GROUP 54A

CHASSIS ELECTRICAL

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

⚠ WARNING

(1) 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 (from rendering the SRS inoperative).

(2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.

(3) 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: front impact sensors, SRS-ECU, SRS warning lamp, 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 (*).

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BATTERY

SERVICE SPECIFICATIONS

M1541000300317

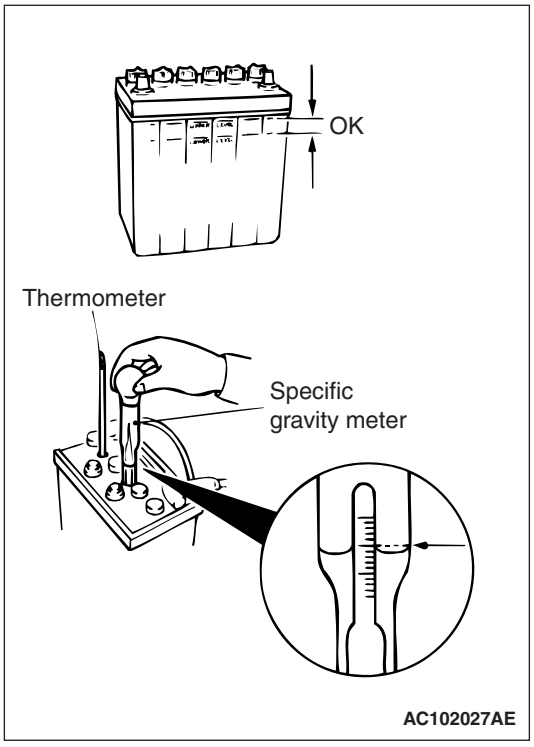
Item	Standard value
Battery electrolyte specific gravity	1.220 – 1.290 (electrolyte temperature 20°C)

ON-VEHICLE SERVICE

FLUID LEVEL AND SPECIFIC GRAVITY CHECK

M1541000900126

⚠ CAUTION



- **If the battery is used with the electrolyte level below the LOWER LEVEL indicator, there is the danger that explosions may occur, so add water to the battery until the electrolyte level is between the LOWER LEVEL and UPPER LEVEL indications.**
- **If too much water is added to make the level rise above the UPPER LEVEL indication, the electrolyte may leak out, so adjust so that the electrolyte level is between the LOWER LEVEL and UPPER LEVEL indications.**

1. Check that the battery electrolyte level is between the UPPER LEVEL and LOWER LEVEL indications.
2. Use a specific gravity meter and a thermometer to measure the specific gravity.

   Standard value: 1.220 – 1.290 (electrolyte temperature 20°C)

3. The specific gravity of the battery electrolyte changes according to the temperature, so the specific gravity when the electrolyte is at a temperature of 20°C can be calculated using the following formula. Use the converted value to judge whether the electrolyte is okay or not.

   D_{20} = (t – 20) × 0.0007 + Dt

   D_{20}: Specific gravity converted to a value for electrolyte temperature of 20°C

   t: Electrolyte temperature at the time of measurement

   Dt: Actual specific gravity

CHARGING

M1541001100662

⚠ CAUTION

- **The battery plugs should be removed during charging.**
- **The battery electrolyte level may rise and overflow from the battery during charging.**
- **Explosions may occur if the battery is brought close to naked flames during charging.**
- **Be careful to avoid tasks that might produce sparks or other danger while the battery is charging.**
- **After charging is complete, replace the battery plugs, pour water over the battery to rinse away any sulphuric acid, and let the battery stand to dry.**
- **Charge the battery in a well-ventilated location.**
- **Do not let the battery electrolyte temperature rise above approximately 45°C (approximately 55°C during rapid charging).**

1. Remove the battery from the vehicle.
2. The normal charging current is a value in amperes which is 1/10th of the battery capacity. If the battery needs to be charged rapidly because of reasons such as time limitations, the maximum charging current for rapid charging is the battery capacity expressed as an ampere value.

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Battery type	Capacity (5-hour rate)	Normal charging current	Rapid charging current
75D23L	52 A	5.2 A	52 A

3. Determine when charging is finished.

   When the specific gravity of the battery electrolyte is constantly within 1.250 – 1.290 for a continuous period of one hour or more.

BATTERY TEST

M1541001200670

TEST STEPS

STEP 1. Battery no-load voltage check

(1) Illuminate the headlamp for 15 seconds.
(2) Turn off the headlamp and then leave it for about 2 minutes to stabilise the battery voltage.
(3) Remove the battery cable.
(4) Measure the battery no-load voltage.

OK: 12.4 V or more (Specific gravity 1.240)

Q: Does the measured voltage correspond with this range?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Battery charging

Q: Is the battery recharged?
YES : Recharge the battery at 5A (constant-current charging) (Refer to Table 1). Then go to Step 1.
NO : Go to Step 3.

STEP 3. Load test check

(1) Connect the battery tester to battery.
(2) Feed a load current through the battery. (Refer to Table 1.)
(3) Measure the battery voltage after 15 seconds and then eliminate a load current.
(4) Compare the measured voltage to the specified lowest voltage. (Refer to Table 2.)

Q: Is the measured voltage higher than the lowest voltage?
YES : The battery is normal.
NO : Replace the battery.

(TABLE 1)

Battery type	75D23L
Charging time when fully discharged [5A constant current charging] (H)	11
Load current (A)	260

(TABLE 2)

Outside air temperature (°C)	21 or more	16 to 20	10 to 15	4 to 9	-1 to 3	-7 to -2	-1.2 to -8	-18 to -13
Minimum voltage (V)	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

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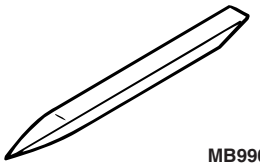
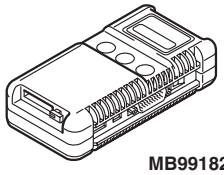
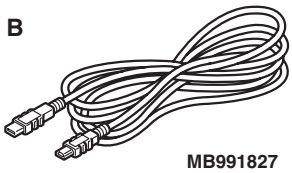
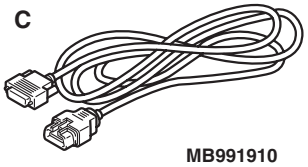
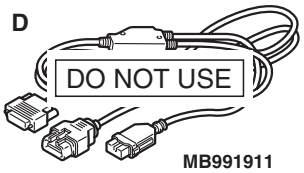
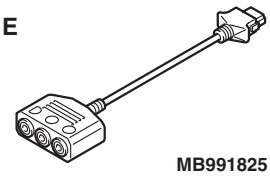
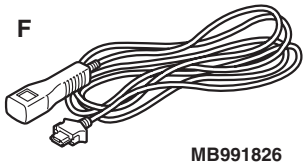
IGNITION SWITCH

SPECIAL TOOLS

M1543000602138

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Steering column cover removal
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	M.U.T.-III sub-assembly A: Vehicle Communication Interface (V.C.I.) B: M.U.T.-III USB cable C: M.U.T.-III Main harness A (Vehicles with CAN communication system) D: M.U.T.-III Main harness B (Vehicles without CAN communication system) E: M.U.T.-III Measurement adapter F: M.U.T.-III Trigger harness	Diagnosis code check **⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.**

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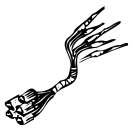
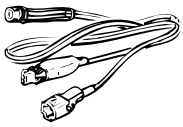
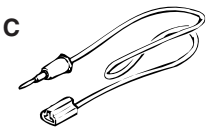
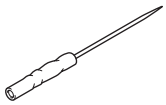
Tool	Number	Name	Application
A  B  C  D MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

IGNITION SWITCH

M1543000701240

The ignition switch is controlled by the Smart Wiring System (SWS). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting P.54B-58. <Except vehicles for Hong Kong and Singapore>
- Using SWS monitor: GROUP 54C, Troubleshooting P.54C-32. <Except vehicles for Hong Kong and Singapore>
- Not using SWS monitor: GROUP 54D, Troubleshooting P.54D-59. <Vehicles for Hong Kong and Singapore>
- Using SWS monitor: GROUP 54E, Troubleshooting P.54E-40. <Vehicles for Hong Kong and Singapore>

IMMOBILIZER <VEHICLES FOR GCC, HONG KONG, SINGAPORE, AUSTRALIA AND NEW ZEALAND>

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

DIAGNOSTIC FUNCTION

M1543007000692

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

HOW TO ERASE DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

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ENCRYPTED CODE REGISTRATION CRITERIA TABLE <Vehicles for Hong Kong and Singapore>

M1543026000152

⚠ CAUTION

Do not replace the engine-A/T-ECU, immobilizer-ECU and the ETACS-ECU simultaneously. Always replace the ECU by ones when the multiple ECU is replaced, and then replace the next ECU after registering the necessary IDs.

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. Under any of the conditions described in the table below, the VIN and encrypted code should be registered in the immobilizer-ECU or engine-A/T-ECU again. In addition, the keyless entry encrypted code should be registered in the ignition key (with transmitter) and ETACS-ECU.

NOTE: The immobilizer-ECU can retain maximum eight different ignition key in the memory.

Item	Operation contents and procedure	Reference page for registration contents
When the engine-A/T-ECU is replaced	Write the VIN	Write the VIN [Refer to GROUP 00, How to perform vehicle identification number (VIN) writing P.00-25].
When the engine-A/T-ECU is rewritten (other than immobilizer system-related item)	Operation is not needed	–
When the immobilizer-ECU is replaced	1. Write the VIN 2. Register all ignition key encrypted code again.	• Write the VIN [Refer to GROUP 00, How to perform vehicle identification number (VIN) writing P.00-25]. • Register the key (Refer to P.54A-40 <Vehicles for Hong Kong and Singapore>) • Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).
When the ETACS-ECU is replaced	Register all ignition key encrypted code again	Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).
When the key ring antenna is replaced	Operation is not needed	–
When the ignition key is added separately.	1. Register all ignition key encrypted code again. 2. Register all ignition key encrypted code again (with transmitter only)	• Register the key (Refer to P.54A-40 <Vehicles for Hong Kong and Singapore>) • Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).

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Item	Operation contents and procedure	Reference page for registration contents
When the ignition key is lost separately.	1. Register all ignition keys other than the lost ignition key again 2. Register all ignition key encrypted codes other than the lost ignition key again	• Register the key (Refer to P.54A-40 <Vehicles for Hong Kong and Singapore>) • Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).
When the ignition key is replaced by the set or the steering lock cylinder is replaced by the piece.	1. Register all ignition keys again <bar code No. input> 2. Register all ignition key encrypted codes again (set supply only)	• Register the key (bar code No.) (Refer to P.54A-40 <Vehicles for Hong Kong and Singapore>). • Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).
When the ignition key is replaced separately by the door lock cylinder, glove box lock, or the tailgate lock cylinder	Register the replaced ignition key encrypted code	Register the encrypted code (Refer to GROUP 42, Method of registering a secret code P.42-65).

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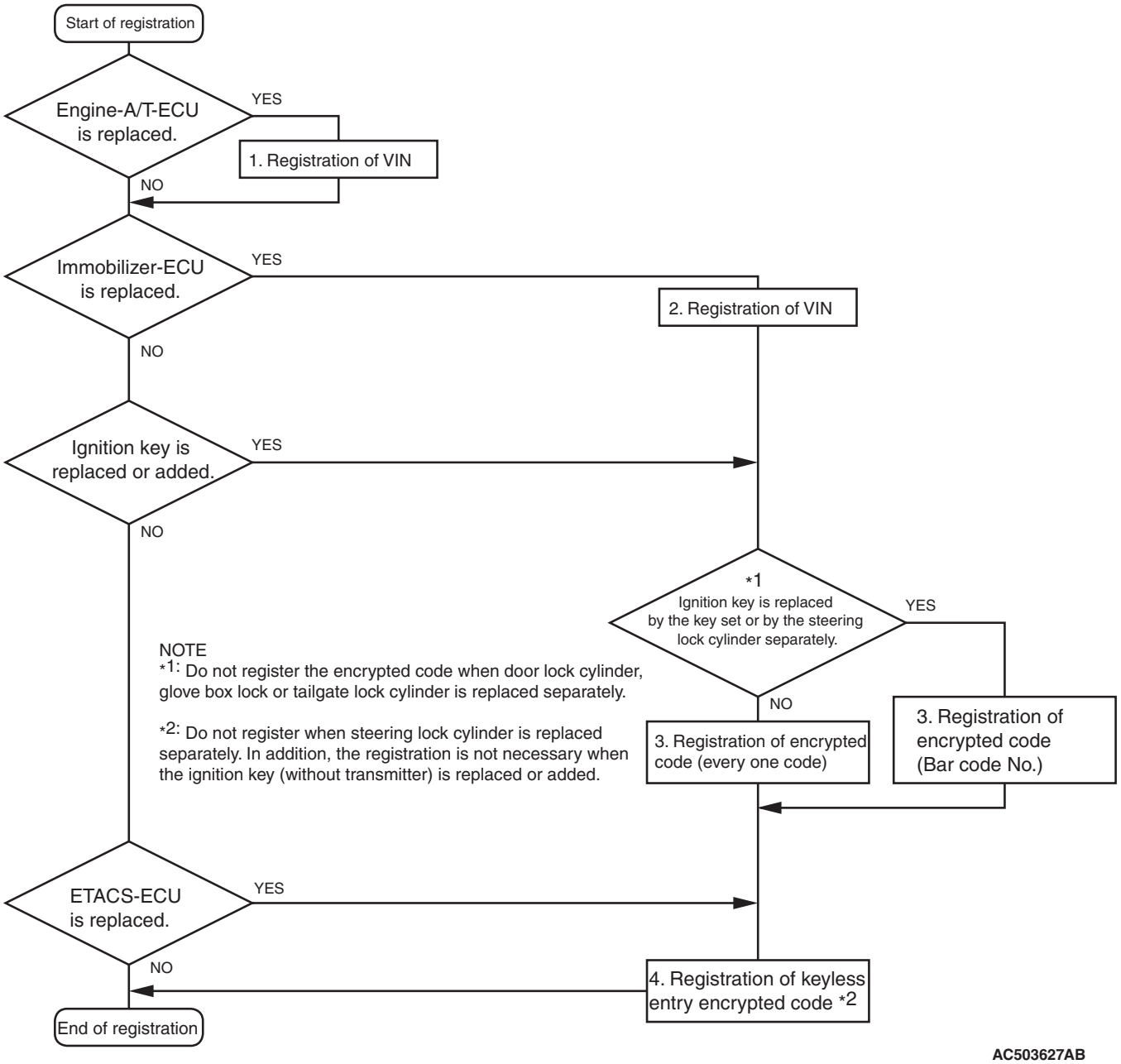
Registration flow chart



NOTE
*1: Do not register the encrypted code when door lock cylinder, glove box lock or tailgate lock cylinder is replaced separately.

*2: Do not register when steering lock cylinder is replaced separately. In addition, the registration is not necessary when the ignition key (without transmitter) is replaced or added.

AC503627AB

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ENCRYPTED CODE REGISTRATION CRITERIA TABLE <Vehicles for GCC, Australia and New Zealand>

M1543026000163

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. Under any of the conditions below, the encrypted code should be registered in the immobilizer-ECU again. The immobilizer-ECU can retain maximum eight different encrypted codes. This means that maximum eight ignition keys can be registered.

Component to be replaced	Engine-ECU <M/T> or Engine-A/T-ECU <A/T>	Immobilizer-ECU	Ignition key
When engine-ECU <M/T> or engine-A/T-ECU <A/T> is replaced	–	Should be replaced	Should be replaced All ignition keys should be registered
When engine-ECU <M/T> or engine-A/T-ECU <A/T> is overwritten*	–	Should not be replaced	Should not be replaced Should be registered again
When immobilizer-ECU is replace	Should not be replaced	–	Should not be replaced All ignition keys should be registered again
When ignition key is added	Should not be replaced	Should not be replaced	• Additional ignition key should be registered • All ignition keys should be registered again
When ignition key is lost	Should not be replaced	Should not be replaced	All the ignition keys other than the lost one should be registered again

*NOTE: *: When the engine-ECU <M/T> or engine-A/T-ECU <A/T> other than immobilizer system is rewritten, it is not necessary to register the ignition key again.*

CHART CLASSIFIED BY DIAGNOSIS CODES <VEHICLES FOR HONG KONG AND SINGAPORE>

M1543007101012

⚠ CAUTION
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Code No.	Diagnosis contents	Reference page
B1702	Reception error of encrypted code	P.54A-13
B1703	Encrypted code inconsistent	P.54A-14
B1722	Antenna failure	P.54A-15
B1731	Communication error with the engine-A/T-ECU	P.54A-18
B1761	VIN not recorded	P.54A-19
B1766	Transponder registered for other vehicle	P.54A-19
U1073	Bus off	P.54A-20

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CHART CLASSIFIED BY DIAGNOSIS CODES <VEHICLES FOR GCC, AUSTRALIA AND NEW ZEALAND>

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⚠ CAUTION
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Code No.	Diagnosis contents	Reference page
11	Transponder communication system or radio interference of encrypted code.	P.54A-21
12	Encrypted codes are not the same or are not registered.	P.54A-22

DIAGNOSTIC TROUBLE CODE PROCEDURES <Vehicles for Hong Kong and Singapore>

Code No.B1702: Reception error of encrypted code

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

OPERATION

The key reminder switch (ignition key ring antenna) supplies the ignition key with power, and the ignition key sends the encrypted code to the immobilizer-ECU. Immobilizer-ECU receives the encrypted code with the key ring antenna, and judges if the ignition key is the registered one.

TROUBLE JUDGMENT

- Diagnosis code No.B1702 is stored when there are other ignition keys or anything that interferes with the communication (things that generate radio waves such as magnets and an air-cleaning device that has a power plug) near the ignition key that is going to start the engine.
- If the encrypted code is not sent to the immobilizer-ECU even when the ignition switch is turned to the ON position, diagnosis code No.B1702 is stored.

NOTE: Diagnosis code No.B1702 is always set along with MPI system diagnosis code No.P0513.

PROBABLE CAUSES

- Interference of the encrypted code
- Malfunction of ignition key
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check the ignition key inserted in the key cylinder for interference.

Q: Are there other ignition keys or anything that interferes with the communication (things that generate radio waves such as magnets and an air-cleaning device that has a power plug) near the ignition key inserted in the key cylinder?
YES : Move away or remove other ignition keys or things that interfere with the communication (things that generate radio waves such as magnets and a air-cleaning device that has a power plug) near the ignition key. Then, go to step 3.
NO : Go to Step 2.

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STEP 2. Check with the spare key that has already been registered.

Check that the engine starts using the spare key that has already been registered.

Q: Is diagnosis code No.B1702 set?

YES : Replace the immobilizer-ECU and register the ID codes again.(Refer to P.54A-9.) After registering the ID codes, go to Step 3.

NO : Replace the ignition key for which diagnosis code No.B1702 is set, and register the ID codes again.(Refer to P.54A-9.) After registering the ID codes, go to Step 3.

STEP 3. Check whether the diagnosis code is reset.

(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.

(2) On completion, check that diagnosis code No.B1702 is not reset.

Q: Is diagnosis code No.B1702 set?

YES : Return to Step 1.

NO : The diagnosis is complete. If another diagnosis code is set, refer to Diagnosis Code Chart P.54A-12.

Code No.B1703: Encrypted code inconsistent

⚠ CAUTION

Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TROUBLE JUDGMENT

When the encrypted code that is sent from the transponder does not correspond to the encrypted code registered in the immobilizer-ECU, the immobilizer-ECU sets diagnosis code No.B1703.

NOTE: Diagnosis code No.B1703 is always set along with MPI system diagnosis code No.P0513.

PROBABLE CAUSES

- Ignition key (encrypted code) is not registered
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

Register all the ignition key encrypted codes again, and recheck the diagnosis code.

(1) Register all the ignition keys again. (Refer to P.54A-9.)

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

(3) Check that diagnosis code No.B1703 is not reset.

Q: Is diagnosis code No.B1703 set?

YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, check if the diagnosis code is set.

NO : The diagnosis is complete. If another diagnosis code is set, refer to Diagnosis Code Chart P.54A-12.

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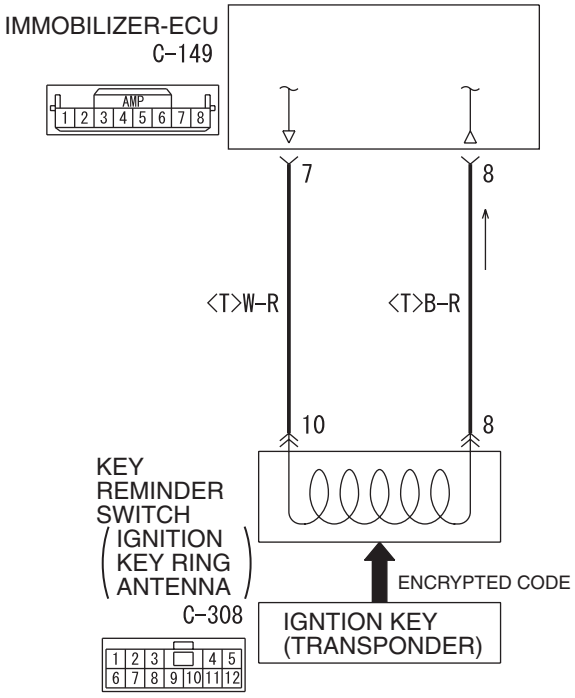
Code No. B1722: Transponder antenna failure

Key Reminder Switch (Ignition Key Ring Antenna) and Immobilizer-ECU Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Grey R : Red P : Pink V : Violet

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TROUBLE JUDGMENT

Diagnosis code No.B1722 is stored when the immobilizer-ECU cannot communicate with the ignition key because of defective key ring antenna (antenna wire).

COMMENT ON TROUBLE SYMPTOM

Current trouble

- The wiring harness wire or connectors between the immobilizer-ECU and the key ring antenna may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the key ring antenna (antenna wire) may be defective.

Past trouble

- If diagnosis code No.B1722 is stored as a past trouble, it is possible that there were defective wiring harnesses, defective connectors or defective antennas before.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the key ring antenna (antenna wire)
- Malfunction of immobilizer-ECU

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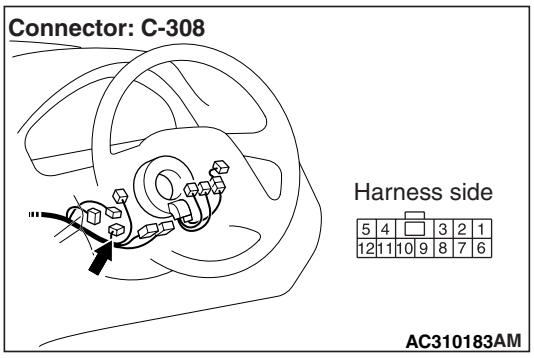
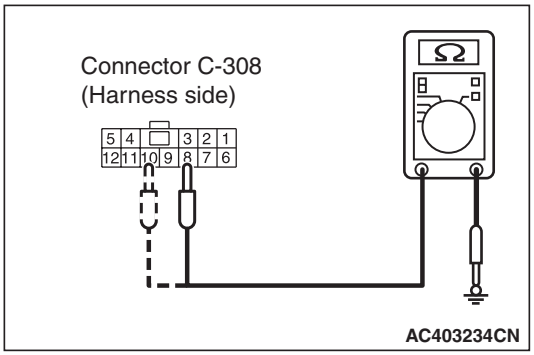
DIAGNOSIS PROCEDURE

STEP 1. Check the key reminder switch (ignition key ring antenna)



(1) Disconnect the key reminder switch (ignition key ring antenna) connector C-308.

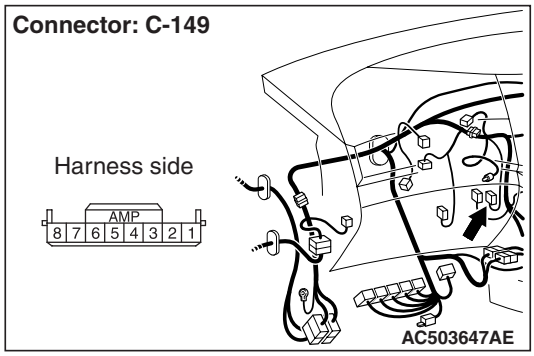


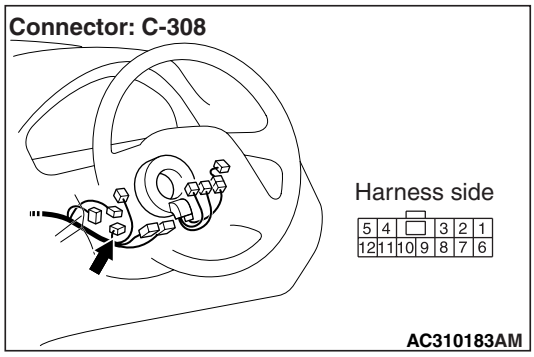
(2) Take the measurements below at harness-side connector.
There should be continuity between terminals 8,10 and body earth.

OK: 2 ohms or less

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : . Replace the key reminder switch (ignition key ring antenna), and then go to Step 5 .

STEP 2. Connector check: Immobilizer-ECU connector C-149 and key reminder switch (ignition key ring antenna) connector C-308.





Q: Is the check result satisfactory?
YES : Go to Step 3.
NO : Repair the connector, and then go to Step 4.

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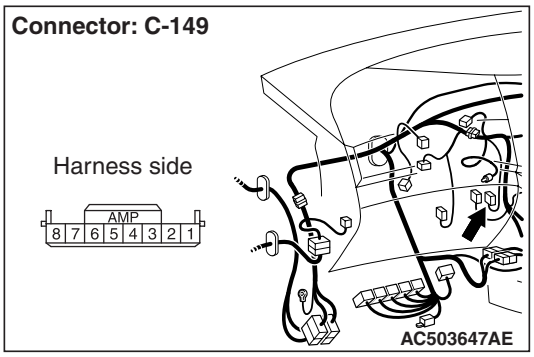
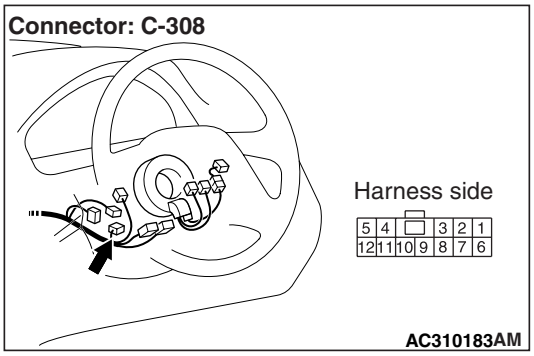
STEP 3. Check the wiring harness between immobilizer-ECU connector C-149 (terminal 7 and 8) and key reminder switch (ignition key ring antenna) connector C-308 (terminal 8 and 10).





Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness, and then go to Step 4.

STEP 4. Check whether the diagnosis code is reset.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check if diagnosis code No.B1722 is set as a current trouble.

Q: Is diagnosis code No.B1722 set as a current trouble?
YES : Replace the key reminder switch (ignition key ring antenna), and then go to Step 5.
NO : If diagnosis code No.B1722 is set as a past trouble, erase the diagnosis code that is set as a past trouble, and the diagnosis is complete.

STEP 5. Check whether the diagnosis code is reset.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check if diagnosis code No.B1722 is set as a current trouble.

Q: Is diagnosis code No.B1722 set as a current trouble?
YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, return to Step 1.
NO : If diagnosis code No.B1722 is set as a past trouble, erase the diagnosis code that is set as a past trouble, and the diagnosis is complete.

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Code No. B1731: Communication error with the engine-A/T-ECU

⚠ CAUTION
If diagnosis code No.B1731 is set in the immobilizer-ECU, diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TROUBLE JUDGMENT
If the immobilizer-ECU cannot receive any signals from the engine-A/T-ECU, diagnosis code B1731 will be set.

COMMENT ON TROUBLE SYMPTOM
Connector(s) or wiring harness in the CAN bus lines between the immobilizer-ECU and the engine-A/T-ECU, the power supply system to the engine-A/T-ECU, the engine-A/T-ECU itself, or the immobilizer-ECU itself may be defective.

NOTE: Diagnosis code No.B1731 is always set along with MPI system diagnosis code No.U1117.

PROBABLE CAUSES
- Malfunction of engine-A/T-ECU
- Malfunction of immobilizer-ECU
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54F – Troubleshooting P.54F-13). Repair the CAN bus line and go to Step 3.

STEP 2. Check whether the diagnosis code is reset.
Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check that diagnosis code No.B1731 is not set as a current trouble.

Q: Is diagnosis code No.B1731 set?
YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, go to Step 3.
NO : The diagnosis is complete. If another diagnosis code is set, refer to Diagnosis Code Chart P.54A-12.

STEP 3. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check that diagnosis code No.B1731 is not set as a current trouble.

Q: Is diagnosis code No.B1731 set?
YES : Replace the engine-A/T-ECU and resister the ID code. (Refer to P.54A-9.)
NO : The diagnosis is complete. If another diagnosis code is set, refer to Diagnosis Code Chart P.54A-12.

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Code No.B1761: VIN not recorded

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TROUBLE JUDGMENT
If the VIN data is not written when the immobilizer-ECU is replaced, the immobilizer-ECU sets diagnosis code No.B1761.

PROBABLE CAUSES
- VIN not written
- Damaged harness wires and connectors
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

Write the VIN
Write the VIN data to the immobilizer-ECU. [Refer to GROUP 00 – How to perform vehicle identification number (VIN) writing P.00-25]

Q: Is diagnosis code No.B1761 set?
YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.)
NO : The procedure is complete.

Code No.B1766: Transponder registered for other vehicle

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TROUBLE JUDGMENT
If the key registered for another vehicle is used to start the engine, the immobilizer-ECU sets diagnosis code No.B1766.

PROBABLE CAUSES
- Ignition key (encrypted code) is another vehicle's key
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check with another key that has already been registered.
Turn the ignition switch to the ON position using another key that has already been registered.

Q: Is the diagnosis code set?
YES : Replace the ignition key by a key set or by the steering lock cylinder, and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, go to Step 2.
NO : Replace the ignition key that the diagnosis code is set, and register the ID codes again. (Refer to P.54A-9.) After registering the ID codes, go to Step 2.

STEP 2. Check whether the diagnosis code is reset.
Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check that diagnosis code No.B1766 is not set.

Q: Is diagnosis code No.B1766 set?
YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.)
NO : The procedure is complete.

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Group TOC

Code No.U1073: Bus off

⚠ CAUTION
If diagnosis code No.U1073 is set in the immobilizer-ECU, diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TROUBLE JUDGMENT

Code No.U1073 will be set when the immobilizer-ECU ceases CAN communication (bus off), and the code will be stored when the ECU resumes the communication.

COMMENTS ON TROUBLE SYMPTOM

The wiring harness wire or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector, or the immobilizer communication lines may be defective.

PROBABLE CAUSES

Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54F – Troubleshooting P.54F-13). Repair the CAN bus line and go to Step 3.

STEP 2. Check whether the diagnosis code is reset.
Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check that diagnosis code No.U1073 is not set as a current trouble.

Q: Is diagnosis code No.U1073 set as a current trouble?
YES : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, go to Step 3.
NO : If a trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00 – How to use troubleshooting/Inspection Service Points P.00-5).

STEP 3. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Turn the ignition switch to the "LOCK" (OFF) position once, and then turn it to the ON position again.
(2) Check that diagnosis code No.U1073 is not set as a current trouble.

Q: Is diagnosis code No.U1073 set as a current trouble?
YES : Return to Step 1.
NO : Erase the diagnosis code that is set as a past trouble, and the diagnosis is complete.

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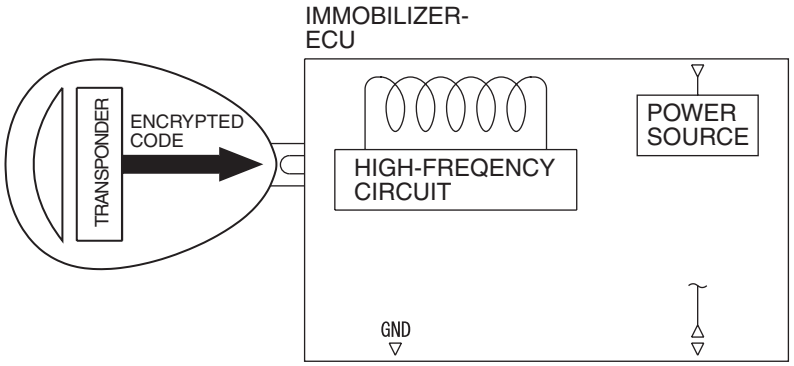
DIAGNOSTIC TROUBLE CODE PROCEDURES <Vehicles for GCC, Australia and New Zealand>

Code No.11 Transponder communication system or radio interference of encrypted code.

Ignition Key Ring and Immobilizer-ECU Circuit



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DIAGNOSIS CODE SET CONDITIONS

This code is set if the encrypted code is sent to the immobilizer-ECU from the ignition key when the ignition switch is turned to the ON position.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of ignition key
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check that the engine is started with another registered ignition key.

Q: Is the check result normal?

YES : Replace the ignition key that cannot start the engine with new registered ignition key. Refer to P.54A-44.

NO : Go to Step 2.

STEP 2. M.U.T.-III diagnosis code

Check that the immobilizer-ECU sets a diagnosis code.

Q: Is the diagnosis code set?

YES (diagnosis cede No.11 is set) : Replace the immobilizer-ECU and register the ignition key.

YES (diagnosis cede No.12 is set) : Code No.12 Encrypted codes are not the same or are not registered. Refer to P.54A-22.

NO : The procedure is complete.

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Code No.12 Encrypted codes are not the same or are not registered.

DIAGNOSIS CODE SET CONDITIONS

This code is set when the ignition key is not registered with the immobilizer-ECU.

PROBABLE CAUSES

- The ignition key is not registered with the immobilizer-ECU.
- Malfunction of immobilizer-ECU

DIAGNOSIS PROCEDURE

Resister the encrypted code.

Q: Was the encrypted code registered?
YES : The procedure is complete.
NO : Replace the immobilizer-ECU and register the encrypted code. (Refer to P.54A-44.)

TROUBLE SYMPTOM CHART

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⚠ CAUTION
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Trouble symptom		Inspection procedure No.	Reference page
The M.U.T.-III cannot communicate with the immobilizer-ECU.	<Vehicles for Hong Kong and Singapore>	1	P.54A-23
MPI system-related diagnosis code No.P0513 is set, and communication between M.U.T.-III and immobilizer cannot be established.	<Vehicles for GCC, Australia and New Zealand>	2	P.54A-24
The ignition key cannot be registered with the M.U.T.-III.	<Vehicles for Hong Kong and Singapore>	3	P.54A-27
	<Vehicles for GCC, Australia and New Zealand>		P.54A-28
The engine does not start. (cranking occurs but initial combustion does not)	<Vehicles for Hong Kong and Singapore>	4	P.54A-30
	<Vehicles for GCC, Australia and New Zealand>		P.54A-31
Check the power supply and earth circuit to the immobilizer-ECU.	<Vehicles for Hong Kong and Singapore>	5	P.54A-32
	<Vehicles for GCC, Australia and New Zealand>		P.54A-35

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SYMPTOM PROCEDURES <Vehicles with engine immoblizer system>

Inspection Procedure 1: The M.U.T.-III cannot communicate with the immobilizer-ECU. <Vehicles for Hong Kong and Singapore>

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

COMMENT ON TROUBLE SYMPTOM

The immobilizer-ECU communicates with the M.U.T.-III via CAN communication. Therefore, communication error of the immobilizer-ECU is suspected.

PROBABLE CAUSES

- Malfunction of immobilizer-ECU power supply and earth
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54F – Troubleshooting P.54F-13).

STEP 2. Check the immoblizer-ECU power supply circuit and earth circuit (Refer to Inspection Procedure 5 "Check the immoblizer ECU power supply circuit and earth circuit" P.54A-32.)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the power supply and earth circuit to the immobilizer-ECU.

STEP 3. Retest the system.
Check that immobilizer-ECU communicates with the M.U.T.-III.

Q: Is the check result normal?
YES : Intermittent Malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)
NO : Replace the immobilizer-ECU and register the ID codes.(Refer to P.54A-9.)

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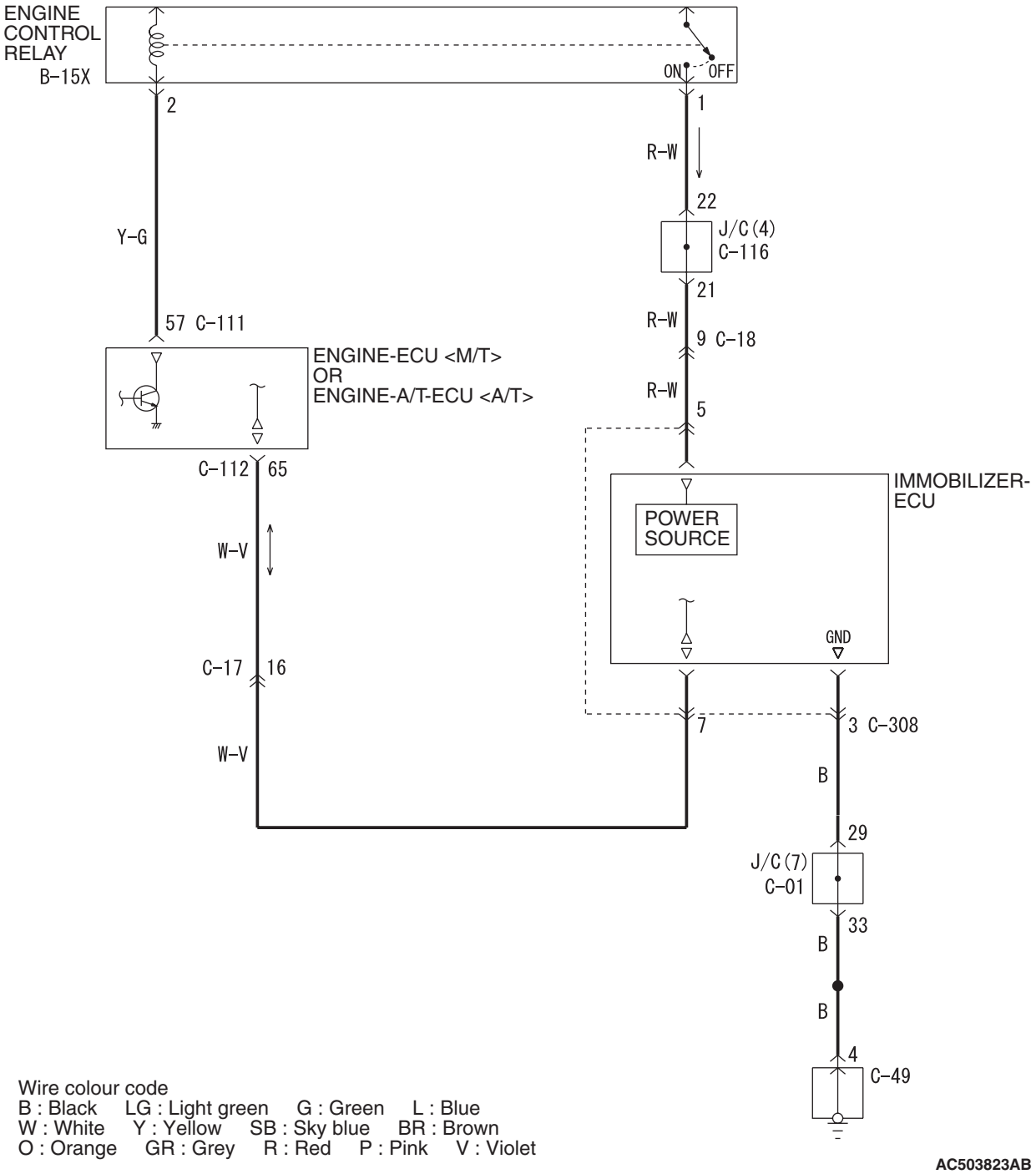
Inspection Procedure 2: MPI system-related diagnosis code No.P0513 is set, and communication between M.U.T.-III and immobilizer cannot be established. <Vehicles for GCC, Australia and New Zealand>

Immobilizer-ECU Power Source, Earth and Engine-ECU <M/T> or Engine-A/T-ECU <A/T> Communication Line Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Grey R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

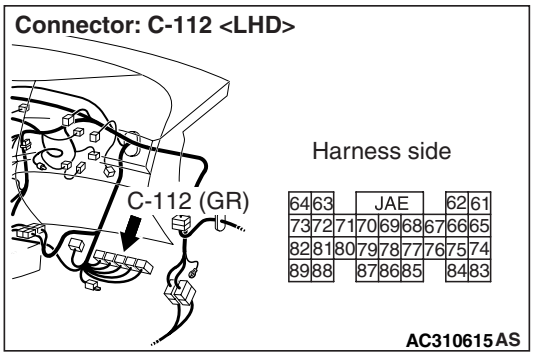
The immobilizer-ECU communicates with the M.U.T.-III via the engine-ECU <M/T> or the engine-A/T-ECU. The communication error between the immobilizer ECU and the engine-ECU <M/T> or the engine-A/T-ECU may be occurred.

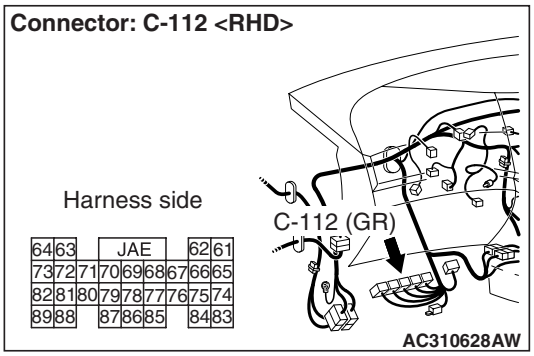
PROBABLE CAUSES

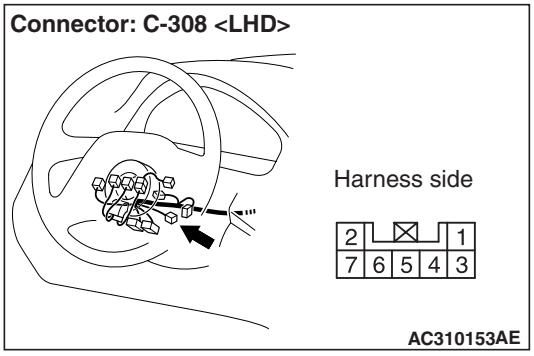
- Malfunction of immobilizer ECU power supply and earth
- Damaged harness wires between the engine-ECU <M/T> or the engine-A/T-ECU and the immobilizer ECU

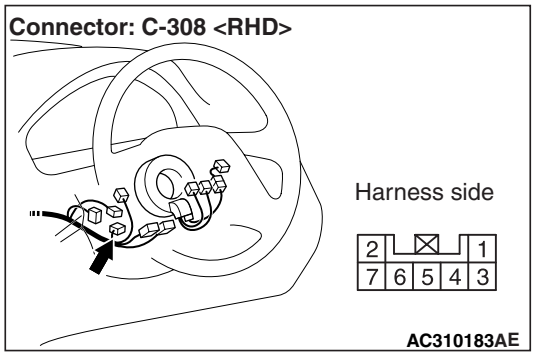
DIAGNOSIS PROCEDURE

STEP 1. Connector check: Key reminder switch connector C-308 and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112.





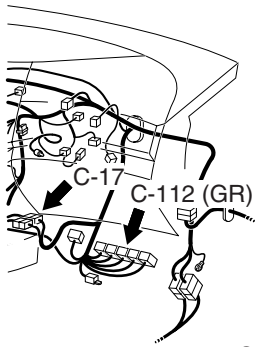




Q: Are key reminder switch connector C-308 and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 in good condition?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Check the harness wires between key reminder switch connector C-308 (terminal 7) and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 (terminal 65).

Connectors: C-17, C-112 <LHD>



C-17

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

Harness side
C-112

64	63				JAE					62	61			
73	72	71	70	69	68	67	66	65						
82	81	80	79	78	77	76	75	74						
89	88			87	86	85				84	83			

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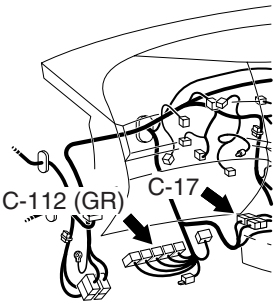
Connectors: C-17, C-112 <RHD>



C-17

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

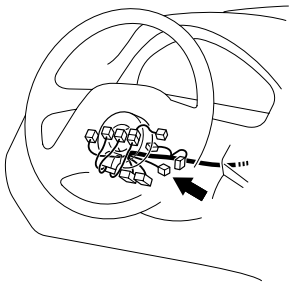
Harness side
C-112

64	63				JAE					62	61			
73	72	71	70	69	68	67	66	65						
82	81	80	79	78	77	76	75	74						
89	88			87	86	85				84	83			

AC310629AD

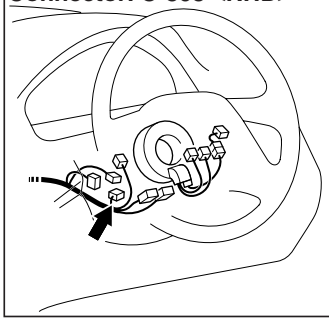
NOTE:

Connector: C-308 <LHD>



AC310153AE

Connector: C-308 <RHD>



AC310183AE

Prior to the wiring harness inspection, check intermediate connector C-17, and repair if necessary.

Q: Are the harness wires between key reminder switch connector C-308 (terminal 7) and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 (terminal 65) in good condition?
YES : Go to Step 3.
NO : Repair the wiring harness.

STEP 3. Check the immoblizer-ECU power supply circuit and earth circuit (Refer to Inspection Procedure 5 "Check the immoblizer ECU power supply circuit and earth circuit" P.54A-35.)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the power supply and earth circuit to the immobilizer ECU.

STEP 4. Retest the system.
Check that immobilizer ECU communicates with the M.U.T.-III.

Q: Is the check result normal?
YES : Intermittent Malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace the immobilizer-ECU, and then go to Step 5.

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STEP 5. Retest the system.
Check that immobilizer ECU communicates with the M.U.T.-III.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the engine-ECU <M/T> or engine-A/T-ECU <A/T>.

Inspection Procedure 3: The ignition key cannot be registered with the M.U.T.-III. <Vehicles for Hong Kong and Singapore>

COMMENTS ON TROUBLE SYMPTOM

If only some ignition keys cannot be registered, the ignition key itself may be defective. If no ignition key can be registered, the key assembly may have already been registered for another vehicle, or the immobilizer-ECU may be defective.

PROBABLE CAUSES

- Malfunction of ignition key
- Damaged harness wires and connectors
- Malfunction of immobilizer-ECU
- Malfunction of engine-A/T-ECU
- Transponder registered for other vehicle

DIAGNOSIS PROCEDURE

STEP 1. Check the ignition key inserted in the key cylinder for interference.

Q: Are there other ignition keys or anything that interferes with the communication (things that generate radio waves such as magnets and an air-cleaning device that has a power plug) near the ignition key inserted in the key cylinder?
YES : Move away or remove other ignition keys or things that interfere with the communication (things that generate radio waves such as magnets and a air-cleaning device that has a power plug) near the ignition key. Then, go to step 2.
NO : Go to Step 3.

STEP 2. Retest the system.
Check that the ignition key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 3.

STEP 3. Check which ignition key cannot be registered.

Q: Are there only some ignition keys that cannot be registered?
Only some keys : Replace the key that cannot be registered and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, go to Step 5.
All keys : Go to Step 4.

STEP 4. Retest the system.
Check the M.U.T.-III screen when the key was not able to be registered.

Q: Which error message did the M.U.T.-III display?
Defective key : Carry out the troubleshooting for diagnosis code B1722 Transponder Antenna Failure. Refer to P.54A-15. Then, go to Step 5.
ECU internal error : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.) After registering the ID codes, go to Step 5.

STEP 5. Retest the system.
Check that the ignition key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the immobilizer-ECU and register the ID codes. (Refer to P.54A-9.)

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Inspection Procedure 3: The ignition key cannot be registered with the M.U.T.-III. <Vehicles for GCC, Australia and New Zealand>

CIRCUIT OPERATION

Refer to P.54A-24.

COMMENTS ON TROUBLE SYMPTOM

If only some ignition keys cannot be registered, the ignition key itself may be defective. If no ignition key can be registered, the immobilizer ECU may be defective.

PROBABLE CAUSES

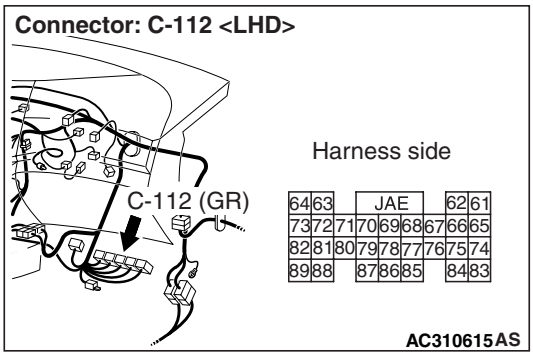
- Malfunction of ignition key
- Damaged harness wires and connectors
- Malfunction of immobilizer ECU
- Malfunction of engine-ECU <M/T> or engine-A/T-ECU <A/T>

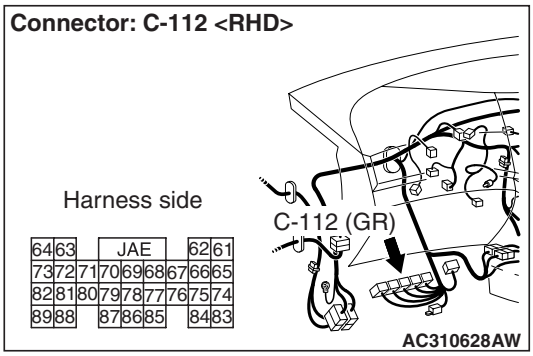
DIAGNOSIS PROCEDURE

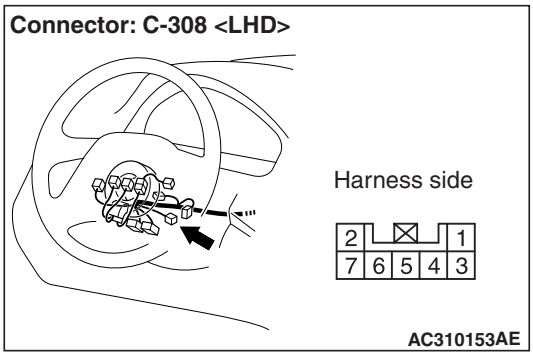
STEP 1. Check that no ignition key can be registered.

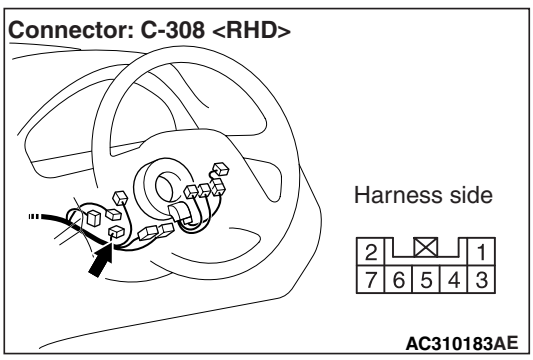
Q: Can any of the ignition keys be registered?
YES : Replace the ignition key that cannot be registered with new registered ignition key.
NO : Go to Step 2.

STEP 2. Connector check: Key reminder switch connector C-308 and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112.









Q: Are key reminder switch connector C-308 and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 in good condition?
YES : Go to Step 3.
NO : . Repair the defective connector.

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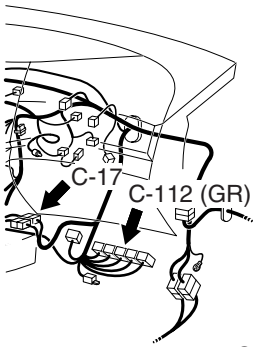
STEP 3. Check the harness wires between key reminder switch connector C-308 (terminal 7) and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 (terminal 65).

Connectors: C-17, C-112 <LHD>



C-17

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

Harness side
C-112

64	63				JAE					62	61
73	72	71	70	69	68	67	66	65			
82	81	80	79	78	77	76	75	74			
89	88			87	86	85				84	83

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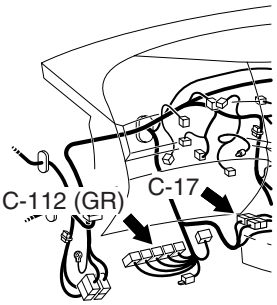
Connectors: C-17, C-112 <RHD>



C-17

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

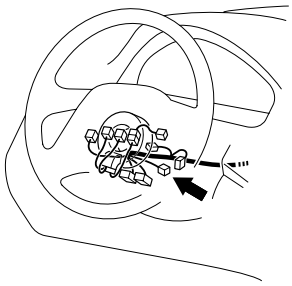
Harness side
C-112

64	63				JAE					62	61
73	72	71	70	69	68	67	66	65			
82	81	80	79	78	77	76	75	74			
89	88			87	86	85				84	83

AC310629AD

NOTE:

Connector: C-308 <LHD>



Harness side

2						1
7	6	5	4	3		

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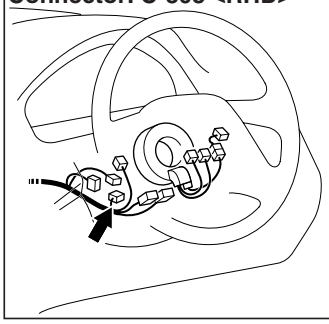
Connector: C-308 <RHD>



Harness side

2						1
7	6	5	4	3		

AC310183AE

Prior to the wiring harness inspection, check intermediate connector C-17, and repair if necessary.

Q: Are the harness wires between key reminder switch connector C-308 (terminal 7) and engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-112 (terminal 65) in good condition?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Check the communication with M.U.T.-III

Q: Can the system communicate with the M.U.T.-III?
YES : Go to Step 5.
NO : Refer to Inspection Procedure 2 "MPI system-related diagnostic code No.P0513 is set, and communication between M.U.T.-III and immobilizer cannot be established. P.54A-24"

STEP 5. M.U.T.-III diagnosis code

Check whether the engine immobilizer system-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Refer to P.54A-13.
NO : Go to Step 6.

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STEP 6. Retest the system.
Check that the ignition key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the immobilizer-ECU, and then go to Step 7.

STEP 7. Retest the system.
Check that the ignition key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the engine-ECU <M/T> or engine-A/T-ECU <A/T>.

Inspection Procedure 4: The engine does not start. (cranking occurs but initial combustion does not) <Vehicles for Hong Kong and Singapore>

COMMENTS ON TROUBLE SYMPTOM
If the fuel injection does not work, the immobilizer ECU and the MPI system may be defective. It is no problem with the malfunction above when the engine is started with unregistered ignition key.

PROBABLE CAUSES
- Malfunction of MPI system
- Malfunction of immobilizer-ECU
- Damaged harness wires and connectors
- Malfunction of ignition key
- VIN not written

DIAGNOSIS PROCEDURE

STEP 1. Battery voltage check
Measure the battery voltage when cranking.

OK: 8 V or more

Q: Is the check result normal?
YES : Go to Step 2.
NO : Check the battery. Refer to P.54A-6.

STEP 2. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54F – Troubleshooting P.54F-13).

STEP 3. M.U.T.-III other system diagnosis code
Check whether the MPI system-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Refer to GROUP 13B, Troubleshooting P.13B-15.
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code
Check whether the engine immobilizer system-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Refer to P.54A-12.
NO : Go to Step 5.

STEP 5. Check that the engine starts.

Q: Does the engine start?
YES : The procedure is complete.
NO : Refer to GROUP 13B, Troubleshooting P.13B-15. Replace the immobilizer ECU and register the ID codes when the cause of the failure cannot be tracked down by performing the troubleshooting in GROUP 13B.(Refer to P.54A-9.)

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Inspection Procedure 4: The engine does not start. (cranking occurs but initial combustion does not) <Vehicles for GCC, Australia and New Zealand>

COMMENTS ON TROUBLE SYMPTOM

If the fuel injection does not work, the immobilizer-ECU and the MPI system may be defective. It is no problem with the malfunction above when the engine is started with unregistered ignition key.

PROBABLE CAUSES

- Malfunction of MPI system
- Malfunction of immobilizer ECU

DIAGNOSIS PROCEDURE

STEP 1. Battery voltage check

Measure the battery voltage when cranking.

OK: 8 V or more

Q: Is the check result normal?

YES : Go to Step 2.

NO : Check the battery. Refer to P.54A-6.

STEP 2. M.U.T.-III other system diagnosis code

Check whether the MPI system-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Refer to GROUP 13A, Troubleshooting P.13A-14 <Vehicles for GCC> or GROUP 13C, Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand>.

NO : Go to Step 3.

STEP 3. M.U.T.-III diagnosis code

Check whether the engine immobilizer system-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Refer to P.54A-13.

NO : Go to Step 4.

STEP 4. Check that the engine starts.

Q: Does the engine start?

YES : The procedure is complete.

NO : Refer to GROUP 13A, Troubleshooting P.13A-14 <Vehicles for GCC> or GROUP 13C, Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand>. Replace the immobilizer-ECU when the cause of the failure cannot tracked down by performing the troubleshooting.

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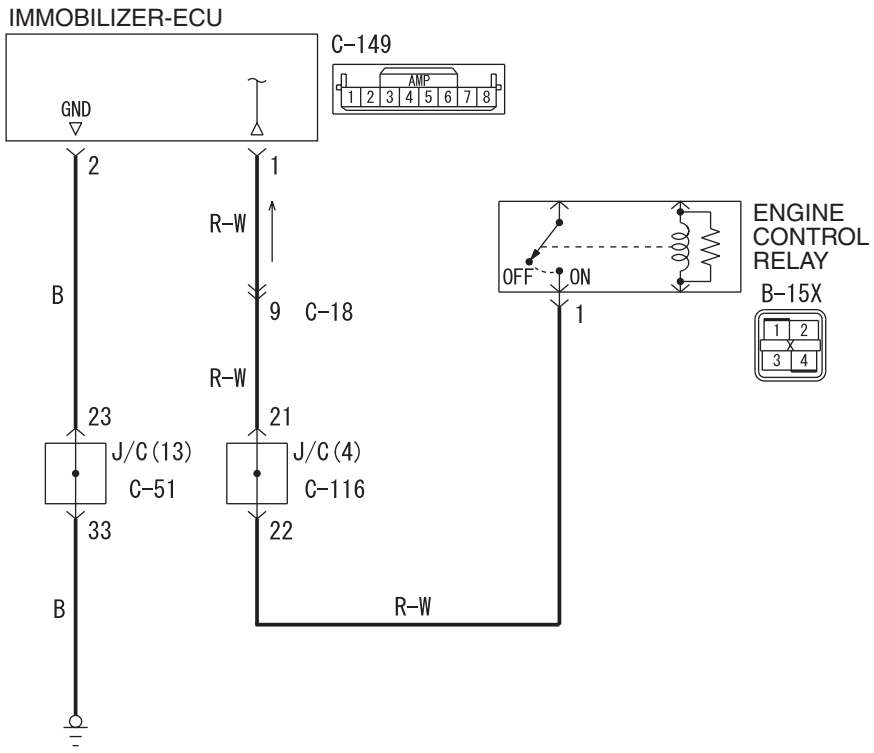
Inspection Procedure 5: Check the power supply and earth circuit to the immobilizer-ECU. <Vehicles for Hong Kong and Singapore>

Immobilizer-ECU Power Source and Earth Communication Line Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Grey R : Red P : Pink V : Violet

AC503826AB

COMMENTS ON TROUBLE SYMPTOM

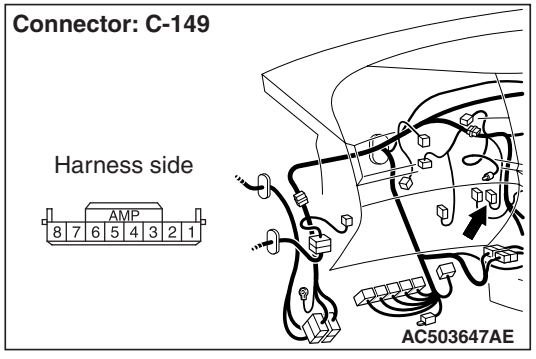
The power supply and earth circuit to the immobilizer ECU may be defective.

PROBABLE CAUSES

Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. Connector check: Immobilizer-ECU connector C-149.



Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

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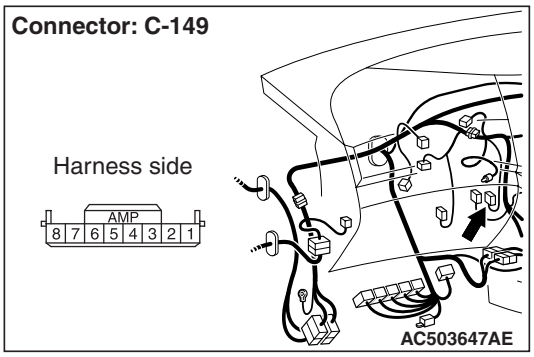
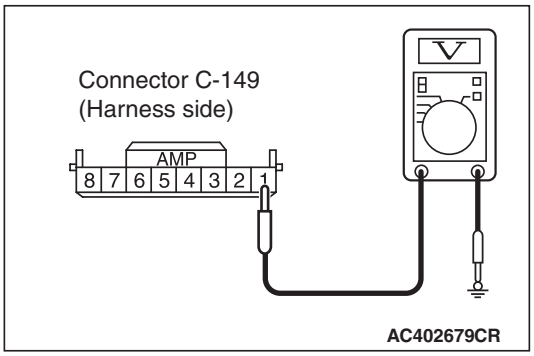
STEP 2. Voltage measurement at immobilizer-ECU connector C-149 in order to check the battery circuit of power supply system to the immobilizer-ECU.



(1) Disconnect the immobilizer-ECU connector C-149 and measure the voltage at immobilizer-ECU connector C-149 harness side.
(2) Turn the ignition switch to “ON” position.

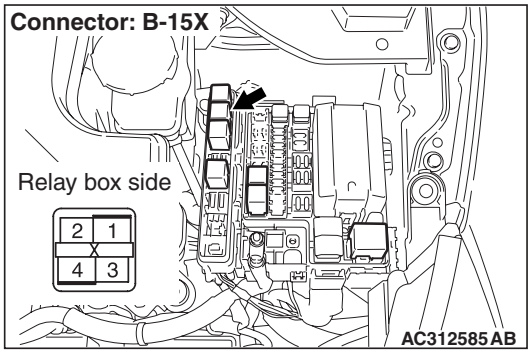


(3) Measure the voltage between terminal 1 and earth.

OK: Battery voltage

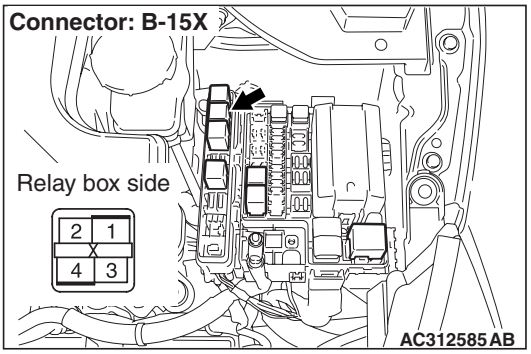
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 3.

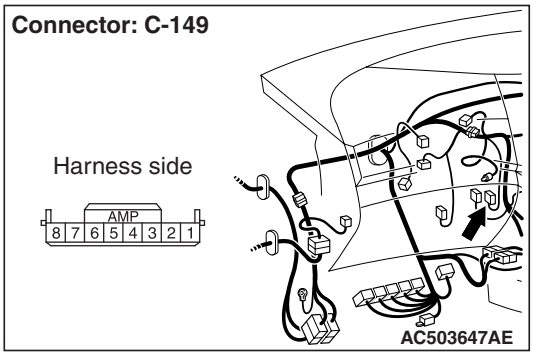
STEP 3. Connector check: Engine control relay connector B-15X.



Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the defective connector.

STEP 4. Check the wiring harness between engine control relay connector B-15X (terminal 1) and immobilizer-ECU connector C-149 (terminal 1).





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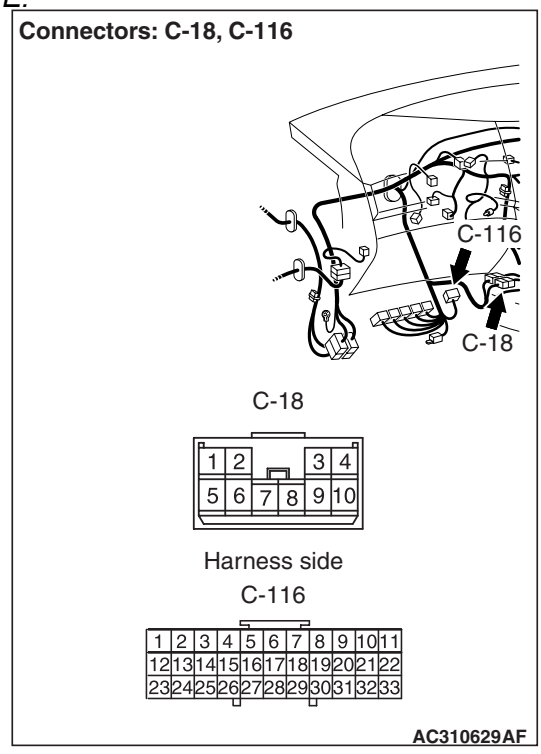
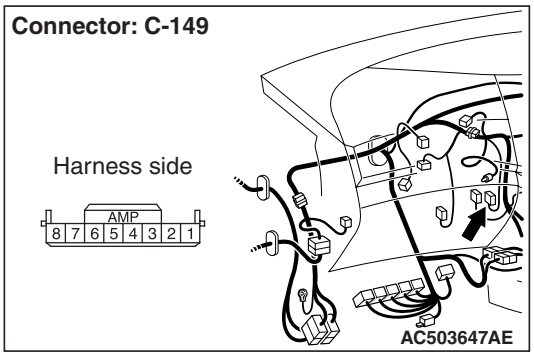


Prior to the wiring harness inspection, check joint connector C-116, intermediate connector C-18, and repair if necessary.

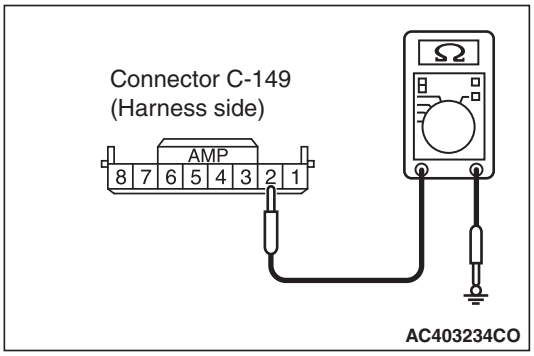
- Check the power supply line for open circuit.

Q: Are the wiring harness between engine control relay connector B-15X (terminal 1) and immobilizer-ECU connector C-149 (terminal 1) in good condition?
YES : Go to Step 5.
NO : Repair the wiring harness.

STEP 5. Resistance measurement at immobilizer-ECU connector C-149 to check the earth circuit to the immobilizer-ECU connector.



(1) Disconnect the immobilizer-ECU connector C-149 and measure the resistance at immobilizer-ECU connector C-149 harness side.
(2) Turn the ignition switch to “ON” position.

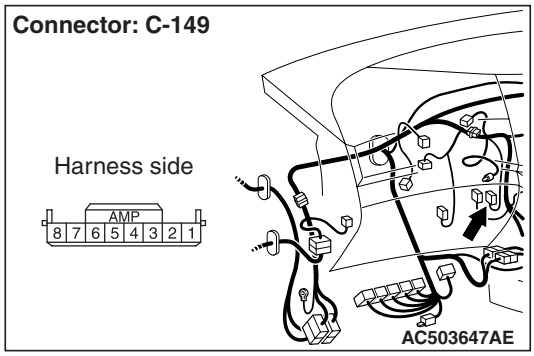


(3) Measure the resistance between terminal 2 and earth.

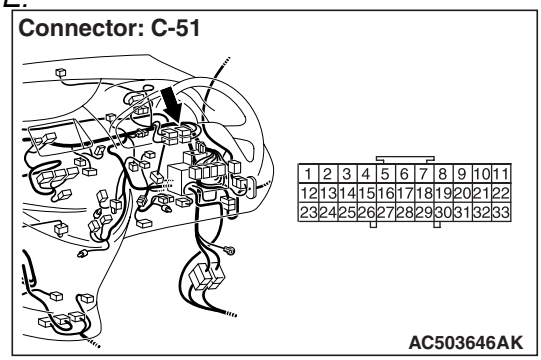
OK: 2 ohms or less

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 6.

STEP 6. Check the wiring harness between immobilizer-ECU connector C-149 (terminal 2) and earth.



NOTE:



Prior to the wiring harness inspection, check joint connector C-51, and repair if necessary.

- Check the earth wires for open circuit.

Q: Are the wiring harness between immobilizer-ECU connector C-149 (terminal 2) and earth in good condition?
YES : The procedure is complete.
NO : Repair the wiring harness.

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Inspection Procedure 5: Check the power supply and earth circuit to the immobilizer-ECU. <Vehicles for GCC, Australia and New Zealand>

CIRCUIT OPERATION

Refer to P.54A-24.

COMMENTS ON TROUBLE SYMPTOM

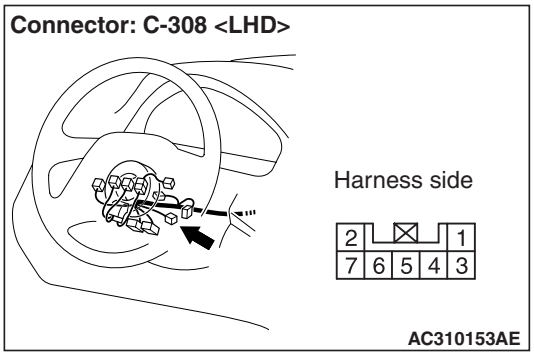
The power supply and earth circuit to the immobilizer ECU may be defective.

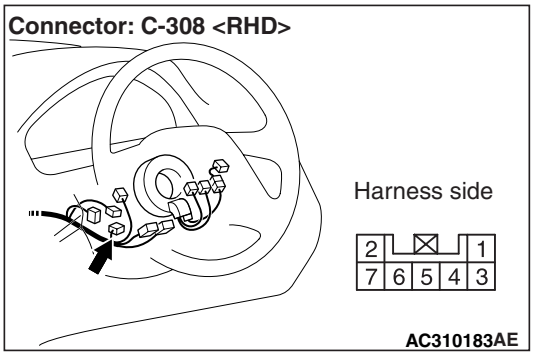
PROBABLE CAUSES

Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

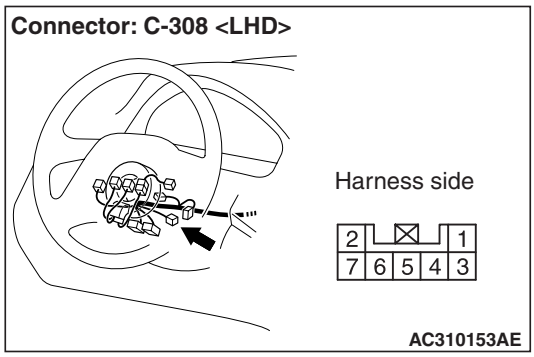
STEP 1. Connector check: Key reminder switch connector C-308.

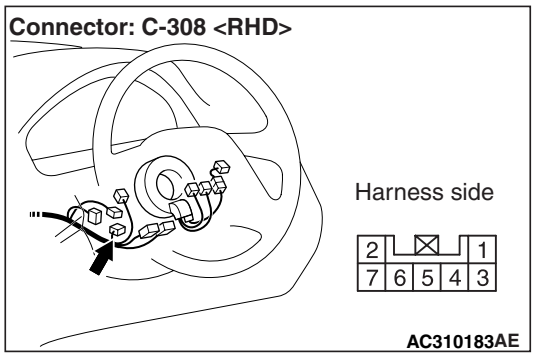




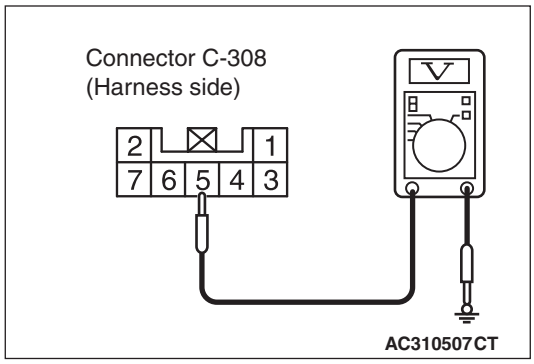
Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Voltage measurement at key reminder switch connector C-308 in order to check the battery circuit of power supply system to the key reminder switch.





(1) Disconnect the key reminder switch connector C-308 and measure the voltage at key reminder switch connector C-308 harness side.
(2) Turn the ignition switch to “ON” position.



(3) Measure the voltage between terminal 5 and earth.

OK: Battery voltage

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 3.

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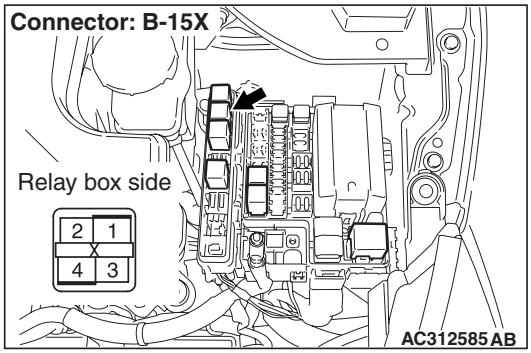
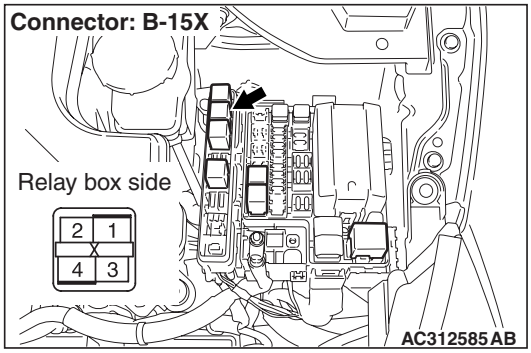
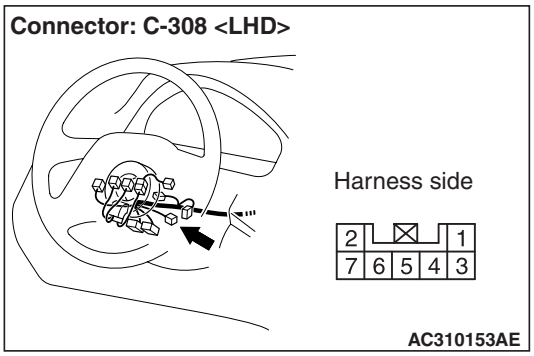
Step 3. Connector check: Engine control relay connector B-15X.

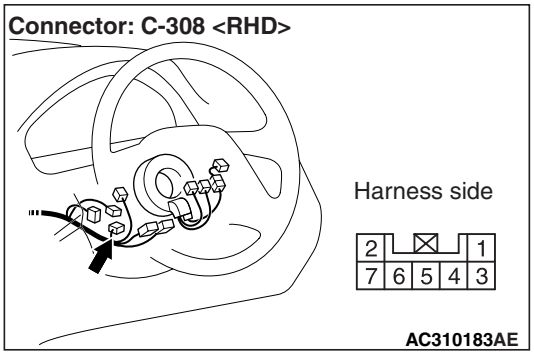


Q: Is the check result normal?
YES : Go to Step 4.
NO : . Repair the defective connector.

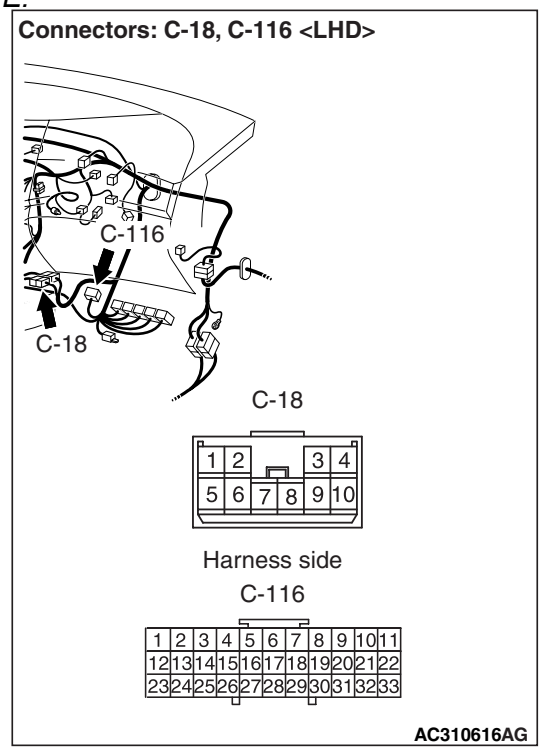
STEP 4. Check the wiring harness between engine control relay connector B-15X (terminal 1) and key reminder switch connector C-308 (terminal 5).

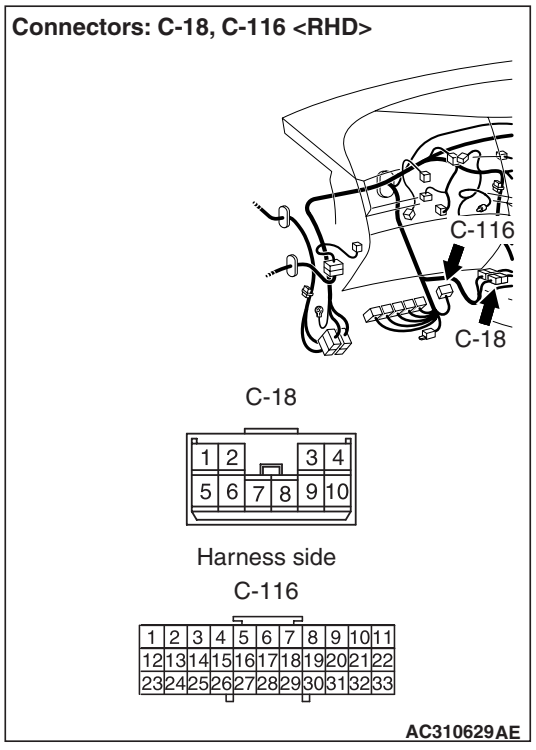






NOTE:





Prior to the wiring harness inspection, check joint connector C-116, intermediate connector C-18, and repair if necessary.

- Check the power supply line for open circuit.

Q: Are the wiring harness between engine control relay connector B-15X (terminal 1) and key reminder switch connector C-308 (terminal 5) in good condition?
YES : Go to Step 5.
NO : Repair the wiring harness.

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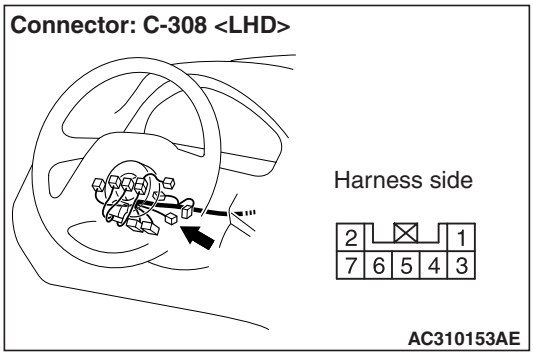
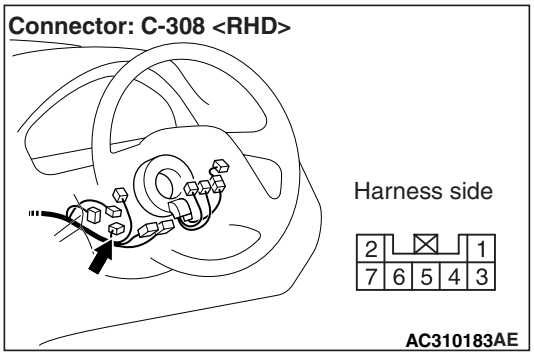
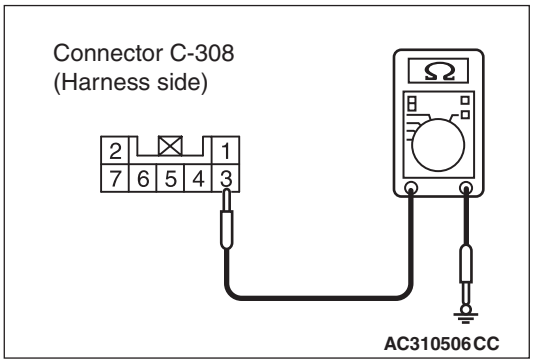
STEP 5. Resistance measurement at key reminder switch connector C-308 to check the earth circuit to the key reminder switch connector.





(1) Disconnect the key reminder switch connector C-308 and measure the resistance at key reminder switch connector C-308 harness side.



(2) Measure the resistance between terminal 3 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 6.

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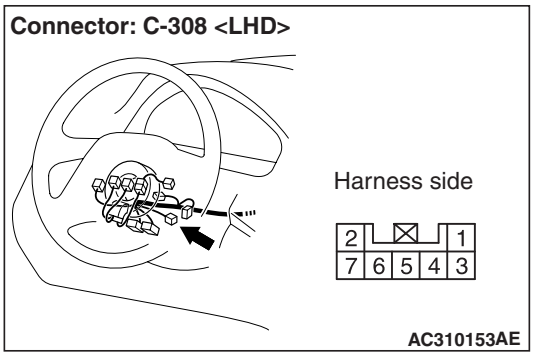
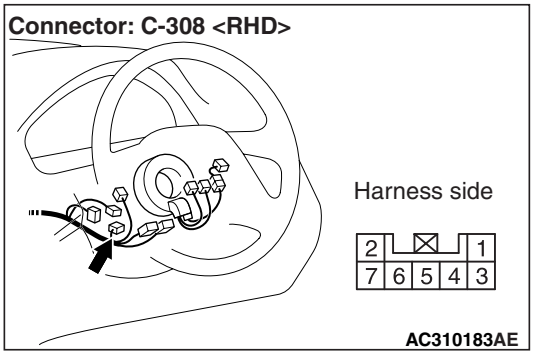
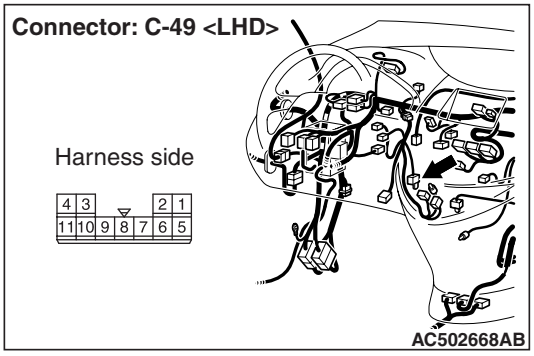
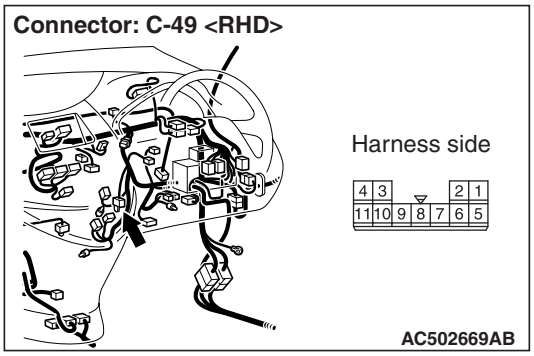
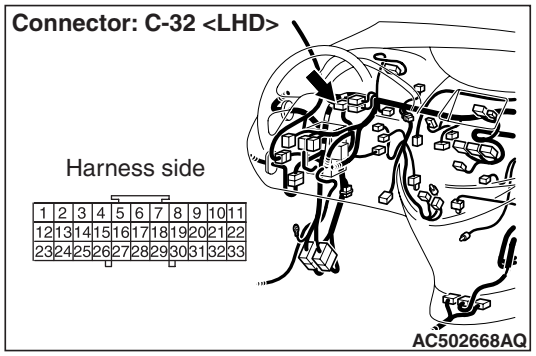
STEP 6. Check the wiring harness between key reminder switch connector C-308 (terminal 3) and connector C-49 (terminal 4).

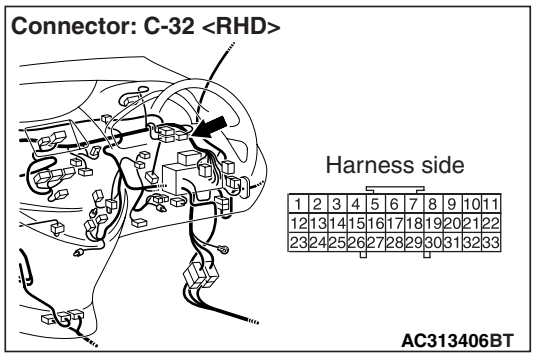












NOTE: Prior to the wiring harness inspection, check joint connector C-32, and repair if necessary.

- Check the earth wires for open circuit.

Q: Are the wiring harness between key reminder switch connector C-308 (terminal 3) and connector C-49 (terminal 4) in good condition?
YES : The procedure is complete.
NO : Repair the wiring harness.

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DATA LIST REFERENCE TABLE

M1543007300477

Item No.	Inspection item	Inspection requirement	Normal condition
01	Key has been registered	–	Number of registered ignition keys

CHECK IMMOBILIZER-ECU

M1543007601040

TERMINAL VOLTAGE CHECK TABLE <VEHICLES FOR HONG KONG AND SINGAPORE>

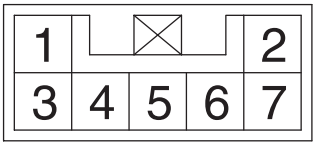
C-149 Immobilizer-ECU connector

AC502073AC

Terminal No.	Signal	Inspection condition	Terminal voltage
1	Input of engine control relay	Ignition switch: "ON"	Battery voltage
2	Earth	Always	0 V
3	CAN H	–	–
4	CAN L	–	–
5	Power supply to ignition switch (IG1)	Ignition switch: "ON"	Battery voltage
6	–	–	–
7	Input and output of ignition key ring antenna	–	–
8	Input and output of ignition key ring antenna	–	–

TERMINAL VOLTAGE CHECK TABLE <VEHICLES FOR GCC, AUSTRALIA AND NEW ZEALAND>

C-308 Immobilizer-ECU connector



AC311921AB

Terminal No.	Signal	Inspection condition	Terminal voltage
3	Immobilizer-ECU earth	Always	0V
5	Immobilizer-ECU power supply	Ignition switch: "LOCK" (OFF)	0V
		Ignition switch: "ON"	System voltage
7	Engine-ECU <M/T> or engine-A/T-ECU	-	-

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ON-VEHICLE SERVICE <Vehicles with engine immoblizer system>

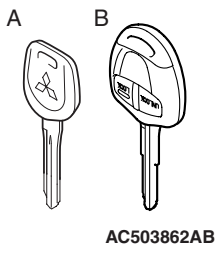
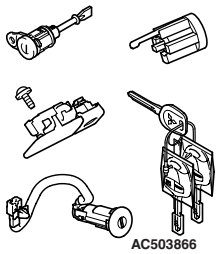
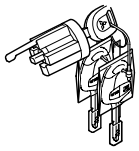
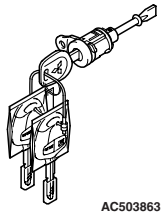
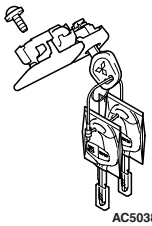
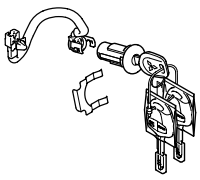
HOW TO REGISTER ENCRYPTED CODE <Vehicles for Hong Kong and New Zealand>

M1543008100829

⚠ CAUTION

- **When the door lock cylinder, glove box lock or the tailgate lock cylinder is replaced separately, do not register the bar code No. attached to the ignition key. If the bar code No. is registered, the conventional key will not be able to start the engine. The new key will not be able to start the engine because it has a different key groove.**
- **If the ignition key with transmitter is added or replaced, register the key (encrypted code), and then register the encrypted code for keyless entry again.(Refer to GROUP 42 – Method of registering a secret code P.42-65.)**

Supply unit chart

Ignition key <single unit> (A: without transmitter, B: with transmitter)	Key set	Steering lock cylinder	Door lock cylinder	Glove box lock	Tailgate lock cylinder
 AC503862AB	 AC503866	 AC503861	 AC503863	 AC503864	 AC503865

NOTE:

- *When re-registering the key (encrypted code), all the keys (encrypted code) registered before must be re-registered because all of them will be erased.*
- *When the ignition key was replaced by the key set or when the ignition key was replaced by the steering lock cylinder separately, register the key (encrypted code) using the bar code No. attached to the key.*
- *If the steering lock cylinder, the door lock cylinder, the glove box lock or the tailgate lock cylinder is replaced as a single unit, two kinds of keys are used (the key that starts the engine and the key that opens and closes the doors). To use only one key, replace the ignition key by the key set instead of replacing it by a single unit.*
- *After the key registration, check that the engine is started normally with all the ignition keys.*

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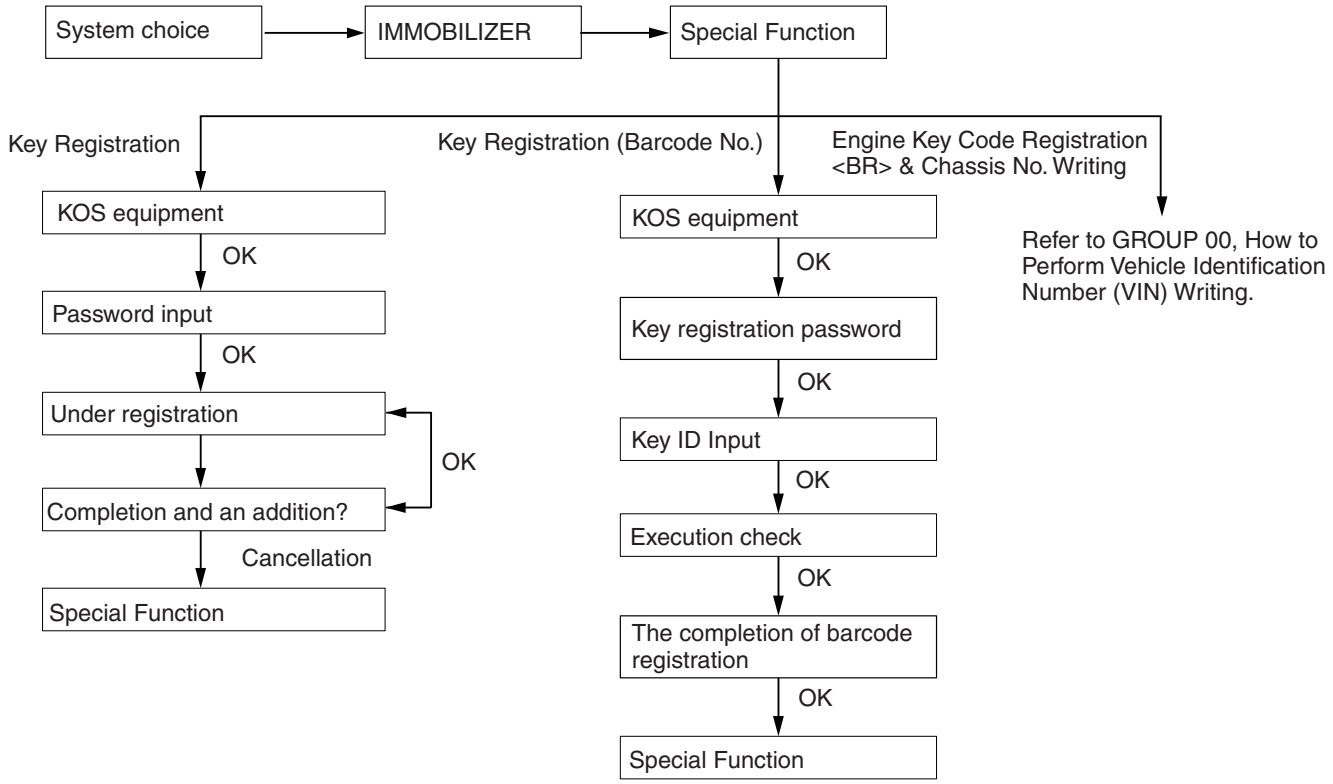
SCREEN FLOW OF M.U.T.-III



AC503789AB

NOTE: KOS stands for keyless operation system. This system enables the driver to lock/unlock the doors and the tailgate by pressing the switch on the front doors and the tailgate while carrying the KOS key (portable card-type key), and the engine can be started without using the conventional mechanical key. Vehicles with KOS do not exist because the system is adopted for Japanese model only.

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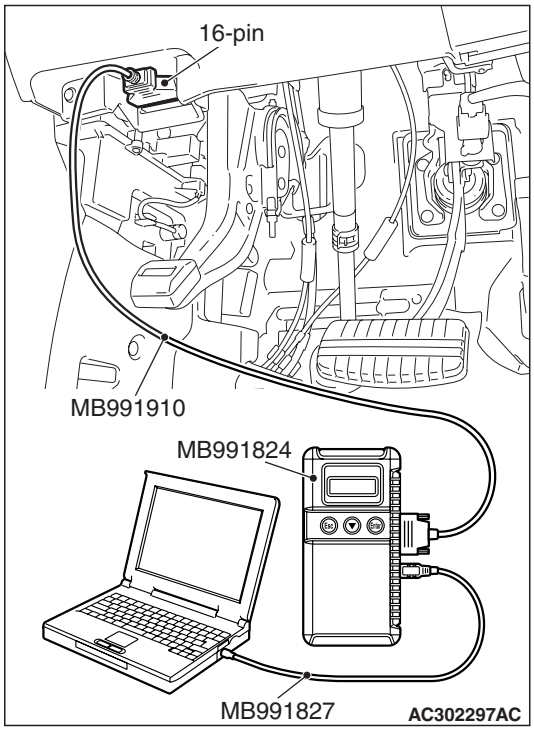
⚠ CAUTION



To prevent damage to M.U.T.-III MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting M.U.T.-III MB991958.

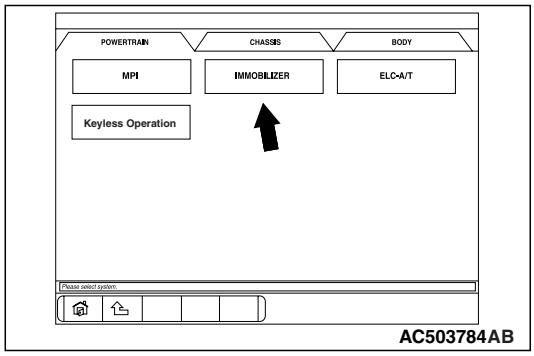
Connect the M.U.T.-III to the 16-pin diagnosis connector as follows.

NOTE: For details on how to use the M.U.T.-III, refer to the "M.U.T.-III operation manual."

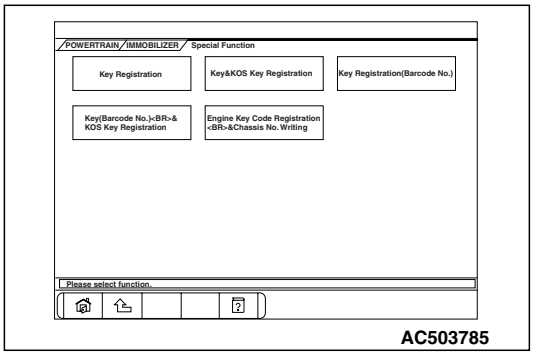
1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect USB cable MB991827 to special tool V.C.I. MB991824 and the personal computer.
4. Connect main wiring harness A (MB991910) to the V.C.I.
5. Connect M.U.T.-III main wiring harness A to the diagnosis connector.
6. Turn the V.C.I. power switch to the "ON" position.

   NOTE: When the V.C.I. is energized, the V.C.I. indicator lamp will be illuminated in a green colour.

7. Start the M.U.T.-III system on the PC and turn the ignition switch to the "ON" position.



8. Select "IMMOBILIZER" button from the "System choice" screen, and select "Special Function" on the next screen.



9. Select the button of the operation to be performed from the "Special Function" screen.
   - "Key Registration": When the ignition key is replaced or added by a single unit, when the immobilizer-ECU is replaced
   - "Key&KOS key Registration": This menu is not used.
   - "Key Registration (Bar code No.)": When the ignition key is replaced by the key set or the steering lock cylinder is replaced by the piece.
   - "Key (Bar code No.)&KOS key Registration": This menu is not used.
   - "Engine Key Code Registration
&Chassis No. Writing": When the engine-A/T-ECU is replaced

   *NOTE: For "Engine Key Code Registration
&Chassis No. Writing", refer to GROUP 00, Precautions before Service P.00-25.*

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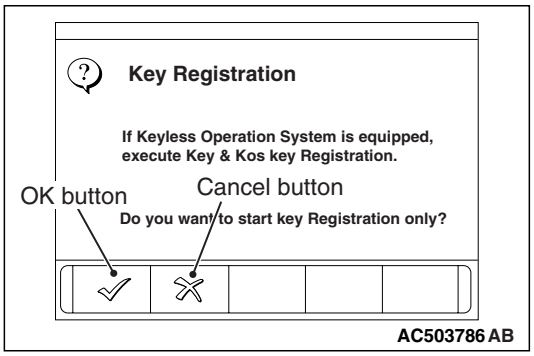
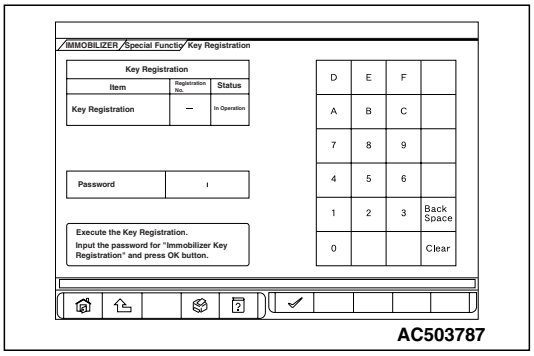
KEY REGISTRATION MOTHOD

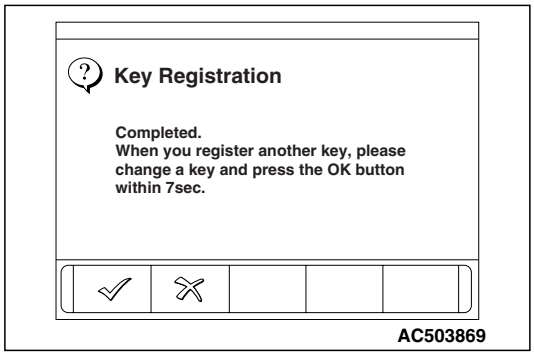


1. When the KOS check screen is displayed, press the OK button as this model is not equipped with KOS.



2. When "Key registration" screen is displayed, enter the password for the key registration and press the OK button. Then, "Executing!" is displayed and the registration process starts.

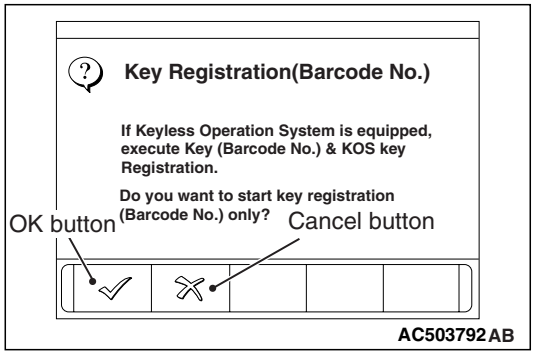
   NOTE:
   - *If the wrong password is entered consecutively 5 times, the password entry for the key registration will be disabled for 16 minutes.*
   - *The key registration cannot be cancelled during the operation.*



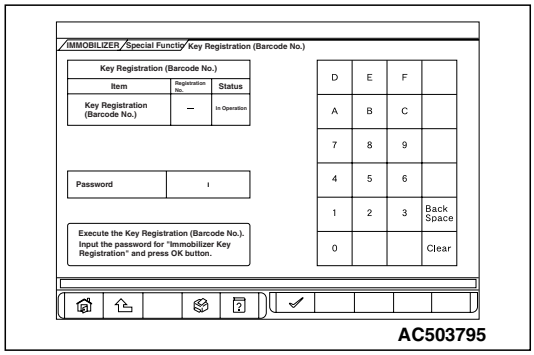
3. When the key registration is completed, "Completed" is displayed. To register the next key, follow the message on the screen and press the OK button. Then, "Executing!" is displayed again and the registration process for the next key starts. To finish the key registration, press the cancel button.

   NOTE:
   - *In order to register another key consecutively after registering the first key, the ignition switch must be turned to the ON position with the second key within 7 seconds after turning it to the "LOCK" (OFF) position with the first key.*
   - *Up to 8 keys can be registered.*

KEY REGISTRATION (BAR CODE NO.) MOTHOD



1. When the KOS check screen is displayed, press the OK button as this model is not equipped with KOS.



2. When "Key Registration (Barcode No.)" screen is displayed, enter the password for the key registration and press the OK button.

   NOTE: If the wrong password is entered consecutively 5 times, the password entry for the key registration will be disabled for 16 minutes.

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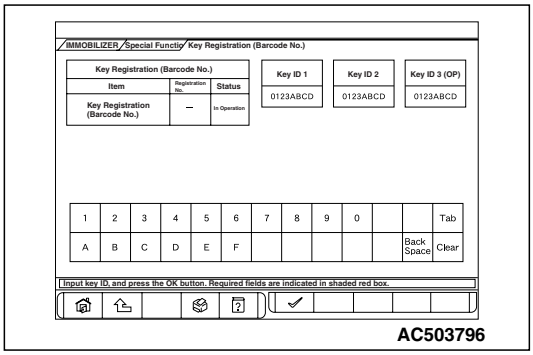
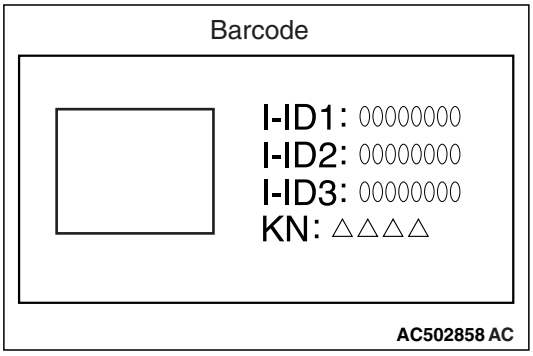


AC503796



AC502858 AC

3. Follow the message on the screen and enter the Bar code No. Then, press the OK button.
4. When "Do you want to start registration?" is displayed, press the OK button to start the registration, or press the Cancel button to cancel the registration.
5. "Key Registration was completed" is displayed. Press the OK button to finish the registration.

HOW TO REGISTER ENCRYPTED CODE <VEHICLES FOR GCC, AUSTRALIA AND NEW ZEALAND>

M1543008100818

⚠ CAUTION

Because registering the encrypted codes is done after all previously-registered codes have been erased, you should keep all of the ignition keys that have already been registered accessible.

If the ignition key, immobilizer-ECU, engine-ECU <M/T> or engine-A/T-ECU <A/T> is replaced or an ignition key is added, encrypted codes of all the ignition keys must be registered. (A maximum of eight different ignition key can be registered). Moreover, when the immobilizer-ECU has been replaced, you will need to use M.U.T.-III to register the immobilizer-ECU and input the vehicle secret code and to register the password (secret code) that the owner specifies into the immobilizer-ECU. If an attempt is made to start the engine with an unregistered ignition key, cranking occurs, but fuel supply is cut off to disable the engine. In approximately.

NOTE: Engine-ECU <M/T> or engine-A/T-ECU <A/T> has an encrypted code for immobilizer-ECU, and the encrypted code is registered in the immobilizer-ECU and ignition key.

POINTS TO NOTE DURING OPERATION

If none of the functions can be used, check the diagnosis codes, and after carrying out any necessary repairs, repeat the operation. If an incorrect password is input ten times in a row, the immobilizer-ECU judges that an unauthorized operation is being attempted. Start-prevention mode will be set, and engine operation will stop and all special functions will be disabled. If the ignition switch is turned to "ON" position, "Unauthorized operation, start- prevention mode" will be cancelled.

KEY ID (ENCRYPTED CODE) REGISTRATION <M.U.T.-III>

All ignition keys can be registered with M.U.T.-III. Additional ignition keys can be registered with M.U.T.-III.

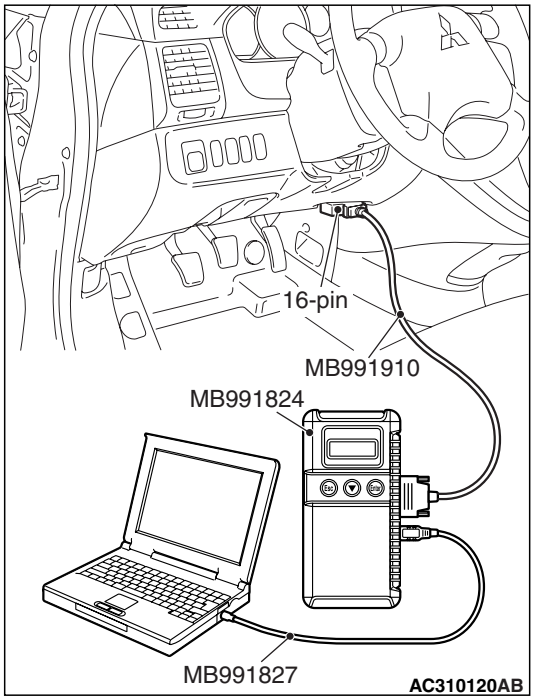
REGISTRATION WITH THE M.U.T.-III

⚠ CAUTION

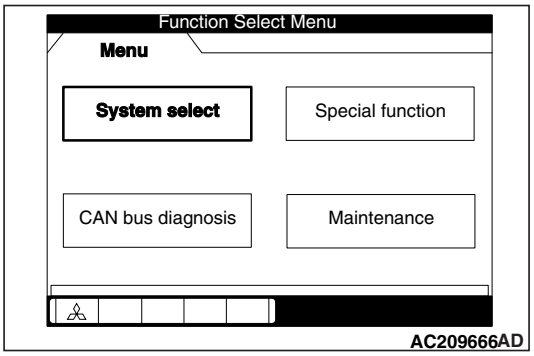
To prevent damage to M.U.T.-III, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting M.U.T.-III.

NOTE:

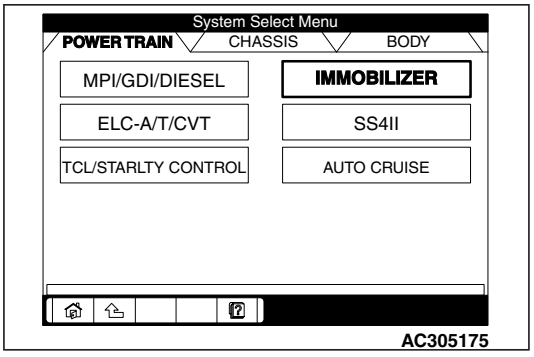
- *Before registration, check that no diagnosis code is set. If a diagnosis code is set, resolve the problem beforehand.*
- *Using the key ID register function will cause all key IDs that have been previously registered in the immobilizer-ECU to be erased. All keys need to be registered. Those which have been registered before should be on hand before using this function.*
- *If registering more than one key, do not disconnect M.U.T.-III halfway through the registration process.*
- *After registering key IDs, check that the engine can be started using all of the keys that have been registered. If the engine will not start, refer to Immobilizer System Troubleshooting P.54A-8.*



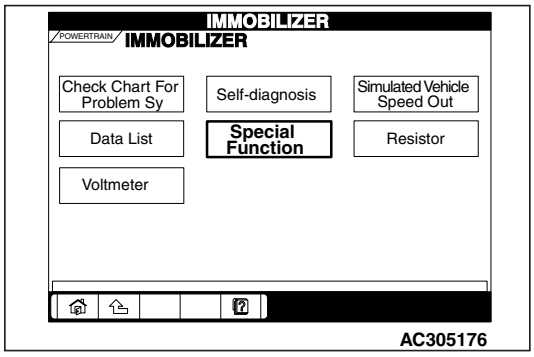
1. Connect the M.U.T.-III to the diagnosis connector (16-pin).
2. Turn the ignition switch to "ON" position.



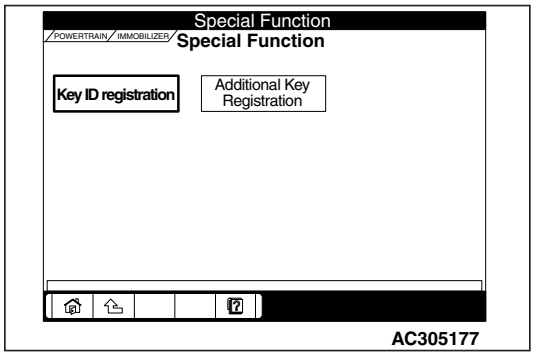
3. Select "System select" from the start-up screen.



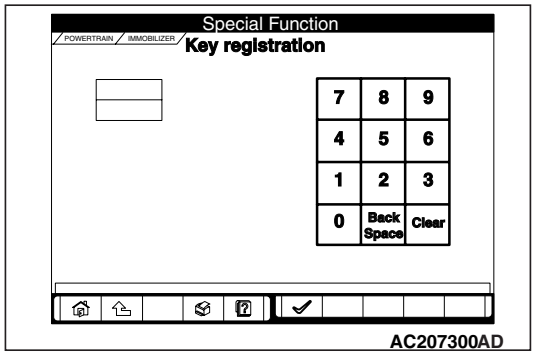
4. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



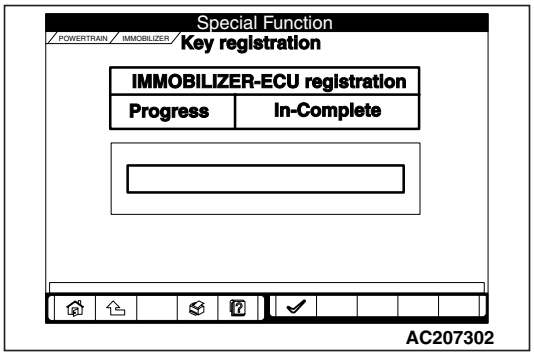
5. Choose "Special Function" from "IMMOBILIZER" screen.



6. Choose "Key registration" from "Special Function" screen.



7. Enter the vehicle's password (secret code) on the "Key registration" screen, and then click the check mark icon. Follow the prompts on the screen to insert key(s) into the ignition switch to begin key registration.



8. If the key ID was registered successfully, "Progress" indication will turn active (grey). Then the registration process completes. If the key ID failed to be registered, "In-Complete" indication will turn active (grey).
9. The number of keys currently registered will be displayed. To register an additional key, replace the ignition key with the next key to be registered within five seconds. Key ID registration screen will be displayed, then register another key.

   NOTE: A maximum of eight different keys can be registered.
10. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
11. Check that the engine can be started with each of the ignition keys.
12. Check that the immobilizer system diagnosis code and MPI system diagnosis code did not set.
13. If not diagnosis code is shown, terminate the M.U.T.-III.
14. Turn the ignition switch to "LOCK" (OFF) position.
15. Disconnect M.U.T.-III.

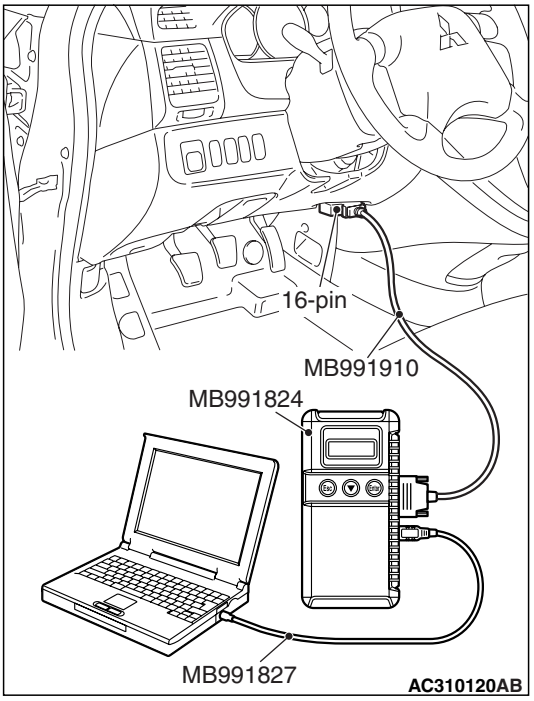
REGISTRATION OF ADDITIONAL KEYS WITH THE M.U.T.-III

Additional key(s) can be registered with the M.U.T.-III while keeping all existing key data.

⚠ CAUTION

To prevent damage to M.U.T.-III, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting M.U.T.-III.

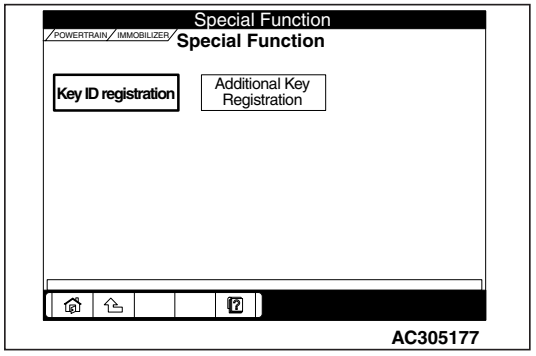
NOTE: To register additional keys with the M.U.T.-III, no registered keys must be lost.



1. Connect M.U.T.-III to the 16-pin diagnosis connector.
2. Turn the ignition switch to "ON" position.

NOTE: Before registration, check that no diagnosis code is set. If a diagnosis code is set, resolve the problem beforehand.

3. Carry out steps 3 to 6 of the sub-section "Registration with M.U.T.-III."



4. Choose "Transponder ID addition" from "Special Function" screen.

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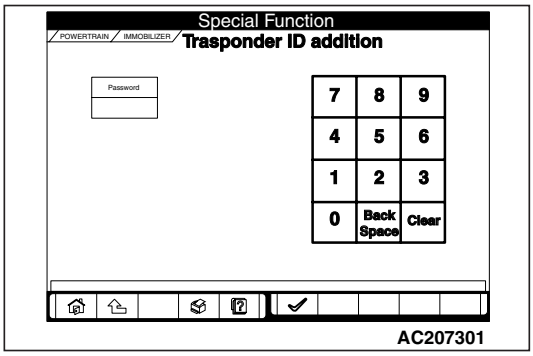
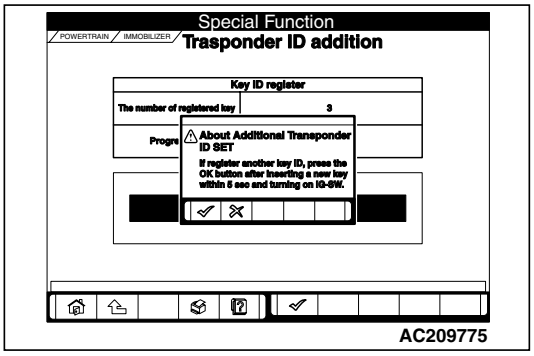


5. Enter the vehicles password (secret code) on the "Transponder ID addition" screen, and then click the check mark icon.



6. If an additional registration is made successfully, the screen will ask if another key is registered or not. If the third ignition key is registered, remove the key, which has been registered. Then insert the third key within five seconds, and then turn it to the ON position.
7. Register the additional ignition key according to step 6 above. The number of the registered ignition keys are shown on "The number of registered key" screen.

   NOTE: A maximum of eight different keys can be registered.
8. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
9. Check that the engine can be started with each of the ignition keys.
10. Check that the immobilizer system diagnosis code and MPI system diagnosis code did not set.
11. If not diagnosis code is shown, terminate the M.U.T.-III.
12. Turn the ignition switch to "LOCK" (OFF) position.
13. Disconnect M.U.T.-III.

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IGNITION SWITCH

REMOVAL AND INSTALLATION

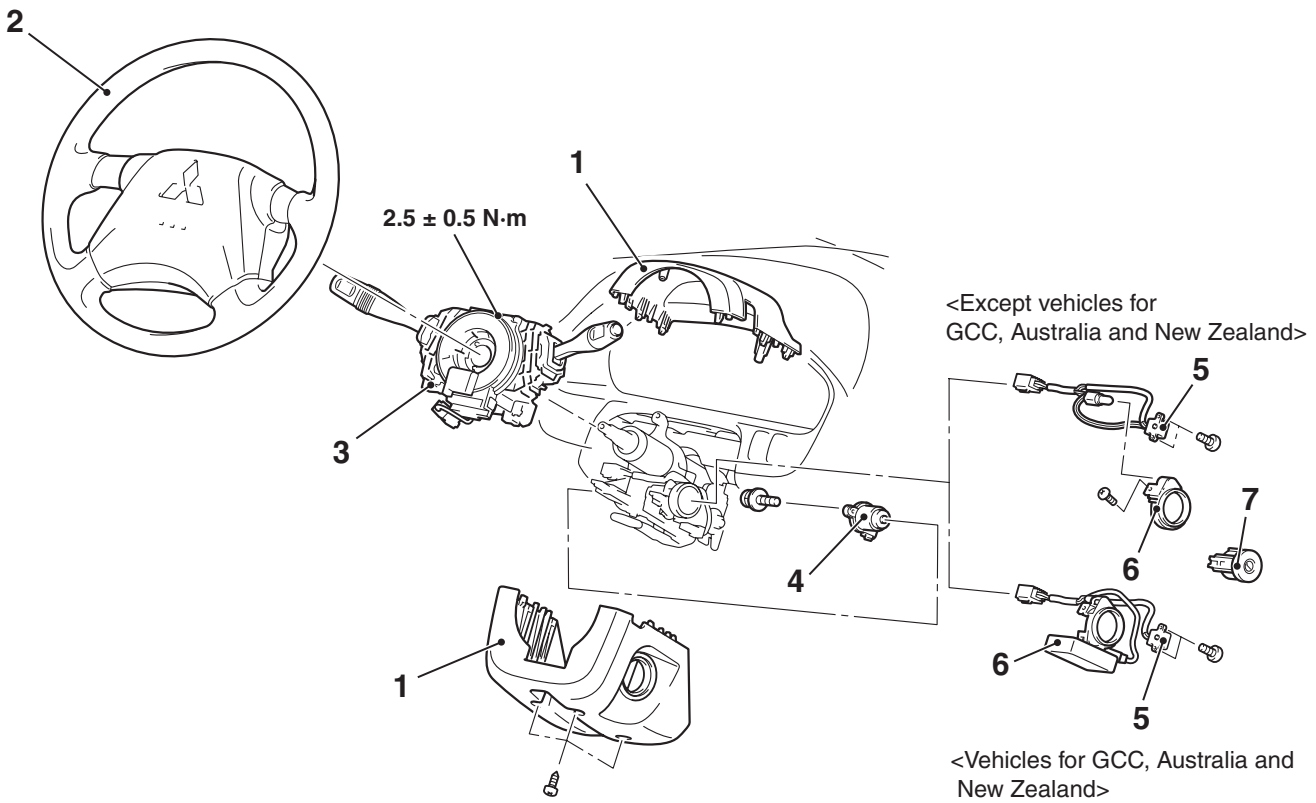
M1543002100984

⚠ *WARNING*

- ***Before removal of the air bag module, refer to GROUP 52B, Service Precautions (P.52B-5) and Driver's, Front Passenger's Air Bag Module(s) and Clock Spring (P.52B-334).***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***

⚠ CAUTION

When the steering lock cylinder is replaced, register the encrypted code. Refer to P.54A-9 <Vehicles for Hong Kong and Singapore>.



AC503812AB

Removal steps

- Gearshift lever knob <M/T> (Refer to GROUP 22A, Transmission Control P.22A-8).
- Selector lever knob <A/T> (Refer to GROUP 23A, Transmission Control P.23A-160).
- Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, Cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).

Removal steps (Continued)

- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Steering column cover (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
2. Steering wheel (Refer to GROUP 37, Steering Wheel P.37-15).

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Removal steps (Continued)

3. Clock spring and column switch assembly (Refer to GROUP 37, Steering Column Shaft Assembly P.37-17 and GROUP 52B, Driver's, Front Passenger's Air Bag Module(s) and Clock Spring P.52B-334).
4. Ignition Switch
5. Key reminder switch

Removal steps (Continued)

6. Key ring antenna <Except vehicles for GCC, Australia and New Zealand>
6. Immobilizer-ECU and key ring antenna assembly <Vehicles for GCC, Australia and New Zealand>

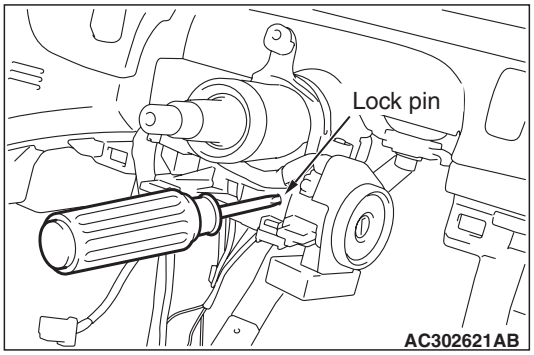
<<A>>

7. Steering lock cylinder

REMOVAL SERVICE POINT

<<A>> STEERING LOCK CYLINDER REMOVAL

1. Insert the key in the steering lock cylinder and turn it to the "ACC" position.

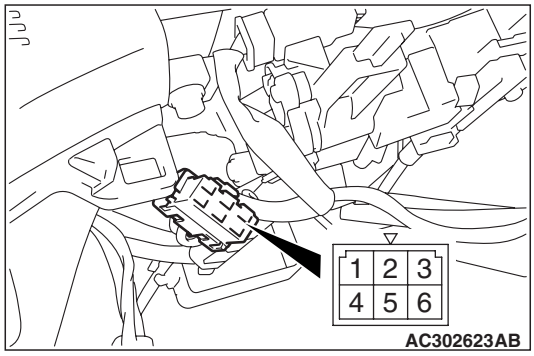


2. Using a small Phillips head screwdriver, pull the steering lock cylinder toward you.

INSPECTION

M1543019503789

IGNITION SWITCH CONTINUITY CHECK



Disconnect ignition switch connector C-307 without removing the ignition switch. Then check the continuity.

Switch position	Tester connection	Specified condition
"LOCK" (OFF)	1 – 2, 1 – 4, 1 – 5, 1 – 6	Open circuit
"ACC"	1 – 6	Less than 2 ohms
"ON"	1 – 2, 1 – 4, 1 – 6, 2 – 4, 2 – 6, 4 – 6	Less than 2 ohms
"START"	1 – 2, 1 – 5, 2 – 5	Less than 2 ohms

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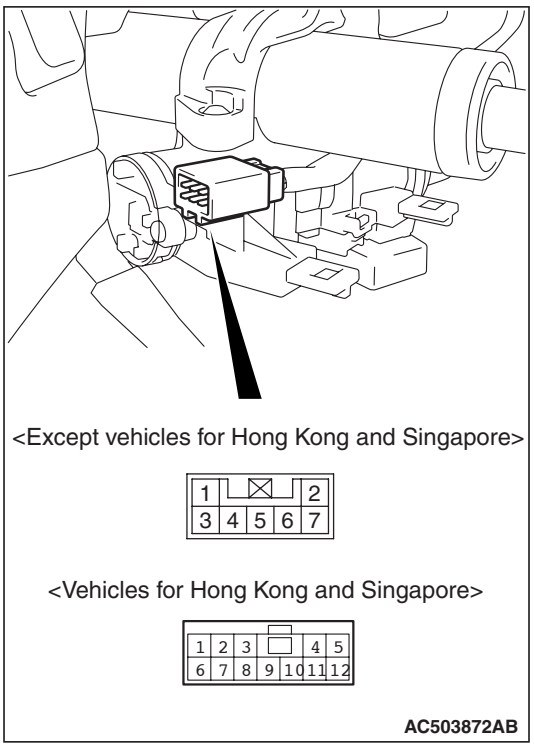
KEY REMINDER SWITCH CONTINUITY CHECK



Disconnect key reminder switch connector C-308 without removing the ignition switch and key reminder switch. Then check the continuity.

<EXCEPT VEHICLES FOR HONG KONG AND SINGAPORE>

Status of ignition key	Tester connection	Specified condition
Removed	4 – 6	Less than 2 ohms
Inserted	4 – 6	Open circuit

<VEHICLES FOR HONG KONG AND SINGAPORE>

Status of ignition key	Tester connection	Specified condition
Removed	3 – 6	Less than 2 ohms
Inserted	3 – 6	Open circuit

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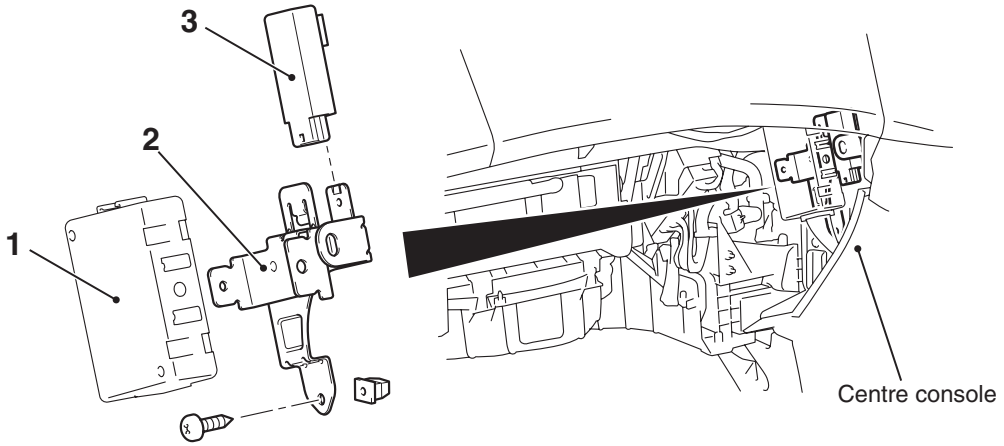
IMMOBLIZER-ECU <Vehicles with engine immoblizer system>

REMOVAL AND INSTALLATION <VEHICLES FOR HONG KONG AND SINGAPORE>

M1543032900035



AC501230AB

Removal steps

- Gearshift lever knob <M/T> (Refer to GROUP 22A, Transmission Control P.22A-8).
- Selector lever knob <A/T> (Refer to GROUP 23A, Transmission Control P.23A-160).
- Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

Removal steps (Continued)

- Front scuff plate inner, Cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).
- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Corner sensor / Back sensor-ECU
2. Immobilizer-ECU and Corner sensor / Back sensor-ECU bracket
3. Immobilizer-ECU

REMOVAL AND INSTALLATION <VEHICLES FOR GCC, AUSTRALIA AND NEW ZEALAND>

M1543032900046

Refer to ignition switch removal and installation. (P.54A-48.)

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COMBINATION METER

SERVICE SPECIFICATIONS

M1543000300498

Item		Standard value	Limit
Speedometer indication range km/h <Vehicles for General Export, Australia and New Zealand>	20	18 – 20	–
	40	38 – 43	–
	80	79 – 84	–
	120	120 – 125	–
	160	161 – 166	–
	200	203 – 211	–
Speedometer indication range km/h <Vehicles for GCC>	20	20 – 24	–
	40	40 – 44	–
	80	80 – 85	–
	120	121 – 127	–
	160	162 – 169	–
	200	203 – 211	–
Speedometer indication range mph <General Export (except for Hong Kong and Singapore): <option>	10	10 – 12	–
	25	25 – 27	–
	50	50 – 53	–
	75	76 – 80	–
	100	101 – 106	–
	125	127 – 132	–
Speedometer needle fluctuation km/h (mph) <Vehicle speed: 35km/h (21 mph) or more>		–	± 3 (± 1)
Tachometer indicating tolerance r/min	2,000	± 100	–
	6,000	± 200	–
Fuel tank pump and gauge unit assembly resistance Ω	Float position F (highest)	6.5 ± 1	–
	Float position E (lowest)	53.2 ± 1	–
Fuel tank gauge unit assembly resistance Ω	Float position F (highest)	6.5 ± 1	–
	Float position E (lowest)	66.8 ± 1	–
Fuel tank pump and gauge unit assembly float height mm	Float position F (A)	57.6 ± 3	–
	Float position E (B)	158.4 ± 3	–
Fuel tank gauge unit float height mm	Float position F (A)	57.0 ± 3	–
	Float position E (B)	180.2 ± 3	–

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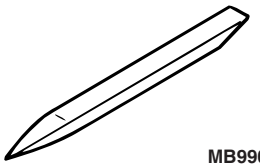
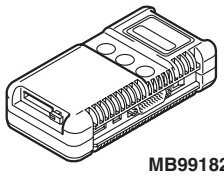
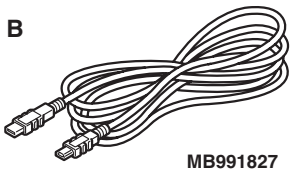
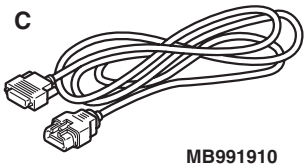
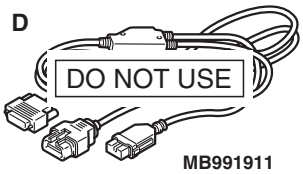
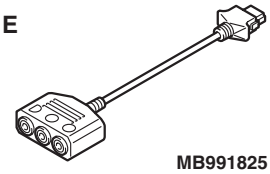
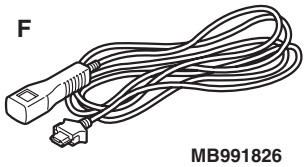
SPECIAL TOOLS

M1543000602149

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of meter bezel
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	M.U.T.-III sub-assembly A: Vehicle communication interface (V. C. I.) B: M.U.T.-III USB cable C: M.U.T.-III Main harness A (Vehicles with CAN communication system) D: M.U.T.-III Main harness B (Vehicles without CAN communication system) E: M.U.T.-III Measurement adapter F: M.U.T.-III Trigger harness	Combination meter (incorporating the meter-ECU) check (Diagnosis code, service data, actuator test) **⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.**

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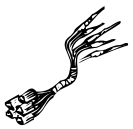
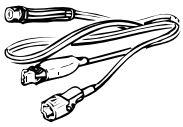
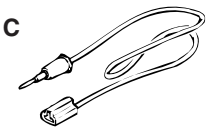
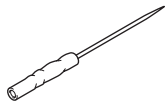
Tool	Number	Name	Application
A  B  C  D MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

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TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

M1543000701284

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

DIAGNOSIS FUNCTION

M1543007000700

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

HOW TO ERASE DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

DIAGNOSIS CODE CHART

M1543007101023

⚠ CAUTION

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Diagnosis code No.	Diagnosis item	Reference page
B1200	Malfunction odometer	P.54A-56
B1201	Trouble of fuel information	P.54A-57
U1073	Bus Off	P.54A-62
U1100	Engine-ECU <M/T> or engine-A/T-ECU <A/T> time-out (related to engine)	P.54A-63
U1101*	Engine-A/T-ECU <A/T> time-out (related to automatic transmission)	P.54A-65
U1102	ABS-ECU time-out	P.54A-67
U1109	ETACS-ECU time-out	P.54A-69
U1112	SRS-ECU time-out	P.54A-70
U1120	Failure information on engine-ECU <M/T> or engine-A/T-ECU <A/T> (related to engine)	P.54A-71
U1206	Flag invalid	P.54A-72

*NOTE: *: For M/T-vehicles, diagnosis code No. U1101 does not mean that there is a problem.*

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DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.B1200: Malfunction odometer

TROUBLE JUDGMENT
This code is stored when the odometer value cannot be determined when reading, writing or verifying the EEPROM storing the odometer value, or the odometer displays abnormal value.

COMMENTS ON TROUBLE SYMPTOM
The combination meter may be defective.

PROBABLE CAUSES
Malfunction of the combination meter

DIAGNOSIS PROCEDURE

Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : Replace combination meter.
NO : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.

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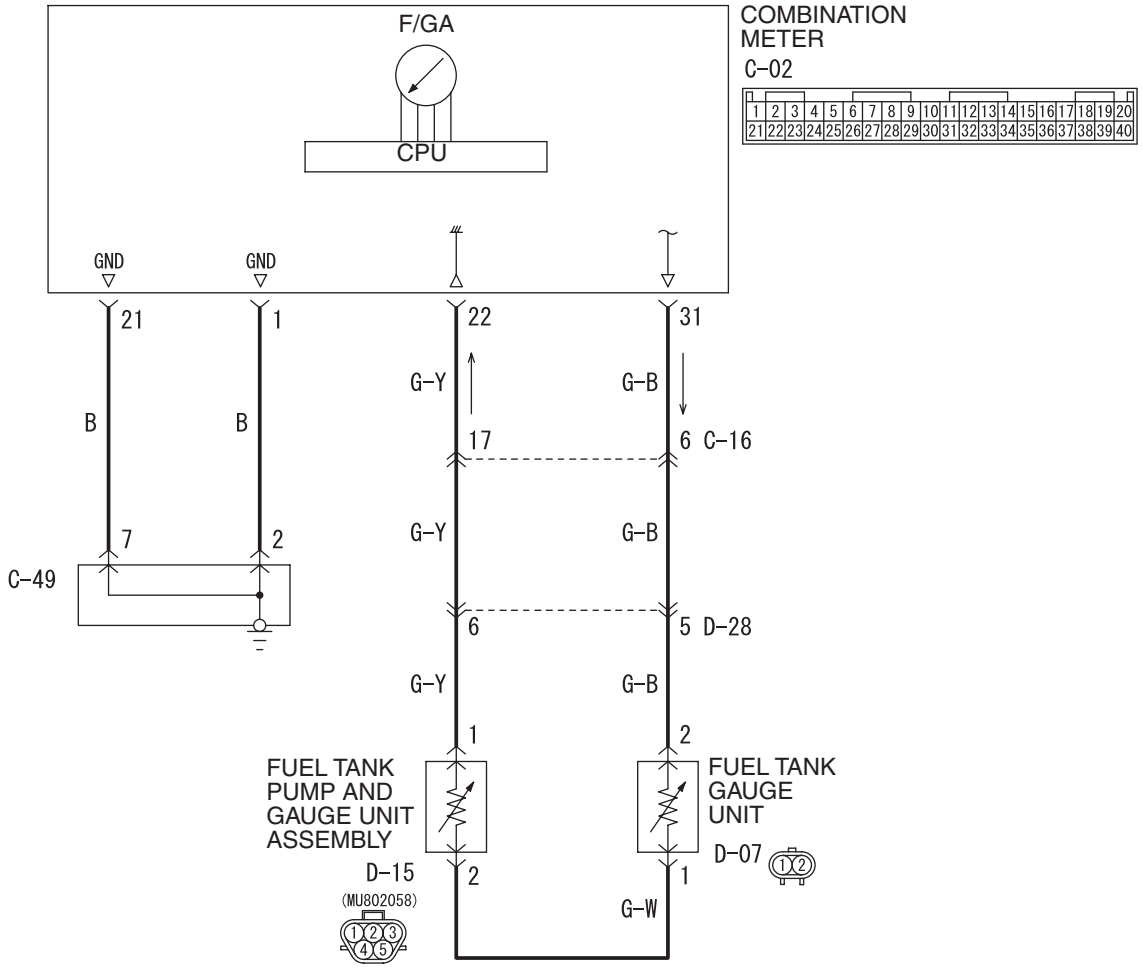
Code No.B1201: Trouble of fuel information

Fuel Gauge Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

If only the fuel gauge does not operate, the fuel tank pump and gauge unit assembly, fuel tank gauge unit, combination meter, wiring harness or connector(s) may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of fuel tank gauge unit
- Malfunction of fuel tank pump and gauge unit assembly
- Malfunction of combination meter

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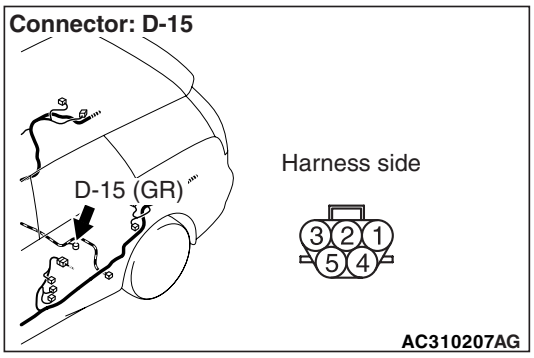
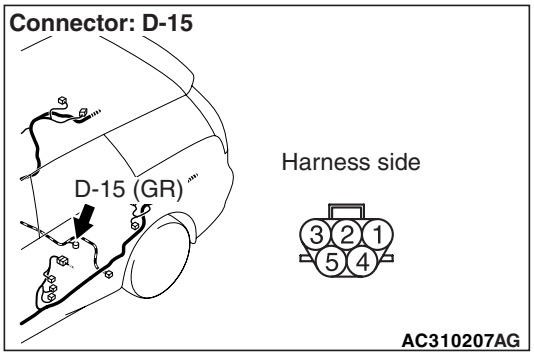
DIAGNOSIS PROCEDURE

STEP 1. Connector check: Fuel tank pump and gauge unit assembly connector D-15.

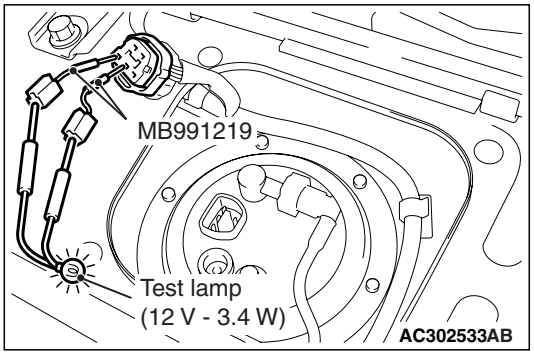


Q: Is fuel tank pump and gauge unit assembly connector D-15 in good condition?
YES : Go to Step 2.
NO : Repair the connector, and then go to Step 11.

STEP 2. Check the fuel gauge circuit.



(1) Disconnect fuel tank pump and gauge unit assembly connector D-15.

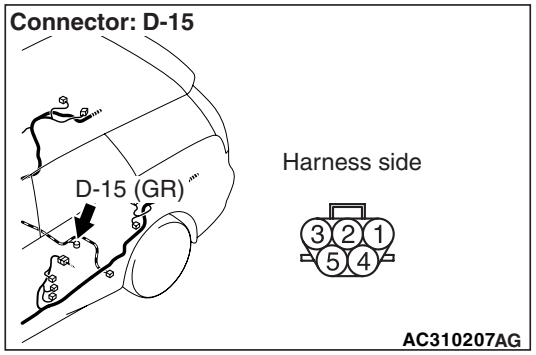


(2) Use special tool Test harness (MB991219) to connect a test lamp (12 V - 3.4 W) between the wiring harness connector terminals 1 and 2.
(3) Turn the Ignition switch to "ON" position.
(4) Check if the test lamp illuminates.

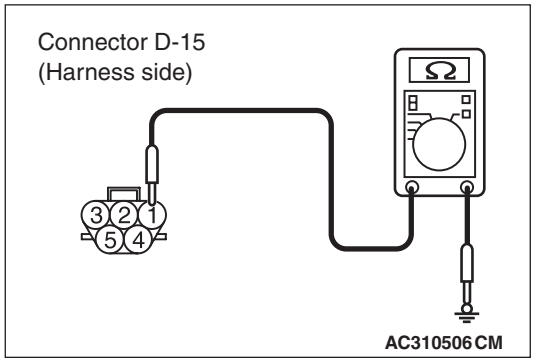
OK: Illuminates

Q: Is the check result satisfactory?
YES : Go to Step 8.
NO : Go to Step 3.

STEP 3. Resistance measurement at fuel tank pump and gauge unit assembly connector D-15 to check the earth circuit to the fuel tank pump and gauge unit assembly.



(1) Disconnect fuel tank pump and gauge unit assembly connector D-15, and measure at the wiring harness side.
(2) Turn the Ignition switch to "LOCK" (OFF) position.
(3) Disconnect the negative battery terminal.



(4) Measure the resistance value between terminal 1 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

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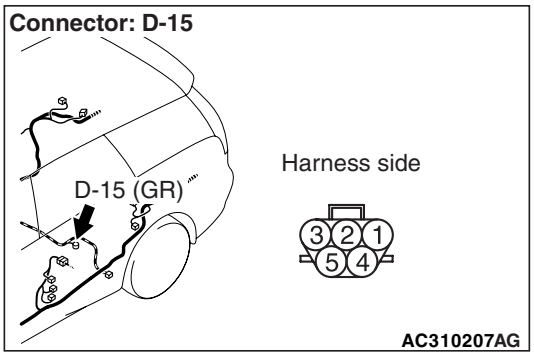
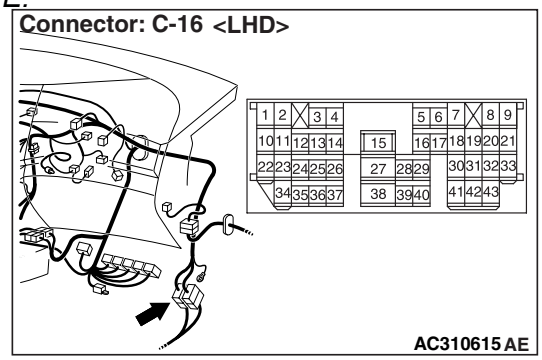
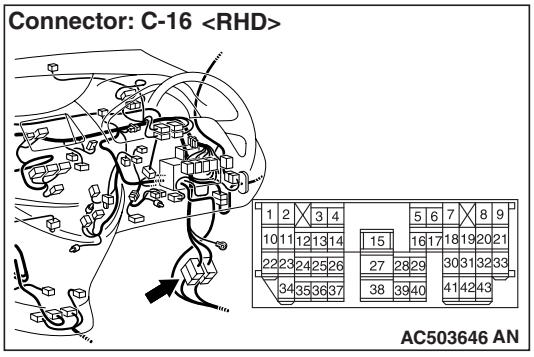
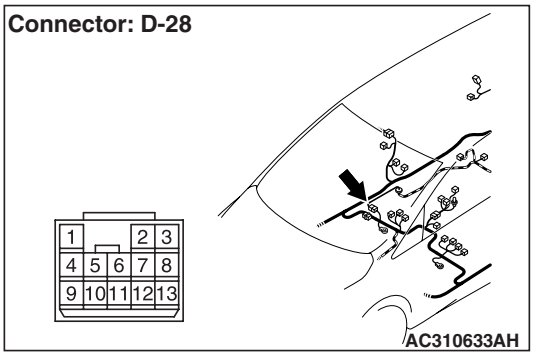
STEP 4. Check the wiring harness between fuel tank pump and gauge unit assembly connector D-15 (terminal 1) and earth.



NOTE:



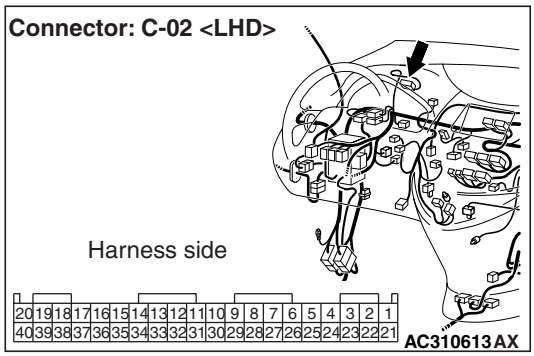


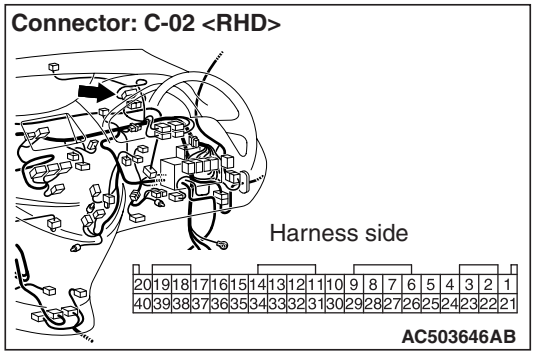


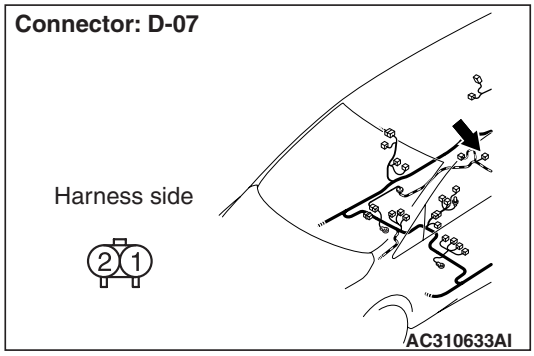
Also check intermediate connector D-28, C-16 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector D-28, C-16 are damaged, repair or replace the connector.

Q: Is the wiring harness between fuel tank pump and gauge unit assembly connector D-15 (terminal 1) and earth in good condition?
YES : Go to Step 11.
NO : Repair the harness, and then go to Step 11.

STEP 5. Connector check: Combination meter connector C-02 and fuel tank gauge unit connector D-07.







Q: Is combination meter connector C-02 and fuel tank gauge unit connector D-07 in good condition?
YES : Go to Step 6.
NO : Repair the connector, and then go to Step 10.

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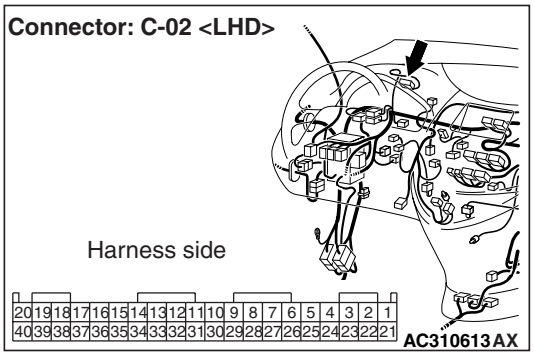
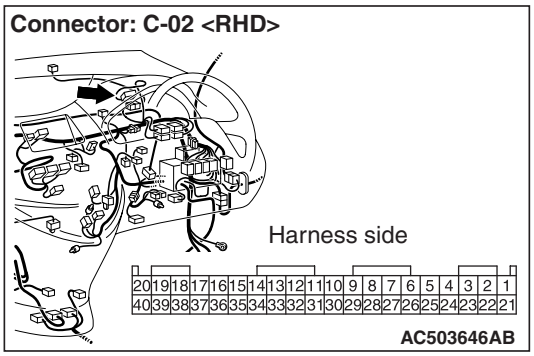
STEP 6. Check the wiring harness between combination meter connector C-02 (terminal 31) and fuel tank gauge unit connector D-07 (terminal 2).

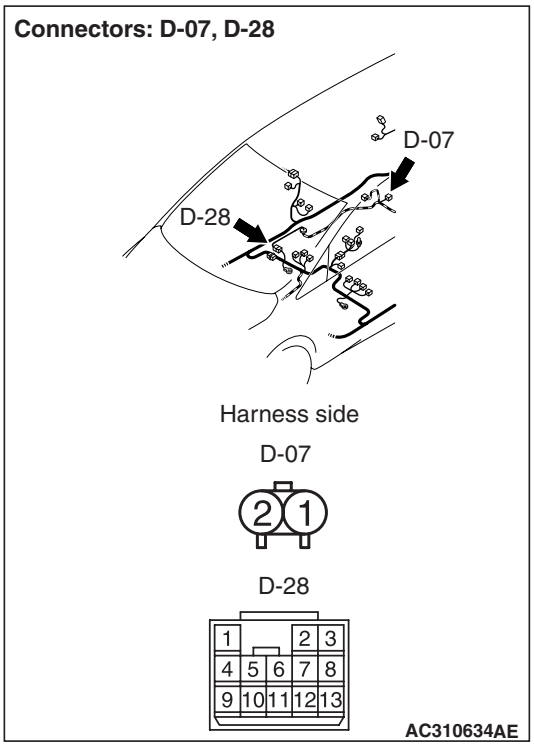
Connector: C-02 <LHD>



Connector: C-02 <RHD>

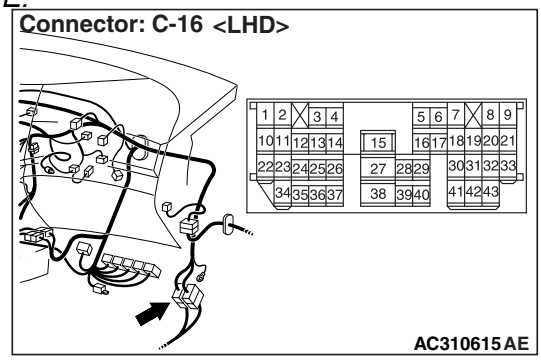


Connectors: D-07, D-28

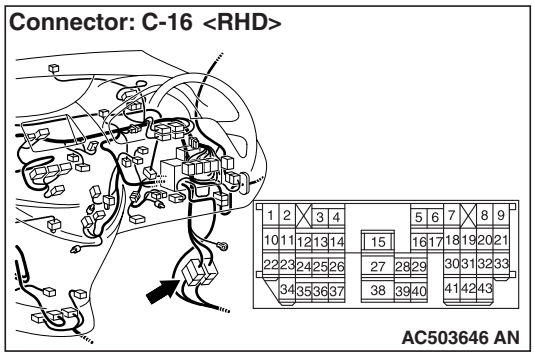


NOTE:

Connector: C-16 <LHD>



Connector: C-16 <RHD>



Also check intermediate connectors C-16, D-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-16, D-28 are damaged, repair or replace the connector.

Q: Is the wiring harness between combination meter connector C-02 (terminal 31) and fuel tank gauge unit connector D-07 (terminal 2) in good condition?
YES : Go to Step 7.
NO : Repair the harness, and then go to Step 10.

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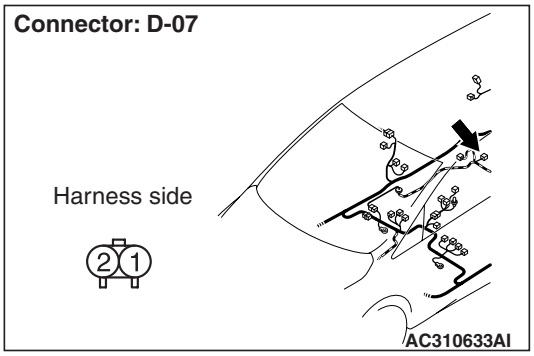
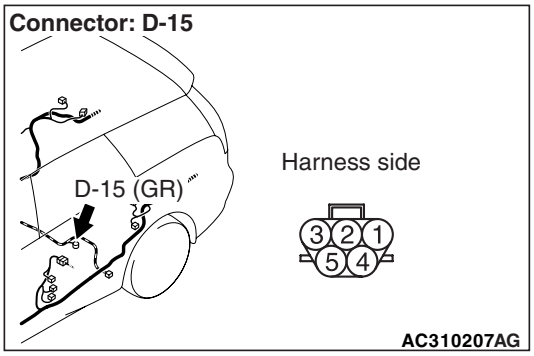
STEP 7. Check the wiring harness between fuel tank gauge unit connector D-07 (terminal 1) and fuel tank pump and gauge unit assembly connector D-15 (terminal 2).





Q: Is the wiring harness between fuel tank gauge unit connector D-07 (terminal 1) and fuel tank pump and gauge unit assembly connector D-15 (terminal 2) in good condition?
YES : Go to Step 9.
NO : Repair the harness, and then go to Step 10.

STEP 8. M.U.T.-III data list
Item No.8A: Fuel gauge (target value)

OK: Fuel gauge and M.U.T.-III displayed values agree with each other.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 9.

STEP 9. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace fuel tank pump and gauge unit assembly and then go to Step 10.

STEP 10. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace fuel tank gauge unit and then go to Step 11.

STEP 11. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 1.

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Code No.U1073: Bus Off

⚠ CAUTION
If diagnosis code U1073 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

If the combination meter ceases communicating once (i.e. bus off) and then returns to it, the combination meter will not communicate for three minutes immediately after that point. This three-minute period is called "Penalty mode." Immediately after the combination meter returns to communication, the diagnosis code is set.

COMMENTS ON TROUBLE SYMPTOM

The wiring harness wire or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostics Table P.54F-13). Repair the CAN bus line and go to Step 3.

STEP 2. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : If the trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace combination meter and then go to Step 3.

STEP 3. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

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Code No.U1100: Engine-ECU <M/T> or Engine-A/T-ECU <A/T> Time-out (Related to Engine)

⚠ CAUTION
If diagnosis code U1100 or U1101 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The combination meter receives engine control system-related signals from the engine-ECU <M/T> or engine-A/T-ECU <A/T> via CAN bus lines. If the display unit can not receives the necessary signals, diagnosis code U1100 will be set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter, the power supply system to the engine-ECU <M/T> or engine-A/T-ECU <A/T>, the engine-ECU <M/T> or engine-A/T-ECU <A/T> itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter, and the power supply system to the engine-ECU <M/T> or engine-A/T-ECU <A/T>. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54F, Explanation about the M.U.T.-III CAN Bus Diagnostics P.54F-7).

⚠ CAUTION
If the ignition switch is turned on without starting the engine and then three minutes passes, the combination meter may store U1102 as past trouble.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of engine-ECU <M/T> or engine-A/T-ECU <A/T>
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54F, Diagnosis – CAN Bus Diagnostics Table P.54F-13). Repair the CAN bus line and go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the MPI system and the A/T system diagnosis codes are set or not.

Q: Is the diagnosis code set?
YES : Diagnose MPI system or A/T system. (Refer to GROUP 13A, Troubleshooting P.13A-14 <Except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B, Troubleshooting P.13B-15 <Vehicles for Hong Kong and Singapore> or GROUP 13C, Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand> or GROUP 23A, Troubleshooting P.23A-17)
NO : Go to Step 3.

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STEP 3. M.U.T.-III other system diagnosis code

Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

ETACS-ECU

- Code No.U1100: engine-ECU <M/T> or engine-A/T-ECU <A/T> time-out (related to Engine)

A/C-ECU

- Code No.U1100: engine-ECU <M/T> or engine-A/T-ECU <A/T> time-out (related to Engine)

Q: Is the diagnosis code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).

NO : Replace engine-ECU <M/T> or engine-A/T-ECU <A/T> and then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).

NO : Replace combination meter and then go to Step 6.

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Go to Step 1.

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Code No.U1101: Engine-A/T-ECU <A/T> Time-out (Related to Automatic Transmission)

⚠ CAUTION
If diagnosis code U1100 or U1101 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The combination meter receives transmission control system-related signal from the engine-A/T-ECU <A/T> via CAN bus lines. If the display unit can not receive the necessary signals, diagnosis code U1101 will be set.

NOTE: For M/T-vehicles, diagnosis code No.U1101 does not mean that there is a problem.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the engine-A/T-ECU <A/T> and the combination meter, the power supply system to the engine-A/T-ECU <A/T>, the engine-ECU or engine-A/T-ECU <A/T> itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the engine-A/T-ECU <A/T> and the combination meter, and the power supply system to the engine-A/T-ECU <A/T>. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54F, Explanation about the M.U.T.-III CAN Bus Diagnostics P.54F-7).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, diagnosis code (past trouble) U1102 may be set on the combination meter after three minutes.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of engine-A/T-ECU <A/T>
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54F, Diagnosis – CAN Bus Diagnostics Table P.54F-13). Repair the CAN bus line and go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the MPI system and the A/T system diagnosis codes are set or not.

Q: Is the diagnosis code set?
YES : Diagnose MPI system or A/T system. (Refer to GROUP 13A, Troubleshooting P.13A-14 <Except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B, Troubleshooting P.13B-15 <Vehicles for Hong Kong and Singapore> or GROUP 13C, Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand> or GROUP 23A, Troubleshooting P.23A-17)
NO : Go to Step 3.

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STEP 3. M.U.T.-III other system diagnosis code

Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

ETACS-ECU

- Code No.U1101: engine-A/T-ECU <A/T> time-out (related to automatic transmission)

A/C-ECU

- Code No.U1101: engine-A/T-ECU <A/T> time-out (related to automatic transmission)

Q: Is the diagnosis code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).

NO : . Replace engine-A/T-ECU <A/T> and then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).

NO : Replace combination meter and then go to Step 6.

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.

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

(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Go to Step 1.

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Code No.U1102: ABS-ECU Time-out

⚠ CAUTION
If diagnosis code U1102 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal

TROUBLE JUDGMENT

The combination meter communicates with the ABS-ECU through CAN bus lines. If it can not receive all the necessary signals from the ABS-ECU, diagnosis code U1102 is set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ABS-ECU and the combination meter, the power supply system to the ABS-ECU, the ABS-ECU itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the ABS-ECU and the combination meter, and the power supply system to the ABS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54F, Explanation about the M.U.T.-III CAN Bus Diagnostics P.54F-7).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, diagnosis code (past trouble) U1100, U1101 may be set on the combination meter after one minutes.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of ABS-ECU
- Malfunction of combination meter

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DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostic Table P.54F-13). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check that the ABS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose the ABS. Refer to GROUP 35B, Troubleshooting – Inspection Chart for Diagnosis Code P.35B-7.
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.
MPI
U1102: ABS-ECU time-out

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : . A poor connection, open circuit or other intermittent malfunction is present in the lines between the ABS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : . Replace ABS-ECU and then go to step 6.

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the ABS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace combination meter and go to Step 6.

STEP 6. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

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Code No.U1109: ETACS-ECU Time-out

⚠ CAUTION
If diagnosis code U1109 is set in the combination meter, diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The combination meter receives signal from the ETACS-ECU via CAN bus lines. If it can not receive all the necessary signals from the ETACS-ECU, diagnosis code U1109 is set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the combination meter, the power supply system to the ETACS-ECU, the ETACS-ECU itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the combination meter, and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54F, Explanation about the M.U.T.-III CAN Bus Diagnostics P.54F-7).

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of ETACS-ECU
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostics Table P.54F-13). On completion, go to Step 4.

STEP 2. M.U.T.-III other system diagnosis code
Check that the ETACS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose SWS. (Refer to GROUP 54B, Troubleshooting P.54B-26 or GROUP 54C, Troubleshooting P.54C-19 or GROUP 54D, Troubleshooting P.54D-28 or GROUP 54E, Troubleshooting P.54E-25)
NO : Go to Step 3.

STEP 3. M.U.T.-III diagnosis code
Check that diagnosis code U1206 is set.

Q: Is the diagnosis code set?
YES : Replace ETACS-ECU and then go to step 4.
NO : Replace combination meter and then go to step 4.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

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Code No.U1112: SRS-ECU Time-out

⚠ CAUTION
If diagnosis code U1112 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The combination meter communicates with the SRS-ECU through CAN bus lines. If it can not receive all the necessary signals from the SRS-ECU, diagnosis code U1112 is set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the SRS-ECU and the combination meter, the power supply system to the SRS-ECU, the SRS-ECU itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the SRS-ECU and the combination meter, and the power supply system to the SRS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54F, Explanation about the M.U.T.-III CAN Bus Diagnostics P.54F-7).

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of SRS-ECU
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostics Table P.54F-13). On completion, go to Step 4.

STEP 2. M.U.T.-III other system diagnosis code
Check that the SRS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose the SRS. Refer to GROUP 52B, Troubleshooting – Check Chart for Diagnosis Code P.52B-11 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, P.52B-164 <vehicles for Hong Kong and Singapore, Australia and New Zealand>.
NO : Go to Step 3.

STEP 3. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the SRS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace SRS-ECU and then go to step 4.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

Code No.U1120: Failure Information on engine-ECU <M/T> or Engine-A/T-ECU (Related to Engine)

⚠ CAUTION
If diagnosis code U1120 is set in the combination meter, diagnose the CAN main bus line.

TROUBLE JUDGMENT

The combination meter communicates with the engine-ECU <M/T> or engine-A/T-ECU <A/T> via CAN bus line. If failure information is sent to the engine-ECU <M/T> or engine-A/T-ECU <A/T>, diagnosis code U1120 will be set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- The engine-ECU <M/T> or engine-A/T-ECU <A/T> or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of engine-ECU <M/T> or engine-A/T-ECU <A/T>
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – CAN Bus Diagnostics Table P.54F-13). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check if an MPI system diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose MPI system. (Refer to GROUP 13A, Troubleshooting P.13A-14 <Except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B, Troubleshooting P.13B-15 <Vehicles for Hong Kong and Singapore> or GROUP 13C, Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand>.)
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.
A/C-ECU

- Code No.U1120: Failure information on engine-ECU <M/T> or engine-A/T-ECU <A/T> (related to engine)

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace engine-ECU <M/T> or engine-A/T-ECU <A/T> and then go to step 6.

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STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the engine-ECU <M/T> or engine-A/T-ECU <A/T> and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace combination meter and then go to step 6.

STEP 6. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

Code No.U1206: Flag invalid

⚠ CAUTION
If diagnosis code U1206 is set in the combination meter, diagnose the CAN main bus line.

TROUBLE JUDGMENT
When the ignition switch is in the LOCK (OFF) position, the combination meter receives door-open signal or communication standby instruction from the ETACS-ECU and keeps CAN communication. If there is a contradiction between these two signals, diagnosis code U1206 will be set.

COMMENTS ON TROUBLE SYMPTOM
Current trouble
- The door switch system of the ETACS-ECU, the ETACS-ECU, or the combination meter may be defective.

Past trouble
- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the ETACS-ECU and the door switch, and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

PROBABLE CAUSES
- Damaged harness wires and connectors
- Malfunction of ETACS-ECU
- Malfunction of combination meter

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostic Table P.54F-13). On completion, go to Step 4.

STEP 2. M.U.T.-III diagnosis code
Check that the ETACS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose SWS. (Refer to GROUP 54B, Troubleshooting P.54B-26 or GROUP 54C, Troubleshooting P.54C-19 or GROUP 54D, Troubleshooting P.54D-28 or GROUP 54E, Troubleshooting P.54E-25.)
NO : Go to Step 3.

STEP 3. Replace the ETACS-ECU and then recheck the diagnosis code.
Replace the ETACS-ECU, and then check that the diagnosis code is not reset.

Q: Is the check result satisfactory?
YES : Go to Step 4.
NO : Replace combination meter and then go to step 4.

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STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is the check result satisfactory?
YES : . The procedure is complete.
NO : . Go to Step 1.

TROUBLE SYMPTOM CHART

M1543007201417

⚠ CAUTION
During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

⚠ CAUTION
When the battery cable is disconnected or the combination meter is removed, the fuel gauge learned value will be erased. To let the display unit re-learn it, enter the vehicle speed (by driving the vehicle or entering simulated vehicle speed) and then stop the vehicle.

Trouble symptom	Inspection procedure number	Reference page
Communication with the M.U.T.-III is not possible.	1	P.54A-74
Power supply circuit.	2	P.54A-75
Odometer and trip meter are not displayed.	3	
All the needle meters do not work.	4	
When the ignition switch is turned to the ON position, the indicator and warning lamps do not illuminate.	5	
Speedometer does not work (other meters work).	6	P.54A-83
The fuel gauge needle moves excessively.	7	
Tachometer does not work (other meters work).	8	P.54A-84
Fuel Gauge does not work (other meters work).	9	P.54A-85
Engine coolant temperature gauge does not work (other meters work).	10	P.54A-91

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SYMPTOM PROCEDURES

Inspection Procedure 1: Communication with the M.U.T.-III is not possible.

COMMENTS ON TROUBLE SYMPTOM

If the system does not communicate with the M.U.T.-III, power supply to the diagnosis connector or CAN bus lines may be defective.

PROBABLE CAUSE

Damaged harness wires and connectors

DIAGNOSIS PORODEDURE

STEP 1. Check that the engine-ECU <M/T> or the engine-A/T-ECU <A/T> communicates with the M.U.T.-III.

Check that the M.U.T.-III communicates with the engine-ECU <M/T> or the engine-A/T-ECU when the M.U.T.-III is operated.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Perform MPI system troubleshooting. (Refer to GROUP 13A – Troubleshooting P.13A-14 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <vehicles for Australia and New Zealand>.)

STEP 2. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?

YES : Diagnose the power supply circuit. Refer to P.54A-75.

NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostics Table P.54F-13).

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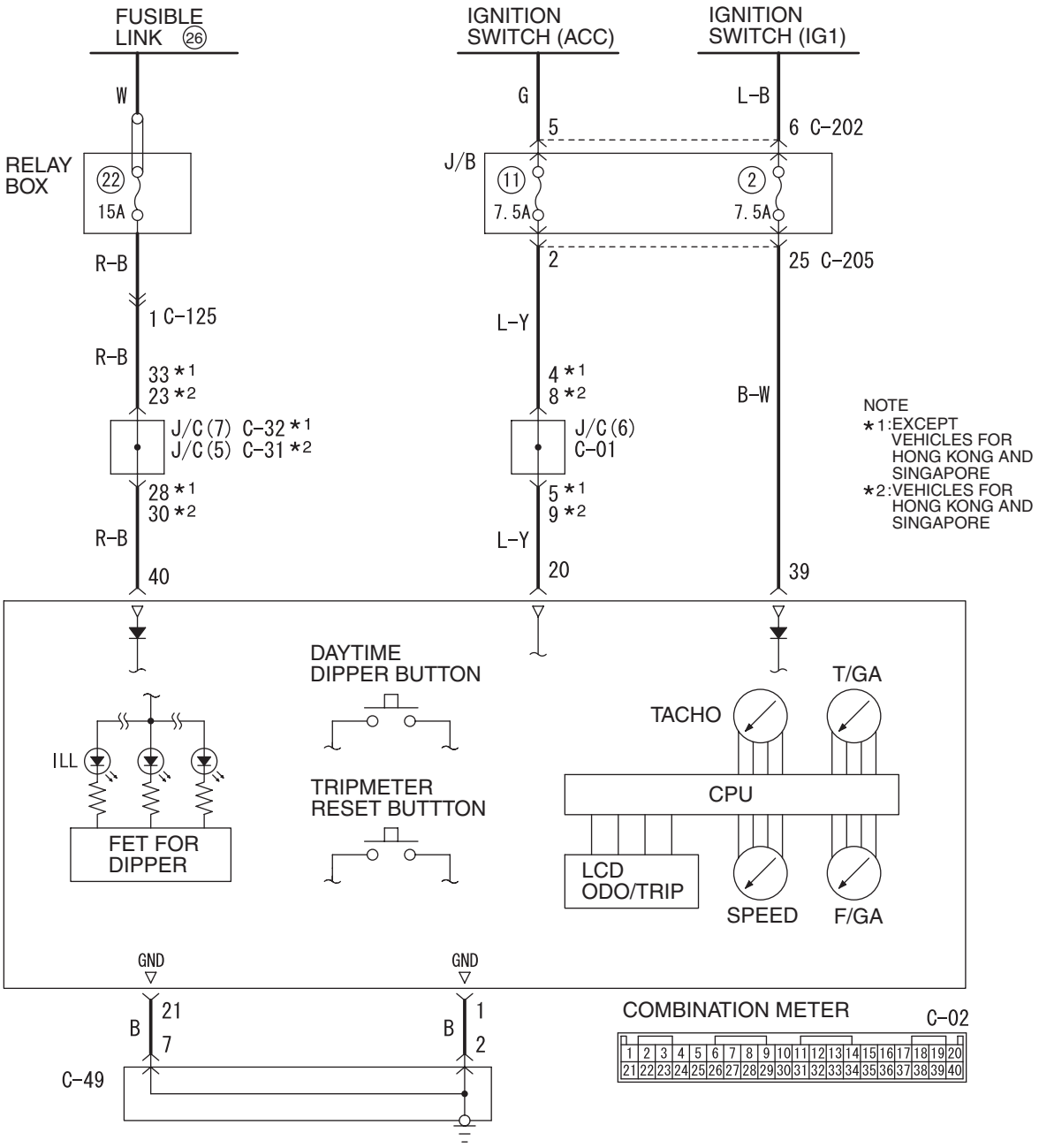
Inspection Procedure 2: Power Supply Circuit.
Inspection Procedure 3: Odometer and Trip meter are not displayed.
Inspection Procedure 4: All the needle meters do not work.
Inspection Procedure 5: When the ignition switch turned to the ON position, the indicator and warning lamps do not illuminate.

Combination Meter Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC503840 AB

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COMMENTS ON TROUBLE SYMPTOM

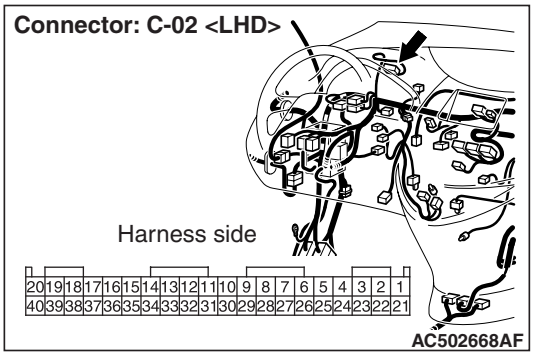
If the odometer and trip meter are not displayed or all meter needles don't move, power supply and earth system to the combination meter, or the combination meter itself may be defective.

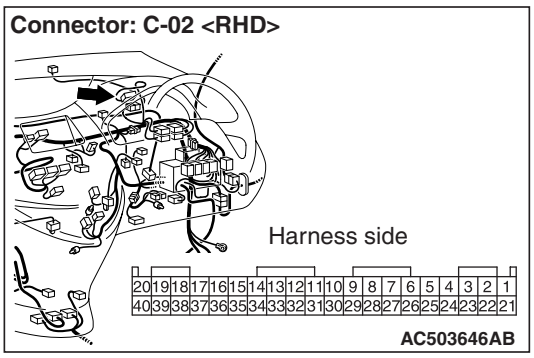
PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of combination meter

DIAGNOSIS PORODEDURE

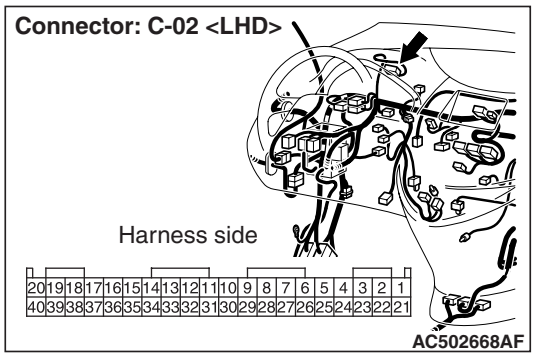
STEP 1. Connector check: Combination meter connector C-02.

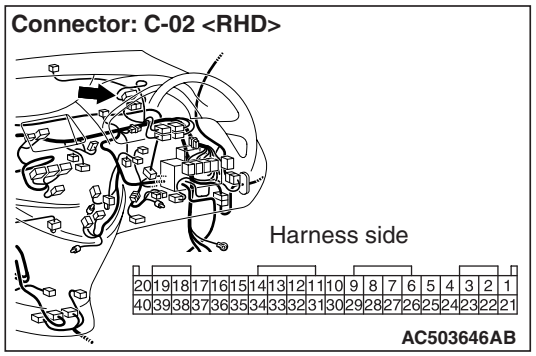




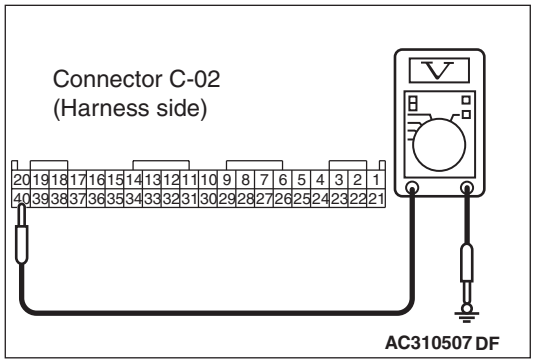
Q: Is combination meter connector C-02 in good condition?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Voltage measurement at combination meter connector C-02 in order to power supply circuit to combination meter (battery power supply).





(1) Disconnect combination meter connector C-02, and measure at the wiring harness side.
(2) Turn the ignition switch to "LOCK" (OFF) position.



(3) Measure the voltage between terminal 40 and earth.

OK: Battery voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

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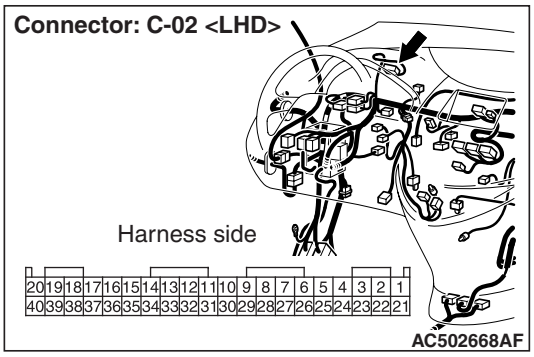
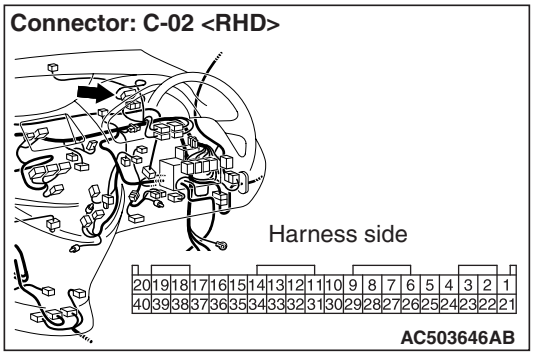
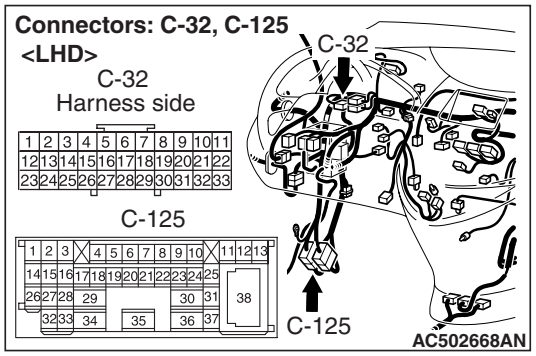
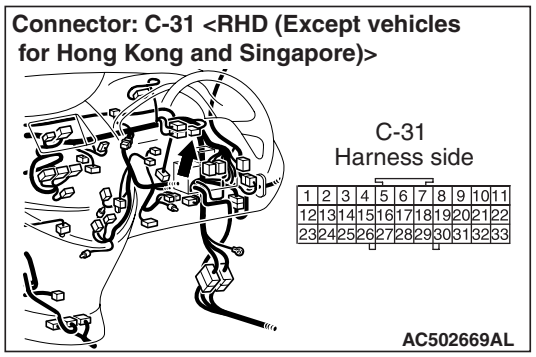
STEP 3. Check the wiring harness between combination meter connector C-02 (terminal 40) and battery (fusible link No.26).

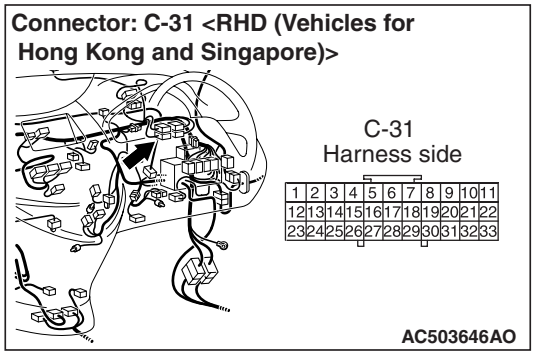


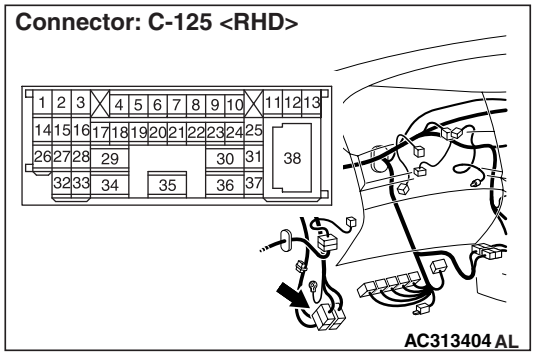


NOTE: Also check joint connector C-32 <except vehicles for Hong Kong and Singapore> or C-31 <vehicles for Hong Kong and Singapore> and intermediate connector C-125 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-32 <except vehicles for Hong Kong and Singapore> or C-31 <vehicles for Hong Kong and Singapore> or intermediate connector C-125 is damaged, repair or replace the connector.



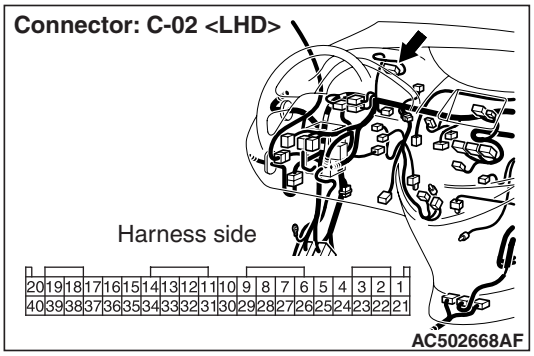


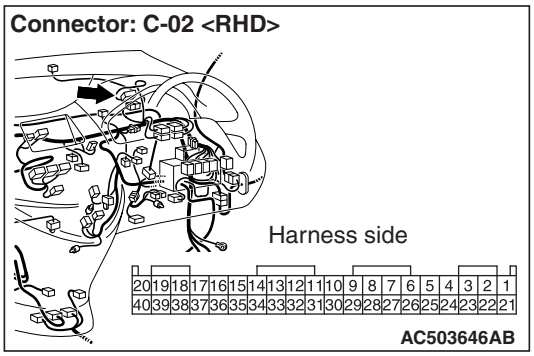




Q: Is the wiring harness between combination meter connector C-02 (terminal 40) and battery (fusible link No.26) in good condition?
YES : Retest the system.
NO : Repair the wiring harness.

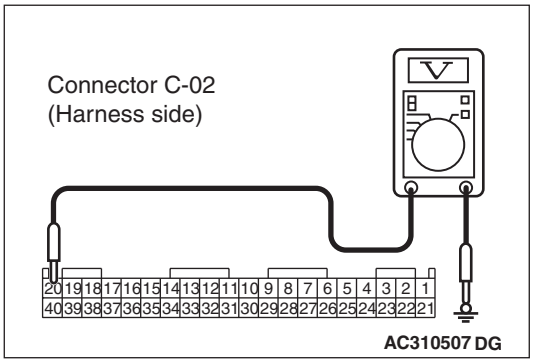
STEP 4. Voltage measurement at combination meter connector C-02 in order to power supply circuit to combination meter (ACC power supply).





(1) Disconnect combination meter connector C-02, and measure at the wiring harness side.

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



(3) Measure the voltage between terminal 20 and earth.

OK: Battery voltage

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

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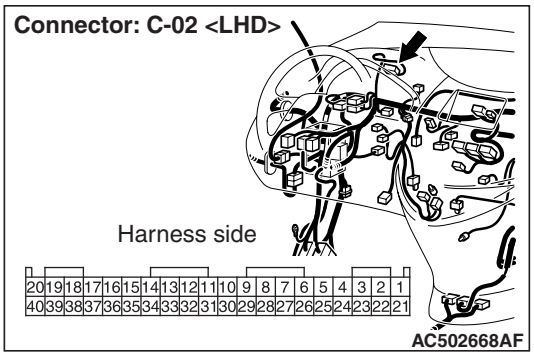
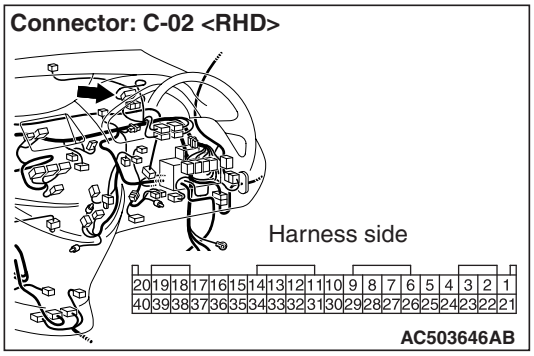
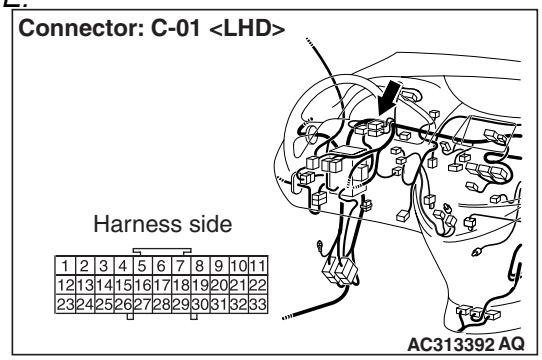
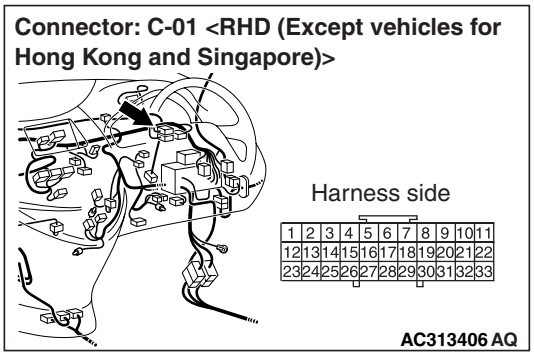
STEP 5. Check the wiring harness between combination meter connector C-02 (terminal 20) and ignition switch (ACC).

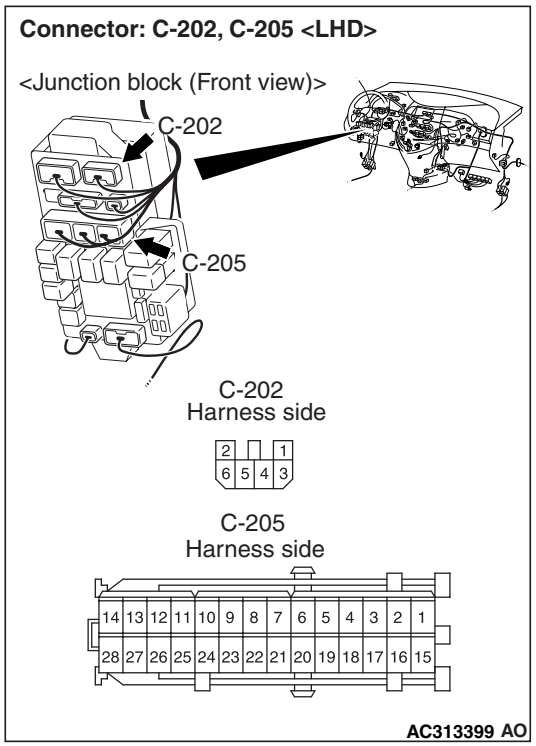


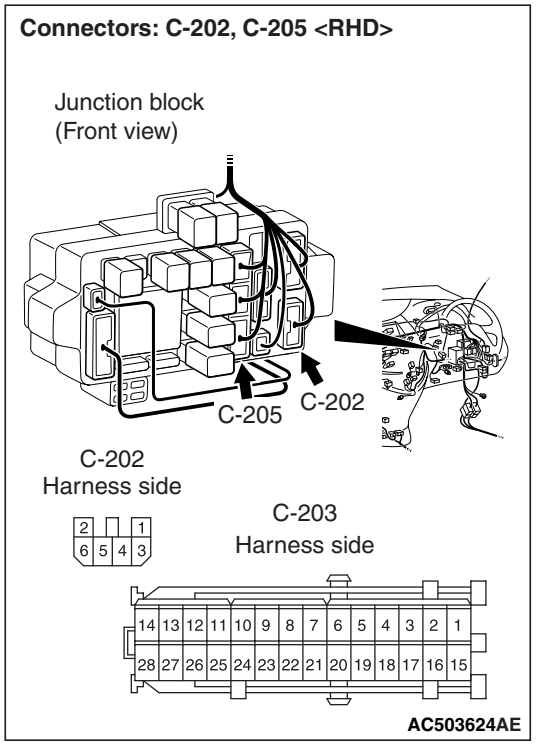


NOTE:









Also check joint connector C-01, junction block connector C-202 and C-205 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-01 or junction block connector C-202 and C-205 is damaged, repair or replace the connector.

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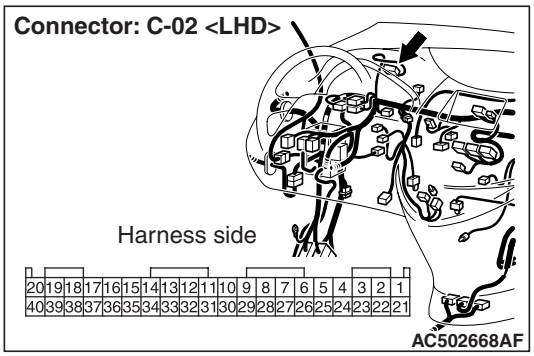
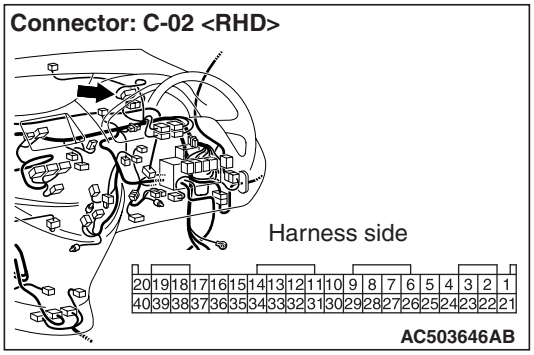
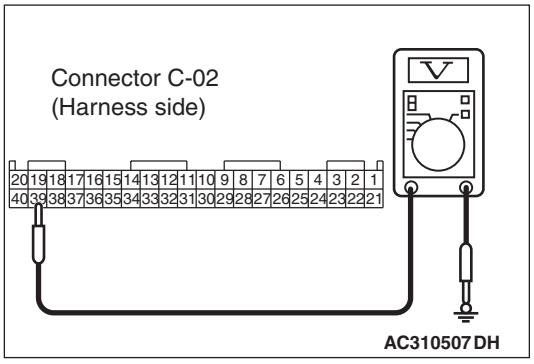
Q: Is the wiring harness between combination meter connector C-02 (terminal 20) and ignition switch (ACC) in good condition?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 6. Voltage measurement at combination meter connector C-02 in order to power supply circuit to combination meter (IG1 power supply).





(1) Disconnect combination meter connector C-02, and measure at the wiring harness side.
(2) Turn the ignition switch to "ON" position.

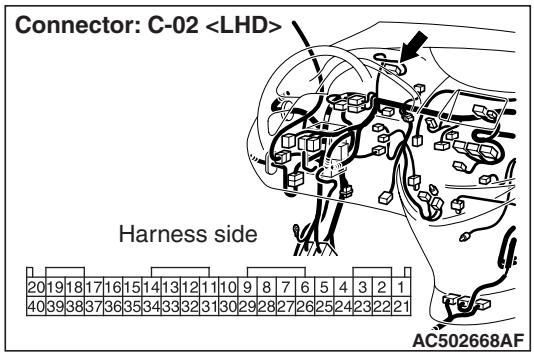


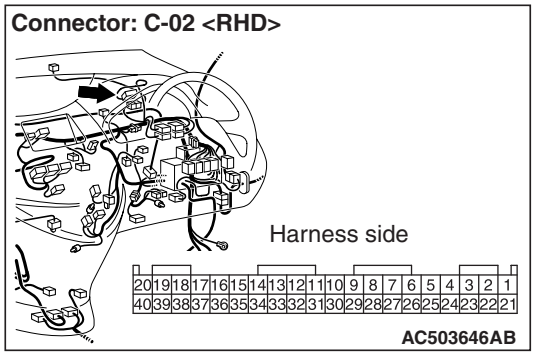
(3) Measure the voltage between terminal 39 and earth.

OK: Battery voltage

Q: Is the check result normal?
YES : . Go to Step 8.
NO : . Go to Step 7.

STEP 7. Check the wiring harness between combination meter connector C-02 (terminal 39) and ignition switch (IG1).





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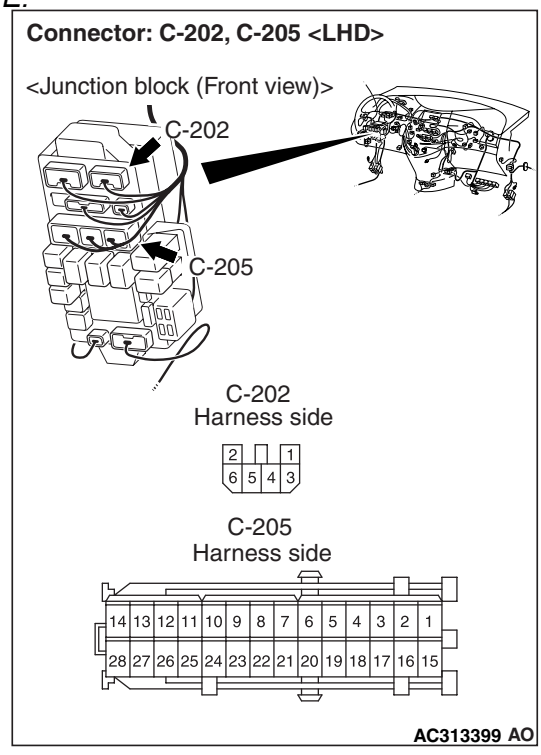

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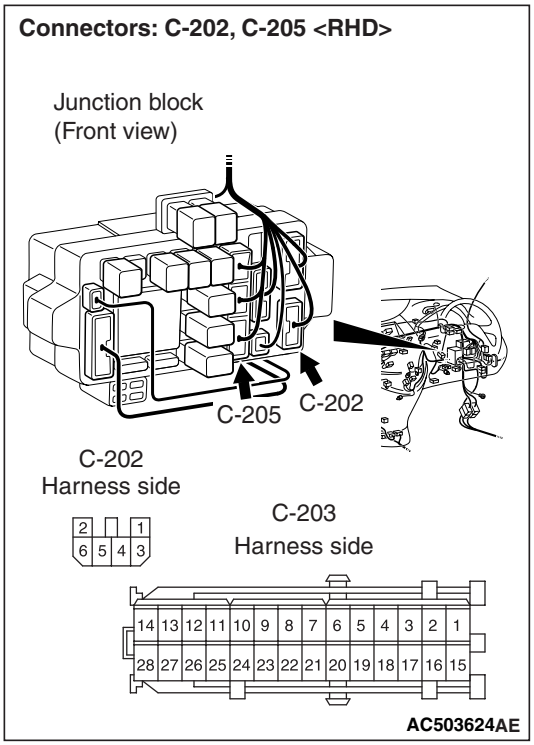
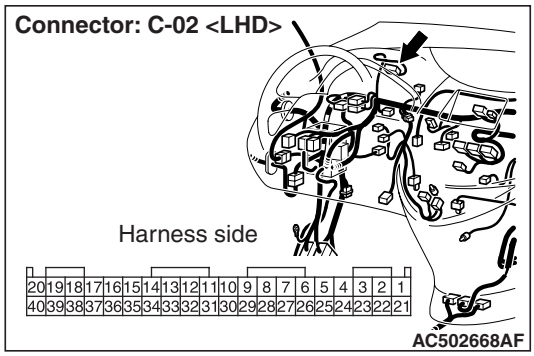
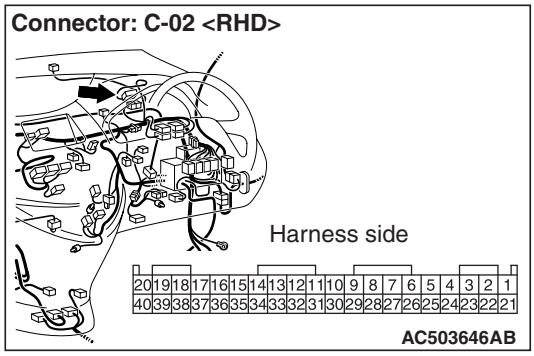


Also check junction block connector C-202 and C-205 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-202 and C-205 is damaged, repair or replace the connector.

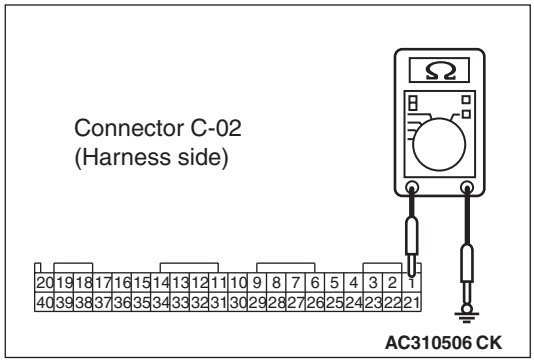
Q: Is the wiring harness between combination meter connector C-02 (terminal 39) and ignition switch (IG1) in good condition?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 8. Resistance measurement at combination meter connector C-02 in order to the earth circuit to the combination meter.



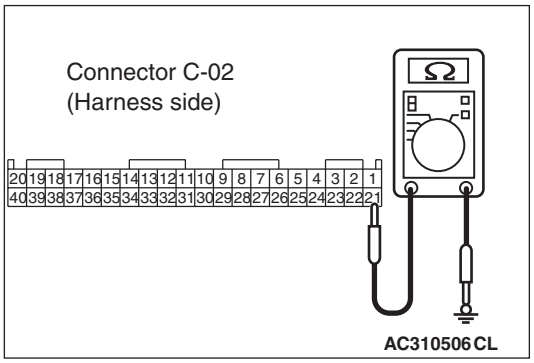


(1) Disconnect combination meter connector C-02, and measure at the wiring harness side.



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

OK: 2 ohms or less

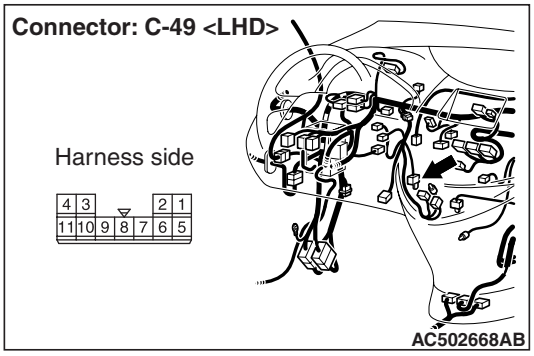


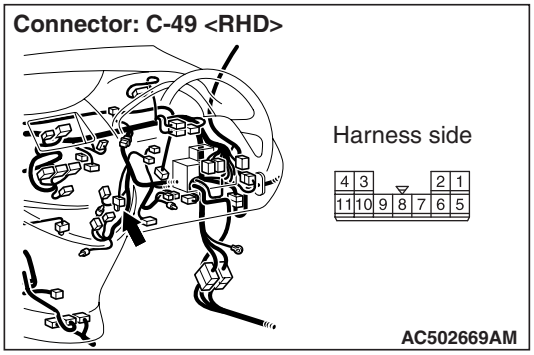
(3) Measure the resistance between terminal 21 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 9.

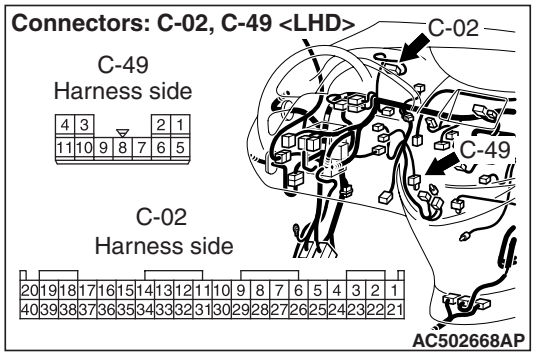
STEP 9. Connector check: Earth connector C-49.

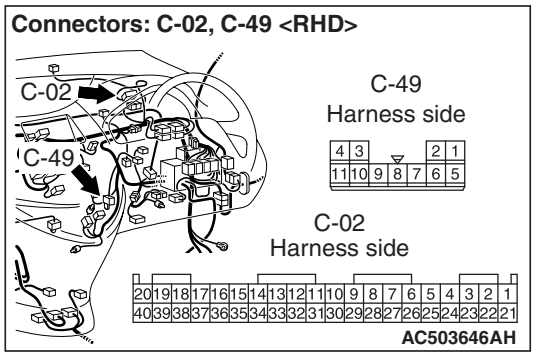




Q: Is earth connector C-49 in good condition?
YES : Go to Step 10.
NO : Repair the defective connector.

STEP 10. Check the wiring harness between combination meter connector C-02 (terminals 1 and 21) and earth connector C-49 (terminals 2 and 7).





Q: Are the wiring harness between combination meter connector C-02 (terminals 1 and 21) and earth connector C-49 (terminals 2 and 7) in good condition?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 11. Retest the system.

Q: Is the check result satisfactory?
YES : Intermittent Malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5).
NO : Replace the combination meter.

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Inspection Procedure 6: Speedometer does not Work (other meters work).
Inspection Procedure 7: The Fuel Gauge Needle Moves Excessively.

⚠ CAUTION
When the battery cable is disconnected or the combination meter is removed, the fuel gauge learned value will be erased. To let the display unit re-learn it, enter the vehicle speed (by driving the vehicle or entering simulated vehicle speed) and then stop the vehicle.

COMMENTS ON TROUBLE SYMPTOM

If only the speedometer does not operate, the engine-ECU <M/T> or engine-A/T-ECU <A/T> system, the combination meter, the wiring harness or its connector may be defective. Furthermore, incorrect level of fuel is shown on the gauge, because the display unit can not learn the fuel gauge.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of engine-ECU <M/T> or engine-A/T-ECU <A/T>
- Malfunction of combination meter

DIAGNOSIS PORODEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostic Table P.54F-13). After diagnosing the CAN bus lines, go to Step 5.

STEP 2. M.U.T.-III diagnosis code
Check whether the MPI system-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.
NO : Go to Step 3.

STEP 3. M.U.T.-III data list
- Item No.82: Vehicle speed sensor malfunction flag (Refer to P.54A-92.)
- Item No.83: Vehicle speed sensor definite flag (Refer to P.54A-92.)
- Item No.84: Vehicle stopped flag (Refer to P.54A-92.)

Q: Is the check result satisfactory?
YES : Go to Step 4.
NO : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.

STEP 4. Check the speedometer.
(1) Connect the M.U.T.-III to the diagnosis connector.
(2) Use the M.U.T.-III to enter simulated vehicle speed.
OK: The speedometer shows that simulated vehicle speed.

Q: Is the check result satisfactory?
YES : Go to Step 5.
NO : Replace combination meter, then go to Step 5.

STEP 5. Retest the system.
Check that the speedometer works normally.

Q: Is the check result satisfactory?
YES : The procedure is complete.
NO : Go to Step 1.

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Inspection Procedure 8: Tachometer does not Work (other meters work).

COMMENTS ON TROUBLE SYMPTOM

If only the tachometer does not operate, the engine-ECU <M/T> or engine-A/T-ECU <A/T> system may not be sending ignition signal, or the combination meter, the wiring harness or its connector may be defective.

PROBABLE CAUSES

- Malfunction of combination meter
- Damaged harness wires and connectors

DIAGNOSIS PORODEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54F, Diagnosis – Can Bus Diagnostic Table P.54F-13). After diagnosing the CAN bus lines, go to Step 5.

STEP 2. M.U.T.-III other system diagnosis code

Check whether the MPI system-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.

NO : Go to Step 3.

STEP 3. M.U.T.-III data list

- Item No.87: Tachometer (Refer to P.54A-92.)

Q: Is the check result satisfactory?

YES : Go to Step 4.

NO : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.

STEP 4. M.U.T.-III actuator test

- Item No.84: Tachometer: 0 r/min (Refer to P.54A-95.)
- Item No.85: Tachometer: 2000 r/min (Refer to P.54A-95.)
- Item No.86: Tachometer: 5000 r/min (Refer to P.54A-95.)

OK: The tachometer operates.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Replace the combination meter and then go to Step 5.

STEP 5. Retest the system.

Check that the tachometer works normally.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Go to Step 1.

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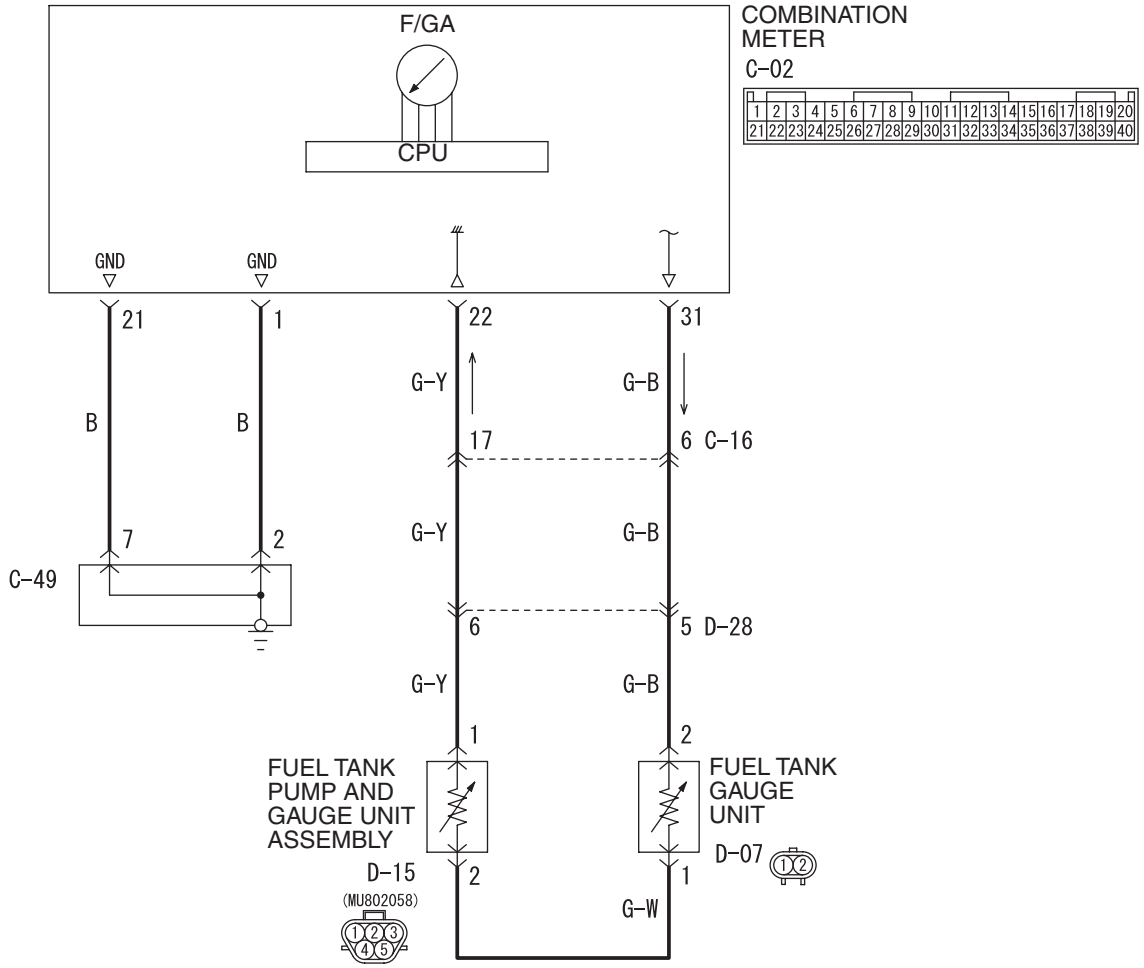
Inspection Procedure 9: Fuel Gauge does not work (other meters work).

Fuel Gauge Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

If only the fuel gauge does not operate, the fuel tank pump and gauge unit assembly, fuel tank gauge unit, combination meter, wiring harness or connector(s) may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of fuel tank gauge unit
- Malfunction of fuel tank pump and gauge unit assembly
- Malfunction of combination meter

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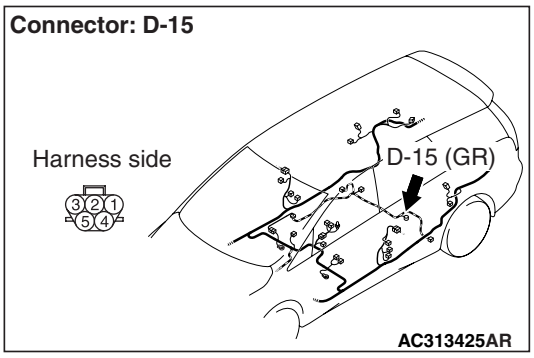
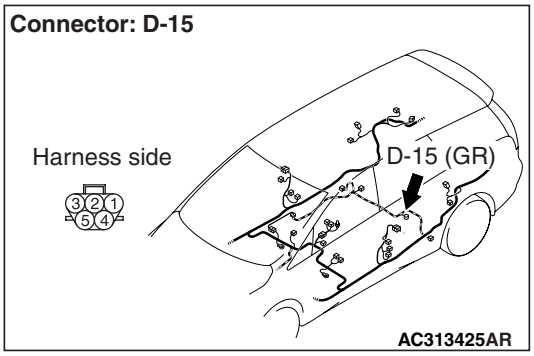
DIAGNOSIS PROCEDURE

STEP 1. Connector check: Fuel tank pump and gauge unit assembly connector D-15.

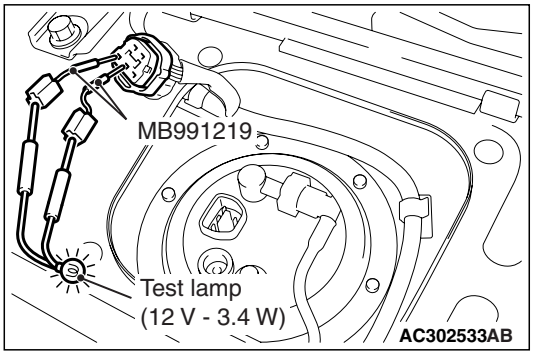


Q: Is fuel tank pump and gauge unit assembly connector D-15 in good condition?
YES : Go to Step 2.
NO : Repair the connector, and then go to Step 12.

STEP 2. Check the fuel gauge circuit.



(1) Disconnect fuel tank pump and gauge unit assembly connector D-15.

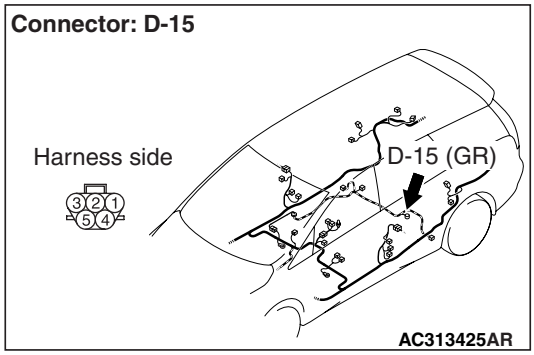


(2) Use special tool MB991219 to connect a test lamp (12 V - 3.4 W) between the wiring harness connector terminals 1 and 2.
(3) Turn the Ignition switch to "ON" position.
(4) Check if the test lamp illuminates.

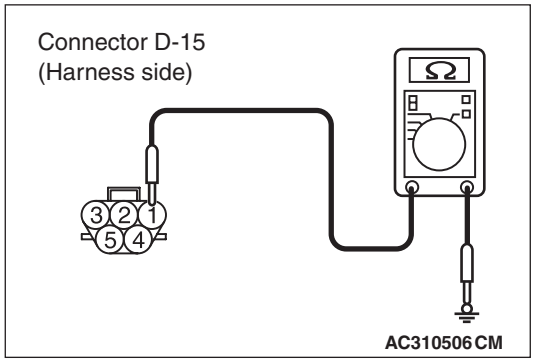
OK: Illuminates

Q: Is the check result satisfactory?
YES : Go to Step 9.
NO : Go to Step 3.

STEP 3. Resistance measurement at fuel tank pump and gauge unit assembly connector D-15 to check the earth circuit to the fuel tank pump and gauge unit assembly.



(1) Disconnect fuel tank pump and gauge unit assembly connector D-15, and measure at the wiring harness side.
(2) Turn the Ignition switch to "LOCK" (OFF) position.
(3) Disconnect the negative battery terminal.



(4) Measure the resistance value between terminal 1 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 4.

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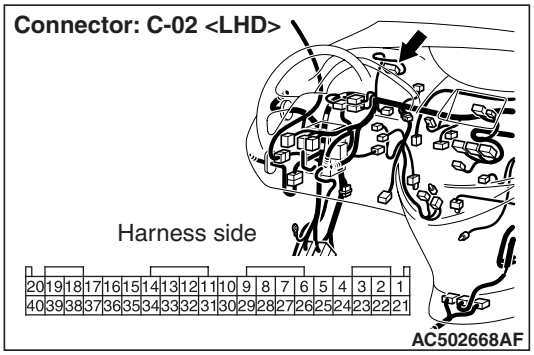
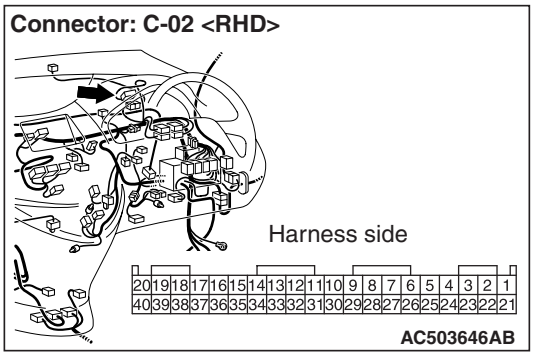
STEP 4. Connector check: Combination meter connector C-02.



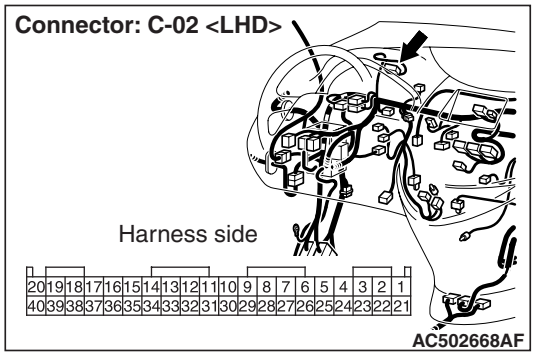


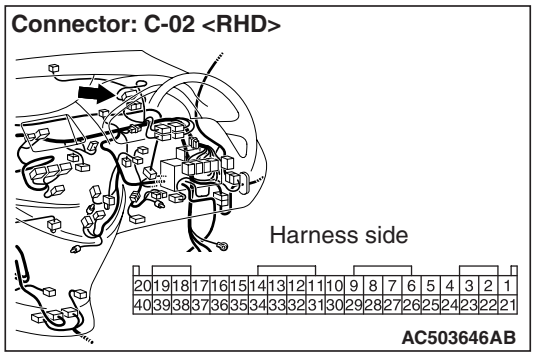
Q: Is combination meter connector C-02 in good condition?

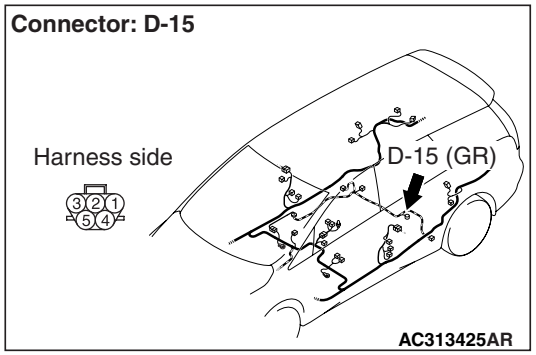
YES : Go to Step 5.

NO : Repair the connector, and then go to Step 12.

STEP 5. Check the wiring harness between fuel tank pump and gauge unit assembly connector D-15 (terminal 1) and combination meter connector C-02 (terminal 22).

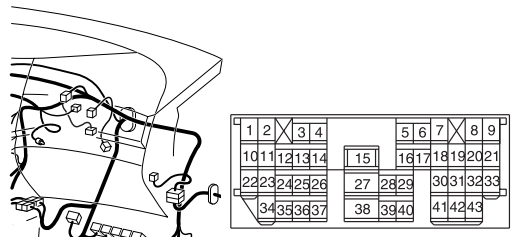






NOTE: Also check intermediate connector D-28, C-16 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector D-28, C-16 are damaged, repair or replace the connector.

Connector: C-16 <LHD>



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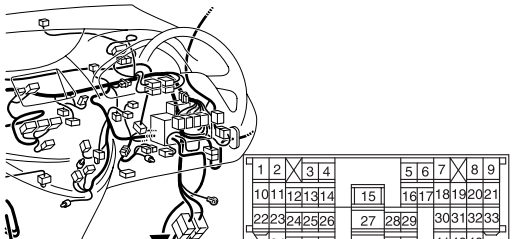
Connector: C-16 <RHD>



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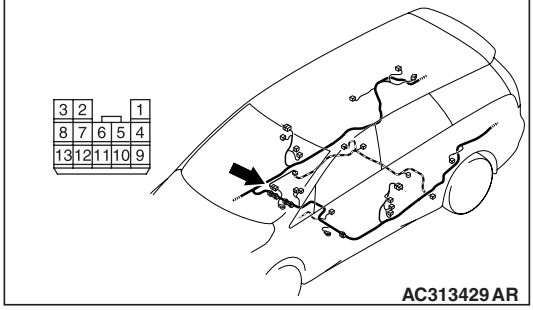
Connector: D-28



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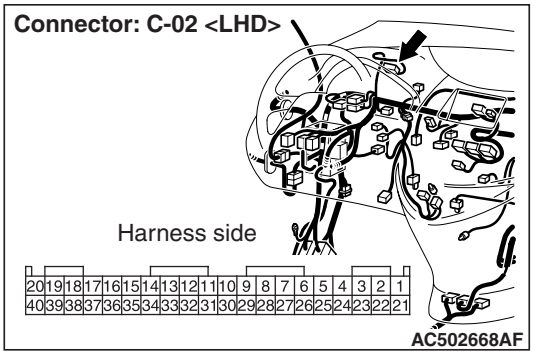
Q: Is the wiring harness between fuel tank pump and gauge unit assembly connector D-15 (terminal 1) and combination meter connector C-02 (terminal 22) in good condition?
YES : Go to Step 12.
NO : . Repair the harness, and then go to Step 12.

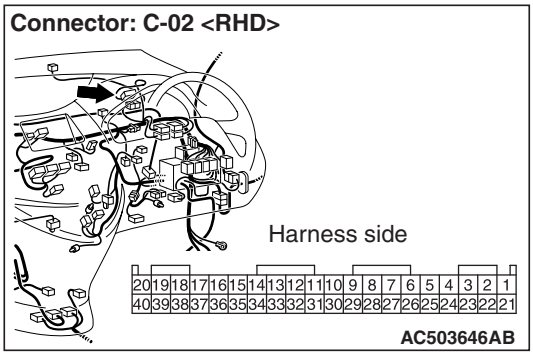
STEP 6. Connector check: Combination meter connector C-02 and fuel tank gauge unit connector D-07.

Connector: C-02 <LHD>



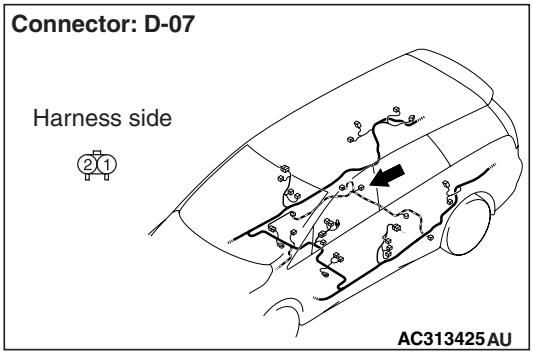
AC502668AF

Connector: C-02 <RHD>



AC503646AB

Connector: D-07



AC313425AU

Q: Is combination meter connector C-02 and fuel tank gauge unit connector D-07 in good condition?
YES : Go to Step 7.
NO : Repair the connector, and then go to Step 11.

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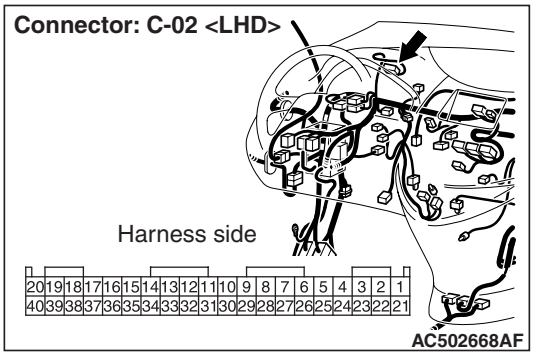
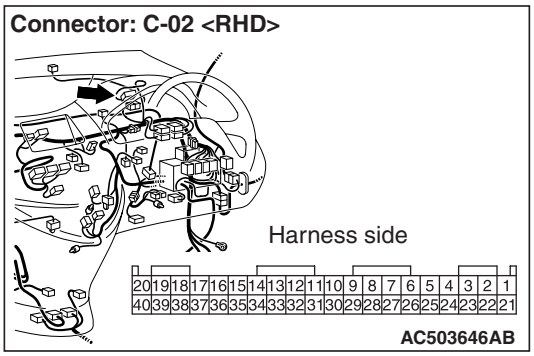
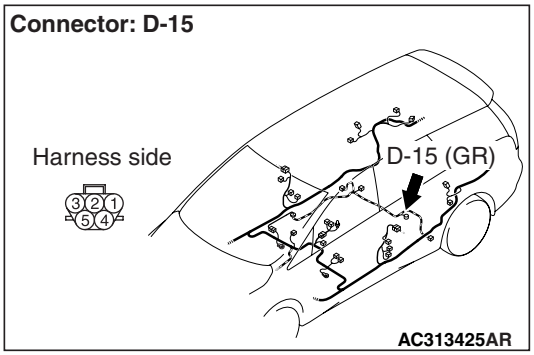
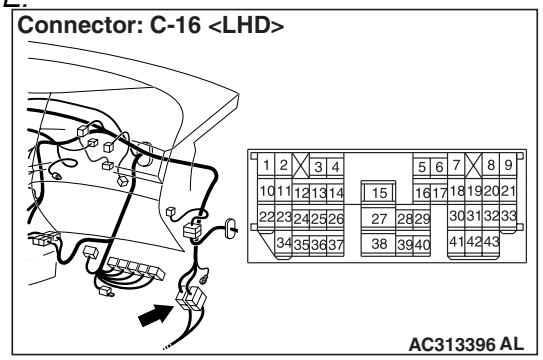
STEP 7. Check the wiring harness between combination meter connector C-02 (terminal 31) and fuel tank gauge unit connector D-07 (terminal 2).

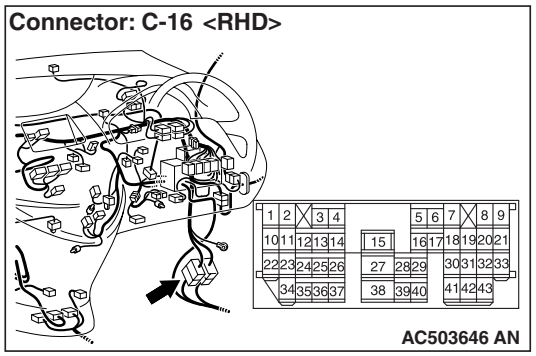


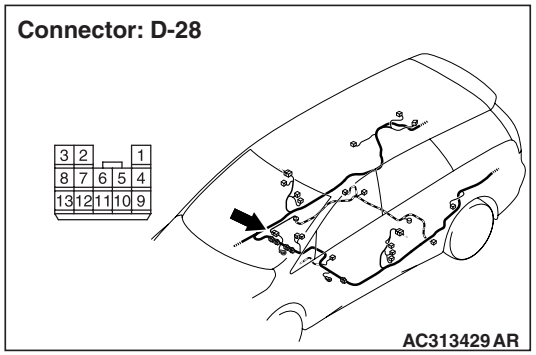




NOTE:







Also check intermediate connectors C-16, D-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-16, D-28 are damaged, repair or replace the connector.

Q: Is the wiring harness between combination meter connector C-02 (terminal 31) and fuel tank gauge unit connector D-07 (terminal 2) in good condition?
YES : Go to Step 8.
NO : Repair the harness, and then go to Step 11.

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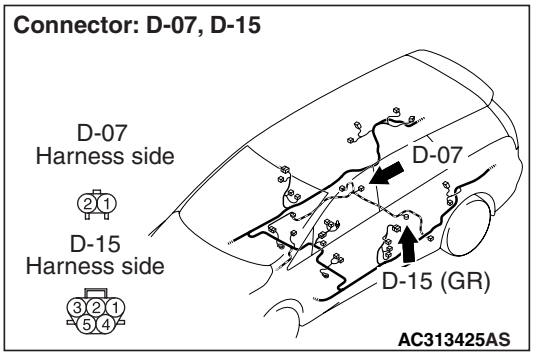
STEP 8. Check the wiring harness between fuel tank gauge unit connector D-07 (terminal 1) and fuel tank pump and gauge unit assembly connector D-15 (terminal 2).



Q: Is the wiring harness between fuel tank gauge unit connector D-07 (terminal 1) and fuel tank pump and gauge unit assembly connector D-15 (terminal 2) in good condition?
YES : Go to Step 10.
NO : Repair the harness, and then go to Step 11.

STEP 9. M.U.T.-III data list
Item No.8A: Fuel gauge (target value)

OK: Fuel gauge and M.U.T.-III displayed values agree with each other.

Q: Is the check result normal?
YES : Go to Step 12.
NO : Go to Step 10.

STEP 10. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace fuel tank pump and gauge unit assembly and then go to Step 11.

STEP 11. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace fuel tank gauge unit and then go to Step 12.

STEP 12. Retest the system.
Check that the fuel gauge works normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 1.

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Inspection Procedure 10: Engine Coolant Temperature Gauge does not Work (other meters work).

COMMENTS ON TROUBLE SYMPTOM

If only the engine coolant temperature gauge does not operate, the engine-ECU <M/T> or engine-A/T-ECU <A/T> system, the combination meter, the wiring harness or its connector may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of engine-ECU <M/T> or engine-A/T-ECU <A/T>
- Malfunction of combination meter

DIAGNOSIS PORODEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54F – Troubleshooting P.54F-13). Repair the CAN bus line and go to Step 5.

STEP 2. M.U.T.-III other system diagnosis code

Check if an MPI system diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <Except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <Vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.

NO : Go to Step 3.

STEP 3. M.U.T.-III data list

- Item No.8C: Water thermometer (Refer to P.54A-92.)
- Item No.8E: Water thermometer definite flag (Refer to P.54A-92.)

Q: Is the check result satisfactory?

YES : Go to Step 4.

NO : Diagnose MPI system. (Refer to GROUP 13A – Troubleshooting P.13A-14 <Except vehicles for Hong Kong, Singapore, Australia and New Zealand>, GROUP 13B – Troubleshooting P.13B-15 <Vehicles for Hong Kong and Singapore> or GROUP 13C – Troubleshooting P.13C-21 <Vehicles for Australia and New Zealand>.) After diagnosing the MPI system, go to Step 5.

STEP 4. M.U.T.-III actuator test

- Item No.88: Water temperature gauge: 0 °C (Refer to P.54A-95.)
- Item No.89: Water temperature gauge: 85 °C (Refer to P.54A-95.)
- Item No.8A: Water temperature gauge: 126 °C (Refer to P.54A-95.)

OK: The water thermometer operates.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Replace combination meter and then go to Step 5.

STEP 5. Retest the system.

Check to see that the engine coolant temperature gauge operates normally.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Go to Step 1.

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DATA LIST REFERENCE TABLE

M1543007300488

The following items of the ECU input data can be read using M.U.T.-III.

Item No.	Check items	Check conditions	Normal conditions
80	Speedometer	Perform a test run of the vehicle.	Speedometer displayed value and M.U.T.-III displayed value agree with each other.*
81	Speedometer (target value)	Perform a test run of the vehicle.	Speedometer displayed value and M.U.T.-III displayed value agree with each other.*
82	Vehicle speed sensor malfunction flag	Ignition switch: ON	Without
83	Vehicle speed sensor definite flag	Ignition switch: ON	Set
84	Vehicle stopped flag	• Ignition switch: ON • Vehicle speed 0 km/h	Set
87	Tachometer	Start the engine.	Tachometer displayed value and M.U.T.-III displayed value agree with each other.
89	Fuel gauge	Ignition switch: ON	Fuel gauge unit resistance value and M.U.T.-III displayed value agree with each other.
8A	Fuel gauge (target value)	Ignition switch: ON	Fuel gauge and M.U.T.-III displayed values agree with each other.
8C	Water thermometer	Ignition switch: ON	Water thermometer and M.U.T.-III displayed values agree with each other.
8E	Water thermometer definite flag	Ignition switch: ON	Set
90	Odometer	Ignition switch: ON	Odometer displayed value and M.U.T.-III displayed value agree with each other.
91	Rheostat	Ignition switch: ON	The brightness of the combination meter illumination changes.
92	Tripmeter A	Ignition switch: ON	Tripmeter A displayed value and M.U.T.-III displayed value agree with each other.
93	Tripmeter B	Ignition switch: ON	Tripmeter B displayed value and M.U.T.-III displayed value agree with each other.
A1	SRS warning lamp	• Ignition switch: ON • After warning lamp pre-check	OFF
		• Ignition switch: ON • During warning lamp pre-check	ON

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Item No.	Check items	Check conditions	Normal conditions
A2	ABS warning lamp	• Ignition switch: ON • After warning lamp pre-check	OFF
		• Ignition switch: ON • During warning lamp pre-check	ON
A3	Hydraulic pressure warning lamp	• Ignition switch: ON • After starting the engine	OFF
		• Ignition switch: ON • Before starting the engine	ON
A4	Charging warning lamp	• Ignition switch: ON • After starting the engine	OFF
		• Ignition switch: ON • Before starting the engine	ON
A5	Engine warning lamp	• Ignition switch: ON • After warning lamp pre-check	OFF
		• Ignition switch: ON • During warning lamp pre-check	ON
A6	Fuel reserve warning lamp	• Ignition switch: ON • Much fuel	OFF
		• Ignition switch: ON • Poor fuel	ON
A7	Brake warning lamp	• Ignition switch: ON • Parking brake: At release	OFF
		• Ignition switch: ON • Parking brake operates • During warning lamp pre-check	ON
A8	Seat belt warning lamp	• Ignition switch: ON • Driver's seatbelt: fastened	OFF
		• Ignition switch: ON • Driver's seatbelt: Not fastened	ON
		• Ignition switch: ON • Front passenger: Set • Driver's seatbelt: Not fastened	ON
B1	Turn-signal indicator (RH)	Turn signal lamp: OFF or only left side lamp illuminates	OFF
		Turn signal lamp: Right side lamp illuminates	ON
B2	Turn-signal indicator (LH)	Turn signal lamp: OFF or only right side lamp illuminates	OFF
		Turn signal lamp: Left side lamp illuminates	ON
B3	Front fog lamp indicator	Front fog lamp: OFF	OFF
		Front fog lamp: ON	ON

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Item No.	Check items	Check conditions	Normal conditions
B4	High-beam indicator	Headlamps: OFF or low beam illuminates	OFF
		Headlamps: High beam illuminates	ON
B5	Door indicator (front, LH)	Left side front door closed	OFF
		Left side front door open	ON
B6	Door indicator (front, RH)	Right side front door closed	OFF
		Right side front door open	ON
B7	Door indicator (rear, LH)	Left side rear door closed	OFF
		Left side rear door open	ON
B8	Door indicator (rear, RH)	Right side rear door closed	OFF
		Right side rear door open	ON
B9	Door indicator (tailgate)	Tailgate closed	OFF
		Tailgate open	ON
BA	Position lamp indicator	Position lamp: OFF	OFF
		Position lamp: ON	ON
C1	A/T indicator: P	Shift position: Other than P position	OFF
		Shift position: P position	ON
C2	A/T indicator: R	Shift position: Other than R position	OFF
		Shift position: R position	ON
C3	A/T indicator: N	Shift position: Other than N position	OFF
		Shift position: N position	ON
C4	A/T indicator: D	Shift position: Other than D position	OFF
		Shift position: D position	ON
C8	A/T indicator: 4	Shift position: Other than 4 position	OFF
		Shift position: 4 position	ON
C9	A/T indicator: 3	Shift position: Other than 3 position	OFF
		Shift position: 3 position	ON
CA	A/T indicator: 2	Shift position: Other than 2 position	OFF
		Shift position: 2 position	ON
CB	A/T indicator: 1	Shift position: Other than 1 position	OFF
		Shift position: 1 position	ON

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Item No.	Check items	Check conditions	Normal conditions
D1	Cruise	• Ignition switch: ON • Cruise main switch: OFF	OFF
		• Ignition switch: ON • Cruise main switch: ON	ON
D7	Oil level warning lamp	• Ignition switch: ON • After starting the engine	OFF
		• Ignition switch: ON • Before starting the engine	ON

*NOTE: * indicates that the slowest vehicle speed is 5 km/h.*

ACTUATOR TEST TABLE

M1543007400087

Item No.	Check items	Test content	Check conditions	Normal conditions
80	Speedometer	Set the speedometer to 0 km/h	Turn the ignition switch to the ON position.	Speedometer shows 0 km/h
81		Set the speedometer to 40 km/h		Speedometer shows 40 km/h
82		Set the speedometer to 100 km/h		Speedometer shows 100 km/h
84	Tachometer	Set the tachometer to 0 r/min	Turn the ignition switch to the ON position.	Tachometer shows 0 r/min
85		Set the tachometer to 2000 r/min		Tachometer shows 2000 r/min
86		Set the tachometer to 5000 r/min		Tachometer shows 5000 r/min
88	Water thermometer	Set the water thermometer to 0 °C	Turn the ignition switch to the ON position.	Water thermometer shows 0 °C
89		Set the water thermometer to 85 °C		Water thermometer shows 85 °C
8A		Set the water thermometer to 126 °C		Water thermometer shows 126 °C
90	Fuel gauge (target value)	Set the fuel gauge to 0 %	Turn the ignition switch to the ON position.	Fuel gauge shows 0 %
91		Set the fuel gauge to 50 %		Fuel gauge shows 50 %
92		Set the fuel gauge to 100 %		Fuel gauge shows 100 %
A0	Combination meter illumination	Set the combination meter illumination to 0 %	Turn the ignition switch to the ON position.	Combination meter illumination is 0 %
A1		Set the combination meter illumination to 50 %		Combination meter illumination is 50 %
A2		Set the combination meter illumination to 100 %		Combination meter illumination is 100 %

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Item No.	Check items	Test content	Check conditions	Normal conditions
A3	Indicator lamp and warning lamp	Illuminate the indicator lamp and the warning lamp.	Turn the ignition switch to the ON position.	Turn, door, fog, high beam, parking brake, check engine, charge, oil pressure, SRS, ABS and seatbelt indicator lamps, and fuel and cruise warning lamps illuminate.
A4		Extinguish the indicator lamps and the warning lamps.		Turn, door, fog, high beam, parking brake, check engine, charge, oil pressure, SRS, ABS and seatbelt indicator lamps, and fuel and cruise warning lamps go out.
A5		Illuminate the indicator lamp and the warning lamp.		The position indicator lamp illuminates.
A6		Extinguish the indicator lamps and the warning lamps.		The position indicator lamp goes out.
A7		Illuminate the indicator lamp and the warning lamp.		The oil level warning lamp illuminates.
		Extinguish the indicator lamps and the warning lamps.		The oil level warning lamp goes out.
A9	A/T indicator lamp and display	Illuminate the A/T indicator lamp or display the A/T indicator.	Turn the ignition switch to the ON position.	• A/T indicator lamp (P, R, N, D) illuminates. • A/T indicator displays gear position (1,2,3 or 4) on LED.
AA		Illuminate the A/T indicator lamp or display no A/T indicator.		• A/T indicator lamp (P, R, N, D) goes out. • A/T indicator does not display gear position (1,2,3 or 4) on LED.

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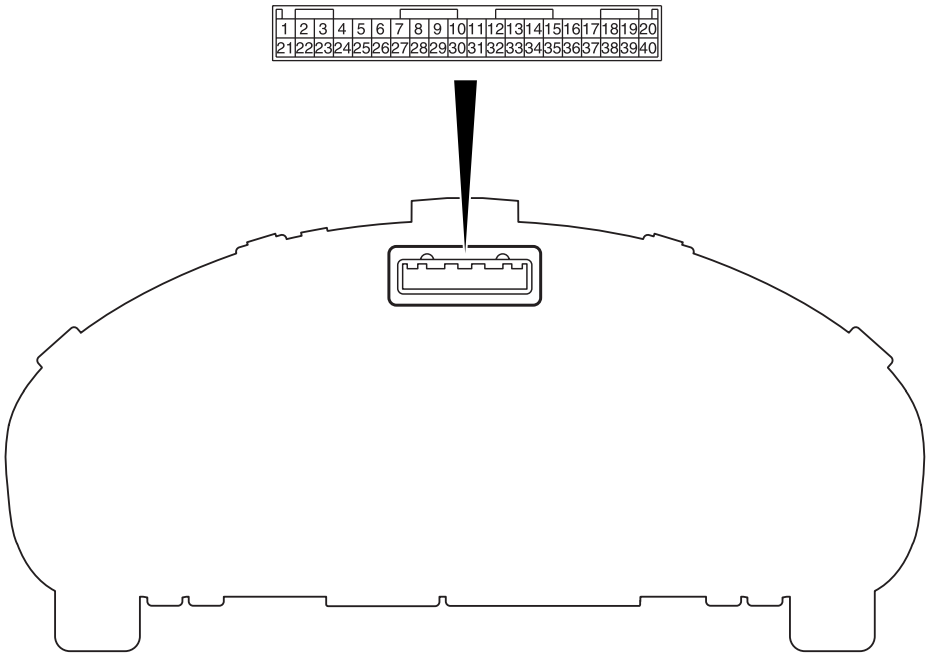
CHECK AT ECU TERMINALS

M1543007600694



AC302719AB

Terminal No.	Check items	Check conditions	Normal conditions
1	Earth	Always	0 V
20	Power supply from ignition switch (ACC)	Ignition switch: ACC	Battery voltage
21	Earth	Always	0 V
22	Fuel earth	Ignition switch: ON	–
23	CAN L	–	–
24	CAN H	–	–
31	Input of fuel gauge	Ignition switch: ON	–
32	Input of seatbelt switch	Ignition switch: ON and the driver's seat belt is unfastened.	–
34	Input of parking brake switch and brake fluid level switch	• Ignition switch: ON and parking brake switch: ON • Ignition switch: ON and brake fluid level switch: ON	–
35	Charging	Ignition switch: ON and before power generation by alternator	–
36	Oil pressure switch	Ignition switch: ON and before starting the engine	–
38	Illumination (power supply)	Illumination switch: ON	Battery voltage
39	Power supply from ignition switch (IG1)	Ignition switch: ON	Battery voltage
40	Battery power supply	Always	Battery voltage

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ON-VEHICLE SERVICE

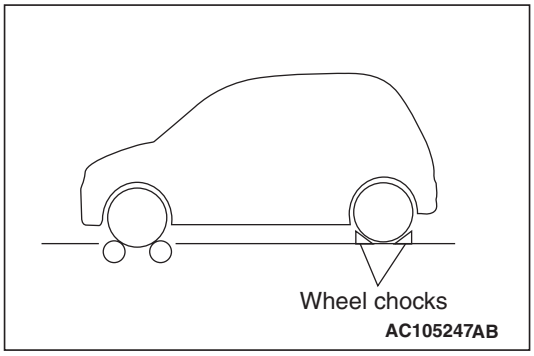
CHECK THE SPEEDOMETER.

M1543000900586

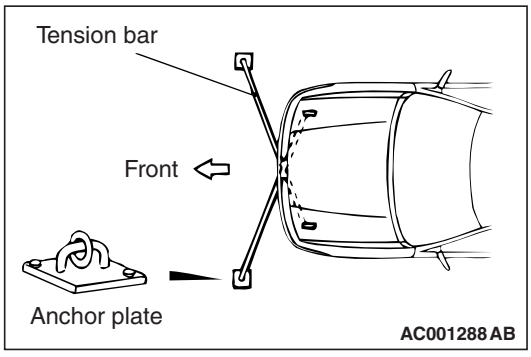
⚠ CAUTION
Since the diagnosis code may be stored in the ABS-ECU or the ASC-ECU when checking the speedometer with speedometer tester, erase the diagnosis code.

⚠ CAUTION
Do not accelerate or decelerate suddenly during servicing work.

1. Check that the tyre pressure is within the tyre pressure label (Refer to GROUP 31 - On-vehicle Service P.31-8).
2. Set the vehicle on the speedometer tester.



3. Chock the rear wheels and depress the parking brake pedal.



4. To prevent the front wheel from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
5. To prevent the vehicle from moving, attach a chain or wire to the rear retraction hook, and make sure the end of the chain or wire is secured.
6. Check that the speedometer indicating range is within the standard value or the needle fluctuation is within the limit.

Standard value <Vehicles for General Export, Australia and New Zealand>:

Standard indicator km/h	Allowance range km/h
20	18 – 20
40	38 – 43
80	79 – 84
120	120 – 125
160	161 – 166
200	203 – 211

Standard value <Vehicles for GCC>:

Standard indicator km/h	Allowance range km/h
20	20 – 24
40	40 – 44
80	80 – 85
120	121 – 127
160	162 – 169
200	203 – 211

Standard value <Vehicles for General Export (except for Hong Kong and Singapore): option>:

Standard indicator mph	Allowance range mph
10	10 – 12
25	25 – 27
50	50 – 53
75	76 – 80
100	101 – 106
125	127 – 132

Limit: Needle fluctuation (Driving speed is 35 km/h (21 mph) or more) ± 3 km/h (1 mph)

TACHOMETER CHECK

M1543001000564

Check that the tachometer indicating error is within the standard value when the actuator tests (item No.85 and 86) are performed using M.U.T.-III.

Standard value:

Engine speed r/min	Tachometer indicating tolerance r/min
2,000	± 100
6,000	± 200

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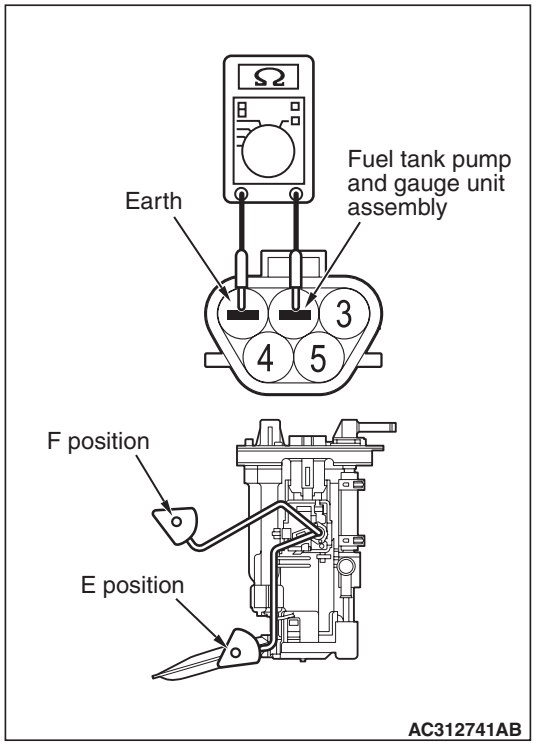
FUEL TANK GAUGE UNIT CHECK

M1543001200706

Remove the fuel tank gauge unit and fuel tank pump and gauge unit assembly (Refer to GROUP 13D, Fuel Tank P.13D-5).

FUEL TANK GAUGE UNIT RESISTANCE

FUEL TANK PUMP AND GAUGE UNIT ASSEMBLY



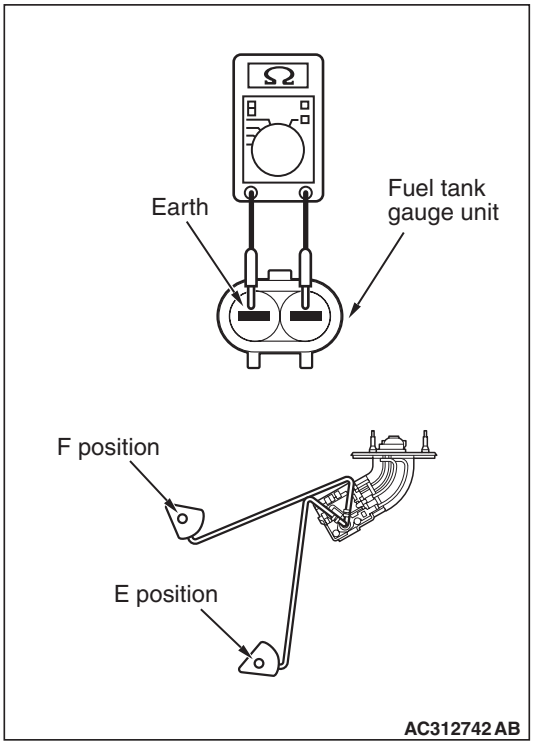
1. Check that the resistance value between the fuel tank pump and gauge unit assembly terminal and the earth terminal is at the standard value when the float of the fuel tank pump and gauge unit assembly is at the F position and the E position.

Standard values:

Float Position	Gauge resistance value
F position	6.5 ± 1 Ω
E position	53.2 ± 1 Ω

2. Check that the resistance value changes smoothly when the float is moved slowly between the F position and the E position.
3. If all checks are correct, go to fuel tank pump and gauge unit assembly float height check. If any check is not correct, replace the fuel tank pump and gauge unit assembly.

FUEL TANK GAUGE UNIT



1. Check that the resistance value between the fuel tank gauge unit terminal and earth terminal is at the standard value when the float of the fuel tank gauge unit is at the F position and the E position.

Standard values:

Float Position	Gauge resistance value
F position	6.5 ± 1 Ω
E position	66.8 ± 1 Ω

2. Check that the resistance value changes smoothly when the float moved slowly between the F position and the E position.
3. If all checks are correct, go to fuel tank gauge unit float height check. If any check is not correct, replace the fuel tank gauge unit.

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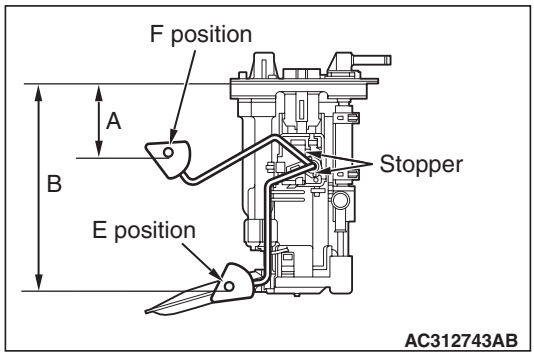
FUEL TANK GAUGE UNIT FLOAT HEIGHT
FUEL TANK PUMP AND GAUGE UNIT ASSEMBLY



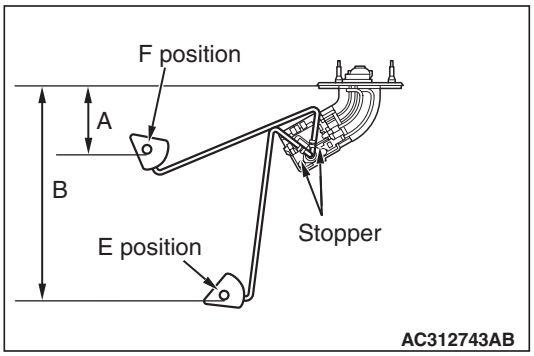
1. Move the float and check that F position height (A) and E position height (B) are at the standard values when the float arm touches the stopper.

   Standard values:

Float Position	Float Centre Height
F position (A)	57.6 ± 3 mm
E position (B)	158.4 ± 3 mm

2. If all checks are correct, go to fuel tank gauge unit float height check. If any check is not correct, replace the fuel tank gauge unit.

FUEL TANK GAUGE UNIT



1. Move the float and check that F position height (A) and E position height (B) are at the standard values when the float arm touches the stopper.

   Standard values:

Float Position	Float Centre Height
F position (A)	57.0 ± 3 mm
E position (B)	180.2 ± 3 mm

2. If all checks are correct, go to fuel tank gauge unit float height check. If any check is not correct, replace the fuel tank gauge unit.

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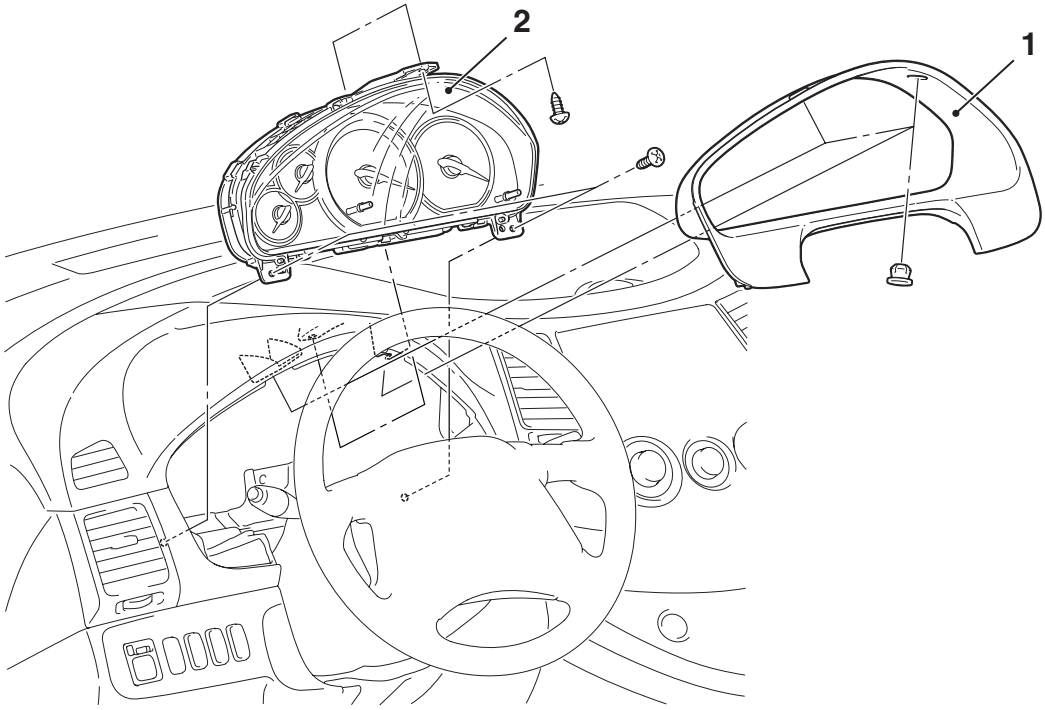
COMBINATION METER ASSEMBLY

REMOVAL AND INSTALLATION

M1543019800134

⚠ CAUTION

When the battery cable is disconnected or the combination meter is removed, the fuel gauge learned value will be erased. To let the display unit re-learn it, enter the vehicle speed (by driving the vehicle or entering simulated vehicle speed) and then stop the vehicle. Service on a level surface. (If the vehicle is inclined, the measurement value will go out.)



AC311964AB

Removal steps

- Steering column cover (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

Removal steps (Continued)

1. Combination meter bezel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
2. Combination meter assembly

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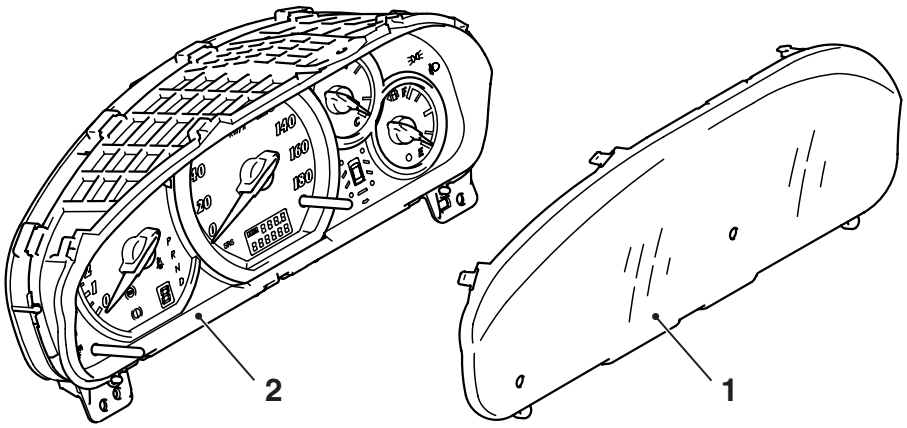
Group TOC

DISASSEMBLY AND REASSEMBLY

M1543019900131



AC313280AB

Disassembly steps

1. Combination meter glass
2. Combination meter

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HEADLAMP

SERVICE SPECIFICATIONS

M1542000300558

Item		Standard value	Limit
Headlamp aiming	Vertical direction	60 mm below horizontal (H)	–
	Horizontal direction	15° sloping section intersects the vertical line (V)	–
Headlamp luminous intensity measurement cd (Corresponding to the illumination 40 m ahead of the vehicle at low beam)		–	30,000 cd or more

PRECAUTIONS ON HOW TO USE THE HEADLAMP ASSEMBLY

Be careful with the following items as resin lenses are used in the headlamp assembly.

- Don't illuminate the headlamp for three minutes or more when the headlamp is covered with scratch protector.
- Don't tape the outer lens.
- Don't scratch the outer lens surface with a sharp edged special tool.
- Use the specified wax remover and rinse the wax off cleanly.
- Use the specified genuine bulb.

TROUBLESHOOTING

M1542011800278

The headlamp are controlled by the Smart Wiring System (SWS). For troubleshooting, refer to GROUP 54B, Troubleshooting P.54B-58 or GROUP 54C, Troubleshooting P.54C-32 or GROUP 54D, Troubleshooting P.54D-59 or GROUP 54E, Troubleshooting P.54E-40.

DISCHARGE HEADLAMP <VEHICLES FOR HONG KONG AND SINGAPORE>

SERVICE PRECAUTIONS

Be sure to read the following warnings and precautions carefully, verify the discharge headlamp related parts, and then perform necessary operations.

⚠ *DANGER*

- ***Do not touch the socket and the connector while the headlamps are on. High voltage is applied to the bulb socket and connector during headlamp operation. The operator can be burnt or dead due to an electric shock by high voltage.***
- ***Do not attempt to use a tester to check them. If the bulb socket and connectors should be inspected using a tester, the operator can be burnt or dead due to an electric shock by high voltage.***
- ***Do not turn on the headlamps while the controller or the bulb is removed. If the headlamps are turned on with the controller or bulb removed, the operator can get burned by the bulb of a high temperature. The operator can be burnt or dead due to an electric shock by high voltage.***
- ***Before service work, turn the lighting switch off and disconnect the battery terminal and the controller connector in a dry place. Do not touch the components with wet hands. If you work on the components with wet hands or in wet conditions, the operator can be burnt or dead due to an electric shock by high voltage.***

⚠ *WARNING*

Be sure to turn on the headlamp using vehicle battery supply. (Do not turn it on using an external power supply.) If the headlamp bulb illuminates without fitting it in the headlamp unit, it may burst due to rise in its internal pressure.

⚠ CAUTION

When reusing the controller with the discharge headlamp damaged, observe the inspection procedures for the related parts of the discharge headlamp before determining the reusability of the controller. If you fail to observe "How to check discharge headlamp components," the vehicle may be damaged.

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HOW TO CHECK DISCHARGE HEADLAMP COMPONENTS. (INSPECTION PROCEDURE WHEN REUSING THE CONTROLLER)

VISUAL CHECK OF THE CONTROLLER (CASE)

If any of the defects below are found, replace the controller.

Items to be checked	Why the controller should be replaced
Obvious deformation (warping, twisting, dents, nicks, chipped edges) of the controller case	Because the printed circuit board or the element(s) may be cracked
Damaged connector (chipped or cracked plastics, or deformed terminal)	Because the damaged part(s) may cause poor connection or short circuit.

CHECK THE WIRING HARNESS BETWEEN THE CONTROLLER AND THE BULB.

If any of the defects below are found, replace the wiring harness between the controller and the bulb.

⚠ ***DANGER***

If the wiring harness between the controller and the bulb is defective, always replace it. Attempting to repair the wiring harness may cause a melted harness wire. The operator can be burnt or dead due to an electric shock by high voltage.

Items to be checked	Why the controller should be replaced
Wiring harness shield damaged	Causing abnormal noise
Damaged connector (chipped or cracked plastics, or deformed terminal)	Because the damaged part(s) may cause poor connection or short circuit.

CHECK THE CONTROLLER OPERATION.

If any of the defects below are found, replace the controller.

NOTE: Ensure that the headlamp control system and its circuit (power supply control at engine start and during steady illumination, high-voltage generating circuit, etc.) are working normally. Then check whether internal breakage has occurred in the controller. However, some internal breakage may not be able to be found.

Check item (Check how the lights illuminate.)
Turn on and off the headlamps several times when they are cold (the status after being kept extinguished for 10 minutes or more) and warm (the status after being illuminated for 15 minutes or more, and then kept extinguished for 1 minute). Verify that the headlamp illuminates without fail by repeating the ON/OFF operation of the headlamp several times.
Observe the headlamps until they illuminate steadily (approximately five minutes after switching on them). Check that the headlamps do not flash or flicker.
Turn on the headlamps for thirty minutes. Check that the brightness is the same between right and left lights.
Turn on the headlamps for thirty minutes. Check that the headlamps do not flash or flicker.

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TROUBLESHOOTING PROCEDURES FOR DISCHARGE HEADLAMP (DIAGNOSIS PROCEDURES FOR MALFUNCTIONS)

1. Check that the connectors are connected securely and the fuse has not been blown.
2. Before starting the diagnosis, read through the "Symptom chart" to understand what and how you should do. Follow all the procedures carefully.
3. The components should be checked with their connectors disconnected.

SYMPTOM CHART

Item to be checked	Trouble symptom		
	The headlamps do not illuminate.	The headlamps flicker.	The headlamps are dim.
Fuse	1	-	-
Wiring harness and connector	2	1	-
Column switch	3	-	-
Bulb	4	2	1
Controller	5	3	2
FRONT-ECU	6	4	-

NOTE:

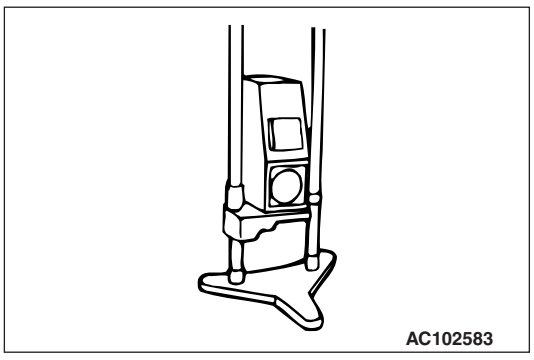
1. *The numbers indicate the sequence in which the component is checked.*
2. *The troubleshooting items other than those above are controlled by the smart wiring system. For troubleshooting, refer to "GROUP 54D, Troubleshooting P.54D-59" or "GROUP 54E, Troubleshooting P.54E-40."*
3. *If the ETACS-ECU failed, only the low-beam headlamps will illuminate as a fail-safe measure.*

ON-VEHICLE SERVICE

HEADLAMP AIMING

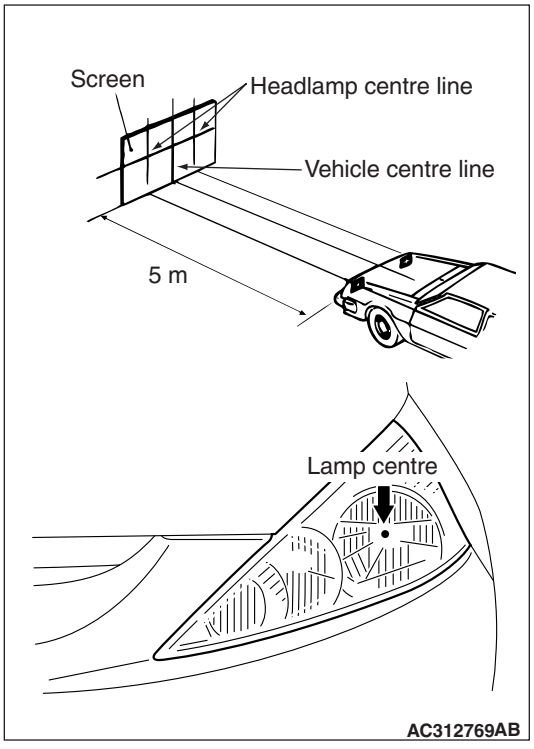
M1542000900936

<USING A BEAM SETTING EQUIPMENT>



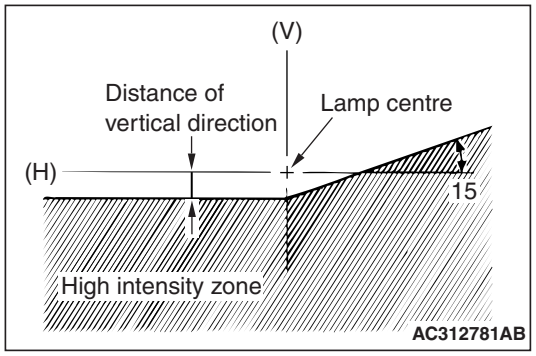
1. The headlamps should be aimed with the proper beam setting equipment, and in accordance with the equipment manufacture's instructions.
2. Alternately turn the adjusting screw to adjust the headlamp aiming.

<USING A SCREEN>



1. Inflate the tyres to the specified pressures and there should be no other load in the vehicles other than driver or substituted weight of approximately 75 kg placed in driver's position.

2. Put the headlamp levelling switch in "0" position. <Vehicles with manual levelling system>
3. Set the distance between the screen and the centre marks of the headlamps as shown in the illumination.

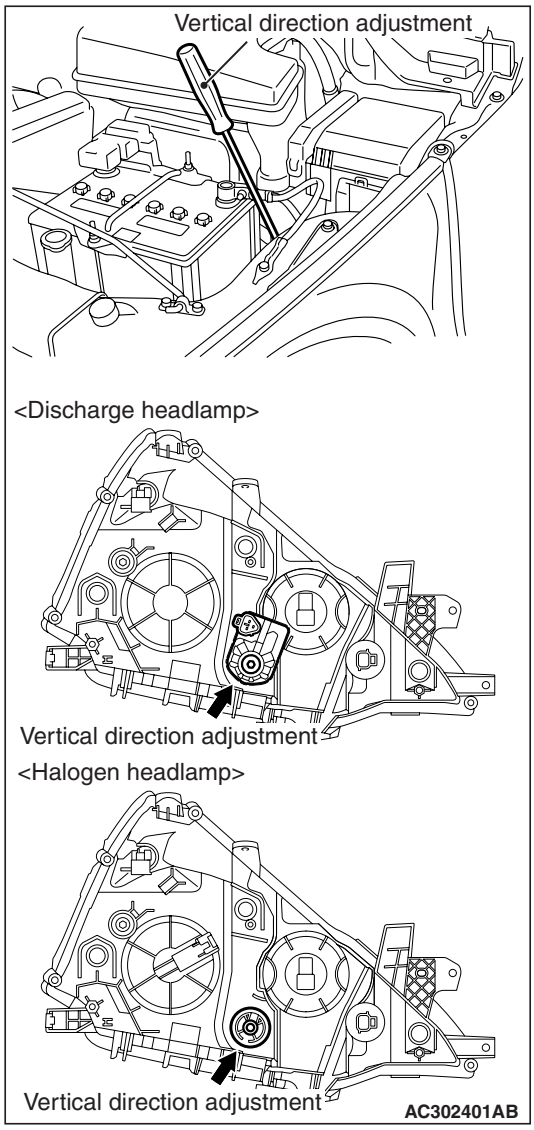


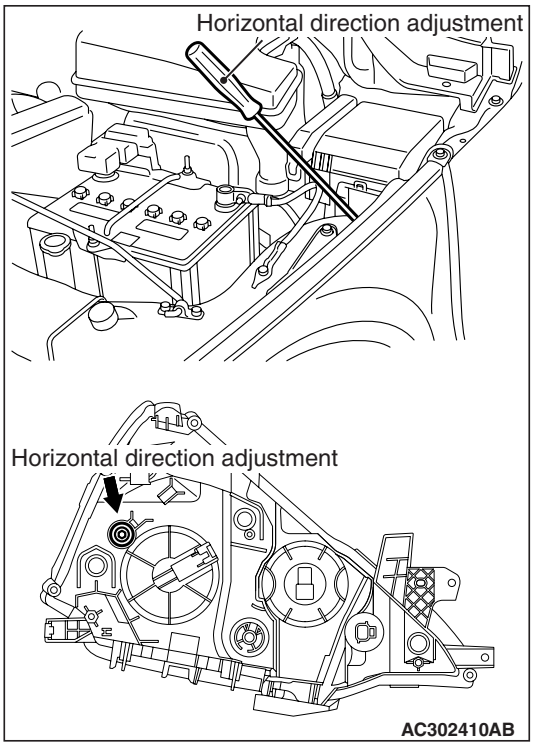
4. Check if the beam shining onto the screen is at the standard value.

   Standard value:
   (Vertical direction) 60 mm below horizontal (H)
   (Horizontal direction) 15° sloping section intersects the vertical line (V)

   NOTE: The illustration shows LH drive vehicles. For RH drive vehicles, it is symmetrical.

⚠ CAUTION
Be sure to adjust the aiming adjustment screw in the tightening direction.





5. Alternately turn the adjusting screw to adjust the headlamp aiming.

HEADLAMP INTENSITY MEASUREMENT

M1542001000583

Using a photometer, and following its manufacture's instruction manual, measure the headlamp intensity and check to be sure that the limit value is satisfied.

Limit: 30,000 cd or more

NOTE:

1. *When measuring the intensity, maintain an engine speed of 2,000 r/min, with the battery in the charging condition.*
2. *There may be special local regulations pertaining to headlamp intensity, be sure to make any adjustments necessary to satisfy such regulations.*
3. *If an illuminometer is used to make the measurements, convert its values to photometer values by using the following formula.*

   $I = Er^2$ Where:

   I=intensity (cd)

   E=illumination (lux)

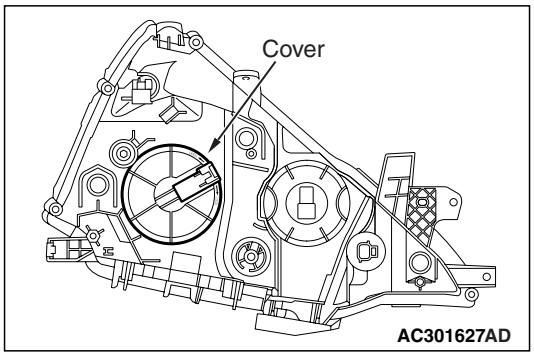
   r=distance (m) from headlamps to illuminometer

BULB REPLACEMENT

M1542001300874

HEADLAMP BULB <LOW-BEAM> REPLACEMENT <VEHICLES WITHOUT DISCHARGE HEADLAMP>

1. Disconnect the connector.



2. Twist the cover to remove.
3. Withdraw the socket from the bulb.

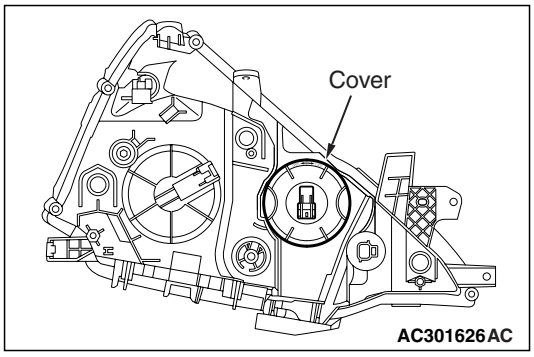
⚠ CAUTION

Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.

4. Remove the spring to withdraw the bulb.

HEADLAMP BULB <HIGH-BEAM> REPLACEMENT

1. Disconnect the connector.



2. Twist the cover to remove.

⚠ CAUTION

Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.

3. Twist the socket to remove.

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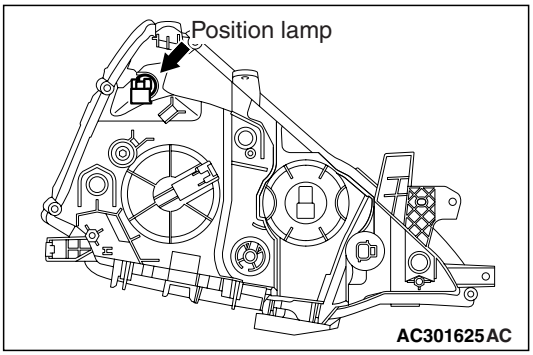
POSITION LAMP BULB REPLACEMENT

⚠ CAUTION

Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.

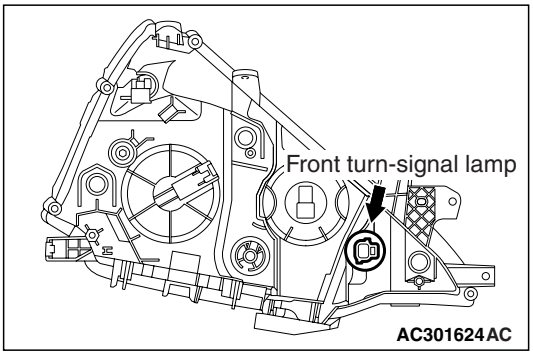


Disconnect the connector, and twist the position lamp socket to remove it.

FRONT TURN-SIGNAL LAMP BULB REPLACEMENT

⚠ CAUTION

Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.



Disconnect the connector, and twist the front turn-signal lamp socket to remove it.

INSPECTION OF HEADLAMP AUTOMATIC-SHUTDOWN FUNCTION <EXCEPT VEHICLES FOR AUSTRALIA AND NEW ZEALAND>

M1542014800017

Confirm that the headlamp turns off when the ignition switch is ON and the driver's door is opened and when the ignition key is pulled out with the lighting switch at ON (HEAD) position and the driver's door is opened. If any malfunction occurs, diagnose SWS. (Refer to GROUP 54B, Troubleshooting P.54B-239 or GROUP 54C, Troubleshooting P.54C-224 or GROUP 54D, Troubleshooting P.54D-204 or GROUP 54E, Troubleshooting P.54E-200)

INSPECTION OF AUTO LAMP FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE>

M1542014900014

Verify that the headlamp will illuminate when placing a hand over the receiver of the photo sensor with the lighting switch in the auto lamp position. If not, carry out the troubleshooting. (Refer to GROUP 54D, Troubleshooting P.54D-206 or GROUP 54E, TroubleshootingP.54E-202).

INSPECTION OF AUTO LAMP LINKED WITH WIPER FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE>

M1542015000014

Verify that the headlamp will illuminate when the wiper switch is turned to the INT, LO, or HI position with the lighting switch in the auto lamp position. If not, carry out the troubleshooting. (Refer to GROUP 54D, Troubleshooting P.54D-207 or GROUP 54E, TroubleshootingP.54E-204).

NOTE: In initial setting, the auto lamp linked with wiper function is disabled. Therefore, verify that the function is enabled. (Refer to GROUP 54E, On-vehicle Service P.54E-353)

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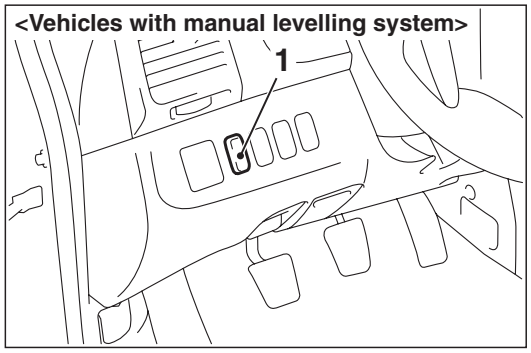
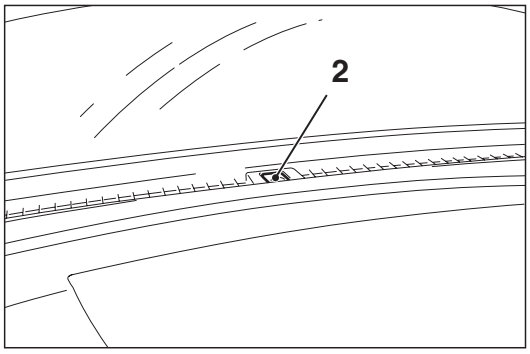
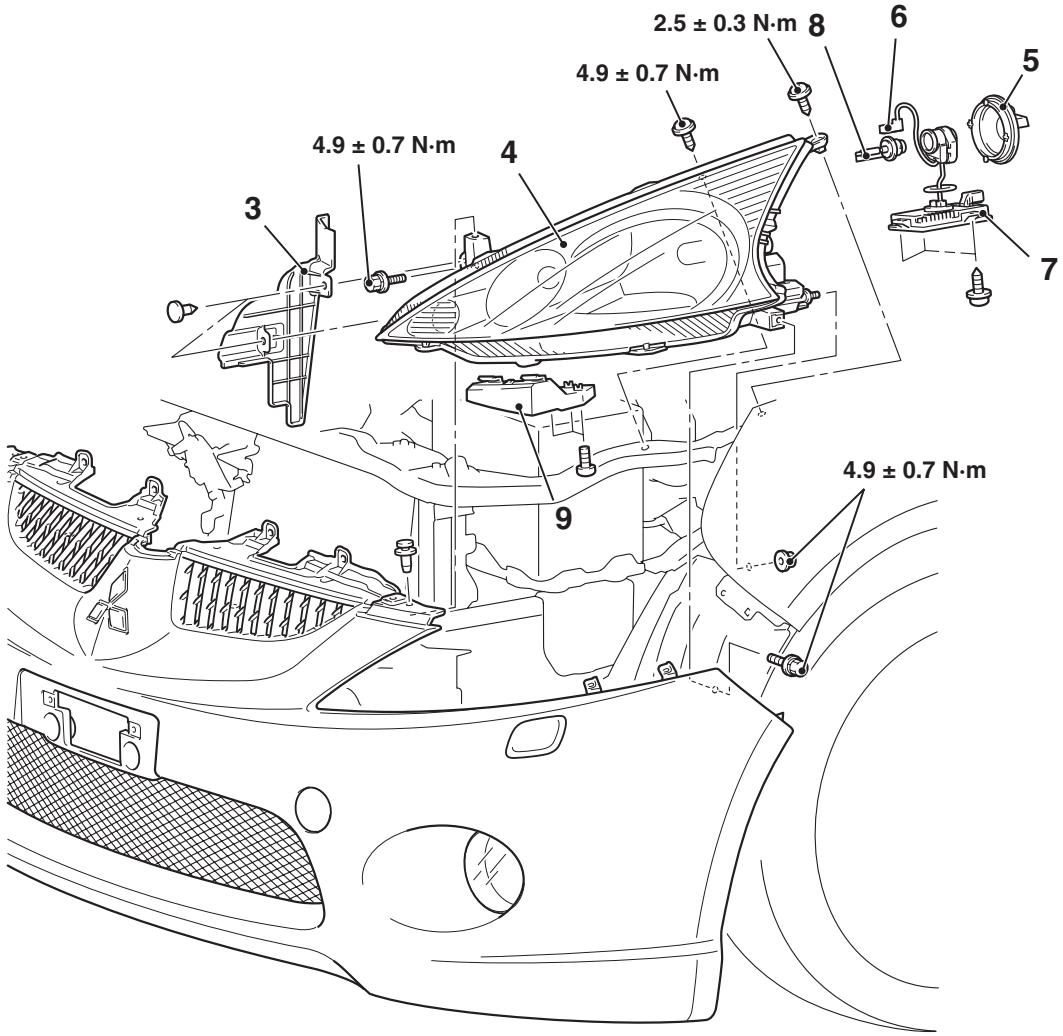
HEADLAMP

REMOVAL AND INSTALLATION

M1542001800589







AC313545AC

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Headlamp levelling switch removal steps <Vehicles with manual levelling system>

- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Headlamp levelling switch

Photo sensor removal steps

2. Photo sensor (Refer to GORUP 55, Photo Sensor and Interior Temperature Sensor P.55-225).

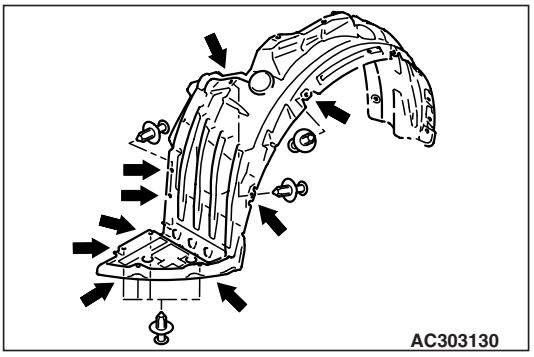
<<A>>

Headlamp removal steps

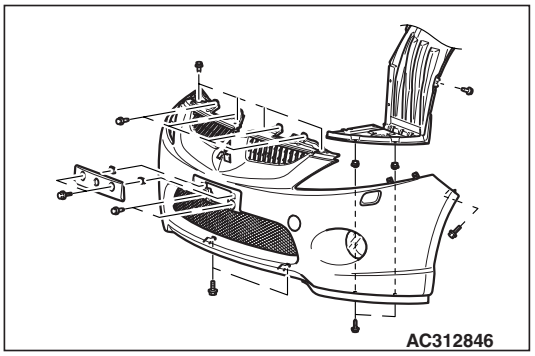
3. Air guide panel
4. Headlamp assembly
5. Headlamp bulb socket cover <Vehicles with discharge headlamp>
6. Connector <Vehicles with discharge headlamp>
7. Headlamp control unit <Vehicles with discharge headlamp>
8. Air guide panel
9. Headlamp bracket

REMOVAL SERVICE POINTS

<<A>> HEADLAMP ASSEMBLY REMOVAL



1. Remove the splash shield assembling clips as shown.

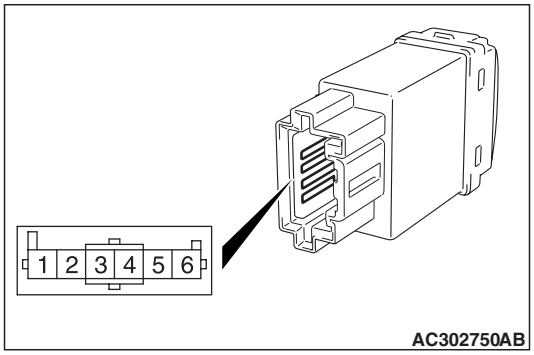


2. Remove the front bumper assembling bolts and clips as shown.
3. Remove the headlamp assembly by sliding out the front bumper.

INSPECTION

M1542011202164

HEADLAMP LEVELLING SWITCH CHECK <VEHICLES WITH MANUAL LEVELLING SYSTEM>



Tester connection	Switch position	Resistance value Ω
4 – 6	0	750
	1	1, 050
	2	1, 410
	3	1, 710
	4	2, 010
5 – 6	0, 1, 2, 3, 4	2, 830

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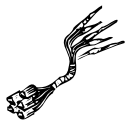
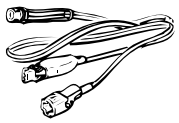
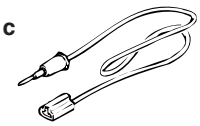
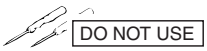
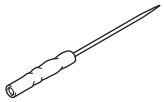
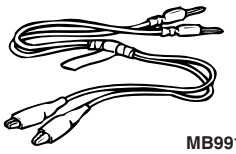
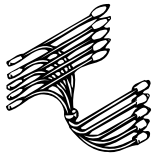
HEADLAMP AUTOMATIC LEVELLING SYSTEM <Vehicles for Hong Kong and Singapore>

SPECIAL TOOL

M1542000601983

Tool	Number	Name	Application
a  b  c  d  MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222	Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector
 MB991529	MB991529	Diagnosis code check harness	• Diagnosis code reading • Levelling motor drive test
 MB991658	MB991658	Test harness	Height sensor check

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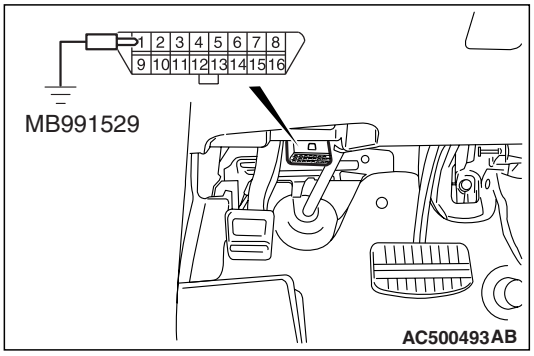
TROUBLESHOOTING

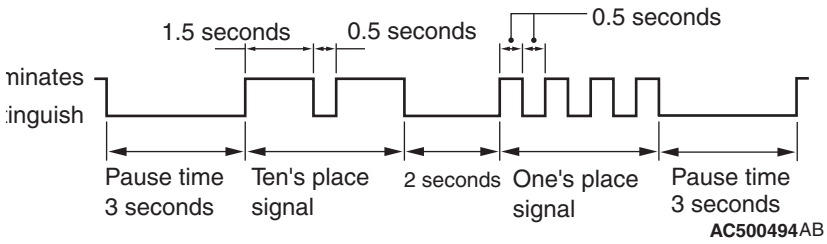
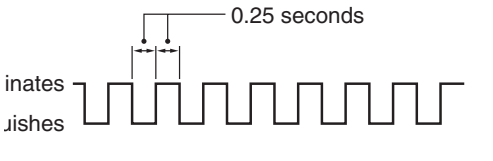
DIAGNOSTIC FUNCTION

M1542009000026

DIAGNOSIS CODE READING METHOD



1. Using the special tool diagnosis code check harness (MB991529), earth diagnosis connector terminal No. 1 (diagnosis control terminal).
2. Turn the ignition switch to the ON position.
3. After elapsing 10 seconds or more, the headlamp automatic levelling warning lamp blinks. Then, read the diagnosis code.

Example of warning lamp blink when diagnosis code No. 24 is set	The warning lamp blink under normal conditions
	

DIAGNOSIS CODE CHART

M1542010700030

⚠ CAUTION

On troubleshooting, if the ignition switch is turned ON while disconnecting connector(s), diagnosis code(s) associated with other system may be set. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Diagnosis code No.	Diagnostic item	Reference page
21	Malfunction of the height sensor (Rear)	P.54A-113
22	Malfunction of the height sensor (Front)	P.54A-115
23	Height sensor power supply line short to earth	P.54A-117
24	Pitch angle abnormality	P.54A-121
31	Malfunction of the levelling unit	P.54A-123

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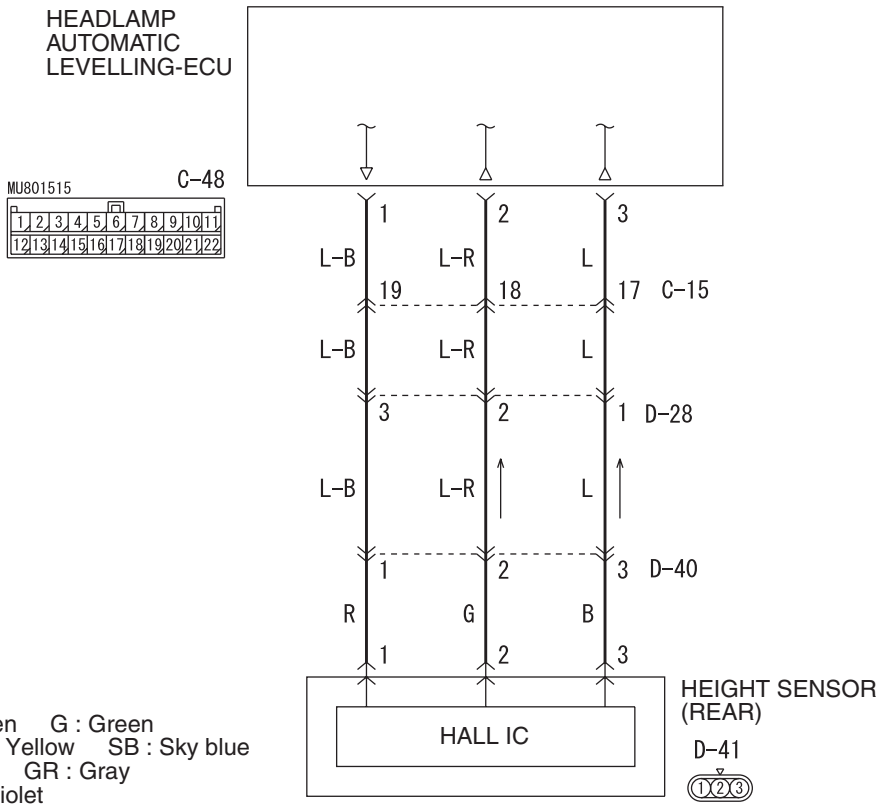
DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.21 Malfunction of the height sensor (Rear)

Height Sensor (Rear) Circuit



Wire colour code
B : Black LG : Light green G : Green
L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray
R : Red P : Pink V : Violet

AC503819AB

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

When the headlamp automatic levelling ECU receives an abnormal voltage signal from the rear height sensor, diagnosis code No. 21 is set.

COMMENTS ON TROUBLE SYMPTOM

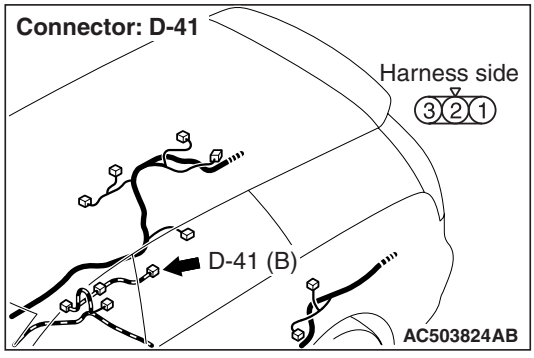
The rear height sensor, the headlamp automatic levelling ECU, or wiring harness and connectors between the two may be defective.

PROBABLE CAUSES

- Malfunction of the rear height sensor
- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Connector check: D-41 Rear height sensor connector



Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

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STEP 2. Check the rear height sensor.

Check that the rear height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?

YES : Go to Step 3.

NO : Replace the rear height sensor.

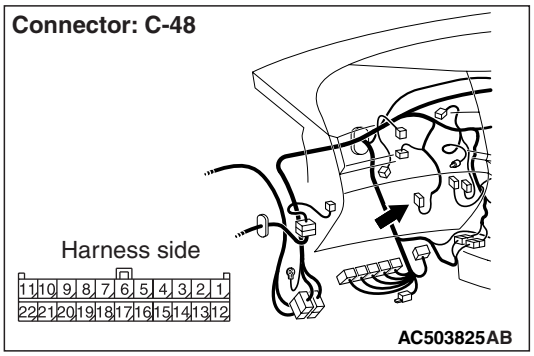
STEP 3. Check whether the diagnosis code is reset.

Q: Is diagnosis code No.21 set?

YES : Go to Step 4.

NO : The diagnosis is complete.

STEP 4. Connector check: C-48 Headlamp automatic levelling ECU connector

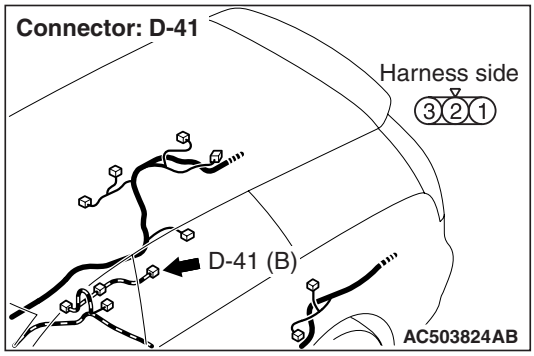


Q: Is the check result normal?

YES : Go to Step 5.

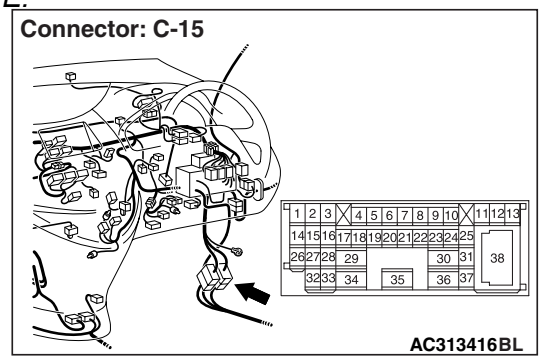
NO : Repair the defective connector.

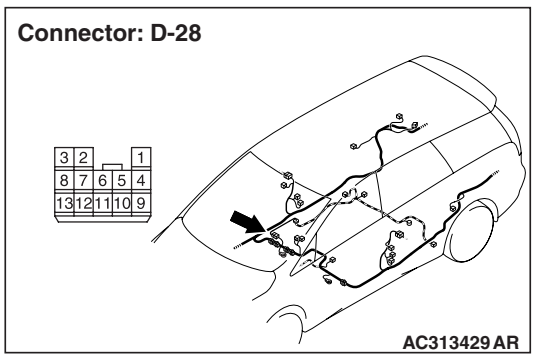
STEP 5. Check the wiring harness from D-41 rear height sensor connector terminal Nos. 1, 2 and 3 to C-48 headlamp automatic levelling ECU connector terminal Nos. 1, 2 and 3.

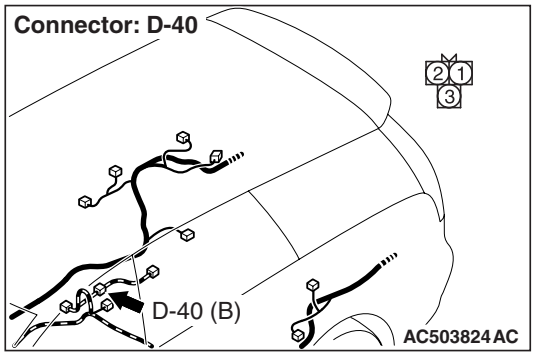


- Check the power supply lines, earth lines and communication lines for open circuit.

NOTE:







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Prior to the wiring harness inspection, check intermediate connectors C-15, D-28, D-40, and repair if necessary.

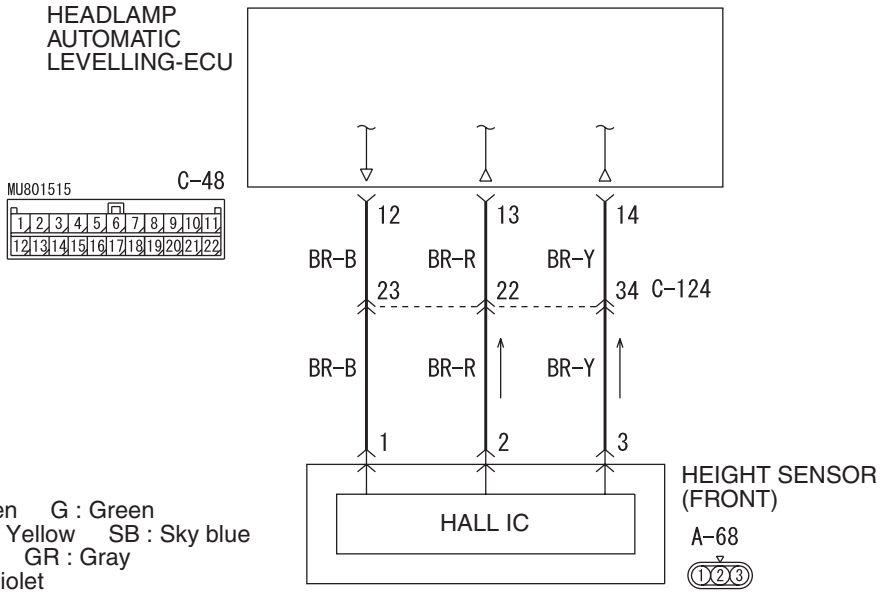
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Check whether the diagnosis code is reset.

Q: Is diagnosis code No.21 set?
YES : Replace the headlamp automatic levelling ECU.
NO : A poor connection, open circuit, or other intermittent malfunctions between the rear height sensor and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

Code No.22 Malfunction of the height sensor (Front)

Height Sensor (Front) Circuit



Wire colour code
B : Black LG : Light green G : Green
L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray
R : Red P : Pink V : Violet

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⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

When the headlamp automatic levelling ECU receives an abnormal voltage signal from the front height sensor, diagnosis code No. 22 is set.

COMMENTS ON TROUBLE SYMPTOM

The front height sensor, the headlamp automatic levelling ECU, or wiring harness and connectors between the two may be defective.

PROBABLE CAUSES

- Malfunction of the front height sensor
- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

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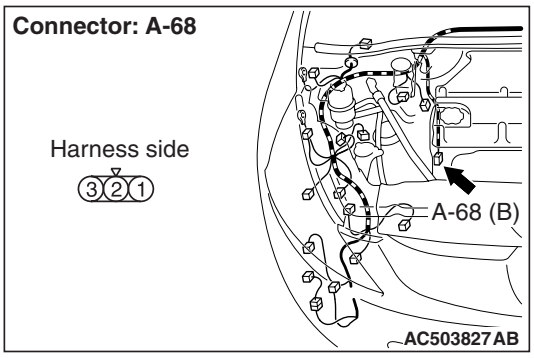
DIAGNOSTIC PROCEDURE

STEP 1. Connector check: A-68 Front height sensor connector



Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Check the front height sensor.

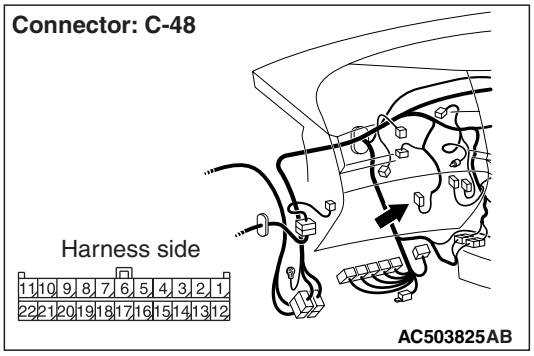
Check that the front height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the front height sensor.

STEP 3. Check whether the diagnosis code is reset.

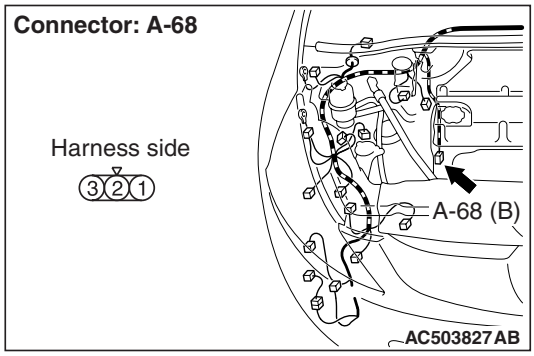
Q: Is diagnosis code No. 22 set?
YES : Go to Step 4.
NO : The diagnosis is complete.

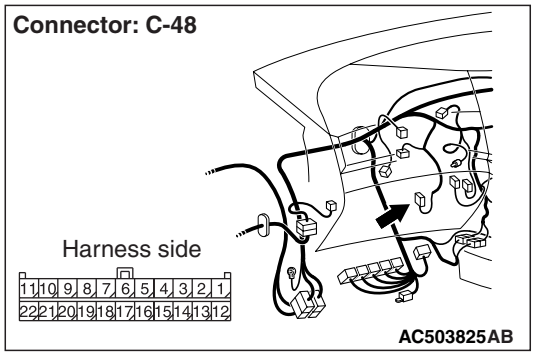
STEP 4. Connector check: C-48 Headlamp automatic levelling ECU connector



Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

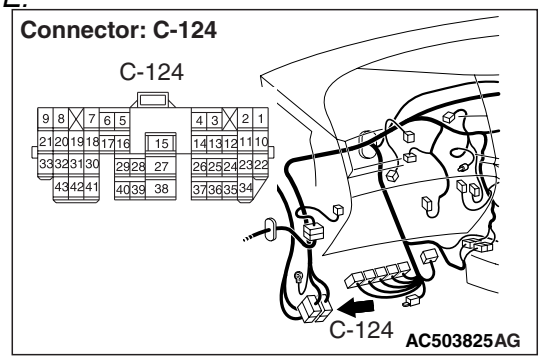
STEP 5. Check the wiring harness from A-68 front height sensor connector terminal Nos. 1, 2 and 3 to C-48 headlamp automatic levelling ECU connector terminal Nos. 12, 13 and 14.





- Check the power supply lines, earth lines and communication lines for open circuit.

NOTE:



Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

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STEP 6. Check whether the diagnosis code is reset.

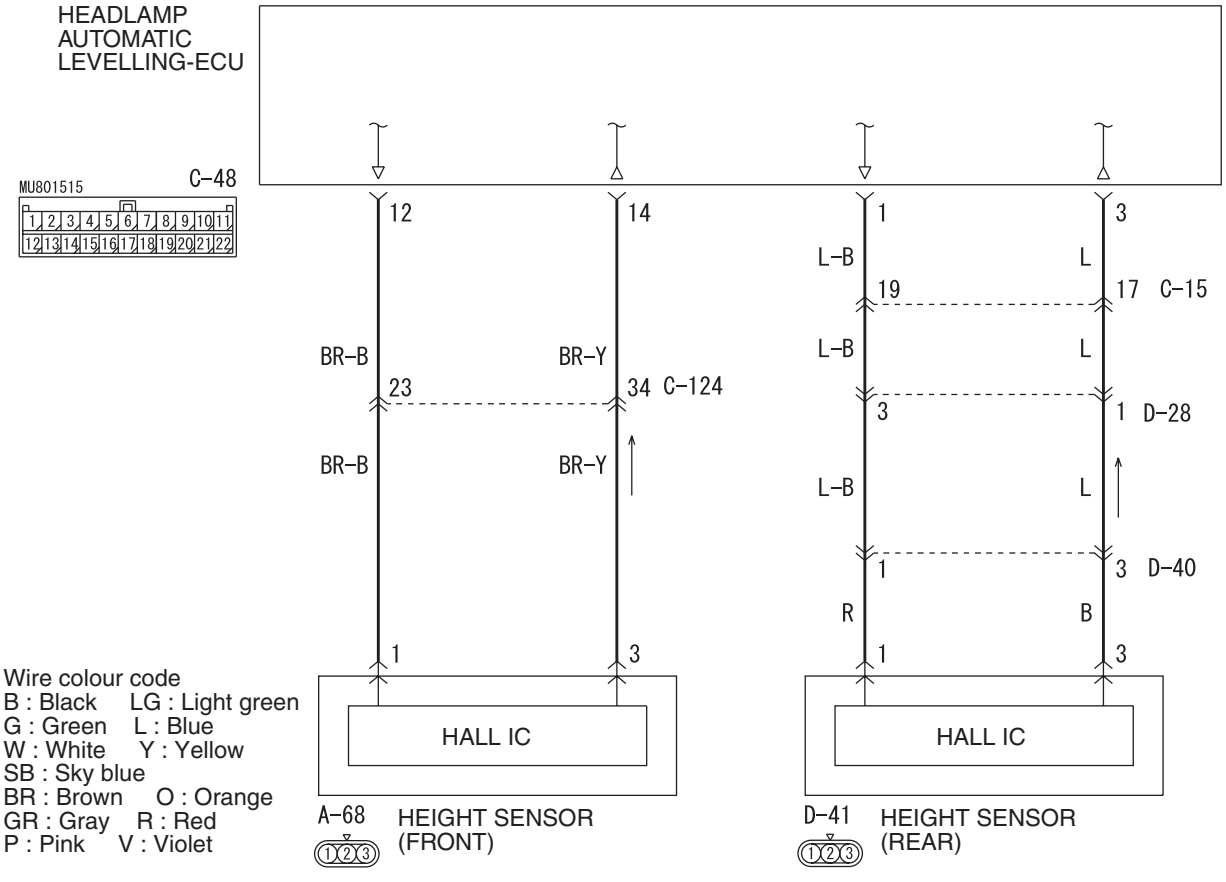
Q: Is diagnosis code No. 22 set?

YES : Replace the headlamp automatic levelling ECU.

NO : A poor connection, open circuit, or other intermittent malfunctions between the front height sensor and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

Code No. 23 Height sensor power supply short to earth

Height Sensor Power Supply Circuit



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⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

If the front height sensor, rear height sensor power supply, or earth line is short-circuited, diagnosis code No. 23 is set.

COMMENTS ON TROUBLE SYMPTOM

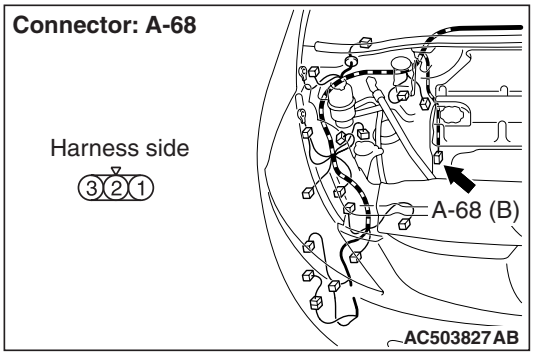
The front height sensor, the rear height sensor, the headlamp automatic levelling ECU, or wiring harness and connectors between the front/rear height sensor and the headlamp automatic levelling ECU may be defective.

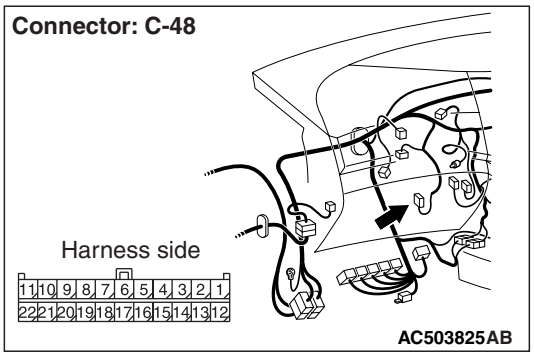
PROBABLE CAUSES

- Malfunction of the front height sensor
- Malfunction of the rear height sensor
- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

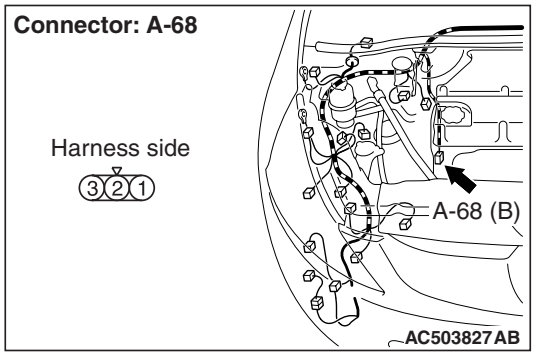
STEP 1. Connector check: A-68 Front height sensor connector, C-48 headlamp automatic levelling ECU connector

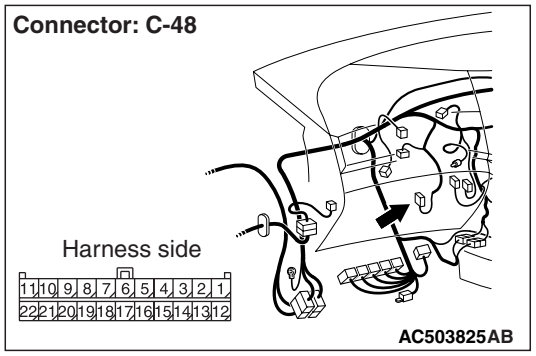




Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

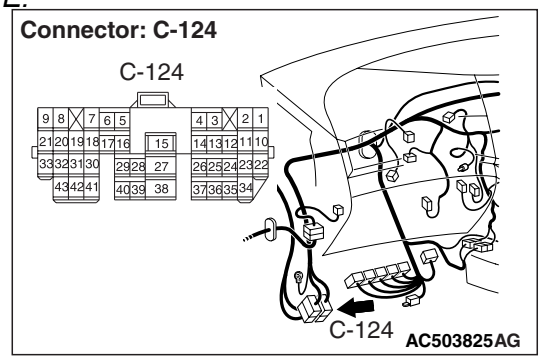
STEP 2. Check the wiring harness from A-68 front height sensor connector terminal Nos. 1 and 3 to C-48 headlamp automatic levelling ECU connector terminal Nos. 12 and 14.





- Check the power supply lines and the earth lines for short circuit.

NOTE:



Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the wiring harness.

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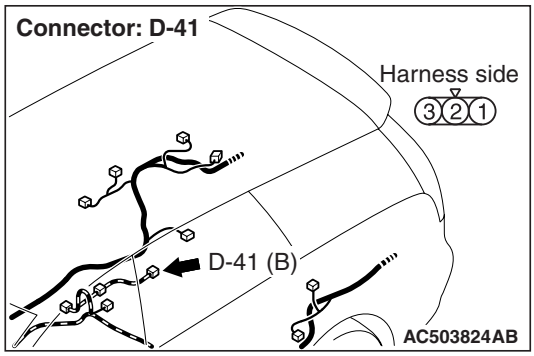
STEP 3. Check whether the diagnosis code is reset.

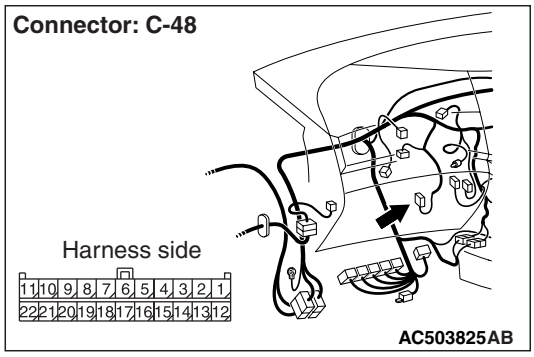
Q: Is diagnosis code No. 23 set?

YES : Go to Step 4.

NO : A poor connection, open circuit, or other intermittent malfunctions between the front height sensor and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

STEP 4. Connector check: D-41 Rear height sensor connector, C-48 headlamp automatic levelling ECU connector





Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the defective connector.

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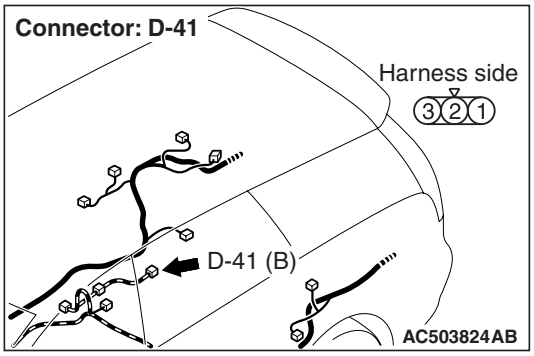
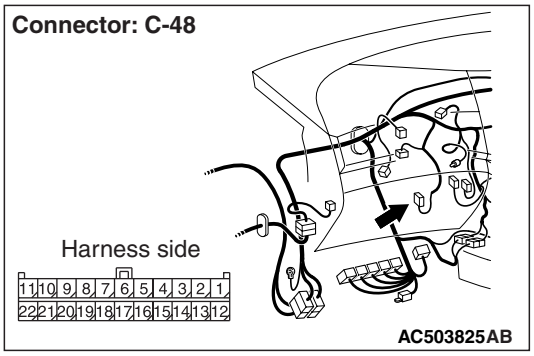
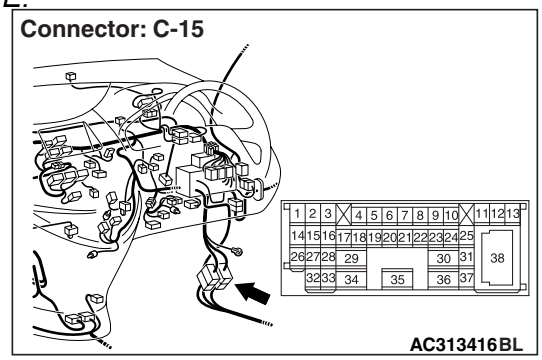
STEP 5. Check the wiring harness from D-41 rear height sensor connector terminal Nos. 1 and 3 to C-48 headlamp automatic levelling ECU connector terminal Nos. 1 and 3.

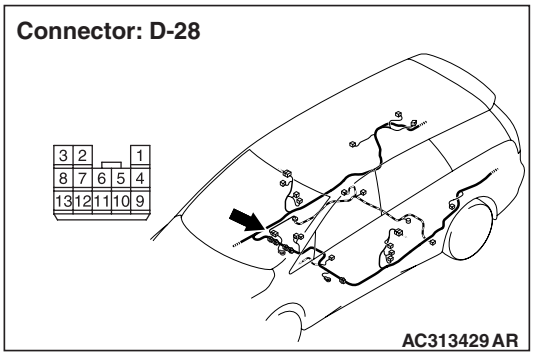


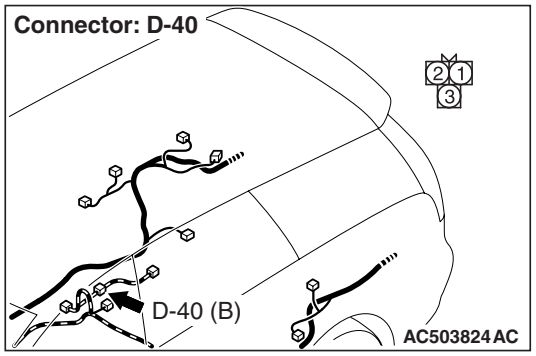


- Check the power supply lines and the earth lines for short circuit.

NOTE:







Prior to the wiring harness inspection, check intermediate connectors C-15, D-28, D-40, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 23 set?
YES : Go to Step 7.
NO : A poor connection, open circuit, or other intermittent malfunctions between the rear height sensor and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

STEP 7. Check the front height sensor.
Check that the front height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?
YES : Go to Step 8.
NO : Replace the front height sensor.

STEP 8. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 23 set?
YES : Go to Step 9.
NO : The diagnosis is complete.

STEP 9. Check the rear height sensor.
Check that the rear height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?
YES : Go to Step 10.
NO : Replace the rear height sensor.

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STEP 10. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 23 set?
YES : Replace the headlamp automatic levelling ECU.
NO : The diagnosis is complete.

Code No. 24 Pitch angle abnormality

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The headlamp automatic levelling ECU receives a vehicle height signal from the front and rear height sensors and calculates the headlamp levelling pitch angle. If an abnormal pitch angle is calculated, diagnosis code No.24 is set.

COMMENTS ON TROUBLE SYMPTOM

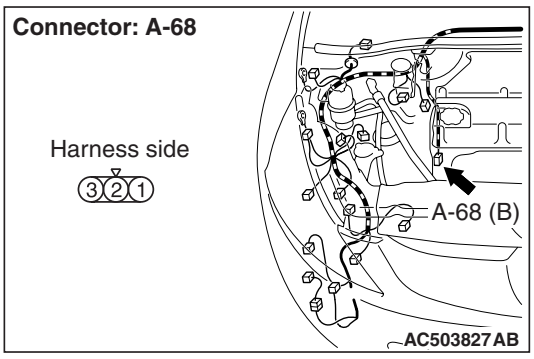
The front height sensor, the rear height sensor or the headlamp automatic levelling ECU may be defective.

PROBABLE CAUSES

- Malfunction of the front height sensor
- Malfunction of the rear height sensor
- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Connector check: A-68 Front height sensor connector



Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

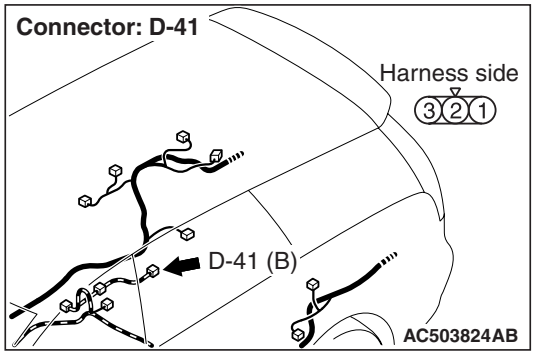
STEP 2. Check the front height sensor.
Check that the front height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the front height sensor.

STEP 3. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 24 set?
YES : Go to Step 4.
NO : The diagnosis is complete.

STEP 4. Connector check: D-41 Rear height sensor connector



Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

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STEP 5. Check the rear height sensor.

Check that the rear height sensor works normally (Refer to P.54A-145).

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the rear height sensor.

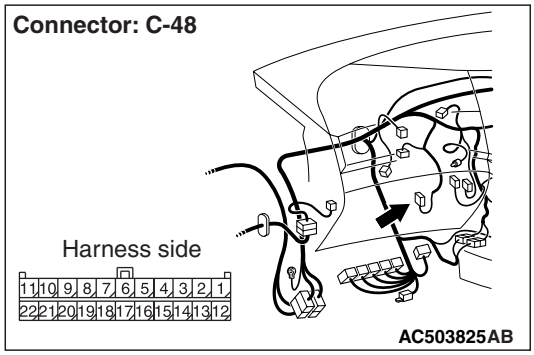
STEP 6. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 24 set?

YES : Go to Step 7.

NO : The diagnosis is complete.

STEP 7. Connector check: C-48 Headlamp automatic levelling ECU connector



Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair the defective connector.

STEP 8. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 24 set?

YES : Replace the headlamp automatic levelling ECU.

NO : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

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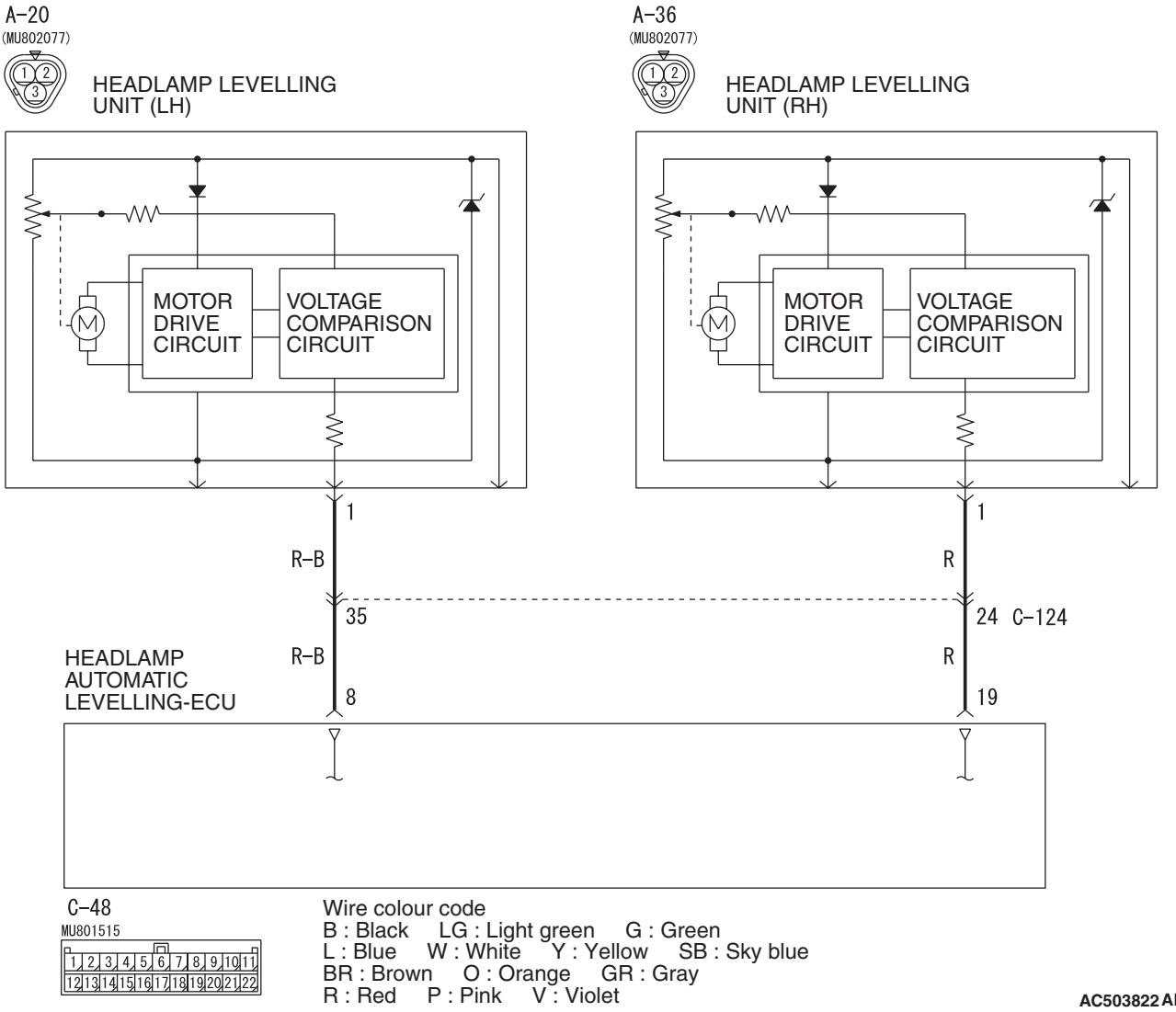
Code No.31 Defective levelling unit

Headlamp levelling Unit Circuit



⚠ CAUTION

Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

If the headlamp levelling unit signal line is short-circuited, diagnosis code No. 31 is set.

COMMENTS ON TROUBLE SYMPTOM

The headlamp assembly (headlamp levelling unit), the headlamp automatic levelling ECU, or wiring harness and connectors between the two may be defective.

PROBABLE CAUSES

- Malfunction of the headlamp levelling unit
- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

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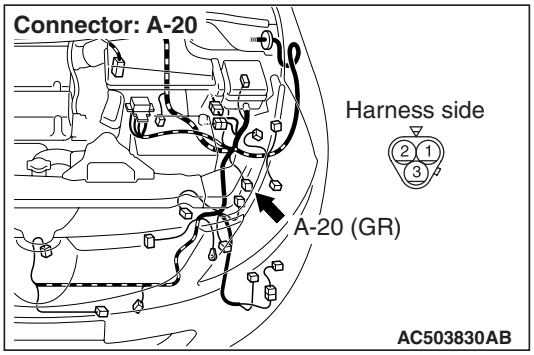
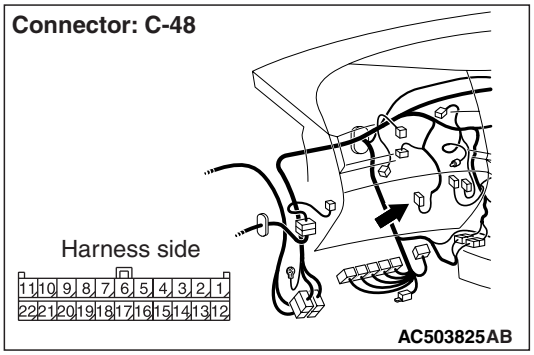
DIAGNOSTIC PROCEDURE

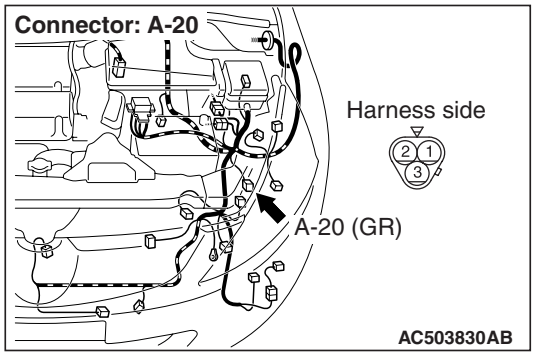
STEP 1. Connector check: A-20 Headlamp levelling unit (LH) connector, C-48 headlamp automatic levelling ECU connector

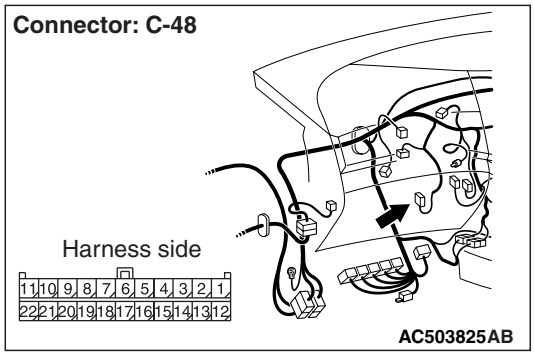




Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

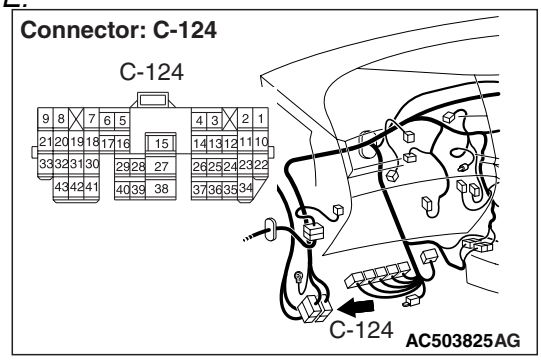
STEP 2. Check the wiring harness between A-20 headlamp levelling unit (LH) connector terminal No. 1 and C-48 headlamp automatic levelling ECU connector terminal No. 8.





- Check the signal lines for open circuit and short circuit.

NOTE:



Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the wiring harness.

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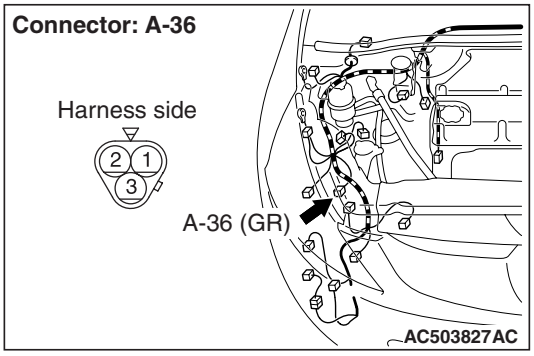
STEP 3. Check whether the diagnosis code is reset.

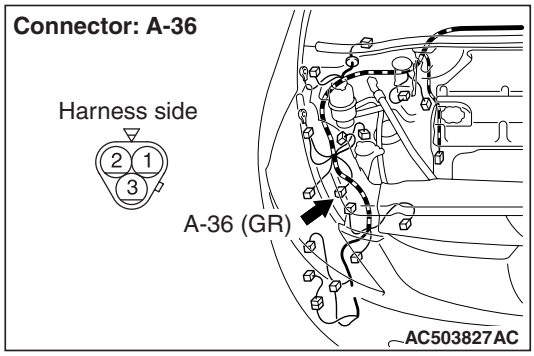
Q: Is diagnosis code No. 31 set?
YES : Go to Step 4.
NO : A poor connection, open circuit, or other intermittent malfunctions between the headlamp levelling unit (LH) and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

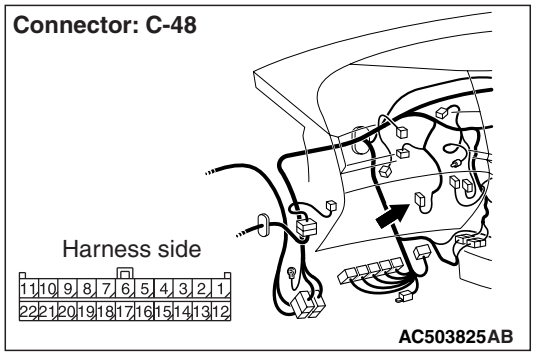
STEP 4. Connector check: A-36 Headlamp levelling unit (RH) connector



Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

STEP 5. Check the wiring harness between A-36 headlamp levelling unit (RH) connector terminal No. 1 and C-48 headlamp automatic levelling ECU connector terminal No. 19.





- Check the signal lines for open circuit and short circuit.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Check whether the diagnosis code is reset.

Q: Is diagnosis code No. 31 set?
YES : Go to Step 7.
NO : A poor connection, open circuit, or other intermittent malfunctions between the headlamp levelling unit and the headlamp automatic levelling ECU. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

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STEP 7. Check whether the diagnosis code is reset.

Replace the headlamp assembly (LH), and then check again if diagnosis code No.31 is set.

Q: Is diagnosis code No. 31 set?

YES : Go to Step 8.

NO : The diagnosis is complete.

STEP 8. Check whether the diagnosis code is reset.

Replace the headlamp assembly (RH), and then check again if diagnosis code No.31 is set.

Q: Is diagnosis code No. 31 set?

YES : Replace the headlamp automatic levelling ECU.

NO : The diagnosis is complete.

TROUBLE SYMPTOM CHART

M1542009100250

Trouble symptom	Inspection procedure number	Reference page
The diagnosis code is not set.	1	P.54A-127
Neither right nor left automatic levelling operates.	2	P.54A-130
Either automatic levelling does not operate.	3	P.54A-133
The headlamp automatic levelling warning lamp does not illuminate.	4	P.54A-137
The headlamp automatic levelling warning lamp does not go out.	5	P.54A-140

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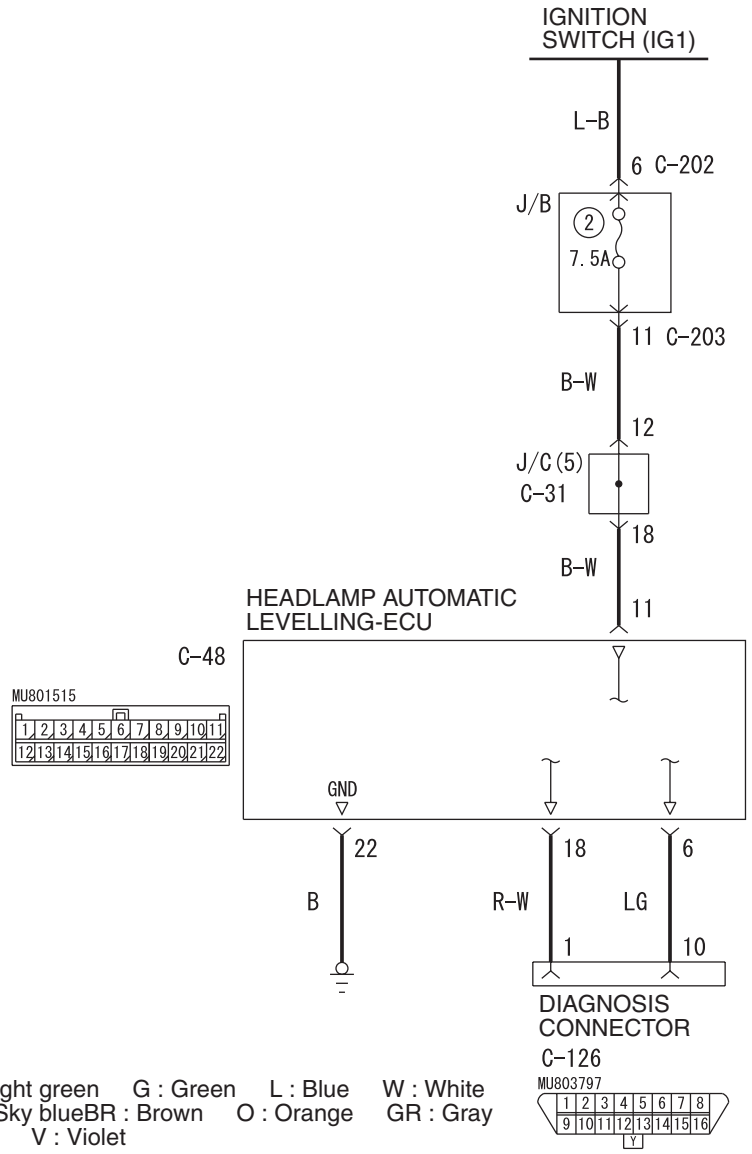
SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The diagnosis code is not set.

Diagnosis Connector Communication Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White
Y : Yellow SB : Sky blueBR : Brown O : Orange GR : Gray
R : Red P : Pink V : Violet

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⚠ CAUTION
Whenever the ECU is replaced, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

COMMENTS ON TROUBLE SYMPTOM

If neither normal nor abnormal diagnosis code is set, the headlamp automatic levelling ECU, the headlamp automatic levelling ECU power supply, wiring harness or connectors of earth, or wiring harness and connectors between the headlamp automatic levelling ECU and diagnosis connector may be defective.

PROBABLE CAUSES

- Malfunction of the headlamp automatic levelling ECU
- Damaged wiring harness and connectors

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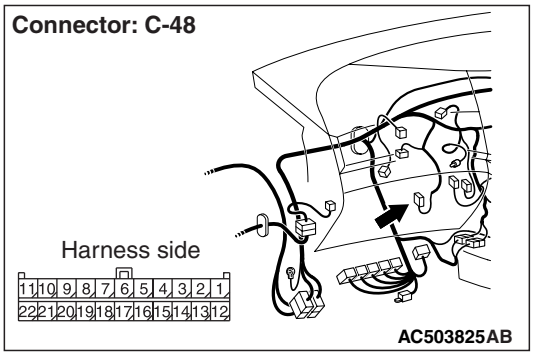
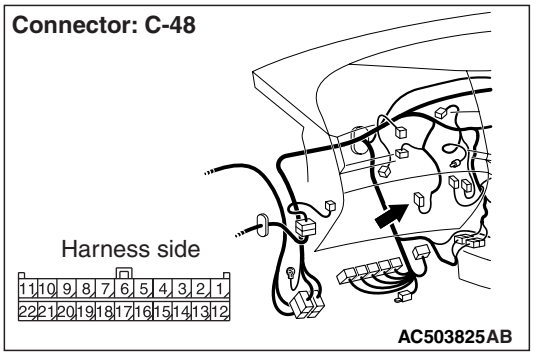
DIAGNOSTIC PROCEDURE

STEP 1. Connector check: C-48 Headlamp automatic levelling ECU connector

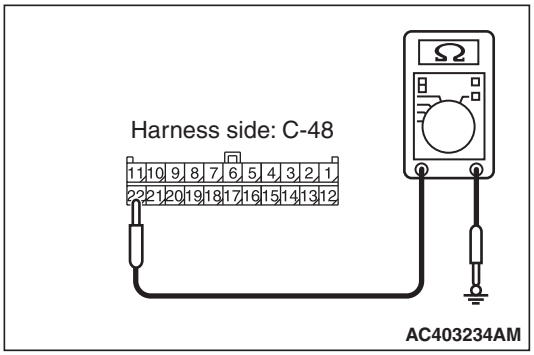


Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Measure the resistance at the C-48 headlamp automatic levelling ECU connector.



(1) Disconnect the connector, and measure the resistance at the wiring harness-side connector.

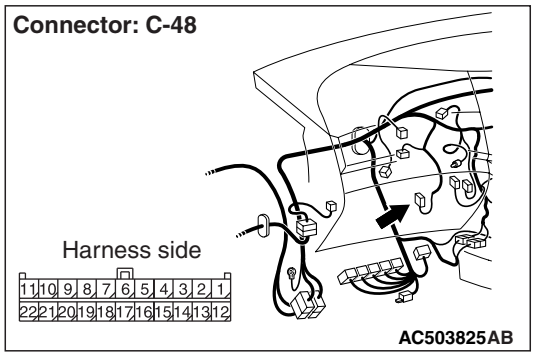


(2) Measure the resistance between C-48 headlamp automatic levelling ECU connector terminal No. 22 and body earth.

OK: 2Ω or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

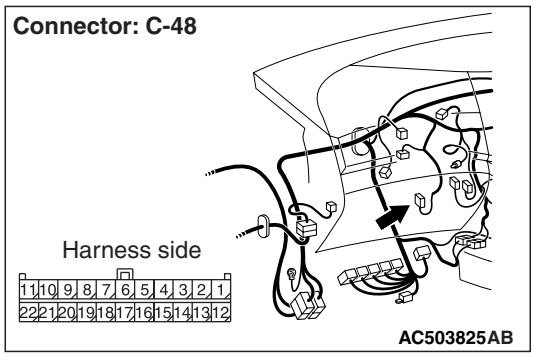
STEP 3. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No.22 and body earth.



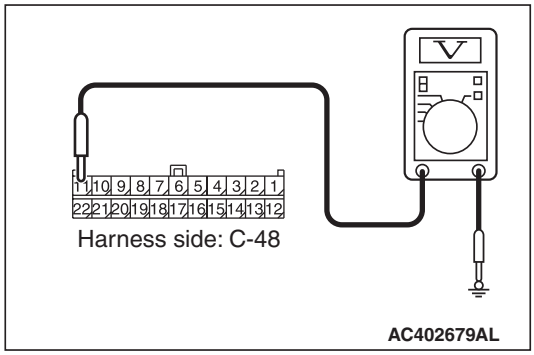
- Check the earth wires for open circuit.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Measure the voltage at the C-48 headlamp automatic levelling ECU connector.



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



(3) Measure the voltage between C-48 headlamp automatic levelling ECU connector terminal No. 11 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

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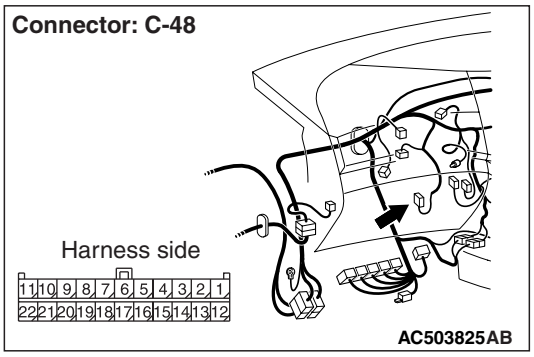
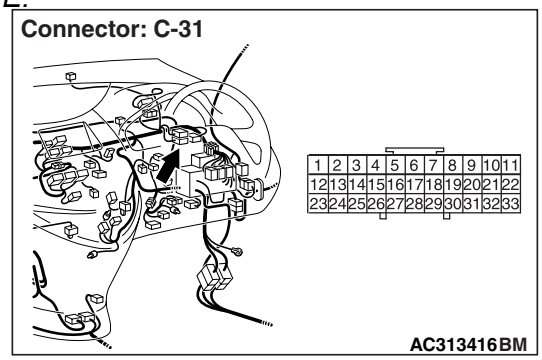
STEP 5. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No.11 and fusible link (2).



NOTE:

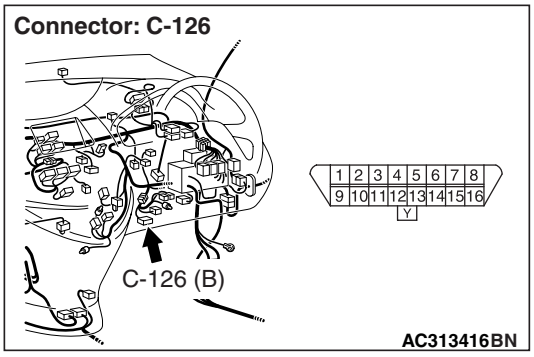


Prior to the wiring harness inspection, check joint connector C-31, and repair if necessary.

- Check the power supply line for open circuit and short circuit.

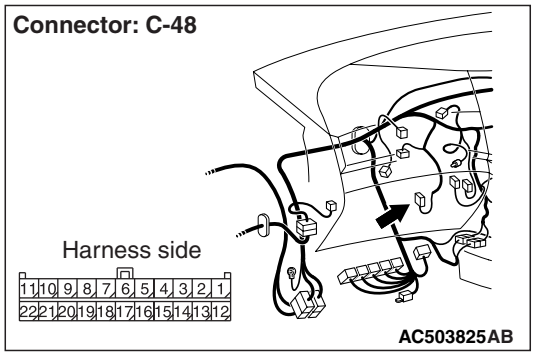
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

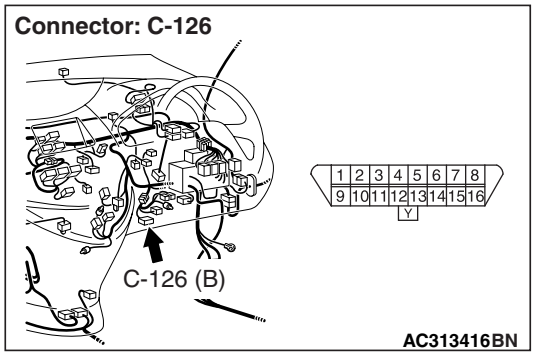
STEP 6. Connector check: C-126 Diagnosis connector



Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

STEP 7. Check the wiring harness from C-48 headlamp automatic levelling ECU connector terminal Nos. 18 and 6 to C-126 diagnosis connector terminal Nos. 1 and 10.





- Check the communication lines for open circuit and short circuit.

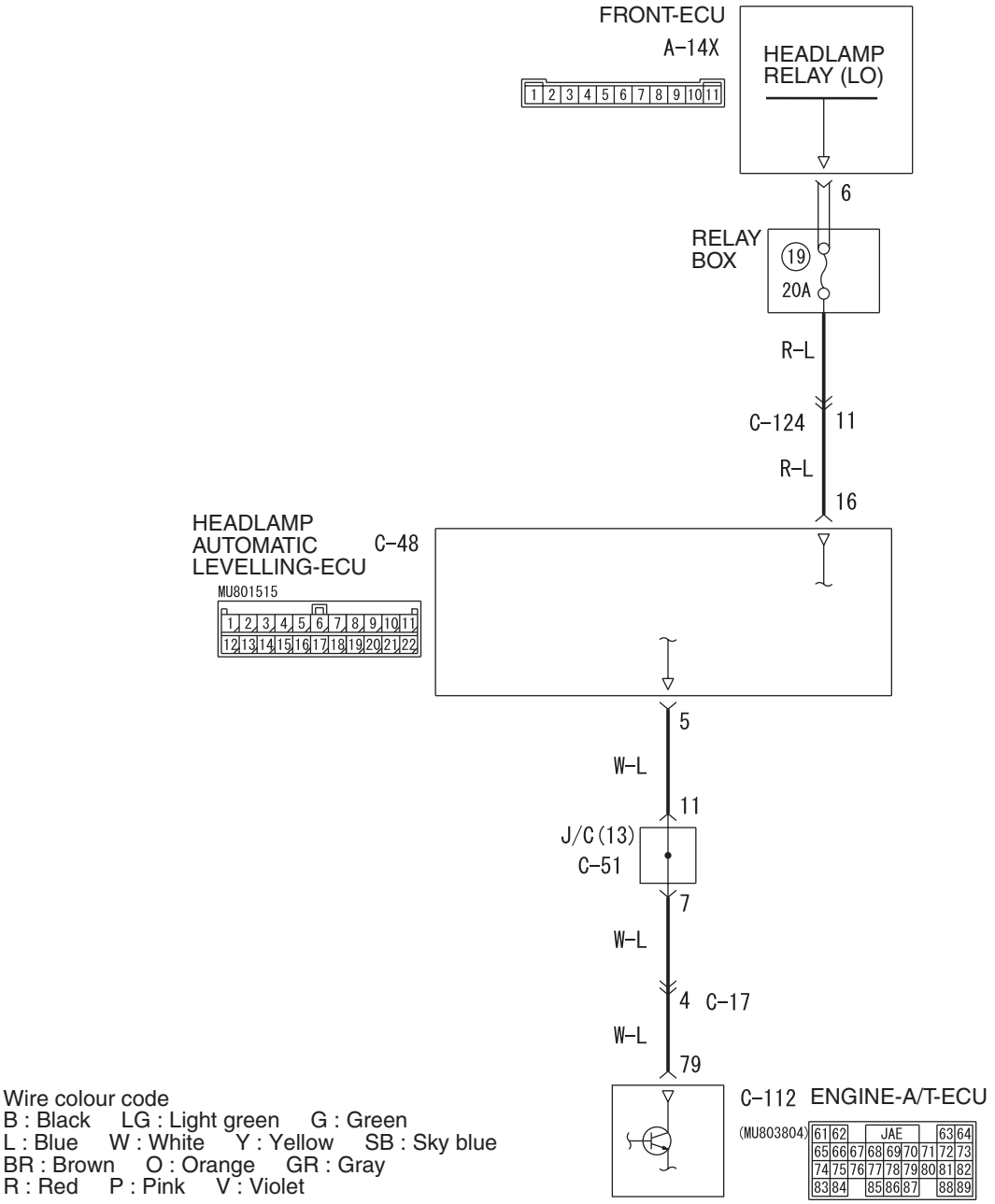
Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the wiring harness.

STEP 8. Retest the system.
Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.54A-126.
NO : Replace the headlamp automatic levelling ECU.

INSPECTION PROCEDURE 2: Neither right nor left automatic levelling operates.

Headlamp Relay (LO) Signal and Vehicle Speed Signal Circuit



Wire colour code
B : Black LG : Light green G : Green
L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray
R : Red P : Pink V : Violet

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⚠ CAUTION
Whenever the ECU is replaced, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

OPERATION

When a vehicle is at a standstill or being driven at a constant speed for 12 seconds or more (except on rough road), the headlamp automatic levelling ECU inputs a headlamp LO relay signal, vehicle speed signal, and height signal for judgement and operates the levelling.

NOTE: The automatic levelling during driving at a constant speed operates only once after starting driving. The automatic levelling does not work if the vehicle pitch angle during driving at a constant speed and the vehicle pitch angle when the vehicle is stopped are the same.

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COMMENTS ON TROUBLE SYMPTOM

Assuming that the automatic levelling diagnosis code is not set, if neither right nor left automatic levelling operates, the headlamp automatic levelling ECU, wiring harness and connectors between the headlamp automatic levelling ECU and the front-ECU (headlamp relay: LO), the engine-A/T-ECU (vehicle signal abnormality), or wiring harness and connectors between the headlamp automatic levelling ECU and the engine-A/T-ECU may be defective.

PROBABLE CAUSES

- Malfunction of the headlamp automatic levelling ECU
- Malfunction of the engine-A/T-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the diagnosis code.

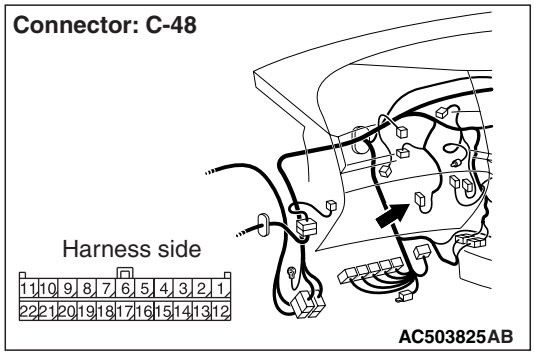
Q: Does the warning lamp blink normally?
YES : Go to Step 2.
NO : INSPECTION PROCEDURE 1 "Diagnosis code is not set." Refer to P.54A-127

STEP 2. M.U.T.-III Diagnosis code of other systems

Check whether the MPI system-related diagnosis code is set.

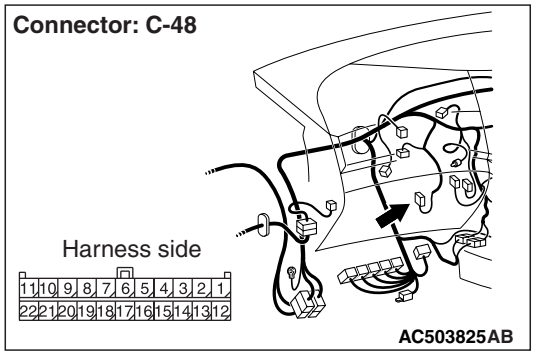
Q: Is the diagnosis code set?
YES : Diagnose the MPI system. (Refer to GROUP 13B – Troubleshooting P.13B-15.) After diagnosing the MPI system, go to Step 3.
NO : Go to Step 3.

STEP 3. Connector check: C-48 Headlamp automatic levelling ECU connector

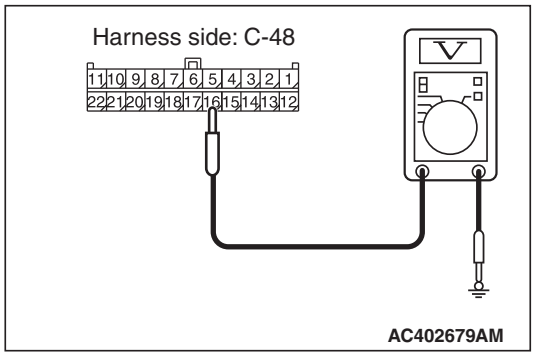


Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the defective connector.

STEP 4. Measure the voltage at the C-48 headlamp automatic levelling ECU connector.



(1) Disconnect the connector, and measure at the wiring harness-side connector.
(2) Turn ON the headlamp switch.

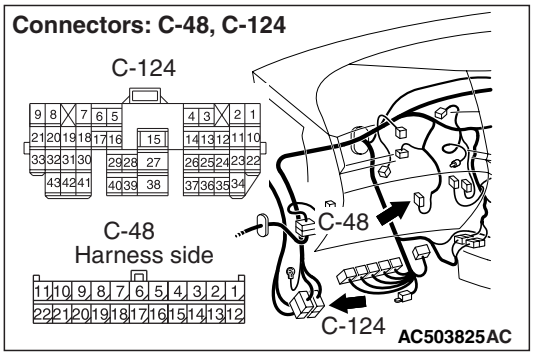


(3) Measure the voltage between C-48 headlamp automatic levelling ECU connector terminal No. 16 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No. 16 and front-ECU connector terminal No. 6.

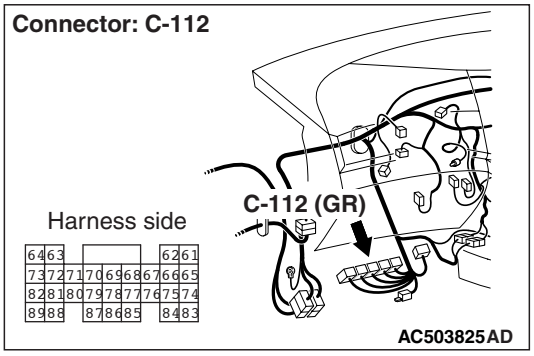


NOTE: Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.

- Check the communication lines for open circuit and short circuit.

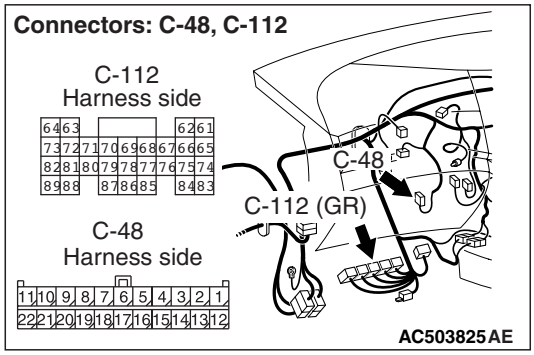
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Connector check: C-112 engine-A/T-ECU connector



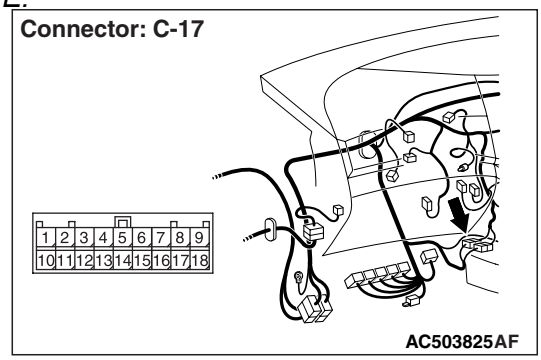
Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

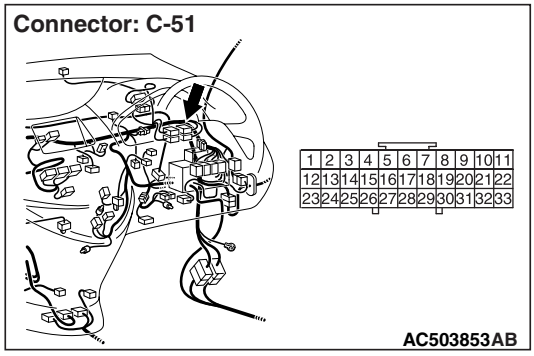
STEP 7. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No. 5 and C-112 engine-A/T-ECU connector terminal No. 79.



- Check the communication lines for open circuit.

NOTE:





Prior to the wiring harness inspection, check intermediate connector C-17 and joint connector C-51, and repair if necessary.

Q: Is the check result normal?
YES : . Go to Step 8.
NO : . Repair the wiring harness.

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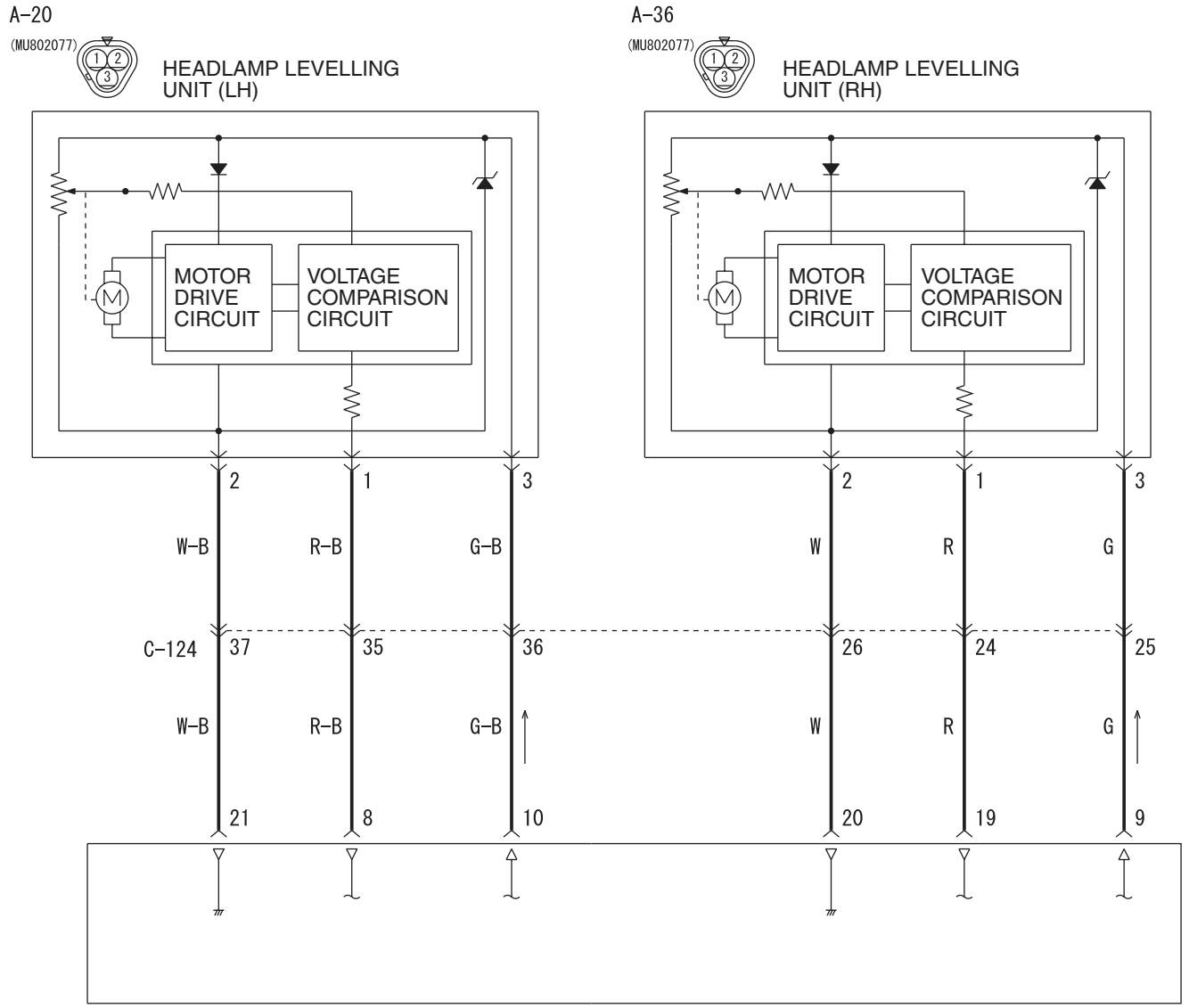
STEP 8. Retest the system.
Check that the automatic levelling operates normally.

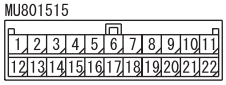
Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)
NO : Replace the headlamp automatic levelling ECU.

INSPECTION PROCEDURE 3: Either automatic levelling does not operate.

Headlamp Levelling Unit Circuit



HEADLAMP AUTOMATIC LEVELLING-ECU
C-48 MU801515



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White
Y : Yellow SB : Sky blueBR : Brown O : Orange GR : Gray
R : Red P : Pink V : Violet

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⚠ CAUTION
Whenever the ECU is replaced, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

COMMENTS ON TROUBLE SYMPTOM

If either automatic levelling does not operate, wiring harness and connectors between the headlamp automatic levelling ECU and the headlamp levelling unit or the headlamp assembly (headlamp levelling unit) may be defective.

PROBABLE CAUSES

- Malfunction of the headlamp assembly (headlamp levelling unit)
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Headlamp levelling unit check

Perform a levelling motor drive test of the headlamp levelling unit to check that the motor is driven. Refer to P.54A-141.

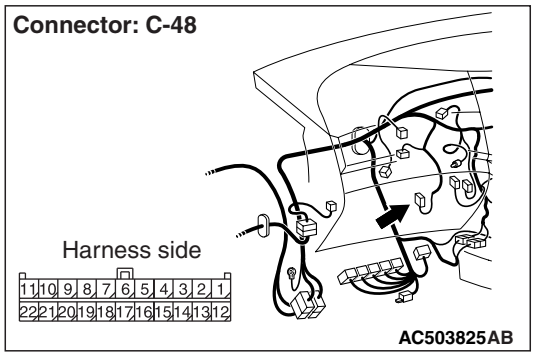
Q: Is the check result normal?

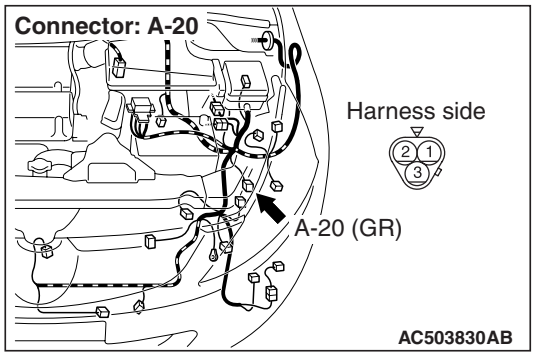
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

NO (The left levelling motor is not driven.) : Go to Step 2.

NO (The right levelling motor is not driven.) : Go to Step 5.

STEP 2. Connector check: C-48 Headlamp automatic levelling ECU connector, A-20 Headlamp levelling unit (LH) connector





Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

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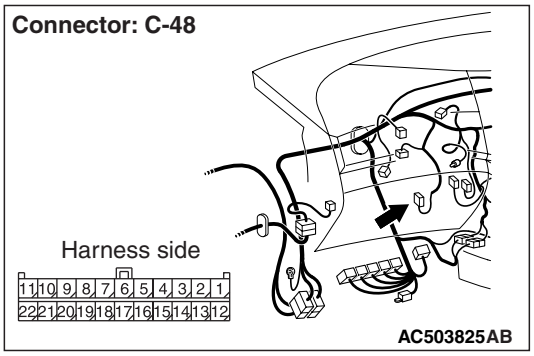
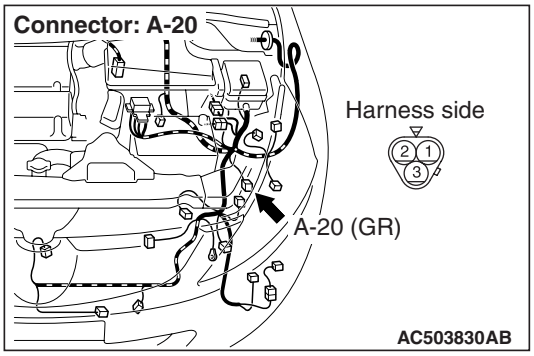
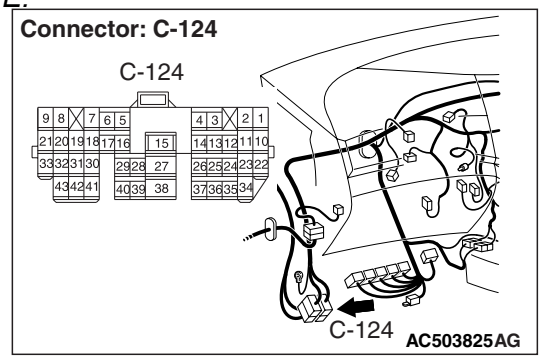
STEP 3. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No. 8, 21,10 and A-20 headlamp levelling unit (LH) connector terminal No. 1, 2, 3.





NOTE:



Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.

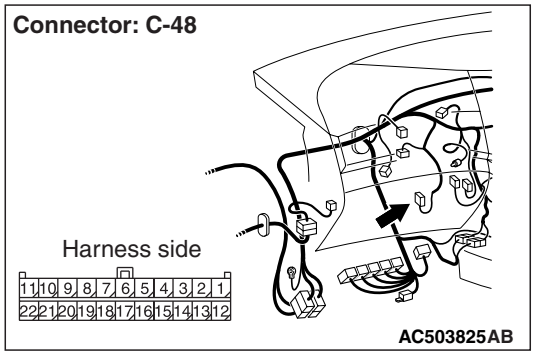
- Check the power supply lines, earth lines and communication lines for open circuit.

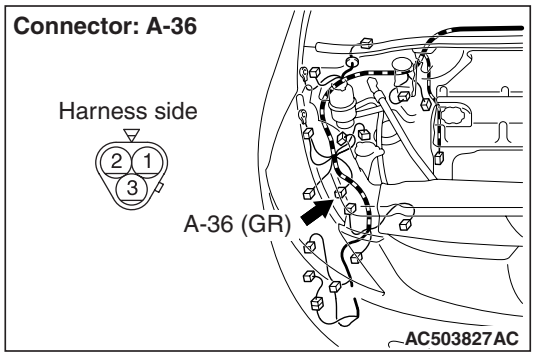
Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Retest the system.
Check that the automatic levelling of the left headlamp operates normally.

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)
NO : Replace the headlamp assembly (LH).

STEP 5. Connector check: C-48 Headlamp automatic levelling ECU connector, A-36 Headlamp levelling unit (RH) connector





Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the defective connector.

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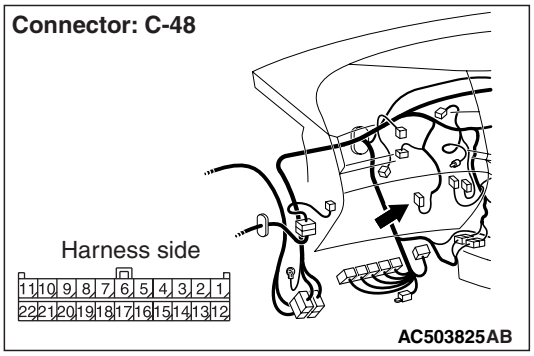
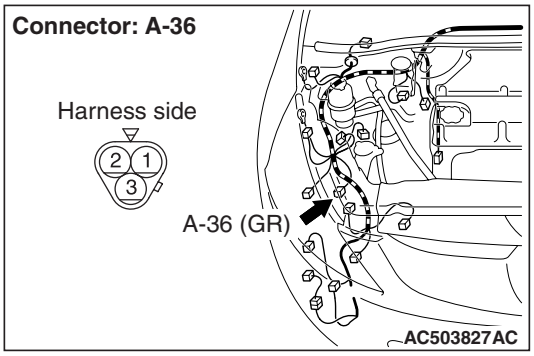
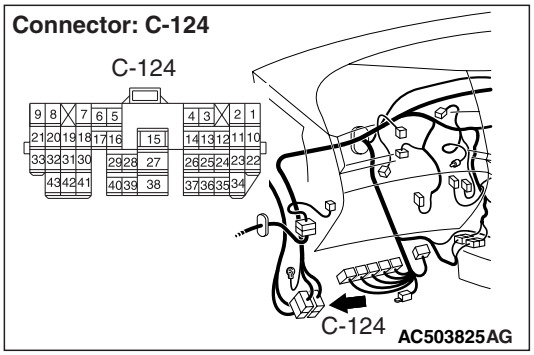
STEP 6. Check the wiring harness between C-48 headlamp automatic levelling ECU connector terminal No. 19, 20, 9 and A-36 headlamp levelling unit (RH) connector terminal No. 1, 2, 3.





NOTE: Prior to the wiring harness inspection, check intermediate connector C-124, and repair if necessary.



- Check the power supply lines, earth lines and communication lines for open circuit.

Q: Is the check result normal?

YES : . Go to Step 7.

NO : . Repair the wiring harness.

STEP 7. Retest the system.

Check that the automatic levelling of the right headlamp operates normally.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)

NO : . Replace the headlamp assembly (RH).

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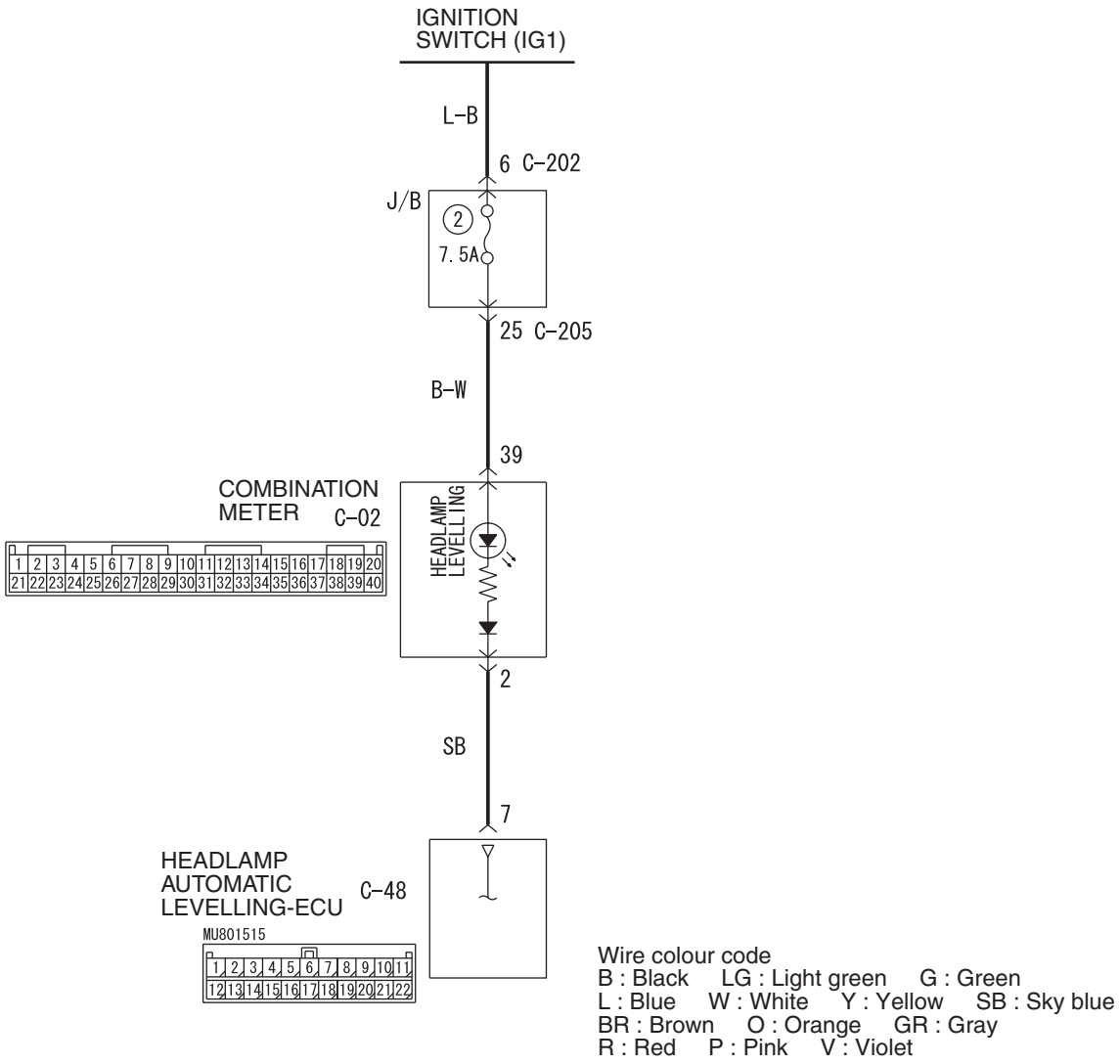
Group TOC

INSPECTION PROCEDURE 4: The headlamp automatic levelling warning lamp does not illuminate.

Headlamp Automatic Levelling Warning Lamp Circuit



⚠ CAUTION

Whenever the ECU is replaced, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

OPERATION

If the height sensor or the headlamp levelling unit is defective, the headlamp automatic levelling warning lamp illuminates.

COMMENTS ON TROUBLE SYMPTOM

If the headlamp automatic levelling warning lamp does not illuminate under the illumination conditions, the warning lamp power supply system may be defective, or the combination meter, the headlamp automatic levelling ECU, or wiring harness and connectors between the two may be defective.

PROBABLE CAUSES

- Malfunction of the headlamp automatic levelling ECU
- Defective combination meter
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the automatic levelling

Check that the automatic levelling operates normally.

Q: Is the check result normal?

YES : Go to Step 2.

NO : INSPECTION PROCEDURE 2 "Neither right nor left automatic levelling operates." Refer to P.54A-130 .

Main Index
Group TOC

STEP 2. M.U.T.-III actuator test

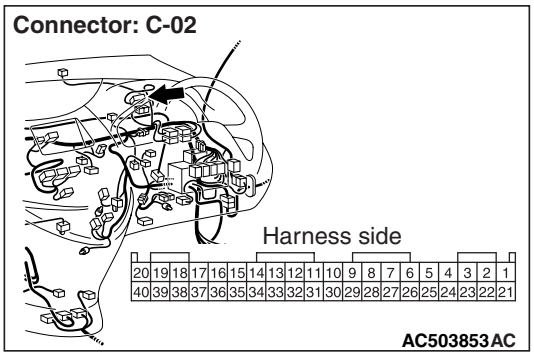
Perform the actuator test for the combination meter, and check that the headlamp automatic levelling warning lamp illuminates (Refer to Combination Meter P.54A-95).

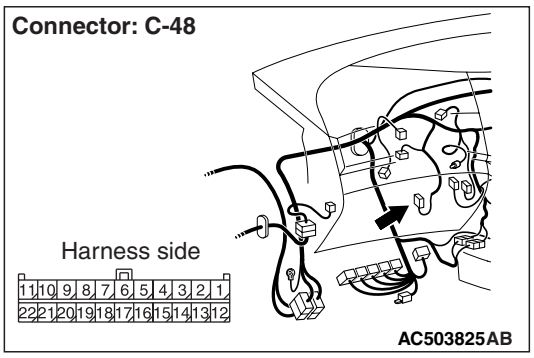
Q: Is the check result normal?

YES : Go to Step 3.

NO : Replace the combination meter.

STEP 3. Connector check: C-02 Combination meter connector, C-48 headlamp automatic levelling ECU connector



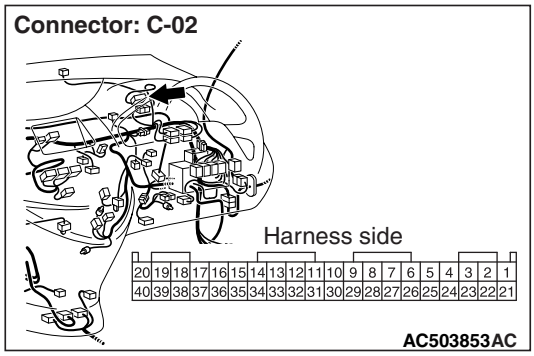


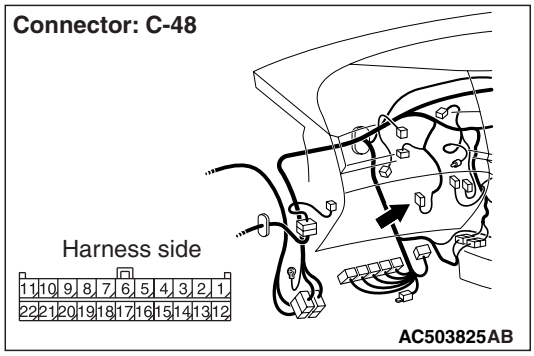
Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the defective connector.

STEP 4. Check the wiring harness between C-02 combination meter connector terminal No. 2 and C-48 headlamp automatic levelling ECU connector terminal No. 7.





Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness.

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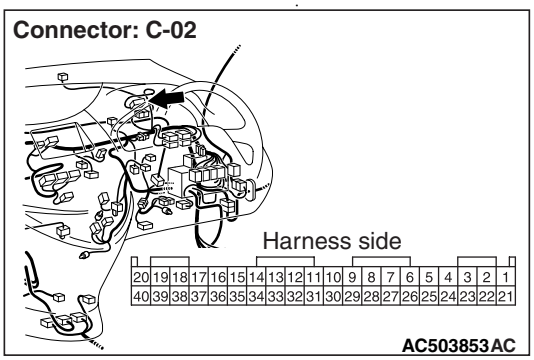
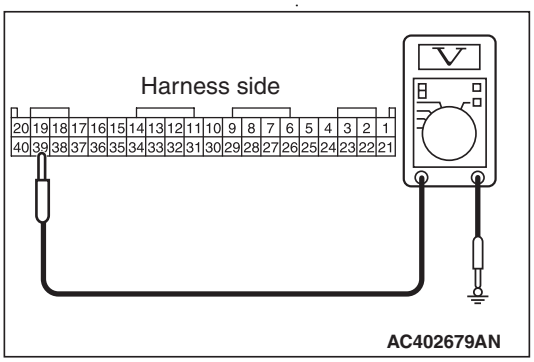
STEP 5. Measure the voltage at C-02 combination meter connector.



Disconnect the connector, and measure at the wiring harness side.

- Turn the ignition switch to the ON position.

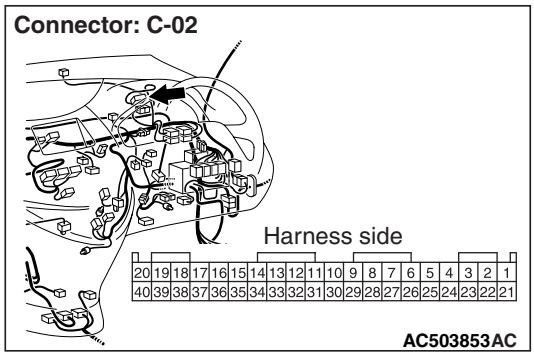


Measure the voltage between C-02 combination meter connector terminal No.39 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the harness wire between ignition switch (IG1) and C-02 combination meter connector terminal No.39.



NOTE: Prior to the wiring harness inspection, check junction block connectors C-202 and C-205, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Retest the system.

Check that the headlamp automatic levelling warning lamp illuminates under the illumination conditions.

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)
NO : Replace the headlamp automatic levelling ECU.

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Group TOC

INSPECTION PROCEDURE 5: The headlamp automatic levelling warning lamp does not go out.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

COMMENTS ON TROUBLE SYMPTOM

If the headlamp automatic levelling warning lamp does not go out, the diagnosis code may be set, or the automatic levelling ECU or the combination meter may be defective.

PROBABLE CAUSES

- Diagnosis code setting is under way.
- Malfunction of the headlamp automatic levelling ECU
- Defective combination meter
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the diagnosis code.
Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Perform troubleshooting at the diagnosis code setting.(Refer to P.54A-126.)
NO : Go to Step 2.

STEP 2. M.U.T.-III actuator test
Perform the actuator test for the combination meter, and check that the headlamp automatic levelling warning lamp goes out (Refer to Combination Meter P.54A-95).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the combination meter.

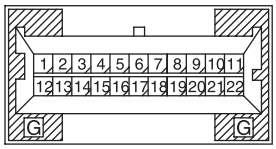
STEP 3. Retest the system.
Check that the headlamp automatic levelling warning lamp goes out.

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-5.)
NO : Replace the headlamp automatic levelling ECU.

TERMINAL VOLTAGE AT THE HEADLAMP AUTOMATIC LEVELLING ECU

M1542015900017

C-149



AC500809AB

Terminal No.	Check items	Check conditions	Normal conditions
1	Rear height sensor power supply	Ignition switch: ON	5 V
2	Input from the rear height sensor	Ignition switch: ON	0.5 – 4.5 V
3	Rear height sensor earth	Always	0 V
5	Input of vehicle speed signal	Perform a test run of the vehicle.	0 to 12 V (pulse signal)
6	Output of the pulse check signal	Ignition switch: ON	0 to 12 V (pulse signal)
7	Input from the headlamp automatic levelling warning lamp	Ignition switch: ON Warning lamp: ON	1.2 V or less

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Group TOC

Terminal No.	Check items	Check conditions	Normal conditions
8	Output to the headlamp levelling unit (LH)	Ignition switch: ON	1.2 – 10.8 V
9	Headlamp levelling unit (RH) power supply	Ignition switch: ON	Battery voltage
10	Headlamp levelling unit (LH) power supply	Ignition switch: ON	Battery voltage
11	Power supply from ignition switch (IG1)	Ignition switch: ON	Battery voltage
12	Front height sensor power supply	Ignition switch: ON	5 V
13	Input from front height sensor	Ignition switch: ON	0.5 – 4.5 V
14	Front height sensor earth	Always	0 V
16	Headlamp relay ON signal	Headlamp: ON	1.5 V or less
18	Output of diagnosis signal	At reading of diagnosis code	1.5 V or less
19	Output to the headlamp levelling unit (RH)	Ignition switch: ON	1.2 – 10.8 V
20	Headlamp levelling unit (RH) earth	Always	0 V
21	Headlamp levelling unit (LH) earth	Always	0 V
22	Earth	Always	0 V

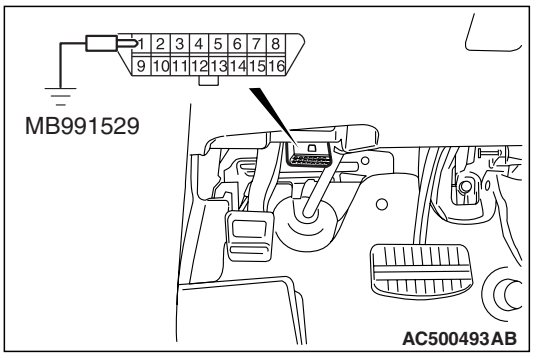
ON-VEHICLE SERVICE

LEVELLING MOTOR DRIVE TEST OF HEADLAMP LEVELLING UNIT

M1542017300011

⚠ CAUTION

- **The levelling motor drive test of headlamp levelling unit shall be performed with a vehicle at a standstill. (When a vehicle speed signal is input from the headlamp automatic levelling ECU, the levelling motor drive test cannot be performed.)**



1. Using the special tool diagnosis code check harness (MB991529), earth diagnosis connector terminal No. 1 (diagnosis control terminal).
2. Turn the ignition switch to the ON position.
3. Turn ON the headlamp switch.
4. Check that the headlamp levelling operates downward for 1.5 seconds.

   NOTE: When the levelling of the headlamp faces downward at the time of drive test start, it stays as is.
5. Check that the headlamp levelling operates upward for 3 seconds.

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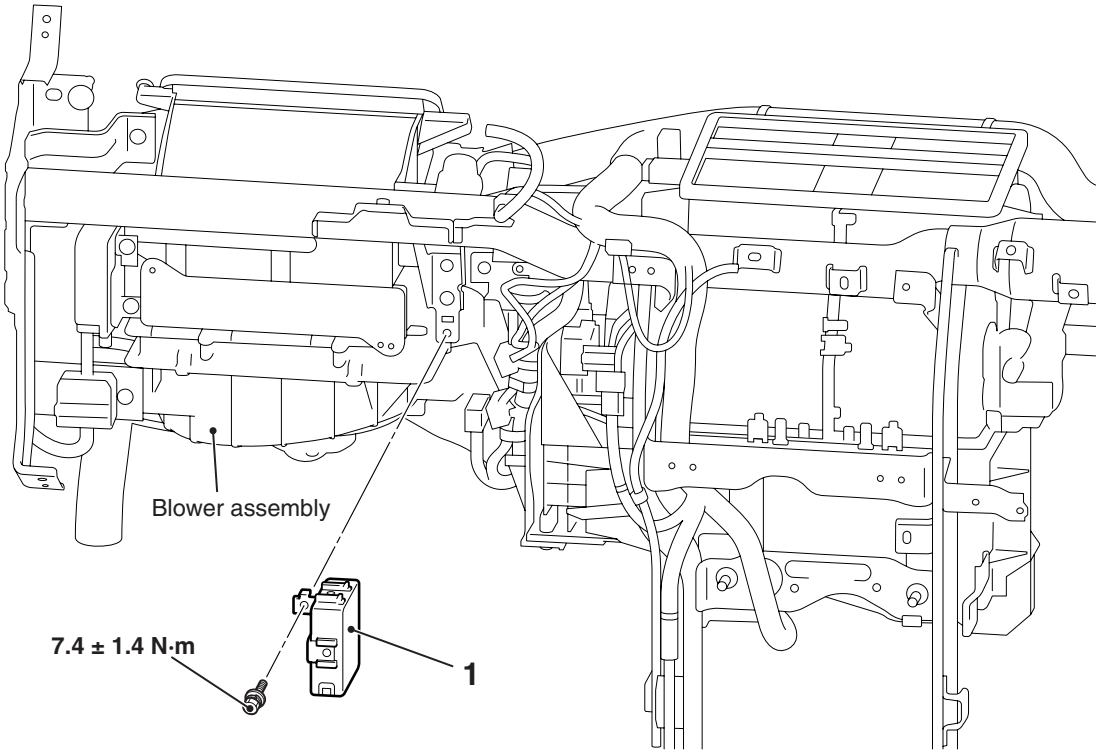
HEADLAMP AUTOMATIC LEVELLING-ECU

REMOVAL AND INSTALLATION

M1542015600016



AC500512 AB

Headlamp automatic levelling ECU removal procedure

- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Headlamp automatic levelling ECU

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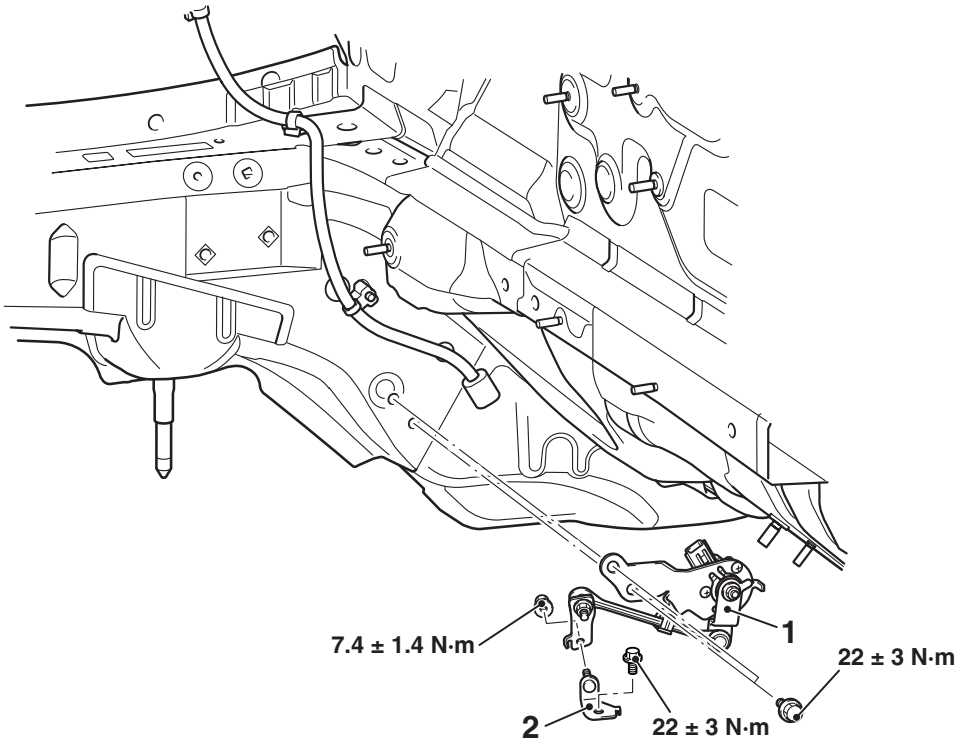
Group TOC

HEIGHT SENSOR

REMOVAL AND INSTALLATION

M1542015800010

FRONT HEIGHT SENSOR



1. Front height sensor
2. Front height sensor bracket

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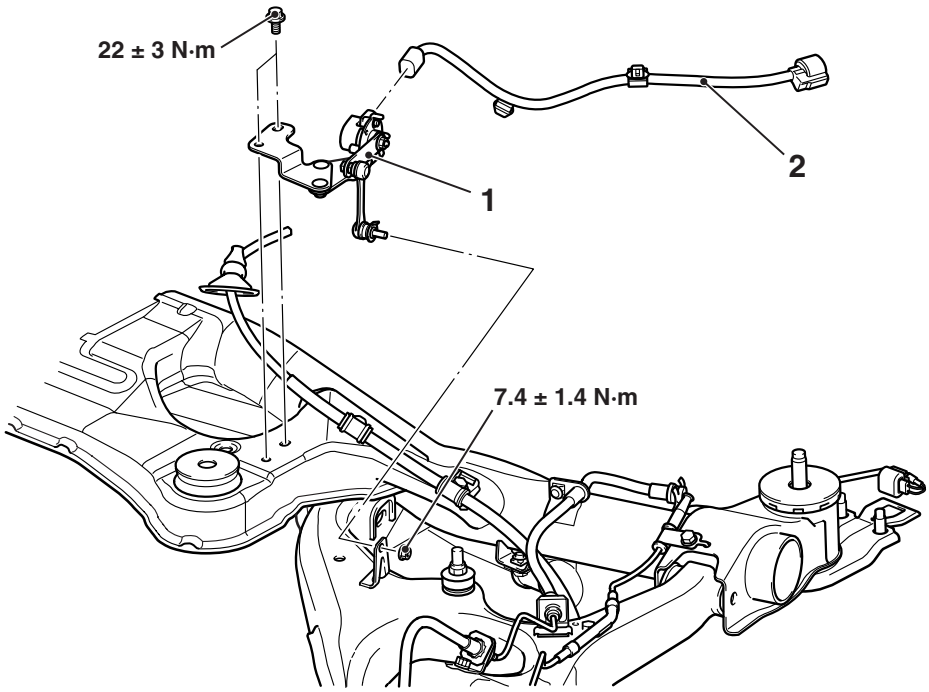
REAR HEIGHT SENSOR



AC500645 AB

1. Rear height sensor
2. Rear height sensor sub harness

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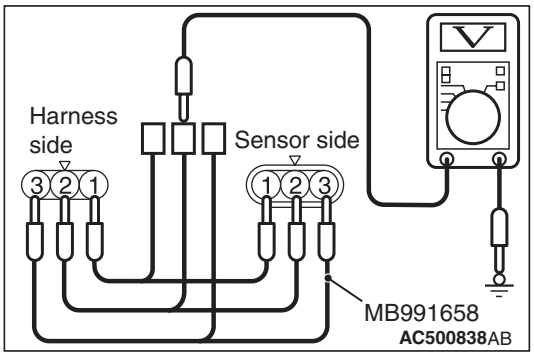
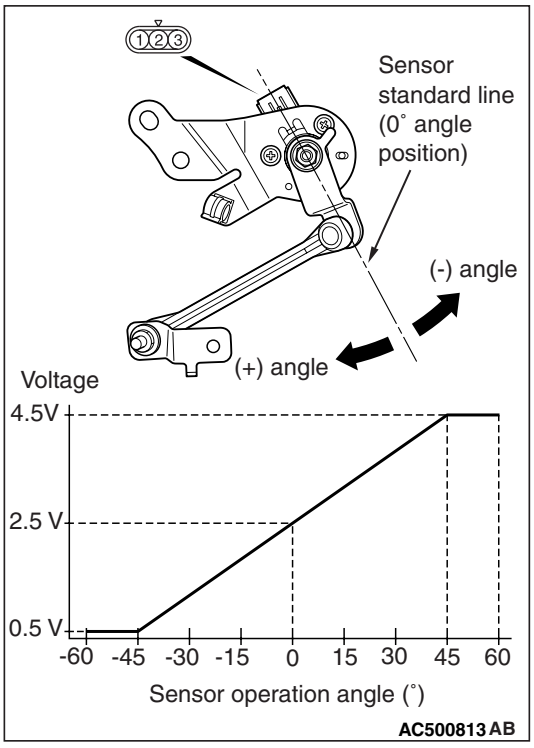
HEIGHT SENSOR CHECK

M1542016000017

FRONT HEIGHT SENSOR CHECK

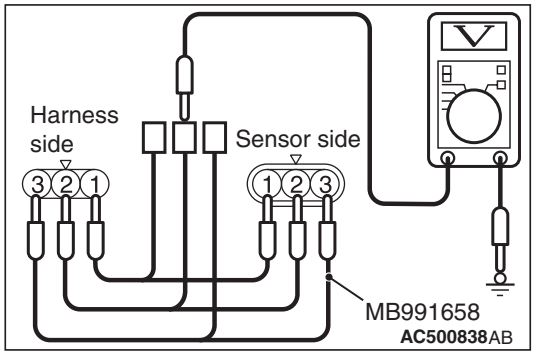


1. Disconnect the sensor connector and connect the special tool test harness (MB991658) as shown.
2. Turn the ignition switch to the ON position.
3. Measure the voltage at sensor connector terminal No.2.

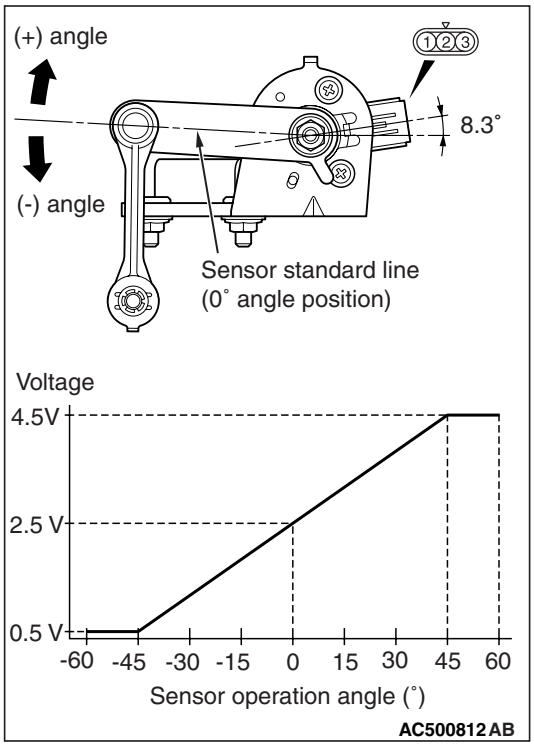


4. Check that voltages show the values described in the graph according to the sensor operation angle.

REAR HEIGHT SENSOR CHECK



1. Disconnect the sensor connector and connect the special tool test harness (MB991658) as shown.
2. Turn the ignition switch to the ON position.
3. Measure the voltage at sensor connector terminal No.2.



4. Check that voltages show the values described in the graph according to the sensor operation angle.

FRONT FOG LAMP

SERVICE SPECIFICATIONS

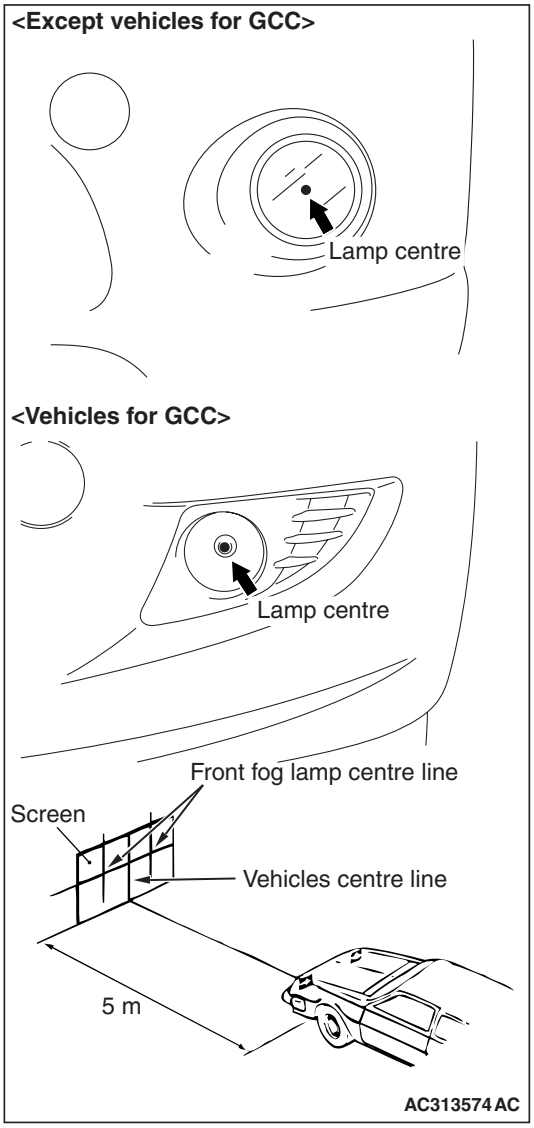
M1542000300569

Item		Standard value
Front fog lamp aiming	Vertical direction	100 mm below horizontal (H)
	Horizontal direction	Parallel to direction of vehicle travel

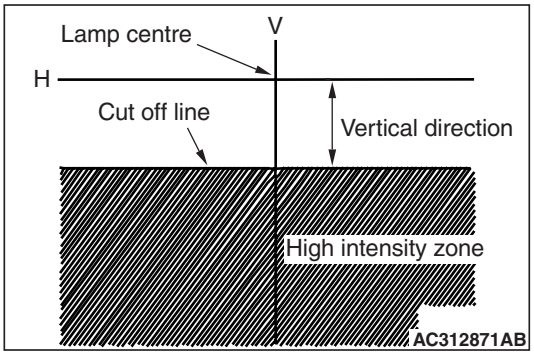
ON-VEHICLE SERVICE

FRONT FOG LAMP AIMING

M1542001100546



1. Measure the centre of the front fog lamps, as shown in the illustration.
2. Set the distance between the screen and the centre of the front fog lamps as shown in the illustration.
3. Inflate the types to the specified pressures and there should be no other load in the vehicles other than driver or substituted weight of approximately 75 kg placed in the driver's position.
4. With the engine running at 2,000 r/min, aim the front fog lamp.



5. Check if the beam shining onto the screen is at the standard value.

   Standard value:
   (Vertical direction) 100 mm below horizontal (H)
   (Horizontal direction) Parallel to direction of vehicle travel

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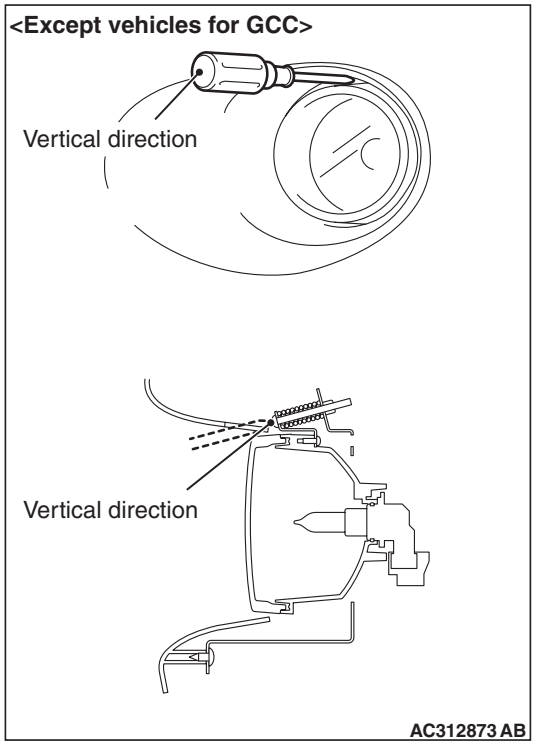
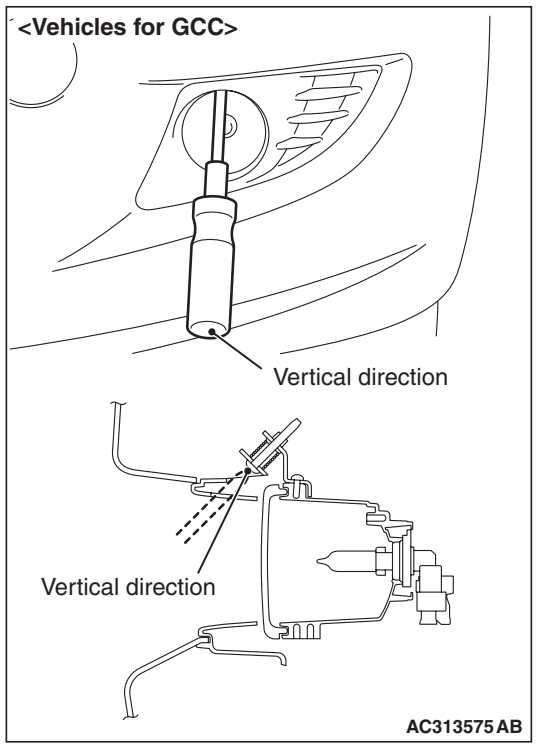
⚠ CAUTION



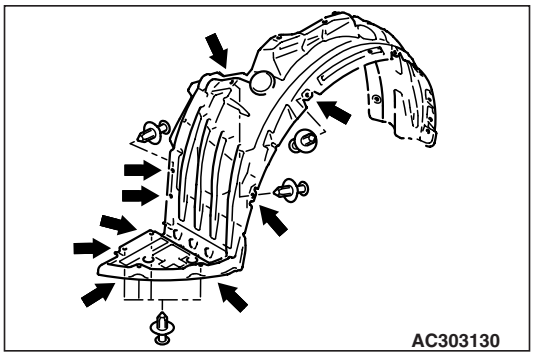


When marking the aiming adjustment, be sure to mask those lamps which are not being adjusted.

NOTE: The horizontal direction is non-adjustable. If the deviation of the light beam axis exceeds the standard value, check to be sure that the mounting location or some other point is not defective.

BULB REPLACEMENT

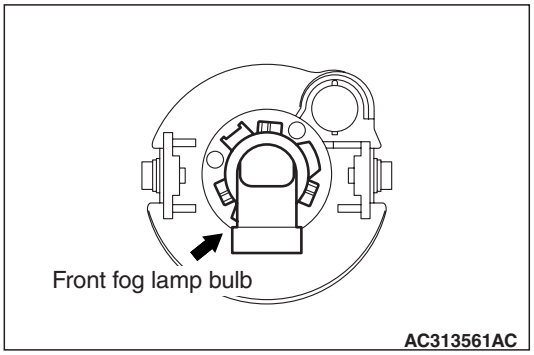
M1542001300885



1. Remove the under cover and the splash shield assembling clips as shown.

⚠ CAUTION

Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.



2. Disconnect the connector and withdraw the bulb.
3. Replace the valve, and connect securely the connector.

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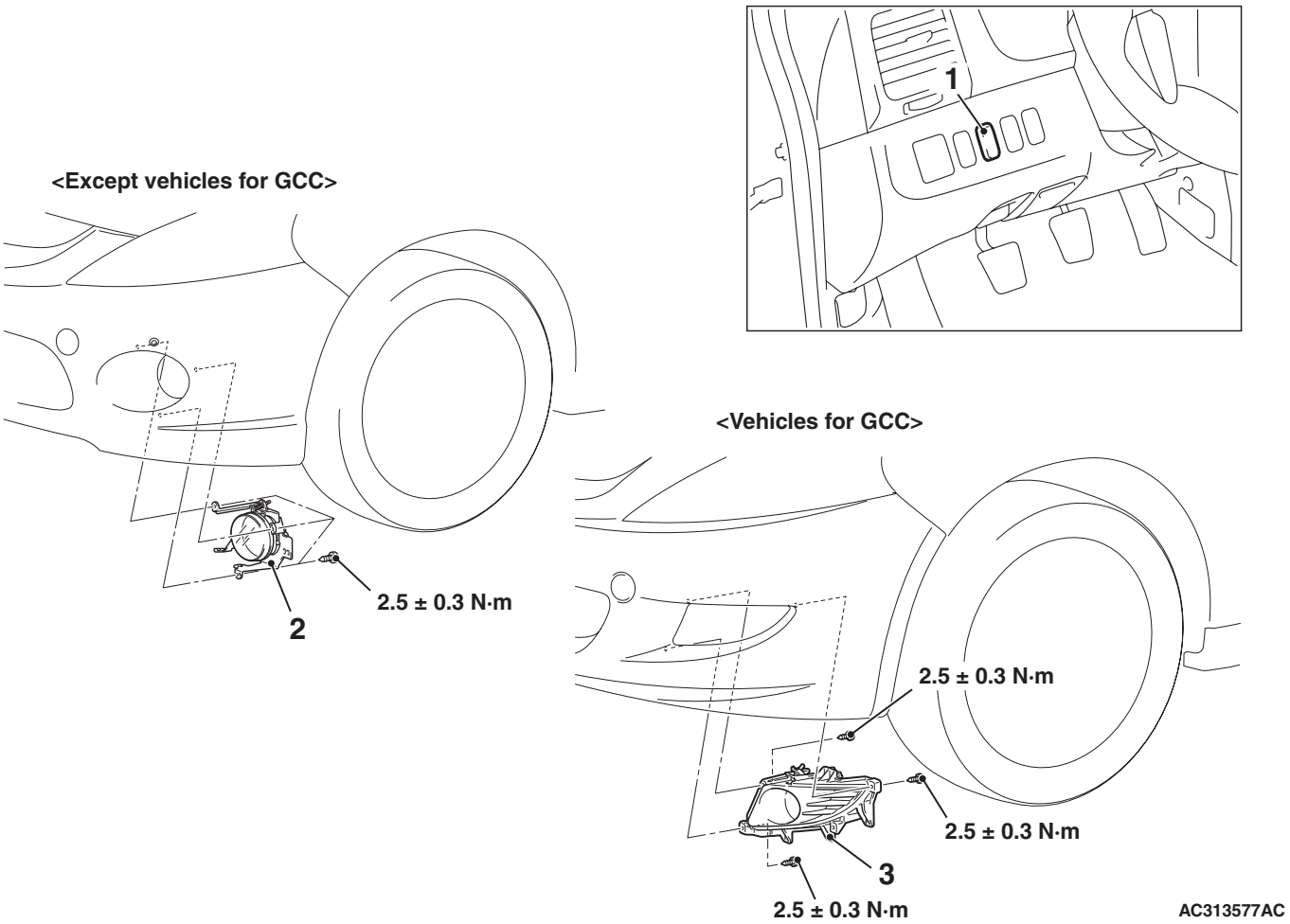
Group TOC

FRONT FOG LAMP

REMOVAL AND INSTALLATION

M1542013600098



Front fog lamp switch removal steps

- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Front fog lamp switch <<A>>

Front fog lamp removal steps

2. Front fog lamp assembly <Except vehicles for GCC> <<A>>
3. Front fog lamp assembly <Vehicles for GCC>

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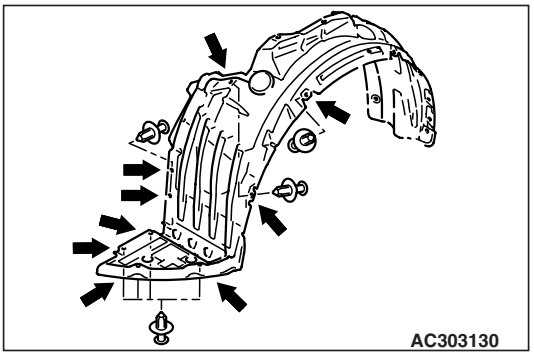
Group TOC

REMOVAL SERVICE POINT

<<A>> FRONT FOG LAMP ASSEMBLY REMOVAL

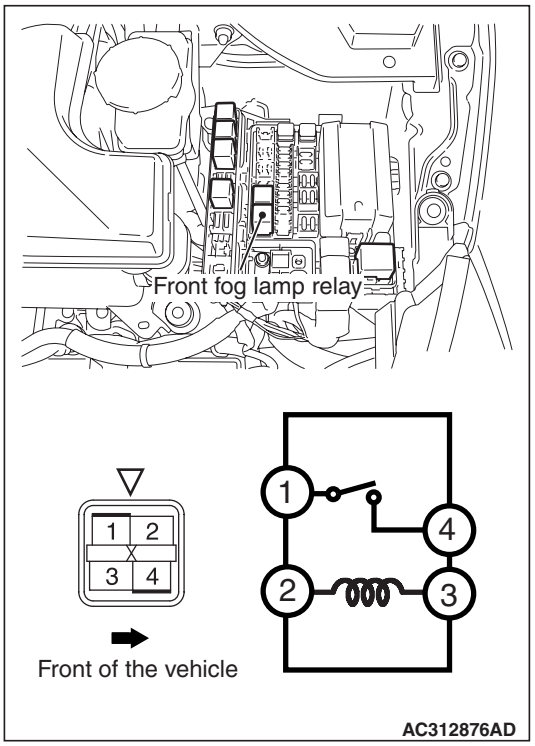


Remove the splash shield assembling bolts and clips as shown.

INSPECTION

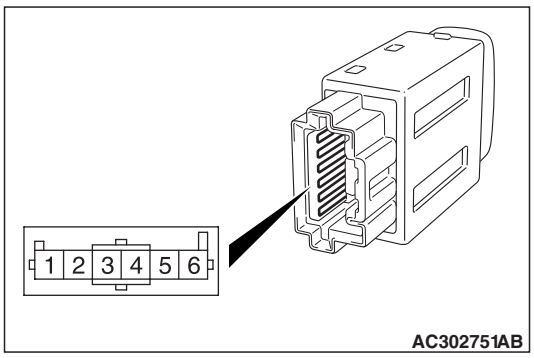
M1542011201428

FRONT FOG LAMP RELAY CONTINUITY CHECK



Battery voltage	Tester connection	Specified condition
Not supplied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1 – 4	Less than 2 ohms

FRONT FOG LAMP SWITCH CONTINUITY CHECK



Switch position	Terminal number	Normal conditions
OFF	1 – 2	Open circuit
ON	1 – 2	Less than 2 ohms

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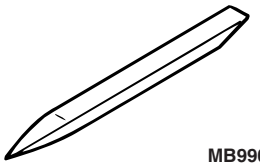
Group TOC

SIDE TURN-SIGNAL LAMP

SPECIAL TOOL

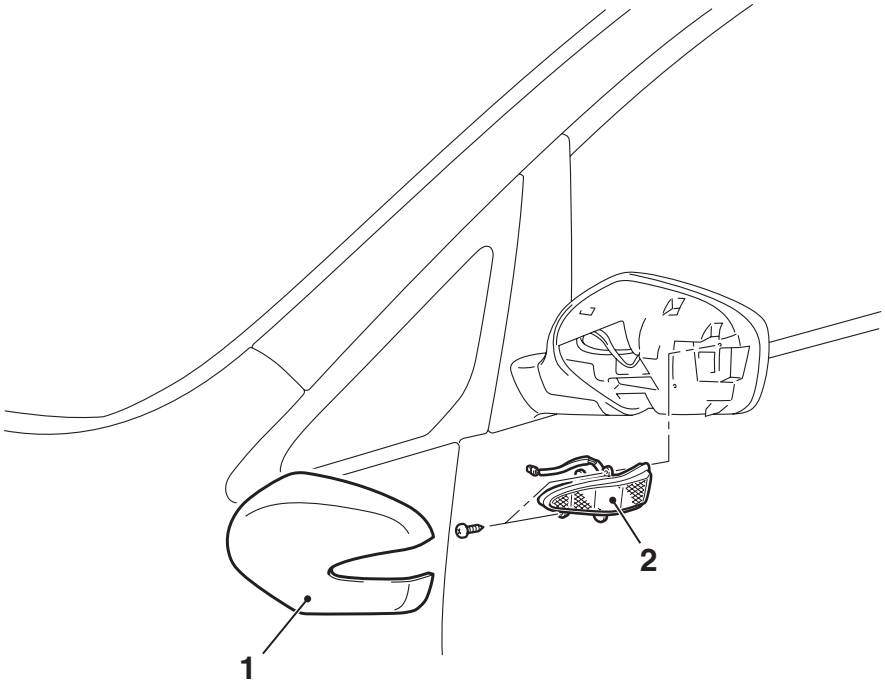
M1542000601314

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of door mirror outer cover

SIDE TURN-SIGNAL LAMP

REMOVAL AND INSTALLATION

M1542012000134



AC312889 AB

Removal steps

- Mirror (Refer to GROUP 51, Door Mirror P.51-32).

Removal steps (Continued)

1. Door mirror outer cover (GROUP 51, Mirror P.51-32).
2. Side turn-signal lamp

INTERIOR LAMP

TROUBLESHOOTING

M1542000701708

The room lamps are controlled by the Smart Wiring System (SWS). For troubleshooting procedures, refer to GROUP 54B, Trouble Symptom Chart P.54B-58 or GROUP 54C, Trouble Symptom Chart P.54C-32 or GROUP 54D, Trouble Symptom Chart P.54D-59 or GROUP 54E, Trouble Symptom Chart P.54E-40.

INTERIOR LAMP

REMOVAL AND INSTALLATION

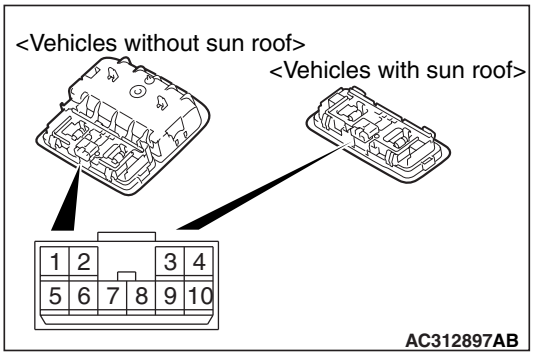
M1542006300051

- Front room lamp assembly (Refer to GROUP 52A, Headlining P.52A-17).
- Rear personal lamp (Refer to GROUP 52A, Headlining P.52A-19).

INSPECTION

M1542011201440

FRONT ROOM LAMP CONTINUITY CHECK



Switch position	Terminal number	Normal conditions
OFF	5 – 6	Less than 2 ohms
–	5 – 9	Less than 2 ohms
ON	5 – 7, 5 – 9, 7 – 9	Less than 2 ohms

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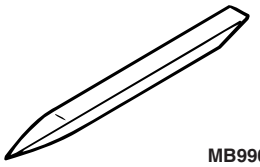
Group TOC

REAR COMBINATION LAMP

SPECIAL TOOL

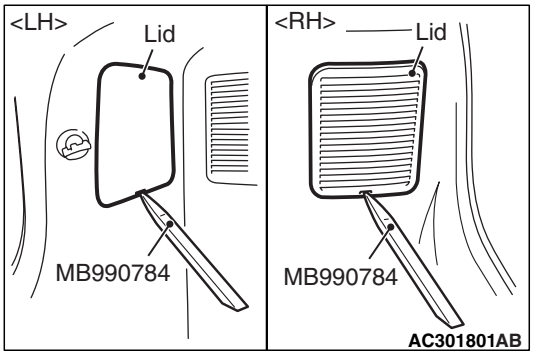
M1542000601325

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Rear combination bulb replacement

ON-VEHICLE SERVICE

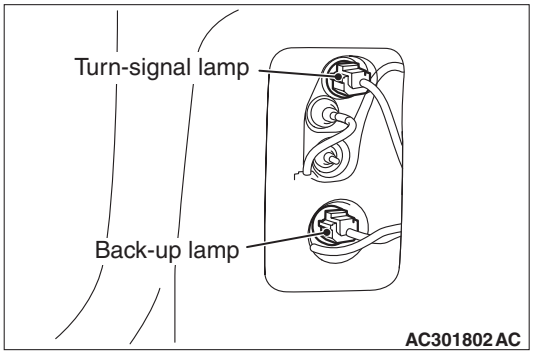
BULB REPLACEMENT

M1542001300896



1. Insert special tool MB990784 (ornament remover) into the notch under the lid, and pry out the lid.

⚠ CAUTION
Don't touch the bulb surface with bare hands or dirty gloves. If the bulb surface (glass part) gets dirty, clean it with alcohol or thinner immediately and dry well, and then install it.



2. Twist the socket to remove.

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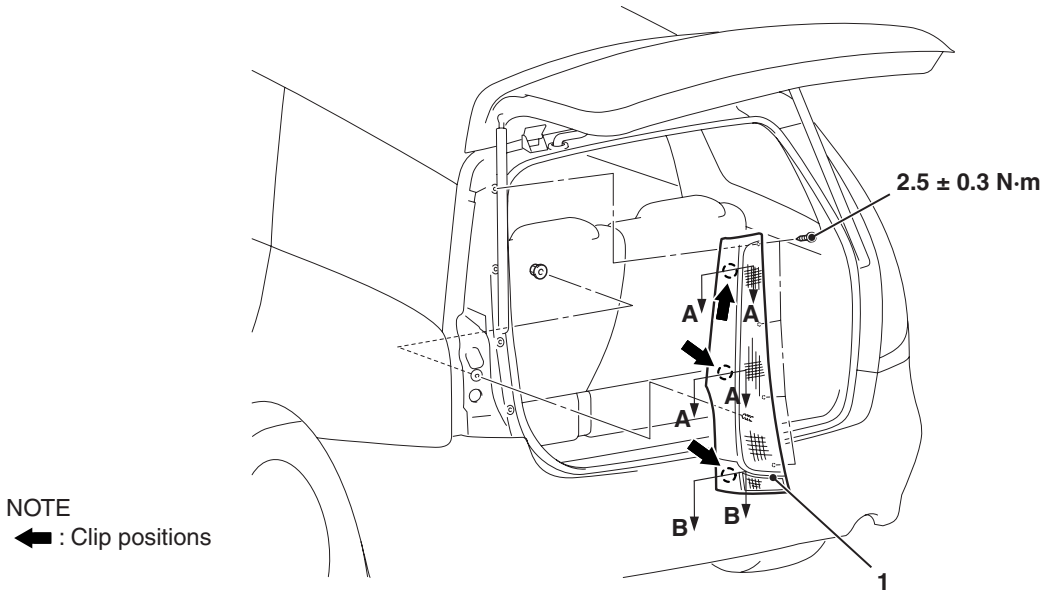
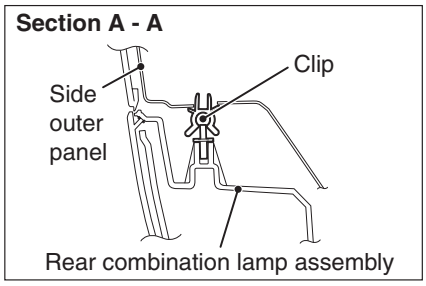
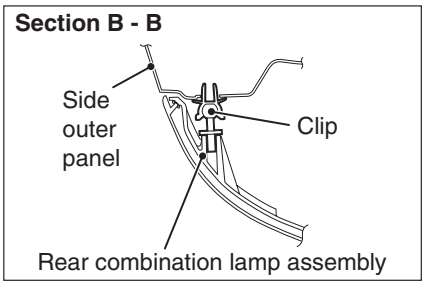
REAR COMBINATION LAMP

REMOVAL AND INSTALLATION

M1542003900571







AC402404AC

Removal steps

- Quarter side cover (Refer to GROUP 52A, Interior Trim P.52A-10).
- Bulb connector connection

Removal steps (Continued)

- Tailgate damper lower (GROUP 42, Tailgate P.42-56).

1. Rear combination lamp assembly

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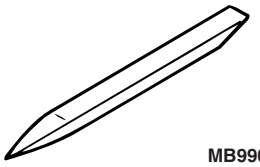
Group TOC

HIGH-MOUNTED STOP LAMP

SPECIAL TOOL

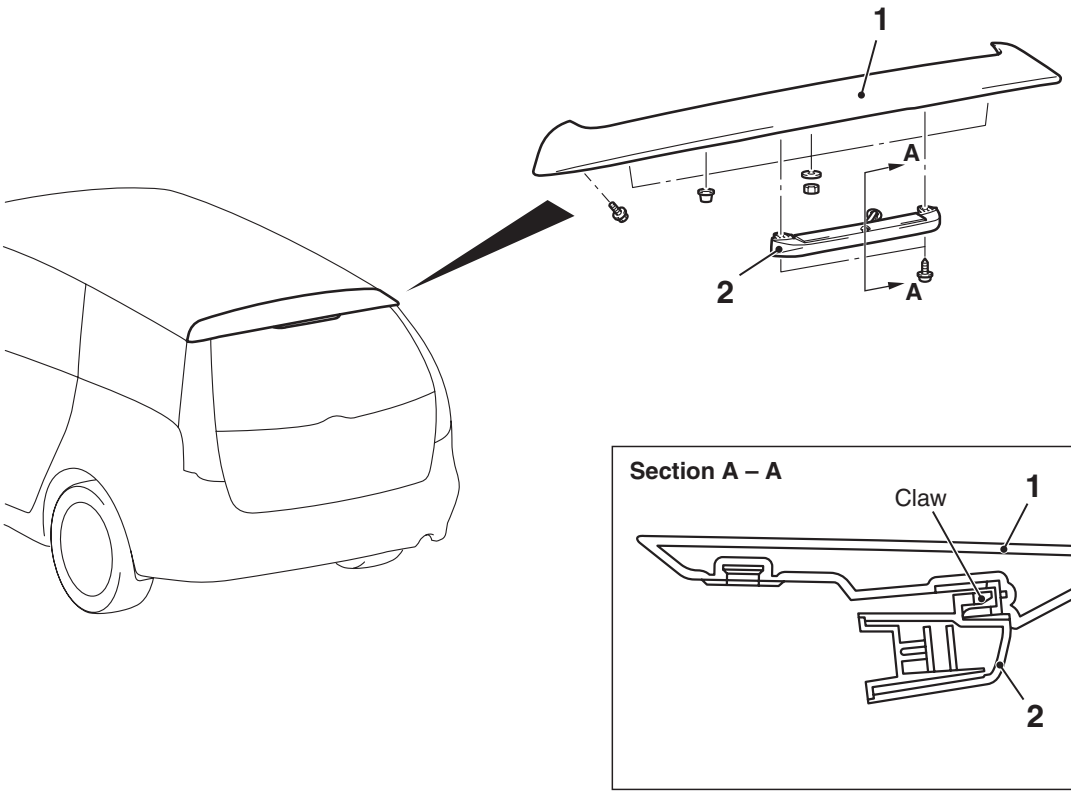
M1542000601336

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of high-mounted stop lamp

HIGH-MOUNTED STOP LAMP

REMOVAL AND INSTALLATION

M1542005100559



AC303890 AB

Removal steps

1. Tailgate spoiler assembly (Refer to GROUP 51, Tailgate spoiler P.51-14).
2. High-mounted stop lamp

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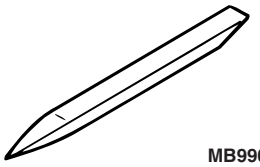
Group TOC

LICENCE PLATE LAMP

SPECIAL TOOL

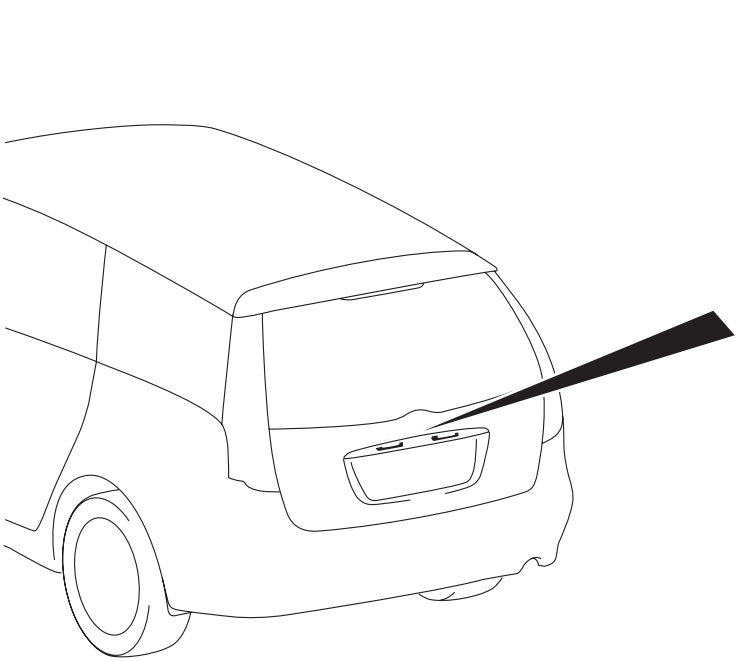
M1542000601347

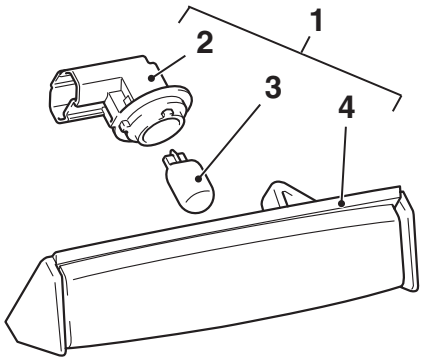
Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of licence plate lamp

LICENCE PLATE LAMP

REMOVAL AND INSTALLATION

M1542004200315





AC301889AB

Removal steps

<<**A**>>
1. Licence plate lamp assembly
2. Socket

Removal steps (Continued)

3. Bulb
4. Licence plate lamp body

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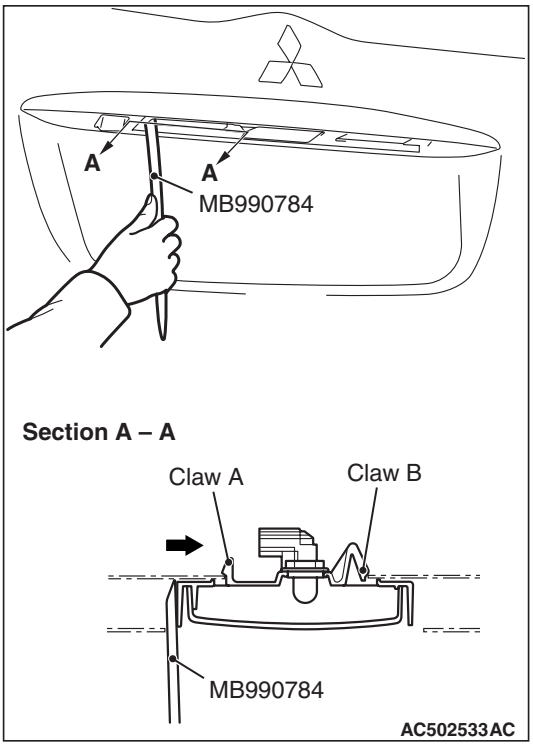
REMOVAL SERVICE POINT

<<A>> LICENCE PLATE LAMP ASSEMBLY REMOVAL



Use special tool MB990784 (ornament remover) to press the licence plate lamp assembly, shorten the clip B and disengage the claw A. Then remove the licence plate lamp assembly.

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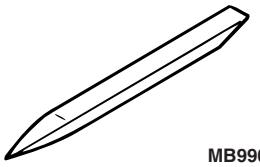
Group TOC

HAZARD WARNING LAMP SWITCH

SPECIAL TOOL

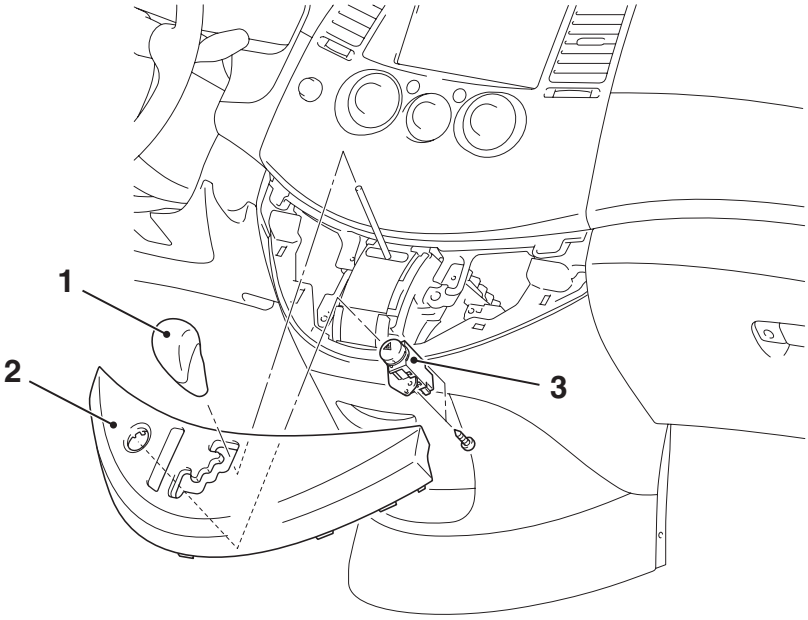
M1542000601358

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of selector lever panel

HAZARD WARNING LAMP SWITCH

REMOVAL AND INSTALLATION

M1542006600580



AC503664AB

Removal steps

1. Gear shift lever knob <M/T>

<<**A**>> 1. Selector lever knob <A/T>

Removal steps (Continued)

2. Selector lever panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2).
3. Hazard warning lamp switch

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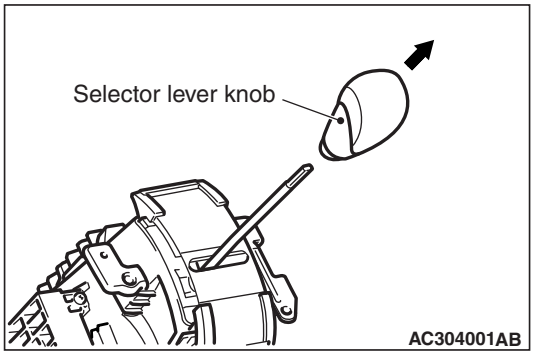
REMOVAL SERVICE POINT

<<A>> SELECTOR LEVER KNOB REMOVAL

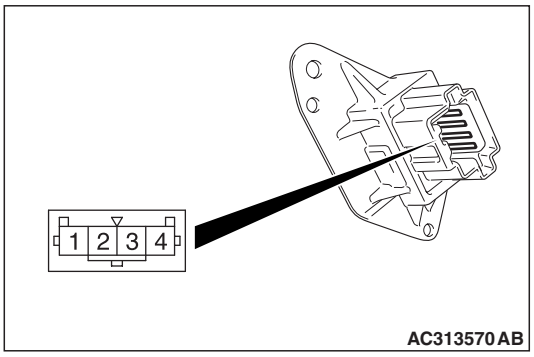


Pull out the selector lever knob to the direction shown.

INSPECTION

M1542011201451

HAZARD WARNING LAMP SWITCH CONTINUITY CHECK



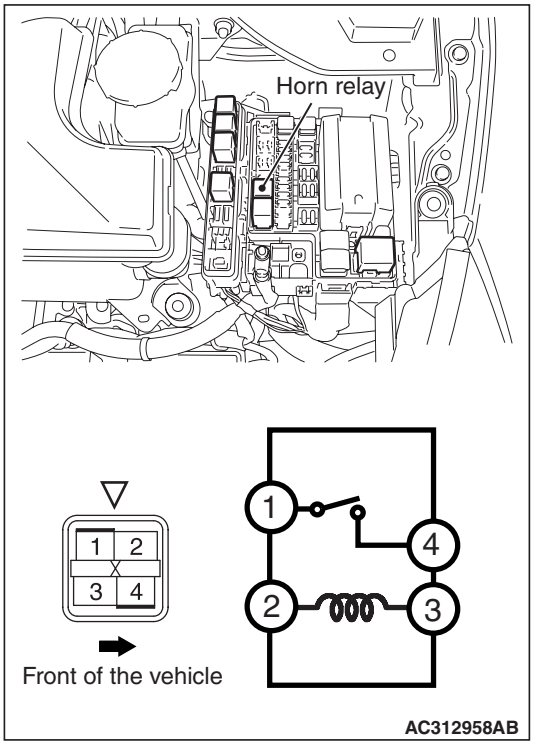
Switch position	Tester connection	Specified condition
OFF	1 – 2	Open circuit
ON		Less than 2 ohms

HORN

INSPECTION

M1543019502913

HORN RELAY CONTINUITY CHECK

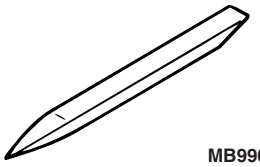
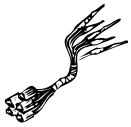
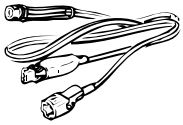
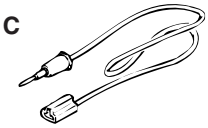
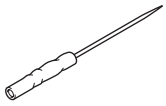


Battery voltage	Tester connection	Specified condition
Not applied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal		Less than 2 ohms

CORNER SENSOR SYSTEM <VEHICLES FOR HONG KONG AND SINGAPORE>

SPECIAL TOOL

M1542000600816

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of switch panel
A  B  C  D DO NOT USE MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

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TROUBLESHOOTING

TROUBLE SYMPTOM CHART

M1543007202045

⚠ CAUTION

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Trouble symptom	Inspection procedure number	Reference page
Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate when the ignition switch is turned to the ON position.	1	P.54A-161
The corner sensor system does not operate.	2	P.54A-164
The system cannot be activated or deactivated even when the sonar switch is pressed.	3	P.54A-165
Only the corner sensor OFF indicator lamp does not illuminate.	4	P.54A-167
All the corner sensor indicators do not illuminate or flash.	5	P.54A-169
All the corner sensor indicators stay on.	6	
Any of the corner sensor indicators does not illuminate.	7	P.54A-171
Any of the corner sensor indicators continues flashing.	8	
Obstacle is not detected even when the selector lever is shifted to "R" (reverse) position.	9	P.54A-180
The corner sensor indicator (rear) continues flashing.	10	

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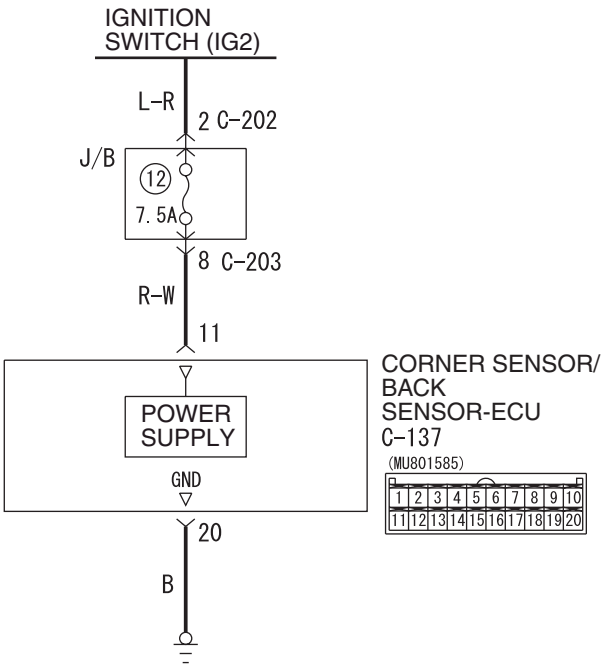
SYMPTOM PROCEDURES

Inspection Procedure 1: Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate when the ignition switch is turned to the ON position.

Corner Sensor System Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6X54X087A

COMMENTS ON TROUBLE SYMPTOM

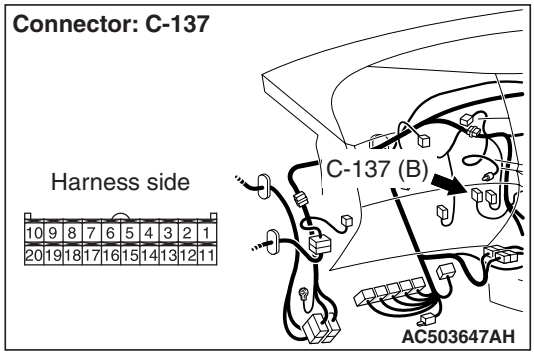
If the corner sensor OFF indicator lamp and corner sensor indicator lamp do not illuminate when the ignition switch is turned to the ON position, the power supply system of corner sensor/back sensor-ECU, corner sensor/back sensor-ECU, or combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the corner sensor/back sensor-ECU
- Malfunction of the combination meter

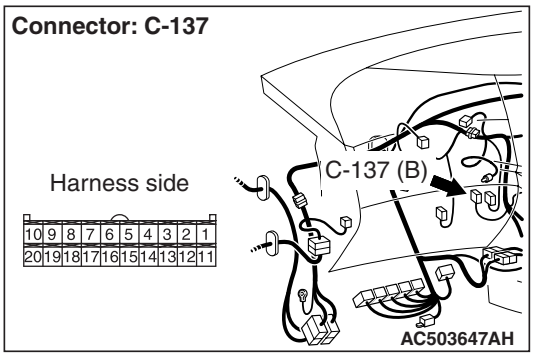
DIAGNOSIS PORODEDURE

STEP 1. Connector check: Corner sensor/back sensor-ECU C-137.

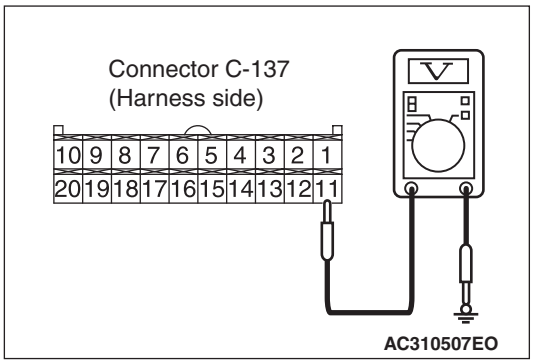


Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Voltage measurement at corner sensor/back sensor-ECU connector C-137 in order to power supply circuit to corner sensor/back sensor-ECU (IG2 power supply)



(1) Disconnect corner sensor/ back sensor-ECU connector C-137, and measure at the wiring harness side.
(2) Turn the ignition switch to "ON" position.

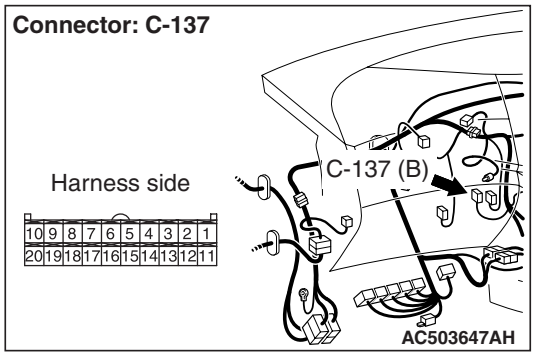


(3) Measure the voltage between terminal 11 and earth.

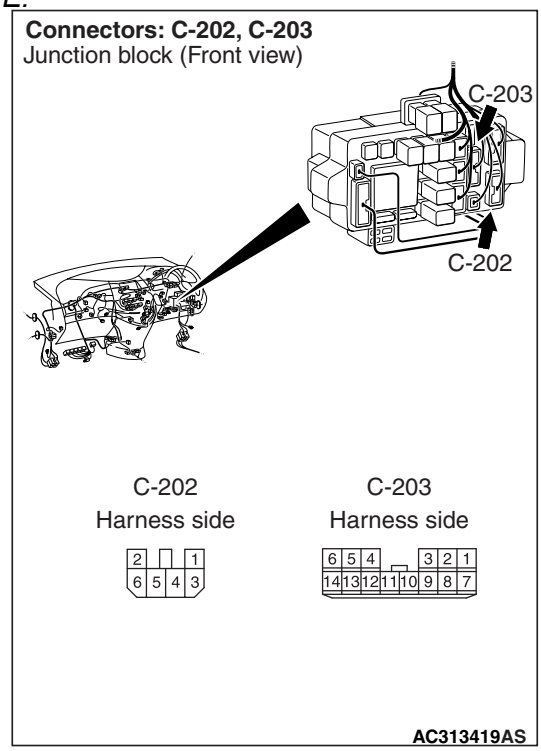
OK: Battery voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 11) and ignition switch (IG2).



NOTE:



Before the wiring harness inspection, inspect junction block connector C-202 and C-203, and repair if necessary.

Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

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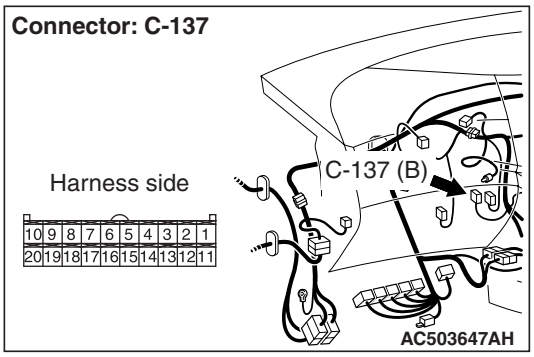
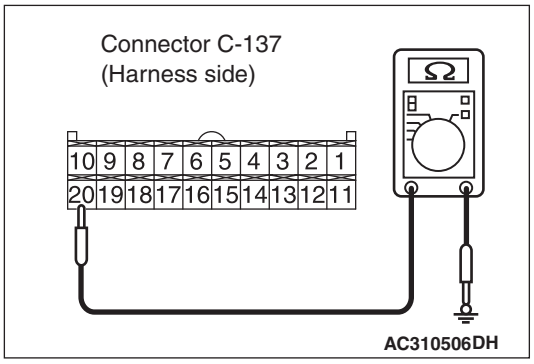
STEP 4. Resistance measurement at corner sensor/back sensor-ECU connector C-137 in order to the earth circuit to the corner sensor/back sensor-ECU.



(1) Disconnect corner sensor/ back sensor-ECU connector C-137, and measure at the wiring harness side.

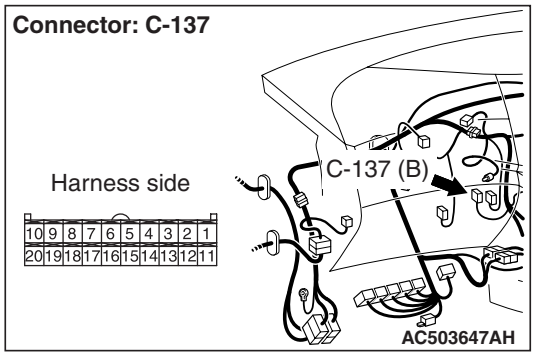


(2) Measure the resistance between terminal 20 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 20) and earth.



Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 6. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, inspect the indicator lamp for normal operation.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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Inspection Procedure 2: The corner sensor system does not operate.

CIRCUIT OPERATION

Refer to P.54A-161.

COMMENTS ON TROUBLE SYMPTOM

If the corner sensor OFF indicator and corner sensor indicator illuminate when the ignition switch is turned to the ON position, the power supply system is normal. The wiring harness, connectors, vehicle speed signal or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the engine-A/T-ECU

DIAGNOSIS PORODEDURE

STEP 1. M.U.T.-III other system diagnosis code

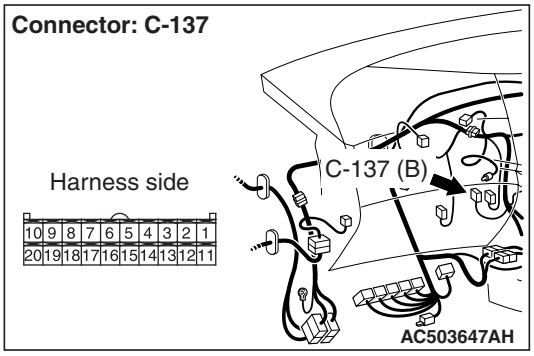
Check whether the MPI system-related diagnosis code is set.

Q: Is the check result normal?

YES : Diagnose the MPI system. Refer to ROUP 13B – Troubleshooting P.13B-15.

NO : Go to Step 2.

STEP 2. Connector check: Corner sensor/back sensor-ECU connector C-137.

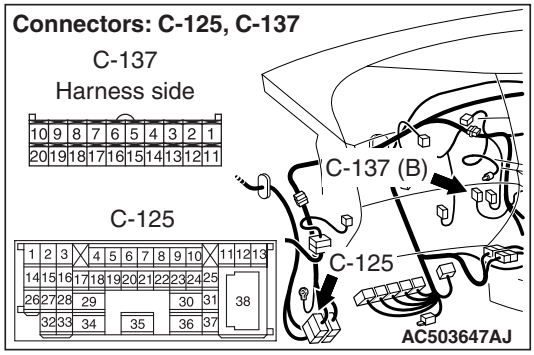


Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 10) and intermediate connector C-125 (terminal 20).



Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the wiring harness.

STEP 4. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, inspect the corner sensor system for normal operation.

Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the engine-A/T-ECU.

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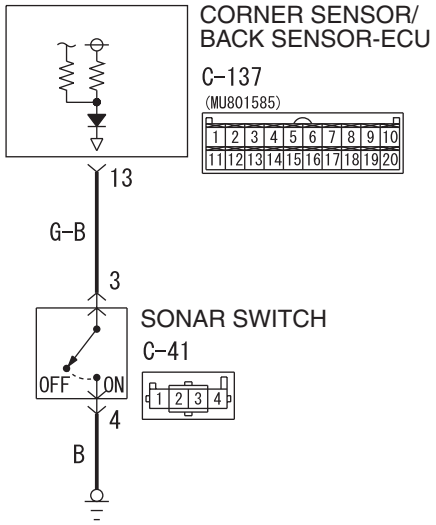
Inspection Procedure 3: System cannot be activated or deactivated even when the sonar switch is pressed.

Sonar Switch Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6X54X088A

COMMENTS ON TROUBLE SYMPTOM

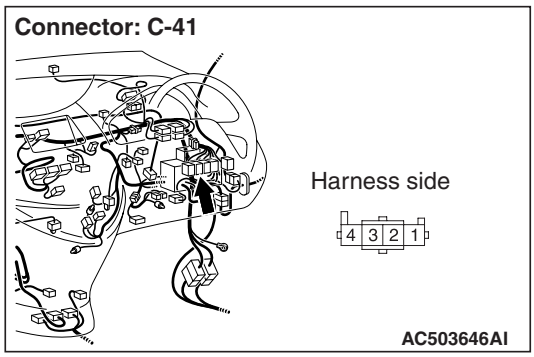
When the system cannot be activated or deactivated even if sonar switch is pressed, the wiring harness, connectors, sonar switch, or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of sonar switch
- Malfunction of corner sensor/back sensor-ECU

DIAGNOSIS PORODEDURE

STEP 1. Connector check: Sonar switch connector C-41.

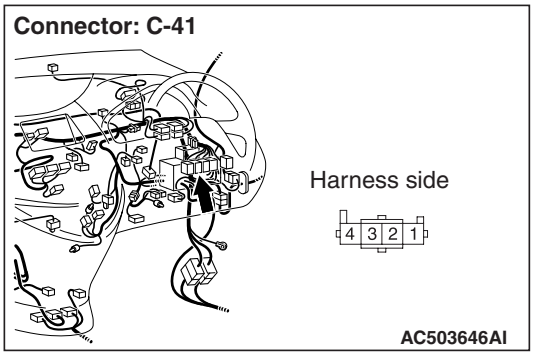


Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

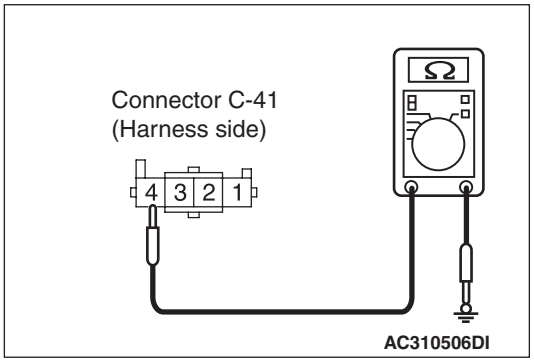
STEP 2. Inspection of sonar switch
Inspect the sonar switch for normal operation. Refer to P.54A-188.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the sonar switch.

STEP 3. Resistance measurement at sonar switch connector C-41 in order to the earth circuit to the sonar switch.



(1) Disconnect corner sensor/ back sensor switch connector C-41, and measure at the wiring harness side.

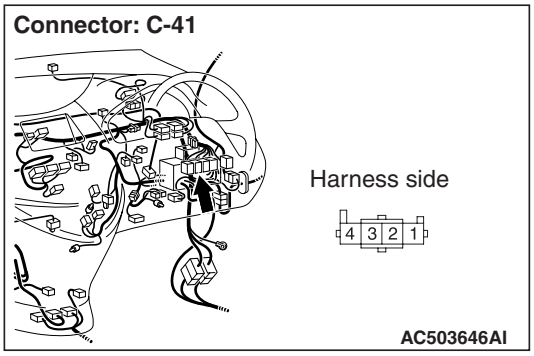


(2) Measure the resistance between terminal 4 and earth.

OK: 2 ohms or less

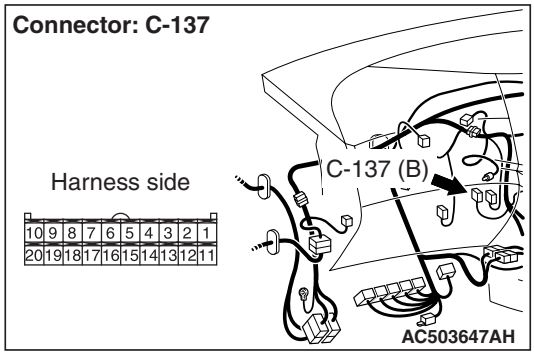
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check the wiring harness between sonar switch connector C-41 (terminal 4) and earth.



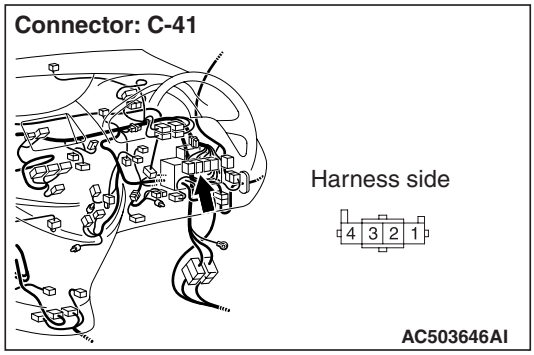
Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

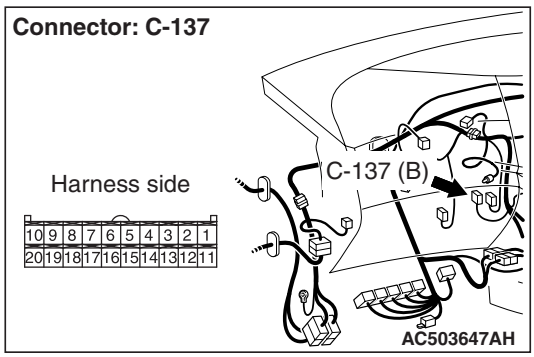
STEP 5. Connector check: Corner sensor/back sensor-ECU C-137.



Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the defective connector.

STEP 6. Check the wiring harness between sonar switch connector C-41 (terminal 3) and corner sensor/back sensor-ECU connector C-137 (terminal 13).





Q: Is the check result normal?
YES : Replace the corner sensor/back sensor-ECU.
NO : Repair the wiring harness.

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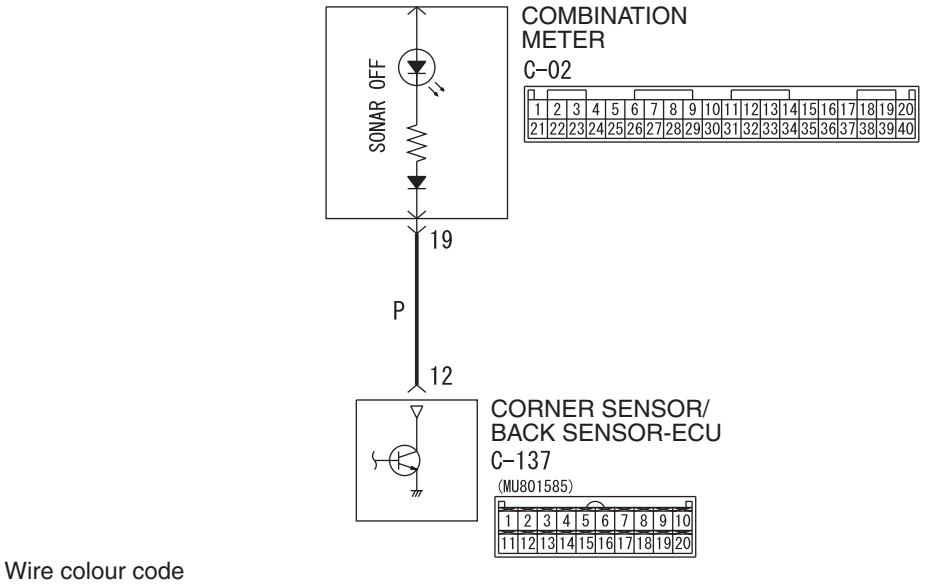
Inspection Procedure 4: Only the corner sensor OFF indicator lamp does not illuminate.

Corner Sensor OFF Indicator Lamp Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6X54X089A

COMMENTS ON TROUBLE SYMPTOM

If only the corner sensor OFF indicator lamp does not illuminate, the wiring harness, connectors, corner sensor/back sensor-ECU, or combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the combination meter

DIAGNOSIS PORODEDURE

STEP 1. Inspect the corner sensor OFF indicator lamp and corner sensor indicator with ignition switch turned to ON position.

Verify that the corner sensor OFF indicator lamp and corner sensor indicator will illuminate for 1 second when the ignition switch is turned to the ON position.

Q: Is the check result normal?

YES <Both of them illuminate normally.> : Retest the system.

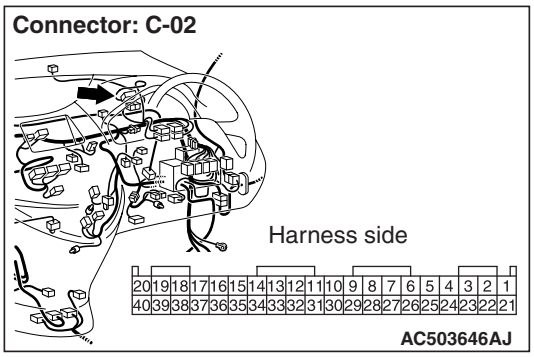
NO <Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate.> : Diagnose the power supply system of the combination meter. Refer to P.54A-75.

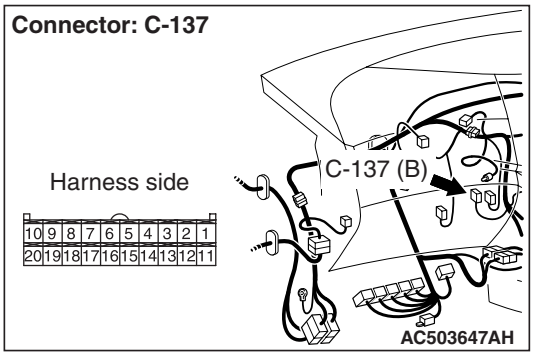
NO <Only corner sensor OFF indicator lamp does not illuminate.> : Go to Step 2.

NO <All the corner sensor indicators do not illuminate.> : Perform "All the corner sensor indicators do not illuminate." Refer to P.54A-169.

NO <Any of corner sensor indicators does not illuminate.> : Perform "Any of corner sensor indicators does not illuminate." Refer to P.54A-171.

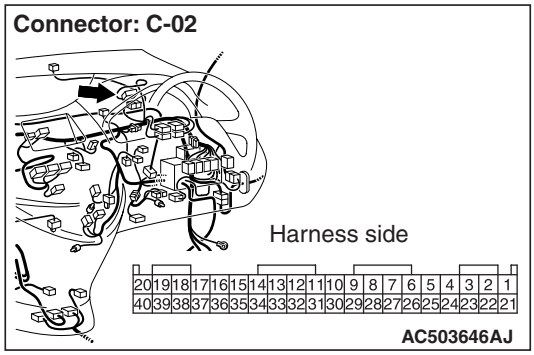
STEP 2. Connector check: Corner sensor/back sensor-ECU connector C-137 and combination meter C-02.

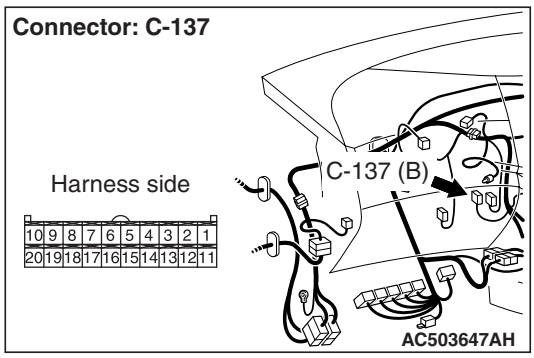




Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the defective connector.

STEP 3. Check the wiring harness between combination meter connector C-02 (terminal 19) and corner sensor/back sensor-ECU connector C-137 (terminal 12).





Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor OFF indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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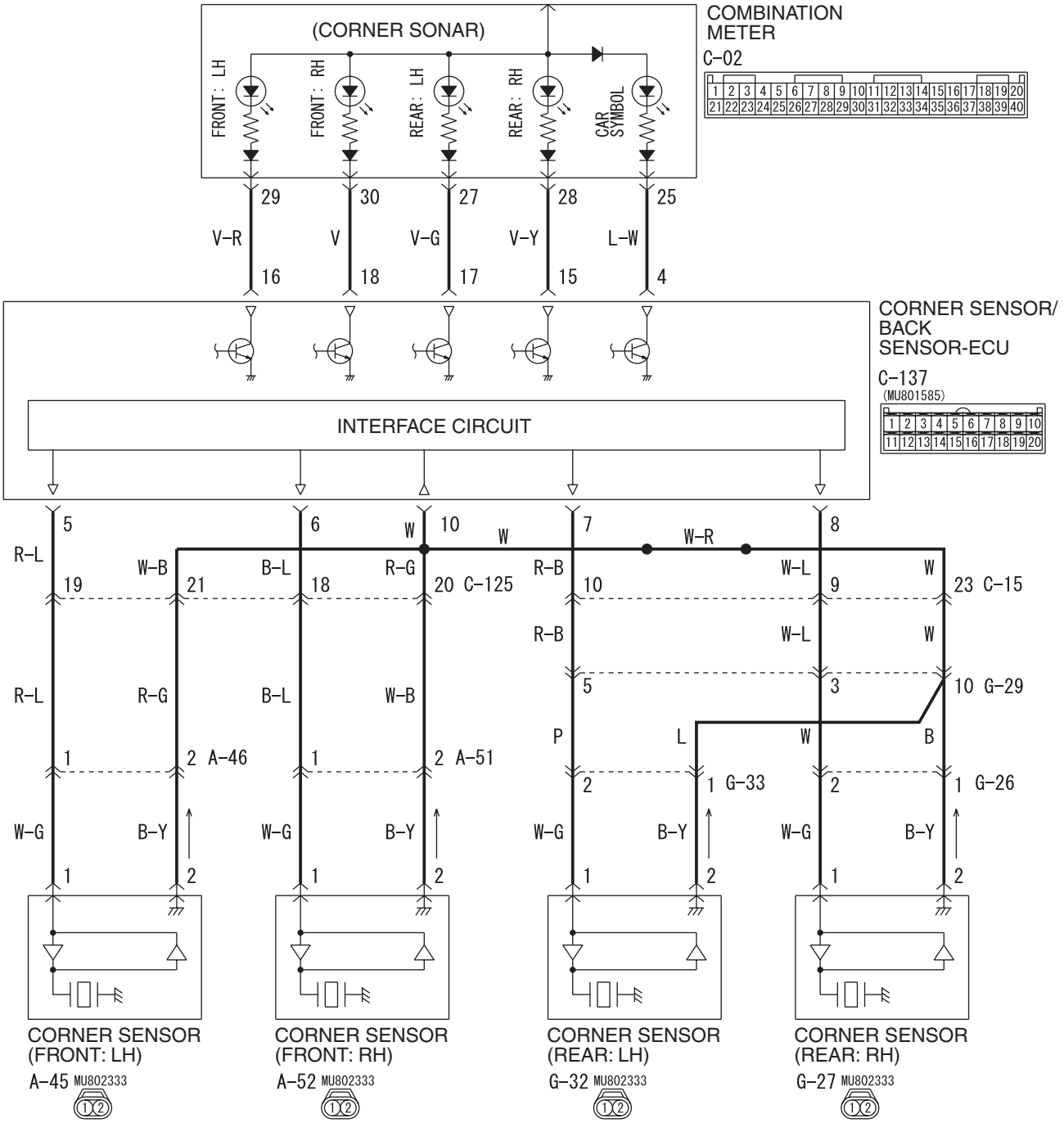
Inspection Procedure 5: All the corner sensor indicators do not illuminate or flash. Inspection Procedure 6: All the corner sensor indicators stay on.

Corner Sensor Indicator Lamp Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6X54X090A

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COMMENTS ON TROUBLE SYMPTOM

If all the corner sensor indicators do not illuminate or flash, or all the corner sensor indicators continue flashing, the wiring harness, connectors, corner sensor/back sensor-ECU, or combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the combination meter

DIAGNOSIS PORODEDURE

STEP 1. Inspect corner sensor OFF indicator lamp and corner sensor indicator with ignition switch turned to ON position.

Verify that the corner sensor OFF indicator lamp and corner sensor indicator will illuminate for 1 second when the ignition switch is turned to the ON position.

Q: Is the check result normal?

YES <Both of them illuminate normally.> : Retest the system.

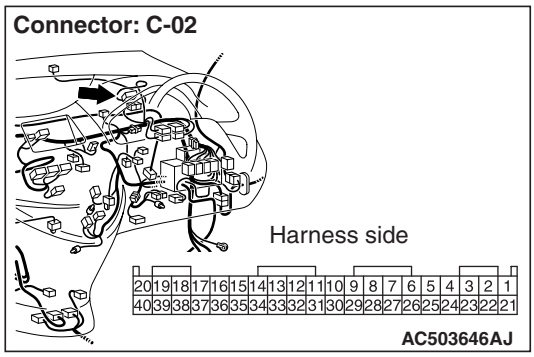
NO <Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate.> : Diagnose the power supply system of the combination meter. Refer to P.54A-75.

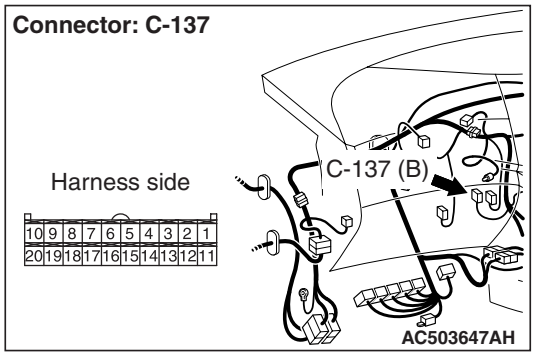
NO <Only corner sensor OFF indicator lamp does not illuminate.> : Perform "Corner sensor OFF indicator lamp does not illuminate." Refer to P.54A-167.

NO <All the corner sensor indicators do not illuminate or continue flashing.> : Go to Step 2.

NO <Any of the corner sensor indicators does not illuminate or continues flashing.> : Perform "Any of corner sensor indicators does not illuminate." Refer to P.54A-171.

STEP 2. Connector check: Corner sensor/back sensor-ECU connector C-137 and combination meter C-02.





Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the combination meter.

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Inspection Procedure 7: Any of the corner sensor indicators does not illuminate.
Inspection Procedure 8: Any of the corner sensor indicators continues flashing.

CIRCUIT OPERATION

Refer to P.54A-169.

COMMENTS ON TROUBLE SYMPTOM

If any of the corner sensor indicator lamp does not illuminate or continues flashing, the wiring harness, connectors, corner sensor/back sensor-ECU, or combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the combination meter

DIAGNOSIS PORODEDURE

STEP 1. Inspect corner sensor OFF indicator lamp and corner sensor indicator with ignition switch turned to ON position.

Verify that the corner sensor OFF indicator lamp and corner sensor indicator will illuminate for 1 second when the ignition switch is turned to the ON position.

Q: Is the check result normal?

YES <Both of them illuminate normally.> : The procedure is complete.

NO <Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate.> : Diagnose the power supply system of the combination meter. Refer to P.54A-75.

NO <Only corner sensor OFF indicator lamp does not illuminate.> : Perform "Corner sensor OFF indicator lamp does not illuminate." Refer to P.54A-167.

NO <All the corner sensor indicators do not illuminate or continue flashing.> : Perform "All the corner sensor indicators do not illuminate." Refer to P.54A-169.

NO <Any of the corner sensor indicators does not illuminate or continues flashing.> : Go to Step 2.

STEP 2. Inspect inoperative corner sensor indicator.

Q: Which corner sensor indicator lamp does not illuminate or continues flashing?

Only front right corner sensor indicator does not illuminate or continues flashing. : Go to Step 3.

Only front left corner sensor indicator does not illuminate or continues flashing. : Go to Step 9.

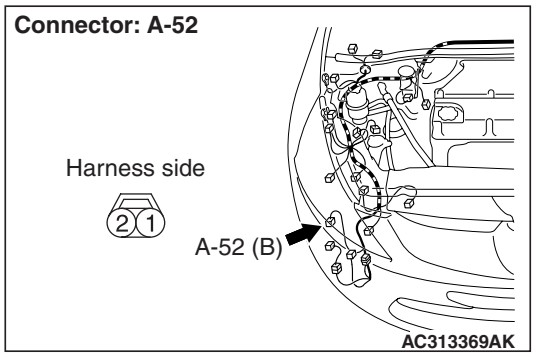
Only rear right corner sensor indicator does not illuminate or continues flashing. : Go to Step 15.

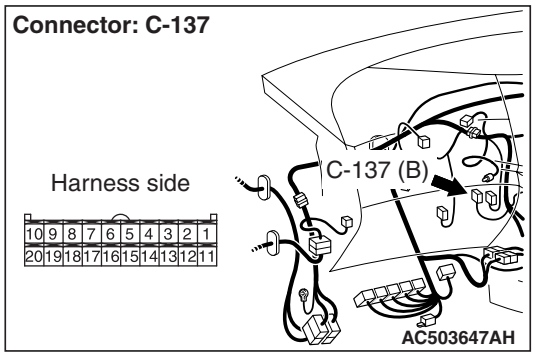
Only rear left corner sensor indicator does not illuminate or continues flashing. : Go to Step 21.

Only rear corner sensor indicators do not illuminate or continue flashing. : Perform "Obstacle is not detected even when the selector lever is shifted to "R" (reverse) position." Refer to P.54A-180.

Only the vehicle plan view does not illuminate. : Go to Step 27.

STEP 3. Connector check: Corner sensor/back sensor-ECU C-137 and corner sensor (front: RH) connector A-52.



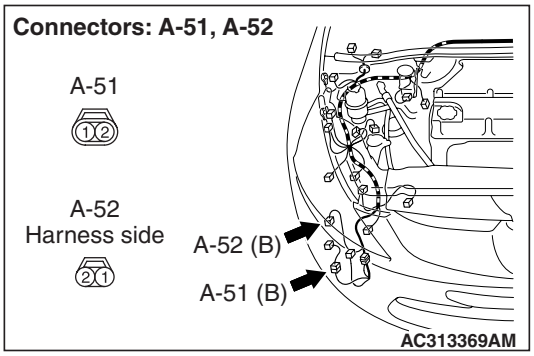


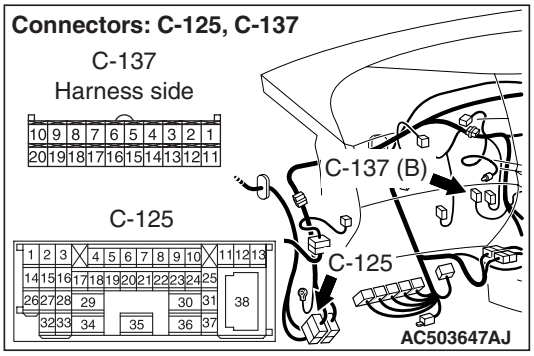
Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the defective connector.

STEP 4. Check the wiring harness between corner sensor (front: RH) connector A-52 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 6, 10).

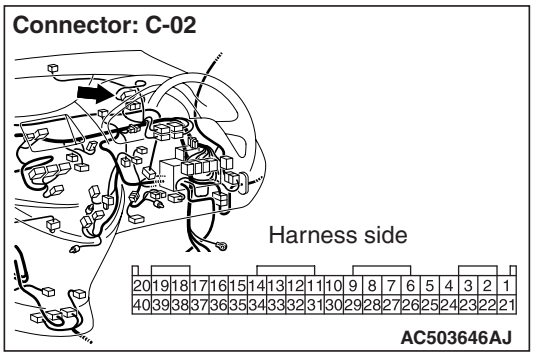




NOTE: Before the wiring harness inspection, inspect intermediate connector A-51 and C125, and repair if necessary.

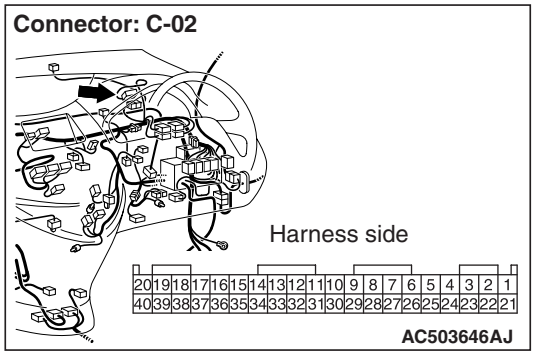
Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the wiring harness.

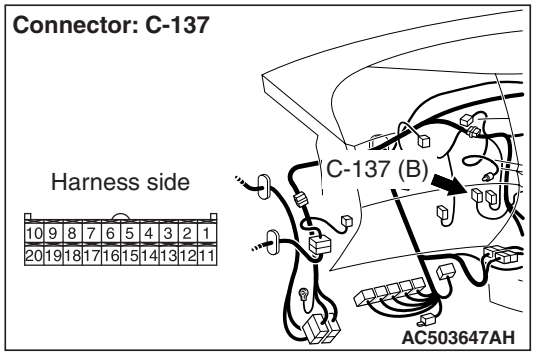
STEP 5. Connector check: Combination meter connector C-02.



Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the defective connector.

STEP 6. Check the wiring harness between combination meter connector C-02 (terminal 30) and corner sensor/back sensor-ECU connector C-137 (terminal 18).





Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Inspection with corner sensor (front: RH) removed

Inspect if the corner sensor indicator (front right) flashes when the ignition switch is turned to the ON position with the corner sensor (front: RH) connector A-52 disconnected.

Q: Does the corner sensor indicator (front right) flash?
YES : Replace the corner sensor (front: RH).
NO : Go to Step 8.

STEP 8. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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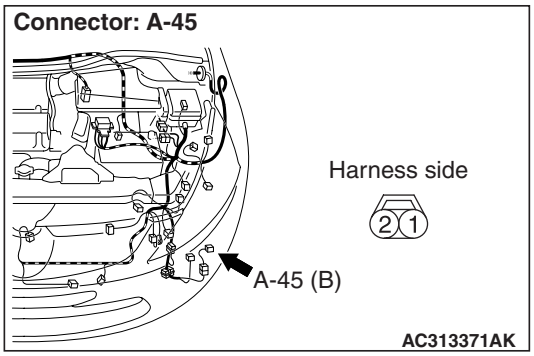
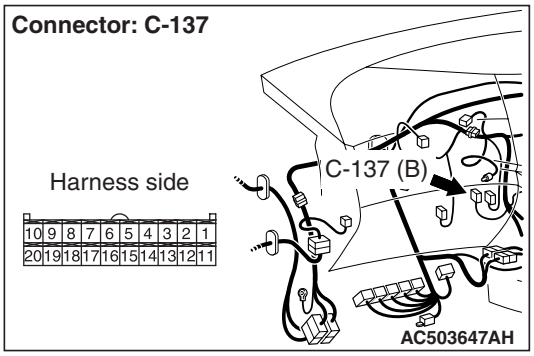
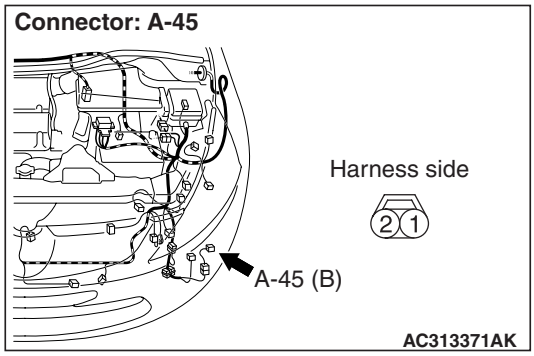
STEP 9. Connector check: Corner sensor/back sensor-ECU connector C-137 and corner sensor (front: LH) connector A-45.

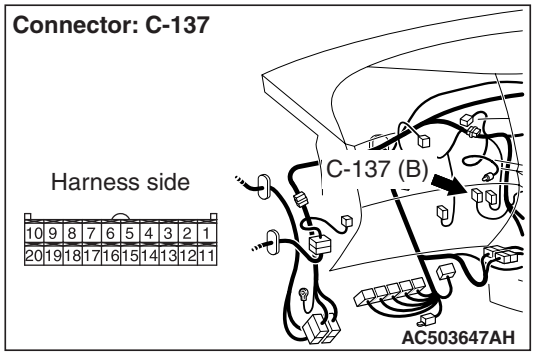




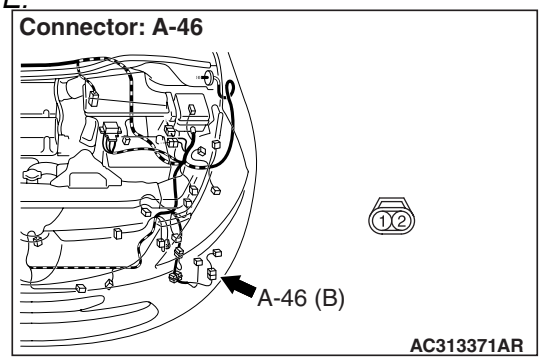
Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the defective connector.

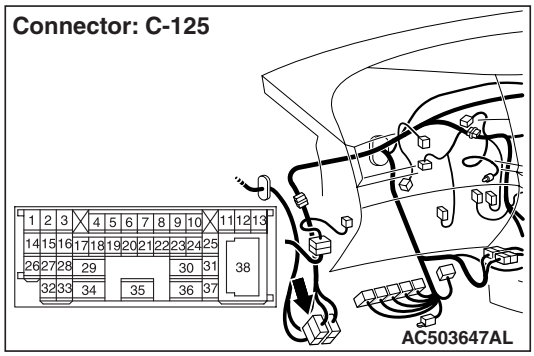
STEP 10. Check the wiring harness between corner sensor (front: LH) connector A-45 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 5, 10).





NOTE:





Before the wiring harness inspection, inspect intermediate connector A-46 and C-125, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the wiring harness.

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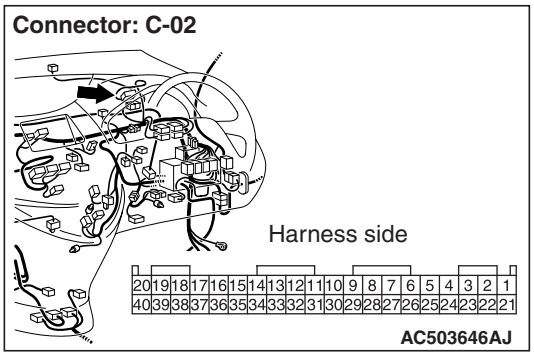
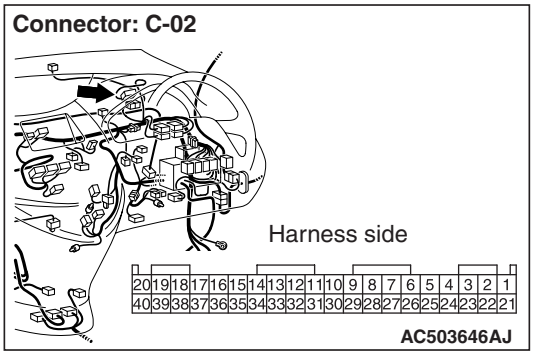
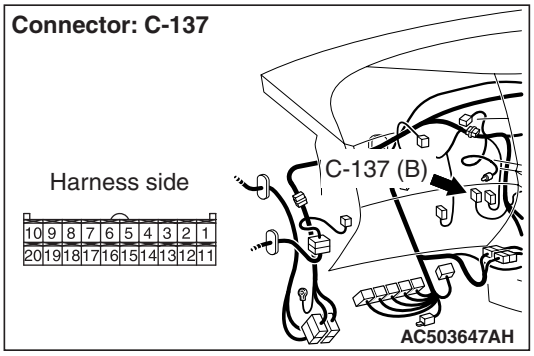
STEP 11. Connector check: Combination meter connector C-02.



Q: Is the check result normal?
YES : Go to Step 12.
NO : Repair the defective connector.

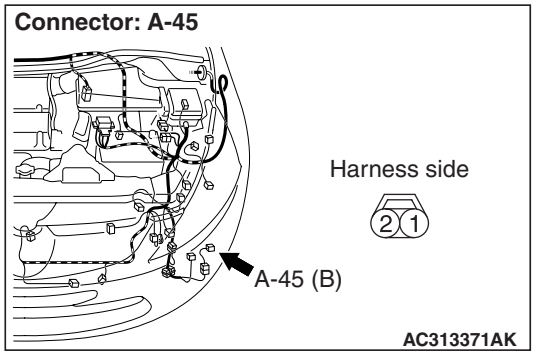
STEP 12. Check the wiring harness between combination meter connector C-02 (terminal 29) and corner sensor/back sensor-ECU connector C-137 (terminal 16).





Q: Is the check result normal?
YES : Go to Step 13.
NO : Repair the wiring harness.

STEP 13. Inspection with corner sensor (front: LH) removed



Inspect if the corner sensor indicator (front left) flashes when the ignition switch is turned to the ON position with the corner sensor (front: LH) connector A-45 disconnected.

Q: Does the corner sensor indicator (front left) flash?
YES : Replace the corner sensor (front: LH).
NO : Go to Step 14.

STEP 14. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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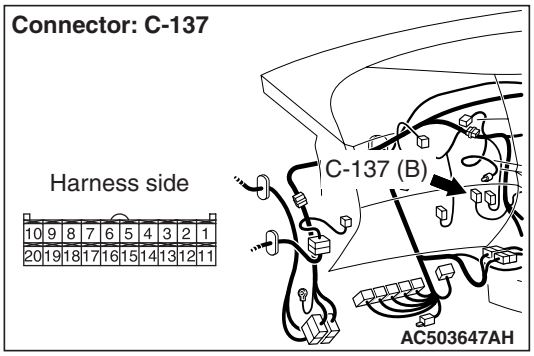
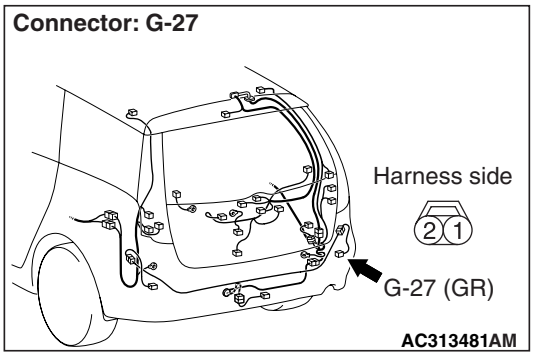
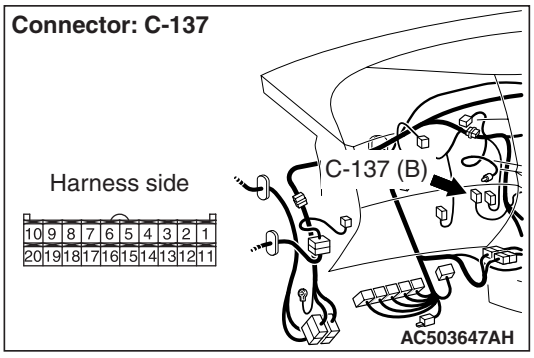
STEP 15. Connector check: Corner sensor/back sensor-ECU connector C-137 and corner sensor (rear: RH) connector G-27.

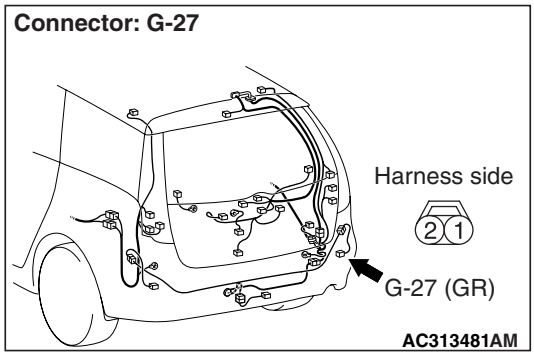




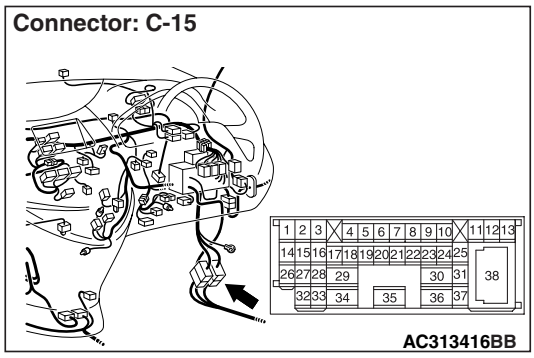
Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the defective connector.

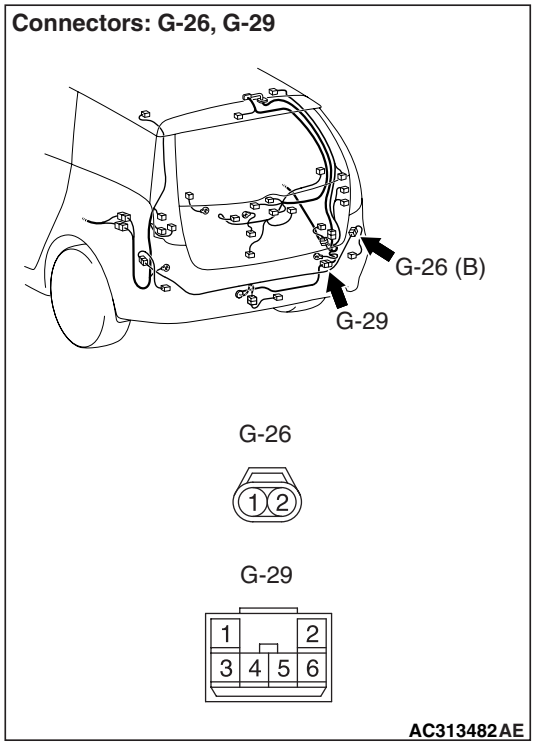
STEP 16. Check the wiring harness between corner sensor (rear: RH) connector G-27 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 8, 10).





NOTE: Before the wiring harness inspection, inspect the intermediate connectors C-15, G-26 and G-29, and repair if necessary.





Q: Is the check result normal?
YES : Go to Step 17.
NO : Repair the wiring harness.

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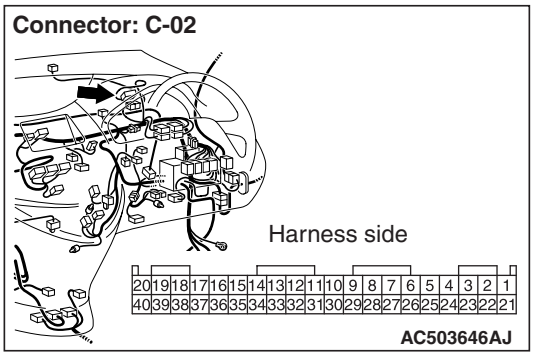
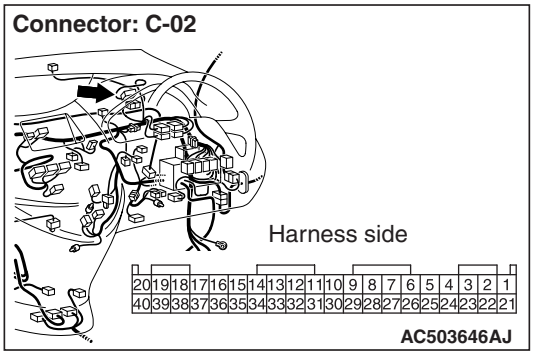
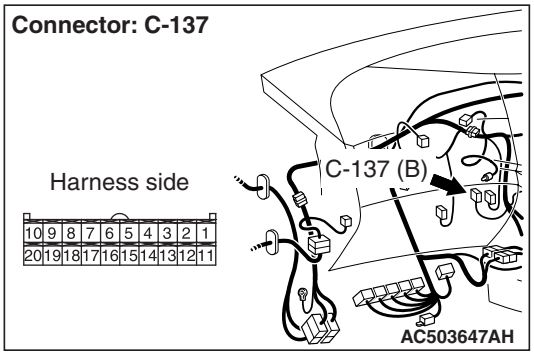
STEP 17. Connector check: Combination meter connector C-02.



Q: Is the check result normal?
YES : Go to Step 18.
NO : Repair the defective connector.

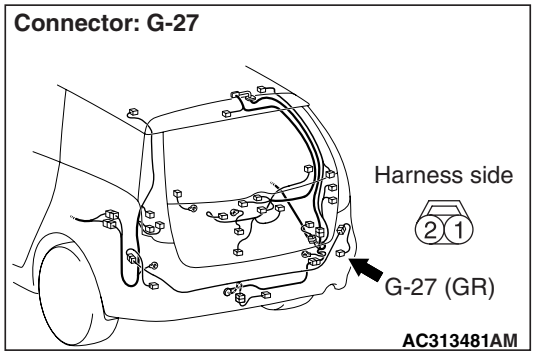
STEP 18. Check the wiring harness between combination meter connector C-02 (terminal 28) and corner sensor/back sensor-ECU connector C-137 (terminal 15).





Q: Is the check result normal?
YES : Go to Step 19.
NO : Repair the wiring harness.

STEP 19. Inspection with corner sensor (rear: RH) removed



Inspect if the corner sensor indicator (rear right) flashes when the ignition switch is turned to the ON position with the corner sensor (rear: RH) connector G-27 disconnected.

Q: Does the corner sensor indicator (rear right) flash?
YES : Replace the corner sensor (rear: RH).
NO : Go to Step 20.

STEP 20. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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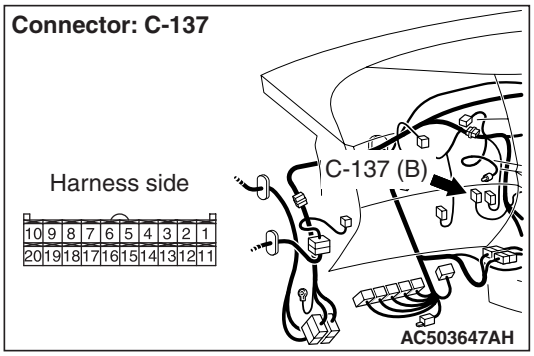
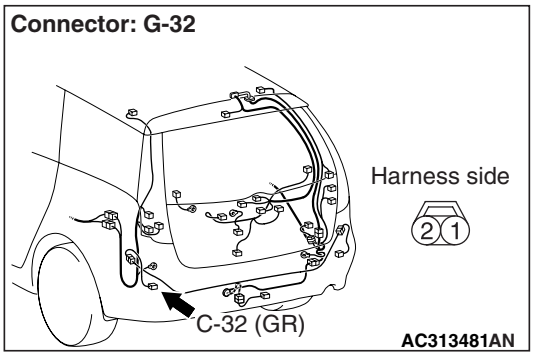
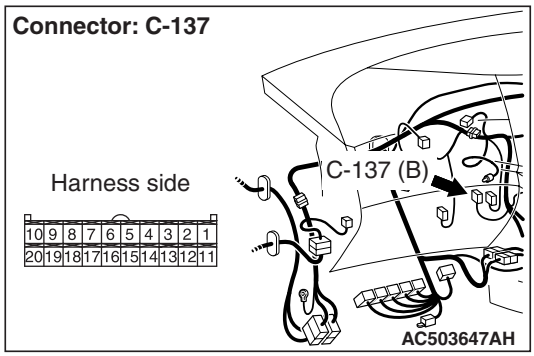
STEP 21. Connector check: Corner sensor/back sensor-ECU connector C-137 and corner sensor (rear: LH) connector G-32.

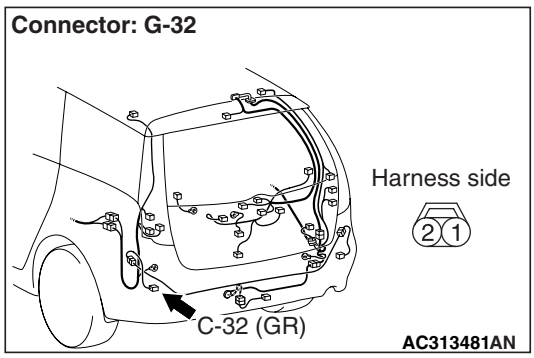




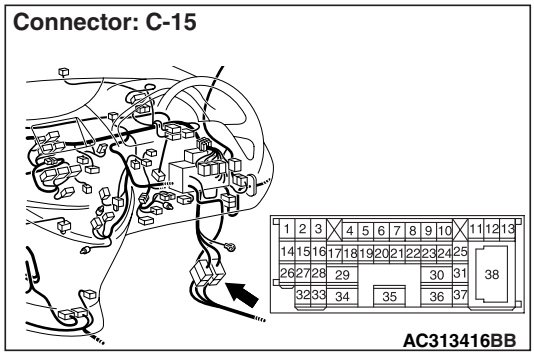
Q: Is the check result normal?
YES : Go to Step 22.
NO : . Repair the defective connector.

STEP 22. Check the wiring harness between corner sensor (rear: LH) connector G-32 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 7, 10).

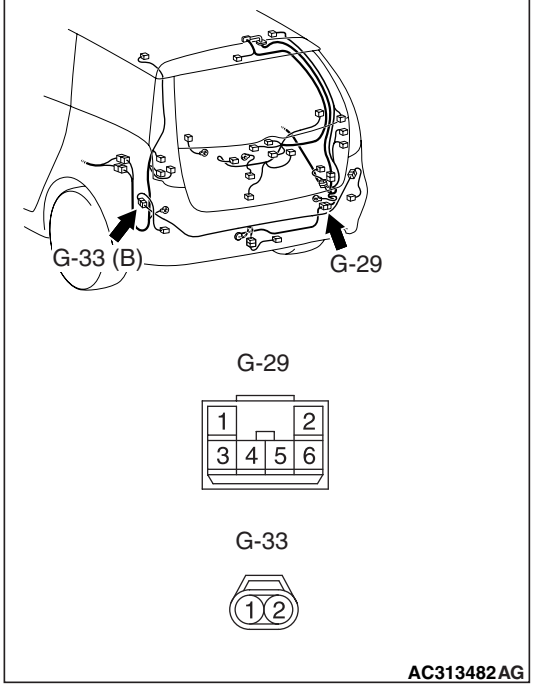




NOTE: Before the wiring harness inspection, inspect the intermediate connectors C-15, G-29 and G-33, and repair if necessary.



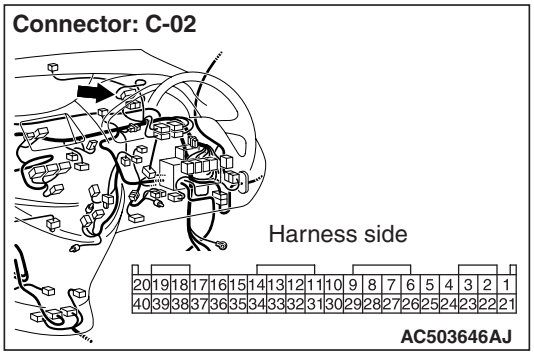
Connectors: G-29, G-33



Q: Is the check result normal?
YES : Go to Step 23.
NO : Repair the wiring harness.

STEP 23. Connector check: Combination meter connector C-02.

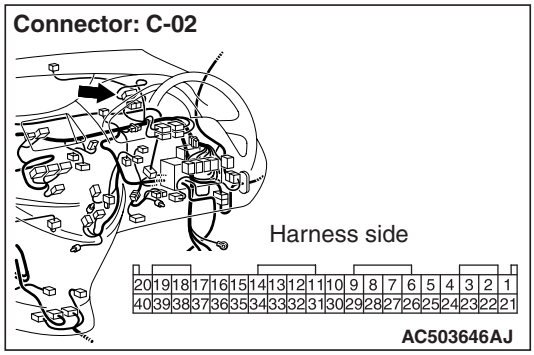
Connector: C-02



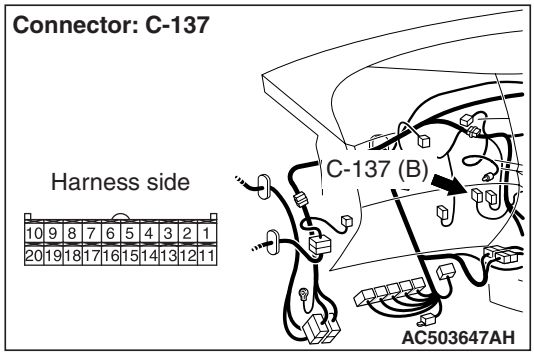
Q: Is the check result normal?
YES : Go to Step 24.
NO : Repair the defective connector.

STEP 24. Check the wiring harness between combination meter connector C-02 (terminal 27) and corner sensor/back senor sensor-ECU connector C-137 (terminal 17).

Connector: C-02



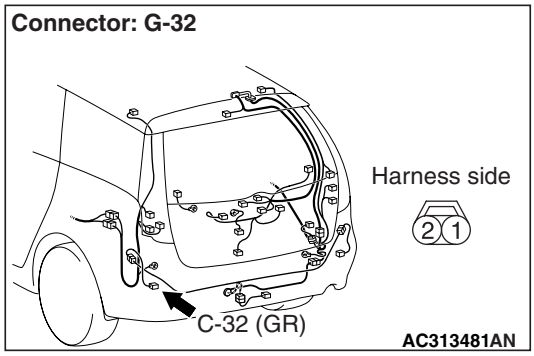
Connector: C-137



Q: Is the check result normal?
YES : Go to Step 25.
NO : Repair the wiring harness.

STEP 25. Inspection with corner sensor (rear: LH) removed

Connector: G-32



Inspect if the corner sensor indicator (rear left) flashes when the ignition switch is turned to the ON position with the corner sensor (rear: LH) connector G-32 disconnected.

Q: Does the corner sensor indicator (rear left) flash?
YES : Replace the corner sensor (rear: LH).
NO : Go to Step 26.

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STEP 26. Verification after corner sensor/back sensor-ECU replacement

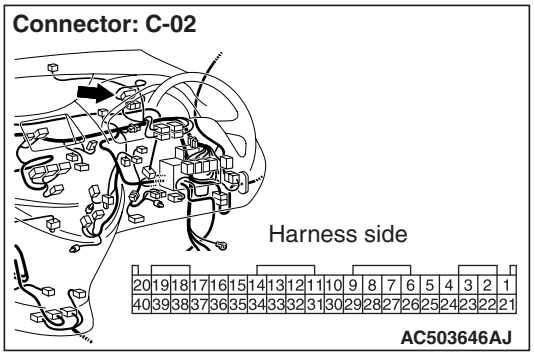
After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

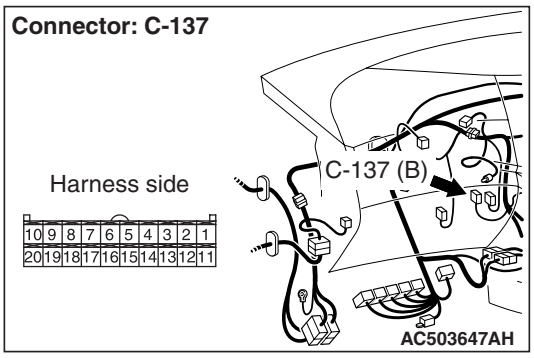
Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the combination meter.

STEP 27. Connector check: Corner sensor/back sensor-ECU connector C-137 and combination meter connector C-02.



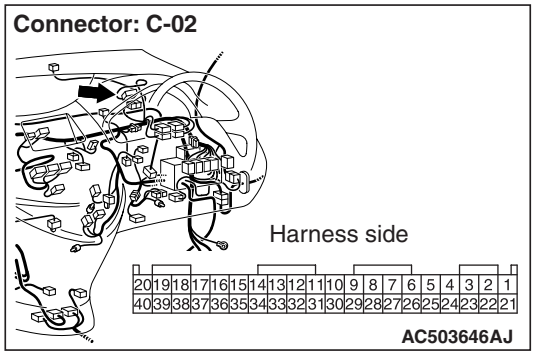


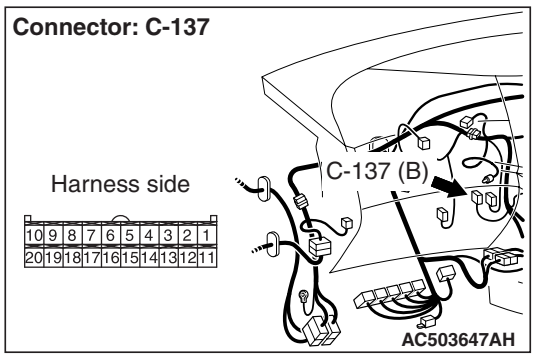
Q: Is the check result normal?

YES : Go to Step 28.

NO : Repair the defective connector.

STEP 28. Check the wiring harness between combination meter connector C-02 (terminal 25) and corner sensor/back sensor-ECU connector C-137 (terminal 4).





Q: Is the check result normal?

YES : Go to Step 29.

NO : Repair the wiring harness.

STEP 29. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

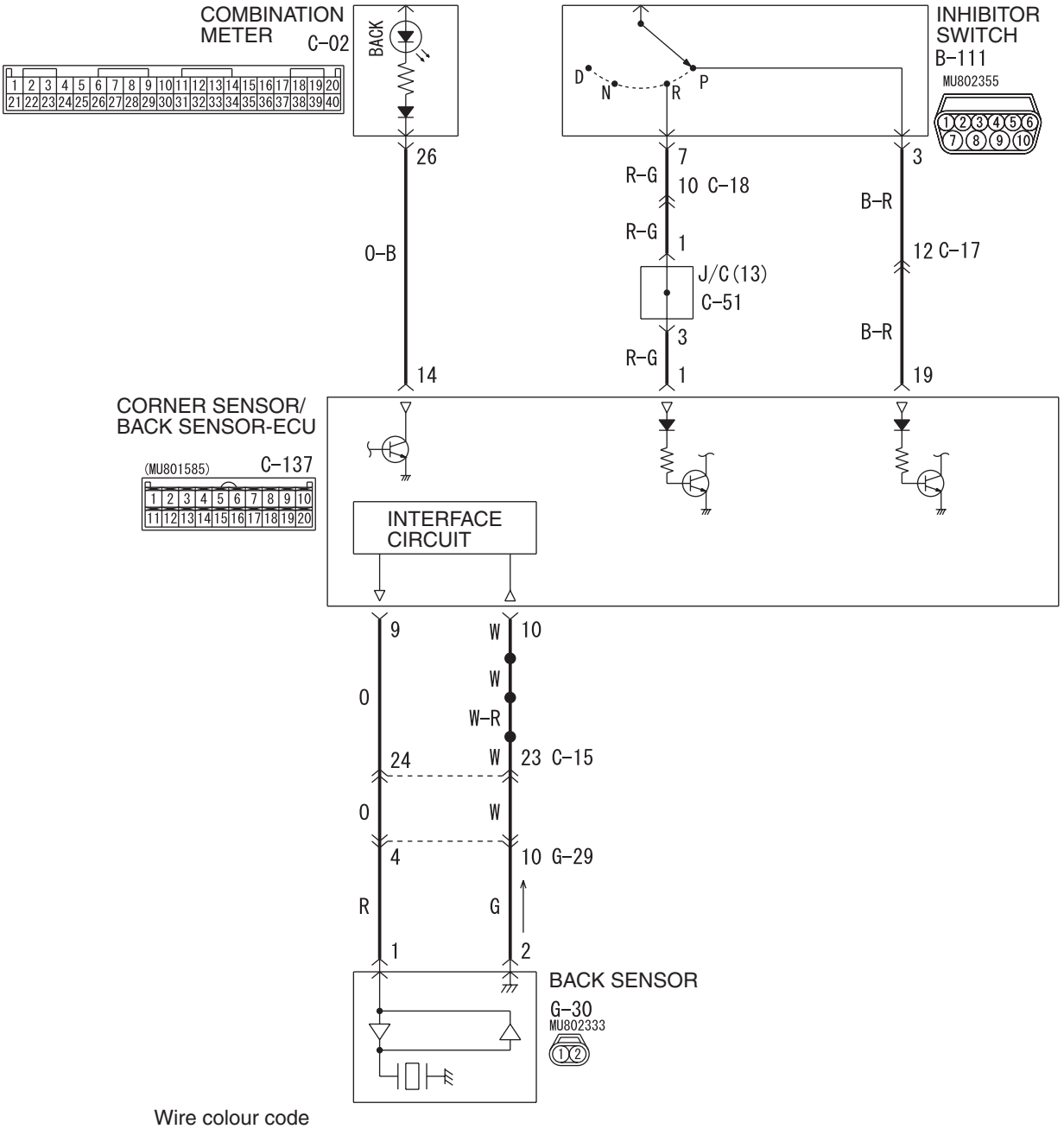
Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the combination meter.

Inspection Procedure 9: Obstacle is not detected even when the selector lever is shifted to "R" (reverse) position.
Inspection Procedure 10: The corner sensor indicator (rear) continues flashing.

Back Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple

W6X54X091A

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COMMENTS ON TROUBLE SYMPTOM

If obstacle is not detected or the corner sensor indicator (rear) continues flashing even when the selector lever is shifted to "R" (reverse) position, the wiring harness, connectors, inhibitor switch, or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the inhibitor switch
- Malfunction of corner sensor/back sensor-ECU

DIAGNOSIS PORODEDURE

STEP 1. Inspect corner sensor OFF indicator lamp and corner sensor indicator with ignition switch turned to ON position.

Verify that the corner sensor OFF indicator lamp and corner sensor indicator will illuminate for 1 second when the ignition switch is turned to the ON position.

Q: Is the check result normal?

YES <Both of them illuminate normally.> : The procedure is complete.

NO <Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate.> : Diagnose the power supply system of the combination meter. Refer to P.54A-75.

NO <Only corner sensor OFF indicator lamp does not illuminate.> : Perform "Corner sensor OFF indicator lamp does not illuminate." Refer to P.54A-167.

NO <All the corner sensor indicators do not illuminate or continue flashing.> : Perform "All the corner sensor indicators do not illuminate." Refer to P.54A-169.

NO <Any of the corner sensor indicators does not illuminate or continues flashing.> : Go to Step 2.

STEP 2. Inspect inoperative corner sensor indicator lamp.

Q: Which corner sensor indicator lamp does not illuminate or continues flashing?

The corner sensor indicators (except rear corner sensor indicators) do not illuminate or continue flashing. : Perform "Any of the corner sensor indicators does not illuminate." Refer to P.54A-171.

Only rear corner sensor indicators do not illuminate or continue flashing. : Go to Step 3.

STEP 3. Verify that the ETACS-ECU buzzer sounds when the selector lever is shifted to "R" (reverse) position.

(1) Turn the ignition switch to the ON position.
(2) Shift the selector lever to the "R" (reverse) position.

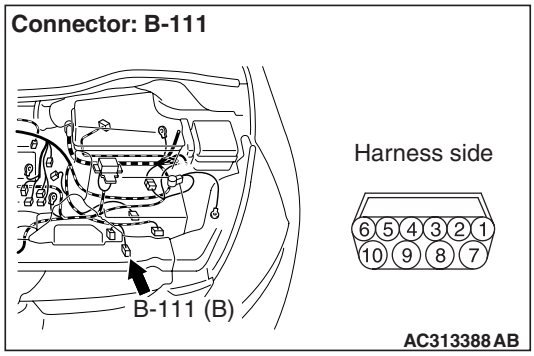
OK: The ETACS-ECU buzzer sounds.

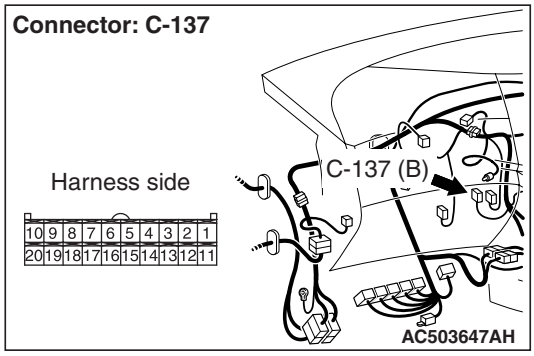
Q: Is the check result normal?

YES : Go to Step 4.

NO : Diagnose SWS.Refer to GROUP 54D – Troubleshooting P.54D-76 or GROUP 54E – Troubleshooting P.54E-79.

STEP 4. Connector check: Corner sensor/back sensor-ECU connector C-137 and inhibitor switch connector B-111.



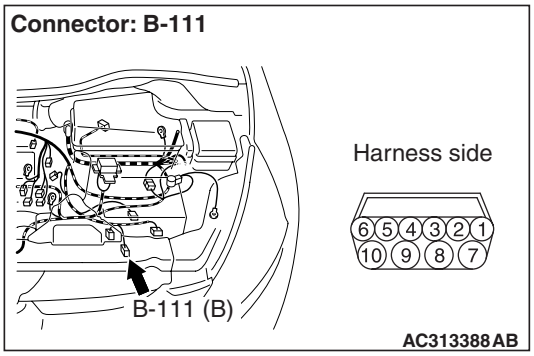


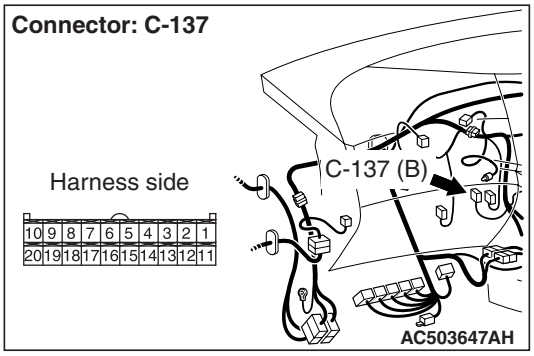
Q: Is the check result normal?

YES : Go to Step 5.

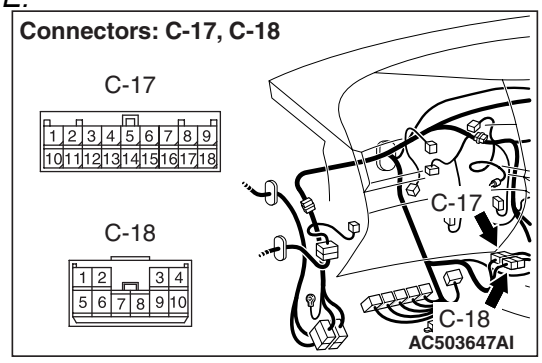
NO : Repair the defective connector.

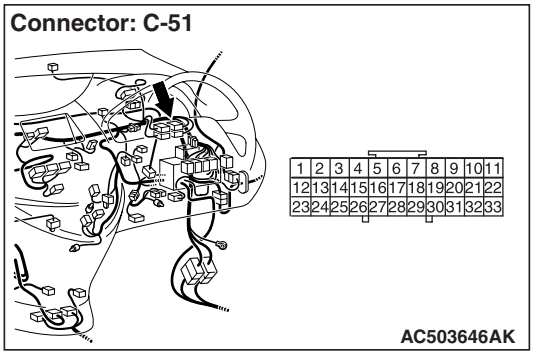
STEP 5. Check the wiring harness between inhibitor switch connector B-111 (terminal 3, 7) and corner sensor/back sensor-ECU connector C-137 (terminal 19, 1).





NOTE:

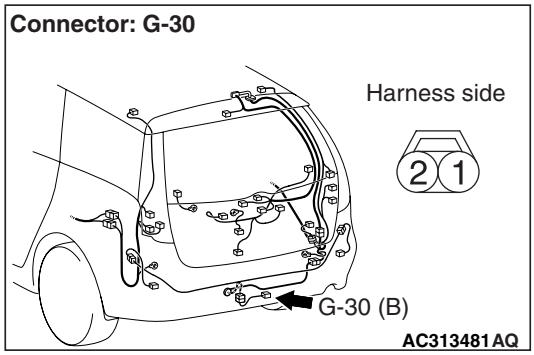




Before the wiring harness inspection, inspect the intermediate connectors C-17, C-18 and joint connector C-51, and repair if necessary.

Q: Is the check result normal?
YES : . Go to Step 6.
NO : . Repair the wiring harness.

STEP 6. Connector check: Back sensor connector G-30.



Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

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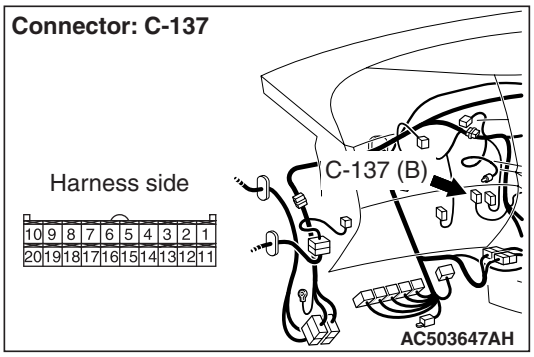
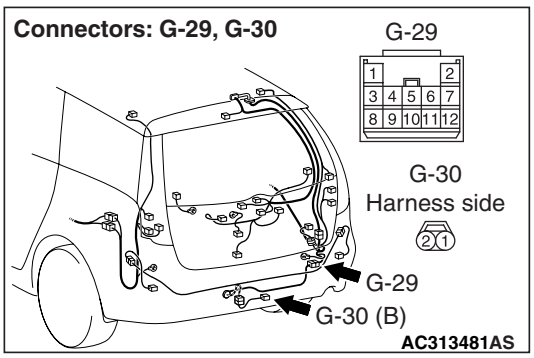
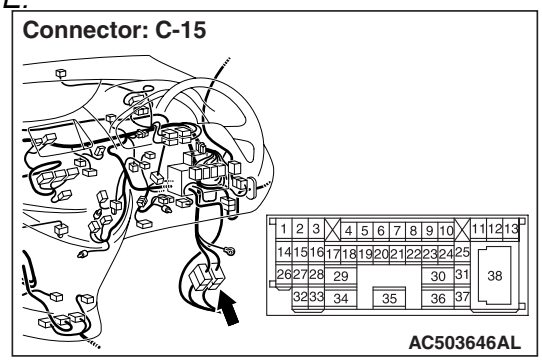
STEP 7. Check the wiring harness between back sensor connector G-30 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 9, 10).





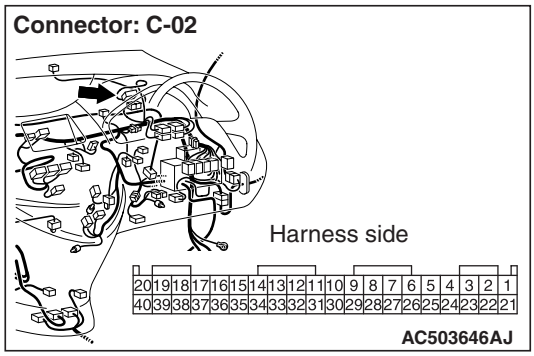
NOTE:



Before the wiring harness inspection, inspect the intermediate connectors C-15 and G-29, and repair if necessary.

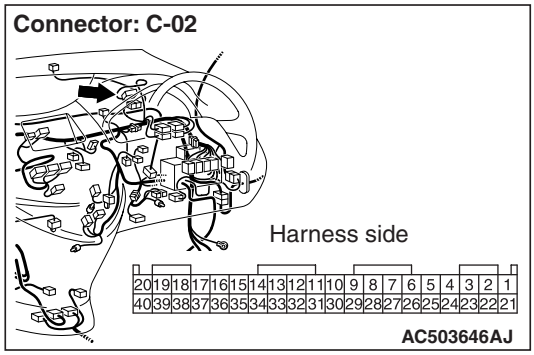
Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the wiring harness.

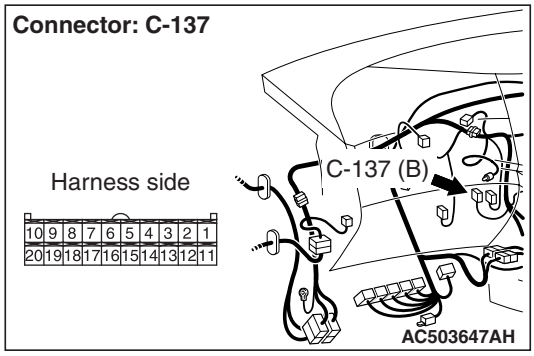
STEP 8. Connector check: Combination meter connector C-02.



Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the defective connector.

STEP 9. Check the wiring harness between combination meter connector C-02 (terminal 26) and corner sensor/back sensor-ECU connector C-137 (terminal 14).





Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the wiring harness.

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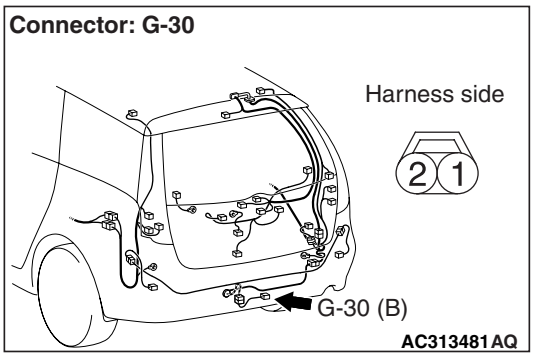
STEP 10. Inspection with back sensor removed



Verify that the corner sensor indicator lamp (rear) flashes when the ignition switch is turned to the ON position with the back sensor connector G-30 disconnected.

Q: Inspect if the corner sensor indicator (rear) flashes.
YES : Replace the back sensor.
NO : Go to Step 11.

STEP 11. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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CHECK AT ECU TERMINALS

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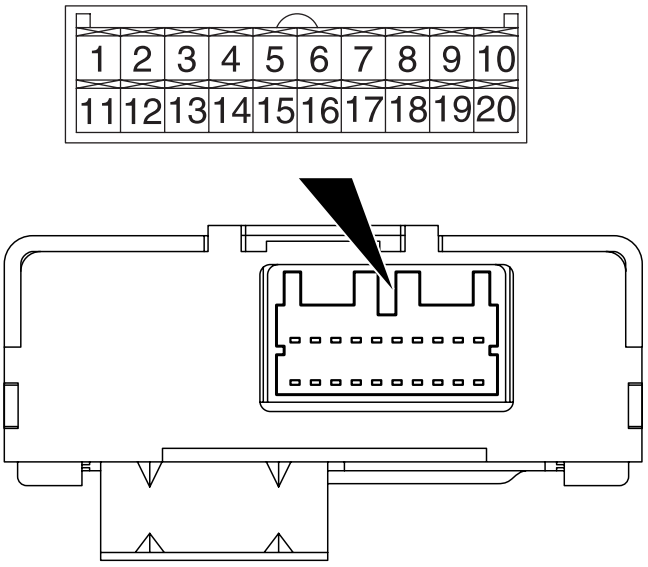

AC206264 AB

Terminal No.	Check items	Check conditions	Normal conditions
1	Inhibitor switch R (reverse) position input	• Ignition switch to ON position • Shift the selector lever to any position other than "R" (reverse).	0 V
		• Ignition switch to ON position • Shift the selector lever to "R" (reverse) position.	Battery voltage
2	Input of vehicle speed signal	Perform a test run of the vehicle.	0 to 5 V (pulse signal)
4	Corner sensor indicator (vehicle outline symbol)	Ignition switch: ON position	Battery voltage (Extinguished), 0V (Illuminated)
5	Corner sensor (front: LH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
6	Corner sensor (front: RH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
7	Corner sensor (rear: LH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
8	Corner sensor (rear: RH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
9	Back sensor	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
10	Sensor earth	Ignition switch: ON position	0 V

Terminal No.	Check items	Check conditions	Normal conditions
11	Power supply to the ignition switch (IG2)	Ignition switch: ON position	Battery voltage
12	Corner sensor OFF indicator lamp output	• Ignition switch: ON position • Sonar switch: OFF	0 V
		• Ignition switch: ON position • Sonar switch: ON	Battery voltage
13	Sonar switch input	• Ignition switch: ON position • Sonar switch: OFF	Battery voltage
		• Ignition switch: ON position • Sonar switch: ON	0 V
14	Corner sensor indicator (back)	Ignition switch: ON position	Battery voltage (Extinguished), 0 V (Illuminated)
15	Corner sensor indicator (rear: RH)	Ignition switch: ON position	Battery voltage (Extinguished), 0 V (Illuminated)
16	Corner sensor indicator (front: LH)	Ignition switch: ON position	Battery voltage (Extinguished), 0 V (Illuminated)
17	Corner sensor indicator (rear: LH)	Ignition switch: ON position	Battery voltage (Extinguished), 0 V (Illuminated)
18	Corner sensor indicator (front: RH)	Ignition switch: ON position	Battery voltage (Extinguished), 0 V (Illuminated)
19	Inhibitor switch P (parking) position input	• Ignition switch: ON position • Shift the selector lever to any position other than "P" (parking).	0 V
		• Ignition switch: ON position • Shift the selector lever to "P" (parking) position.	Battery voltage
20	Earth	Always	0 V

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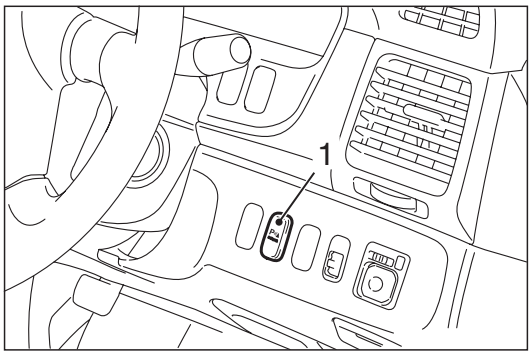
CORNER SENSOR SYSTEM

REMOVAL AND INSTALLATION

M1543030700024



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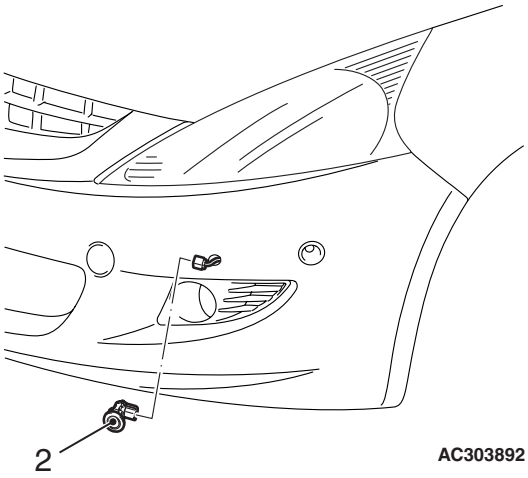

AC303892

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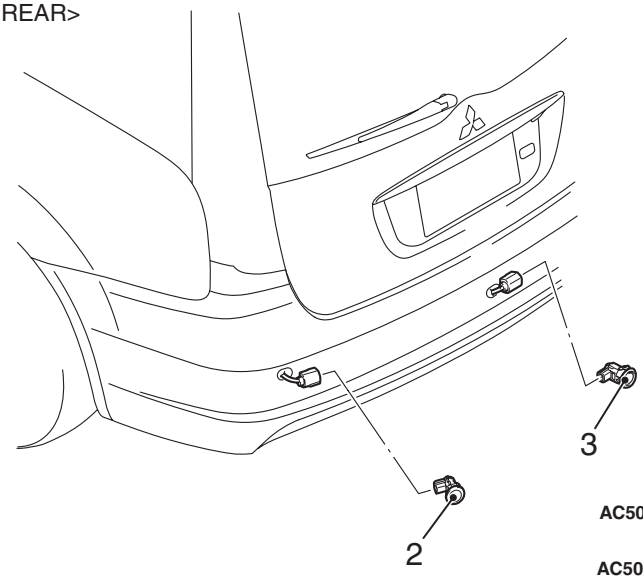
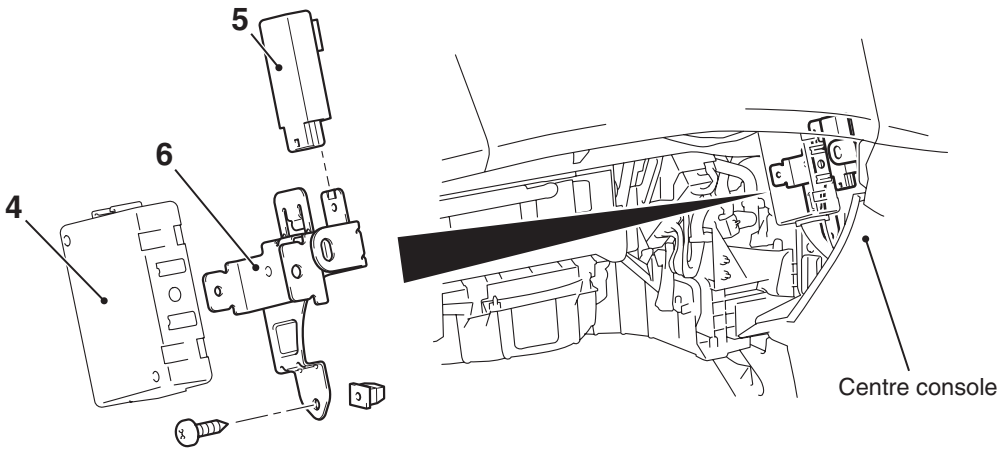


AC502612

AC502947AB



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Corner sensor/back sensor switch removal steps

- Selector lever knob, selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).
- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Corner sensor/back sensor switch

Corner sensor or back sensor removal steps

2. Corner sensor
3. Back sensor

Corner sensor/back sensor-ECU removal steps

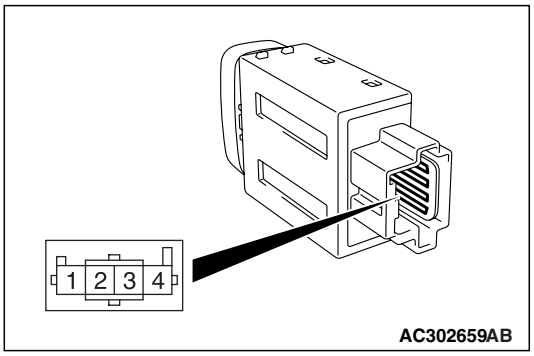
- Selector lever knob, selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).
- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

4. Corner sensor/back sensor-ECU
5. Immobilizer-ECU
6. Immobilizer-ECU and Corner sensor/back sensor-ECU bracket

INSPECTION

M1543019503778

SONAR SWITCH CONTINUITY CHECK



Switch position	Terminal number	Normal conditions
OFF	3 – 4	Open circuit
ON		Less than 2 ohms

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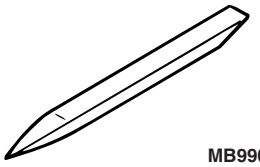
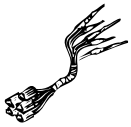
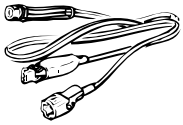
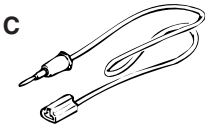
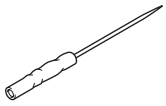
Group TOC

CORNER SENSOR SYSTEM <VEHICLES FOR AUSTRALIA AND NEW ZEALAND>

SPECIAL TOOL

M1542000600816

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of switch panel
A  B  C  D DO NOT USE MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

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TROUBLESHOOTING

TROUBLE SYMPTOM CHART

M1543007202067

⚠ CAUTION

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Trouble symptom	Inspection procedure number	Reference page
Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate when the ignition switch is turned to the ON position.	1	P.54A-191
The corner sensor system does not operate.	2	P.54A-194
The system cannot be activated or deactivated even when the sonar switch is pressed.	3	P.54A-195
The corner sensor OFF indicator lamp does not illuminate.	4	P.54A-197
The right or left corner sensor does not detect the obstacle.	5	P.54A-200
Obstacle is not detected even when the selector lever is shifted to "R" (reverse) position.	6	P.54A-203

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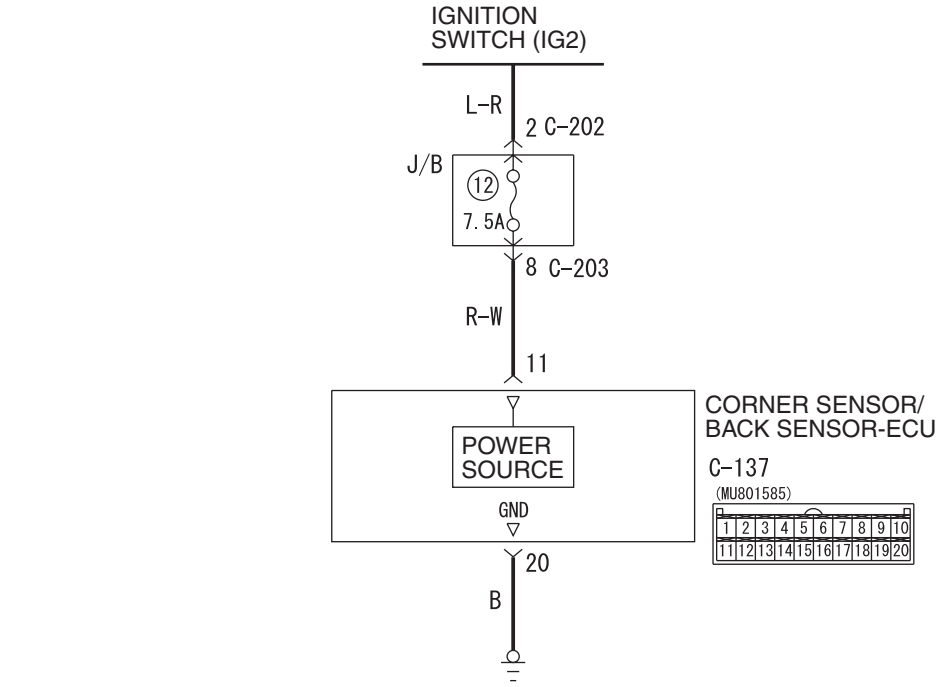
SYMPTOM PROCEDURES

Inspection Procedure 1: Corner sensor OFF indicator lamp and corner sensor indicator do not illuminate when the ignition switch is turned to the ON position.

Corner Sensor System Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

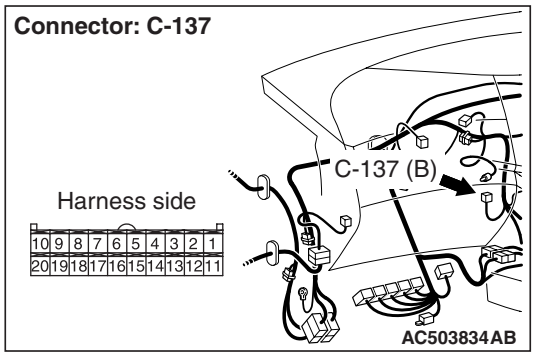
If the corner sensor OFF indicator lamp and corner sensor indicator lamp do not illuminate when the ignition switch is turned to the ON position, the power supply system of corner sensor/back sensor-ECU, corner sensor/back sensor-ECU or combination meter may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the combination meter

DIAGNOSIS PORODEDURE

STEP 1. Connector check: Corner sensor/back sensor-ECU C-137.



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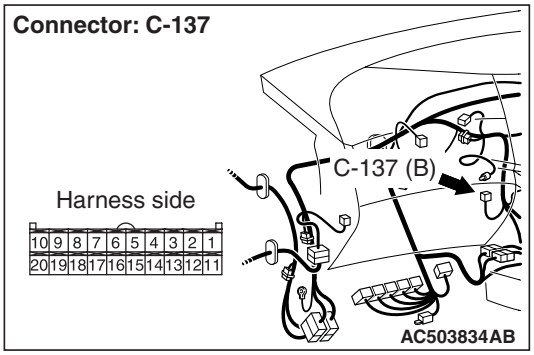
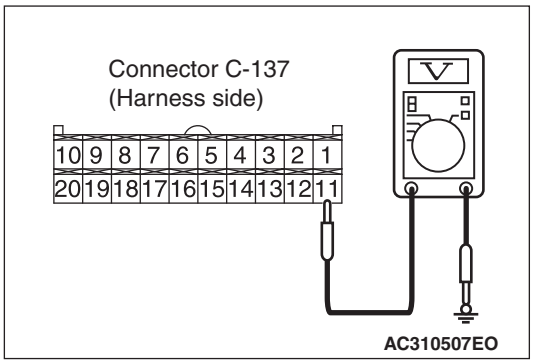
Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Voltage measurement at corner sensor/back sensor-ECU connector C-137 in order to power supply circuit to corner sensor/back sensor-ECU (IG2 power supply)



(1) Disconnect corner sensor/back sensor-ECU connector C-137, and measure at the wiring harness side.
(2) Turn the ignition switch to "ON" position.

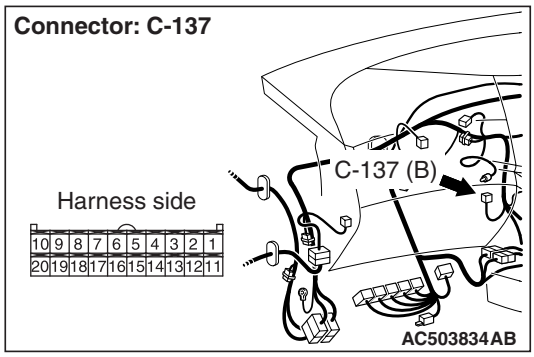


(3) Measure the voltage between terminal 11 and earth.

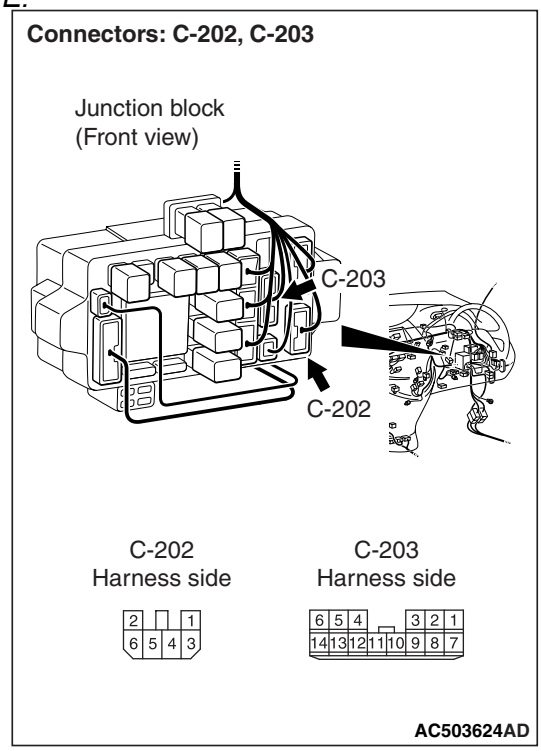
OK: Battery voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 11) and ignition switch (IG2).



NOTE:



Before the wiring harness inspection, inspect junction block connector C-202 and C-203, and repair if necessary.

Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

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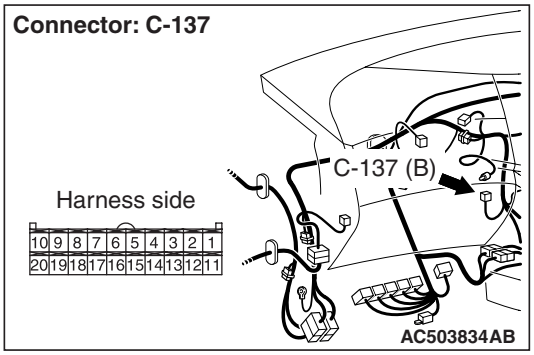
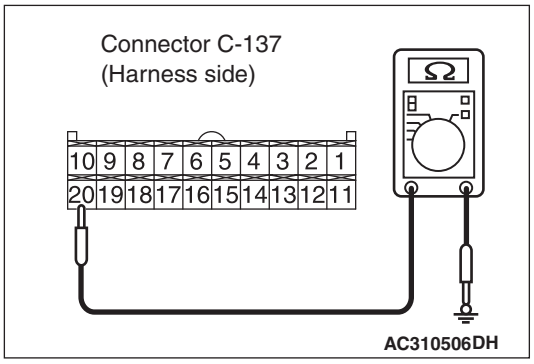
STEP 4. Resistance measurement at corner sensor/back sensor-ECU connector C-137 in order to the earth circuit to the corner sensor/back sensor-ECU.



(1) Disconnect corner sensor/back sensor-ECU connector C-137, and measure at the wiring harness side.

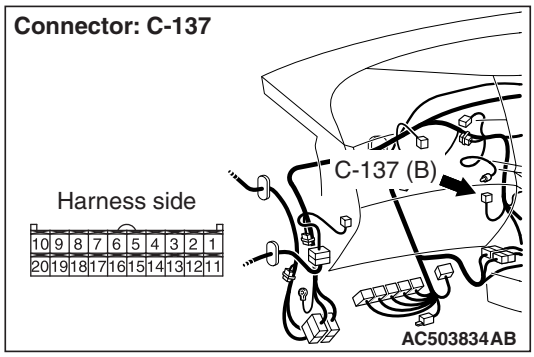


(2) Measure the resistance between terminal 20 and earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 20) and earth.



Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 6. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, inspect the indicator lamp for normal operation.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

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Inspection Procedure 2: The corner sensor system does not operate.

CIRCUIT OPERATION

Refer to P.54A-191.

COMMENTS ON TROUBLE SYMPTOM

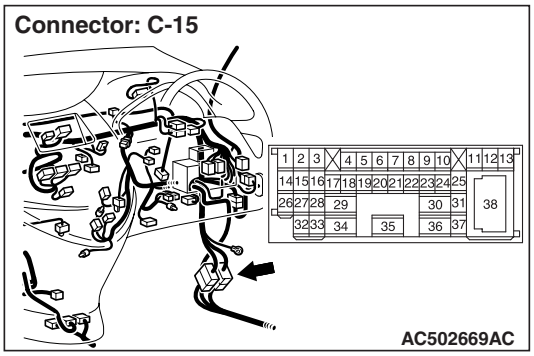
If the corner sensor OFF indicator when the ignition switch is turned to the ON position, the power supply system is normal. The wiring harness, connectors or corner sensor/back sensor-ECU may be defective.

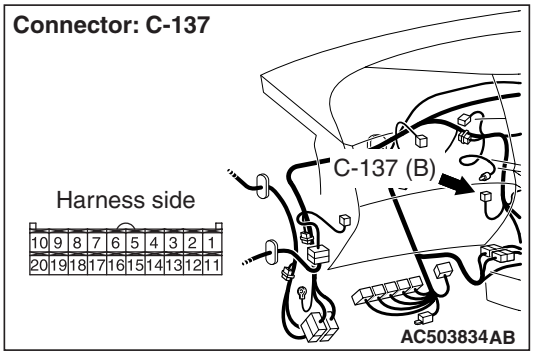
PROBABLE CAUSES

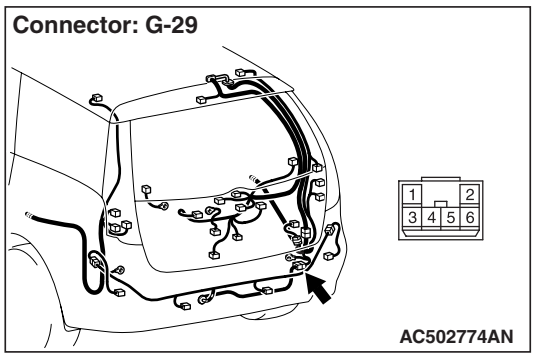
- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU

DIAGNOSIS PORODEDURE

STEP 1. Connector check: Corner sensor/back sensor-ECU connector C-137, intermediate connector C-15 and G-29.

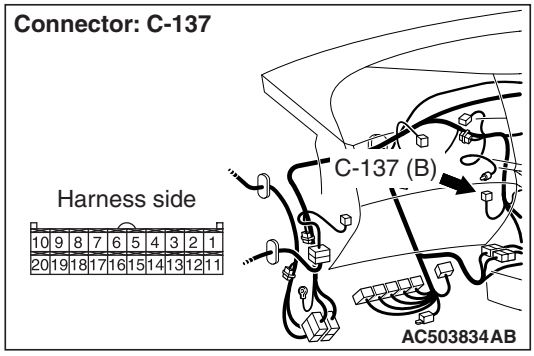


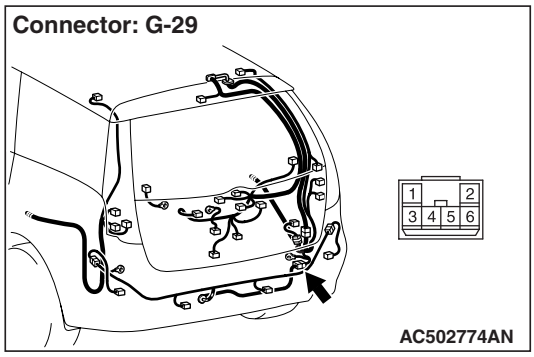




Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Check the wiring harness between corner sensor/back sensor-ECU connector C-137 (terminal 10) and intermediate connector G-29 (terminal 10).





Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the wiring harness.

STEP 3. Retest the system.
The corner sensor system should work normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the corner sensor/back sensor-ECU.

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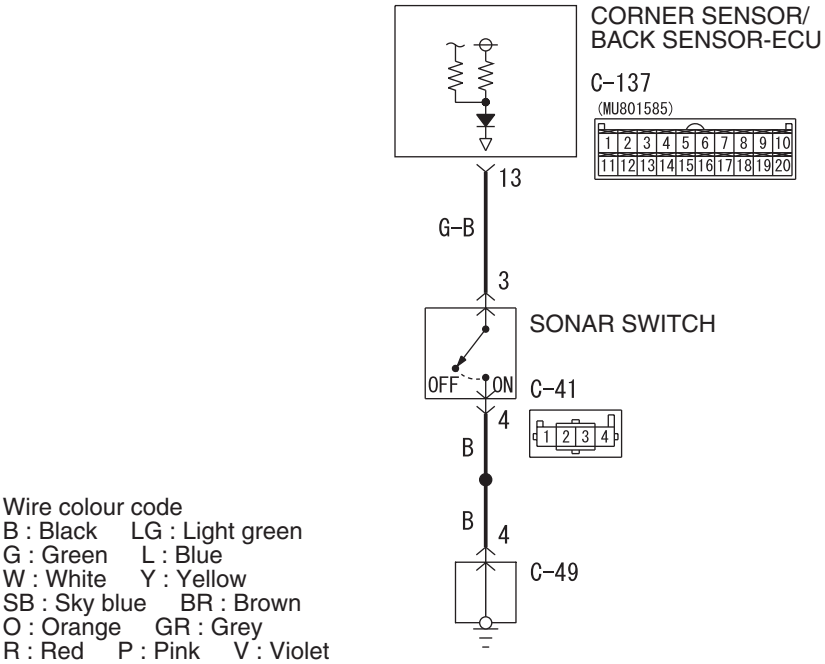
Inspection Procedure 3: System cannot be activated or deactivated even when the sonar switch is pressed.

Sonar Switch Circuit



Wire colour code
B : Black LG : Light green
G : Green L : Blue
W : White Y : Yellow
SB : Sky blue BR : Brown
O : Orange GR : Grey
R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

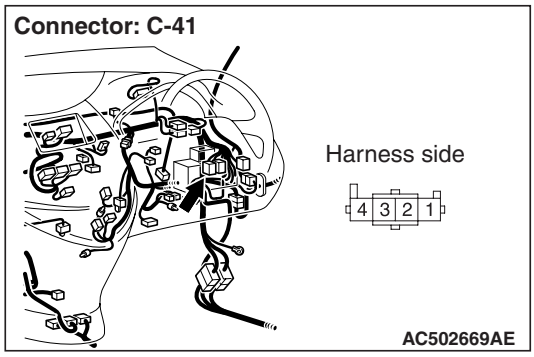
When the system cannot be activated or deactivated even if sonar switch is pressed, the wiring harness, connectors, sonar switch, or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of sonar switch
- Malfunction of corner sensor/back sensor-ECU

DIAGNOSIS PORODEDURE

STEP 1. Connector check: Sonar switch connector C-41.

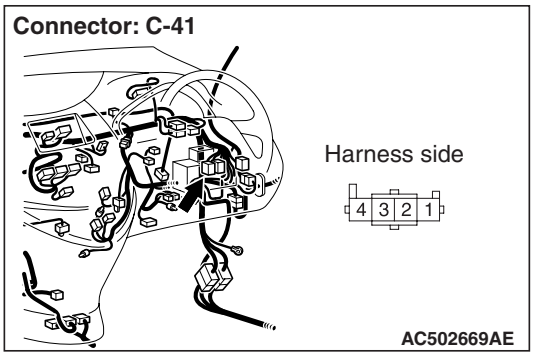


Q: Is the check result normal?
YES : . Go to Step 2.
NO : . Repair the defective connector.

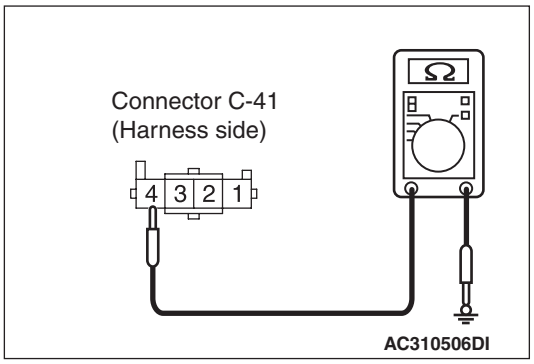
STEP 2. Inspection of sonar switch
Inspect the sonar switch for normal operation. Refer to P.54A-188.

Q: Is the check result normal?
YES : . Go to Step 3.
NO : . Replace the sonar switch.

STEP 3. Resistance measurement at sonar switch connector C-41 in order to the earth circuit to the sonar switch.



(1) Disconnect sonar switch connector C-41, and measure at the wiring harness side.

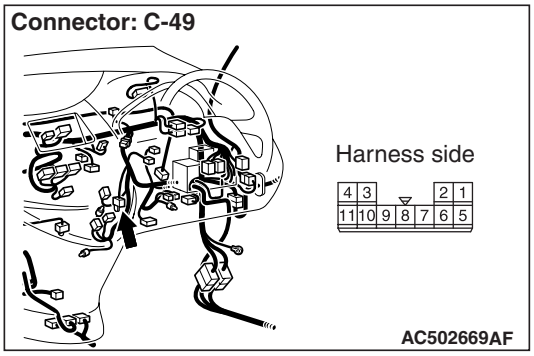


(2) Measure the resistance between terminal 4 and earth.

OK: 2 ohms or less

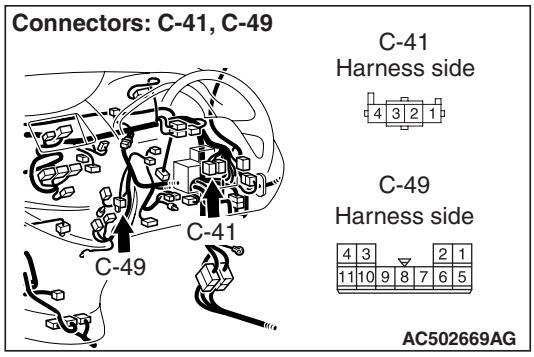
Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 4.

STEP 4. Connector check: Earth connector C-49.



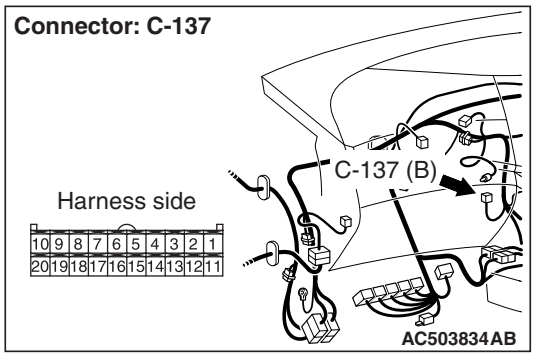
Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

STEP 5. Check the wiring harness between sonar switch connector C-41 (terminal 4) and earth connector C-49 (terminal 4).



Q: Is the check result normal?
YES : Retest the system.
NO : Repair the wiring harness.

STEP 6. Connector check: Corner sensor/back sensor-ECU C-137.



Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

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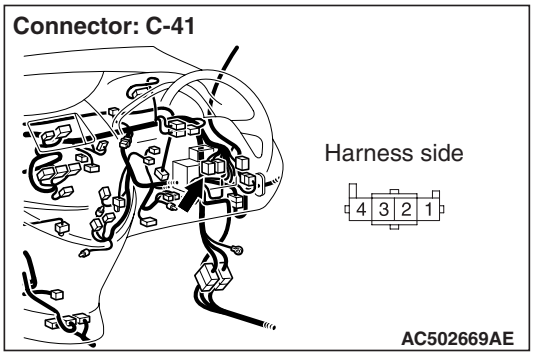
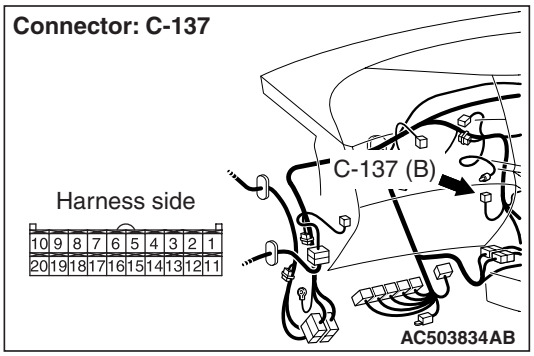
STEP 7. Check the wiring harness between corner sensor/back sonar switch connector C-41 (terminal 3) and corner sensor/back sensor-ECU connector C-137 (terminal 13).

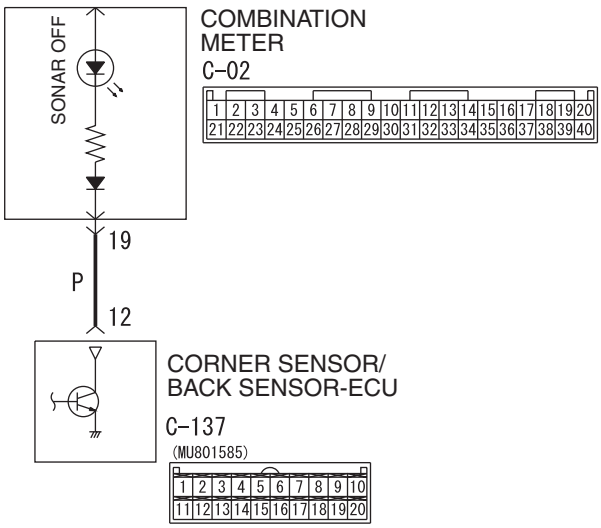




Q: Is the check result normal?
YES : Replace the corner sensor/back sensor-ECU.
NO : Repair the wiring harness.

Inspection Procedure 4: The corner sensor OFF indicator lamp does not illuminate.

Corner Sensor OFF Indicator Lamp Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

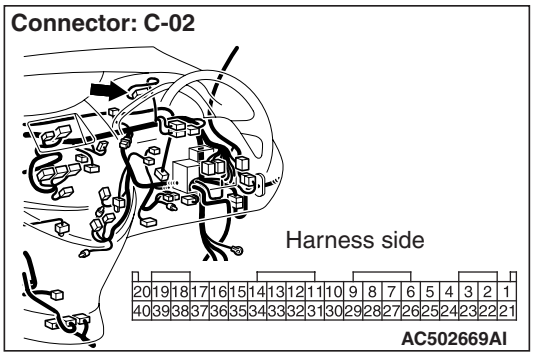
If the corner sensor OFF indicator lamp does not illuminate, the wiring harness, connectors, corner sensor/back sensor-ECU, or combination meter may be defective.

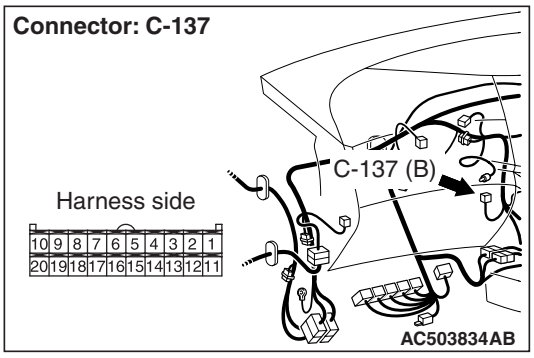
PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor/back sensor-ECU
- Malfunction of the combination meter

DIAGNOSIS PORODEDURE

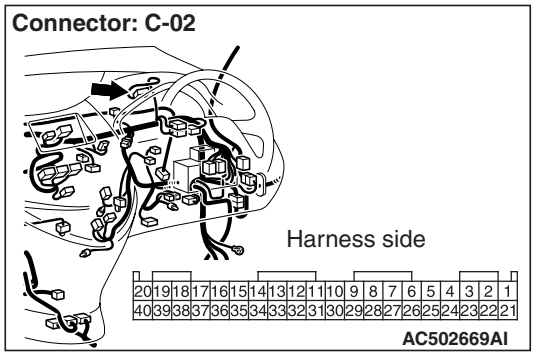
STEP 1. Connector check: Corner sensor/back sensor-ECU connector C-137 and combination meter C-02.

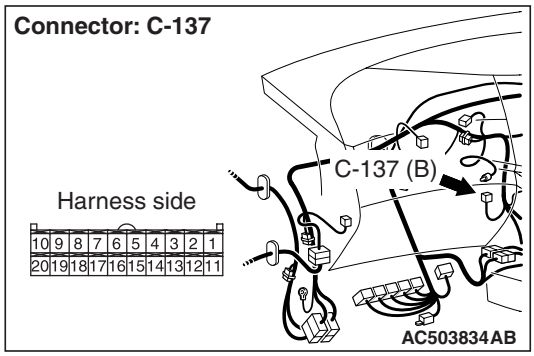




Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the defective connector.

STEP 2. Check the wiring harness between combination meter connector C-02 (terminal 19) and corner sensor/back sensor-ECU connector C-137 (terminal 12).





Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the wiring harness.

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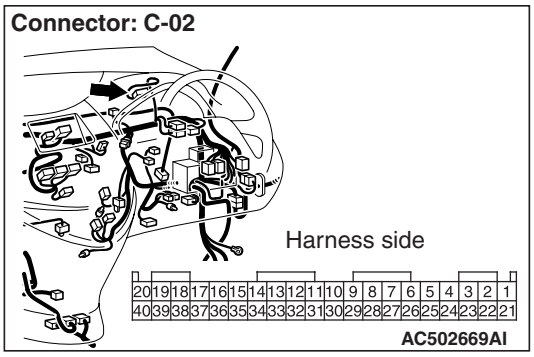
STEP 3. Check the wiring harness between combination meter connector C-02 (terminal 39) and ignition switch (IG2).



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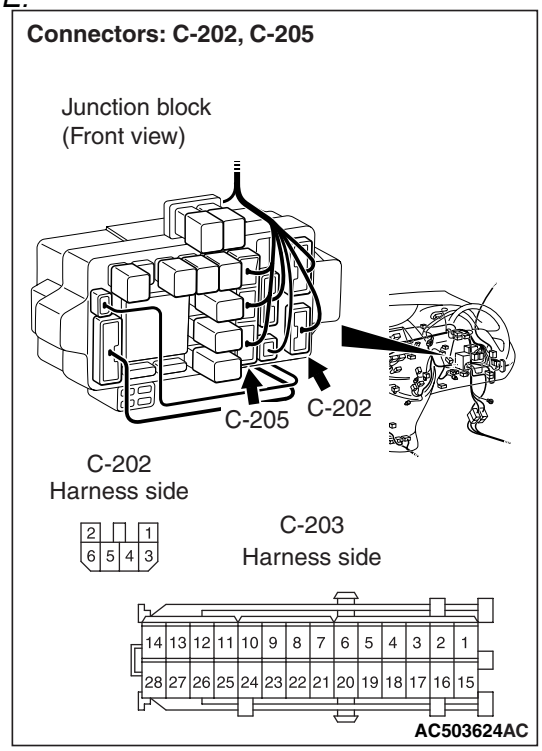


Before the wiring harness inspection, inspect junction block connector C-202 and C-205, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

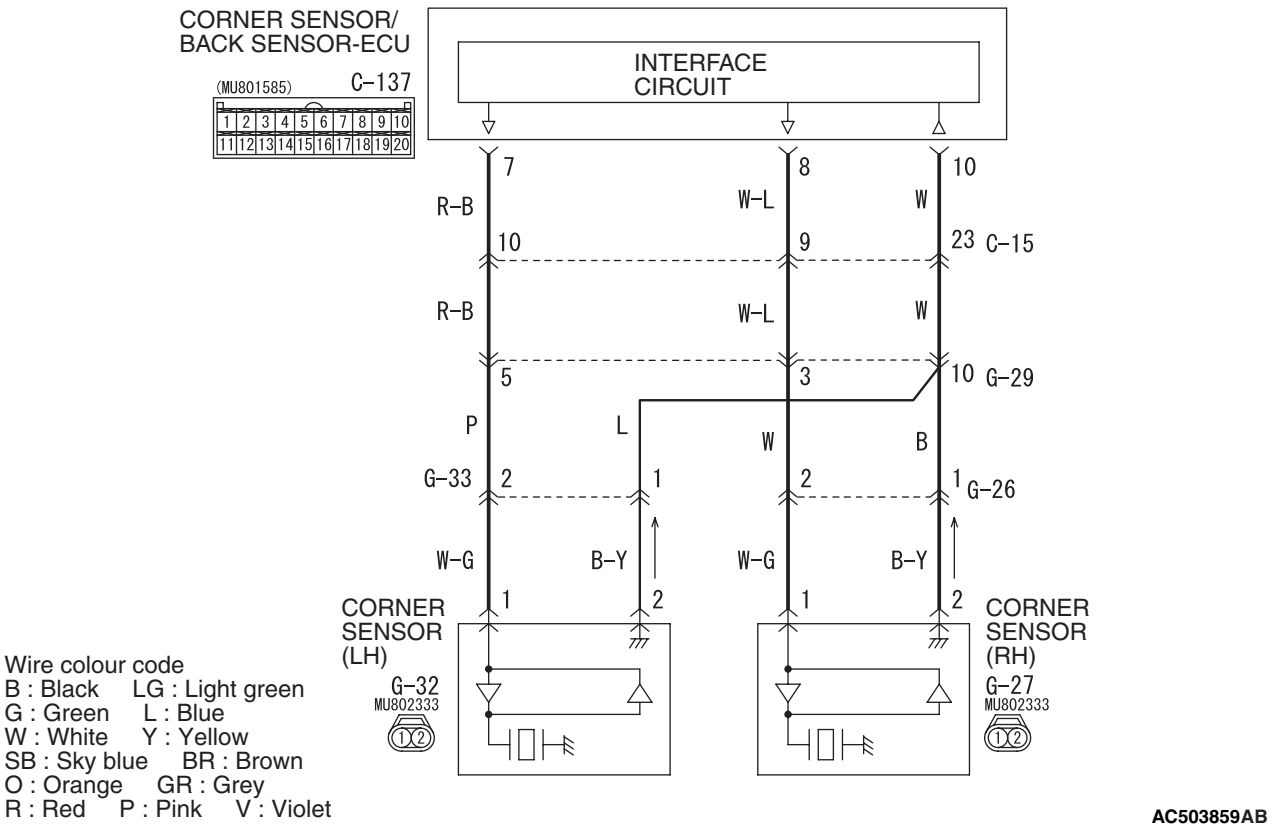
STEP 4. Verification after corner sensor/back sensor-ECU replacement

After replacing the corner sensor/back sensor-ECU, verify that the corner sensor OFF indicator lamp illuminates normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the combination meter.

Inspection Procedure 5: The right or left corner sensor does not detect the obstacle.

Corner Sensor Circuit



COMMENTS ON TROUBLE SYMPTOM

If either corner sensor does not detect the obstacle, the wiring harness, connectors, each sensor or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of corner sensor
- Malfunction of corner sensor/back sensor-ECU

DIAGNOSIS PORODEDURE

STEP 1. Confirm which corner sensor does not detect the obstacle.

Q: Which corner sensor does not detect the obstacle?
Corner sensor (RH) : Go to Step 2.
Corner sensor (LH) : Go to Step 5.

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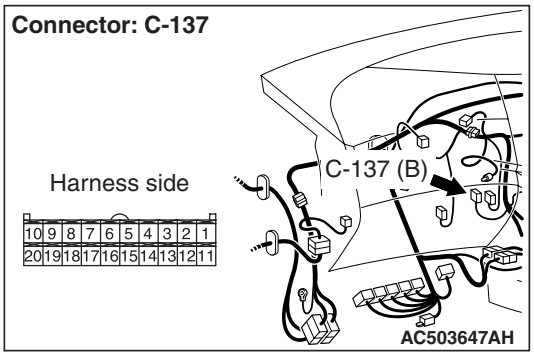
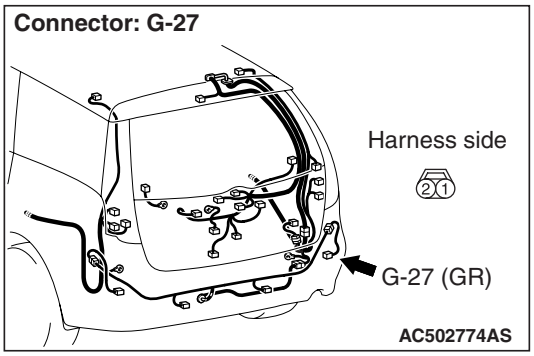
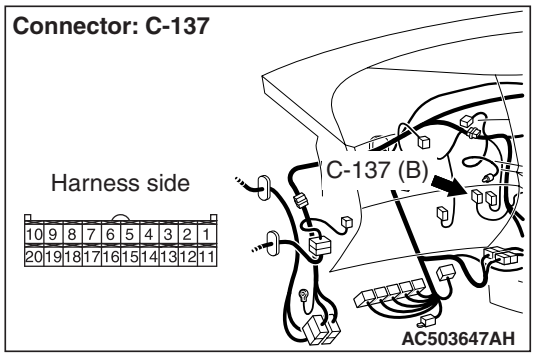
STEP 2. Connector check: Corner sensor/back sensor-ECU connector C-137 and corner senstor (rear: RH) connector G-27.

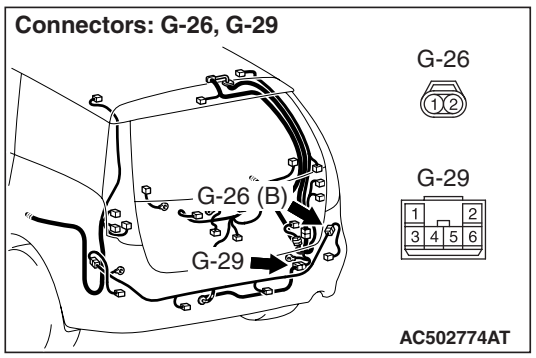




Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the defective connector.

STEP 3. Check the wiring harness between corner senstor (rear: RH) connector G-27 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 8, 10).





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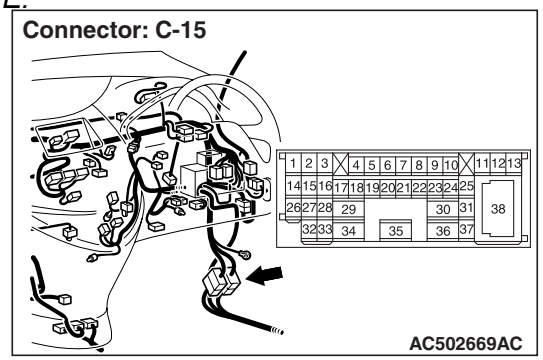


Before the wiring harness inspection, inspect the intermediate connectors C-15, G-26 and G-29, and repair if necessary.

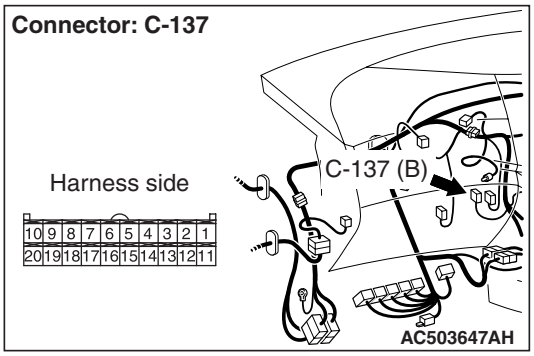
Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

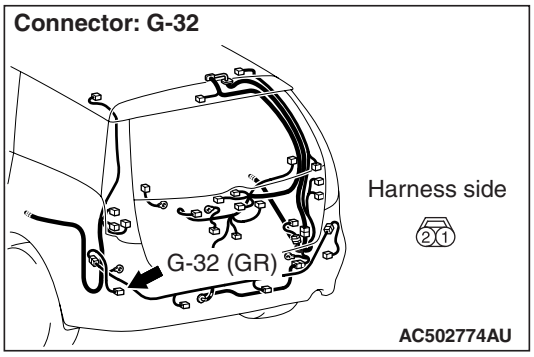
STEP 4. Verification after corner sensor replacement

After replacing the corner sensor (RH), verify that the corner sensor system is normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the corner sensor/back sensor-ECU.

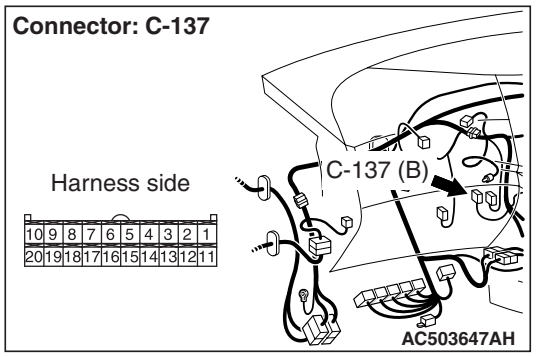
STEP 5. Connector check: Corner sensor/back sensor-ECU connector C-137 and corner senstor (rear: LH) connector G-32.

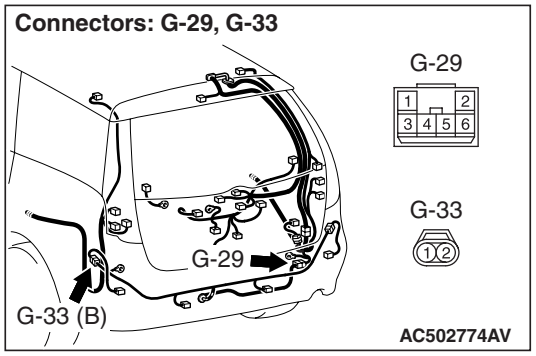




Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the defective connector.

STEP 6. Check the wiring harness between corner senstor (rear: LH) connector G-32 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 7, 10).





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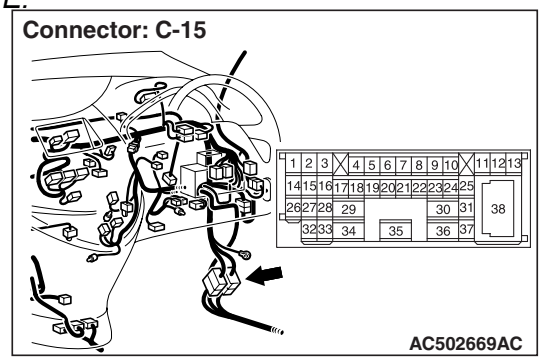

Before the wiring harness inspection, inspect the intermediate connectors C-15, G-29 and G-33, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Verification after corner sensor replacement

After replacing the corner sensor (LH), verify that the corner sensor system is normally.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Replace the corner sensor/back sensor-ECU.

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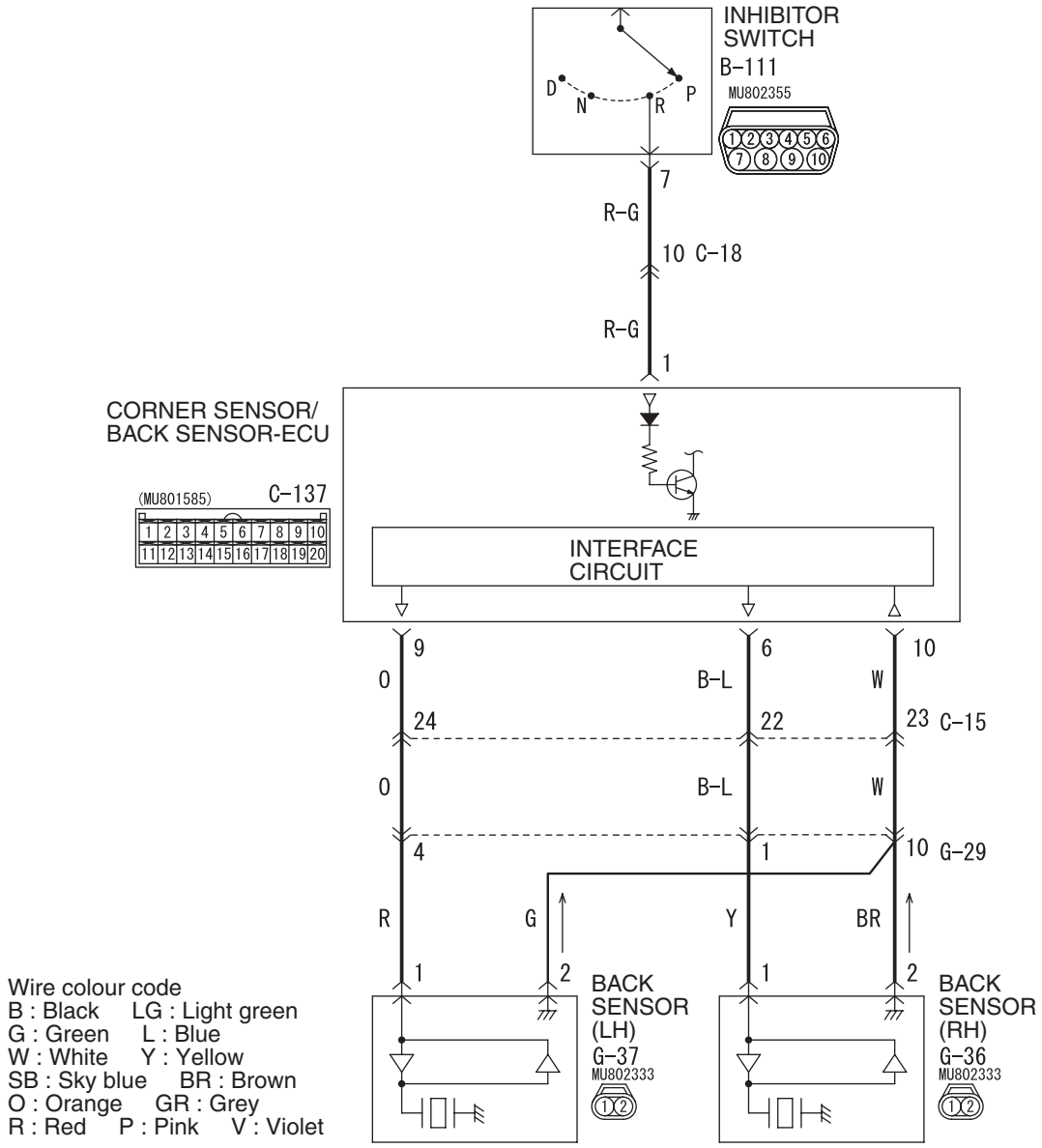
Inspection Procedure 6: Obstacle is not detected even when the selector lever is shifted to "R" (reverse) position.

Back Sensor Circuit



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COMMENTS ON TROUBLE SYMPTOM

If obstacle is not detected even when the selector lever is shifted to "R" (reverse) position, the wiring harness, connectors, inhibitor switch, or corner sensor/back sensor-ECU may be defective.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the inhibitor switch
- Malfunction of corner sensor/back sensor-ECU

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DIAGNOSIS PORODEDURE

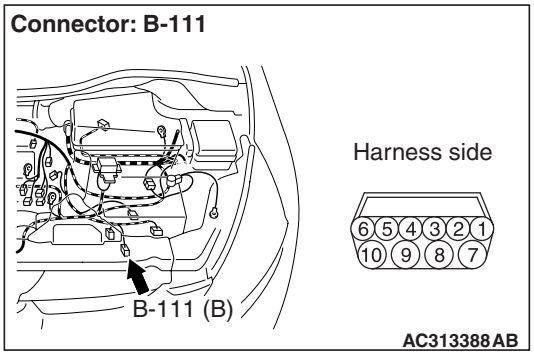
STEP 1. Verify that the ETACS-ECU buzzer sounds when the selector lever is shifted to "R" (reverse) position.

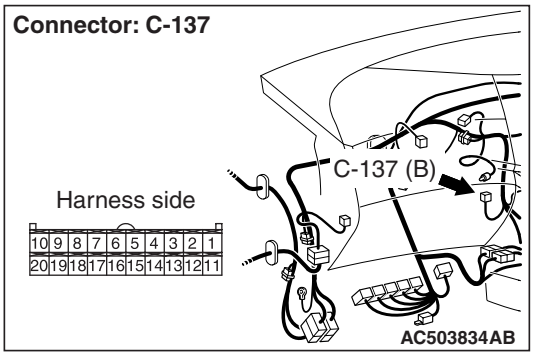
(1) Turn the ignition switch to the ON position.
(2) Shift the selector lever to the R (reverse) position.

OK: The ETACS-ECU buzzer sounds.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Diagnose SWS.Refer to GROUP 54D – Troubleshooting P.54D-76 or GROUP 54E – Troubleshooting P.54E-79.

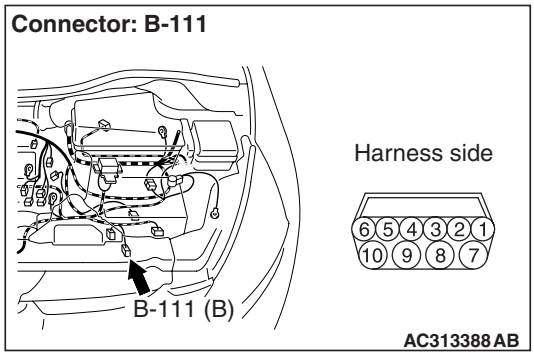
STEP 2. Connector check: Corner sensor/back sensor-ECU connector C-137 and inhibitor switch connector B-111.

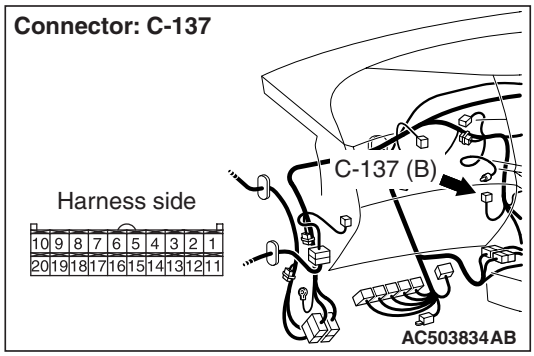




Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the defective connector.

STEP 3. Check the wiring harness between inhibitor switch connector B-111 (terminal 7) and corner sensor/back sensor-ECU connector C-137 (terminal 1).





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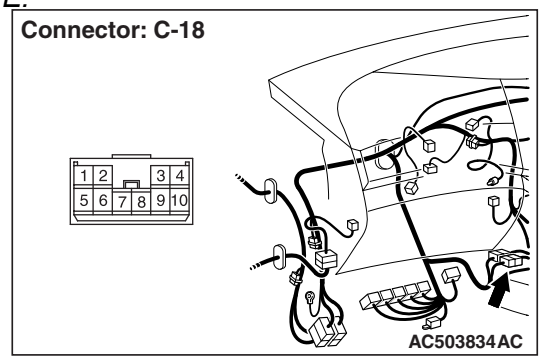

Before the wiring harness inspection, inspect the intermediate connectors C-18 and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

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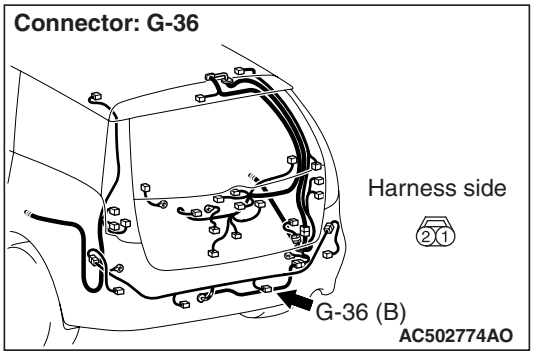
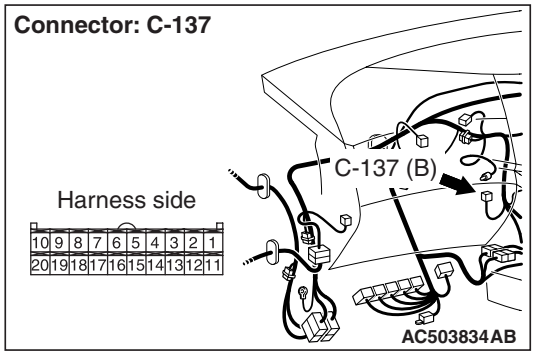
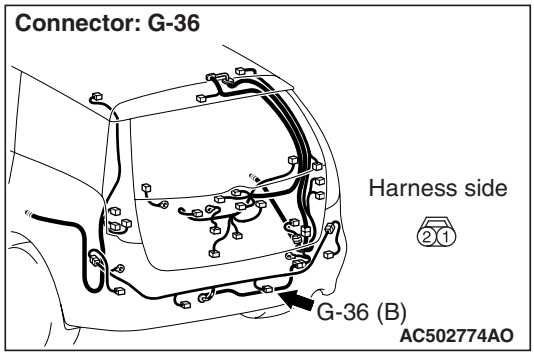
STEP 4. Connector check: Back sensor (RH) connector G-36.



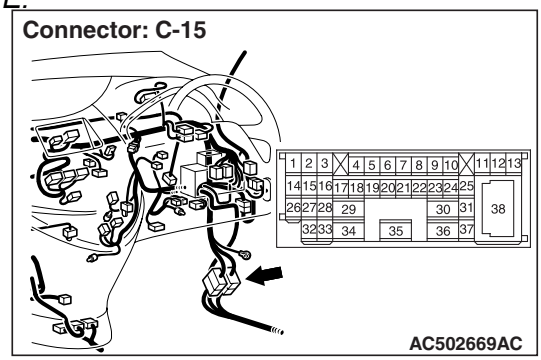
Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

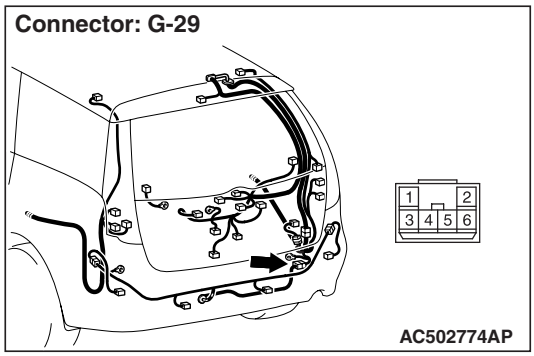
STEP 5. Check the wiring harness between back sensor (RH) connector G-36 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 6, 10).





NOTE:

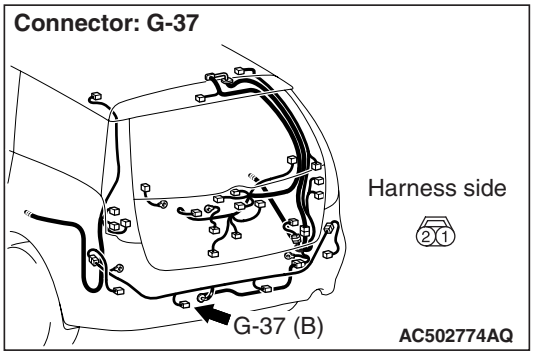




Before the wiring harness inspection, inspect the intermediate connectors C-15 and G-29, and repair if necessary.

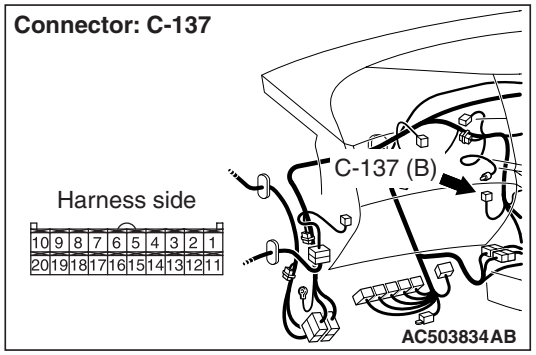
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

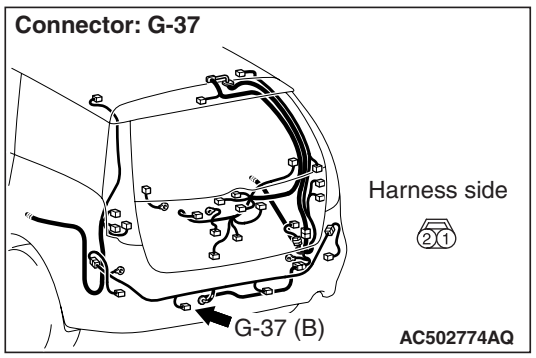
STEP 6. Connector check: Back sensor (LH) connector G-37.



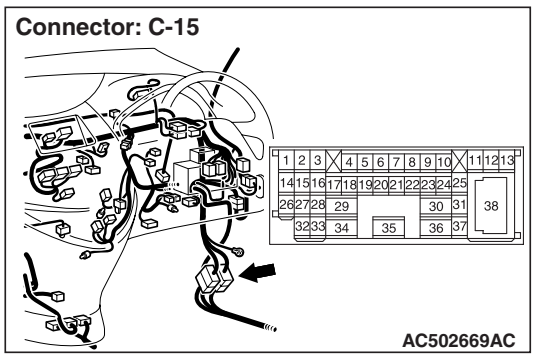
Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

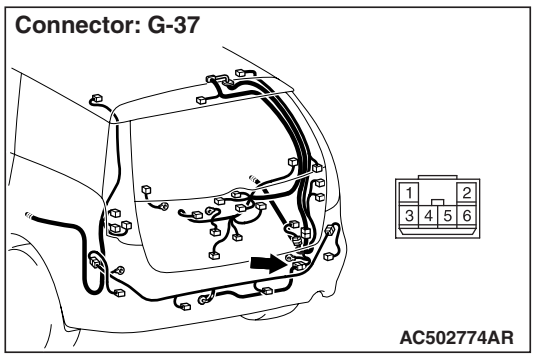
STEP 7. Check the wiring harness between back sensor (LH) connector G-37 (terminal 1, 2) and corner sensor/back sensor-ECU connector C-137 (terminal 9, 10).





NOTE: Before the wiring harness inspection, inspect the intermediate connectors C-15 and G-29, and repair if necessary.





Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the wiring harness.

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STEP 8. Verification after back sensor (RH) replacement

After replacing the back sensor (RH), verify that the corner sensor system works normally.

Q: Is the check result normal?

YES : The procedure is complete.

NO : Go to Step 9.

STEP 9. Verification after back sensor (LH) replacement

After replacing the back sensor (LH), verify that the corner sensor system works normally.

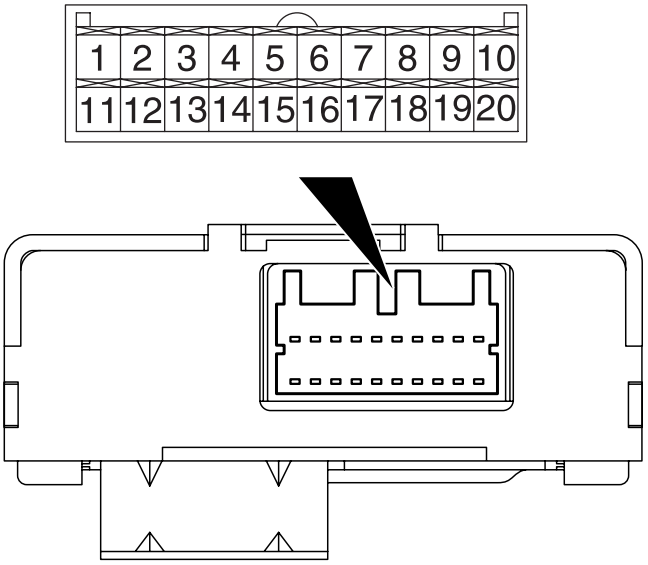
Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the corner sensor/back sensor-ECU.

CHECK AT ECU TERMINALS

M1543007601062



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Terminal No.	Check items	Check conditions	Normal conditions
1	Inhibitor switch R (reverse) position input	• Ignition switch to ON position • Shift the selector lever to any position other than "R" (reverse).	0 V
		• Ignition switch to ON position • Shift the selector lever to "R" (reverse) position.	Battery voltage
3	Input of ignition switch (IG2) signal	Ignition switch: ON position	0 V to battery voltage
6	Back sensor (RH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
7	Corner sensor (rear: LH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
8	Corner sensor (rear: RH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)

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Terminal No.	Check items	Check conditions	Normal conditions
9	Back sensor (LH)	Ignition switch: ON position	0V (40kHz pulse signal, emitted approx. every 125ms)
10	Sensor earth	Ignition switch: ON position	0 V
11	Power supply to the ignition switch (IG2)	Ignition switch: ON position	Battery voltage
12	Corner sensor OFF indicator lamp output	• Ignition switch: ON position • Sonar switch input: OFF	0 V
		• Ignition switch: ON position • Sonar switch input: ON	Battery voltage
13	Sonar switch input	• Ignition switch: ON position • Sonar switch input: OFF	Battery voltage
		• Ignition switch: ON position • Sonar switch input: ON	0 V
20	Earth	Always	0 V

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CORNER SENSOR SYSTEM

REMOVAL AND INSTALLATION

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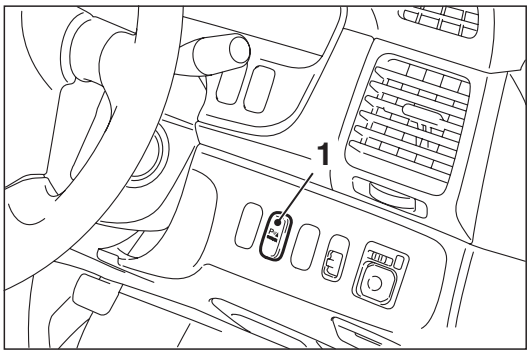
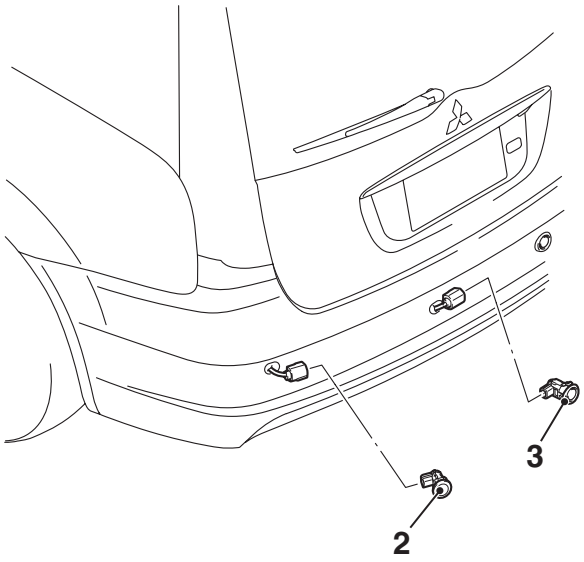


AC502612



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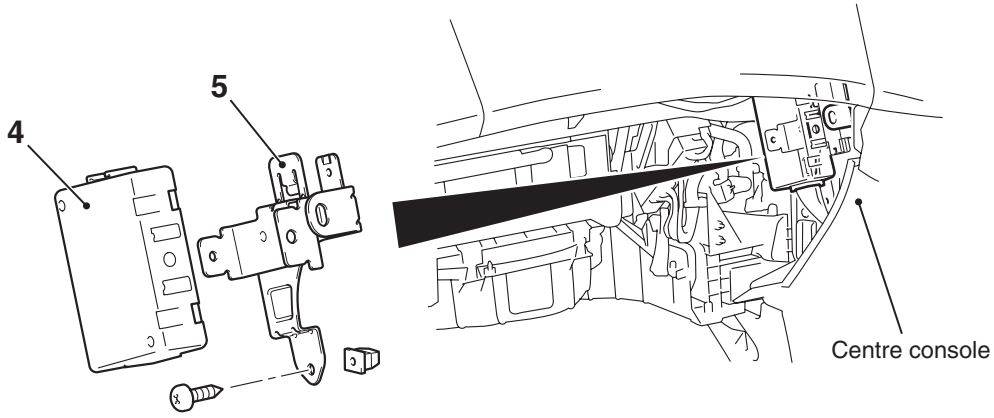

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Corner sensor/back sensor switch removal steps

- Selector lever knob, selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).
- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Corner sensor/back sensor switch

Corner sensor or back sensor removal steps

2. Corner sensor
3. Back sensor

Corner sensor/back sensor-ECU removal steps

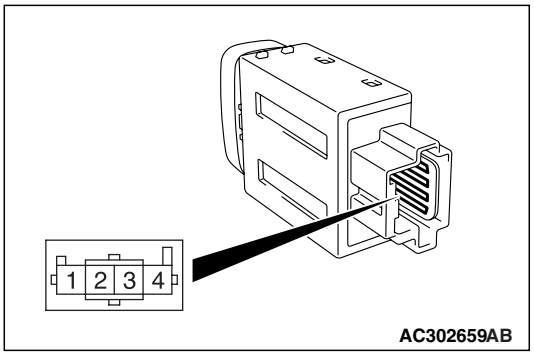
- Selector lever knob, selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).
- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

4. Corner sensor/back sensor-ECU
5. Corner sensor/back sensor-ECU bracket

INSPECTION

M1543019503778

SONAR SWITCH CONTINUITY CHECK



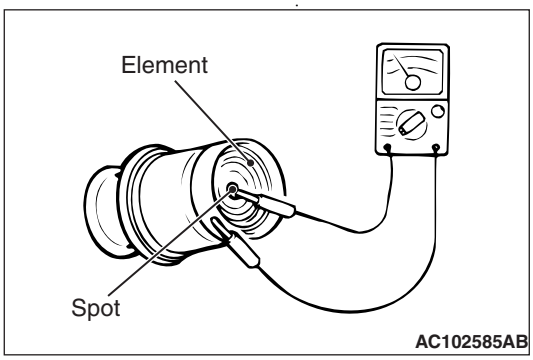
Switch position	Terminal number	Normal conditions
OFF	3 – 4	Open circuit
ON		Less than 2 ohms

CIGARETTE LIGHTER

INSPECTION

M1543019502924

- Remove the plug and check the spot for wear.
- Check that there are no tobacco stains or foreign particles on the element.



Use a multimeter to check the continuity of the element.

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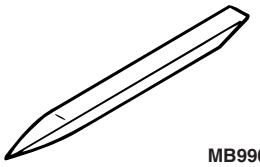
COLUMN SWITCH

SPECIAL TOOL

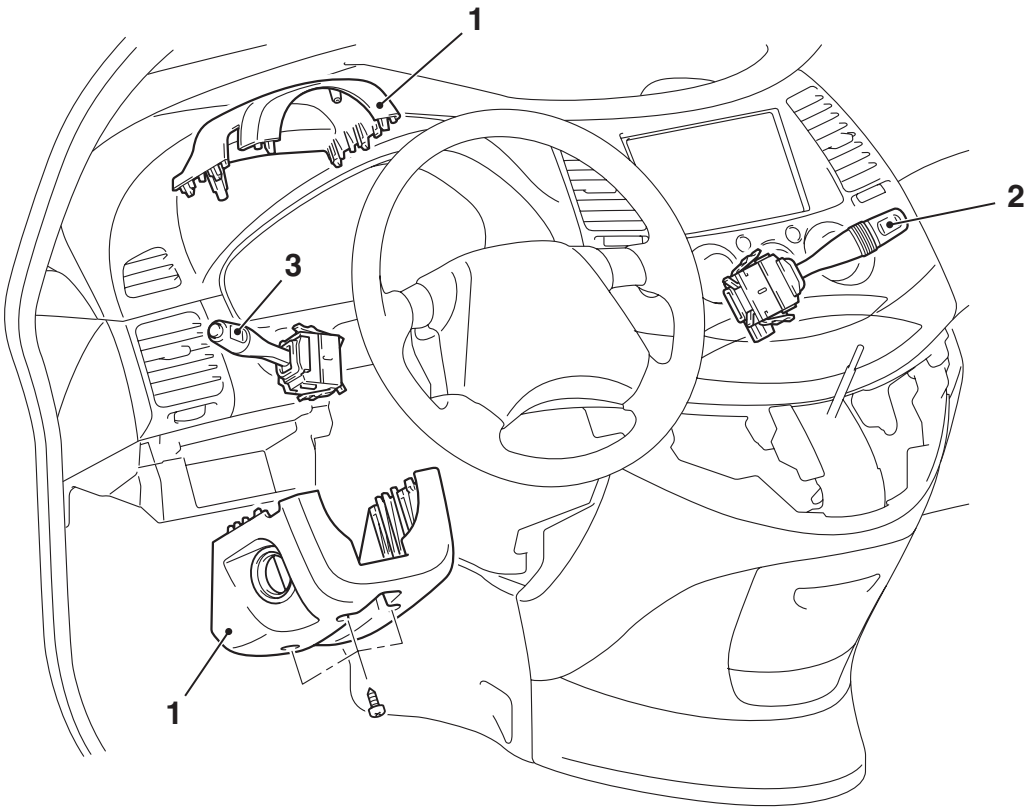
M1543000602150

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of steering column cover

COLUMN SWITCH

REMOVAL AND INSTALLATION

M1543009100725



AC312967AB

Removal steps

- Gear shift lever knob <M/T>
- Selector lever knob <A/T> (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Front scuff plate inner, Cowl side trim (Refer to GROUP 52A, Interior Trim P.52A-10).

Removal steps (Continued)

- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Lower panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

1. Steering column cover (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
2. Windshield wiper and washer switch
3. Lighting switch

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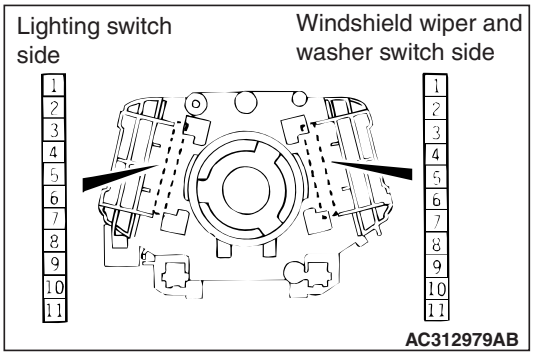
INSPECTION

M1543019502935

COLUMN SWITCH (SWITCH BODY) CONTINUITY CHECK

1. Removal the lighting switch and the windshield wiper and washer switch.
2. Check that there is continuity between the same terminals [terminals (3) and (11)] of each connector of the column switch body which is still on the steering column.



Column switch body	Tester connection	Specified condition
Lighting switch side connector side, Windshield wiper and washer switch side connector	3 – 3, 4 – 4, 5 – 5, 6 – 6, 7 – 7, 8 – 8, 9 – 9, 10 – 10, 11 – 11	Less than 2 ohms

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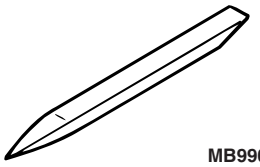
CLOCK

SPECIAL TOOLS

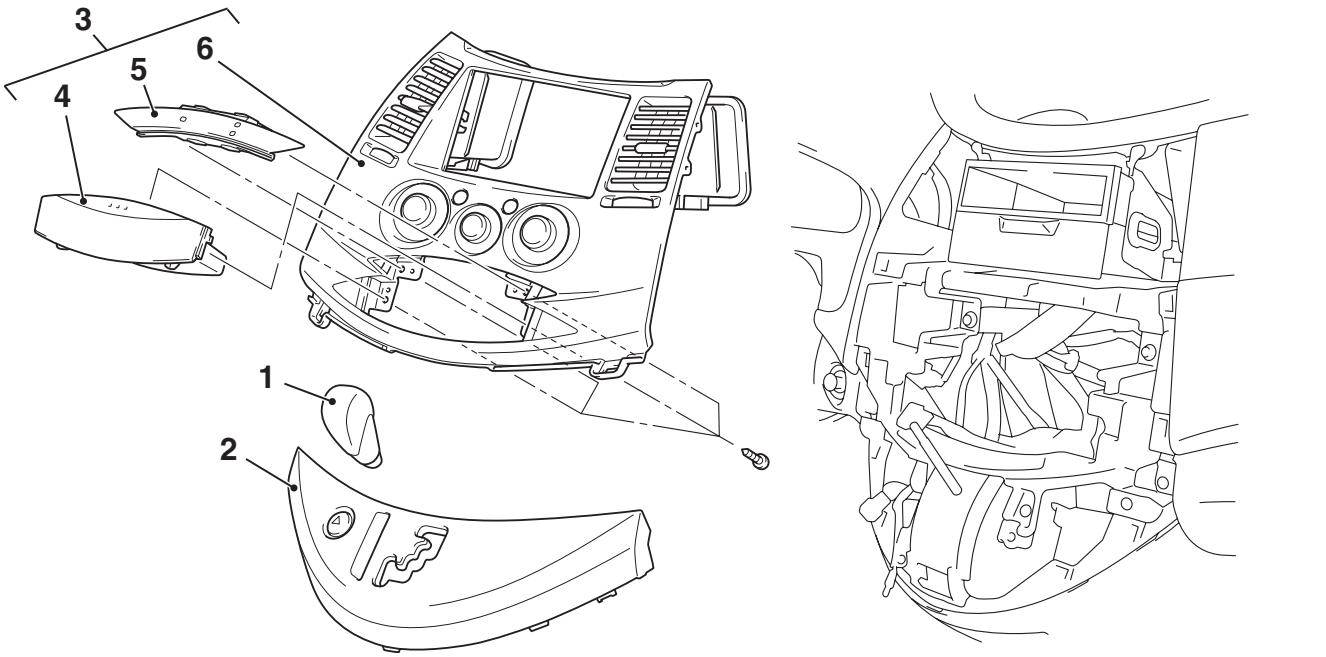
M1543000601607

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of selector lever panel, instrument centre panel

CLOCK

REMOVAL AND INSTALLATION

M1543005900343



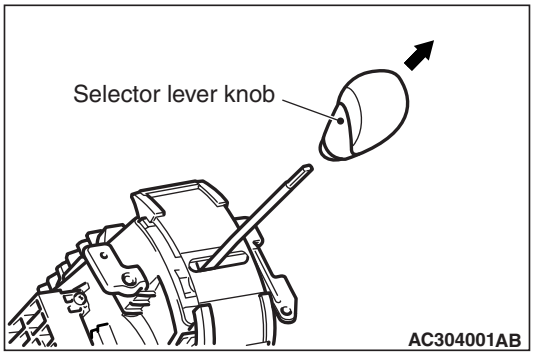
AC313599AB

Removal steps

<<A>>
1. Gear shift lever knob <M/T>
1. Selector lever knob <A/T>
2. Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
3. Instrument centre panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
4. Accessory box assembly
5. Clock

REMOVAL SERVICE POINTS

<<A>> SELECTOR LEVER KNOB REMOVAL



Pull out the selector lever knob to the direction shown.

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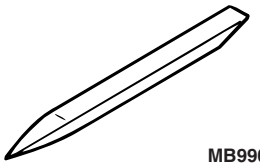
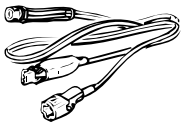
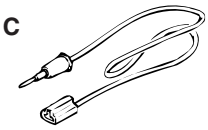
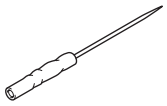
RADIO AND TAPE PLAYER OR CD PLAYER

SPECIAL TOOLS

M1542000601369

Tool	Number	Name	Application
 MB990784	MB990784	Ornament remover	Removal of selector panel, instrument centre panel
A B  C  D DO NOT USE MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	For checking voltage (continuity and value) at harness and connectors A: For checking connector pin contact voltage B: For checking power supply circuits C: For checking power supply circuits D: For connection to commercially available tester
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

TROUBLESHOOTING

M1544000700165

Use these steps to plan your diagnostic strategy. Follow through with each step to ensure that you have exhausted all possible methods of finding an audio 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.

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

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TROUBLE SYMPTOM CHART

M1544004900536

Symptom		Inspection Procedure No.	Reference Page
Power of radio and tape player or CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.		1	P.54A-216
No sound from one speaker.		2	P.54A-219
Noise	Noise appears at certain places when travelling (AM).	3	P.54A-229
	Noise is present while moving (FM).	4	P.54A-230
	Mixed with noise, only at night (AM).	5	P.54A-231
	Broadcasts can be heard but both AM and FM have a lot of noise.	6	P.54A-232
	There is more noise on either AM or FM.	7	P.54A-233
	There is noise when starting the engine.	8	P.54A-233
	Some noise appears when there is vibration or shocks during travelling.	9	P.54A-235
	Noise sometimes appears on FM during travelling.	10	P.54A-236
	Ever-present noise.	11	P.54A-237
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	12	P.54A-237
	Poor reception.	13	P.54A-238
	Distortion on AM or on both AM and FM.	14	P.54A-239
	Distortion on FM only.	15	P.54A-239
	Using the auto select function, too few automatic stations are selected.	16	P.54A-240
	Preset stations are erased.	17	P.54A-241
Tape player	Cassette tape can not be inserted.	18	P.54A-244
	Sound quality is poor, or sound is weak.	19	P.54A-244
	Cassette tape can not be ejected.	20	P.54A-244
	Uneven revolution. Tape speed is fast or slow.	21	P.54A-245
	Automatic search does not work.	22	P.54A-245
	Malfunction of the auto reverse.	23	P.54A-246
	Tape gets caught in mechanism.	24	P.54A-246
CD player	CD can not be inserted.	25	P.54A-247
	No sound (CD only).	26	P.54A-247
	CD sound skips.	27	P.54A-248
	Sound quality is poor.	28	P.54A-248
	CD can not be ejected.	29	P.54A-249

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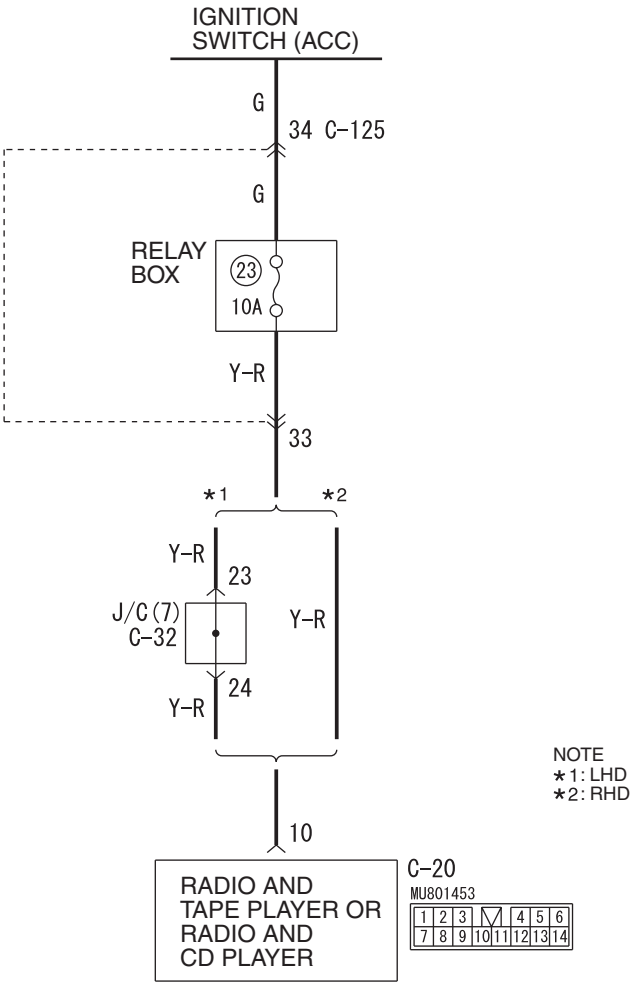
SYMPTOM PROCEDURES

Inspection Procedure 1: Power of Radio and Tape Player or CD Player does not turn ON when the Ignition Switch is in the "ACC" Position or "ON" Position.

Radio and Tape Player or Radio and CD Player Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet

W4X54X133A

COMMENTS ON TROUBLE SYMPTOM

The cause is probably a faulty radio and tape player or CD player power supply circuit system.

PROBABLE CAUSES

- Damaged wiring harness or connector.
- Malfunction of radio and tape player or CD player.

DIAGNOSIS PROCEDURE

STEP 1. Check to see that the power turns ON when the power switch is turned ON.

(1) Turn the ignition switch to "ACC" position.
(2) Turn ON the radio and tape player or CD player power switch.

Q: Is it possible to put the radio and tape player or CD player power in the "ON" position?
YES : Go to Step 2.
NO : . Go to Step 5.

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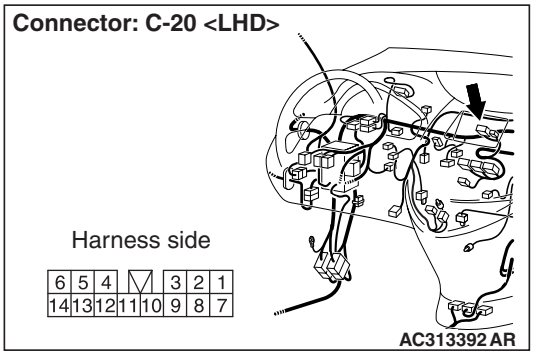
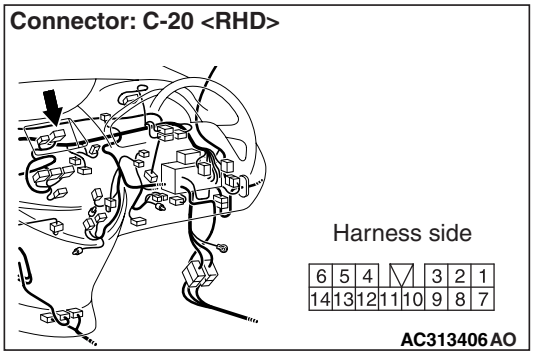
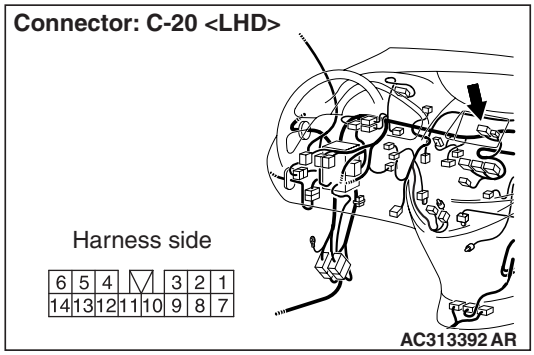
STEP 2. Connector check: radio and tape player or CD player connector C-20.

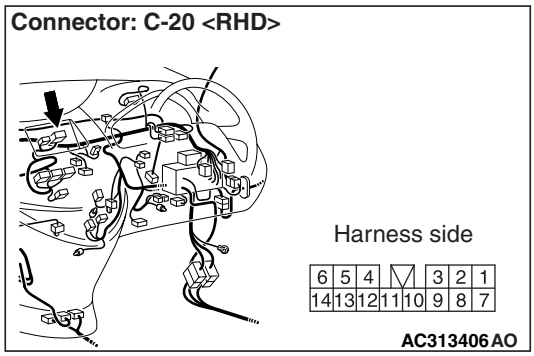




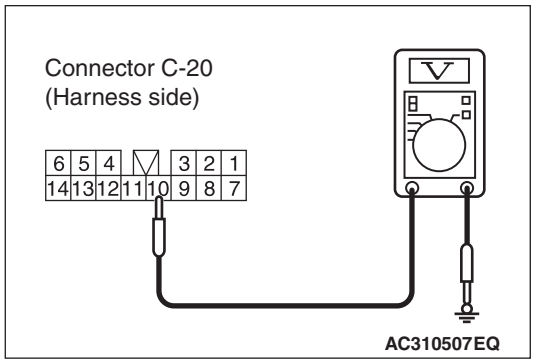
Q: Is radio and tape player or CD player connector C-20 in good condition?
YES : Go to Step 3.
NO : Repair or replace the component(s). If the power switch is turned on, the radio and tape player or CD player should operate normally.

STEP 3. Voltage measurement at radio and tape player or CD player connector C-20 in order to check the battery circuit of power supply system to the radio and tape player or CD player (ignition switch ACC).





(1) Disconnect radio and tape player or CD player connector C-20, and measure at the wiring harness side.
(2) Turn the ignition switch to "ACC" position.



(3) Measure the voltage between terminal 10 and earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

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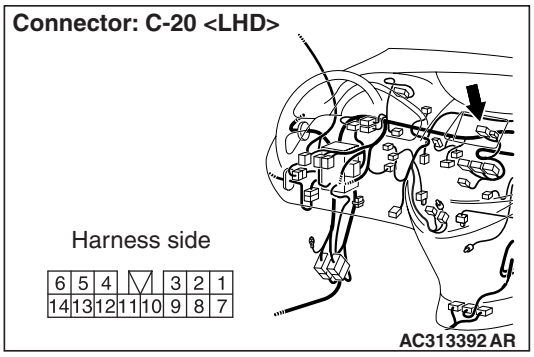
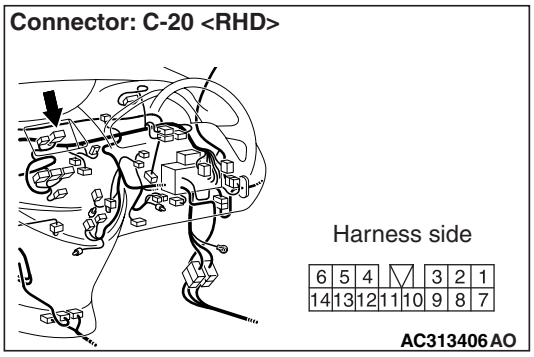
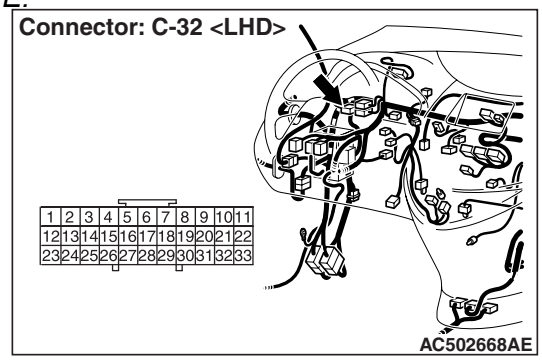
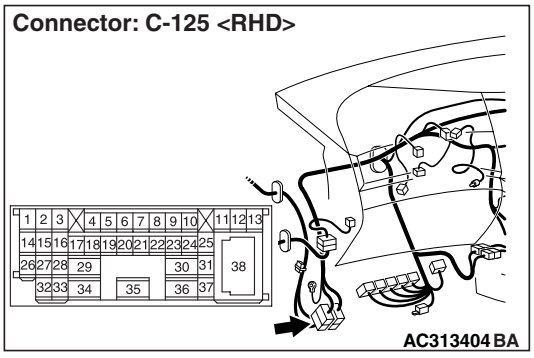
STEP 4. Check the wiring harness between radio and tape player or CD player connector C-20 (terminal 10) and ignition switch (ACC).





NOTE:





Prior to the wiring harness inspection, check joint connector C-32 <LH drive vehicles> and intermediate connectors C-125, and repair if necessary.

Q: Are the wiring harnesses between radio and tape player or CD player connector C-20 (terminal 10) and ignition switch (ACC) in good condition?
YES : Go to Step 5.
NO : Repair or replace the damage component(s). If the power switch is turned on, the radio and tape player or CD player should operate normally.

STEP 5. Check the assembling state of the radio and tape player or CD player.

NOTE: The radio and tape player or CD player is earthed to the instrument panel centre reinforcement directly.

Q: Is the radio and tape player or CD player installed correctly?
YES : Repair or replace the radio and tape player or CD player. If the power switch is turned on, the radio and tape player or CD player should operate normally.
NO : Install properly. If the power switch is turned on, the radio and tape player or CD player should operate normally.

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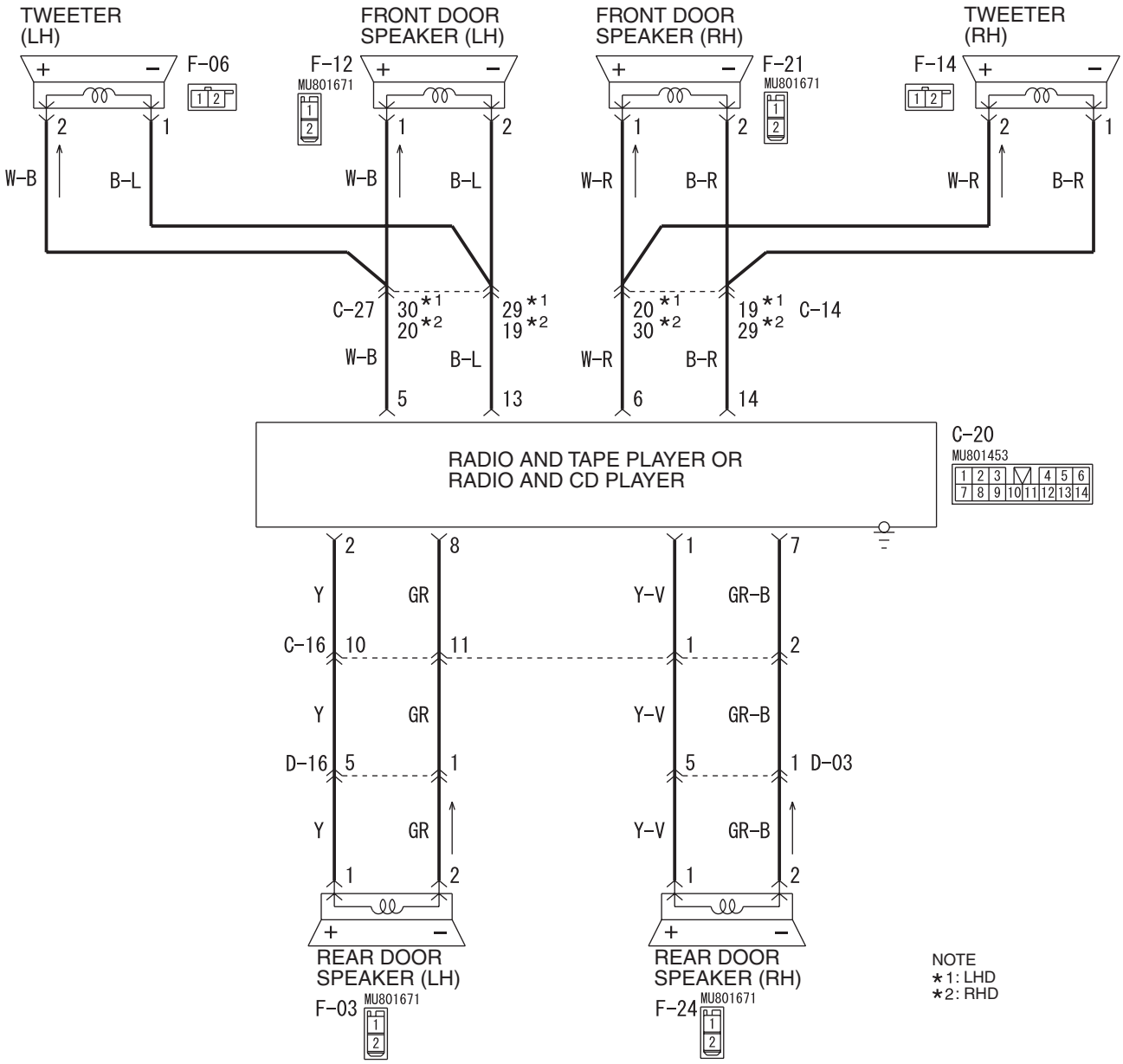
Inspection Procedure 2: No Sound from One Speaker.

Speaker System Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet

W4X54X134A

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COMMENTS ON TROUBLE SYMPTOM

The cause is probably a faulty speaker circuit system.

PROBABLE CAUSES

- Malfunction of speaker.
- Damaged wiring harness or connector.
- Malfunction of radio and tape player or CD player.

DIAGNOSIS PROCEDURE

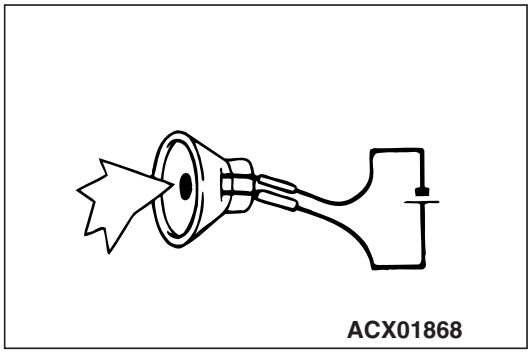
STEP 1. Check to see which speaker the sound is not output from.

Use the speaker test to determine which speaker does not sound.

Q: Which speaker is not working?
Front door speaker (LH) : Go to Step 2.
Front door speaker (RH) : Go to Step 5.
Tweeter (LH) : Go to Step 8.
Tweeter (RH) : Go to Step 11.
Rear door speaker (LH) : Go to Step 14.
Rear door speaker (RH) : Go to Step 17.

STEP 2. Check the front door speaker (LH).

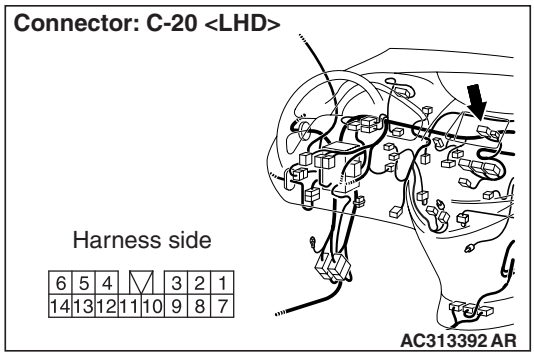
(1) Remove the front door speaker (LH). Refer to P.54A-253.

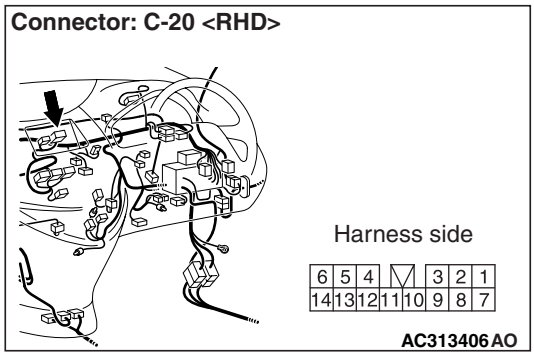


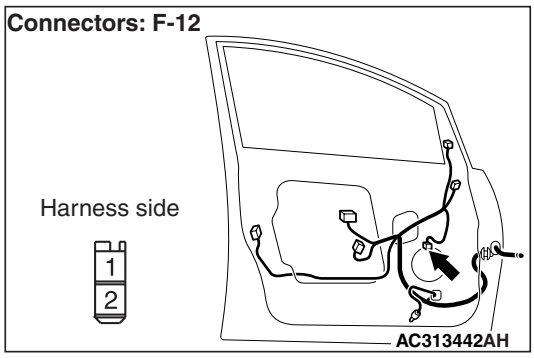
(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

Q: Is the front door speaker (LH) generating noise?
YES : Go to Step 3.
NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.

STEP 3. Connector check: Front door speaker (LH) connector F-12 and radio and tape player or CD player connector C-20.







Q: Are harness connectors F-12 and C-20 in good condition?
YES : Go to Step 4.
NO : Repair or replace the damage component(s). The front door speaker (LH) should sound.

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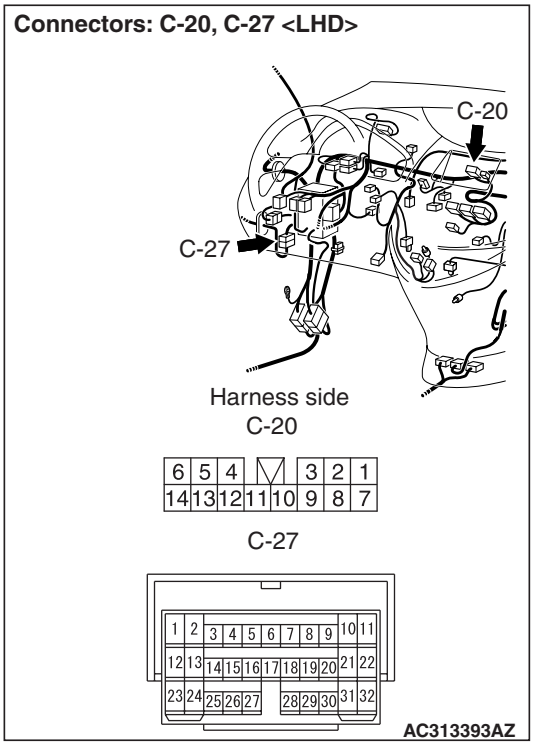
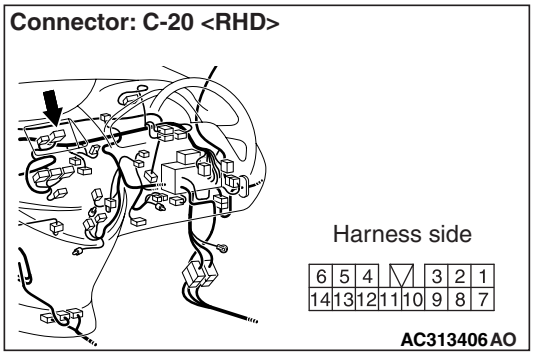
STEP 4. Check the wiring harness between front door speaker (LH) connector F-12 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminals 5 and 13).

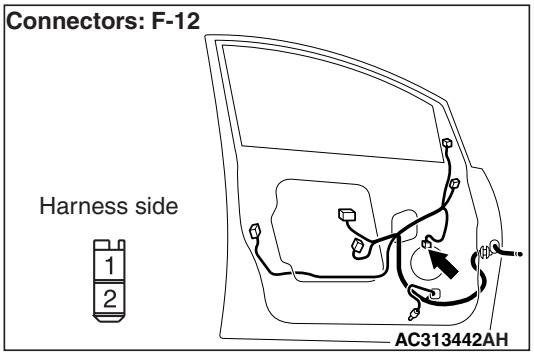
Connectors: C-20, C-27 <LHD>



Connector: C-20 <RHD>

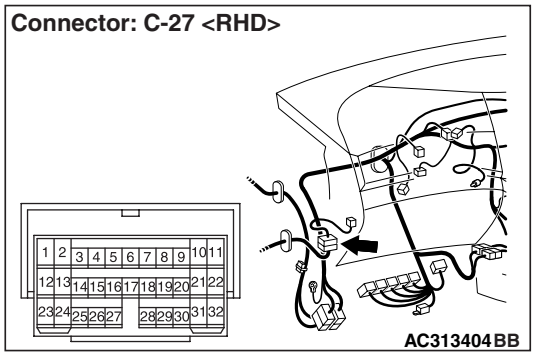


Connectors: F-12



NOTE: Prior to the wiring harness inspection, check intermediate connectors C-27, and repair if necessary.

Connector: C-27 <RHD>



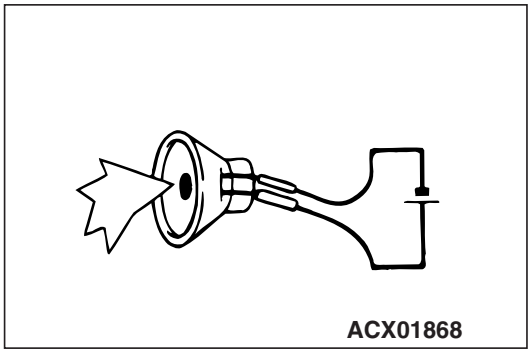
Q: Is the wiring harness between front door speaker (LH) connector F-12 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 5 and 13) in good condition?

YES : Repair or replace the radio and tape player or CD player. The front door speaker (LH) should sound.

NO : Repair or replace the damage component(s). The front door speaker (LH) should sound.

STEP 5. Check the front door speaker (RH).

(1) Remove the front door speaker (RH). Refer to P.54A-253.



(2) Check that the front door speaker (RH) generates noise when a five-volt voltage is applied on the front door speaker (RH) terminal.

Q: Is the front door speaker (RH) generating noise?

YES : Go to Step 6.

NO : Replace the front door speaker (RH). The front door speaker (RH) should sound.

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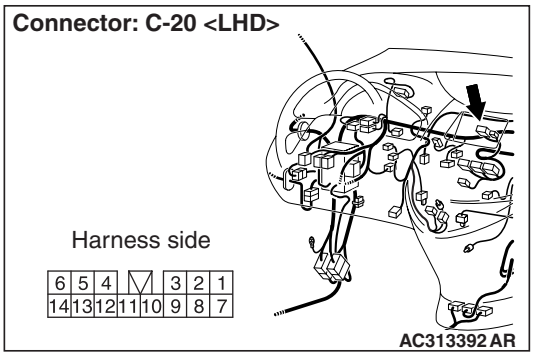
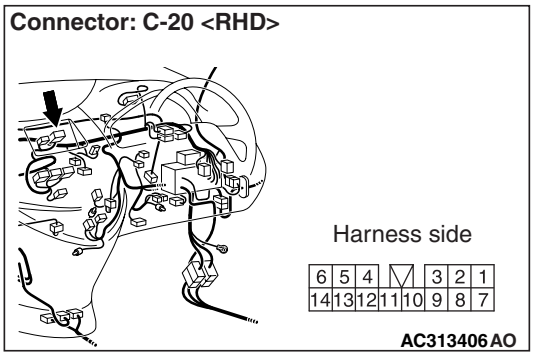
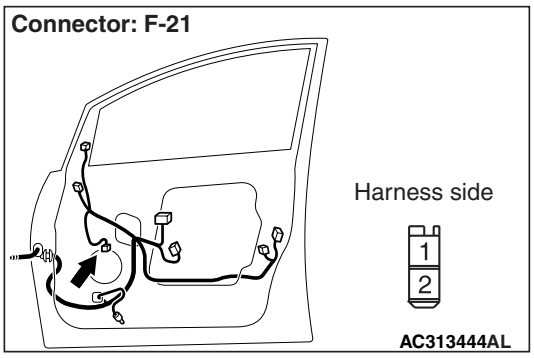
STEP 6. Connector check: Front door speaker (RH) connector F-21 and radio and tape player or CD player connector C-20.





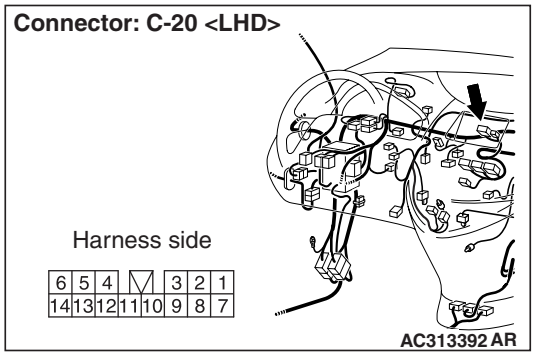


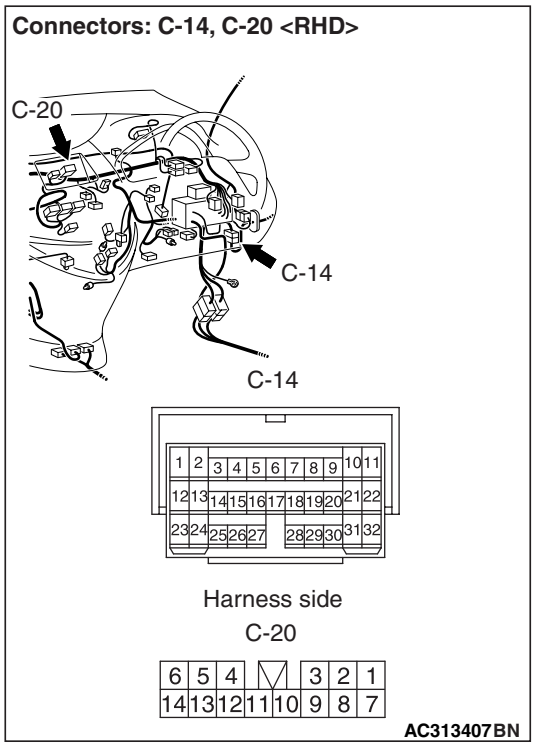
Q: Are harness connectors F-21 and C-20 in good condition?

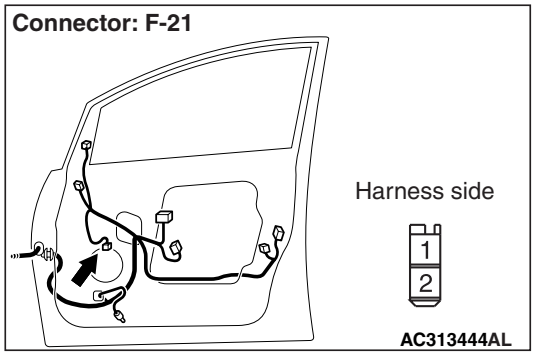
YES : . Go to Step 7.

NO : . Repair or replace the damage component(s). The front door speaker (RH) should sound.

STEP 7. Check the wiring harness between front door speaker (RH) connector F-21 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 6 and 14).







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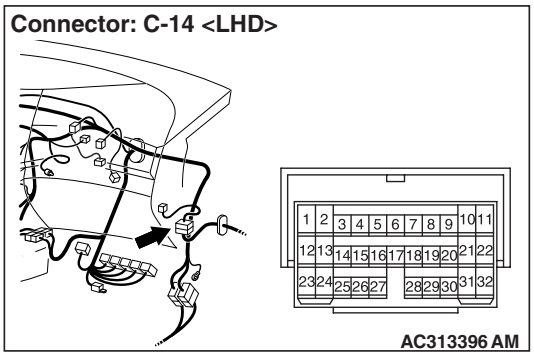
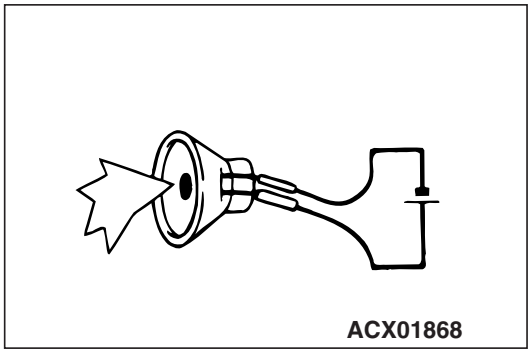
NOTE: Prior to the wiring harness inspection, check intermediate connector C-14, and repair if necessary.



Q: Is the wiring harness between front door speaker (RH) connector F-21 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 6 and 14) in good condition?
YES : Repair or replace the radio and tape player or CD player. The front door speaker (RH) should sound.
NO : Repair the wiring harness. The front door speaker (RH) should sound.

STEP 8. Check the tweeter (LH).

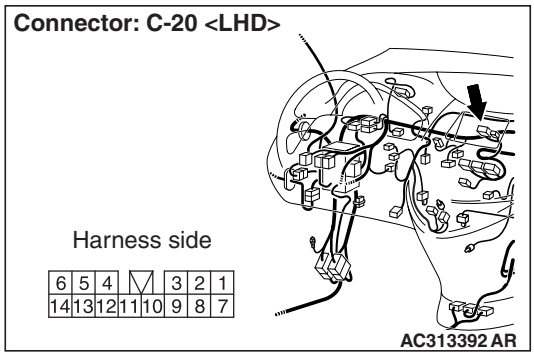
(1) Remove the tweeter (LH). Refer to P.54A-253.

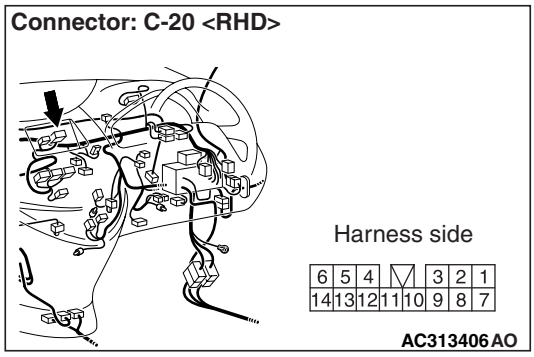


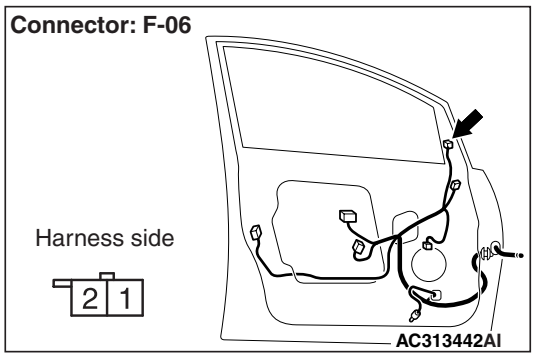
(2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.

Q: Is the tweeter (LH) generating noise?
YES : Go to Step 9.
NO : Replace the tweeter (LH). The tweeter (LH) should sound.

STEP 9. Connector check: Tweeter (LH) connector F-06 and radio and tape player or CD player connector C-20







Q: Are harness connectors F-06 and C-20 in good condition?
YES : Go to Step 10.
NO : Repair or replace the damage component(s). The tweeter (LH) should sound.

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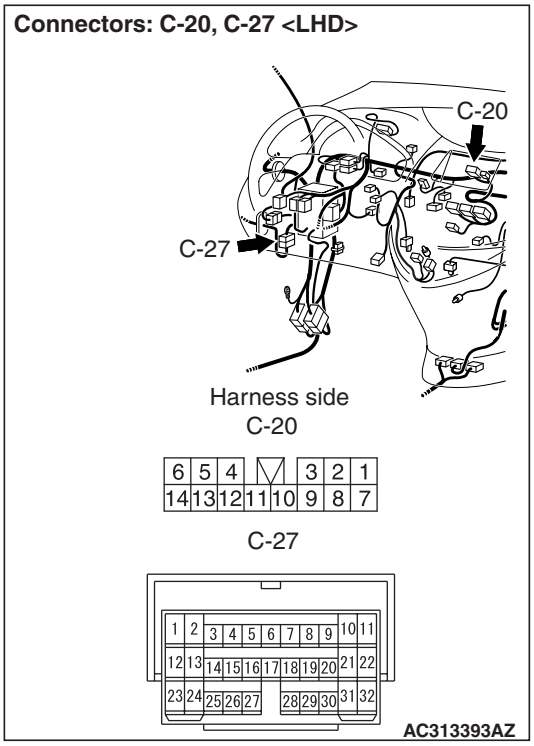
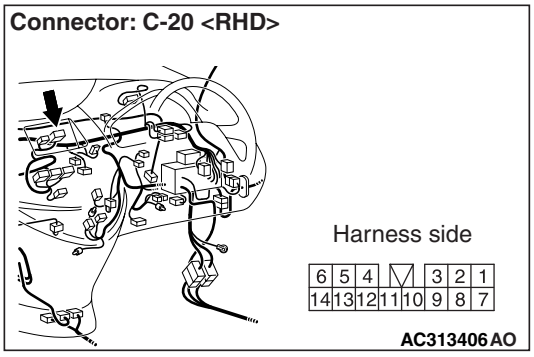
STEP 10. Check the wiring harness between tweeter (LH) connector F-06 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 13 and 5).

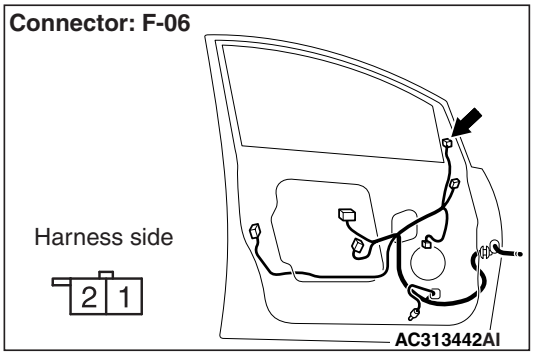
Connectors: C-20, C-27 <LHD>



Connector: C-20 <RHD>

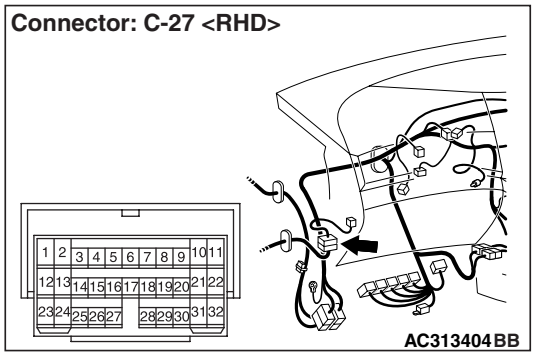


Connector: F-06



NOTE: Prior to the wiring harness inspection, check intermediate connectors C-27, and repair if necessary.

Connector: C-27 <RHD>



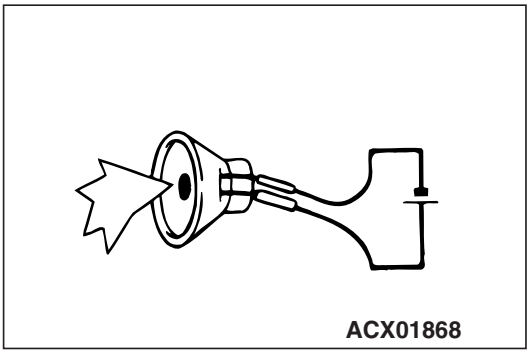
Q: Is the wiring harness between tweeter (LH) connector F-06 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 5 and 13) in good condition?

YES : Repair or replace the radio and tape player or CD player. The tweeter (LH) should sound.

NO : Repair or replace the damage component(s). The tweeter (LH) should sound.

STEP 11. Check the tweeter (RH).

(1) Remove the tweeter (RH). Refer to P.54A-253.



(2) Check that the tweeter (RH) generates noise when a five-volt voltage is applied on the tweeter (RH) terminal.

Q: Is the tweeter (RH) generating noise?

YES : Go to Step 12.

NO : Replace the tweeter (RH). The tweeter (RH) should sound.

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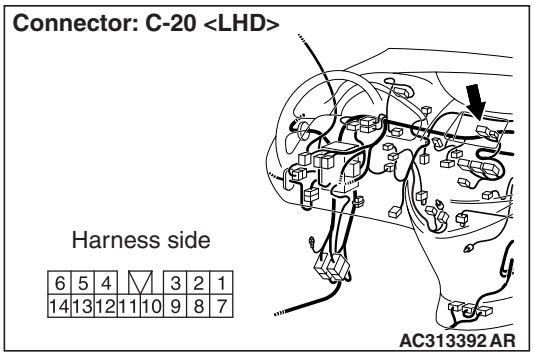
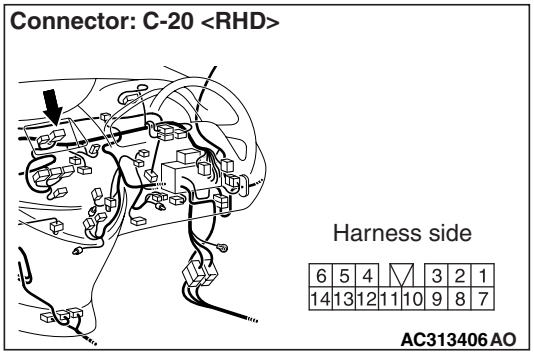
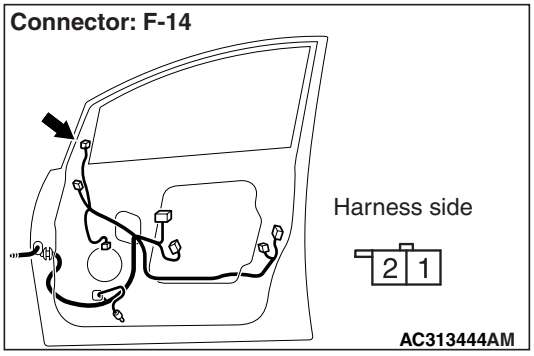
STEP 12. Connector check: Tweeter (RH) connector F-14 and radio and tape player or CD player connector C-20.





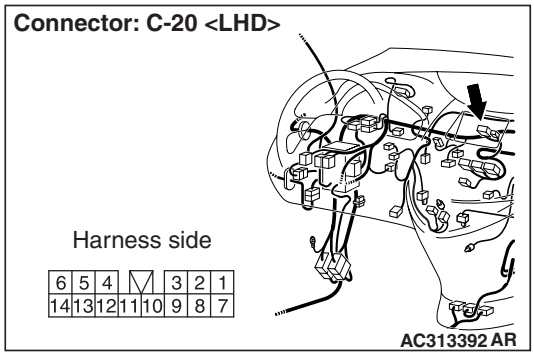


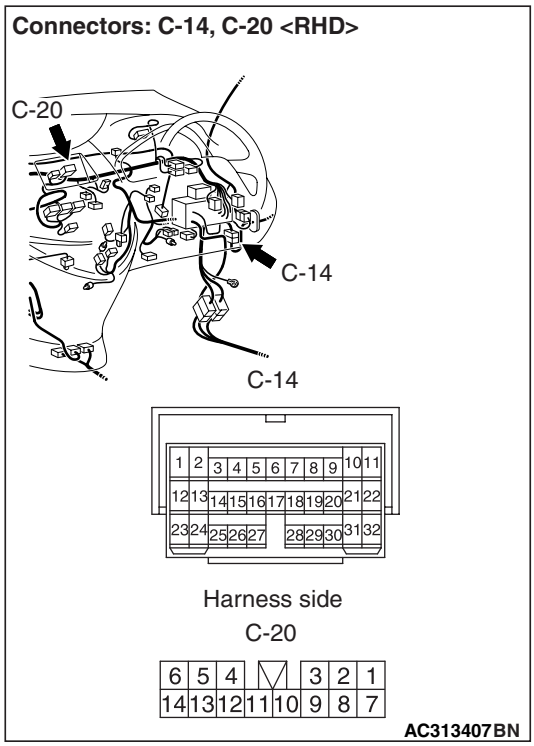
Q: Are harness connectors F-14 and C-20 in good condition?

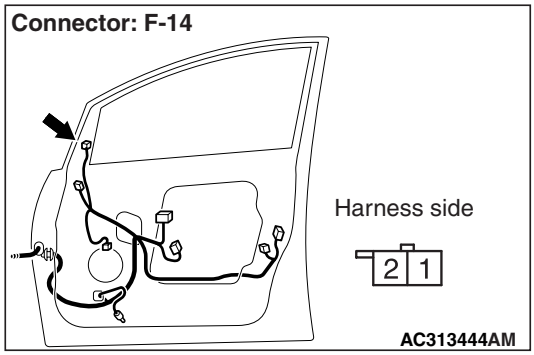
YES : Go to Step 13.

NO : Repair or replace the damage component(s). The tweeter (RH) should sound.

STEP 13. Check the wiring harness between tweeter (RH) connector F-14 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 14 and 6).







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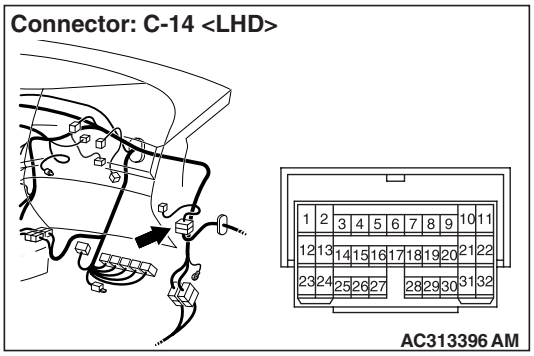
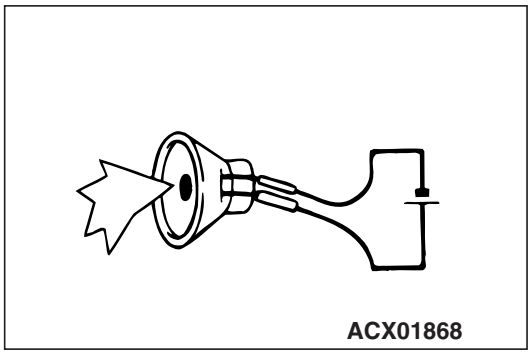
NOTE: Prior to the wiring harness inspection, check intermediate connectors C-14, and repair if necessary.



Q: Is the wiring harness between tweeter (RH) connector F-14 (terminals 1 and 2) and radio and tape player or CD player connector C-20 (terminals 14 and 6) in good condition?
YES : Repair or replace the radio and tape player or CD player. The tweeter (RH) should sound.
NO : Repair or replace the damage component(s). The tweeter (RH) should sound.

STEP 14. Check the rear door speaker (LH).

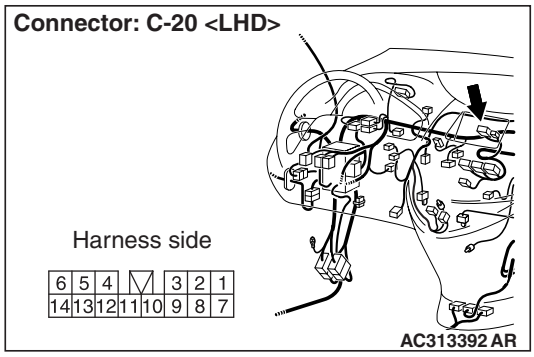
(1) Remove the rear door speaker (LH). Refer to P.54A-253.

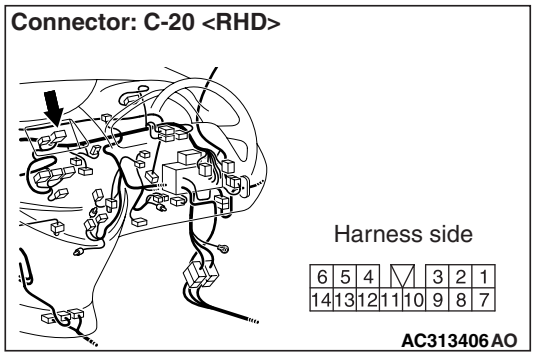


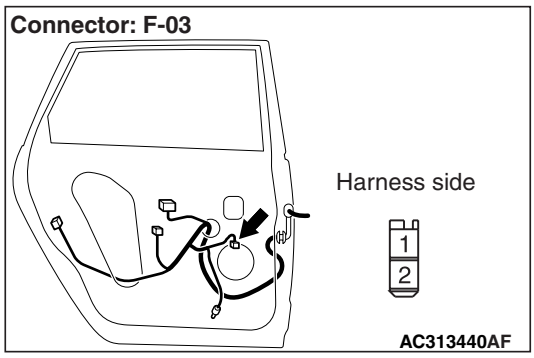
(2) Check that the rear door speaker (LH) generates noise when a five-volt voltage is applied on the rear door speaker (LH) terminal.

Q: Is the rear door speaker (LH) generating noise?
YES : . Go to Step 15.
NO : . Replace the rear door speaker (LH). The rear door speaker (LH) should sound.

STEP 15. Connector check: Rear door speaker (LH) connector F-03 and radio and tape player or CD player connector C-20.







Q: Are harness connectors F-03 and C-20 in good condition?
YES : . Go to Step 16.
NO : . Repair or replace the damage component(s). The rear door speaker (LH) should sound.

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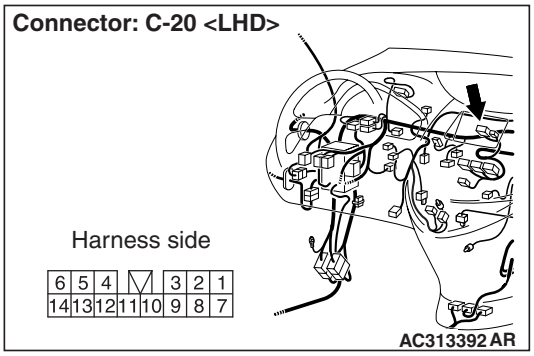
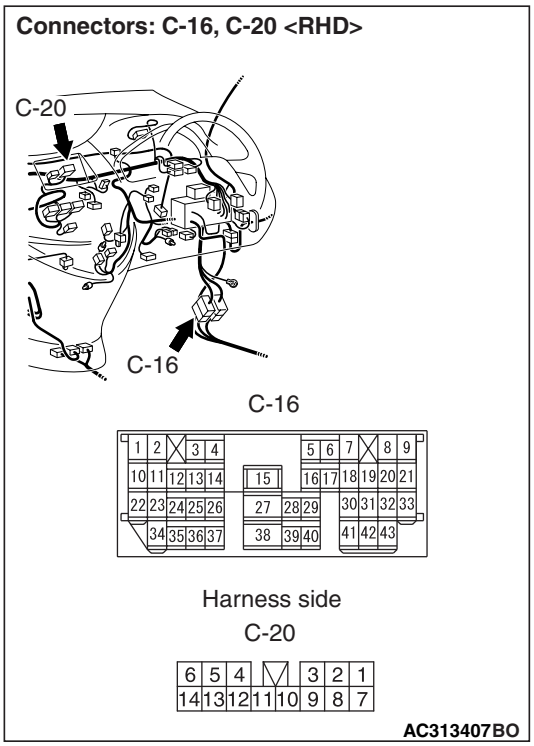
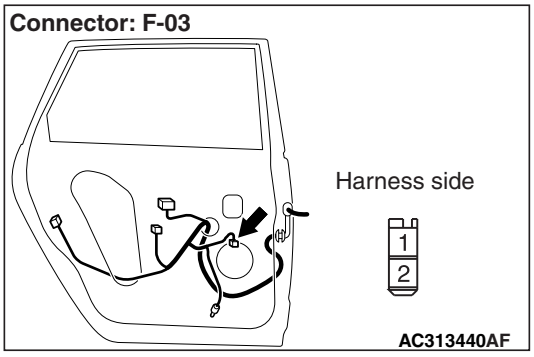
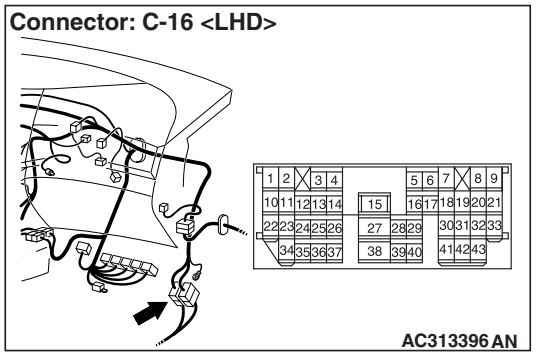
STEP 16. Check the wiring harness between rear door speaker (LH) connector F-03 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 2 and 8).

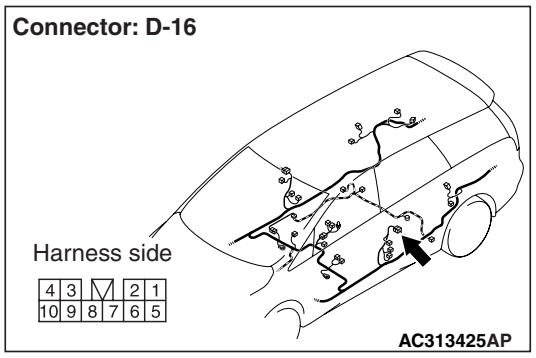






NOTE: Prior to the wiring harness inspection, check intermediate connectors D-16 and C-16, and repair if necessary.





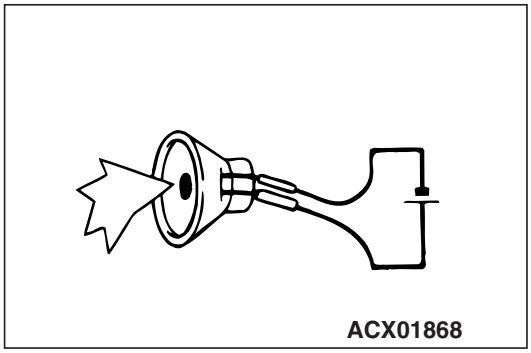
Q: Is the wiring harness between rear door speaker (LH) connector F-03 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 2 and 8) in good condition?

YES : Repair or replace the radio and tape player or CD player. The rear door speaker (LH) should sound.

NO : Repair or replace the damage component(s). The rear door speaker (LH) should sound.

STEP 17. Check the rear door speaker (RH).

(1) Remove the rear door speaker (RH). Refer to P.54A-253.



(2) Check that the rear door speaker (RH) generates noise when a five-volt voltage is applied on the rear door speaker (RH) terminal.

Q: Is the rear door speaker (RH) generating noise?

YES : Go to Step 18.

NO : Replace the rear door speaker (RH). The rear door speaker (RH) should sound.

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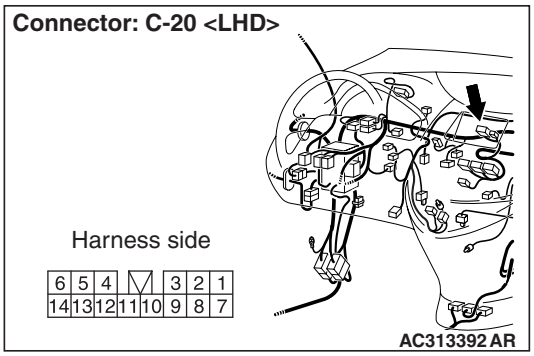
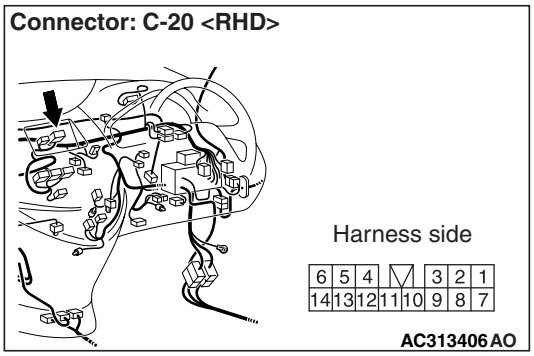
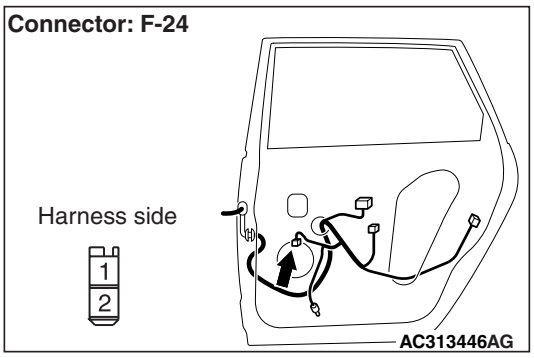
STEP 18. Connector check: Rear door speaker (RH) connector F-24 and radio and tape player or CD player connector C-20.





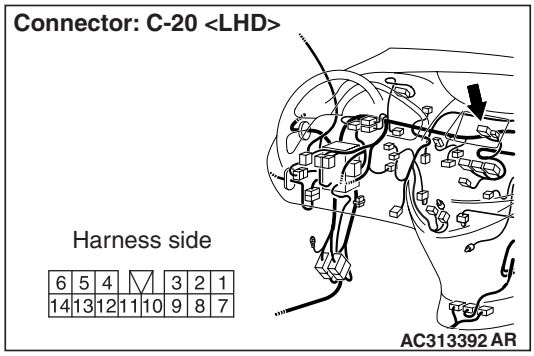


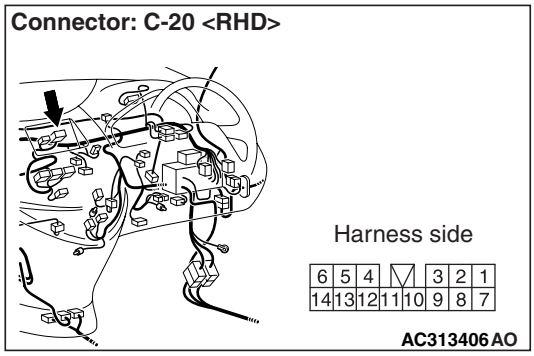
Q: Are harness connectors F-24 and C-20 in good condition?

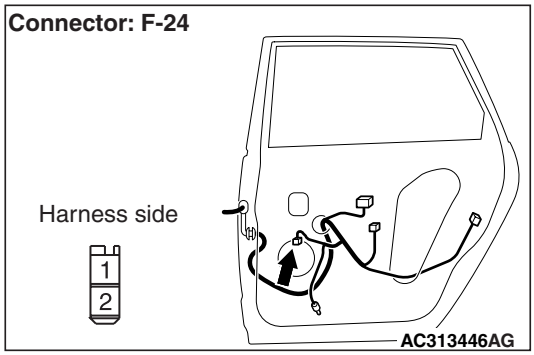
YES : Go to Step 19.

NO : Repair or replace the damage component(s). The rear door speaker (RH) should sound.

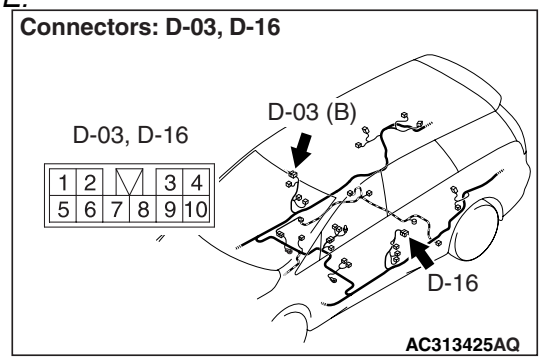
STEP 19. Check the wiring harness between rear door speaker (RH) connector F-24 (terminals 1 and 2) and radio and tape player or CD player connector C-20 (terminals 1 and 7).







NOTE:



Prior to the wiring harness inspection, check intermediate connectors D-03, D-16, and repair if necessary.

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Q: Is the wiring harness between rear door speaker (RH) connector F-24 (terminal 1 and 2) and radio and tape player or CD player connector C-20 (terminal 1 and 7) in good condition?
YES : Repair or replace the radio and tape player or CD player. The rear door speaker (RH) should sound.
NO : Repair or replace the damage component(s). The rear door speaker (RH) should sound.

Inspection Procedure 3: Noise Appears at Certain Places when Travelling (AM).

DIAGNOSIS PROCEDURE

STEP 1. Check the noise occur when entering or near a particular structure (building, tunnel, mountain, etc).

Q: Does the noise occur when entering or near a particular structure (building, tunnel, mountain, etc.)?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. After taking the following measures to prevent the noise, check that no noise appears.
(1) Change to a different station with a stronger wave to boost resistance to interference.
(2) Suppress high tones to reduce noise.
(3) Extend antenna completely.

Q: Do the following measures eliminate the noise?
YES : The following causes can be considered.
NO : Go to Step 4.

STEP 3. Ask the owner about the state of the noise.
(1) Find out the following information from the owner.
(2) Place where the noise occurs.
(3) Locality conditions (valley, mountain, etc).
(4) Name and frequency of stations affected by noise

Q: Which is the noise, vehicle noise or external noise?
Vehicle noise : It may not be possible to prevent noise if the signal is weak.
External noise : In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference. Go to Step 4.

STEP 4. Check that there is no noise.

Q: Does noise still exist?
YES : If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service centre.
NO : Normal.

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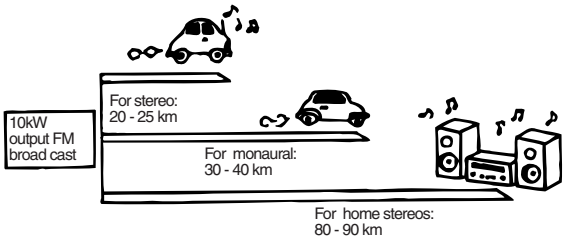
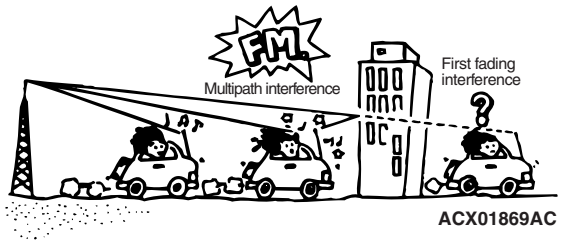
Inspection Procedure 4: Noise is Present while Moving (FM).





DIAGNOSIS PROCEDURE

NOTE: FM waves have the same properties as lamp, and can be deflected and blocked. FM signal reception is severely degraded in the shadow of obstructions such as buildings or mountains. An FM receiver will then only receive a reflected signal.

1. The signal becomes weak as the distance from the station's transmission antenna increases. The signal strength received depends on the signal strength of the transmitting station and intervening obstructions such as buildings and hills. Generally speaking, the area of good reception is approximately 20 – 25 km for stereo reception, and 30 – 40 km for monaural reception.
2. The signal will becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the station transmitter and the vehicle), and noise will appear. <This is called first fading, and gives a steady buzzing noise.>
3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. When moving, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitive buzzing.>
4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.

After taking measures to prevent the noise, check that no noise occurs.

5. Change to a different station with a stronger wave to boost resistance to interference.
6. Suppress high tones to reduce noise.
7. Extend antenna completely.

If there is noise, the following causes can be considered.

8. If due to vehicle noise: It may not be possible to prevent noise if the signal is weak.
9. If due to external noise: In almost all cases, prevention on the receiver side is not possible. Weak signals especially are susceptible to interference.

If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service centre.

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Inspection Procedure 5: Mixed with Noise, Only at Night (AM).

The following factors can be considered as PROBABLE CAUSES of noise appearing at night.

1. Factors due to signal conditions: Due to the fact that long-distance signals are more easily received at night, even stations that are received without problem during the day may experience interference in a general worsening of reception conditions. The weaker a station is the more susceptible it is to interference, and a change to different station or the appearance of a beating sound* may occur.

   NOTE: Beat sound: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but electrical waves as well.*
2. Factors due to vehicles noise: Alternator noise may be a cause.

DIAGNOSIS PROCEDURE

STEP 1. Check that the noise still obvious even when the lamps are off.

Q: Is the noise still obvious even when the lamps are off?
YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check hat the following actions.
(1) Tune to a station with a stronger wave.
(2) Tune to a station with a stronger wave without completely extending the antenna (Mast antenna).

Q: Is there more noise than on radio in other vehicles?
YES : Consult the radio manufacturer's service centre.
NO : Check that there is no noise.

STEP 3. Check that the noise fades away when the vehicle harness is moved away from the radio (if the harness is not in the proper position).

Q: Does the noise fade away when the vehicle harness is moved any from the radio (If the harness is not in the proper position)?
YES : Consult the radio manufacturer's service centre.
NO : If there is more noise than other radios, consult the radio manufacturer's service centre.

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Inspection Procedure 6: Broadcasts can be Heard but Both AM and FM have a Lot of Noise.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. Check to see that the noise is gone.

STEP 2. Check that the noise occur when the engine is stopped or the engine is running.

Q: Does noise occur when the engine is stopped or the engine is running?
When the engine is stopped : Go to Step 3.
When the engine is running : Check the vehicle's noise suppressor (Refer to Inspection Procedure 9 P.54A-235).

STEP 3. Check that the following actions disappear the noise.

(1) Tune to a station with a stronger wave.
(2) Extend the antenna completely (Mast antenna).
(3) Adjust the sound quality to suppress high tones.

Q: Is the noise eliminated?
YES : Consult the radio manufacturer's service centre.
NO : Go to Step 4.

STEP 4. Check that the radio is correctly earthed

The radio is connected to the earth with an assembling screw.

Q: Is the radio correctly earthed?
YES : Go to Step 5.
NO : Consult the radio manufacturer's service centre.

STEP 5. Check the connection of the antenna plug and radio and tape player or CD player.

Q: Is the antenna plug thoroughly connected to the radio and tape player or CD player?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check that the noise is eliminated when the antenna plug is properly attached.

Q: Is the noise eliminated?
YES : Consult the radio manufacturer's service centre.
NO : Go to Step 7.

STEP 7. Check that the antenna is in good condition and is it properly mounted.

Q: Is the antenna in good condition and is it properly mounted?
YES : Consult the radio manufacturer's service centre.
NO : Either repair or replace the antenna assembly. Check to see that the noise is gone.

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Inspection Procedure 7: There is More Noise on Either AM or FM.

DIAGNOSIS PROCEDURE

There is much noise only on AM. Due to differences in AM and FM systems, AM is more susceptible to noise interference.

STEP 1. Check that there is noise under the following state(s).

- A motorcycle was passing.
- Lighting was flashing.
- A vehicle passed close by, but it appeared to be a vehicle generating a particularly large amount of noise radiation.
- Passed beneath a power line.
- Passed beneath a telephone line.
- Passed close by a signal alternator.
- Passed close by some other sources of electrical noise.
- Passed under a bridge.

Q: Is there noise in the above states?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Continue to check for static; when static is detected, check for the conditions listed above.

Q: Is there noise in the state described in Step 1?
YES : Noise prevention on the radio side is difficult. If the problem is particularly worse than other radios, consult a service centre.
NO : Go to Step 3.

STEP 3. Check noise prevention on the radio side is difficult.

Q: Is the noise level worse than other radios?
YES : Consult a service centre. Noise encountered during FM reception only. Due to differences in FM and AM systems, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user. a problem with the radio.> Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.
NO : f the noise level is roughly the same as other radios, there is no action to be taken.

Inspection Procedure 8: There is Noise when Starting the Engine.

DIAGNOSIS PROCEDURE

⚠ CAUTION

- **Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.**
- **Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.**
- **Noise prevention should be performed by suppressing strong sources of noise step by step.**

NOTE: Capacitor: The capacitor does not pass DC current, but as the number of waves increases when it passes AC current, impedance (resistance against AC) decreases, and current flow is facilitated. A noise suppressing capacitor which take advantage of this property is inserted between the power line for the noise source and the earth. This suppresses noise by earthing the noise component (AC or pulse signal) to the body of the vehicle.

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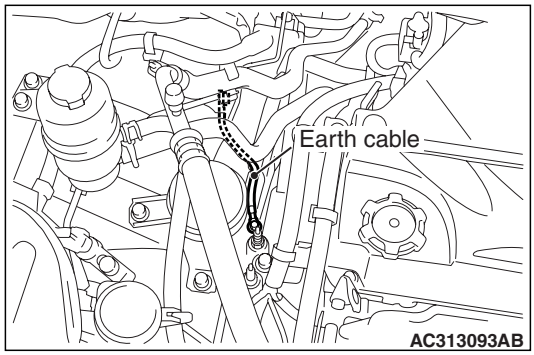
NOTE: Coil: The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.

Noise type sounds are in parentheses	**Conditions**	**Cause**	**Remedy**
AM or FM: ignition noise (popping, snapping, cracking, buzzing)	• Increasing the engine speed causes the alternator whine sound to speed up and the volume to decrease • Disappears when the ignition switch turned to "ACC."	• Mainly due to the spark plugs • Due to engine noise	• Check or replace the earth cable. • Check or replace the noise capacitor.
Other electrical components	–	Noise may occur as the electrical components become older.	Repair or replace the electrical components.
Static electricity (cracking, crinkling)	• Disappears when the vehicle is completely stopped. • Severe when the clutch is engaged	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.
Static electricity (cracking, crinkling)	• Various noise are produced depending on the body part of the vehicle.	Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Earth parts by bonding. Cases where the problem is not eliminated by a signal response to one area are common, due to several body parts being imperfectly earthed.



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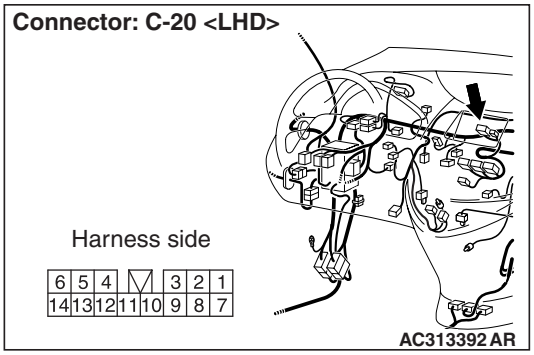
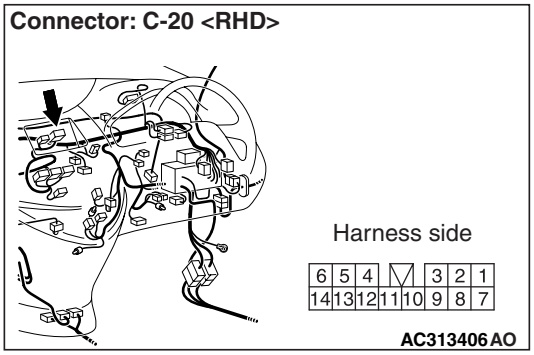
Inspection Procedure 9: Some Noise Appears when there is Vibration or Shocks During Travelling.

DIAGNOSIS PROCEDURE

STEP 1. Connector check: Radio and tape player or CD player connector C-20.





Q: Is radio and tape player or CD player connector C-20 in good condition?
YES : Go to Step 2.
NO : Repair or replace the connector. Check that there is no noise.

STEP 2. Check that noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station.

NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the earth, causing a buzzing noise. Since no measures can be taken to discharge the static electricity of the vehicle body. Check that there is no noise.

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?
YES : Go to Step 3.
NO : It may be static electricity noise.

STEP 3. Check that the radio correctly earthed.

The radio is connected to the earth with an assembling screw.

Q: Is the radio correctly earthed?
YES : Go to Step 4.
NO : Tighten the screw securely. Check that there is no noise.

STEP 4. Check by replacing the radio and tape player or CD player.

Q: Are operations normal when using another radio and tape player or CD player?
YES : Either repair or replace the radio and tape player or CD player. Check that there is no noise.
NO : Either repair or replace the antenna assembly. Check that there is no noise.

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Inspection Procedure 10: Noise Sometimes Appears on FM during Travelling.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. Check that there is no noise.

STEP 2. The check after adjusting the radio.

Q: Readjust the radio. Is the noise eliminated?
YES : Check that there is no noise.
NO : Go to Step 3.

STEP 3. Check with several broadcasting stations.

NOTE: Multipath noise and fading noise: Because of the frequency of FM waves in extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

Multipath noise

- *This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

Fading noise

- *This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

Q: Is the abnormality in reception generated only within a certain range?
YES : The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.
NO : Go to Step 4.

STEP 4. Check that noise appears when the radio switch is turned on while the vehicle is stopped.

NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the earth, causing a buzzing noise. There is no measures to discharge the static electricity of the vehicle body. Check that there is no noise.

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?
YES : Go to Step 5.
NO : It may be static electricity noise.

STEP 5. Check that the radio is correctly earthed.

The radio is connected to the earth with an assembling screw.

Q: Is the radio correctly earthed?
YES : Go to Step 6.
NO : Tighten the screw securely. Check that there is no noise.

STEP 6. Check by replacing the radio and tape player or CD player.

Q: Are operations normal when using another radio and tape player or CD player?
YES : Either repair or replace the radio and tape player or CD player. Check that there is no noise.
NO : Either repair or replace the antenna assembly. Check that there is no noise.

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Inspection Procedure 11: Ever-Present Noise.

DIAGNOSIS PROCEDURE

Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Travelling conditions of the vehicle
- Terrain of area travelled through
- Surrounding buildings
- Signal conditions
- Time period

For this reason, if there are still problems with noise even after the measures described in inspection procedure 4 to 10 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc. and contact the radio manufacturer's service centre.

Inspection Procedure 12: There is Noise but No Reception for Both AM and FM or No Sound from AM, or No Sound from FM.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. The radio should sound normally.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underground garage, inside a building, etc).?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Relocate and check.

Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?
YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check the connection of the antenna plug and the radio and tape player or CD player.

Q: Is the antenna plug thoroughly connected to the radio and tape player or CD player?
YES : Go to Step 6.
NO : Thoroughly connect the antenna plug and the radio and tape player or CD player. The radio should sound normally.

STEP 6. Check by replacing the radio and tape player or CD player.

Q: Are operations normal when using another radio and tape player or CD player?
YES : Either repair or replace the radio and tape player or CD player. The radio should sound normally.
NO : Either repair or replace the antenna assembly. The radio should sound normally.

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Inspection Procedure 13: Poor Reception.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. Check that a poor reception is resolved.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underneath garage, inside a building, etc).?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Relocate and check.

Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : Check that a poor reception is resolved.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?
YES : Check that a poor reception is resolved.
NO : Go to Step 5.

STEP 5. Check with several broadcasting stations.

NOTE: Multipath noise and fading noise: Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

Multipath noise

- *This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

Fading noise

- *This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

Q: Is the abnormality in reception generated only within a certain range?
YES : Check that a poor reception is resolved.
NO : Go to Step 6.

STEP 6. Check the connection of the antenna plug and the radio and tape player or CD player.

Q: Is the antenna plug thoroughly connected to the radio and tape player or CD player?
YES : Go to Step 7.
NO : Thoroughly connect the antenna plug and the radio and tape player or CD player. Check that a poor reception is resolved.

STEP 7. Check by replacing the radio and tape player or CD player.

Q: Does the another radio and tape player or CD player work normally?
YES : Either repair or replace the radio and tape player or CD player. Check that a poor reception is resolved.
NO : Either repair or replace the antenna assembly. Check that a poor reception is resolved.

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Inspection Procedure 14: Distortion on AM or on Both AM and FM.

DIAGNOSIS PROCEDURE

STEP 1. Check the degree in which distortion is generated.

Q: How much distortion is generated?
Occasional distortion : Go to Step 2.
Constant distortion : Go to Step 3.

STEP 2. Check by the transmission antenna.

Q: Is there distortion by the transmission antenna?
YES : The input from the antenna is too big.
NO : Go to Step 3.

STEP 3. Check how the speakers are setup.

Q: Are any cords coming in contact with the paper cones of the speakers?
YES : Move the cords so that they do not come in contact with the paper cones of the speaker. Check that a distortion is resolved.
NO : Go to Step 4.

STEP 4. Check the speakers.

1. Remove the speakers.
2. Check to see if there is any ripping of the paper cones or any foreign obstacles in the paper cone.

Q: Are the speakers normal?
YES : Go to Step 5.
NO : Repair or replace the speakers. Check that a distortion is resolved.

STEP 5. Check how the speakers are setup.

Q: Check to see if the speakers are setup in a deformed manner.
YES : Correct the way the speakers are setup so they are securely setup. Check that a distortion is resolved.
NO : Repair or replace the radio and tape player or CD player. Check that a distortion is resolved.

Inspection Procedure 15: Distortion on FM Only.

DIAGNOSIS PROCEDURE

STEP 1. Check with another broadcasting station.

Q: Is there distortion when turning to another broadcasting station?
YES : Go to Step 2.
NO : The signal from that station is too weak.

STEP 2. Relocate the reception area and check.

Q: When relocating the reception area does the distortion increase or decrease?
YES : The cause may be multipath noise.
NO : Repair or replace the radio and tape player or CD player. Check that a distortion is resolved.

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Inspection Procedure 16: Using the Auto Select Function, Too Few Automatic Stations are Selected.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. The auto-select function should operate normally.

STEP 2. Check the number of radio stations.

Q: Are there sufficient numbers of radio stations within the area?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Check the distance from the transmission antenna.

Q: Is there a transmission antenna within a range of 2 miles?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. The check if there are not that many radio stations and when there is no transmission antenna in the vicinity.
Execute automatic selection and check to see that the strongest radio frequency is receivable within the area.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underneath garage, inside a building, etc).?
YES : Go to Step 6.
NO : Go to Step 7.

STEP 6. Relocate and check.
Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 7.

STEP 7. Check the connection of the antenna plug and the radio and tape player or CD player.

Q: Is the antenna plug thoroughly connected to the radio and tape player or CD player?
YES : Repair or replace the radio and tape player or CD player. The auto-select function should operate normally.
NO : Thoroughly connect the antenna plug and the radio and tape player or CD player. The auto-select function should operate normally.

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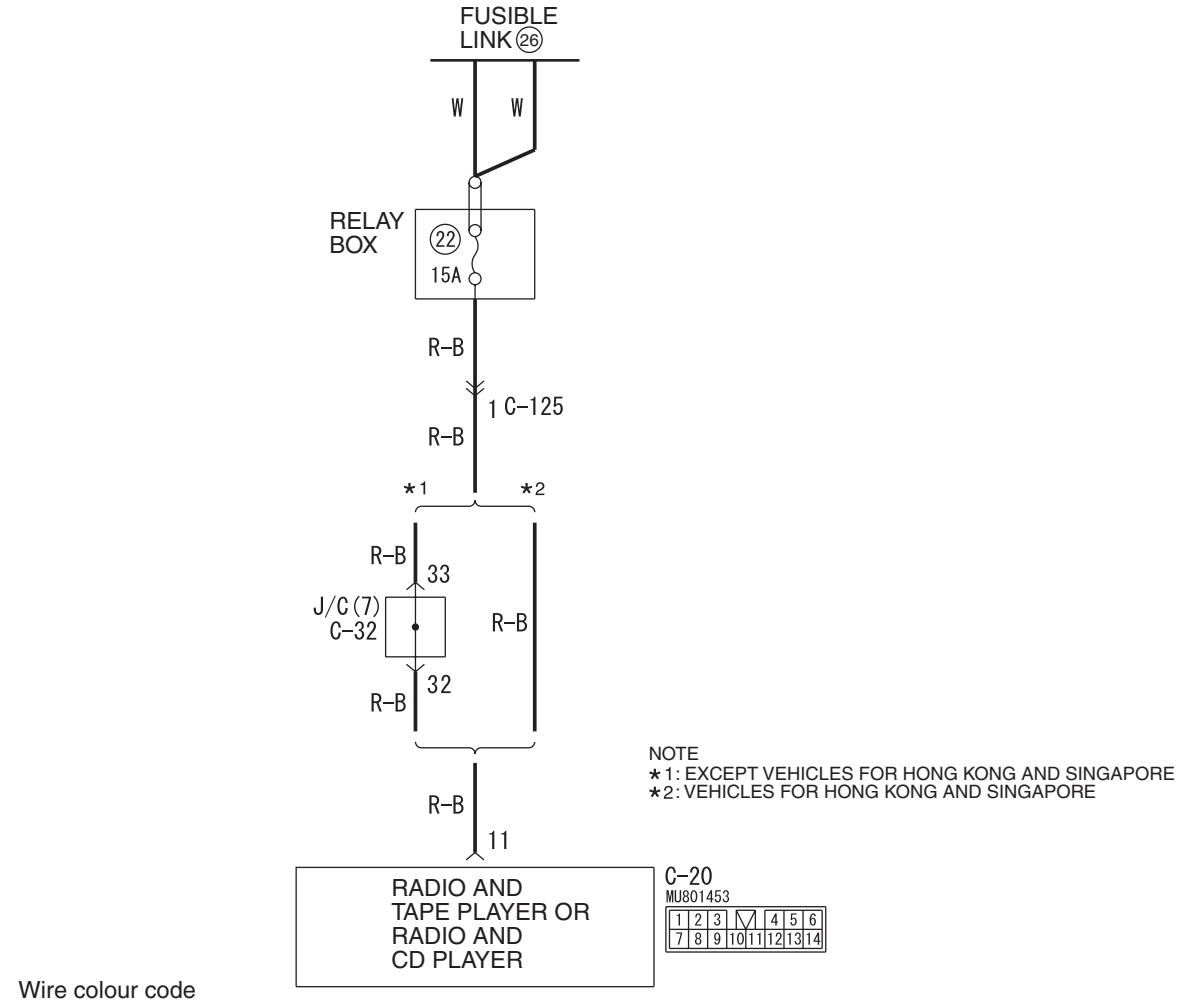
Inspection Procedure 17: Preset Station are Erased.

Memory Backup Power Circuit



NOTE
*1: EXCEPT VEHICLES FOR HONG KONG AND SINGAPORE
*2: VEHICLES FOR HONG KONG AND SINGAPORE

Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

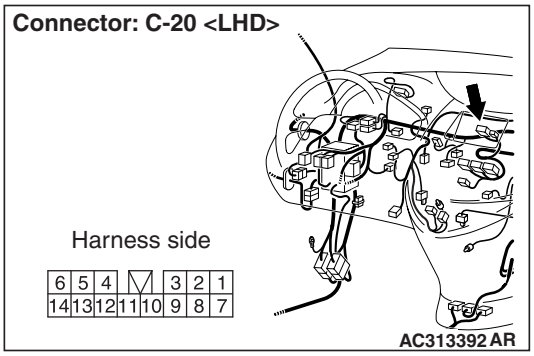
The cause is probably a faulty radio and tape player or CD player memory backup power supply circuit system.

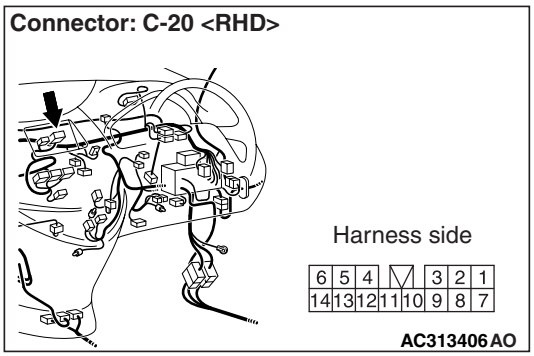
PROBABLE CAUSES

- Damaged wiring harness or connector.
- Malfunction of the radio and tape player or CD player.

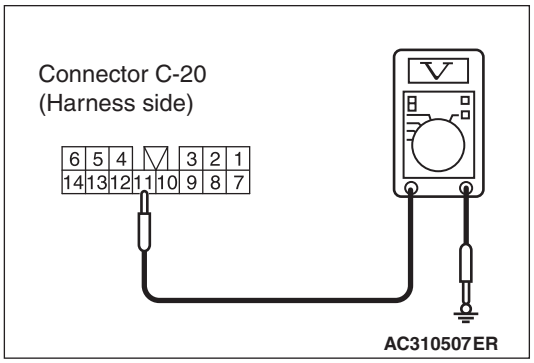
DIAGNOSIS PROCEDURE

STEP 1. Voltage measurement at radio and tape player or CD player connector C-20.





(1) Disconnect radio and tape player or CD player connector C-20.



(2) Measure the voltage between terminal number 11 and earth.

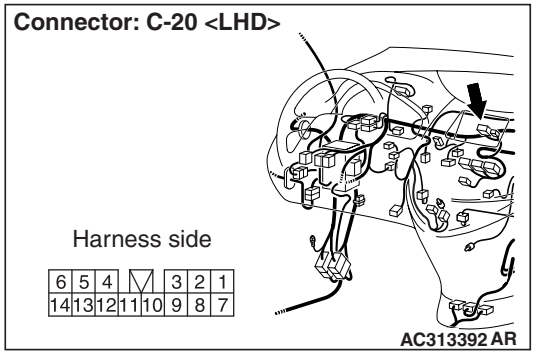
OK: System voltage

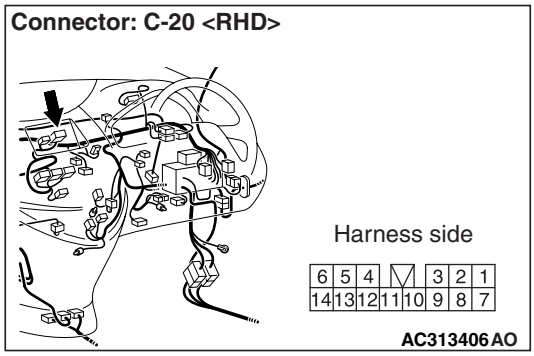
Q: Does the measured voltage correspond with this range?

When YES <radio and tape player or CD player does not execute memory save then.> : Either repair or replace the radio and tape player or CD player. Check that a memory is retained.

NO : Go to Step 2.

STEP 2. Connector check: Radio and tape player or CD player connector C-20.





Q: Is radio and tape player or CD player connector C-20 in good condition?

YES : Go to Step 3.

NO : Repair or replace the damage component(s). Check that a memory is retained.

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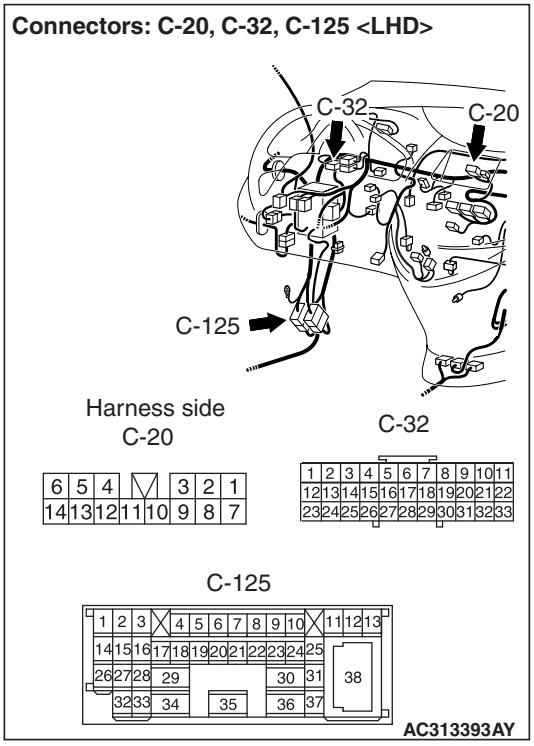
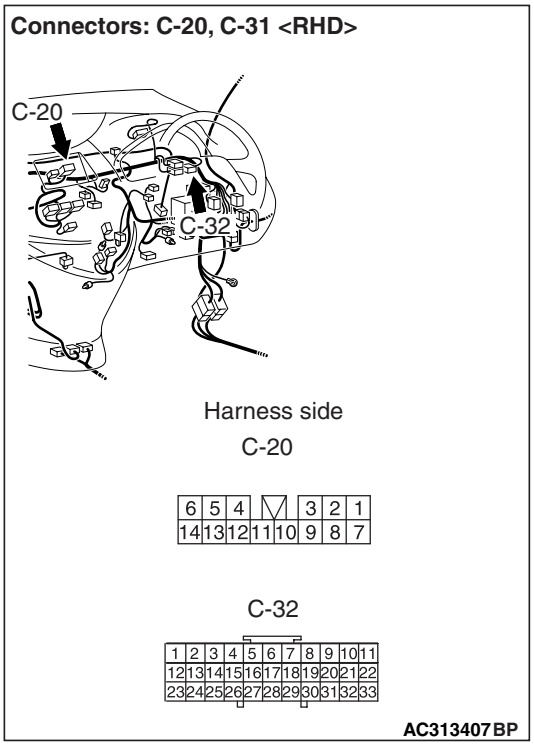
STEP 3. Check the wiring harness between radio and tape player or CD player connector C-20 (terminal 11) and fusible link 26 (battery).

Connectors: C-20, C-32, C-125 <LHD>

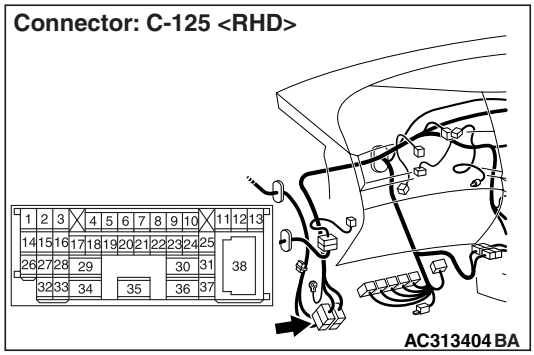


Connectors: C-20, C-31 <RHD>



NOTE: Prior to the wiring harness inspection, check joint connector C-32 <Except vehicles for Hong Kong and Singapore> and intermediate connector C-125, and repair if necessary.

Connector: C-125 <RHD>



Q: Are the wiring harness between radio and tape player or CD player connector C-20 (terminal 11) and fusible link 26 (battery) in good condition?

YES : Repair or replace the radio and tape player or CD player. Check that a memory is retained.

NO : Repair or replace the damage component(s). Check that a memory is retained.

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Inspection Procedure 18: Cassette Tape can not be Inserted.

DIAGNOSIS PROCEDURE

STEP 1. Check that there are any foreign objects inside the cassette player.

NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc). in the cassette player may damage the mechanism. The player should be taken to a service dealer for repair.

Q: Are there any foreign objects inside the cassette player?
YES : There are any foreign objects inside the cassette player, remove the object(s). A cassette tape should be inserted normally.
NO : Go to Step 2.

STEP 2. Check that the radio with cassette player works when another tape is inserted.

NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tape with a length of C-20 or greater can often get caught in the mechanism and should not be used.

Q: Does the cassette player work if another tape is inserted?
YES : The cassette tape used is defective. A cassette tape should be inserted normally.
NO : Replace the radio with cassette player. A cassette tape should be inserted normally.

Inspection Procedure 19: Sound Quality is Poor, or Sound is Weak.

DIAGNOSIS PROCEDURE

STEP 1. Check that the player works normally if the tape is changed.

NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tapes with a length of C-20 or greater can often get caught in the mechanism and should not be used.

Q: Does the player work normally if the tape is changed?
YES : The tape used is defective.
NO : Go to Step 2.

STEP 2. Check that the player play OK if the tape player head is cleaned.

Q: Does the player play OK if the tape player head is cleaned?
YES : The sound quality should return to normal.
NO : Go to Step 3.

STEP 3. Check that the proper operation is obtained when the tape player is replaced.

Q: Is proper operation obtained when the tape player is replaced?
YES : Replace the radio and tape player. The sound quality should return to normal.
NO : Repair or replace the speakers. The sound quality should return to normal.

Inspection Procedure 20: Cassette Tape can not be Ejected.

DIAGNOSIS PROCEDURE

The problems covered here are all the result of the use of a bad tape (deformed or not properly tightened) or of a malfunction of the cassette player itself. Malfunctions involving the tape becoming caught in the mechanism and ruining the case are also possible, and attempting to force the tape out of the player can cause damage to the mechanism. The player should be taken to a service dealer for repair.

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Inspection Procedure 21: Uneven Revolution. Tape Speed is Fast or Slow.

DIAGNOSIS PROCEDURE

STEP 1. Check that the tape player work normally when the tape is changed.

NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tape with a length of C-20 or greater can often get caught in the mechanism and should not be used.

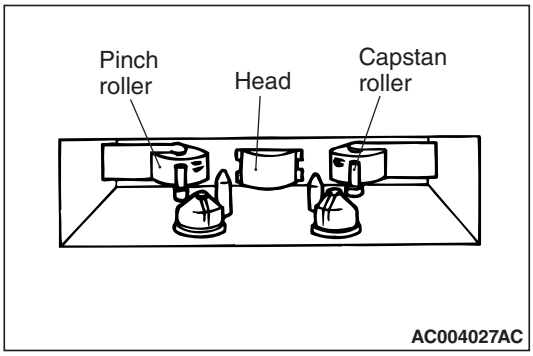
Q: Does the player work normally if the tape is changed?
YES : The tape used is defective. The cassette tape speed should be stable.
NO : Go to Step 2.

STEP 2. Check that there are any foreign objects inside the cassette player.

NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc). out of the cassette player may damage the mechanism. The player should be taken to a service dealer for repair.

Q: Are there any foreign objects inside the cassette player?
YES : . The procedure is complete.
NO : . Go to step 3.

STEP 3. Check that the head or capstan roller is dirty.



Q: Is the head or capstan roller dirty?
YES : Clean the head or capstan roller. The cassette tape speed should be stable.
NO : Repair or replace the tape player. The procedure is complete.

Inspection Procedure 22: Automatic Search does not Work.

DIAGNOSIS PROCEDURE

STEP 1. Check that the "APS" (automatic search) button be depressed properly.

NOTE: When the time between songs on a tape is less than three seconds, or when there is a three second period in the middle of a song in which the volume level is extremely low, the automatic search function may not work properly.

Q: Can the "APS" (automatic search) button be depressed properly?
YES : Go to Step 2.
NO : The button is operated improperly. Repair radio and tape player.

STEP 2. Check that the player works when the tape is changed.

NOTE: Ensure that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tapes of C-20 or greater length often get caught in the mechanism and should not be used.

Q: Does the player work if the tape is changed?
YES : The tape used is defective.
NO : Replace the radio and tape player. Check that the automatic search function operates normally.

Main Index
Group TOC

Inspection Procedure 23: Malfunction of the Auto Reverse.

DIAGNOSIS PROCEDURE

STEP 1. Check that the tape player works normally when the tape is changed.

NOTE: Ensure that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tape of C-20 or greater length often get caught in the mechanism and should not be used.

Q: Does the tape player work normally if the tape is changed?
- **YES :** The tape used is defective. The auto reverse function should operate normally.
- **NO :** Go to Step 2.

STEP 2. Check that the problem only occur while the vehicle is being driven.

Q: Does the problem only occur while the vehicle is being driven?
- **YES :** Go to Step 3.
- **NO :** Replace the radio and tape player. The auto reverse function should operate normally.

STEP 3. Check that the tape player is properly installed to the vehicle.

Q: Is the tape player properly installed to the vehicle?
- **YES :** Replace the radio and tape player. The auto reverse function should operate normally.
- **NO :** Repair the installation condition. The procedure is complete.

Inspection Procedure 24: Tape gets Caught in Mechanism.

NOTE: When the tape is caught in the mechanism, the tape case may not eject. When this occurs, do not try to force the tape out as this may damage the tape player mechanism. Take the cassette to a service dealer for repair.

DIAGNOSIS PROCEDURE

STEP 1. Check that the player works normally if tape is changed.

NOTE: Check that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tape with a length of C-20 or greater can often get caught in the mechanism and should not be used.

Q: Does the player work normally if tape is changed?
- **YES : .** The tape used is defective. The tape player should operate normally.
- **NO : .** Replace the radio with ape player. The procedure is complete.

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Group TOC

Inspection Procedure 25: CD can not be Inserted.

DIAGNOSIS PROCEDURE

STEP 1. Check that a CD has been already loaded.

Q: Has a CD been already loaded?
NO : Go to Step 2.
YES : Take out the CD (If the CD can not be ejected, refer to INSPECTION PROCEDURE 29 P.54A-249). Check that a CD can be inserted.

STEP 2. Check how a CD is inserted.

- Ensure that the ignition switch is at "ACC" or "ON".

NOTE: If you try to load a CD when the ignition switch is at the positions other than "ACC" or "ON", the CD will not be inserted completely and then rejected.

Q: If you try to load the CD, does the CD stops halfway and then rejected?
YES : Refer to INSPECTION PROCEDURE 29 P.54A-249.
NO : Go to Step 3.

STEP 3. Check after the CD is loaded.

NOTE: Even though the CD is loaded, "E" (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.

Q: Though the CD is inserted completely, is "E" (error) displayed and the CD ejected?
YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Check the CD.

Check the CD for the conditions below:

- Is the CD loaded with its label facing down?
- Is the recorded face dirty or scratched?
- Is there dew on the recorded face?

Q: Is the CD in good condition?
YES : Go to Step 5.
NO : The original CD is defective. Check that a CD can be inserted.

STEP 5. Check again using a normal CD, which is not dirty or scratched.

- Load another normal CD.
- Check that the CD player recognizes and play the CD.

Q: When you substitute another normal CD, is the CD loaded correctly?
YES : The original CD is defective. Check that a CD can be inserted.
NO : Replace the radio with CD player. The procedure is complete.

Inspection Procedure 26: No Sound (CD only).

DIAGNOSIS PROCEDURE

STEP 1. Check again using a normal CD, which is not dirty or scratched.

Q: When you substitute another normal CD, is the CD played normally?
YES : The original CD is defective. The CD player should sound normally.
NO : Go to Step 2.

STEP 2. Check power supply to the CD player when the ignition switch is at "ACC" or "ACC".

Q: Is the radio and CD player energized when the ignition switch is turned to the "ACC" or "ON position?
YES : Replace the radio and CD player. The procedure is complete.
NO : Check the memory backup power supply circuit. Refer to Inspection Procedure 1 P.54A-216.

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Group TOC

Inspection Procedure 27: CD Sound Skips.

DIAGNOSIS PROCEDURE

STEP 1. Check the state in which the sound on the CD jumps.

Q: Does the sound jump when the car is parked?
YES : Go to Step 2.
NO : Go to Step 4.

STEP 2. Check the surface of the CD.

Q: Are there any scratches or soiling on the CD?
YES : The CD is defective if there are any scratches. Clean the CD surface if it is dirty. Check that a CD sound skip is resolved.
NO : Go to Step 3.

STEP 3. Check when replacing with a CD that can be played normally without any scratches or soiling.

Q: Does the CD play normally when replaced with a CD that is not scratched or dirty and can play normally?
YES : Defective CD used. Check that a CD sound skip is resolved.
NO : Go to Step 4.

STEP 4. Check by tapping the radio and CD player.

NOTE: Check by using a proper CD which is free from scratches, dirt or any other abnormality.

Q: Does the sound jump when tapping the radio and CD player?
YES : Securely mount the radio and CD player. Check that a CD sound skip is resolved.
NO : Either repair or replace the radio and CD player. (Take the following measures if a servicing shop is closely).

1. Investigate in detail the state when the sound jumps while driving the car.
2. Describe the state to the service shop for consultation.
3. Either repair or replace the radio and CD player according to the instructions of the service shop.

Check that a CD sound skip is resolved.

Inspection Procedure 28: Sound Quality is Poor.

DIAGNOSIS PROCEDURE

Check to see that the CD can be played normally and that it is free of any scratches or soiling.
Replace with better sound quality CD.

Q: Is the sound quality better replacing the CD with a clean CD without any scratches that can be played?
YES : Defective CD used. The sound quality should return to normal.
NO : Either repair or replace the radio and CD player. The sound quality should return to normal.

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Group TOC

Inspection Procedure 29: CD can not be ejected.

DIAGNOSIS PROCEDURE

Check the power of ignition switch "ACC".

Q: Does the radio and CD player power turn ON when the ignition switch is in the "ACC" or "ON" position?

YES : Replace the radio and CD player. Check that a CD can be ejected normally.

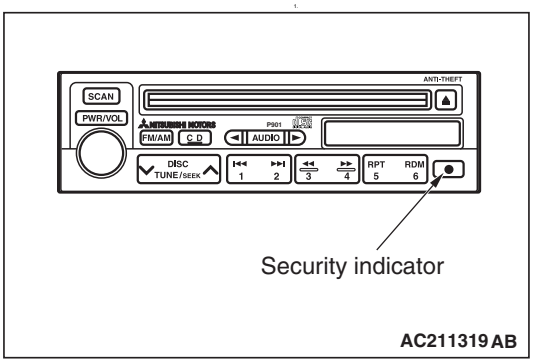
NO : Check the power supply circuit. Refer to Inspection Procedure 1 P.54A-216.

ON-VEHICLE SERVICE

PROCEDURE FOR INPUT OF SECURITY CODE FOR ANTI-THEFT SYSTEM <VEHICLES FOR AUSTRALIA AND NEW ZEALAND>

M1544004400285

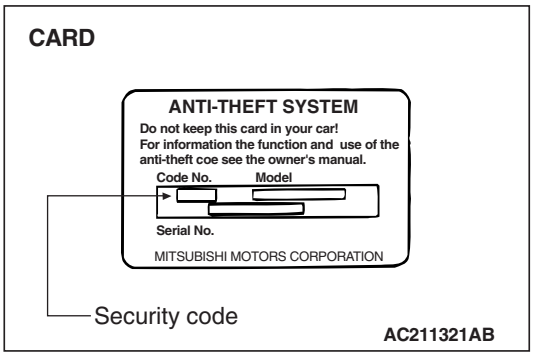
The radio and CD player do not work under the following conditions:



AC211319AB

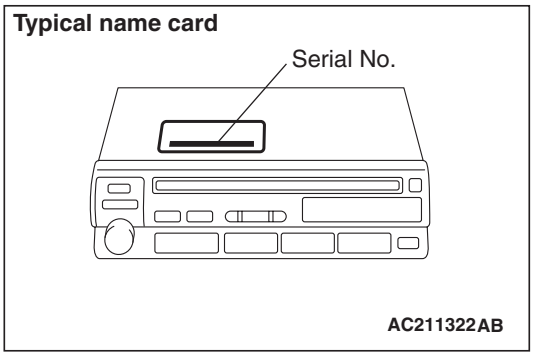
If the ignition key is removed, the security indicator of this radio and CD player flickers to prevent theft from happening.

2. Power supply to the radio and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
3. The power supply to the radio and CD player has been suspended for more than an hour due to a blown fuse or discharged battery.
4. If the radio and CD player do not work for these conditions, enter the security code as follows:
5. The radio and CD player has been replaced.



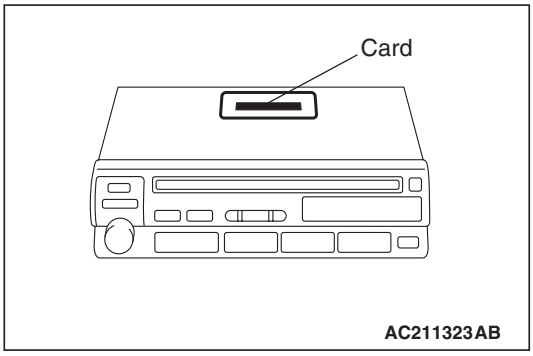
AC211321AB

1. Confirm the security code using any of the following methods.
   (1) Use the security code indicated on the cards retained in the vehicle.



AC211322AB

   (2) If the security code is unknown owing to the owner's loss of the card:
      a. Remove the radio and CD player referring to P.54A-252.
      b. Read the serial number stamped on the radio and CD player.
      c. Look up the security code (anti-theft code table) corresponding to the serial number.



AC211323AB

   (3) When the radio and CD player is replaced: Use the security code on the cards attached to the upper surface of the replacement radio and CD player.

NOTE: Deliver the two cards to the owner.

2. Connect the radio to the vehicle harness.

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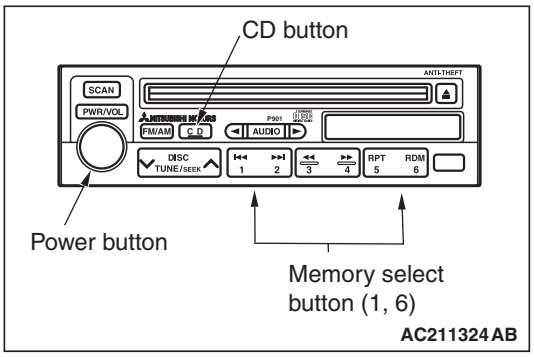
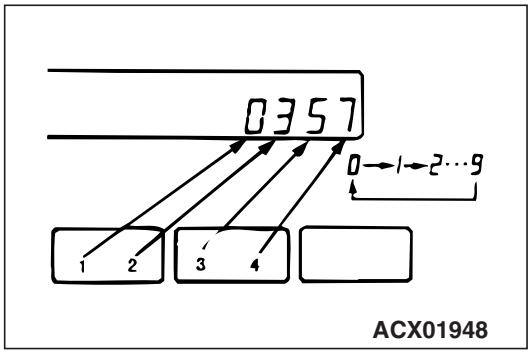
Group TOC

3. Turn the ignition key to the "ACC" or "ON" position.



4. Press the "PWR" button, and "CODE" will be displayed.

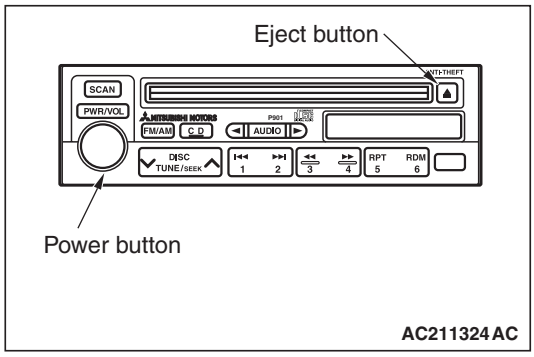


5. Press number 1 through number 4 memory select button to set the four-digit security code shown on the card. Every time each digit key is pressed, the figure changes as follows: 0 to 1 to 2 to 3 to 4 to 5 to 6 to 7 to 8 to 9 to 0
6. Press the "CD" button, and a beep will be heard. If entered correctly, the radio and tape player will work.
7. If the security code is not accepted, "1Err" is displayed. In a few seconds, it will change to "CODE." Then repeat steps 5 and 6.

NOTE:

- *The anti-theft system will allow three attempts maximum to input the correct code.*
- *The second error is displayed as "2 Err." When the third error is made, "3 Err" is displayed and then the display changes to "OFF." If this should occur, the unit will not work any more.*
- *To input the security code again, turn the ignition switch to the "ACC" or "ON" position and wait for one hour when "OFF" is displayed. After "OFF" disappears on the display and changes into "CODE" the security code can be input again.*

THREE-MINUTE OPERATION MODE



To facilitate replacement or check, the radio with tape and CD player can be operated for three minutes without inputting the security code.

1. Press the "PWR" button and "EJECT" button together to operate the radio with tape and CD player.
2. In three minutes the unit will not be able to work. Then the radio with tape and CD player will be switched off.

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Group TOC

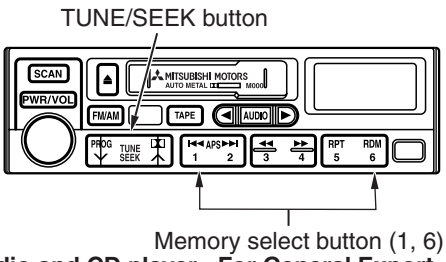
SPEAKER TEST

M1544005400471

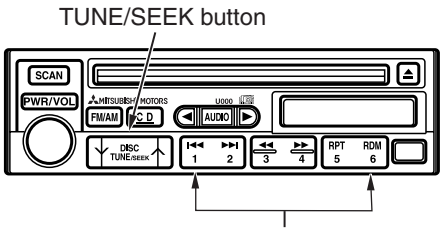
Enter the speaker test mode according to the following steps:

1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the radio and CD player.

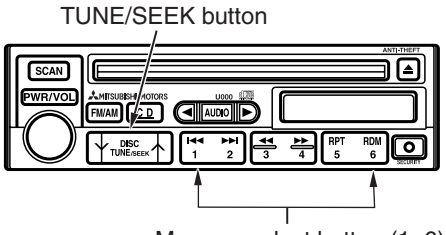
Radio and tape player <For General Export (except for Hong Kong and Singapore) and GCC>



Radio and CD player <For General Export (except for Hong Kong and Singapore), Australia and New Zealand>

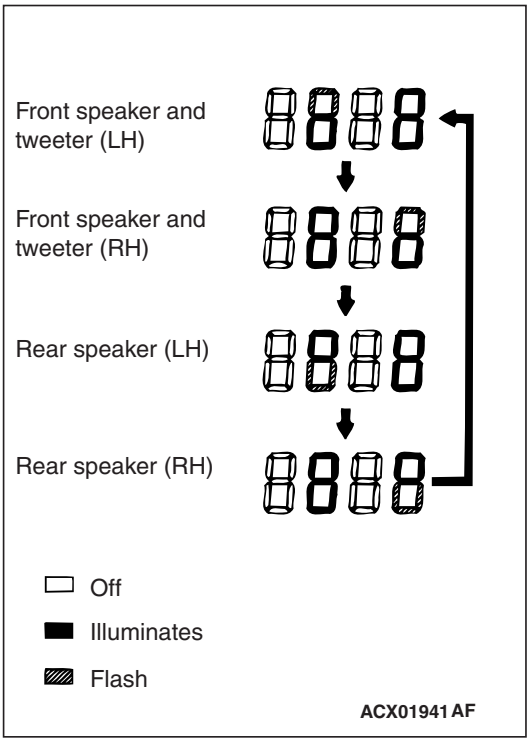


Radio and CD player <For Australia and New Zealand>



AC313620 AC

2. Press the following buttons in that order within sixty seconds from step (1).
   (1) Memory select "1" button
   (2) "TUNE/SEEK (DOWN)" button
   (3) "TUNE/SEEK (UP)" button
   (4) Memory select "6" button



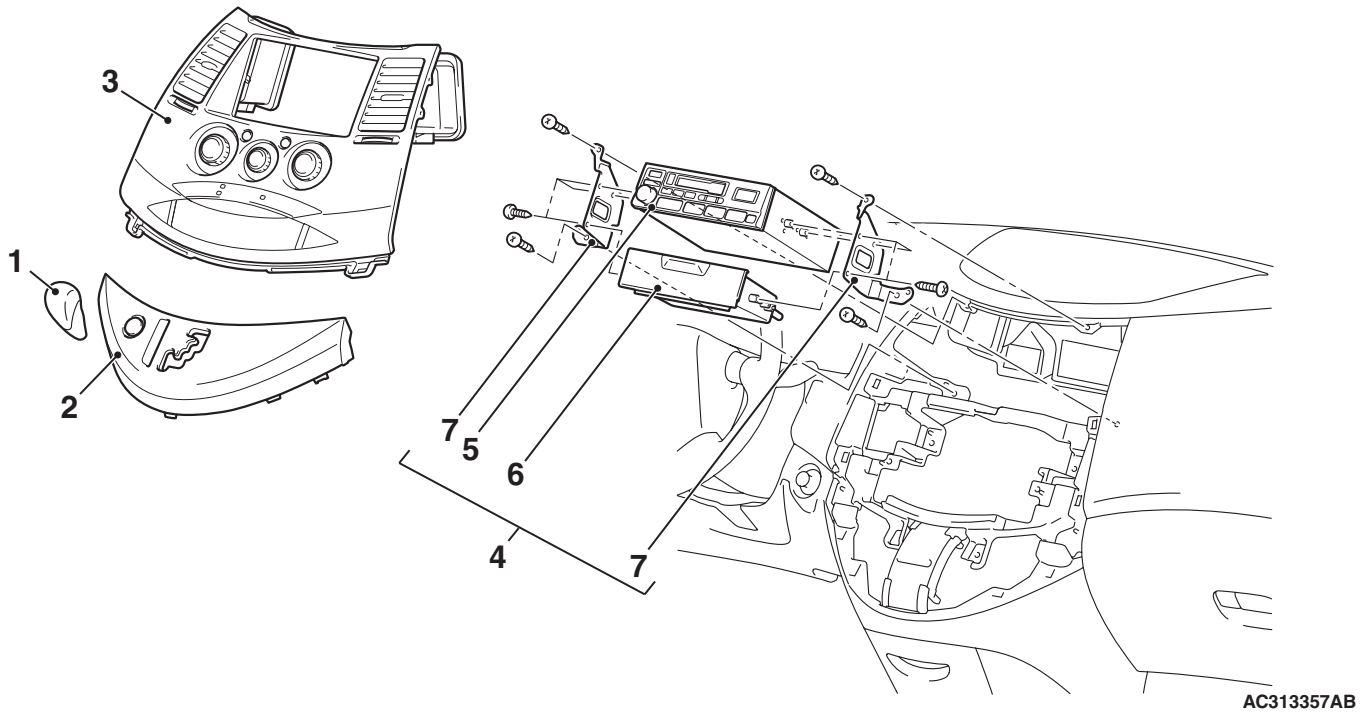
ACX01941 AF

3. Check that the speaker, which is displayed on the radio panel display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button (tape or CD) is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

RADIO AND TAPE PLAYER OR CD PLAYER

REMOVAL AND INSTALLATION

M1544011500046



Removal steps

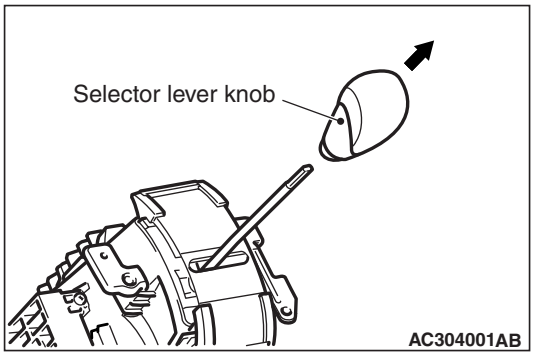
<<A>>
1. Gear shift lever knob <M/T>
1. Selector lever knob <A/T>
2. Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
3. Instrument centre panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

Removal steps (Continued)

4. Radio and tape player or CD player and bracket assembly
5. Radio and tape player or CD player
6. Box
7. Bracket

REMOVAL SERVICE POINTS

<<A>> SELECTOR LEVER KNOB REMOVAL



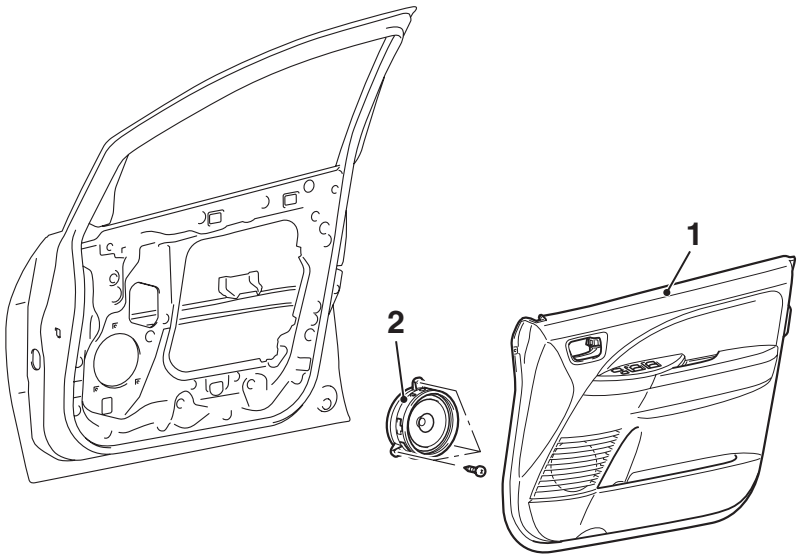
Pull out the selector lever knob to the direction shown.

SPEAKER

REMOVAL AND INSTALLATION

M1544002600625

<SPEAKER>

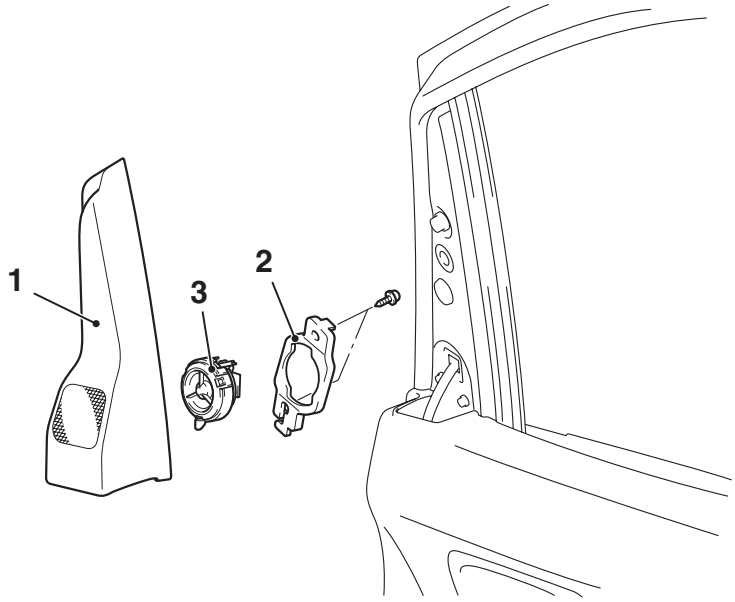


AC303651AB

Removal steps

1. Door trim (Refer to GROUP 52A, Door Trim P.52A-12).
2. Speaker

<TWEETER> <VEHICLES FOR GENERAL EXPORT (OPTION), AUSTRALIA AND NEW ZEALAND>



AC302772AB

Removal steps

1. Front door sash trim (Refer to GROUP 52A, Door Trim P.52A-12).

Removal steps (Continued)

2. Bracket
3. Tweeter

ANTENNA

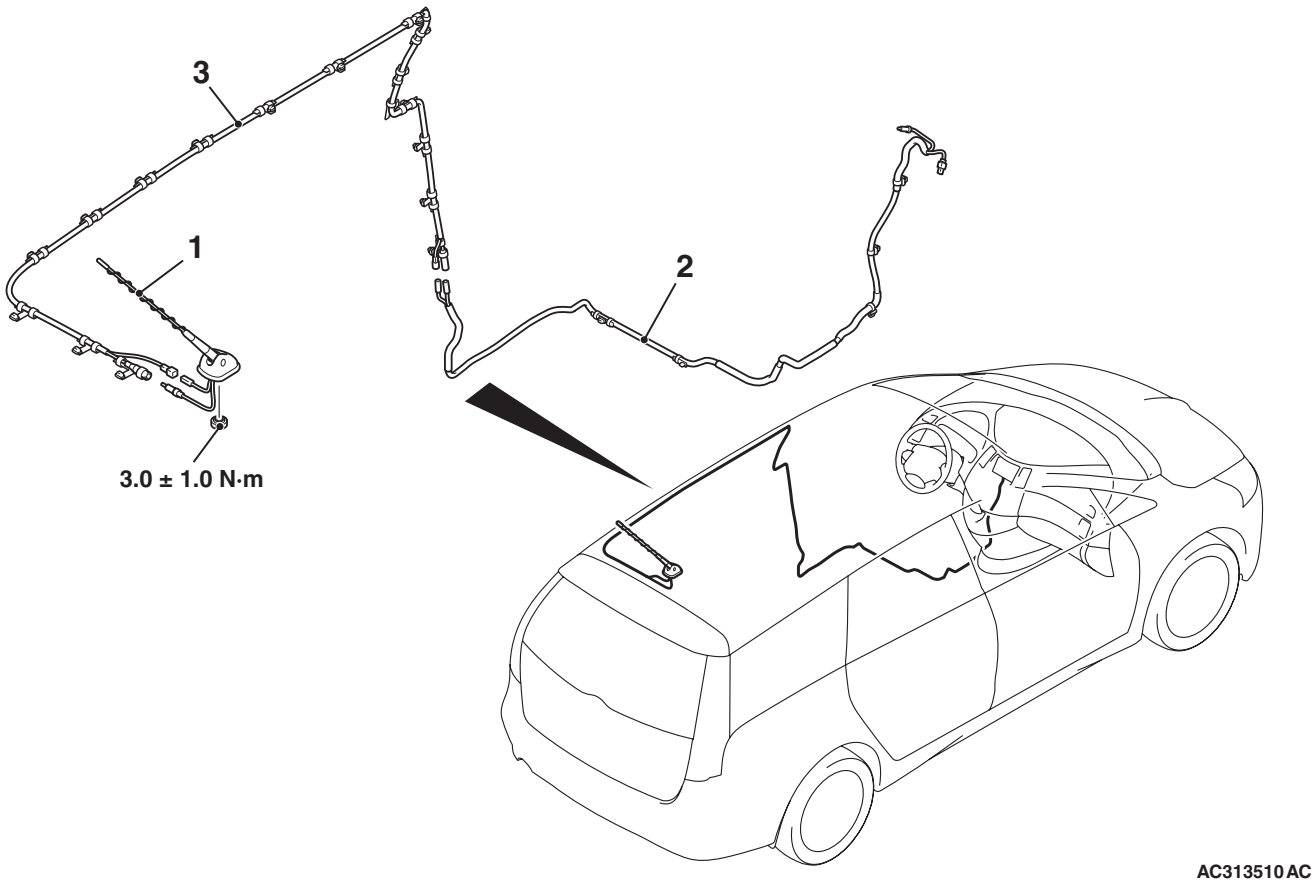
ROOF ANTENNA <EXCEPT VEHICLES FOR HONG KONG AND SINGAPORE>

REMOVAL AND INSTALLATION

M1544006400065

⚠ CAUTION

For the removal of the headlining, refer to GROUP 52B, Service Precautions P.52B-5 and Side and Curtain Air Bag Module P.52B-342.



AC313510 AC

Removal steps

- Headlining assembly (Refer to GROUP 52A, Headlining P.52A-17).

1. Antenna rod

- Front seat assembly (Refer to GROUP 52A, Front Seat Assembly P.52A-21).
- Front scuff plate inner, Scuff plate rear (Refer to GROUP 52A, Interior Trim P.52A-10).
- Outer seat belt lower anchor bolt (Refer to GROUP 52A, Front Seat Belt P.52A-37).
- Centre pillar trim lower (Refer to GROUP 52A, Interior Trim P.52A-10).

Removal steps (Continued)

- Second seat assembly, Seat anchor cover outer/inner, Slide adjuster end cover outer/inner, Rail cover outer/inner (Refer to GROUP 52A, Second Seat Assembly P.52A-27).
- Gear shift lever knob <M/T> (Refer to GROUP 22A, Transmission Control P.22A-8).
- Selector lever knob <A/T> (Refer to GROUP 23A, Transmission Control P.23A-160).
- Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).

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Removal steps (Continued)

- Cowl side trim <LH> (Refer to GROUP 52A, Interior Trim P.52A-10).
- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Cowl side trim <RH> (Refer to GROUP 52A, Interior Trim P.52A-10).
- Lower panel, Console side cover, Centre console (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Foot rest

Removal steps (Continued)

- Accelerator pedal arm stopper (Refer to GROUP 17, Accelerator pedal P.17-3).
- Floor carpet
- Side roof duct, Centre roof duct (Refer to GROUP 55, Duct P.55-249).
- Curtain air bag module (Refer to GROUP 52B, Side and Curtain Air Bag Module(s) P.52B-342).
- Instrument centre panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Radio and tape player or radio and CD player (Refer to P.54A-252).

2. Antenna feeder cable
3. Antenna amplifier

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Group TOC

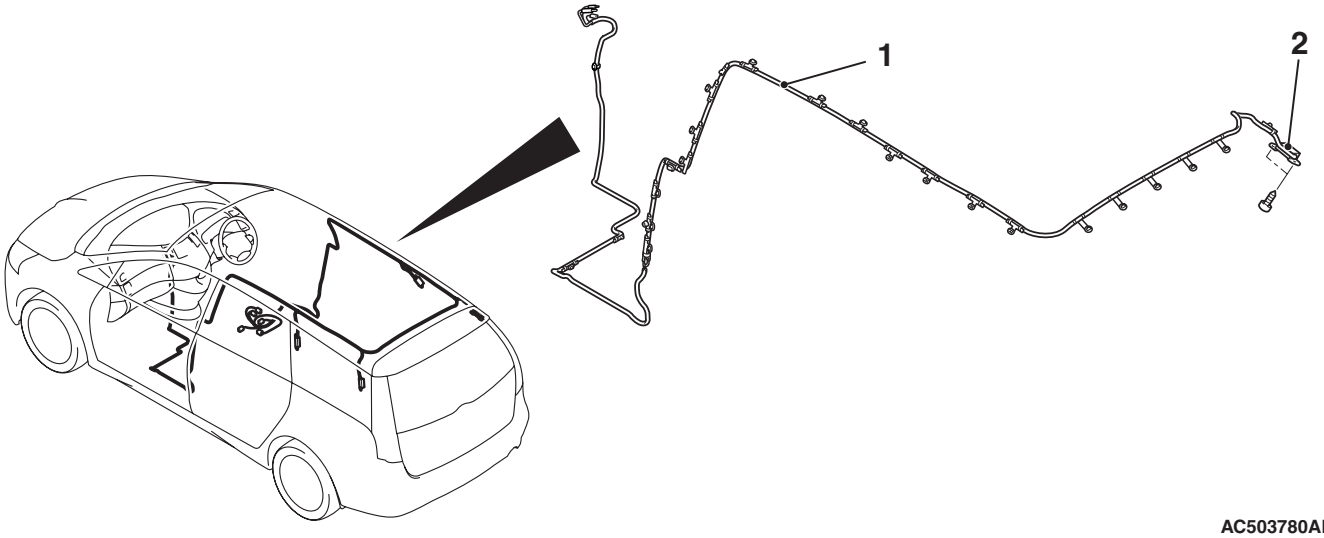
GLASS ANTENNA <VEHICLES FOR HONG KONG AND SINGAPORE>

REMOVAL AND INSTALLATION

M1544005100102

⚠ CAUTION

For the removal of the headlining, refer to GROUP 52B, Service Precautions P.52B-5 and Side and Curtain Air Bag Module P.52B-342.



AC503780AB

Removal steps

- Headlining assembly (Refer to GROUP 52A, Headlining P.52A-17).
- Front seat assembly (Refer to GROUP 52A, Front Seat Assembly P.52A-21).
- Front scuff plate inner, Scuff plate rear (Refer to GROUP 52A, Interior Trim P.52A-10).
- Outer seat belt lower anchor bolt (Refer to GROUP 52A, Front Seat Belt P.52A-37).
- Centre pillar trim lower (Refer to GROUP 52A, Interior Trim P.52A-10).
- Second seat assembly, Seat anchor cover outer/inner, Slide adjuster end cover outer/inner, Rail cover outer/inner (Refer to GROUP 52A, Second Seat Assembly P.52A-27).
- Selector lever knob <A/T> (Refer to GROUP 23A, Transmission Control P.23A-160).
- Selector lever panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Cowl side trim <LH> (Refer to GROUP 52A, Interior Trim P.52A-10).

Removal steps (Continued)

- Glove box assembly (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Fuel filler lid lock release handle (Refer to GROUP 42, Fuel Filler Lid P.42-10).
- Cowl side trim <RH> (Refer to GROUP 52A, Interior Trim P.52A-10).
- Lower panel, Console side cover, Centre console (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Foot rest
- Accelerator pedal arm stopper (Refer to GROUP 17, Accelerator pedal P.17-3).
- Floor carpet
- Side roof duct, Centre roof duct (Refer to GROUP 55, Duct P.55-249).
- Curtain air bag module (Refer to GROUP 52B, Side and Curtain Air Bag Module(s) P.52B-342).
- Instrument centre panel (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Radio and tape player or radio and CD player (Refer to P.54A-252).

1. Antenna feeder cable
2. Glass antenna amplifier

DEFOGGER

TROUBLESHOOTING

M1543019600237

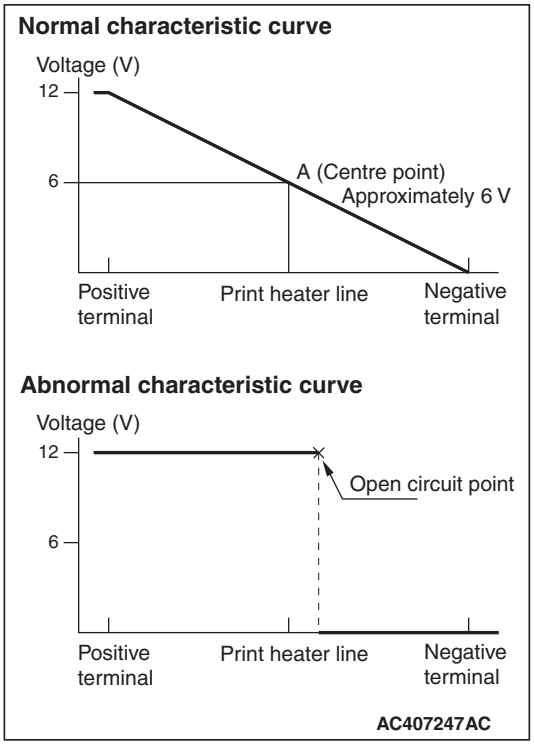
Refer to GROUP 55, Troubleshooting P.55-47.

ON-VEHICLE SERVICE

INSPECTION

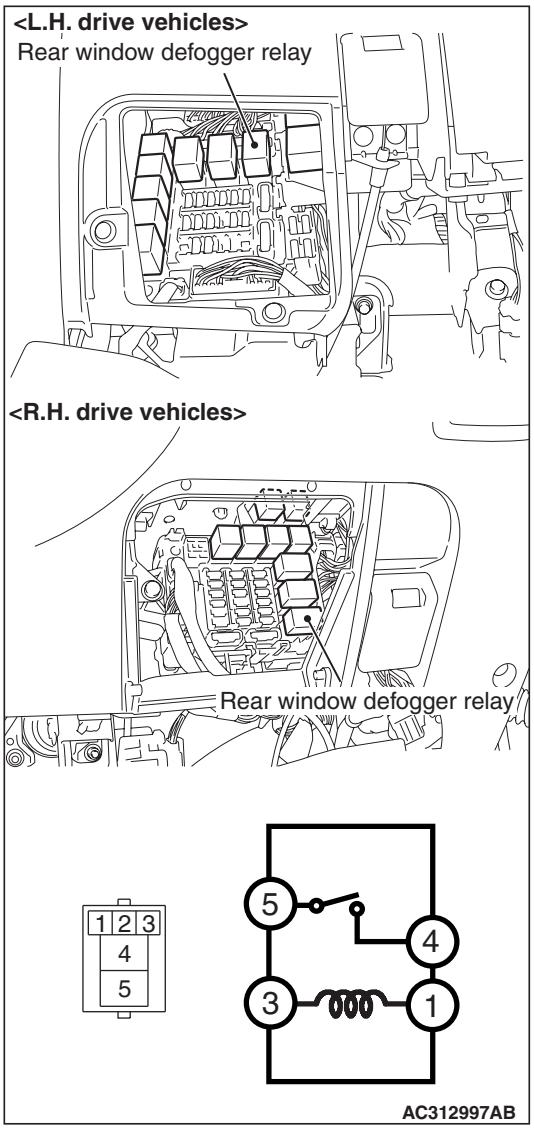
M1543019502946

PRINTED HEATER CHECK



1. Run the engine at a speed of 2,000 r/min to fully charge the battery, and then check the printed heater.
2. With the defogger switch turned on, use a multimeter to measure the voltages of each printed heater at centre point A on the window glass. The printed heater is okay if 6 V is displayed.
3. If a voltage of 12 V is indicated at point A, the open circuit location is between point A and the (-) terminal to find the point where the voltage changes is the location of the open circuit.
4. In addition, if a voltage of 0 V is indicated at point A, the open circuit location is between point A and the (+) terminal. Use the same procedure as described above to find the point where the voltage changed to 12 V.

REAR WINDOW DEFOGGER RELAY CONTINUITY CHECK



Battery voltage	Tester connection	Specified condition
Not applied	4 – 5	Open circuit
• Connect terminal 3 to the positive battery terminal • Connect terminal 1 to the negative battery terminal		Less than 2 ohms

DEFOGGER SWITCH

REMOVAL AND INSTALLATION

M1543006200392

Refer to GROUP 55, Heater control unit P.55-212.