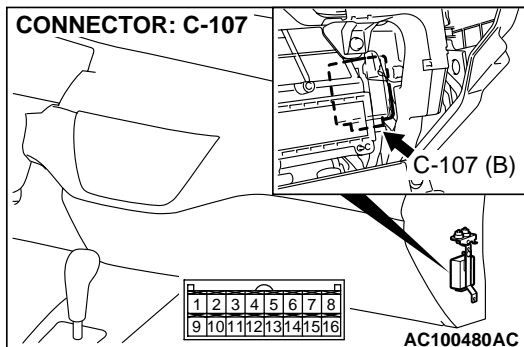
NO : Check the speedometer circuit and repair or replace as required (Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#)).

STEP 2. Check the harness wire between auto-cruise control-ECU connector C-107 terminal 10 and PCM connector C-116 terminal 80 for damage.

Q: Is the harness wire in good condition?

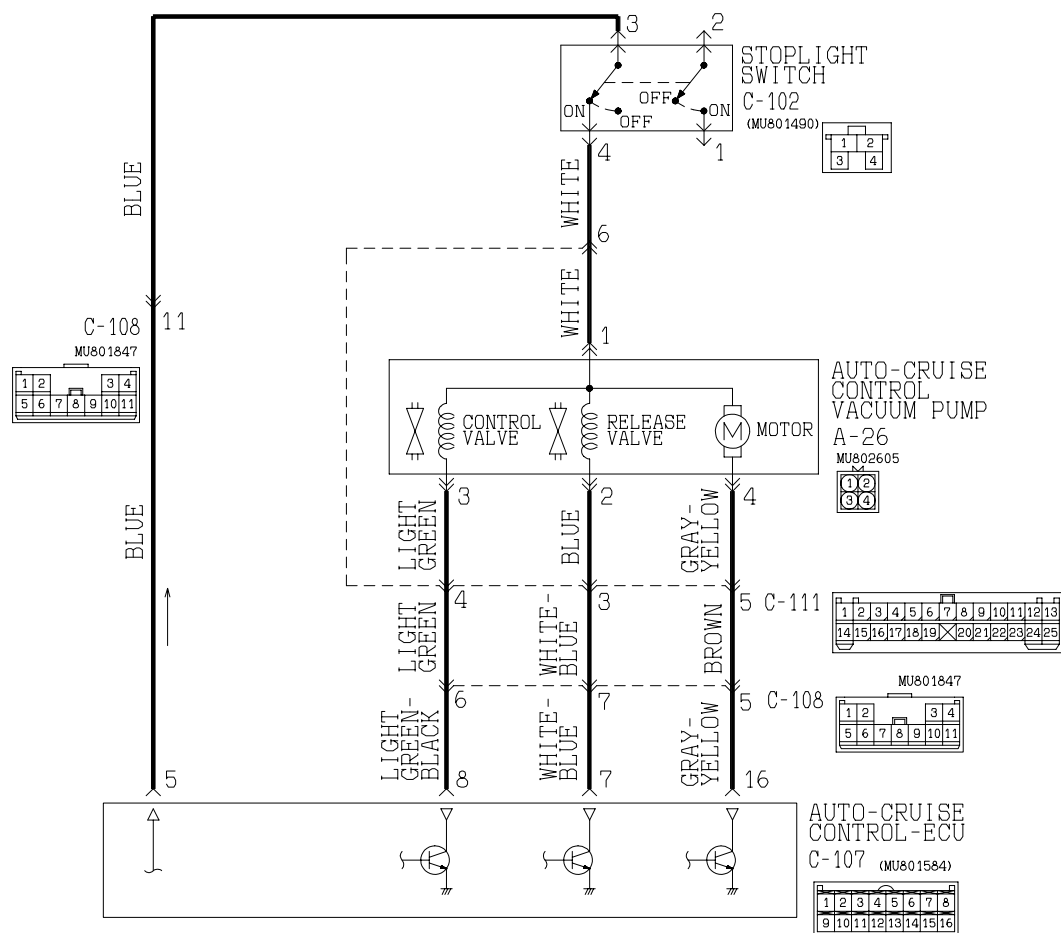
YES : Check that diagnostic trouble code 12 is not output. If diagnostic trouble code 12 is output, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 12 is not output.

NO : Repair the harness wire and then check that diagnostic trouble code 12 is not output.

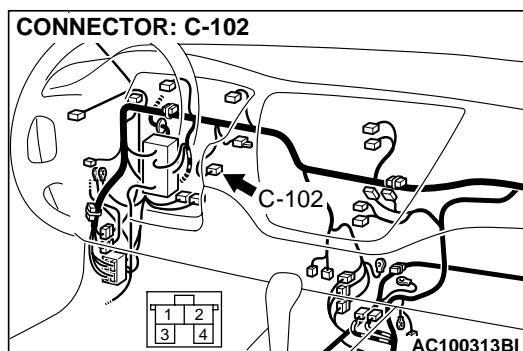
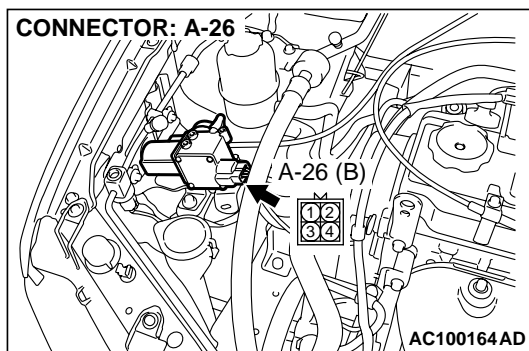


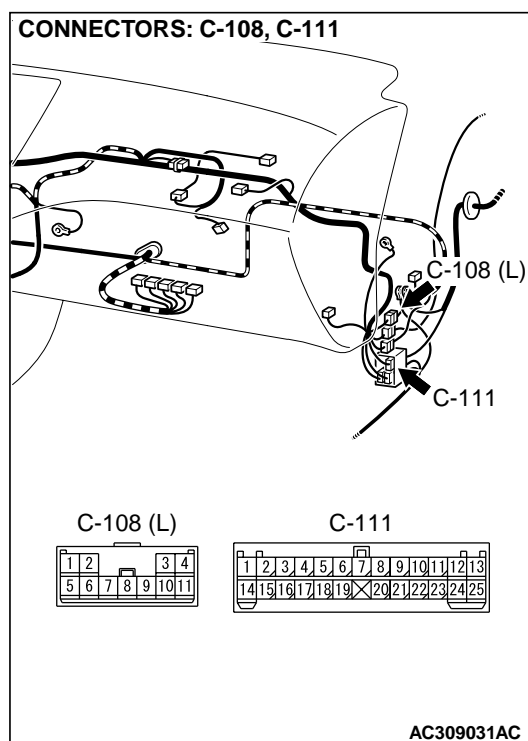
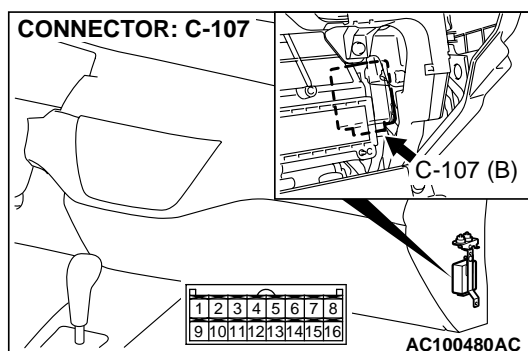
DTC 14 Auto-cruise Vacuum Pump Power Supply System

Auto-cruise Vacuum Pump Power Supply



W2J09M04AA





CIRCUIT OPERATION

This circuit supplies the power to the vacuum pump. The battery positive voltage is supplied to the auto-cruise control vacuum pump by turning on the transistor at terminal number 16 of the auto-cruise control-ECU. The conditions for turning on the transistor at terminal number 16 of the auto-cruise control-ECU are as follows.

- Ignition switch "ON"
- Auto-cruise control main switch "ON"
- Stoplight switch ON

DTC SET CONDITIONS

None of the drive signals from release valve, control valve and motor of the auto-cruise vacuum pump are input to the auto-cruise control-ECU.

TROUBLESHOOTING HINTS

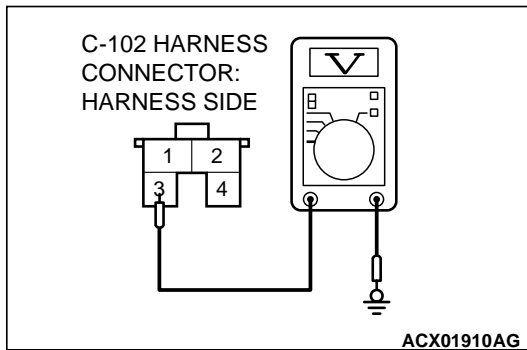
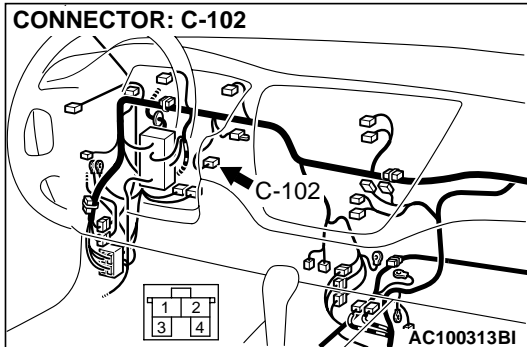
The most likely causes for this code to be set are:

- Malfunction of the stoplight switch
- Malfunction of the auto-cruise vacuum pump
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set



STEP 1. Measure the signal voltage at stoplight switch connector C-102 by backprobing.

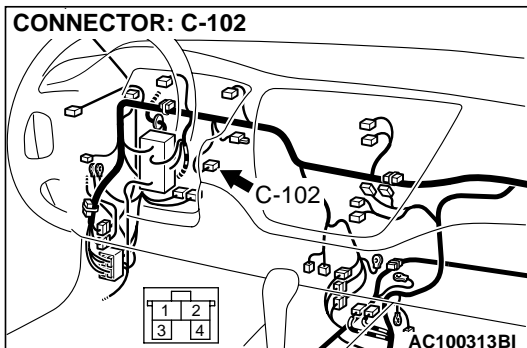
- (1) Do not disconnect stoplight switch connector C-102.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between stoplight switch connector C-102 terminal 3 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When brake pedal is depressed).
 - The measured voltage should measure 0 V. (When brake pedal is not depressed).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 3.

NO : Go to Step 2.

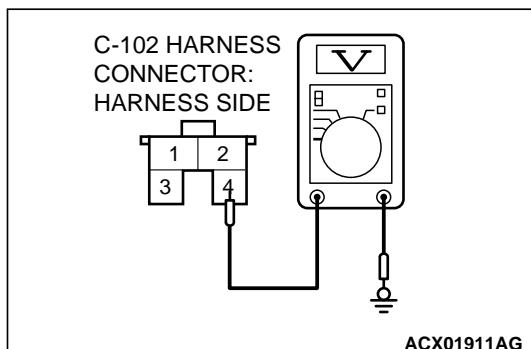
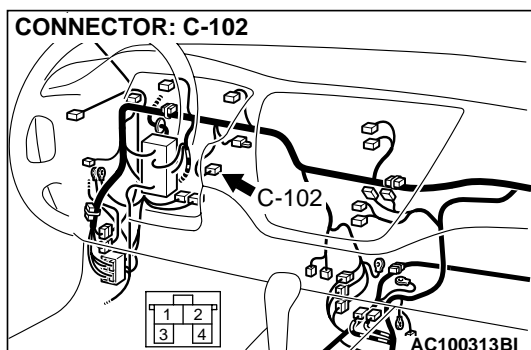


STEP 2. Check stoplight switch connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 14.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.



STEP 3. Measure the signal voltage at stoplight switch connector C-102 by backprobing.

- (1) Do not disconnect stoplight switch connector C-102.
- (2) Turn the ignition switch to the "ON" position and the auto-cruise control main switch to the "ON" position.

- (3) Measure the voltage between stoplight switch connector C-102 terminal 4 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When brake pedal is depressed).
 - The measured voltage should measure 0 V. (When brake pedal is not depressed).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 6.

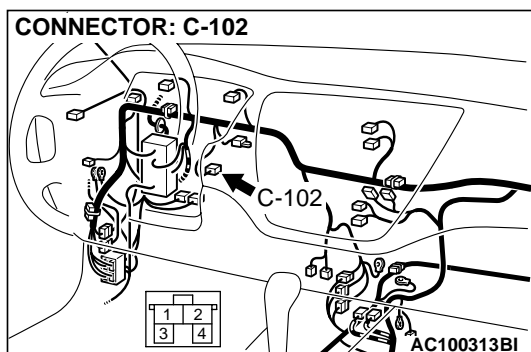
NO : Go to Step 4.

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

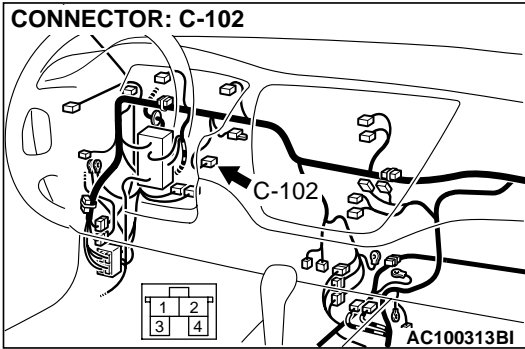
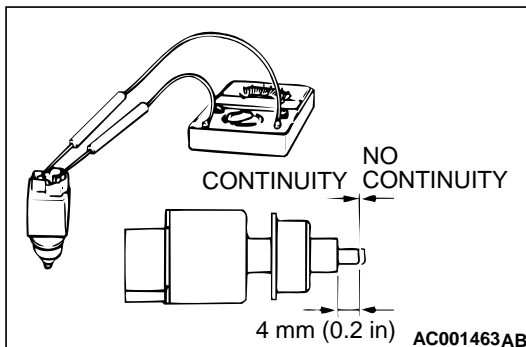
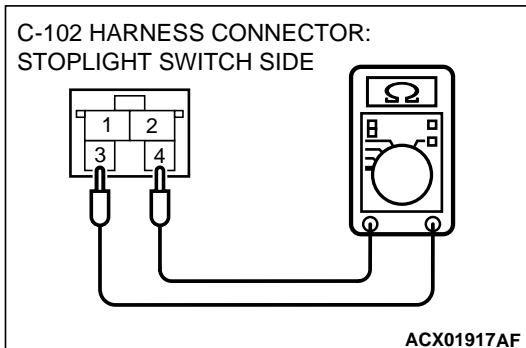
Q: Are the connector and terminals in good condition?

YES : Go to Step 5.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.



CONNECTOR: C-102

C-102 HARNESS CONNECTOR:
STOPLIGHT SWITCH SIDE**STEP 5. Check the stoplight switch.**

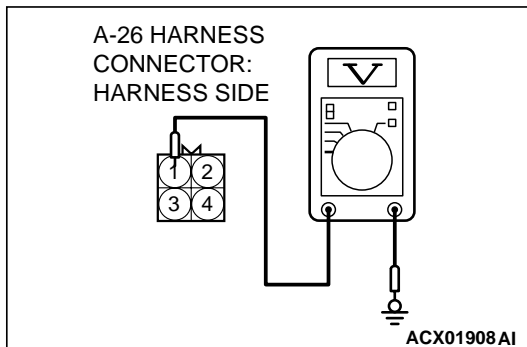
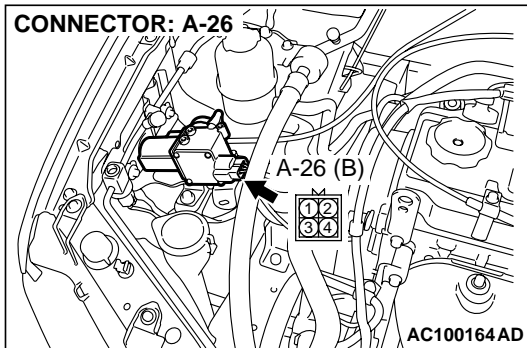
(1) Disconnect stoplight switch connector C-102.

- (2) Connect an ohmmeter to the stoplight switch between terminals 3 and 4, and check whether there is continuity when the plunger of the stoplight switch is pushed in and an open circuit when it is released.
- (3) The stoplight switch is in good condition if the circuit is open when the plunger is pushed in to a depth of within 4 mm (0.2 inch) from the outer case edge surface, and if there is continuity when it is released.

Q: Is the stoplight switch in good condition?

YES : Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 14 is not output.

NO : Replace the stoplight switch. Refer to GROUP 35A, Brake Pedal [P.35A-34](#). Then check that a diagnostic trouble code 14 is not output.



STEP 6. Measure the signal voltage at auto-cruise control vacuum pump connector A-26 by backprobing.

- (1) Do not disconnect auto-cruise control vacuum pump connector A-26.
- (2) Turn the ignition switch to the "ON" position and the auto-cruise control main switch to the "ON" position.

- (3) Measure the voltage between auto-cruise control vacuum pump connector A-26 terminal 1 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When brake pedal is depressed).
 - The measured voltage should measure 0 V. (When brake pedal is not depressed).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 9.

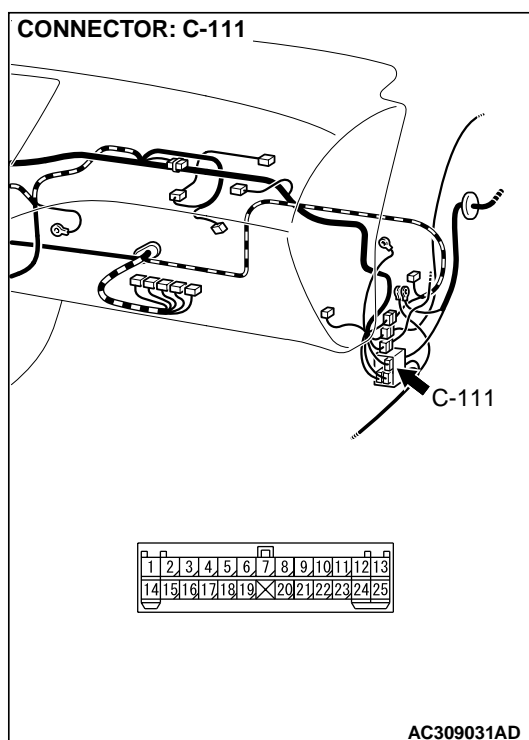
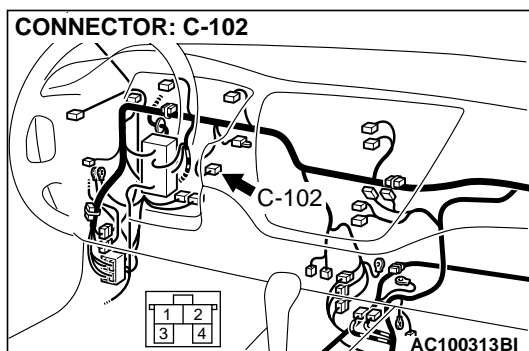
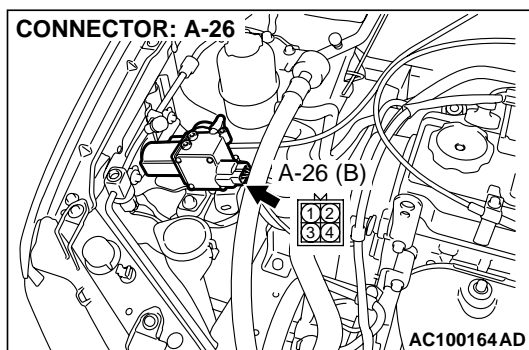
NO : Go to Step 7.

STEP 7. Check auto-cruise control vacuum pump connector A-26, stoplight switch connector C-102 and intermediate connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

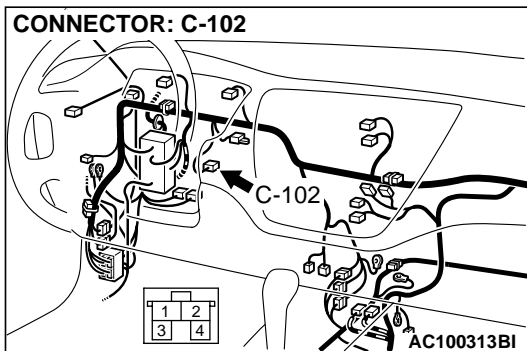
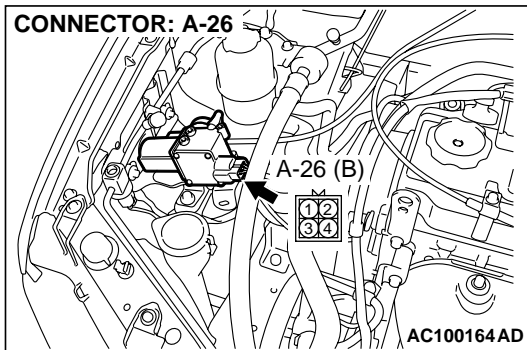
YES : Go to Step 8.

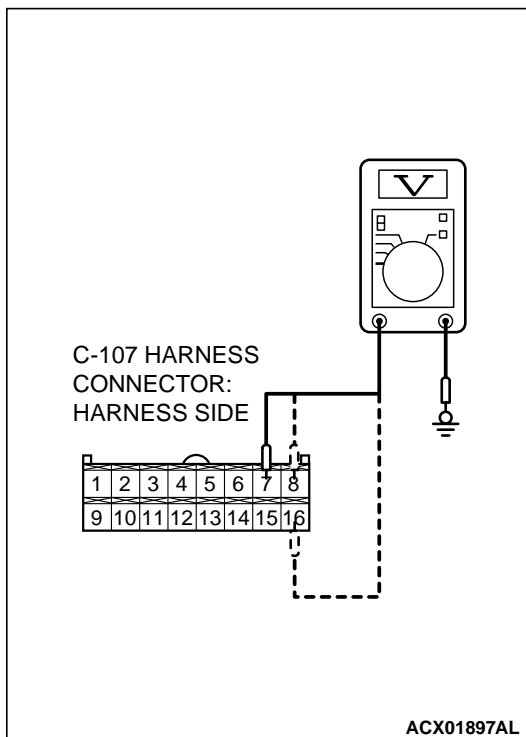
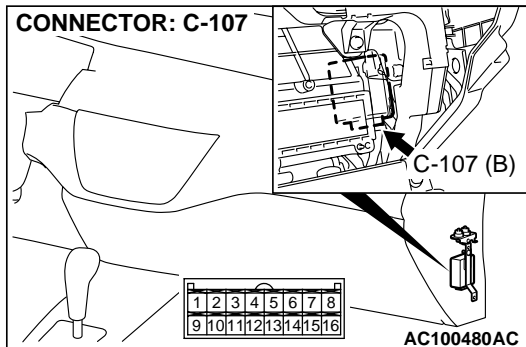
NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.



STEP 8. Check the harness auto-cruise control vacuum pump connector A-26 terminal 1 and wire between stoplight switch connector C-102 terminal 4 for damage.
Q: Is the harness wire in good condition?

- YES :** Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#)). Then check that diagnostic trouble code 14 is not output.
- NO :** Repair the harness wire and then check that diagnostic trouble code 14 is not output.





STEP 9. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control main switch to the "ON" position.
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 7 and ground by backprobing.
 - The measured voltage should measure greater than 10 V. (When cancelling constant speed driving with the auto-cruise control CANCEL switch).
- (5) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 8 and ground by backprobing.
 - The measured voltage should measure greater than 10 V. (When decelerating with the auto-cruise control SET switch while driving at constant speed).
- (6) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 16 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When the motor is stopped during a constant road speed).
- (7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 14 is not output.

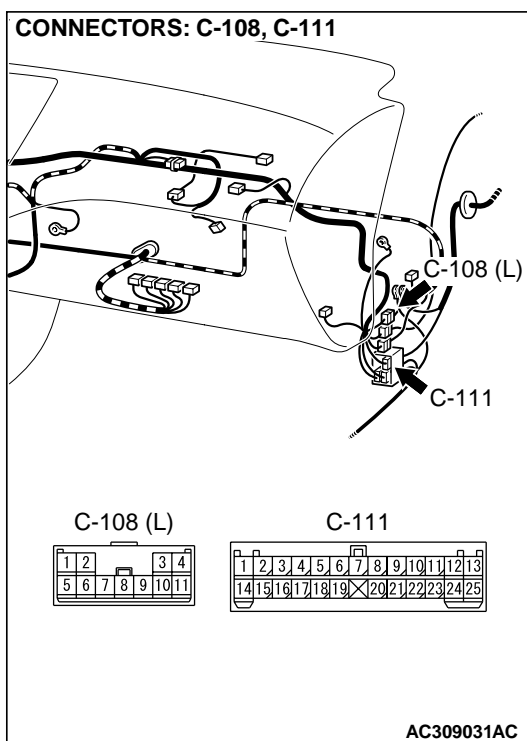
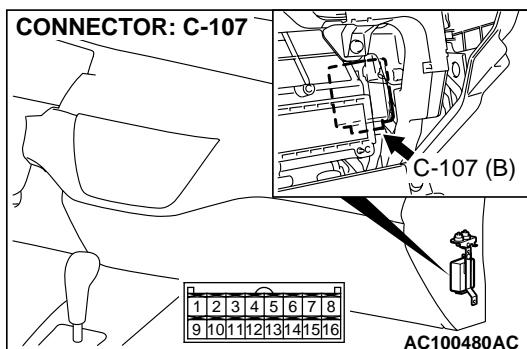
NO : Go to Step 10.

STEP 10. Check auto-cruise control-ECU connector C-107 and intermediate connector C-108, C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.

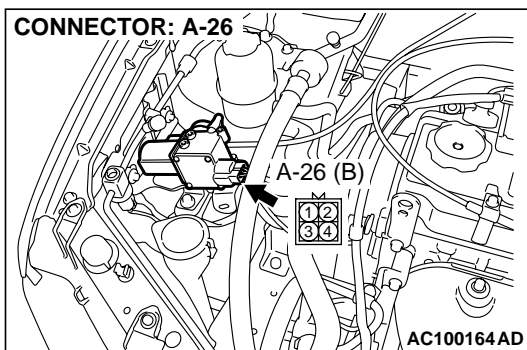


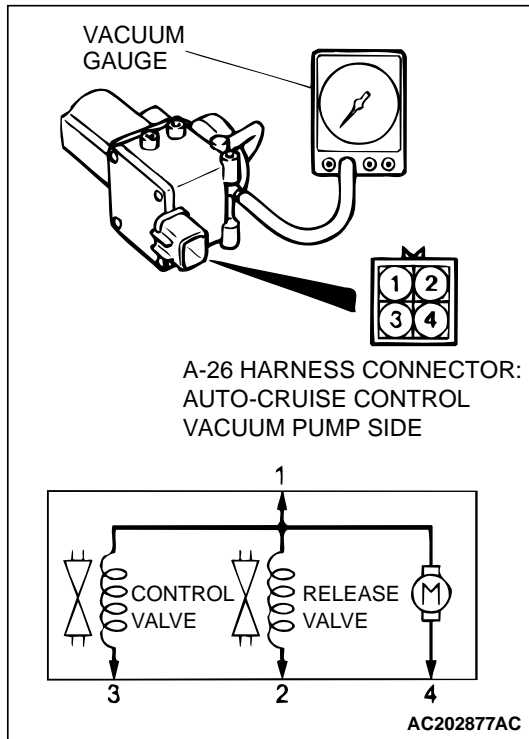
STEP 11. Check auto-cruise control vacuum pump connector A-26 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 12.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.



**STEP 12. Check the auto-cruise vacuum pump.**

- (1) Disconnect the vacuum hose from the auto-cruise vacuum pump and connect a vacuum gauge to the vacuum pump.
- (2) Disconnect the vacuum pump connector.
- (3) Check the auto-cruise vacuum pump and valves according to the following procedure:
 - a. Connect the positive battery terminal to auto-cruise vacuum pump connector terminal 1, and the negative battery terminal to terminals 2, 3, and 4. The vacuum gauge should read 27 kPa (8.0 in Hg) or more.
 - b. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 2 is disconnected from the negative battery terminal while terminals 1, and 3 remain connected.
 - c. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 3 is disconnected from the negative battery terminal while terminals 1, and 2 remain connected.

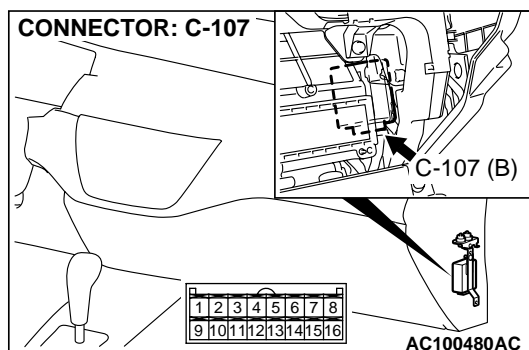
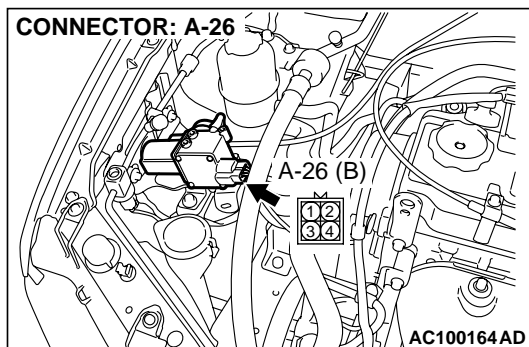
Q: Are all of the above values satisfied?**YES :** Go to Step 13.**NO :** Replace the auto-cruise vacuum pump. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 14 is not output.

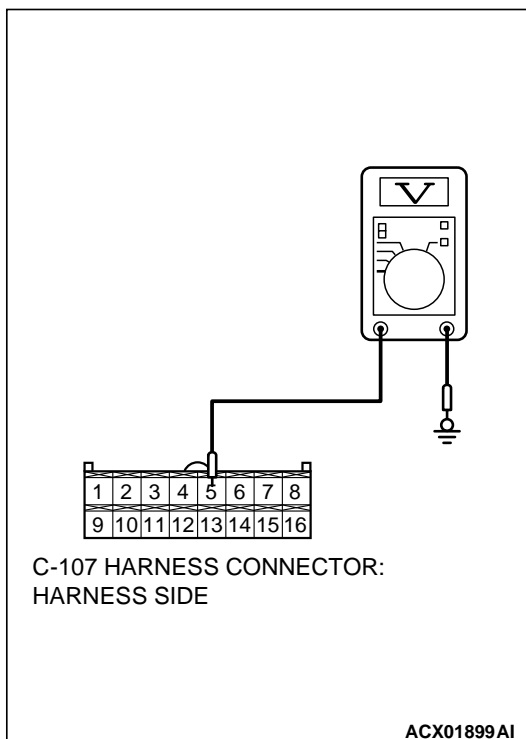
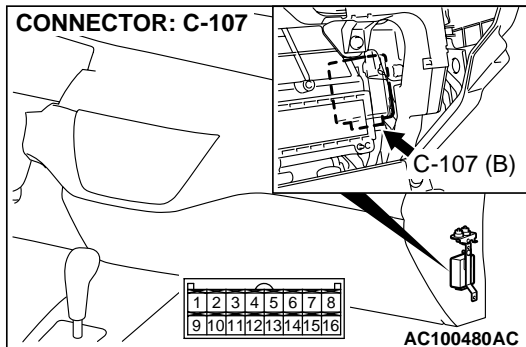
STEP 13. Check the harness wires between auto-cruise control vacuum pump connector A-26 terminal 2, 3, 4 and auto-cruise control-ECU connector C-107 terminal 7, 8, 16 for damage.

Q: Are the harness wires in good condition?

YES : Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 14 is not output.

NO : Repair harness wire and then check that diagnostic trouble code 14 is not output.





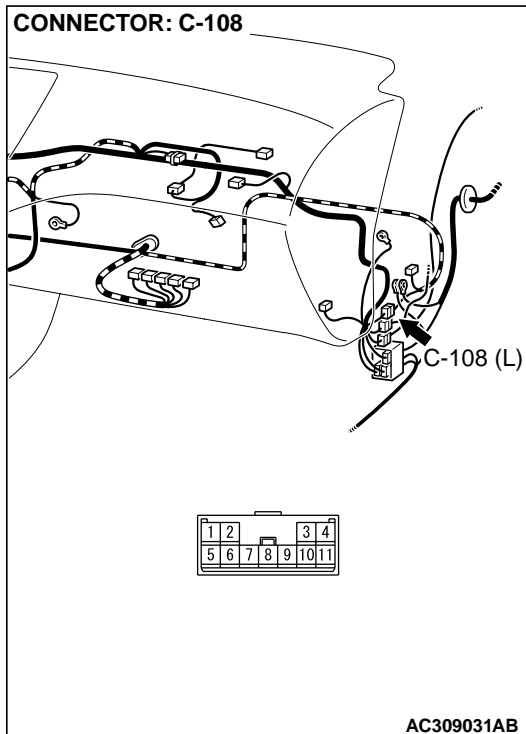
STEP 14. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control main switch to the "ON" position.
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 5 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When brake pedal is depressed).
 - The measured voltage should measure 0 V. (When brake pedal is not depressed).
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 15.

NO : Go to Step 17.

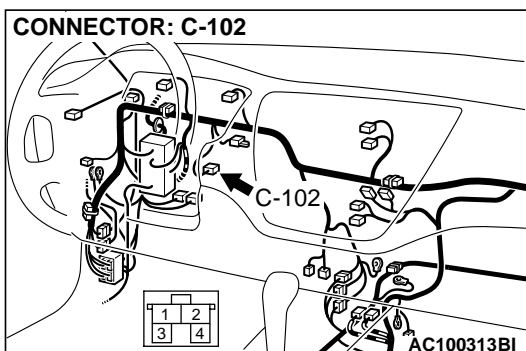


STEP 15. Check intermediate connector C-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 16.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.

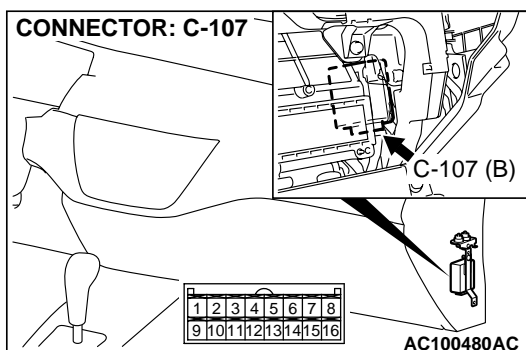


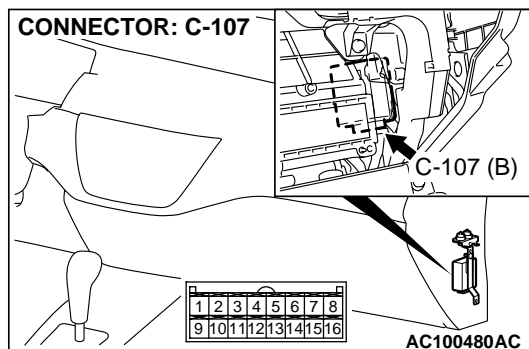
STEP 16. Check the harness wire between stoplight switch connector C-102 terminal 3 and auto-cruise control-ECU connector C-107 terminal 5 for damage.

Q: Is the harness wire in good condition?

YES : Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#)). Then check that diagnostic trouble code 14 is not output.

NO : Repair the harness wire and then check that diagnostic trouble code 14 is not output.





STEP 17. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

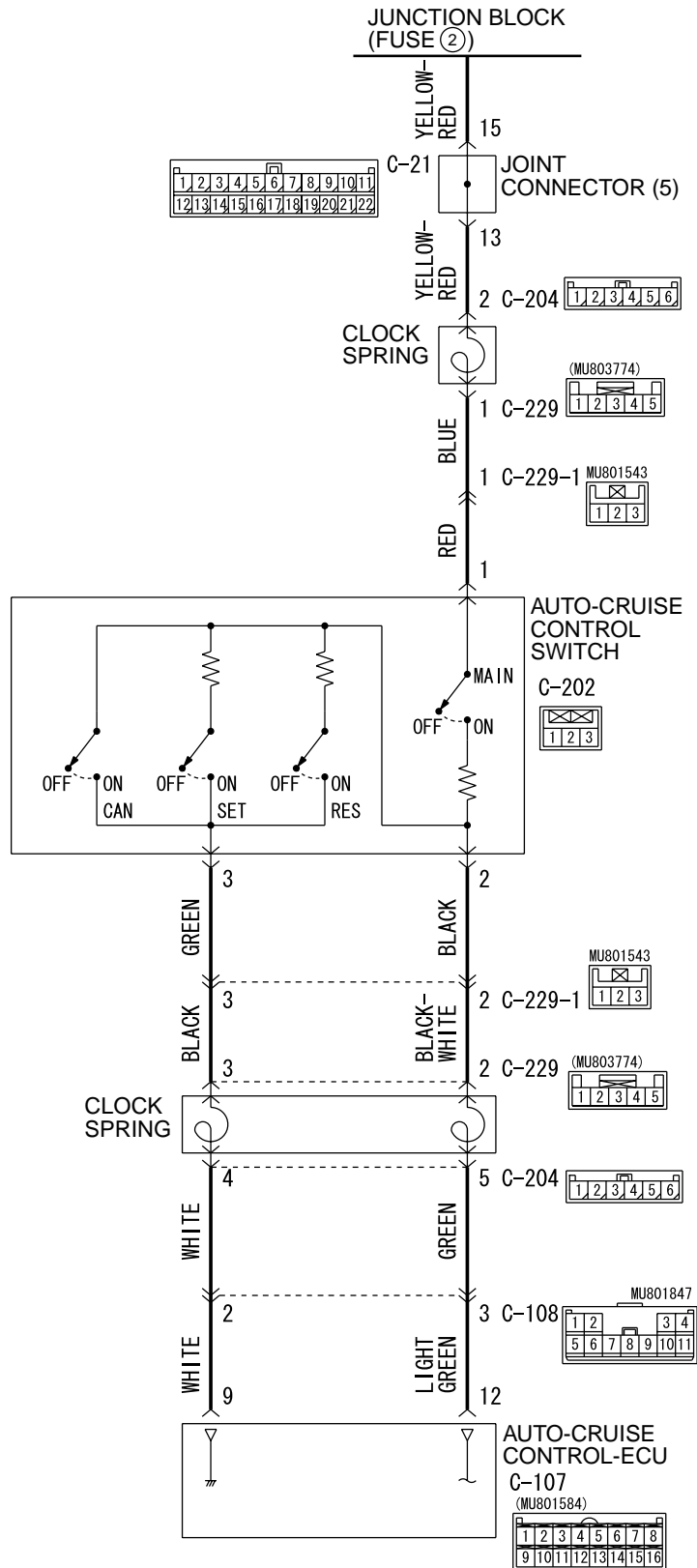
Q: Are the connector and terminals in good condition?

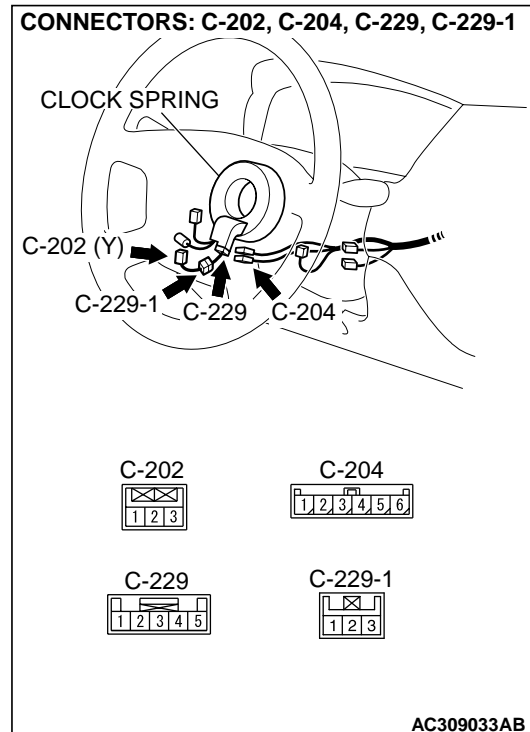
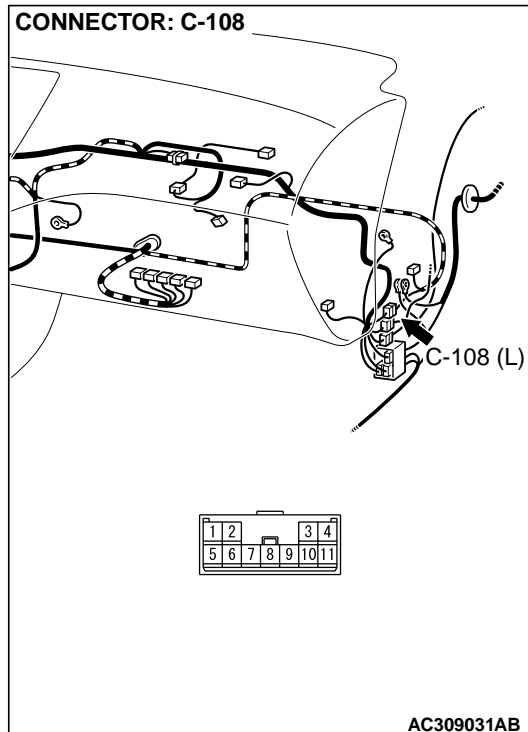
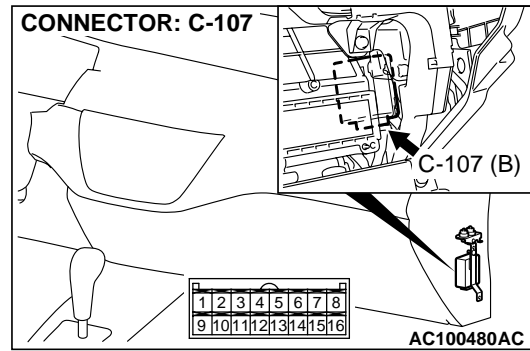
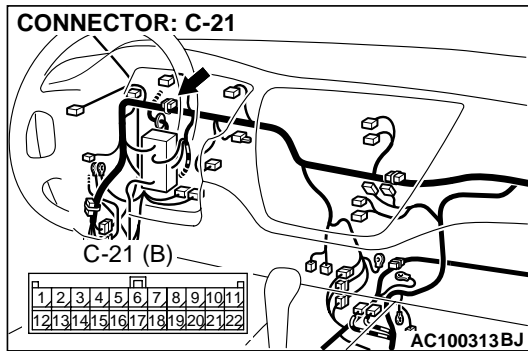
YES : Check that diagnostic trouble code 14 is not output. If diagnostic trouble code 14 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 14 is not output.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 14 is not output.

DTC15 : Auto-cruise Control Switch System

Auto-cruise Control Switch System Circuit





CIRCUIT OPERATION

This circuit judges the signals of each switch ("OFF," "SET," "RESUME," "CANCEL" and "MAIN") of the auto-cruise control switch. The auto-cruise control-ECU detects the state of the auto-cruise control switch by sensing the voltages shown below.

- When all switches are OFF, the ECU detects 3.5 – 5.0 volts.
- When the "SET" switch is ON, the ECU detects 0.4 – 2.3 volts.
- When the "RESUME" switch is ON, the ECU detects 2.3 – 3.5 volts.
- When the "CANCEL" switch is ON, the ECU detects 0.4 volts or less.

- When the main switch is ON, the ECU detects 7.0 volts.

DTC SET CONDITIONS

This code is output when the auto-cruise control switch "RESUME" switch, "SET" switch or "CANCEL" switch stays ON.

TROUBLESHOOTING HINTS

The most likely causes for this code to be set are:

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

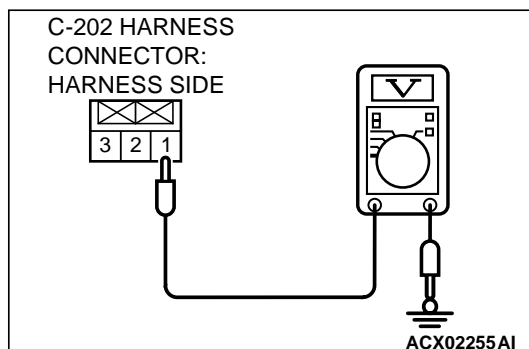
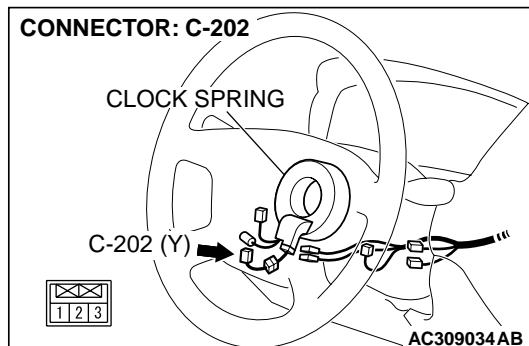
DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Measure the 12-Volt supply circuit voltage at auto-cruise control switch connector C-202.

- (1) Disconnect auto-cruise control switch connector C-202.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between auto-cruise control switch connector C-202 terminal 1 and ground.
 - The measured voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position, connect auto-cruise control switch connector C-202.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 6.

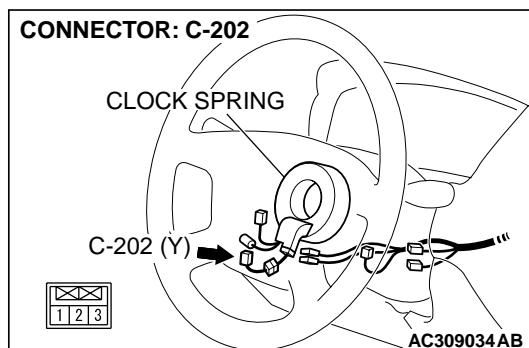
NO : Go to Step 2.

STEP 2. Check auto-cruise control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 3.

NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that diagnostic trouble code 15 is not output.



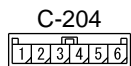
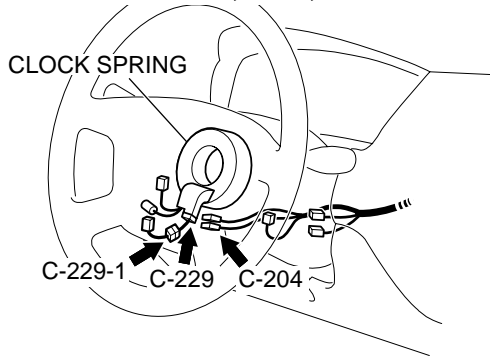
STEP 3. Check the clock spring.

Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#).

Q: Is the clock spring in good condition?

YES : Go to Step 4.

NO : Replace the clock spring (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then check that diagnostic trouble code 15 is not output.

CONNECTORS: C-204, C-229, C-229-1

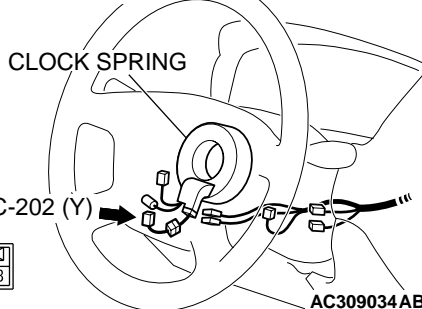
AC309033AC

STEP 4. Check intermediate connector C-229-1, clock spring connectors C-204 and C-229 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.

NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that diagnostic trouble code 15 is not output.

CONNECTOR: C-202

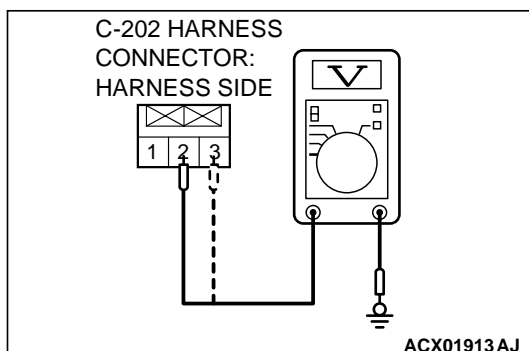
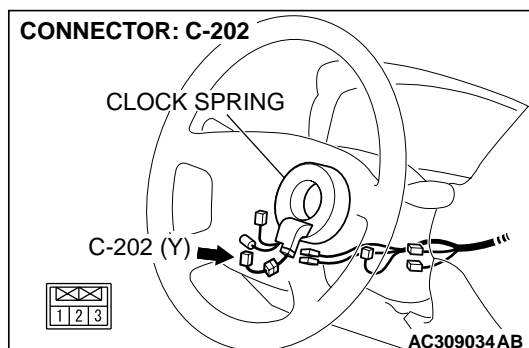
AC309034AB

STEP 5. Check the harness wire between junction block (fuse 2) and auto-cruise control switch connector C-202 terminal 1 for damage.

Q: Is the harness wire in good condition?

YES : This malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions [P.00-6](#)). Then check that diagnostic trouble code 15 is not output.

NO : Repair harness wire and then check that diagnostic trouble code 15 is not output.



STEP 6. Measure the signal voltage at auto-cruise control switch connector C-202 by backprobing.

- (1) Do not disconnect auto-cruise control switch connector C-202.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between auto-cruise control switch connector C-202 terminal 2 and ground by backprobing.
 - Voltage should measure battery positive voltage. (MAIN switch is at the "ON" position.)
- (4) Measure the voltage between terminal 3 and ground by backprobing.
 - Voltage should measure between 6.8 and 7.2 volts. (MAIN switch is at the "ON" position.)
 - Voltage should measure between 3.5 and 5.0 volts. (All switches are at the "OFF" position.)
 - Voltage should measure between 0.4 and 2.3 volts. ("SET" switch is at the "ON" position)
 - Voltage should measure between 2.3 and 3.5 volts. ("RESUME" switch is at the "ON" position.)
 - Voltage should measure between 1 volt or less. ("CANCEL" switch is at the "ON" position.)
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 9.

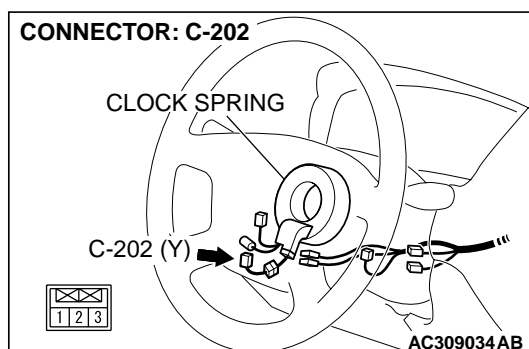
NO : Go to Step 7.

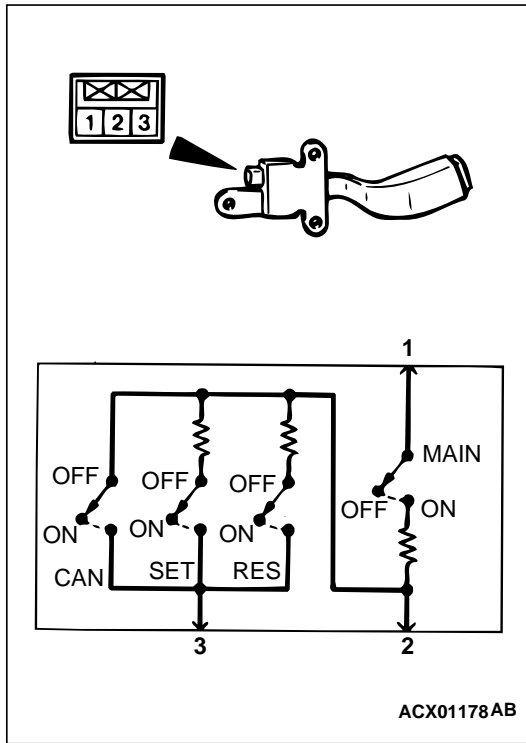
STEP 7. Check auto-cruise control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 8.

NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that diagnostic trouble code 15 is not output.



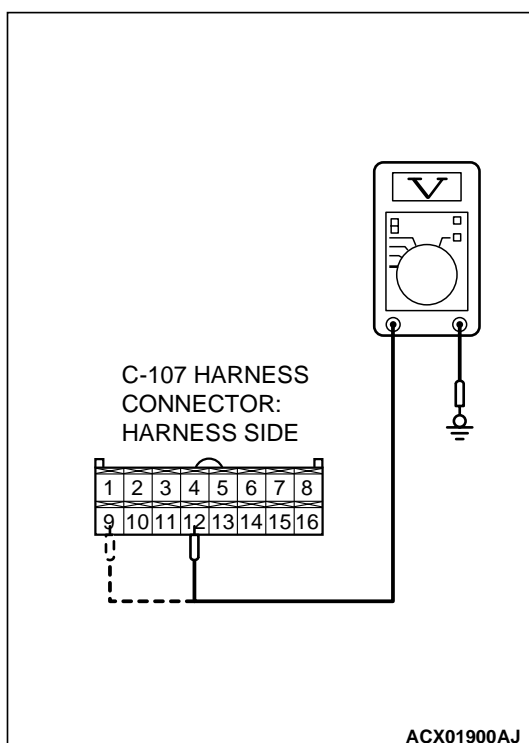
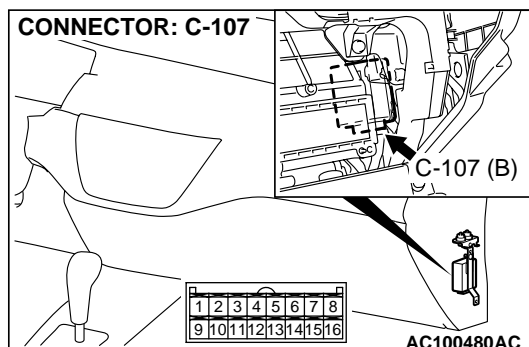
**STEP 8. Check the auto-cruise control switch.**

- (1) Remove the auto-cruise control switch (Refer to [P.17-120](#)).
- (2) Measure the resistance between the terminals when each of the "CRUISE" (MAIN), "COAST/SET", "ACC/RES" and "CANCEL" switch is pressed.

SWITCH POSITION	RESISTANCE BETWEEN TERMINALS	
"CRUISE" (MAIN) switch "OFF"	Terminal 1 and 2	Less than 2 ohms
"CRUISE" (MAIN) switch "ON"	Terminal 1 and 2	Approximately 3.9 kΩ
"CANCEL" switch "ON"	Terminal 2 and 3	Approximately 0 Ω
"ACC/RES" switch ON	Terminal 2 and 3	Approximately 910 Ω
"COAST/SET" switch ON	Terminal 2 and 3	Approximately 220 Ω

Q: Is the measured values correspond to those in the table below?

- YES :** Check that diagnostic trouble code 15 is not output. If diagnostic trouble code 15 is output, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 15 is not output.
- NO :** Replace the auto-cruise control switch (Refer to [P.17-120](#)). Then check that diagnostic trouble code 15 is not output.



STEP 9. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

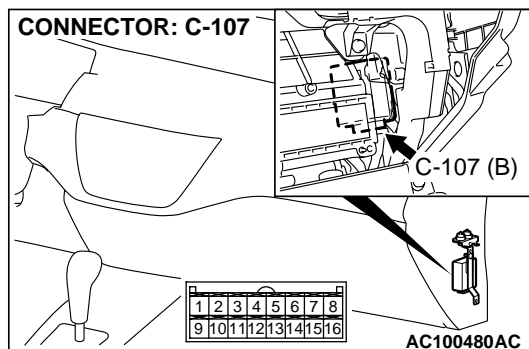
- (1) Remove the auto-cruise control-ECU mounting nut (Refer to P.17-120).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position.

- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 12 and ground by backprobing.
 - Voltage should measure battery positive voltage. (The MAIN switch is at the "ON" position.)
- (5) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 9 and ground by backprobing.
 - Voltage should measure between 6.8 and 7.2 volts. (MAIN switch is at the "ON" position.)
 - Voltage should measure between 3.5 and 5.0 volts. (All switches are at the "OFF" position.)
 - Voltage should measure between 0.4 and 2.3 volts. ("SET" switch is at the "ON" position.)
 - Voltage should measure between 2.3 and 3.5 volts. ("RESUME" switch is at the "ON" position.)
 - Voltage should measure between 1 volt or less. ("CANCEL" switch is at the "ON" position.)
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that diagnostic trouble code 15 is not output. If diagnostic trouble code 15 is output, replace the auto-cruise control-ECU (Refer to P.17-120). Then check that diagnostic trouble code 15 is not output.

NO : Go to Step 10.



STEP 10. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 11.

NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that diagnostic trouble code 15 is not output.

STEP 11. Check the clock spring.

Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#).

Q: Is the clock spring in good condition?

YES : Go to Step 12.

NO : Replace the clock spring (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then check that diagnostic trouble code 15 is not output.

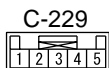
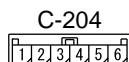
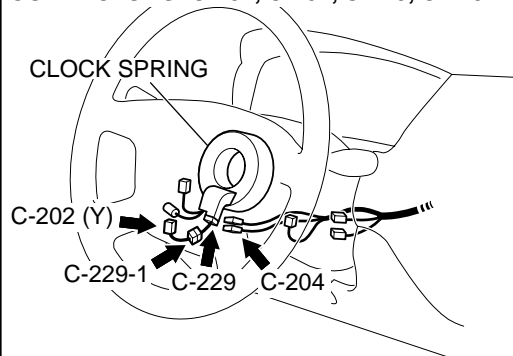
STEP 12. Check auto-cruise control switch connector C-202, intermediate connector C-229-1 and C-108 and clock spring connectors C-204 and C-229 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 13.

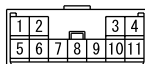
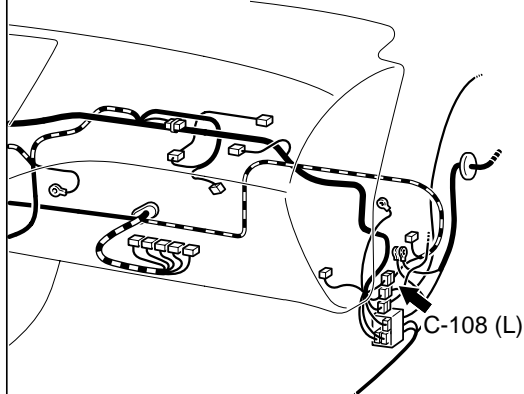
NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that diagnostic trouble code 15 is not output.

CONNECTORS: C-202, C-204, C-229, C-229-1



AC309033AB

CONNECTOR: C-108



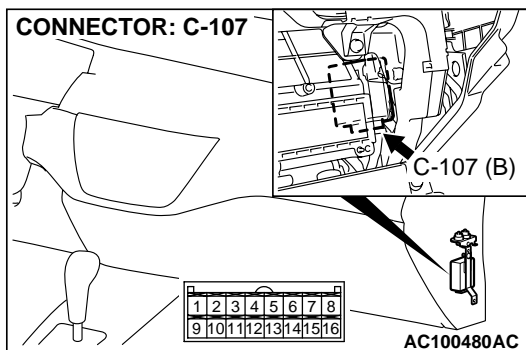
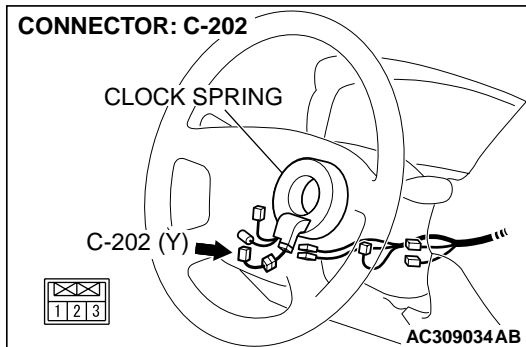
AC309031AB

STEP 13. Check the harness wires between auto-cruise control switch connector C-202 terminal 2, 3 and auto-cruise control-ECU connector C-107 terminal 12, 9 for damage.

Q: Are the harness wires in good condition?

YES : Check that diagnostic trouble code 15 is not output. If diagnostic trouble code 15 is output, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 15 is not output.

NO : Repair harness wire and then check that diagnostic trouble code 15 is not output.



DTC 16: Auto-cruise Control-ECU

DTC SET CONDITIONS

This code is output when a problem is found on the cancel status hold circuit or microcomputer operation monitor circuit, which is incorporated in the auto-cruise control-ECU.

TROUBLESHOOTING HINTS

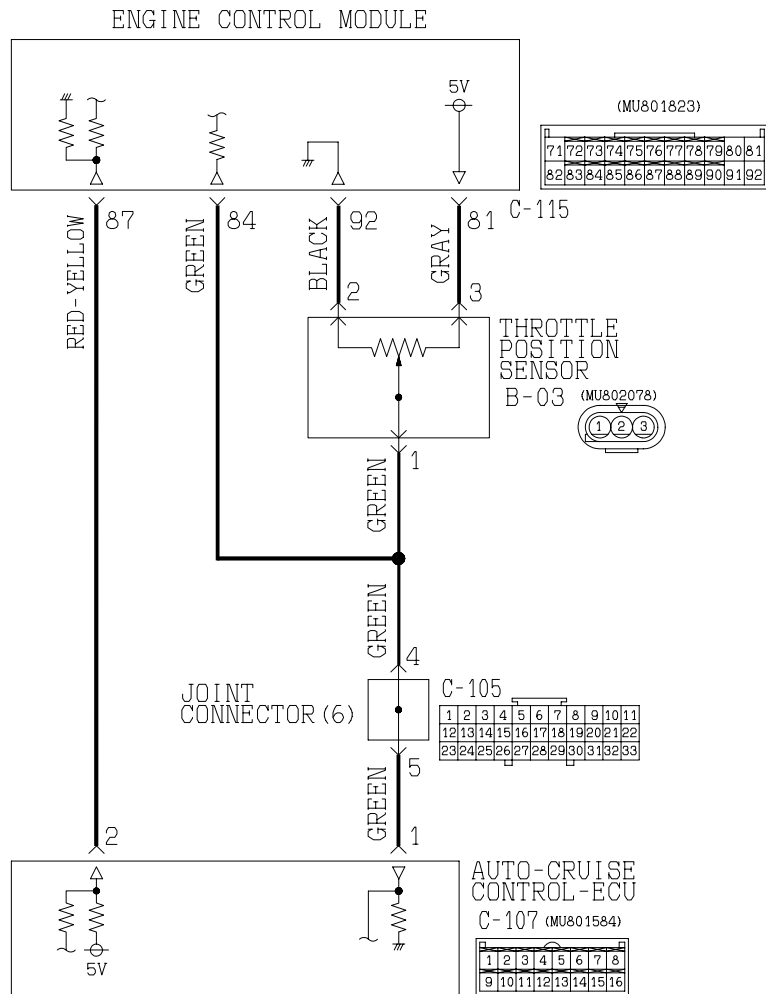
Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

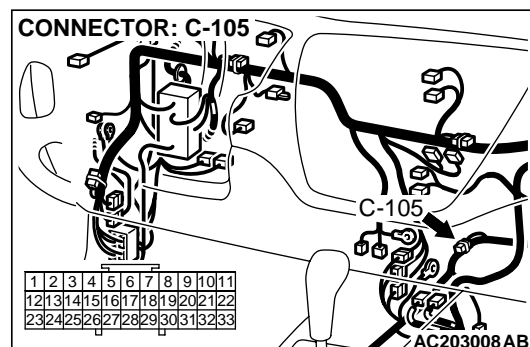
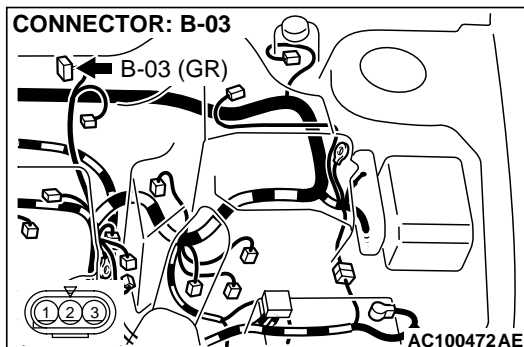
Replace the auto-cruise control-ECU (Refer to [P.17-120](#)).
Check that diagnostic trouble code 16 is not output.

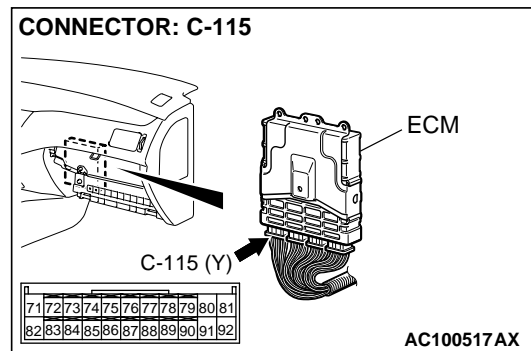
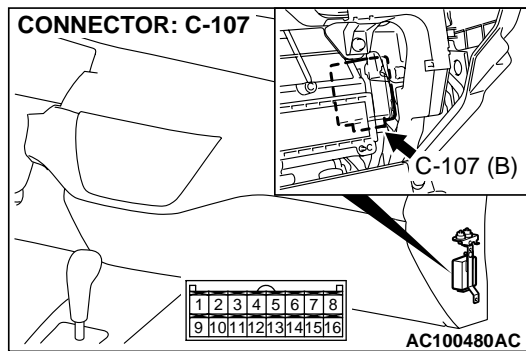
DTC 17: Throttle Position Sensor and Idle Position Signal System <M/T>

Throttle Position Sensor and Idle Position Signal System Circuit



AC203544 AB





CIRCUIT OPERATION

The throttle position sensor signal and idle position signal are sent to the auto-cruise control-ECU through this circuit.

The throttle position sensor sends a voltage signal to terminal 1 of the auto-cruise control-ECU. The voltage depends on throttle opening angle.

The auto-cruise control-ECU receives an idle position signal from the ECM at terminal 2. The signal is OFF when the accelerator pedal is depressed, and ON when the accelerator pedal is released.

DTC SET CONDITIONS

- The Idle position signal is ON and the throttle position sensor voltage is 2.5 volts or more for four seconds or more.
- The Idle position signal is OFF and the throttle position sensor voltage is 0.2 volts or less for four seconds or more.

TROUBLESHOOTING HINTS

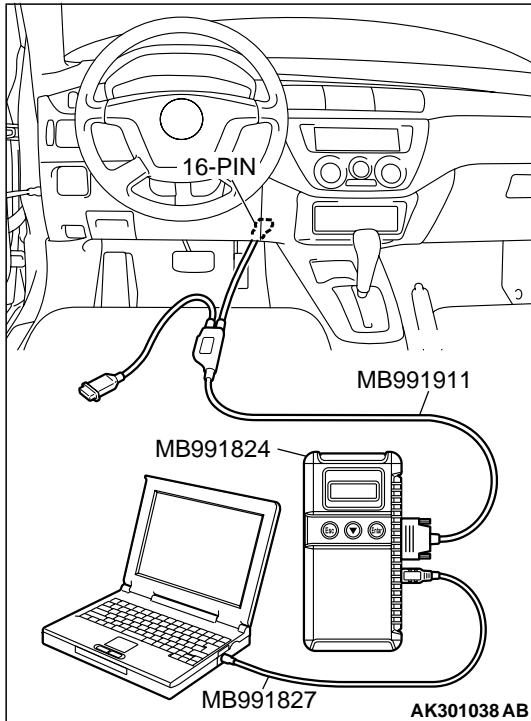
The most likely causes for this code to be set are:

- Malfunction of the throttle position sensor.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.
- Malfunction of the ECM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991223: Harness Set



STEP 1. Check the throttle position sensor.

⚠ 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) Using scan tool MB991958.
- (2) Connect scan tool MB991958 to the data link connector.
- (3) Turn the ignition switch to the "ON" position.
- (4) Read the MFI-DTC.
- (5) Turn the ignition switch to the "LOCK"(OFF) position.

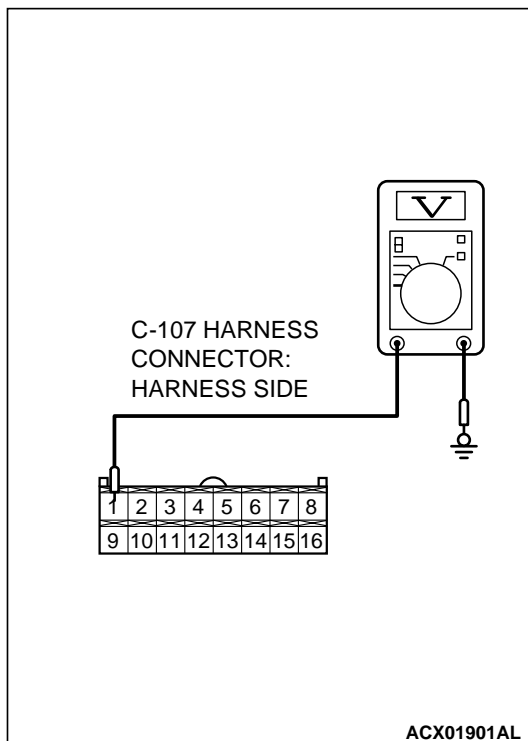
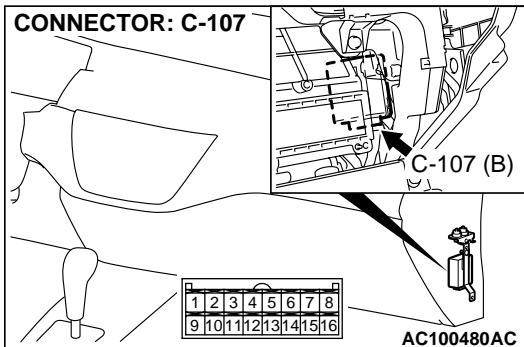
Q: Is the MFI-DTC P0121, P0122 or P0123 is output?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

NO : Go to Step 2.

STEP 2. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.



- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 1 and ground by backprobing.
 - The measure voltage should measure between 4.0 and 5.5 volts. (When accelerator pedal is fully depressed.)
 - The measure voltage should measure between 0.4 and 1.0 volts. (When accelerator pedal is released.)
- (5) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 5.

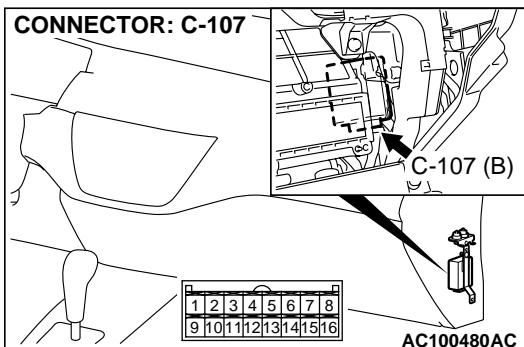
NO : Go to Step 3.

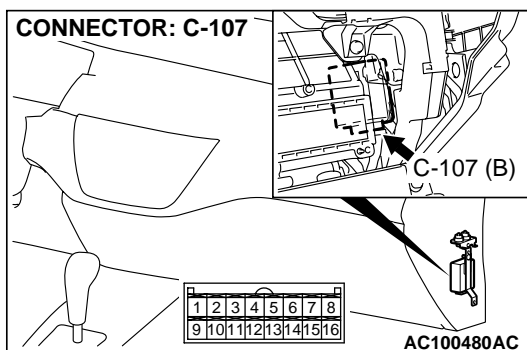
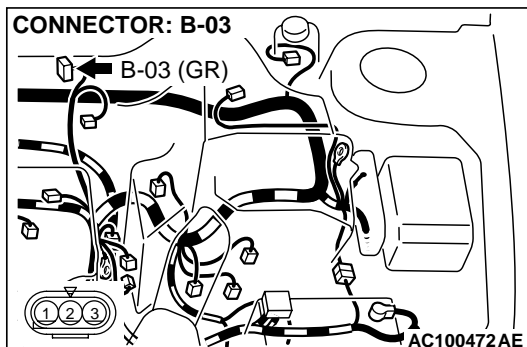
STEP 3. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

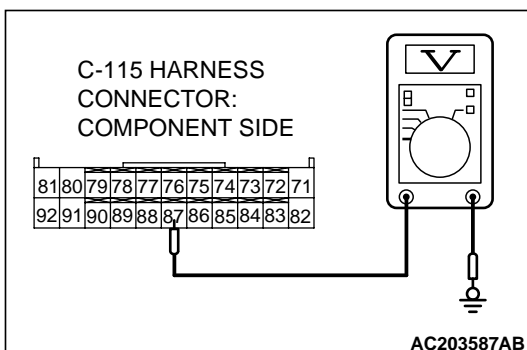
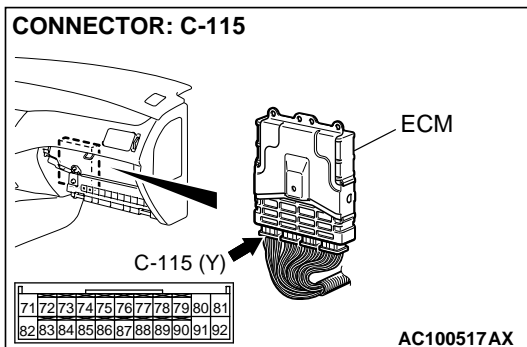
NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 17 is not output.





STEP 4. Check the harness wire between throttle position sensor connector B-03 terminal 1 and auto-cruise control-ECU connector C-107 terminal 1 for damage.
Q: Is the harness wire in good condition?

- YES :** Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 17 is not output.
- NO :** Repair harness wire and then check that diagnostic trouble code 17 is not output.

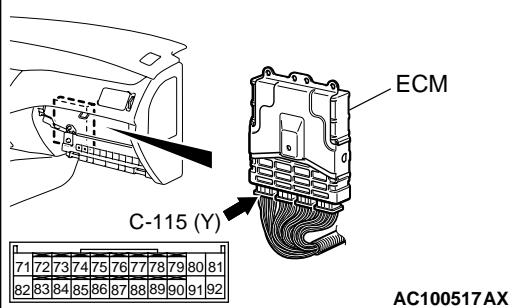


STEP 5. Measure the signal voltage at ECM connector C-115.

- (1) Disconnect ECM connector C-115.
- (2) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.
- (3) Measure the voltage between ECM connector C-115 terminal 87 and ground.
 - The measured voltage should measure between 4.0 and 5.5 volts.
- (4) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.0 and 5.5 volts?

- YES :** Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the ECM. Then check that diagnostic trouble code 17 is not output.
- NO :** Go to Step 6.

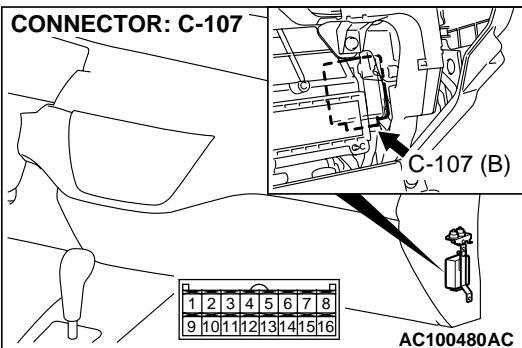
CONNECTOR: C-115

STEP 6. Check ECM connector C-115 and auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 17 is not output.

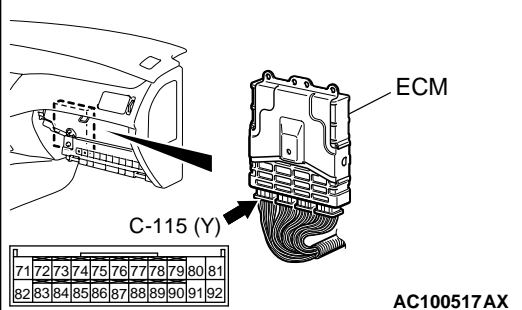
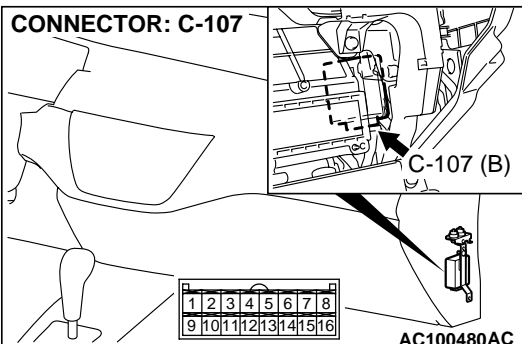
CONNECTOR: C-107

STEP 7. Check the harness wire between ECM connector C-115 terminal 87 and auto-cruise control-ECU connector C-107 terminal 2 for damage.

Q: Is the harness wire in good condition?

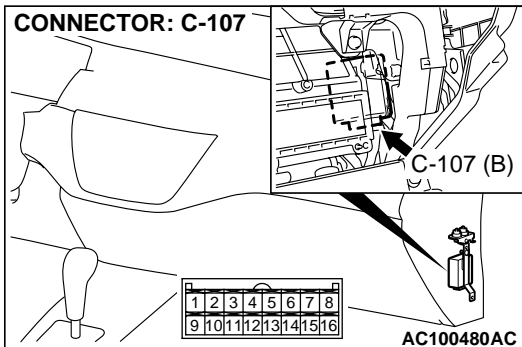
YES : Go to Step 8.

NO : Repair harness wire and then check that diagnostic trouble code 17 is not output.

CONNECTOR: C-115**CONNECTOR: C-107**

STEP 8. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.

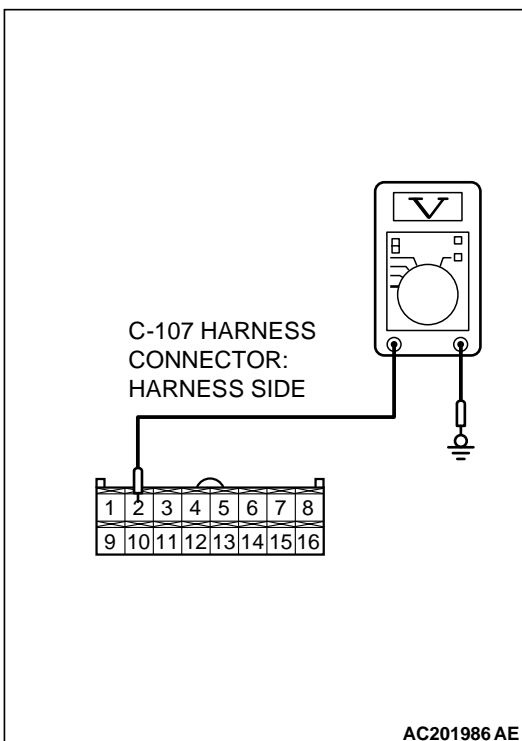


- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 2 and ground by backprobing.
 - The measured voltage should measure between 4.0 and 5.5 volts. (When accelerator pedal is depressed.)
 - The measured voltage should measure between 2.5 volts or less. (When accelerator pedal is released.)
- (5) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

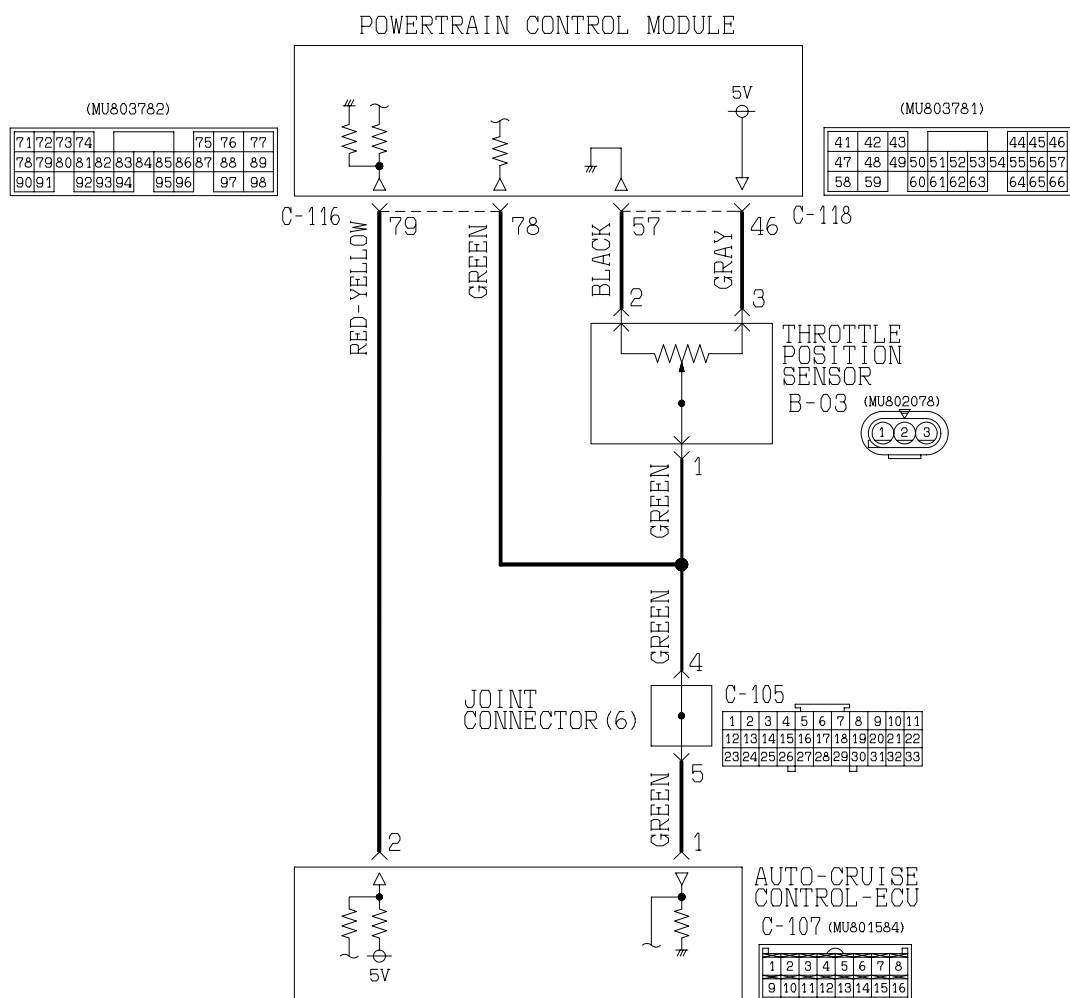
YES : Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 17 is not output.

NO : Replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 17 is not output.

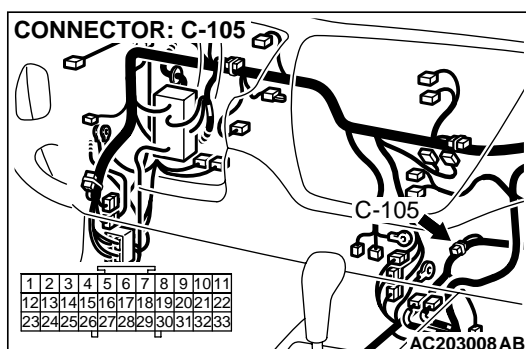
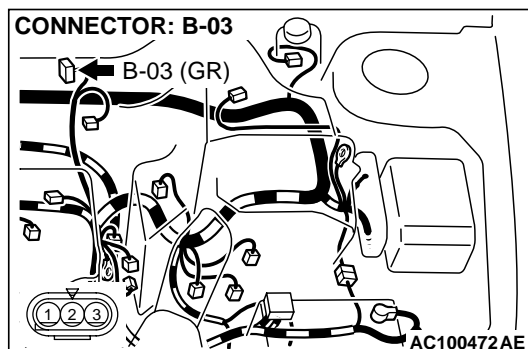


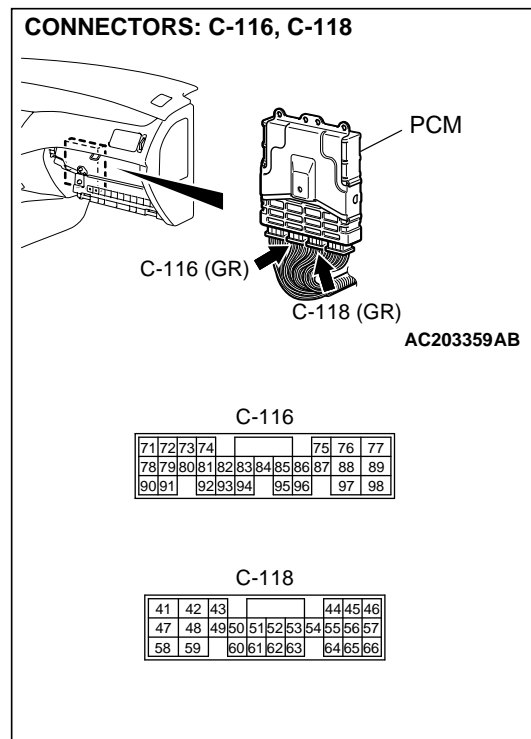
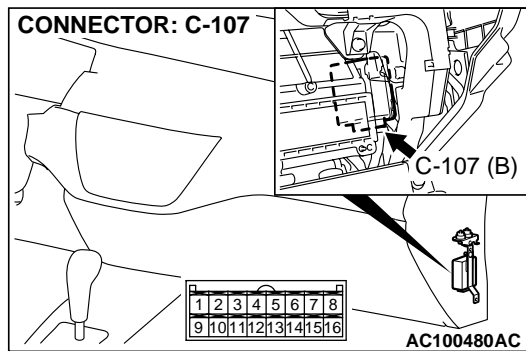
DTC 17: Throttle Position Sensor and Idle Position Signal System <A/T>

Throttle Position Sensor and Idle Position Signal System Circuit



AC203545AB





CIRCUIT OPERATION

The throttle position sensor signal is sent to the auto-cruise control-ECU through this circuit. The auto-cruise control-ECU receives a signal from the throttle position sensor at terminal 1. The signal is OFF when the accelerator pedal is depressed, and ON when the accelerator pedal is released. The throttle position sensor sends a voltage signal to terminal 1 of the auto-cruise control-ECU. The voltage depends on throttle opening angle.

DTC SET CONDITIONS

If 2.5 volts or more 0.2 volts or less is output for four seconds or more.

TROUBLESHOOTING HINTS

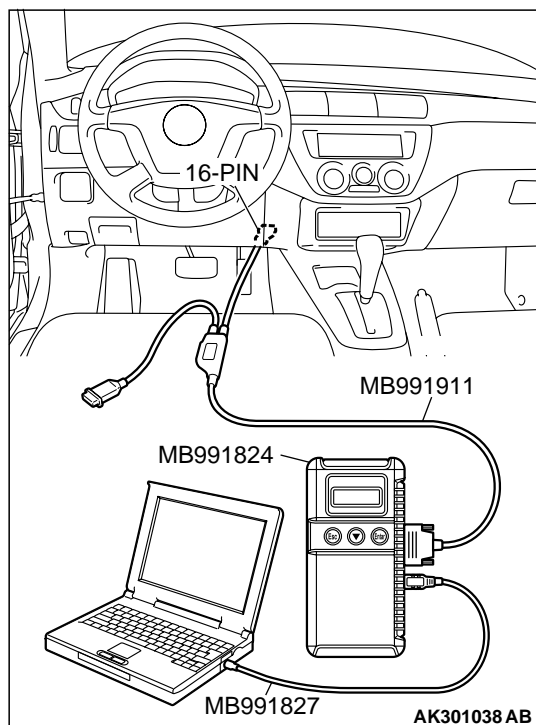
The most likely causes for this code to be set are:

- Malfunction of the throttle position sensor.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.
- Malfunction of the PCM.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991223: Harness Set

**STEP 1. Check the throttle position sensor.****⚠ 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) Using scan tool MB991958.
- (2) Connect scan tool MB991958 to the data link connector.
- (3) Turn the ignition switch to the "ON" position.
- (4) Read the MFI-DTC.
- (5) Turn the ignition switch to the "LOCK"(OFF) position.

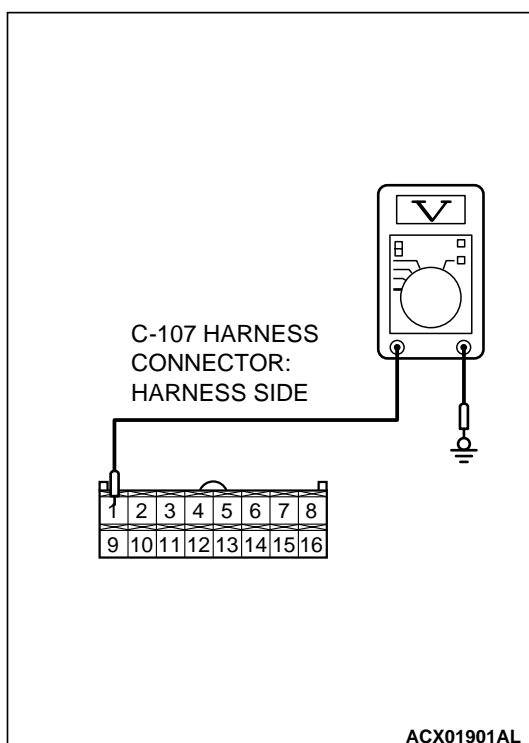
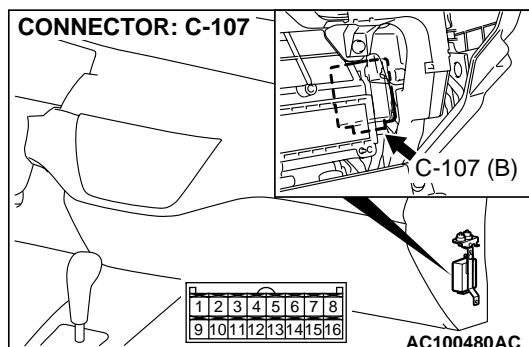
Q: Is the MFI-DTC P0121, P0122 or P0123 is output?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

NO : Go to Step 2.

STEP 2. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.



- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 1 and ground by backprobing.
 - The measure voltage should measure between 4.0 and 5.5 volts. (When accelerator pedal is fully depressed.)
 - The measure voltage should measure between 0.4 and 1.0 volts. (When accelerator pedal is released.)
- (5) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Go to Step 5.

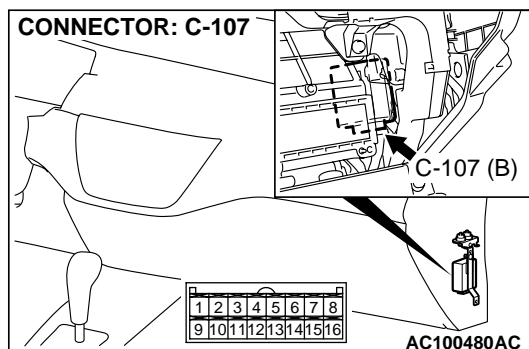
NO : Go to Step 3.

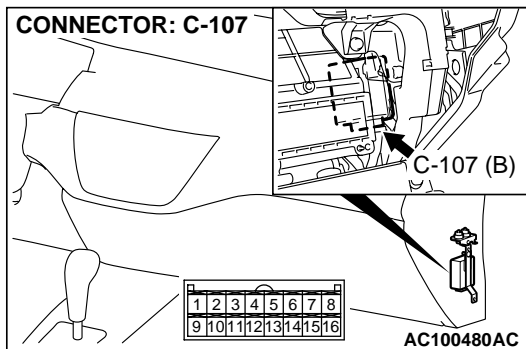
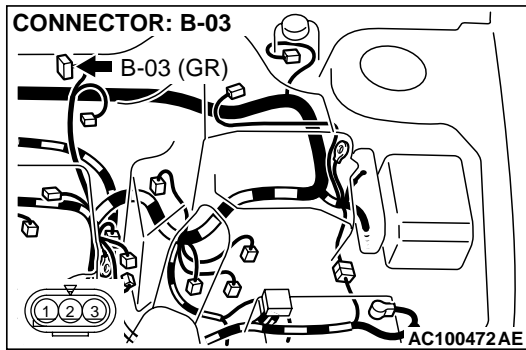
STEP 3. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 17 is not output.

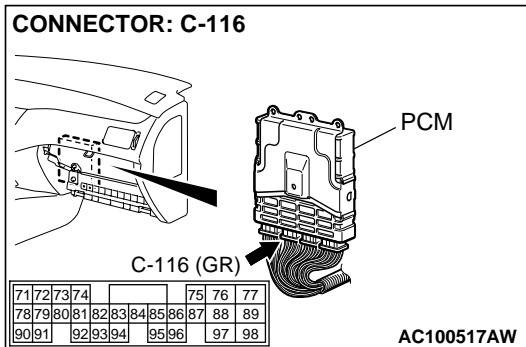




STEP 4. Check the harness wire between throttle position sensor connector B-03 terminal 1 and auto-cruise control-ECU connector C-107 terminal 1 for damage.

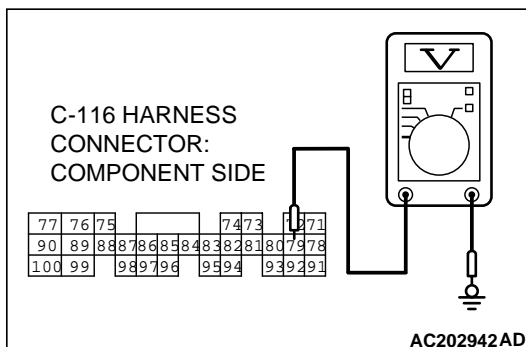
Q: Is the harness wire in good condition?

- YES :** Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 17 is not output.
- NO :** Repair harness wire and then check that diagnostic trouble code 17 is not output.



STEP 5. Measure the signal voltage at PCM connector C-116.

- (1) Disconnect PCM connector C-116.
- (2) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.

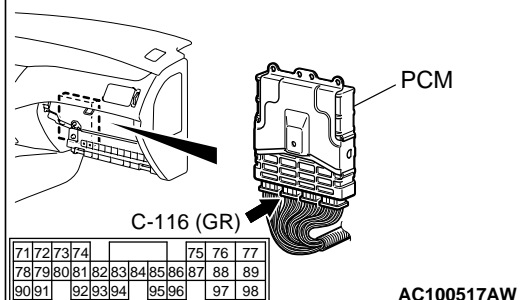


- (3) Measure the voltage between PCM connector C-116 terminal 79 and ground.
 - The measured voltage should measure between 4.0 and 5.5 volts.
- (4) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 4.0 and 5.5 volts?

- YES :** Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the PCM. Then check that diagnostic trouble code 17 is not output.
- NO :** Go to Step 6.

CONNECTOR: C-116



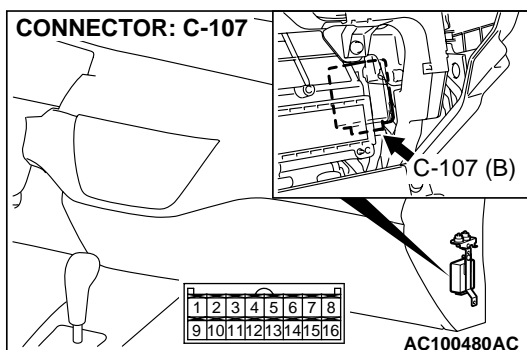
STEP 6. Check PCM connector C-116 and auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that diagnostic trouble code 17 is not output.

CONNECTOR: C-107



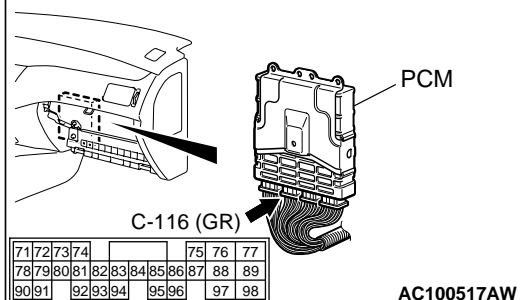
STEP 7. Check the harness wire between PCM connector C-116 terminal 79 and auto-cruise control-ECU connector C-107 terminal 2 for damage.

Q: Is the harness wire in good condition?

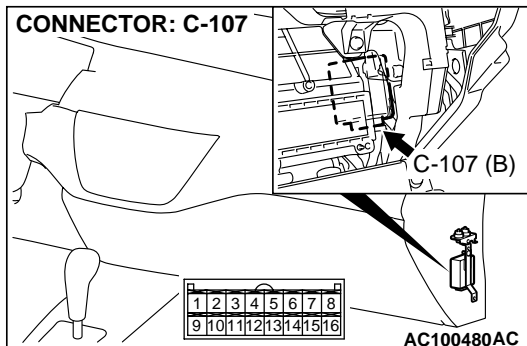
YES : Go to Step 8.

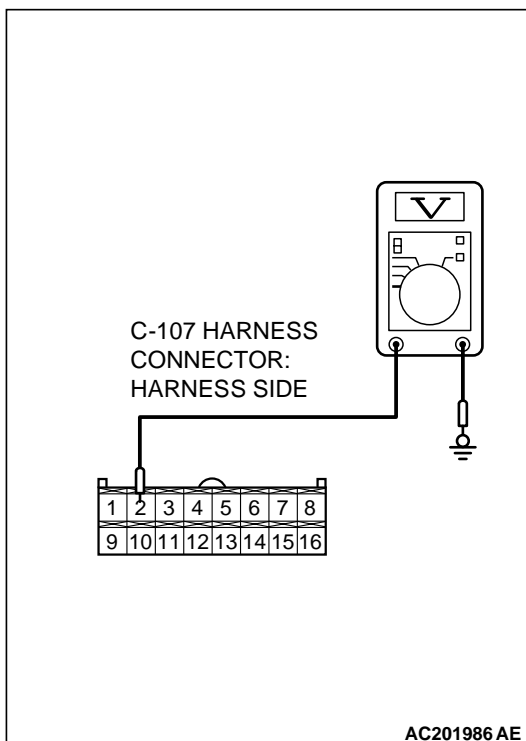
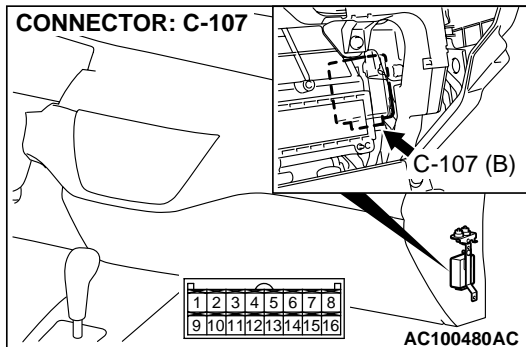
NO : Repair harness wire and then check that diagnostic trouble code 17 is not output.

CONNECTOR: C-116



CONNECTOR: C-107





STEP 8. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position and the auto-cruise control MAIN switch to the "ON" position.
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 2 and ground by backprobing.
 - The measured voltage should measure between 4.0 and 5.5 volts. (When accelerator pedal is depressed.)
 - The measured voltage should measure between 2.5 volts or less. (When accelerator pedal is released.)
- (5) Turn the auto-cruise control MAIN switch to the "OFF" position and the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that diagnostic trouble code 17 is not output. If diagnostic trouble code 17 is output, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that diagnostic trouble code 17 is not output.

NO : Replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that diagnostic trouble code 17 is not output.

SYMPTOM CHART

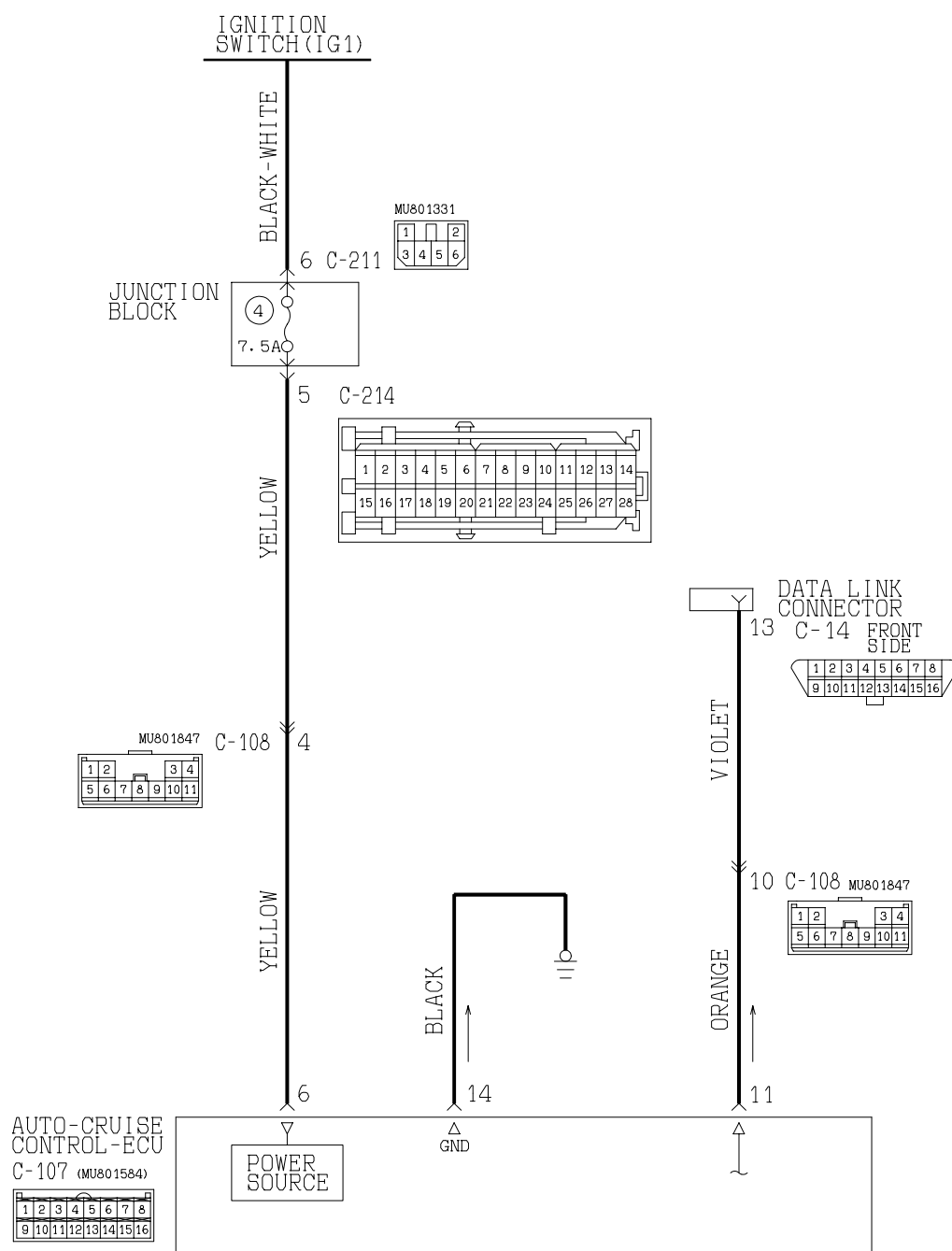
M1172002300388

SYMPTOMS		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool MB991958 is not possible	Communication with all systems is not possible	-	Group 13A, Symptom Procedures – Inspection Procedure 1P.13A-714
	Communication with auto-cruise control-ECU only is not possible	1	P.17-68
Auto-cruise control is not cancelled.	When brake pedal is depressed	2	P.17-77
	When clutch pedal is depressed <M/T>	3	P.17-85
	When selector lever is moved to "N" range <A/T>	4	P.17-91
	When "CANCEL" switch is turned ON	5	P.17-96
Auto-cruise control cannot be set.		6	P.17-96
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.		7	<M/T>P.17-98 <A/T>P.17-100
Auto-cruise control indicator light inside combination meter does not illuminate. (However, auto-cruise control is normal.)		8	P.17-103

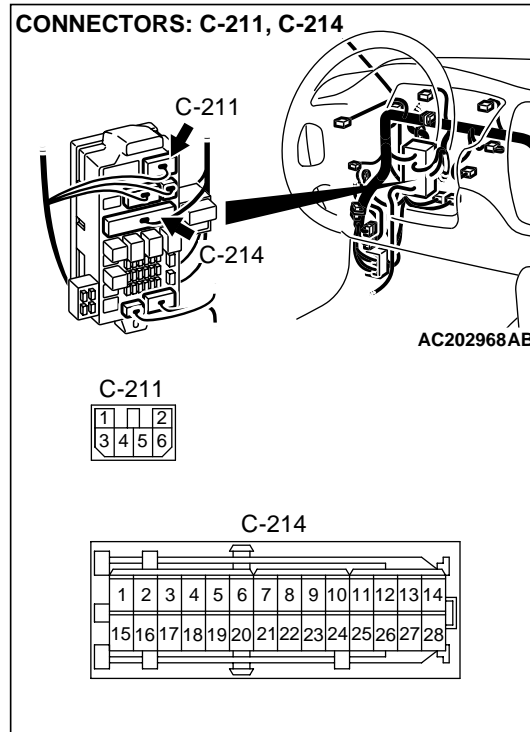
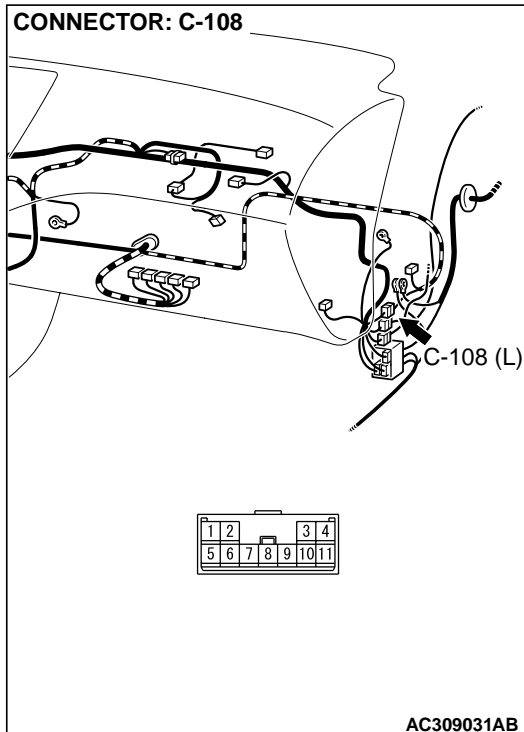
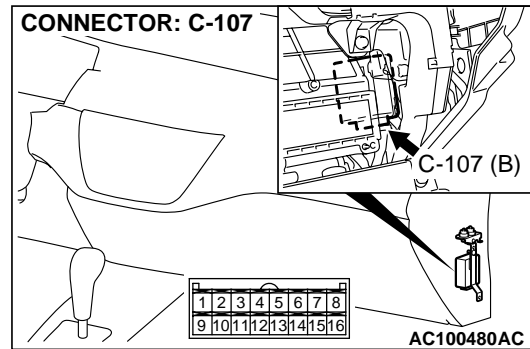
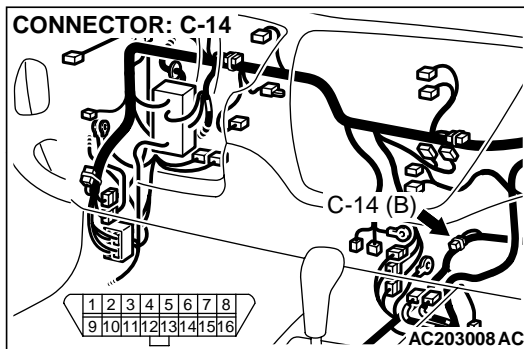
SYMPTOM PROCEDURES

**INSPECTION PROCEDURE 1: Communication With Scan Tool MB991958 is not Possible
(Communication with the Auto-cruise Control-ECU Only is not Possible.)**

Auto-cruise Control-ECU Supply, Ground and Data Link Circuit



W2J09M07AA



CIRCUIT OPERATION

Power of the auto-cruise control-ECU is transmitted from the ignition switch (IG1) to the auto-cruise control-ECU through multi-purpose fuse 13 in the junction block.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a malfunction of the auto-cruise control-ECU power supply circuit or the auto-cruise control-ECU ground circuit.

TROUBLESHOOTING HINTS

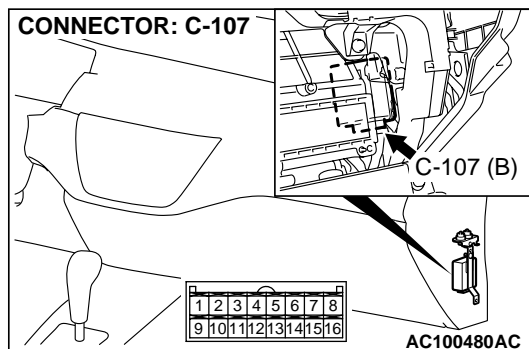
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS**Required Special Tool:**

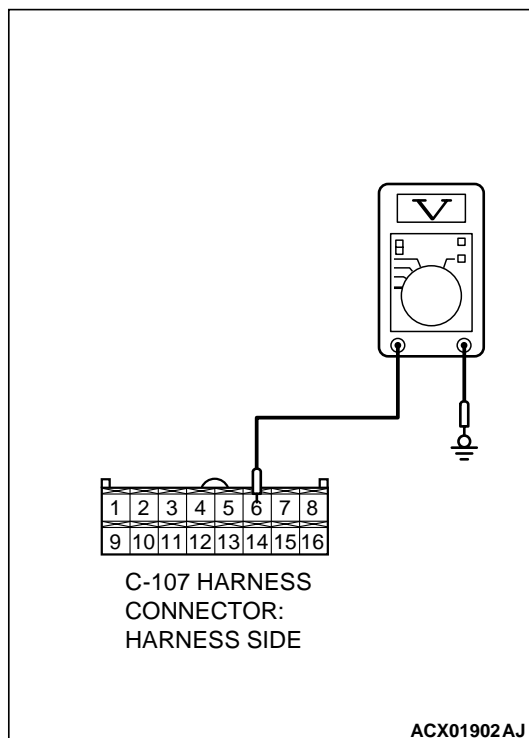
- MB991223: Harness Set

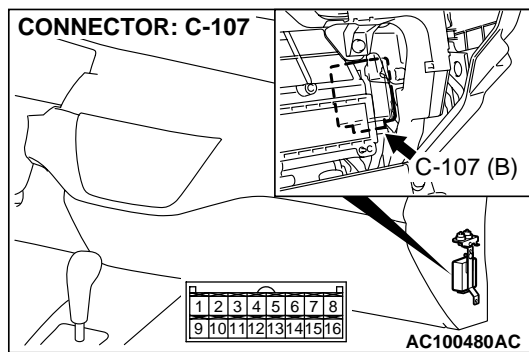
STEP 1. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position.



- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 6 and ground by backprobing.
 - The measured voltage should measure battery positive voltage.
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?**YES** : Go to Step 5.**NO** : Go to Step 2.



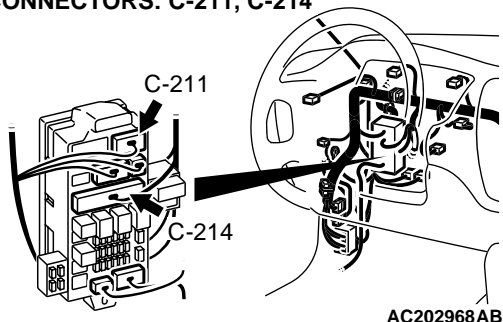
STEP 2. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 3.

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

CONNECTORS: C-211, C-214



C-211

1	2
3	4

C-214

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28

AC202968AB

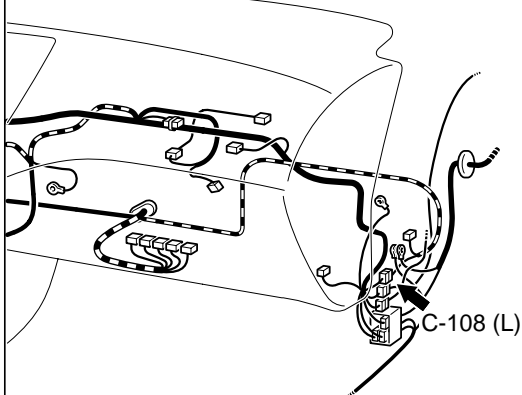
STEP 3. Check junction block connectors C-211, C-214 and intermediate harness connector C-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

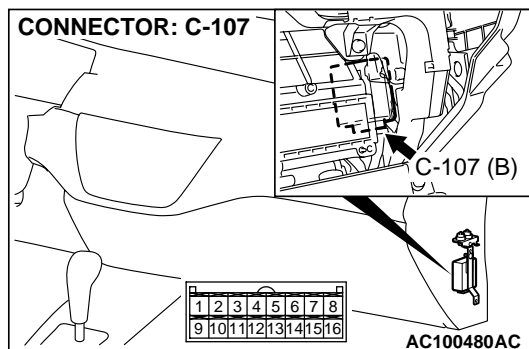
NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that the malfunction is eliminated.

CONNECTOR: C-108



1	2	3	4
5	6	7	8

AC309031AB

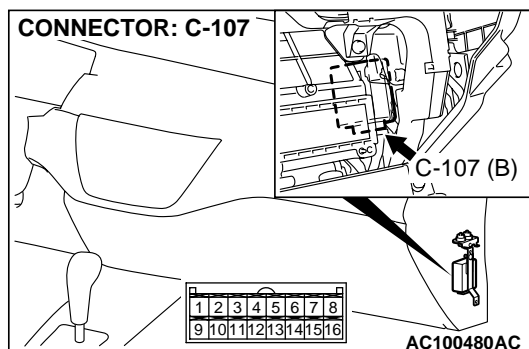


STEP 4. Check the harness wire between ignition switch and auto-cruise control-ECU connector C-107 terminal 6 for damage.

Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.



STEP 5. Measure the ground circuit voltage at auto-cruise control-ECU connector C-107 by backprobing.

(1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).

(2) Do not disconnect auto-cruise control-ECU connector C-107.

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

(4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 14 and ground by backprobing.

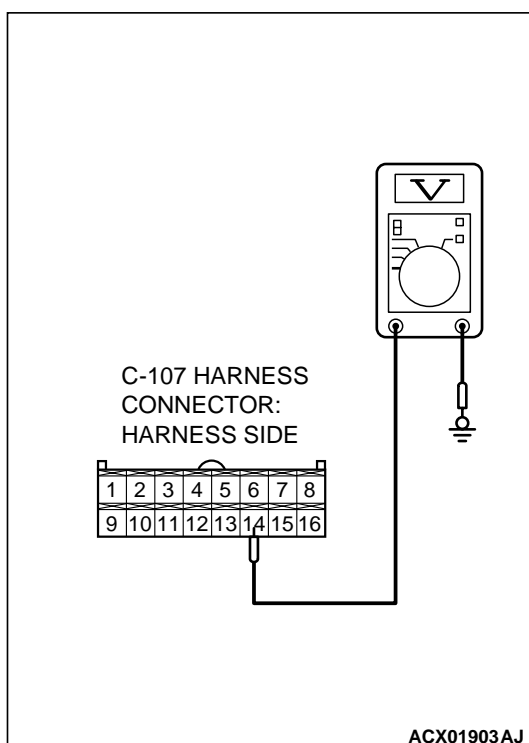
- The measured voltage should measure 0.5 volts or less.

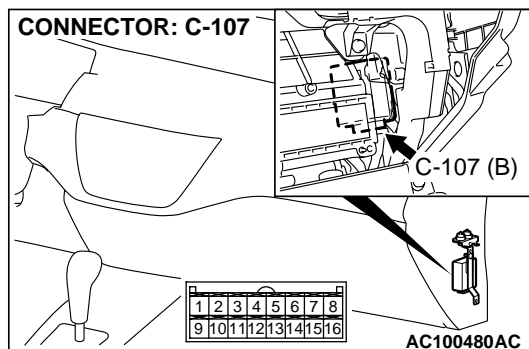
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volts or less?

YES : Go to Step 8.

NO : Go to Step 6.



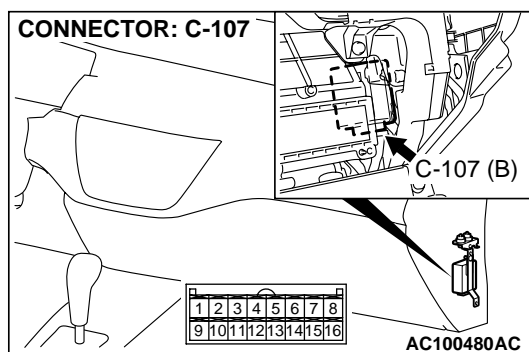


STEP 6. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 7.

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



STEP 7. Check the harness wire between auto-cruise control-ECU connector C-107 terminal 14 and ground for damage.

Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

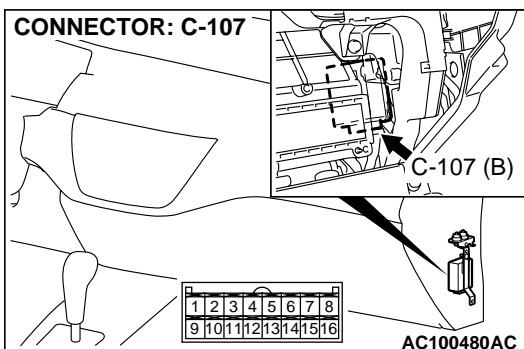
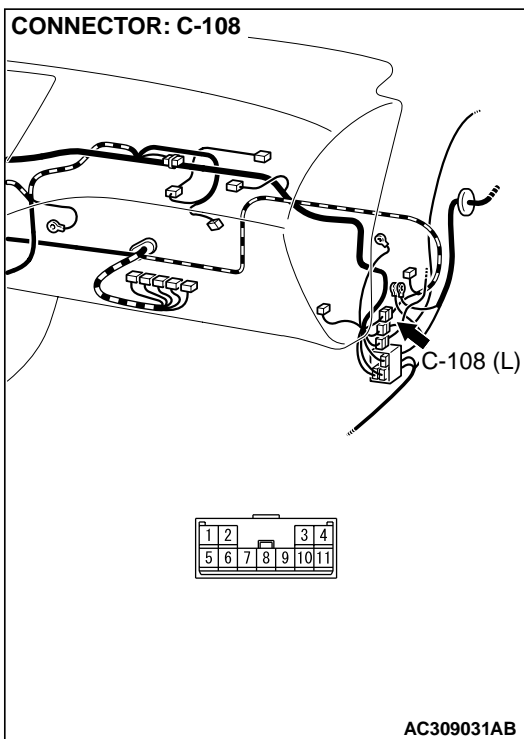
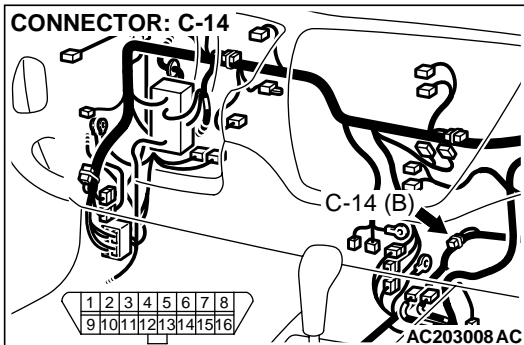
NO : Repair the harness wire and then check that the malfunction is eliminated.

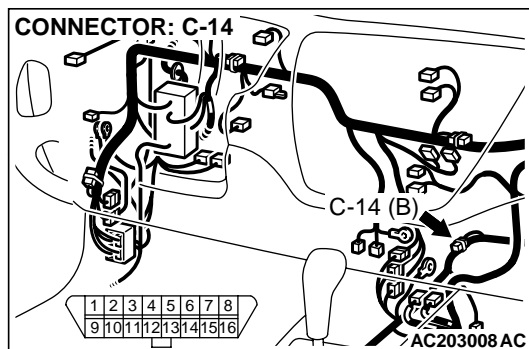
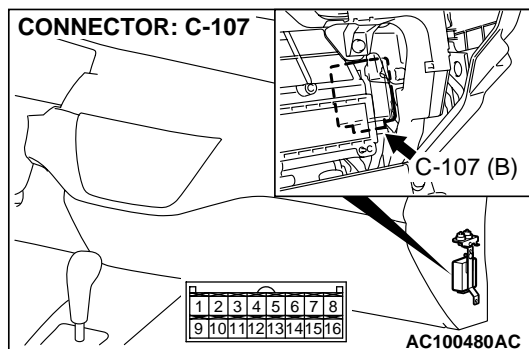
STEP 8. Check data link connector C-14, intermediate harness connector C-108 and auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 9.

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





STEP 9. Check the harness wire between auto-cruise control-ECU connector C-107 terminal 17 and data link connector C-14 terminal 13 for damage.

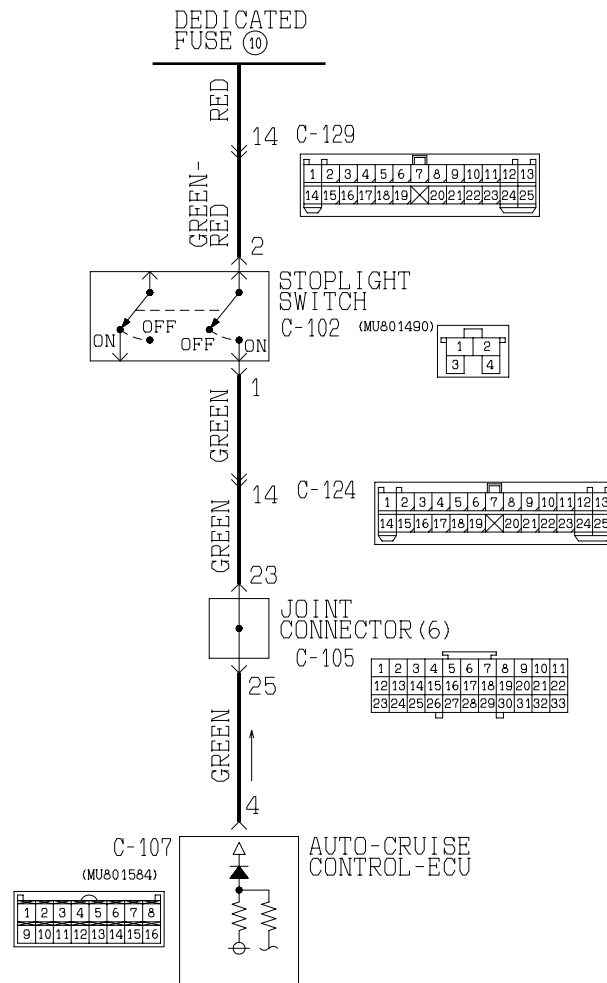
Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

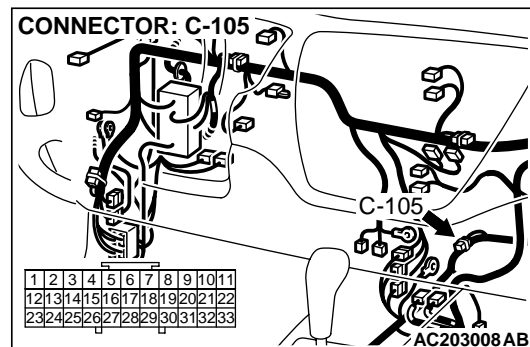
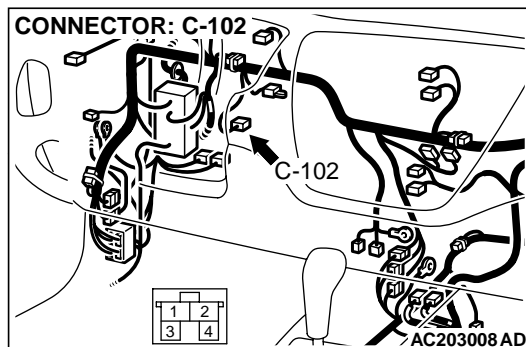
NO : Repair the harness wire and then check that the malfunction is eliminated.

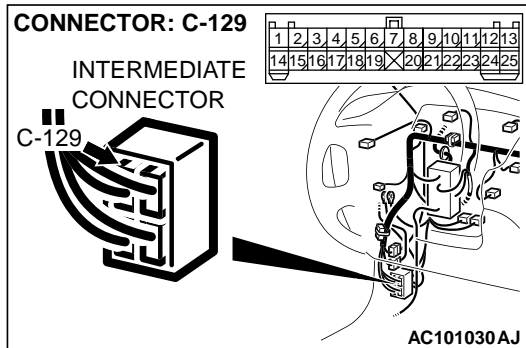
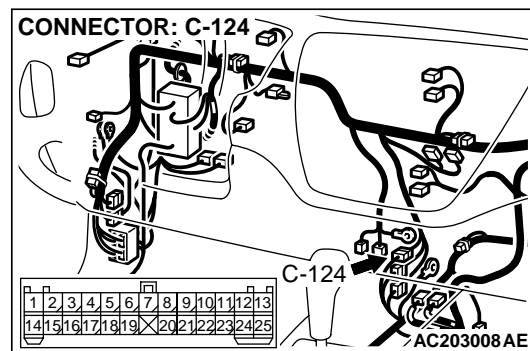
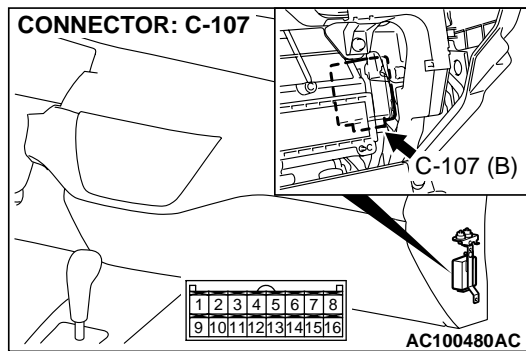
INSPECTION PROCEDURE 2: When the Brake Pedal is Depressed, Auto-cruise Control is not Cancelled.

Stoplight Switch Circuit



AC308934



**CIRCUIT OPERATION**

This is the stoplight switch input signal circuit. The signal is sent to the stoplight switch from multi-purpose fuse 3, and is then sent to the auto-cruise control-ECU.

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

- Malfunction of the stoplight switch.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

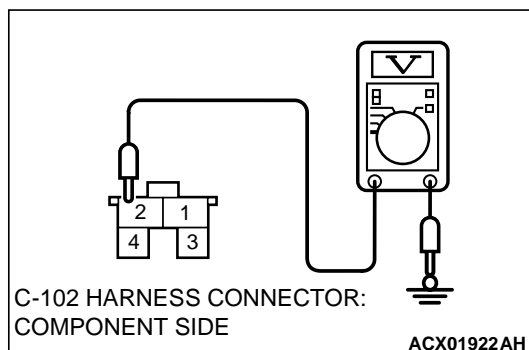
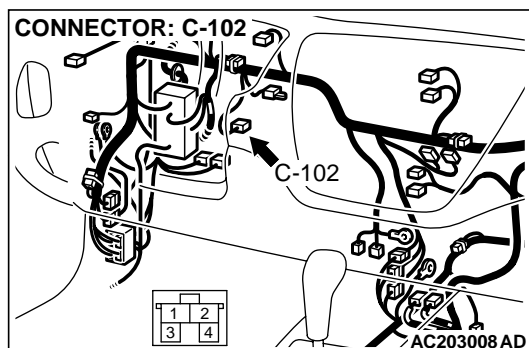
DIAGNOSIS**Required Special Tool:**

- MB991223: Harness Set

STEP 1. Check if the stoplight illuminates.**Q: Is the stoplight illuminated?**

YES : Go to Step 9.

NO : Go to Step 2.



STEP 2. Measure the 12-Volt supply circuit voltage at stoplight switch connector C-102.

(1) Disconnect stoplight switch connector C-102.

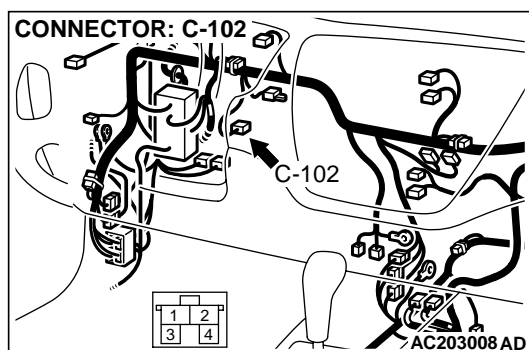
(2) Measure the voltage between stoplight switch connector C-102 terminal 2 and ground.

- The measured voltage should measure battery positive voltage.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 6.

NO : Go to Step 3.

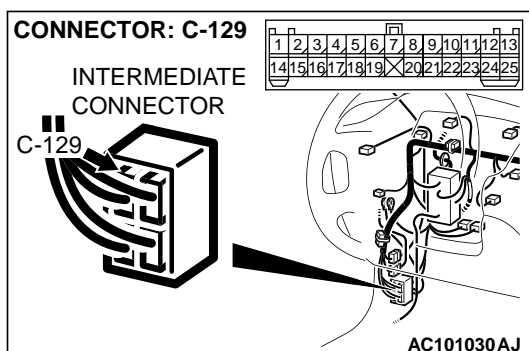


STEP 3. Check stoplight switch connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

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

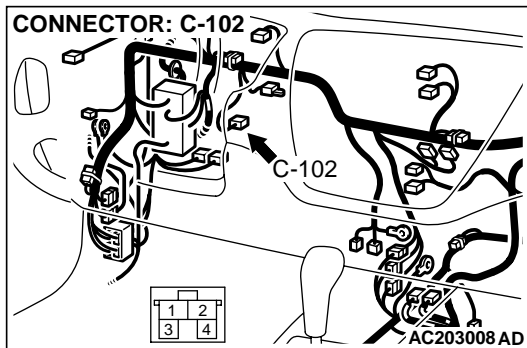


STEP 4. Check intermediate connector C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 5.

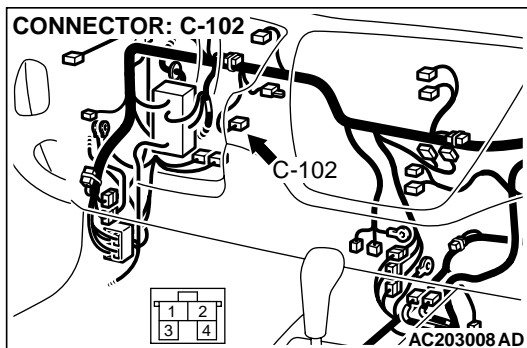
NO : Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that the malfunction is eliminated.



STEP 5. Check the harness wire between dedicated fuse No.10 and stoplight switch connector C-102 terminal 2 for damage.

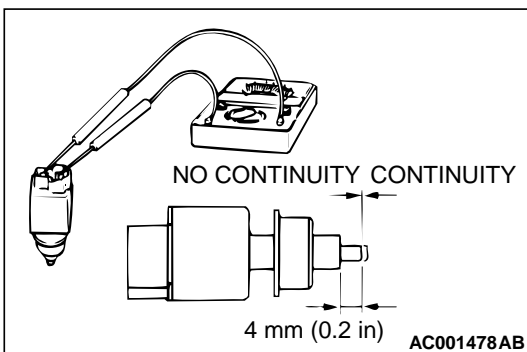
Q: Is the harness wire in good condition?

- YES :** Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.
- NO :** Repair the harness wire and then check that the malfunction is eliminated.

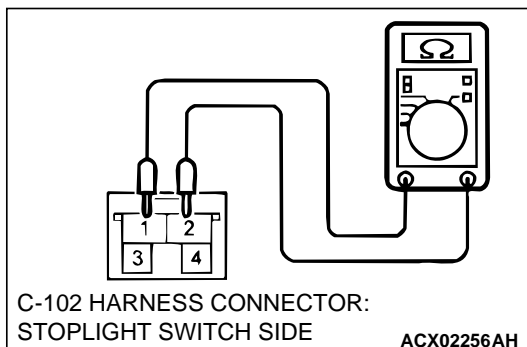


STEP 6. Check the stoplight switch.

(1) Disconnect stoplight switch connector C-102.



- (2) Connect an ohmmeter to the stoplight switch, and check continuity when the plunger of the stoplight switch is pushed in and when it is released.
- (3) The stoplight switch is in good condition if the circuit is open when the plunger is pushed in to a depth of within 4 mm (0.2 inch) from the outer case edge surface, and if the resistance value is less than 2 ohm when it is released.



- (4) The check for continuity should be made at terminals 1 and 2 of the stoplight switch.

Q: Is the stoplight switch in good condition?

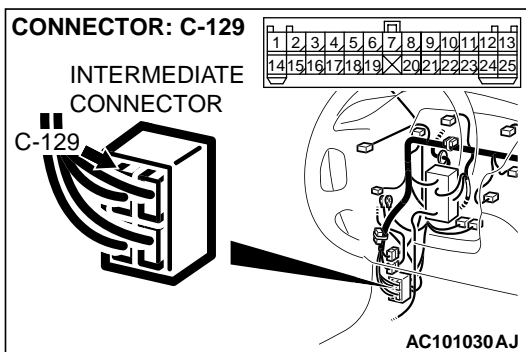
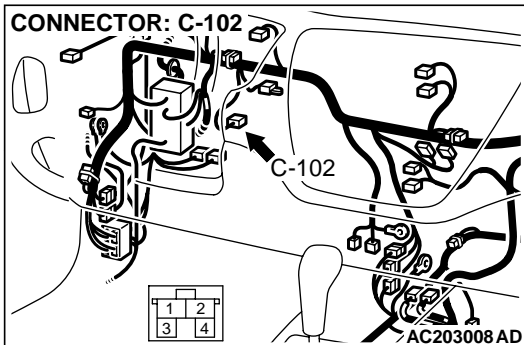
- YES :** Go to Step 7.
- NO :** Replace the stoplight switch. Refer to GROUP 35A, Brake Pedal [P.35A-34](#). Then check that the malfunction is eliminated.

STEP 7. Check stoplight switch connector C-102 and intermediate connector C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 8.

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

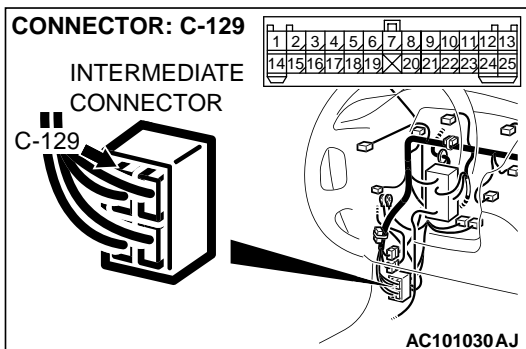
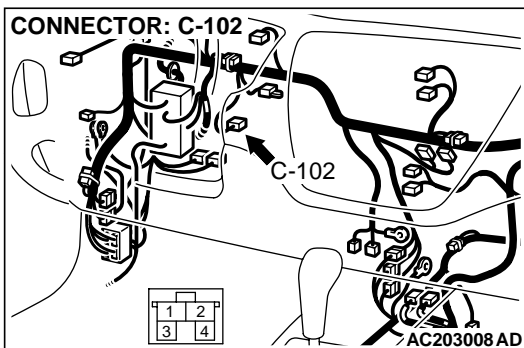


STEP 8. Check the harness wire between stoplight switch connector C-102 terminal 2 and intermediate connector C-129 terminal 14 for damage.

Q: Is the harness wire in good condition?

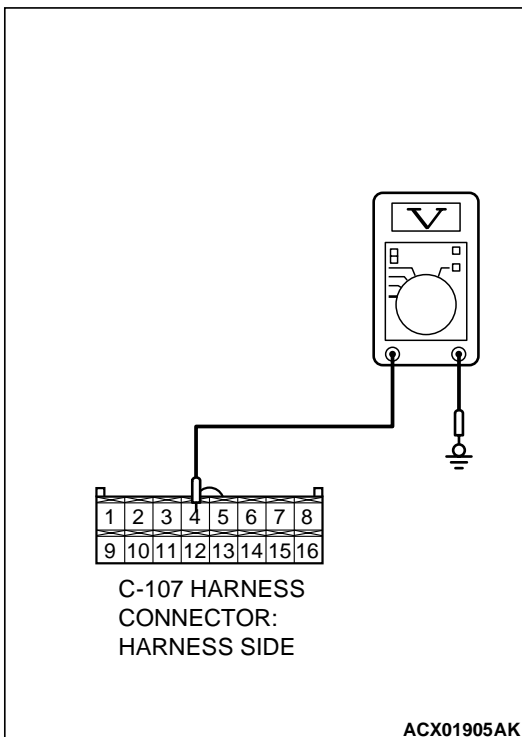
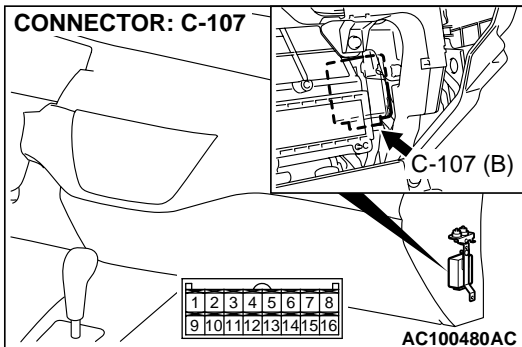
YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.



STEP 9. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position.



- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 4 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When brake pedal is depressed).
 - The measured voltage should measure 0.5 volts or less. (When brake pedal is not depressed).
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

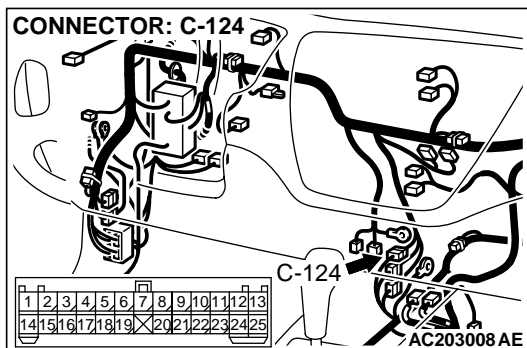
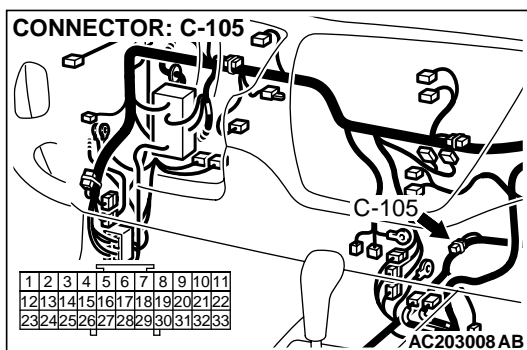
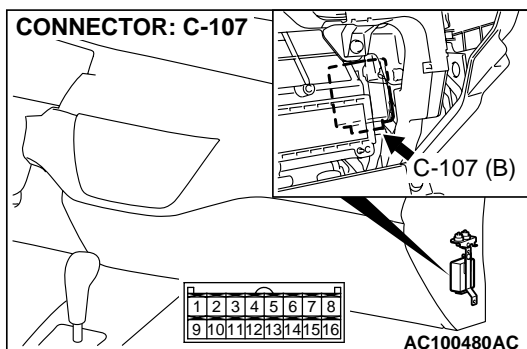
NO : Go to Step 10.

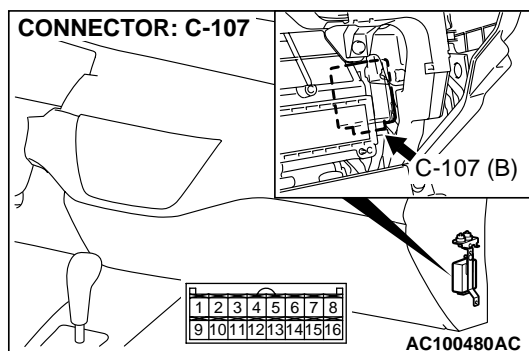
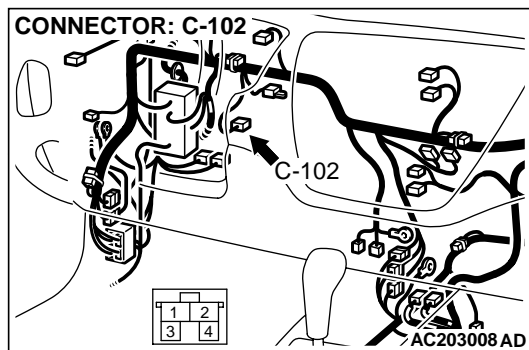
STEP 10. Check auto-cruise control-ECU connector C-107, joint connector C-105 and intermediate connector C-124 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.

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





STEP 11. Check the harness wire between stoplight switch connector C-102 terminal 1 and auto-cruise control-ECU connector C-107 terminal 4 for damage.

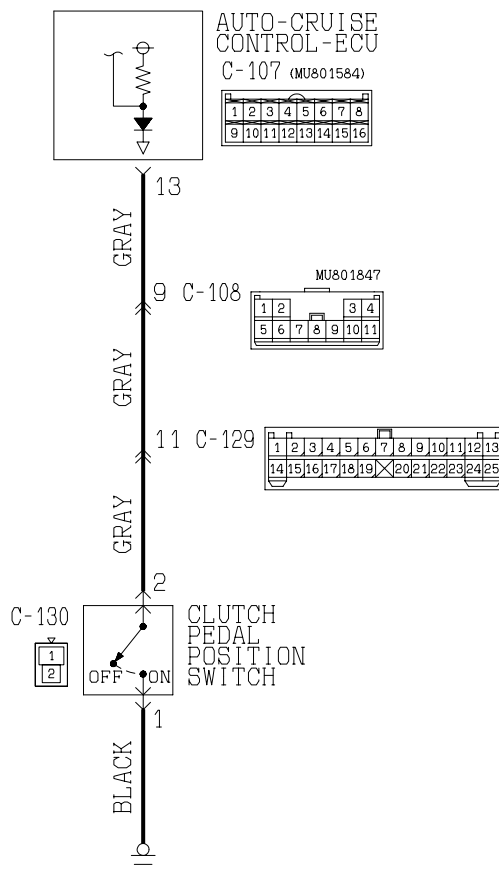
Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

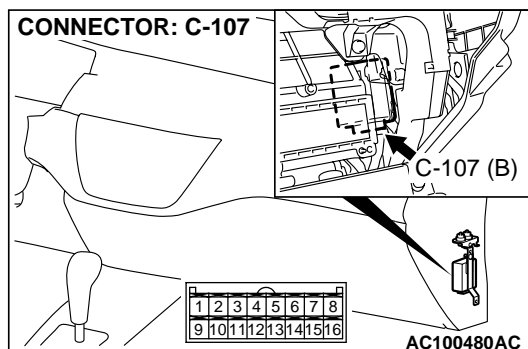
NO : Repair the harness wire and then check that the malfunction is eliminated.

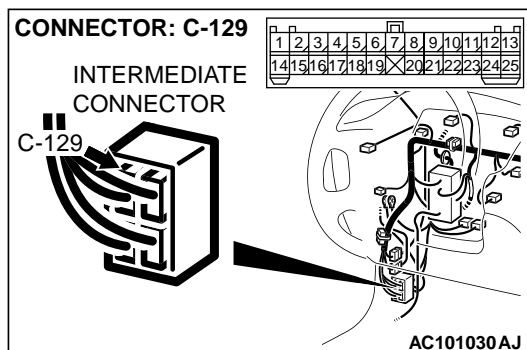
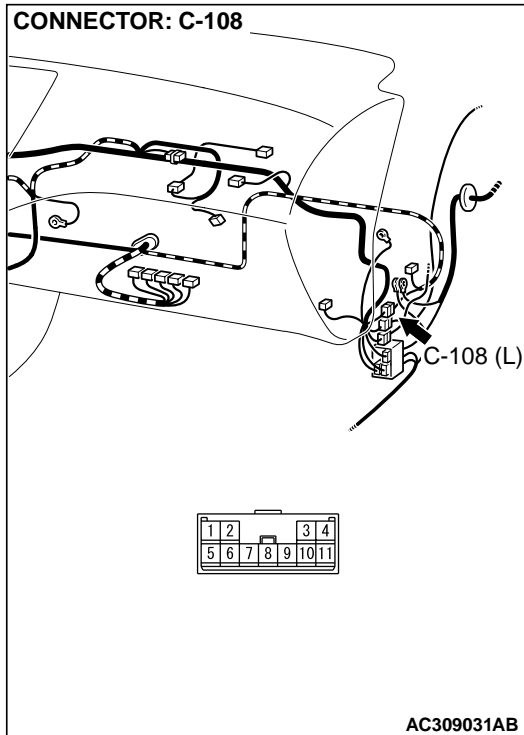
INSPECTION PROCEDURE 3: When the Clutch Pedal is Depressed, Auto-cruise Control is not Cancelled <M/T>

Clutch Pedal Position Switch Circuit



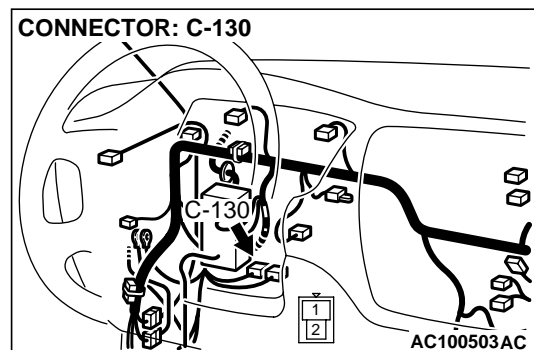
AC308935





CIRCUIT OPERATION

This circuit indicates the operation status of the clutch pedal position switch. When the clutch pedal position switch is ON (clutch pedal is depressed), the voltage of auto-cruise control-ECU terminal number 13 will indicate 0 volt.



TECHNICAL DESCRIPTION (COMMENT)

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

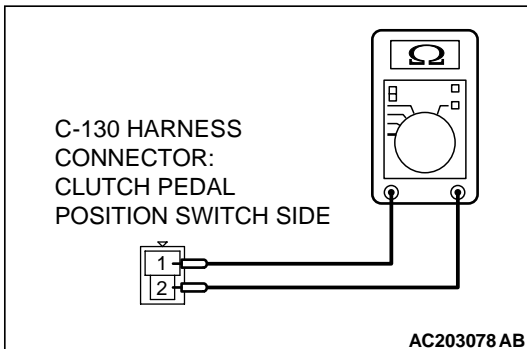
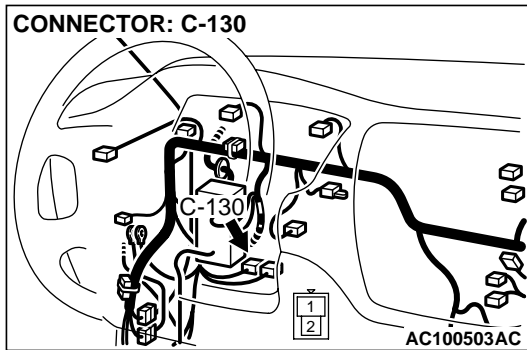
TROUBLESHOOTING HINTS

- Malfunction of the clutch pedal position switch.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

STEP 1. Check the clutch pedal position switch.

(1) Disconnect clutch pedal position switch connector C-130.



(2) Measure the continuity between the terminals.

MEASUREMENT CONDITIONS	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
When clutch pedal is depressed.	1 – 2	Less than 2 ohms
When clutch pedal is not depressed.	1 – 2	Open circuit

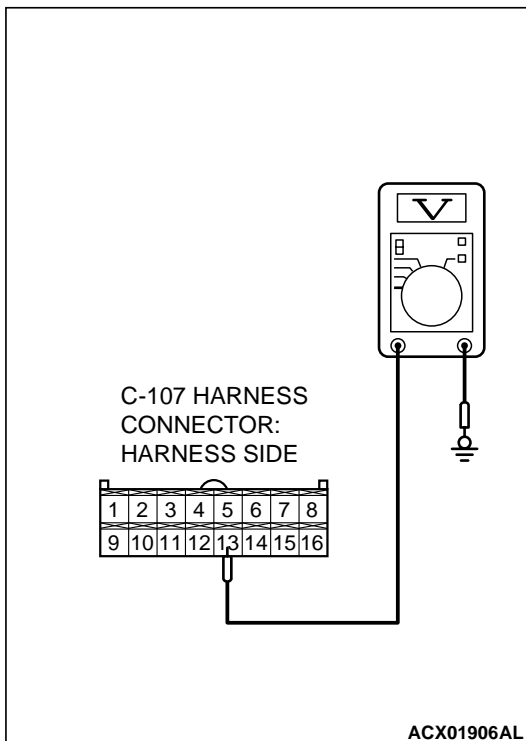
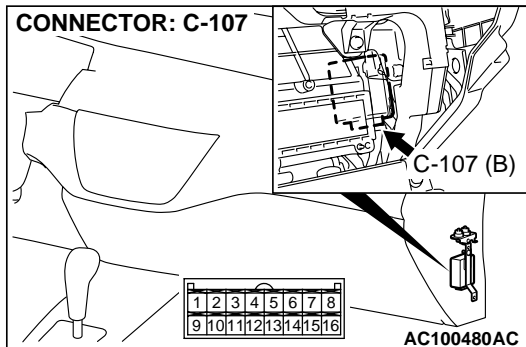
Q: Is the clutch pedal position switch in good condition?

YES : Go to Step 2.

NO : Replace the clutch pedal position switch. Refer to GROUP 21A, Clutch Pedal [P.21A-12](#). Then check that the malfunction is eliminated.

STEP 2. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control switch connector C-107.
- (3) Turn the ignition switch to the "ON" position.



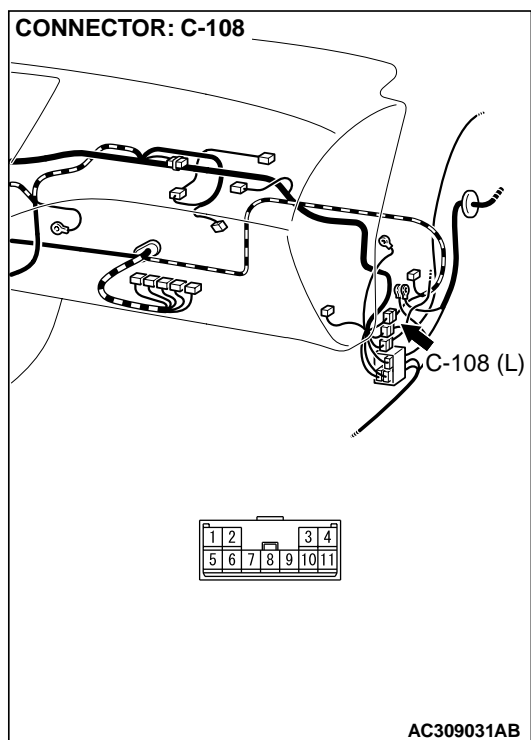
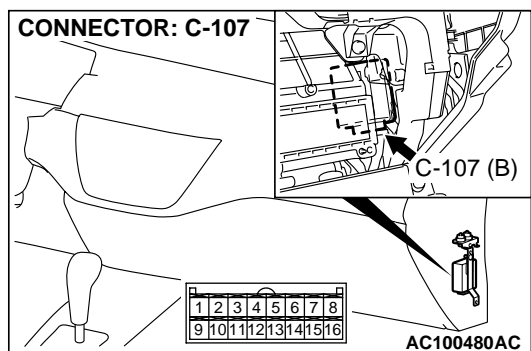
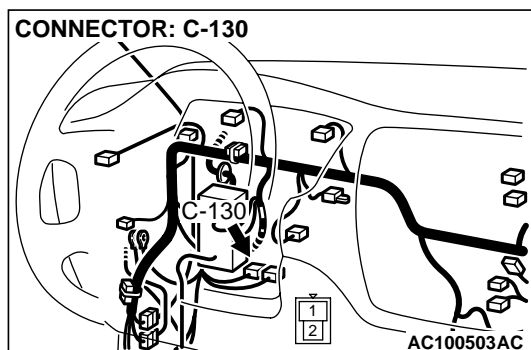
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 13 and ground by backprobing.
 - voltage should measure 0.5 volts or less. (When clutch pedal is depressed.)
 - voltage should measure battery positive voltage. (When clutch pedal is not depressed.)
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

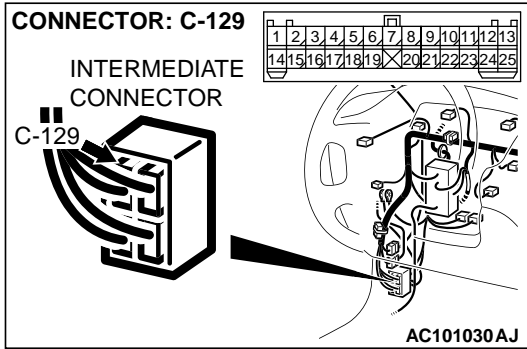
Q: Are all of the measured voltages satisfied?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Go to Step 3.

STEP 3. Check clutch pedal position switch connector C-130, auto-cruise control-ECU connector C-107, intermediate connectors C-108 and C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

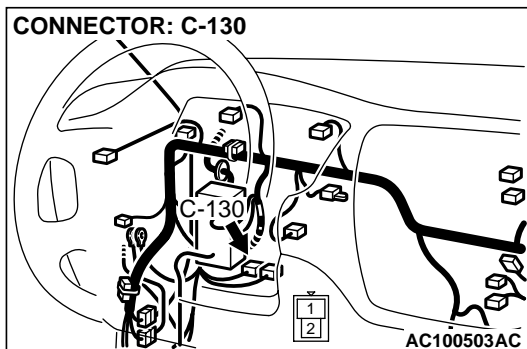




Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

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

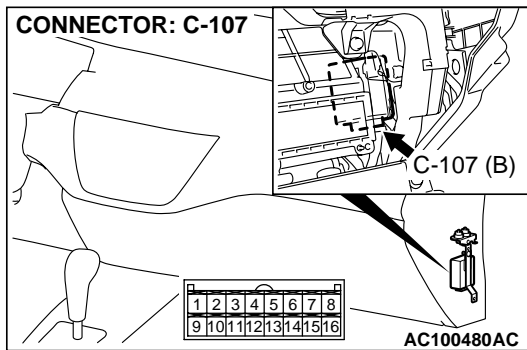


STEP 4. Check the harness wire between clutch pedal position switch connector C-130 terminal 2 and auto-cruise control-ECU connector C-107 terminal 13 for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair the harness wire and then check that the malfunction is eliminated.

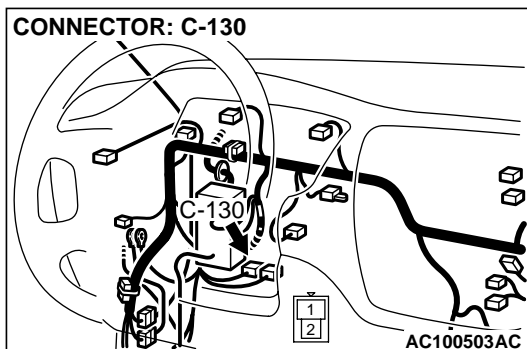


STEP 5. Check the harness wire between clutch pedal position switch connector C-130 terminal 1 and ground wire for damage.

Q: Is the harness wire in good condition?

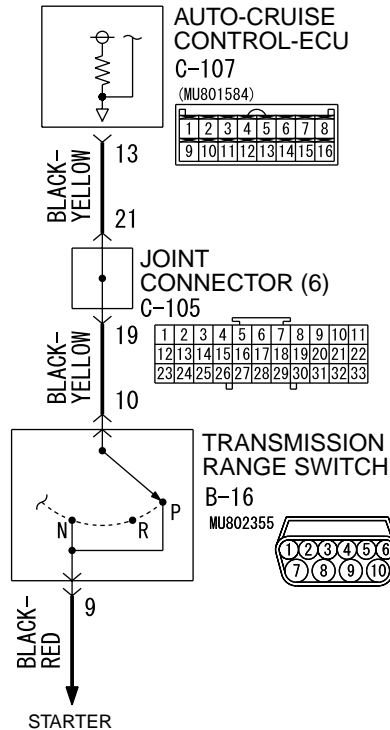
YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.

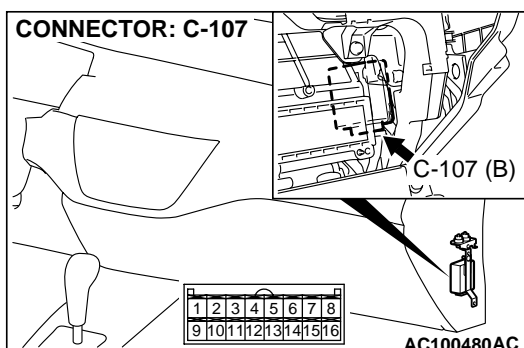
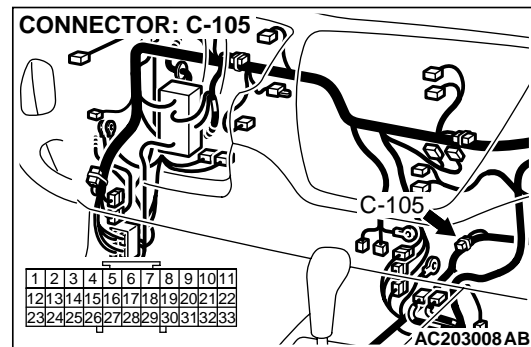
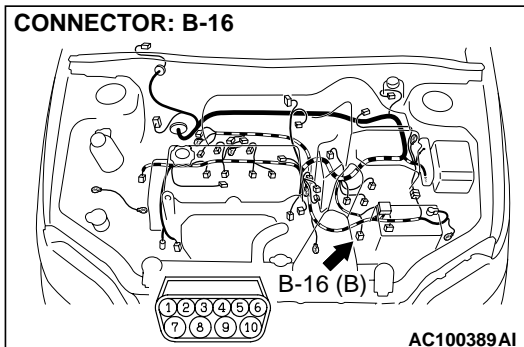


INSPECTION PROCEDURE 4: When the Selector Lever is Moved to "N" Range, Auto-cruise Control is not Cancelled <A/T>.

Transmission Range Switch Circuit



W4J17M01AA
AC308936



CIRCUIT OPERATION

This circuit transmits the "N" or "P" position signal of the transmission range switch to the auto-cruise control-ECU. When the transmission range switch is at the "N" or "P" position, auto-cruise control-ECU terminal number 13 will receive 0 volt.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably an open-circuit in the output signal circuit in "N" range.

TROUBLESHOOTING HINTS

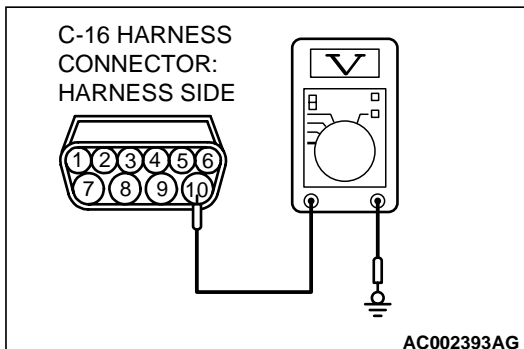
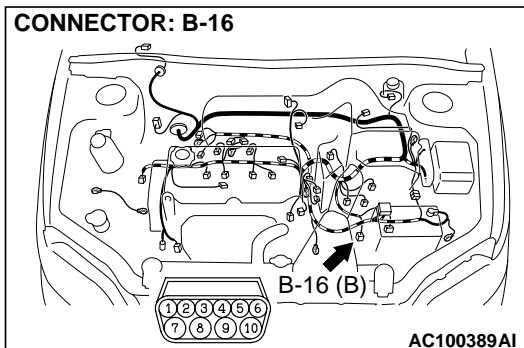
- Malfunction of the transmission range switch.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS**Required Special Tool:**

- MB991223: Harness Set

STEP 1. Check the output circuit voltage at transmission range switch connector B-16 by backprobing.

- (1) Do not disconnect transmission range switch connector B-16.
- (2) Turn the ignition switch to the "ON" position.



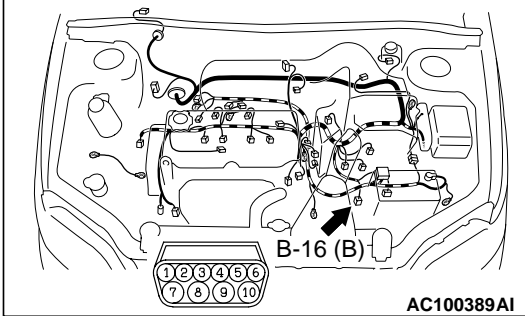
- (3) Measure the voltage between transmission range switch connector B-16 terminal 10 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When select lever is in a position other than "N" range.)
 - The measured voltage should measure 0.5 volts or less. (When select lever is in "N" range.)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Go to Step 2.

CONNECTOR: B-16



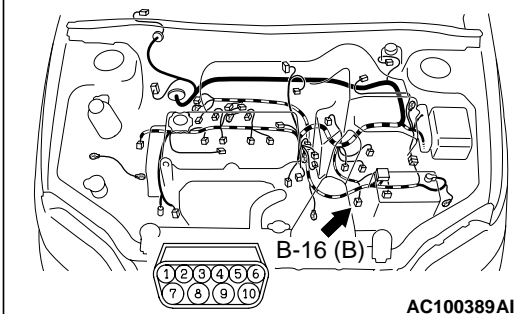
STEP 2. Check transmission range switch connector B-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 3.

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

CONNECTOR: B-16



STEP 3. Check the circuit at the transmission range switch.

(1) Disconnect the transmission range switch connector B-16.

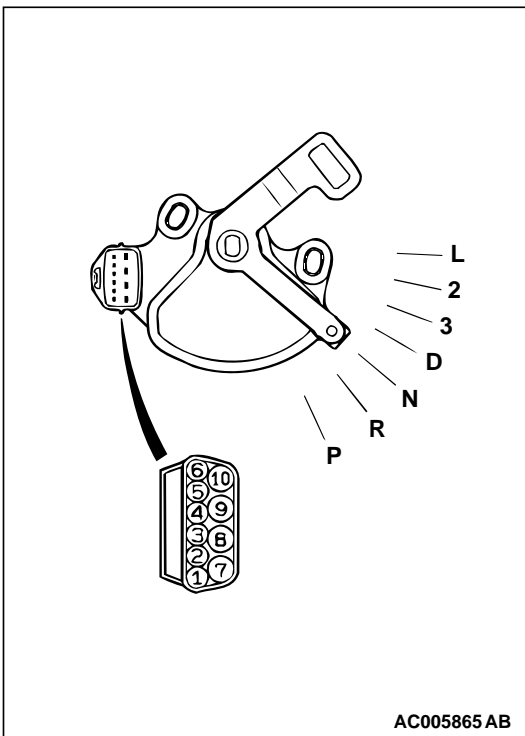
(2) Measure the continuity transmission range switch connector terminals.

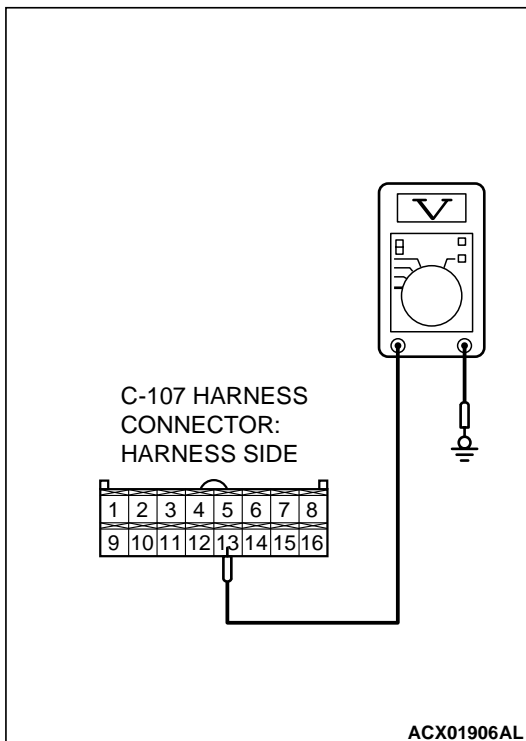
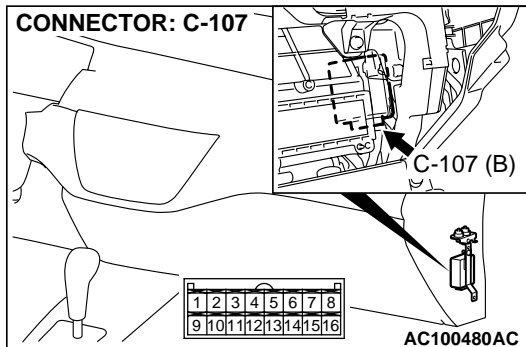
ITEMS	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
P	3 – 8, 9 – 10	Less than 2 ohms.
N	4 – 8, 9 – 10	

Q: Is the continuity meet the table above?

YES : Go to Step 4.

NO : Replace the transmission range switch. Refer to GROUP 23C, Transaxle [P.23C-9](#). Then check that the malfunction is eliminated.



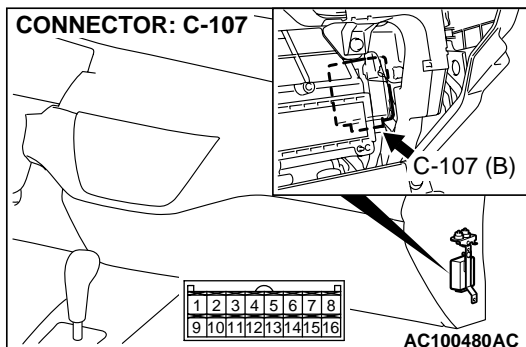
**STEP 4. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.**

- (1) Remove the auto-cruise control-ECU mounting nut. Refer to [P.17-120](#).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position.
- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 13 and ground by backprobing.
 - The measured voltage should measure battery positive voltage. (When select lever is in a position other than "N" range).
 - The measured voltage should measure 0.5 volts or less. (When select lever is in "N" range).
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

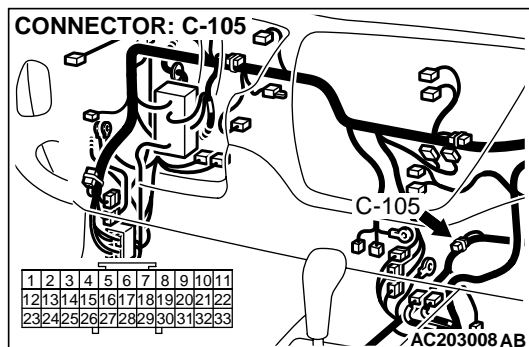
YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Go to Step 5.

**STEP 5. Check auto-cruise control-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.****Q: Are the connector and terminals in good condition?**

YES : Go to Step 6.

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

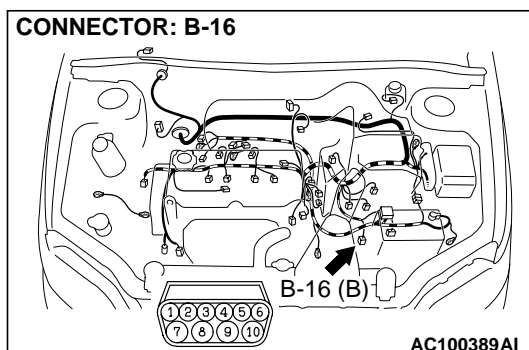


STEP 6. Check intermediate connector C-105 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 7.

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

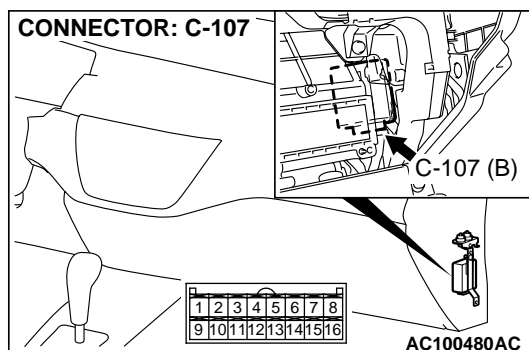


STEP 7. Check the harness wire between transmission range switch connector B-16 terminal 10 and auto-cruise control-ECU connector C-107 terminal 13 for damage.

Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.



INSPECTION PROCEDURE 5: When the Auto-cruise Control "CANCEL" Switch is Set to ON, Auto-cruise Control is not Cancelled.

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

- Malfunction of the auto-cruise control switch.

DIAGNOSIS

Replace the auto-cruise control switch (Refer to [P.17-120](#)). Then check the malfunction is eliminated.

INSPECTION PROCEDURE 6: Auto-cruise Control cannot be Set.

TECHNICAL DESCRIPTION (COMMENT)

The fail-safe function is probably cancelling auto-cruise control. In this case, scan tool MB991958 can be used to Retest the system in each system by checking the diagnostic trouble codes. The scan tool can also be used to check if the circuits of each input switch are normal or not by checking the input switch codes.

TROUBLESHOOTING HINTS

- Malfunction of the auto-cruise control switch.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991223: Harness Set

STEP 1. Can the auto-cruise control-ECU communicate with scan tool MB991958?

⚠ CAUTION

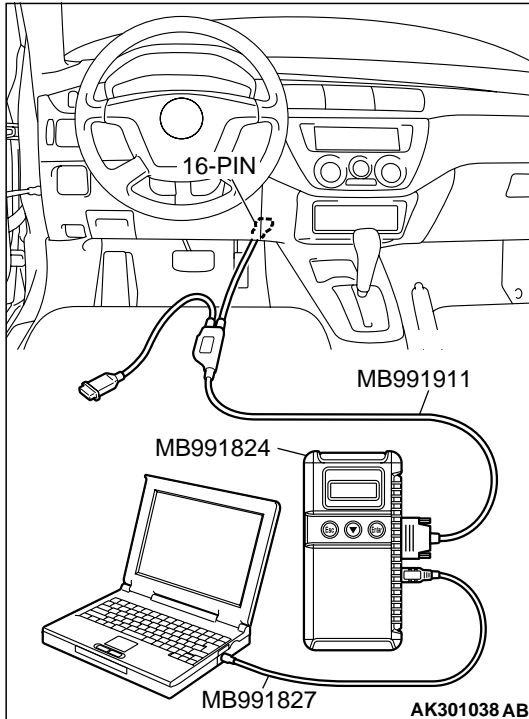
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK"(OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Using scan tool MB991958.
- (2) Connect scan tool MB991958 to the data link connector.
- (3) Turn the ignition switch to the "ON" position.

Q: Can the auto-cruise control-ECU communicate with the scan tool?

YES : Go to Step 2.

NO : Inspect each trouble symptom. (Refer to Inspection Procedure number 1 [P.17-68.](#))

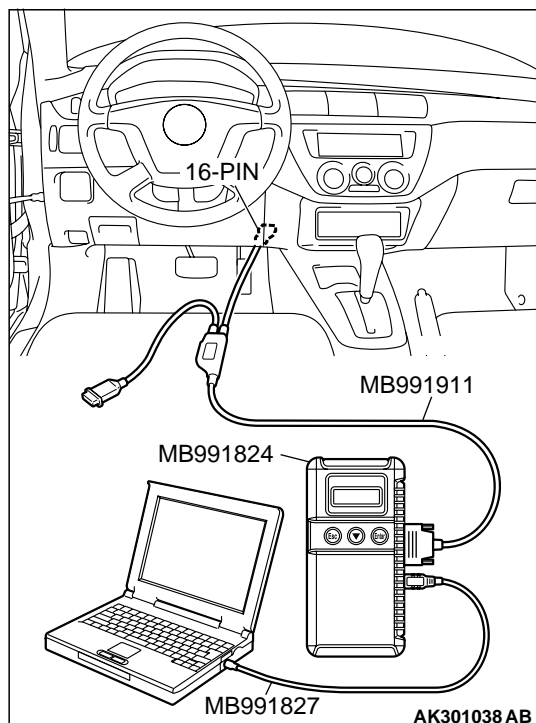


STEP 2. Is any diagnostic trouble code output?

Q: Is any diagnostic trouble code output?

YES : Diagnostic trouble code number 11, 12, 14, 15, 16 or 17 is output, refer to the following. (Code number 11 [P.17-18.](#)) (Code number 12 <M/T>[P.17-24](#) .) (Code number 12 <A/T>[P.17-26](#) .) (Code number 14 [P.17-28.](#)) (Code number 15 [P.17-43.](#)) (Code number 16 [P.17-52.](#)) (Code number 17 <M/T>[P.17-53](#) .) (Code number 17 <A/T>[P.17-60](#) .) Then check that the malfunction is eliminated.

NO : Go to Step 3.



STEP 3. Using scan tool MB991502 or MB991958, check data list.

⚠ 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) Using scan tool MB991958.
- (2) Connect scan tool MB991958 to the data link connector.
- (3) Check the following items in the data list.

Refer to [P.17-112](#), Data List Reference Table.

- Item 04: Auto-cruise control "CANCEL" switch.
- Item 05: Stoplight switch.
- Item 14: Clutch pedal position switch <M/T>.
- Item 14: Park/neutral position switch <A/T>.

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

Q: Is the check above meet the specifications?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU. (Refer to [P.17-120](#).) Then that the malfunction is eliminated.

NO : Follow the diagnostic trouble code procedures and the symptom procedures below. • Item 04: Refer to Diagnostic Trouble Code Procedures number 15 [P.17-43](#). • Item 05: Refer to Symptom Procedures number 2 [P.17-77](#). • Item 14: Refer to Symptom Procedures number 3 <M/T> [P.17-85](#) . • Item 14: Refer to Symptom Procedures number 4 <A/T> [P.17-91](#) .

INSPECTION PROCEDURE 7: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <M/T>.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably the malfunction of the vehicle speed sensor or incorrect vacuum in the auto-cruise control vacuum pump or actuator.

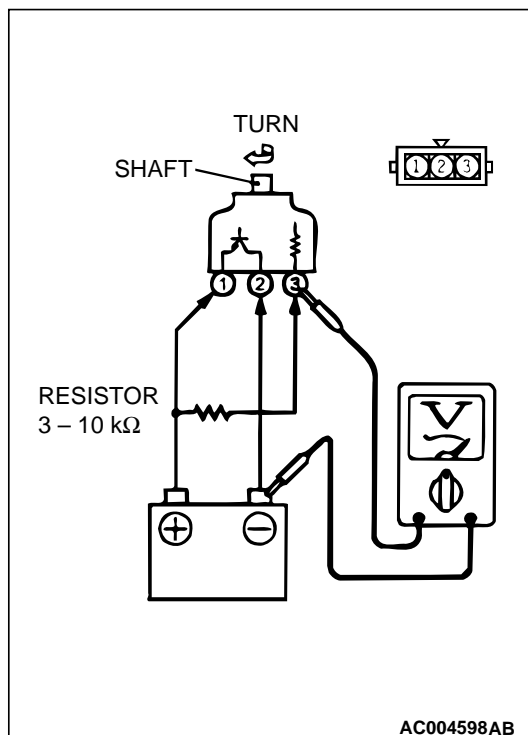
TROUBLESHOOTING HINTS

- Malfunction of the vehicle speed sensor.
- Malfunction of the auto-cruise control vacuum pump.
- Malfunction of the actuator.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set



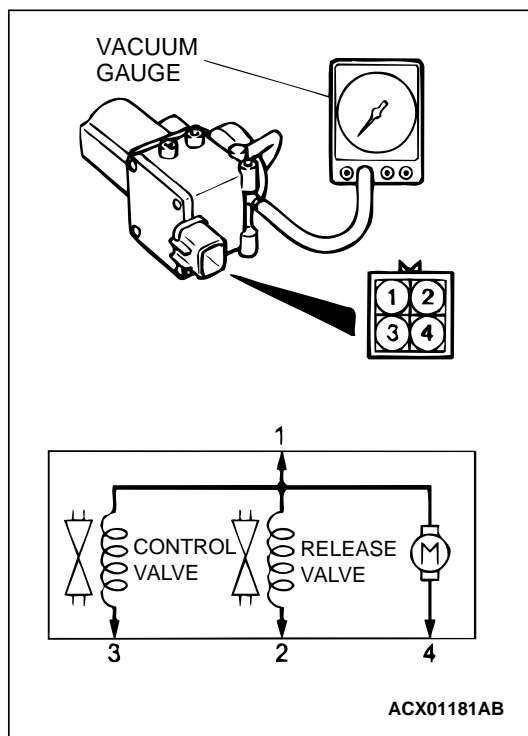
STEP 1. Check the vehicle speed sensor.

- (1) Remove the vehicle speed sensor and connect a 3 – 10-kΩ resistor as shown in the illustration.
- (2) Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 2 – 3. (one turn = four pulses)

Q: Is the voltage within specifications?

YES : Go to Step 2.

NO : Replace the vehicle speed sensor. Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#). Then check that the malfunction is eliminated.



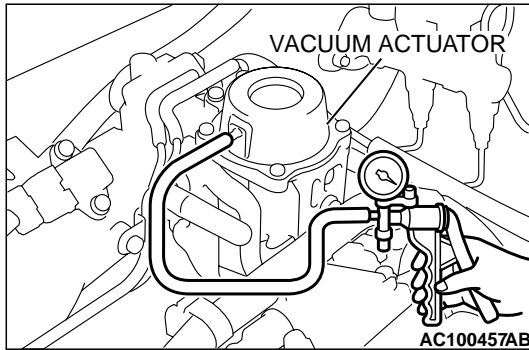
STEP2. Check the auto-cruise vacuum pump.

- (1) Disconnect the vacuum hose from the auto-cruise vacuum pump and connect a vacuum gauge to the vacuum pump.
- (2) Disconnect the vacuum pump connector.
- (3) Check the auto-cruise vacuum pump and valves according to the following procedure:
 - a. Connect the positive battery terminal to auto-cruise vacuum pump connector terminal 1, and the negative battery terminal to terminals 2, 3, and 4. Then the vacuum gauge should read 27 kPa (8.0 in Hg) or more.
 - b. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 2 is disconnected from the negative battery terminal while terminals 1, and 3 remain connected.
 - c. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 3 is disconnected from the negative battery terminal while terminals 1, and 2 remain connected.

Q: Are all of the above values satisfied?

YES : Go to Step 3.

NO : Replace the auto-cruise vacuum pump (Refer to [P.17-120](#)). Then that the malfunction is eliminated.

**STEP 3. Check the vacuum actuator.**

- (1) Disconnect the vacuum hose from the vacuum actuator, and then connect a hand vacuum pump to the vacuum actuator.
- (2) Apply a vacuum and check that the throttle lever moves and the vacuum is maintained.

Q: Is the vacuum actuator damaged?

YES : Replace the vacuum actuator. Refer to GROUP 13A, Throttle Body Assembly [P.13A-923](#). Then check that the malfunction is eliminated.

NO : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that the malfunction is eliminated.

INSPECTION PROCEDURE 7: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <A/T>.**TECHNICAL DESCRIPTION (COMMENT)**

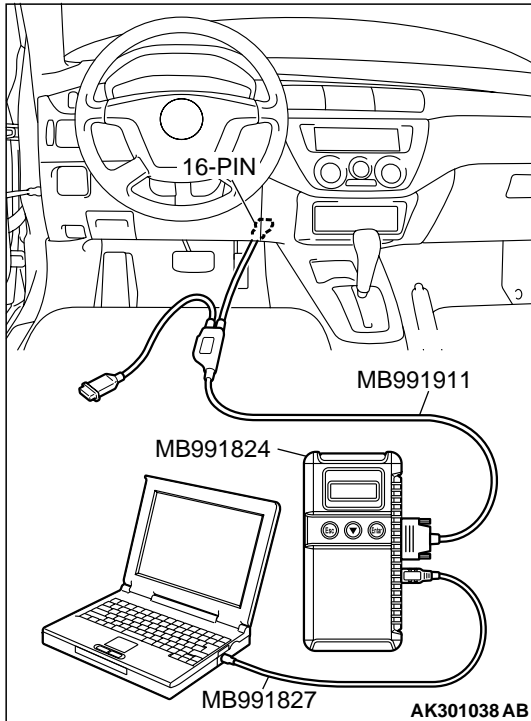
The cause is probably the malfunction of the output shaft speed sensor or PCM or incorrect vacuum in the auto-cruise control vacuum pump or actuator.

TROUBLESHOOTING HINTS

- Malfunction of the output shaft speed sensor.
- Malfunction of the PCM.
- Malfunction of the auto-cruise control vacuum pump.
- Malfunction of the actuator.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS**Required Special Tool:**

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991911: MUT-III Main Harness B
- MB991223: Harness Set



STEP 1. Check the vehicle speed signal.

⚠ 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) Using scan tool MB991958.
- (2) Connect scan tool MB991958 to the data link connector.
- (3) Turn the ignition switch to the "ON" position.
- (4) Read the MFI-DTC.
- (5) Turn the ignition switch to the "LOCK"(OFF) position.

Q: Is the MFI-DTC P0720 is output?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

NO : Go to Step 2.

STEP2. Check the auto-cruise vacuum pump.

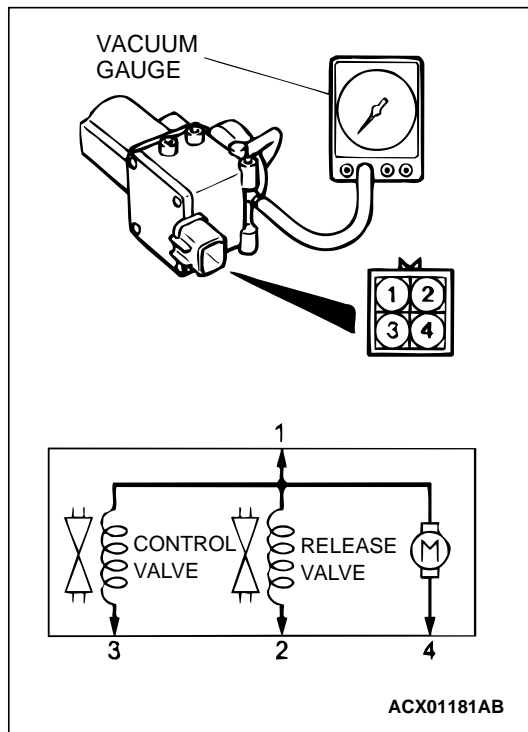
- (1) Disconnect the vacuum hose from the auto-cruise vacuum pump and connect a vacuum gauge to the vacuum pump.
- (2) Disconnect the vacuum pump connector.
- (3) Check the auto-cruise vacuum pump and valves according to the following procedure:

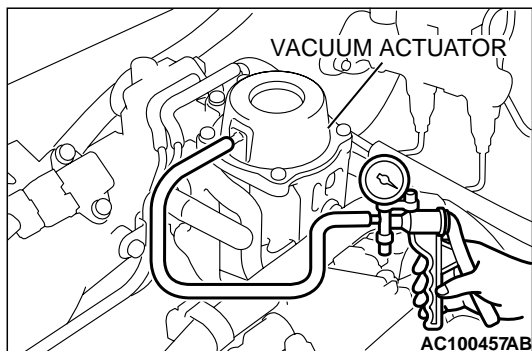
- a. Connect the positive battery terminal to auto-cruise vacuum pump connector terminal 1, and the negative battery terminal to terminals 2, 3, and 4. Then the vacuum gauge should read 27 kPa (8.0 in Hg) or more.
- b. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 2 is disconnected from the negative battery terminal while terminals 1, and 3 remain connected.
- c. The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 3 is disconnected from the negative battery terminal while terminals 1, and 2 remain connected.

Q: Are all of the above values satisfied?

YES : Go to Step 3.

NO : Replace the auto-cruise vacuum pump (Refer to [P.17-120](#)). Then that the malfunction is eliminated.



**STEP 3. Check the vacuum actuator.**

- (1) Disconnect the vacuum hose from the vacuum actuator, and then connect a hand vacuum pump to the vacuum actuator.
- (2) Apply a vacuum and check that the throttle lever moves and the vacuum is maintained.

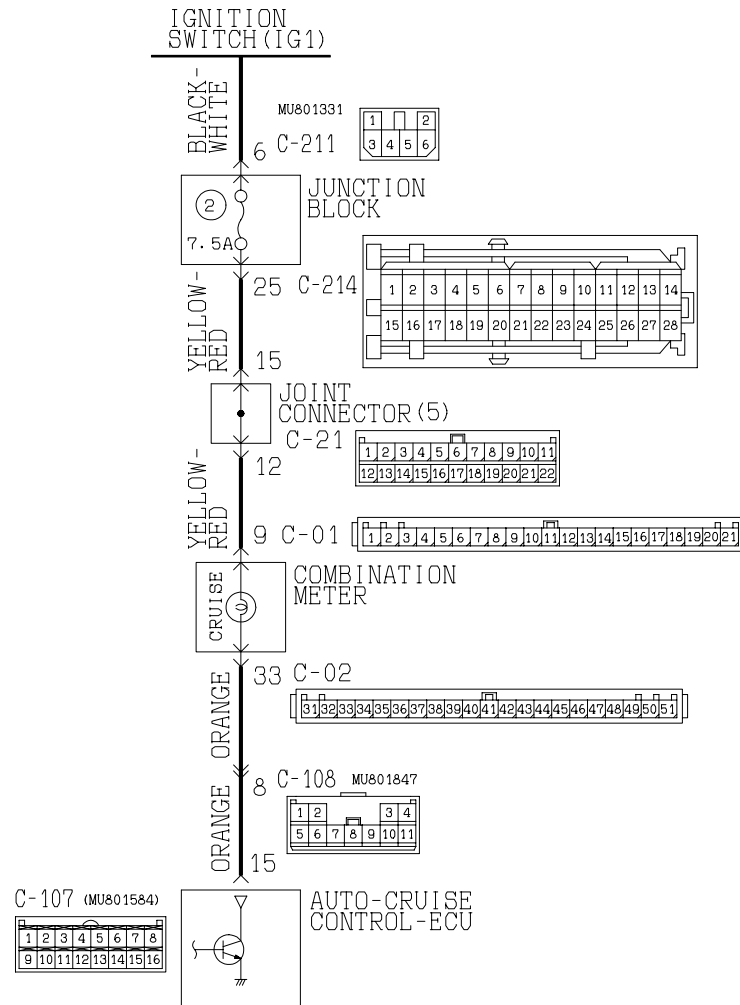
Q: Is the vacuum actuator damaged?

YES : Replace the vacuum actuator (Refer to GROUP 13A, Throttle Body Assembly [P.13A-923](#)). Then check that the malfunction is eliminated.

NO : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that the malfunction is eliminated.

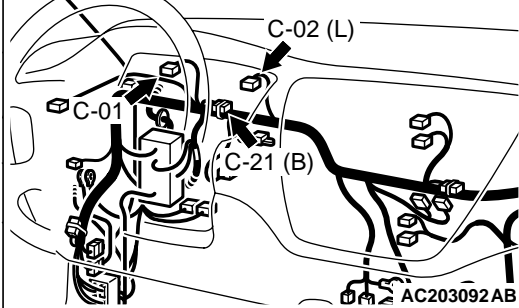
INSPECTION PROCEDURE 8: Auto-cruise Control Indicator Light inside Combination Meter does not Illuminate. (However, Auto-cruise Control is Normal.)

Auto-cruise Control Indicator Light Drive Circuit



W2J09M00AA

CONNECTORS: C-01, C-02, C-21



C-01

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----

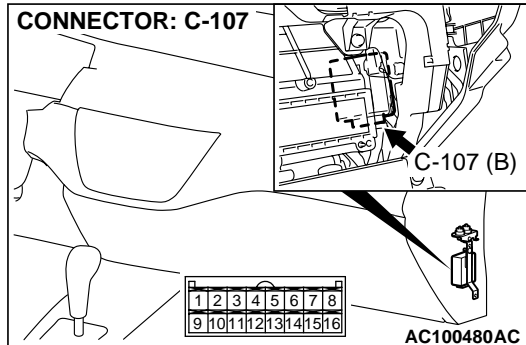
C-02

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

C-21

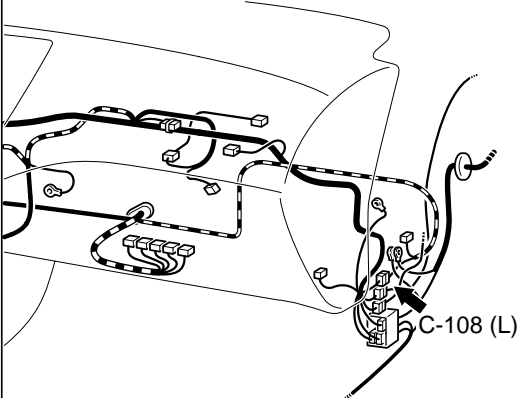
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

CONNECTOR: C-107



1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

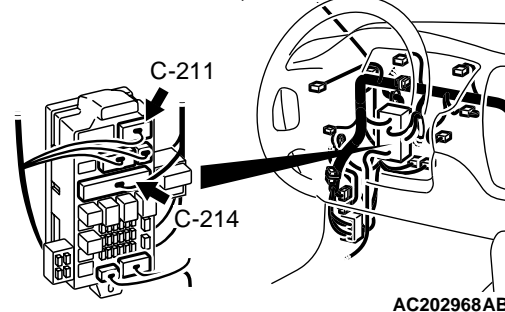
CONNECTOR: C-108



1	2	3	4
5	6	7	8
9	10	11	

AC309031AB

CONNECTORS: C-211, C-214



C-211

1	2
3	4
5	6

C-214

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28

CIRCUIT OPERATION

The power for the auto-cruise indicator in the combination meter is supplied from the ignition switch (IG1). When the auto-cruise control system is operating, the transistor inside the auto-cruise control-ECU illuminates the auto-cruise indicator through ECU terminal number 15.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably the malfunction of the indicator bulb or the malfunction of the connector or harness.

TROUBLESHOOTING HINTS

- Malfunction of the indicator bulb.
- Damaged harness or connector.
- Malfunction of the auto-cruise control-ECU.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the auto-cruise control indicator bulb.

- (1) Remove the combination meter (Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#)).
- (2) Check the auto-cruise control indicator bulb.

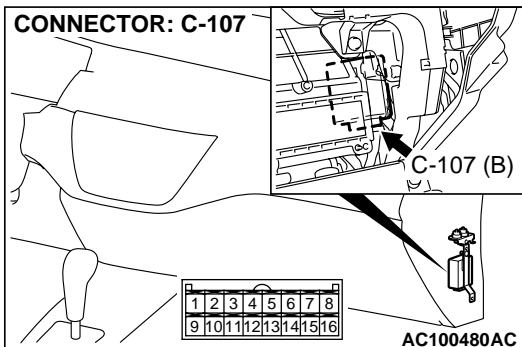
Q: Is the bulb blown?

YES : Replace the bulb. Then check that the malfunction is eliminated.

NO : Go to Step 2.

STEP 2. Measure the signal voltage at auto-cruise control-ECU connector C-107 by backprobing.

- (1) Remove the auto-cruise control-ECU mounting nut (Refer to [P.17-120](#)).
- (2) Do not disconnect auto-cruise control-ECU connector C-107.
- (3) Turn the ignition switch to the "ON" position.

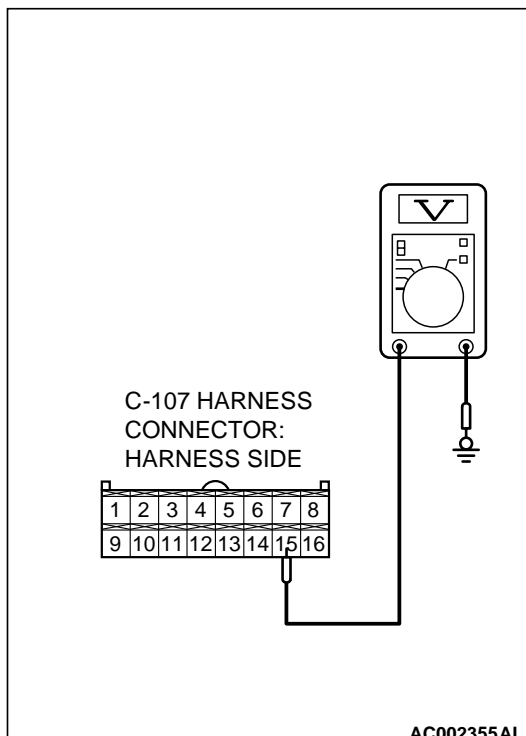


- (4) Measure the voltage between auto-cruise control-ECU connector C-107 terminal 15 and ground by backprobing.
 - The measured voltage should measure battery positive voltage.
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

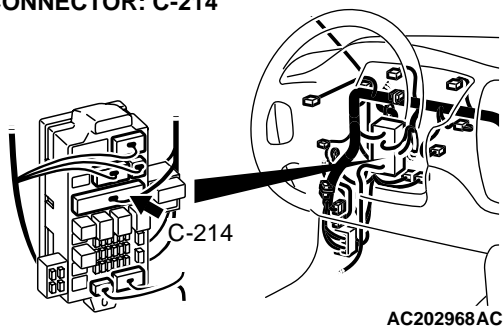
Q: Is the measured voltage battery positive voltage?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that the malfunction is eliminated.

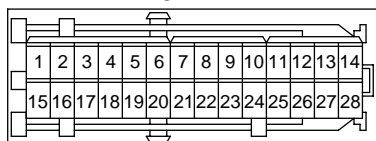
NO : Go to Step 3.



CONNECTOR: C-214



C-214

**STEP 3. Measure the signal voltage at junction block connector C-214 by backprobing.**

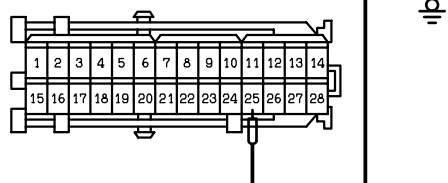
- (1) Do not disconnect junction block connector C-214.
- (2) Turn the ignition switch to the "ON" position.

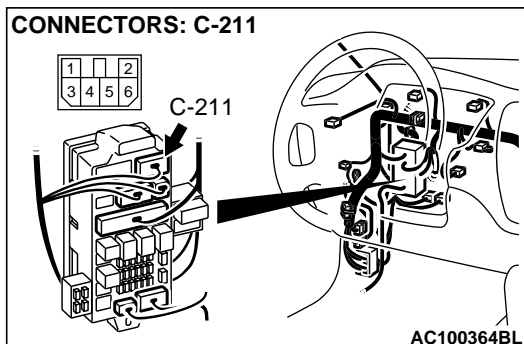
- (3) Measure the voltage between junction block connector C-214 terminal 25 and ground by backprobing.
 - The measured voltage should measure battery positive voltage.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 5.

NO : Go to Step 4.

C-214 HARNESS
CONNECTOR:
HARNESS SIDE

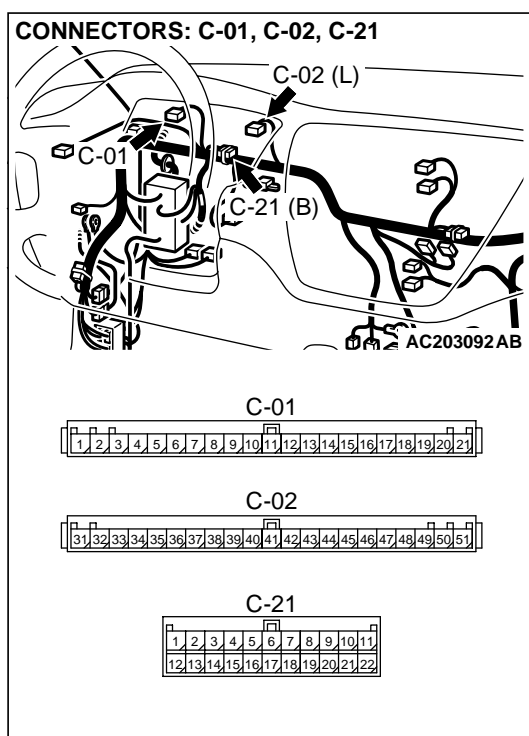


STEP 4. Check junction block connector C-211 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Replace the junction block. Then check that the malfunction is eliminated.

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



STEP 5. Check combination meter connectors C-01, C-02 and intermediate connector C-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

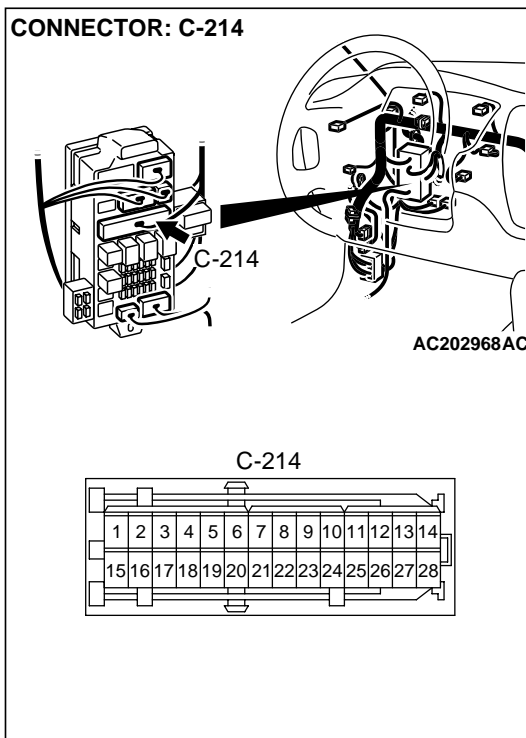
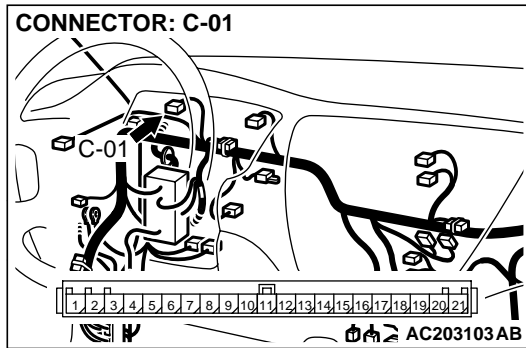
NO : Repair or replace connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then check that the malfunction is eliminated.

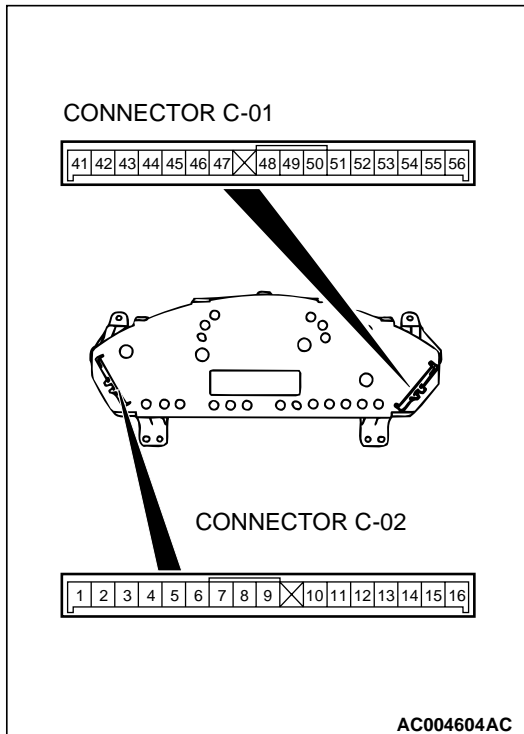
STEP 6. Check the harness wire between combination meter connector C-01 terminal 19 and junction block connector C-214 terminal 25 for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 7.

NO : Repair the harness wire and then check that the malfunction is eliminated.





STEP 7. Check the combination meter.

- (1) Remove the combination meter and measure at the combination meter side (Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#)).
- (2) Measure the continuity between combination meter C-01 terminal 9 and combination meter C-02 terminal 33.
 - The measured continuity should be less than 2 ohms.
- (3) Install the combination meter.

Q: Is the measured continuity less than 2 ohms?

YES : Go to Step 8.

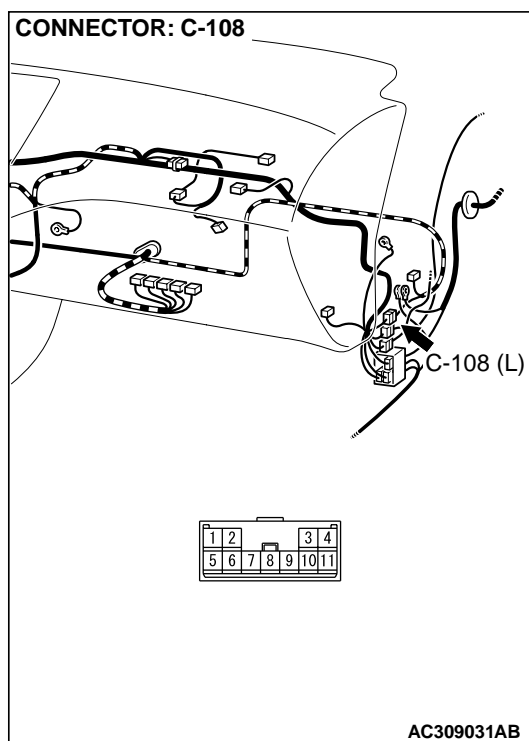
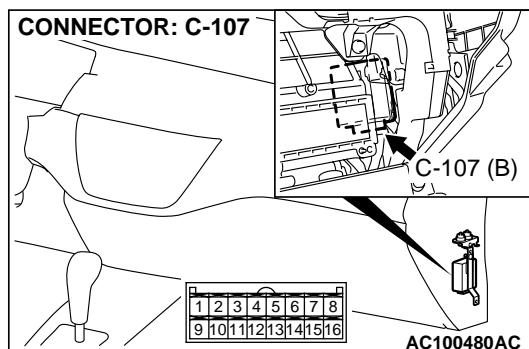
NO : Replace the combination meter (Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#)). Then check that the malfunction is eliminated.

STEP 8. Check auto-cruise control-ECU connector C-107 and intermediate connector C-108 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 9.

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

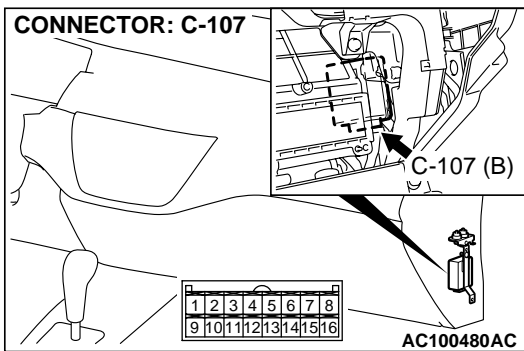
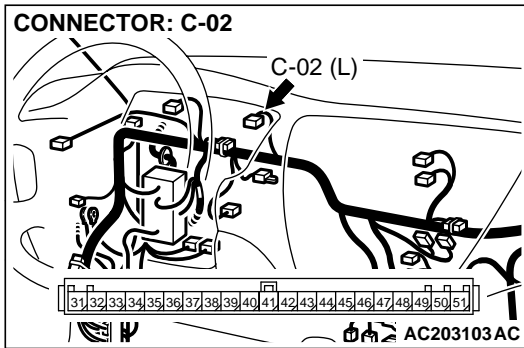


STEP 9. Check the harness wire between combination meter connector C-02 terminal 33 and auto-cruise control-ECU connector C-107 terminal 15 for damage.

Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the auto-cruise control-ECU (Refer to [P.17-120](#)). Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.



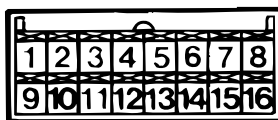
DATA LIST REFERENCE TABLE

M1172002400330

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM		INSPECTION REQUIREMENT	NORMAL CONDITION
CANCEL SWITCH	04	Auto-cruise control switch	CANCEL	CANCEL switch: "ON"	ON
				CANCEL switch: "OFF"	OFF
IDLE SW SIG	08	Closed throttle position switch		Accelerator pedal: Depressed	OFF
				Accelerator pedal: Released	ON
MAIN SW	01	Auto-cruise control switch	MAIN	MAIN switch: "ON"	ON
				MAIN switch: "OFF"	OFF
OD OFF	15	A/T control signal		No "OD-OFF" request	OFF
				"OD-OFF" request	ON
PNP SW/CLUTCH	14	Clutch pedal position switch <M/T>		Clutch pedal: Depressed	ON
				Clutch pedal: Released	OFF
		Transmission range switch <A/T>		Selector lever: "P" or "N" position	ON
				Selector lever: Other than "P" or "N" position	OFF
RESUME SWITCH	03	Auto-cruise control switch	RESUME	RESUME switch: "ON"	ON
				RESUME switch: "OFF"	OFF
SET SWITCH	02		SET	SET switch: "ON"	ON
				SET switch: "OFF"	OFF
STOPLIGHT SW	05	Stoplight switch		Brake pedal: Depressed	ON
				Brake pedal: Released	OFF
TP SENSOR	13	Throttle position sensor	Ignition switch: "ON"	Accelerator pedal: Released	335 – 935 mV
				Accelerator pedal: Depressed	Increases in proportion to throttle opening angle.
				Accelerator pedal: Fully depressed	4,390 – 5,290 mV
VSS	10	Vehicle speed sensor		Road test the vehicle	The speedometer and scan tool MB991958 display the same value.

CHECK AUTO-CRUISE CONTROL-ECU TERMINALS

M1172002700319



ACX02234

TERMINAL NO.	INSPECTION ITEM	INSPECTION CONDITIONS		NORMAL CONDITION
1	Throttle position sensor input	When accelerator pedal is fully depressed		4.0 – 5.5 V
		When accelerator pedal is released		0.4 – 1.0 V
2	Power train control module output (Closed throttle position switch)	When accelerator pedal is depressed		4.0 – 5.5 V
		When accelerator pedal is not depressed		2.5 V or less
3	A/T control output	Ignition switch: "ON" position		Battery positive voltage
4	Stoplight switch input	When brake pedal is depressed	When stoplight switch is ON	Battery positive voltage
		When brake pedal is not depressed	When stoplight switch is OFF	0 V
5	Pump power supply	Ignition switch: "ON" position Stoplight switch: OFF		10 V or more
6	ECU power supply	Ignition switch: "ON" position		Battery positive voltage
7	Release valve	When decelerating with the "SET" switch while driving at constant speed		1 V or less
8	Control valve			10 V or more
7	Release valve	When cancelling constant speed driving with the "CANCEL" switch		10 V or more
8	Control valve			Battery positive voltage
9	Auto-cruise control switch input	When main switch is "ON"		Approximately 7.0 V
		When input switch has not been operated	When all switches are OFF	3.5 – 5.0 V
		When input switch is pushed down	When "SET" switch is ON	0.4 – 2.3 V
		When input switch is pushed up	When "RESUME" switch is ON	2.3 – 3.5 V
		When input switch is pulled forward	When "CANCEL" switch is ON	0.4 V or less
10	Vehicle speed signal input	Ignition switch: "ON" position	Move the vehicle forward slowly	0 and 8 – 12 V alternate
12	ACC power supply	When ignition switch is in "ACC" position Main switch: "ON"		Battery positive voltage

TERMINAL NO.	INSPECTION ITEM	INSPECTION CONDITIONS		NORMAL CONDITION
13	Clutch pedal position switch input <M/T>	When pedal is not depressed	When clutch pedal position switch is OFF	Battery positive voltage
		When pedal is depressed	When clutch pedal position switch is ON	0 V
	Transmission range switch input <A/T>	When select lever is in a position other than N range	When transmission range switch is OFF	Battery positive voltage
		When select lever is in N range	When transmission range switch is ON	0 V
14	Ground	At any time		0 V
15	"CRUISE" indicator light input (inside combination meter)	When indicator light is illuminated		0 V
		When indicator light is switch off		Battery positive voltage
16	Auto-cruise vacuum pump motor input	When driving at constant speed using the "SET" switch	Motor stopped/running	Battery positive voltage/0 V
		When accelerating with the "RESUME" switch while driving at constant speed	Motor stopped/running	Battery positive voltage/0 V
		When decelerating with the "SET" switch while driving at constant speed	Motor stopped	Battery positive voltage
		When cancelling constant speed driving with the "CANCEL" switch	Motor stopped	Battery positive voltage

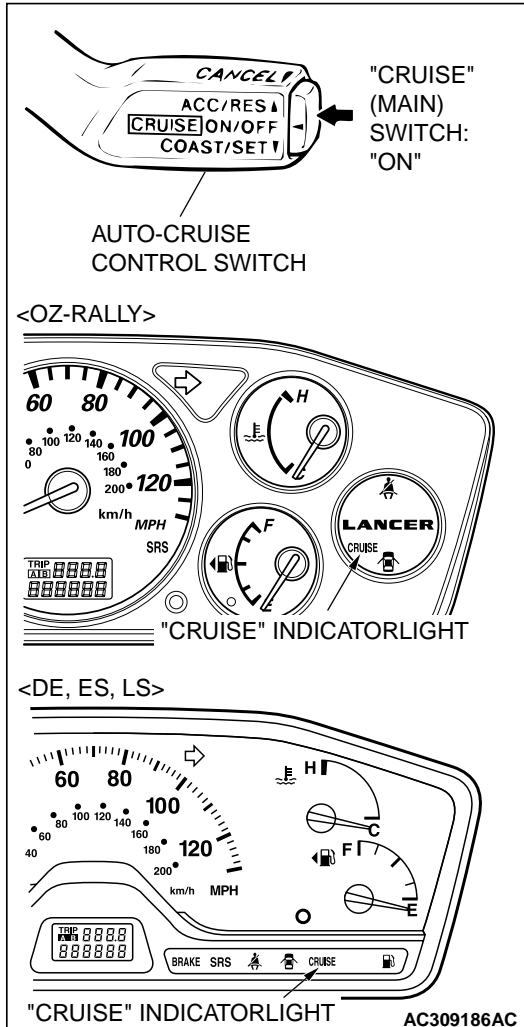
ON-VEHICLE SERVICE

AUTO-CRUISE CONTROL SWITCH CHECK

M1172001100303

AUTO-CRUISE CONTROL MAIN SWITCH CHECK

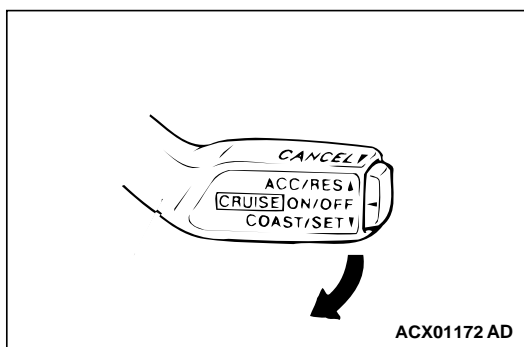
1. Turn the ignition switch to the "ON" position.
2. Check that the "CRUISE" indicator light within the combination meter illuminates when the "CRUISE" (MAIN) switch is switched "ON".



AUTO-CRUISE CONTROL SETTING

1. Switch "ON" the "CRUISE" (MAIN) switch.
2. Drive at the desired speed, above approximately 40 km/h (25 mph).
3. Push the auto-cruise control switch in the direction of arrow.
4. Check to be sure that when the switch is released the speed is the desired constant speed.

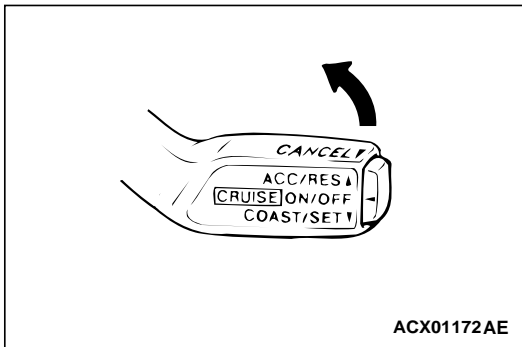
NOTE: If the vehicle's speed decreases to approximately 15 km/h (9 mph) below the set speed because of climbing a hill for example, the auto-cruise control will be cancelled.



SPEED-INCREASE SETTING

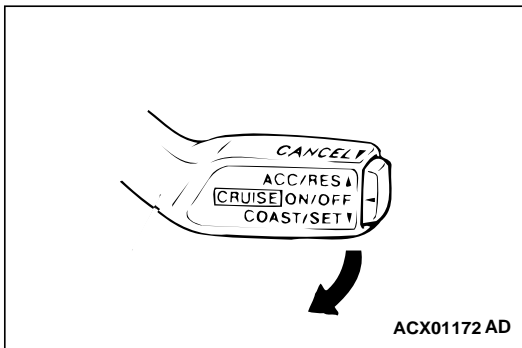
1. Set to the desired speed.
2. Push the auto-cruise control switch in the direction of arrow.
3. Check to be sure that acceleration continues while the switch is held, and that after it is released the constant speed at the time when it was released becomes the driving speed.

NOTE: Acceleration can be continued even if the vehicle speed has passed the high-speed limit [approximately 200 km/h (124 mph)]. But the speed when the auto-cruise control switch is released will be recorded as the high-speed limit.

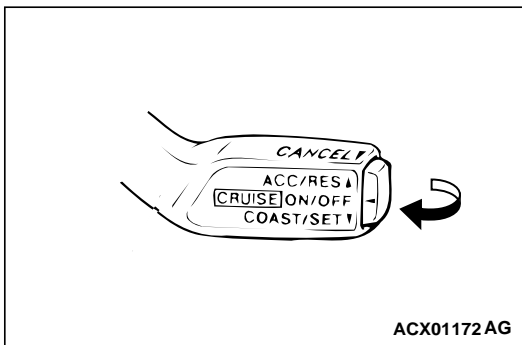
**SPEED-REDUCTION SETTING**

1. Set to the desired speed.
2. Push the auto-cruise control switch in the direction of arrow.
3. Check to be sure that deceleration continues while the switch is pressed, and that after it is released the constant speed at the time when it was released becomes the driving speed.

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

**RETURN TO THE SET SPEED BEFORE CANCELLATION AND AUTO-CRUISE CONTROL CANCELLATION**

1. Set the auto-cruise speed control.
2. When any of the following operations are performed while at constant speed during auto-cruise control, check if normal driving is resumed and deceleration occurs.
 - (1) The auto-cruise control switch is pulled in the direction of arrow.
 - (2) The brake pedal is depressed.
 - (3) The selector lever is moved to the "N" range.
3. At a vehicle speed of 40 km/h (25 mph) or higher, check if when the "ACC/RES" switch is switched ON, the vehicle speed returns to the speed before auto-cruise control driving was cancelled, and constant speed driving occurs.
4. When the "CRUISE" (MAIN) switch is turned to the "OFF" while driving at constant speed, check if normal driving is resumed and deceleration occurs.

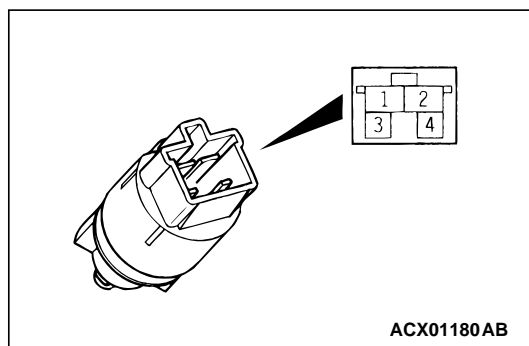


AUTO-CRUISE CONTROL SYSTEM COMPONENT CHECK

M1172001700349

STOPLIGHT SWITCH

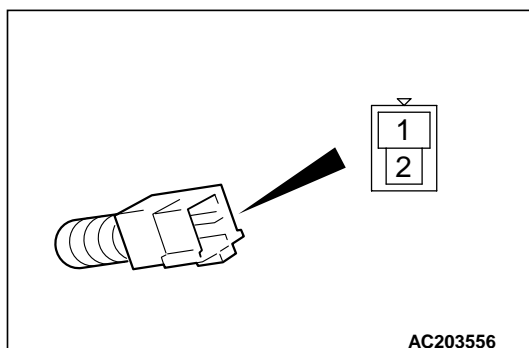
1. Disconnect the connector.
2. Check for continuity between the terminals of the switch.



MEASUREMENT CONDITION	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
When brake pedal is depressed.	1 – 2 (for stoplight circuit)	Less than 2 ohms
	3 – 4 (for auto-cruise control circuit)	Open circuit
When brake pedal is not depressed.	1 – 2 (for stoplight circuit)	Open circuit
	3 – 4 (for auto-cruise control circuit)	Less than 2 ohms

CLUTCH PEDAL POSITION SWITCH <M/T>

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



MEASUREMENT CONDITIONS	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
When clutch pedal is depressed.	1 – 2	Less than 2 ohms
When clutch pedal is not depressed.	1 – 2	Open circuit

TRANSMISSION RANGE SWITCH ("N" POSITIN)

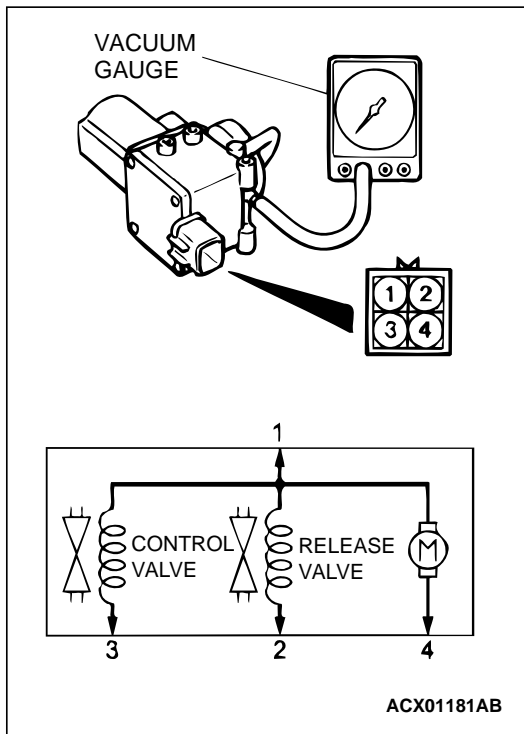
Refer to GROUP 23A, On-vehicle Service – Essential Service [P.23A-339](#).

THROTTLE POSITION SENSOR

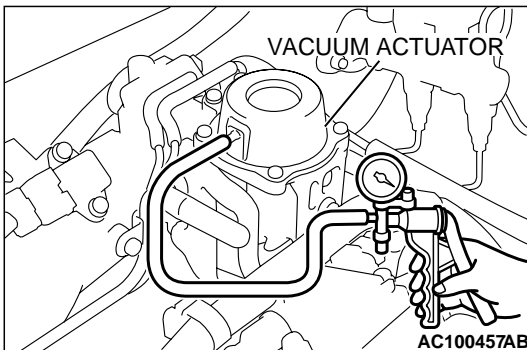
Refer to GROUP 13A, On-vehicle Service – Throttle Position Sensor Check [P.13A-912](#).

AUTO-CRUISE VACUUM PUMP

1. Disconnect the vacuum hose from the auto-cruise vacuum pump and connect a vacuum gauge to the vacuum pump.
2. Disconnect the vacuum pump connector.
3. Check the auto-cruise vacuum pump and valves according to the following procedure:
 - (1) Connect the positive battery terminal to auto-cruise vacuum pump connector terminal 1, and the negative battery terminal to terminals 2, 3, and 4. Then the vacuum gauge should read 27 kPa (8.0 in Hg) or more.
 - (2) The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 2 is disconnected from the negative battery terminal while terminals 1, and 3 remain connected.
 - (3) The vacuum should be maintained when terminal 4 is disconnected from the negative battery terminal while terminals 1, 2, and 3 remain connected. Then the vacuum gauge should read 0 kPa (0 in Hg) when terminal 3 is disconnected from the negative battery terminal while terminals 1, and 2 remain connected.

**VACUUM ACTUATOR**

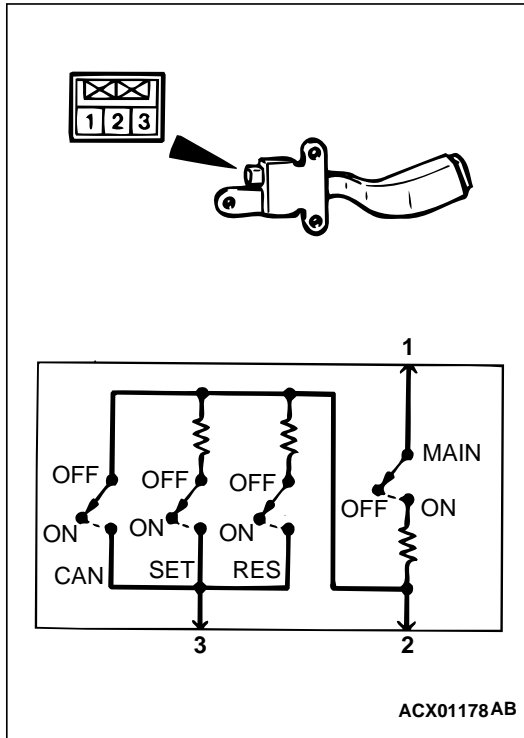
1. Disconnect the vacuum hose from the vacuum actuator, and connect a hand vacuum pump to the actuator.
2. Check that the throttle lever operates when applying vacuum, and the vacuum is maintained.



AUTO-CRUISE CONTROL CHECK

Measure the resistance between the terminals when each of the "COAST/SET", "ACC/RES", "CANCEL" and "CRUISE" (MAIN) switches is pressed. If the values measured at the time correspond to those in the table below, the resistance values are correct.

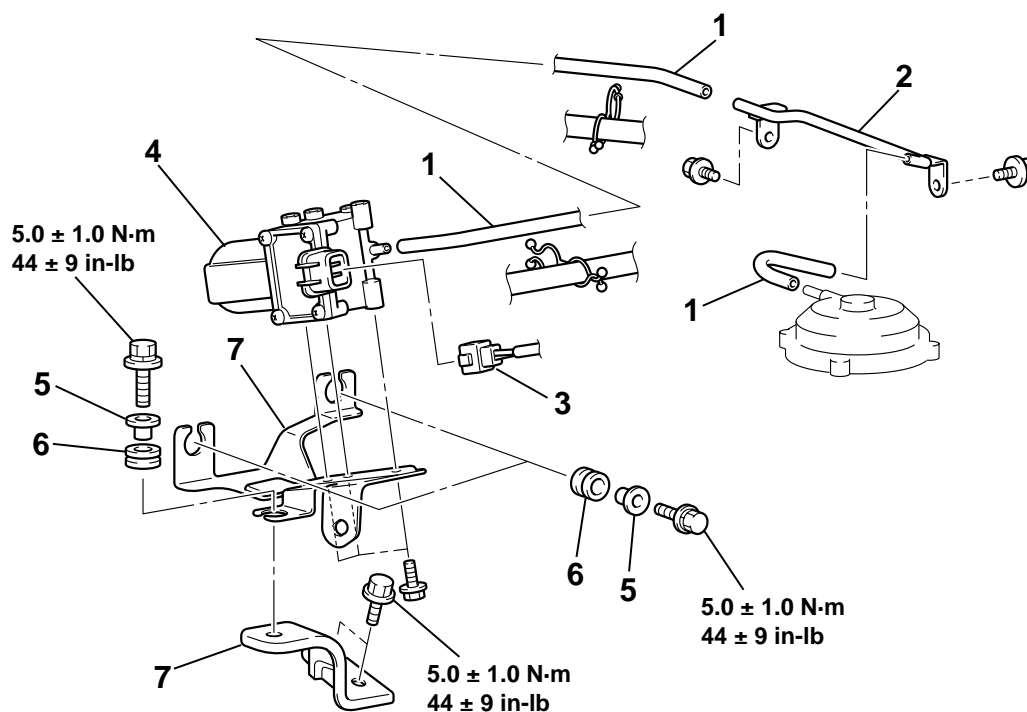
SWITCH POSITION	RESISTANCE BETWEEN TERMINALS	
"CRUISE" (MAIN) switch "OFF"	Terminals 1 and 2	Less than 2 ohms
"CRUISE" (MAIN) switch "ON"	Terminals 1 and 2	Approximately 3.9 k Ω
"CANCEL" switch ON	Terminals 2 and 3	Approximately 0 Ω
"ACC/RES" switch ON	Terminals 2 and 3	Approximately 910 Ω
"COAST/SET" switch ON	Terminals 2 and 3	Approximately 220 Ω

**VEHICLE SPEED SENSOR CHECK <M/T>**

Refer to GROUP 54A, Combination Meters Assembly and Vehicle Speed Sensor – Inspection [P.54A-46](#).

AUTO-CRUISE CONTROL REMOVAL AND INSTALLATION <ACTUATOR>

M1172001400304



AC100458AB

REMOVAL STEPS

1. VACUUM HOSE
2. VACUUM PIPE
3. WIRING CONNECTOR
4. VACUUM PUMP ASSEMBLY

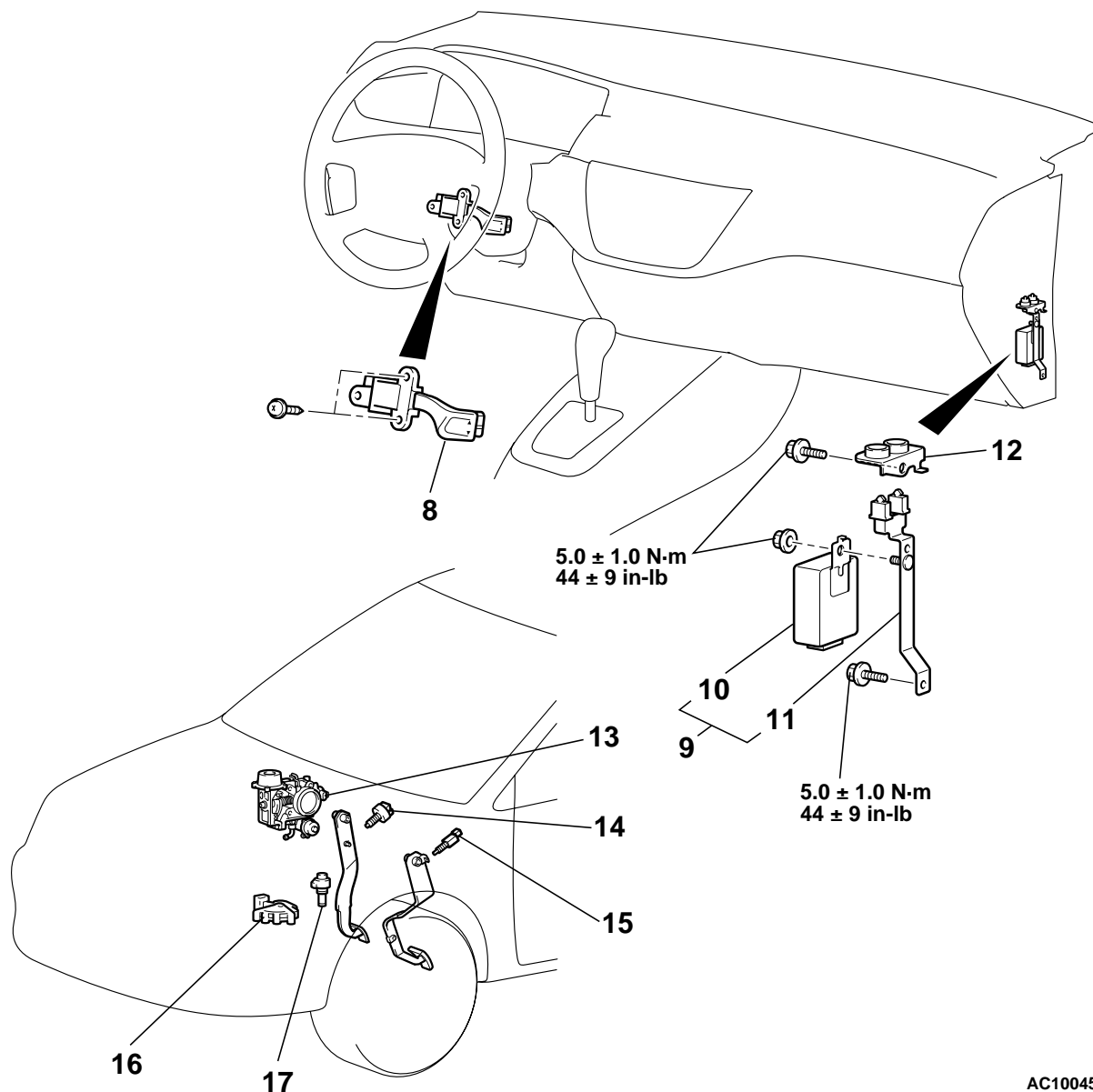
REMOVAL STEPS (Continued)

5. SPACER
6. RUBBER MOUNT
7. PUMP BRACKET

<SWITCHES, CONTROL UNIT AND SENSORS>

⚠ WARNING

Before removal of the air bag module, refer to **GROUP 52B, SRS Service Precautions and GROUP 52B, Air Bag Module and Clock Spring.**



AC100459AB

CONTROL SWITCH REMOVAL STEPS

- STEERING WHEEL (REFER TO GROUP 37A, STEERING WHEEL AND SHAFT [P.37A-25.](#))
- 8. AUTO-CRUISE CONTROL SWITCH

CONTROL UNIT REMOVAL STEPS

- GLOVE BOX (REFER TO GROUP52A, INSTRUMENT PANEL [P.52A-3.](#))
- COWL SIDE TRIM (REFER TO GROUP52A, TRIMS [P.52A-3.](#))
- 9. AUTO-CRUISE CONTROL-ECU AND BRACKET ASSEMBLY
- 10. AUTO-CRUISE CONTROL-ECU
- 11. LOWER BRACKET
- 12. UPPER BRACKET

SENSOR REMOVAL STEPS

13. THROTTLE POSITION SENSOR
14. STOPLIGHT SWITCH (REFER TO
GROUP 35A, BRAKE PEDAL
[P.35A-34.](#))
15. CLUTCH PEDAL POSITION
SWITCH <M/T> (REFER TO
GROUP 21A, CLUTCH PEDAL
[P.21A-12.](#))
16. TRANSMISSION RANGE SWITCH
<A/T> (REFER TO GROUP 23C,
TRANSAXLE [P.23C-9.](#))
17. VEHICLE SPEED SENSOR <M/T>

AUTO-CRUISE CONTROL <2.4L ENGINE>

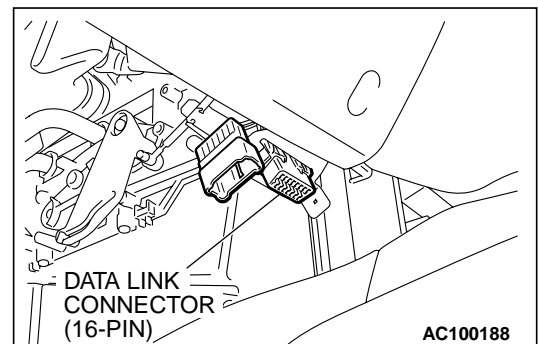
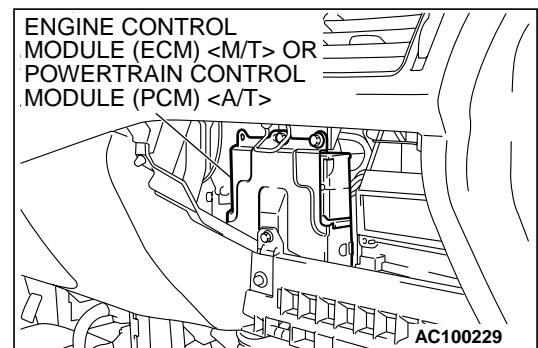
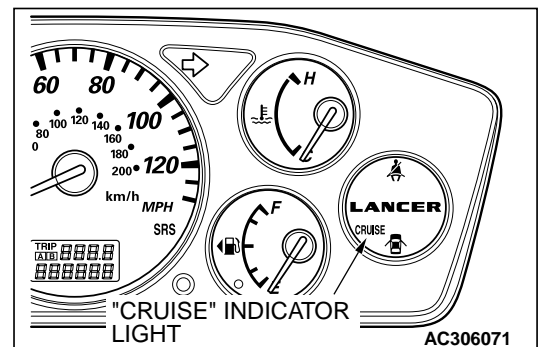
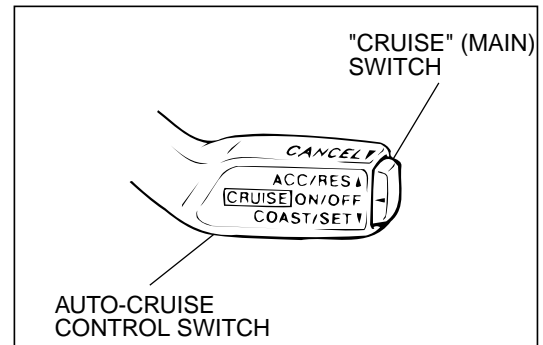
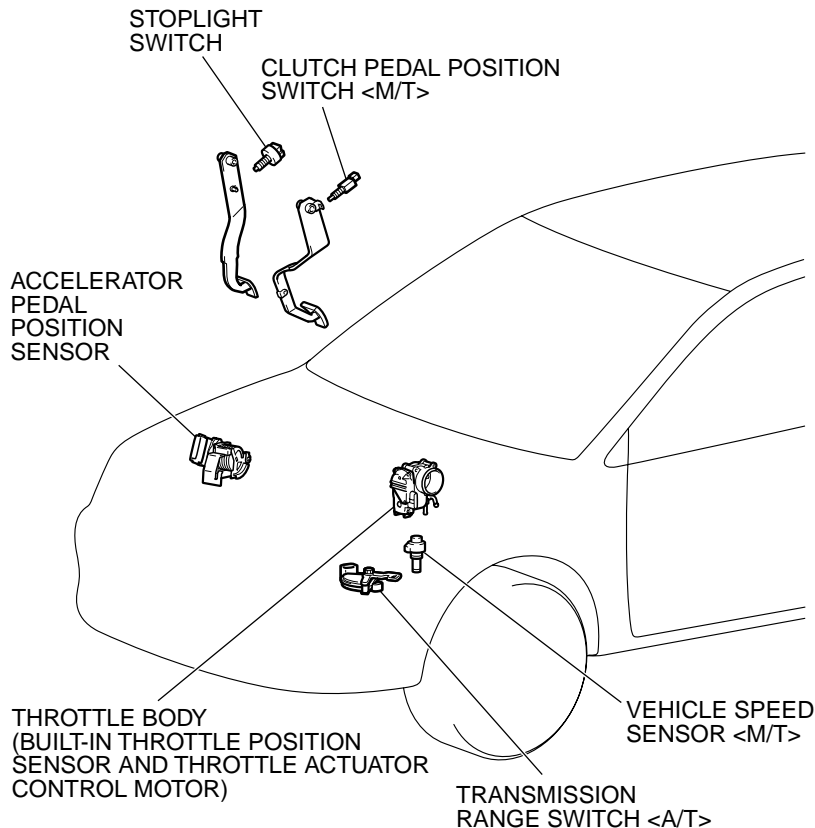
GENERAL DESCRIPTION

By using the auto-cruise control, the driver can select and maintain a desired cruising speed [between 40 km/h (25 mph) and 200 km/h (124 mph)] without depressing the accelerator pedal.

For this auto-cruise control system, in conjunction with the electronic throttle valve control system, the engine control module (ECM) <M/T> or powertrain control module (PCM) <A/T> electronically controls the throttle valve.

M1172000100311

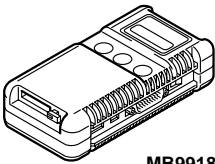
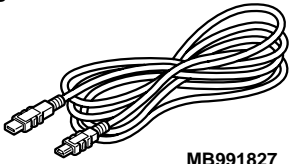
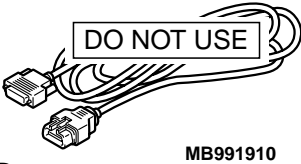
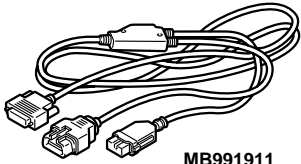
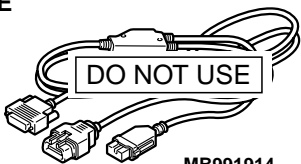
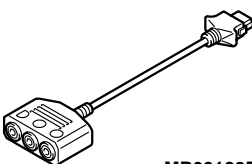
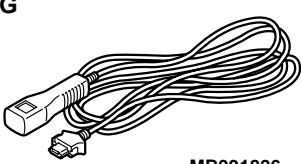
CONSTRUCTION DIAGRAM


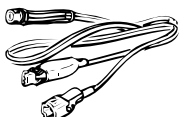
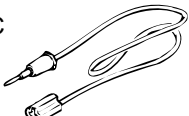



AC309161AB

SPECIAL TOOLS

M1172000600316

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>A</p>  <p>MB991824</p> <p>B</p>  <p>MB991827</p> <p>C</p>  <p>MB991910</p> <p>D</p>  <p>MB991911</p> <p>E</p>  <p>MB991914</p> <p>F</p>  <p>MB991825</p> <p>G</p>  <p>MB991826 MB991958</p>	<p>MB991958</p> <p>A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>MUT-III sub assembly</p> <p>A: Vehicle communication interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-iii Main Harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III trigger harness</p>	<p>MB991824-KIT</p> <p><i>NOTE: G: MB991826 MUT-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</i></p>	<p>Diagnostic trouble code check.</p> <p>CAUTION</p> <p>MUT-III Main Harness B (MB991911) should be used. MUT-III main harness A and C should not be used for this vehicle.</p>

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>A</p>  <p>B</p>  <p>C</p>  <p>D</p>  <p>MB991223AD</p>	<p>MB991223</p> <p>A: MB991219</p> <p>B: MB991220</p> <p>C: MB991221</p> <p>D: MB991222</p> <p>Harness set</p> <p>A: Inspection harness</p> <p>B: LED harness</p> <p>C: LED harness adapter</p> <p>D: Probe</p>	General service tools	Checking the continuity and measuring the voltage at the harness connector

AUTO-CRUISE CONTROL SYSTEM DIAGNOSIS

INTRODUCTION TO AUTO-CRUISE CONTROL SYSTEM DIAGNOSIS

M1172003300273

The auto-cruise control system allows driving without stepping on the accelerator pedal by setting a random speed between 40 km/h (25 mph) and 200 km/h (124 mph). Problems in this system can be investigated by the following methods.

Auto-cruise control system diagnostic trouble codes

The auto-cruise control system consists of the engine control module (ECM) <M/T> or powertrain control module (PCM) <A/T>, control switches and sensors. The control switches and sensors monitor the state of the vehicle. The ECM <M/T> or PCM

<A/T> controls the throttle valve opening angle in the throttle body in accordance with the input signals from the switches and sensors. If the ECM <M/T> or PCM <A/T> detects a problem on any of those components, the ECM <M/T> or PCM <A/T> estimates where the problem may be occurring, and will set a diagnostic trouble code. Diagnostic trouble codes cover the auto-cruise control switch, stoplight switch and ECM <M/T> or PCM <A/T>.

AUTO-CRUISE CONTROL SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1172002000291

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

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any auto-cruise control system DTC.
4. If you can verify the condition but no auto-cruise control system DTCs are set, and the malfunction may be intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-6.
5. If you can verify the condition but there are no auto-cruise control system DTCs, or the system cannot communicate with scan tool MB991958 (MUT-III sub assembly), refer to P.17-169, Symptom Chart, and find the fault.
6. If there is an auto-cruise control system DTC, record the number of the code, then erase the code from vehicle memory using the scan tool.
7. Re-create the auto-cruise control system DTC set conditions to see if the same Auto-cruise Control System DTC will set again.
 - If the same Auto-cruise Control System DTC sets again, perform the diagnostic procedures for the set code. Refer to P.17-128, Auto-cruise Control System Diagnostic Trouble Code Chart.

AUTO-CRUISE CONTROL SYSTEM DIAGNOSTIC FUNCTION

M1172004900074

HOW TO CONNECT THE SCAN TOOL (MUT-III).

Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: Vehicle communication interface (V.C.I.)
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

CAUTION

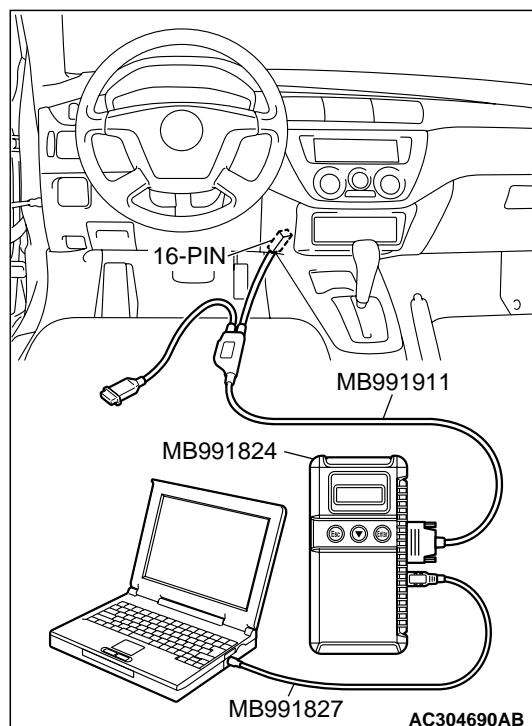
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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 MB991911 to special tool MB991824.
5. Connect special tool MB991911 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 MUT-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 AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tool:

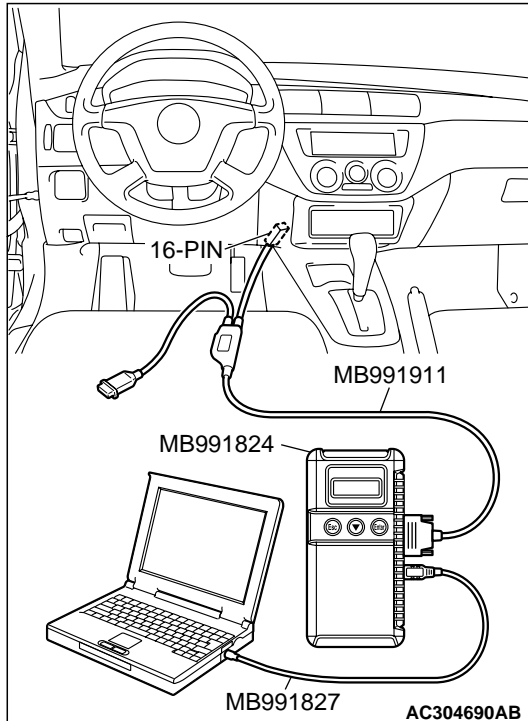
- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

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.

NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "AUTO-CRUISE" from the "POWERTRAIN" tab.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "DTC erase" to erase the DTC.
9. Turn the ignition switch to the "LOCK" (OFF) position.
10. Disconnect scan tool MB991958.



HOW TO READ DATA LIST

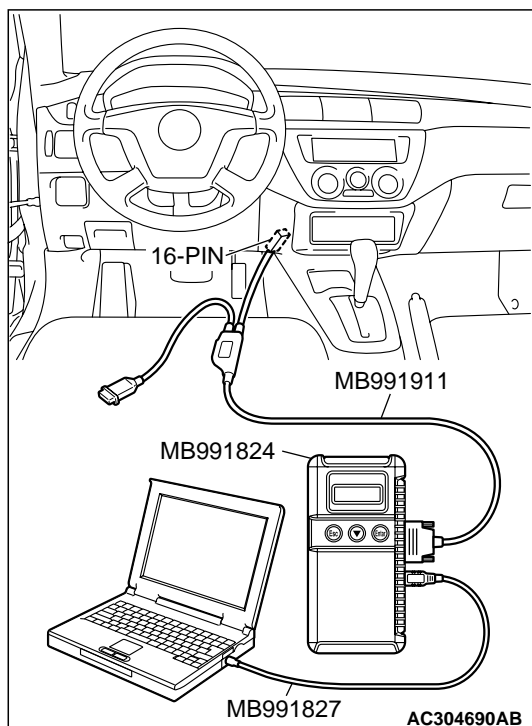
Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

⚠ 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.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "AUTO-CRUISE" from the "POWERTRAIN" tab.
6. Select "Data List."
7. Choose an appropriate item.
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect scan tool MB991958.



DIAGNOSTIC TROUBLE CODE CHART

M1172002200314

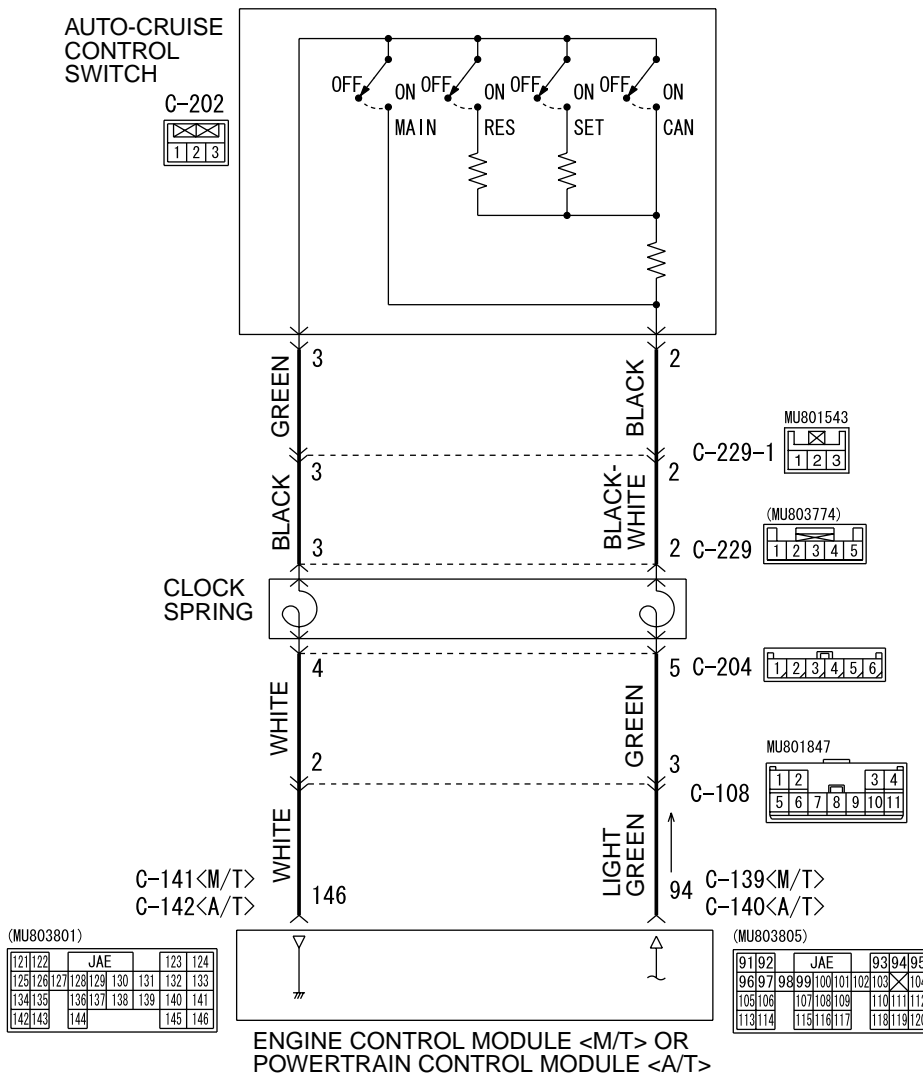
Check according to the inspection chart that is appropriate for the diagnostic trouble code.

DIAGNOSTIC TROUBLE CODE NO.	INSPECTION ITEM	REFERENCE PAGE
15	Auto-cruise control switch system	P.17-129
21	Cancel latch signal system	P.17-147
22	Stoplight switch system	P.17-148
23	Powertrain control module (PCM) and its related components	P.17-167

DIAGNOSTIC TROUBLE CODE PROCEDURES

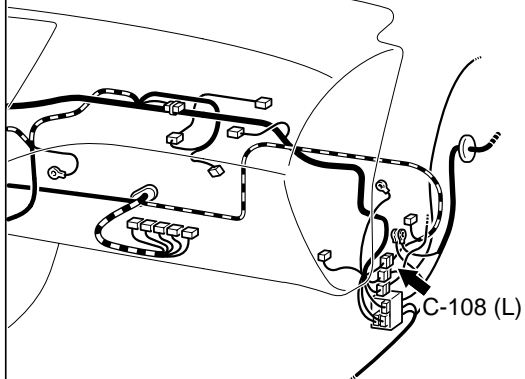
DTC15 : Auto-cruise Control Switch System

Auto-cruise Control Switch System Circuit



AC308996

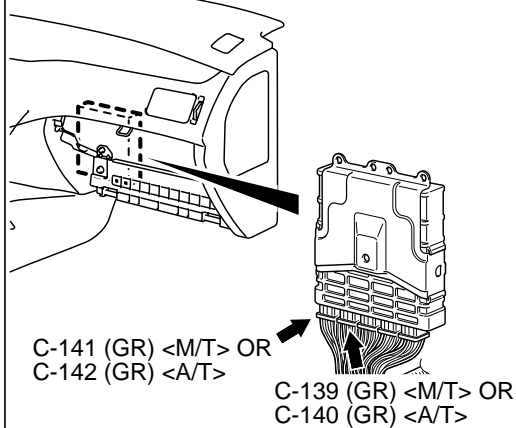
CONNECTOR: C-108



1	2		3	4
5	6	7	8	9
10	11			

AC309031AB

CONNECTORS: C-139 <M/T>, C-140 <A/T>, C-141 <M/T>, C-142 <A/T>

C-141 (GR) <M/T> OR
C-142 (GR) <A/T>C-139 (GR) <M/T> OR
C-140 (GR) <A/T>C-139 <M/T>
OR C-140 <A/T>

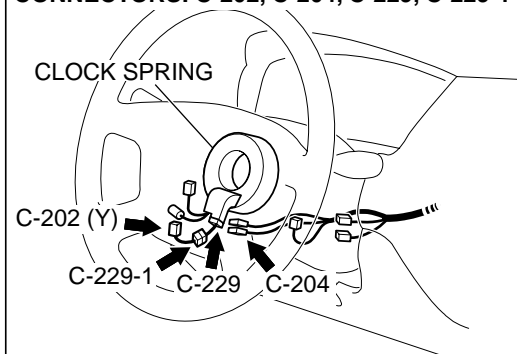
91	92	JAE	93	94	95
96	97	98	99	100	101
102	103	104			
105	106	107	108	109	110
111	112	113	114	115	116
117	118	119	120		

C-141 <M/T>
OR C-142 <A/T>

121	122	JAE	123	124
125	126	127	128	129
130	131	132	133	
134	135	136	137	138
139	140	141	142	143
144	145	146		

AC309032AB

CONNECTORS: C-202, C-204, C-229, C-229-1



C-202

1	2	3
---	---	---

C-204

1	2	3	4	5	6
---	---	---	---	---	---

C-229

1	2	3	4	5
---	---	---	---	---

C-229-1

1	2	3
---	---	---

AC309033AB

CIRCUIT OPERATION

This circuit judges the signals of each switch ("COAST/SET", "ACC/RES" and "CANCEL") of the auto-cruise control switch. The ECM <M/T> or PCM <A/T> detects the state of the auto-cruise control switch by sensing the voltages shown below.

- When all switches are OFF: 4.7 – 5.0 volts
- When the "CRUISE" (MAIN) switch is "ON": 0 – 0.3 volt
- When the "COAST/SET" switch is ON: 2.0 – 2.8 volts
- When the "ACC/RES" switch is ON: 3.3 – 4.1 volts
- When the "CANCEL" switch is ON: 0.8 – 1.5 volts

DTC SET CONDITIONS

Check Condition

- The "CRUISE" indicator light illuminates.

Judgement Criteria

- If the auto-cruise control switch is operated, this DTC will be set when the ECM <M/T> or PCM <A/T> terminal voltage is different from the standard value.

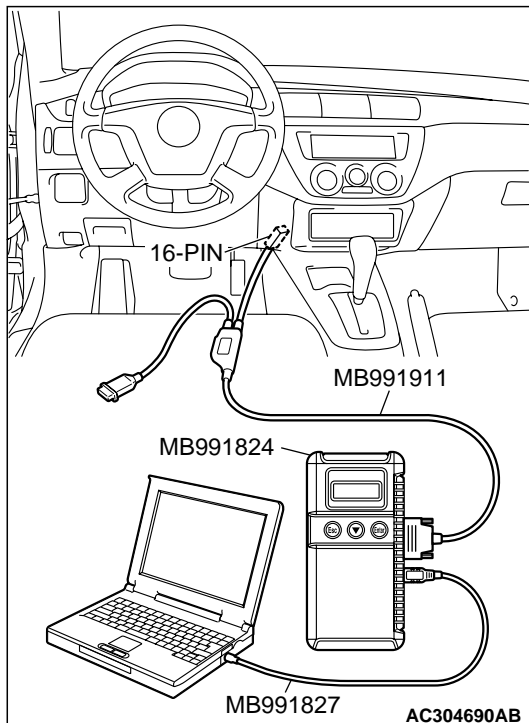
TROUBLESHOOTING HINTS (The most likely causes for this case:)

- Malfunction of the auto-cruise control switch.
- Malfunction of the clock spring.
- Damaged harness or connector.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B
- MB991223: Harness set



STEP 1. Using scan tool MB991958, check data list item 01: Main Switch, list item 02: Set Switch, item 03: Resume Switch and list item 04: 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.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to data list mode.
 - Item 01: Main Switch.
 - When "CRUISE" (MAIN) switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
 - When "CRUISE" (MAIN) switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- (4) Set scan tool MB991958 to data list mode.
 - Item 02: Set Switch.
 - When "COAST/SET" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
 - When "COAST/SET" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- (5) Set scan tool MB991958 to data list mode.
 - Item 03: Resume Switch.
 - When "ACC/RES" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
 - When "ACC/RES" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- (6) Set scan tool MB991958 to data list mode.
 - Item 04: Cancel Switch.
 - When "CANCEL" switch is at the "ON" position, the display on scan tool MB991958 should be "ON".
 - When "ACC/RES" switch is at the "OFF" position, the display on scan tool MB991958 should be "OFF".
- (7) Turn the ignition switch to the "LOCK" (OFF) position.
- (8) Disconnect scan tool MB991958.

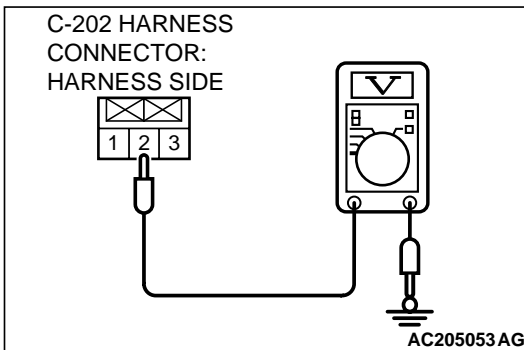
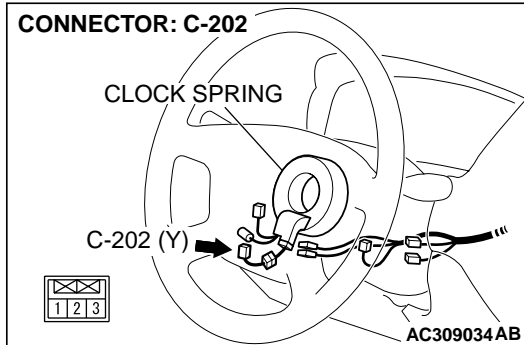
Q: Is the switch operating properly?

YES : Go to Step 17.

NO : Go to Step 2.

STEP 2. Measure the power supply voltage at auto-cruise control switch connector C-202 by backprobing.

- (1) Remove the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)).
- (2) Connect the negative (-) battery cable.
- (3) Do not disconnect auto-cruise control switch connector C-202.
- (4) Turn the ignition switch to the "ON" position and the "CRUISE" (MAIN) switch to the "OFF" position.



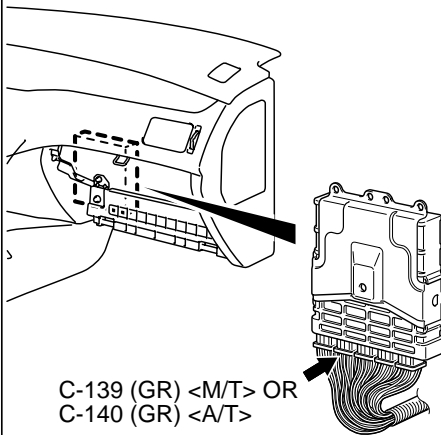
- (5) Measure the voltage between connector C-202 terminal 2 and ground by backprobing.
 - The voltage should be between 4.7 and 5.0 volts.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 9.

NO : Go to Step 3.

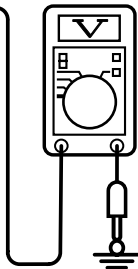
CONNECTORS: C-139 <M/T>, C-140 <A/T>

C-139 <M/T>
OR C-140 <A/T>

91	92	JAE				93	94	95
96	97	98	99	100	101	102	103	104
105	106					110	111	112
113	114	115	116	117				

AC309032AC

91	92	JAE				93	94	95
96	97	98	99	100	101	102	103	104
105	106					110	111	112
113	114	115	116	117				

C-139 <M/T> OR
C-140 <A/T> HARNESS
CONNECTOR:
HARNESS SIDE

AC304572AD

STEP 3. Measure the power supply voltage at ECM connector C-139 <M/T> or PCM connector C-140 <A/T> by backprobing.

- (1) Do not disconnect ECM connector C-139 <M/T> or PCM connector C-140 <A/T>.
- (2) Turn the ignition switch to the "ON" position and the "CRUISE" (MAIN) switch to the "OFF" position.

- (3) Measure the voltage between ECM connector C-139 <M/T> terminal 94 or PCM connector C-140 <A/T> terminal 94 and ground by backprobing.

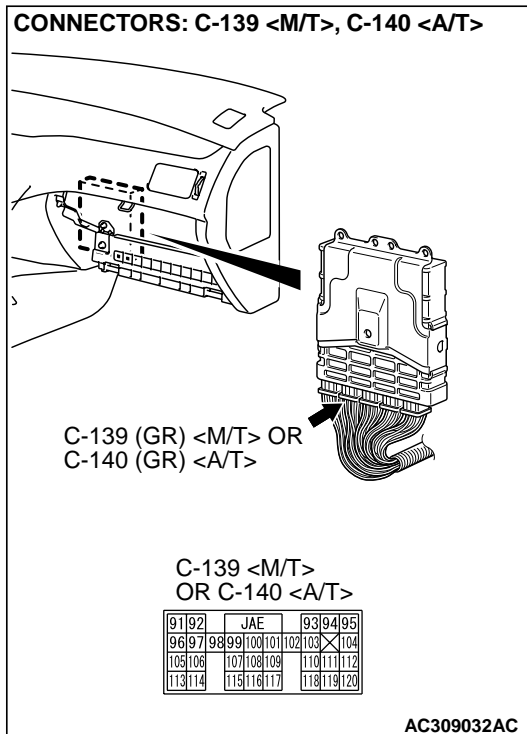
- The measured voltage should be between 4.7 and 5.0 volts.

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

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

YES : Go to Step 6.

NO : Go to Step 4.

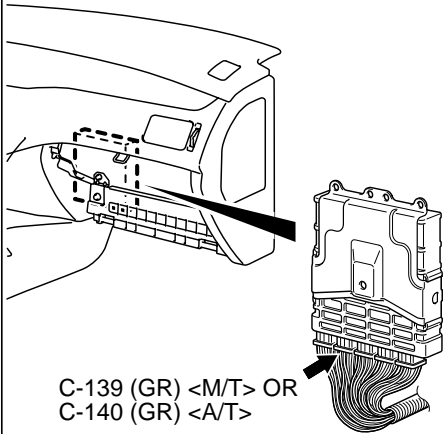


STEP 4. Check ECM connector C-139 <M/T> or PCM connector C-140 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Is the connector and terminals in good condition?

YES : Go to Step 5.

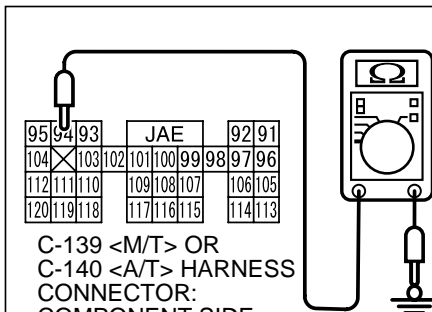
NO : Repair or replace the faulty connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.

CONNECTORS: C-139 <M/T>, C-140 <A/T>

C-139 (GR) <M/T> OR
C-140 (GR) <A/T>C-139 <M/T>
OR C-140 <A/T>

91	92	JAE	93	94	95
96	97	98	99	100	101
102	103	104	105	106	107
108	109	110	111	112	113
114	115	116	117	118	119
120					

AC309032AC

C-139 <M/T> OR
C-140 <A/T> HARNESS
CONNECTOR:
COMPONENT SIDE

AC304573AD

STEP 5. Check the harness for short circuit to ground between the ECM connector C-139 <M/T> terminal 94 or PCM connector C-140 <A/T> terminal 94 and the auto-cruise control switch connector C-202 terminal 2.

- (1) Disconnect ECM connector C-139 <M/Y> or PCM connector C-140 and measure at the harness connector side.
- (2) Turn the ignition switch to the "ON" position and the "CRUISE" (MAIN) switch to the "OFF" position.

- (3) Measure the continuity between ECM connector C-139 <M/T> terminal 94 or PCM connector C-140 <A/T> terminal 94 and ground.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Connect ECM connector C-139 <M/T> or PCM connector C-111 <A/T>.

Q: Is the measured continuity open circuit?

YES : Install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-205). Then go to Step 17.

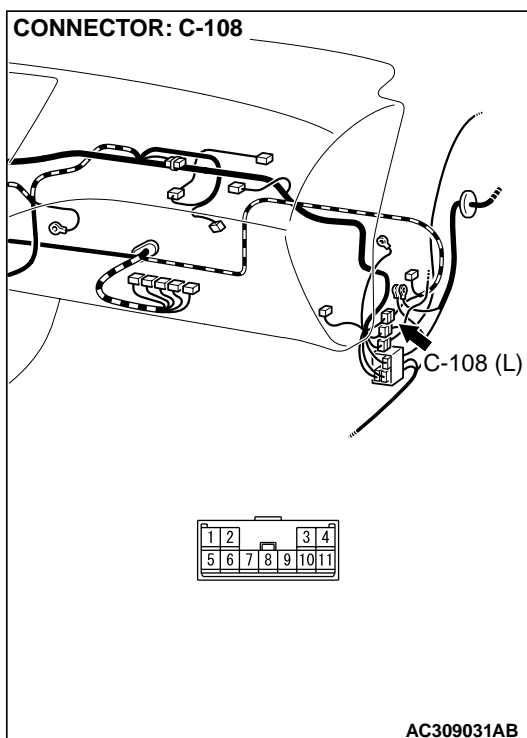
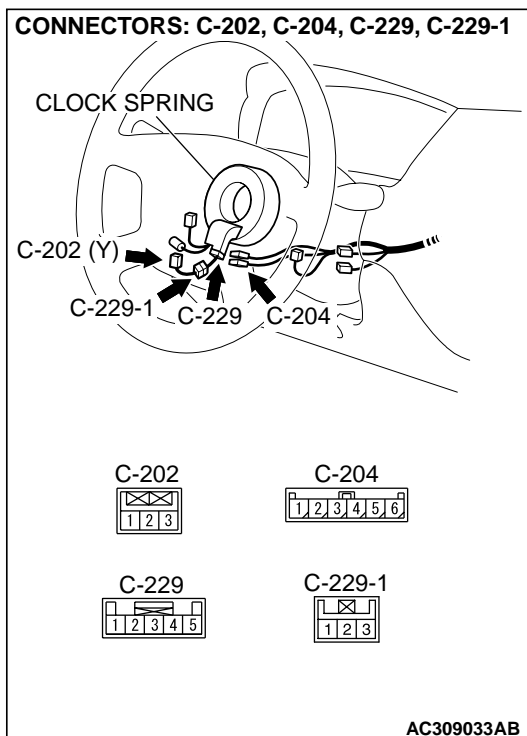
NO : Go to Step 6.

STEP 6. Check auto-cruise control switch connector C-202, intermediate connector C-229-1 and C-108 and clock spring connectors C-204 and C-229 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are there connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the faulty connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.



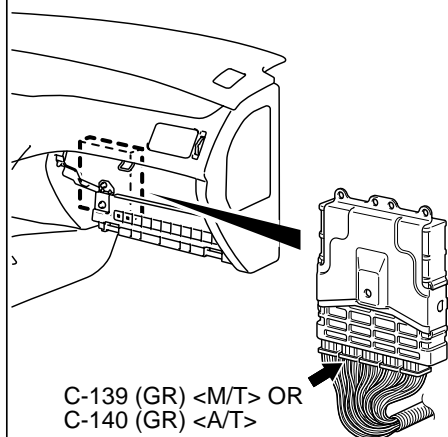
STEP 7. Check the harness wire between ECM connector C-139 <M/T> terminal 94 or PCM connector C-140 <A/T> terminal 94 and auto-cruise control switch connector C-202 terminal 2 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 8.

NO : Repair the damaged harness wire, and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-205). Then go to Step 18.

CONNECTORS: C-139 <M/T>, C-140 <A/T>

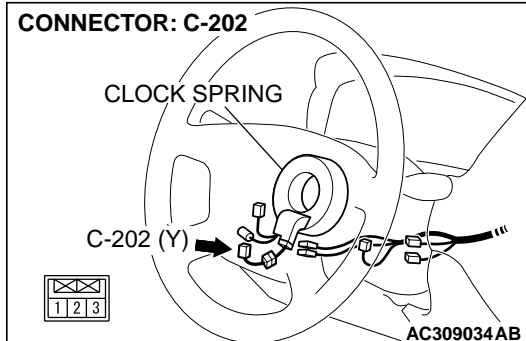


C-139 <M/T>
OR C-140 <A/T>

91	92	JAE	93	94	95
96	97	98	99	100	101
102	103	104	105	106	107
108	109	110	111	112	113
114	115	116	117	118	119
120					

AC309032AC

CONNECTOR: C-202



CLOCK SPRING

C-202 (Y)

1	2	3
---	---	---

AC309034AB

STEP 8. Check the clock spring.

Refer to GROUP 52B, Air Bag Modules and Clock Spring
[P.52B-212](#).

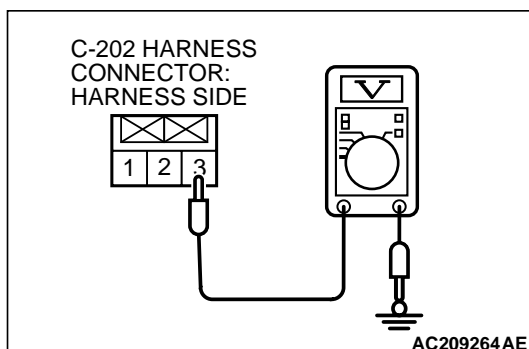
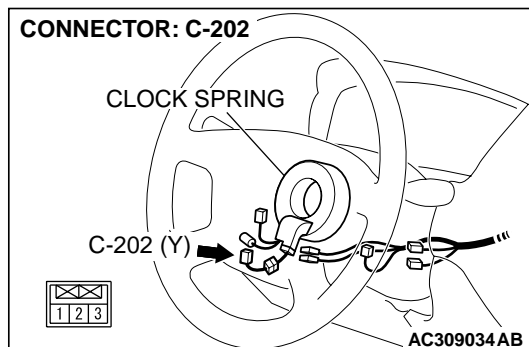
Q: Is the clock spring in good condition?

YES : It can be assumed that this malfunction is intermittent
(Refer to GROUP 00, How to Use
Troubleshooting/Inspection Service Points – How to
Cope with Intermittent Malfunction [P.00-6](#)), and install
the air bag module (driver's side) (Refer to GROUP
52B, Air Bag Modules and Clock Spring [P.52B-205](#)).
Then go to Step 18.

NO : Replace the clock spring and install the air bag
module (driver's side) (Refer to GROUP 52B, Air Bag
Modules and Clock Spring [P.52B-205](#)). Then go to
Step 18.

**STEP 9. Measure the ground voltage at auto-cruise control
switch connector C-202 by backprobing.**

- (1) Do not disconnect auto-cruise control switch connector
C-207.
- (2) Turn the ignition switch to the "ON" position and the
"CRUISE" (MAIN) switch to the "ON" position.

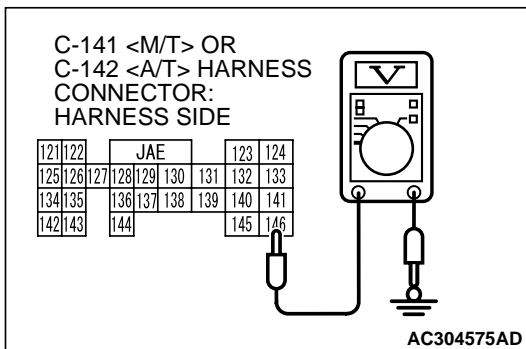
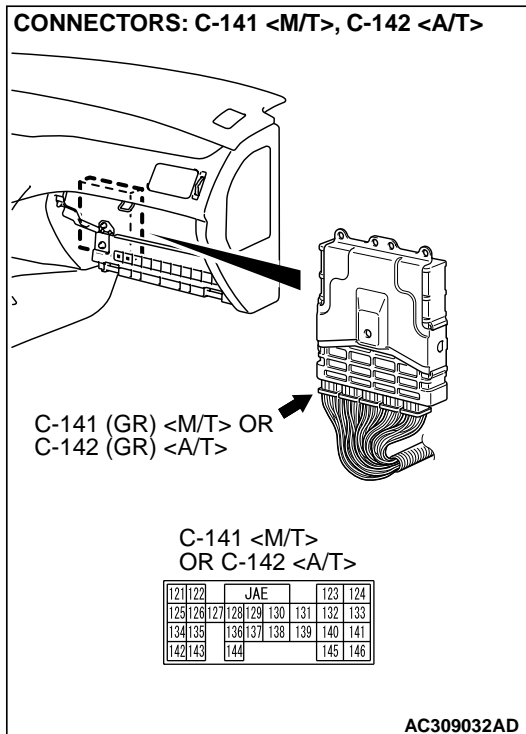


- (3) Measure the voltage between connector C-202 terminal 3
and ground.
 - The measured voltage should be 0.5 volt or less.
- (4) Turn the "CRUISE" (MAIN) switch to the "OFF" position and
the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 15.

NO : Go to Step 10.



STEP 10. Measure the ground voltage at ECM connector C-141 <M/T> or PCM connector C-142 <A/T> by backprobing.

(1) Do not the disconnect ECM connector C-141 <M/T> or PCM connector C-142 <A/T>.

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

(3) Measure the voltage between ECM connector C-141 <M/T> or PCM connector C-142 <A/T> terminal 146 and ground by backprobing.

- The measured voltage should be 0.5 volt or less.

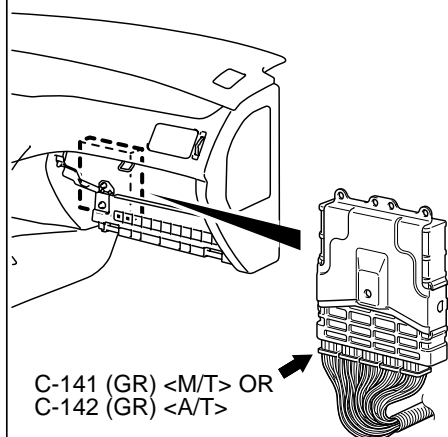
(4) Turn the "CRUISE" (MAIN) switch to the "OFF" position and the ignition switch to the "OFF" position.

Q: Is the measured voltage 0.5 volt or less?

YES : Go to Step 12.

NO : Go to Step 11.

CONNECTORS: C-141 <M/T>, C-142 <A/T>



C-141 <M/T>
 OR C-142 <A/T>

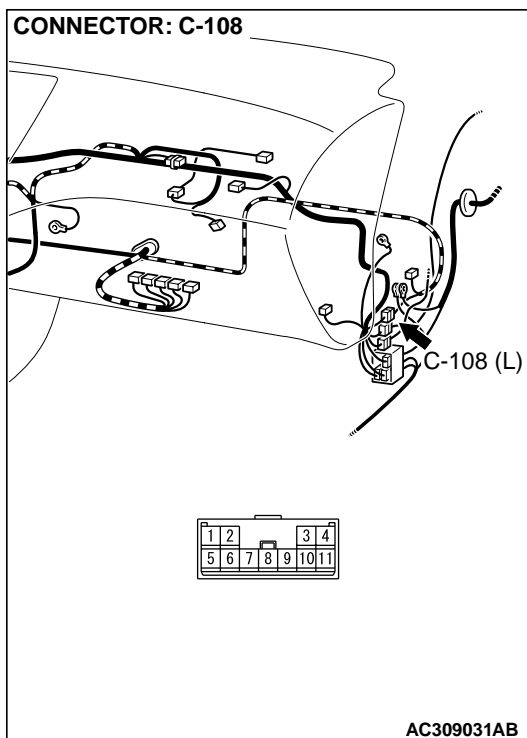
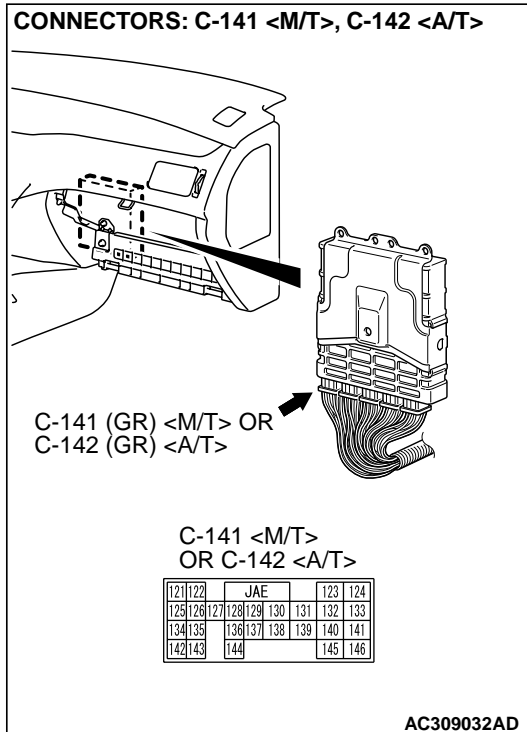
121	122	JAE				123	124
125	126	127	128	129	130	131	132 133
134	135	136 137 138				139	140 141
142	143	144				145	146

AC309032AD

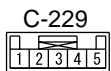
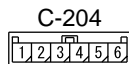
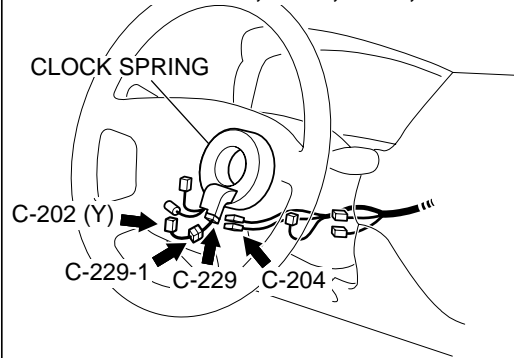
STEP 11. Check ECM connector C-141 <M/T> or PCM connector C-142 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Is the connector and terminals in good condition?

- YES :** Install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 17.
- NO :** Repair or replace the faulty connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.

STEP 12. Check ECM connector C-141 <M/T> or PCM connector C-142 <A/T>, intermediate connector C-108 and C-229-1, auto-cruise control switch connector C-202 and clock spring connectors C-204 and C-229 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



CONNECTORS: C-202, C-204, C-229, C-229-1



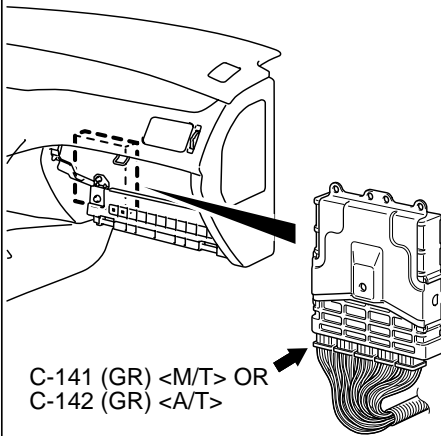
AC309033AB

Q: Are there connectors and terminals in good condition?

YES : Go to Step 13.

NO : Repair or replace the faulty connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.

CONNECTORS: C-141 <M/T>, C-142 <A/T>

C-141 <M/T>
OR C-142 <A/T>

121	122	JAE				123	124
125	126	127	128	129	130	131	132
134	135		136	137	138	139	140
142	143		144			145	146

AC309032AD

CONNECTOR: C-202

CLOCK SPRING

C-202 (Y)

1	2	3
---	---	---

AC309034AB

STEP 13. Check the harness wire between ECM connector C-141 <M/T> terminal 146 or PCM connector C-142 <A/T> terminal 146 and auto-cruise control switch connector C-202 terminal 3 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 14.

NO : Repair the damaged harness wire, and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-205). Then go to Step 18.

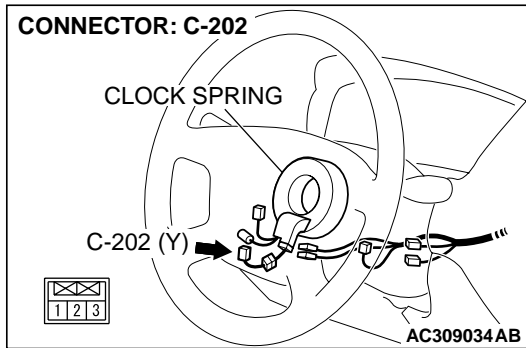
STEP 14. Check the clock spring.

Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-212.

Q: Is the clock spring in good condition?

YES : It can be assumed that this malfunction is intermittent (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-205). Then go to Step 18.

NO : Replace the clock spring and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring P.52B-205). Then go to Step 18.

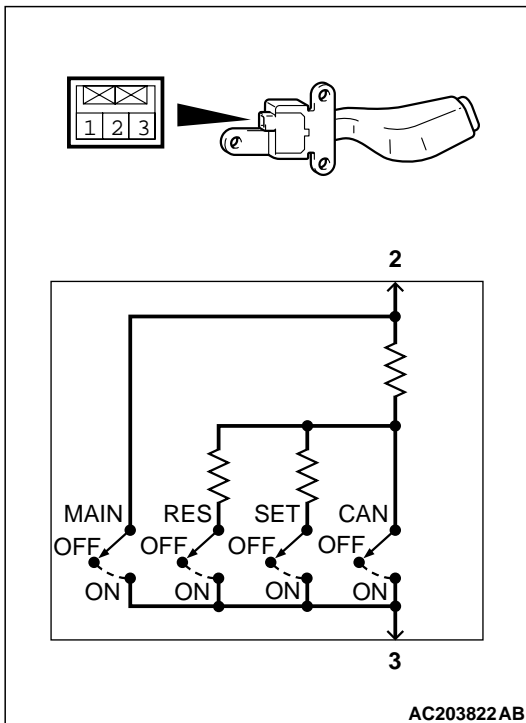


STEP 15. Check auto-cruise control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the connector and terminals in good condition?

YES : Go to Step 16.

NO : Repair or replace the faulty connector (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.



STEP 16. Check the auto-cruise control switch.

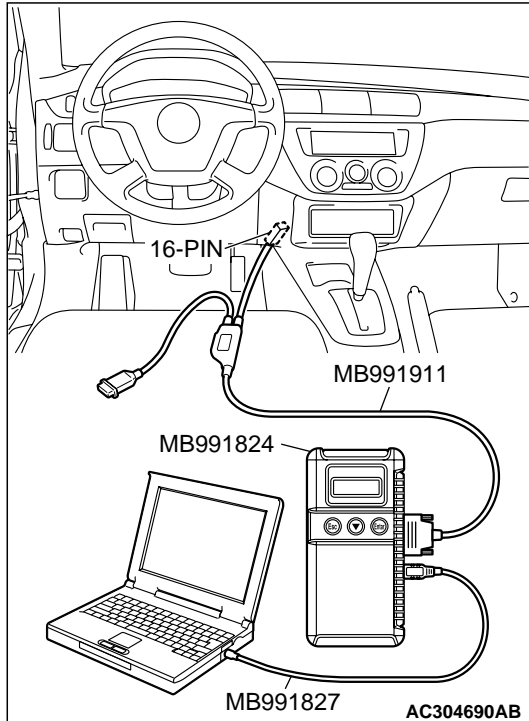
- (1) Remove auto-cruise control switch. (Refer to [P.17-204](#)).
- (2) Measure the resistance between terminal 2 and terminal 3 when each of the "CRUISE" (MAIN), "COAST/SET", "ACC/RES" and "CANCEL" switch is pressed.

SWITCH POSITION	SPECIFIED CONDITION
"CRUISE" (MAIN) switch "OFF"	Open circuit
"CRUISE" (MAIN) switch "ON"	Less than 2 ohms
"CANCEL" switch ON	Approximately 100 Ω
"ACC/RES" switch ON	Approximately 887 Ω
"COAST/SET" switch ON	Approximately 300 Ω

Q: Is the resistance within specifications?

YES : Install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 17.

NO : Replace the auto-cruise control switch (Refer to [P.17-204](#)), and install the air bag module (driver's side) (Refer to GROUP 52B, Air Bag Modules and Clock Spring [P.52B-205](#)). Then go to Step 18.



STEP 17. Using scan tool MB99158, read the diagnostic trouble code.

⚠ CAUTION

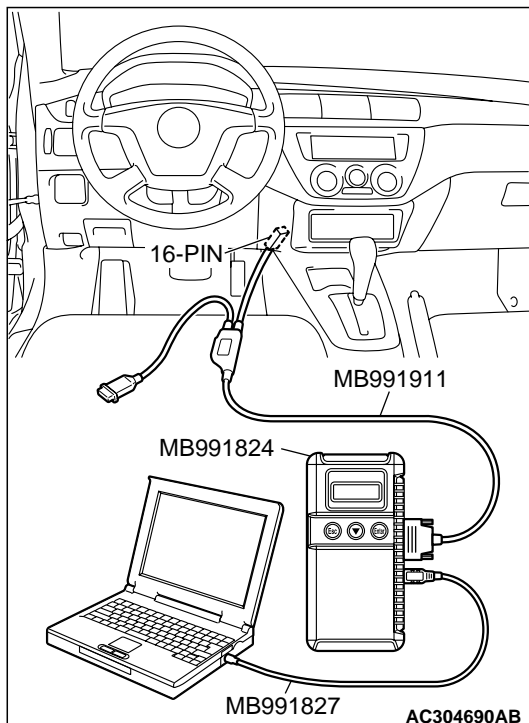
To prevent damage to scan tool MB99158, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB99158.

- (1) Connect scan tool MB99158 to the data link connector.
(Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB99158 to read the diagnostic trouble codes.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB99158.

Q: Is DTC 15 set?

YES : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. Then go to Step 18.

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.00-6).



STEP 18. Using scan tool MB99158, read the diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB99158, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB99158.

- (1) Connect scan tool MB99158 to the data link connector
(Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB99158 to read the diagnostic trouble codes.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB99158.

Q: Is DTC 15 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC 21: Cancel Latch Signal System

DTC SET CONDITIONS

The ECM <M/T> or PCM <A/T> communicates cancellation retention information between the two microprocessors. This DTC is set when cancellation retention information contains inconsistency.

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

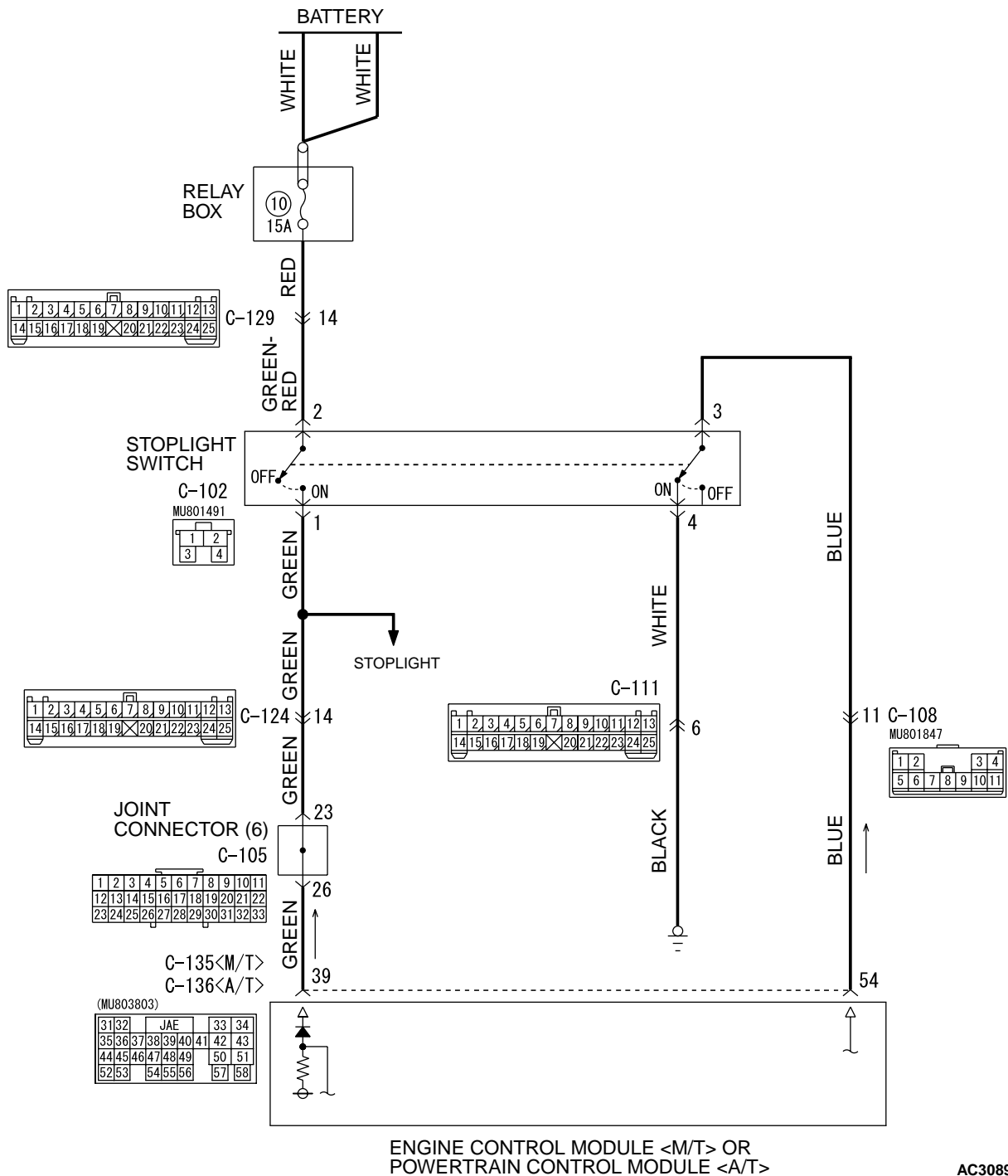
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. Then check that diagnostic trouble code 21 is not set.

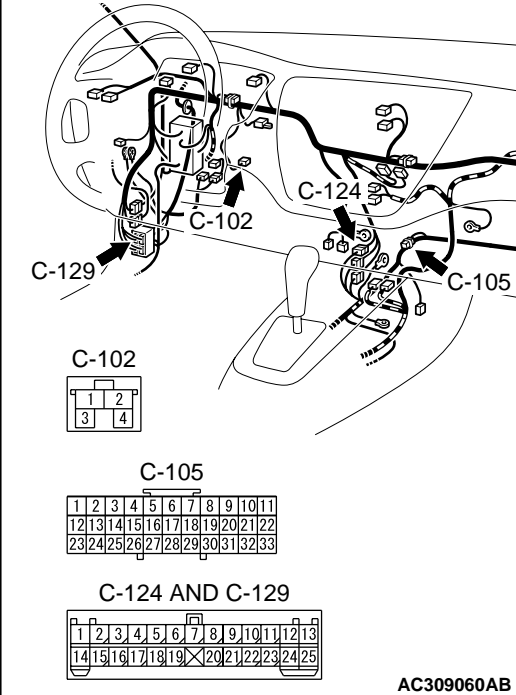
DTC 22: Stoplight Switch System

Stoplight Switch System Circuit

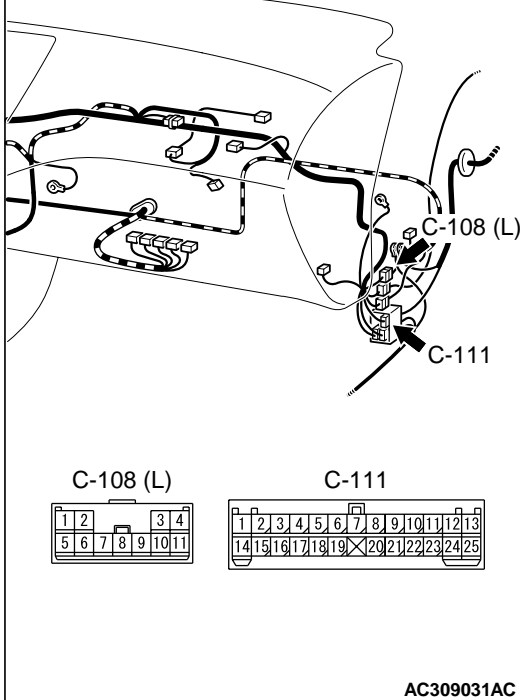


AC308997

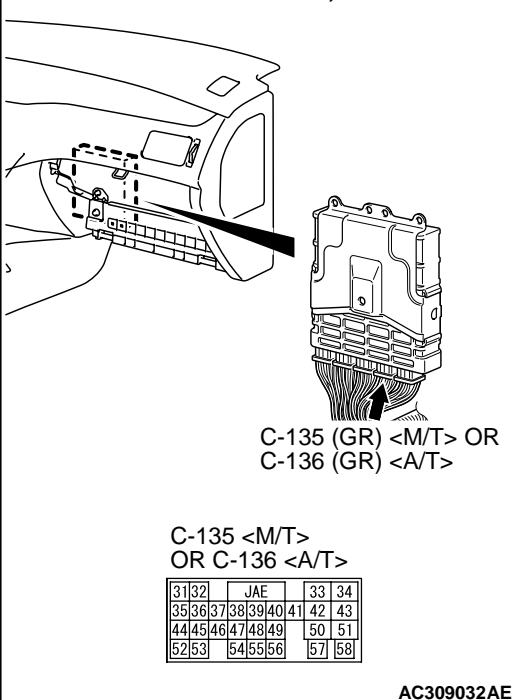
CONNECTORS: C-102, C-105, C-124, C-129



CONNECTORS: C-108, C-111



CONNECTORS: C-135 <M/T>, C-136 <A/T>



CIRCUIT OPERATION

- Battery positive voltage is supplied to the stop-light switch (terminal 2 and 3).
- When the brake pedal is depressed, battery positive voltage is applied to the ECM <M/T> or PCM <A/T> (terminal 39 and 54).

DTC SET CONDITIONS

Check Condition

- The "CRUISE" indicator light illuminates.

Judgement Criteria

- Short in stop light switch circuit.
- Open circuit in the brake switch circuit (between PCM terminal 54 and ground).

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

- Malfunction of the stoplight switch.

- Damaged harness or connector.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS**Required Special Tools:**

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B
- MB991223: Harness set

STEP 1. Using scan tool MB991958, check data list item 05: Stoplight Switch.**⚠ CAUTION**

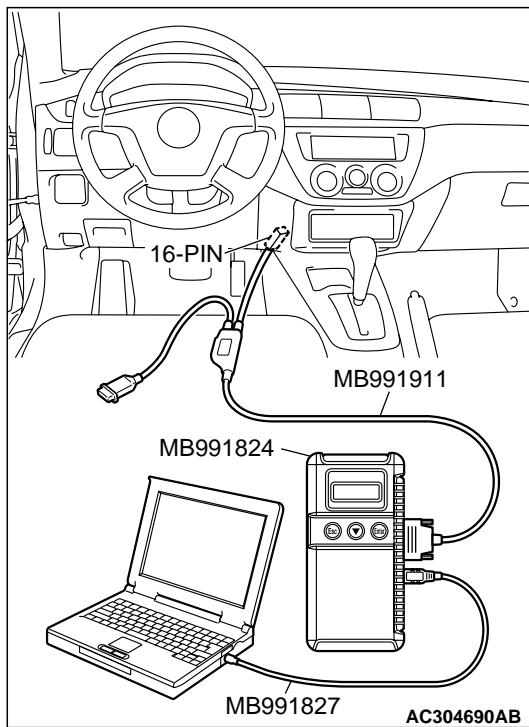
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
(Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to data reading mode.
 - Item 05, Stoplight Switch.
 - When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".
 - When the brake pedal is released, the display on scan tool MB991958 should be "OFF".
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 14.

NO : Go to Step 2.

**STEP 2. Check the stoplight operation.**

Check the stoplight operation.

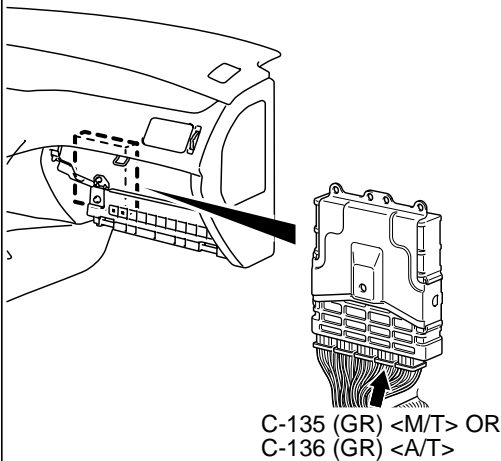
- When the brake pedal is depressed, the stoplight will illuminate.
- When the brake pedal is released, the stoplight does not illuminate.

Q: Is the stoplight will illuminate (when the brake pedal is depressed) and the stoplight does not illuminate (when the brake pedal is released)?

YES : Go to Step 3.

NO : Go to Step 6.

CONNECTORS: C-135 <M/T>, C-136 <A/T>



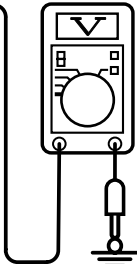
C-135 <M/T>
OR C-136 <A/T>

31	32	JAE	33	34
35	36	37	38	39
40	41	42	43	
44	45	46	47	48
49	50	51		
52	53	54	55	56
		57	58	

AC309032AE

31	32	JAE	33	34
35	36	37	38	39
40	41	42	43	
44	45	46	47	48
49	50	51		
52	53	54	55	56
		57	58	

C-135 <M/T> OR
C-136 <A/T> HARNESS
CONNECTOR:
HARNESS SIDE



AC304645AD

STEP 3. Measure the terminal voltage at ECM connector C-135 <M/T> or PCM connector C-136 <A/T>.

- (1) Do not disconnect ECM connector C-135 <M/T> or PCM connector C-136 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between ECM connector C-135 <M/T> terminal 39 or PCM connector C-136 <A/T> terminal 39 and ground by backprobing.

- When the brake pedal is depressed, the voltage should measure battery positive voltage (approximately 12 volts).
- When the brake pedal is released, the voltage should measure 1 volt or less.

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

Q: Is the measured voltage battery positive voltage (approximately 12 volts) when the brake pedal is depressed and 1 volt or less when the brake pedal is released?

YES : Go to Step 13.

NO : Go to Step 4.

STEP 4. Check ECM connector C-135 <M/T> or PCM connector C-136 <A/T> and joint connector (6) C-105 and intermediate connector C-124 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

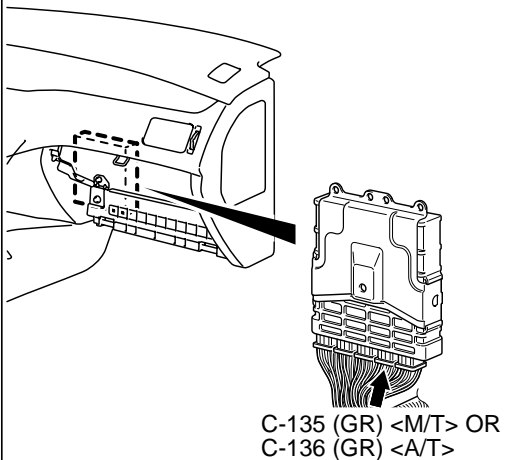
Q: Are there connectors and terminals in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#)). Then go to Step 23.

CONNECTORS: C-135 <M/T>, C-136 <A/T>

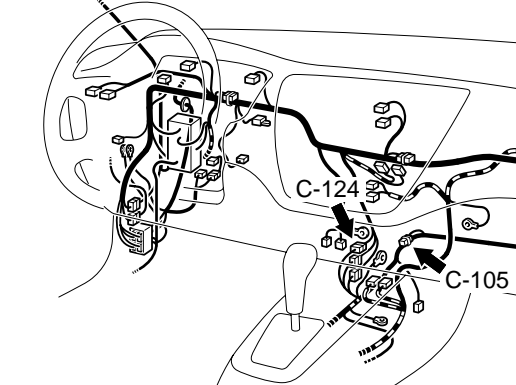


C-135 <M/T>
OR C-136 <A/T>

31	32	JAE	33	34
35	36	37	38	39
40	41	42	43	
44	45	46	47	48
49	50	51		
52	53	54	55	56
57	58			

AC309032AE

CONNECTORS: C-105, C-124



C-105

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

C-124

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	

AC309060AC

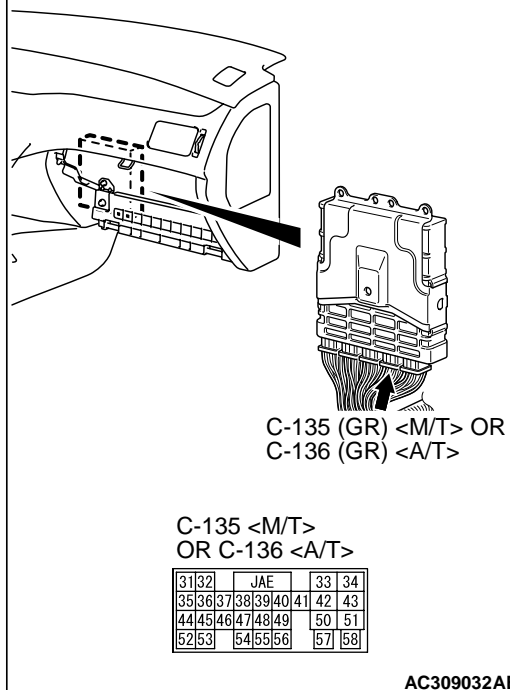
STEP 5. Check the harness wire between ECM connector C-135 <M/T> terminal 9 or PCM connector C-136 <A/T> terminal 9 and stoplight switch connector C-102 terminal 1 for damage.

Q: Are there harness wires in good condition?

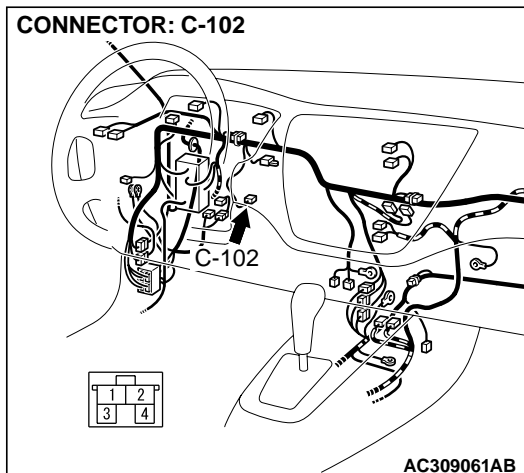
YES : Go to Step 13.

NO : Repair the damaged harness wire. Then go to Step 23.

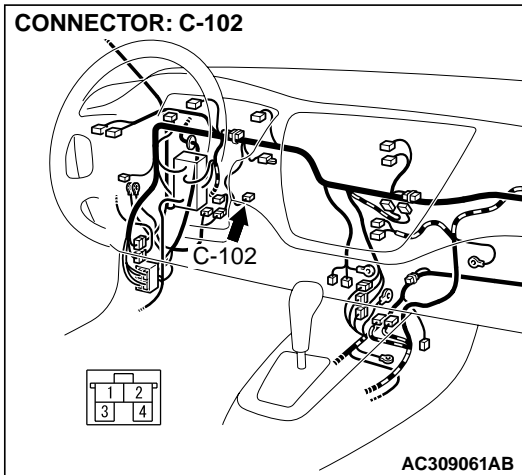
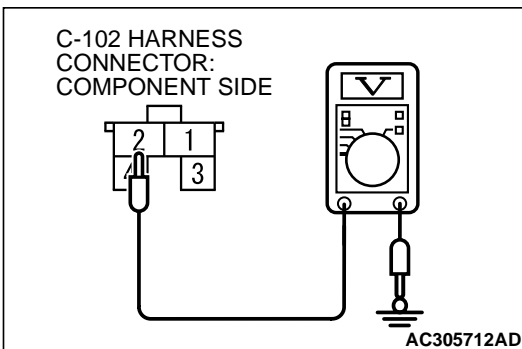
CONNECTORS: C-135 <M/T>, C-136 <A/T>



CONNECTOR: C-102



CONNECTOR: C-102

C-102 HARNESS
CONNECTOR:
COMPONENT SIDE**STEP 6. Measure the power supply voltage at stoplight switch connector C-102.**

(1) Disconnect stoplight switch connector C-102.

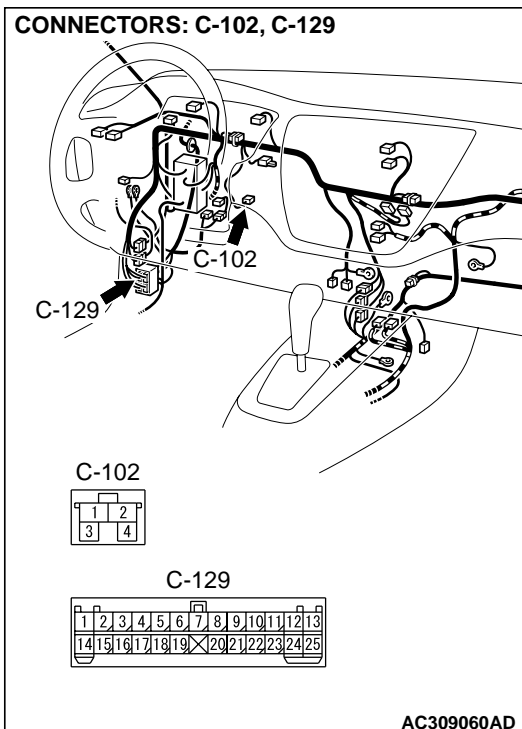
(2) Measure the voltage between stoplight switch connector C-102 terminal 2 and ground.

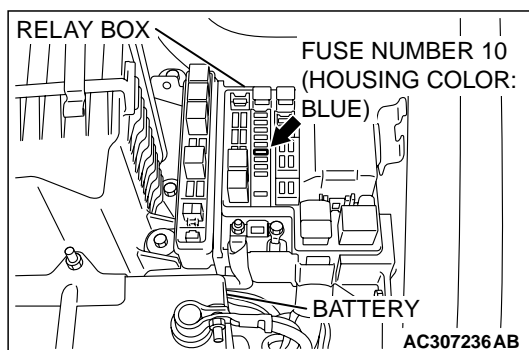
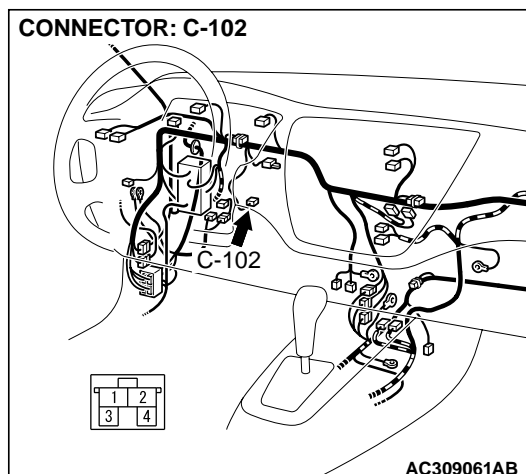
- Voltage should be battery positive voltage.

(3) Connect stoplight switch connector C-102.

Q: Is the measured voltage battery positive voltage (approximately 12 volts)?**YES :** Go to Step 10.**NO :** Go to Step 7.

CONNECTORS: C-102, C-129

**STEP 7. Check stoplight switch connector C-102 and intermediate connector C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.****Q: Are there connectors and terminals in good condition?****YES :** Go to Step 8.**NO :** Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then go to Step 23.

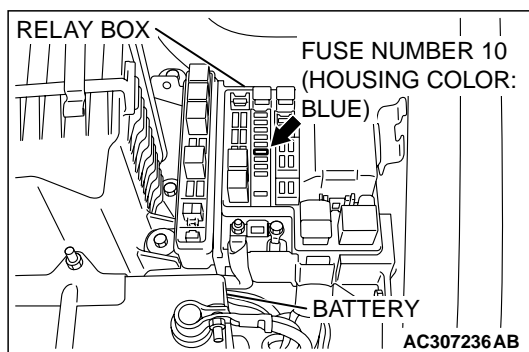


STEP 8. Check the harness wire between stoplight switch connector C-102 terminal 2 and fuse number 10 at the relay box in engine compartment for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 9.

NO : Repair the damaged harness wire. Then go to Step 23.

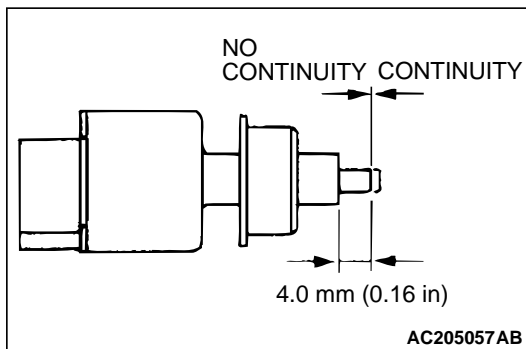
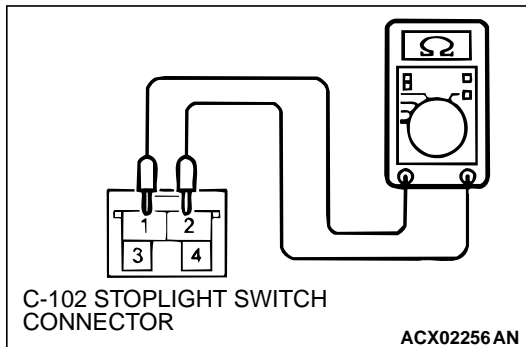


STEP 9. Check the fuse number 10 at the relay box in engine compartment.

Q: Is the fuse in good condition?

YES : Go to Step 10.

NO : Check the stoplight system harness and replace the fuse. Then go to Step 23.

**STEP 10. Check the stoplight switch.**

- (1) Remove the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)).
- (2) Connect an ohmmeter to the stoplight switch between terminals 1 and 2.
- (3) Check for continuity between the terminals when the plunger of the stoplight switch is pushed in and when it is released.
- (4) The stoplight switch is operating properly if the circuit is open between terminals 1 and 2 when the plunger is pushed in to a depth of within 4.0 mm (0.16 inch) from the outer case edge surface, and if the resistance value is less than 2 ohms between terminals 1 and 2 when it is released.

Q: Is the stoplight switch between terminals 1 and 2 still open circuit even with the plunger pushed in, and resistance value is less than 2 ohms when plunger is released?

YES : Install the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)). Then go to Step 11.

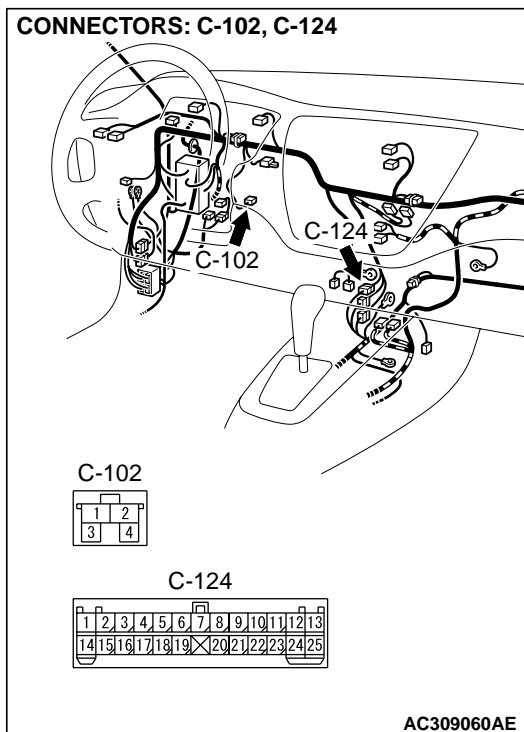
NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)). Then go to Step 23.

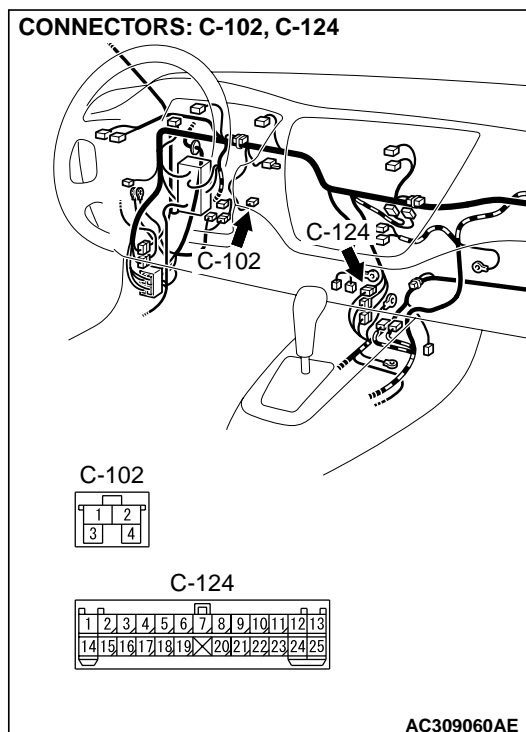
STEP 11. Check stoplight switch connector C-102 and intermediate connector C-124 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are there connectors and terminals in good condition?

YES : Go to Step 12.

NO : Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then go to Step 23.



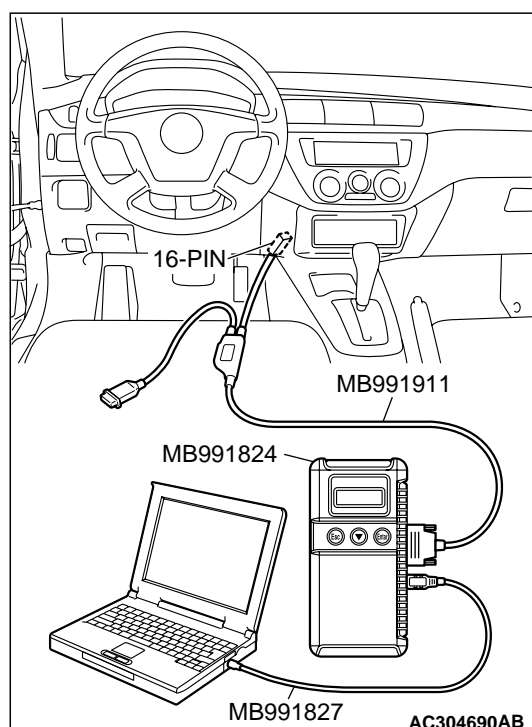


STEP 12. Check the harness wire between stoplight switch connector C-102 terminal 1 and intermediate connector C-124 terminal 14 for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 13.

NO : Repair the damaged harness wire. Then go to Step 23.



STEP 13. Using scan tool MB991558, check data list item 05: Stoplight Switch.

CAUTION

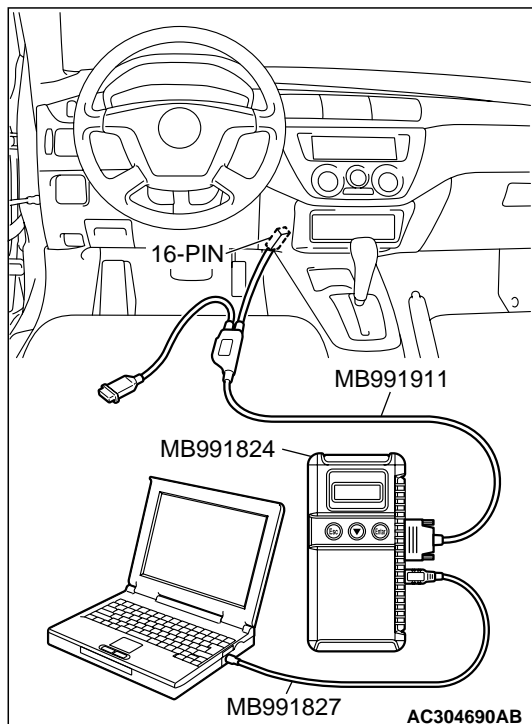
To prevent damage to scan tool MB991558, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991558.

- (1) Connect scan tool MB991558 to the data link connector (Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991558 to data reading mode.
 - Item 05, Stoplight Switch.
 - When the brake pedal is depressed, the display on scan tool MB991558 should be "ON".
 - When the brake pedal is released, the display on scan tool MB991558 should be "OFF".
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991558.

Q: Is the switch operating properly?

YES : Go to Step 22.

NO : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. Then go to Step 23.



STEP 14. Using scan tool MB991958, check data list item 06: Brake 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 P.17-126.

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

(3) Set scan tool MB991958 to data reading mode.

- Item 06, Brake Switch.

- When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".

- When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

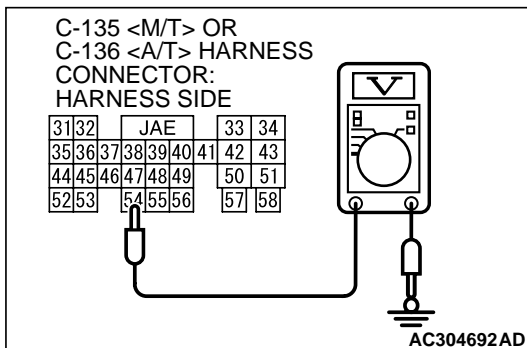
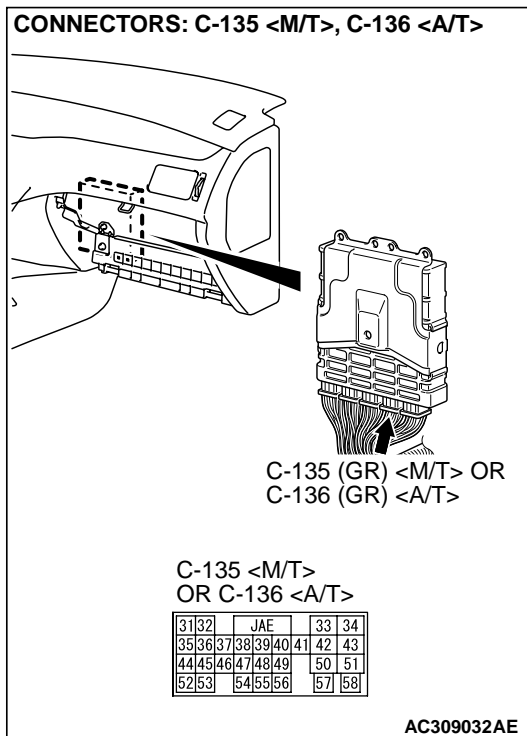
(4) Turn the ignition switch to the "LOCK" (OFF) position.

(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 22.

NO : Go to Step 15.



STEP 15. Measure the terminal voltage at ECM connector C-135 <M/T> or PCM connector C-136 <A/T>.

- (1) Do not disconnect ECM connector C-135 <M/T> or PCM connector C-136 <A/T>.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between ECM connector C-135 <M/T> terminal 54 or PCM connector C-136 <A/T> terminal 54 and ground by backprobing.

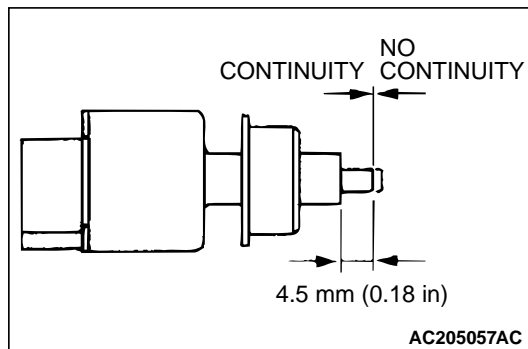
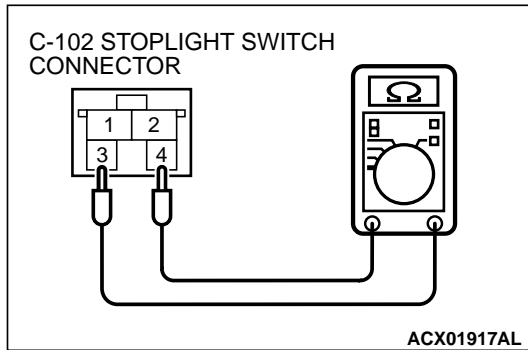
- When the brake pedal is depressed, the voltage should measure battery positive voltage (approximately 12 volts).
- When the brake pedal is released, the voltage should measure 1 volt or less.

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

Q: Is the measured voltage battery positive voltage (approximately 12 volts) when the brake pedal is depressed and 1 volt or less when the brake pedal is released?

YES : Go to Step 21.

NO : Go to Step 16.

**STEP 16. Check the stoplight switch.**

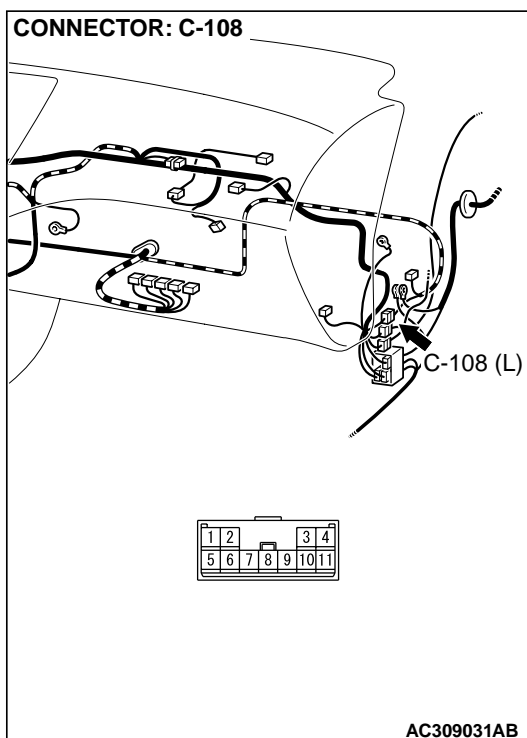
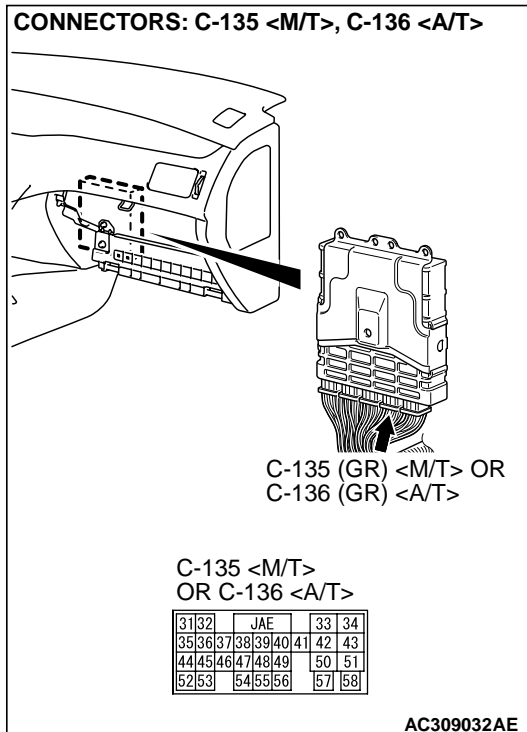
- (1) Remove the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)).
- (2) Connect an ohmmeter to the stoplight switch between terminals 3 and 4.
- (3) Check for continuity between the terminals when the plunger of the stoplight switch is pushed in and when it is released.
- (4) The stoplight switch is operating properly if the circuit is open between terminals 3 and 4 when the plunger is released, and if resistance value is less than 2 ohms between terminals 3 and 4 when the plunger is pushed in to a depth of within 4.5 mm (0.18 inch) from the outer case edge surface.

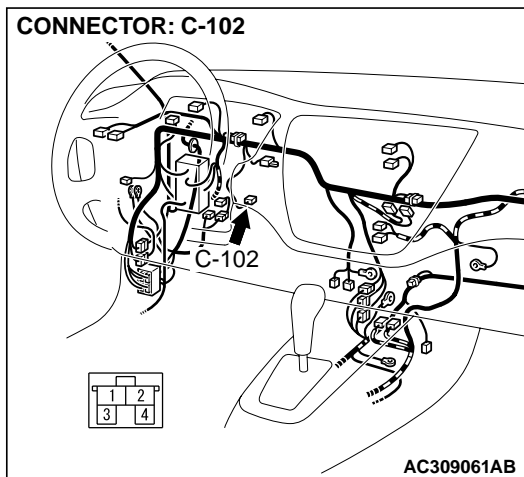
Q: Is the stoplight switch between terminals 3 and 4 still open circuit when the plunger is released, and resistance value is less than 2 ohms even with the plunger is pushed in?

YES : Install the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)). Then go to Step 17.

NO : Replace the stoplight switch (Refer to GROUP 35A, Brake Pedal [P.35A-34](#)). Then go to Step 23.

STEP 17. Check ECM connector C-135 <M/T> or PCM connector C-136 <A/T>, intermediate connector C-108 and stoplight switch connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Are there connectors and terminals in good condition?

YES : Go to Step 18.

NO : Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#)). Then go to Step 23.

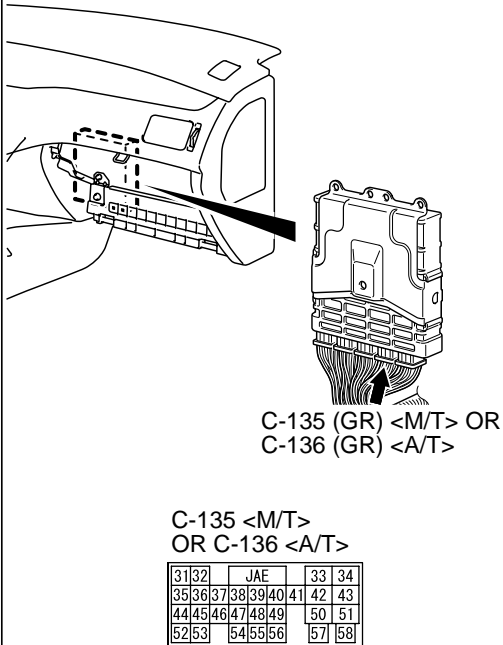
STEP 18. Check the harness wire between ECM connector C-135 <M/T> terminal 54 or PCM connector C-136 <A/T> terminal 54 and stoplight switch connector C-102 terminal 3 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 19.

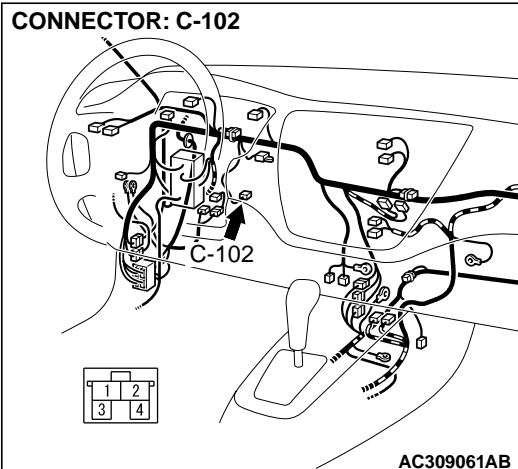
NO : Repair the damaged harness wire. Then go to Step 23.

CONNECTORS: C-135 <M/T>, C-136 <A/T>



AC309032AE

CONNECTOR: C-102



AC309061AB

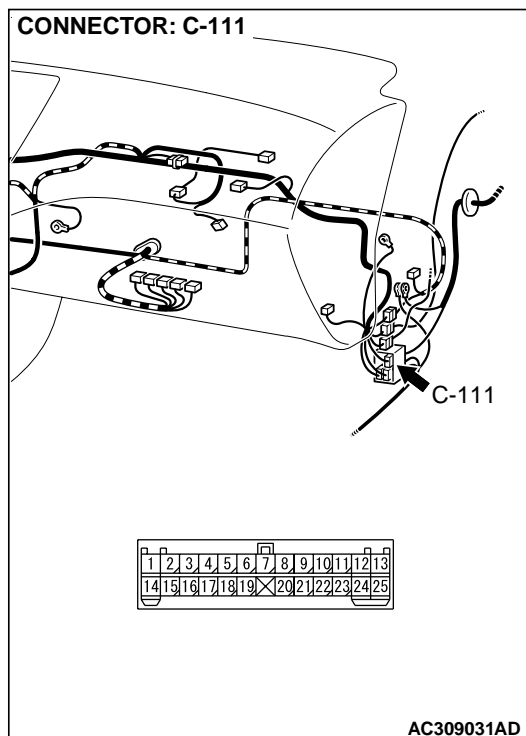
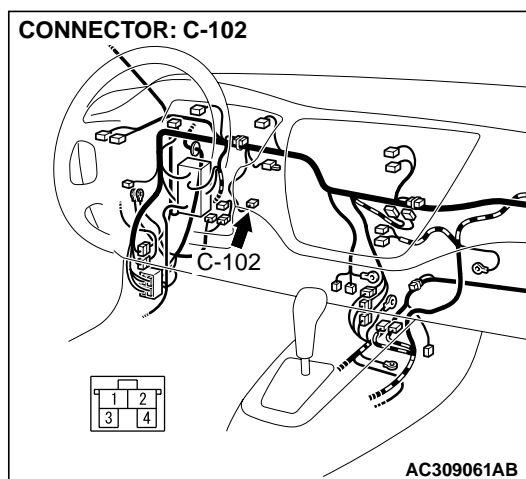
STEP 19. Check stoplight switch connector C-102 and intermediate connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

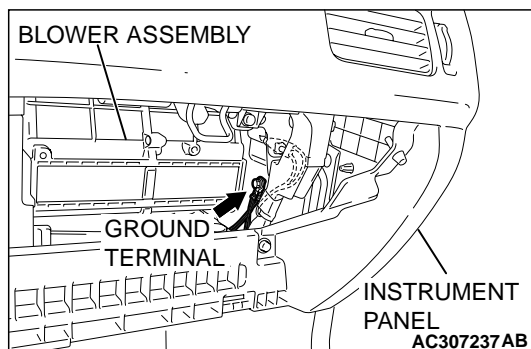
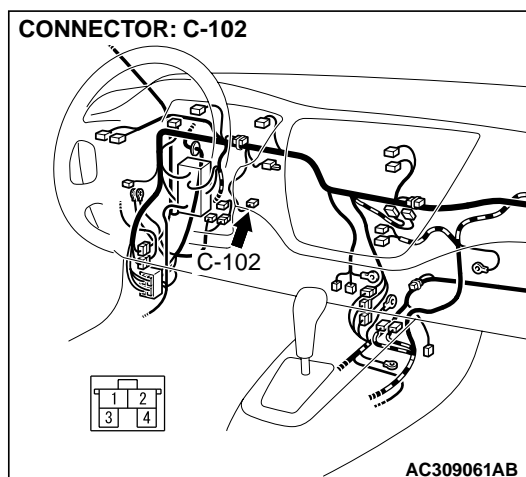
Q: Are there connectors and terminals in good condition?

YES : Go to Step 20.

NO : Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#)). Then go to Step 23.



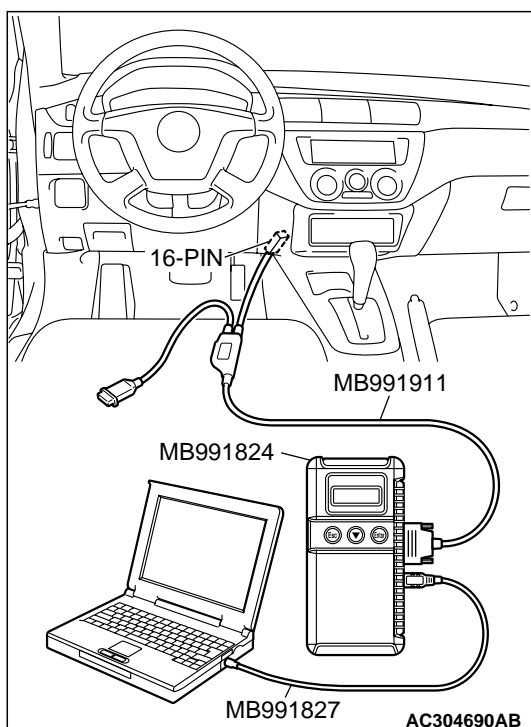


STEP 20. Check the harness wire between stoplight switch connector C-102 terminal 4 and ground for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 21.

NO : Repair the damaged harness wire. Then go to Step 23.



STEP 21. Using scan tool MB991958, check data list item 06: Brake 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
[P.17-126](#).

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

(3) Set scan tool MB991958 to data reading mode.

- Item 06, Brake Switch.

- When the brake pedal is depressed, the display on scan tool MB991958 should be "ON".

- When the brake pedal is released, the display on scan tool MB991958 should be "OFF".

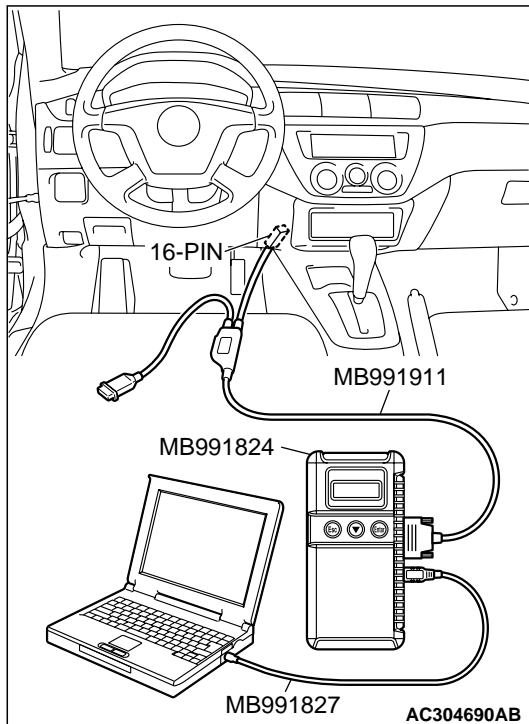
(4) Turn the ignition switch to the "LOCK" (OFF) position.

(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 22.

NO : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. Then go to Step 23.



STEP 22. Using scan tool MB99158, read the diagnostic trouble codes.

⚠ CAUTION

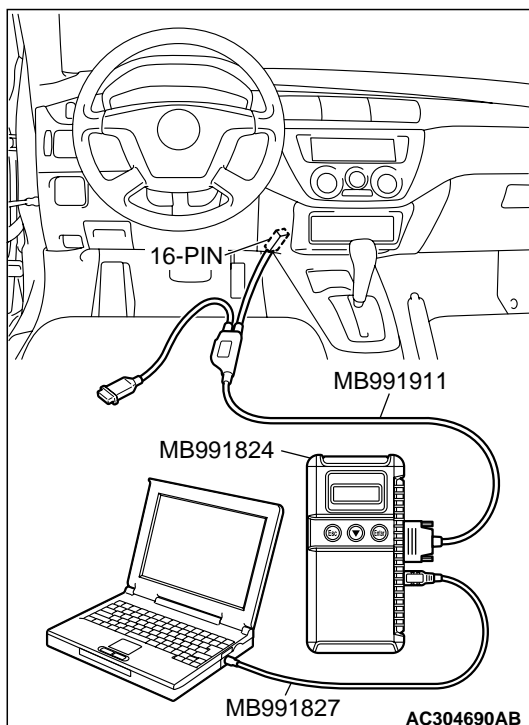
To prevent damage to scan tool MB99158, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB99158.

- (1) Connect scan tool MB99158 to the data link connector [P.17-126](#).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB99158 to read the diagnostic trouble codes.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB99158.

Q: Is DTC 22 set?

YES : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. Then go to Step 23.

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.00-6](#)).



STEP 23. Using scan tool MB99158, read the diagnostic trouble codes.

⚠ CAUTION

To prevent damage to scan tool MB99158, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB99158.

- (1) Connect scan tool MB99158 to the data link connector [P.17-126](#).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB99158 to read the diagnostic trouble codes.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB99158.

Q: Is DTC 22 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC 23: Powertrain Control module (PCM) and Its Related Components

DTC SET CONDITIONS

This DTC is set when there is an failure in the ECM <M/T> or PCM <A/T> and its related components.

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

- Malfunction of the MFI system.
- Malfunction of the A/T system.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

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.

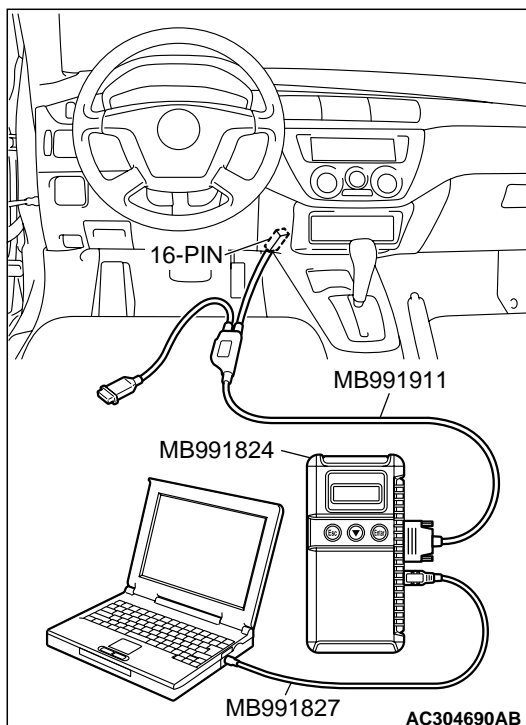
- (1) Connect scan tool MB991958 to the data link connector (Refer to [P.17-126](#)).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code (Refer to GROUP 13B, MFI Diagnosis - How to Read and Erase Diagnostic Trouble Code [P.13B-6](#)).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

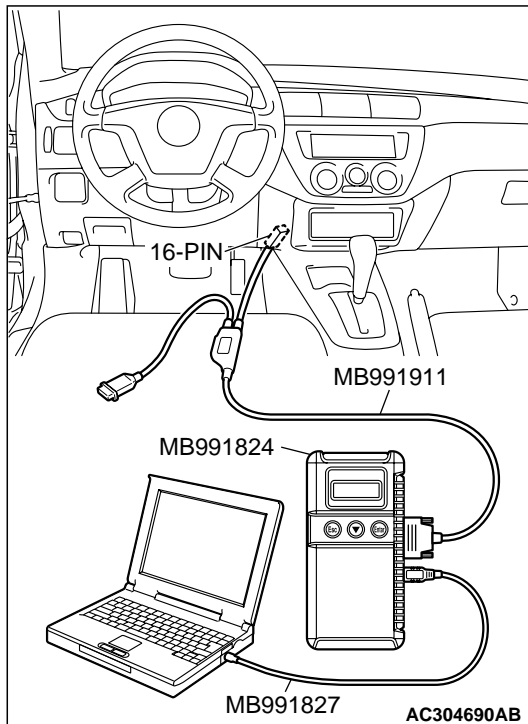
Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#)). Then go to Step 4.

NO <M/T> : Go to Step 3.

NO <A/T> : Go to Step 2.





STEP 2. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

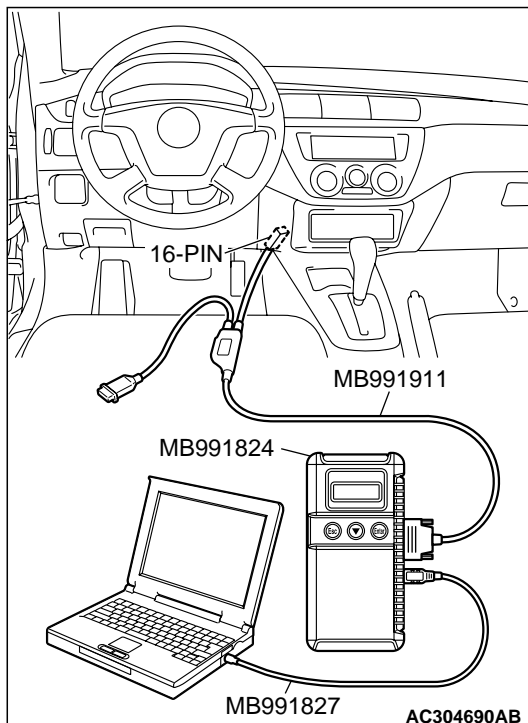
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector (Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T system diagnostic trouble code (Refer to GROUP 23B, Diagnosis Function - How to Read and Erase Diagnostic Trouble Code P.23B-13).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the automatic transaxle control system (Refer to GROUP 23B, A/T Diagnosis – Diagnostic Trouble Code Chart P.23B-38). Then go to Step 4.

NO : Go to Step 3.



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

⚠ CAUTION

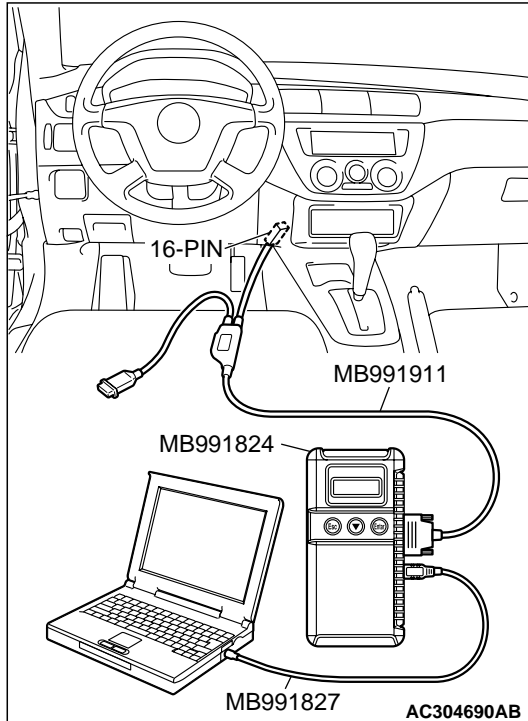
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector (Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the auto-cruise control system diagnostic trouble codes (Refer to P.17-126).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC 23 set?

YES : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. 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.00-6).



STEP 4. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the auto-cruise control system diagnostic trouble codes (Refer to P.17-126).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC 23 set?

YES : Return to Step 1.

NO : The procedure is complete.

SYMPTOM CHART

M1172002300399

SYMPTOM		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool is not possible	Communication with all systems is impossible	-	Group 13B, Symptom Procedures – Inspection Procedure 1 P.13B-727 .
	Communication with the ECM <M/T> or PCM <A/T> only is impossible	-	Group 13B, Symptom Procedures – Inspection Procedure 2 P.13B-730 .
Auto-cruise control is not cancelled.	When brake pedal is depressed	1	P.17-170
	When clutch pedal is depressed <M/T>	2	P.17-171
	When selector lever is moved to "N" range <A/T>	3	P.17-178
	When "CANCEL" switch is turned ON	4	P.17-178

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Auto-cruise control cannot be set.	5	P.17-179
Hunting (repeated acceleration and deceleration) occurs at the set vehicle speed.	6	<M/T> P.17-183 <A/T> P.17-185
When "CRUISE" (MAIN) switch is turned "ON", "CRUISE" indicator light inside combination meter does not illuminate. (However, Auto-cruise Control is Normal).	7	P.17-187

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: When the Brake Pedal is Depressed, Auto-cruise Control is not Cancelled.

COMMENT

The stoplight switch circuit is suspected.

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

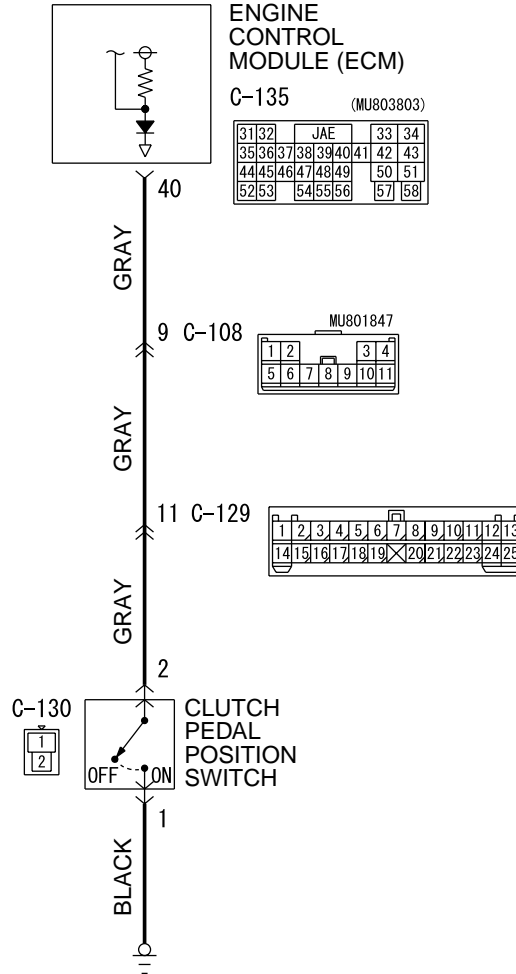
- Malfunction of the stoplight switch.
- Damaged harness or connector.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Refer to [P.17-148](#), Diagnostic Trouble Code Procedures – DTC 22: Stoplight Switch System.

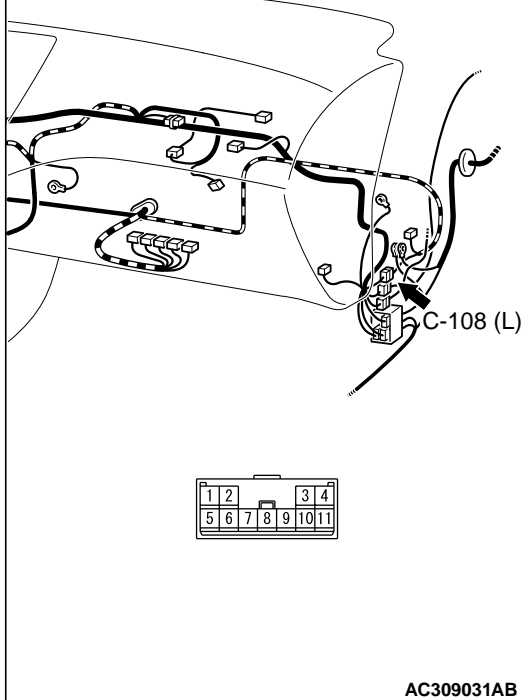
INSPECTION PROCEDURE 2: When the Clutch Pedal is Depressed, Auto-cruise Control is not Cancelled <M/T>.

Clutch Pedal Position Switch Circuit

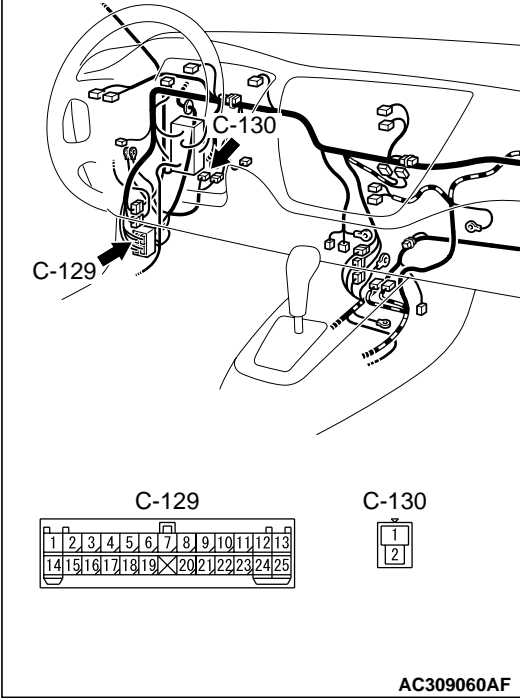


AC309039

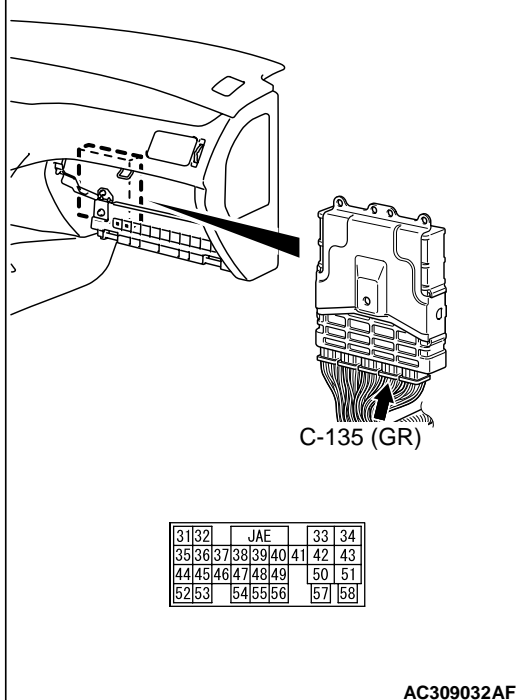
CONNECTOR: C-108



CONNECTORS: C-129, C-130



CONNECTOR: C-135

**CIRCUIT OPERATION**

This circuit indicates the operation status of the clutch pedal position switch. When the clutch pedal position switch is ON (clutch pedal is depressed), the voltage of ECM terminal number 40 will indicate 0 volt.

TECHNICAL DESCRIPTION (COMMENT)

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

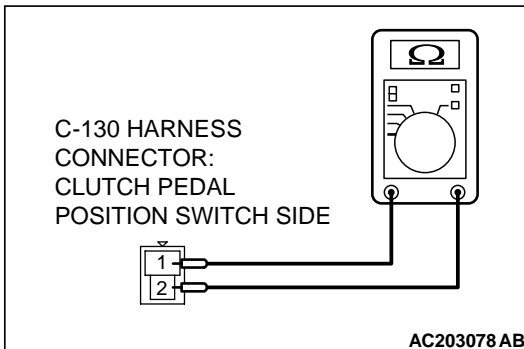
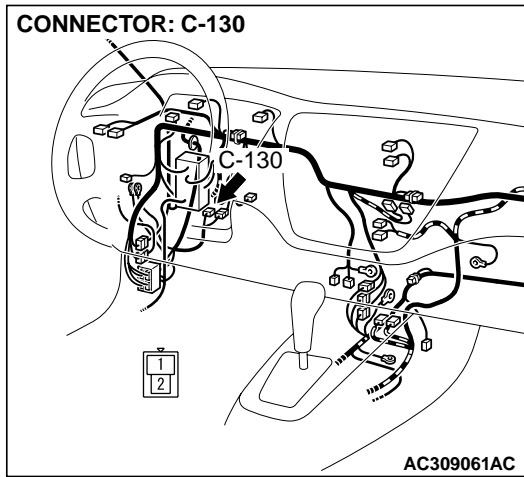
TROUBLESHOOTING HINTS

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

DIAGNOSIS

STEP 1. Check the clutch pedal position switch.

(1) Disconnect clutch pedal position switch connector C-130.



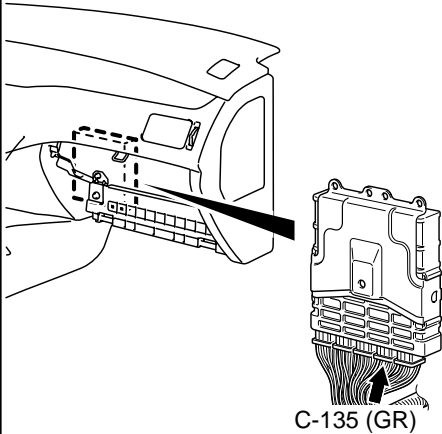
(2) Measure the continuity between the terminals.

MEASUREMENT CONDITIONS	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
When clutch pedal is depressed.	1 – 2	Less than 2 ohms
When clutch pedal is not depressed.	1 – 2	Open circuit

Q: Is the clutch pedal position switch in good condition?

YES : Go to Step 2.

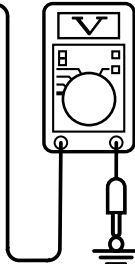
NO : Replace the clutch pedal position switch. Refer to GROUP 21A, Clutch Pedal [P.21A-12](#). Then check that the malfunction is eliminated.

CONNECTOR: C-135

AC309032AF

31	32	JAE		33	34
35	36	37	38	39	40
41	42	43	44	45	46
47	48	49	50	51	52
53	54	55	56	57	58

C-135 HARNESS
CONNECTOR:
HARNESS SIDE



AC309094AB

STEP 2. Measure the signal voltage at ECM connector C-135 by backprobing.

- (1) Do not disconnect auto-cruise control switch connector C-135.
- (2) Turn the ignition switch to the "ON" position.

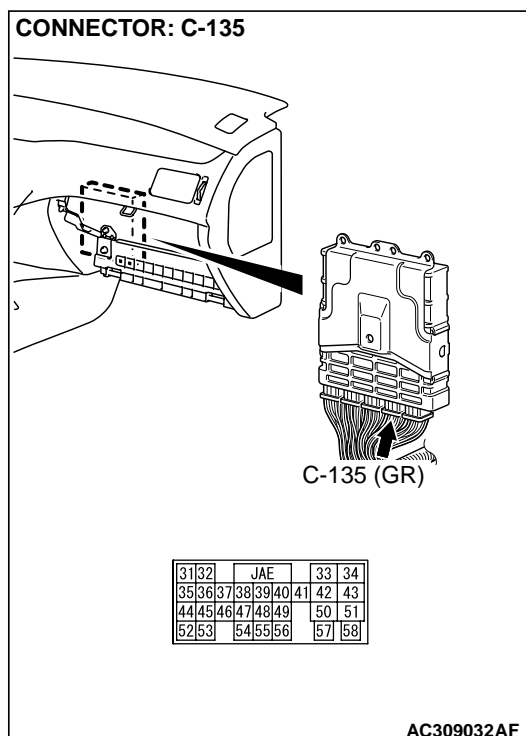
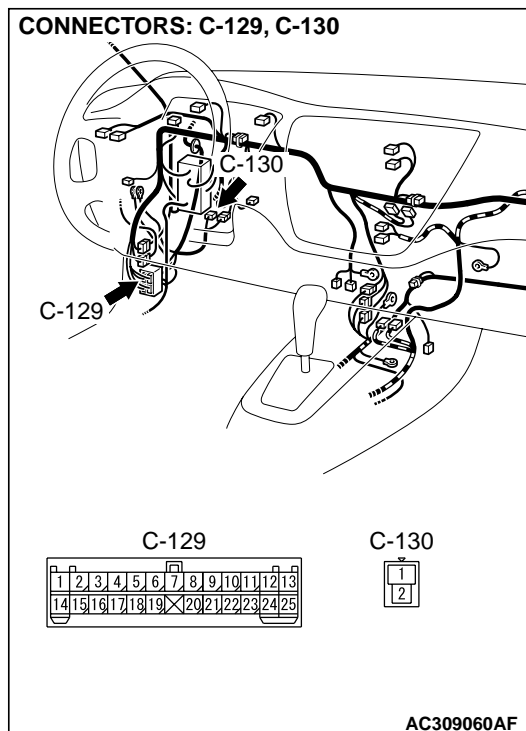
- (3) Measure the voltage between auto-cruise control-ECU connector C-135 terminal 40 and ground by backprobing.
 - voltage should measure 0.5 volts or less. (When clutch pedal is depressed.)
 - voltage should measure battery positive voltage. (When clutch pedal is not depressed.)
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are all of the measured voltages satisfied?

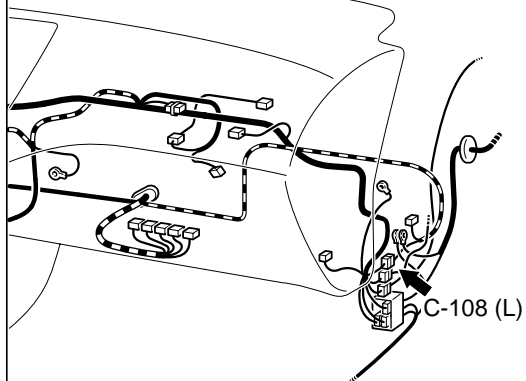
YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. Then check that the malfunction is eliminated.

NO : Go to Step 3.

STEP 3. Check clutch pedal position switch connector C-130, ECM connector C-135, intermediate connectors C-108 and C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



CONNECTOR: C-108



AC309031AB

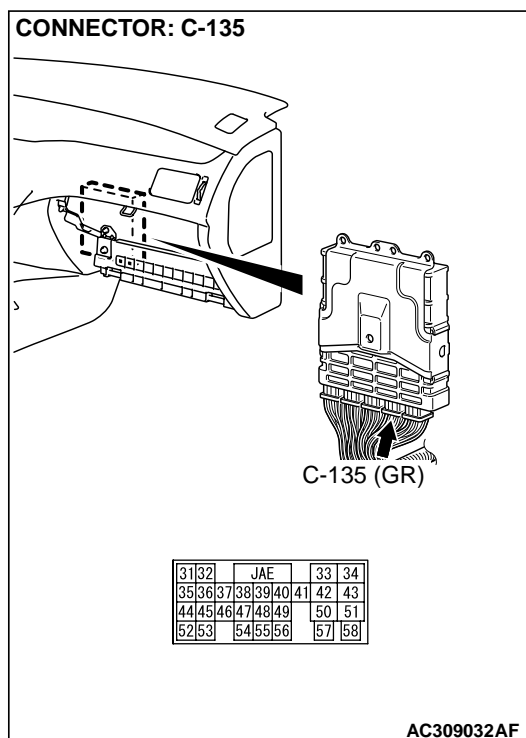
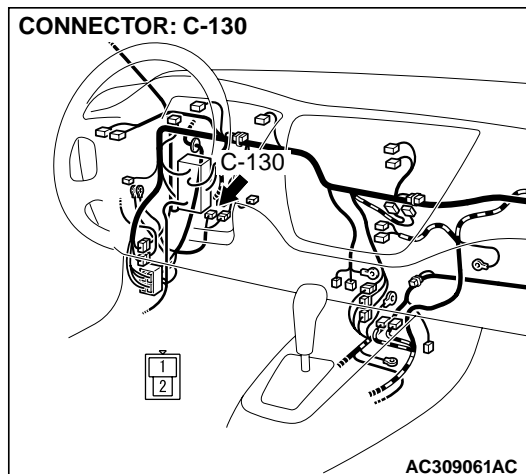
Q: Are the connectors and terminals in good condition?**YES :** Go to Step 4.**NO :** Repair or replace connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then check that the malfunction is eliminated.

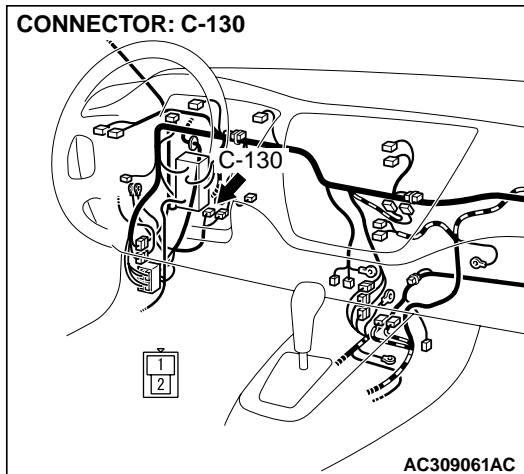
STEP 4. Check the harness wire between clutch pedal position switch connector C-130 terminal 2 and ECM connector C-135 terminal 40 for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair the harness wire and then check that the malfunction is eliminated.





STEP 5. Check the harness wire between clutch pedal position switch connector C-130 terminal 1 and ground wire for damage.

Q: Is the harness wire in good condition?

YES : Check that the malfunction is eliminated. If the malfunction is eliminated, replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. Then check that the malfunction is eliminated.

NO : Repair the harness wire and then check that the malfunction is eliminated.

INSPECTION PROCEDURE 3: When the Selector Lever is Moved to "N" Range, Auto-cruise Control is not Cancelled <A/T>.

COMMENT

The transmission range switch circuit is suspected.

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

- Malfunction of the transmission range switch.
- Damaged harness or connector.
- Malfunction of the PCM.

DIAGNOSIS

Refer to GROUP 23B, Diagnostic Trouble Code Procedures – DTC 27: Transmission Range Switch System (Open Circuit) [P.23B-110](#), DTC 28: Transmission Range Switch System (Short Circuit) [P.23B-137](#).

INSPECTION PROCEDURE 4: When the Auto-cruise Control "CANCEL" Switch is turned to ON, Auto-cruise Control is not Cancelled.

COMMENT

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

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

- Malfunction of the auto-cruise control switch.

DIAGNOSIS

Replace the auto-cruise control switch (Refer to [P.17-204](#), Auto-cruise Control).

INSPECTION PROCEDURE 5: Auto-cruise Control cannot be Set.

COMMENT

The fail-safe function is probably canceling auto-cruise control. In this case, scan tool MB991958 can be used to Retest each system by checking the diagnostic trouble codes. The scan tool can also be used to check if the circuits of each input switch are normal or not by checking the input switch codes.

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

- Malfunction of the auto-cruise control switch.
- Malfunction of the stoplight switch.
- Malfunction of the transmission range switch.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

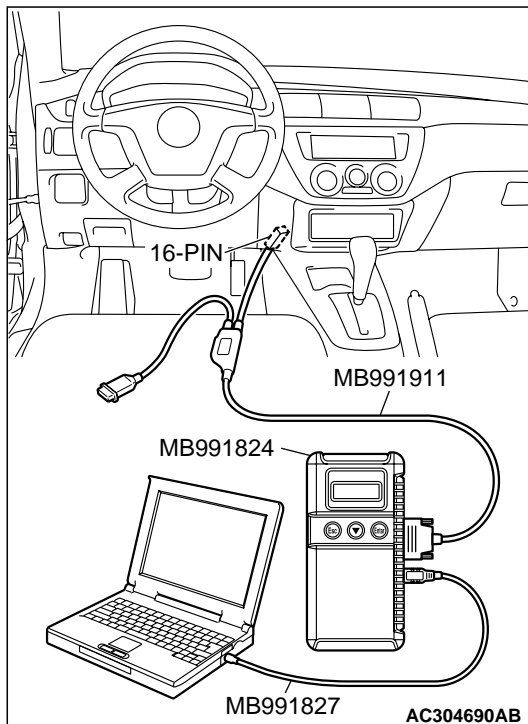
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

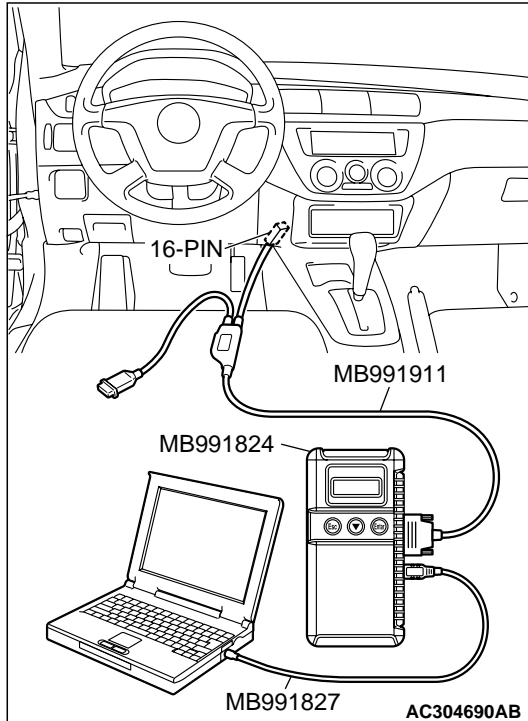
- (1) Connect scan tool MB991958 to the data link connector (Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for auto-cruise control system diagnostic trouble code (Refer to P.17-126).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC set?

YES : Refer to P.17-128, Diagnostic Trouble Code Chart.
 Then go to Step 6.

NO : Go to Step 2.





STEP 2. Using scan tool MB991958, check data list item 04: 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.17-126).

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

(3) Set scan tool MB991958 to data reading mode (Refer to P.17-126).

- Item 04, Cancel Switch.

- When "CANCEL" switch is at the ON position, the display on scan tool MB991958 should be "ON".

- When "CANCEL" switch is at the OFF position, the display on scan tool MB991958 should be "OFF".

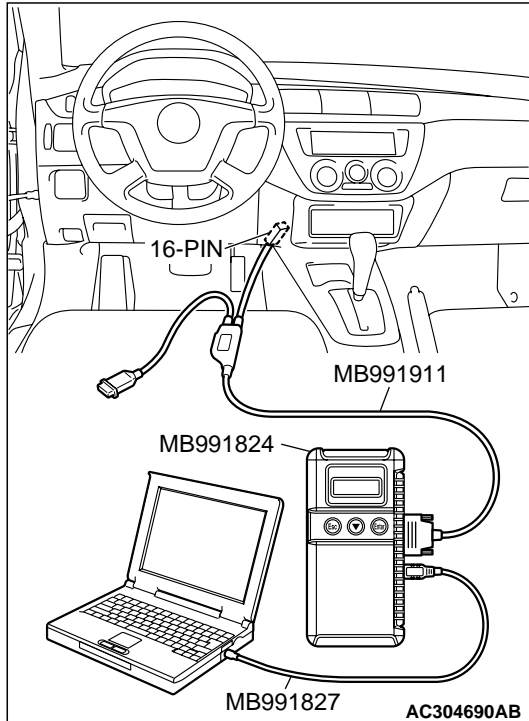
(4) Turn the ignition switch to the "LOCK" (OFF) position.

(5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 3.

NO : Refer to P.17-178, Symptom Procedures number 4. Then go to Step 6.



STEP 3. Using scan tool MB991958, check data list item 05: Stoplight Switch and data list item 06: Brake switch.

⚠ CAUTION

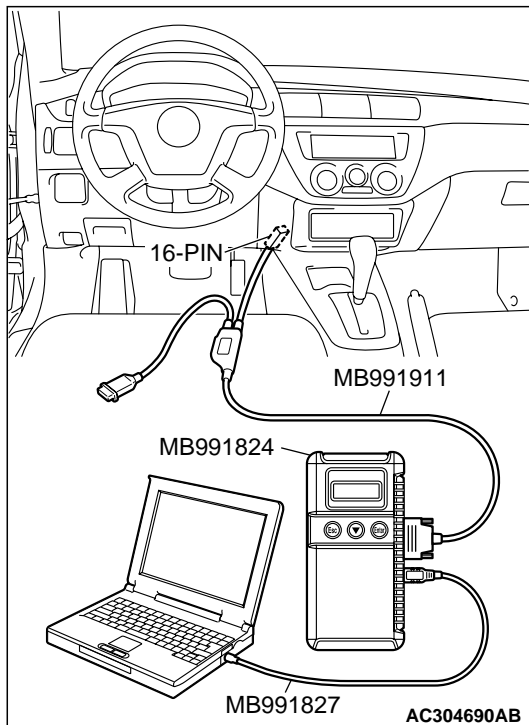
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector (Refer to [P.17-126](#)).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to data reading mode (Refer to [P.17-126](#)).
 - Item 05, Stoplight Switch.
 - When brake pedal is depressed, the display on scan tool MB991958 should be "ON".
 - When brake pedal is released, the display on scan tool MB991958 should be "OFF".
- (4) Set scan tool MB991958 to data reading mode.
 - Item 06, Brake Switch.
 - When brake pedal is depressed, the display on scan tool MB991958 should be "ON".
 - When brake pedal is released, the display on scan tool MB991958 should be "OFF".
- (5) Turn the ignition switch to the "LOCK" (OFF) position.
- (6) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 4.

NO : Refer to [P.17-170](#), Symptom Procedures number 1. Then go to Step 6.



STEP 4. Using scan tool MB991958, check data list item 07: Clutch pedal position switch <M/T> or Transmission Range Switch <A/T>.

⚠ 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.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Set scan tool MB991958 to data reading mode (Refer to P.17-126).
 - Item 07, Clutch pedal position switch <M/T>.
 - When clutch pedal is depressed, the display on scan tool MB991958 should be "ON".
 - When clutch pedal is released, the display on scan tool MB991958 should be "OFF".
 - Item 07, Transmission Range Switch <A/T>.
 - When selector lever is at the "P" or "N" position, the display on scan tool MB991958 should be "ON".
 - When selector lever is at the "R" or "D" position, the display on scan tool MB991958 should be "OFF".
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is the switch operating properly?

YES : Go to Step 5

NO : Refer to P.17-178, Symptom Procedures number 3. Then go to Step 6

STEP 5. Check the symptoms.

Q: Can auto-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.00-6).

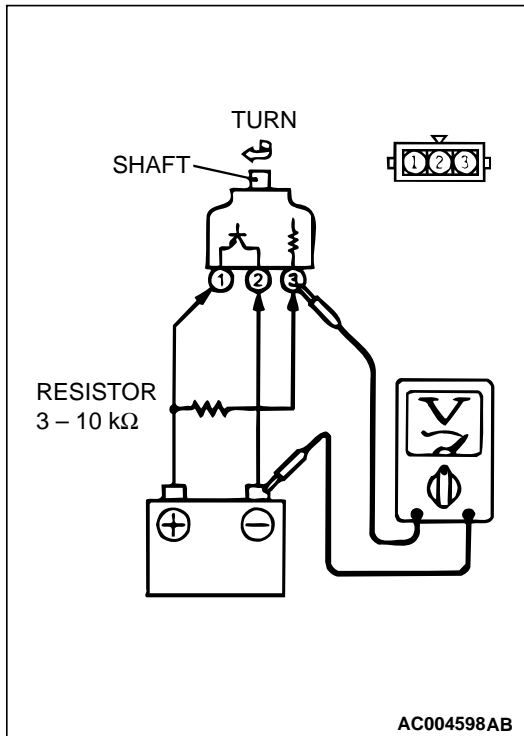
NO : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. Then go to Step 6.

STEP 6. Check the symptoms.

Q: Can auto-cruise control be set?

YES : The procedure is complete.

NO : Return to Step 1.

**STEP 2. Check the vehicle speed sensor.**

- (1) Remove the vehicle speed sensor and connect a 3 – 10-kΩ resistor as shown in the illustration.
- (2) Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 2 – 3. (one turn = four pulses)

Q: Is the voltage within specifications?

YES : Go to Step 3.

NO : Replace the vehicle speed sensor. Refer to GROUP 54A, Combination Meter Assembly and Vehicle Speed Sensor [P.54A-46](#). Then go to Step 4.

STEP 3. Retest the system**Q: Does a hunting occur?**

YES : Replace the ECM [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) [P.13B-919](#)]. 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.00-6](#)).

STEP 4. Retest the system**Q: Does a hunting occur?**

YES : Return to Step 1.

NO : The procedure is complete.

INSPECTION PROCEDURE 6: Hunting (Repeated Acceleration and Deceleration) Occurs at the Set Vehicle Speed <A/T>.

COMMENT

The output shaft speed sensor signal or the throttle body is suspected.

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

- Malfunction of the output shaft speed sensor.
- Malfunction of the throttle body.
- Malfunction of the PCM.

DIAGNOSIS

Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

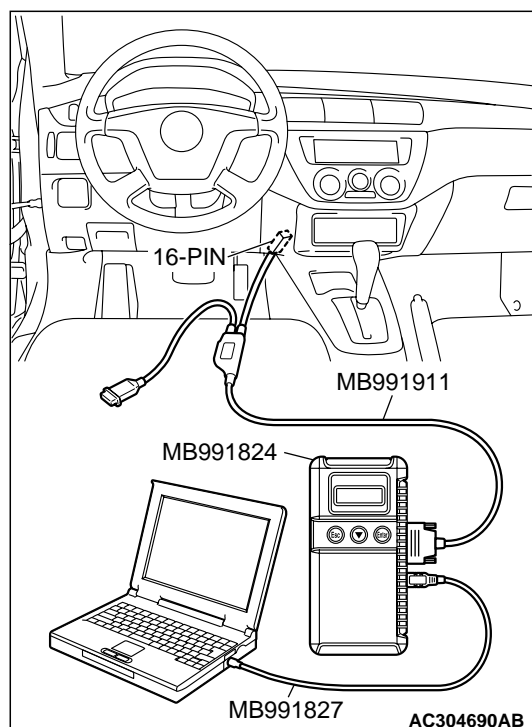
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

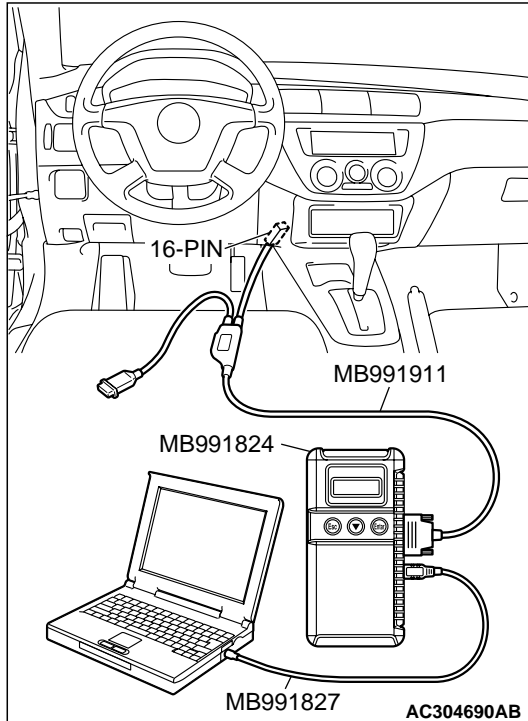
- (1) Connect scan tool MB991958 to the data link connector (Refer to P.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T system diagnostic trouble code (Refer to GROUP 23B, Diagnosis Function - How to Read and Erase Diagnostic Trouble Code P.23B-13).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the automatic transaxle control system. (Refer to GROUP 23B, A/T Diagnosis – Diagnostic Trouble Code Chart P.23B-38). Then go to Step 4.

NO : Go to Step 2.





STEP 2. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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.17-126).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code (Refer to GROUP 13B, MFI Diagnosis - How to Read and Erase Diagnostic Trouble Code P.13B-6).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-31). Then go to Step 4.

NO : Go to Step 3.

STEP 3. Retest the system

Q: Does a hunting occur?

YES : Replace the PCM [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. 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.00-6).

STEP 4. Retest the system

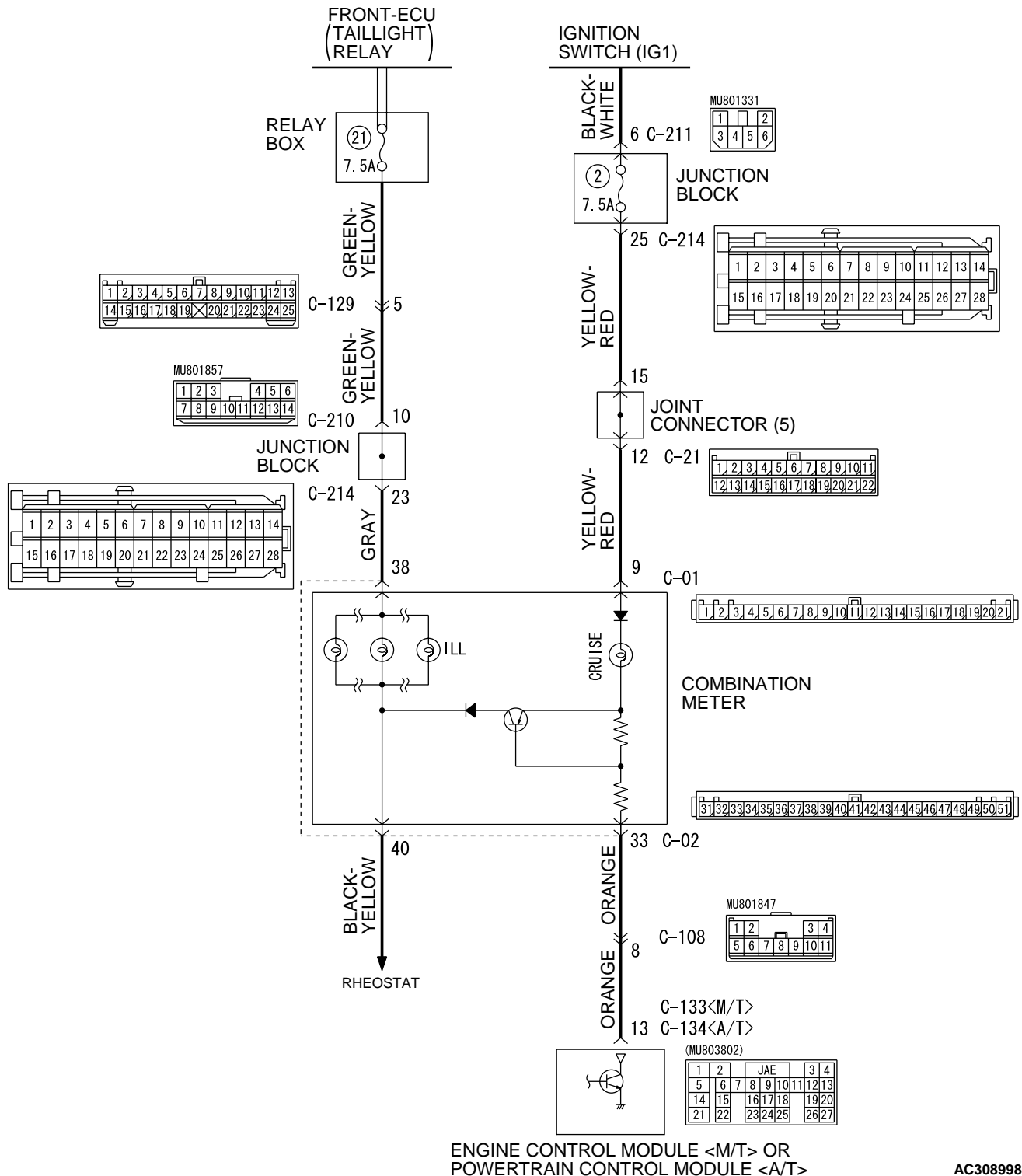
Q: Does a hunting occur?

YES : Return to Step 1.

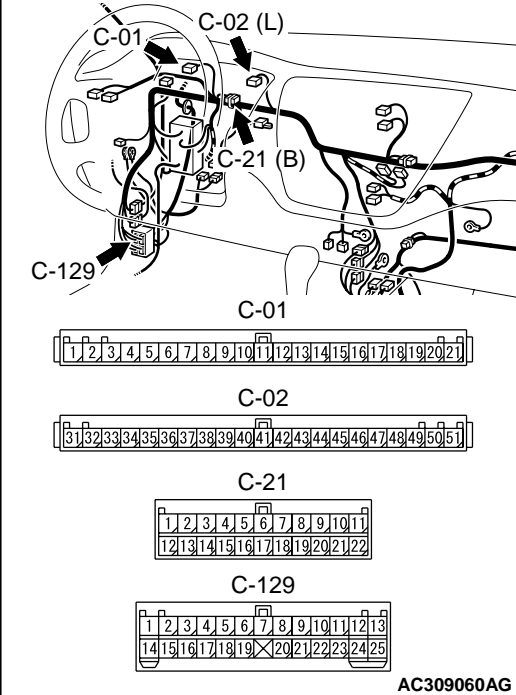
NO : The procedure is complete.

INSPECTION PROCEDURE 7: When "CRUISE" (MAIN) Switch is Turned "ON", "CRUISE" Indicator Light Inside Combination Meter does not Illuminate. (However, Auto-cruise Control is Normal).

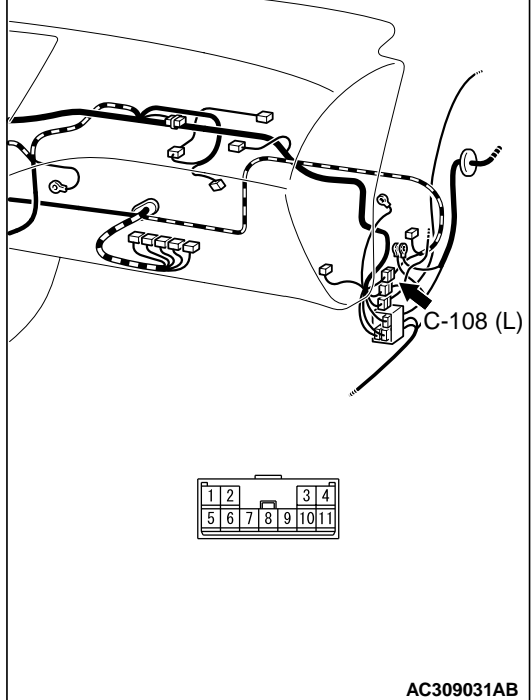
Auto-cruise Control Indicator Light Drive Circuit



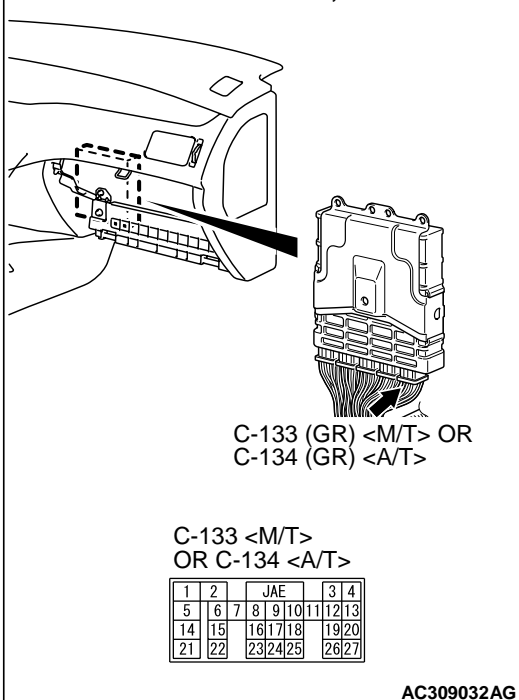
CONNECTORS: C-01, C-02, C-21, C-129



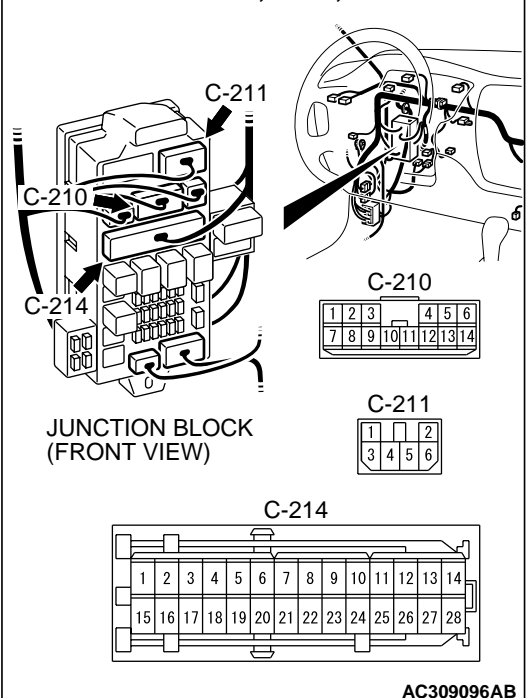
CONNECTOR: C-108



CONNECTORS: C-133 <M/T>, C-134 <A/T>



CONNECTORS: C-210, C-211, C-214



CIRCUIT OPERATION

The ECM <M/T> or PCM <A/T> detects "CRUISE" (MAIN) switch "ON" signal to illuminate the "CRUISE" indicator light on the combination meter.

COMMENT

Connector(s), wiring harness between the ECM <M/T> or PCM <A/T> and the combination meter, the indicator light bulb and the ECM <M/T> or PCM <A/T> may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the indicator light bulb.
- Damaged harness or connector.
- Malfunction of the ECM <M/T>.
- Malfunction of the PCM <A/T>.

DIAGNOSIS

Required Special Tool:

- MB991958: Scan tool (MUT-III sub assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB cable
 - MB991911: MUT-III main harness B

STEP 1. Check that the indicator light inside the combination meter illuminates.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check the indicator lights other than "CRUISE" indicator light illuminate.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Do the indicator lights other than the "CRUISE" indicator light illuminate normally?

YES : Go to Step 6.

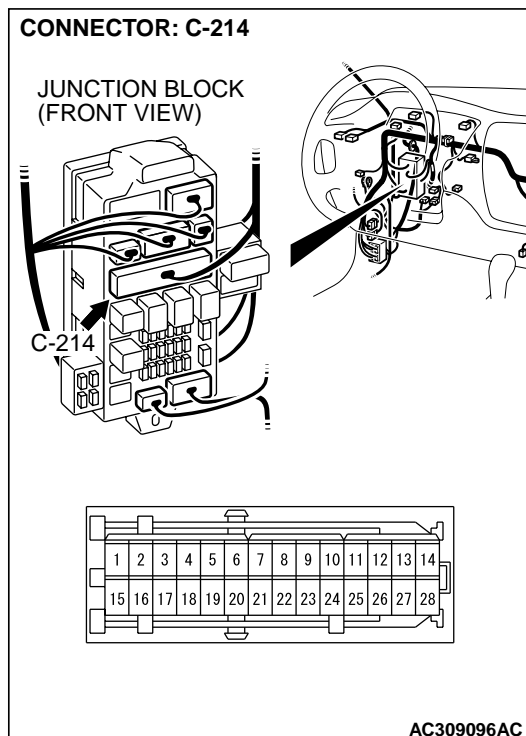
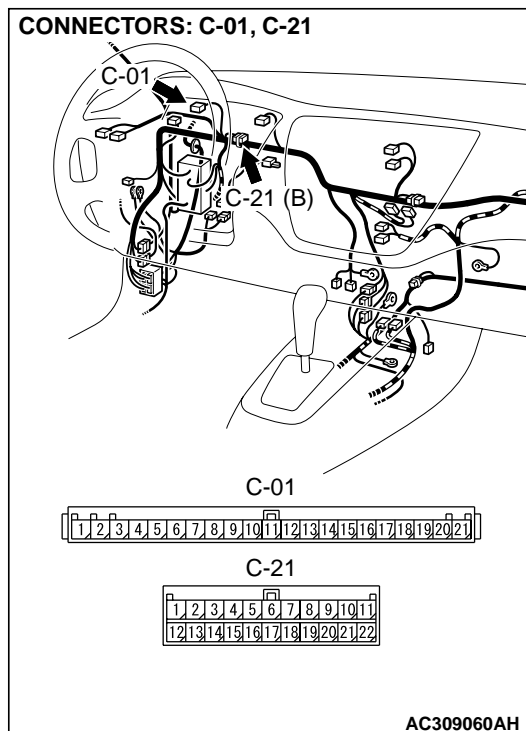
NO : Go to Step 2.

STEP 2. Check combination meter connector C-01, joint connector (5) C-21 and junction block connector C-214 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are there connectors and terminals in good condition?

YES : Go to Step 3.

NO : Repair or replace the damaged components. (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then go to Step 11.

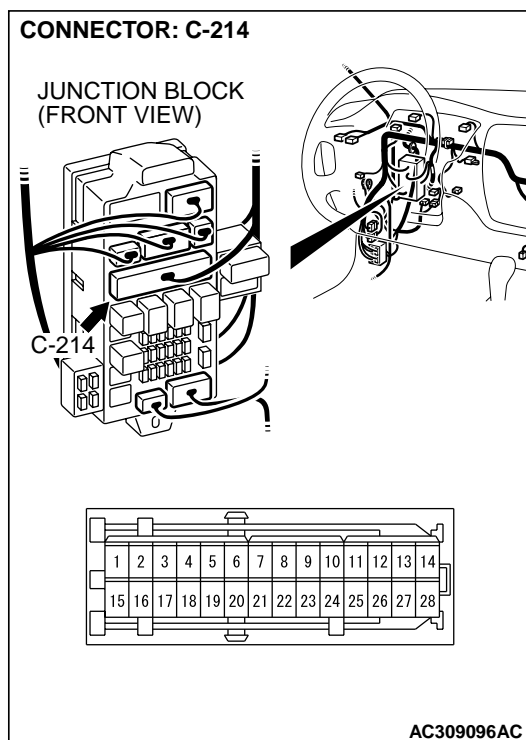
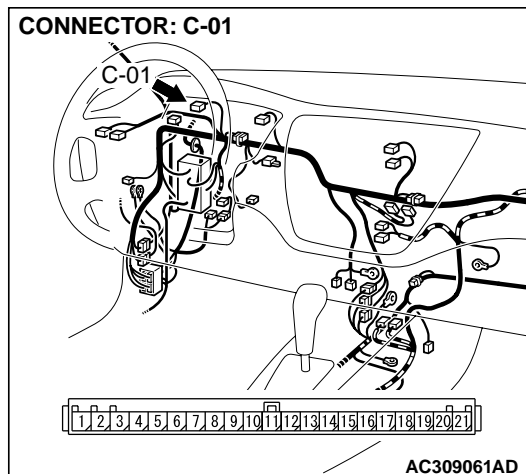


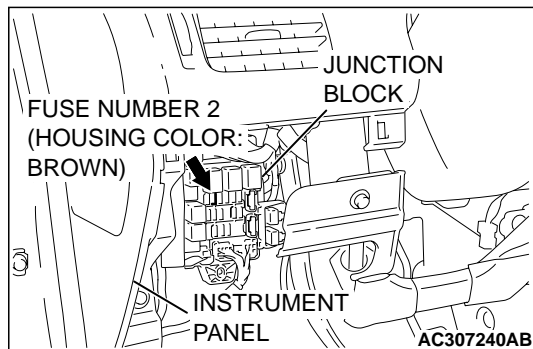
STEP 3. Check the harness wire between combination meter connector C-01 terminal 9 and junction block connector C-214 terminal 25 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 4.

NO : Repair the damaged harness wire. Then go to Step 11.





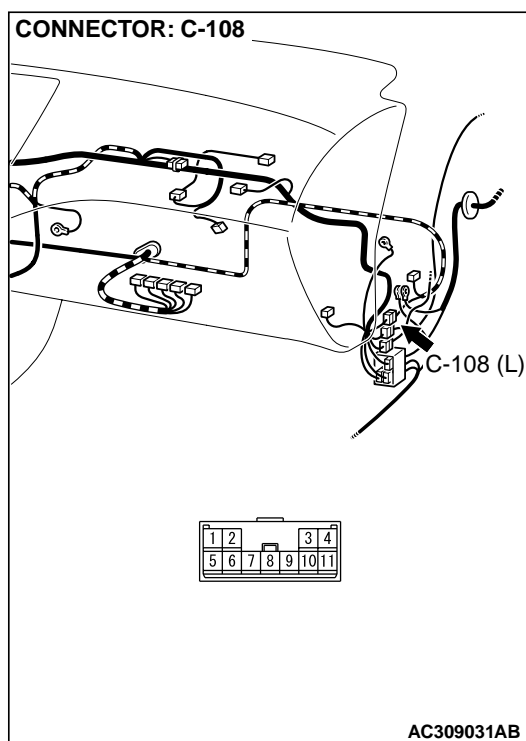
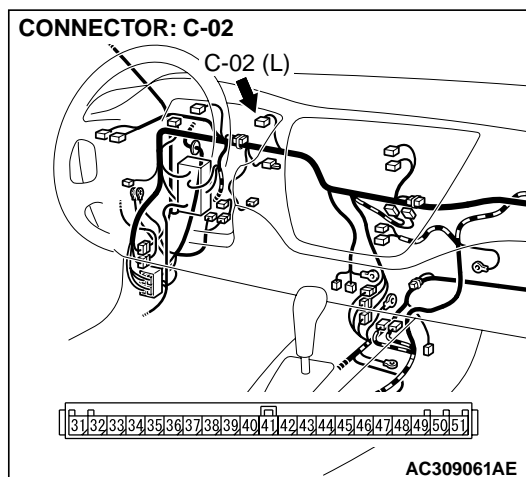
STEP 4. Check fuse number 2 at the junction block.**Q: Is the fuse in good condition?****YES :** Go to Step 5.**NO :** Replace the fuse. Then go to Step 11.

STEP 5. Check that the indicator light inside the combination meter illuminates.

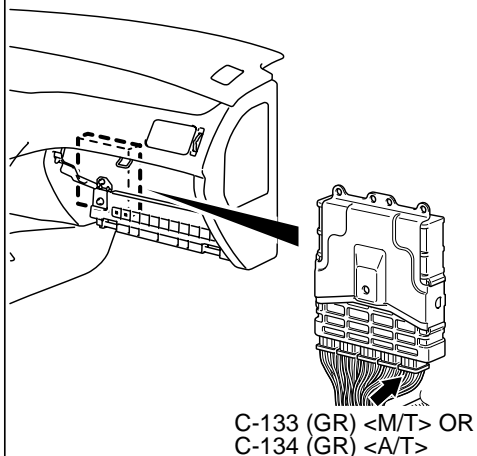
- (1) Turn the ignition switch to the "ON" position.
- (2) Check that the indicator light inside the combination meter illuminates.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the indicator light illuminate 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.00-6](#)).**NO :** Replace the combination meter. (Refer to GROUP 54A, Combination meter assembly [P.54A-46](#)). Then go to Step 11.

STEP 6. Check combination meter connector C-02, intermediate connector C-108 and ECM connector C-133 <M/T> or PCM connector C-134 <A/T> for loose, corroded or damaged terminals, or terminals pushed back in the connector.



CONNECTORS: C-133 <M/T>, C-134 <A/T>

C-133 <M/T>
OR C-134 <A/T>

1	2	JAE		3	4
5	6	7	8	9	10
11	12	13	14	15	16
17	18	19	20	21	22
23	24	25	26	27	

AC309032AG

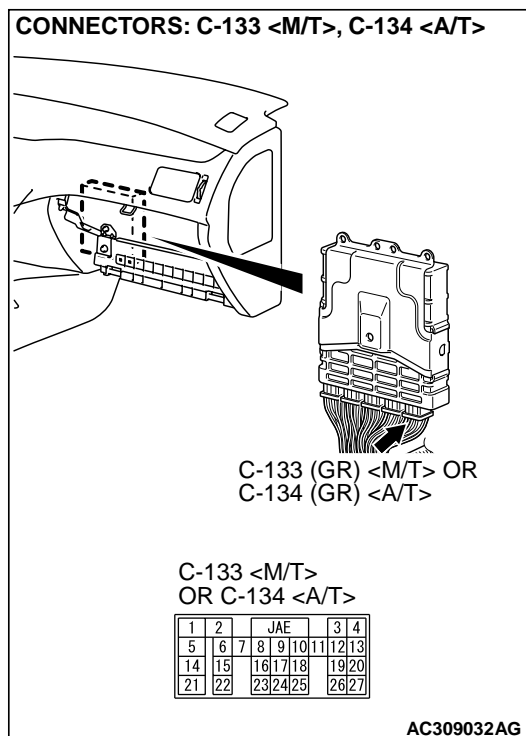
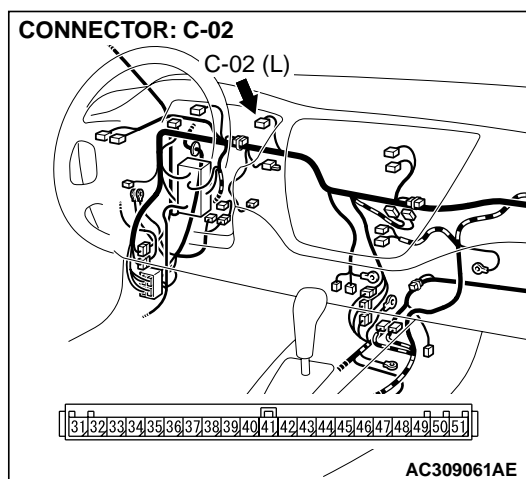
Q: Are the connectors and terminals in good condition?**YES :** Go to Step 7.**NO :** Repair or replace the damaged components (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). Then go to Step 11.

STEP 7. Check the harness wire between combination meter connector C-02 terminal 33 and ECM connector C-133 <M/T> terminal 13 or PCM connector C-134 <A/T> terminal 13 for damage.

Q: Are the harness wires in good condition?

YES : Go to Step 8.

NO : Repair the damaged harness wire. Then go to Step 11.



STEP 8. Check the auto-cruise control indicator light bulb.

(1) Remove the combination meter. (Refer to GROUP 54A, Combination meter assembly [P.54A-46](#)).

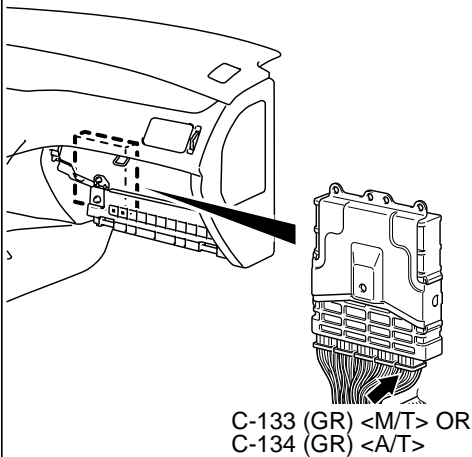
(2) Check the auto-cruise control indicator light bulb.

Q: Is the bulb in good condition?

YES : Install the combination meter. (Refer to GROUP 54A, Combination meter assembly [P.54A-46](#)). Then go to Step 9.

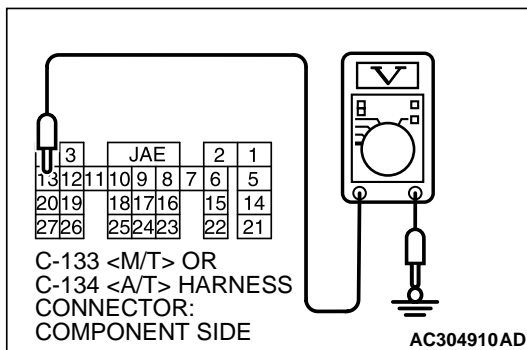
NO : Replace the bulb and install the combination meter. (Refer to GROUP 54A, Combination meter assembly [P.54A-46](#)). Then go to Step 11.

CONNECTORS: C-133 <M/T>, C-134 <A/T>

C-133 <M/T>
OR C-134 <A/T>

1	2	JAE				3	4
5	6	7	8	9	10	11	12
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	

AC309032AG

**STEP 9. Measure the terminal voltage at ECM connector C-133 <M/T> or PCM connector C-134 <A/T>.**

- (1) Disconnect ECM connector C-133 <M/T> or PCM connector C-134 <A/T> measure the harness connector.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the terminal voltage between ECM connector C-133 <M/T> terminal 13 or PCM connector C-134 <A/T> terminal 13 and ground.

- When the ignition switch to the "ON" position, the voltage should measure battery positive voltage (approximately 12 volts).
- When the ignition switch to the "LOCK" (OFF) position, the voltage should measure 0.5 volt or less.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Connect ECM connector C-133 <M/T> or PCM connector C-134 <A/T>.

Q: Is the measured voltage battery positive voltage (approximately 12 volts) when ignition switch to the "ON" position, and 0.5 volt or less when ignition switch to the "OFF" (LOCK) position?

YES : Go to Step 10.

NO : Replace the combination meter (Refer to GROUP 54A, Combination meter assembly [P.54A-46](#)). Then go to Step 11.

STEP 10. Check the symptoms.

Q: Does the auto-cruise control indicator light illuminate when "CRUISE" (MAIN) switch is turned "ON"?

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

NO : Replace the ECM <M/T> or PCM <A/T> [Refer to GROUP 13B, Engine Control Module (ECM) and Powertrain Control Module (PCM) P.13B-919]. Then go to Step 11.

STEP 11. Check the symptoms.

Q: Does the auto-cruise control indicator light illuminate when "CRUISE" (MAIN) switch is turned "ON"?

YES : Return to Step 1.

NO : The procedure is complete.

DATA LIST REFERENCE TABLE

M1172002400341

⚠ CAUTION

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

*NOTE: *:Disconnect the throttle position sensor connector, and then delete the diagnostic trouble code that was recorded during the inspection with the use of scan tool MB991958 after the inspection has been completed.*

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM		INSPECTION REQUIREMENT		NORMAL CONDITION
APS SNS(MAIN)	12	Accelerator pedal position sensor (main)		Ignition switch: "ON"	Accelerator pedal: Released	735 – 1,335 mV
					Accelerator pedal: Gradually depressed	Increases in response to the pedal depression stroke
					Accelerator pedal: Fully depressed	4,000 mV or more
BREAK SW	06	Stoplight switch		Brake pedal: Depressed		ON
				Brake pedal: Released		OFF
CANCEL CODE	13	Cancel code		Ignition switch: "ON"		The cancel code, which set when the auto-cruise control system was cancelled at the last time, is set again.
CANCEL SWITCH	04	Auto-cruise control switch	CANCEL	"CANCEL" switch: ON		ON
				"CANCEL" switch: OFF		OFF

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM		INSPECTION REQUIREMENT		NORMAL CONDITION	
CLUTCH SW	07	Clutch pedal positon switch <M/T>		Clutch pedal: Depressed		ON	
				Clutch pedal: Released		OFF	
		Transmission range switch <A/T>		Transmission range switch: "P" or "N"		ON	
				Transmission range switch: Other than above		OFF	
CRUISE	09	Auto-cruise control operation		Auto-cruise control: active		ON	
				Auto-cruise control: Inactive		OFF	
IDLE SW SIG	08	Accelerator pedal position switch		Accelerator pedal: Depressed		OFF	
				Accelerator pedal: Released		ON	
MAIN SW	01	Auto-cruise control switch	CRUISE (MAIN)	"CRUISE" (MAIN) switch: "ON"		ON	
				"CRUISE" (MAIN) switch: "OFF"		OFF	
RESUME SWITCH	03	Auto-cruise control switch	ACC/RES	"ACC/RES" switch: ON		ON	
				"ACC/RES" switch: OFF		OFF	
SET SWITCH	02	Auto-cruise control switch	COAST/S ET	"COAST/SET" switch: ON		ON	
				"COAST/SET" switch: OFF		OFF	
STOPLIGHT SW	05	Stoplight switch		Brake pedal: Depressed		ON	
				Brake pedal: Released		OFF	
TP SNSR(MAIN)	11	Throttle position sensor (main)*		<ul style="list-style-type: none">Remove the intake air hose at the throttle body.Disconnect the throttle position sensor connector, and then connect terminal numbers 1, 2, 3 and 4 with the use of the special tool: MB991348.Ignition switch: "ON"	Fully close the throttle valve with your finger	300 – 700 mV	
					Fully open the throttle valve with your finger	4,000 mV or more	
				No load		520 – 620 mV	
				Selector lever: "N" to "D"		540 – 640 mV	
VSS	10	Vehicle speed signal		Road test the vehicle		The speedometer and scan tool MB991958 display the same value.	

ECM<M/T> OR PCM<A/T> TERMINAL VOLTAGE REFERENCE CHART FOR AUTO-CRUISE CONTROL SYSTEM OPERATION

M1172006000011

1	2	JAE				3	4
5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	

31	32	JAE				33	34
35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58

61	62	JAE				63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89							

91	92	JAE				93	94
95	96	97	98	99	100	101	102
103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118
119	120						

121	122	JAE				123	124
125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140
141	142	143	144			145	146

AC304505

TERMINAL NO.	CHECK ITEM	CHECK CONDITION		NORMAL CONDITION
13	"CRUISE" indicator light input	When "CRUISE" indicator light is illuminated		0.5 V or less
		When "CRUISE" indicator light is switch off		Battery positive voltage
15	Throttle actuator control motor relay	Ignition switch: "ON"		0.5 V or less
		Ignition switch: "OFF" (LOCK)		Battery positive voltage
34	ECM <M/T> or PCM <A/T> power supply	Ignition switch: "ON"		Battery positive voltage
		Ignition switch: "OFF" (LOCK)		0.5 V or less
38	Closed throttle position switch	Ignition switch: "ON"	Release the accelerator pedal	0.5 V or less
			Depress the accelerator pedal.	4.5 – 5.5 V
39	Stoplight switch	Ignition switch: "ON"	Depress the brake pedal.	Battery positive voltage
			Release the brake pedal.	1V or less
40	Clutch pedal position switch <M/T>	Ignition switch: "ON"	Depress the clutch pedal.	Battery positive voltage
			Release the clutch pedal.	1V or less
43	ECM <M/T> or PCM <A/T> power supply	Ignition switch: "ON"		Battery positive voltage
		Ignition switch: "OFF" (LOCK)		0.5 V or less
51	Transmission range switch <A/T>: "P" and "N"	Ignition switch: "ON"	Transmission range: "P" or "N"	Battery positive voltage
			Transmission range: Other than above	1V or less
54	Brake switch	Ignition switch: "ON"	Depress the brake pedal.	Battery positive voltage
			Release the brake pedal.	1V or less
57	MFI relay	Ignition switch: "ON"		0.5 V or less
		Ignition switch: "OFF" (LOCK)		Battery positive voltage
58	ECM <M/T> or PCM <A/T> backup power supply	Always		Battery positive voltage
92	Accelerator pedal position sensor (main) power supply	Ignition switch: "ON"		4.5 – 5.5 V
		Ignition switch: "OFF" (LOCK)		0.5 V or less

TERMINAL NO.	CHECK ITEM	CHECK CONDITION		NORMAL CONDITION
94	Auto-cruise control switch power supply	Ignition switch: "ON"	All switches: OFF	4.7 – 5.0 V
			"CRUISE" (MAIN) switch: "ON"	0 – 0.3 V
			"COAST/SET" switch: ON	2.0 – 2.8 V
			"ACC/RES" switch: ON	3.3 – 4.1 V
			"CANCEL" switch: ON	0.8 – 1.5 V
97	Accelerator pedal position sensor (sub) power supply	Ignition switch: "ON"		4.5 – 5.5 V
		Ignition switch: "OFF" (LOCK)		0.5 V or less
106	Throttle position sensor power supply	Ignition switch: "ON"		4.5 – 5.5 V
		Ignition switch: "OFF" (LOCK)		0.5 V or less
107	Accelerator pedal position sensor (sub)	Ignition switch: "ON"	Release the accelerator pedal	0.435 – 1.035 V
			Depress the accelerator pedal.	3.7 V or more
113	Throttle position sensor (sub)	<ul style="list-style-type: none"> Remove the intake air hose at the throttle body Disconnect the throttle position sensor, and then connect terminal numbers 3, 4, 5 and 6 with the use of the special tool: MB991348. Ignition switch: "ON" 	Fully close the throttle valve with your finger	2.2 – 2.8 V
			Fully open the throttle valve with your finger	4.6 V or more
114	Accelerator pedal position sensor (main)	Ignition switch: "ON"	Release the accelerator pedal	0.735 – 1.035 V
			Depress the accelerator pedal.	4.0 V or more
115	Throttle position sensor (main)	<ul style="list-style-type: none"> Remove the intake air hose at the throttle body Disconnect the throttle position sensor, and then connect terminal numbers 3, 4, 5 and 6 with the use of the special tool: MB991348. Ignition switch: "ON" 	Fully close the throttle valve with your finger	0.3 – 0.7 V
			Fully open the throttle valve with your finger	4.0 V or more
132	ECM <M/T> or PCM <A/T> power supply voltage applied to throttle actuator control motor	Ignition switch: "ON"		Battery positive voltage
		Ignition switch: "OFF" (LOCK)		0.5 V or less
133	Throttle actuator control motor (+)	<ul style="list-style-type: none"> Ignition switch: "ON" Accelerator pedal: fully opened to fully closed 		Decreases slightly (approx. 2V) from battery voltage.
141	Throttle actuator control motor (–)	<ul style="list-style-type: none"> Ignition switch: "ON" Accelerator pedal: fully closed to fully opened 		Decreases slightly (approx. 2V) from battery voltage.

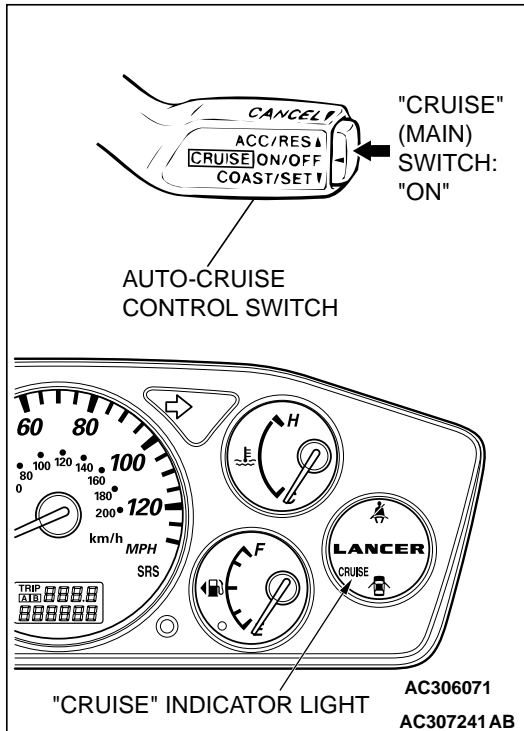
ON-VEHICLE SERVICE

AUTO-CRUISE CONTROL SWITCH CHECK

M1172001200076

AUTO-CRUISE CONTROL MAIN SWITCH CHECK

1. Turn the ignition switch to the "ON" position.
2. Check that the "CRUISE" indicator light within the combination meter illuminates when the "CRUISE" (MAIN) switch is switched "ON".



AUTO-CRUISE CONTROL SETTING

Refer to [P.17-115](#).

SPEED-INCREASE SETTING

Refer to [P.17-115](#).

SPEED-REDUCTION SETTING

Refer to [P.17-115](#).

RETURN TO THE SET SPEED BEFORE CANCELLATION AND AUTO-CRUISE CONTROL CANCELLATION

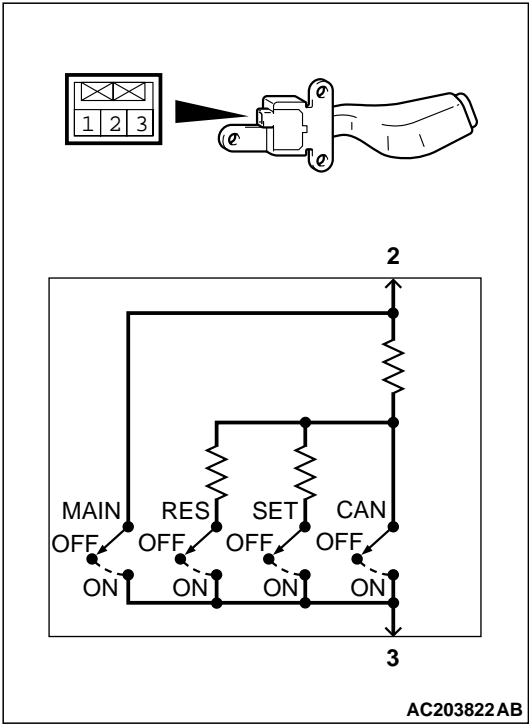
Refer to [P.17-115](#).

AUTO-CRUISE CONTROL SYSTEM COMPONENT
CHECK

M1172001700350

AUTO-CRUISE CONTROL SWITCH CHECK

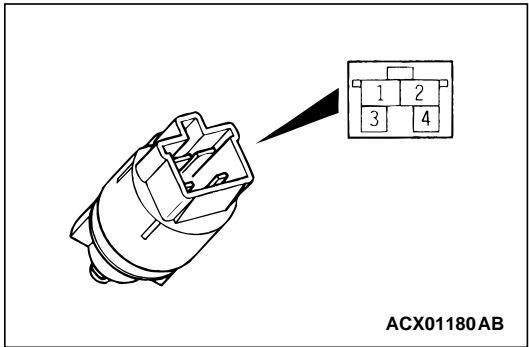
1. Remove the auto-cruise control switch (Refer to [P.17-204](#)).
2. Measure the resistance between terminal 2 and terminal 3 when each of the "COAST/SET", "ACC/RES", "CANCEL" and "CRUISE" (MAIN) switches is pressed. If the values measured at the time correspond to those in the table below, the resistance values are correct.



SWITCH POSITION	SPECIFIED CONDITION
"CRUISE" (MAIN) switch "OFF"	Open circuit
"CRUISE" (MAIN) switch "ON"	Less than 2 ohms
"CANCEL" switch ON	Approximately 100 Ω
"ACC/RES" switch ON	Approximately 887 Ω
"COAST/SET" switch ON	Approximately 300 Ω

STOPLIGHT SWITCH

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



MEASUREMENT CONDITION	TERMINAL CONNECTOR OF TESTER	SPECIFIED CONDITION
When brake pedal is depressed.	1 – 2 (for stoplight circuit)	Less than 2 ohms
	3 – 4 (for auto-cruise control circuit)	Open circuit
When brake pedal is not depressed.	1 – 2 (for stoplight circuit)	Open circuit
	3 – 4 (for auto-cruise control circuit)	Less than 2 ohms

CLUTCH PEDAL POSITION SWITCH <M/T>

Refer to [P.17-117](#).

TRANSMISSION RANGE SWITCH ("N" POSITIN)

Refer to GROUP 23B, On-vehicle Service – Essential Service
[P.23B-328](#).

THROTTLE POSITION SENSOR

Refer to GROUP 13B, On-vehicle Service – Throttle Actuator
Control Motor Check [P.13B-913](#).

ACCELERATOR PEDAL POSITION SENSOR

Refer to GROUP 13B, On-vehicle Service – Accelerator Pedal
Position Sensor Check [P.13B-909](#).

VEHICLE SPEED SENSOR CHECK <M/T>

Refer to GROUP 54A, Combination Meters Assembly and
Vehicle Speed Sensor – Inspection [P.54A-46](#).

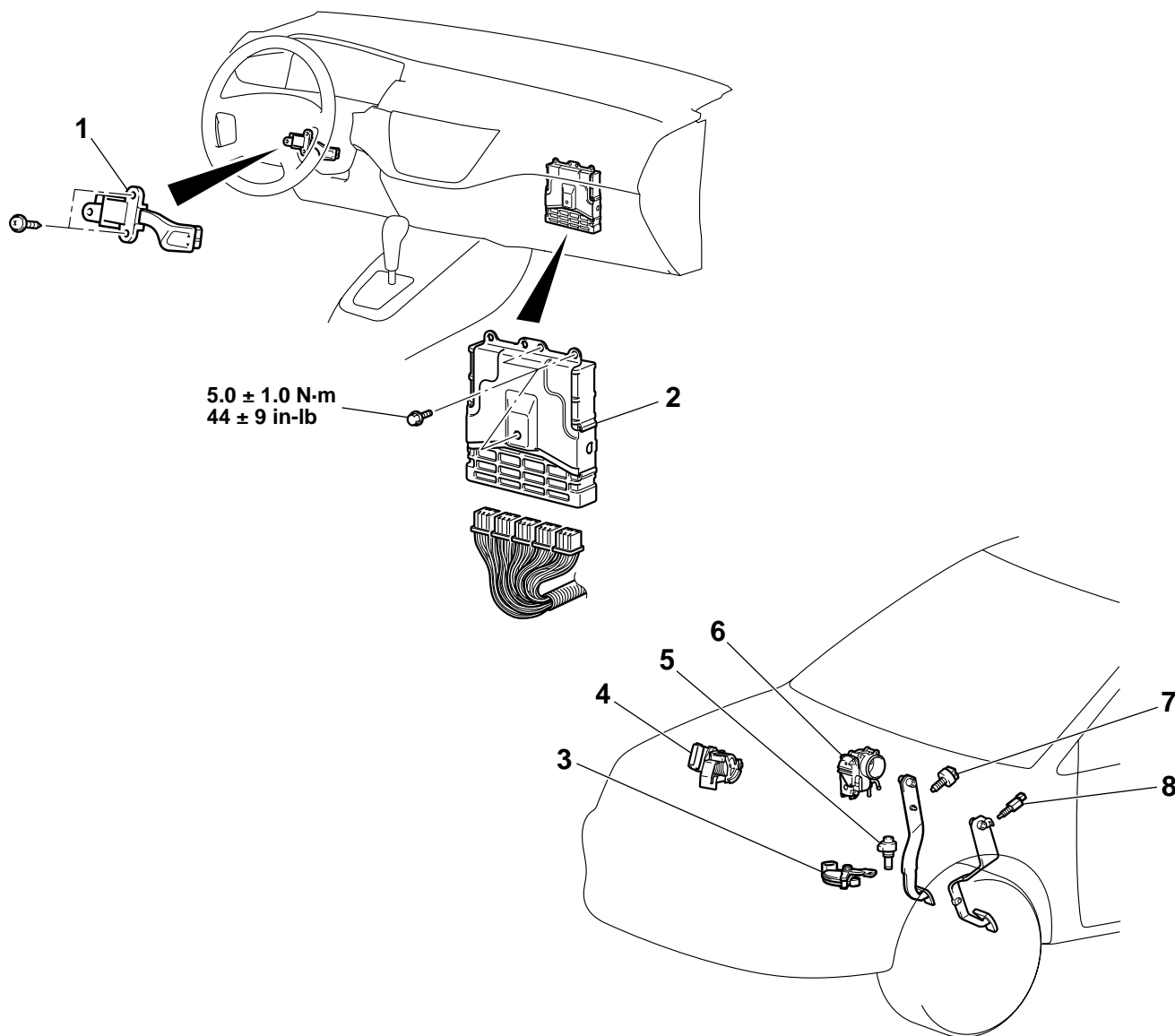
AUTO-CRUISE CONTROL

REMOVAL AND INSTALLATION

M1172001400315

⚠ WARNING

Before removal of the air bag module, refer to **GROUP 52B, SRS Service Precautions P.52B-16** and **GROUP 52B, Air Bag Module and Clock Spring P.52B-205**.



AC308999AB

CONTROL SWITCH REMOVAL STEPS

- AIR BAG MODULE (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52B-205.)

CONTROL UNIT REMOVAL

1. AUTO-CRUISE CONTROL SWITCH
2. ECM <MT> OR PCM <A/T> [REFER TO GROUP 13B, ENGINE CONTROL MODULE (ECM) AND POWERTRAIN CONTROL MODULE (PCM) P.13B-919.]

SENSOR REMOVAL STEPS

3. TRANSMISSION RANGE SWITCH <A/T> (REFER TO GROUP 23C, TRANSAXLE P.23C-9.)
4. ACCELERATOR PEDAL POSITION SENSOR (REFER TO P.17-9.)
5. VEHICLE SPEED SENSOR <M/T>
6. THROTTLE BODY (REFER TO GROUP 13B, THROTTLE BODY P.13B-917.)

SENSOR REMOVAL STEPS

7. STOPLIGHT SWITCH (REFER TO GROUP 35A, BRAKE PEDAL [P.35A-34.](#))
8. CLUTCH PEDAL POSITION SWITCH <M/T> (REFER TO GROUP 21A, CLUTCH PEDAL [P.21A-12.](#))

EMISSION CONTROL

GENERAL DESCRIPTION

M1173000100518

The emission control system consists of the following subsystems:

- Positive crankcase ventilation system
- Evaporative emission system
- Exhaust emission control system

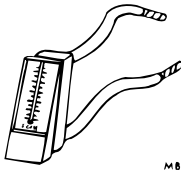
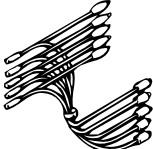
DIAGNOSIS

M1173000700156

SYMPTOM	PROBABLE CAUSE	REMEDY
Engine will not start or hard to start	Vacuum hose disconnected or damaged	Repair or replace
	The EGR valve is not closed.	Repair or replace
	Malfunction of the evaporative emission purge solenoid	Repair or replace
Rough idle or engine stalls	The EGR valve is not closed.	Repair or replace
	Vacuum hose disconnected or damaged.	Repair or replace
	Malfunction of the positive crankcase ventilation 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 exhaust gas recirculation system	Check the system; If there is a problem, check its component parts.
Excessive oil consumption	Positive crankcase ventilation line clogged	Check positive crankcase ventilation system
Poor fuel mileage	Malfunction of the exhaust gas recirculation system	Check the system; If there is a problem, check its component parts.

SPECIAL TOOLS

M1173000600223

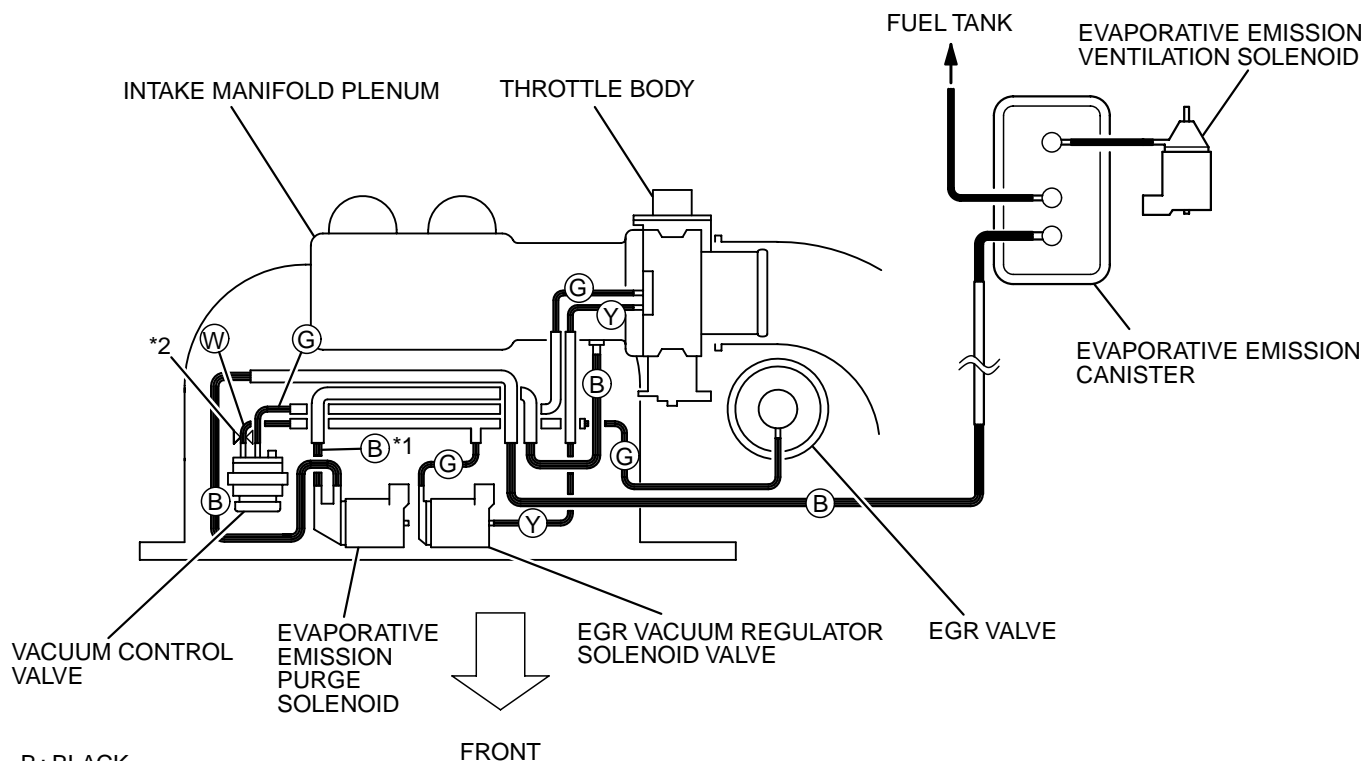
TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
	MB995061 Purge flow indicator	MLR6890A Part of MIT280220	Inspection of purge control system
	MB991658 Test harness set	Tool not available	Inspection of EGR valve (Stepper Motor)

VACUUM HOSES

VACUUM HOSE ROUTING

M1173000900440

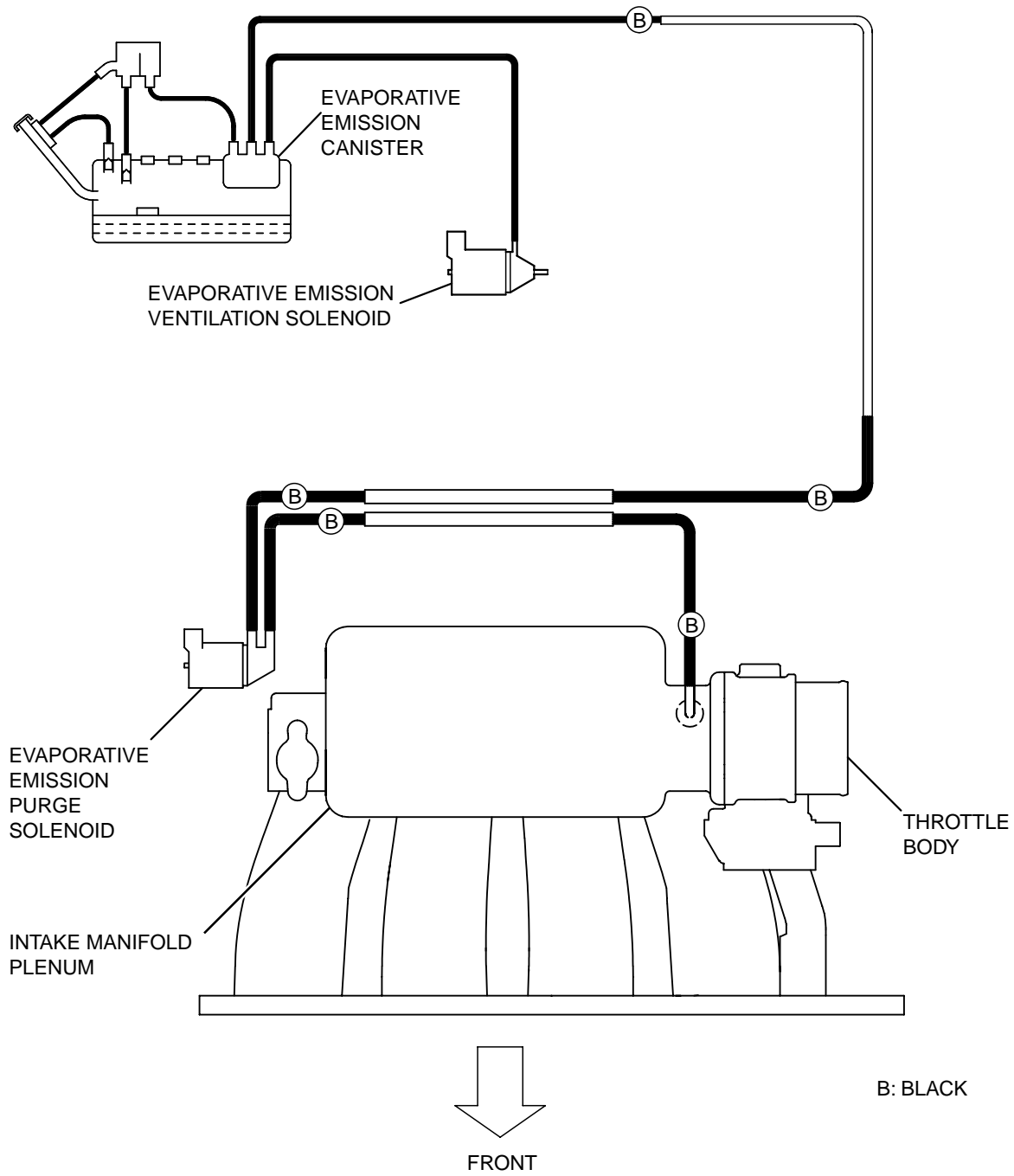
<2.0L ENGINE>



B: BLACK
 G: GREEN
 L: LIGHT BLUE
 W: WHITE
 Y: YELLOW
 *1: RED PAINT MARK
 *2: RESTRICTOR

AK301802AB

<2.4L ENGINE>

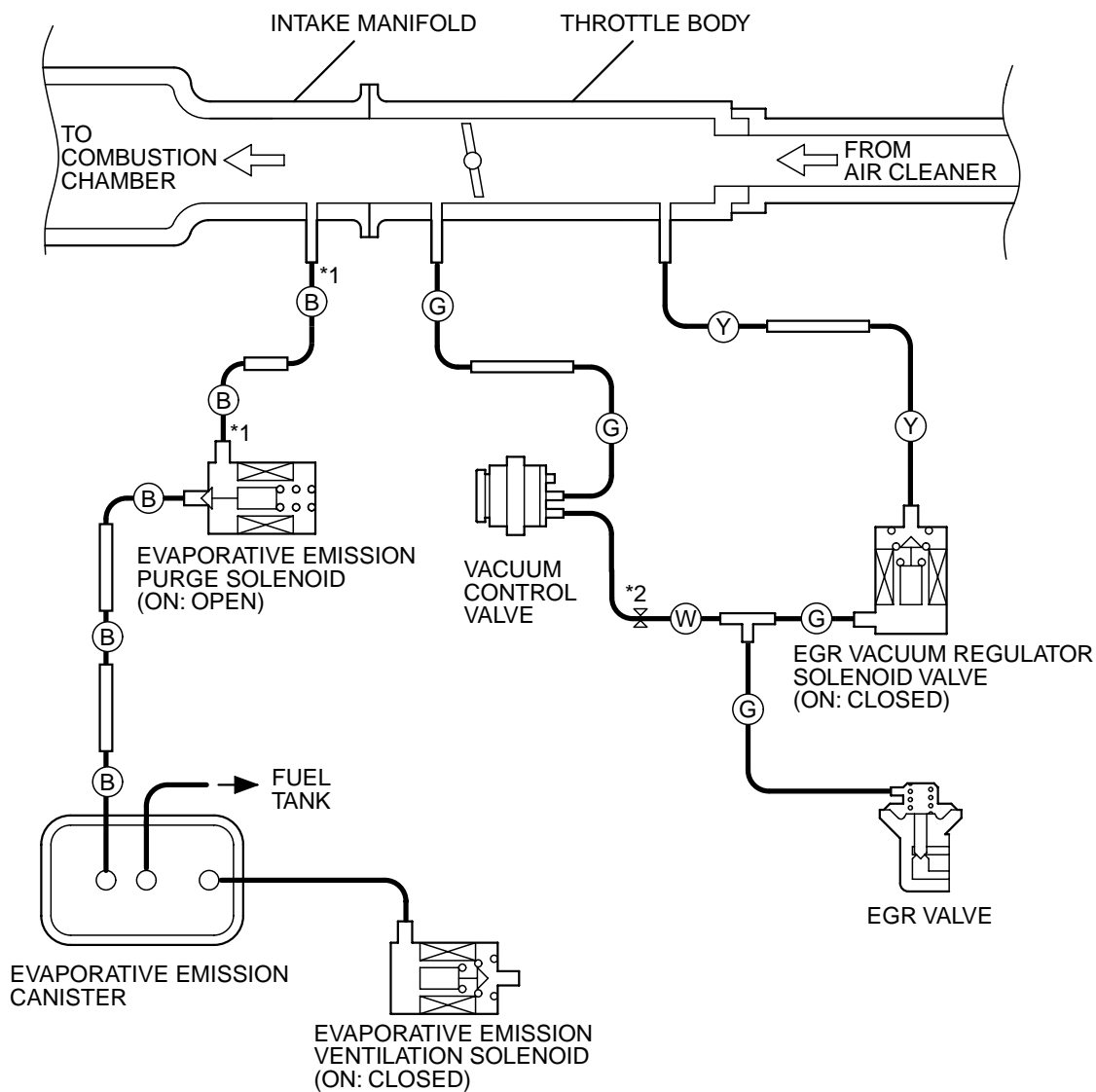


AK300725AB

VACUUM CIRCUIT DIAGRAM

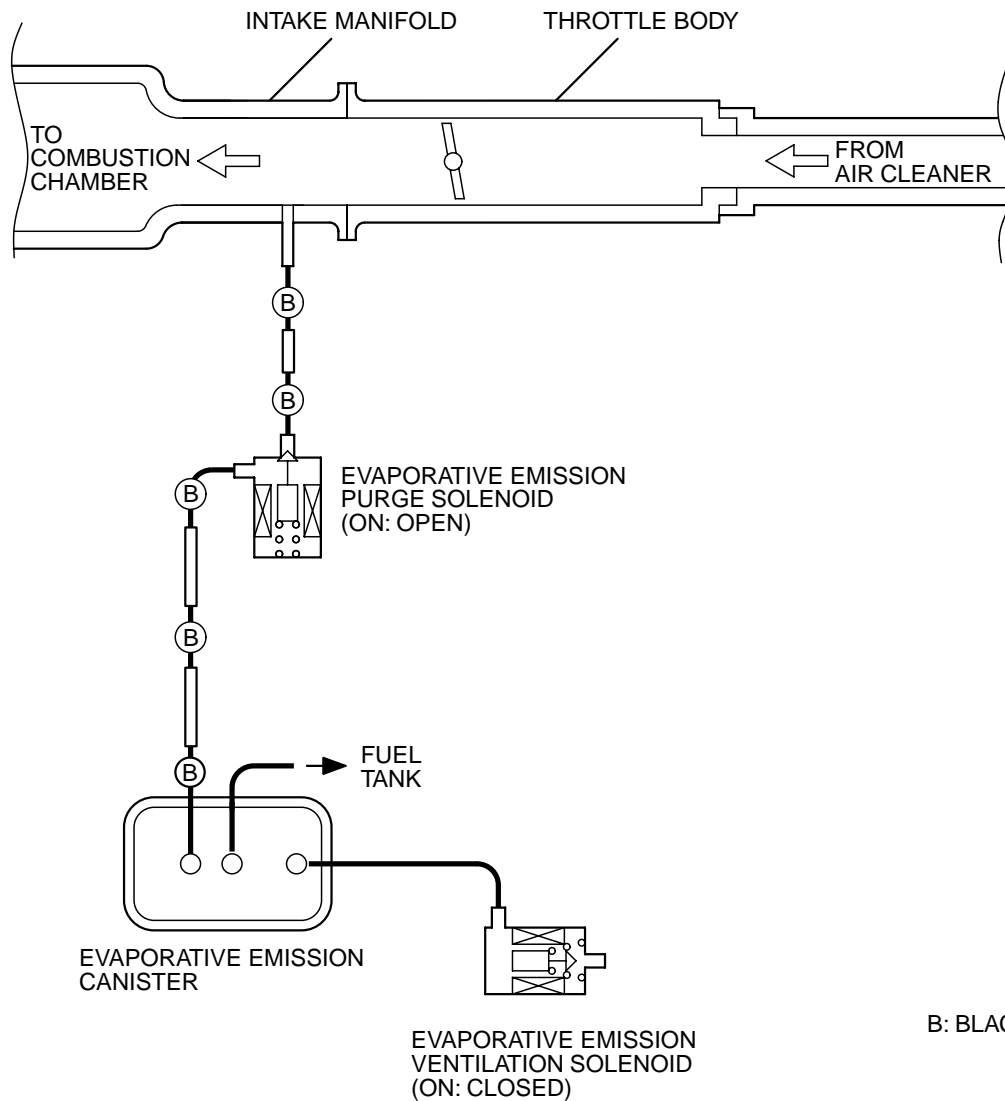
M1173007100296

<2.0L ENGINE>



AK301829AB

<2.4L ENGINE>



AK300552 AB

VACUUM HOSE INSTALLATION

M1173007200129

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

M1173007300171

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

POSITIVE CRANKCASE VENTILATION SYSTEM

GENERAL DESCRIPTION (POSITIVE CRANKCASE VENTILATION SYSTEM)

M1173005000345

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.

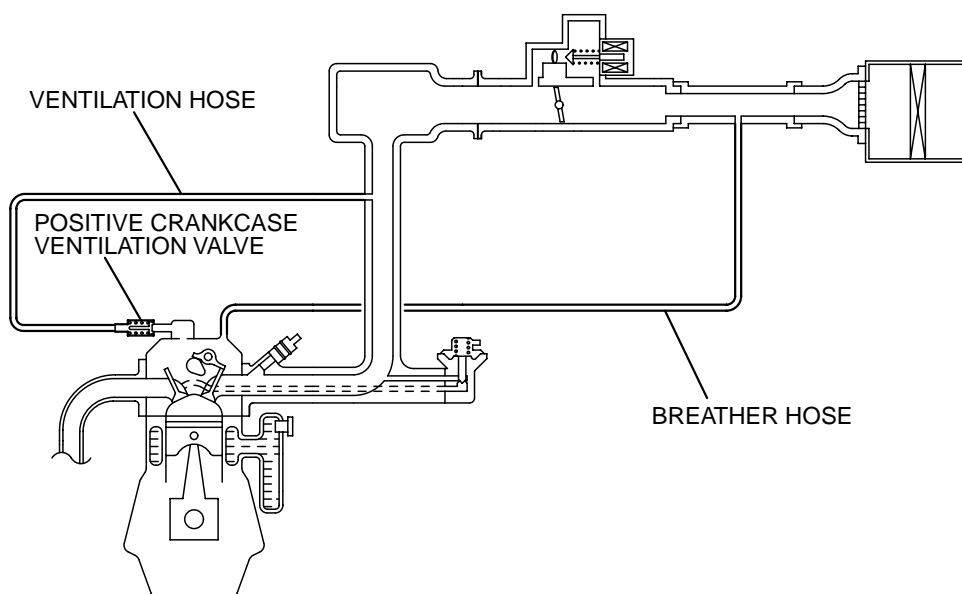
The blow-by gas inside the crankcase is drawn into the intake manifold through the PCV valve.

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.

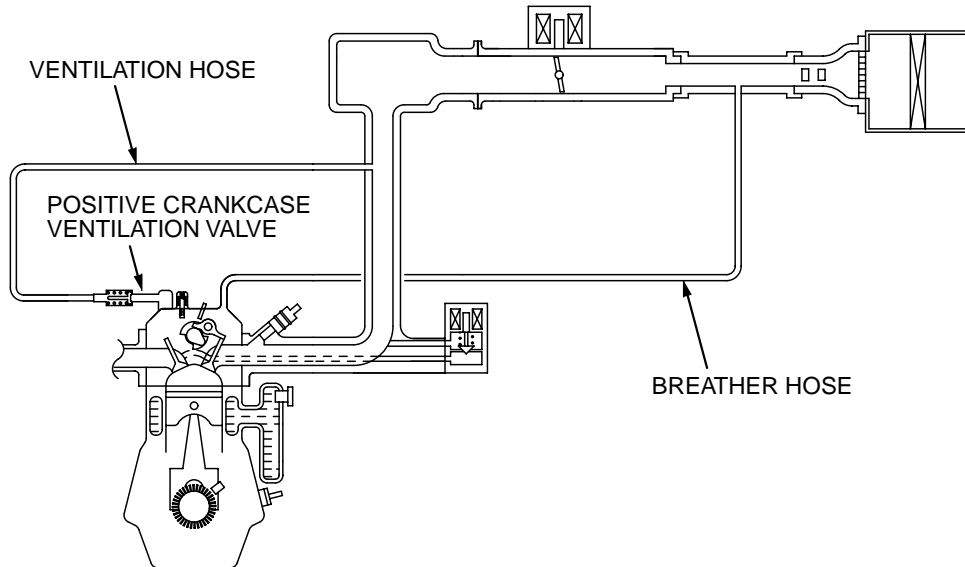
SYSTEM DIAGRAM

<2.0L ENGINE>



AK301830 AB

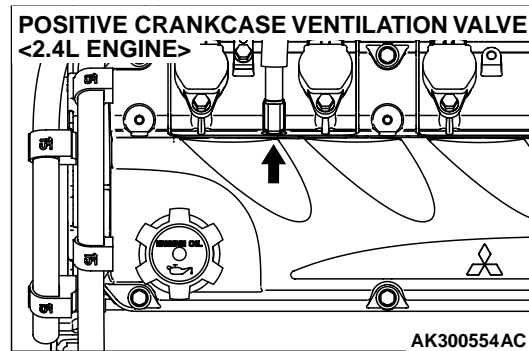
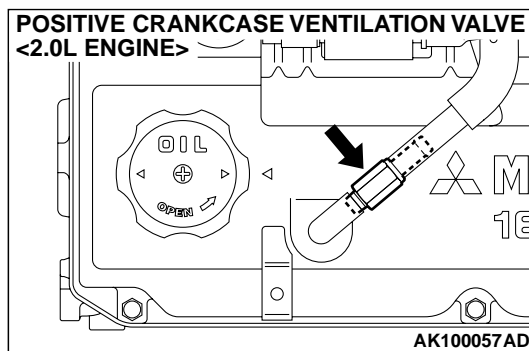
<2.4L ENGINE>



AK300553 AB

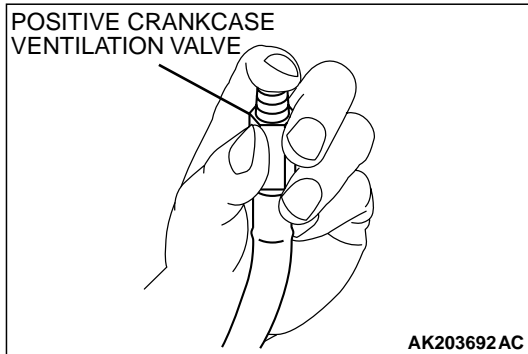
COMPONENT LOCATION

M1173007400253



**POSITIVE CRANKCASE VENTILATION SYSTEM
CHECK**

M1173001100232



1. Remove the positive crankcase ventilation (PCV) valve from the rocker cover, then reconnect the PCV valve to the vacuum supply hose.

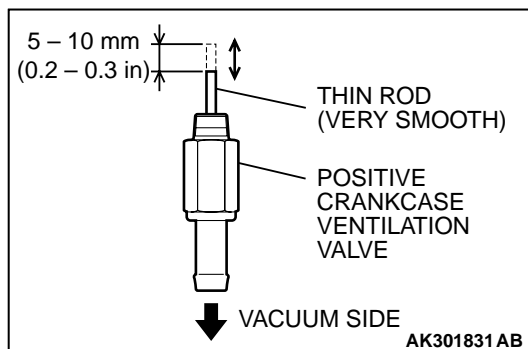
2. With the engine idling, put your finger on the open end of the PCV valve, and check for negative pressure (vacuum).

NOTE: At this time, the plunger in the PCV valve should move back and forth as the open end is covered and uncovered.

3. If negative pressure is not felt, clean or replace the PCV valve. Inspect the vacuum supply hose and vacuum supply hose port for restriction or plugged condition.

**POSITIVE CRANKCASE VENTILATION VALVE
CHECK**

M1173001200228



1. Hold the positive crankcase ventilation (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.
2. 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.

EVAPORATIVE EMISSION CONTROL SYSTEM

GENERAL DESCRIPTION (EVAPORATIVE EMISSION SYSTEM)

M1173005100438

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.

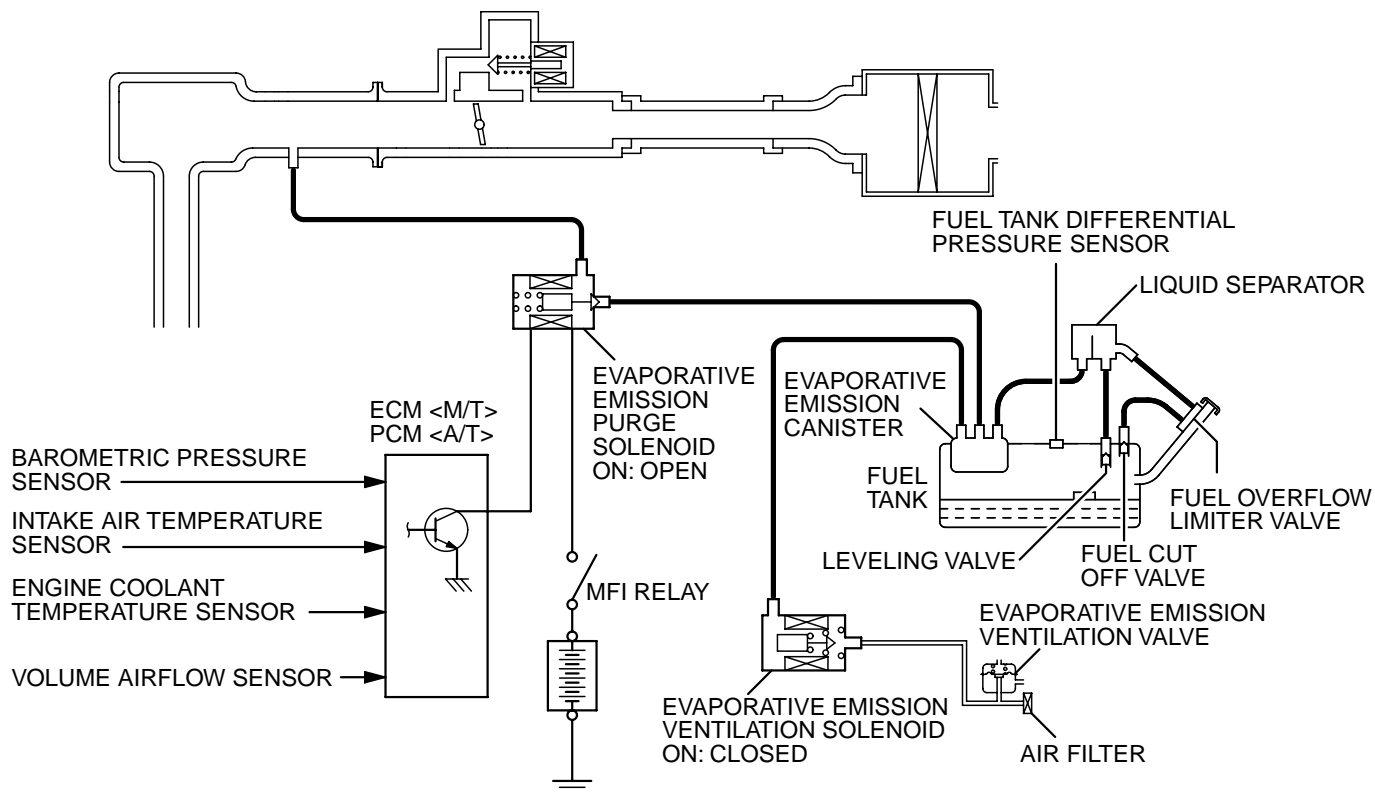
When the engine coolant temperature is low or when the intake air quantity is small (when the engine is at idle, for example), the engine control module (ECM) or powertrain control module (PCM) brings the EVAP purge solenoid into the OFF state to shut off the fuel vapor flow to the intake manifold plenum. 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 the OBD-II EVAP leaks and shuts off the atmosphere flow to the EVAP canister. Then the fuel tank differential pressure sensor monitors the fuel vapor pressure to detect OBD-II EVAP leaks. The fuel overflow limiter valve and the leveling valve prevent fuel from being overfilled. The fuel overflow limiter valve and the leveling valve prevents fuel leaks if the vehicle is rolled over in an accident.

The EVAP ventilation valve releases the air from the fuel tank through the EVAP canister into the atmosphere when the fuel tank pressure increases due to refueling, etc. The EVAP ventilation valve and the air filter supply the atmospheric air to the EVAP canister when the fuel tank pressure decreases.

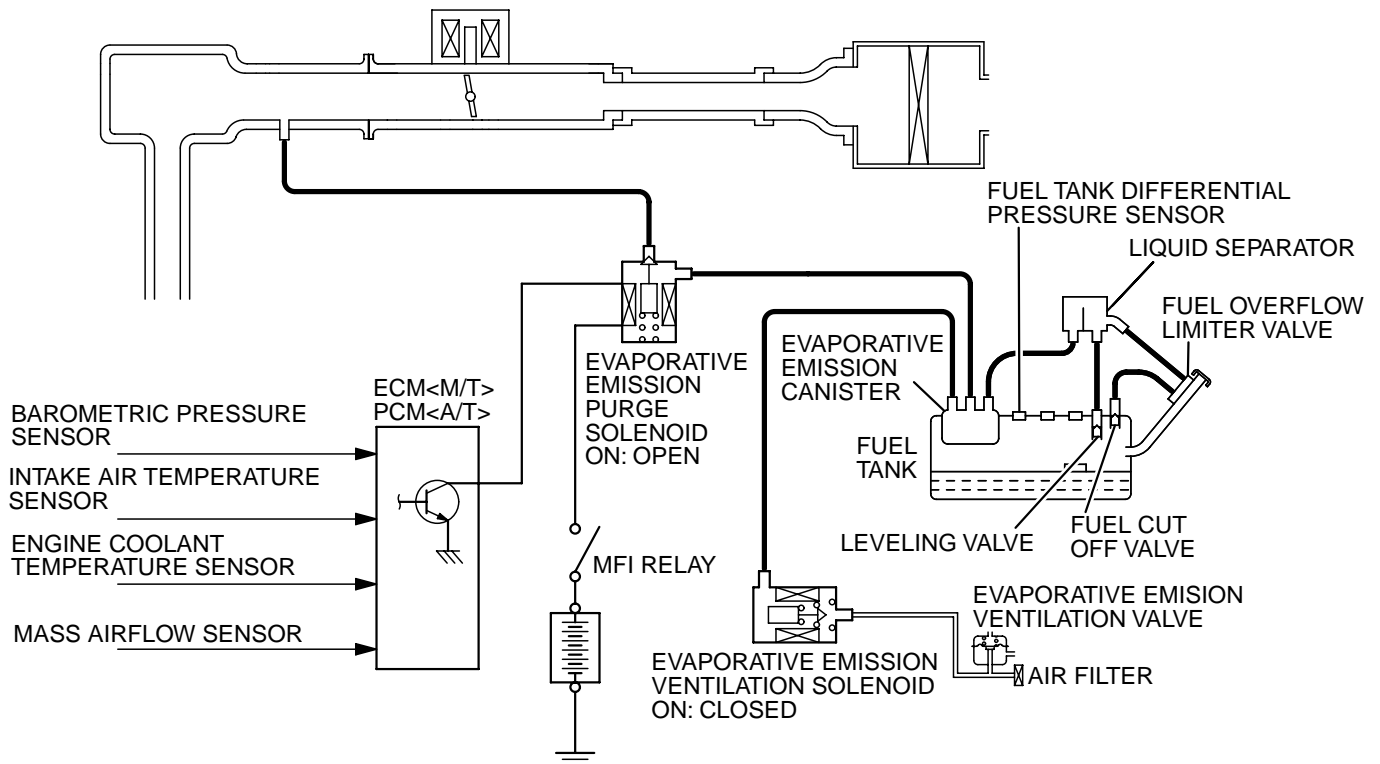
SYSTEM DIAGRAM

<2.0L ENGINE>



AK301833 AB

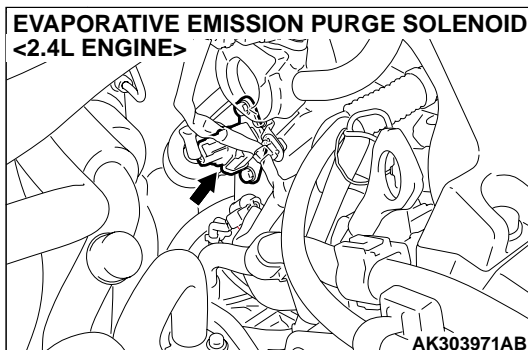
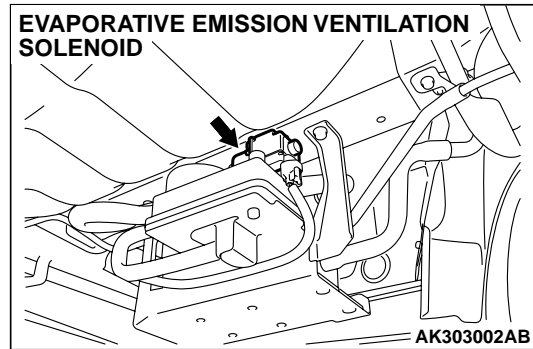
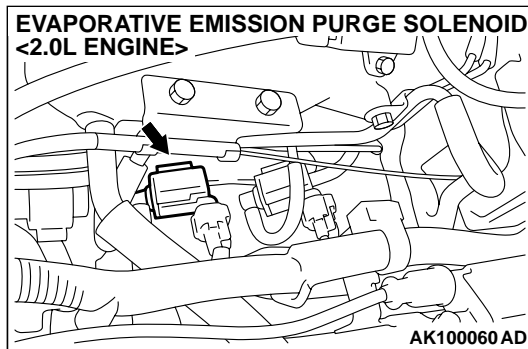
<2.4L ENGINE>



AK300555AC

COMPONENT LOCATION

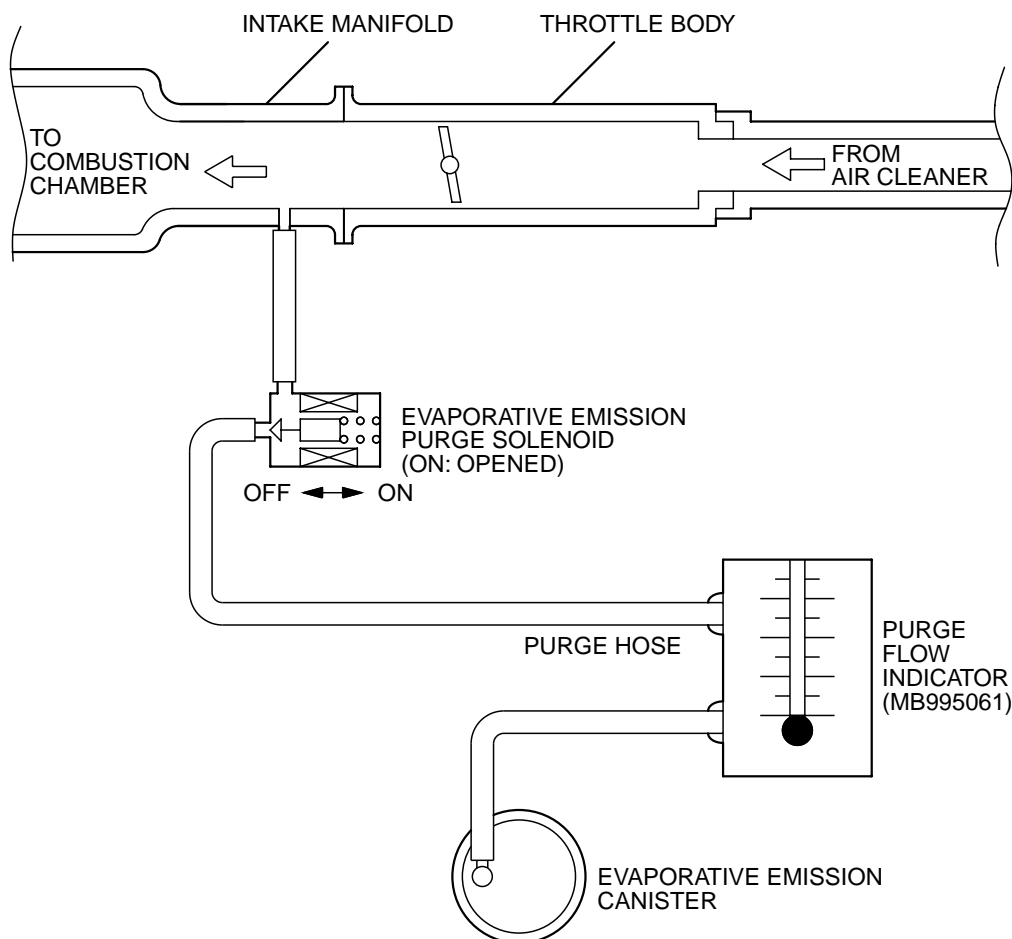
M1173007500249



PURGE CONTROL SYSTEM CHECK (PURGE FLOW CHECK)

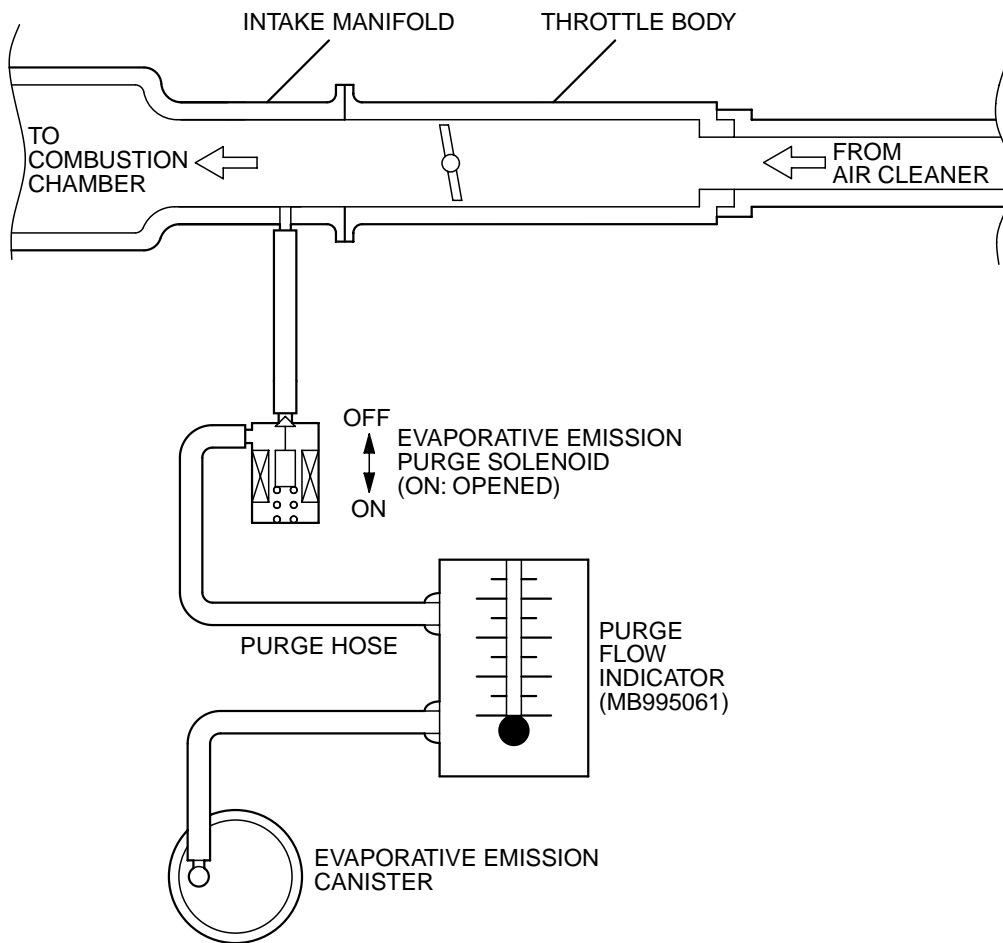
M1173001400329

<2.0L ENGINE>



AK300654 AB

<2.4L ENGINE>



AK300556 AB

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 checks, set the vehicle in the following conditions:
 - Engine coolant temperature: 80 – 95°C (176 – 203°F)
 - Lights, electric cooling fan and accessories: OFF
 - Transaxle: P range

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 cm³/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.

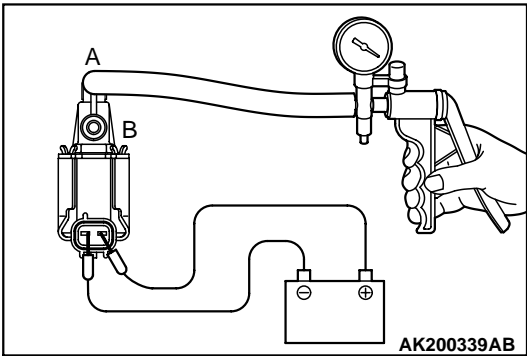
EVAPORATIVE EMISSION PURGE SOLENOID
CHECK

M1173001700256

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

NOTE: When disconnecting the vacuum hose, always place an identification mark so that it can be reconnected at its original position.

2. Disconnect the harness connector.
3. Connect a hand vacuum pump to nipple (A) of the EVAP purge solenoid (refer to the illustration at left).
4. As described in the chart below, check airtightness by applying a vacuum with voltage applied directly from the battery to the EVAP purge solenoid valve and without applying voltage.

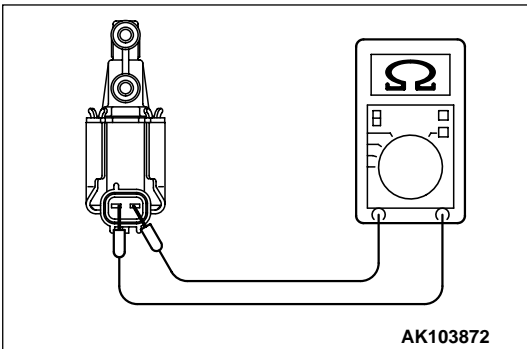


BATTERY POSITIVE VOLTAGE	NORMAL CONDITION
Applied	Vacuum leaks
Not applied	Vacuum maintained

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.



VOLUME AIRFLOW SENSOR CHECK

M1173007900537

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

MASS AIRFLOW SENSOR CHECK

M1173050400075

<2.4L ENGINE>

To inspect these parts, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

BAROMETRIC PRESSURE SENSOR CHECK

M1173008000281

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100567

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

INTAKE AIR TEMPERATURE SENSOR CHECK

M1173008200285

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

FUEL TANK DIFFERENTIAL PRESSURE SENSOR CHECK

M1173007700243

To inspect the sensor, refer to GROUP 13C, Fuel Supply – Fuel Tank – Fuel Tank Inspection – Fuel Tank Differential Pressure Sensor Check [P.13C-13](#).

EVAPORATIVE EMISSION VENTILATION SOLENOID CHECK

M1173007800176

Refer to Emission Control – Evaporative Emission Canister and Fuel Tank Pressure Relief Valve – Inspection – Evaporative Emission Ventilation Solenoid Check [P.17-231](#).

EXHAUST GAS RECIRCULATION (EGR) SYSTEM**GENERAL DESCRIPTION (EXHAUST GAS RECIRCULATION SYSTEM)**

M1173005200350

The exhaust gas recirculation (EGR) system 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 for driveability quality.

OPERATION

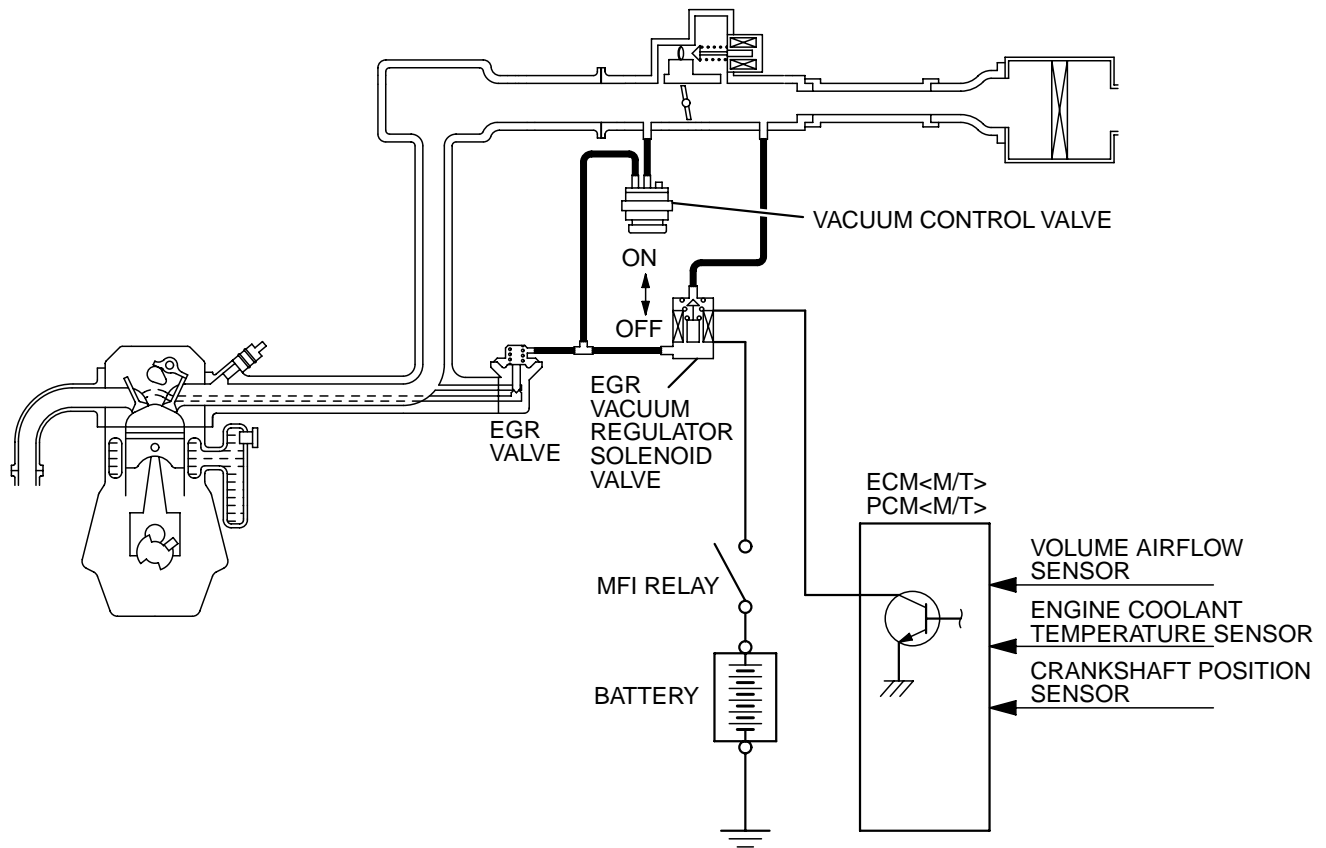
When the engine coolant temperature is low, when the engine is at idle or when a wide open throttle operation is performed, the EGR valve is kept closed, achieving no EGR.

After warming up of the engine, the EGR valve can be opened by the engine control module (ECM) or powertrain control module (PCM).

The ECM or PCM monitors the EGR system and illuminates the Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) to indicate that there is a malfunction.

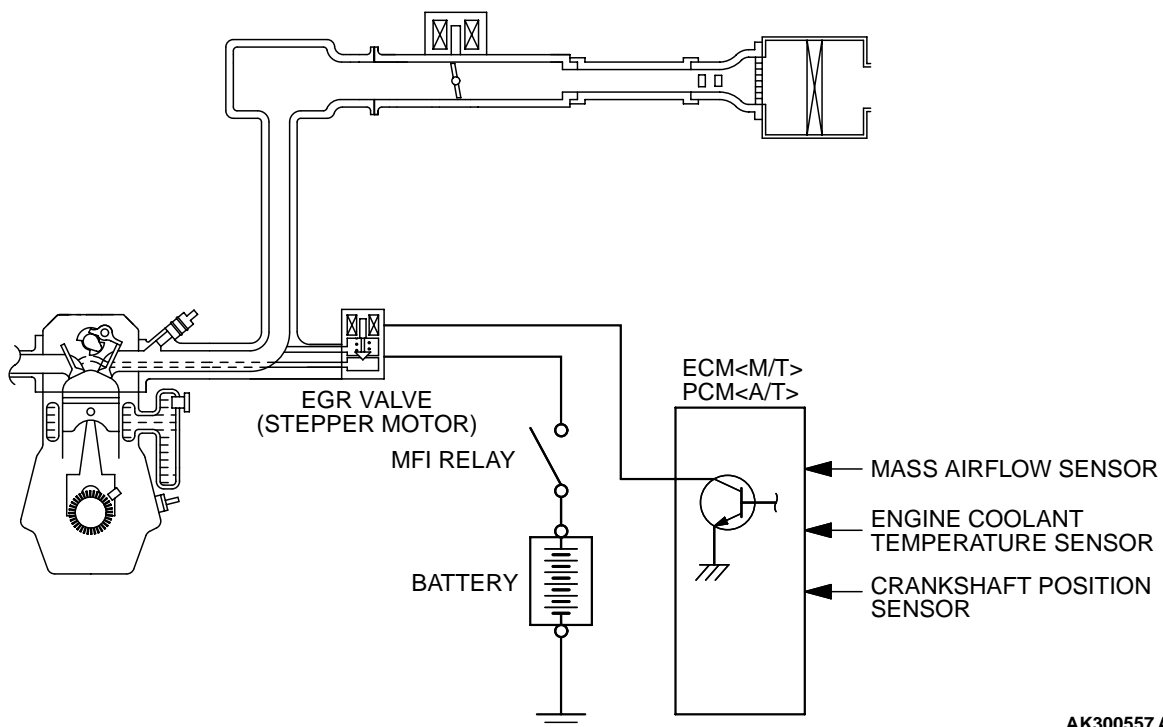
SYSTEM DIAGRAM

<2.0L ENGINE>



AK301834AB

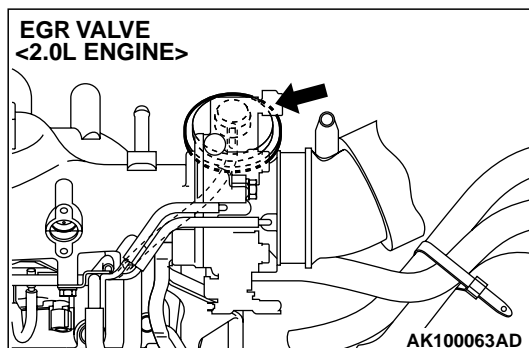
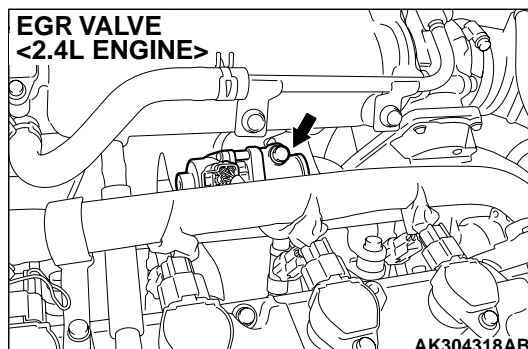
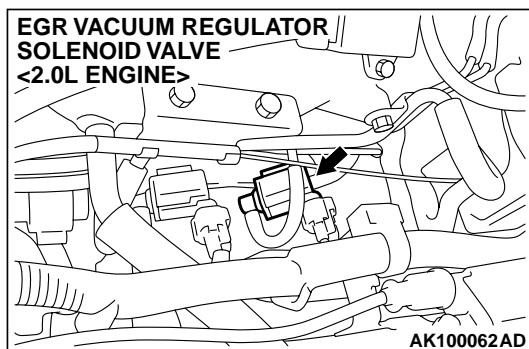
<2.4L ENGINE>



AK300557 AC

COMPONENT LOCATION

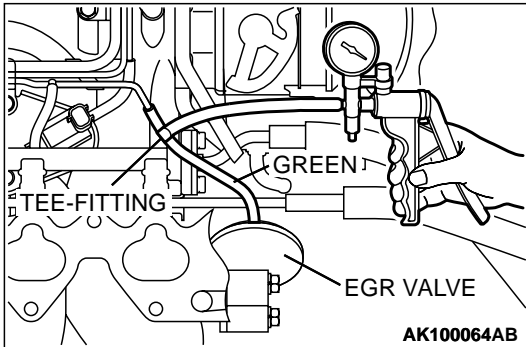
M1173007600257



EXHAUST GAS RECIRCULATION SYSTEM CHECK

M1173002600371

<2.0L ENGINE>



1. Disconnect the vacuum hose (green) from the EGR valve, and then connect a hand vacuum pump via the Tee-fitting.
2. Start the engine. As described in the chart below, check the vacuum condition when the throttle valve is opened suddenly (revving) during cold and hot engine conditions. If the engine is hot and the vacuum does not rise over 13 kPa (3.9 in Hg), perform the vacuum control valve check and EGR port vacuum check. Then continue to Step 3. If vacuum rises momentarily, proceed to Step 3.

When engine is cold

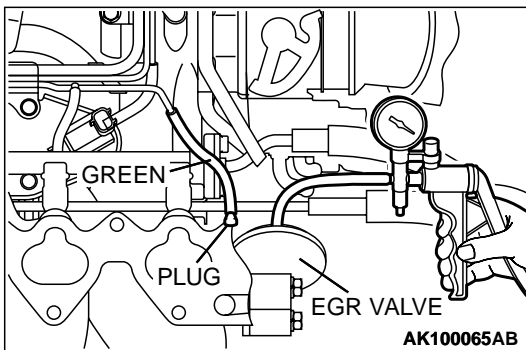
[Engine coolant temperature: 20°C (68°F) or less]

THROTTLE VALVE	NORMAL VACUUM CONDITION
Open quickly	No vacuum (Remained as barometric pressure).

When engine is hot

[Engine coolant temperature: 80°C (176°F) or more]

THROTTLE VALVE	NORMAL VACUUM CONDITION
Open quickly	Momentarily rises over 13 kPa (3.9 in Hg)

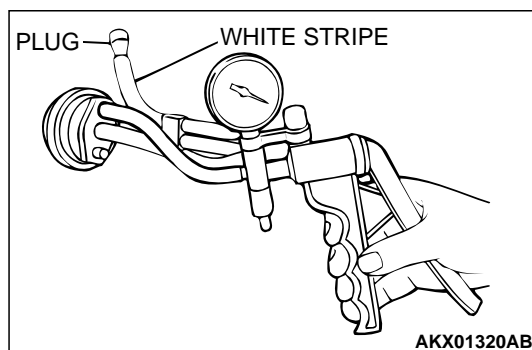


3. Stop the engine. Remove the Tee-fitting and the hand vacuum pump.
4. Connect the hand vacuum pump directly to the EGR valve.
5. Start the engine and run at idle until warm.
6. The engine idling speed should be rough when a vacuum of 27 kPa (7.9 in Hg) or more is applied to the EGR valve.
7. If engine idles rough, EGR passage is open and the system is OK. If engine idle is not rough, the EGR passage and the valve must be checked for restrictions. Perform the EGR valve check. Then repeat the exhaust gas recirculation system check.

VACUUM CONTROL VALVE CHECK

M1173002700196

<2.0L ENGINE>



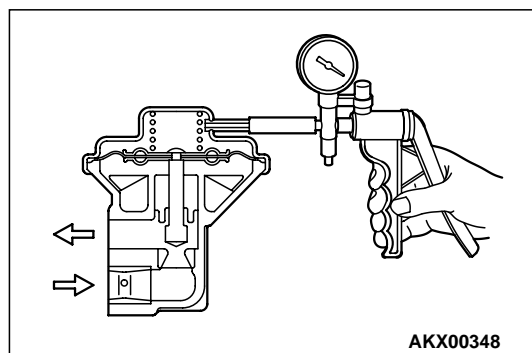
1. Disconnect the vacuum hose (white stripe) from the vacuum control valve and connect the hand vacuum pump to the vacuum control valve.
2. Plug the end of the removed vacuum hose.
3. Start the engine and run at idle.
4. As described in the chart below, check the vacuum condition.

ENGINE CONDITION	NORMAL VACUUM CONDITION
Idling	Approximately 21.3 – 24.0 kPa (6.3 – 7.1 in Hg)

EGR VALVE CHECK

M1173002800245

<2.0L ENGINE>



1. Remove the EGR valve and inspect for sticking, carbon deposits, etc. If found, clean with a suitable solvent so that the valve seats correctly.
2. Connect a hand vacuum pump to the EGR valve.
3. Apply 67 kPa (20 in Hg) of vacuum, and check to be sure that the vacuum is maintained.
4. As described in the chart below, apply a vacuum and check the passage of air by blowing through one side of the EGR passage.

VACUUM	PASSAGE OF AIR
5.3 kPa (1.6 in Hg) or less	Air is not blown out
27 kPa (7.9 in Hg) or more	Air is blown out

NOTE: Passage of air should be checked by blowing the valve port.

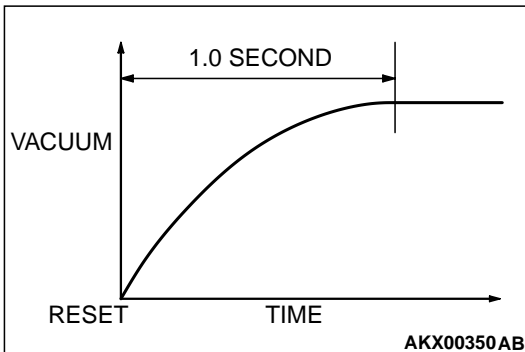
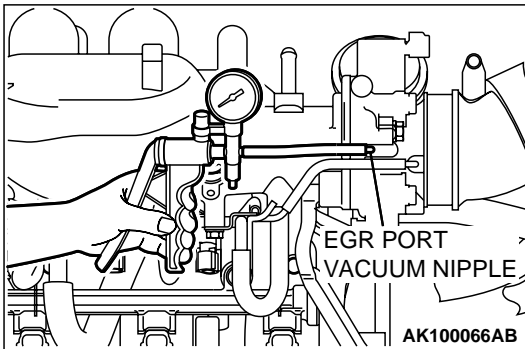
5. Reinstall the EGR valve, using a new gasket, and tighten to the specified torque.

Tightening torque: 22 ± 4 N·m (16 ± 3 ft-lb)

EGR PORT VACUUM CHECK

M1173002900189

<2.0L ENGINE>



1. Disconnect the vacuum hose (green stripe) from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.

2. Start the engine.
3. Measure engine vacuum at idle.

Standard value: 51 kPa (15 in Hg) or more

4. Reset the vacuum pump to "0" (Release vacuum).
5. Using a stop watch, measure how long it takes for the vacuum gauge to reach 51 kPa (15 in Hg).

Standard value: 1.0 second or less

6. If it takes more than 1.0 second for the gauge to reach 51 kPa (15 in Hg), the EGR may be restricted and should be cleaned.

EGR VACUUM REGULATOR SOLENOID VALVE CHECK

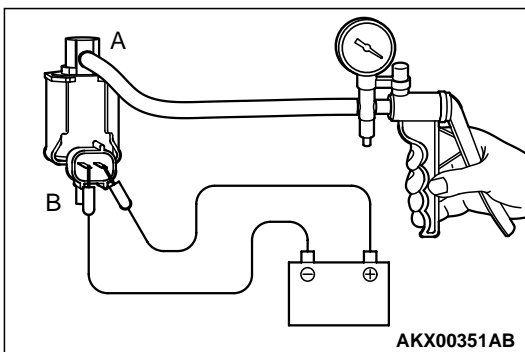
M1173003100272

<2.0L ENGINE>

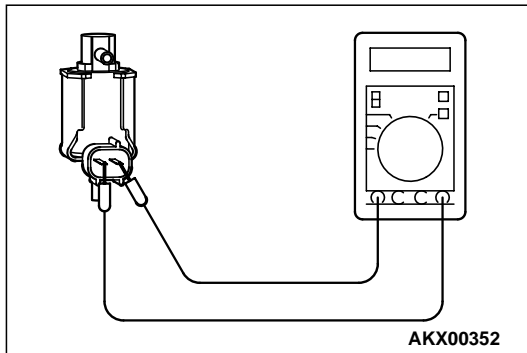
1. Disconnect the vacuum hose (green) from the EGR vacuum regulator solenoid valve.

NOTE: When disconnecting the vacuum hose, always make sure 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 EGR vacuum regulator solenoid valve. (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 EGR vacuum regulator solenoid valve and without applying voltage.



BATTERY POSITIVE VOLTAGE	NORMAL CONDITION
Not applied	Vacuum leaks
Applied	Vacuum maintained



5. Measure the resistance between the terminals of the EGR vacuum regulator solenoid valve.

Standard value: 29 – 35 Ω [at 20°C (68°F)]

6. Replace the EGR vacuum regulator solenoid valve if resistance is out of specification.

EGR VALVE (STEPPER MOTOR) CHECK

M1173050200093

<2.4L ENGINE>

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 PCM may have failed.

Checking the Coil Resistance

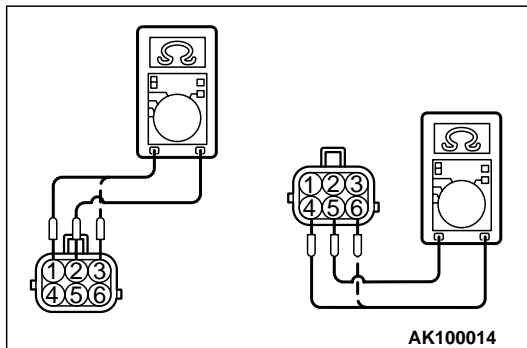
1. Remove the EGR valve.
2. Measure the resistance between terminal No. 2 and either terminal No. 1 or terminal No. 3 of the connector at the EGR valve.

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.

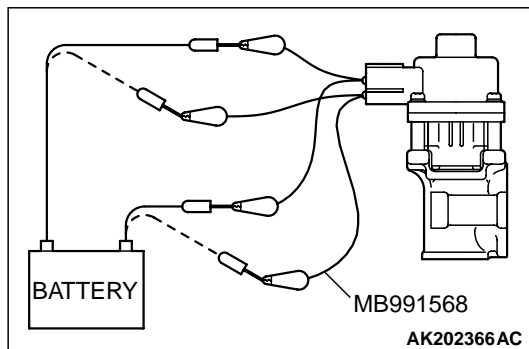
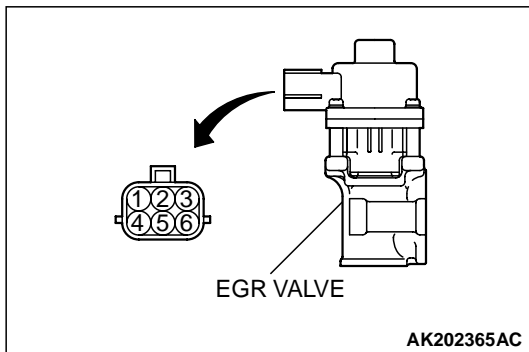
Standard value: 20 – 24 Ω [at 20°C (68°F)]

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

⚠ CAUTION

Connecting battery voltage to the EGR valve for a long term 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 positive (+) terminal the battery to terminal No. 5.

⚠ CAUTION

Connecting battery voltage to the EGR valve for a long term 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.

EGR VALVE (STEPPER MOTOR) CLEANING

M1173050300023

<2.4L ENGINE>

NOTE: DO not use solvents or other cleaning agents, which will enter the motor and cause a malfunction.

Remove the EGR valve and make sure that it is not stuck and does not have any carbon deposits. If there are any carbon deposits, use a wire brush to clean it.

VOLUME AIRFLOW SENSOR CHECK

M1173007900548

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

MASS AIRFLOW SENSOR CHECK

M1173050400086

<2.4L ENGINE>

To inspect these parts, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100556

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

<2.4L ENGINE>

To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

CRANKSHAFT POSITION SENSOR CHECK

M1173008300282

<2.0L ENGINE>

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) <2.0L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13A-29](#).

<2.4L ENGINE>

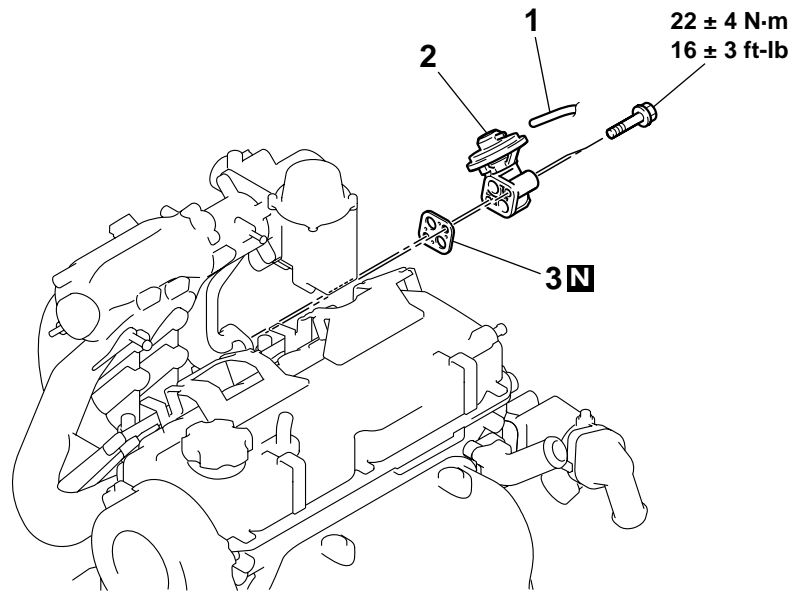
To inspect the sensor, refer to GROUP 13B, Multiport Fuel Injection (MFI) <2.4L Engine> – Multiport Fuel Injection (MFI) Diagnosis – Diagnostic Trouble Code Chart [P.13B-31](#).

REMOVAL AND INSTALLATION <2.0L ENGINE>

M1173010500238

Pre-removal and Post-installation Operation

Air Cleaner Assembly Removal and Installation (Refer to GROUP 15, Air Cleaner P.15-4).



AC308922AB

REMOVAL STEPS

1. EMISSION VACUUM HOSE CONNECTION

REMOVAL STEPS (Continued)

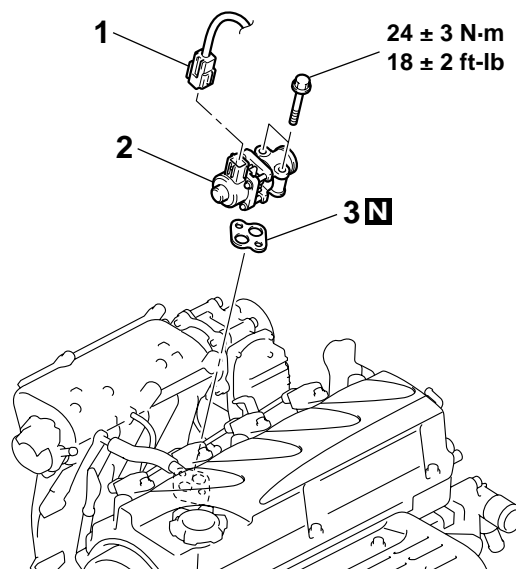
2. EGR VALVE
3. EGR VALVE GASKET

REMOVAL AND INSTALLATION <2.4L ENGINE>

M1173010500227

Pre-removal and Post-installation Operation

Resonator Removal and Installation (Refer to GROUP 15, Air Cleaner P.15-4).



AC302329AD

REMOVAL STEPS

1. EGR VALVE CONNECTOR

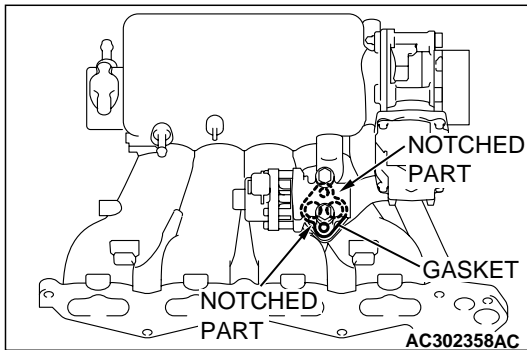
REMOVAL STEPS (Continued)

2. EGR VALVE
3. EGR VALVE GASKET

REMOVAL SERVICE POINT

>>A<< EGR VALVE GASKET INSTALLATION

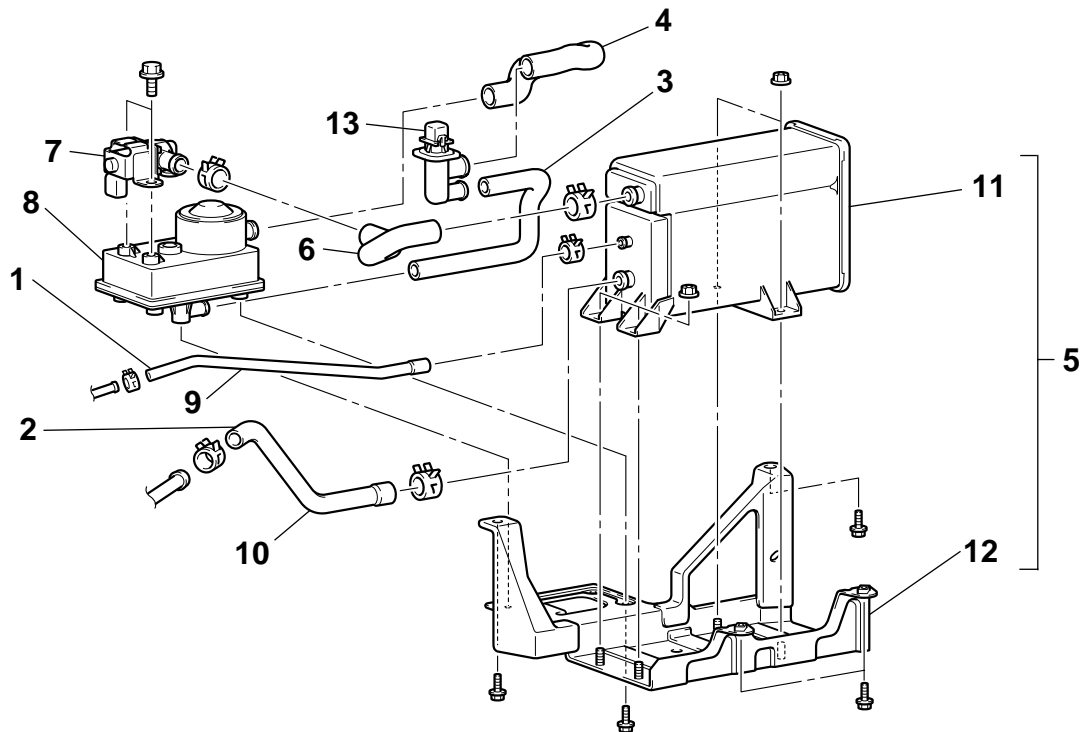
Install the EGR valve gasket as shown in the illustration.



EVAPORATIVE EMISSION CANISTER AND FUEL TANK PRESSURE RELIEF VALVE

REMOVAL AND INSTALLATION

M1173004800371



AC305944AB

REMOVAL STEPS

1. PURGE HOSE B CONNECTION
2. VAPOR HOSE CONNECTION
3. VENT HOSE C
4. VENT HOSE B
5. ONBOARD REFUELING VAPOR RECOVERY (ORVR) VENT VALVE MODULE AND EVAPORATIVE EMISSION CANISTER ASSEMBLY
6. VENT HOSE A

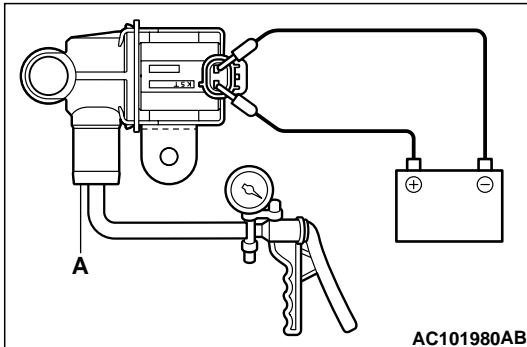
REMOVAL STEPS (Continued)

7. EVAPORATIVE EMISSION VENTILATION SOLENOID
8. ORVR VENT VALVE MODULE
9. PURGE HOSE B
10. VAPOR HOSE
11. EVAPORATIVE EMISSION CANISTER
12. BRACKET
13. VENT PIPE ASSEMBLY

INSPECTION

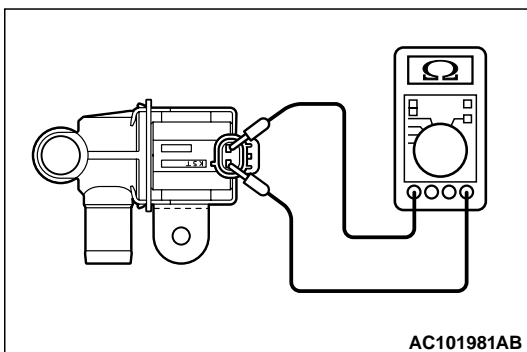
M1173004900152

EVAPORATIVE EMISSION VENTILATION SOLENOID CHECK



1. Connect a hand vacuum pump to nipple (A) of the solenoid.
2. 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



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

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

CATALYTIC CONVERTER

GENERAL DESCRIPTION (CATALYTIC CONVERTER)

M1173005300131

The three way catalytic converter, together with the closed loop air-fuel ratio control based on the oxygen sensor signal, oxidizes carbon monoxides (CO) and hydrocarbons (HC), also reduces nitrogen oxides (NO_x).

When the mixture is controlled at stoichiometric air-fuel ratio, the three way catalytic converter provides the highest purification against the three constituents, namely, CO, HC and NO_x.

REMOVAL AND INSTALLATION

Refer to GROUP 15 for the removal and installation of catalytic converter because it is integrated in the exhaust manifold and the front exhaust pipe.

M1173003900427

- Exhaust manifold side (the vehicles with 2.0L engine) : Refer to GROUP 15 - Exhaust Manifold [P.15-11](#).
- Front exhaust pipe side : Refer to GROUP 15- Exhaust Pipe and Main Muffler [P.15-13](#)

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1173006400335

ITEMS	SPECIFICATIONS
Engine control system	
Accelerator cable attaching bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Accelerator cable clump attaching bolt	$10 \pm 2 \text{ N}\cdot\text{m}$ ($89 \pm 17 \text{ in}\cdot\text{lb}$)
Accelerator pedal bracket installation nut	$12 \pm 2 \text{ N}\cdot\text{m}$ ($102 \pm 22 \text{ in}\cdot\text{lb}$)
Accelerator pedal position sensor assembly attaching bolt	$12 \pm 1 \text{ N}\cdot\text{m}$ ($102 \pm 13 \text{ in}\cdot\text{lb}$)
Accelerator pedal position sensor bracket attaching bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Accelerator pedal position sensor bracket support attaching bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Auto-cruise control system	
Auto-cruise control-ECU bracket attaching bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Auto-cruise control-ECU installation nut	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
ECM (M/T) or PCM (A/T) bracket bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Vacuum pump bracket attaching bolt	$5.0 \pm 1.0 \text{ N}\cdot\text{m}$ ($44 \pm 9 \text{ in}\cdot\text{lb}$)
Emission control system	
EGR valve bolt <2.0L engine>	$22 \pm 4 \text{ N}\cdot\text{m}$ ($16 \pm 3 \text{ ft}\cdot\text{lb}$)
EGR valve bolt <2.4L engine>	$24 \pm 3 \text{ N}\cdot\text{m}$ ($18 \pm 2 \text{ ft}\cdot\text{lb}$)

SERVICE SPECIFICATIONS

M1173000300374

ITEM		STANDARD VALUE
Engine control system		
Accelerator cable free play mm (in)		1.0 – 2.0 (0.04 – 0.08)
Curb idle speed r/min	2.0L Engine	700 ± 100
	2.4L Engine	750 ± 100
Emission control system		
Purge flow cm ³ /s (SCFH) [at 80 – 95°C (176 – 205°F) with sudden revving]		20 (2.5)
Evaporative emission purge solenoid coil resistance [at 20°C (68°F)] Ω		22 – 26
EGR vacuum regulator solenoid valve coil resistance [at 20°C (68°F)] Ω	2.0L Engine	29 – 35
EGR valve (Stepper Motor) connector resistance [at 20°C (68°C)] Ω	2.4L Engine	20 – 24
Evaporative emission ventilation solenoid coil resistance [at 20°C (68°C)] Ω		17 – 21