

# GROUP 54A

# CHASSIS

# ELECTRICAL

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

#### **WARNING**

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

#### NOTE

The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (\*).

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## BATTERY

## SERVICE SPECIFICATIONS

M1541000300243

Item	Specification
Specific gravity of the battery fluid	1.220 – 1.290 (20°C)

## ON-VEHICLE SERVICE

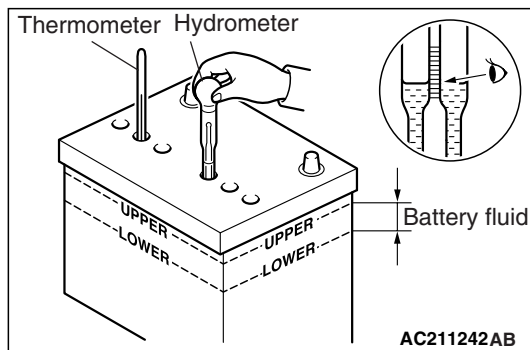
## FLUID LEVEL AND SPECIFIC GRAVITY CHECK

M1541001000405

Inspect whether or not the battery fluid is between the UPPER LEVEL and LOWER LEVEL marks.

**CAUTION**

- If the battery fluid is below the LOWER LEVEL, the battery could explode in using.
- If the battery fluid is over the UPPER LEVEL, leakage could result.



1. Use a hydrometer and thermometer to check the specific gravity of the battery fluid.

**Standard value: 1.220 – 1.290 (20°C)**

2. The specific gravity of the battery fluid varies with the temperature, so use the following formula to calculate the specific gravity for 20°C. Use the calculated value to determine whether or not the specific gravity is satisfactory.

$$D20 = (t-20) \times 0.0007 + Dt$$

**D20: Specific gravity of the battery fluid calculated for 20°C**

**Dt: Actually measured specific gravity**

**t: Actually measured temperature**

## CHARGING

M1541001100877

**CAUTION**

- The battery plus 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.
- After charging is complete, replace the battery plus, pour water over the battery to rinse away any sulphuric acid, and let the battery stand to dry.
- Do not let the battery electrolyte temperature rise above approximately 45°C (approximately 55°C during rapid charging).

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.

1. Remove the battery from the vehicle.

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

**The judgment method of a charge end**

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**

M1541001200959

**BATTERY TESTING PROCEDURE****STEP 1. Check the battery cables.**

Remove the negative cable, then the positive cable. Check for dirty or corroded connections.

**Q: Are the battery cables dirty or have corroded connections?**

**YES :** Clean the battery cables. Then go to Step 2.

**NO :** Go to Step 2.

**STEP 2. Check the battery post.**

Check for loose battery post.

**Q: Are the battery post faulty?**

**YES :** Replace the battery. Then go to Step 4.

**NO :** Go to Step 3.

**STEP 3. Check the battery case and cover.**

(1) Remove the hold-downs and shields.

(2) Check for broken/cracked case or cover.

**Q: Is the battery case or cover faulty?**

**YES :** . Replace the battery. Then go to Step 4.

**NO :** . Go to Step 4.

**LOAD TEST CHART**

Temperature °C	21 and above	16	10	4	- 1	- 7	- 12	- 18
Minimum voltage (V)	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

**STEP 4. Check the open circuit voltage.**

(1) Turn headlamps on for 15 seconds.

(2) Turn headlamps off for two minutes to allow battery positive voltage to stabilize.

(3) Disconnect the battery cables.

(4) Read open circuit voltage.

**Q: Is open circuit voltage 12.4 volts or more?**

**YES :** Go to Step 5.

**NO :** Charge the battery at 5 amps for 15 hours. Then re-test.

**STEP 5. Check the load test.**

(1) Connect a load tester to the battery.

(2) Load the battery at the recommended discharge rate (See LOAD TEST RATE CHART) for 15 seconds.

(3) Read voltage after 15 seconds, then remove load.

(4) Compare the measured value with the minimum voltage (See LOAD TEST CHART).

**Q: Is the voltage higher than minimum voltage?**

**YES :** The battery is normal.

**NO :** Replace the battery. Then go to Step 4.

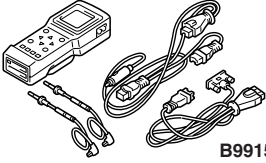
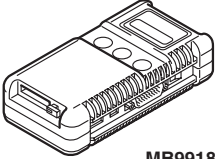
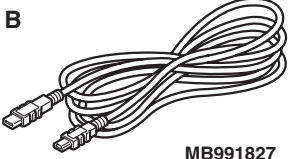

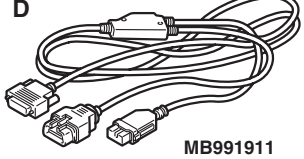
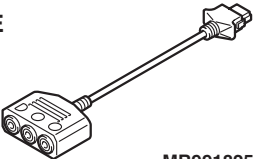
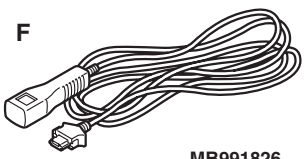
**LOAD TEST RATE CHART**


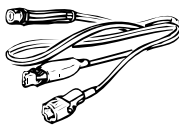
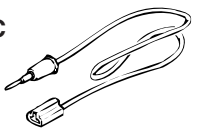

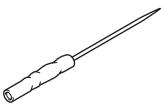
<b>Battery type</b>	<b>75D23L</b>
Charging time when fully discharged [5 A constant current charging] (H)	11
Load current (A)	260

# IGNITION SWITCH

## SPECIAL TOOLS

M1543000602376

Tool	Number	Name	Use
 <p>B991502</p>	MB991502	M.U.T.-II sub assembly	<ul style="list-style-type: none"> <li>Immobilizer system check</li> <li>Encrypted code registration</li> </ul>
<p><b>A</b></p>  <p>MB991824</p> <p><b>B</b></p>  <p>MB991827</p> <p><b>C</b></p>  <p>MB991910</p> <p><b>D</b></p>  <p>MB991911</p> <p><b>E</b></p>  <p>MB991825</p> <p><b>F</b></p>  <p>MB991826</p> <p>MB991955</p>	<p>MB991955</p> <p>A: MB991824</p> <p>B: MB991827</p> <p>C: MB991910</p> <p>D: MB991911</p> <p>E: MB991825</p> <p>F: MB991826</p>	<p>M.U.T.-III sub-assembly</p> <p>A: Vehicle Communication Interface (V. C. I.)</p> <p>B: M.U.T.-III USB cable</p> <p>C: M.U.T.-III main harness A (Vehicles with CAN communication system)</p> <p>D: M.U.T.-III main harness B (Vehicles without CAN communication system)</p> <p>E: M.U.T.-III measurement adapter</p> <p>F: M.U.T.-III trigger harness</p>	<ul style="list-style-type: none"> <li>Immobilizer system check</li> <li>Encrypted code registration</li> </ul> <p><b>CAUTION</b></p> <p><b>M.U.T.-III main harness B (MB991911) should be used. M.U.T.-III main harness A should not be used for this vehicle.</b></p>

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

## INTRODUCTION

M1543009901650

### IGNITION KEY REMINDER BUZZER

#### <VEHICLES FOR GCC>

The ignition key reminder buzzer will sound under the following condition, and warn the driver to remove the ignition key.

- The driver's door is opened when the ignition switch is at "LOCK" (OFF) or "ACC" position without removing the ignition key.

However, the lamp reminder buzzer will take precedence over this function.

### DOOR LOCK PREVENTION FUNCTION

If the key is left in the ignition switch while the driver's door opened or the assistant door opened, all door are automatically unlock to prevent locking the ignition key in the vehicle after door is locked.

### IMMOBILIZER SYSTEM <VEHICLES FOR SOUTH AFRICA, ARGENTINA, GCC, AUSTRALIA AND NEW ZEALAND>

The immobilizer system consists of the ignition key, the immobilizer-ECU with key ring antenna, and the engine-A/T-ECU. The ignition key has a built-in transponder. Only the registered ignition key permits the engine to start, therefore, the engine can never

be started by means of a forged key or by connecting the ignition wiring directly. The system is significantly safe and reliable against theft. In addition, the driver has only to turn the ignition switch to the "ON" position to activate the immobilizer system. If the requirements for starting the engine are not satisfied, the engine will be immobilized. If a registered ignition key is lost, all your ignition keys need to be registered again using M.U.T.-II/III to ensure security (Refer to [P.54A-14](#)). An additional ignition key can be registered as follows (only if no ignition keys are lost):

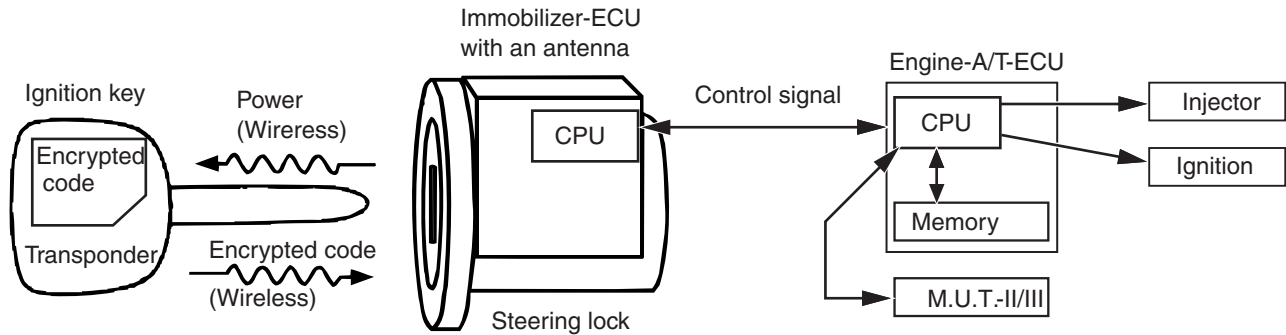
- Using M.U.T.-II/III (Refer to [P.54A-14](#)).

## OPERATION

- When the ignition switch is turned to "ON" position, the engine-A/T-ECU sends a requirement for the encrypted code to the immobilizer-ECU (at this time, the engine is remobilized).
- When the immobilizer-ECU receives the requirement from the engine-A/T-ECU, the immobilizer-ECU supplies power to the transponder inside the ignition key via the antenna. The energized transponder sends the encrypted code back to the immobilizer-ECU via the antenna.



3. The immobilizer-ECU judges the encrypted code with its code logic in itself. If they are identical, the immobilizer-ECU sends the encrypted code to the engine-A/T-ECU.
4. If the engine-A/T-ECU can not receive the encrypted code, the engine will be immobilized.



AC206892AG

## TROUBLESHOOTING

### IGNITION KEY REMINDER BUZZER AND DOOR LOCK PREVENTION FUNCTION DIAGNOSIS

M1543000701507

The ignition key reminder tone alarms are controlled by the Smart Wiring System (SWS). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

## IMMOBILIZER SYSTEM DIAGNOSIS

### DIAGNOSIS CODE CHART

M1543007100484

#### **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.

Use the following chart to develop proper diagnostic strategy.

Diagnosis code No.	Diagnosis item	Reference page
11	Transponder communication system or radio interference of encrypted code	<a href="#">P.54A-10.</a>
12	Encrypted codes are not the same or are not registered	<a href="#">P.54A-10.</a>

## DIAGNOSTIC TROUBLE CODE PROCEDURES

---

### Diagnosis code 11: Transponder Communication System or Radio Interference of Encrypted Code

---

#### DIAGNOSIS CODE SET CONDITION

- Diagnosis code 11 may be output if other ignition keys are in the vicinity of the vehicle as it is being started.
- The transponder's encrypted code is not sent to the immobilizer-ECU immediately after the ignition switch is turned to "ON" position.

*NOTE: Diagnosis code 11 is always output together with MPI system diagnosis code 54.*

#### TROUBLESHOOTING HINTS

- Radio interference of the encrypted code
- Malfunction of the transponder
- Malfunction of the immobilizer-ECU.

#### DIAGNOSIS PROCEDURE

---

**STEP 1. Check for presence of other key near the key in the ignition.**

**Q: Is there any other key near the key in the ignition?**

**YES :** Move the other key well away from key being used. Retest the system.

**NO :** Go to Step 2.

---

**STEP 2. Check that the engine start using the spare ignition key which encrypted code has been registered.**

**Q: Does the engine start using the spare ignition key for which the encrypted code has been registered?**

**YES :** Replace the ignition key that does not work. Then register the password (secret code) and encrypted code [P.54A-14](#). Retest the system.

**NO :** Go to Step 3.

---

#### STEP 3. M.U.T.-II/III diagnosis code

**Q: Which diagnosis code is set, diagnosis code 11 or 12 the encrypted code has been registered?**

**Diagnosis code 12 is set :** Refer to [P.54A-10](#).

**Diagnosis code 11 is set :** Go to Step 4.

---

**STEP 4. Connector check: Immobilizer-ECU connector C-304-1.**

**Q: Are immobilizer-ECU connector C-304-1 in good condition?**

**YES :** Replace immobilizer-ECU and Then register the password (secret cod) and encrypted code. Retest the system.

**NO :** Repair or replace the damage component(s).

---

### Diagnosis code 12: Encrypted Codes are not the same or are not Registered

---

#### DIAGNOSIS CODE SET CONDITION

The encrypted code sent by the transponder is not the same encrypted code which is registered in the immobilizer-ECU.

*NOTE: Diagnosis code 12 is always output together with MPI system diagnosis code 54.*

#### TROUBLESHOOTING HINTS

- The encrypted code in the ignition key has not been properly registered

- Malfunction of immobilizer-ECU.

#### DIAGNOSIS PROCEDURE

**Was the encrypted code registered?**

**YES :** Replace the immobilizer-ECU. and then re-register the encrypted code (Refer to [P.54A-14](#)).

**NO :** Register the encrypted code (Refer to [P.54A-14](#)).

## SYMPTOM CHART

M1543007201570

Symptom	Inspection procedure No.	Reference page
Communication with M.U.T.-II/III is impossible.	1	P.54A-11
The ignition key cannot be registered.	2	P.54A-13
Engine does not start (Cranking but no initial combustion).	3	P.54A-13

## SYMPTOM PROCEDURES

## INSPECTION PROCEDURE 1: Communication with M.U.T.-II/III is Impossible.

## TECHNICAL DESCRIPTION (COMMENT)

- This malfunction may be caused by a defective immobilizer-ECU, engine-A/T-ECU, or a defect in the communication line between the immobilizer-ECU and engine-A/T-ECU. If this malfunction appears when the MPI system and M.U.T.-II/III can communicate each other, MPI system diagnosis code 54 will reset.
- If the MPI system is normal, the engine control relay can be determined as normal. In addition, if the MPI system and M.U.T.-II/III can communicate each other, the circuits between the diagnosis connector and the engine-A/T-ECU can be determined as normal.

*NOTE: If this malfunction appears, MPI system diagnosis code 54 will be output.*

## TROUBLESHOOTING HINTS

- Malfunction of the immobilizer-ECU
- Malfunction of the engine-A/T-ECU
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

## DIAGNOSIS PROCEDURE

**STEP 1. Check if M.U.T.-II/III can communicate with the MPI system and if an MPI system diagnosis code other than P0513 is set.**

**Q: Can M.U.T.-II/III communicate with the MPI system? Is an MPI system diagnosis code other than P0513 set?**

**YES :** Go to Step 2.

**NO :** Refer to GROUP 13B, MPI Diagnosis  
[P.13B-24.](#)

**STEP 2. Measure the voltage at immobilizer-ECU connector C-304-1.**

- (1) Disconnect immobilizer-ECU connector C-304-1.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 1 and earth.

**OK: System voltage**

**Q: Is the check result normal?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.

**STEP 3. Connector check: Immobilizer-ECU connector C-304-1 and engine control relay connector B-17X.**

**Q: Are immobilizer-ECU connector C-304-1 and engine control relay connector B-17X in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

**STEP 4. Check the harness wires between immobilizer-ECU connector C-304-1 (terminal 1) and engine control relay connector B-17X (terminal 1).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-106, joint connector C-17 and key reminder switch connector C-304, and repair if necessary.*

**Q: Are the harness wires between immobilizer-ECU connector C-304-1 (terminal 1) and engine control relay connector B-17X (terminal 1) in good condition?**

**YES :** There is no action to be taken.

**NO :** Replace damaged component(s). Confirm that M.U.T.-II/III communicates normally.

**STEP 5. Measure the resistance at immobilizer-ECU connector C-304-1.**

- (1) Disconnect immobilizer-ECU connector C-304-1.  
(2) Measure the resistance between terminal 4 and earth.

**OK: 2 ohms or less**

**Q: Is the check result normal?**

**YES :** Go to Step 8.

**NO :** Go to Step 6.

---

**STEP 6. Connector check: Immobilizer-ECU connector C-304-1.**

**Q: Is immobilizer-ECU connector C-304-1 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

---

**STEP 7. Check the harness wire between immobilizer-ECU connector C-304-1 (terminal 4) and earth.**

*NOTE: Prior to the wiring harness inspection, check key reminder switch connector C-304, and repair if necessary.*

**Q: Is the harness wire between immobilizer-ECU connector C-304-1 (terminal 4) and earth in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

---

**STEP 8. Connector check: Immobilizer-ECU connector C-304-1 and engine-A/T-ECU connector C-136.**

**Q: Are immobilizer-ECU connector C-304-1 and engine-A/T-ECU connector C-136 in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

---

**STEP 9. Check the harness wires between immobilizer-ECU connector C-304-1 (terminal 3) and engine-A/T-ECU connector C-136 (terminal 65).**

*NOTE: Prior to the wiring harness inspection, check key reminder switch connector C-304, intermediate connector C-104, and repair if necessary.*

**Q: Are the harness wires between immobilizer-ECU connector C-304-1 (terminal 3) and engine-A/T-ECU connector C-136 (terminal 65) in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

---

**STEP 10. Replace the immobilizer-ECU or engine-A/T-ECU.**

Replace the immobilizer-ECU or engine-A/T-ECU.

**Q: Did the communication with the M.U.T.-II/III become possible after replacing the immobilizer-ECU or the engine-A/T-ECU?**

**YES :** Register the password (secret code) and encrypted code [P.54A-14](#). Confirm that M.U.T.-II/III communicates normally

**NO :** Go to Step 11.

---

**STEP 11. Recheck for malfunction.**

**Q: Is a malfunction eliminated?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace the immobilizer-ECU or engine-A/T-ECU.

---

**INSPECTION PROCEDURE 2: The Ignition Key cannot be Registered.**

---

**TECHNICAL DESCRIPTION (COMMENT)**

The ignition key transponder or the immobilizer-ECU is suspected to be defective.

**TROUBLESHOOTING HINTS**

- Malfunction of the ignition key
- Malfunction of immobilizer-ECU

**DIAGNOSIS PROCEDURE**

---

**STEP 1. M.U.T.-II/III diagnosis code**

**Q: Does diagnosis code 11 reset?**

**YES :** Refer to [P.54A-9](#).

**NO :** Replace the ignition key that cannot be registered. Then re-register the encrypted code. (Refer to [P.54A-14](#)). Verify that the ignition key can be registered, then Go to Step 2.

---

**STEP 2. Retest the system.**

**Q: Does registered ignition key function properly?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace the immobilizer-ECU.

---

**INSPECTION PROCEDURE 3: Engine does not Start (Cranking but no Initial Combustion).**

---

**TECHNICAL DESCRIPTION (COMMENT)**

If the fuel injectors are not operating, there might be a problem with the MPI system in addition to a malfunction of the immobilizer system. It is normal for this to occur if an attempt is made to start the engine using a key that has not been properly registered.

**TROUBLESHOOTING HINTS**

- Malfunction of MPI system
- Malfunction of immobilizer-ECU

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Check the battery positive voltage.**

Measure the battery positive voltage during cranking.

**Q: Is the voltage 8 volts or more?**

**YES :** Go to Step 2.

**NO :** Check the battery. Refer to [P.54A-5](#). The engine should start.

---

**STEP 2. Check the immobilizer system diagnosis code and MPI system diagnosis code.**

**Q: Which diagnosis code resets, the immobilizer system diagnosis code or the MPI system diagnosis code?**

**Immobilizer system diagnosis code :** Refer to [P.54A-9](#).

**MPI system diagnosis code :** Refer to GROUP 13B, Troubleshooting [P.13B-24](#).

**No diagnosis code :** Go to Step 3.

---

**STEP 3. Check the starting system.**

**Q: Does the engine start?**

**YES :** Go to Step 4.

**NO :** Refer to GROUP 13B, Troubleshooting – Symptom Chart [P.13B-245](#). If the malfunction is not resolved, replace the immobilizer-ECU. Then register the password (secret code) and encrypted code. (Refer to [P.54A-14](#)). The engine should start.

**STEP 4. Retest the system****Q: Is the malfunction eliminated?**

**YES :** The procedure is complete. (If no malfunction are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction P.00-5).

**NO :** Replace the immobilizer-ECU.

**DATA LIST REFERENCE TABLE**

M1543007300381

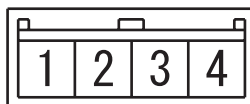
Item No.	Inspection item	Inspection requirement	Normal condition
01	Key has been registered	—	Number of registered ignition keys

**CHECK AT IMMOBILIZER-ECU**

M1543007601103

**TERMINAL VOLTAGE CHECK**

C-304-1 Immobilizer-ECU connector



AC212297AC

Terminal No.	Signal	Inspection condition	Terminal voltage
1	Immobilizer-ECU power supply	Ignition switch: "LOCK" (OFF)	0V
		Ignition switch: "ON"	System voltage
2	-	-	-
3	Engine-A/T-ECU	-	-
4	Immobilizer-ECU earth	Always	0V

**ON-VEHICLE SERVICE****HOW TO REGISTER ENCRYPTED CODE**

M1543008100669

**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-A/T-ECU 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.-II/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-A/T-ECU 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.-II>**

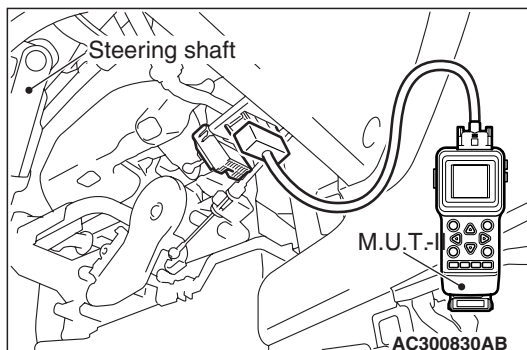
All ignition keys can be registered with M.U.T.-II. Additional ignition keys can be registered with M.U.T.-II.

**Registration with the M.U.T.-II****⚠ CAUTION**

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

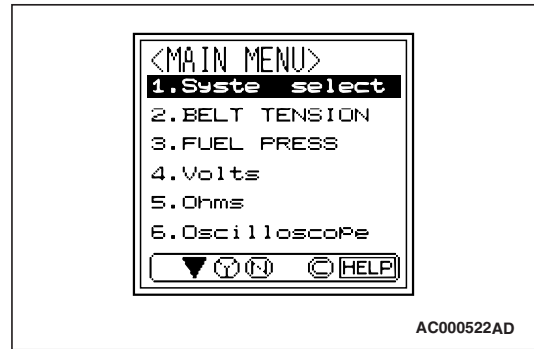
**NOTE:**

- 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.-II 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 Diagnosis [P.54A-8](#).

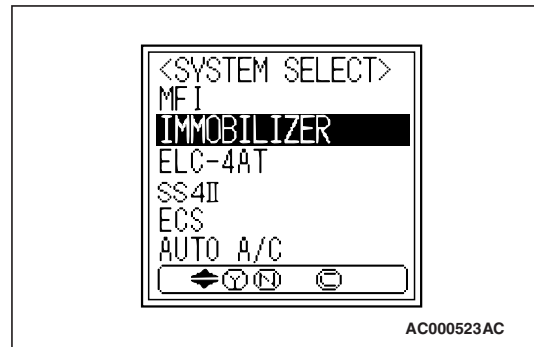


1. Connect M.U.T.-II to diagnosis connector (16-pin).

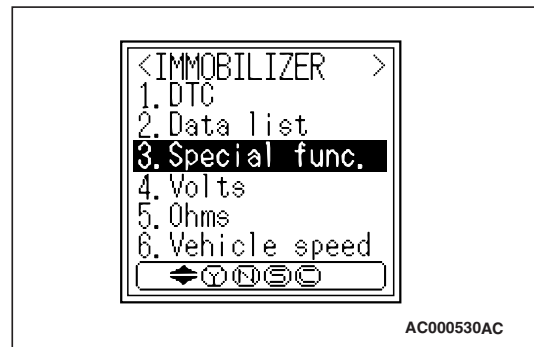
2. Turn the ignition switch to "ON" position.



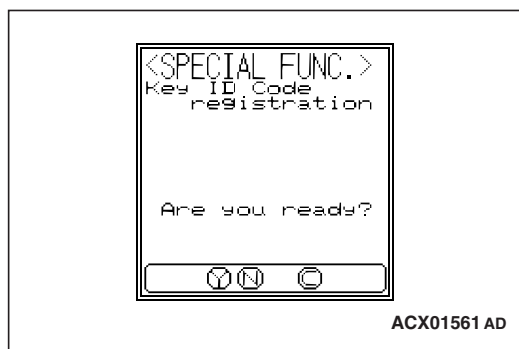
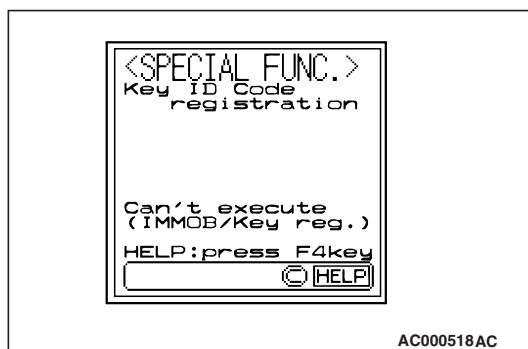
3. At "System Select," press "YES"



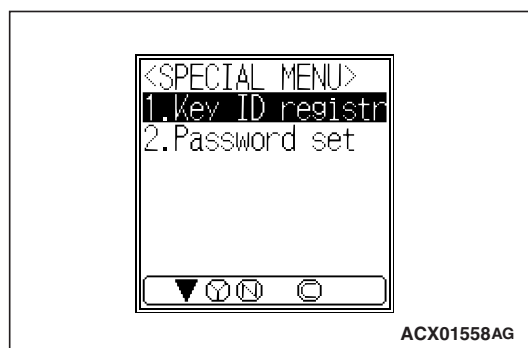
4. Select "Immobilizer," press "YES".



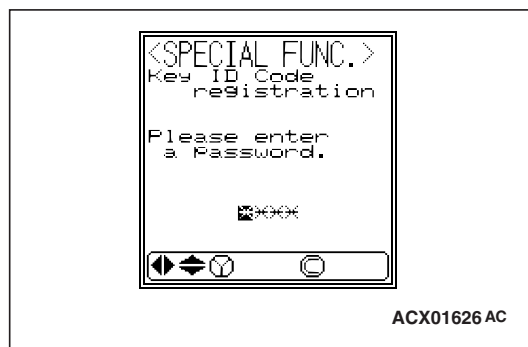
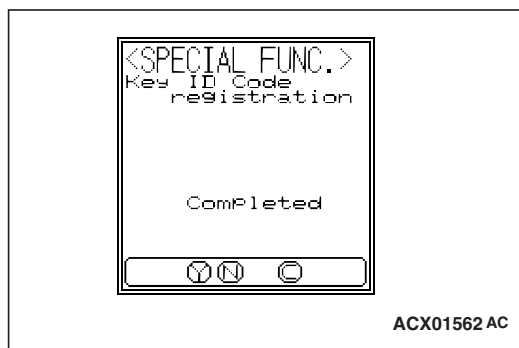
5. Select "Special Func", press "YES". If diagnosis code No.11 exists, "Can't execute" will be displayed. Check for diagnosis code No.11 (Refer to [P.54A-9](#).)



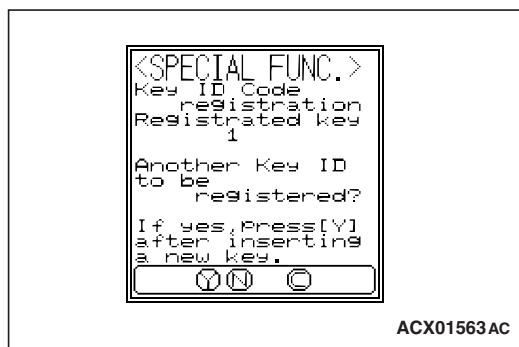
8. Press the "YES" key to start key ID registration.



6. Select "key ID register", press "YES".



9. This will be displayed when the key ID registration is successful. If an error occurs during key ID registration, the message "Can't execute" will be displayed. If the key has already been registered, "Key ID has been registered" will be displayed.



7. Input the password. Use the "UP" and "DOWN" keys to change the current password digit to a value between 0 and 9. Use the "LEFT" and "RIGHT" keys to move to a different password digit. Press the "YES" key to accept the password. If an incorrect password is input five times in a row, this screen is displayed and the immobilizer-ECU switches to unauthorized operation, start-prevention mode.

**NOTE:** Four separate digits must be input to make up the password.

10. 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 and then press the "YES" key. Key ID registration screen will be displayed, then register another key. If key ID registration is complete, press the "NO" key.

**NOTE:** A maximum of eight different keys can be registered.

11. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
12. Check that the engine can be started with each of the ignition keys.



13. Check that the immobilizer system diagnosis code and MPI system diagnosis code did not set.
14. Turn the ignition switch to "LOCK" (OFF) position.
15. Disconnect M.U.T.-II.

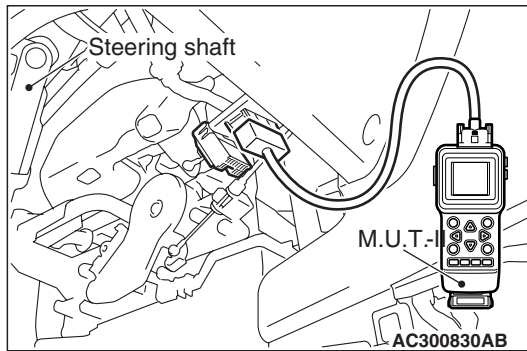
## Registration of additional keys with the M.U.T.-II

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

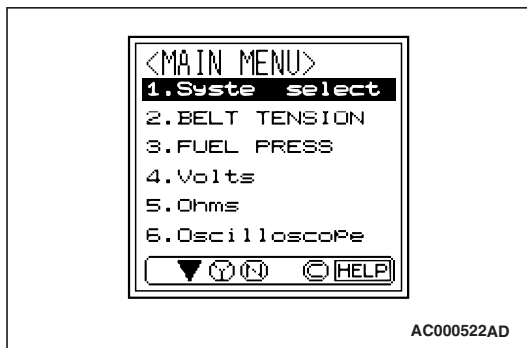
### ⚠ CAUTION

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

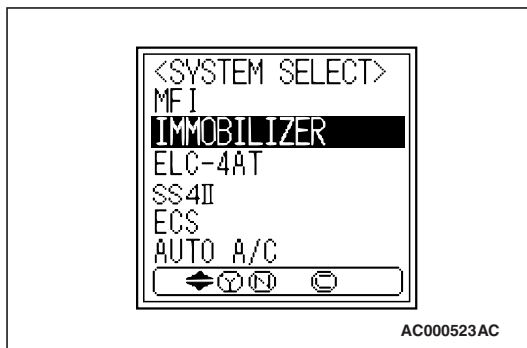
**NOTE:** To register additional keys with the M.U.T.-II, no registered keys must be lost.



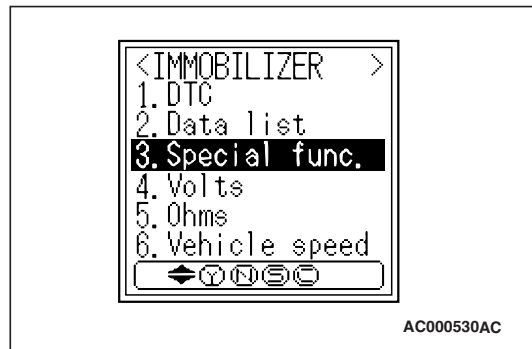
1. Connect M.U.T.-II (MB991502) to the 16-pin diagnosis connector.
2. Turn the ignition switch to "ON" position.



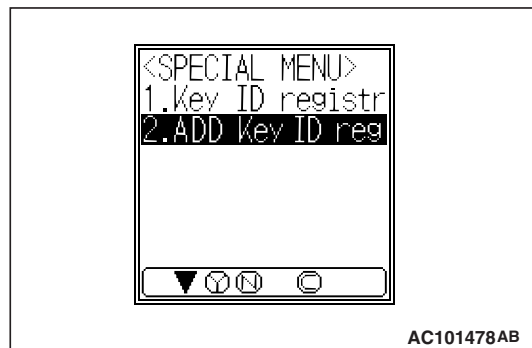
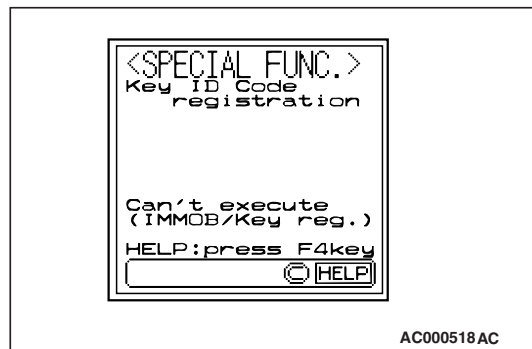
3. At "System Select," press "YES"



4. Select "Immobilizer," press "YES".



5. Select "Special Func", press "YES". If diagnosis code No.11 exists, "Can't execute" will be displayed. Check for diagnosis code No.11 (Refer to P.54A-9.)



6. Select "Add key ID reg", press "YES".



7. Press the "YES" key to start key ID registration.

8. This will be displayed when the add key ID registration is successful. If an error occurs during key ID registration, the message "Can't execute" will be displayed. If the key has already been registered, "Key ID has been registered" will be displayed.



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 and then press the "YES" key. Key ID registration screen will be displayed, then register another key.

**NOTE:** A maximum of eight different keys can be registered.

10. If key ID registration is complete, press the "NO" key.
11. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
12. Check that the engine can be started with each of the ignition keys.
13. Check that the immobilizer system diagnosis code and MPI system diagnosis code did not set.
14. Turn the ignition switch to "LOCK" (OFF) position.
15. Disconnect M.U.T.-II.

## 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.

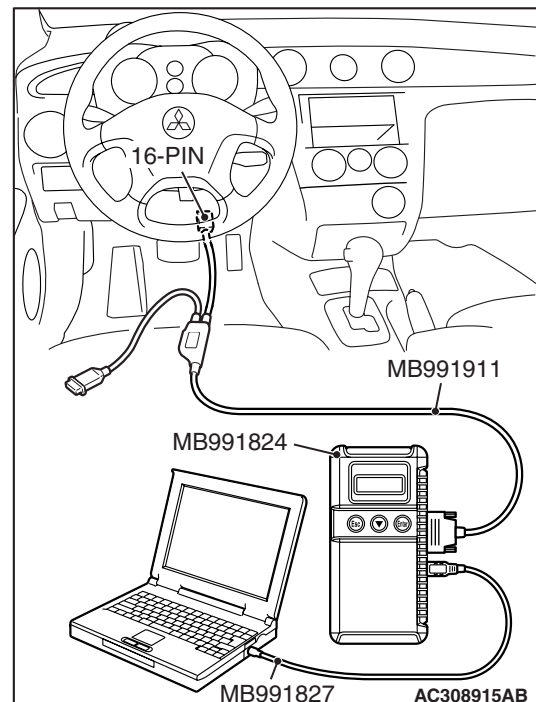
## Registration with the M.U.T.-III

### ⚠ CAUTION

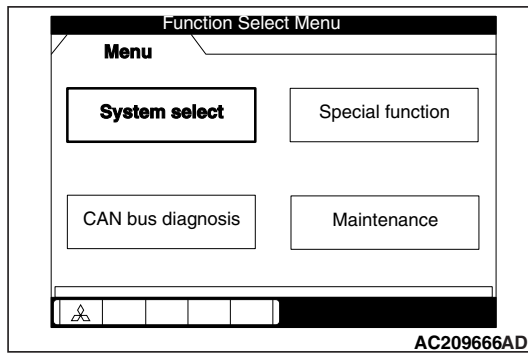
To prevent damage to M.U.T.-III, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting M.U.T.-III.

### NOTE:

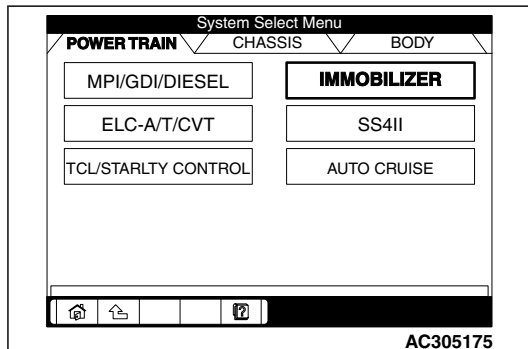
- Before registration, check that no diagnosis code is set. If a diagnosis code is set, resolve the problem beforehand.
- Using the key ID register function will cause all key IDs that have been previously registered in the immobilizer-ECU to be erased. All keys need to be registered. Those which have 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 Diagnosis [P.54A-8](#).



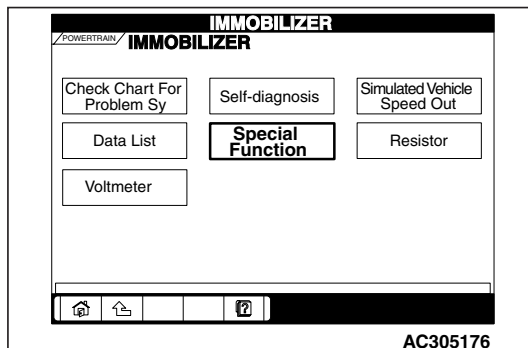
1. Connect the M.U.T.-III to the diagnosis connector (16-pin).
2. Turn the ignition switch to "ON" position.



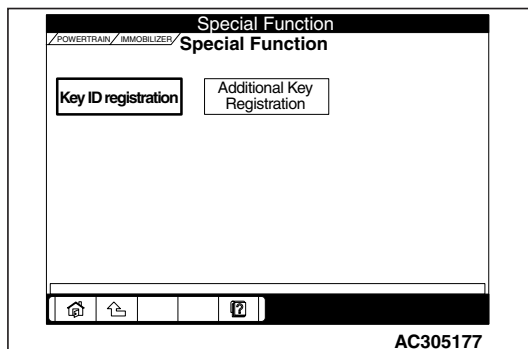
3. Select "System select" from the start-up screen.



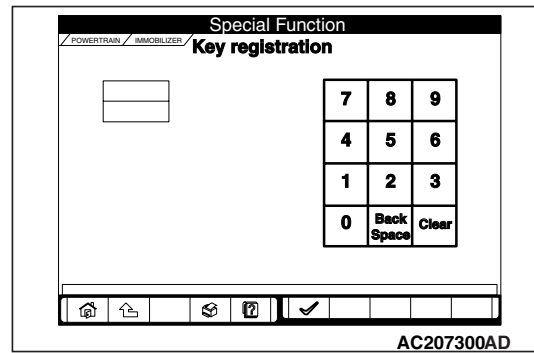
4. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



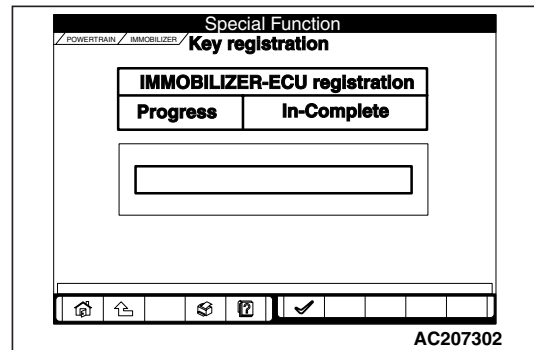
5. Choose "Special Function" from "IMMOBILIZER" screen.



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 (gray). Then the registration process completes. If the key ID failed to be registered, "In-Complete" indication will turn active (gray).
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.

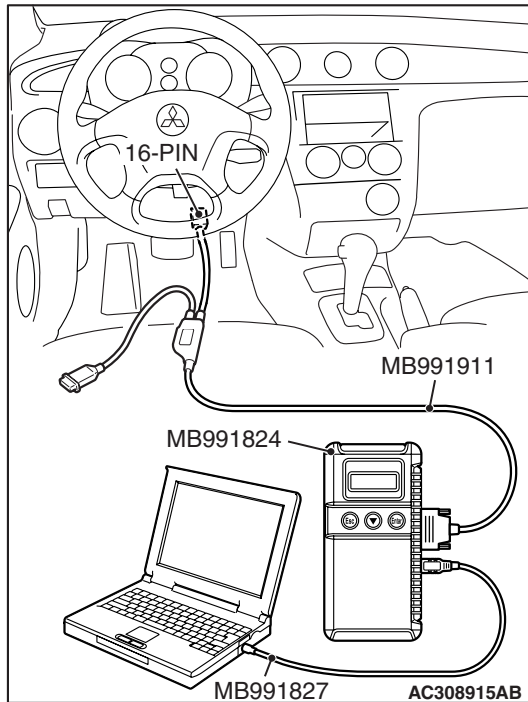
## Registration of additional keys with the M.U.T.-III

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.

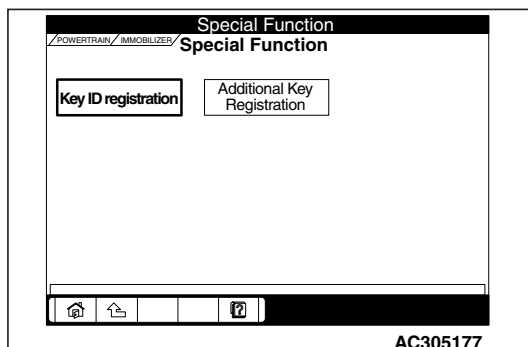


1. Connect M.U.T.-III to the 16-pin diagnosis connector.

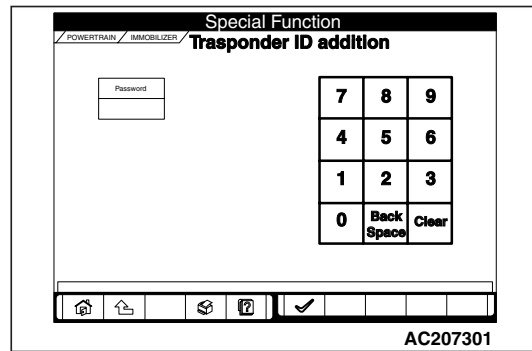
2. Turn the ignition switch to "ON" position.

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

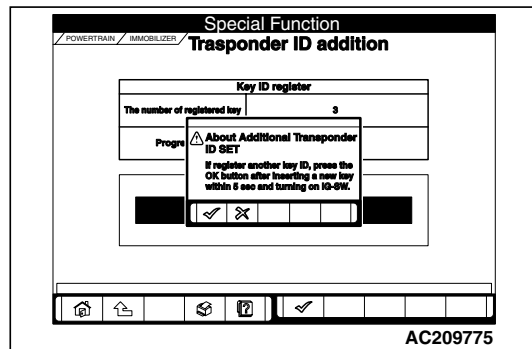
3. Carry out steps 3 to 6 of the sub-section "Registration with M.U.T.-III."



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



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.

**Registration of additional key(s) without using the M.U.T.-III**

If the M.U.T.-III is not available, new key(s) can be registered by operating two keys which have been registered to the vehicle (A maximum of eight keys can be registered to one vehicle). Follow the procedure below to register new key(s) to the vehicle.

*NOTE: The registered key is the key that allows you to start the engine.*

1. Turn "ON" the ignition switch by using the first registered key (key A), and wait for five seconds.
2. Remove the first registered key (key A).
3. Insert the second registered ignition key (key B), and turn it to the ON position.
4. The immobilizer-ECU identifies the new key to accept or reject it, and operates the immobilizer indicator (See the table below).
5. If a new ignition key is registered further, repeat steps 1 to 7 above.

A maximum of eight ignition keys can be registered to one vehicle (If you attempt to register the ninth key, the immobilizer-ECU rejects the key). If any of the following conditions are satisfied, the additional key registration mode will terminate:

- The ignition switch has been on for more than 30 seconds.
  - After the ignition key has been turned to the "LOCK" (OFF), the engine control relay is turned off.
  - The M.U.T.-III has started communicating with vehicle systems.
6. After the registration mode has terminated, the additionally registered key(s) should allow you to start the engine.

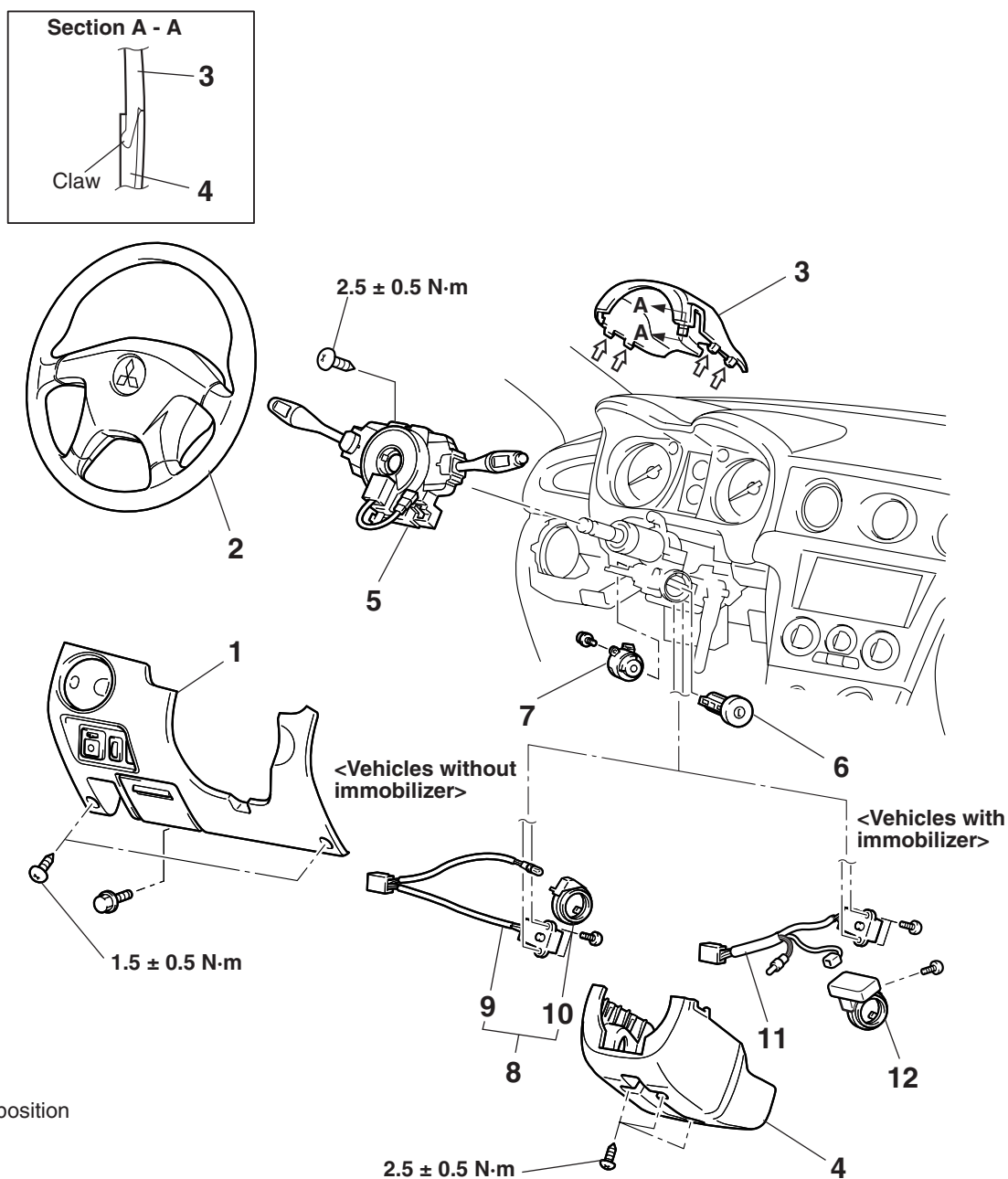
## IGNITION SWITCH

## REMOVAL AND INSTALLATION

M1543002101028

**⚠ WARNING**

- Before removal of the air bag module, refer to **GROUP 52B, SRS Service Precautions (P.52B-4)** and **Air Bag Module and Clock Spring (P.52B-4)**.
- When removing and installing the steering wheel, do not let it bump against the air bag module.



### Removal steps

1. Instrument lower panel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Steering wheel (Refer to GROUP 37, Steering wheel [P.37-15](#))
3. Column cover upper
4. Column cover lower
5. Clock spring and column switch assembly (Refer to GROUP 52B, Air bag module(s) and clock spring [P.52B-87](#))

<<A>>

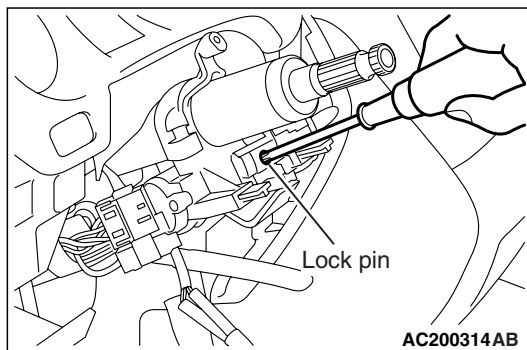
6. Steering lock cylinder

### Removal steps (Continued)

- Ignition switch connector
7. Ignition switch
  - Key reminder switch connector
  8. Key reminder switch and ring assembly
  9. Key reminder switch
  10. Illumination ring
  11. Key reminder switch and bulb assembly
  12. Immobilizer-ECU

## REMOVAL SERVICE POINT

### <<A>> STEERING LOCK CYLINDER REMOVAL

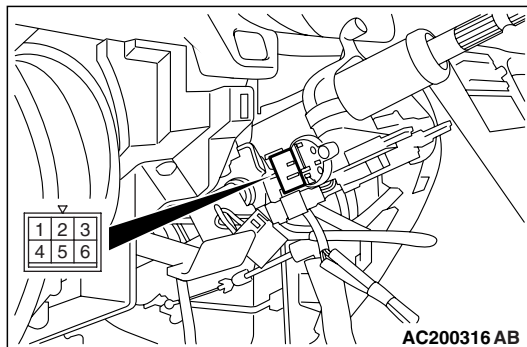


1. Insert the key in the steering lock cylinder and turn it to the "ACC" position.
2. Using a small Phillips head screwdriver, pull the steering lock cylinder toward you.

## INSPECTION

M1544009700184

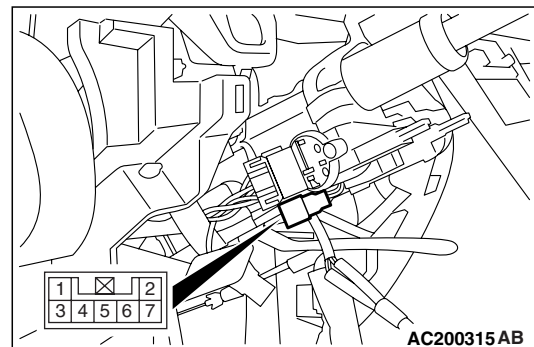
### IGNITION SWITCH CONTINUITY CHECK



Disconnect ignition switch connector C-303 without removing the ignition switch. Then check the continuity.

Switch position	Tester connection	Specified condition
"LOCK" (OFF)	1-2, 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5, 2-6, 3-4, 3-5, 3-6, 4-5, 4-6, 5-6	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

### KEY REMINDER SWITCH CONTINUITY CHECK



Disconnect key reminder switch connector C-304 without removing the ignition switch and key reminder switch. Then check the continuity.

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

# COMBINATION METER ASSEMBLY AND VEHICLE SPEED SENSOR

## SERVICE SPECIFICATIONS

M1543000300755

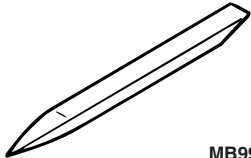
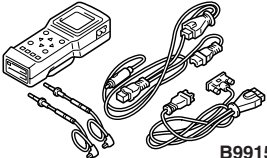
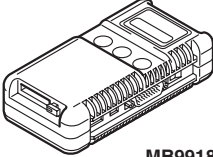

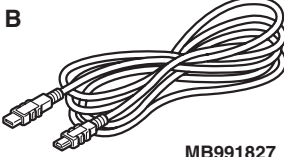

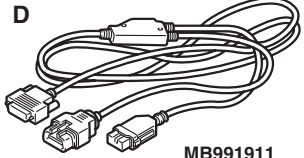
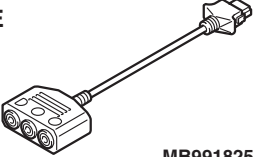
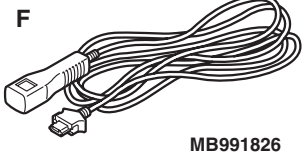
Item			Standard value	
Speedometer indication	Vehicles for 130 MPH speedometer	10		10 – 13
		25		25 – 28
		50		50 – 54
		75		76 – 80
		100		102 – 106
		125		127 – 132
	Vehicles for 220 km/h speedometer <Except for Australia and New zealand>	20		20 – 24
		40		40 – 44
		80		80 – 86
		120		122 – 128
		160		163 – 170
		200		204 – 212
	Vehicles for Australia and New zealand	20		18 – 22
		40		38 – 42
		80		79 – 84
		120		120 – 125
		160		161 – 166
		200		202 – 207
Tachometer indication tolerance r/min		700		700 ± 100
		2,000		2,000 ± 100
		3,000		3,000 ± 150
		4,000		4,000 ± 200
		5,000		5,000 ± 250
		6,250		6,250 ± 150
Fuel gauge unit resistance Ω	Fuel gauge unit	2WD <Vehicles for Chile>	Float position F (highest)	13 ± 1
			Float position E (lowest)	120 ± 1
		4WD <Except for Brazil and Chile	Float position F (highest)	1.5 ± 0.5
			Float position E (lowest)	55 ± 1.5
		4WD <Vehicles for Brazil and Chile>	Float position F (highest)	13 ± 1
			Float position E (lowest)	120 ± 1
	Fuel pump and gauge unit	4WD <Except for Brazil and Chile	Float position F (highest)	1.5 ± 0.5
			Float position E (lowest)	55 ± 1.5
		4WD <Vehicles for Brazil and Chile>	Float position F (highest)	13 ± 1
			Float position E (lowest)	120 ± 1


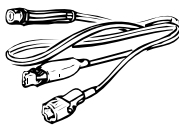
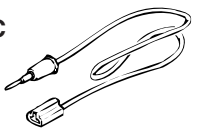
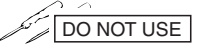
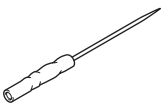


Item				Standard value
Fuel gauge unit float height mm	Fuel gauge unit	2WD <Vehicles for Chile>	Float position F (A)	32.8
			Float position E (B)	185.7
		4WD	Float position F (A)	20.8
			Float position E (B)	193.8 ± 0.5
	Fuel pump and gauge unit	4WD	Float position F (A)	36.7
			Float position E (B)	150.3
Engine coolant temperature gauge unit resistance Ω				104 + 13.5 (at 70°C)

## SPECIAL TOOLS

M1543000602387

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of instrument panel driver's side garnish and meter bezel.
 B991502	MB991502	M.U.T.-II sub assembly	Reading MPI system diagnosis code
<p><b>A</b></p>  MB991824	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	Reading MPI system diagnosis code <div>  <b>CAUTION</b>  <b>M.U.T.-III main harness B (MB991911) should be used. M.U.T.-III main harness A should not be used for this vehicle.</b> </div>
<p><b>B</b></p>  MB991827			
<p><b>C</b></p>  MB991910			
<p><b>D</b></p>  MB991911			
<p><b>E</b></p>  MB991825			
<p><b>F</b></p>  MB991826  MB991955			

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

## TROUBLESHOOTING

### SYMPTOM CHART

M1543007202108

Symptom	Inspection procedure No.	Reference page
Speedometer does not work (the other meters work). <L.H. drive vehicles>	1	<a href="#">P.54A-28</a>
Speedometer does not work (the other meters work). <R.H. drive vehicles>	2	<a href="#">P.54A-29</a>
Tachometer does not work (the other meters work). <L.H. drive vehicles>	3	<a href="#">P.54A-30</a>
Tachometer does not work (the other meters work). <R.H. drive vehicles>	4	<a href="#">P.54A-31</a>
Fuel gauge does not work (the other meters work). <L.H. drive vehicles>	5	<a href="#">P.54A-32</a>
Fuel gauge does not work (the other meters work). <R.H. drive vehicles>	6	<a href="#">P.54A-34</a>
Engine coolant temperature gauge does not work (the other meters work).	7	<a href="#">P.54A-35</a>
Combination meters does not work (the instruments do not work).	8	<a href="#">P.54A-36</a>

---

## SYMPTOM PROCEDURES

---

**INSPECTION PROCEDURE 1: Speedometer does not work (the other meters work). <L.H. drive vehicles>**

---

### TECHNICAL DESCRIPTION (COMMENT)

The engine-A/T-ECU and its associated components, the combination meter assembly, the wiring harness, or the connector(s) may be defective.

### TROUBLESHOOTING HINTS

- Malfunction of the engine-A/T-ECU
- Malfunction of the combination meter assembly
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

### DIAGNOSIS PROCEDURE

---

#### STEP 1. Check the speedometer.

- (1) Connect the M.U.T.-II/III to the diagnosis connector.
- (2) Use the M.U.T.-II/III to enter simulated vehicle speed.

**Q: Does the speedometer show that simulated vehicle speed?**

**YES :** Go to Step 5.

**NO :** Go to Step 2.

---

#### STEP 2. Connector check: Combination meter connector C-04 and diagnosis connector C-24 for damage.

**Q: Is combination meter connector C-04 and diagnosis connector C-24 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s).

---

#### STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 46) and diagnosis connector C-24 (terminal 14).

*NOTE: Prior to the wiring harness inspection, joint connector (3) C-02, and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 46) and diagnosis connector C-24 (terminal 14) in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damage component(s).

---

#### STEP 4. Retest the system.

**Q: Is the fuel speedometer normal?**

**YES :** The procedure is complete. (If malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace the combination meter assembly.

---

#### STEP 5. M.U.T.-II/III diagnosis code

**Q: Is the MPI-related diagnosis code set?**

**Code No.24 is set :** GROUP 13A – Troubleshooting [P.13A-72](#).

**Code No.P0500 is set :** GROUP 13B – Troubleshooting [P.13B-177](#).

**NO :** Go to Step 6.

---

#### STEP6. Connector check: Joint connector C-02 and engine-A/T-ECU connector C-110 <2400-Except MIVEC> or C-136 <2400-MIVEC>.

**Q: Is joint connector C-02 and engine-A/T-ECU connector C-110 <2400-Except MIVEC> or C-136 <2400-MIVEC> in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damage component(s).

---

#### STEP 7. Check the wiring harness between joint connector (3) C-02 (terminal 25) and engine-A/T-ECU connector C-110 (terminal 80) <2400-Except MIVEC> or C-136 (terminal 79) <2400-MIVEC>.

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-105, and repair if necessary.*

**Q: Is the wiring harness between joint connector (3) C-02 (terminal 25) and engine-A/T-ECU connector C-110 (terminal 80) <2400-Except MIVEC> or C-136 (terminal 79) <2400-MIVEC> in good condition?**

**YES :** Go to Step 8.

**NO :** Repair or replace the damage component(s).

---

**STEP 8. Retest the system.**

**Q: Is the speedometer normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 9.

---

**STEP 9. Pulse check**

Use the M.U.T.-II/III or a voltmeter to check that the vehicle speed signal is received.

*NOTE: Drive the vehicle with the M.U.T.-II/III connected to the diagnosis connector. The M.U.T.-II/III buzzer should sound.*

System switch	Check conditions
Vehicle speed signal	When the vehicle speed has reached 10 km/h or more

**OK: The M.U.T.-II/III sounds or the voltmeter needle fluctuates.**

**Q: Is the check result normal?**

**YES :** Replace the combination meter assembly.

**NO :** Replace the engine-A/T-ECU.

---

**INSPECTION PROCEDURE 2: Speedometer does not work (the other meters work). <R.H. drive vehicles>**

---

**TECHNICAL DESCRIPTION (COMMENT)**

The engine-A/T-ECU and its associated components, the combination meter assembly, the wiring harness, or the connector(s) may be defective.

**TROUBLESHOOTING HINTS**

- Malfunction of the engine-A/T-ECU
- Malfunction of the combination meter assembly
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Check the speedometer.**

- (1) Connect the M.U.T.-II/III to the diagnosis connector.
- (2) Use the M.U.T.-II/III to enter simulated vehicle speed.

**Q: Does the speedometer show that simulated vehicle speed?**

**YES :** Go to Step 5.

**NO :** Go to Step 2.

---

**STEP 2. Connector check: Combination meter connector C-04 and diagnosis connector C-24 for damage.**

**Q: Is combination meter connector C-04 and diagnosis connector C-24 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s).

---

**STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 46) and diagnosis connector C-24 (terminal 14).**

**Q: Is the wiring harness between combination meter connector C-04 (terminal 46) and diagnosis connector C-24 (terminal 14) in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damage component(s).

---

**STEP 4. Retest the system.**

**Q: Is the fuel speedometer normal?**

**YES :** The procedure is complete. (If malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace the combination meter assembly.

**STEP 5. M.U.T.-II/III diagnosis code**

**Q: Is the MPI-related diagnosis code set?**

**Code No.24 is set :** GROUP 13A –  
Troubleshooting [P.13A-72](#).

**Code No.P0500 is set :** GROUP 13B –  
Troubleshooting [P.13B-177](#).

**NO :** Go to Step 6.

**STEP6. Connector check: Combination meter connector C-04 and engine-A/T-ECU connector C-110 <2400-Except MIVEC> or C-136 <2400-MIVEC>.**

**Q: Is combination meter connector C-04 and engine-A/T-ECU connector C-110 <2400-Except MIVEC> or C-136 <2400-MIVEC> in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damage component(s).

**STEP 7. Check the wiring harness between combination meter connector C-04 (terminal 46) and engine-A/T-ECU connector C-110 (terminal 80) <2400-Except MIVEC> or C-136 (terminal 79) <2400-MIVEC>.**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-105, and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 46) and engine-A/T-ECU connector C-110 (terminal 80) <2400-Except MIVEC> or C-136 (terminal 79) <2400-MIVEC> in good condition?**

**YES :** . Go to Step 8.

**NO :** . Repair or replace the damage component(s).

**STEP 8. Retest the system.**

**Q: Is the speedometer normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 9.

**STEP 9. Pulse check**

Use the M.U.T.-II/III or a voltmeter to check that the vehicle speed signal is received.

*NOTE: Drive the vehicle with the M.U.T.-II/III connected to the diagnosis connector. The M.U.T.-II/III buzzer should sound.*

System switch	Check conditions
Vehicle speed signal	When the vehicle speed has reached 10 km/h or more

**OK: The M.U.T.-II/III sounds or the voltmeter needle fluctuates.**

**Q: Is the check result normal?**

**YES :** Replace the combination meter assembly.

**NO :** Replace the engine-A/T-ECU.

**INSPECTION PROCEDURE 3: Tachometer does not work (the other meters work). <L.H. drive vehicles>**

**TECHNICAL DESCRIPTION (COMMENT)**

Ignition signal may not be received from the engine-A/T-ECU, or the combination meter assembly, the wiring harness, or the connector(s) may be defective.

**TROUBLESHOOTING HINTS**

- Malfunction of the combination meter assembly
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

**DIAGNOSIS PROCEDURE****STEP 1. M.U.T.-II/III diagnosis code**

**Q: Is the MPI-related diagnosis code set?**

**Code No.44 is set :** GROUP 13A –  
Troubleshooting [P.13A-91](#).

**Code No.P0300 is set :** GROUP 13B –  
Troubleshooting [P.13B-135](#).

**NO (the diagnosis code is not set) :** Go to Step 2.

---

**STEP 2. Connector check: Combination meter connector C-04 and engine A/T-ECU connector C-111 <2400-Except MIVEC> or C-136 <2400-MIVEC>.**

**Q: Is combination meter connector C-04 and engine A/T-ECU connector C-111 <2400-Except MIVEC> or C-136 <2400-MIVEC> in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s).

---

**STEP 3. Retest the system.**

**Q: Is the tachometer normal?**

**YES :** Intermittent Malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 4.

---

**STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 47) and engine-A/T-ECU connector C-111 (terminal 43) <2400-Except MIVEC> or C-136 (terminal 87) <2400-MIVEC>.**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-105, and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 47) and engine-A/T-ECU connector C-111 (terminal 43) <2400-Except MIVEC> or C-136 (terminal 87) <2400-MIVEC> in good condition?**

**YES :** Replace the combination meter assembly.

**NO :** Repair or replace the damage component(s).

---

**INSPECTION PROCEDURE 4: Tachometer does not work (the other meters work). <R.H drive vehicles>**

---

## TECHNICAL DESCRIPTION (COMMENT)

Ignition signal may not be received from the engine-A/T-ECU, or the combination meter assembly, the wiring harness, or the connector(s) may be defective.

## TROUBLESHOOTING HINTS

- Malfunction of the combination meter assembly
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

## DIAGNOSIS PROCEDURE

---

### STEP 1. M.U.T.-II/III diagnosis code

**Q: Is the MPI-related diagnosis code set?**

**Code No.44 is set :** GROUP 13A – Troubleshooting [P.13A-91](#).

**Code No.P0300 is set :** GROUP 13B – Troubleshooting [P.13B-135](#).

**NO (the diagnosis code is not set) :** Go to Step 2.

---

**STEP 2. Connector check: Combination meter connector C-04 and engine A/T-ECU connector C-111 <2400-Except MIVEC> or C-136 <2400-MIVEC>.**

**Q: Is combination meter connector C-04 and engine A/T-ECU connector C-111 <2400-Except MIVEC> or C-136 <2400-MIVEC> in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s).

---

**STEP 3. Retest the system.**

**Q: Is the tachometer normal?**

**YES :** Intermittent Malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 4.



**STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 47) and engine-A/T-ECU connector C-111 (terminal 43) <2400-Except MIVEC> or C-136 (terminal 87) <2400-MIVEC>.**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-105, and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 47) and engine-A/T-ECU connector C-111 (terminal 43) <2400-Except MIVEC> or C-136 (terminal 87) <2400-MIVEC> in good condition?**

**YES :** Replace the combination meter assembly.

**NO :** Repair or replace the damage component(s).

## INSPECTION PROCEDURE 5: Fuel gauge does not work (the other meters work). <L.H. drive vehicles>

### TECHNICAL DESCRIPTION (COMMENT)

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

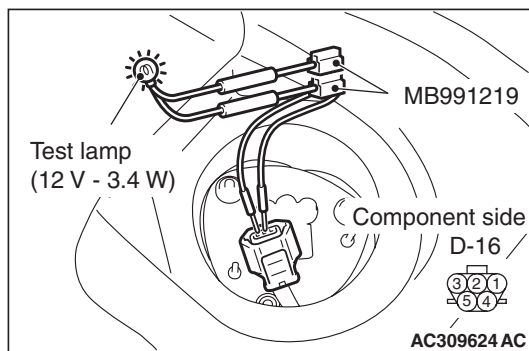
### TROUBLESHOOTING HINTS

- Malfunction of the fuel gauge unit.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Malfunction of the combination meter.

### DIAGNOSIS PROCEDURE

#### STEP 1. Check the fuel gauge circuit.

- (1) Disconnect D-15 fuel gauge unit connector <2WD> or D-16 fuel pump and gauge unit (main) connector <4WD>.



- (2) Connect a test lamp (12 V – 3.4 W) via test harness (MB991219) between the wiring harness connector terminals 1 and 2.
- (3) Turn the ignition switch to the "ON" position.

**Q: Does the test lamp illuminate?**

**YES :** Go to Step 8.

**NO :** Go to Step 2.

**STEP 2. Connector check: Combination meter connector C-04, fuel gauge unit connector D-15 <2WD> or fuel pump and gauge unit (main) connector D-16 <4WD>.**

**Q: Is combination meter connector C-04, fuel gauge unit connector D-15 <2WD> or fuel pump and gauge unit (main) connector D-16 <4WD> in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damaged component(s).

**STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 43) and fuel gauge unit connector D-15 (terminal 1) <2WD> or fuel pump and gauge unit (main) connector D-16 (terminal 2) <4WD>.**

*NOTE: Prior to the wiring harness inspection, check fuel gauge unit (sub) connector D-12 <4WD>, intermediate connector D-23 <Vehicles for Brazil and Chile>, D-24 <except for Brazil and Chile>, C-117 and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 43) and fuel gauge unit connector D-15 (terminal 1) <2WD> or fuel pump and gauge unit (main) connector D-16 (terminal 2) <4WD> in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Then go to Step 4.



---

**STEP 4. Retest the system.**

**Q: Is the fuel gauge normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 5.

---

**STEP 5. Connector check: Fuel gauge unit connector D-15 <2WD> or fuel pump and gauge unit (main) connector D-16 <4WD>.**

**Q: Is fuel gauge unit connector D-15 <2WD> or fuel pump and gauge unit (main) connector D-16 <4WD> in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace the damaged component(s).

---

**STEP 6. Check the wiring harness between fuel gauge unit connector D-15 (terminal 2) <2WD> or fuel pump and gauge unit (main) connector D-16 (terminal 1) <4WD> and earth.**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors D-23 <Vehicles for Brazil and Chile>, D-24 <except for Brazil and Chile>, and repair if necessary.*

**Q: Is the wiring harness between fuel gauge unit connector D-15 (terminal 2) <2WD> or fuel pump and gauge unit (main) connector D-16 (terminal 1) <4WD> and earth in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s).

---

**STEP 7. Retest the system.**

**Q: Is the fuel gauge normal?**

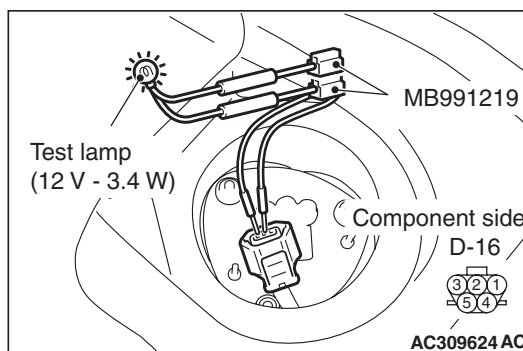
**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Carry out the troubleshooting again.

---

**STEP 8. Check the fuel gauge circuit.**

(1) Disconnect D-15 fuel gauge unit connector <2WD> or D-16 fuel pump and gauge unit (main) connector <4WD>.



(2) Connect a test lamp (12 V – 3.4 W) via special tool test harness (MB991219) between the wiring harness connector terminals 1 and 2.

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

**Q: Does the fuel gauge in the combination meter fluctuate about half of it full scale?**

**YES :** Replace the fuel gauge unit.

**NO :** Go to Step 9.

---

**STEP 9. Retest the system.**

**Q: Is the fuel gauge normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace combination meter.

**INSPECTION PROCEDURE 6: Fuel gauge does not work (the other meters work). <R.H. drive vehicles>****TECHNICAL DESCRIPTION (COMMENT)**

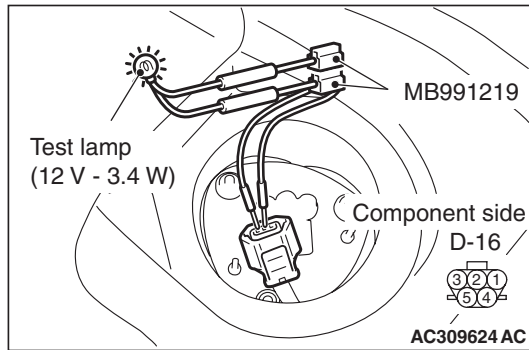
If only the fuel gauge does not operate, the fuel pump and gauge unit, the combination meter, wiring harness or connector(s) may be defective.

**TROUBLESHOOTING HINTS**

- Malfunction of the fuel gauge unit.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Malfunction of the combination meter.

**DIAGNOSIS PROCEDURE****STEP 1. Check the fuel gauge circuit.**

- (1) Disconnect D-16 fuel pump and gauge unit (main) connector.



- (2) Connect a test lamp (12 V – 3.4 W) via test harness (MB991219) between the wiring harness connector terminals 1 and 2.
- (3) Turn the ignition switch to the "ON" position.

**Q: Does the test lamp illuminate?**

- YES :** Go to Step 8.  
**NO :** Go to Step 2.

**STEP 2. Connector check: Combination meter connector C-04, fuel pump and gauge unit (main) connector D-16.**

**Q: Is combination meter connector C-04, fuel pump and gauge unit (main) connector D-16 in good condition?**

- YES :** Go to Step 3.  
**NO :** Repair or replace the damaged component(s).

**STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 43) and fuel pump and gauge unit (main) connector D-16 (terminal 2).**

*NOTE: Prior to the wiring harness inspection, check fuel gauge unit (sub) connector D-12, intermediate connector C-117, D-24, and repair if necessary.*

**Q: Is the wiring harness between combination meter connector C-04 (terminal 43) and fuel pump and gauge unit (main) connector D-16 (terminal 2) in good condition?**

- YES :** Go to Step 4.  
**NO :** Repair or replace the damaged component(s). Then go to Step 4.

**STEP 4. Retest the system.**

**Q: Is the fuel gauge normal?**

- YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).
- NO :** Go to Step 5.

**STEP 5. Connector check: Fuel pump and gauge unit (main) connector D-16.**

**Q: Is fuel pump and gauge unit (main) connector D-16 in good condition?**

- YES :** Go to Step 6.  
**NO :** Repair or replace the damaged component(s).

**STEP 6. Check the wiring harness between fuel pump and gauge unit connector D-16 (terminal 1) and earth.**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors D-24, and repair if necessary.*

**Q: Is the wiring harness between fuel pump and gauge unit connector D-16 (terminal 1) and earth in good condition?**

- YES :** Go to Step 7.  
**NO :** Repair or replace the damaged component(s).

---

**STEP 7. Retest the system.****Q: Is the fuel gauge normal?**

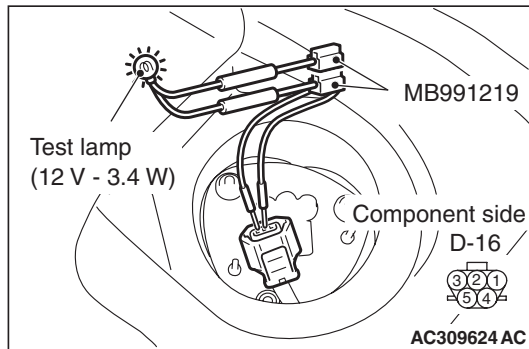
**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction P.00-5).

**NO :** Carry out the troubleshooting again.

---

**STEP 8. Check the fuel gauge circuit.**

- (1) Disconnect D-16 fuel pump and gauge unit (main) connector.



- (2) Connect a test lamp (12 V – 3.4 W) via special tool test harness (MB991219) between the wiring harness connector terminals 1 and 2.

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

**Q: Does the fuel gauge in the combination meter fluctuate about half of it full scale?**

**YES :** Replace the fuel gauge unit.

**NO :** Go to Step 9.

---

**STEP 9. Retest the system.****Q: Is the fuel gauge normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction P.00-5).

**NO :** Replace combination meter.

---

**INSPECTION PROCEDURE 7: Engine Coolant Temperature Gauge does not Work. (the other meters work).**

---

**TECHNICAL DESCRIPTION (COMMENT)**

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

**TROUBLESHOOTING HINTS**

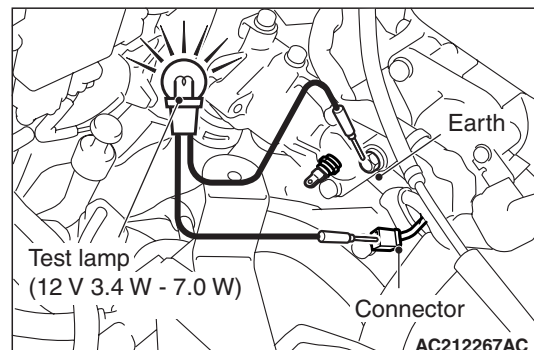
- Malfunction of the engine coolant temperature gauge unit
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Malfunction of the combination meter.

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Check the engine coolant temperature gauge circuit.**

- (1) Disconnect the B-109 engine coolant temperature gauge unit connector.



- (2) Connect a test lamp (12 V – 3.4 W to 12 V – 7.0 W) to the wiring harness side connector.

- (3) Ignition switch: ON

**Q: Does the test lamp illuminate?**

**YES :** Go to Step 5.

**NO :** Go to Step 2.

**STEP 2. Connector check: Combination meter connector C-04 and engine coolant temperature gauge unit connector B-109.**

**Q: Is combination meter connector C-04 and engine coolant temperature gauge unit connector B-109 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s).

**STEP 3. Retest the system.**

**Q: Is the engine coolant temperature gauge normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Go to Step 4.

**STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 44) and engine coolant temperature gauge unit connector B-109 (terminal 1).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-104, and repair if necessary.*

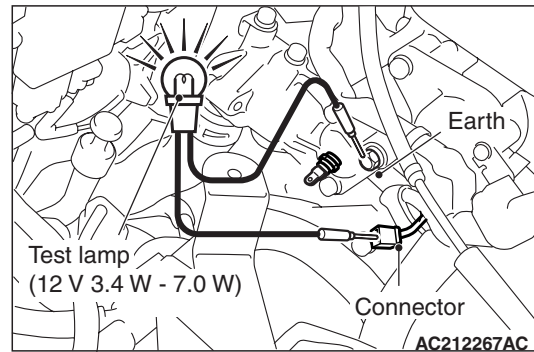
**Q: Is the wiring harness between combination meter connector C-04 (terminal 44) and engine coolant temperature gauge unit connector B-109 (terminal 1) in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace the damage component(s).

**STEP 5. Check the engine coolant temperature gauge circuit.**

(1) Disconnect the B-109 engine coolant temperature gauge unit connector.



(2) Connect a test lamp (12 V – 3.4 W to 12 V – 7.0 W) to the wiring harness side connector.

(3) Ignition switch: ON

**Q: Does the engine coolant temperature gauge in the combination meter fluctuate about half of its full scale?**

**YES :** Replace the engine coolant temperature gauge unit.

**NO :** Go to Step 6.

**STEP 6. Retest the system**

**Q: Is the engine coolant temperature gauge normal?**

**YES :** The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-5](#)).

**NO :** Replace the combination meter.

**INSPECTION PROCEDURE 8: Combination meter does not work (the instruments do not work).**

## TECHNICAL DESCRIPTION (COMMENT)

The cause is thought to be malfunction of the power, earth circuitry or combination meter.

## TROUBLESHOOTING HINTS

- Malfunction of the combination meter
- Damaged wiring harness or connectors

## DIAGNOSIS PROCEDURE

**STEP 1. Measure the voltage at combination meter connector C-04 in order to check the battery circuit of power supply system to the combination meter.**

(1) Disconnect the combination meter connector C-04 and measure the voltage at combination meter connector C-04 component side.

(2) Measure the voltage between terminal 35 and earth.

**OK: System voltage**

**Q: IS the check result normal?**

**YES :** Go to Step 4.

**NO :** Go to Step 2.

---

**STEP 2. Connector check: combination meter connector C-04.**

**Q: Is combination meter connector C-04 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the connector. Check to see that all meters operate.

---

**STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 35) and battery.**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-116 and joint connector (3) C-02, and repair if necessary.*

**Q: Are the wiring harness between combination meter connector C-04 (terminal 35) and battery in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

---

**STEP 4. Measure the voltage at combination meter connector C-04 to check the battery circuit of power supply system to the combination meter.**

- (1) Measure at combination meter connector C-04 without disconnecting the connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Measure the voltage between terminal 42 and earth.

**OK: System voltage**

**Q: Is the check result normal?**

**YES :** Go to Step 7.

**NO :** Go to Step 5.

---

**STEP 5. Connector check: Combination meter connector C-04.**

**Q: Is combination meter connector C-04 in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace the connector. Check to see that all meters operate.

---

**STEP 6. Check the wiring harness between combination meter connector C-04 (terminal 42) and ignition switch (IG1).**

*NOTE: Prior to the wiring harness inspection, check Junction block connectors C-203 and C-205, and repair if necessary.*

**Q: Are the wiring harness between combination meter connector C-04 (terminal 42) and ignition switch (IG1) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

---

**STEP 7. Measure the resistance at combination meter connector C-04 to check the earth circuit to the combination meter.**

- (1) Disconnect the combination meter connector C-04 and measure the resistance at combination meter connector C-04.
- (2) Measure the resistance between terminal 40 and earth.

**OK: 2 ohms or less**

- (3) Measure the resistance between terminal 41 and earth.

**OK: 2 ohms or less**

**Q: Is the check result normal?**

**YES :** Repair or replace the connector.

**NO :** Go to Step 8.

---

**STEP 8. Connector check: Combination meter connector C-04 for damage.**

**Q: Is combination meter connector C-04 in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

---

**STEP 9. Check the wiring harness between combination meter connector C-04 (terminal 40 and 41) and earth.**

**Q: Are the wiring harness between combination meter connector C-04 (terminal 40 and 41) and earth in good condition?**

**YES :** This procedure is complete.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

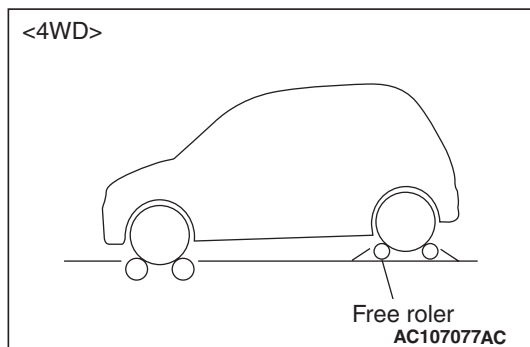
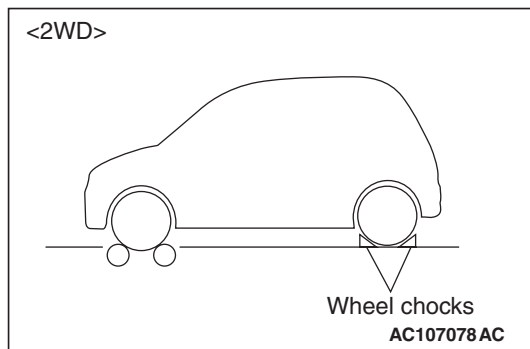
## ON-VEHICLE SERVICE

## SPEEDOMETER CHECK

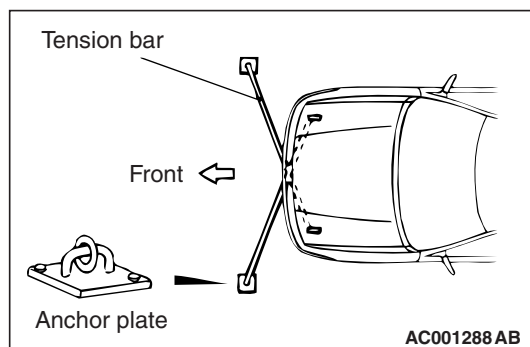
M1543000900821

Adjust the pressure of tires to the specified level.

(Refer to GROUP 31, On-vehicle Service P.31-8).

**⚠ CAUTION****Do not operate the clutch suddenly. Do not increase/decrease speed rapidly while testing.****⚠ CAUTION****Set a free-roller on the rear tyre for 4WD.**

1. Set the vehicle onto a speedometer tester and use wheel chocks to hold the rear wheels.



2. 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.

3. 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.
4. Check if the speedometer indicator range is within the standard values.

**Standard value:****Vehicles for 130 MPH speedometer**

Standard indicator MPH	Allowance range MPH
10	10 – 13
25	25 – 28
50	50 – 54
75	76 – 80
100	102 – 106
125	127 – 132

**Vehicles for 220 km/h speedometer <Except for Australia and New Zealand>**

Standard indicator km/h	Allowance range km/h
20	20 – 24
40	40 – 44
80	80 – 86
120	122 – 128
160	163 – 170
200	204 – 212

**Vehicles for Australia and New Zealand**

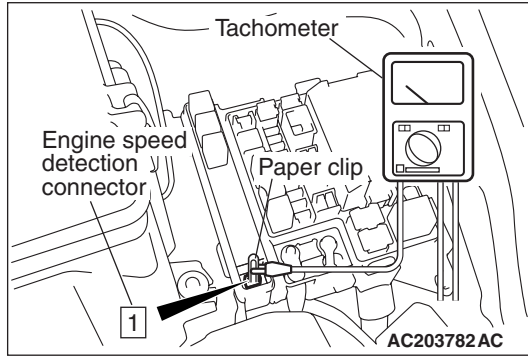
Standard indicator km/h	Allowance range km/h
20	18 – 22
40	38 – 42
80	79 – 84
120	120 – 125
160	161 – 166
200	202 – 207

5. If not to the standard value, inspect for proper tyre size. If not correct, replace the tires with original size tyres and retest. If correct, replace the speedometer. If still not to standard value, replace the vehicle speed sensor.



## TACHOMETER CHECK

M1543001000393



1. Attach an external high quality tachometer to the engine speed detection connector on the harness side (such as with a paper clip).

**NOTE:** For tachometer check, use an external high quality inductive tachometer.

2. Compare the readings of the vehicle tachometer and the external tachometer at every engine speed, and check if the variations are within the standard values.

### Standard values:

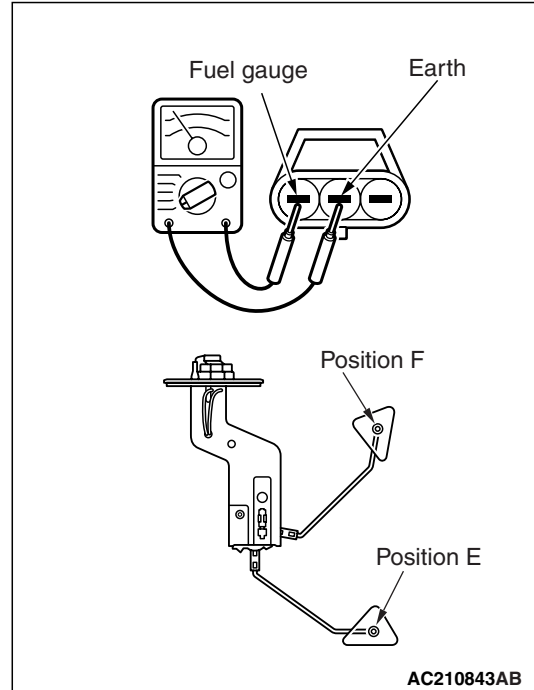
- 700 r/min:  $\pm 100$  r/min
- 2,000 r/min:  $\pm 100$  r/min
- 3,000 r/min:  $\pm 150$  r/min
- 4,000 r/min:  $\pm 200$  r/min
- 5,000 r/min:  $\pm 250$  r/min
- 6,250 r/min:  $\pm 150$  r/min

## FUEL GAUGE UNIT CHECK <2WD>

M1543001200900

Remove the fuel pump module and the remove the fuel gauge unit. (Refer to GROUP 13C, Fuel Tank P.13C-12 <Vehicles for brazil and Chile>).

## FUEL GAUGE UNIT RESISTANCE



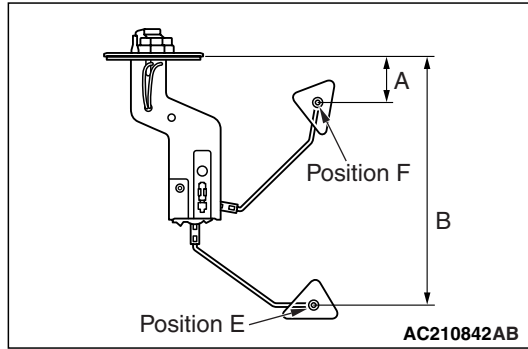
1. Check that resistance value between the fuel gauge terminal and earth terminal is at the standard value when the fuel gauge unit float is between position F (highest) and position E (lowest).

### Standard value <Vehicles for Chile>:

- Float position F :  $13 \pm 1 \Omega$
- Float position E :  $120 \pm 1 \Omega$

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

## FUEL GAUGE UNIT FLOAT HEIGHT



1. Move the float and measure height A at position F (highest) and B at position E (lowest) with the float arm touching stopper.

**Standard value <Vehicles for Chile>:**

- Position F (A) : 32.8 mm
- Position E (B) : 185.7 mm

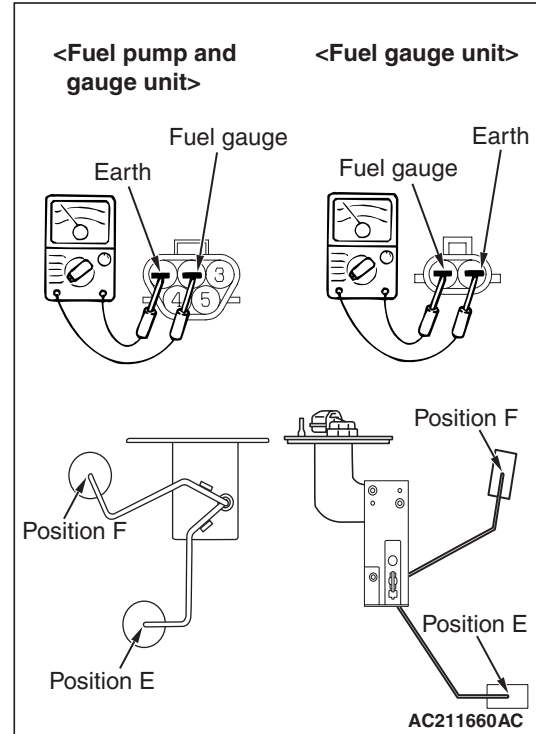
2. If all checks are correct, go to fuel gauge unit float height check. If any check is not correct, replace the fuel gauge unit.

## FUEL GAUGE UNIT CHECK &lt;4WD&gt;

M1543001200911

Remove the fuel pump and gauge unit and the remove the fuel gauge unit. (Refer to GROUP 13C, Fuel Tank P.13C-8 <Except for Brazil and Chile> or P.13C-12 <Vehicles for brazil and Chile>).

## FUEL GAUGE UNIT RESISTANCE



1. Check that resistance value between the fuel gauge terminal and earth terminal is at the standard value when the fuel pump and gauge unit or fuel gauge unit float is between position F (highest) and position E (lowest).

**Standard value <Except for Brazil and Chile>:**

- Float position F:  $1.5 \pm 0.5 \Omega$
- Float position E:  $55 \pm 1.5 \Omega$

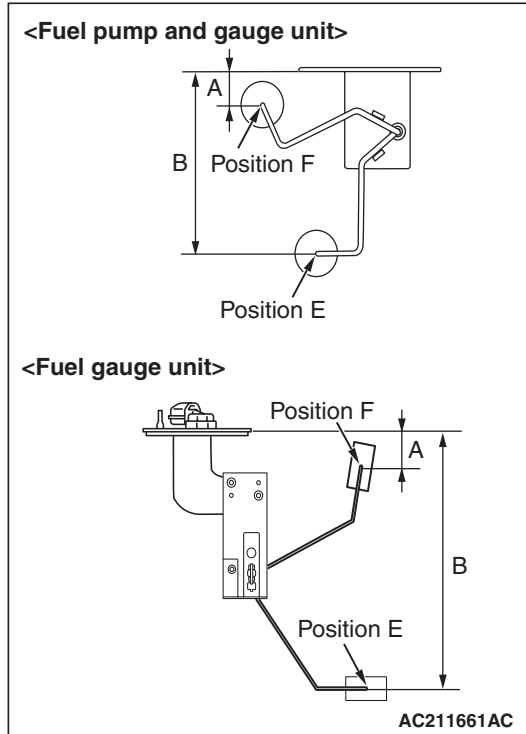
**Standard value <Vehicles for Brazil and Chile>:**

- Float position F:  $13 \pm 1 \Omega$
- Float position E:  $120 \pm 1 \Omega$

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



## FUEL GAUGE UNIT FLOAT HEIGHT



1. Move the float and measure height A at position "F" (highest) and B at position "E" (lowest) with the float arm touching stopper.

**Standard value <Fuel pump and gauge unit>:**

- Float position A: 36.7 mm
- Float position B: 150.3 mm

**Standard value <Fuel gauge unit>:**

- Float position A: 20.8 mm
- Float position B:  $193.8 \pm 0.5$  mm

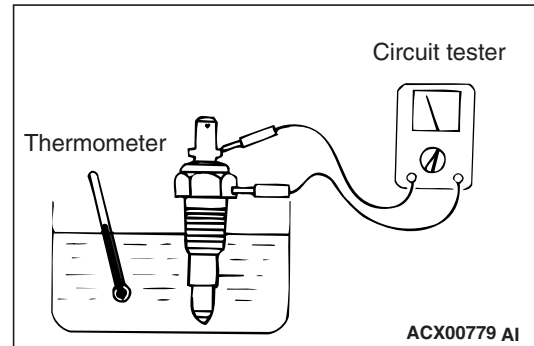
2. If all checks are correct, go to fuel pump and gauge unit or fuel gauge unit float height check. If any check is not correct, replace the fuel pump and gauge unit or fuel gauge unit.

## ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK

M1543001500525

1. Drain the engine coolant (Refer to GROUP 14- On-vehicle Service [P.14-10](#)).

2. Remove the engine coolant temperature gauge unit.

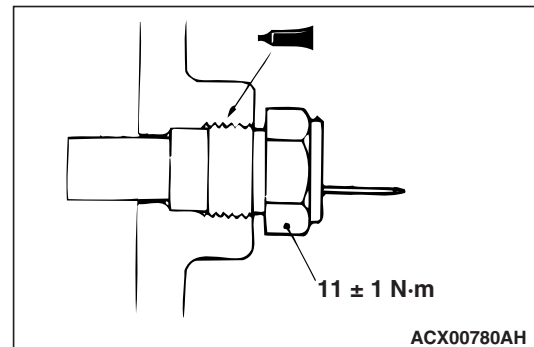


3. Put water temperature gauge unit into the hot water in specified temperature, and ensure that basic resistance is within standard value.

**Standard value:  $104 \pm 13.5 \Omega$  (at  $70^\circ\text{C}$ )**

**Reference value**

Temperature ( $^\circ\text{C}$ )	Resistance $\Omega$
50	230
60	155
80	73



4. After inspection, apply specified sealant at threads of water temperature gauge unit, and tighten to the specified torque.

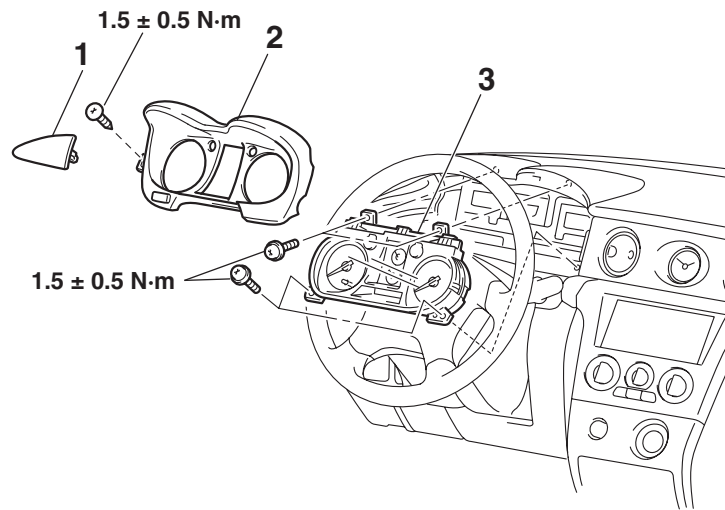
**Semi-drying sealant: 3M 1215 or equivalent**

5. Add engine coolant (Refer to GROUP 14 – On-vehicle Service [P.14-10](#)).

## COMBINATION METER ASSEMBLY

## REMOVAL AND INSTALLATION

M1543002900485



AC211662AB

**Removal steps**

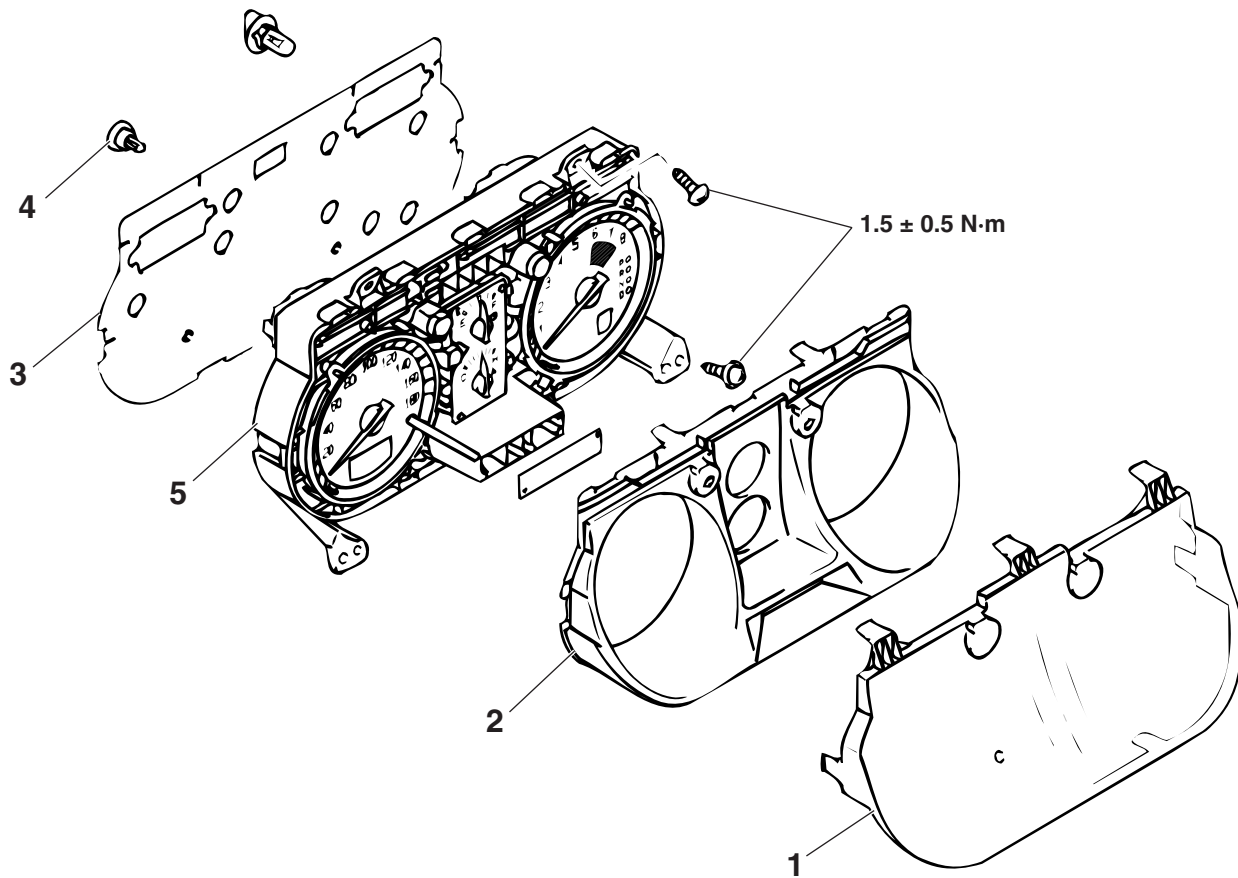
1. Instrument panel driver's side garnish (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)

**Removal steps (Continued)**

2. Meter bezel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
3. Combination meter assembly

DISASSEMBLY AND REASSEMBLY

M1543003100396



AC211663AB

**Disassembly steps**

1. Meter glass
2. Meter panel
3. Circuit board cover

**Disassembly steps (Continued)**

4. Bulb
5. Combination meter assembly

## HEADLAMP

## SERVICE SPECIFICATIONS

M1542000300956

Item		Standard value	Limit
Headlamp aiming (Low-beam side)	Vertical direction	Within 0.57° below horizontal (H)	The headlamp beam should tilt downwards by 0.17° or more.
	Horizontal direction	Position at which the stat up point of 15° is crossed with vertical line (V)	–
Headlamp aiming (High-beam side)	Vertical direction	High-intensity zone centre should be within 0.42° below horizontal (H)	The headlamp beam should tilt downwards by 0.09° or more.
	Horizontal direction	High-intensity zone centre should be along the vertical line (V).	The vertical headlamp beam range should be within 1°.
Headlamp luminous intensity measurement cd {When a screen is set 25 m ahead of the vehicle}		–	30,000 cd or more

## TROUBLESHOOTING

## TROUBLESHOOTING &lt;Vehicles with headlamp automatic shutdown function&gt;

M1542000702046

Features the headlamp automatic shutdown function to avoid battery drain when the headlamps are left on. The main features are as follows:

- Extinguishes automatically in three minutes if the ignition switch is turned off with the lighting switch on.
- Extinguishes in one second if the driver's door is opened within that 3-minute period.
- If the headlamps are turned on with the ignition switch off, the headlamps and tail lamps will extinguish in three minutes after the driver's door is opened or closed.

The headlamps are controlled by the Smart Wiring System (SWS). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

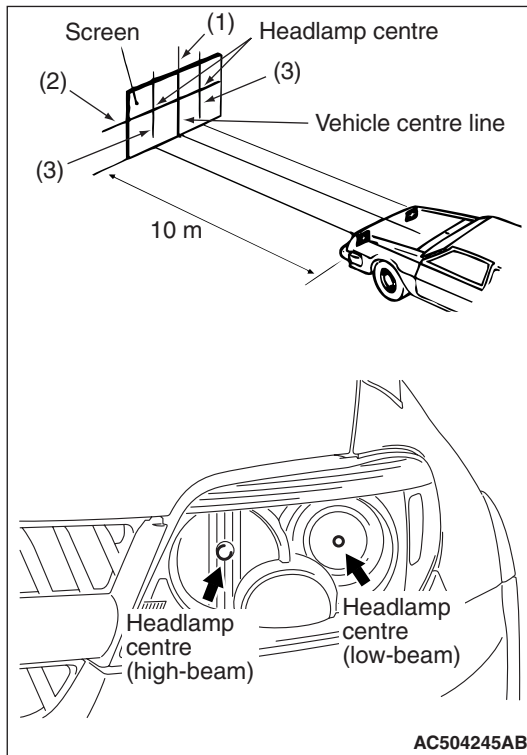
## ON-VEHICLE SERVICE

## HEADLAMP AIMING

M1542000900958

## PRE-AIMING INSTRUCTIONS

1. Inspect for badly rusted or faulty headlamp assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tyre inflation, and adjust it if necessary.
4. If the fuel tank is not full, place a weight in luggage room of the vehicle to simulate weight of a full tank [3 kg per liter.]
5. There should be no other load in the vehicle other than driver or substituted weight of approximately 75 kg placed in driver's position.
6. Thoroughly clean the headlamp lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 10 m away from the bulb centre-marks on the headlamp lens.
8. Rock vehicle sideways to allow vehicle to assume its normal position.
9. Bounce the front suspension through three (3) oscillations by applying the body weight to hood or bumper.



10. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
- (1) Position a vertical tape or mark so that it is aligned with the vehicle centre line.
  - (2) Measure the distance from the centre-marks on the headlamp lens to the floor. Transfer the measurement to the screen. Horizontal tape or mark on the screen is for reference of vertical adjustment.

*NOTE: Height from the floor to the centre of the headlamps (Reference value)*

*Low-beam: 818 mm*

*High-beam: 804 mm*

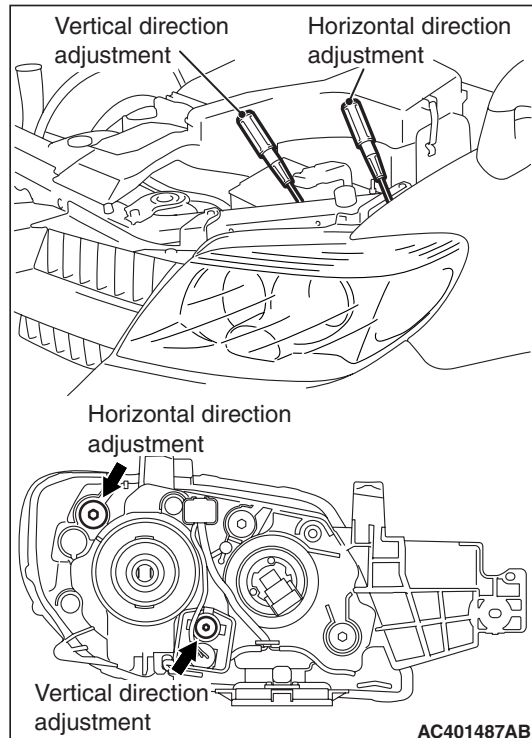
- (3) Measure the distance from the centre line of the vehicle to the centre of each headlamp. Transfer the measurement to the screen. Vertical tape or mark on the screen with reference to the centre line of each headlamp bulb.

## HEADLAMP ADJUSTMENT (LOW-BEAM)

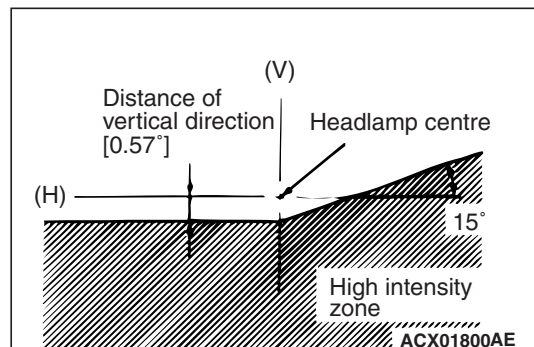
1. The low-beam headlamp should project on the screen upper edge of the beam (cut-off).

### ⚠ CAUTION

- Do not cover a headlamp for more than three minutes to prevent the plastic headlamp lens deformation.
- When adjusting one headlamp beam, make sure that another headlamp is off by disconnecting the connector from it. When reconnecting the connector, make sure that the headlamp beam is not disturbed accidentally.



2. If not the case, turn the adjusting screws to achieve the specified low-beam cut-off location on the aiming screen.



**Standard value:**

**Vertical direction:** 0.57° below horizontal (H)

**Horizontal direction:** Position at which the startup point of 15° is crossed with vertical line (V)

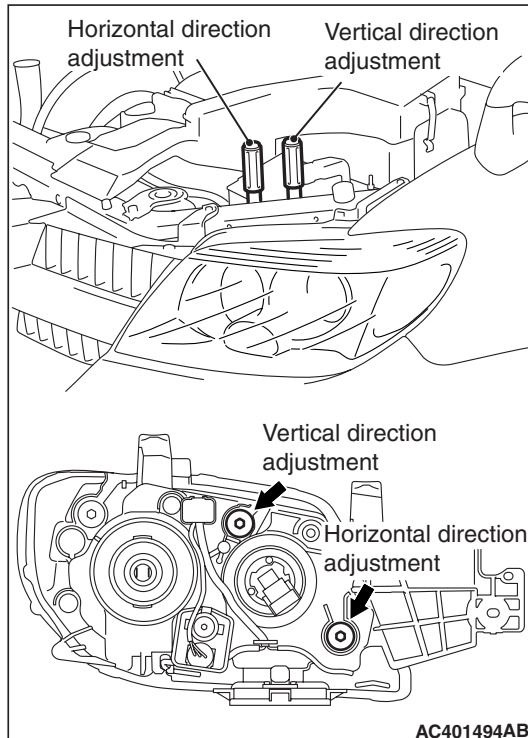
**Limit:**

**Vertical direction:** The headlamp beam should tilt downwards by 0.17° or more.

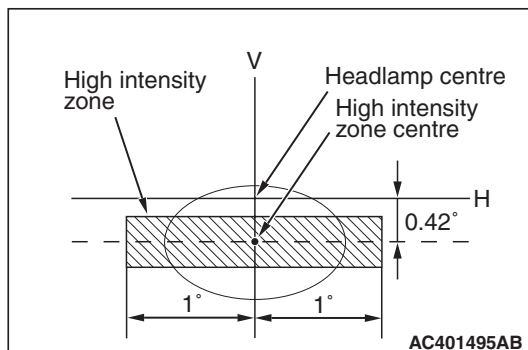
## HEADLAMP ADJUSTMENT (HIGH-BEAM)

**CAUTION**

- Do not cover a headlamp for more than three minutes to prevent the plastic headlamp lens deformation.
  - When adjusting one headlamp beam, make sure that another headlamp is off by disconnecting the connector from it. When reconnecting the connector, make sure that the headlamp beam is not disturbed accidentally.
- The high-beam headlamp should project on the screen upper edge of the beam (cut-off).



- If not the case, turn the adjusting screws to achieve the specified high-beam cut-off location on the aiming screen.



**Standard value:**

**Vertical direction:** 0.42° below horizontal (H)

**Horizontal direction:** High-intensity zone centre should be along the vertical line (V).

**Limit:**

**Vertical direction:** 0.09° from the standard value

**Horizontal direction:** The vertical headlamp beam range should be within 1°.

## LUMINOUS INTENSITY MEASUREMENT

M1542001000613

- Set the headlamps to high-beam.
- Using a photometer, and following its manufacturer's instruction manual, measure the headlamp centre intensity and check to be sure that the limit value is satisfied.

**Limit: 30,000 cd or more {When a screen is set 25m ahead of the vehicle}**

*NOTE: When measuring the intensity, maintain an engine speed of 2,000 r/min., with the battery fully charged.*

*There may be special local regulations pertaining to headlamp intensity. Be sure to make any adjustments necessary to satisfy such regulations.*

*If an illuminometer is used to make the measurements, convert its values to photometer values by using the following formula.*

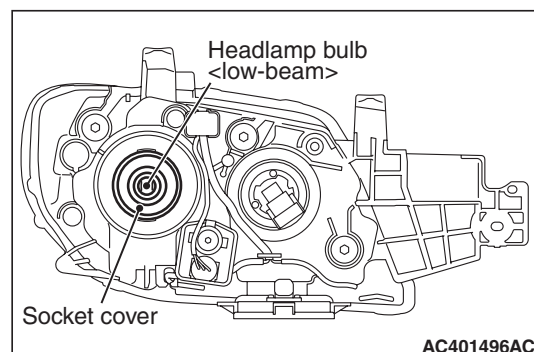
$$I = E \times r^2:$$

- I = Intensity (cd)
- E = Illumination (lux)
- r = Distance (m) from headlamps to illuminometer

## BULB REPLACEMENT

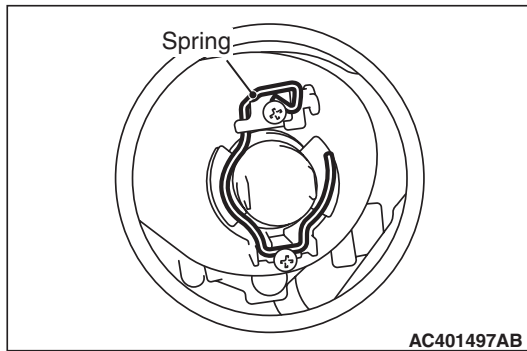
M1542001301349

## Headlamp bulb (low-beam)

**CAUTION**

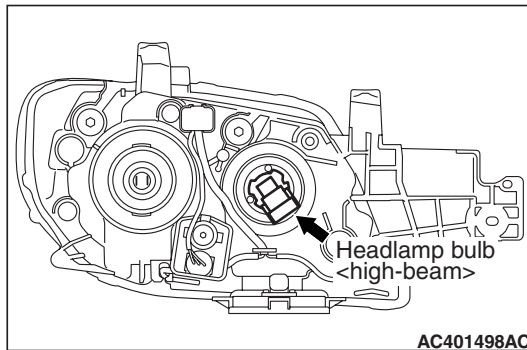
**Do not touch the surface of the bulb with hands or dirty gloves as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.**

- Disconnect the connector.
- Remove the socket cover.



3. Release the bulb securing spring, and remove the bulb.
4. Replace the valve, and connect the connector securely.

### Headlamp bulb (high-beam)



#### **CAUTION**

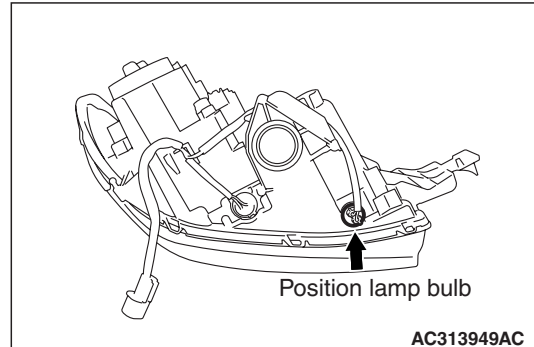
Do not touch the surface of the bulb with hands or dirty gloves as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

1. Disconnect the connector.
2. Twist the socket to withdraw the bulb.
3. Replace the valve, and connect the connector securely.

### Position lamp bulb

#### **CAUTION**

Do not touch the bulb surface bare-handed or with dirty gloves. If dirt is attached on surface of the bulb, immediately use alcohol or thinner to remove dirt, and install the bulb after well dried.

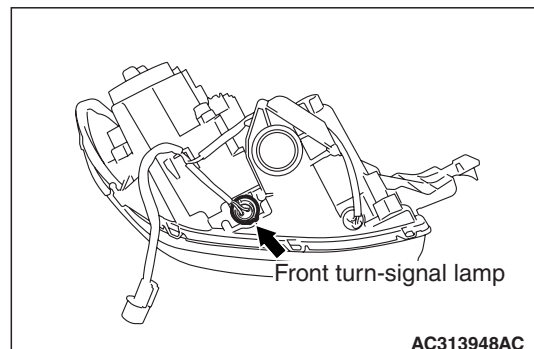


1. Twist the socket to withdraw the bulb.
2. Replace the valve, and connect the connector securely.

### Front turn-signal lamp bulb

#### **CAUTION**

Do not touch the bulb surface bare-handed or with dirty gloves. If dirt is attached on surface of the bulb, immediately use alcohol or thinner to remove dirt, and install the bulb after well dried.



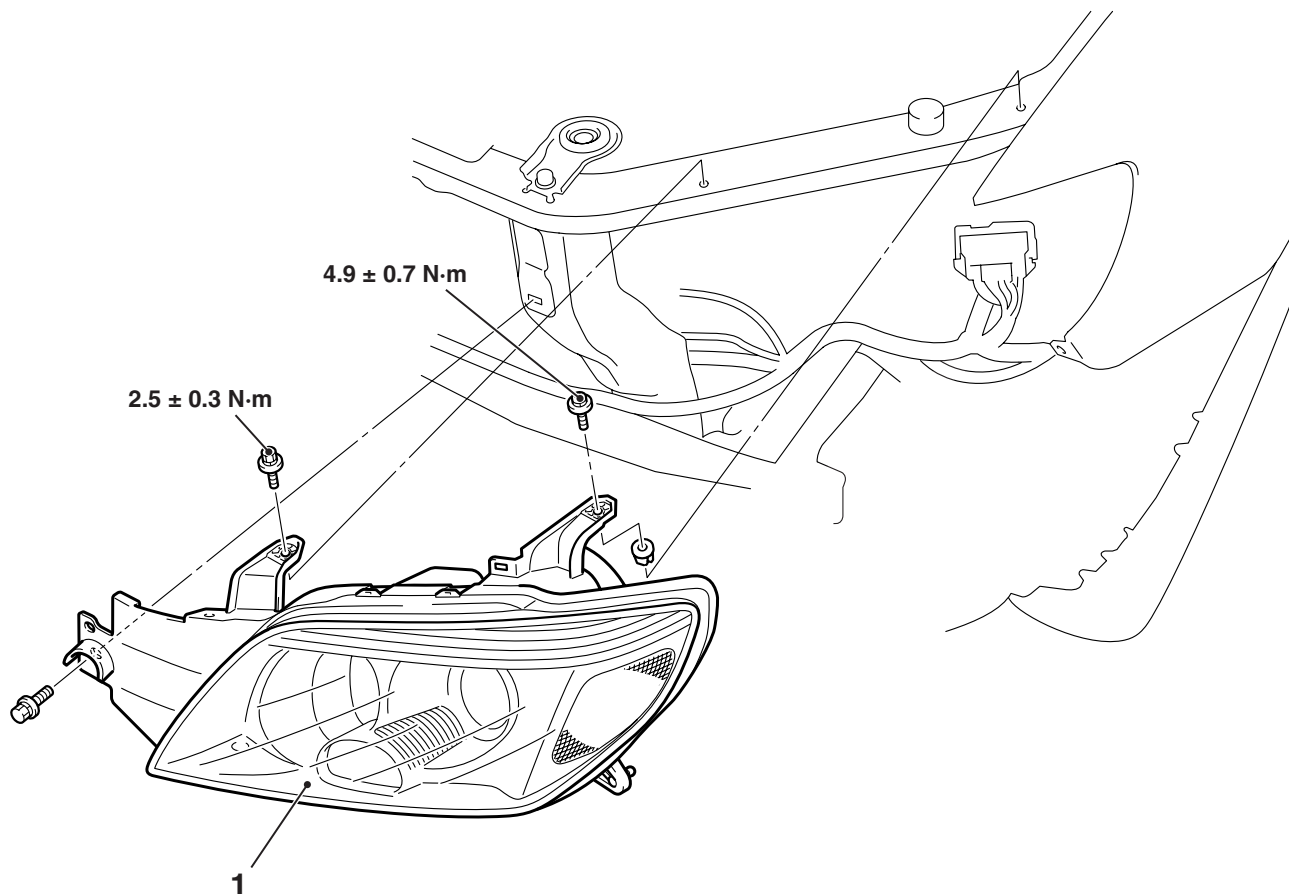
1. Twist the socket to withdraw the bulb.
2. Replace the valve, and connect the connector securely.



## HEADLAMP

## REMOVAL AND INSTALLATION

M1542001800619

**Post-installation Operation**Headlamp Aiming Adjustment (Refer to [P.54A-44](#)).

AC401503AB

**Removal steps**

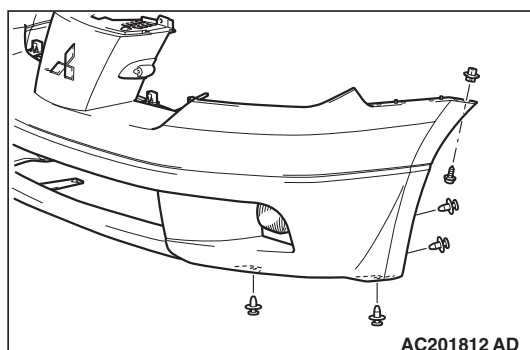
- Front bumper assembly (Refer to GROUP 51, Front Bumper Assembly [P.51-3](#)).

&lt;&lt;A&gt;&gt;

1. Headlamp assembly

**REMOVAL SERVICE POINT**

## &lt;&lt;A&gt;&gt; HEADLAMP ASSEMBLY REMOVAL



AC201812 AD

1. Remove half of the front bumper assembling clips and bolts.

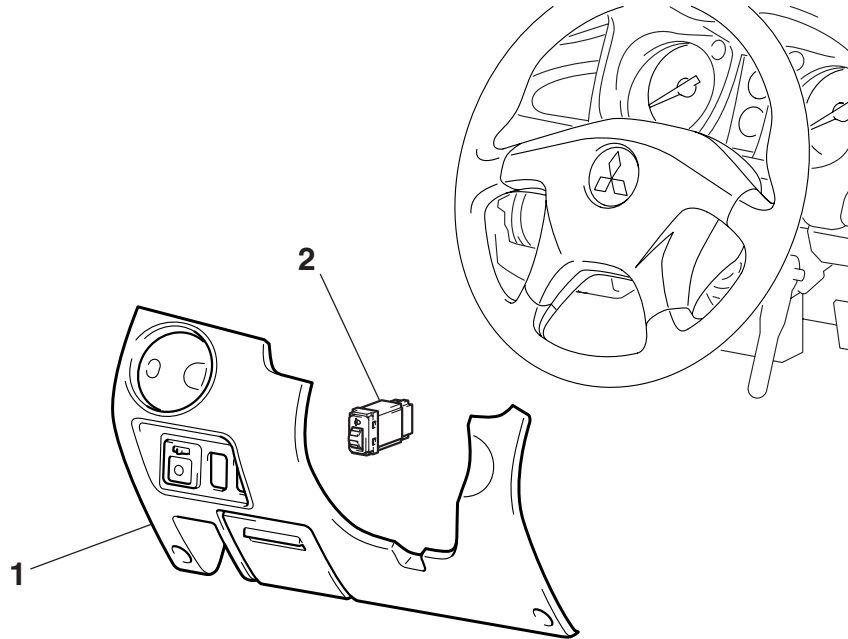
*NOTE: The figure illustrates the procedures to remove the headlamp assembly (LH).*

2. Slide the front bumper down to remove the headlamp assembly.

## HEADLAMP LEVELING SWITCH

## REMOVAL AND INSTALLATION

M1542013700136



AC210845AE

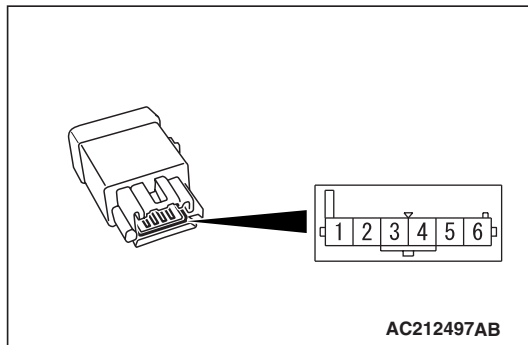
**Removal steps**

1. Instrument lower panel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles>)
2. Headlamp leveling switch

## INSPECTION

M1542011201105

## HEADLAMP LEVELING SWITCH RESISTANCE CHECK



Terminal No.	Switch position	Resistance
4 - 6	0	750 ohms
	1	1050 ohms
	2	1410 ohms
	3	1710 ohms
	4	2010 ohms
5 - 6	0, 1, 2, 3, 4	2830 ohms

## FOG LAMP

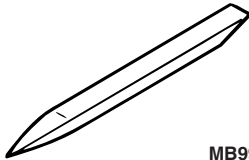
## SERVICE SPECIFICATIONS

M1542000300257

Item	Standard value
Fog lamp aiming (vertical direction)	Within 45 mm (0.86°) to 75 mm (1.44°) below the vertical centre line ahead of fog lamp.

## SPECIAL TOOL

M1542000600634

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of instrument panel driver's side garnish, meter bezel and fog lamp switch

## TROUBLESHOOTING

M1542000702057

When the front fog lamp switch is turned to ON with the tail lamp or the headlamp on (the tail lamp switch or the headlamp switch is ON), the fog lamp relay turns on, and the fog lamps will illuminate.

If the tail lamps or the headlamps are turned off with the lighting switch OFF while the fog lamps are on, the front fog lamps turn off at the same time to prevent unattended operation.

If the tail lamps are turned off by the headlamp automatic shutdown function, the fog lamps turn off at the same time. However, if the tail lamps illuminate again, the fog lamps do not.

The front fog lamps are controlled by the Smart Wiring System (SWS). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

## ON-VEHICLE SERVICE

## FOG LAMP AIMING

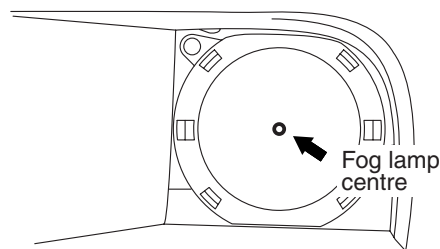
M1542001100784

## PRE-AIMING INSTRUCTIONS

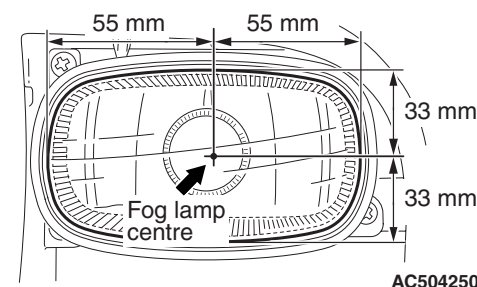
1. Inspect for badly rusted or faulty fog lamp assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tyre inflation, and adjust if necessary.
4. If fuel tank is not full, place a weight in the trunk of the vehicle to simulate weight of a full tank (0.8 kg) per liter.]

5. There should be no other load in the vehicle other than driver or substituted weight of approximately 75 kg placed in driver's position.
6. Thoroughly clean the fog lamp lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 3 m away from the bulb centre-marks on the fog lamp lens.
8. Rock the vehicle sideways to allow the vehicle to assume its normal position.
9. Bounce the front suspension through three (3) oscillations by applying the body weight to the hood or bumper.

## &lt;Vehicles for General Export and GCC&gt;

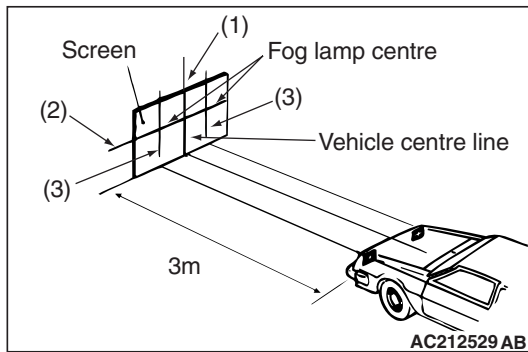


## &lt;Vehicles for Australia and New Zealand&gt;



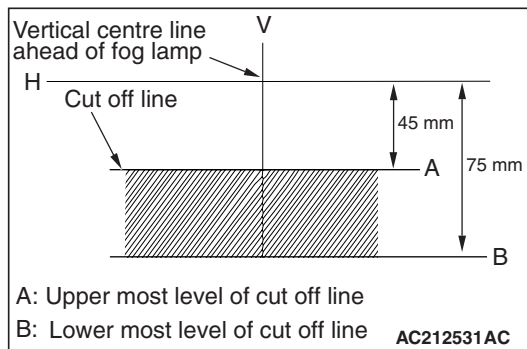
AC504250AB

10. Measure the centre of the fog lamps as shown in the illustration.



11. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
- (1) Position a vertical tape or mark so that it is aligned with the vehicle centre line.
  - (2) Measure the distance from the centre of the fog lamp lens to the floor. Transfer the measurement to the screen. Horizontal tape or mark on the screen is for reference of vertical adjustment.
  - (3) Measure the distance from the centre line of the vehicle to the centre of each fog lamp. Transfer the measurement to the screen. Vertical tape or mark on the screen is for reference to the centre line of each fog lamp.

## FOG LAMP ADJUSTMENT



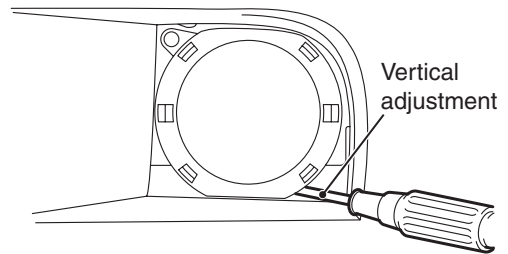
1. Check if the beam shining onto the screen is at the standard value.

**Standard value:**

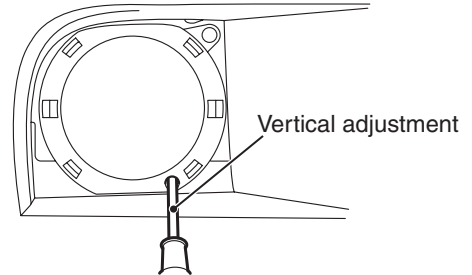
**Fog lamp cut off line (Vertical direction):**  
Within 45 mm (0.86°) to 75 mm (1.44°) below the vertical centre line ahead of fog lamp.

<Vehicles for General Export and GCC>

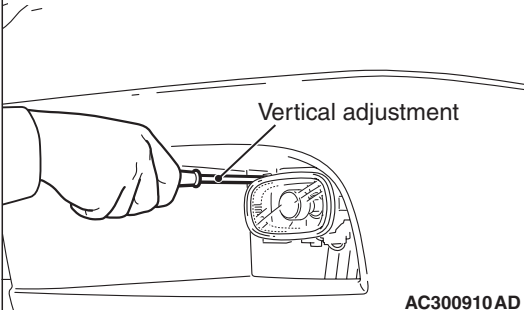
L. H. side



R. H. side



<Vehicles for Australia and New Zealand>



2. If it is not within the standard value range, adjust by turning the adjusting screw.

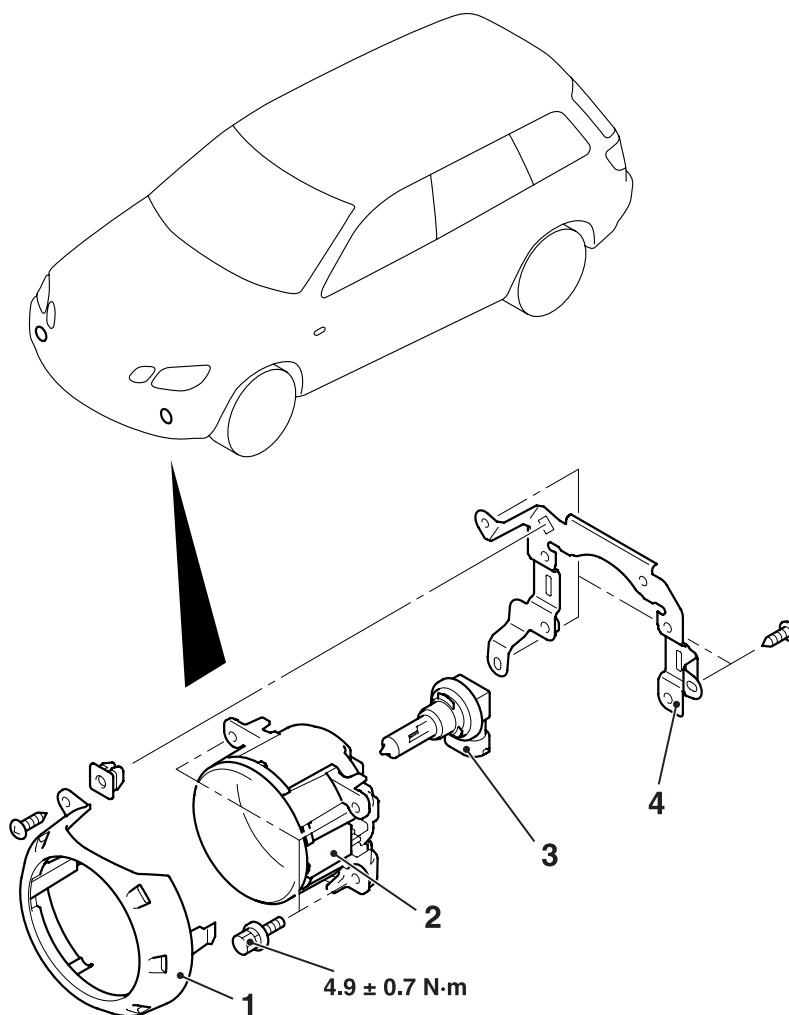
**NOTE:** The horizontal direction is non-adjustable. If deviation of the lamp beam axis exceeds the standard value, check that the mounting location or some other points are not faulty.

## FOG LAMP

## REMOVAL AND INSTALLATION

M1542001500856

&lt;Vehicles for General Export and GCC&gt;



AC402054AC

**Removal steps**

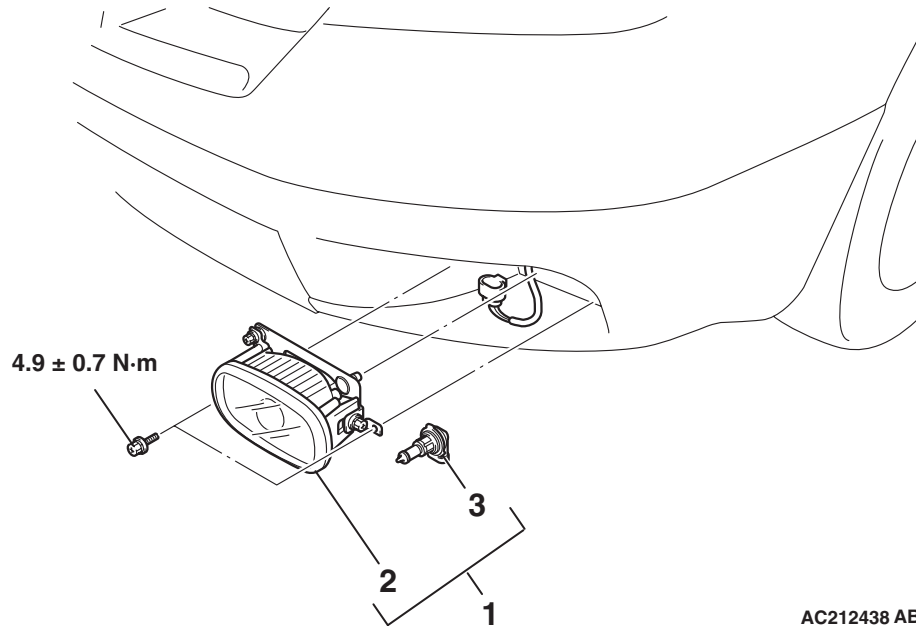
1. Fog lamp cover
2. Fog lamp
3. Fog lamp bulb

**Removal steps (Continued)**

- Front bumper (Refer to 51, Front bumper [P.51-3](#)).
- 4. Fog lamp bracket

&lt;&lt;A&gt;&gt;

<Vehicles for Australia and New Zealand>



**Removal steps**

1. Fog lamp assembly

<<A>>

AC212438 AB

**Removal steps (Continued)**

2. Fog lamp
3. Fog lamp bulb

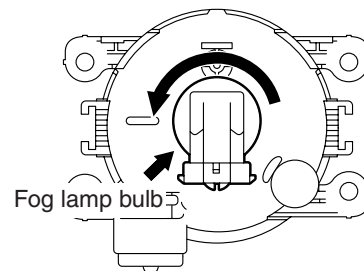
**REMOVAL SERVICE POINT**

<<A>> FOG LAMP BULB REMOVAL

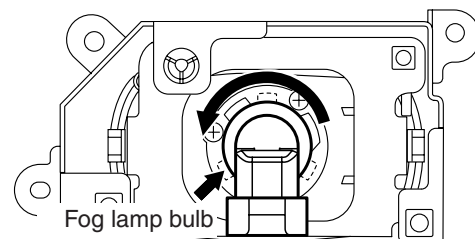
**CAUTION**

- Use the specified genuine part when replacing the bulb.
- Do not touch the glass portion of bulb with bare hand or dirty gloves. Should the glass portion be spoiled, remove the soil as soon as possible using alcohol or thinner and let it dry before mounting.

<Vehicles for General Export and GCC>



<Vehicles for Australia and New Zealand>



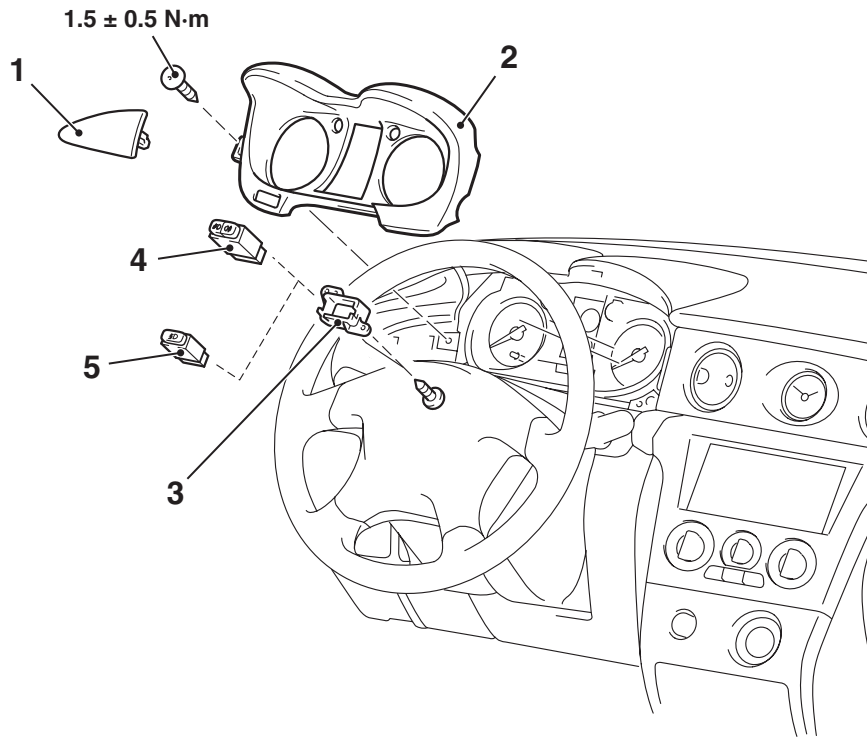
AC504253AB

Turn the fog lamp bulb left to remove it.

## FOG LAMP SWITCH

## REMOVAL AND INSTALLATION

M1542011700118



AC309641AB

**Removal steps**

1. Instrument panel driver's side garnish (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Meter bezel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)

**Removal steps (Continued)**

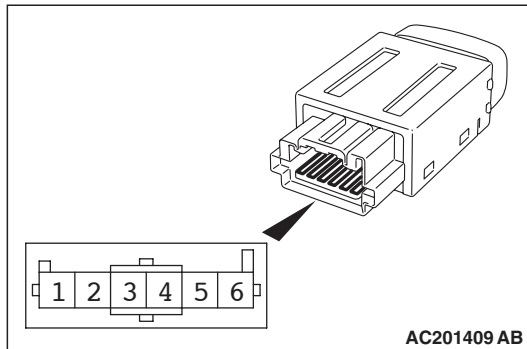
3. Fog lamp switch bracket
4. Fog lamp switch (front and rear fog lamp switch) <Vehicles with rear fog lamp>
5. Fog lamp switch (front fog lamp switch) <Vehicles without rear fog lamp>



## INSPECTION

FRONT FOG LAMP SWITCH CONTINUITY  
CHECK

M1542011201677



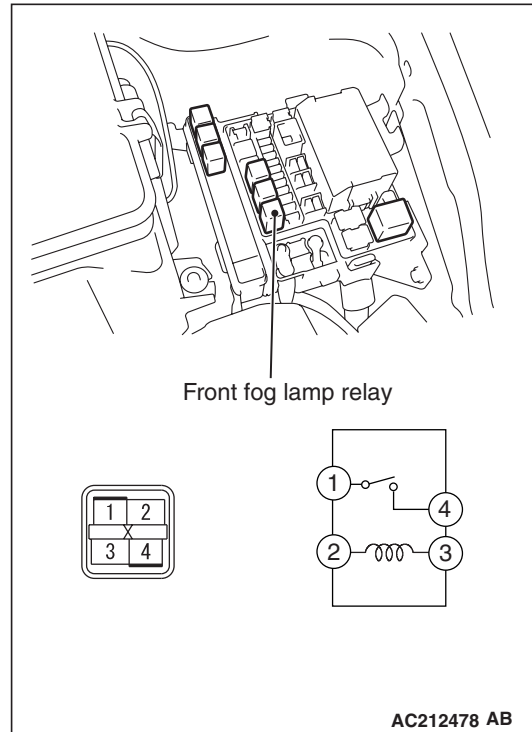
## &lt;Vehicles without rear fog lamp&gt;

Switch position	Tester connection	Specified condition
Pressed	1 – 2	Less than 2 ohms
Released	1 – 2	Open circuit

## &lt;Vehicles with rear fog lamp&gt;

Switch position	Tester connection	Specified condition
Pressed	5 – 6	Less than 2 ohms
Released	5 – 6	Open circuit

## FRONT FOG LAMP RELAY CHECK

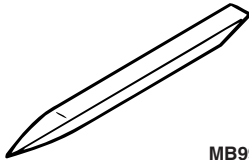


Battery voltage	Tester connection	Specified condition
Not supplied	1 – 4	Open circuit
<ul style="list-style-type: none"><li>Connect terminal 2 to the positive battery terminal</li><li>Connect terminal 3 to the negative battery terminal</li></ul>	1 – 4	Less than 2 ohms

REAR FOG LAMP <Vehicles for Argentina>

SPECIAL TOOL

M1542000600690

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of instrument panel driver's side garnish, meter bezel and fog lamp switch

REAR FOG LAMP TROUBLESHOOTING

M1542000702068

If the rear fog lamp switch is turned ON when the headlamp or the front fog lamp is turned ON, the rear fog lamp is switched ON and OFF alternatively.  
If the headlamp and the front fog lamp, the rear fog lamp is turned OFF at the same time.

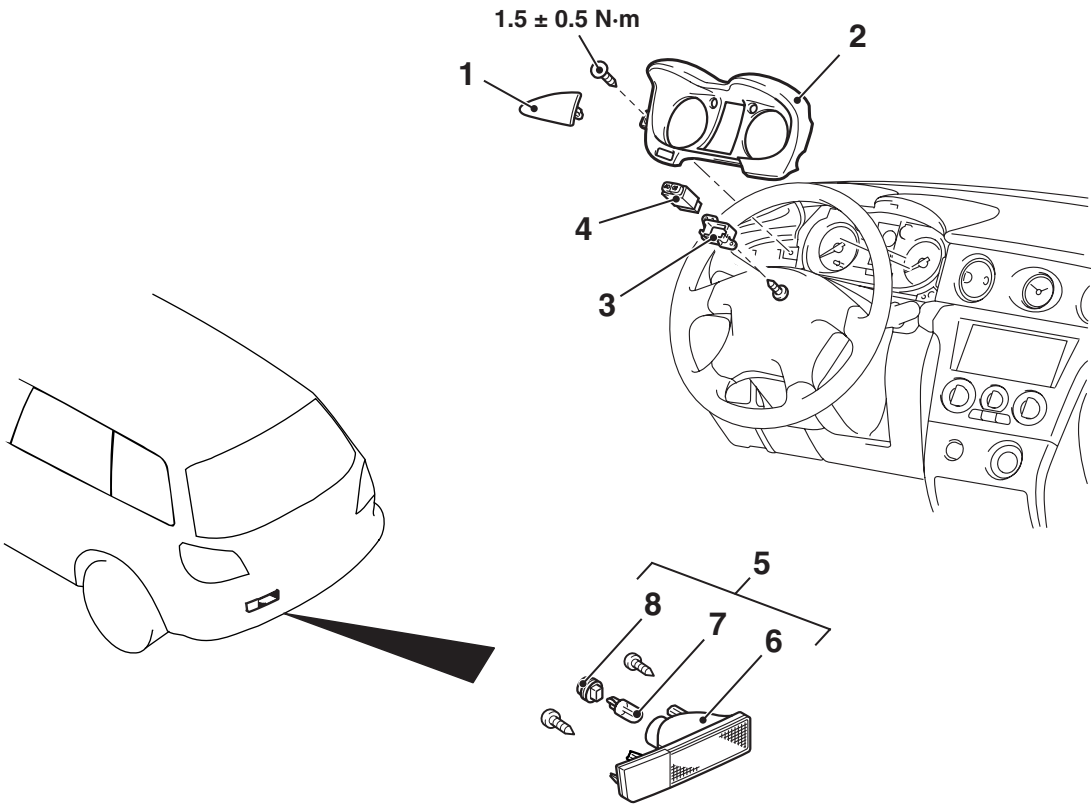
The fog lamps are controlled by the Smart Wiring System (SWS). For Troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

REAR FOG LAMP

REMOVAL AND INSTALLATION

M1542009800130



**Rear fog lamp switch removal steps**

1. Instrument panel driver's side garnish (Refer to GROUP 52A, Instrument panel assembly P.52A-3 <L.H.drive vehicles>)
2. Meter bezel (Refer to GROUP 52A, Instrument panel assembly P.52A-3 <L.H.drive vehicles>)
3. Fog lamp switch bracket
4. Fog lamp switch (front fog lamp switch and rear fog lamp switch)

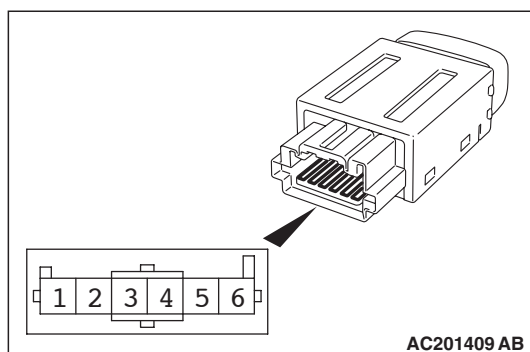
**Rear fog lamp removal steps**

- Rear bumper (Refer to GROUP 51, Rear bumper P.51-8).
- 5. Rear fog lamp assembly
- 6. Rear fog lamp body and lens
- 7. Socket
- 8. Bulb

**INSPECTION**

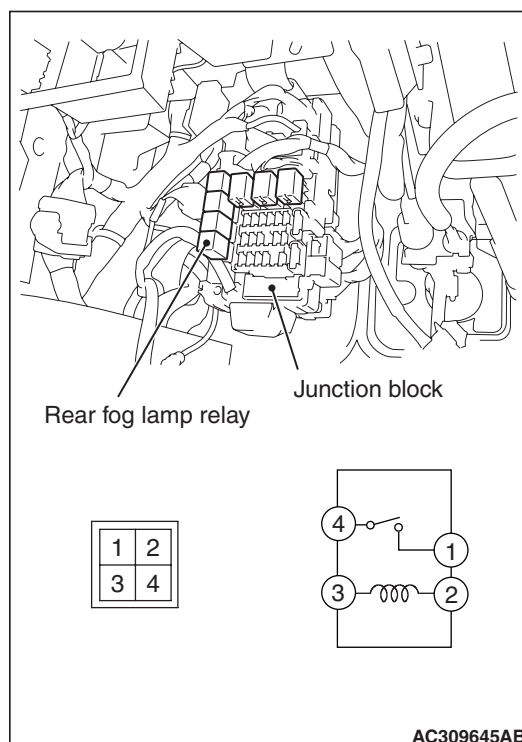
**REAR FOG LAMP SWITCH CONTINUITY CHECK**

M1542007700074



Switch position	Tester connection	Specified condition
Pressed	1 – 2	Less than 2 ohms
Released	1 – 2	Open circuit

**REAR FOG LAMP RELAY CHECK**

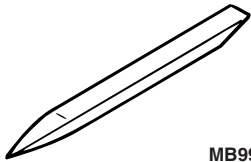


Battery voltage	Tester connection	Specified condition
Not supplied	1 – 4	Open circuit
<ul style="list-style-type: none"> <li>• Connect terminal 3 to the positive battery terminal</li> <li>• Connect terminal 2 to the negative battery terminal</li> </ul>	1 – 4	Less than 2 ohms

SIDE TURN-SIGNAL LAMP

SPECIAL TOOL

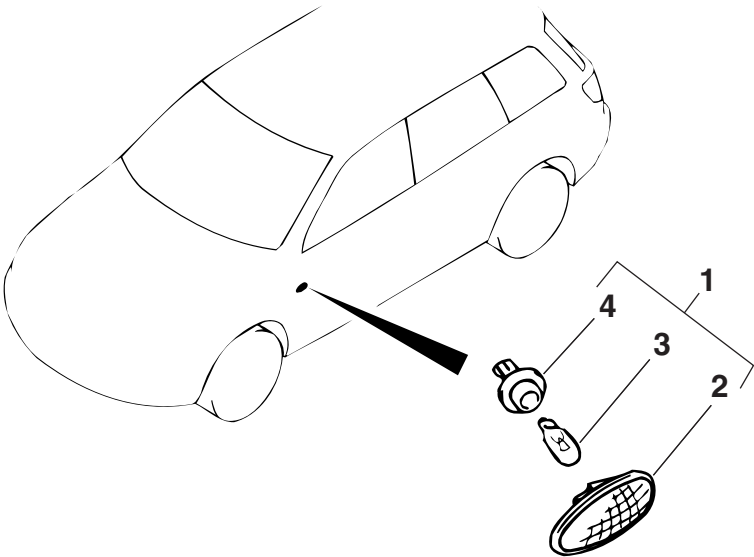
M1542000600656

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of side turn-signal lamp

SIDE TURN-SIGNAL LAMP

REMOVAL AND INSTALLATION

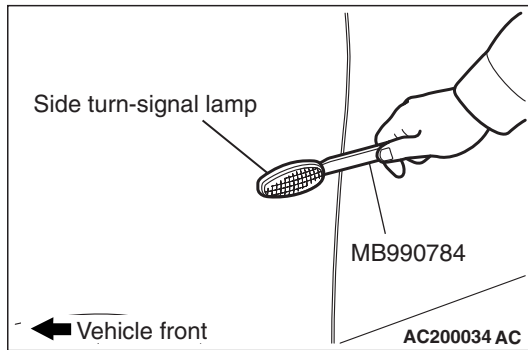
M1542003300104



AC203309 AD

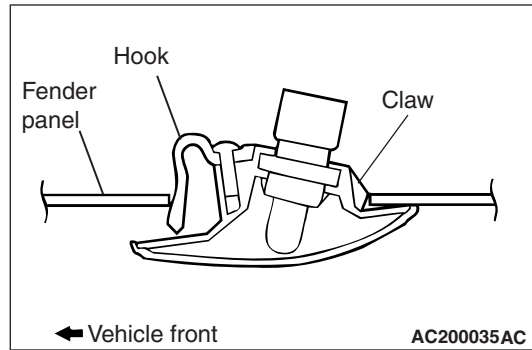
- Removal steps**
- <<A>> >>A<<
1. Side turn-signal lamp assembly
  2. Side turn-signal lamp
  3. Bulb
  4. Socket

## REMOVAL SERVICE POINT

<<A>> SIDE TURN-SIGNAL LAMP  
REMOVAL

Use a special tool ornament remover (MB990784), etc. to remove the side turn-signal lamp by pushing the fender forward, bending the hook, and then unclamping the thumb.

## INSTALLATION SERVICE POINT

>>A<< SIDE TURN-SIGNAL LAMP INSTAL-  
LATION

Clamp the thumb on the fender panel the assemble the side turn-signal lamp.

## ROOM LAMP

## TROUBLESHOOTING

M1542000702079

## Room lamp delay shutdown function

The room lamp off is delayed by ETACS-ECU. The lamps off delay time vary according to the conditions. The control details are as follows. The lamp delay off Yes/No and delay time can be set with the settings (adjustment function). For adjustment methods and adjustment details (post-adjustment operations). The room lamps are controlled by the Smart Wiring System (SWS). For adjustment procedure, refer to GROUP 54B, On-vehicle Service [P.54B-155](#).

- The room lamp lamps up if the ignition switch is at the "LOCK" (OFF) position and either of the doors are opened (either of the door switches: ON). At this time, if all doors are closed (all door switches: OFF) then the lamp will gradually dim down to lamps off in about 30 seconds.

**NOTE:** When the lamps are dimmed and the ignition switch is turned ON or if the door is locked, then the dimming operations stop and the lamps are turned OFF.

- When the ignition switch is at the ON position and one of the doors are opened (one of the door switches: ON) then the room lamp will lamp up. At this time, if all doors are closed (all door switches: OFF) then the lamps will dim out.
- When the ignition key is pulled out the room lamp lamps up and then will dim out in 30 seconds. The lamp will dim out if the ignition key is inserted again and the door is locked while the timer is activated.

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

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

Interior lamp automatic shutoff function  
<vehicles with keyless entry system>

The interior lamp automatic shutoff function, dims out the room lamp and other interior lamps by activating the keep relay built-in the ETACS-ECU when the ignition switch is OFF and the multi-purpose fuse loaded signals built-in the ETACS-ECU is ON and 30 minutes passes. The lamps lamp back up if the ignition switch is turned to the ON position or either of the doors is opened (either of the door switches: ON). The function Yes/No feature can be changed with the settings (adjustment function). For adjustment methods and adjustment details (post-adjustment operations).

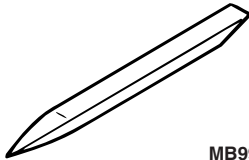
The room lamps are controlled by the Smart Wiring System (SWS). For adjustment procedure, refer to GROUP 54B, On-vehicle Service [P.54B-155](#). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

REAR COMBINATION LAMP

SPECIAL TOOL

M1542000601154

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of ventilation cap and rear combination lamp assembly

REAR COMBINATION LAMP DIAGNOSIS

M1542000702080

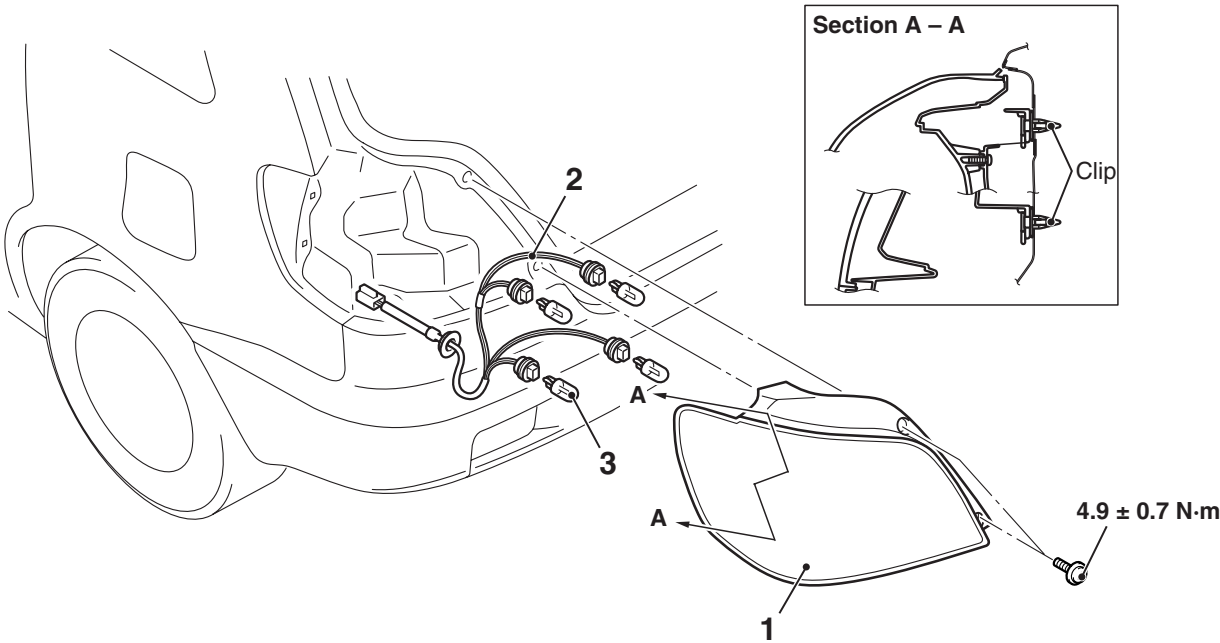
The lamps setup on the rear combination lamp is controlled in the same manner as the lamps of the headlamp assembly. For details go to the reference. For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

REAR COMBINATION LAMP

REMOVAL AND INSTALLATION

M1542003900720



AC401504AB

Removal steps

- Ventilation cap (Refer to GROUP 52A, Trims [P.52A-19](#).)
- Rear combination lamp connector connection

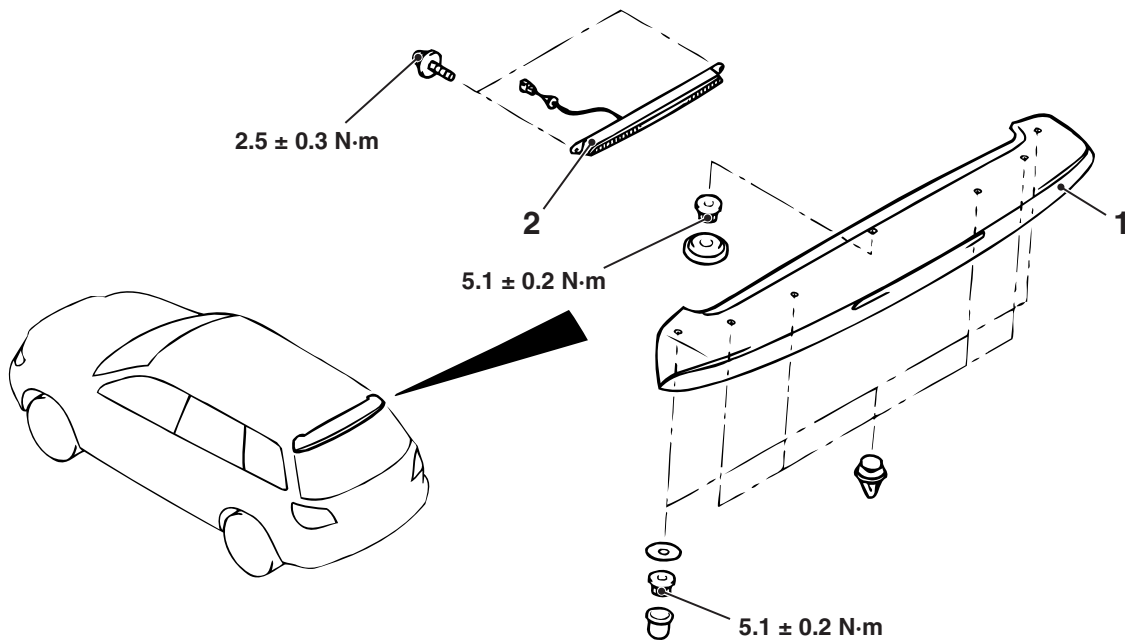
Removal steps (Continued)

1. Rear combination lamp
2. Harness assembly
3. Bulb

## HIGH-MOUNTED STOP LAMP

### REMOVAL AND INSTALLATION

M1542005100623



AC401728 AB

#### Removal steps

- Tailgate upper trim (Refer to GROUP 52A, Tailgate trim [P.52A-25](#)).
- High-mounted stop lamp connector connection

#### Removal steps (Continued)

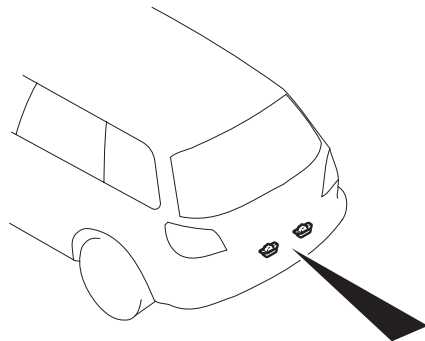
1. Spoiler
2. High-mounted stop lamp



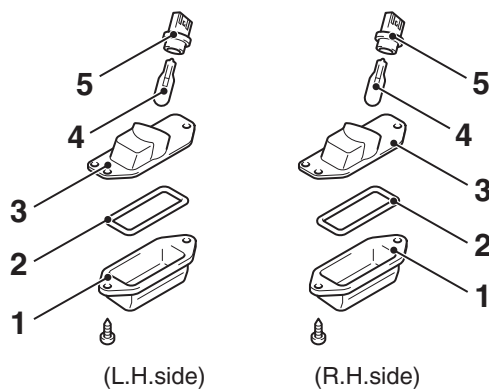
## LICENCE PLATE LAMP

## REMOVAL AND INSTALLATION

M1542004200445

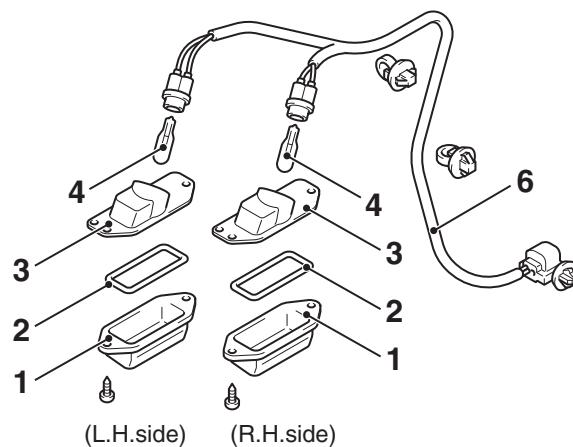


&lt;Vehicles for Argentina&gt;

**Removal steps**

1. Licence plate lamp lens
2. Packing
3. Licence plate lamp body
4. Licence plate lamp bulb
5. Socket assembly <Vehicles for Argentina>

&lt;Except for Argentina&gt;

**Removal steps (Continued)**

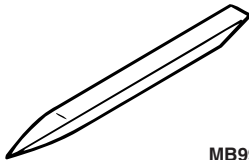
- Rear bumper assembly (Refer to GROUP 51, Rear bumper assembly [P.51-6.](#))
- 6. Licence plate wiring harness <Except for Argentina>

AC401625AC

# HAZARD WARNING LAMP SWITCH

## SPECIAL TOOL

M1542000600678

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre lower panel assembly

## TROUBLESHOOTING

M1542000702091

### FLASHER TIMER FUNCTION

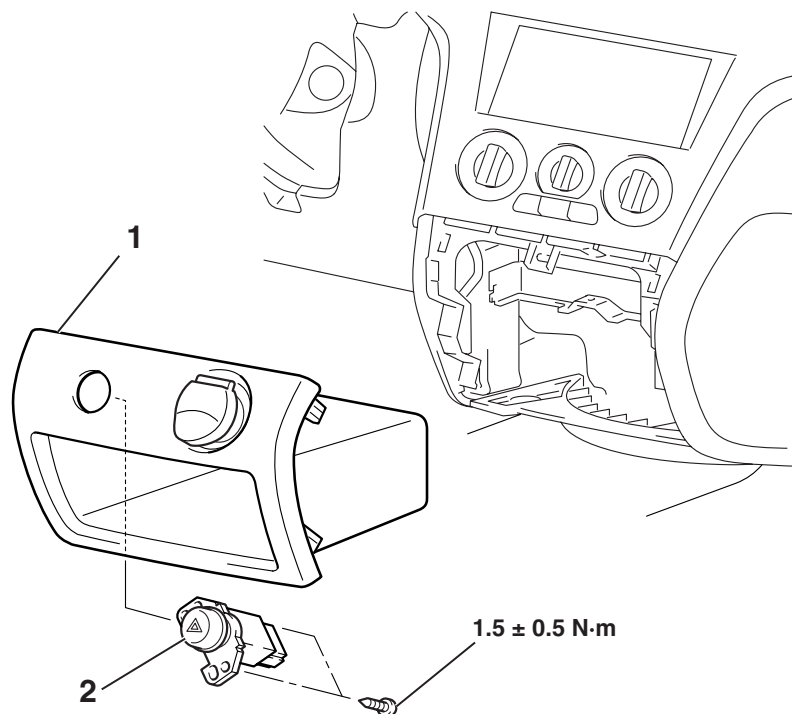
The hazard warning lamps (flasher timer function) are controlled by the Smart Wiring System (SWS). For troubleshooting, refer to respective Groups below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

## HAZARD WARNING LAMP SWITCH

### REMOVAL AND INSTALLATION

M1542006600502



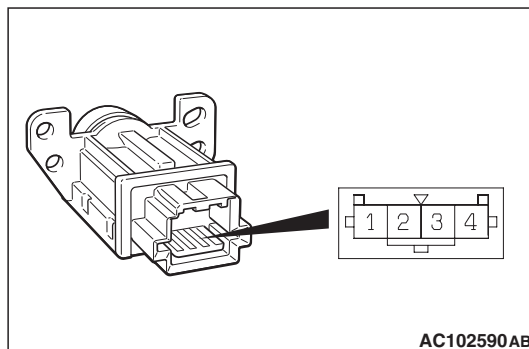
AC100541 AC

#### Removal steps

1. Centre lower panel assembly (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Hazard warning lamp switch

## INSPECTION

M1542011200704

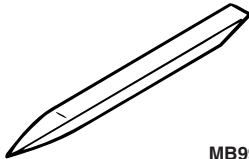
HAZARD WARNING LAMP SWITCH CON-  
TINUITY CHECK

Switch position	Tester connection	Specified condition
Released	1 – 2	Open circuit
Pressed	1 – 2	Less than 2 ohms

## COLUMN SWITCH

## SPECIAL TOOL

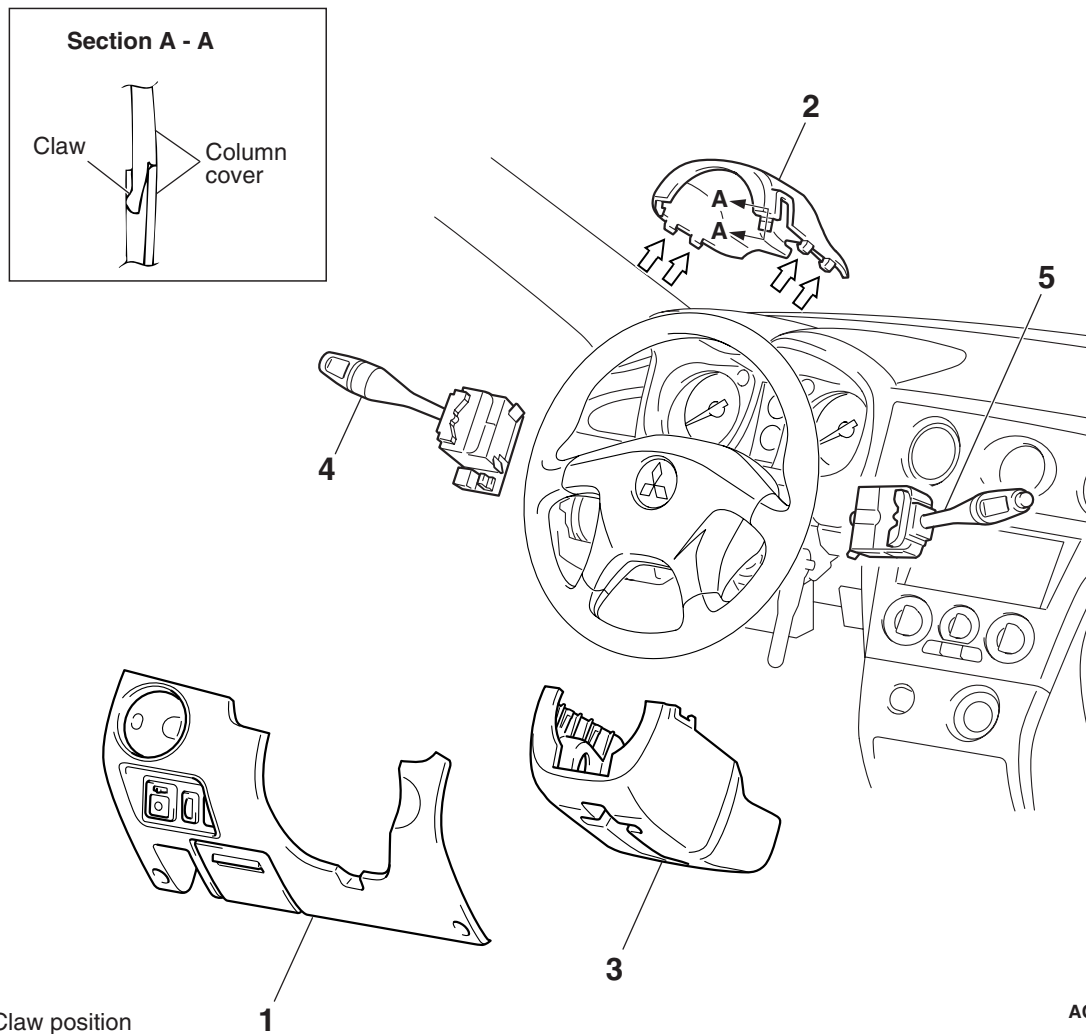
M1542000600689

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of column cover

## COLUMN SWITCH

## REMOVAL AND INSTALLATION

M1543009100509



AC100538AC

**Removal steps**

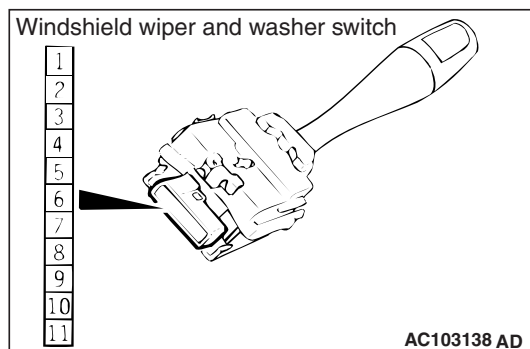
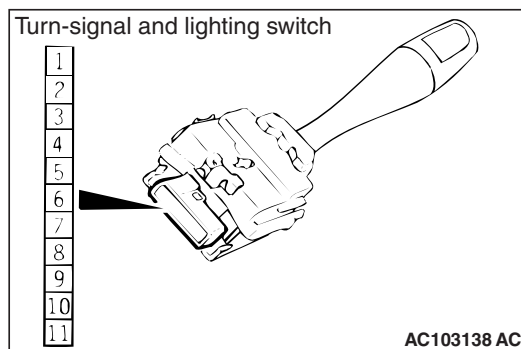
1. Instrument panel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Column cover upper

**Removal steps (Continued)**

3. Column cover lower
4. Turn-signal and lighting switch
5. Windshield wiper and washer switch

## INSPECTION

M1542011201688

WINDSHIELD WIPER AND WASHER  
SWITCH CHECK <L.H. DRIVE VEHICLES>TURN-SIGNAL AND LIGHTING SWITCH  
CHECK <R.H. DRIVE VEHICLES>

Switch position	Tester condition	Specified condition
OFF	4 – 6, 5 – 6, 6 – 7, 6 – 8, 6 – 9, 6 – 10, 6 – 11	Open circuit
Windshield mist wiper switch	6 – 11	Less than 2 ohms
Windshield intermittent wiper switch	6 – 10	Less than 2 ohms
Windshield low-speed wiper switch	6 – 9	Less than 2 ohms
Windshield high-speed wiper switch	6 – 8	Less than 2 ohms
Windshield washer switch	6 – 7	Less than 2 ohms
Rear wiper switch	4 – 6	Less than 2 ohms
Rear washer switch	5 – 6	Less than 2 ohms

## NOTE:

- Measure intermittent volume switch resistance value between terminals 3 and 6. The measured resistance should change smoothly from approximately 0 ohm ("FAST" position) to 1 kilohm ("SLOW" position)
- On L.H. drive vehicles, integrated column ECU does not allow turn-signal and lighting switch continuity test. For inspection and diagnosis, refer to the respective Group below.
  - Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
  - Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

Switch position	Tester condition	Specified condition
OFF	3 – 4, 3 – 6, 3 – 7, 3 – 8, 3 – 9, 3 – 10, 3 – 11	Open circuit
Headlamp washer switch	3 – 4	Less than 2 ohms
Headlamp switch	3 – 6	Less than 2 ohms
Tail lamp switch	3 – 7	Less than 2 ohms
Passing switch	3 – 8	Less than 2 ohms
Dimmer switch	3 – 9	Less than 2 ohms
Turn-signal lamp switch (RH)	3 – 10	Less than 2 ohms
Turn-signal lamp switch (LH)	3 – 11	Less than 2 ohms

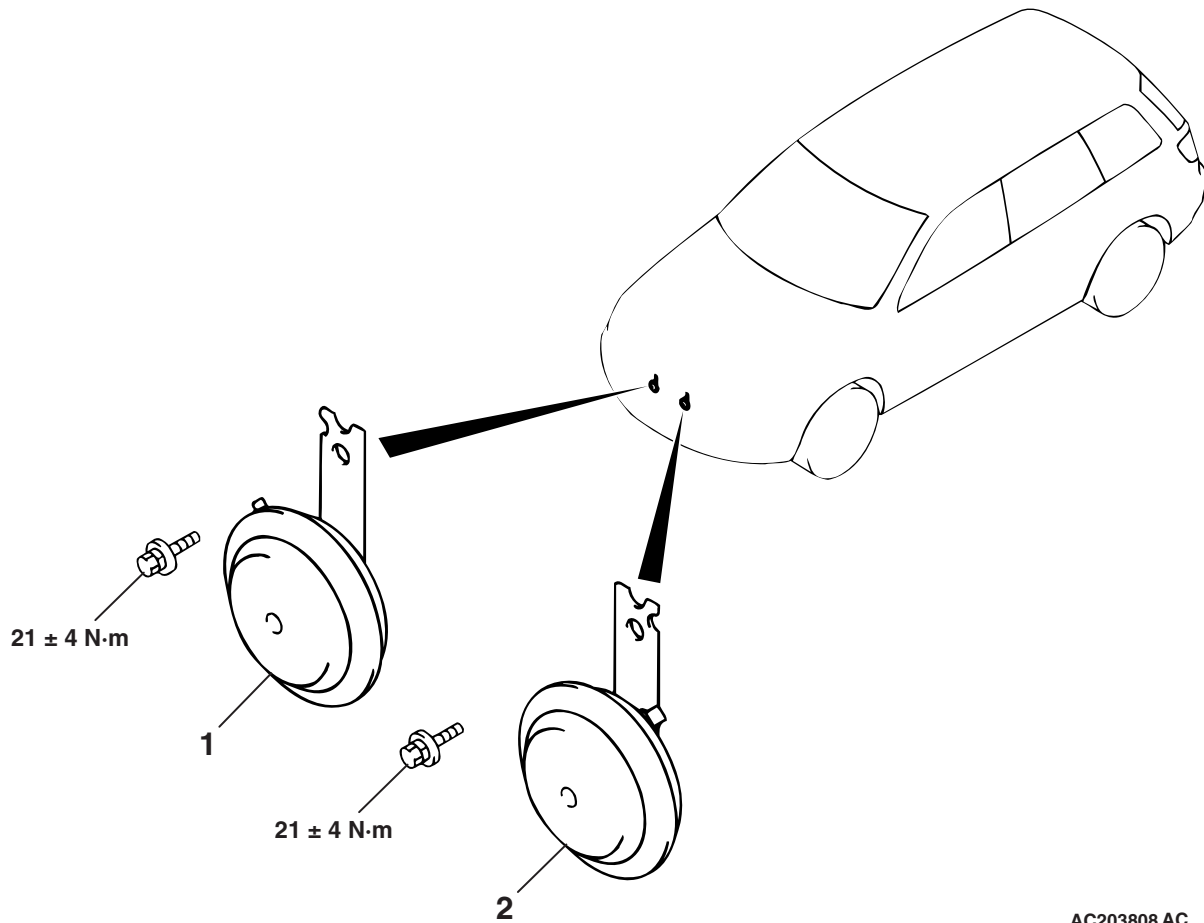
NOTE: On R.H. drive vehicles, integrated column ECU does not allow windshield wiper switch continuity test. For inspection and diagnosis, refer to the respective Group below.

- Not using SWS monitor: GROUP 54B, Troubleshooting [P.54B-25](#).
- Using SWS monitor: GROUP 54C, Troubleshooting [P.54C-18](#).

## HORN

### REMOVAL AND INSTALLATION

M1543007900383



AC203808 AC

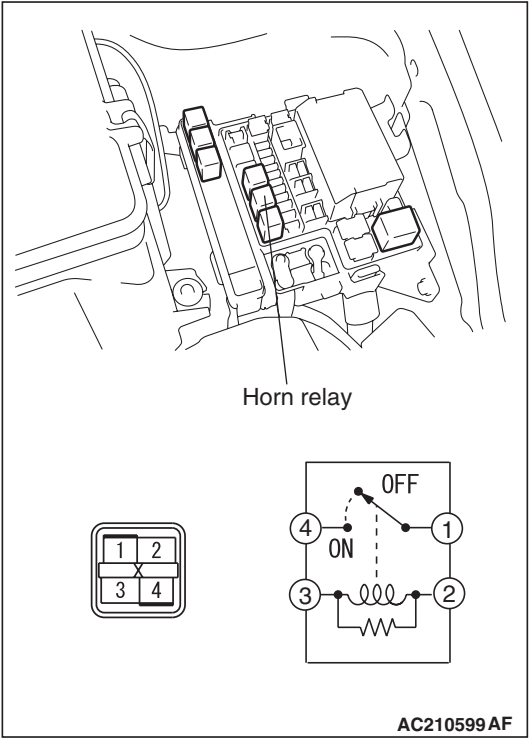
#### Removal Steps

1. Horn <LO>
2. Horn <HI>

INSPECTION

M1543006500036

HORN RELAY CONTINUITY CHECK



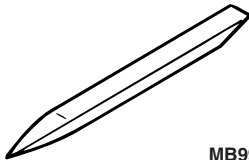
Battery voltage	Tester connection	Specified condition
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"><li>Connect terminal 2 to the positive battery terminal</li><li>Connect terminal 3 to the negative battery terminal</li></ul>	1 – 4	Less than 2 ohms



## CLOCK

## SPECIAL TOOL

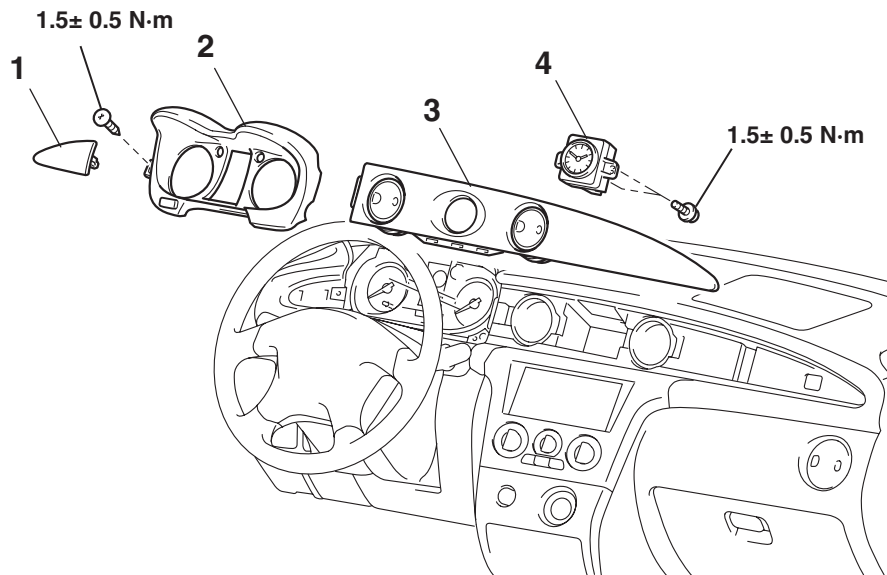
M1543000602365

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of instrument panel driver's side garnish, meter bezel and instrumental panel centre clock panel

## CLOCK

## REMOVAL AND INSTALLATION

M1543005900279



AC100537 AC

**Removal steps**

1. Instrument panel driver's side garnish (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Meter bezel (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)

**Removal steps (Continued)**

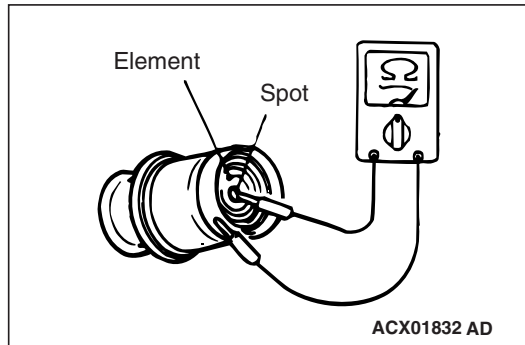
3. Instrument panel clock garnish (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
4. Clock

## CIGARETTE LIGHTER

### INSPECTION

M1543005700220

### CIGARETTE LIGHTER CHECK

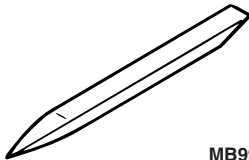


- Take out the plug, and check for a worn edge on the element spot connection, and for shreds of tobacco or other material on the element.
- Using an ohmmeter, check that the element resistance value is 1.7 ohms.

## ACCESSORY SOCKET

## SPECIAL TOOL

M1543000601469

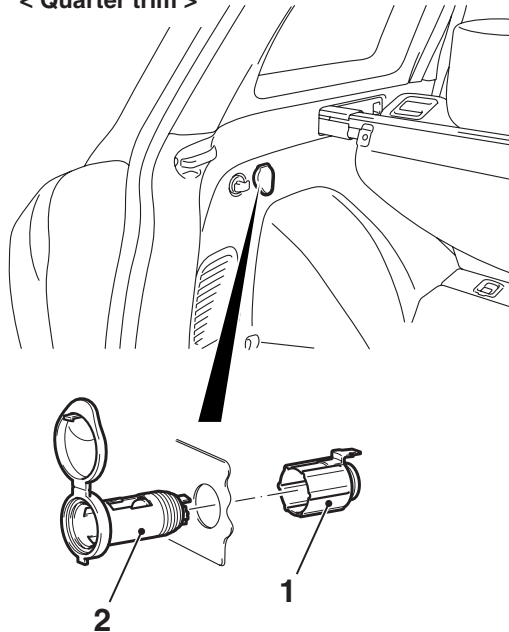
Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre lower panel assembly

## ACCESSORY SOCKET

## REMOVAL AND INSTALLATION

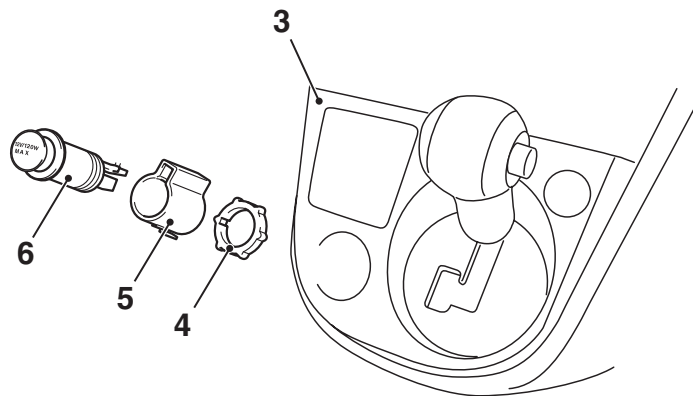
M1543008900405

## &lt; Quarter trim &gt;

**Removal Steps <Quarter trim >**

- Quarter trim lower (LH) (Refer to GROUP 52A, Trim [P.52A-19](#))
- Socket case
- Accessory socket

## &lt;Gear shift lever panel (Vehicles for South Africa)&gt;

**Removal Steps <Gear shift lever panel >**

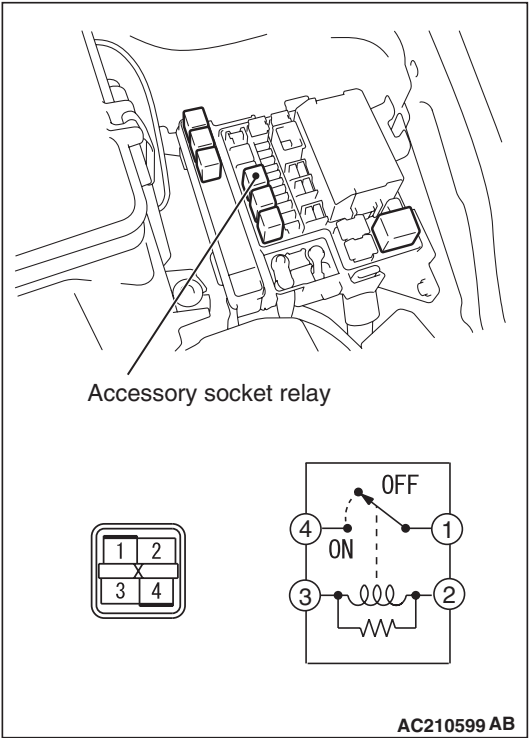
- Gear shift lever panel (Refer to GROUP 52A, Instrument panel assembly [P.52A-9](#) <R.H.drive vehicles>)
- Fixing ring
- Gear shift lever panel
- Accessory socket

AC309773AB

INSPECTION

M1543009000171

ACCESSORY SOCKET RELAY CONTINU-  
ITY CHECK

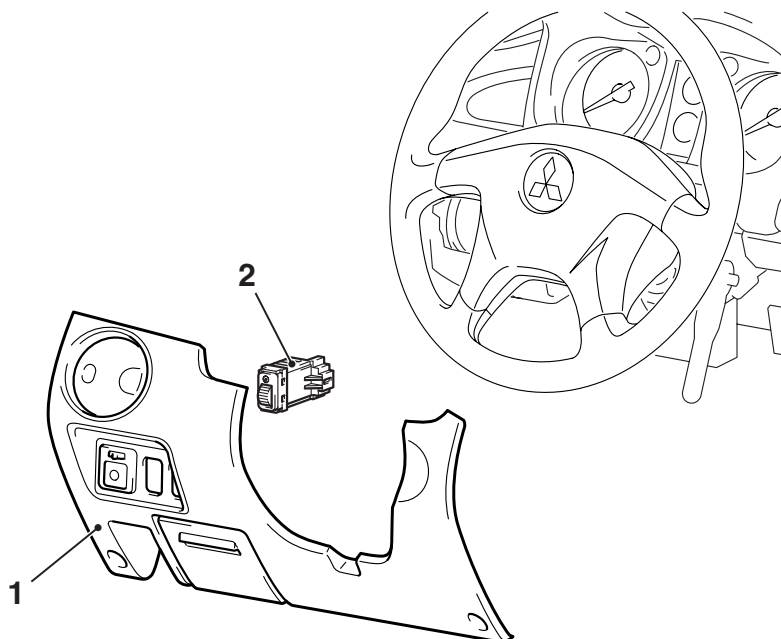


Battery voltage	Tester connection	Specified condition
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"><li>Connect terminal 2 to the positive battery terminal</li><li>Connect terminal 3 to the negative battery terminal</li></ul>	1 – 4	Less than 2 ohms

# RHEOSTAT

## REMOVAL AND INSTALLATION

M1542006000403



### Removal steps

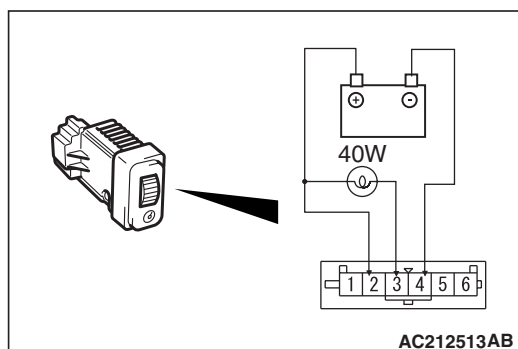
1. Instrument lower panel (Refer to GROUP 52A, Instrument panel assembly P.52A-3 <L.H.drive vehicles> or P.52A-9 <R.H.drive vehicles>).
2. Rheostat

## INSPECTION

AC401651AB

M1542006100206

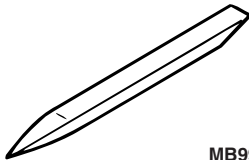

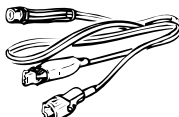
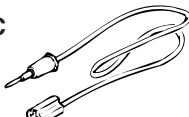

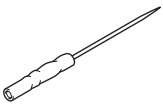
### RHEOSTAT RESISTANCE CHECK



1. Connect the battery and the test bulb (40 W) as shown in the illumination.
2. Operate the rheostat, and if brightness changes smoothly without switching off, rheostat function is normal.

**RADIO WITH TAPE PLAYER AND CD PLAYER****SPECIAL TOOLS**

M1544000600362

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre panel
<p>A</p>  <p>B</p>  <p>C</p>  <p>D</p>  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****AUDIO SYSTEM TROUBLESHOOTING**

M1544000700091

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.

## SYMPTOM CHART

M1544004900569

Symptom		Inspection Procedure No.	Reference Page
Power of radio and tape or CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.		1	<a href="#">P.54A-76</a>
No sound from one speaker. <L.H.drive vehicles for Argentina and R.H.drive vehicles>		2	<a href="#">P.54A-77</a>
No sound from one speaker. <L.H.drive vehicles (Except for Argentina)>		3	<a href="#">P.54A-81</a>
Noise	Noise appears at certain places when traveling (AM).	4	<a href="#">P.54A-84</a>
	Noise is preset while moving (FM).	5	<a href="#">P.54A-85</a>
	Mixed with noise, only at night (AM).	6	<a href="#">P.54A-86</a>
	Broadcasts can be heard but both AM and FM have a lot of noise.	7	<a href="#">P.54A-86</a>
	There is more noise on either AM or FM.	8	<a href="#">P.54A-87</a>
	There is noise when starting the engine.	9	<a href="#">P.54A-88</a>
	Some noise appears when there is vibration or shocks during traveling.	10	<a href="#">P.54A-90</a>
	Noise sometimes appears on FM during traveling.	11	<a href="#">P.54A-90</a>
	Ever-present noise.	12	<a href="#">P.54A-91</a>
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	13	<a href="#">P.54A-91</a>
	Poor reception.	14	<a href="#">P.54A-92</a>
	Distortion on AM or on both AM and FM.	15	<a href="#">P.54A-93</a>
	Distortion on FM only.	16	<a href="#">P.54A-93</a>
	Using the auto select function, too few automatic stations are selected.	17	<a href="#">P.54A-94</a>
	Preset stations are erased.	18	<a href="#">P.54A-95</a>
Tape player	Cassette tape can not be inserted.	19	<a href="#">P.54A-95</a>
	Sound quality is poor, or sound is weak.	20	<a href="#">P.54A-96</a>
	Cassette tape can not be ejected.	21	<a href="#">P.54A-96</a>
	Uneven revolution. Tape speed is fast or slow.	22	<a href="#">P.54A-96</a>
	Automatic search does not work.	23	<a href="#">P.54A-97</a>
	Malfunction of the auto reverse.	24	<a href="#">P.54A-98</a>
	Tape gets caught in mechanism.	25	<a href="#">P.54A-98</a>
CD player	CD can not be inserted.	26	<a href="#">P.54A-99</a>
	No sound (CD only).	27	<a href="#">P.54A-99</a>
	CD sound skips.	28	<a href="#">P.54A-100</a>
	Sound quality is poor.	29	<a href="#">P.54A-100</a>
	CD cannot be ejected.	30	<a href="#">P.54A-100</a>



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## SYMPTOM PROCEDURES

---

**INSPECTION PROCEDURE 1: Power of radio and tape or CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.**

---

### TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a faulty radio and tape or CD player power supply circuit system.

### TROUBLESHOOTING HINTS

- Damaged wiring harness or connector.
- Malfunction of the radio and tape 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 or CD player power switch.

**Q: Is it possible to put the radio and tape or CD player power in the "ON" position?**

**YES :** Go to Step 2.

**NO :** Go to Step 5.

---

#### STEP 2. Connector check: Radio and tape or CD player connector C-102.

**Q: Is radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s). If the power switch is turned on, the radio and tape or CD player should operate normally.

---

#### STEP 3. Check the wiring harness between radio and tape or CD player connector C-102 (terminal 11) and battery.

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-116 and joint connector (3) C-02, and repair if necessary.*

**Q: Are the wiring harnesses between radio and tape or CD player connector C-102 (terminal 11) and battery in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damage component(s). If the power switch is turned on, the radio and tape or CD player should operate normally.

---

#### STEP 4. Check the assembling state of the radio and tape or CD player.

*NOTE: The radio and tape or CD player is earthed to the instrument panel centre reinforcement directly.*

**Q: Is the radio and tape or CD player installed correctly?**

**YES :** Repair or replace the radio and tape or CD player. If the power switch is turned on, the radio and tape or CD player should operate normally.

**NO :** Install properly. If the power switch is turned on, the radio and tape or CD player should operate normally.

---

#### STEP 5. Measure the voltage at radio and tape or CD player connector C-102 in order to check the battery circuit of power supply system to the radio and tape or CD player (ignition switch ACC).

- (1) Disconnect radio and tape or CD player connector C-102, 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 8.

**NO :** Go to Step 6.

---

#### STEP 6. Connect check: Radio and tape or CD player connector C-102.

**Q: Is radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damage component(s). If the power switch is turned on, the radio and tape or CD player should operate normally.

**STEP 7. Check the wiring harness between radio and tape or CD player connector C-102 (terminal 10) and ignition switch (ACC).**

*NOTE: L.H. drive vehicles; prior to the wiring harness inspection, check intermediate connector C-116, and repair if necessary.*

*NOTE: R.H. drive vehicles; prior to the wiring harness inspection, check junction block connector C-202 and intermediate connector C-116, and repair if necessary.*

**Q: Is the wiring harness between radio and tape or CD player connector C-102 (terminal 10) and ignition switch (ACC) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair or replace the damage component(s). If the power switch is turned on, the radio and tape or CD player should operate normally.

**STEP 8. Check the assembling state of the radio and tape or CD player.**

*NOTE: The radio and tape or CD player is earthed to the instrument panel centre reinforcement directly.*

**Q: Is the radio and tape or CD player installed correctly?**

**YES :** Repair or replace the radio and tape or CD player. If the power switch is turned on, the radio and tape or CD player should operate normally.

**NO :** Install properly. If the power switch is turned on, the radio and tape or CD player should operate normally.

**INSPECTION PROCEDURE 2: No Sound from One Speaker. <L.H.drive vehicles for Argentina and R.H.drive vehicles>**

## TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a faulty speaker circuit system.

## TROUBLESHOOTING HINTS

- Malfunction of the speaker.
- Damaged wiring harness or connector.
- Malfunction of the radio and tape 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.

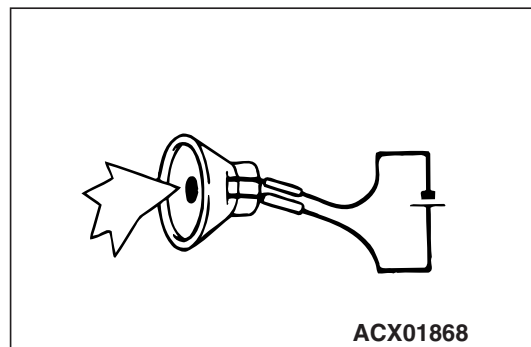
**Tweeter (RH) :** Go to Step 11.

**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-105](#).



(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 E-14 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors front door speaker (LH) connector E-14 and radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damage component(s). The door speaker (LH) should sound.

**STEP 4. Check the wiring harness between front door speaker (LH) connector E-14 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminals 5 and 13).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-118 <L.H.drive vehicles>, C-34 <R.H.drive vehicles>, and repair if necessary.*

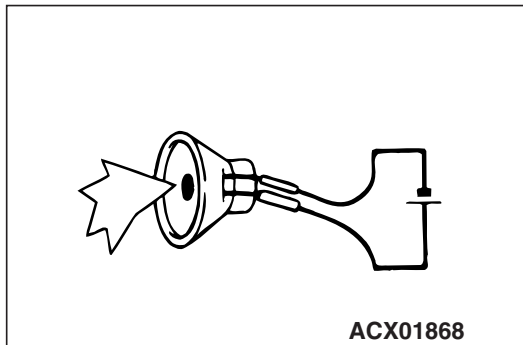
**Q: Is the wiring harness between front door speaker (LH) connector E-14 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 5 and 13) in good condition?**

**YES :** Repair or replace the radio and tape 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-105](#).



(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.

**STEP 6. Connector check: Front door speaker (RH) connector E-22 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors front door speaker (RH) connector E-22 and radio and tape or CD player connector C-102 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 E-22 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 6 and 14).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-15, and repair if necessary.*

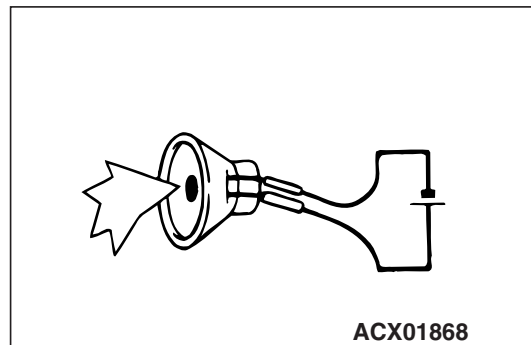
**Q: Is the wiring harness between front door speaker (RH) connector E-22 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 6 and 14) in good condition?**

**YES :** Repair or replace the radio and tape 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-105](#).



(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 E-07 and radio and tape or CD player  
connector C-102.

**Q: Are harness connectors tweeter (LH) connector  
E-07 and radio and tape or CD player connector  
C-102 in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damage  
component(s). The tweeter (LH) should  
sound.

**STEP 10. Check the wiring harness between  
tweeter (LH) connector E-07 (terminal 1 and 2)  
and radio and tape or CD player connector C-102  
(terminal 13 and 5).**

*NOTE: Prior to the wiring harness inspection, check  
intermediate connectors C-118 <L.H.drive vehi-  
cles>, C-34 <R.H.drive vehicles>, and repair if nec-  
essary.*

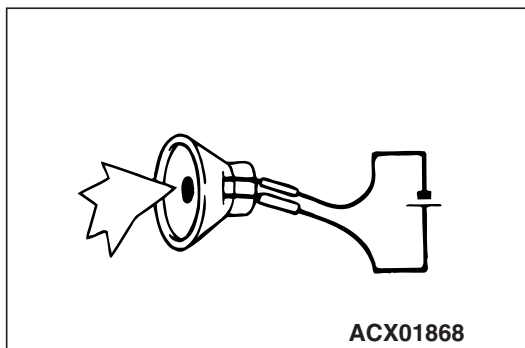
**Q: Is the wiring harness between tweeter (LH)  
connector E-07 (terminal 1 and 2) and radio and  
tape or CD player connector C-102 (terminal 13 and  
5) in good condition?**

**YES :** Repair or replace the radio and tape 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-105](#).



(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.

**STEP 12. Connector check: Tweeter (RH)**  
connector E-15 and radio and tape or CD player  
connector C-102.

**Q: Are harness connectors tweeter (RH) connector  
E-15 and radio and tape or CD player connector  
C-102 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 E-15 (terminal 1 and 2)  
and radio and tape or CD player connector C-102  
(terminal 14 and 6).**

*NOTE: Prior to the wiring harness inspection, check  
intermediate connector C-15, and repair if necessary.*

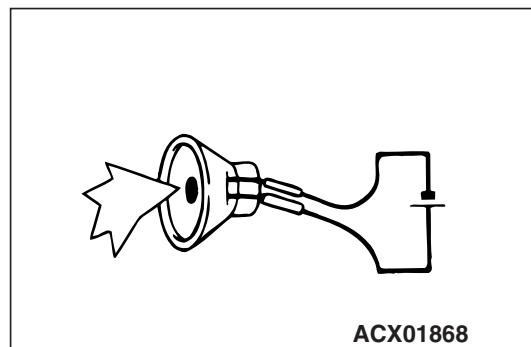
**Q: Is the wiring harness between tweeter (RH)  
connector E-15 (terminals 1 and 2) and radio and  
tape or CD player connector C-102 (terminals 14  
and 6) in good condition?**

**YES :** Repair or replace the radio and tape 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-105](#).



(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 E-10 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors rear door speaker (LH) connector E-10 and radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 16.

**NO :** Repair or replace the damage component(s). The rear door speaker (LH) should sound.

**STEP 16. Check the wiring harness between rear door speaker (LH) connector E-10 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 2 and 8).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-117 and D-26 <L.H.drive vehicles>, D-25 <R.H.drive vehicles>, and repair if necessary.*

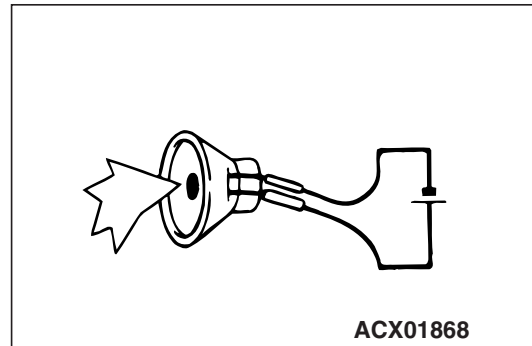
**Q: Is the wiring harness between rear door speaker (LH) connector E-10 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 2 and 8) in good condition?**

**YES :** Repair or replace the radio and tape 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-105.



(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.

**STEP 18. Connector check: Rear door speaker (RH) connector E-26 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors rear door speaker (RH) connector E-26 and radio and tape or CD player connector C-102 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 E-26 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 1 and 7).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-13 and D-02 <L.H.drive vehicles>, D-01 <R.H.drive vehicles>, and repair if necessary.*

**Q: Is the wiring harness between rear door speaker (RH) connector E-26 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminal 1 and 7) in good condition?**

**YES :** Repair or replace the radio and tape 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: No Sound from One Speaker. <L.H.drive vehicles (Except for Argentina)>**

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is probably a faulty speaker circuit system.

**TROUBLESHOOTING HINTS**

- Malfunction of the speaker.
- Damaged wiring harness or connector.
- Malfunction of the radio and tape 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.

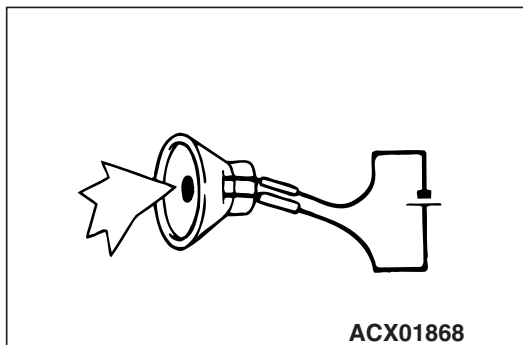
tweeter (RH) : Go to Step 11.

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-105](#).



(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 E-14 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors front door speaker (LH) connector E-14 and radio and tape or CD player connector C-102 in good condition?**

**YES** : Go to Step 4.

**NO** : Repair or replace the damage component(s). The door speaker (LH) should sound.

**STEP 4. Check the wiring harness between front door speaker (LH) connector E-14 (terminal 1 and 2) and radio and tape or CD player connector C-102 (terminals 5 and 13).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-118, and repair if necessary.*

**Q: Is the wiring harness between front door speaker (LH) connector E-14 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 5 and 13) in good condition?**

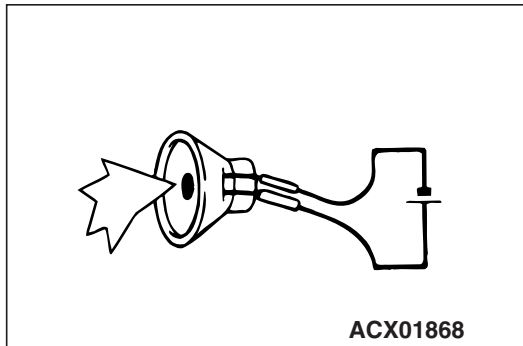
**YES** : Repair or replace the radio and tape or CD player. The front door speaker (LH) should sound.

**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-105](#).



- (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.

**STEP 6. Connector check: Front door speaker (RH) connector E-22 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors front door speaker (RH) connector E-22 and radio and tape or CD player connector C-102 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 E-22 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 6 and 14).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-15, and repair if necessary.*

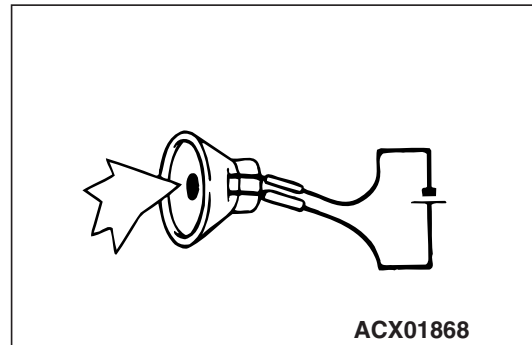
**Q: Is the wiring harness between front door speaker (RH) connector E-22 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 6 and 14) in good condition?**

**YES :** Repair or replace the radio and tape or CD player. The front door speaker (RH) should sound.

**NO :** Repair or replace the damage component(s). The front door speaker (RH) should sound.

**STEP 8. Check the tweeter (LH).**

- (1) Remove the tweeter (LH). Refer to [P.54A-105](#).



- (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 E-07 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors tweeter (LH) connector E-07 and radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damage component(s). The tweeter (LH) should sound.

**STEP 10. Check the wiring harness between tweeter (LH) connector E-07 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 13 and 5).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-118, and repair if necessary.*

**Q: Is the wiring harness between tweeter (LH) connector E-07 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 13 and 5) in good condition?**

**YES :** Repair or replace the radio and tape or CD player. The tweeter (LH) should sound.

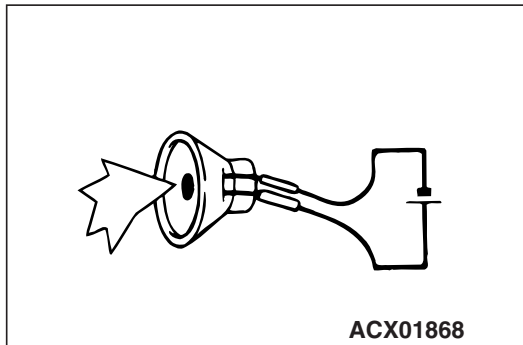
**NO :** Repair or replace the damage component(s). The tweeter (LH) should sound.



---

**STEP 11. Check the tweeter (RH).**

(1) Remove the tweeter (RH). Refer to [P.54A-105](#).



(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.

---

**STEP 12. Connector check: Tweeter (RH) connector E-15 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors tweeter (RH) connector E-15 and radio and tape or CD player connector C-102 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 E-15 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 14 and 6).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-15, and repair if necessary.*

**Q: Is the wiring harness between tweeter (RH) connector E-15 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 14 and 6) in good condition?**

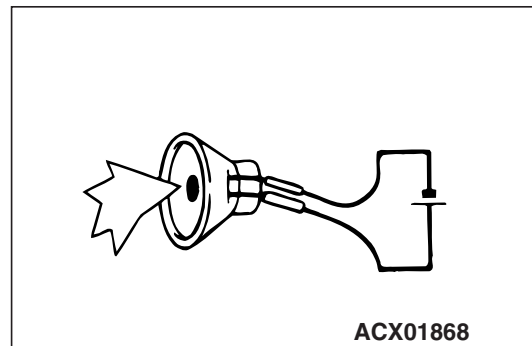
**YES :** Repair or replace the radio and tape or CD player. The tweeter (RH) should sound.

**NO :** Repair 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-105](#).



(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 E-10 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors rear door speaker (LH) connector E-10 and radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 16.

**NO :** Repair or replace the damage component(s). The rear door speaker (LH) should sound.

---

**STEP 16. Check the wiring harness between rear door speaker (LH) connector E-10 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 2 and 8).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-117 and D-25, and repair if necessary.*

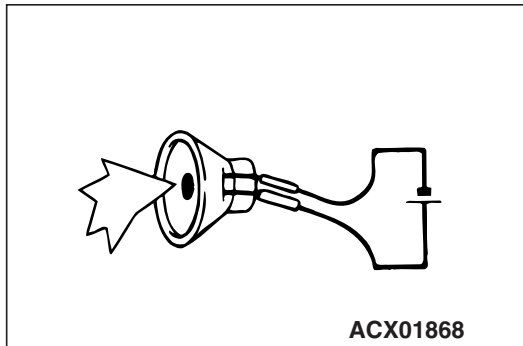
**Q: Is the wiring harness between rear door speaker (LH) connector E-10 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 2 and 8) in good condition?**

**YES :** Repair or replace the radio and tape or CD player. The rear door speaker (LH) should sound.

**NO :** Repair the wiring harness. 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-105.



- (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.

**STEP 18. Connector check: Rear door speaker (RH) connector E-26 and radio and tape or CD player connector C-102.**

**Q: Are harness connectors rear door speaker (RH) connector E-26 and radio and tape or CD player connector C-102 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 E-26 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 1 and 7).**

*NOTE: Prior to the wiring harness inspection, check intermediate connectors C-13 and D-01, and repair if necessary.*

**Q: Is the wiring harness between rear door speaker (RH) connector E-26 (terminals 1 and 2) and radio and tape or CD player connector C-102 (terminals 1 and 7) in good condition?**

**YES :** Repair or replace the radio and tape 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 4: Noise Appears at Certain Places when Traveling (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.

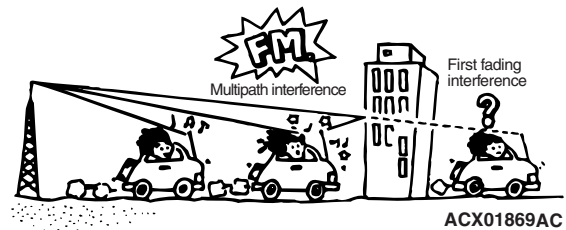
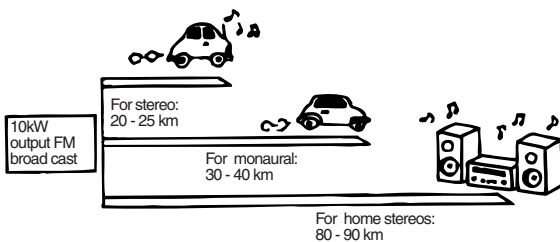
**STEP 4. Check that there is no noise.**

**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.

**INSPECTION PROCEDURE 5: 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 become 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.

---

### INSPECTION PROCEDURE 6: Mixed with Noise, Only at Night (AM).

---

The following factors can be considered as possible causes of noise appearing at night.

- 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.*

- 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.

- Tune to a station with a stronger wave.
- 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.

---

### INSPECTION PROCEDURE 7: Broadcasts can be Heard but Both AM and FM have a lot of Noise.

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### DIAGNOSIS PROCEDURE

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#### 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 10 [P.54A-90](#)).

---

**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 or CD player.**

**Q: Is the antenna plug thoroughly connected to the radio and tape 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.

---

**INSPECTION PROCEDURE 8: 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 :** If the noise level is roughly the same as other radios, there is no action to be taken.

---

## INSPECTION PROCEDURE 9: There is Noise when Starting the Engine.

---

### DIAGNOSIS PROCEDURE

#### CAUTION

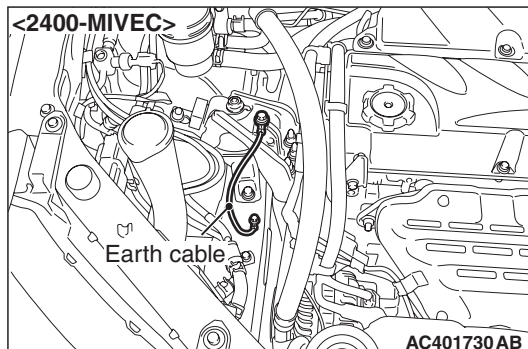
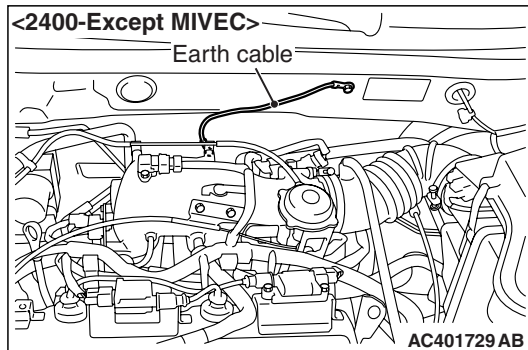
- Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.
- Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.
- Noise 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 takes 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.*

*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)	<ul style="list-style-type: none"> <li>Increasing the engine speed causes the alternator whine sound to speed up and the volume to decrease</li> <li>Disappears when the ignition switch turned to "ACC."</li> </ul>	<ul style="list-style-type: none"> <li>Mainly due to the spark plugs</li> <li>Due to engine noise</li> </ul>	<ul style="list-style-type: none"> <li>Check or replace the earth cable.</li> <li>Check or replace the noise capacitor.</li> </ul>
Other electrical components	—	Noise may occur as the electrical components become older.	Repair or replace the electrical components.
Static electricity (cracking, crinkling)	<ul style="list-style-type: none"> <li>Disappears when the vehicle is completely stopped.</li> <li>Severe when the clutch is engaged</li> </ul>	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)	<ul style="list-style-type: none"> <li>Various noise are produced depending on the body part of the vehicle.</li> </ul>	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.





**INSPECTION PROCEDURE 10: Some Noise Appears When There is Vibration or Shocks During Traveling.**

---

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Connector check: radio and tape or CD player connector C-102.**

**Q:** Is radio and tape or CD player connector C-102 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 or CD player.**

**Q:** Are operations normal when using another radio and tape or CD player?

**YES :** Either repair or replace the radio and tape or CD player. Check that there is no noise.

**NO :** Either repair or replace the antenna assembly. Check that there is no noise.

---

**INSPECTION PROCEDURE 11: Noise Sometimes Appears on FM during Traveling.**

---

**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 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 :** 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 or CD player.**

**Q: Are operations normal when using another radio and tape or CD player?**

**YES :** Either repair or replace the radio and tape or CD player. Check that there is no noise.

**NO :** Either repair or replace the antenna assembly. Check that there is no noise.

---

**INSPECTION PROCEDURE 12: Ever-Present Noise.**

**DIAGNOSIS PROCEDURE**

Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled 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 11 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 13: 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 in 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 or CD player.**

**Q: Is the antenna plug thoroughly connected to the radio and tape or CD player?**

**YES :** Go to Step 6.

**NO :** Thoroughly connect the antenna plug and the radio and tape or CD player. The radio should sound normally.

---

**STEP 6. Check by replacing the radio and tape or CD player.**

**Q: Are operations normal when using another radio and tape or CD player?**

**YES :** Either repair or replace the radio and tape or CD player. The radio should sound normally.

**NO :** Either repair or replace the antenna assembly. The radio should sound normally.

---

**INSPECTION PROCEDURE 14: 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 in 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 or CD player.**

- Q:** Is the antenna plug thoroughly connected to the radio and tape or CD player?  
**YES :** Go to Step 7.  
**NO :** Thoroughly connect the antenna plug and the radio and tape or CD player. Check that a poor reception is resolved.

---

**STEP 7. Check by replacing the radio and tape or CD player.**

- Q:** Does the another radio and tape or CD player work normally?  
**YES :** Either repair or replace the radio and tape 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.

---

**INSPECTION PROCEDURE 15: 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 or CD player. Check that a distortion is resolved.

---

**INSPECTION PROCEDURE 16: 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 or CD player. Check that a distortion is resolved.

**INSPECTION PROCEDURE 17: 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 in 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 or CD player.**

---

**Q: Is the antenna plug thoroughly connected to the radio and tape or CD player?**

**YES :** Repair or replace the radio and tape or CD player. The auto-select function should operate normally.

**NO :** Thoroughly connect the antenna plug and the radio and tape or CD player. The auto-select function should operate normally.

---

**INSPECTION PROCEDURE 18: Preset Stations are Erased.**

---

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is probably a faulty radio and tape or CD player memory backup power supply circuit system.

**TROUBLESHOOTING HINTS**

- Damaged wiring harness or connector.
- Malfunction of the radio and tape or CD player.

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Measure the voltage at radio and tape or CD player connector C-102.**

- (1) Disconnect radio and tape or CD player connector C-102.
- (2) Measure the voltage between terminal number 11 and earth.

**OK: System voltage**

**Q: Is the check result normal?**

**When YES <Radio and tape or CD player does not execute memory save then.> :** Either repair or replace the radio and tape or CD player. Check that a memory is retained.

**NO :** Go to Step 2.

---

**STEP 2. Connector check: Radio and tape or CD player connector C-102.**

**Q: Is radio and tape or CD player connector C-102 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damage component(s). Check that a memory is retained.

---

**STEP 3. Check the wiring harness between radio and tape or CD player connector C-102 (terminal 11) and battery.**

*NOTE: Prior to the wiring harness inspection, check joint connector (3) C-02 and intermediate connectors C-116, and repair if necessary.*

**Q: Are the wiring harness between radio and tape or CD player connector C-22 (terminal 11) and battery in good condition?**

**YES :** Repair or replace the radio and tape or CD player. Check that a memory is retained.

**NO :** Repair or replace the damage component(s). Check that a memory is retained.

---

**INSPECTION PROCEDURE 19: Cassette Tape can Not be Inserted.**

---

**DIAGNOSIS PROCEDURE**

---

**STEP 1. Check that there are any foreign objects inside the tape player.**

*NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc.) in the tape player may damage the mechanism. The player should be taken to a service dealer for repair.*

**Q: Are there any foreign objects inside the tape player?**

**YES :** There are any foreign objects inside the tape player, remove the object(s). A cassette tape should be inserted normally.

**NO :** Go to Step 2.

---

**STEP 2. Check that the radio and tape 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-120 or greater can often get caught in the mechanism and should not be used.*

**Q: Does the tape 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 tape player. A cassette tape should be inserted normally.

**INSPECTION PROCEDURE 20: 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-120 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 21: 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 tape 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.

---

**INSPECTION PROCEDURE 22: 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-120 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 tape player.**

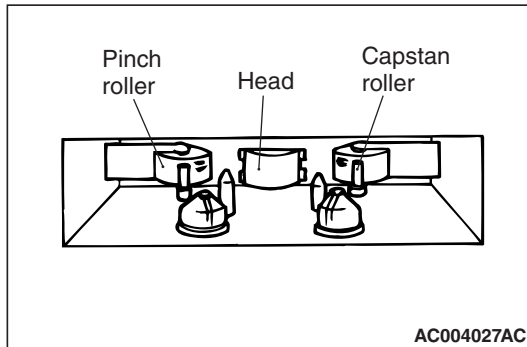
*NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc.) out of the tape player may damage the mechanism. The player should be taken to a service dealer for repair.*

**Q: Are there any foreign objects inside the tape 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 23: 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-120 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.



**INSPECTION PROCEDURE 24: 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-120 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 25: 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-120 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 and tape player. The procedure is complete.

---

**INSPECTION PROCEDURE 26: CD cannot be Inserted.**

---

**DIAGNOSIS PROCEDURE**

---

**STEP1. 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 30 [P.54A-100](#)). 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 30 [P.54A-100](#).

**NO :** Go to Step 3.

---

**STEP3. 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 27: 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 CD player. The procedure is complete.

**NO :** Check the memory backup power supply circuit. Refer to Inspection Procedure 1 [P.54A-76](#).

**INSPECTION PROCEDURE 28: 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 29: Sound Quality is Poor.**

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**DIAGNOSIS PROCEDURE**

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**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.

---

**INSPECTION PROCEDURE 30: CD cannot 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 with CD player. Check that a CD can be ejected normally.

**NO :** Check the power supply circuit. Refer to Inspection Procedure 1 [P.54A-76](#).

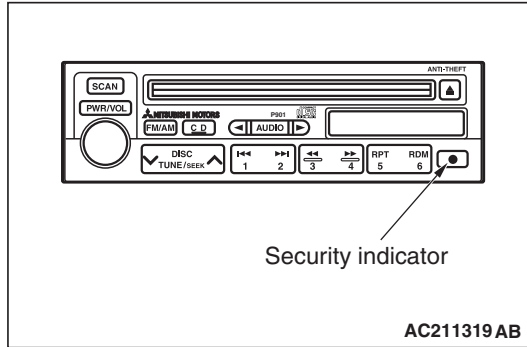
## ON-VEHICLE SERVICE

### PROCEDURE FOR INPUT OF SECURITY CODE FOR ANTI-THEFT SYSTEM

#### <Vehicles for Australia and New Zealand>

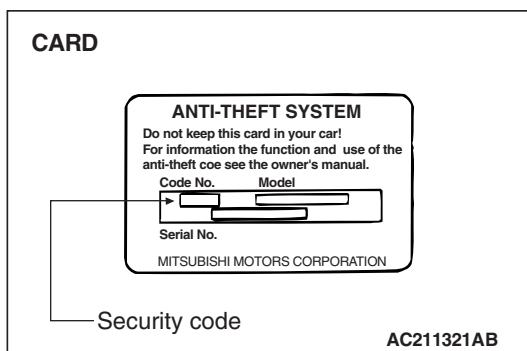
M1544004400315

The radio and CD player do not work under the following conditions:

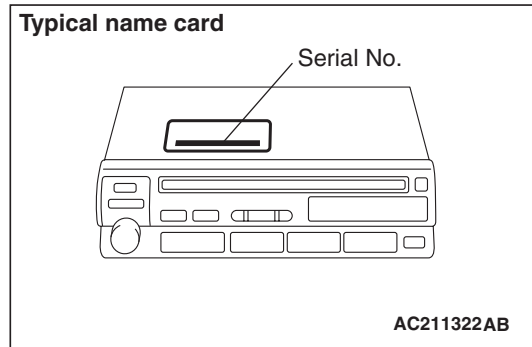


If the ignition key is removed, the security indicator of this radio and CD player flickers to prevent theft from happening.

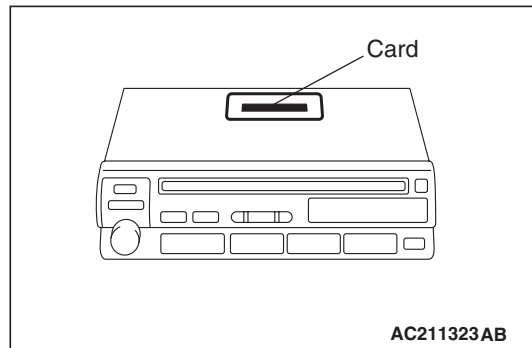
2. Power supply to the radio and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
3. The power supply to the radio and CD player has been suspended for more than an hour due to a blown fuse or discharged battery.
4. If the radio and CD player does not work for these conditions, enter the security code as follows:
5. The radio and CD player has been replaced.



1. Confirm the security code using any of the following methods.
  - (1) Use the security code indicated on the cards retained in the vehicle.



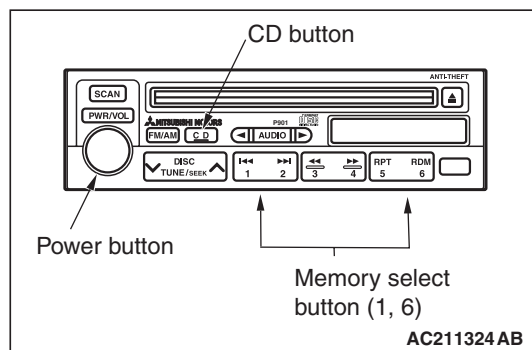
- (2) If the security code is unknown owing to the owner's loss of the card:
  - a. Remove the radio and CD player referring to P.54A-104.
  - b. Read the serial number stamped on the radio and CD player.
  - c. Look up the security code (anti-theft code table) corresponding to the serial number.



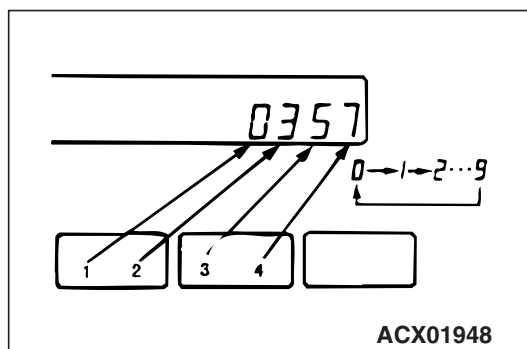
- (3) When the radio and CD player is replaced: Use the security code on the cards attached to the upper surface of the replacement radio and CD player.

**NOTE:** Deliver the two cards to the owner.

2. Connect the radio to the vehicle harness.
3. Turn the ignition key to the "ACC" or "ON" position.



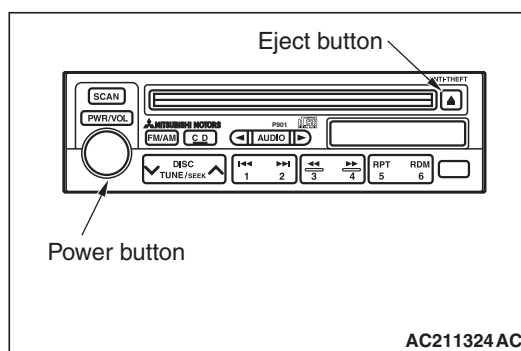
4. Press the "PWR" button, and "CODE" will be displayed.



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**

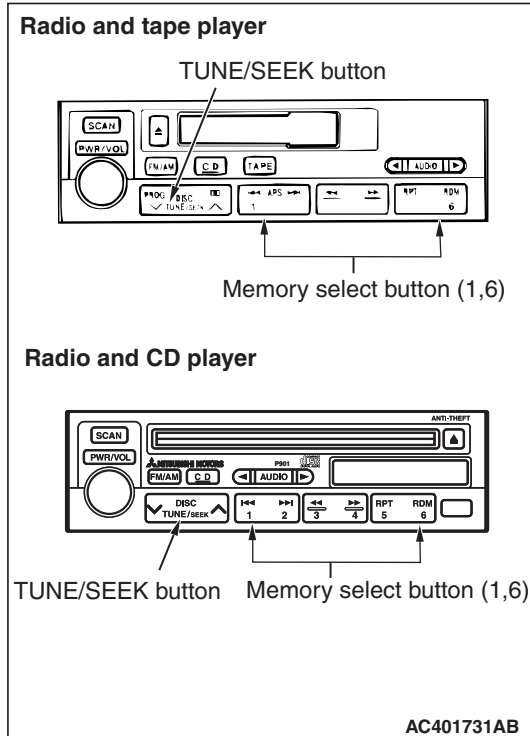
To facilitate replacement or check, the radio with tape and CD player can be operated for three minutes without inputting the security code.

## SPEAKER TEST

M1544005400404

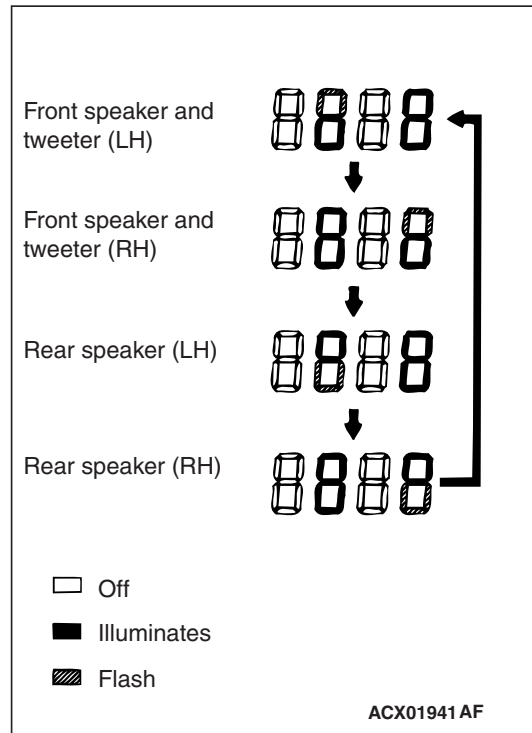
Enter the speaker test mode according to the following steps:

1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the radio and tape or CD player.



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

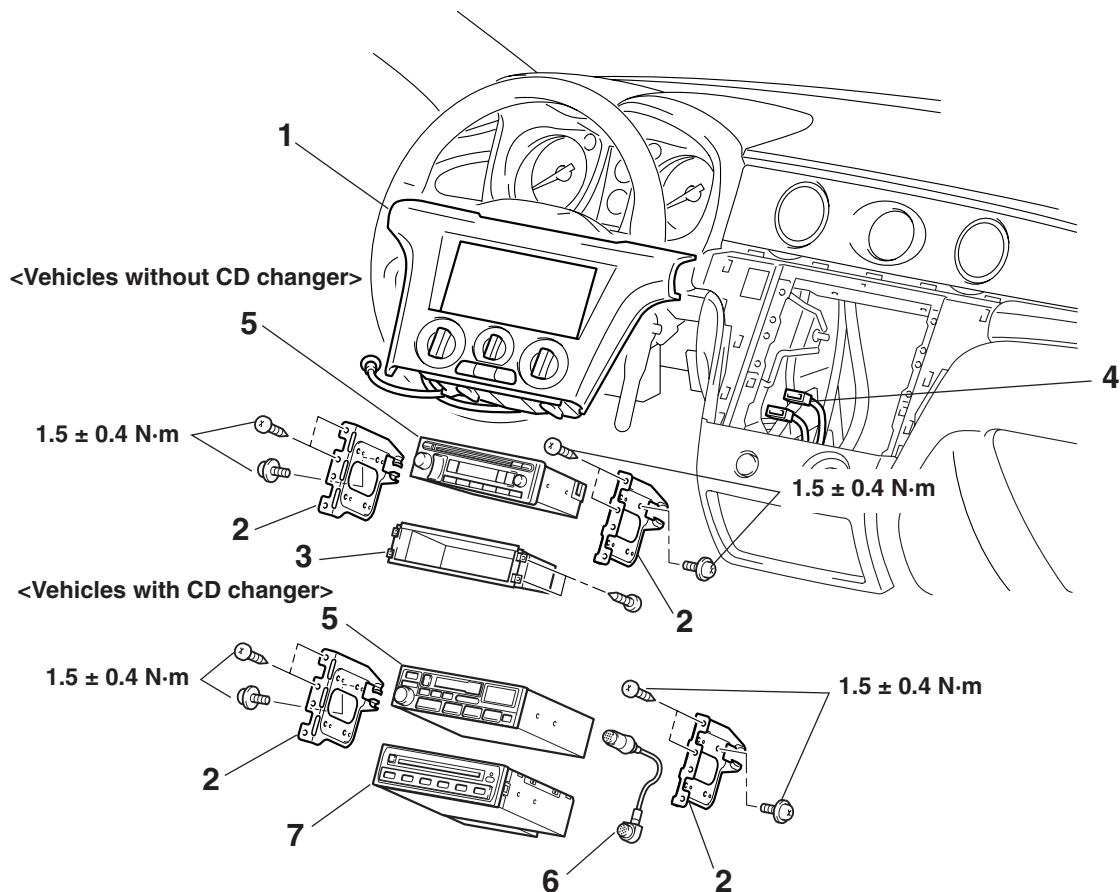


3. Check that the speaker, which is displayed on the radio panel display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button (tape or CD) is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

RADIO WITH TAPE PLAYER AND CD  
PLAYER

## REMOVAL AND INSTALLATION

M1544001100229



AC210840AC

**Radio removal steps**

1. Centre panel assembly (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles> or [P.52A-9](#) <R.H.drive vehicles>)
2. Radio bracket
3. Box

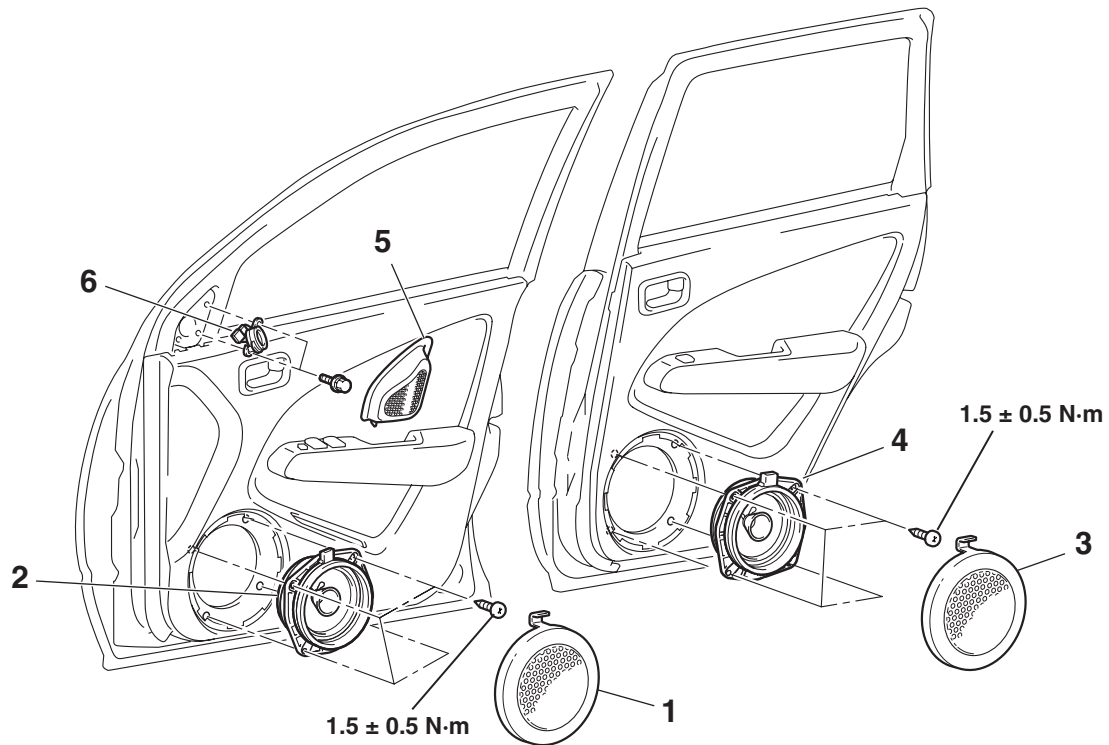
**Radio removal steps (Continued)**

4. Antenna feeder cable and harness connector
5. Radio and tape player or radio and CD player
6. DIN cable
7. CD changer

## SPEAKER

### REMOVAL AND INSTALLATION

M1544002600540



AC102825 AD

#### Front door speaker removal steps

1. Front door speaker garnish
2. Front door speaker

#### Rear door speaker removal steps

3. Rear door speaker garnish
4. Rear door speaker

#### Tweeter removal steps

5. Delta cover (Refer to GROUP 51, Door Mirror [P.51-47](#)).
6. Tweeter



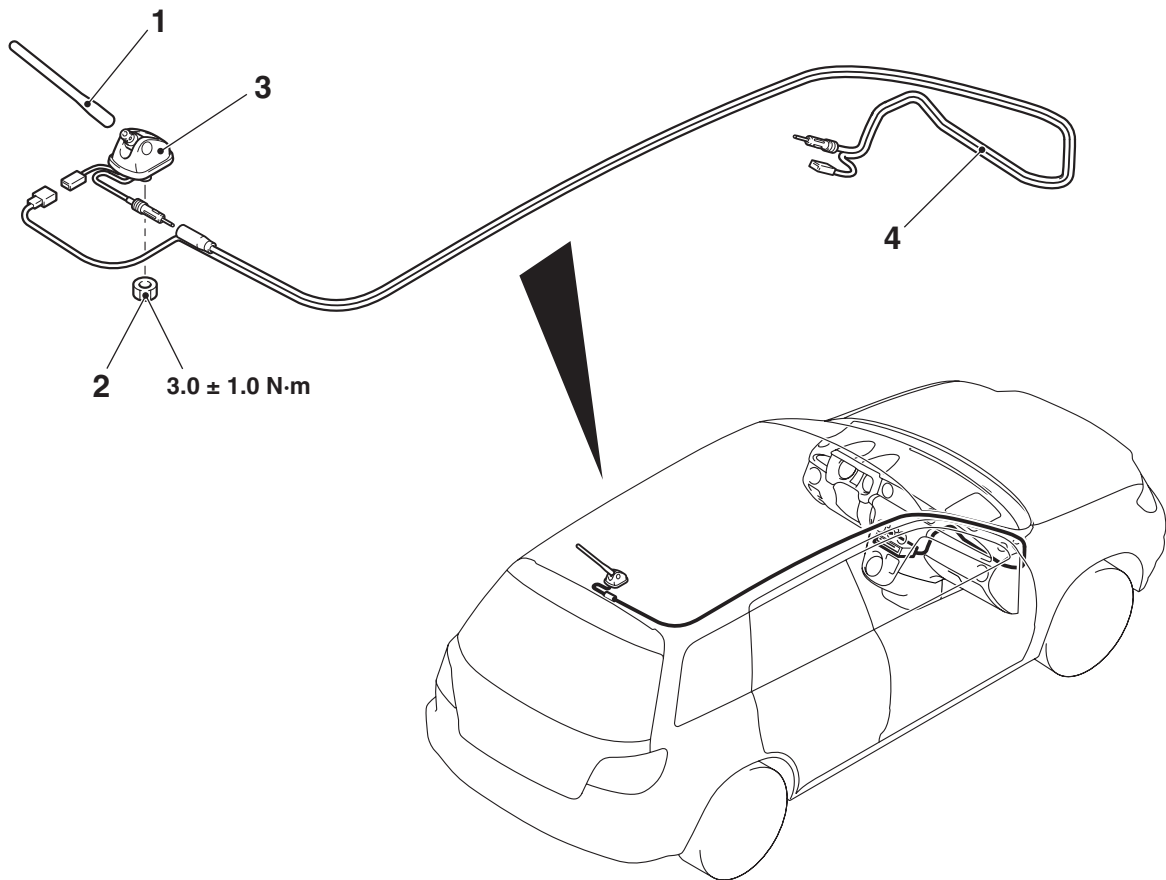
## ANTENNA

## REMOVAL AND INSTALLATION

M1544002900808

**Pre-removal and Post-installation Operation**

- Front pillar trim, Quarter trim upper, Quarter trim lower, Centre pillar trim lower, Centre pillar trim upper (Refer to GROUP 52A, Trim [P.52A-19.](#))
- Assist Grip, Headlining (Refer to GROUP 52A, Headlining [P.52A-27.](#))
- Instrument Panel Removal and Installation (Refer to GROUP 52A, Instrument Panel Assembly [P.52A-3](#) <L.H. drive vehicles> or [P.52A-9](#) <R.H. drive vehicles>.)

**Removal steps**

1. Rod assembly
2. Antenna nut

**Removal steps (Continued)**

3. Base
4. Antenna feeder assembly

AC300925AC

## REAR WINDOW DEFOGGER

### GENERAL INFORMATION

M1543000100513

#### Rear Defogger operation

The defogger relay turns ON if the defogger switch built-in the A/C-ECU is turned ON when the ignition switch is in the "ON" position. When the defogger relay turns ON, power is supplied to the defogger and the defogger is activated. The defogger comes with a timer function that causes the defogger switch to automatically turn OFF in about 11 minutes after the defogger switch is turned ON.

### TROUBLESHOOTING

#### REAR WINDOW DEFOGGER TROUBLESHOOTING

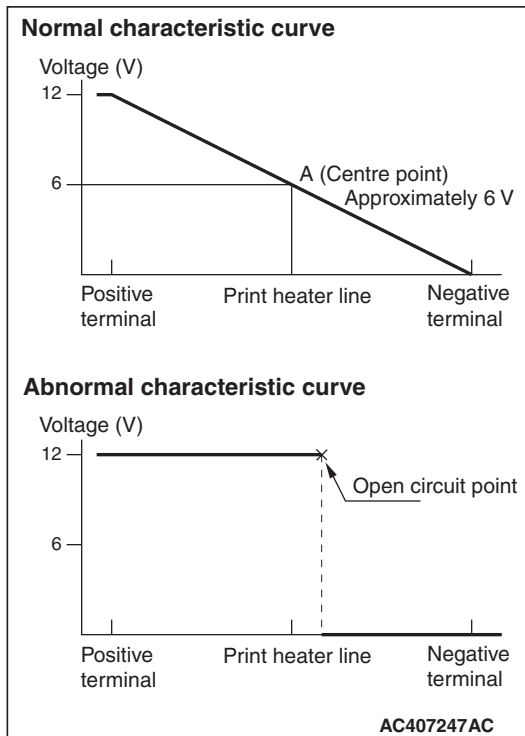
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The rear window defogger is controlled by the A/C-ECU. For troubleshooting, refer to GROUP 55A, Troubleshooting P.55A-5 or GROUP 55B, Troubleshooting P.55B-9.

### ON-VEHICLE SERVICE

#### PRINTED HEATER LINES CHECK

M1543001800407



1. Run engine at 2,000 r/min. Check heater element with battery at full.
2. Turn "ON" rear window defogger switch. Measure heater element voltage with circuit tester at rear

window glass centre A. Condition is good if it indicates about six volts.

3. If 12 volts is indicated at A, there is a break in the negative terminals from A. Move test bar slowly to negative terminal to detect where voltage changes suddenly (0 volts).
4. If 0 volts is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (12 volts) in the same method described above.

### REAR WINDOW DEFOGGER SWITCH

#### REMOVAL AND INSTALLATION

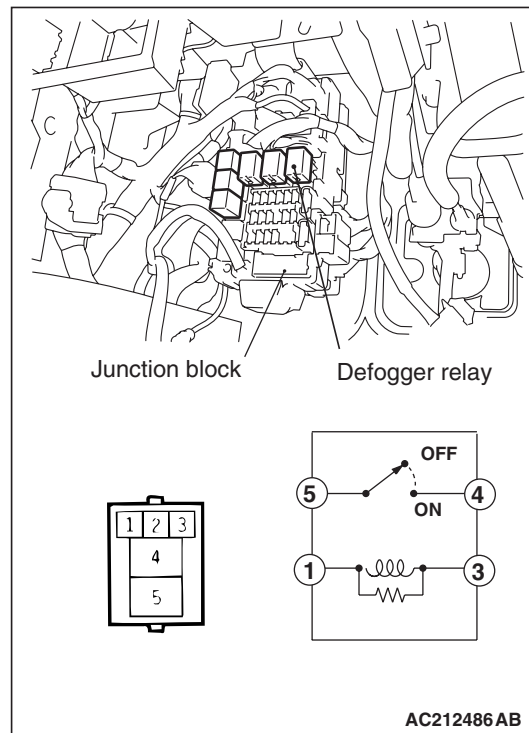
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Refer to GROUP 55A, Heater Control Assembly and Blower Switch Assembly P.55A-30.

### INSPECTION

M1543019502214


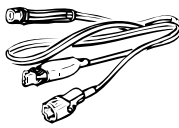
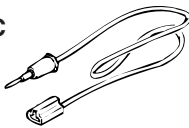
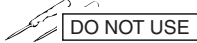
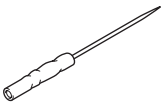
#### DEFOGGER RELAY CHECK



Battery voltage	Tester connection	Specified condition
Not supplied	4 – 5	Open circuit
<ul style="list-style-type: none"><li>• Connect terminal 1 to the positive battery terminal</li><li>• Connect terminal 3 to the negative battery terminal</li></ul>	4 – 5	Less than 2 ohms

**SPEED ALARM <Vehicles for GCC>****SPECIAL TOOLS**

M1547500200012

Tool	Number	Name	Use
<b>A</b>  <b>B</b>  <b>C</b>  <b>D</b>  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****SPEED ALARM SYSTEM  
TROUBLESHOOTING**

M1547500300031

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 speed alarm 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.

**TROUBLE SYMPTOM CHART**

M1547500400027

Symptom	Inspection Procedure No.	Reference Page
The speedometer does not sound when the vehicle speed is 125 km/h or more.	1	P.54A-109

## SYMPTOM PROCEDURES

**INSPECTION PROCEDURE 1:** The speedometer does not sound when the vehicle speed is 125 km/h or more.

### TECHNICAL DESCRIPTION (COMMENT)

The cause is thought to be malfunction of the power, earth circuitry or speed alarm-ECU.

### TROUBLESHOOTING HINTS

- Malfunction of the speed alarm-ECU
- Damaged wiring harness or connectors

### DIAGNOSIS PROCEDURE

#### STEP 1. Check the speed meter.

**Q: IS the check result normal?**

**YES :** Go to Step 2.

**NO :** Diagnose the speedometer. Refer to [P.54A-28](#).

#### STEP 2. Measure the voltage at speed alarm-ECU connector C-39 in order to check the battery circuit of power supply system to the speed alarm-ECU.

- (1) Disconnect the speed alarm-ECU connector C-39 and measure the voltage at speed alarm-ECU connector C-39 component side.
- (2) Measure the voltage between terminal 1 and earth.

**OK: System voltage**

**Q: IS the check result normal?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.

#### STEP 3. Connector check: Speed alarm-ECU connector C-39.

**Q: Is speed alarm-ECU connector C-39 in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the connector. Check to see that all meters operate.

#### STEP 4. Check the wiring harness between speed alarm-ECU connector C-39 (terminal 1) and ignition switch (IG1).

*NOTE: Prior to the wiring harness inspection, check junction connectors C-202 and C-203, and repair if necessary.*

**Q: Are the wiring harness between speed alarm-ECU connector C-39 (terminal 1) and ignition switch (IG1) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

#### STEP 5. Measure the resistance at speed alarm-ECU connector C-39 to check the earth circuit to the speed alarm-ECU.

- (1) Disconnect the speed alarm-ECU connector C-39 and measure the resistance at speed alarm-ECU connector C-39.
- (2) Measure the resistance between terminal 8 and earth.

**OK: 2 ohms or less**

**Q: Is the check result normal?**

**YES :** Go to Step 8.

**NO :** Go to Step 6.

#### STEP 6. Connector check: Speed alarm-ECU connector C-39.

**Q: Is speed alarm-ECU connector C-39 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the connector. Check to see that all meters operate.

#### STEP 7. Check the wiring harness between speed alarm-ECU connector C-39 (terminal 8) and earth.

**Q: Are the wiring harness between speed alarm-ECU connector C-39 (terminal 8) and earth in good condition?**

**YES :** This procedure is complete.

**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

**STEP 8. Connector check: Engine-A/T-ECU connector C-136.**

**Q:** Is Engine-A/T-ECU connector C-136 in good condition?

**YES :** Go to Step 9.

**NO :** Repair or replace the connector. Check to see that all meters operate.

**STEP 9. Check the wiring harness between speed alarm-ECU connector C-39 (terminal 4) and Engine-A/T-ECU connector C-136 (terminal 79).**

*NOTE: Prior to the wiring harness inspection, check junction connectors C-02, intermediate connector C-105, and repair if necessary.*

**Q:** Are the wiring harness between speed alarm-ECU connector C-39 (terminal 4) and Engine-A/T-ECU connector C-136 (terminal 79) in good condition?

**YES :** Replace the speed alarm-ECU.

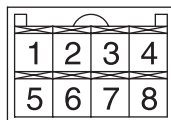
**NO :** Repair or replace the wiring harness. Check to see that all meters operate.

**CHECK AT SPEED ALARM-ECU**

M1547500700028

**TERMINAL VOLTAGE CHECK**

C-39 Speed alarm-ECU connector



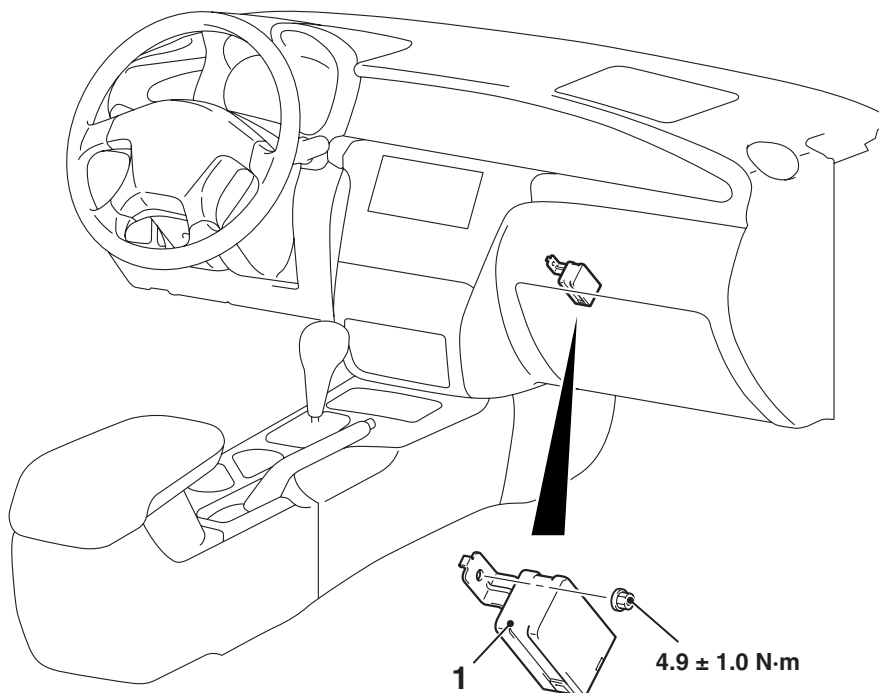
AC309702AB

Terminal No.	Signal	Inspection condition	Terminal voltage
1	Speed alarm-ECU power supply	Ignition switch: "LOCK" (OFF)	0 V
		Ignition switch: "ON"	System voltage
2 – 3	–	–	–
4	Engine-A/T-ECU	–	–
5 – 7	–	–	–
8	Speed alarm-ECU earth	Always	0 V

## SPEED ALARM

### REMOVAL AND INSTALLATION

M1547500800025



AC309603AC

#### Removal steps

- Glove box (Refer to GROUP 52A, Instrument panel assembly [P.52A-3](#) <L.H.drive vehicles>)
1. Speed alarm-ECU

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## NOTES