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 paassenger (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

M1541000300351

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

ON-VEHICLE SERVICE

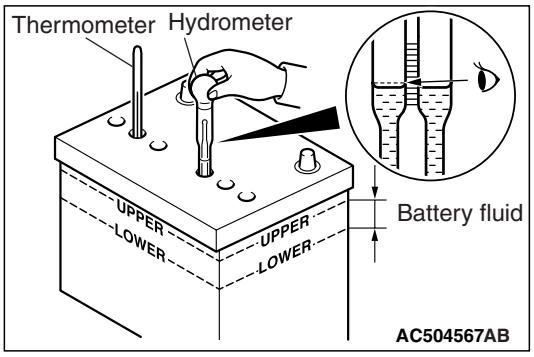
FLUID LEVEL AND SPECIFIC GRAVITY CHECK

M1541001000502

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



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

   Standard value: 1.220 – 1.290 (20° C)

3. 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) × 0.0007 + Dt

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

   Dt: Actually measured specific gravity

   t: Actually measured temperature

CHARGING

M1541001100929

⚠ 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.**
- **Be careful to avoid tasks that might produce sparks or other danger while the battery is 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.**
- **Charge the battery in a well-ventilated location.**
- **Do not let the battery electrolyte temperature rise above approximately 45° C (approximately 55° C during rapid charging).**

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

Battery type	Capacity (5-hour rate)	Normal charging current	Rapid charging current
55D23L	48 A	4.8 A	48 A

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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

M1541001200982

BATTERY TESTING PROCEDURE

STEP 1. Check the battery cables.
(1) Remove the negative cable, then the positive cable.
(2) 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.

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

Battery type	**55D23L**
Charging time when fully discharged h (5-amp. rated current charging)	10
Load test (Amps)	170

LOAD TEST CHART

Temperature °C	**21 and above**	**16**	**10**	**4**	**–1**	**–7**	**–12**	**–18**
Minimum voltage	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

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IGNITION SWITCH

GENERAL INFORMATION

M1543009901694

IGNITION KEY REMINDER BUZZER

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.

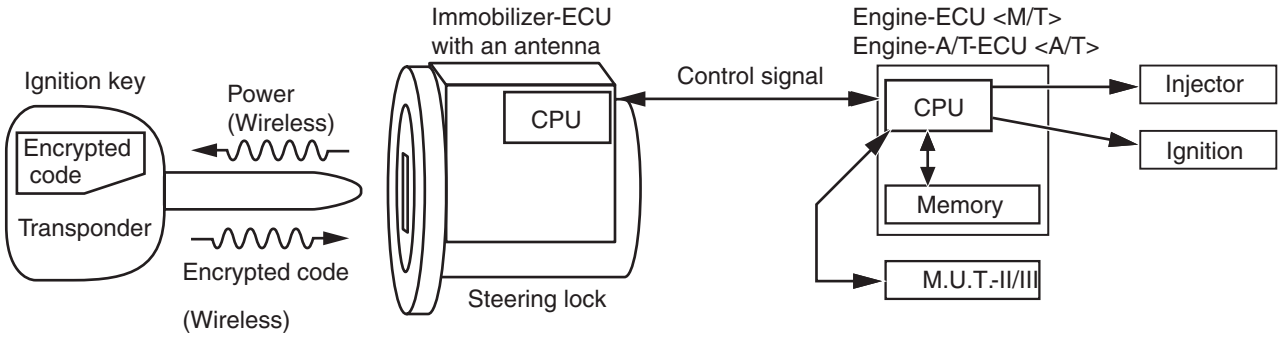
IMMOBILIZER SYSTEM

The immobilizer system consists of the ignition key with a transponder, the immobilizer-ECU, and the engine-ECU <M/T> or engine-A/T-ECU <A/T>. 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-20). 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-20).

OPERATION

1. When the ignition switch is turned to "ON" position, the engine-ECU <M/T> or engine-A/T-ECU <M/T> sends a requirement for the encrypted code to the immobilizer-ECU (at this time, the engine is remobilized).
2. When the immobilizer-ECU receives the requirement from the engine-ECU <M/T> or engine-A/T-ECU <A/T>, 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-ECU <M/T> or engine-A/T-ECU.
4. If the engine-ECU <M/T> or engine-A/T-ECU can not receive the encrypted code, the engine will be immobilized.



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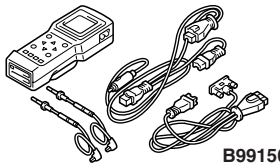
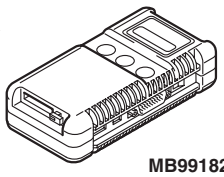
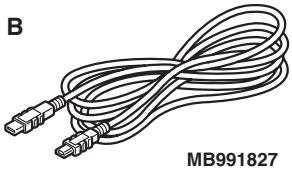
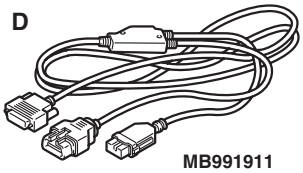
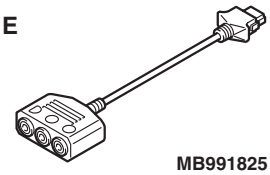
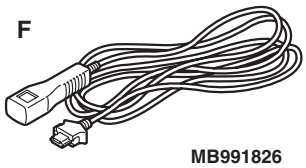
SPECIAL TOOLS

M1543000602451

Tool	Number	Name	Use
 B991502	MB991502	M.U.T.-II sub assembly	• Immobilizer system check • Encrypted code registration
A  MB991824 B  MB991827 C DO NOT USE MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	M.U.T.-III sub-assembly A: Vehicle communication interface (V. C. I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III measurement adapter F: M.U.T.-III trigger harness	• Immobilizer system check • Encrypted code registration **⚠ CAUTION** **If you connect M.U.T.-III main harness A to a vehicle without CAN communication system to use the M.U.T.-III, a pulse signal may interfere with the simulated vehicle speed lines, thus causing the M.U.T.-III inoperative. Therefore, use the M.U.T.-III main harness B (MB991911) instead.**

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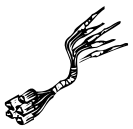
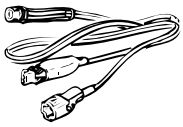
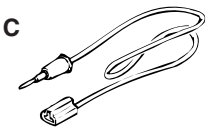
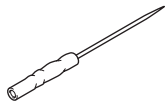
Tool	Number	Name	Use
A  B  C  D MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit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

TROUBLESHOOTING

IGNITION KEY REMINDER BUZZER AND DOOR LOCK PREVENTION FUNCTION TROUBLESHOOTING

M1543000701358

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

- Not using SWS monitor: GROUP 54B, SWS Diagnosis P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Diagnosis P.54C-17.

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ENCRYPTED CODE REGISTRATION CRITERIA TABLE

M1543026000226

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. Under any of the conditions below, the encrypted code should be registered in the immobilizer-ECU again. The immobilizer-ECU can retain maximum eight different encrypted codes. This means that maximum eight ignition keys can be registered. Refer to P.54A-20 for the procedure to register the encrypted code.

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

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

IMMOBILIZER SYSTEM TROUBLESHOOTING

DIAGNOSIS CODE CHART

M1543007100763

⚠ 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 code(s). If diagnosis code 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	P.54A-10
12	Encrypted codes are not the same or are not registered	P.54A-11

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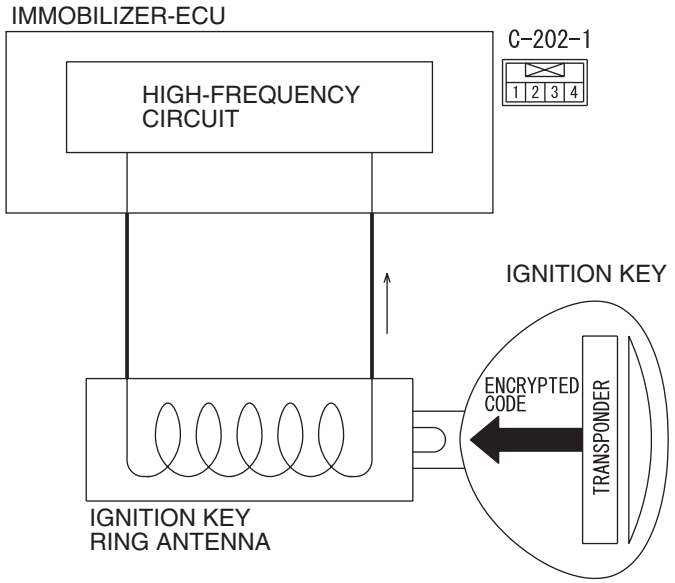
DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.11: Transponder Communication System or Radio Interference of Encrypted Code

Ignition Key Ring and Immobilizer-ECU Circuit



W4J54L000A

DIAGNOSIS CODE SET CONDITION

- Diagnosis code No.11 may be set if other ignition keys or equipments which cause a radio interference 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 No.11 is always set together with MPI system diagnosis code No.P0513.

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 for presence of the equipment which cause a radio interference.

Q: Is there any equipment which the customer attached? For example, a plug-in air freshener and so on.
YES : Remove or disconnect the equipment. Retest the system.
NO : Go to Step 3.

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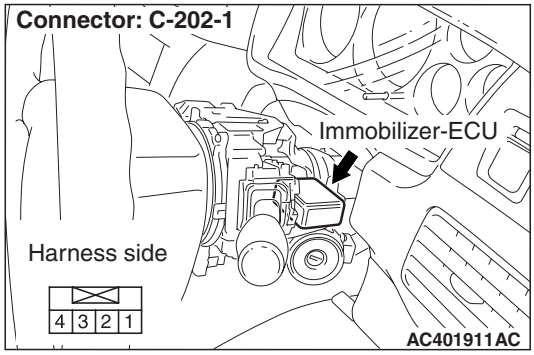
STEP 3. Check that the engine start using the spare ignition key which encrypted code has been registered.

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 (Refer to P.54A-9). Retest the system.
NO : Go to Step 4.

STEP 4. Check whether the diagnosis code is reset.

Q: Which diagnosis code is set, code No.11 or 12 the encrypted code has been registered?
Code No.12 is set : Refer to P.54A-11.
Code No.11 is set : Go to Step 5.

STEP 5. Connector check: Immobilizer-ECU connector C-202-1.



Q: Is immobilizer-ECU connector C-202-1 in good condition?
YES : Replace immobilizer-ECU (Refer to P.54A-24). Retest the system.
NO : Repair or replace the damage component(s).

Code No.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 No.12 is always set together with MPI system diagnosis code No.P0513.

TROUBLESHOOTING HINTS

- The encrypted code in the ignition key has not been properly registered.
- The encrypted code in the ignition key is the initial value.
- Malfunction of immobilizer-ECU.

DIAGNOSIS PROCEDURE

Was the encrypted code registered?
YES : Replace the immobilizer-ECU (Refer to P.54A-24).
NO : Register the encrypted code (Refer to P.54A-20).

SYMPTOM CHART

M1543007201611

Symptom	Inspection procedure No.	Reference page
Communication with M.U.T.-II/III is impossible.	1	P.54A-12
The ignition key cannot be registered.	2	P.54A-18
Engine does not start (cranking but no initial combustion).	3	P.54A-18

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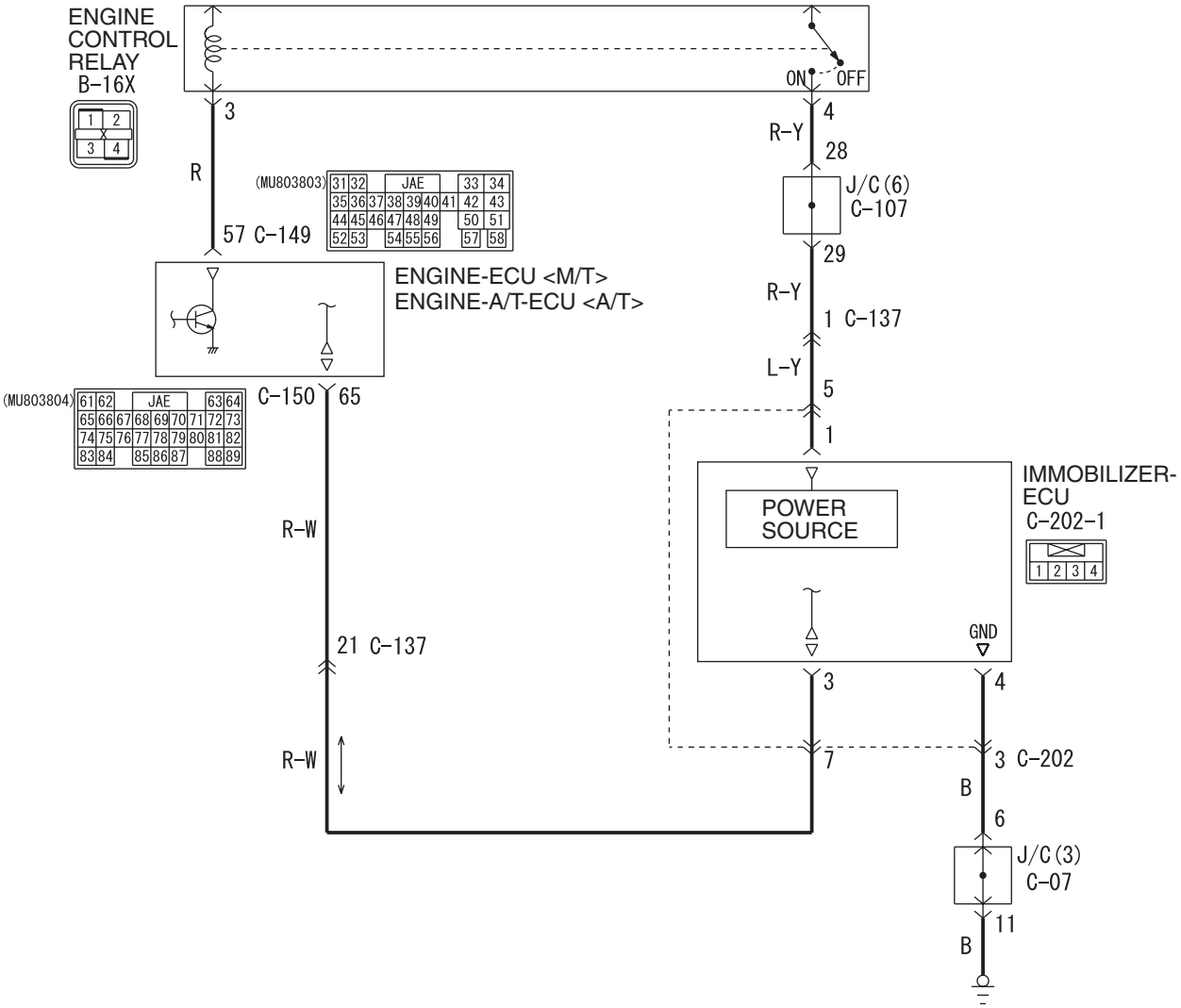
SYMPTOM PROCEDURES

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

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



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

W6J54L007A

TECHNICAL DESCRIPTION (COMMENT)

- This malfunction may be caused by a defective immobilizer-ECU, engine-ECU <M/T> or engine-A/T-ECU <A/T>, or a defect in the communication line between the immobilizer-ECU and engine-ECU <M/T> or engine-A/T-ECU <A/T>. If this malfunction appears when the MPI system and M.U.T.-II/III can communicate each other, MPI system diagnosis code No.P0513 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-ECU <M/T> or engine-A/T-ECU <A/T> can be determined as normal.

NOTE: If this malfunction appears, MPI system diagnosis code No.P0513 will be set.

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TROUBLESHOOTING HINTS

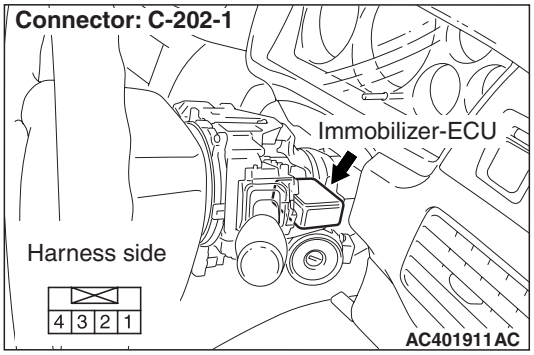
- Malfunction of the immobilizer-ECU.
- Malfunction of the engine-ECU <M/T> or engine-A/T-ECU <A/T>.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

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.

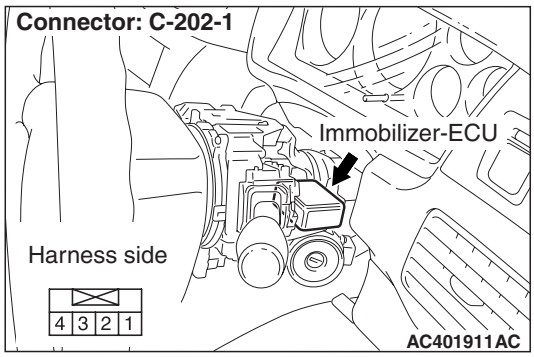
Q: Can M.U.T.-II/III communicate with the MPI system? Is an MPI system diagnosis code other than P0513 set?
YES : Go to Step 2.
NO : Refer to GROUP 13A, MPI Diagnosis P.13A-19.

STEP 2. Connector check: Immobilizer-ECU connector C-202-1

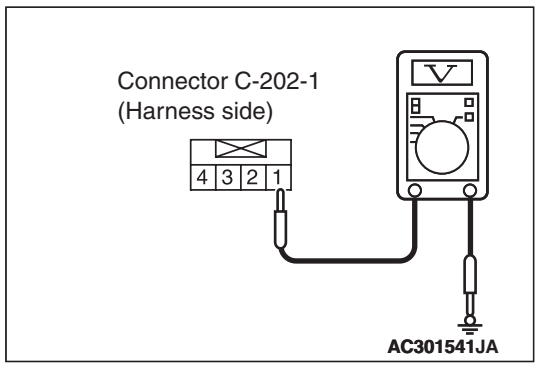


Q: Is immobilizer-ECU connector C-202-1 in good condition?
YES : Go to Step 3.
NO : Repair or replace the damaged component(s). Confirm that M.U.T.-II/III communicates normally.

STEP 3. Voltage measurement at immobilizer-ECU connector C-202-1.



(1) Disconnect immobilizer-ECU connector C-202-1.
(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 6.
NO : Go to Step 4.

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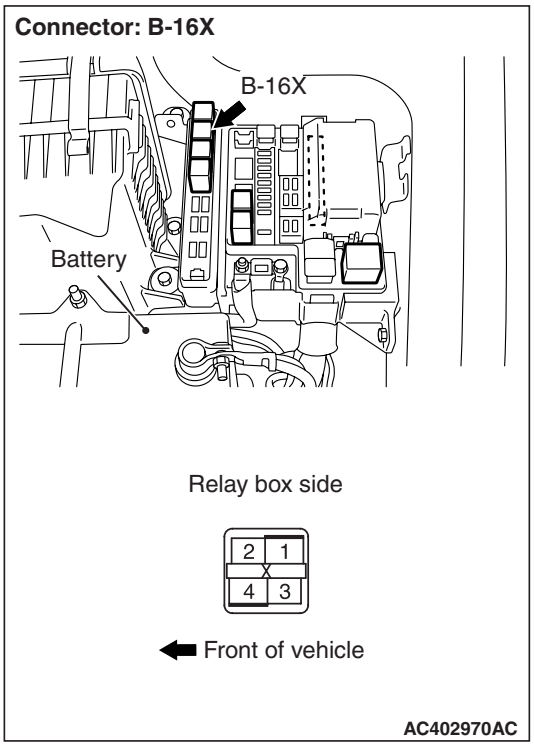
STEP 4. Connector check: Engine control relay connector B-16X

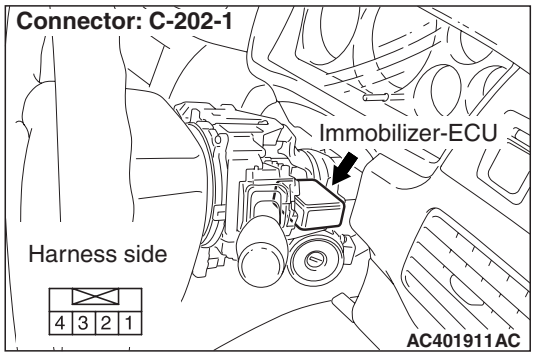


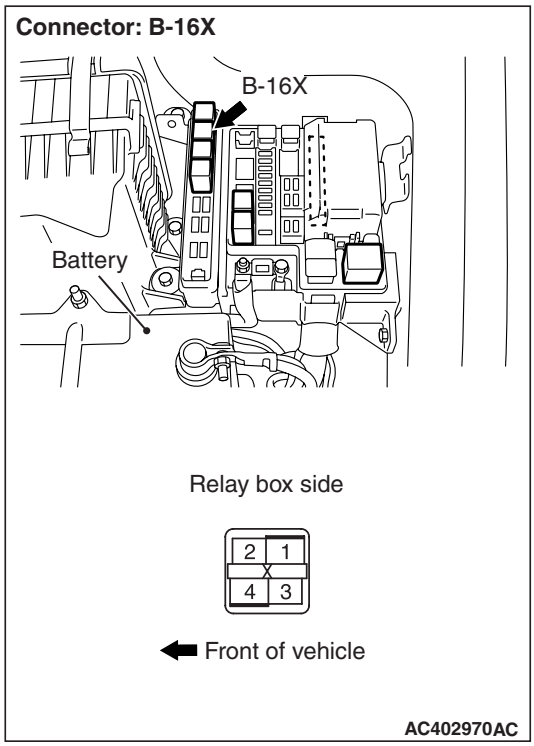
Q: Is engine control relay connector B-16X in good condition?

YES : Go to Step 5.

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

STEP 5. Check the harness wires between immobilizer-ECU connector C-202-1 (terminal 1) and engine control relay connector B-16X (terminal 1).





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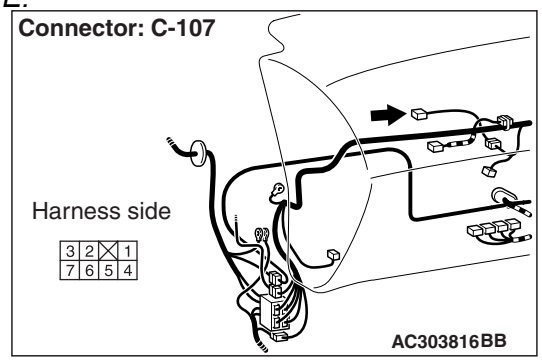
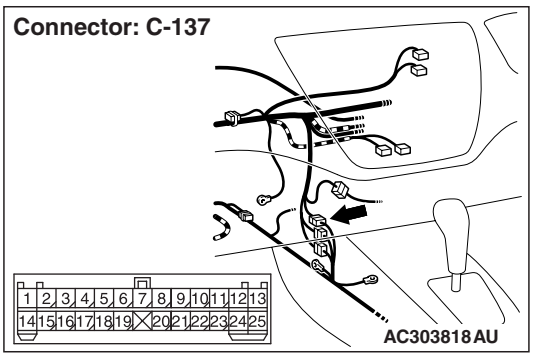
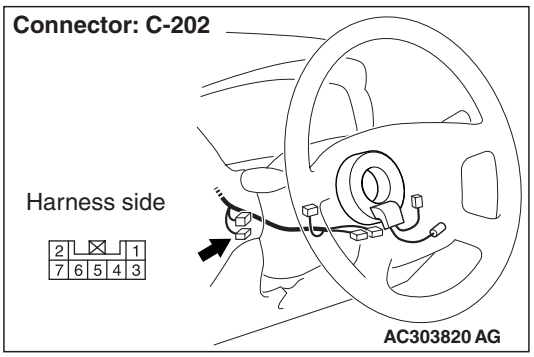
NOTE:



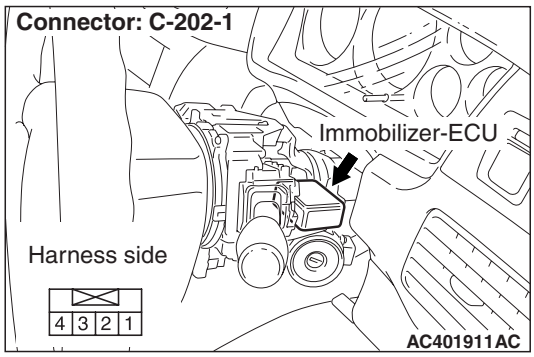




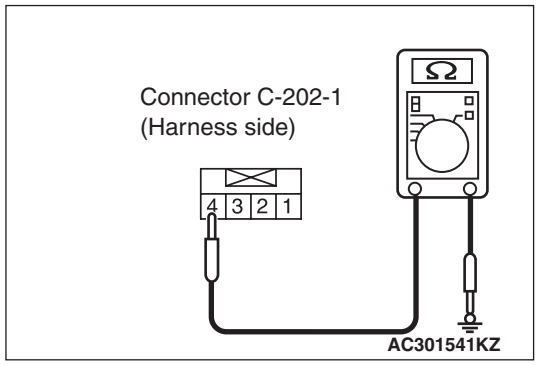
Prior to the wiring harness inspection, check intermediate connector C-137, joint connector C-107 and key reminder switch connector C-202, and repair if necessary.

Q: Are the harness wires between immobilizer-ECU connector C-202-1 (terminal 1) and engine control relay connector B-16X (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 6. Resistance measurement at immobilizer-ECU connector C-202-1.



(1) Disconnect immobilizer-ECU connector C-202-1.



(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 7.

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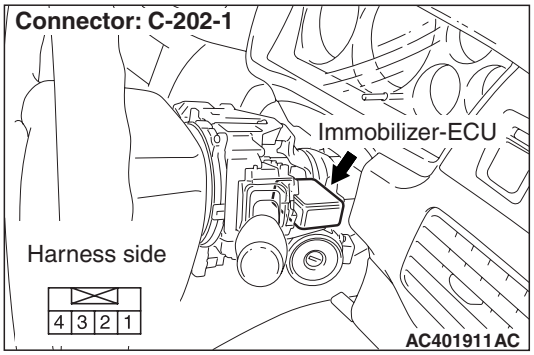
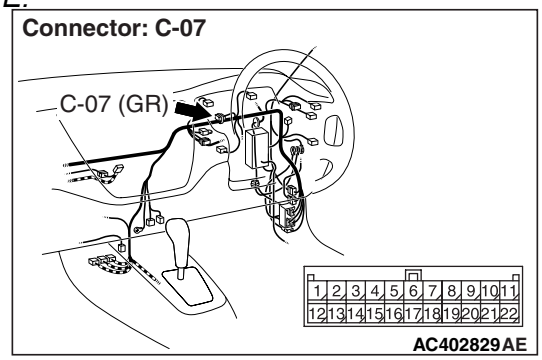
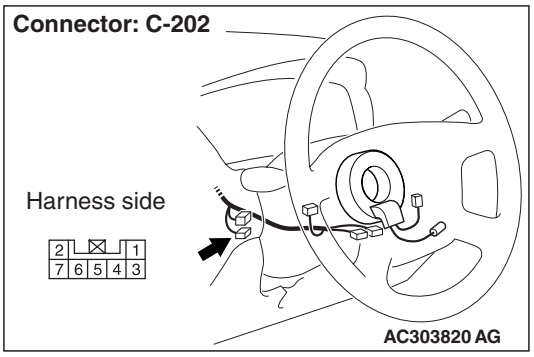
STEP 7. Check the harness wire between immobilizer-ECU connector C-202-1 (terminal 4) and earth.



NOTE:

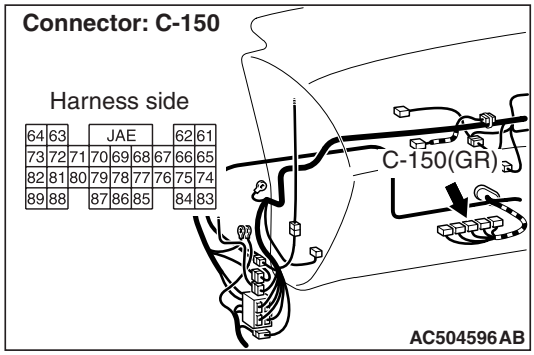




Prior to the wiring harness inspection, check joint connector C-07, key reminder switch connector C-202, and repair if necessary.

Q: Is the harness wire between immobilizer-ECU connector C-202-1 (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: Engine-ECU connector C-150 <M/T> or engine-A/T-ECU connector C-150 <A/T>



Q: Are engine-ECU connector C-150 <M/T> or engine-A/T-ECU connector C-150 <A/T> 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.

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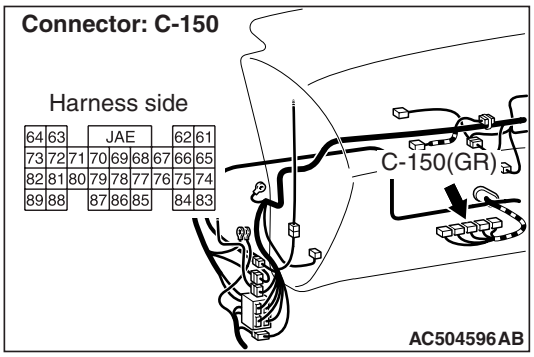
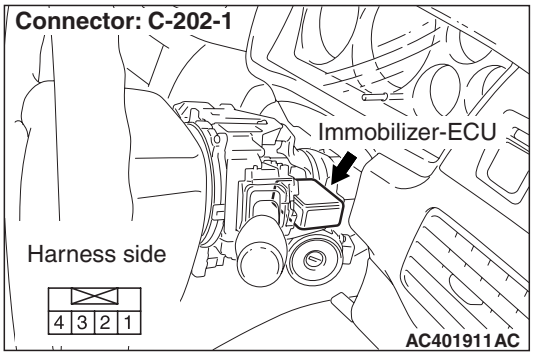
STEP 9. Check the harness wires between immobilizer-ECU connector C-202-1 (terminal 3) and engine-ECU connector C-150 (terminal 65) <M/T> or engine-A/T-ECU connector C-150 (terminal 65) <A/T>.





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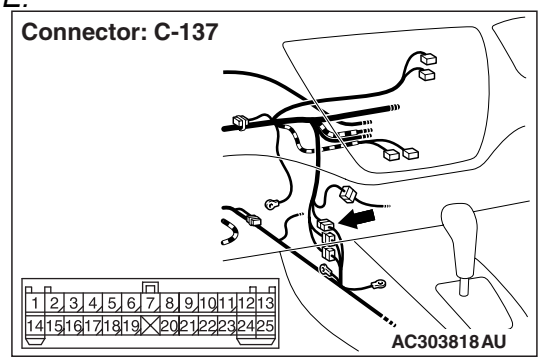

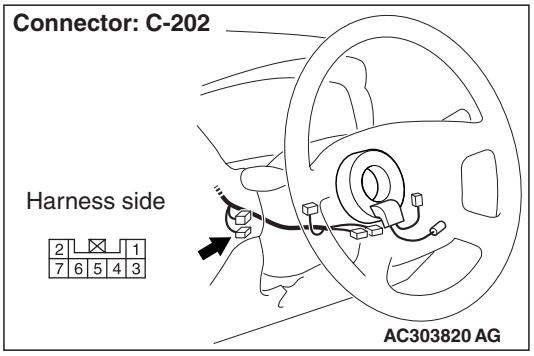

Prior to the wiring harness inspection, check key reminder switch connector C-202, intermediate connector C-137, and repair if necessary.

Q: Are the harness wires between immobilizer-ECU connector C-202-1 (terminal 3) and engine-ECU connector C-150 (terminal 65) <M/T> or engine-A/T-ECU connector C-150 (terminal 65) <A/T> 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.
Replace the immobilizer-ECU (Refer to P.54A-24).

Q: Did the communication with M.U.T.-II/III become possible after replacing the immobilizer-ECU?
YES : 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.00-13).
NO : Replace the engine-ECU <M/T> or engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine ECU and engine-A/T-ECU removal and installation P.13A-335). Confirm that M.U.T.-II/III communicates normally.

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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 No.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-20). 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.00-13).
NO : Replace the immobilizer-ECU (Refer to P.54A-24).

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 system voltage.
Measure the system voltage during cranking.

Q: Is the voltage 8 volts or more?
YES : Go to Step 2.
NO : Check the battery (Refer to P.54A-4). 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 is set : Refer to P.54A-9.
MPI system diagnosis code is set : Refer to GROUP 13A, Diagnosis P.13A-19.
No diagnosis code is set : Go to Step 3.

STEP 3. Check the starting system.

Q: Does the engine start?
YES : Go to Step 4.
NO : Refer to GROUP 13A, Diagnosis –Symptom Chart P.13A-204. If the malfunction is not resolved, replace the immobilizer-ECU (Refer to P.54A-24). The engine should start.

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STEP 4. Retest the system

Q: Is the malfunction eliminated?

YES : The procedure is complete. If any malfunction is not 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.00-13).

NO : Replace the immobilizer-ECU (Refer to P.54A-24).

DATA LIST REFERENCE TABLE

M1543007300563

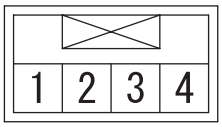
Item No.	Inspection item	Inspection requirement	Normal condition
01	Key has been registered	–	Number of registered ignition keys

CHECK IMMOBILIZER-ECU

M1543007600809

TERMINAL VOLTAGE CHECK TABLE

C-202-1



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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-ECU <M/T> or engine-A/T-ECU	-	-
4	Immobilizer-ECU earth	Always	0V

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ON-VEHICLE SERVICE

HOW TO REGISTER ENCRYPTED CODE

M1543008100711

⚠ CAUTION

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

If the ignition key, Immobilizer-ECU, engine-ECU<M/T> or engine-A/T-ECU<A/T> is replaced or an ignition key is added, encrypted codes of all the ignition keys must be registered. (A maximum of eight different ignition key can be registered.) Moreover, when the immobilizer-ECU has been replaced, you need to register the password (secret key code) and an encrypted code into the immobilizer-ECU by using the M.U.T.-II/III. The vehicle's password input is required for the registration from the M.U.T.-II/III, and the vehicle's password can be changed by the owner using the M.U.T.-II/III.

If an attempt is made to start the engine with an unregistered ignition key, cranking occurs, but fuel supply is cut off to disable the engine. In approximately.

NOTE: Engine-ECU<M/T> or engine-A/T-ECU<A/T> has the password (secret key code) for immobilizer-ECU, and the password (secret key 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 five 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 for 16 minutes. "Unauthorized operation, start-prevention mode" can not canceled unless 16 minutes pass, even if the ignition switch is turned to "ON" position from "LOCK (OFF)" position.

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.

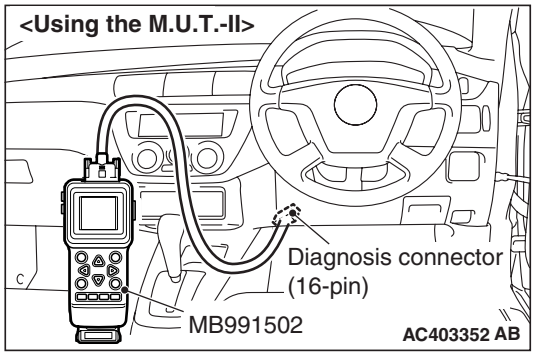
REGISTRATION WITH THE M.U.T.-II

⚠ CAUTION

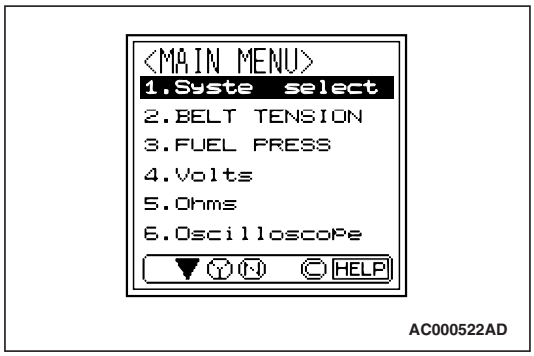
To prevent damage to M.U.T.-II, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting M.U.T.-II.

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-6.*



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"

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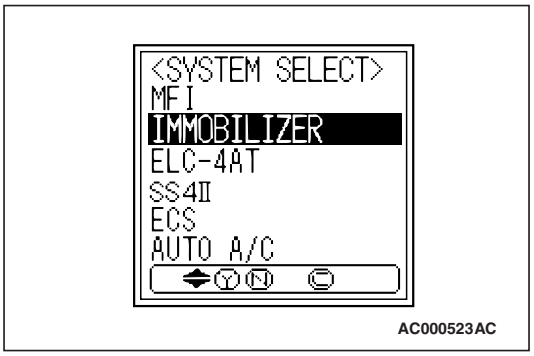

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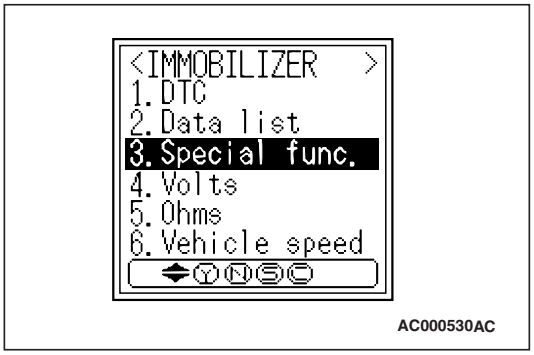
4. Select "Immobilizer," press "YES".



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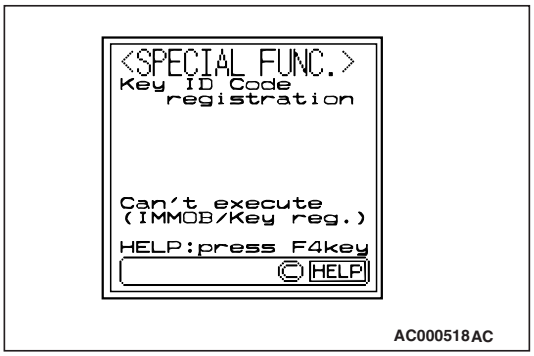
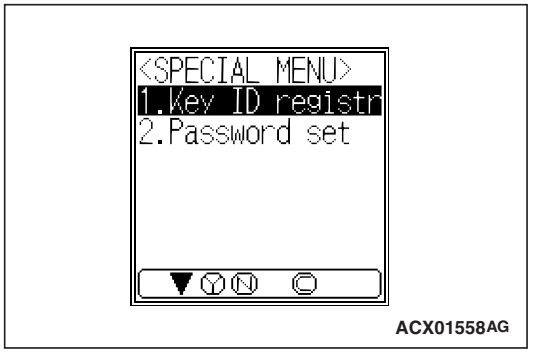
5. Select "Special Func", press "YES".

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

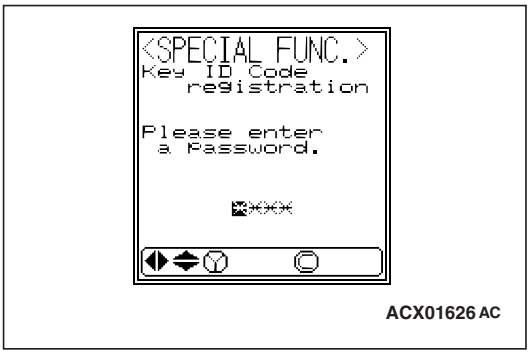


AC000518AC



ACX01558AG

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

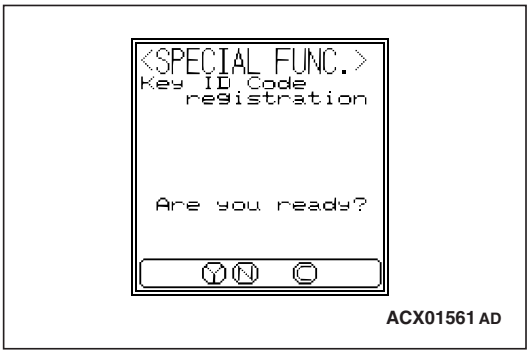


ACX01626 AC

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.

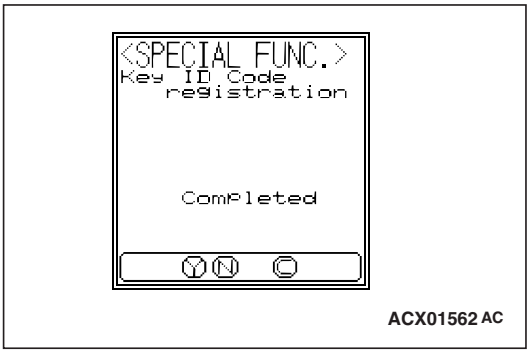
   If an incorrect password is input five times in a row, this screen is displayed and the immobilizer-ECU switches to unauthorized operation, start-prevention mode for 16 minutes.

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



ACX01561 AD

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



ACX01562 AC

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.

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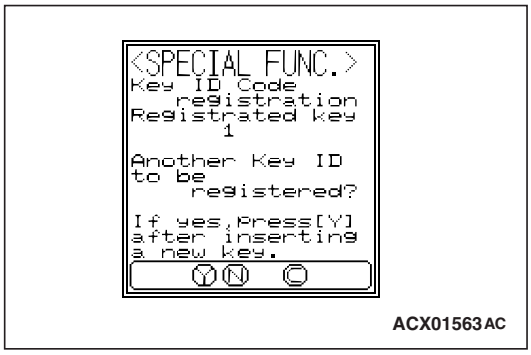


10. The number of keys currently registered will be displayed. To register an additional key, replace the ignition key with the next key to be registered within seven seconds and then press the "YES" key. Key ID registration screen will be displayed, then register another key.

    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.

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.

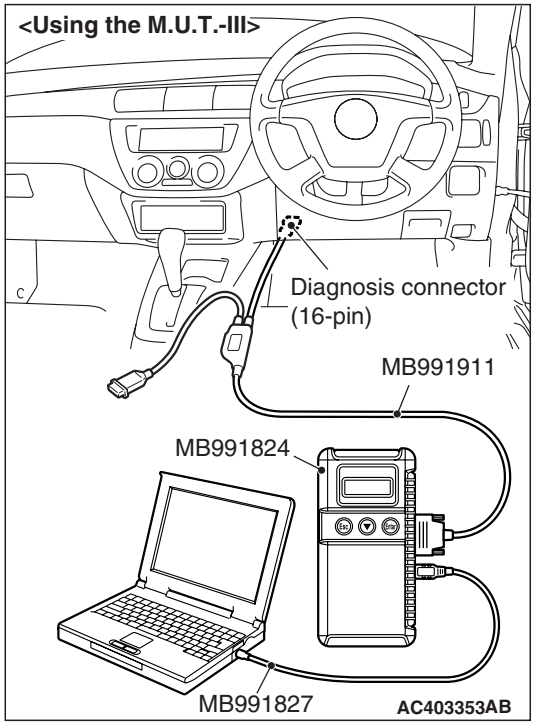
REGISTRATION WITH THE M.U.T.-III

⚠ 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-6.*



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

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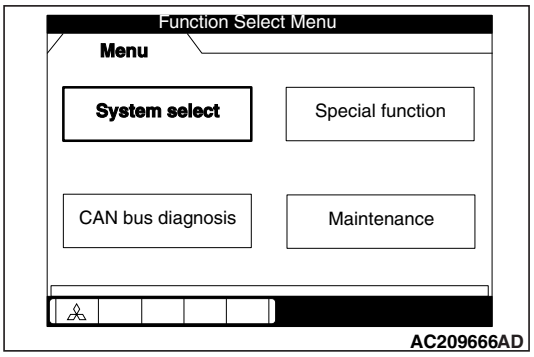
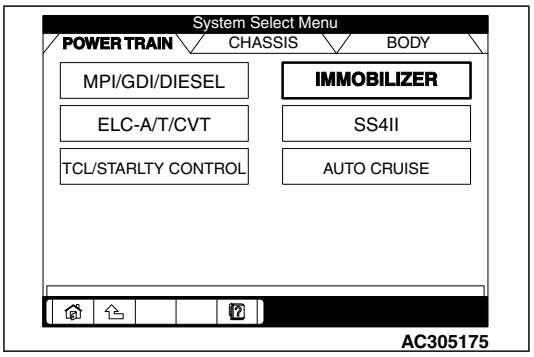
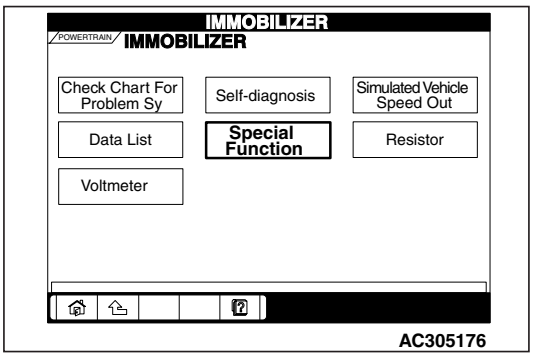


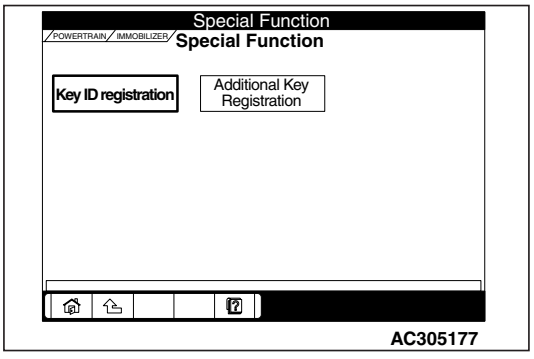
3. Select "System select" from the start-up screen.



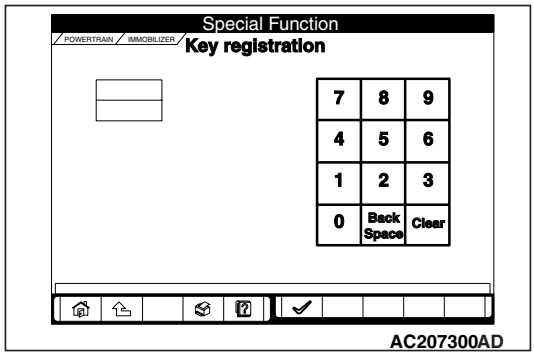
4. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



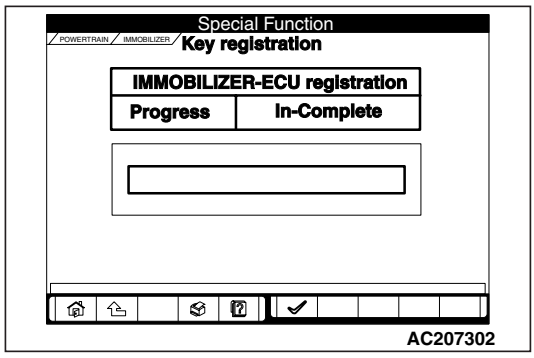
5. Choose "Special Function" from "IMMOBILIZER" screen.



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



7. Enter the vehicle's password 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 seven 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.

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IGNITION SWITCH

REMOVAL AND INSTALLATION

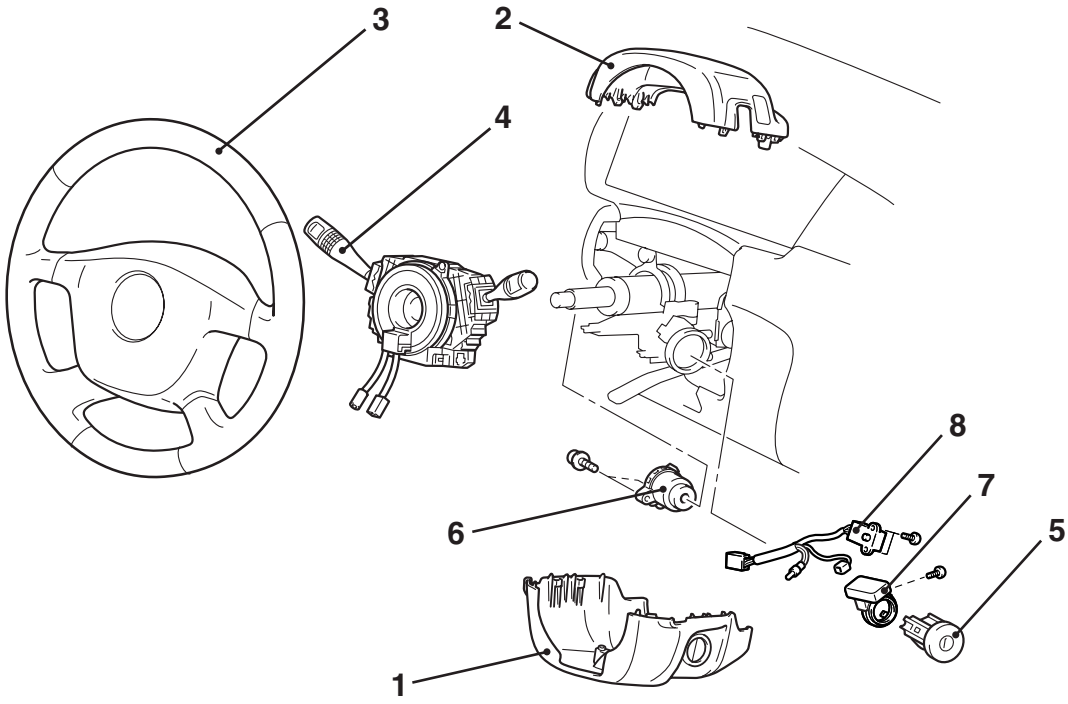
M1543002101062

⚠ WARNING

- ***Before removal of the air bag module, refer to GROUP 52B, SRS Service Precautions P.52B-5 and Driver's, Front Passenger's Air Bag Module(s) and Clock Spring P.52B-157.***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***

⚠ CAUTION

When the immobilizer-ECU replacement is performed, always refer to P.54A-9.



AC304659AB

Removal steps

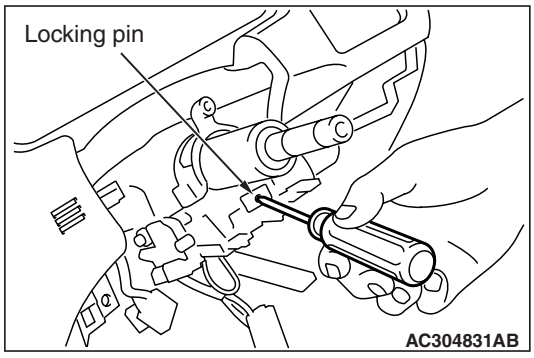
1. Column cover lower
2. Column cover upper
3. Steering wheel and air bag module assembly (Refer to GROUP 37, Steering wheel P.37-15)
4. Clock spring and column switch assembly (Refer to GROUP 37, Steering shaft P.37-17)

<<A>>

5. Steering lock cylinder
   - Ignition switch connector
6. Ignition switch
7. Immobilizer-ECU
   - Key reminder switch connector
8. Key reminder switch and bulb assembly

REMOVAL SERVICE POINT

<<A>> STEERING LOCK CYLINDER REMOVAL



AC304831AB

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.

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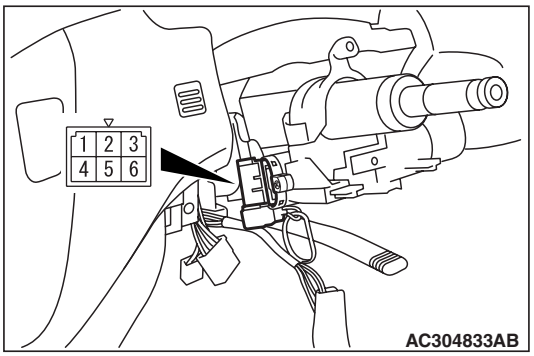
INSPECTION

M1544009700322

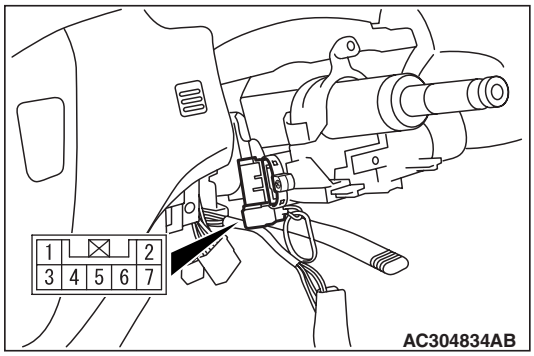
IGNITION SWITCH CONTINUITY CHECK



Disconnect ignition switch connector C-201 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-202 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

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COMBINATION METER ASSEMBLY

SERVICE SPECIFICATIONS

M1543000300614

Item		Standard value
Speedometer indication error km/h	20	18 – 22
	40	38 – 42
	80	79 – 84
	120	120 – 125
	160	161 – 166
	200	202 – 207
Tachometer indication error r/min	700	±120
	2,000	–175 + 225
	3,000	–175 + 300
	4,000	–225 + 375
	5,000	–225 + 425
	6,000	–225 + 475
	7,000	–200 + 500
Fuel tank gauge unit resistance Ω	Float position F (highest)	3 ±0.6
	Float position E (lowest)	110 ±2
Fuel gauge unit float height mm	Float position F (A)	24.1 ±2.0
	Float position E (B)	151.6 ±2.0
Engine coolant temperature gauge unit resistance Ω		104 ±13.5 (at 70° C)
Combination meter internal resistance Ω	Engine coolant temperature gauge to earth (terminal No. 1 – 50)	233 ±3
	Fuel gauge to earth (terminal No. 1 – 51)	181 ±2

SEALANT

M1543024600040

Item	Specified sealant
Engine coolant temperature gauge unit	3M™ AAD Part No.8672 or equivalent

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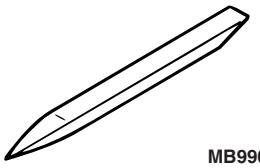
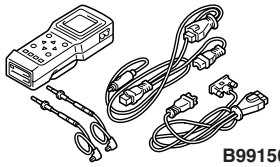
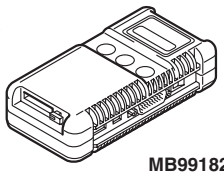
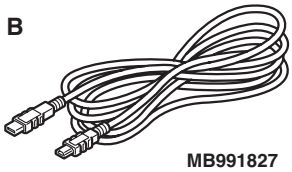
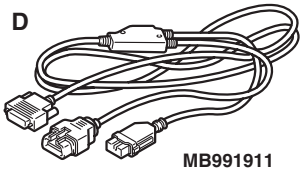
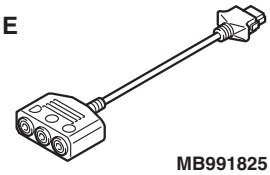
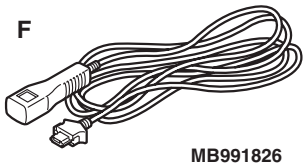
SPECIAL TOOLS

M1543000602462

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of meter bezel and Instrument panel ornament
 B991502	MB991502	M.U.T.-II sub assembly	Reading MPI system diagnosis code
A  MB991824 B  MB991827 C DO NOT USE MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	M.U.T.-III sub-assembly A: Vehicle communication interface (V. C. I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III measurement adapter F: M.U.T.-III trigger harness	Reading MPI system diagnosis code **⚠ CAUTION** **If you connect M.U.T.-III main harness A to a vehicle without CAN communication system to use the M.U.T.-III, a pulse signal may interfere with the simulated vehicle speed lines, thus causing the M.U.T.-III inoperative. Therefore, use the M.U.T.-III main harness B (MB991911) instead.**

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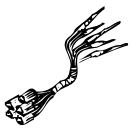
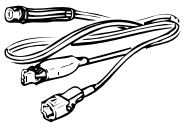
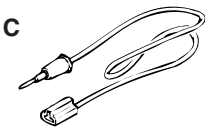
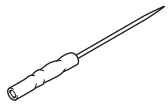
Tool	Number	Name	Use
A  B  C  D MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit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

TROUBLESHOOTING

SYMPTOM CHART

M1543007201622

Symptom	Inspection procedure No.	Reference page
Speedometer does not work (the other meters work). <M/T>	1	P.54A-29
Speedometer does not work (the other meters work). <A/T>	2	P.54A-34
Tachometer does not work (the other meters work).	3	P.54A-39
Fuel gauge does not work (the other meters work).	4	P.54A-41
Engine coolant temperature gauge does not work (the other meters work).	5	P.54A-44
Combination meters does not work (the instruments do not work).	6	P.54A-46

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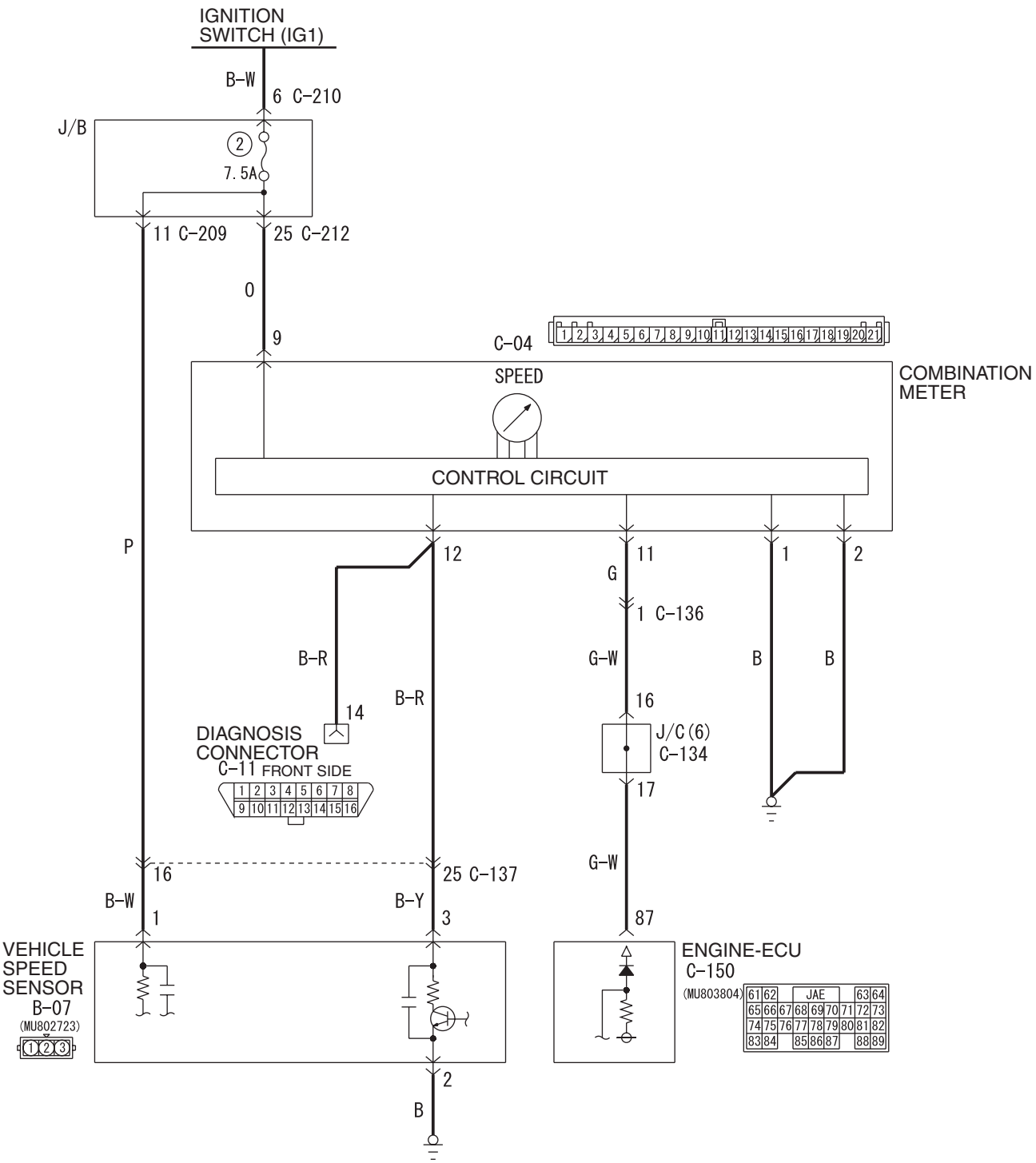
SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Speedometer does not work (the other meters work). <M/T>

Speedometer Circuit



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

W6J54L002A

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TECHNICAL DESCRIPTION (COMMENT)

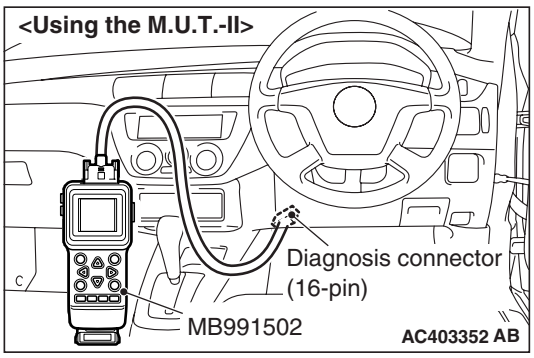
The engine-ECU and its associated components, the combination meter assembly, the wiring harness, or the connector(s) may be defective.

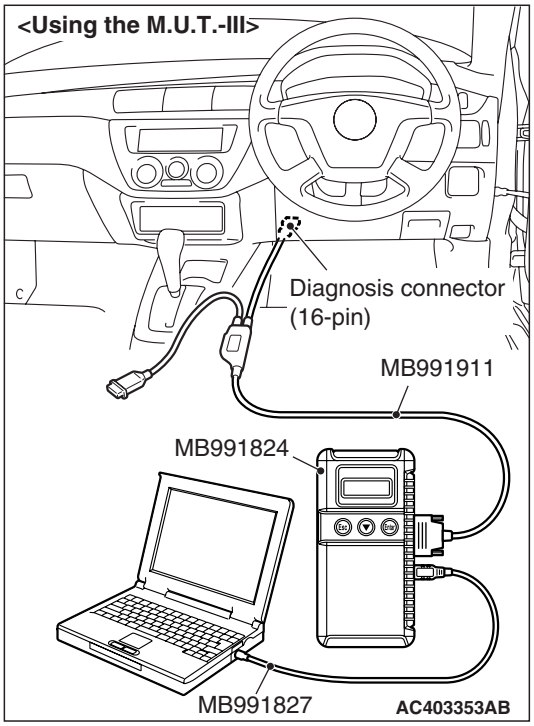
TROUBLESHOOTING HINTS

- Malfunction of the vehicle speed sensor
- Malfunction of the engine-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. M.U.T.-II/III actuator test.



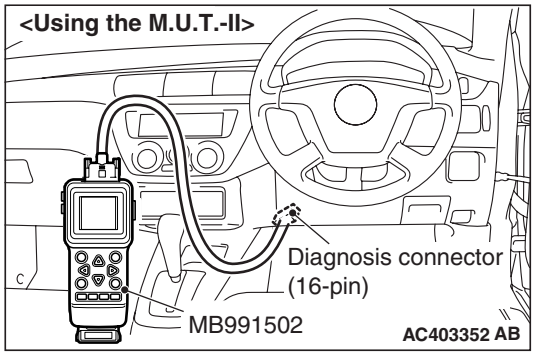


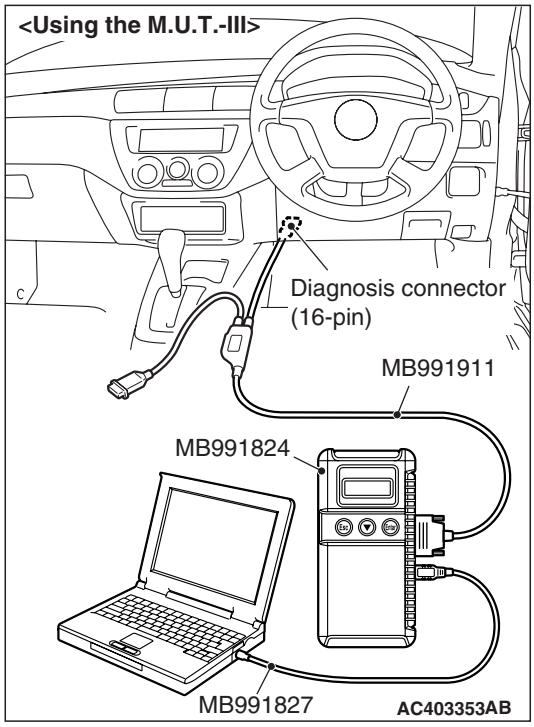
(1) Connect the M.U.T.-II/III to the diagnosis connector.

(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 6.
NO : Go to Step 2.

STEP 2. Check the vehicle speed sensor. (M.U.T.-II/III diagnosis code)





(1) Connect M.U.T.-II/III to the diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the MPI system diagnosis code.

Q: Is MPI system diagnosis code set?
YES : Refer to GROUP 13A –Troubleshooting P.13A-19.
NO : Go to Step 3.

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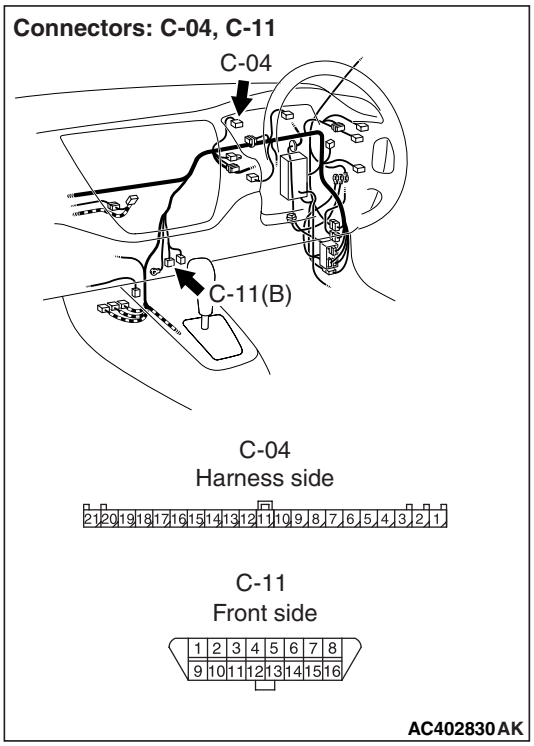
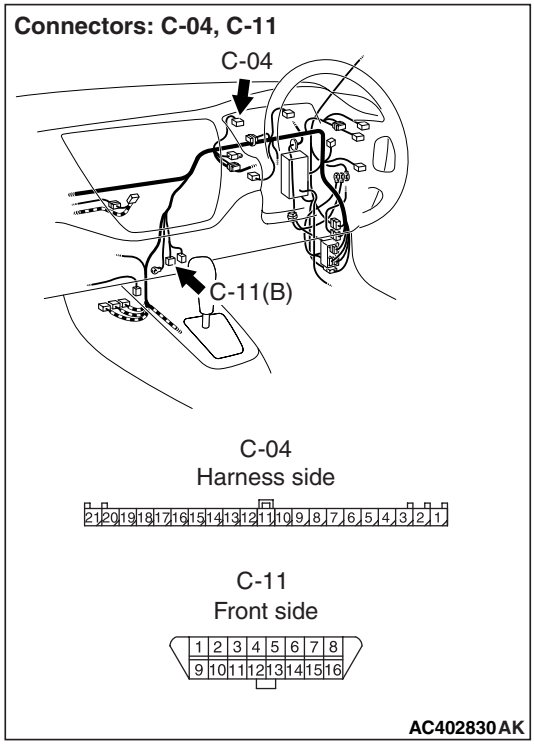
STEP 3. Connector check: Combination meter connector C-04 and diagnosis connector C-11.



Q: Is combination meter connector C-04 and diagnosis connector C-11 in good condition?
YES : Go to Step 4.
NO : Repair or replace the damage component(s).

STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 12) and diagnosis connector C-11 (terminal 14).



Q: Is the wiring harness between combination meter connector C-04 (terminal 12) and diagnosis connector C-11 (terminal 14) in good condition?
YES : Go to Step 5.
NO : Repair or replace the wiring harness.

STEP 5. 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.00-13).
NO : Replace the combination meter assembly.

STEP 6. Check whether the diagnosis code is reset.

Q: Is the MPI-related diagnosis code set?
YES : Refer to GROUP 13A –Troubleshooting P.13A-19.
NO : Go to Step 7.

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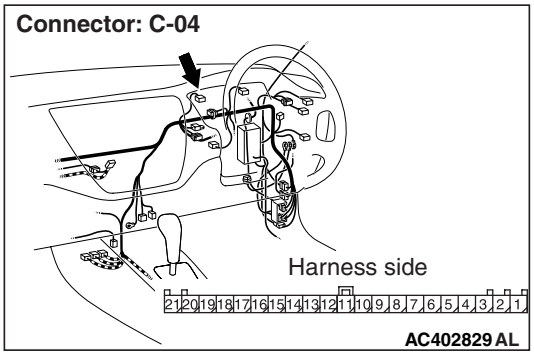
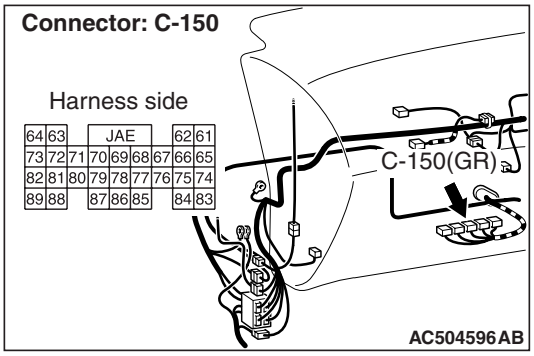
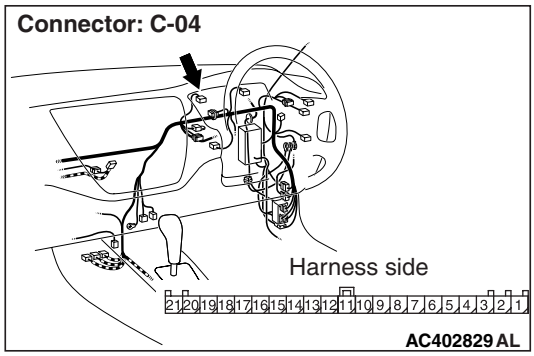
STEP 7. Connector check: Combination meter connector C-04 and engine-ECU connector C-150

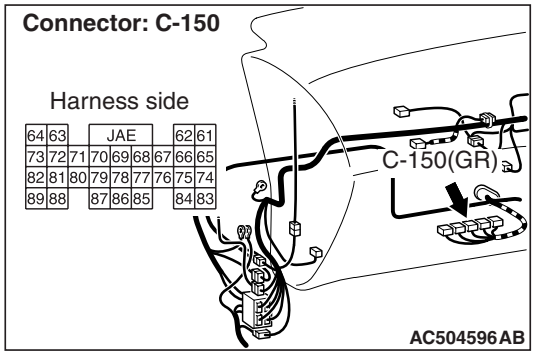




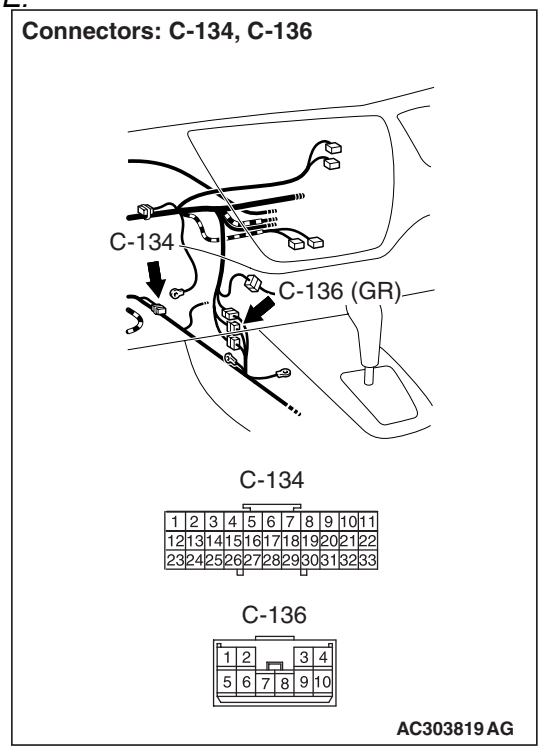
Q: Is combination meter connector C-04 and engine-ECU connector C-150 in good condition?
YES : Go to Step 8.
NO : Repair or replace the damage component(s).

STEP 8. Check the wiring harness between combination meter connector C-04 (terminal 11) and engine-ECU connector C-150 (terminal 87).





NOTE:



Prior to the wiring harness inspection, check intermediate connectors C-136, joint connectors C-134 and repair if necessary.

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Q: Is the wiring harness between combination meter connector C-04 (terminal 11) and engine-ECU connector C-150 (terminal 87) in good condition?
YES : Go to Step 9.
NO : Repair the wiring harness.

STEP 9. 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.00-13).
NO : Go to Step 10.

STEP 10. Pulse check
Use the M.U.T.-II/III or a voltmeter to check that the vehicle speed signal is received.

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-ECU (Refer to GROUP 13A, Engine ECU and engine-A/T-ECU removal and installation P.13A-335).

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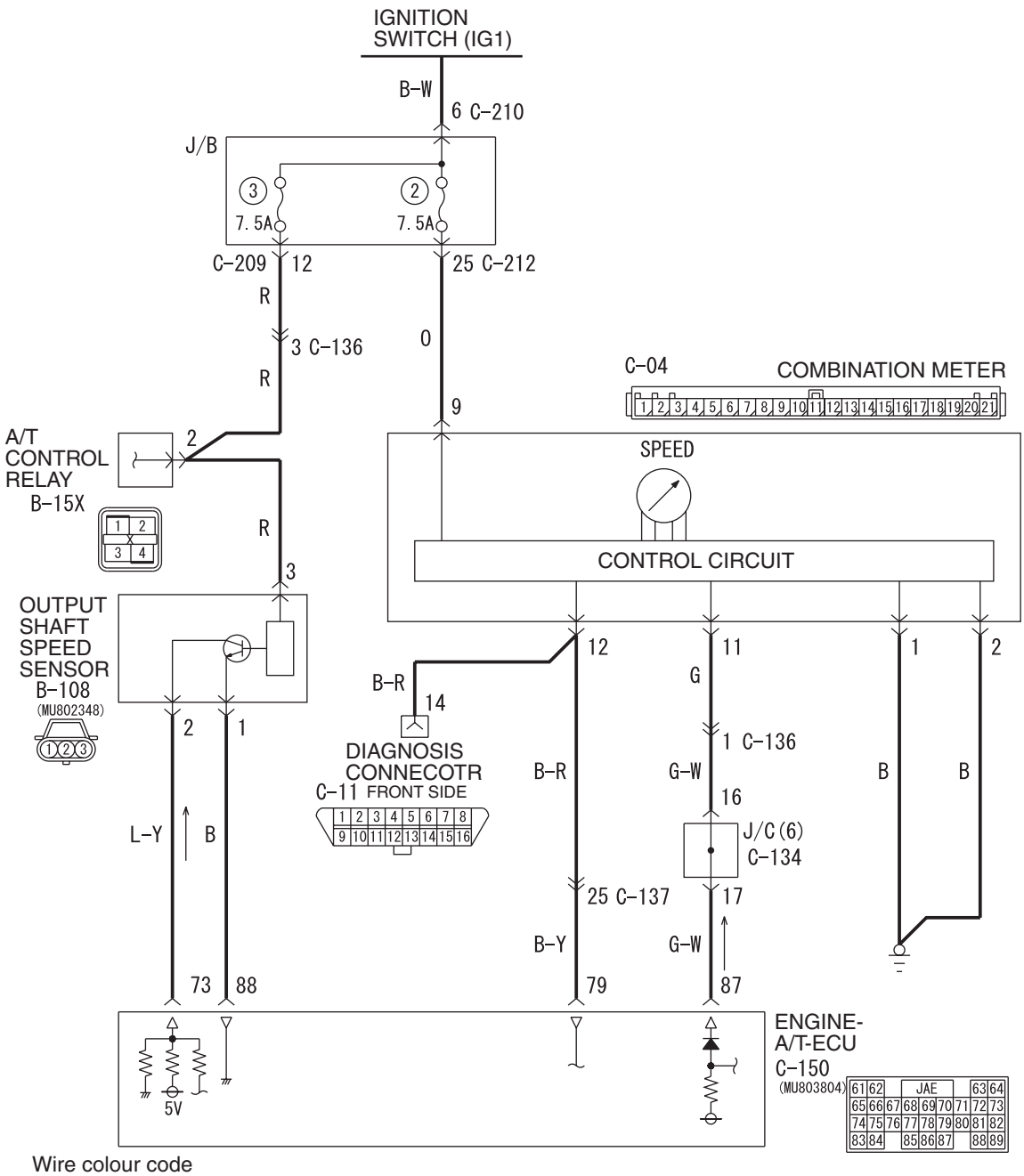
INSPECTION PROCEDURE 2: Speedometer does not work (the other meters work). <A/T>

Speedometer Circuit



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

W6J54L001A

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 vehicle speed sensor
- 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.

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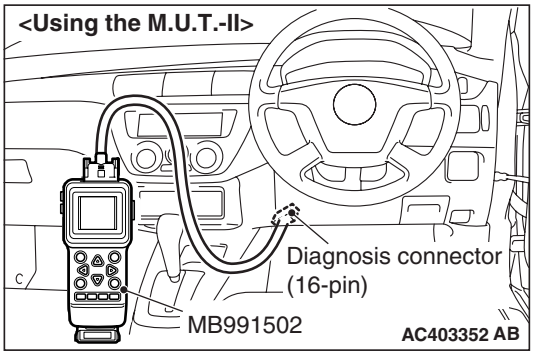
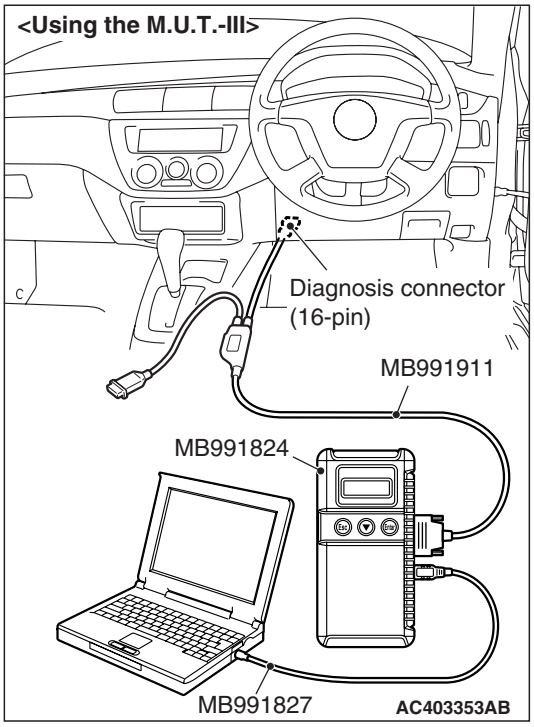
DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-II/III actuator test

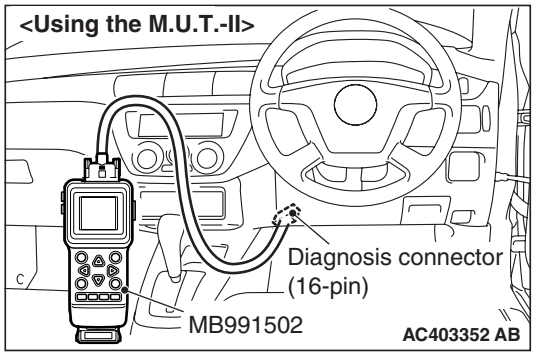


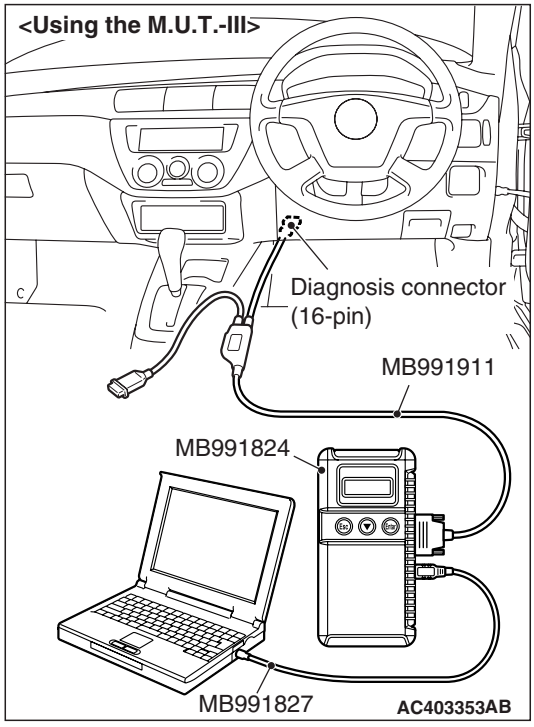


(1) Connect the M.U.T.-II/III to the diagnosis connector.
(2) Use the M.U.T.-II/III to enter simulated vehicle speed.

Q: Does the speedometer show that simulated vehicle speed?
YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the output shaft speed sensor. (M.U.T.-II/III diagnosis code)





(1) Connect M.U.T.-II/III to the diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the automatic transmission system diagnosis code.

Q: Is automatic transmission system diagnosis code 23 set?
YES : Refer to P.23A-30.
NO : Go to Step 3.

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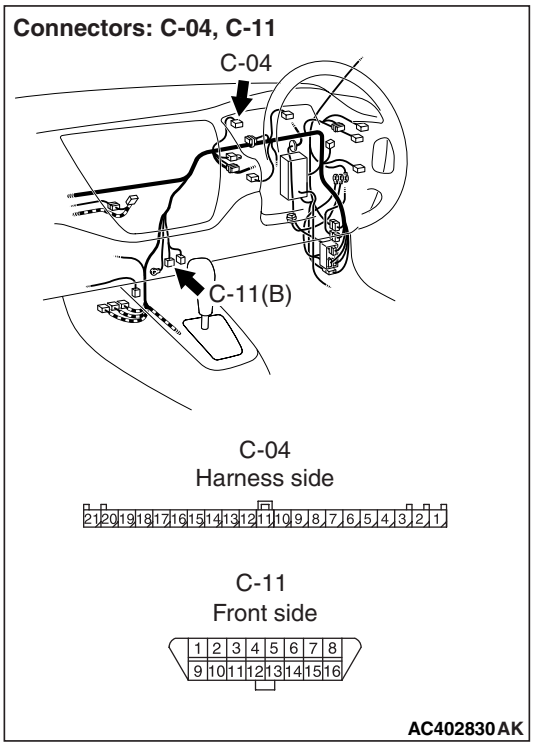
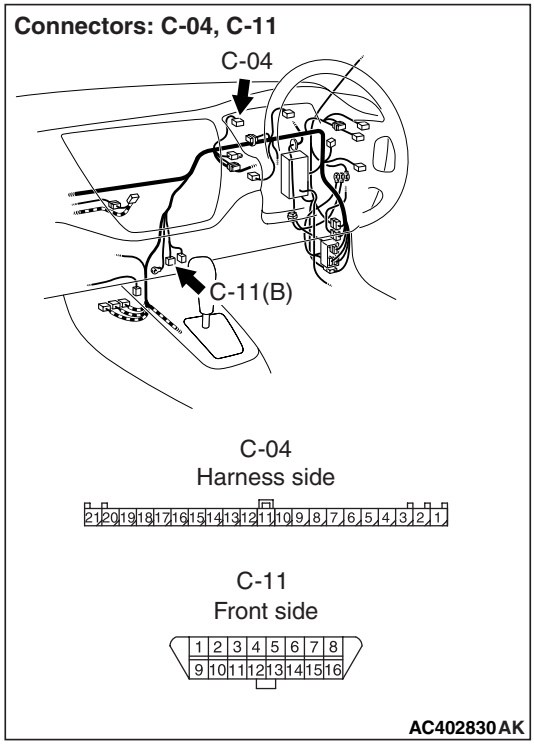
STEP 3. Connector check: Combination meter connector C-04 and diagnosis connector C-11



Q: Is combination meter connector C-04 and diagnosis connector C-11 in good condition?
YES : Go to Step 4.
NO : Repair or replace the damage component(s).

STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 12) and diagnosis connector C-11 (terminal 14).



Q: Is the wiring harness between combination meter connector C-04 (terminal 12) and diagnosis connector C-11 (terminal 14) in good condition?
YES : Go to Step 5.
NO : Repair or replace the wiring harness.

STEP 5. 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.00-13).
NO : Replace the combination meter assembly.

STEP 6. Check whether the diagnosis code is reset.

Q: Is the MPI-related diagnosis code set?
YES : Refer to GROUP 13A –Troubleshooting P.13A-19.
NO : Go to Step 7.

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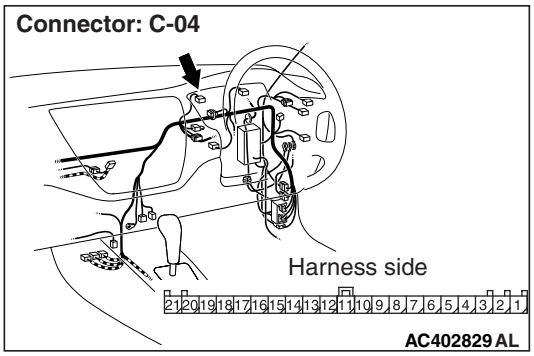
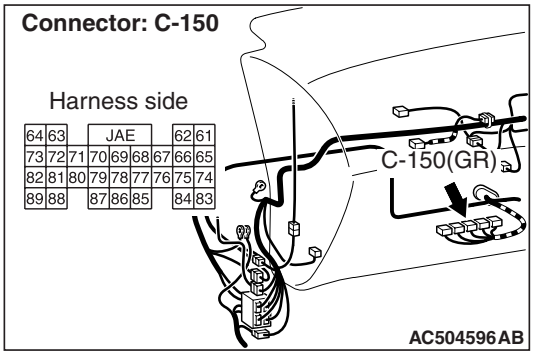
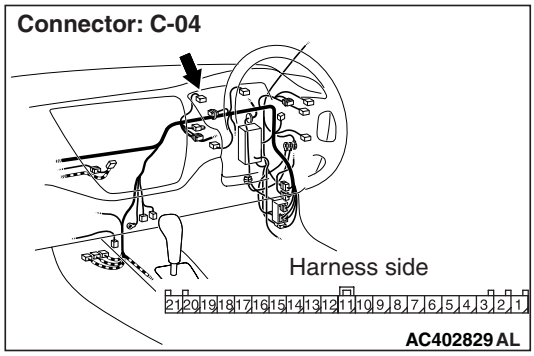
STEP 7. Connector check: Combination meter connector C-04 and engine-A/T-ECU connector C-150

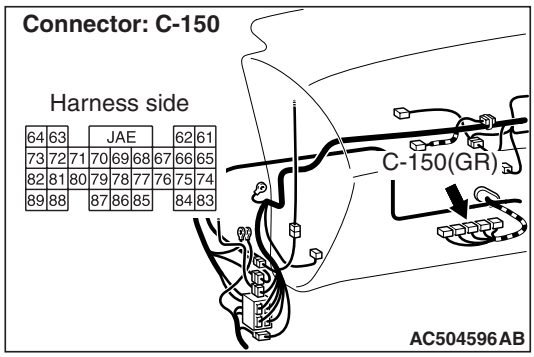




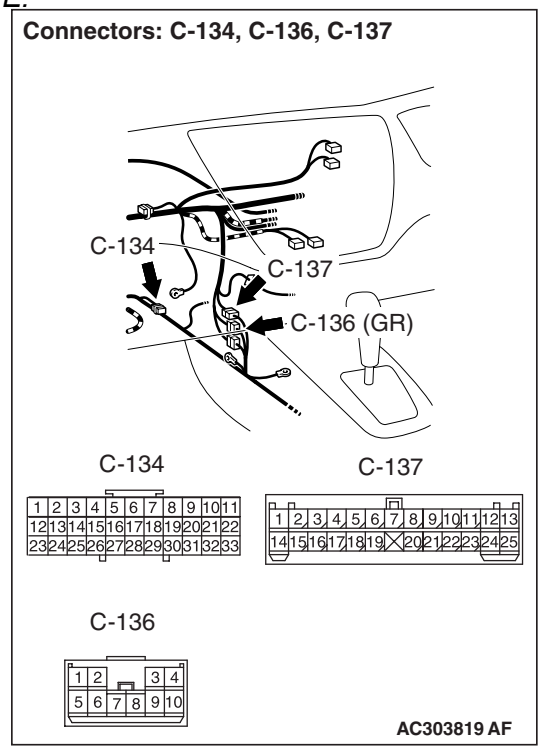
Q: Is combination meter connector C-04 and engine-A/T-ECU connector C-150 in good condition?
YES : Go to Step 8.
NO : Repair or replace the damage component(s).

STEP 8. Check the wiring harness between combination meter connector C-04 (terminal 11, 12) and engine-A/T-ECU connector C-150 (terminal 87, 79).





NOTE:



Prior to the wiring harness inspection, check intermediate connectors C-136, C-137, joint connector C-134 and repair if necessary.

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Q: Is the wiring harness between combination meter connector C-04 (terminal 11, 12) and engine-A/T-ECU connector C-150 (terminal 87, 79) in good condition?
YES : Go to Step 9.
NO : Repair the wiring harness.

STEP 9. 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.00-13).
NO : Go to Step 10.

STEP 10. Pulse check
Use the M.U.T.-II/III or a voltmeter to check that the vehicle speed signal is received.

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 (Refer to GROUP 13A, Engine ECU and engine-A/T-ECU removal and installation P.13A-335).

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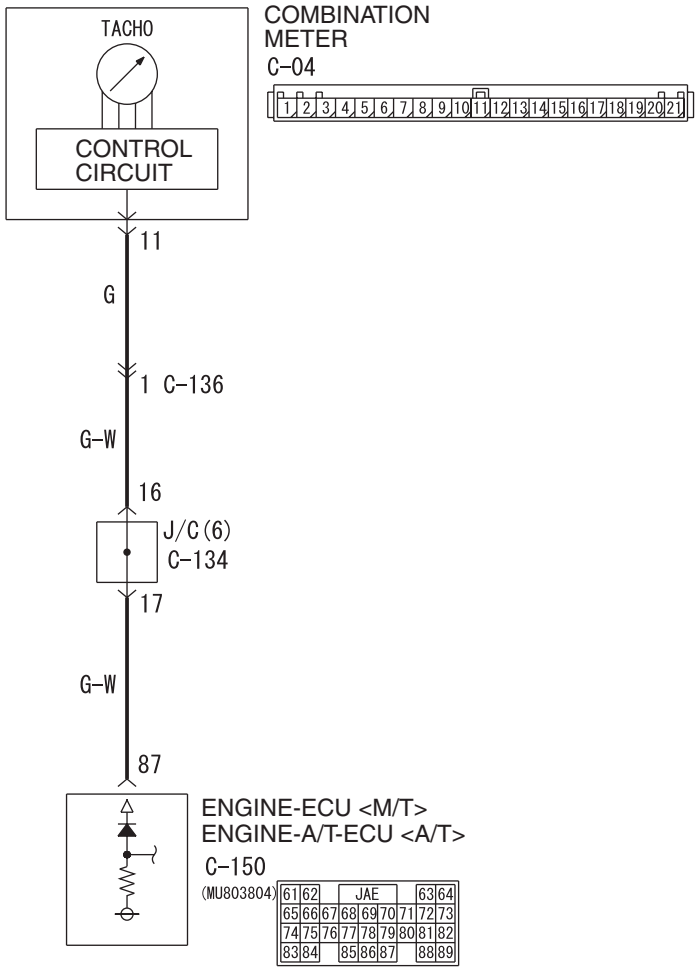
INSPECTION PROCEDURE 3: Tachometer does not work (the other meters work).

Tachometer Circuit



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

W6J54L003A

TECHNICAL DESCRIPTION (COMMENT)

Ignition signal may not be received from the engine-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. Check whether the diagnosis code is reset.

Q: Is the MPI-related diagnosis code set?
YES : Refer to GROUP 13A –Troubleshooting P.13A-19.
NO : Go to Step 2

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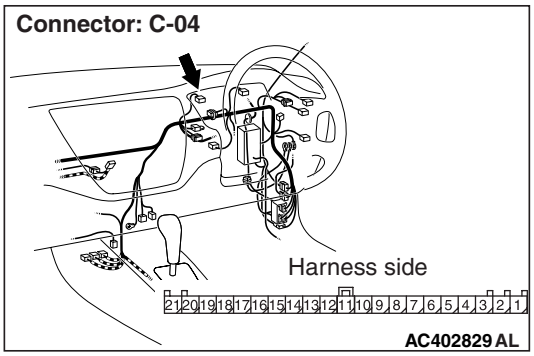
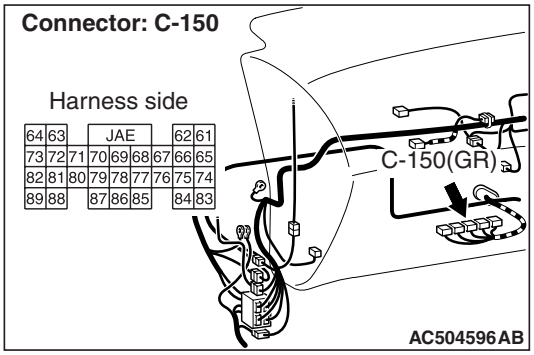
STEP 2. Connector check: Combination meter connector C-04 and engine-ECU connector C-150 <M/T> or engine-A/T-ECU connector C-150 <A/T>



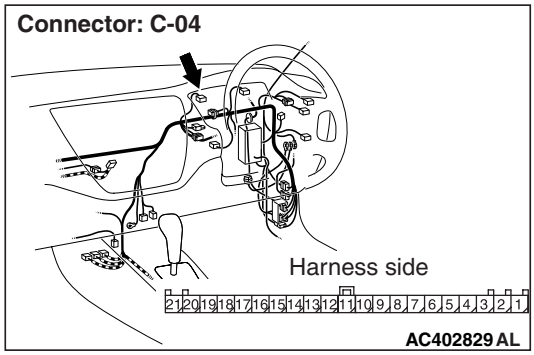


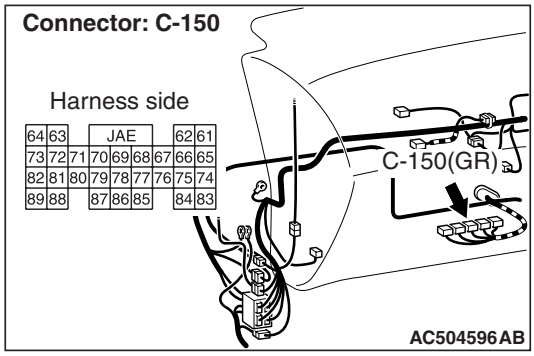
Q: Is combination meter connector C-04 and engine-ECU connector C-150 <M/T> or engine-A/T-ECU connector C-150 <A/T> in good condition?
YES : Go to Step 3
NO : Repair or replace the damage component(s).

STEP 3. Retest the system.

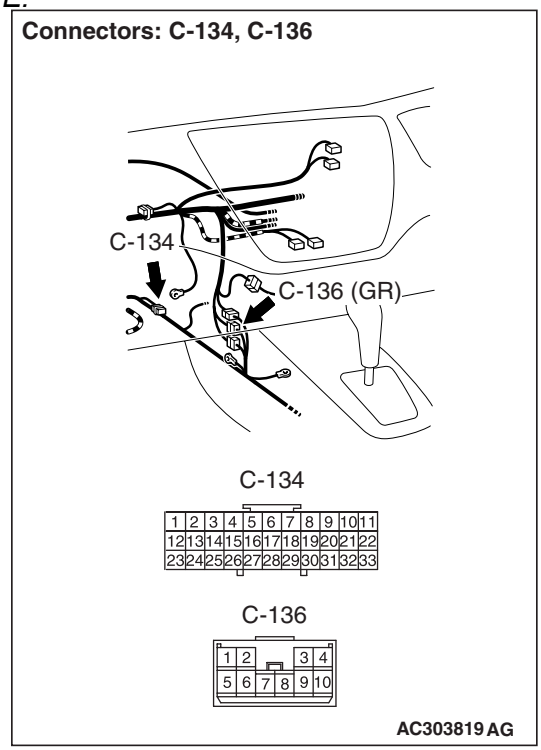
Q: Is the tachometer normal?
YES : Intermittent Malfunction. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction P.00-13).
NO : Go to Step 4

STEP 4. Check the wiring harness between combination meter connector C-04 (terminal 11) and engine-ECU connector C-150 (terminal 87) <M/T> or engine-A/T-ECU connector C-150 (terminal 87) <A/T>.





NOTE:



Prior to the wiring harness inspection, check intermediate connector C-136, joint connector C134, and repair if necessary.

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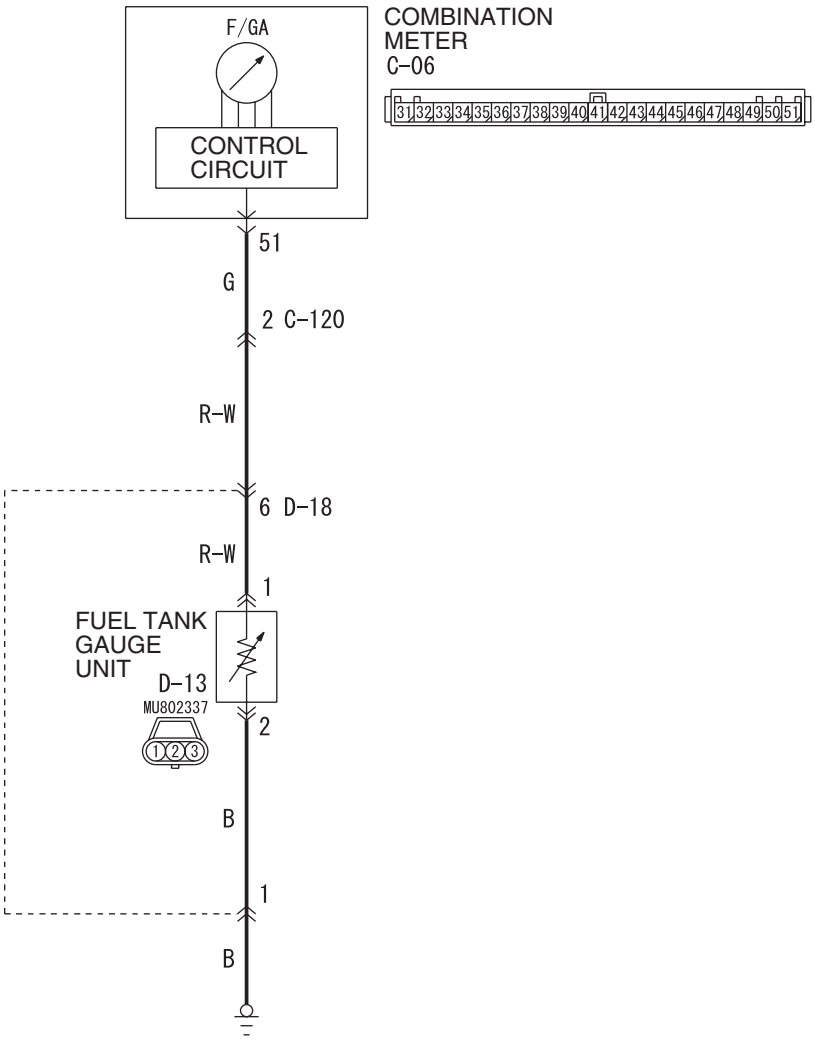
Q: Is the wiring harness between combination meter connector C-04 (terminal 11) and engine-ECU connector C-150 (terminal 87) <M/T> or engine-A/T-ECU connector C-150 (terminal 87) <A/T> in good condition?
YES : Replace the combination meter assembly.
NO : Repair or replace the damage component(s).

INSPECTION PROCEDURE 4: Fuel gauge does not work (the other meters work).

Fuel Gauge Circuit



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

W5J54L004A

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TECHNICAL DESCRIPTION (COMMENT)

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

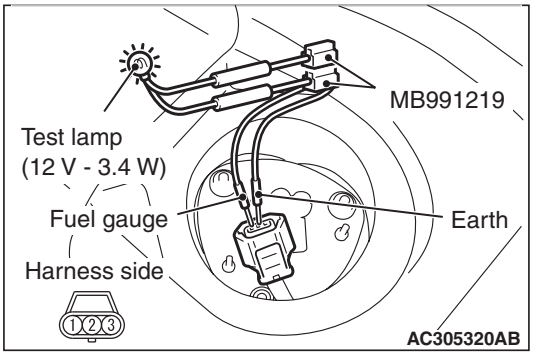
TROUBLESHOOTING HINTS

- 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-13 fuel gauge unit connector.



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

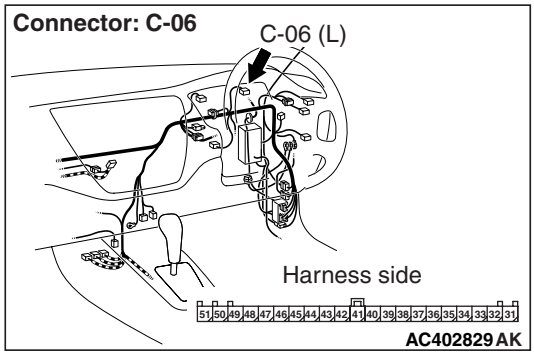
(3) Turn the ignition switch to the "ON" position.

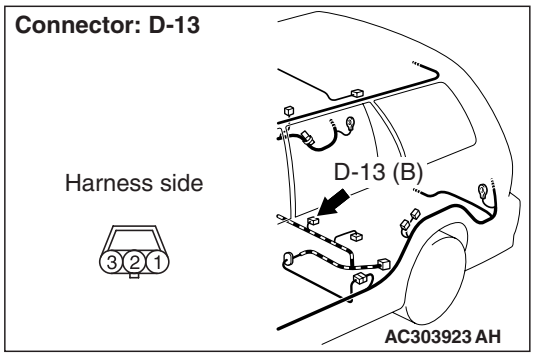
Q: Does the test lamp illuminate?

YES : Go to Step 4.

NO : Go to Step 2.

STEP 2. Connector check: Combination meter connector C-06, fuel gauge unit connector D-13





Q: Is combination meter connector C-04, fuel gauge unit connector D-13 in good condition?

YES : Go to Step 3.

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

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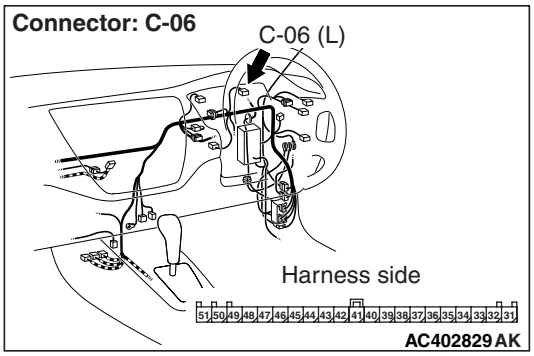
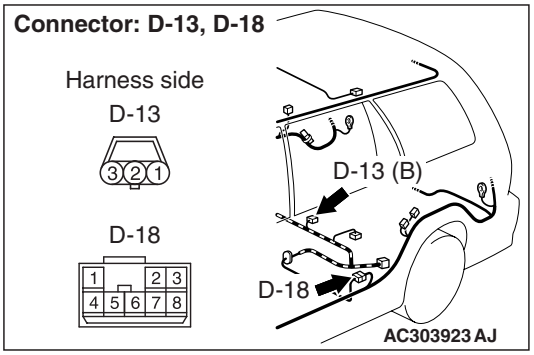
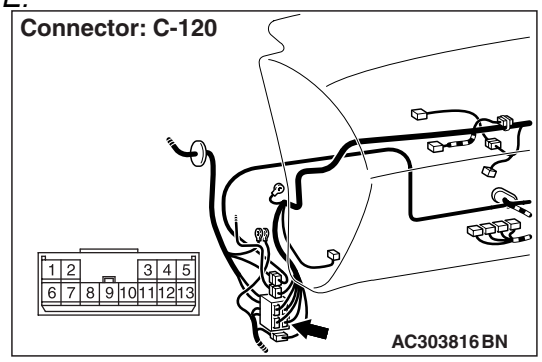
STEP 3. Check the wiring harness between combination meter connector C-06 (terminal 51) and fuel gauge unit connector D-13 (terminal 1).





NOTE:



Prior to the wiring harness inspection, check intermediate connector C-120, D-18, and repair if necessary.

Q: Is the wiring harness between combination meter connector C-06 (terminal 51) and fuel gauge unit connector D-13 (terminal 1) 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.00-13).
NO : Replace combination meter.

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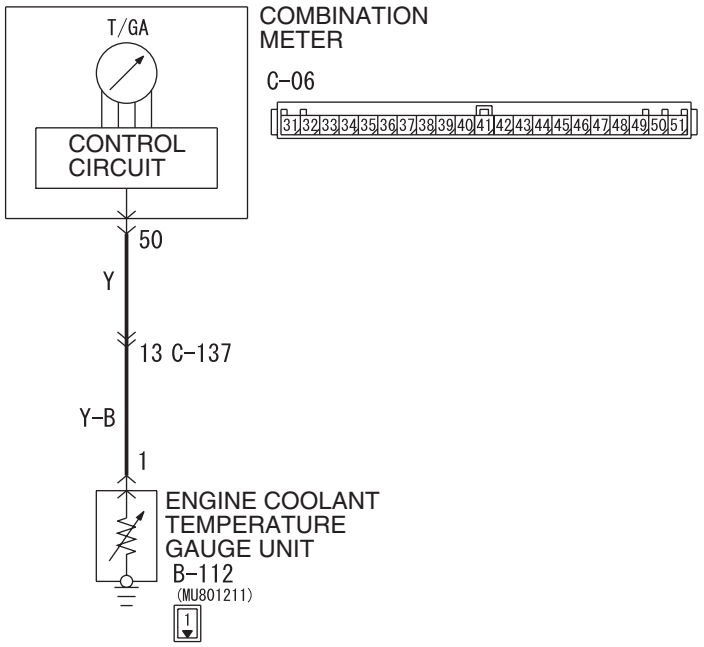
INSPECTION PROCEDURE 5: Engine Coolant Temperature Gauge does not Work (the other meters work).

Engine Coolant Temperature Gauge Circuit



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

W5J54L005A

TECHNICAL DESCRIPTION (COMMENT)

If only the engine coolant temperature gauge does not operate, 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 unit.

Check to see that the engine coolant temperature gauge unit operate normally. Refer to P.54A-52.

Q: Is the engine coolant temperature gauge unit normal?

YES : Go to Step 2.

NO : Replace the fuel gauge unit. Then go to step 4.

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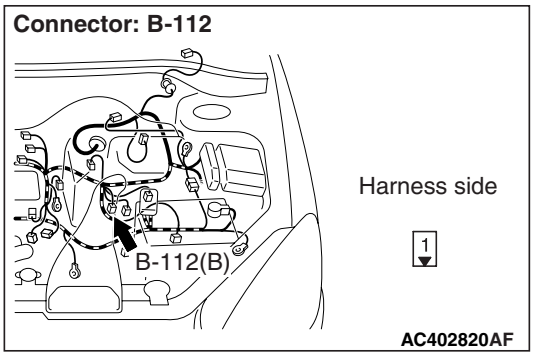
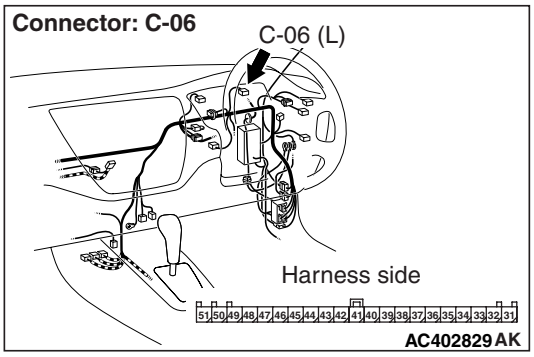
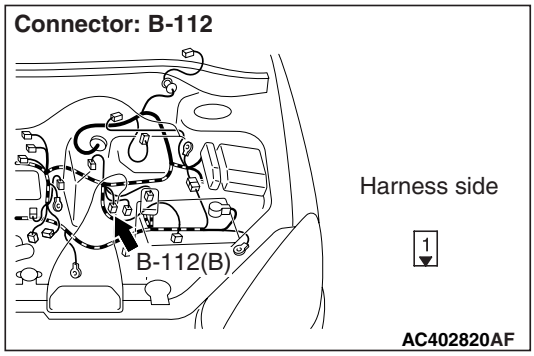
STEP 2. Connector check: Combination meter connector C-06 and engine coolant temperature gauge unit connector B-112

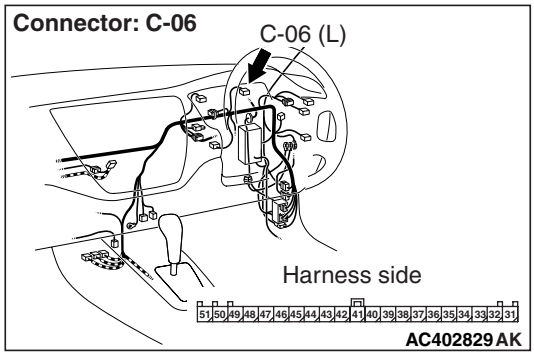




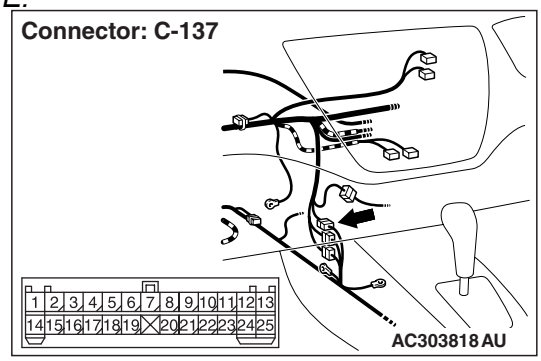
Q: Is combination meter connector C-06 and engine coolant temperature gauge unit connector B-112 in good condition?
YES : Go to Step 3.
NO : Repair or replace the damage component(s).

STEP 3. Check the wiring harness between combination meter connector C-06 (terminal 50) and engine coolant temperature gauge unit connector B-112 (terminal 1).





NOTE:



Prior to the wiring harness inspection, check intermediate connectors C-137, and repair if necessary.

Q: Is the wiring harness between combination meter connector C-06 (terminal 50) and engine coolant temperature gauge unit connector B-112 (terminal 1) in good condition?
YES : Go to Step 4.
NO : Repair or replace the damage component(s).

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STEP 4. Retest the system

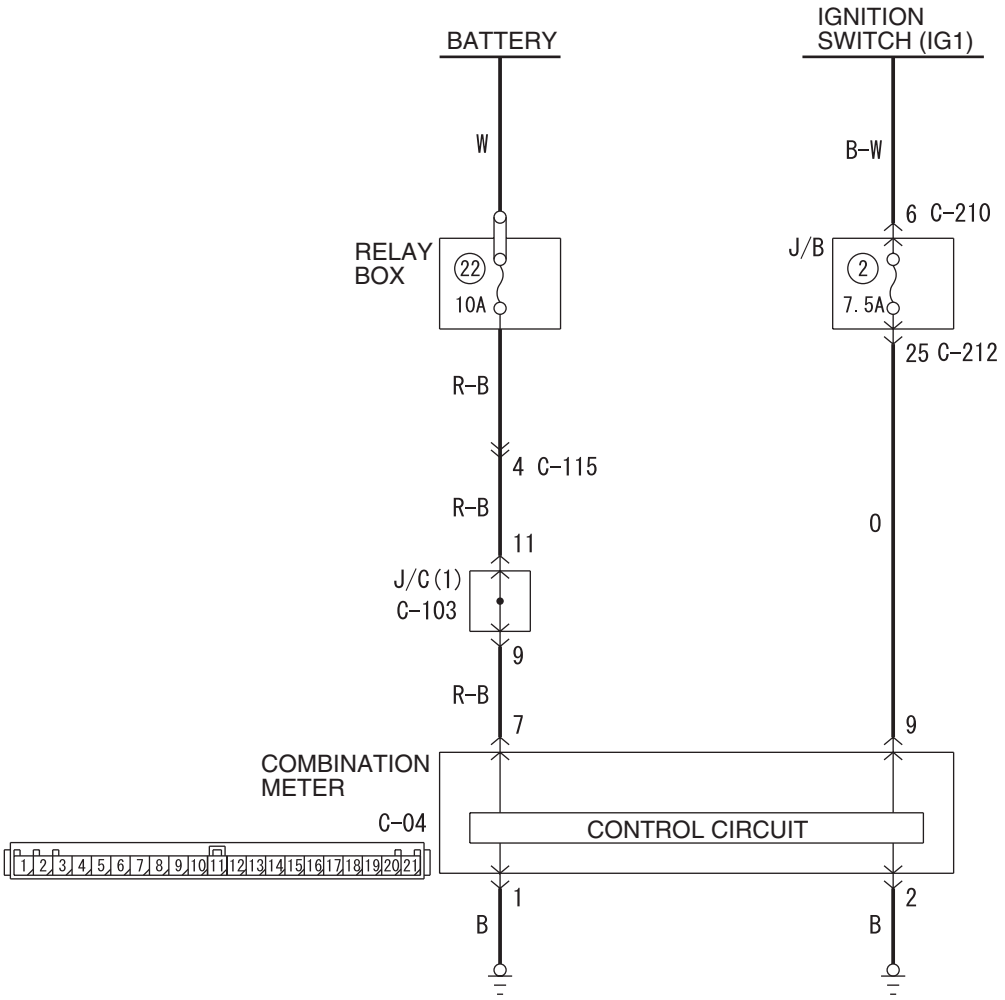
Q: Is the engine coolant temperature gauge normal?

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.00-13).

NO : Replace the combination meter.

INSPECTION PROCEDURE 6: Combination meter does not work. (the instruments do not work)

Combination Meter Power Source Circuit



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

W5J54L006A

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TECHNICAL DESCRIPTION (COMMENT)

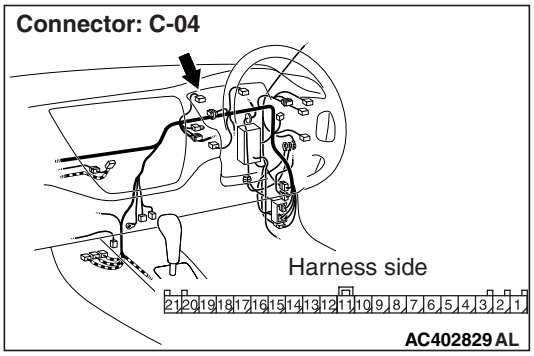
The cause is thought to be malfunction of the power, earth circuitry or combination meter.

TROUBLESHOOTING HINTS

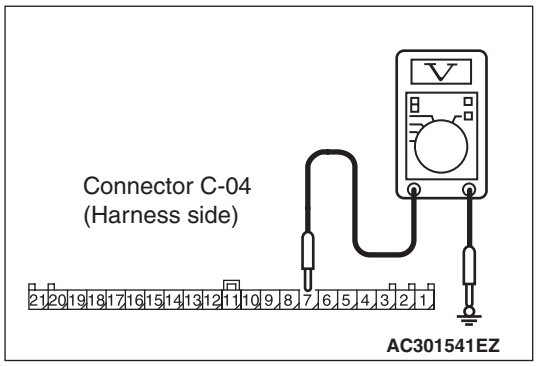
- Malfunction of the combination meter
- Damaged wiring harness or connectors

DIAGNOSIS PROCEDURE

STEP 1. Voltage measurement 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 harness side.



(2) Measure the voltage between terminal 7 and earth.

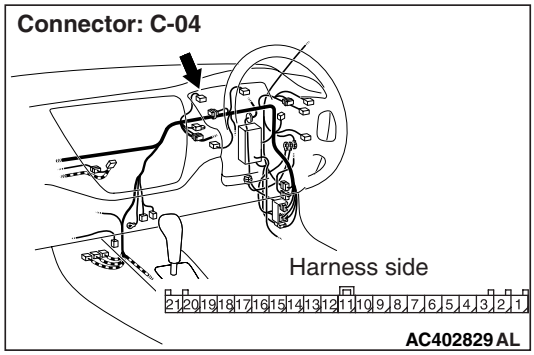
OK: System voltage

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.

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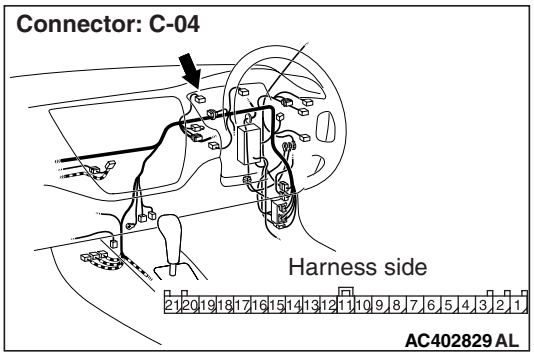
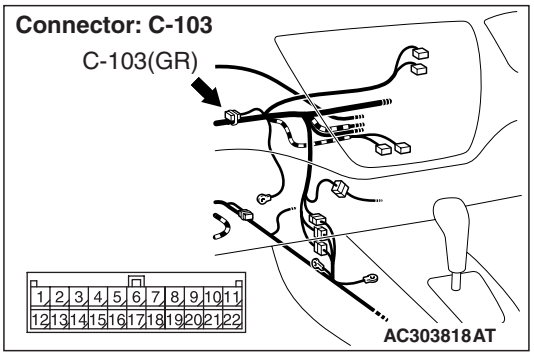
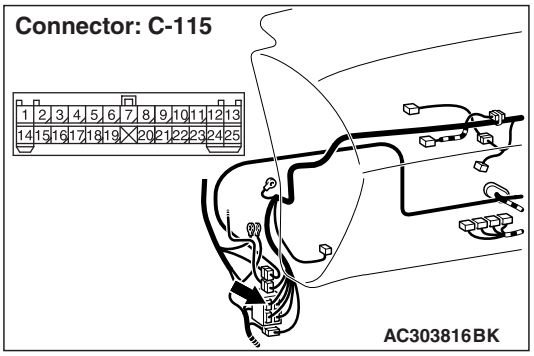
STEP 3. Check the wiring harness between combination meter connector C-04 (terminal 7) and battery.



NOTE:

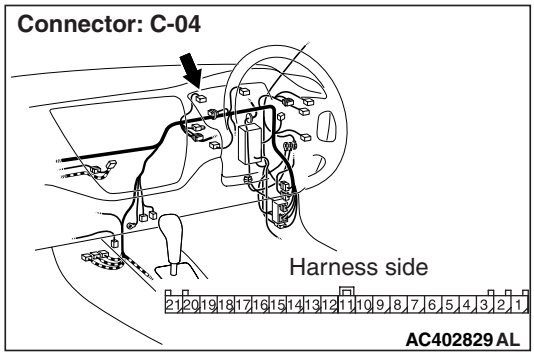




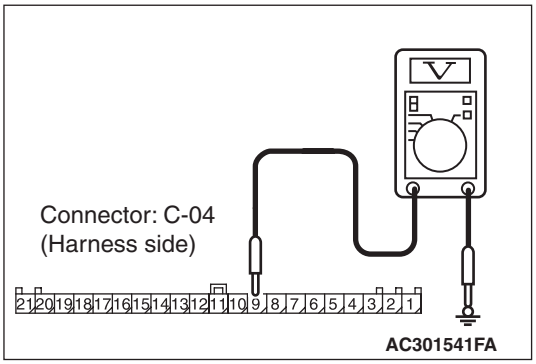
Prior to the wiring harness inspection, check intermediate connectors C-115, joint connector C-103, and repair if necessary.

Q: Are the wiring harness between combination meter connector C-04 (terminal 7) 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. Voltage measurement 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 9 and earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 5.

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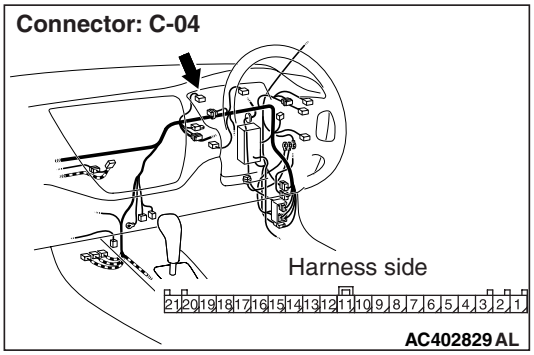
STEP 5. Connector check: combination meter connector C-04

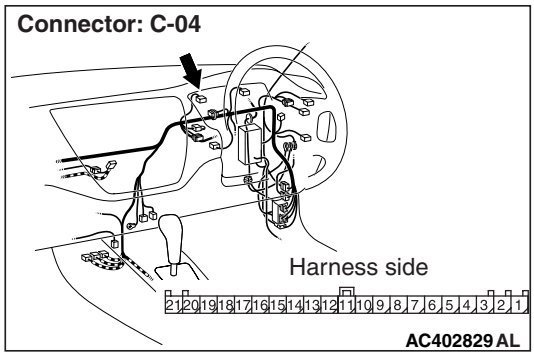


Q: Is combination meter connector C-04 in good condition?

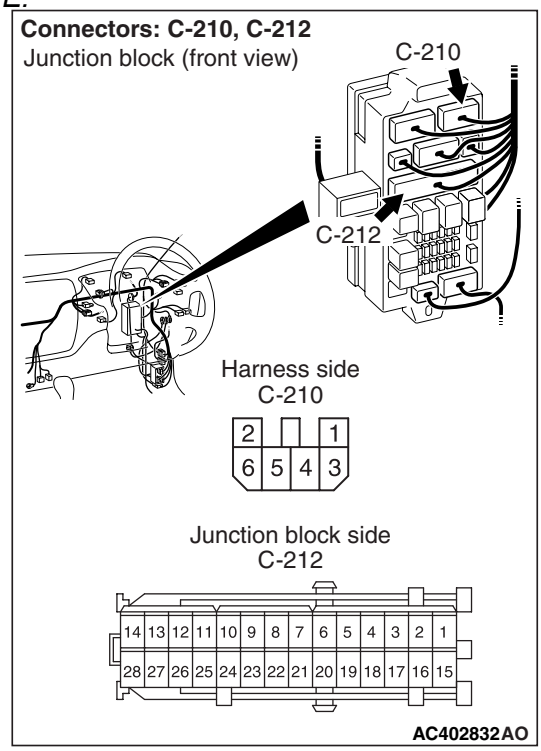
YES : Go to Step 6.

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 9) and ignition switch (IG1).



NOTE:



Prior to the wiring harness inspection, check Junction block connectors C-210 and C-212, 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.

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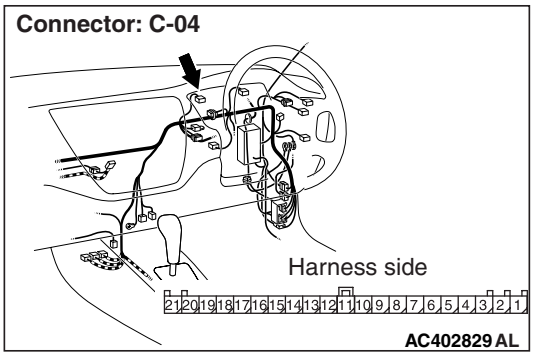
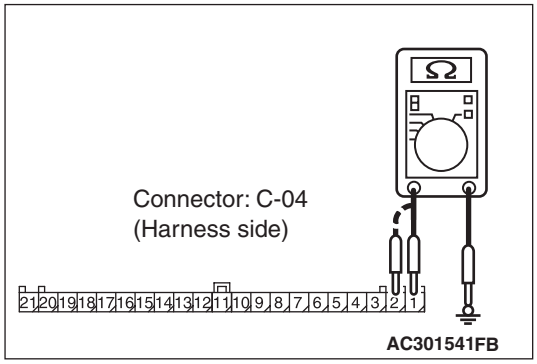
STEP 7. Resistance measurement at combination meter connector C-04 to check the earth circuit to the combination meter.



(1) Disconnect the combination meter connector C-04 and measure the resistance at combination meter connector C-04.



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

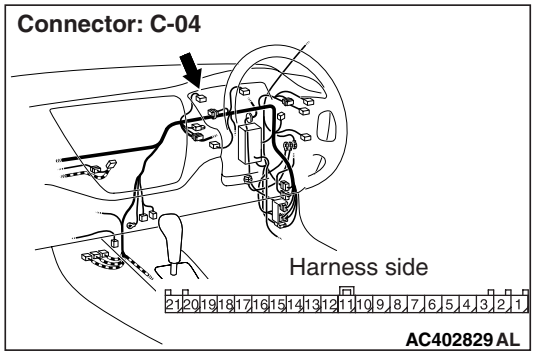
OK: 2 ohms or less

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

OK: 2 ohms or less

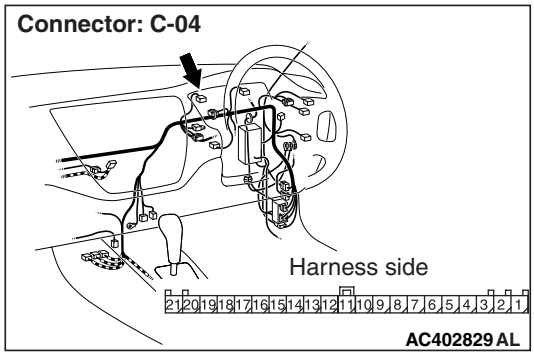
Q: Is the check result normal?
YES : Repair or replace the connector.
NO : Go to Step 8.

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



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 1 and 2) and earth.



Q: Are the wiring harness between combination meter connector C-04 (terminal 1 and 2) and earth in good condition?
YES : This procedure is complete.
NO : Repair or replace the wiring harness. Check to see that all meters operate.

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ON-VEHICLE SERVICE

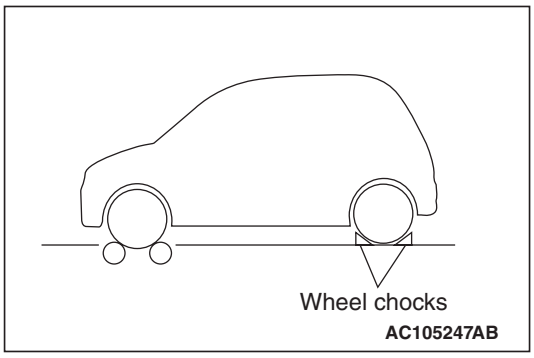
SPEEDOMETER CHECK

M1543000900702

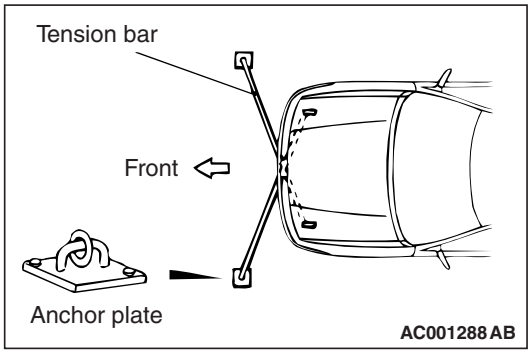
Adjust the pressure of tyres to the specified level. (Refer to GROUP 31, On-vehicle Service P.31-8.)

⚠ CAUTION

Do not operate the clutch suddenly. Do not increase/decrease speed rapidly while testing.



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.

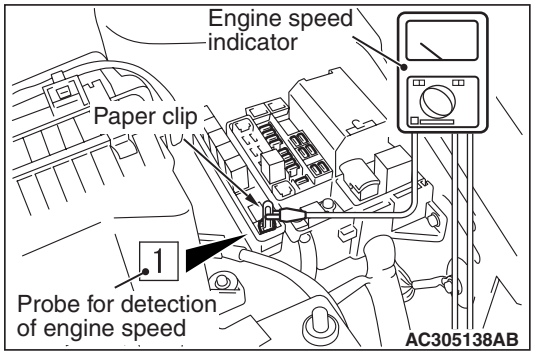
Standard value:

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 tyres with original size tyres and retest. If correct, replace the speedometer. If still not to standard value, replace the vehicle speed sensor.

TACHOMETER CHECK

M1543001000627



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:

Engine speed (r/min)	Indication allowance of tachometer r/min
700	±120
2, 000	– 175 + 225
3, 000	– 175 + 300
4, 000	– 225 + 375
5, 000	– 225 + 425
6, 000	– 225 + 475
7, 000	– 200 + 500

FUEL TANK GAUGE UNIT CHECK

M1543001200814

Remove the fuel tank gauge unit. (Refer to GROUP 13B, Fuel Tank P.13B-4.)

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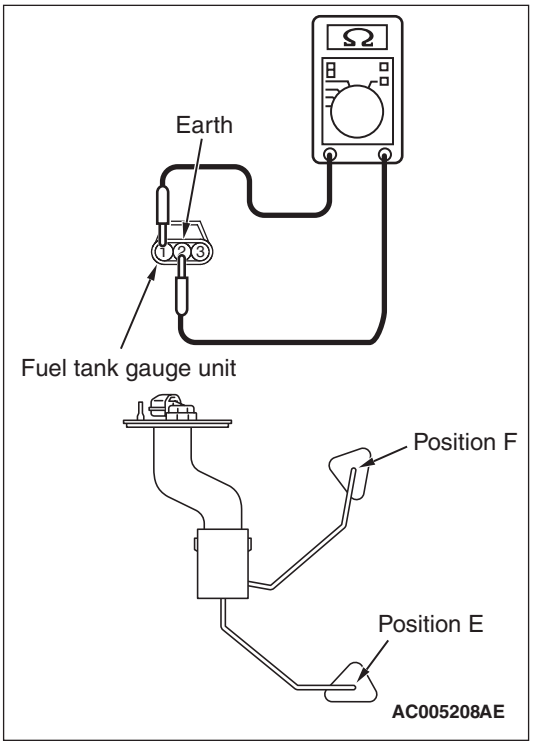
FUEL TANK GAUGE UNIT RESISTANCE



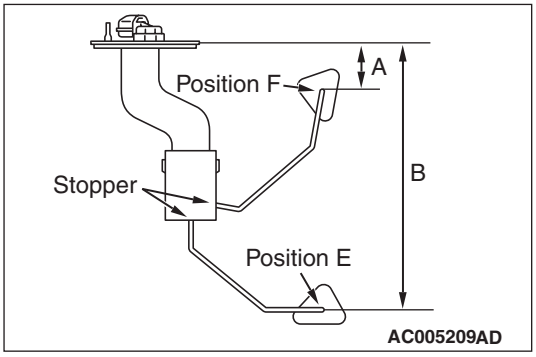
1. Check that resistance value between the fuel gauge terminal and earth terminal is at the standard value when the fuel tank gauge unit float is between position "F" (highest) and position "E" (lowest).

   Standard values:

Float position	Resistance of gauge
Position F	3 ± 0.6 Ω
Position E	110 ± 2 Ω

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 tank gauge unit float height check. If any check is not correct, replace the fuel tank gauge unit.

FUEL TANK 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 values:

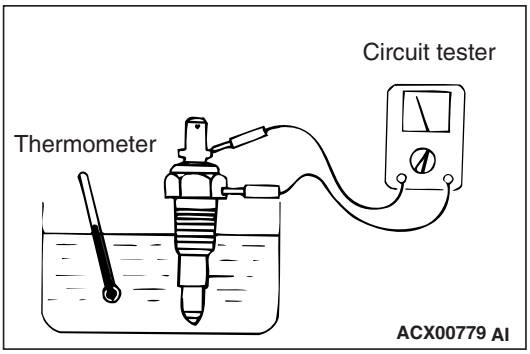
Float position	Float centre height
Position F (A)	24.1 ±2.0 mm
Position E (B)	151.6 ±2.0 mm

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

ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK

M1543001500536

1. Drain the engine coolant. (Refer to GROUP 14, On-vehicle Service P.14-21.)
2. Remove the engine coolant temperature gauge unit.



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

   Standard value: 104 ±13.5 Ω (at 70° C)

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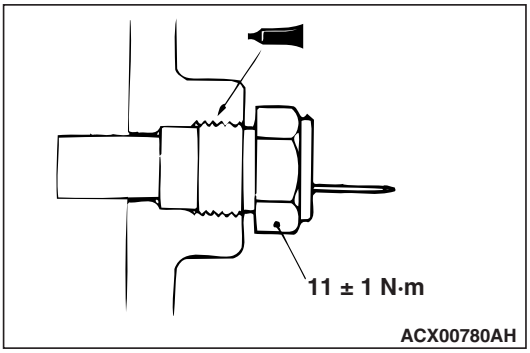
Reference value

Temperature (° C)	Resistance Ω
50	230
60	155
80	73



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

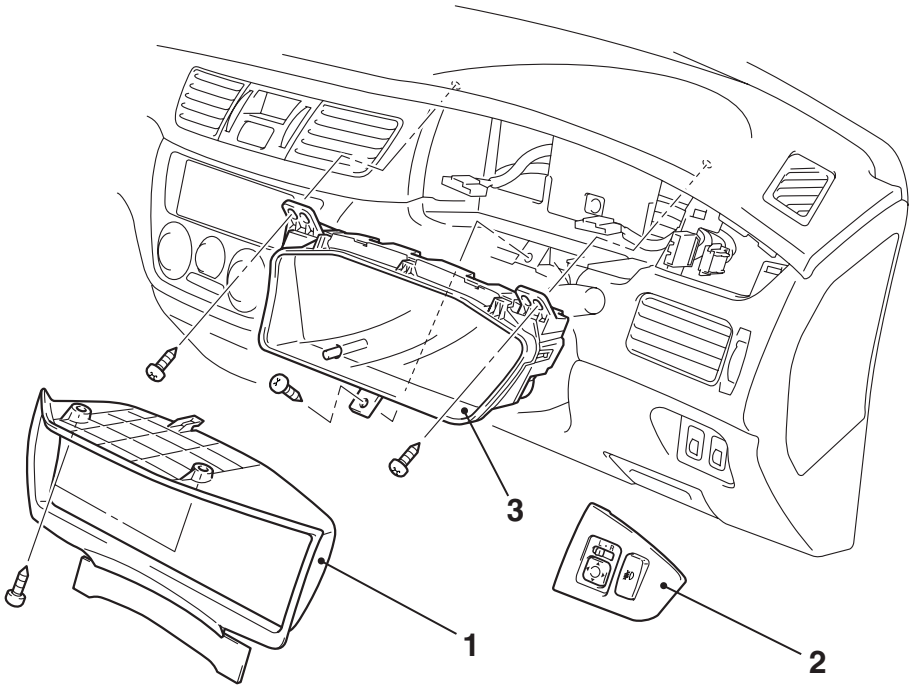
   Semi-drying sealant: 3M™ AAD Part No.8672 or equivalent

5. Add engine coolant. (Refer to GROUP 14, On-vehicle Service P.14-21.)

COMBINATION METER ASSEMBLY

REMOVAL AND INSTALLATION

M1543021300084



Removal steps

1. Meter bezel

Removal steps (Continued)

2. Instrument panel ornament
3. Combination meter assembly

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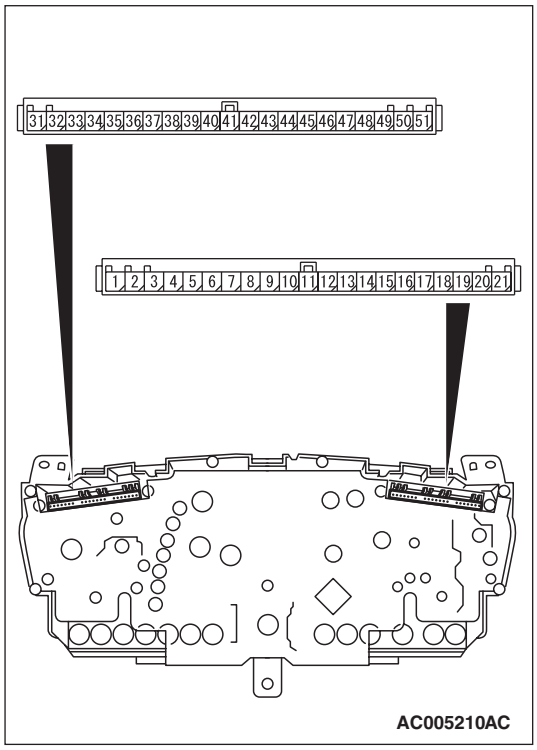
INSPECTION

M1543019503273

COMBINATION METER INTERNAL RESISTANCE CHECK



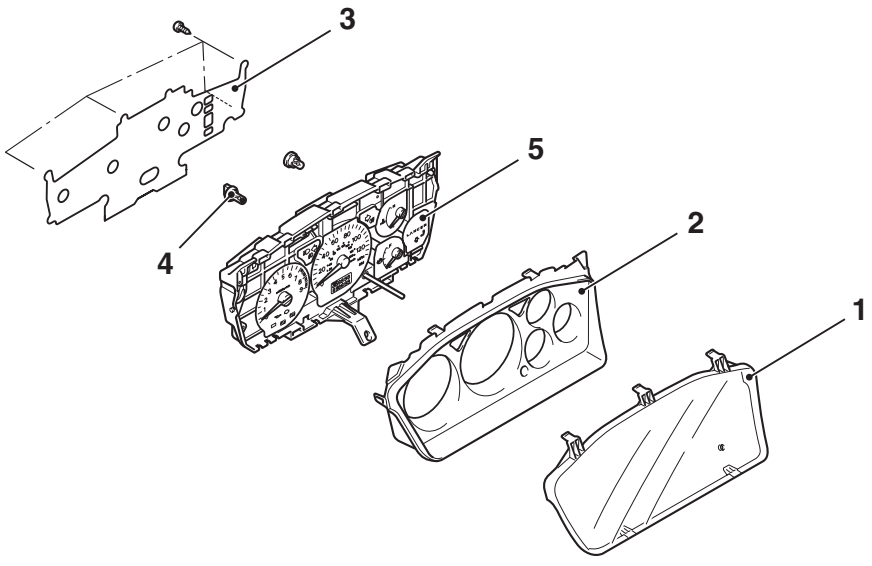
Use circuit tester to measure combination meter internal resistance.

Standard Value:

measuring terminal No.	Terminal name	Standard value (Ω)
1 - 50	Engine coolant temperature gauge to earth	233 ±3
1 - 51	Fuel gauge to earth	181 ±2

DISASSEMBLY AND REASSEMBLY

M1543003100415



Disassembly steps

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

Disassembly steps (Continued)

4. Bulb
5. Combination meter assembly

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HEADLAMP

SERVICE SPECIFICATIONS

M1542000300718

Item			Standard value	Limit
Headlamp aiming	Low beam	Vertical direction	0.69° below horizontal (H)	±0.29° from the standard value
		Horizontal direction	Position at which the stat up point of 15° is crossed with vertical line (V)	±0.5° from the standard value
Measurement of headlamp illuminable intensity cd			–	30,000 cd or more per one headlamp

TROUBLESHOOTING

M1542000701849

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, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

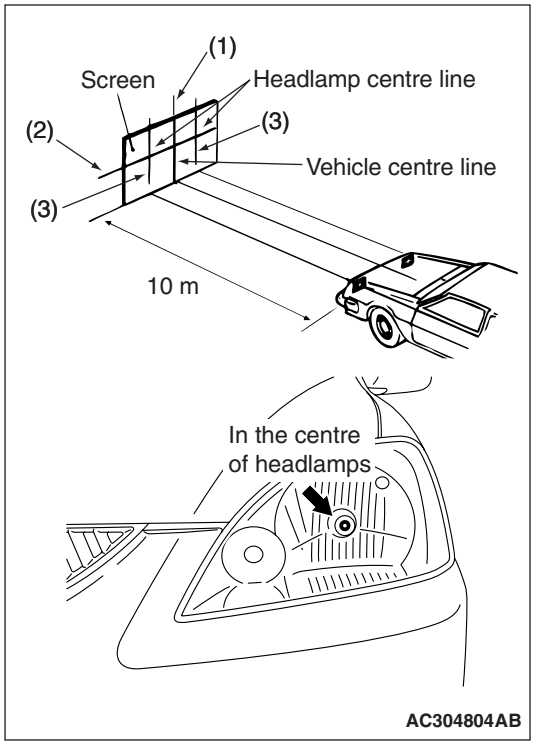
ON-VEHICLE SERVICE

HEADLAMP AIMING

M1542000900776

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 if it is 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 (0.8 kg per litre).
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 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): 840 mm

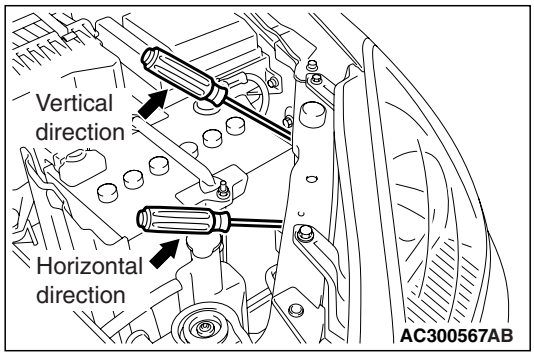
(3) Measure the distance from the centre line of the vehicle to the centre of each headlamp. Transfer the measurement to the screen. Vertical tape or mark on the screen with reference to the centre line of each headlamp bulb.

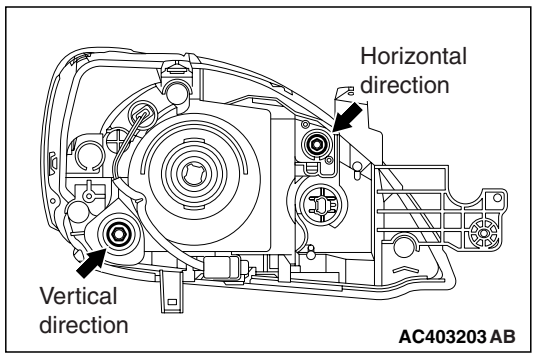
HEADLAMP ADJUSTMENT

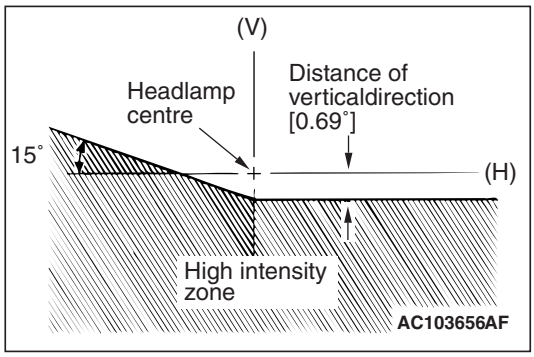
⚠ CAUTION

- **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.**

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







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) 0.69° below horizontal (H), (Horizontal direction) Position at which the stat up point of 15° is crossed with vertical line (V)

   Limit: Vertical direction; ±0.29° from the standard value, Horizontal direction; ±0.5° from the standard value

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LUMINOUS INTENSITY MEASUREMENT

M1542001000635

1. Set the headlamps to high-beam.
2. 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

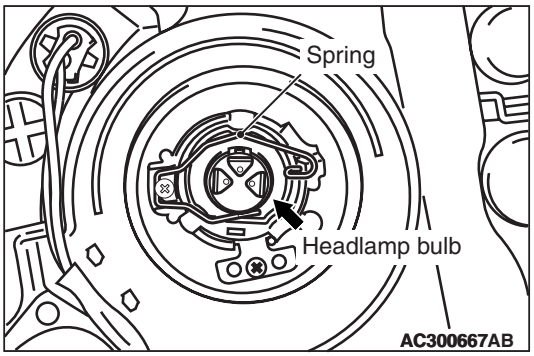
BULB REPLACEMENT

M1542001301059

HEADLAMP BULB

⚠ 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.

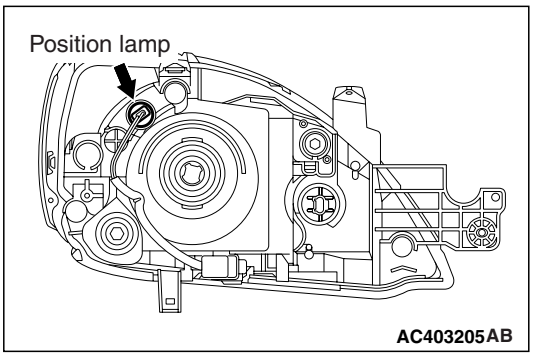
1. Disconnect the battery.
2. Disconnect the connector.



3. Remove the socket cover.
4. Remove bulb mounting spring to pull out bulb.
5. After bulb is replaced, properly reconnect connector.

POSITION LAMP BULB

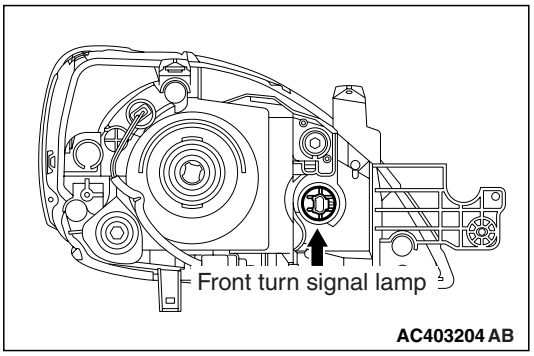
⚠ CAUTION
Do not touch the bulb surface bare-handed or with dirty gloves. If dirt is attached on surface of the bulb, immediately use alcohol or thinner to remove dirt, and install the bulb after well dried.



1. Disconnect the connector.
2. Screw out position lamp socket to pull out position lamp bulb.

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. Disconnect the connector.
2. Screw out front turn-signal lamp socket to pull out front turn-signal lamp bulb.

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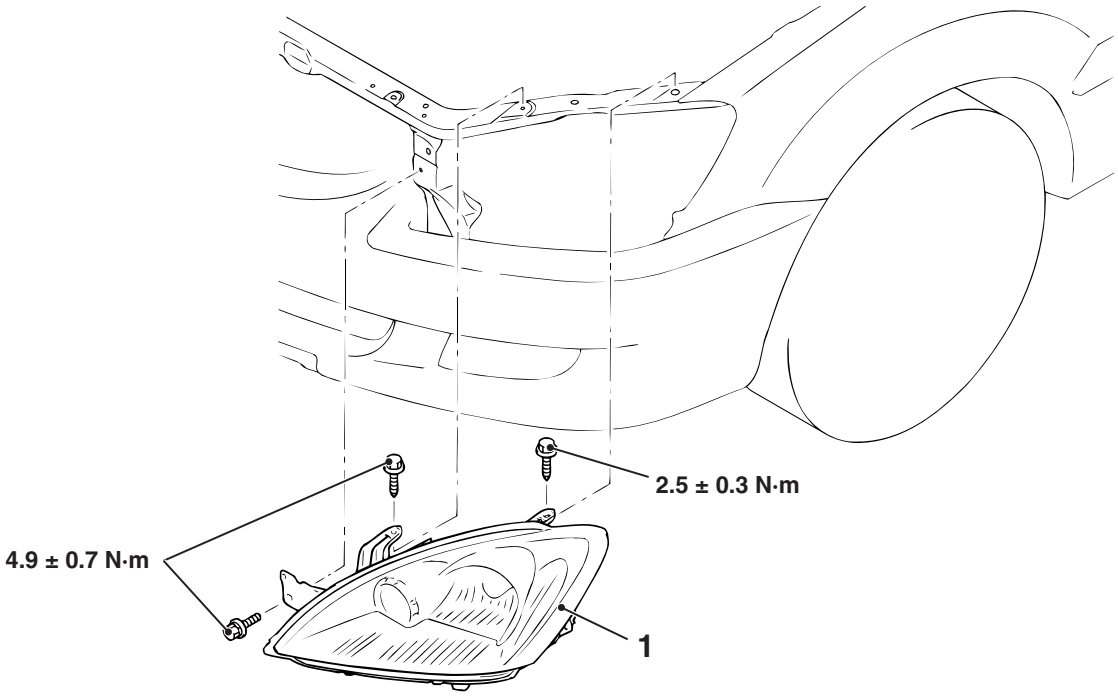
HEADLAMP

REMOVAL AND INSTALLATION

M1542001800631

Post-installation Operation
Headlamp Aiming Adjustment (Refer to P.54A-55.)



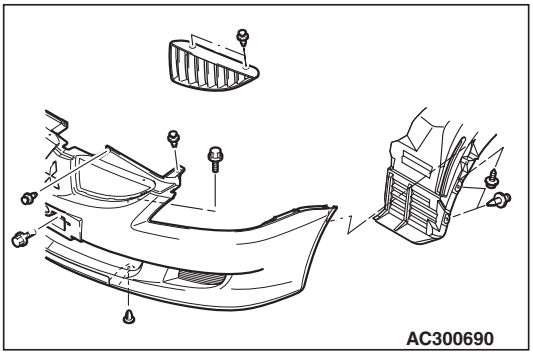
AC304719AC

Removal steps

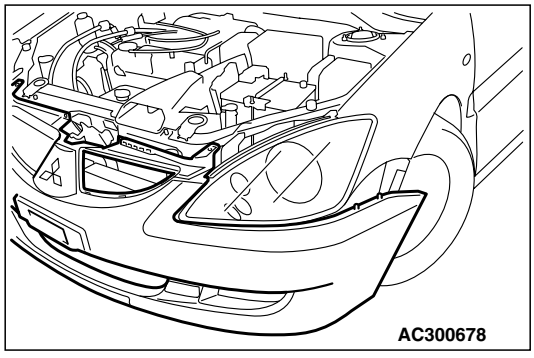
<<A>> 1. Headlamp assembly

REMOVAL SERVICE POINT

<<A>> HEADLAMP ASSEMBLY REMOVAL



1. Remove the splash shield, the radiator grill <ES>, the front bumper assembly installation clips, the screws and the bolts as shown.



2. Slide the front bumper assembly and remove the headlamp assembly.

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FOG LAMP

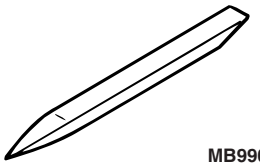
SERVICE SPECIFICATION

M1542000300729

Item	Standard value
Front fog lamp light axis check	Illuminates to within 40 metres

SPECIAL TOOL

M1542000601585

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of instrument panel ornament

TROUBLESHOOTING

M1542000701850

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, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

ON-VEHICLE SERVICE

FRONT FOG LAMP AIMING CHECK

M1542001100632

After setting the vehicles to the following condition, adjust the front fog lamp aiming.

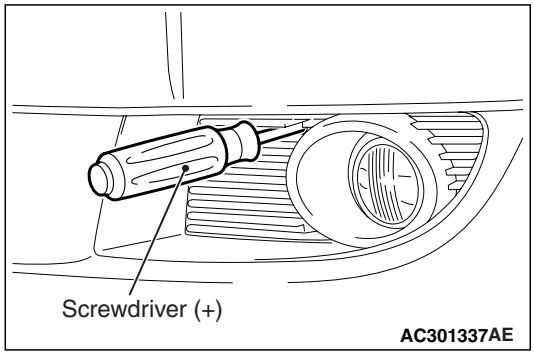
- Check that the tyre inflation pressure is at the value indicated on the tyre pressure labels.
- Set the vehicle to the unladen condition and park it on a level surface.
- Have a single person (approximately 75 kg) sit in the driver's seat.
- Run the engine at a speed of 2000 r/min to fully charge the battery.

Turn on the front fog lamps and check that the illumination is within the standard value range.

Standard value: Illuminates to within 40 metres

⚠ CAUTION

For the fog lamp which is not being measured, disconnect that fog lamp's connector if possible so that it does not illuminate while carrying out the adjustment. Furthermore, make sure that the light axis does not get shifted when re-connecting the connector.



If the value is out of the standard value, insert the screwdriver (+) through the aiming hole on the side under cover to adjust by turning the adjusting gear for fog lamp aiming.

NOTE: Horizontal adjustment is not possible.
In addition, the method of checking the light axis on a screen (simple check) is given below.

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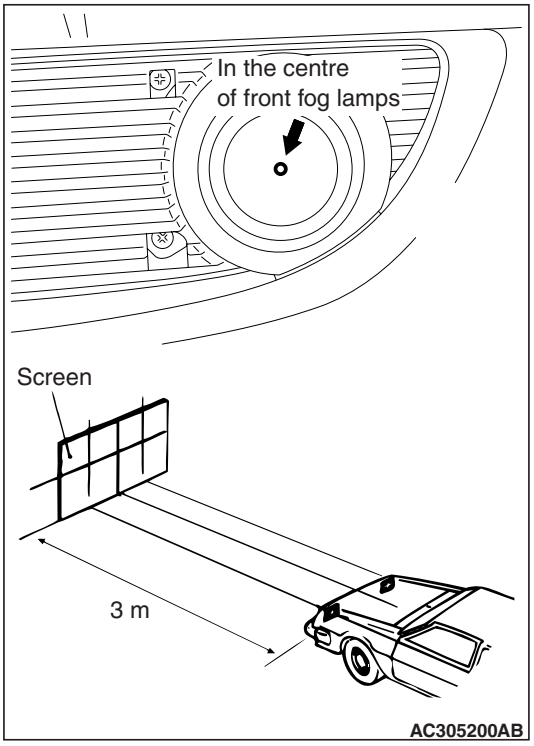
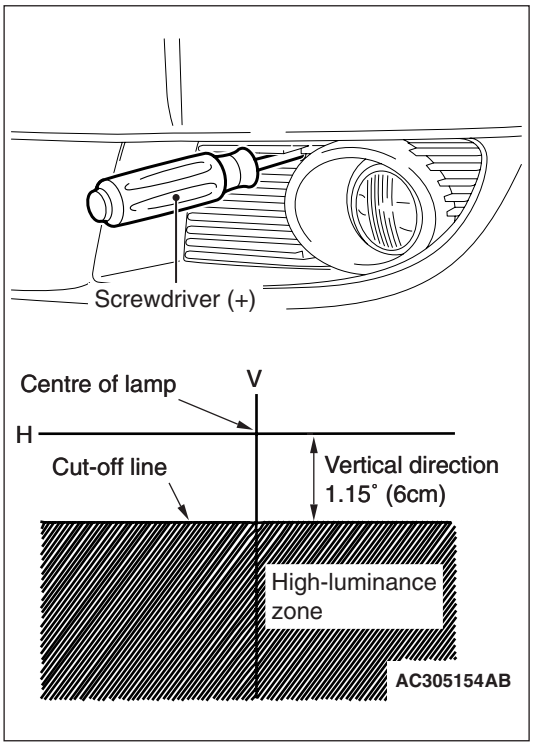
Group TOC



1. Place the screen so that it is directly opposite the centre of the fog lamp at a distance of 3 metres, and turn on the fog lamps.

⚠ CAUTION

For the front fog lamp which is not being measured, disconnect that fog lamp's connector if possible so that it does not illuminate while carrying out the adjustment. Furthermore, make sure that the light axis does not get shifted when re-connecting the connector.



2. Insert the screwdriver (+) through the aiming hole on the side under cover. By turning the adjusting gear for fog lamp aiming, align the cutoff line (border line of the shadow temperature) with the specified position in the figure.

   NOTE: Horizontal adjustment is not possible.

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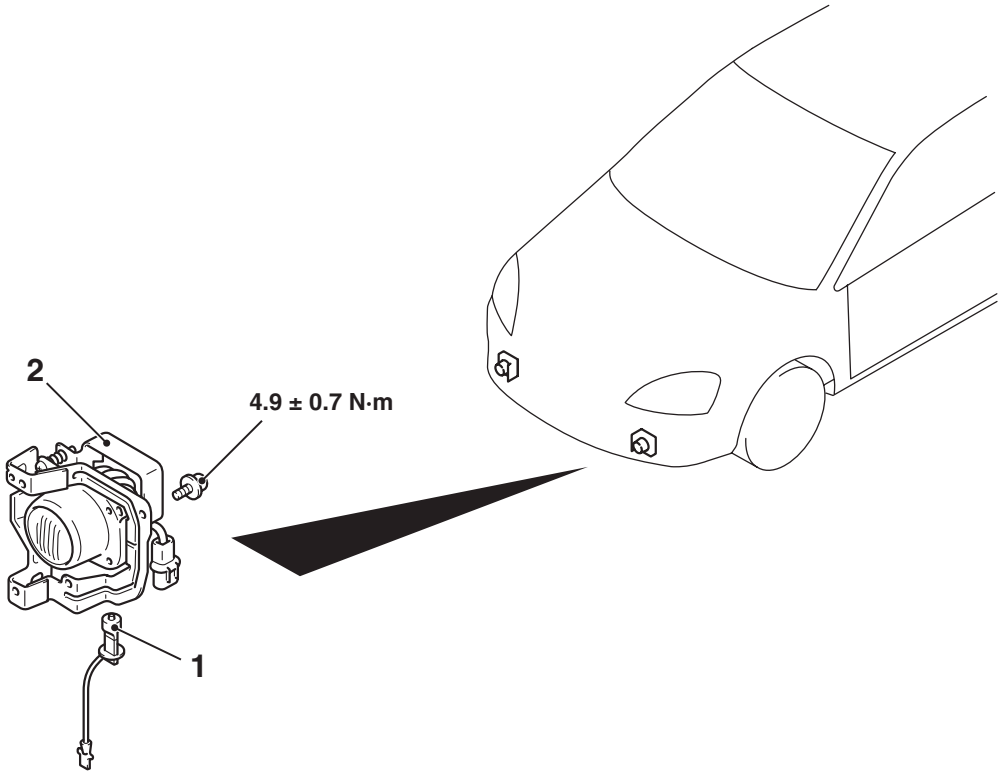
FOG LAMP

REMOVAL AND INSTALLATION

M1542001500696



AC304660AB

Removal steps

- Side under cover

<<A>> 1. Front fog lamp bulb
2. Front fog lamp assembly

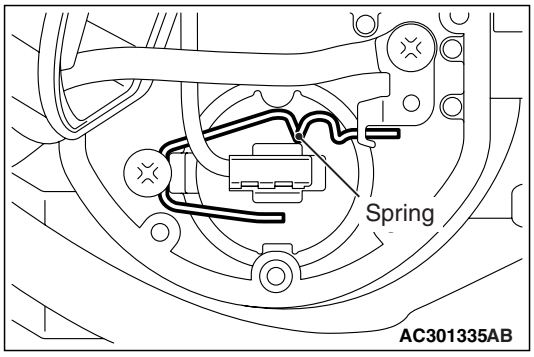
REMOVAL SERVICE POINT

<<A>> FRONT FOG LAMP BULB REMOVAL

⚠ CAUTION

Do not touch the surface of the bulb with bare hands or dirty gloves. If the surface (glass section) should become dirty, clean it immediately with alcohol or thinner, and let it dry thoroughly before installing it.

1. Remove the bulb cover.



AC301335AB

2. Remove the bulb installation spring and extract the bulb.

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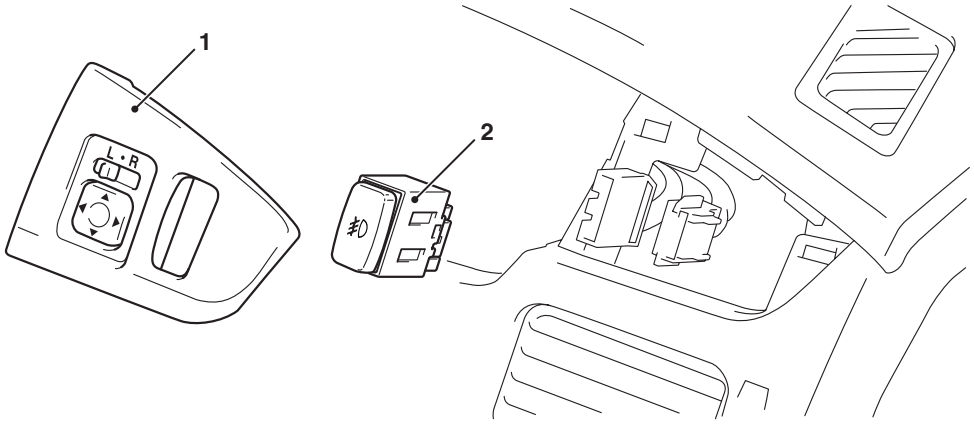
FOG LAMP SWITCH

REMOVAL AND INSTALLATION

M1542013900099



AC402392AB

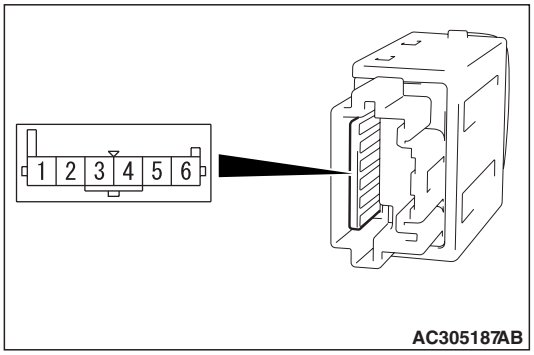
Removal steps

1. Instrument panel ornament (Refer to GROUP 52A, Instrument panel P.52A-2.)
2. Fog lamp switch

INSPECTION

M1542011201763

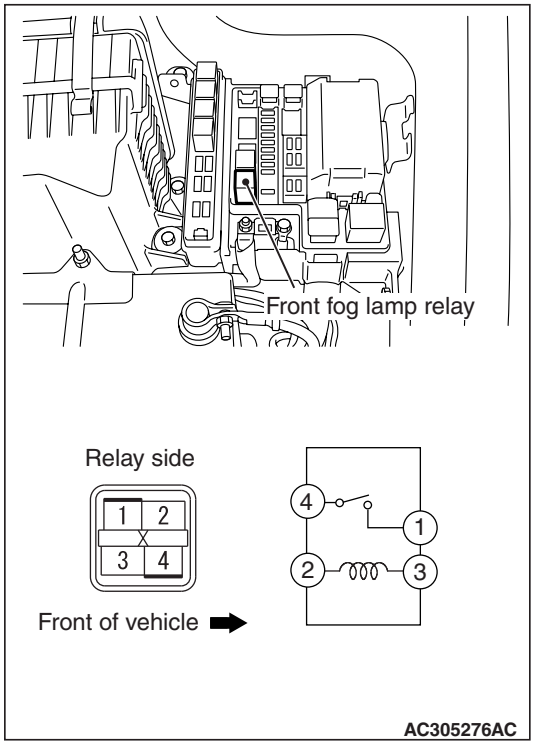
FRONT FOG LAMP SWITCH CONTINUITY CHECK



AC305187AB

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

FRONT FOG LAMP RELAY CHECK



AC305276AC

Battery voltage	Tester connection	Specified condition
Not supplied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1 – 4	Less than 2 ohms

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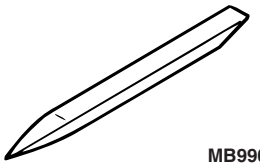
SIDE TURN-SIGNAL LAMP

SPECIAL TOOL

M1542000601604

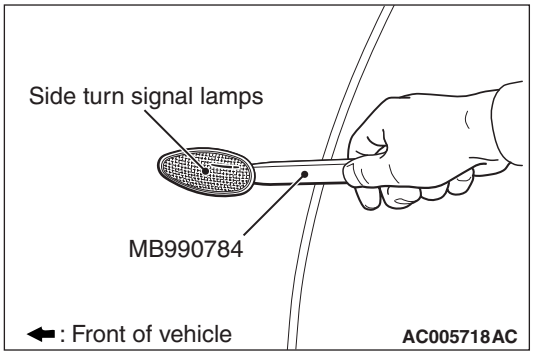
Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of side turn-signal lamp

SIDE TURN-SIGNAL LAMP

REMOVAL AND INSTALLATION

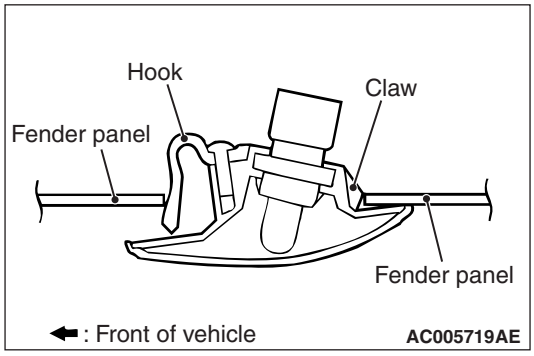
M1542003300256

REMOVAL SERVICE POINT



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



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

ROOM LAMP

TROUBLESHOOTING

M1542000701872

DIMMER INTERIOR LAMP CONTROL 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).

- ADJUSTMENT PROCEDURE
  - Not using SWS monitor: GROUP 54B, P.54B-261.
  - The room lamp lights 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 15 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.

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Group TOC

- 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 light 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 lights up and then will dim out in 15 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, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

INTERIOR LAMP AUTOMATIC SHUTDOWN FUNCTION <VEHICLES WITH KEYLESS ENTRY SYSTEM>

The interior lamp automatic shutdown 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 lights 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).

- ADJUSTMENT PROCEDURE
  - Not using SWS monitor: GROUP 54B, P.54B-261.

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

- Not using SWS monitor: GROUP 54B, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

REAR COMBINATION LAMP

TROUBLESHOOTING

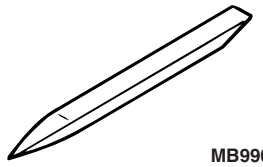
M1542000701883

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, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

SPECIAL TOOL

M1542000601615

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

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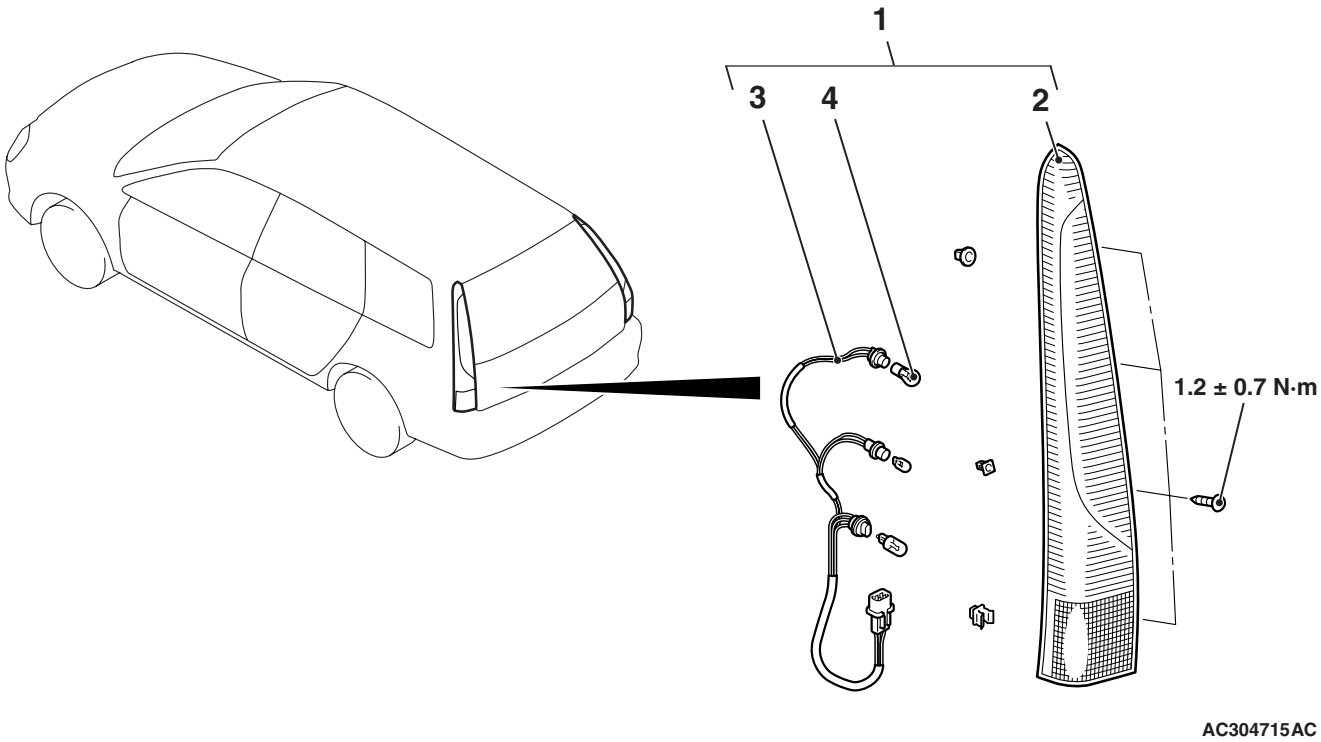
REAR COMBINATION LAMP

REMOVAL AND INSTALLATION

M1542003900786



AC304715AC

Removal steps

1. Rear combination lamp assembly
2. Rear combination lamp body

Removal steps (Continued)

3. Socket assembly
4. Bulb

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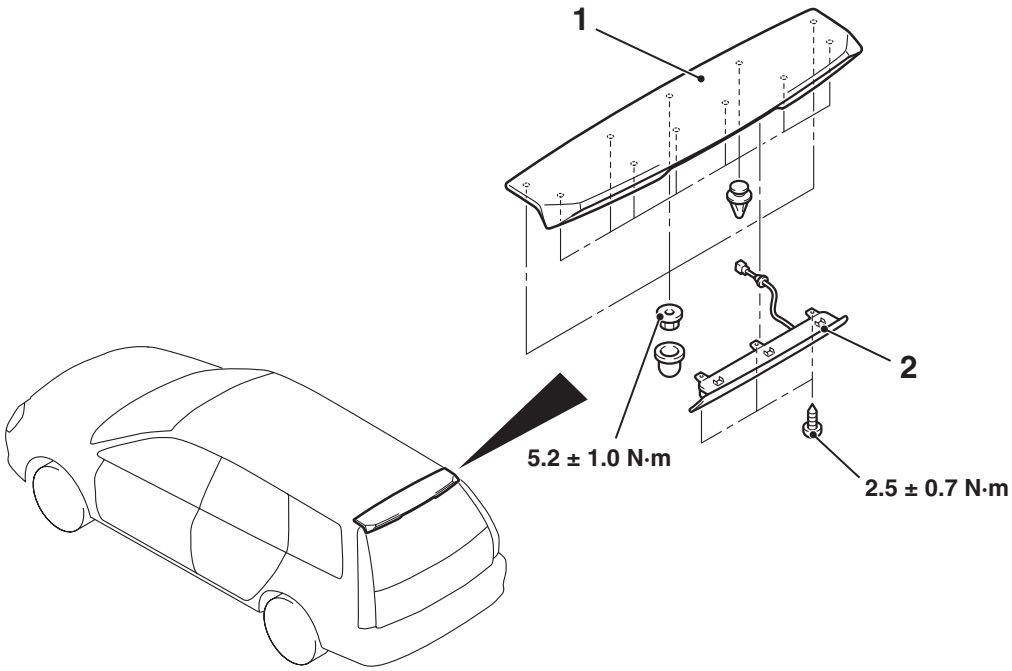
Group TOC

HIGH-MOUNTED STOP LAMP

REMOVAL AND INSTALLATION

M1542005100645



AC304722AC

Removal steps

- Tailgate trim upper (Refer to GROUP 52A, Tailgate trim P.52A-18.)
- High-mounted stop lamp connector connection
- Rear washer hose connection (Refer to GROUP 51, Rear wiper and washer P.51-29.)

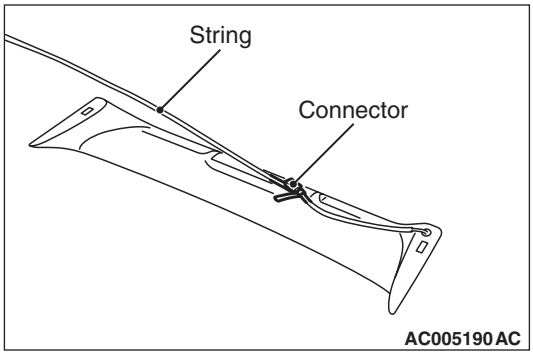
1. Tailgate spoiler (Refer to GROUP 51, Tailgate spoiler P.51-19.)

- Rear washer nozzle (Refer to GROUP 51, Rear wiper and washer P.51-29.)

2. High-mounted stop lamp

REMOVAL SERVICE POINT

<<A>> HIGH-MOUNTED STOP LAMP REMOVAL



AC005190AC

Use the following steps to easily route high-mounted stop lamp harness in the event of installation:

⚠ CAUTION

Ensure that the string is tightly tied.

1. Tie a string on the high-mounted stop lamp harness (at the connector side).
2. Carefully pull out the high-mounted stop lamp.

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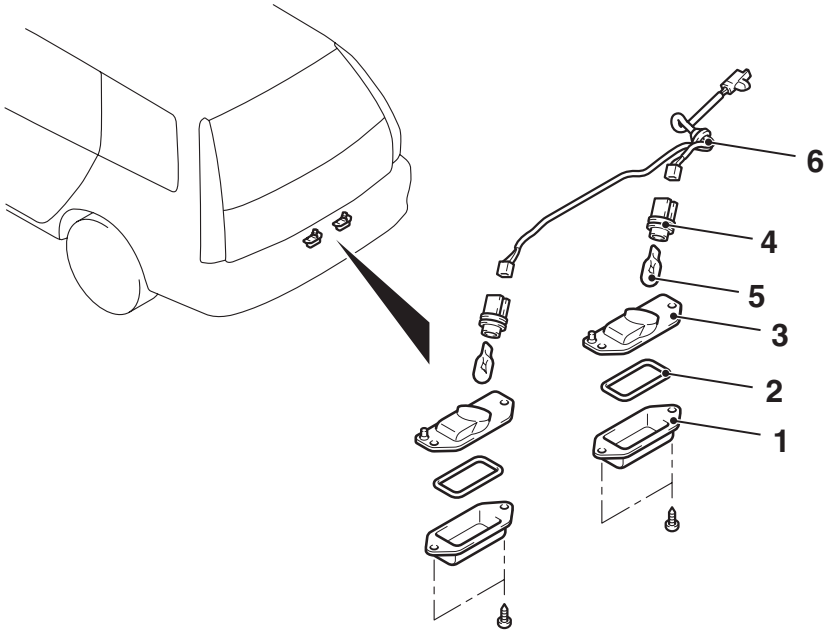
Group TOC

LICENCE PLATE LAMP

REMOVAL AND INSTALLATION

M1542004200360



AC304717AB

Removal steps
1. Licence plate lamp lens
2. Gasket
3. Licence plate lamp body

Removal steps (Continued)
4. Socket
5. Licence plate lamp bulb
6. Harness

HAZARD WARNING LAMP SWITCH

TROUBLESHOOTING

M1542000701894

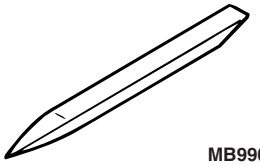
FLASHER TIMER FUNCTION

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, SWS Troubleshooting P.54B-32.
- Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.

SPECIAL TOOL

M1542000601626

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre panel and centre air outlet panel

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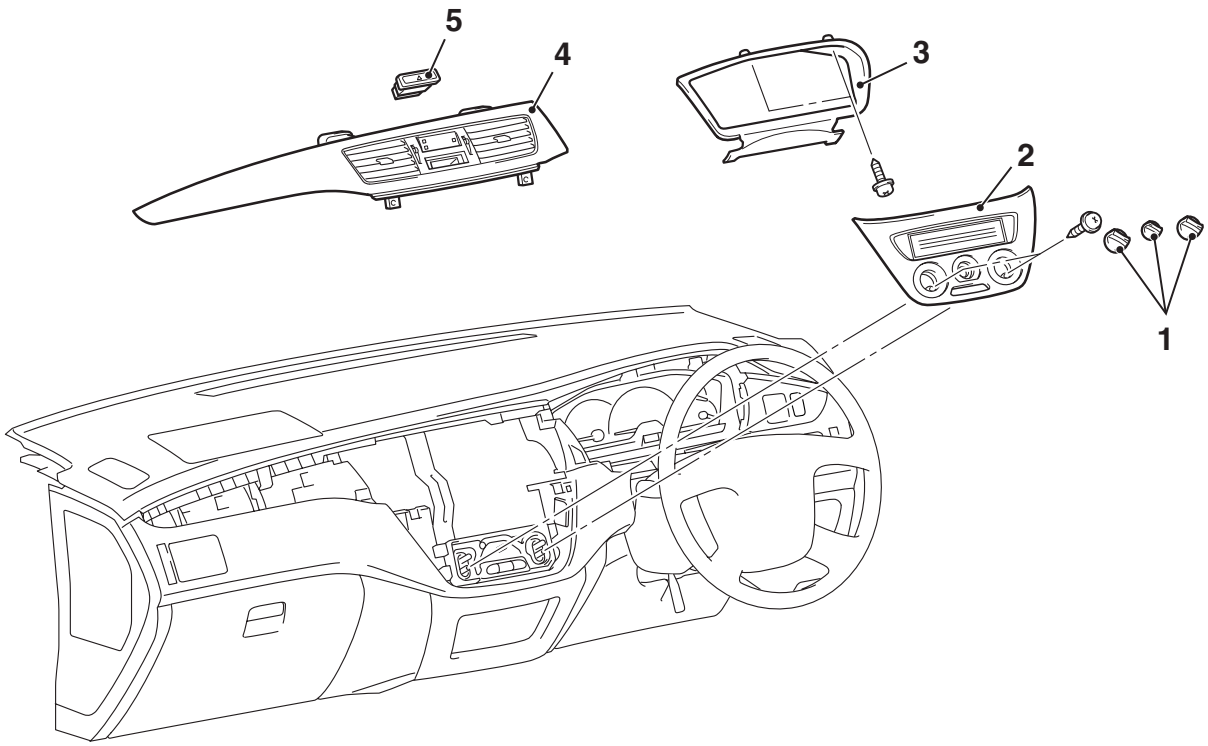
HAZARD WARNING LAMP SWITCH

REMOVAL AND INSTALLATION

M1542006600773



AC402400AB

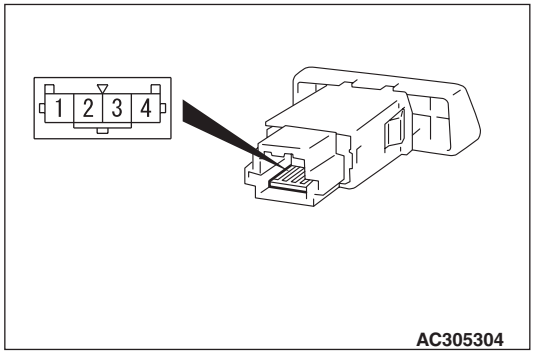
Removal steps

1. Knob <vehicles with manual A/C>
2. Centre panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)
3. Meter bezel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)
4. Centre air outlet panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)
5. Hazard warning lamp switch

INSPECTION

M1542011201785

HAZARD WARNING LAMP SWITCH CONTINUITY CHECK



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

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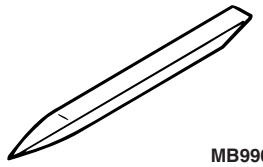
Group TOC

COLUMN SWITCH

SPECIAL TOOL

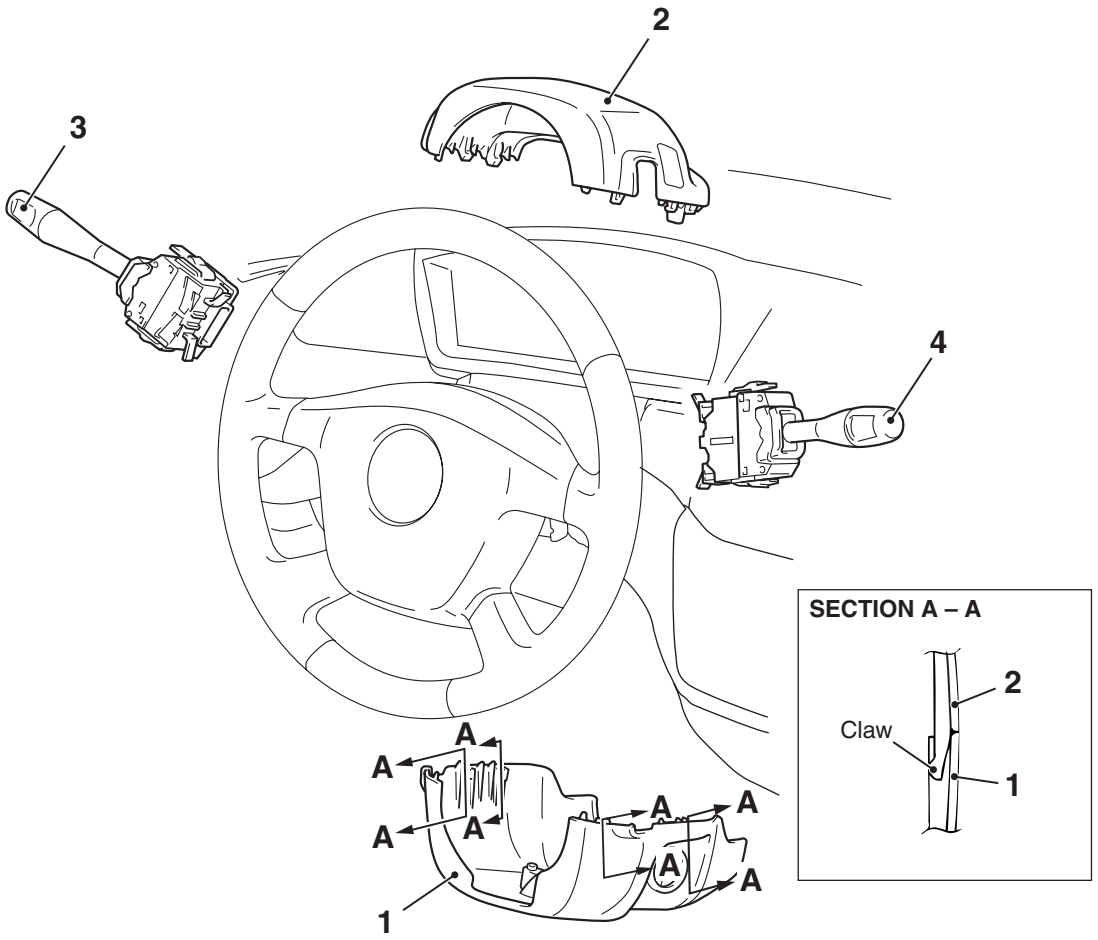
M1542000601637

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

COLUMN SWITCH

REMOVAL AND INSTALLATION

M1543009100628



AC305305AC

Removal steps

1. Lower column cover
2. Upper column cover

Removal steps (Continued)

3. Turn-signal and lighting switch
4. Windshield wiper and washer switch

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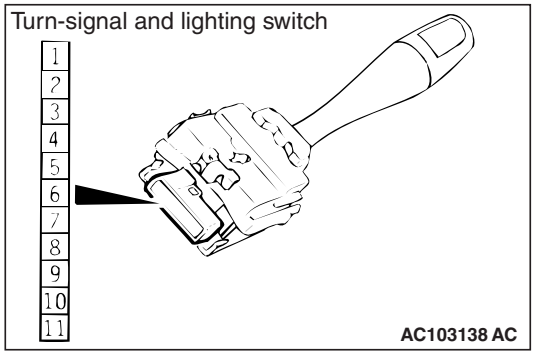
Group TOC

INSPECTION

M1542011201796

WINDSHIELD WIPER AND WASHER SWITCH CHECK



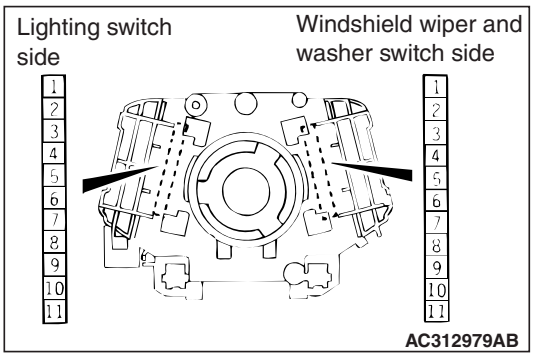
Switch position	Tester condition	Specified condition
OFF	4 – 6, 5 – 6, 6 – 7, 6 – 8, 6 – 9, 6 – 10, 6 – 11	Open circuit
Windshield mist wiper switch	6 – 11	Less than 2 ohms
Windshield intermittent wiper switch	6 – 10	Less than 2 ohms
Windshield low-speed wiper switch	6 – 9	Less than 2 ohms
Windshield 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 kiloohm ("SLOW" position)*
- *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, SWS Troubleshooting P.54B-32.*
  - *Using SWS monitor: GROUP 54C, SWS Troubleshooting P.54C-17.*

COLUMN SWITCH (SWITCH BODY) CONTINUITY CHECK

1. Removal the lighting switch and the windshield wiper and washer switch.
2. Check that there is continuity between the same terminals [terminals (3) and (11)] of each connector of the column switch body which is still on the steering column.



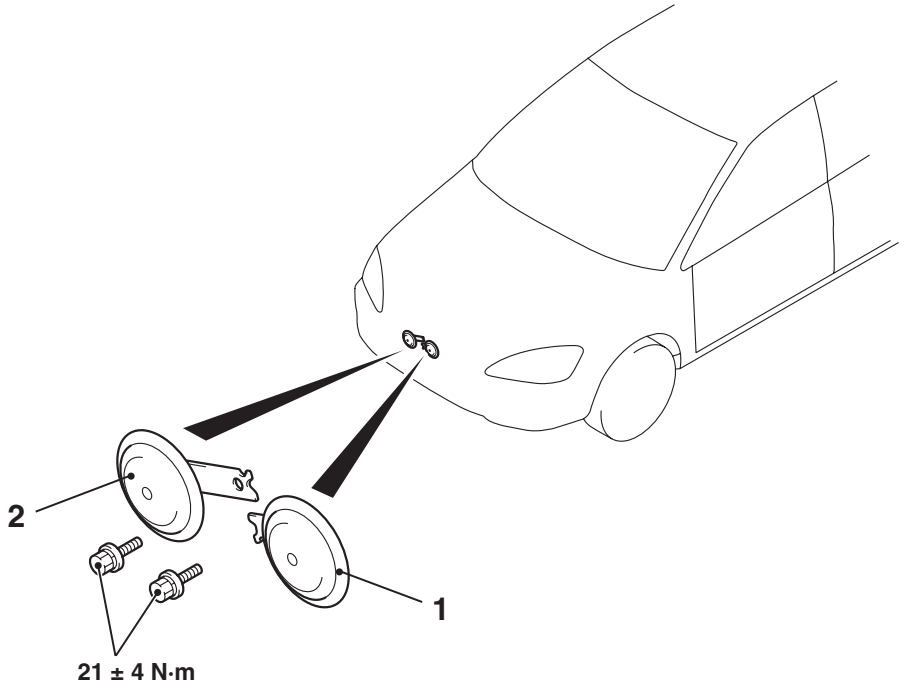
Column switch body	Tester connection	Specified condition
Lighting switch side connector side, Windshield wiper and washer switch side connector	3 – 3, 4 – 4, 5 – 5, 6 – 6, 7 – 7, 8 – 8, 9 – 9, 10 – 10, 11 – 11	Less than 2 ohms

Main Index
Group TOC

HORN

REMOVAL AND INSTALLATION

M1543007900509



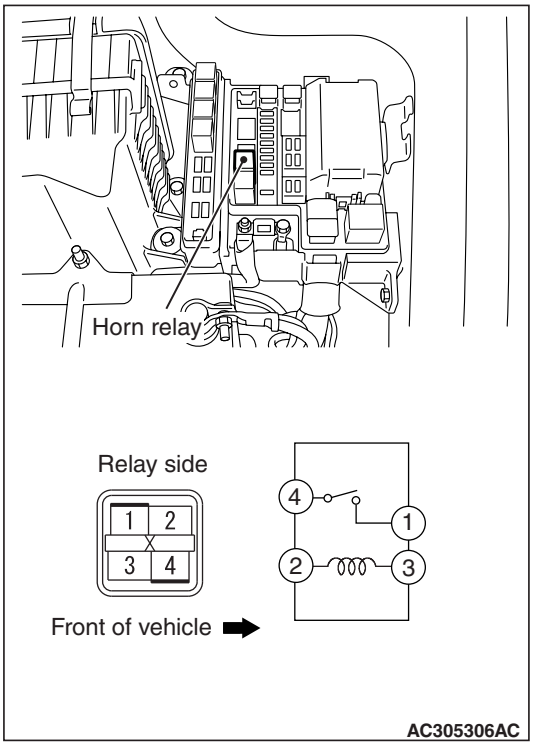
AC402523AB

Removal Steps

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

HORN RELAY CONTINUITY CHECK

M1543019503284



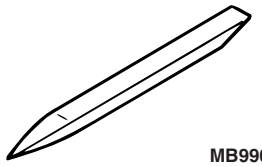
AC305306AC

Battery voltage	Tester connection	Specified condition
Not applied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1 – 4	Less than 2 ohms

CLOCK

SPECIAL TOOL

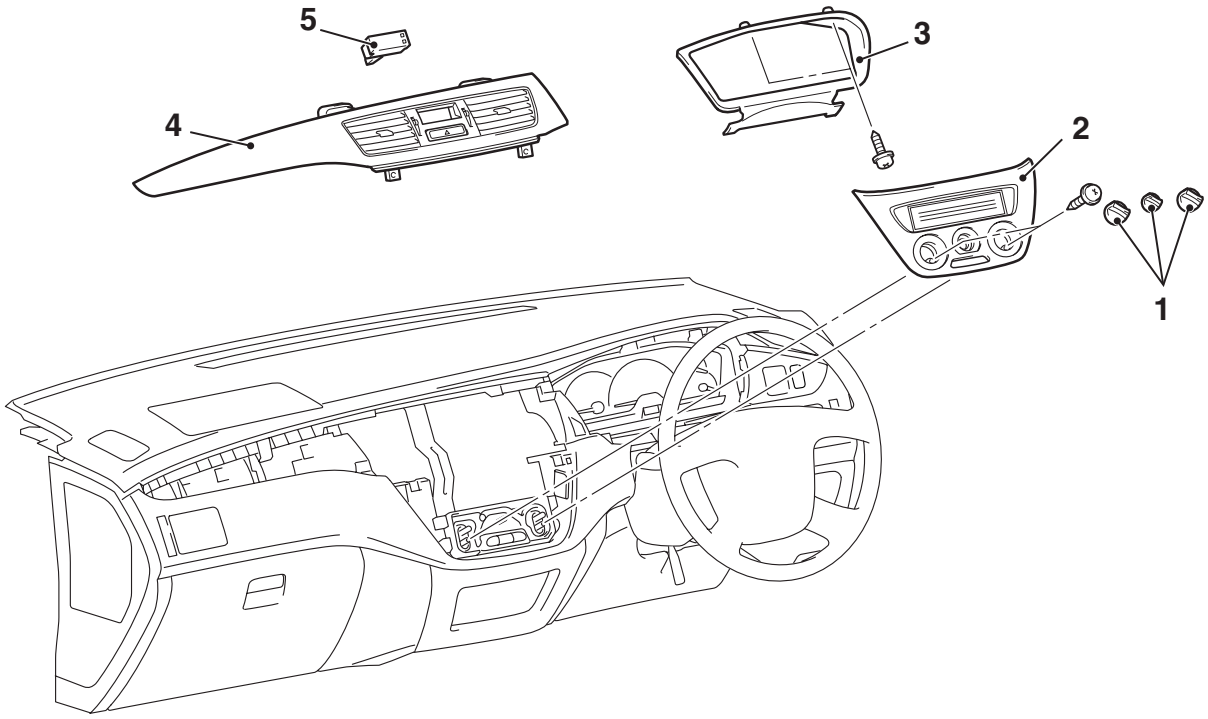
M1543000602473

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre panel and centre air outlet panel

CLOCK

REMOVAL AND INSTALLATION

M1543005900365



AC402410AB

Removal steps

1. Knob <vehicles with manual A/C>
2. Centre panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)

Removal steps (Continued)

3. Meter bezel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)
4. Centre air outlet panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)
5. Clock

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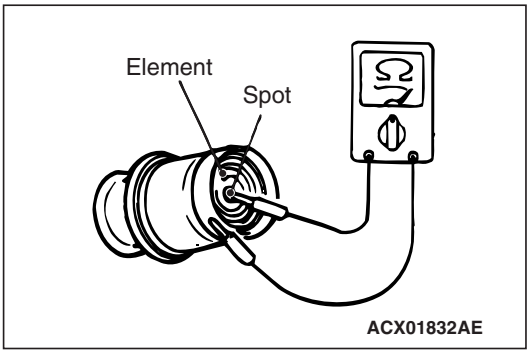
CIGARETTE LIGHTER

INSPECTION

M1543005700286

CIGARETTE LIGHTER CHECK

1. 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.

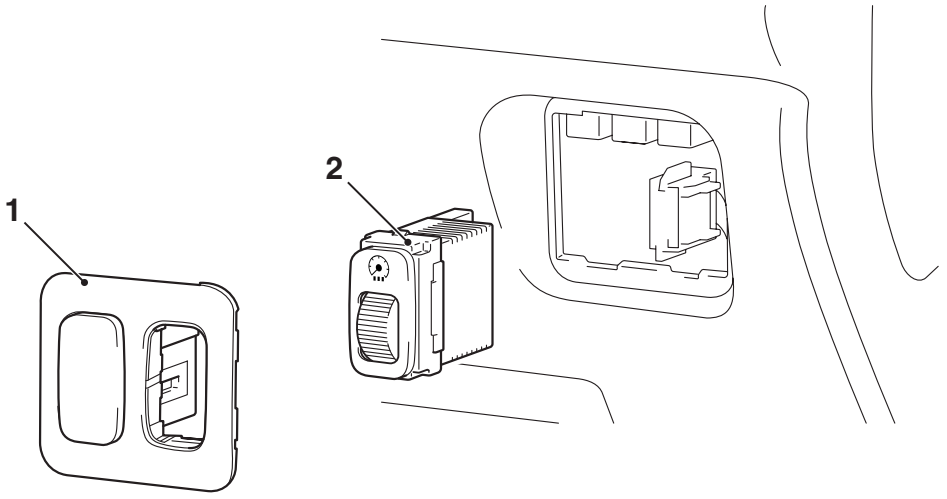


2. Using an ohmmeter, check that the element resistance value is 1.7 ohms.

RHEOSTAT

REMOVAL AND INSTALLATION

M1542006000384



Removal steps

1. Switch panel
2. Rheostat switch

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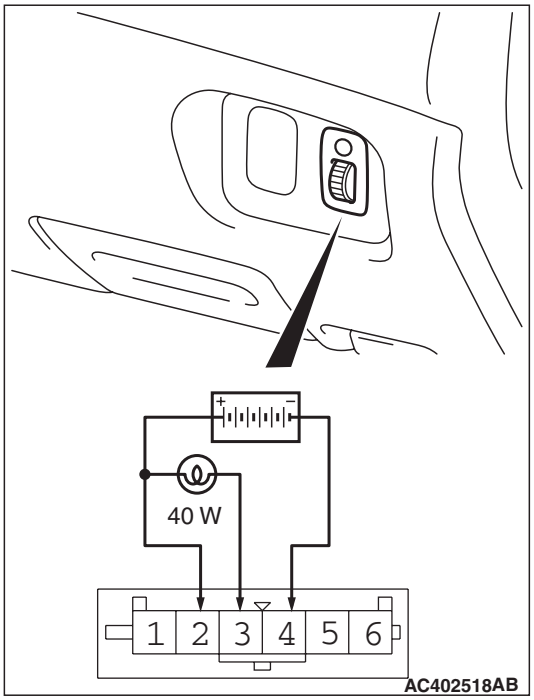
INSPECTION

M1542006100251

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.

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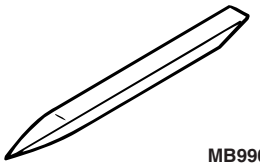
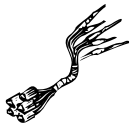
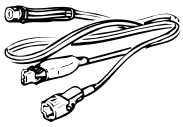
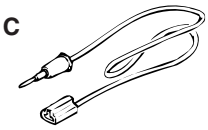
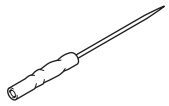
RADIO AND CD PLAYER

SPECIAL TOOLS

M1544000600481

Tool	Number	Name	Use
 MB990784	MB990784	Ornament remover	Removal of centre panel
A  B  C  D DO NOT USE MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	For checking voltage (continuity and value) at harness and connectors A: For checking connector pin contact voltage B: For checking power supply circuits C: For checking power supply circuits D: For connection to commercially available tester
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

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TROUBLESHOOTING

AUDIO SYSYTEM TROUBLESHOOTING

M1544000700228

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

M1544004900644

Symptom		Inspection Procedure No.	Reference Page
Power of radio and CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.		1	P.54A-77
No sound from one speaker.		2	P.54A-80
Noise	Noise appears at certain places when traveling (AM).	3	P.54A-88
	Noise is preset while moving (FM).	4	P.54A-88
	Mixed with noise, only at night (AM).	5	P.54A-89
	Broadcasts can be heard but both AM and FM have a lot of noise.	6	P.54A-90
	There is more noise on either AM or FM.	7	P.54A-91
	There is noise when starting the engine.	8	P.54A-92
	Some noise appears when there is vibration or shocks during traveling.	9	P.54A-93
	Noise sometimes appears on FM during traveling.	10	P.54A-94
	Ever-present noise.	11	P.54A-94
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	12	P.54A-95
	Poor reception.	13	P.54A-95
	Distortion on AM or on both AM and FM.	14	P.54A-96
	Distortion on FM only.	15	P.54A-97
	Using the auto select function, too few automatic stations are selected.	16	P.54A-97
	Preset stations are erased.	17	P.54A-98
CD player	CD can not be inserted.	18	P.54A-101
	No sound (CD only).	19	P.54A-101
	CD sound skips.	20	P.54A-102
	Sound quality is poor.	21	P.54A-102
	CD cannot be ejected.	22	P.54A-103

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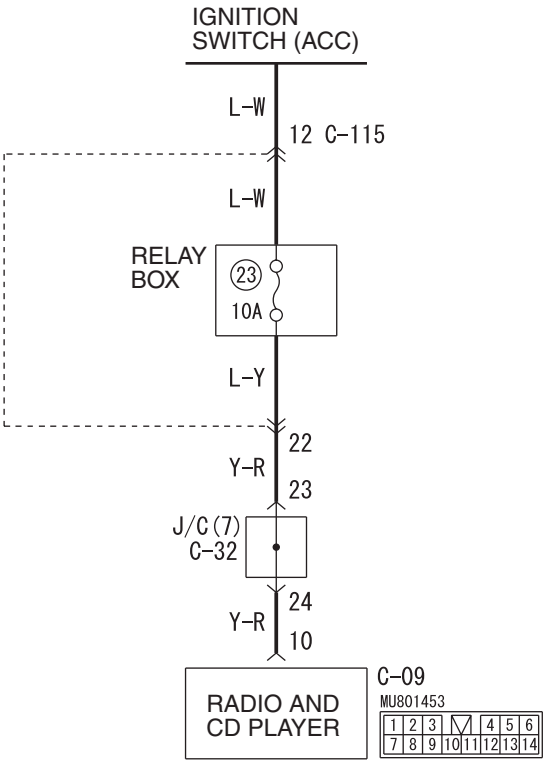
Group TOC

SYMPTOM PROCEDURES

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

Radio and CD Player Power Supply Circuit



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

W6J54L004A

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

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

Q: Is it possible to put the radio and CD player power in the "ON" position?
YES : Go to Step 2.
NO : Go to Step 5.

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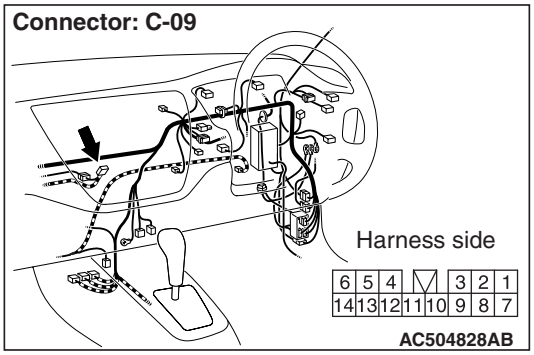
STEP 2. Connector check: radio and CD player connector C-09.

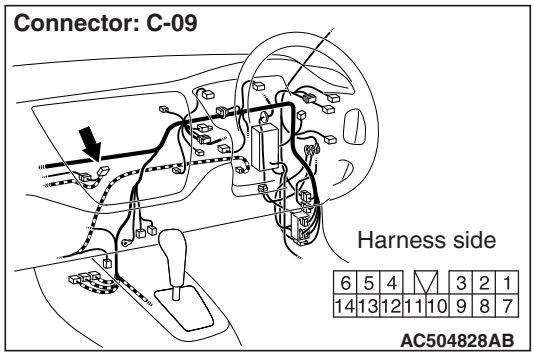


Q: Is radio and CD player connector C-09 in good condition?

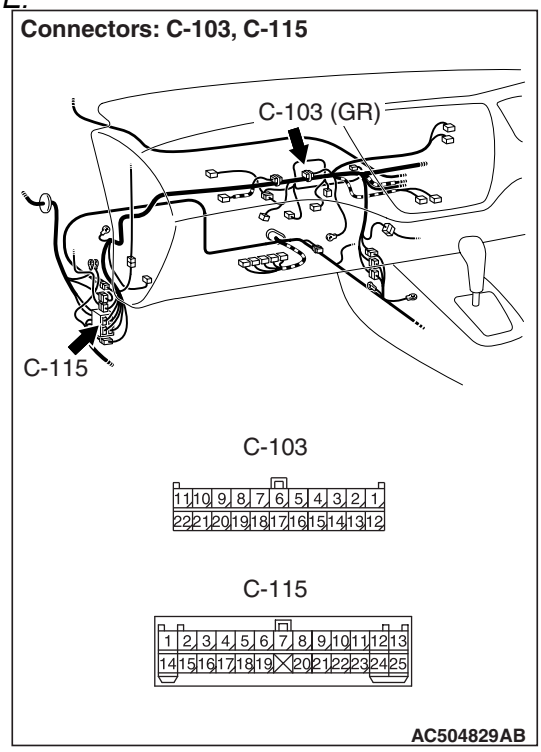
YES : Go to Step 3.

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

STEP 3. Check the wiring harness between radio and CD player connector C-09 (terminal 11) and battery.



NOTE:



Prior to the wiring harness inspection, check intermediate connectors C-115 and joint connector (1) C-103, and repair if necessary.

Q: Are the wiring harnesses between radio and CD player connector C-09 (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 CD player should operate normally.

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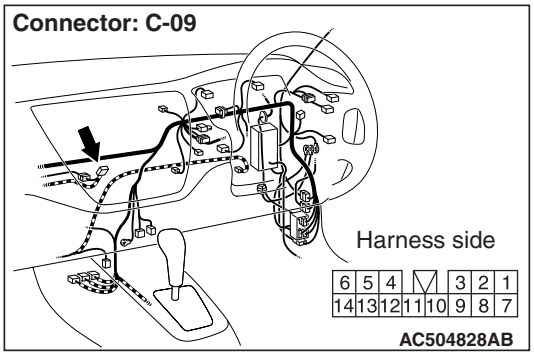
STEP 4. Check the assembling state of the radio and CD player.

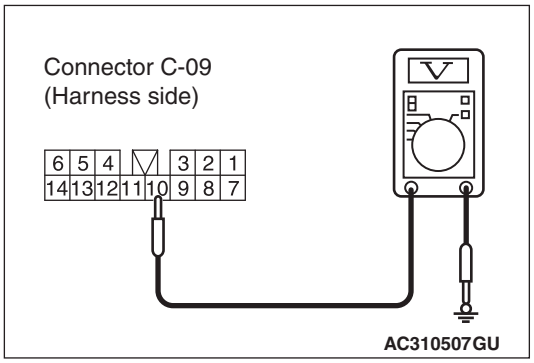
NOTE: The radio and CD player is earthed to the instrument panel centre reinforcement directly.

Q: Is the radio and CD player installed correctly?
YES : Repair or replace the radio and CD player. If the power switch is turned on, the radio and CD player should operate normally.
NO : Install properly. If the power switch is turned on, the radio and CD player should operate normally.

STEP 5. Measure the voltage at radio and CD player connector C-09 in order to check the battery circuit of power supply system to the radio and CD player (ignition switch ACC).



(1) Disconnect radio and CD player connector C-09, and measure at the wiring harness side.
(2) Turn the ignition switch to "ACC" position.

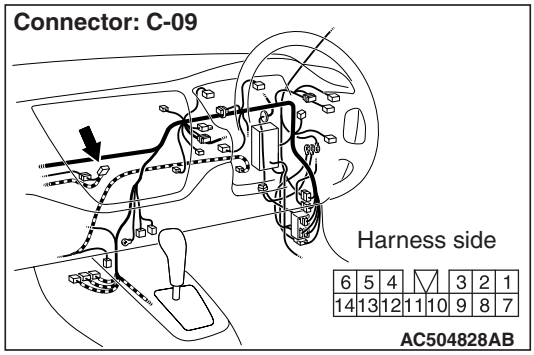


(3) Measure the voltage between terminal 10 and earth.

OK: System voltage

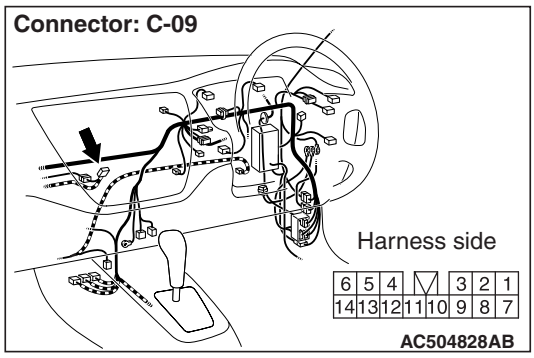
Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. Connect check: radio and CD player connector C-09.

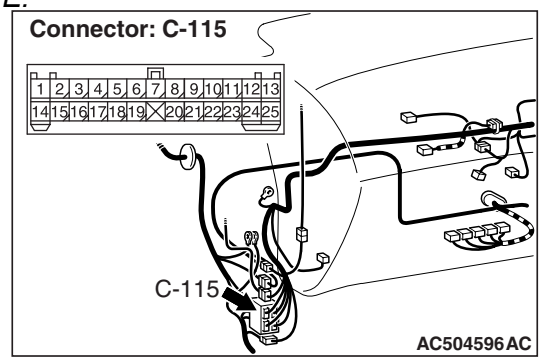


Q: Is radio and CD player connector C-09 in good condition?
YES : Go to Step 7.
NO : Repair or replace the damage component(s). If the power switch is turned on, the radio and CD player should operate normally.

STEP 7. Check the wiring harness between radio and CD player connector C-09 (terminal 10) and ignition switch (ACC).



NOTE:



Prior to the wiring harness inspection, check intermediate connector C-115, and repair if necessary.

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Q: Is the wiring harness between radio and CD player connector C-09 (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 CD player should operate normally.

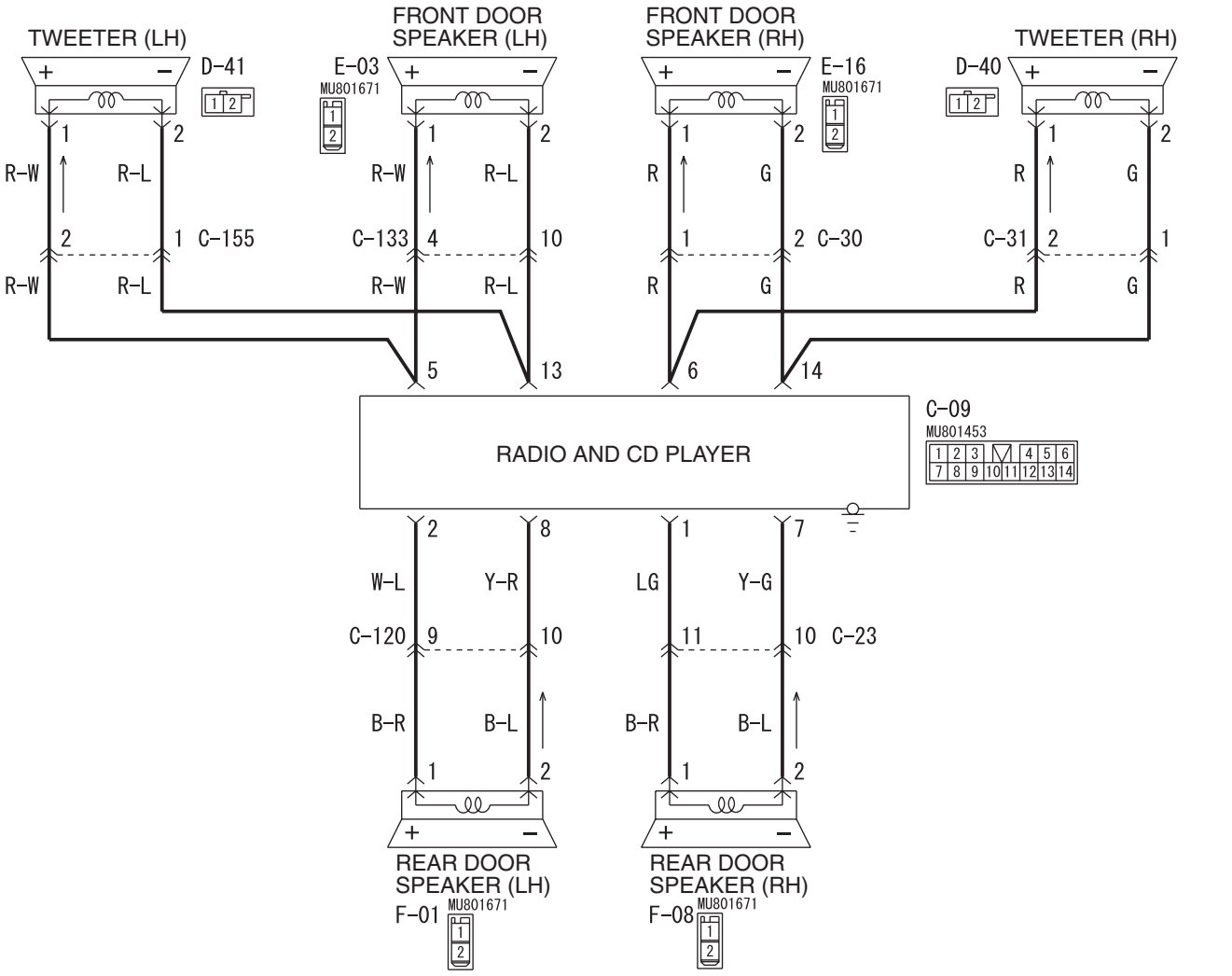
STEP 8. Check the assembling state of the radio and CD player.

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

Q: Is the radio and CD player installed correctly?
YES : Repair or replace the radio and CD player. If the power switch is turned on, the radio and CD player should operate normally.
NO : Install properly. If the power switch is turned on, the radio and CD player should operate normally.

INSPECTION PROCEDURE 2: No Sound from One Speaker.

Speaker System Circuit



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

W6J54L005A

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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 CD player.

DIAGNOSIS PROCEDURE

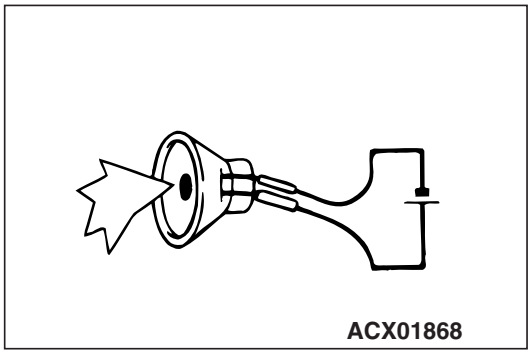
STEP 1. Check to see which speaker the sound is not output from.

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).

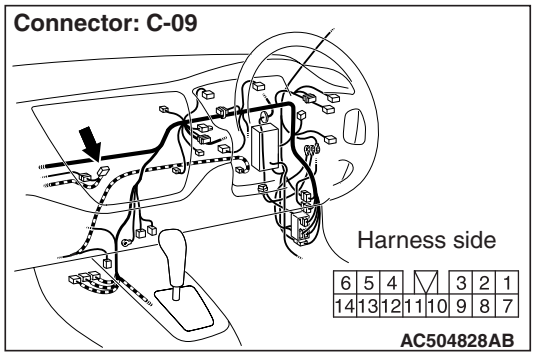
(1) Remove the front door speaker (LH). Refer to P.54A-107.

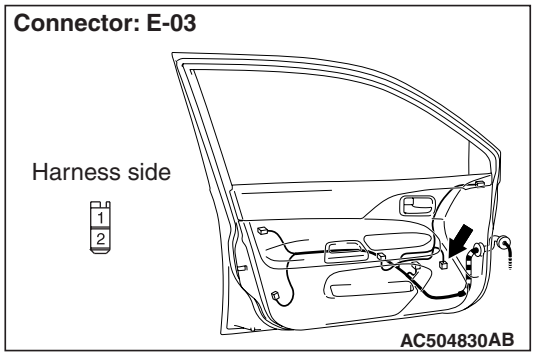


(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

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-03 and radio and CD player connector C-09.





Q: Are harness connectors front door speaker (LH) connector E-03 and radio and CD player connector C-09 in good condition?
YES : Go to Step 4.
NO : Repair or replace the damage component(s). The door speaker (LH) should sound.

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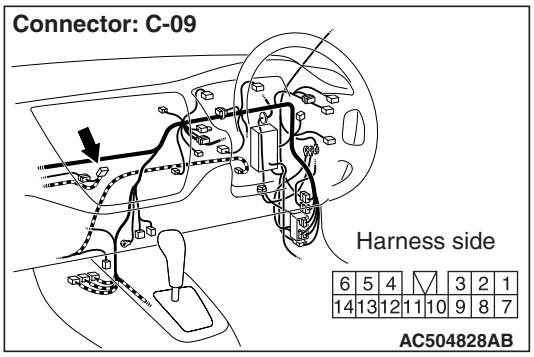
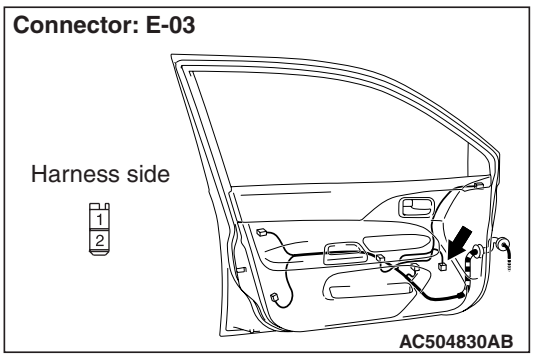
STEP 4. Check the wiring harness between front door speaker (LH) connector E-03 (terminal 1 and 2) and radio and CD player connector C-09 (terminals 5 and 13).





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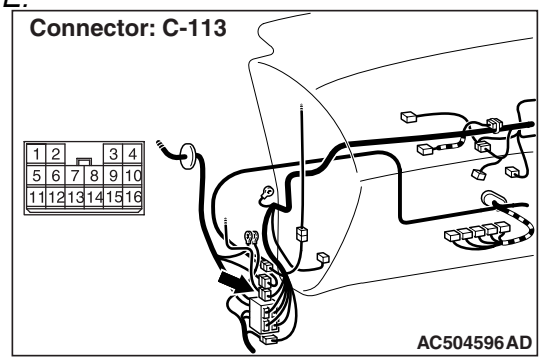
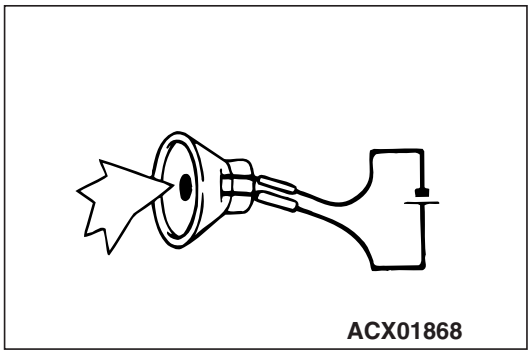


Prior to the wiring harness inspection, check intermediate connectors C-113, and repair if necessary.

Q: Is the wiring harness between front door speaker (LH) connector E-03 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 5 and 13) in good condition?
YES : Repair or replace the radio and CD player. The front door speaker (LH) should sound.
NO : Repair or replace the damage component(s). The front door speaker (LH) should sound.

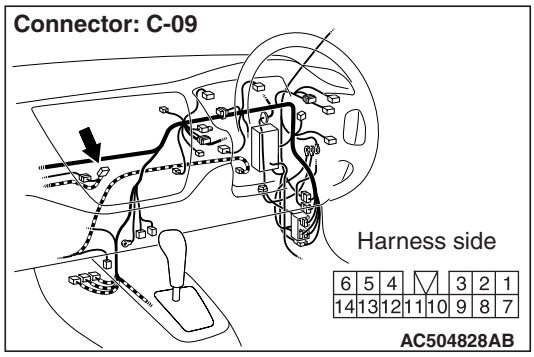
STEP 5. Check the front door speaker (RH).
(1) Remove the front door speaker (RH). Refer to P.54A-107.

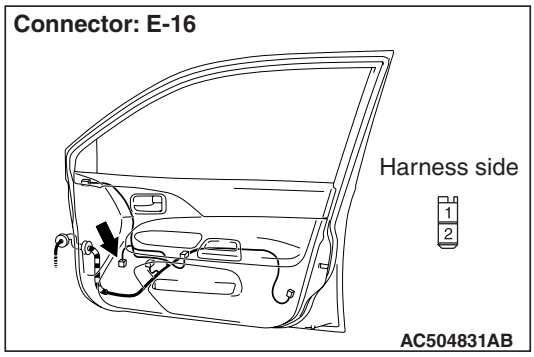


(2) Check that the front door speaker (RH) generates noise when a five-volt voltage is applied on the front door speaker (RH) terminal.

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-16 and radio and CD player connector C-09.





Q: Are harness connectors front door speaker (RH) connector E-16 and radio and CD player connector C-09 in good condition?
YES : Go to Step 7.
NO : Repair or replace the damage component(s). The front door speaker (RH) should sound.

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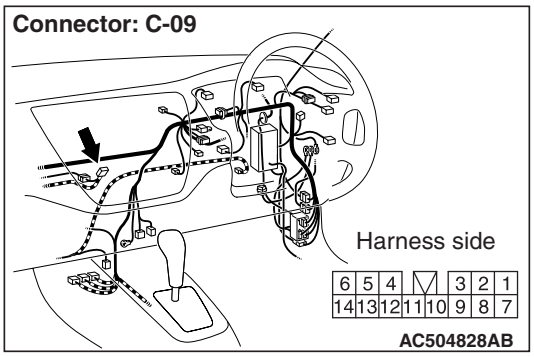
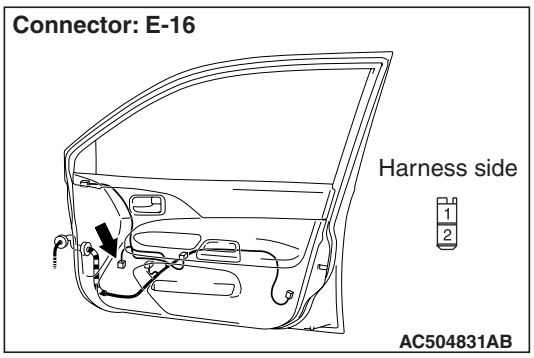
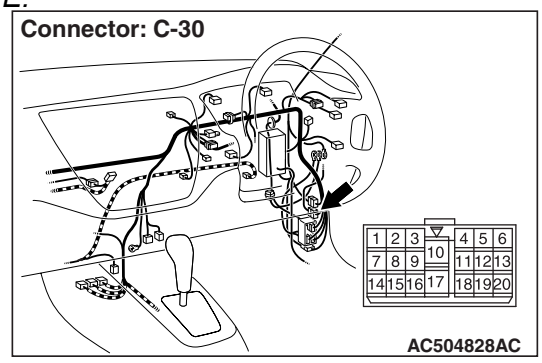
STEP 7. Check the wiring harness between front door speaker (RH) connector E-16 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 6 and 14).





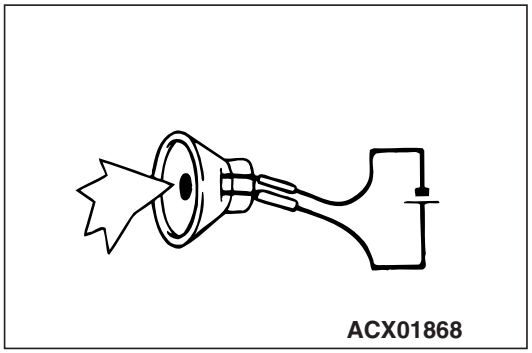
NOTE:



Prior to the wiring harness inspection, check intermediate connector C-30, and repair if necessary.

Q: Is the wiring harness between front door speaker (RH) connector E-16 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 6 and 14) in good condition?
YES : Repair or replace the radio and CD player. The front door speaker (RH) should sound.
NO : Repair the wiring harness. The front door speaker (RH) should sound.

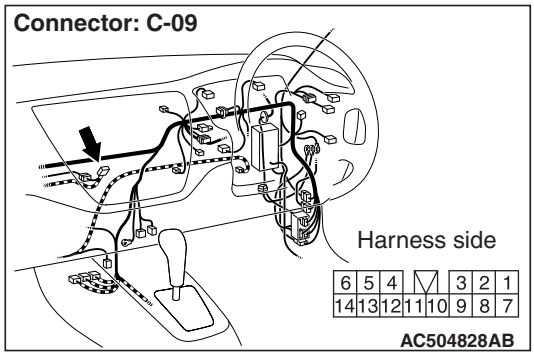
STEP 8. Check the tweeter (LH).
(1) Remove the tweeter (LH). Refer to P.54A-107.

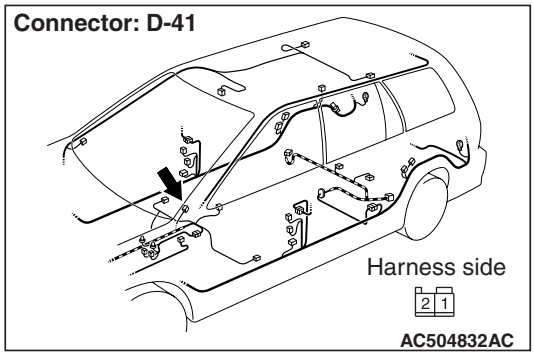


(2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.

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 D-41 and radio and CD player connector C-09.





Q: Are harness connectors tweeter (LH) connector D-41 and radio and CD player connector C-09 in good condition?
YES : Go to Step 10.
NO : Repair or replace the damage component(s). The tweeter (LH) should sound.

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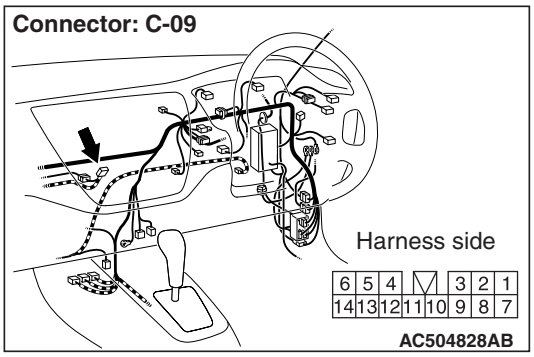
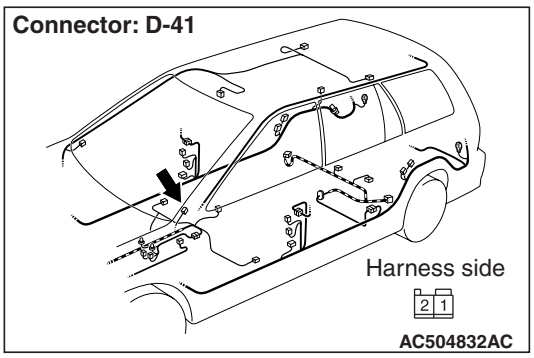
STEP 10. Check the wiring harness between tweeter (LH) connector D-41 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 5 and 13).





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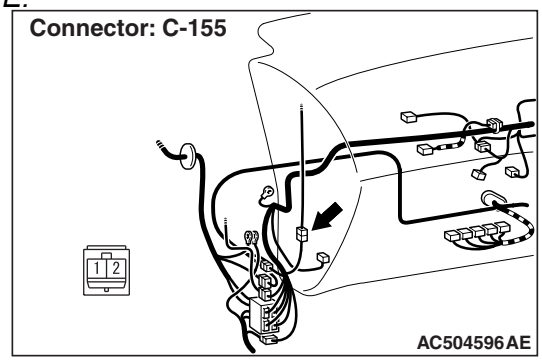
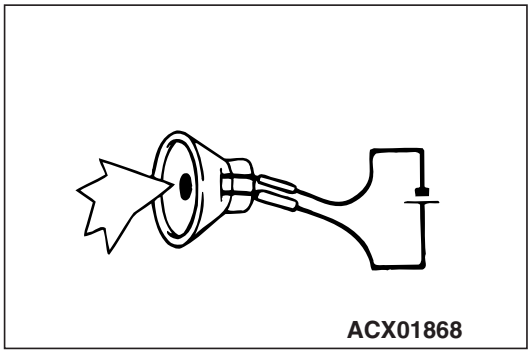


Prior to the wiring harness inspection, check intermediate connectors C-155, and repair if necessary.

Q: Is the wiring harness between tweeter (LH) connector D-41 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 5 and 13) in good condition?
YES : Repair or replace the radio and CD player. The tweeter (LH) should sound.
NO : Repair or replace the damage component(s). The tweeter (LH) should sound.

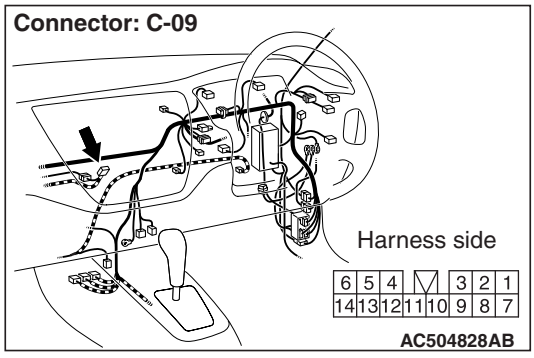
STEP 11. Check the tweeter (RH).
(1) Remove the tweeter (RH). Refer to P.54A-107.

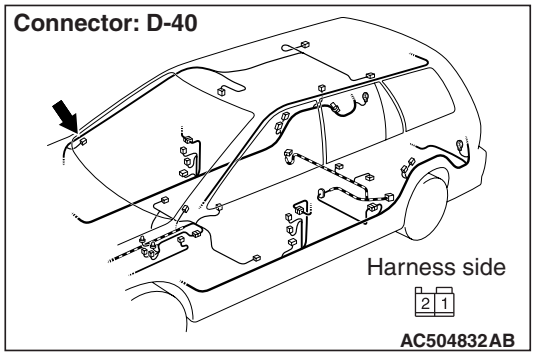


(2) Check that the tweeter (RH) generates noise when a five-volt voltage is applied on the tweeter (RH) terminal.

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 D-40 and radio and CD player connector C-09.





Q: Are harness connectors tweeter (RH) connector D-40 and radio and CD player connector C-09 in good condition?
YES : Go to Step 13.
NO : Repair or replace the damage component(s). The tweeter (RH) should sound.

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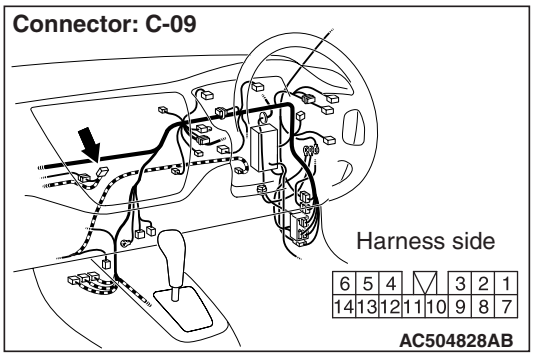
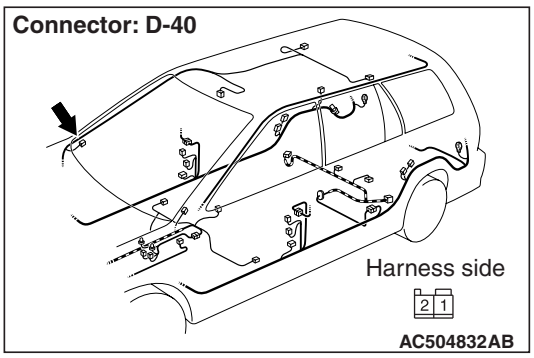
STEP 13. Check the wiring harness between tweeter (RH) connector D-40 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 6 and 14).





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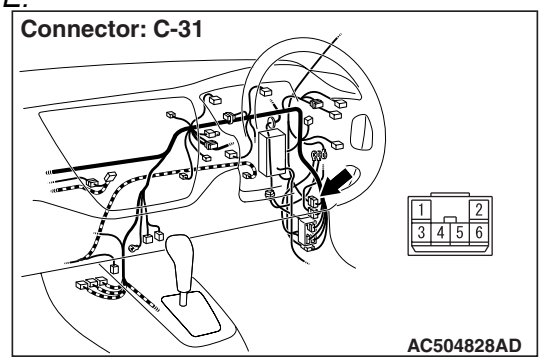
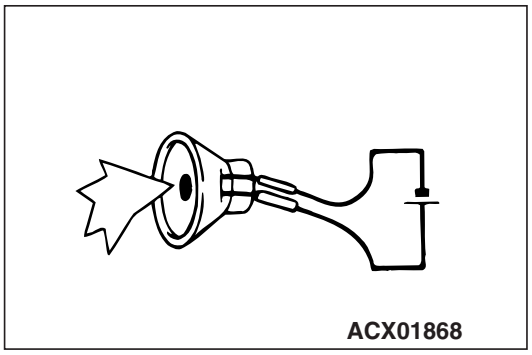


Prior to the wiring harness inspection, check intermediate connector C-31, and repair if necessary.

Q: Is the wiring harness between tweeter (RH) connector D-40 (terminals 1 and 2) and radio and CD player connector C-09 (terminals 6 and 14) in good condition?
YES : Repair or replace the radio and CD player. The tweeter (RH) should sound.
NO : Repair or replace the damage component(s). The tweeter (RH) should sound.

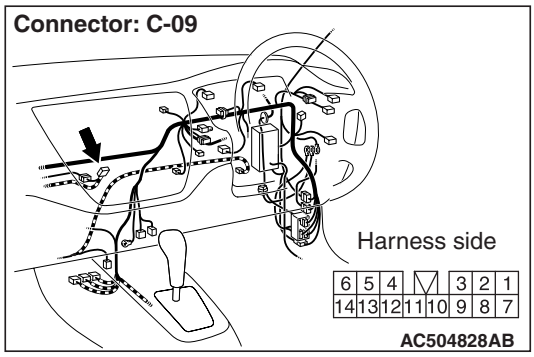
STEP 14. Check the rear door speaker (LH).
(1) Remove the rear door speaker (LH). Refer to P.54A-107.

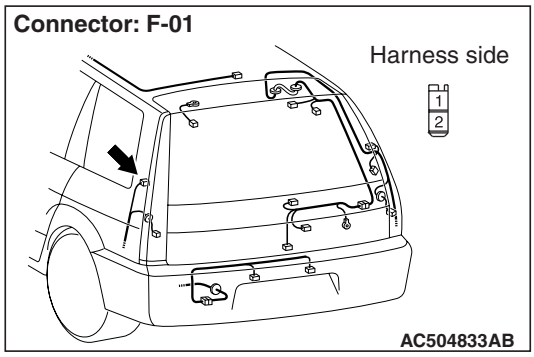


(2) Check that the rear door speaker (LH) generates noise when a five-volt voltage is applied on the rear door speaker (LH) terminal.

Q: Is the rear door speaker (LH) generating noise?
YES : Go to Step 15.
NO : Replace the rear door speaker (LH). The rear door speaker (LH) should sound.

STEP 15. Connector check: Rear door speaker (LH) connector F-01 and radio and CD player connector C-09.





Q: Are harness connectors rear door speaker (LH) connector F-01 and radio and CD player connector C-09 in good condition?
YES : Go to Step 16.
NO : Repair or replace the damage component(s). The rear door speaker (LH) should sound.

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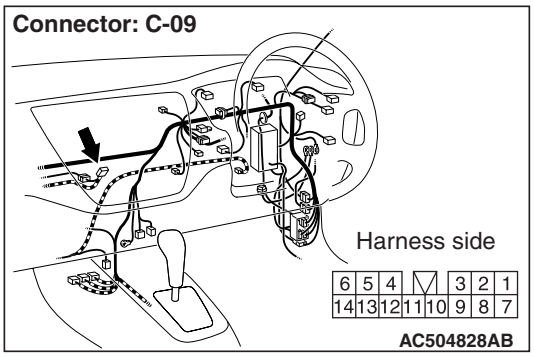
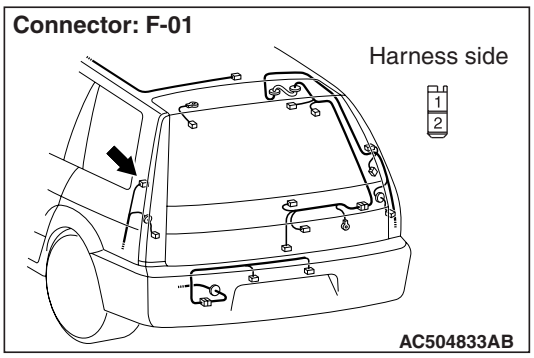
STEP 16. Check the wiring harness between rear door speaker (LH) connector F-01 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 2 and 8).





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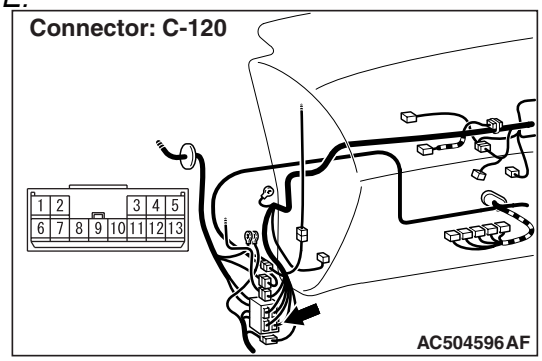
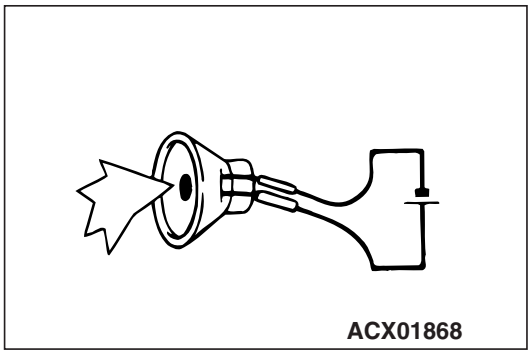


Prior to the wiring harness inspection, check intermediate connectors C-120 , and repair if necessary.

Q: Is the wiring harness between rear door speaker (LH) connector F-01 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 2 and 8) in good condition?
YES : Repair or replace the radio and CD player. The rear door speaker (LH) should sound.
NO : Repair or replace the damage component(s). The rear door speaker (LH) should sound.

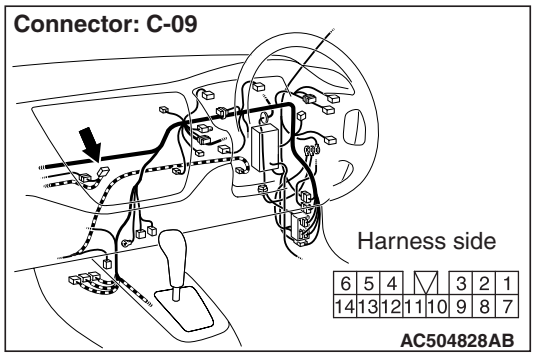
STEP 17. Check the rear door speaker (RH).
(1) Remove the rear door speaker (RH). Refer to P.54A-107.

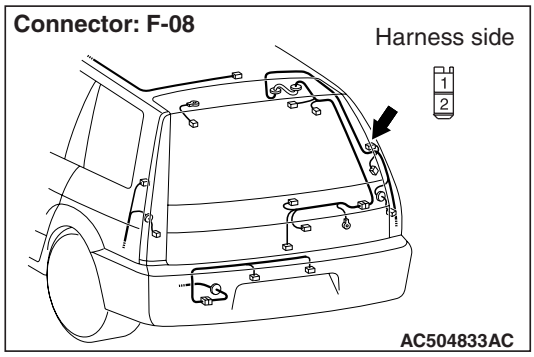


(2) Check that the rear door speaker (RH) generates noise when a five-volt voltage is applied on the rear door speaker (RH) terminal.

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 F-08 and radio and CD player connector C-09.





Q: Are harness connectors rear door speaker (RH) connector F-08 and radio and CD player connector C-09 in good condition?
YES : Go to Step 19.
NO : Repair or replace the damage component(s). The rear door speaker (RH) should sound.

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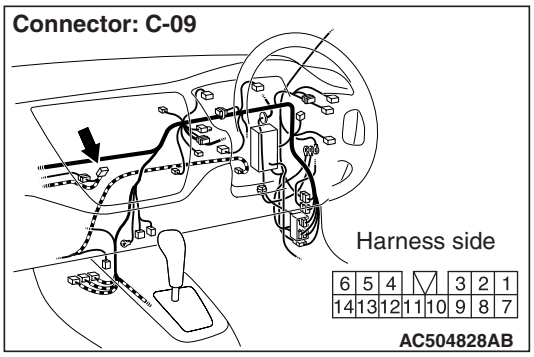
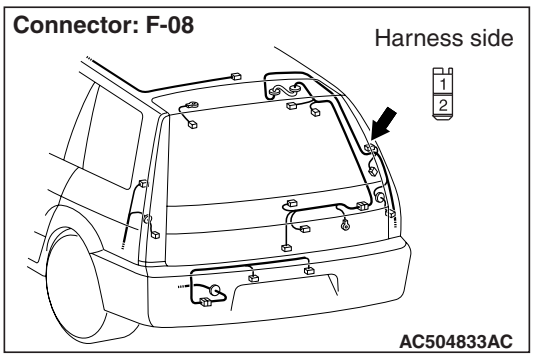
STEP 19. Check the wiring harness between rear door speaker (RH) connector F-08 (terminals 1 and 2) and radio and CD player connector C-09 (terminals 1 and 7).





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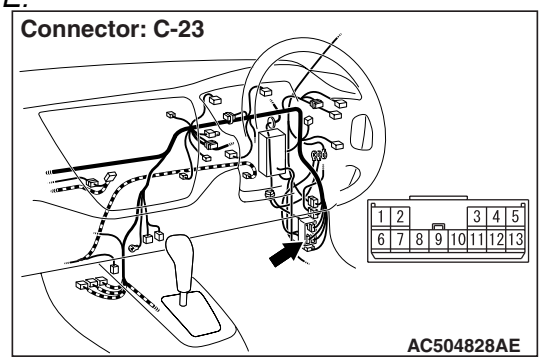

Prior to the wiring harness inspection, check intermediate connectors C-23, and repair if necessary.

Q: Is the wiring harness between rear door speaker (RH) connector F-08 (terminal 1 and 2) and radio and CD player connector C-09 (terminal 1 and 7) in good condition?

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

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

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INSPECTION PROCEDURE 3: 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: Dose 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.

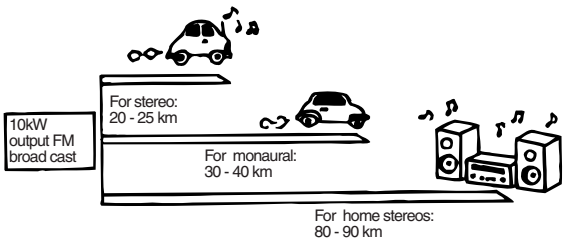
STEP 3. Ask the owner about the state of the noise.
(1) Find out the following information from the owner.
(2) Place where the noise occurs.
(3) Locality conditions (valley, mountain, etc.)
(4) Name and frequency of stations affected by noise

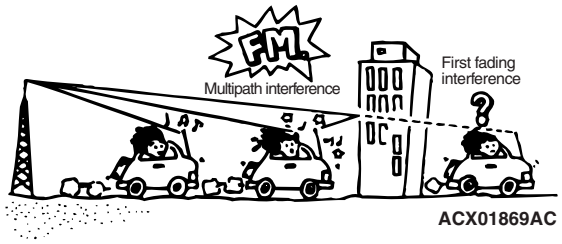
Q: Which is the noise, vehicle noise or external noise?
Vehicle noise : It may not be possible to prevent noise if the signal is weak.
External noise : In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference. Go to Step 4.

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 4: Noise is Present while Moving (FM).





DIAGNOSIS PROCEDURE

NOTE: FM waves have the same properties as lamp, and can be deflected and blocked. FM signal reception is severely degraded in the shadow of obstructions such as buildings or mountains. An FM receiver will then only receive a reflected signal.

1. The signal becomes weak as the distance from the station's transmission antenna increases. The signal strength received depends on the signal strength of the transmitting station and intervening obstructions such as buildings and hills. Generally speaking, the area of good reception is approximately 20 – 25 km for stereo reception, and 30 – 40 km for monaural reception.

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2. The signal will becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the station transmitter and the vehicle), and noise will appear. <This is called first fading, and gives a steady buzzing noise.>
3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. When moving, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitive buzzing.>
4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.

After taking measures to prevent the noise, check that no noise occurs.

5. Change to a different station with a stronger wave to boost resistance to interference.
6. Suppress high tones to reduce noise.
7. Extend antenna completely.

If there is noise, the following causes can be considered.

8. If due to vehicle noise: It may not be possible to prevent noise if the signal is weak.
9. If due to external noise: In almost all cases, prevention on the receiver side is not possible. Weak signals especially are susceptible to interference.

If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service centre.

INSPECTION PROCEDURE 5: Mixed with Noise, Only at Night (AM).

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

1. Factors due to signal conditions: Due to the fact that long-distance signals are more easily received at night, even stations that are received without problem during the day may experience interference in a general worsening of reception conditions. The weaker a station is the more susceptible it is to interference, and a change to different station or the appearance of a beating sound* may occur.

   NOTE: Beat sound: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but electrical waves as well.*
2. Factors due to vehicles noise: Alternator noise may be a cause.

DIAGNOSIS PROCEDURE

STEP 1. Check that the noise still obvious even when the lamps are off.

Q: Is the noise still obvious even when the lamps are off?
YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check hat the following actions.
(1) Tune to a station with a stronger wave.
(2) Tune to a station with a stronger wave without completely extending the antenna (Mast antenna).

Q: Is there more noise than on radio in other vehicles?
YES : Consult the radio manufacturer's service centre.
NO : Check that there is no noise.

STEP 3. Check that the noise fades away when the vehicle harness is moved away from the radio (if the harness is not in the proper position).

Q: Does the noise fade away when the vehicle harness is moved any from the radio (If the harness is not in the proper position)?
YES : Consult the radio manufacturer's service centre.
NO : If there is more noise than other radios, consult the radio manufacturer's service centre.

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INSPECTION PROCEDURE 6: Broadcasts can be Heard but Both AM and FM have a lot of Noise.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. Check to see that the noise is gone.

STEP 2. Check that the noise occur when the engine is stopped or the engine is running.

Q: Does noise occur when the engine is stopped or the engine is running?
When the engine is stopped : Go to Step 3.
When the engine is running : Check the vehicle's noise suppressor (Refer to Inspection Procedure 10 P.54A-93).

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 CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check that the noise is eliminated when the antenna plug is properly attached.

Q: Is the noise eliminated?
YES : Consult the radio manufacturer's service centre.
NO : Go to Step 7.

STEP 7. Check that the antenna is in good condition and is it properly mounted.

Q: Is the antenna in good condition and is it properly mounted?
YES : Consult the radio manufacturer's service centre.
NO : Either repair or replace the antenna assembly. Check to see that the noise is gone.

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INSPECTION PROCEDURE 7: There is More Noise on Either AM or FM.

DIAGNOSIS PROCEDURE

There is much noise only on AM. Due to differences in AM and FM systems, AM is more susceptible to noise interference.

STEP 1. Check that there is noise under the following state(s).

- A motorcycle was passing.
- Lighting was flashing.
- A vehicle passed close by, but it appeared to be a vehicle generating a particularly large amount of noise radiation.
- Passed beneath a power line.
- Passed beneath a telephone line.
- Passed close by a signal alternator.
- Passed close by some other sources of electrical noise.
- Passed under a bridge.

Q: Is there noise in the above states?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Continue to check for static; when static is detected, check for the conditions listed above.

Q: Is there noise in the state described in Step 1?
YES : Noise prevention on the radio side is difficult. If the problem is particularly worse than other radios, consult a service centre.
NO : Go to Step 3.

STEP 3. Check noise prevention on the radio side is difficult.

Q: Is the noise level worse than other radios?
YES : Consult a service centre. Noise encountered during FM reception only. Due to differences in FM and AM systems, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user. a problem with the radio.> Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.
NO : f the noise level is roughly the same as other radios, there is no action to be taken.

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INSPECTION PROCEDURE 8: There is Noise when Starting the Engine.

DIAGNOSIS PROCEDURE

⚠ CAUTION

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

NOTE: Capacitor: The capacitor does not pass DC current, but as the number of waves increases when it passes AC current, impedance (resistance against AC) decreases, and current flow is facilitated. A noise suppressing capacitor which take advantage of this property is inserted between the power line for the noise source and the earth. This suppresses noise by earthing the noise component (AC or pulse signal) to the body of the vehicle.

NOTE: Coil: The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.

Noise type sounds are in parentheses	Conditions	Cause	Remedy
AM or FM: ignition noise (popping, snapping, cracking, buzzing)	• Increasing the engine speed causes the alternator whine sound to speed up and the volume to decrease • Disappears when the ignition switch turned to "ACC."	• Mainly due to the spark plugs • Due to engine noise	• Check or replace the earth cable. • Check or replace the noise capacitor.
Other electrical components	–	Noise may occur as the electrical components become older.	Repair or replace the electrical components.
Static electricity (cracking, crinkling)	• Disappears when the vehicle is completely stopped. • Severe when the clutch is engaged	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.
Static electricity (cracking, crinkling)	• Various noise are produced depending on the body part of the vehicle.	Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Earth parts by bonding. Cases where the problem is not eliminated by a signal response to one area are common, due to several body parts being imperfectly earthed.

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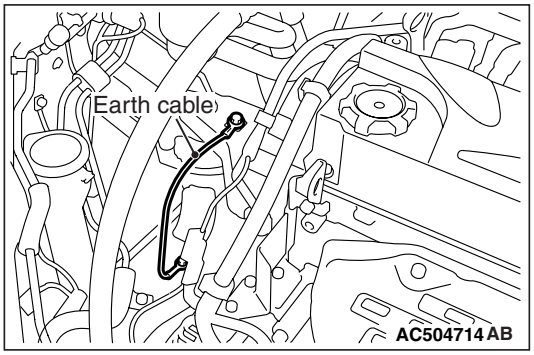
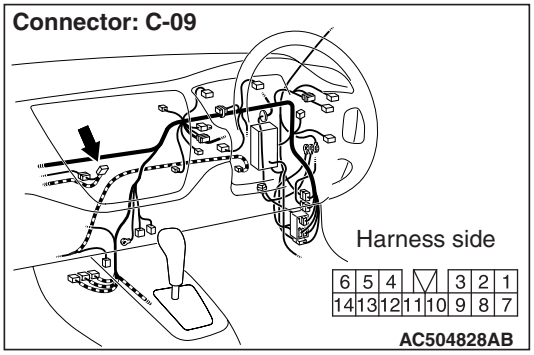


INSPECTION PROCEDURE 9: Some Noise Appears When There is Vibration or Shocks During Traveling.

DIAGNOSIS PROCEDURE

STEP 1. Connector check: radio and CD player connector C-09.



Q: Is radio and CD player connector C-09 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 CD player.

Q: Are operations normal when using another radio and CD player?
YES : Either repair or replace the radio and CD player. Check that there is no noise.
NO : Either repair or replace the antenna assembly. Check that there is no noise.

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INSPECTION PROCEDURE 10: Noise Sometimes Appears on FM during 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 in extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

Multipath noise
- *This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

Fading noise
- *This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

Q: Is the abnormality in reception generated only within a certain range?
YES : The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.
NO : Go to Step 4.

STEP 4. Check that noise appears when the radio switch is turned on while the vehicle is stopped.

NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the earth, causing a buzzing noise. There is no measures to discharge the static electricity of the vehicle body. Check that there is no noise.

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?
YES : Go to Step 5.
NO : It may be static electricity noise.

STEP 5. Check that the radio is correctly earthed.

The radio is connected to the earth with an assembling screw.

Q: Is the radio correctly earthed?
YES : Go to Step 6.
NO : Tighten the screw securely. Check that there is no noise.

STEP 6. Check by replacing the radio and CD player.

Q: Are operations normal when using another radio and CD player?
YES : Either repair or replace the radio and 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: 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 3 to 10 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc. and contact the radio manufacturer's service centre.

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INSPECTION PROCEDURE 12: There is Noise but No Reception for Both AM and FM or No Sound from AM, or No Sound from FM.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. The radio should sound normally.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underground garage, inside a building, etc.)?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Relocate and check.
Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?
YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check the connection of the antenna plug and the radio and CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?
YES : Go to Step 6.
NO : Thoroughly connect the antenna plug and the radio and CD player. The radio should sound normally.

STEP 6. Check by replacing the radio and CD player.

Q: Are operations normal when using another radio and CD player?
YES : Either repair or replace the radio and CD player. The radio should sound normally.
NO : Either repair or replace the antenna assembly. The radio should sound normally.

INSPECTION PROCEDURE 13: Poor Reception.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. Check that a poor reception is resolved.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underneath garage, inside a building, etc.)?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Relocate and check.
Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : Check that a poor reception is resolved.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?
YES : Check that a poor reception is resolved.
NO : Go to Step 5.

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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 CD player.

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

STEP 7. Check by replacing the radio and CD player.

Q: Does the another radio and CD player work normally?
YES : Either repair or replace the radio and 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 14: Distortion on AM or on Both AM and FM.

DIAGNOSIS PROCEDURE

STEP 1. Check the degree in which distortion is generated.

Q: How much distortion is generated?
Occasional distortion : Go to Step 2.
Constant distortion : Go to Step 3.

STEP 2. Check by the transmission antenna.

Q: Is there distortion by the transmission antenna?
YES : The input from the antenna is too big.
NO : Go to Step 3.

STEP 3. Check how the speakers are setup.

Q: Are any cords coming in contact with the paper cones of the speakers?
YES : Move the cords so that they do not come in contact with the paper cones of the speaker. Check that a distortion is resolved.
NO : Go to Step 4.

STEP 4. Check the speakers.

1. Remove the speakers.
2. Check to see if there is any ripping of the paper cones or any foreign obstacles in the paper cone.

Q: Are the speakers normal?
YES : Go to Step 5.
NO : Repair or replace the speakers. Check that a distortion is resolved.

STEP 5. Check how the speakers are setup.

Q: Check to see if the speakers are setup in a deformed manner.
YES : Correct the way the speakers are setup so they are securely setup. Check that a distortion is resolved.
NO : Repair or replace the radio and CD player. Check that a distortion is resolved.

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INSPECTION PROCEDURE 15: Distortion on FM Only.

DIAGNOSIS PROCEDURE

STEP 1. Check with another broadcasting station.

Q: Is there distortion when turning to another broadcasting station?
YES : Go to Step 2.
NO : The signal from that station is too weak.

STEP 2. Relocate the reception area and check.

Q: When relocating the reception area does the distortion increase or decrease?
YES : The cause may be multipath noise.
NO : Repair or replace the radio and CD player. Check that a distortion is resolved.

INSPECTION PROCEDURE 16: Using the Auto Select Function, Too Few Automatic Stations are Selected.

DIAGNOSIS PROCEDURE

STEP 1. Check the state of the antenna.

Q: Is the mast antenna assembled?
YES : Go to Step 2.
NO : Assemble the mast antenna. The auto-select function should operate normally.

STEP 2. Check the number of radio stations.

Q: Are there sufficient numbers of radio stations within the area?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Check the distance from the transmission antenna.

Q: Is there a transmission antenna within a range of 2 miles?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. The check if there are not that many radio stations and when there is no transmission antenna in the vicinity.
Execute automatic selection and check to see that the strongest radio frequency is receivable within the area.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions (underneath garage, inside a building, etc.)?
YES : Go to Step 6.
NO : Go to Step 7.

STEP 6. Relocate and check.
Automatically receive in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 7.

STEP 7. Check the connection of the antenna plug and the radio and CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?
YES : Repair or replace the radio and CD player. The auto-select function should operate normally.
NO : Thoroughly connect the antenna plug and the radio and CD player. The auto-select function should operate normally.

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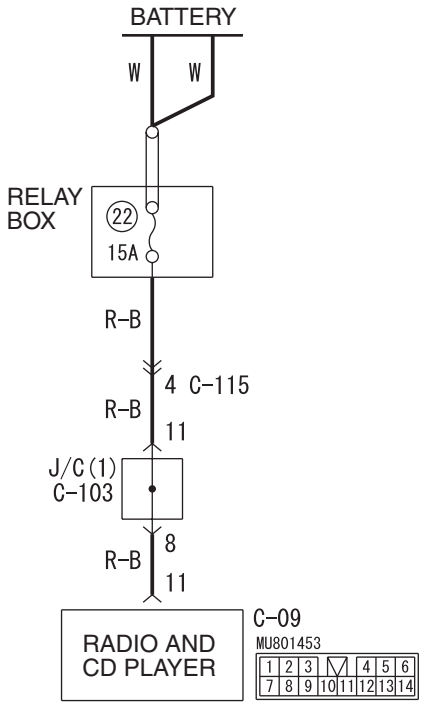
INSPECTION PROCEDURE 17: Preset Stations are Erased.

Memory Backup Power Circuit



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

W6J54L006A

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

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

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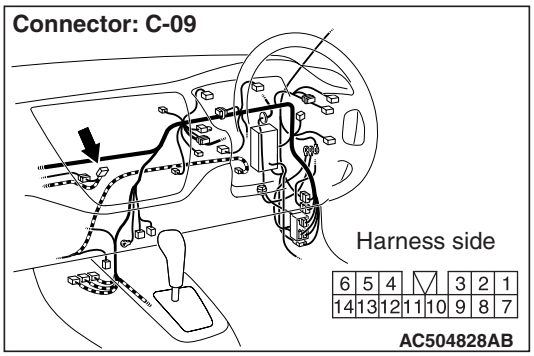
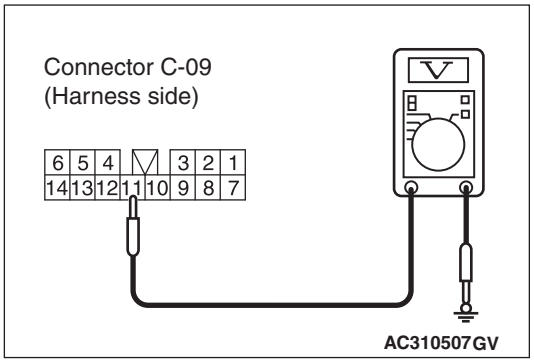
DIAGNOSIS PROCEDURE

STEP 1. Measure the voltage at radio and CD player connector C-09.



(1) Disconnect radio and CD player connector C-09.



(2) Measure the voltage between terminal number 11 and earth.

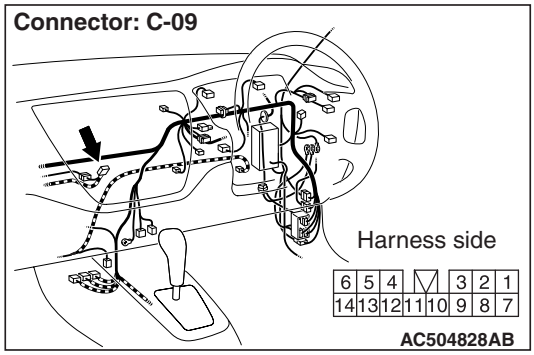
OK: System voltage

Q: Is the check result normal?

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

NO : Go to Step 2.

STEP 2. Connector check: Radio and CD player connector C-09.



Q: Is radio and CD player connector C-09 in good condition?

YES : Go to Step 3.

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

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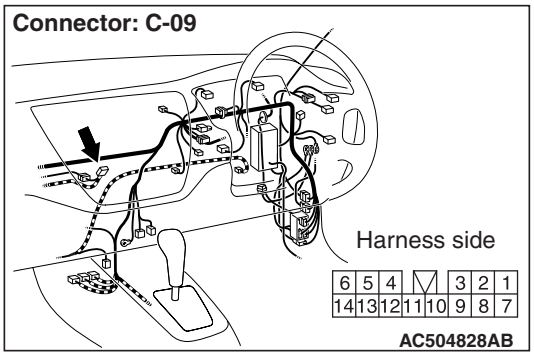
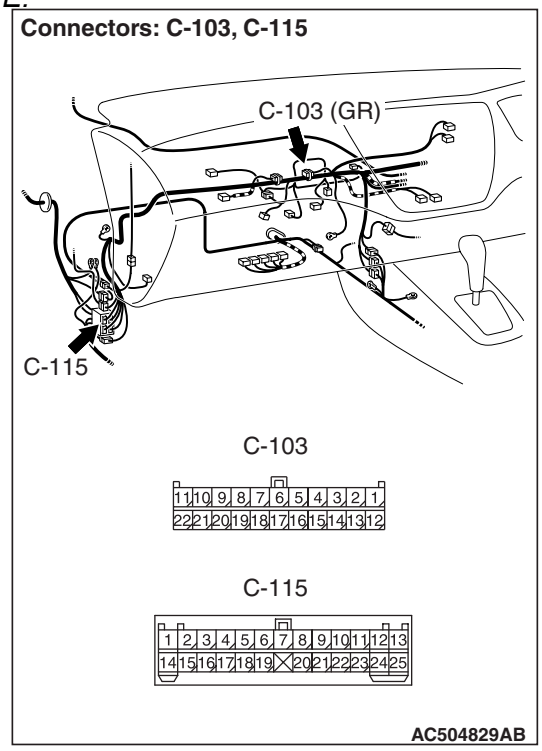
STEP 3. Check the wiring harness between radio and CD player connector C-09 (terminal 11) and battery.



NOTE:



Prior to the wiring harness inspection, check joint connector (1) C-103 and intermediate connectors C-115, and repair if necessary.

Q: Are the wiring harness between radio and CD player connector C-09 (terminal 11) and battery in good condition?

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

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

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INSPECTION PROCEDURE 18: 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 22 P.54A-103). 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-103.
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 19: 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-77.

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INSPECTION PROCEDURE 20: 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 21: Sound Quality is Poor.

DIAGNOSIS PROCEDURE

Check to see that the CD can be played normally and that it is free of any scratches or soiling.
Replace with better sound quality CD.

Q: Is the sound quality better replacing the CD with a clean CD without any scratches that can be played?
YES : Defective CD used. The sound quality should return to normal.
NO : Either repair or replace the radio and CD player. The sound quality should return to normal.

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INSPECTION PROCEDURE 21: 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 and CD player. Check that a CD can be ejected normally.

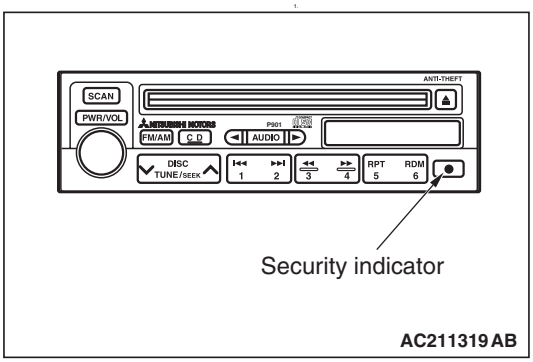
NO : Check the power supply circuit. Refer to Inspection Procedure 1 P.54A-77.

ON-VEHICLE SERVICE

PROCEDURE FOR INPUT OF SECURITY CODE FOR ANTI-THEFT SYSTEM

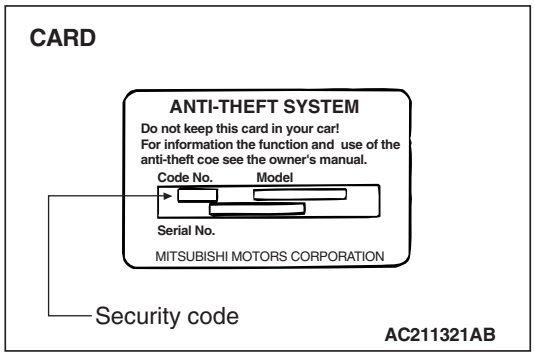
M1544004400359

The radio and CD player do not work under the following conditions:

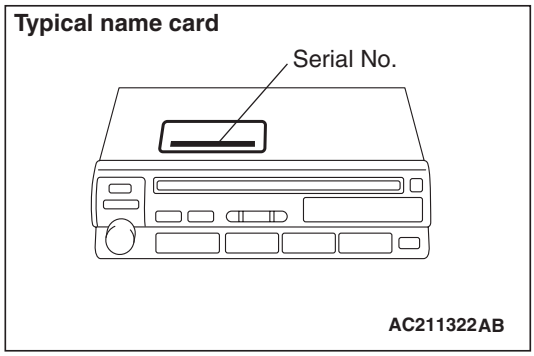


If the ignition key is removed, the security indicator of this radio and CD player flickers to prevent theft from happening.

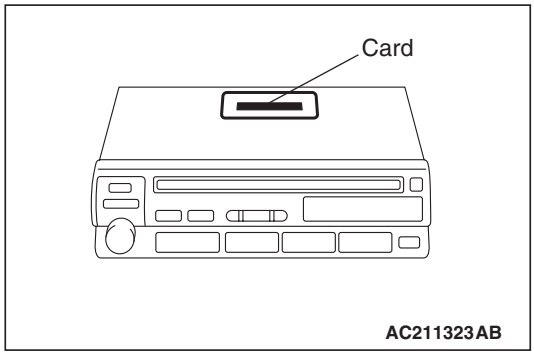
2. Power supply to the radio and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
3. The power supply to the radio and CD player has been suspended for more than an hour due to a blown fuse or discharged 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-106.
      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.

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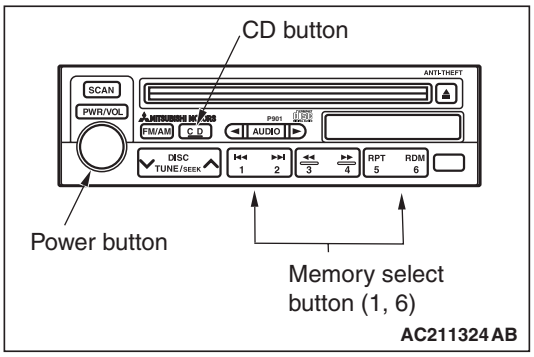
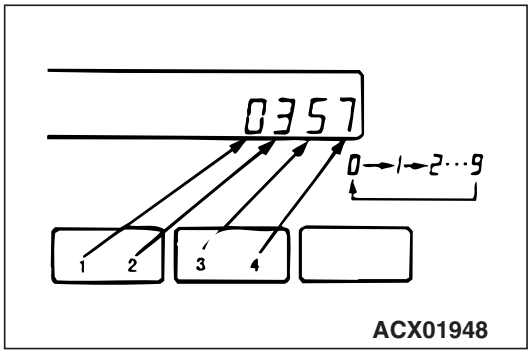
3. Turn the ignition key to the "ACC" or "ON" position.



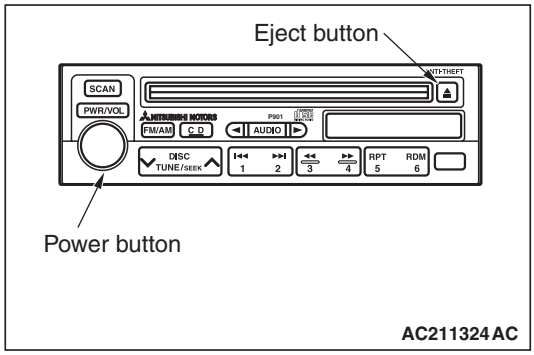
4. Press the "PWR" button, and "CODE" will be displayed.



5. Press number 1 through number 4 memory select button to set the four-digit security code shown on the card. Every time each digit key is pressed, the figure changes as follows: 0 to 1 to 2 to 3 to 4 to 5 to 6 to 7 to 8 to 9 to 0
6. Press the "CD" button, and a beep will be heard. If entered correctly, the radio and tape player will work.
7. If the security code is not accepted, "1Err" is displayed. In a few seconds, it will change to "CODE." Then repeat steps 5 and 6.

   NOTE:
   - *The anti-theft system will allow three attempts maximum to input the correct code.*
   - *The second error is displayed as "2 Err." When the third error is made, "3 Err" is displayed and then the display changes to "OFF." If this should occur, the unit will not work any more.*
   - *To input the security code again, turn the ignition switch to the "ACC" or "ON" position and wait for one hour when "OFF" is displayed. After "OFF" disappears on the display and changes into "CODE" the security code can be input again.*

Three-minute operation mode



To facilitate replacement or check, the radio with tape and CD player can be operated for three minutes without inputting the security code.

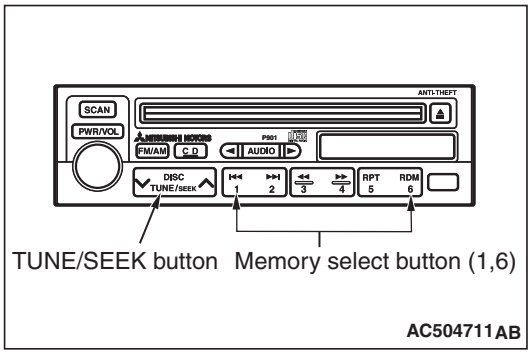
1. Press the "PWR" button and "EJECT" button together to operate the radio with tape and CD player.
2. In three minutes the unit will not be able to work. Then the radio with tape and CD player will be switched off.

SPEAKER TEST

M1544005400493

Enter the speaker test mode according to the following steps:

1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the radio and CD player.



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

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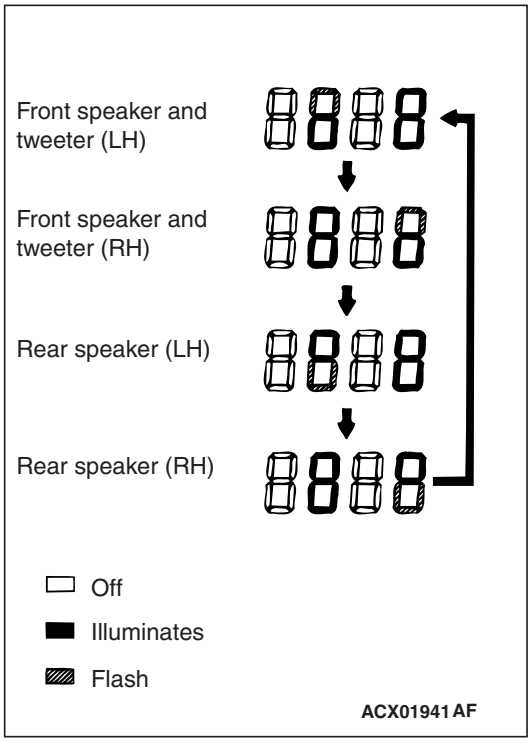

3. Check that the speaker, which is displayed on the radio panel display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button (CD) is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

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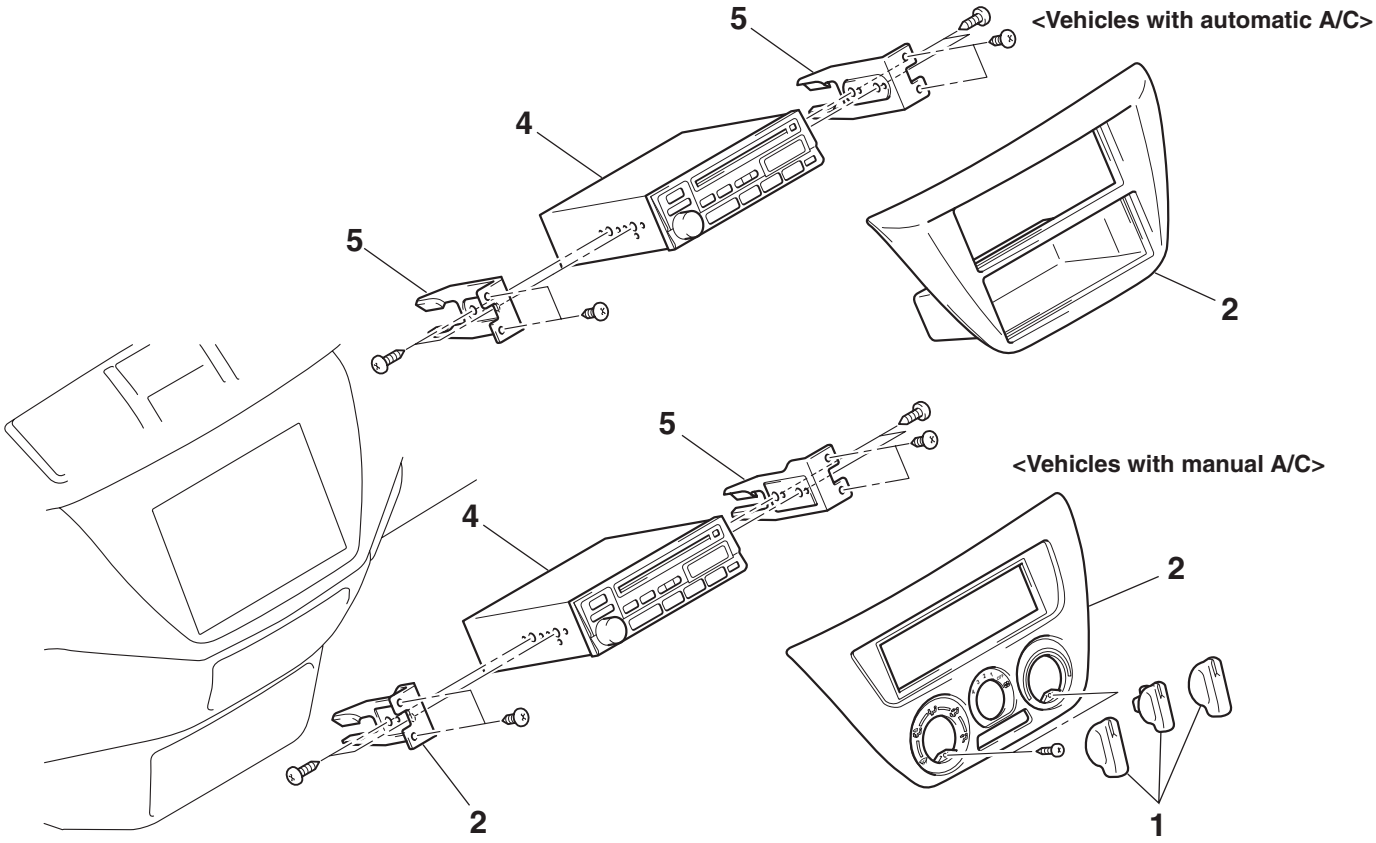
RADIO AND CD PLAYER

REMOVAL AND INSTALLATION

M1544009900111



AC504599 AB

Radio removal steps

1. Knob
2. Centre panel (Refer to GROUP 52A, Instrument panel assembly P.52A-2)

Radio removal steps (Continued)

3. Bracket
4. Radio and CD player

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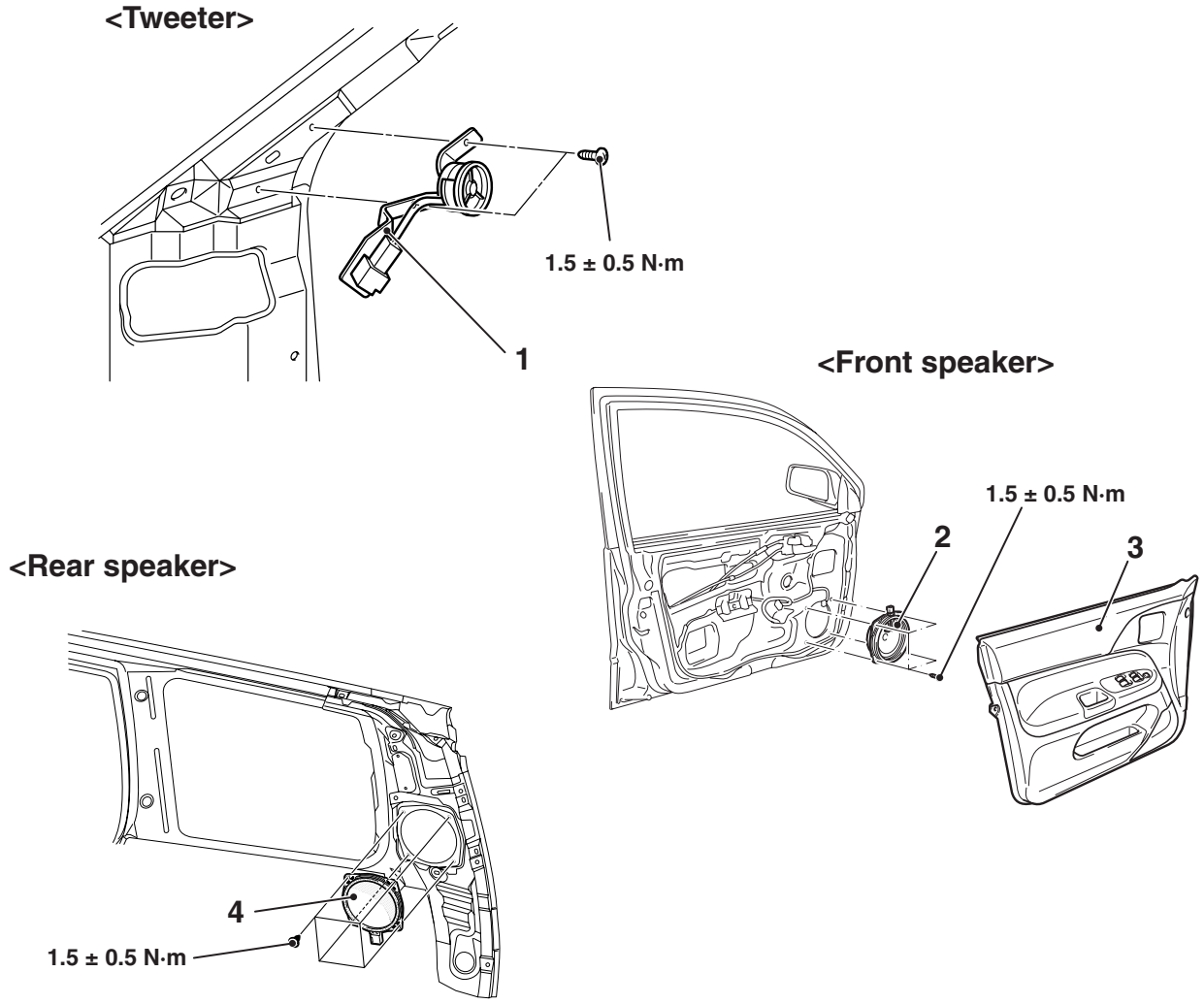
Group TOC

SPEAKER

REMOVAL AND INSTALLATION

M1544002600777



AC504604AB

Tweeter removal steps

- Front pillar trim (Refer to GROUP 52A, Trims P.52A-11).

1. Tweeter

Front speaker removal steps

2. Front door trim (Refer to GROUP 52A, Door trim P.52A-14.)
3. Front speaker

Rear speaker removal steps

- Quarter trim upper (Refer to GROUP 52A, Trims P.52A-11.)

4. Rear speaker

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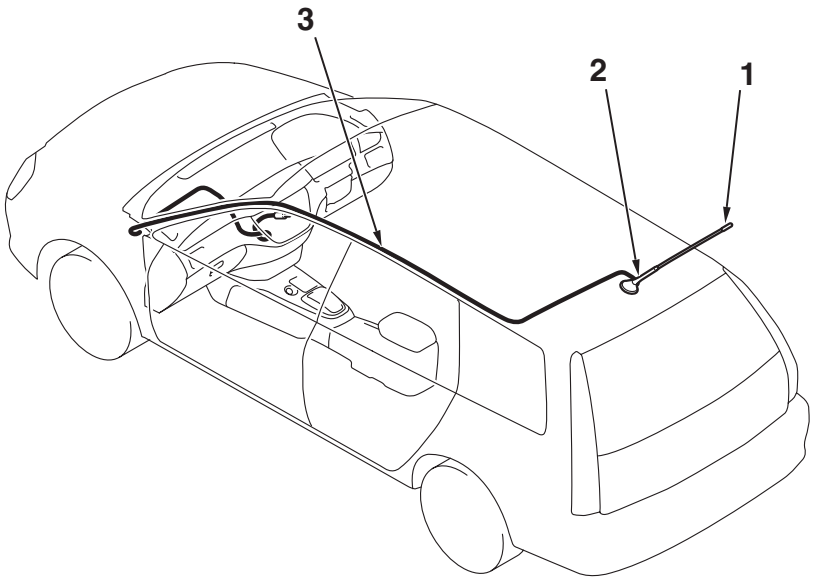
Group TOC

ANTENNA

REMOVAL AND INSTALLATION

M1544002900734

Pre-removal and Post-installation Operation
- Front pillar trim, Centre pillar trim lower, Centre pillar trim upper, Quarter trim lower, Quarter trim upper (Refer to GROUP 52A –Trims P.52A-11.)
- Headlining Removal and Installation (Refer to GROUP 52A, Headlining P.52A-20.)



AC402519 AB

Removal steps
1. Roof antenna pole
2. Roof antenna base

Removal steps (Continued)
- Instrument panel assembly (Refer to GROUP 52A, Instrument panel assembly P.52A-2.)

3. Antenna feeder cable

REAR WINDOW DEFOGGER

GENERAL INFORMATION

M1543000100557

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

M1543000701369

The rear window defogger is controlled by the A/C-ECU. For troubleshooting, refer to GROUP 55-Troubleshooting P.55A-5.

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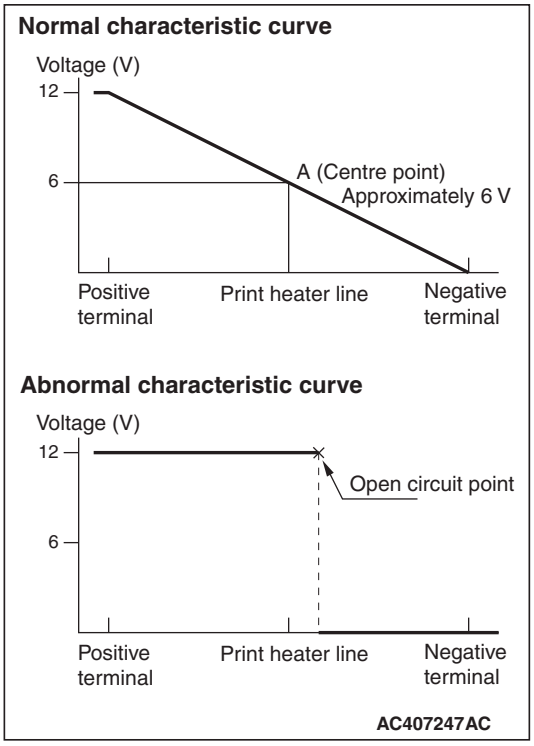
Group TOC

ON-VEHICLE SERVICE

PRINTED HEATER LINES CHECK

M1543001800418



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

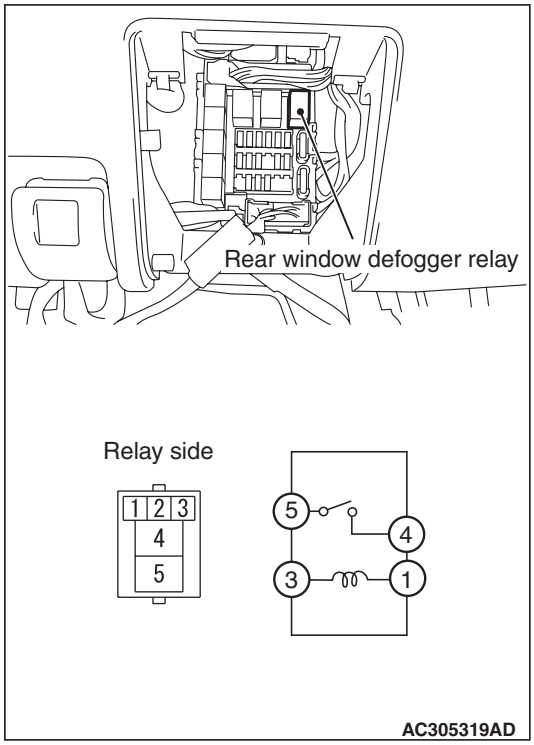
M1543006200466

Refer to GROUP 55, Heater Control Assembly and A/C Switch P.55A-48 <manual A/C> or Heater Control Assembly and A/C Switch P.55B-66 <automatic A/C>.

INSPECTION

M1543019503295

DEFOGGER RELAY CHECK



Battery voltage	Tester connection	Specified condition
Not supplied	4 – 5	Open circuit
• Connect terminal 3 to the positive battery terminal • Connect terminal 1 to the negative battery terminal	4 – 5	Less than 2 ohms