# GROUP 51

# EXTERIOR

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# SPECIFICATIONS

## SERVICE SPECIFICATIONS

M1511000301210

| Item | Standard value |
|---|---|
| Stop position of the windshield wiper arm/blade assembly mm(in) | ϕ2(0.08) marking ±5(0.20) |
| Stop position of rear wiper arm and blade assembly (Distance from the wiper blade to the ceramic line on the liftgate glass) mm(in) | 0 to 20(0.79) from the ceramic line |
| Heated door mirror resistance value ohm | 7.2 ±1.4 at 25 °C (77° F) |

## ADHESIVES

M1511000502251

| Item | Specifications |
|---|---|
| Front and rear three-diamond mark | Double-sided tape: Generic products<br>0.8 mm (0.03 in) thickness |
| Clip D for roof drip molding | Double-sided tape: Generic products<br>10 mm (0.39 in) width and 30 mm (1.18 in) thickness |
| Side air dam | Double-sided tape: Generic products<br>4.0 mm (0.16 in) width and 1.2 mm (0.05 in) thickness |
| Rear roof garnish | Double-sided tape: Generic products<br>10 mm (0.39 in) width and 1.2 mm (0.05 in) thickness |
| Liftgate molding (attached on tailgate garnish)<br><Some models> | Double-sided tape: Generic products<br>A: 10 mm (0.39 in) width and 1.2 mm (0.05 in) thickness<br>B,C: 1.2 mm (0.05 in) thickness |
| Adhesive and dirt remover | 3M™ AAD Part number 8906 |

## LUBRICANT

M1511000400117

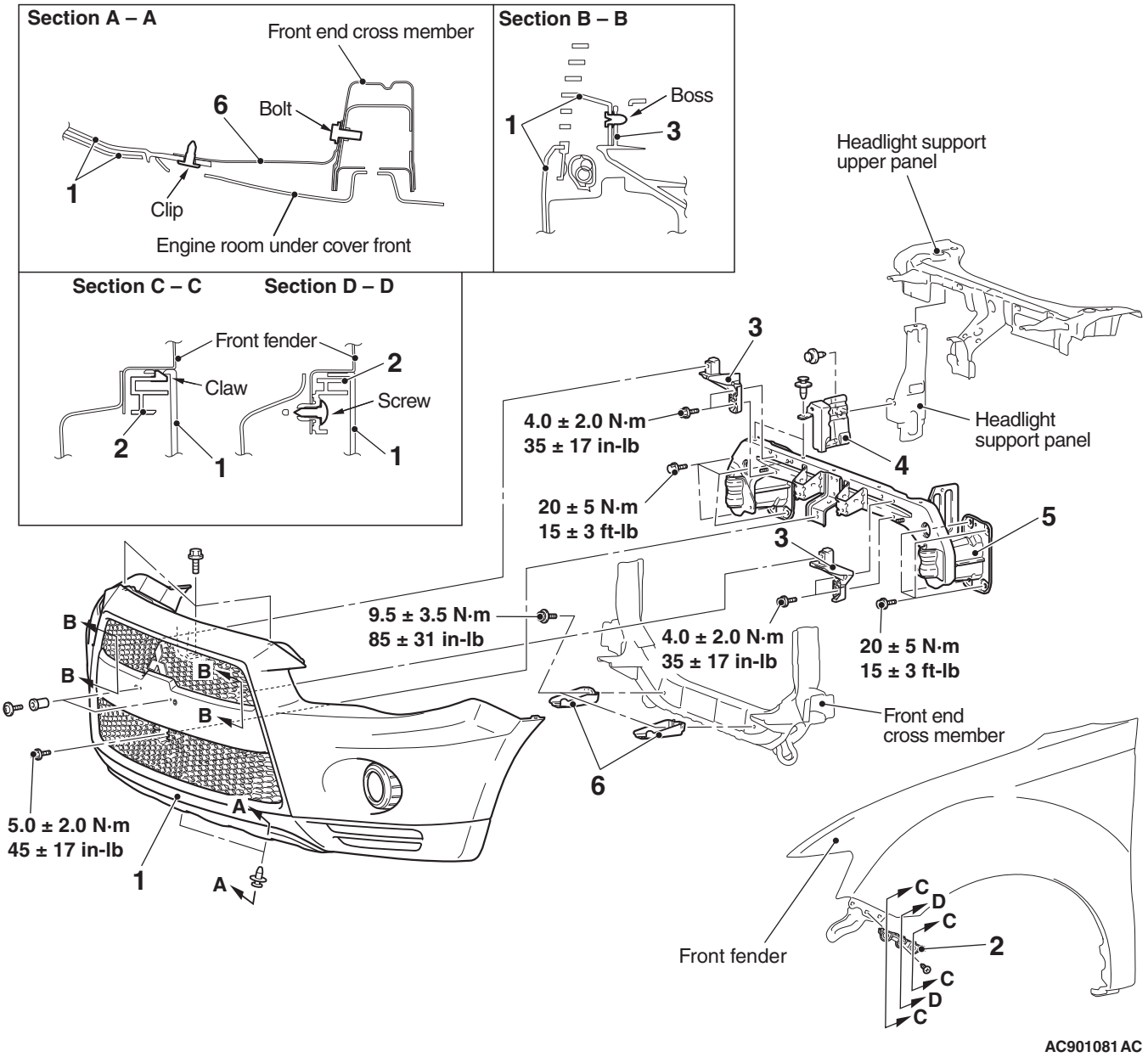
| Item | | Specified lubricant | Quantity |
|---|---|---|---|
| Wiper motor link rod | Contact joint between link rod and wiper motor link plate | Multipurpose grease SAE J310, NLGI No.1(mineral oil + Li) or equivalent | As required |

# FRONT BUMPER ASSEMBLY

## REMOVAL AND INSTALLATION

M1511001401942

**Pre-removal and post-installation operation**
- Headlight support panel cover removal and installation (Refer to P.51-9.)
- Engine room under cover front removal and installation (Refer to P.51-22.)
- Splash shield removal and installation (Refer to GROUP 42A, Splash Shield P.42A-10.)




AC901081 AC

**Removal steps**
- Fog light connector connection <Vehicles with fog light>

1. Front bumper assembly
2. Front bumper side bracket
- Ambient temperature sensor (Refer to Group 55A, Ambient Temperature Sensor P.55A-124)

**Removal steps (Continued)**

3. Headlight bracket
4. Front end panel guide
- Horn (Refer to Group 54A, Horn P.54A-317)
- Front harness

5. Front bumper reinforcement
6. Bumper lower bracket

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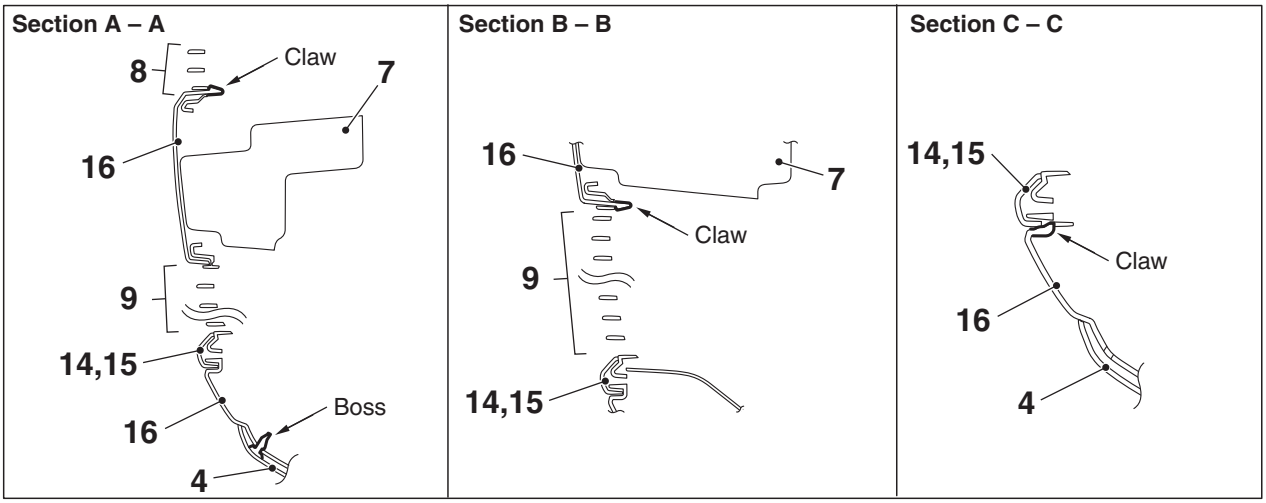
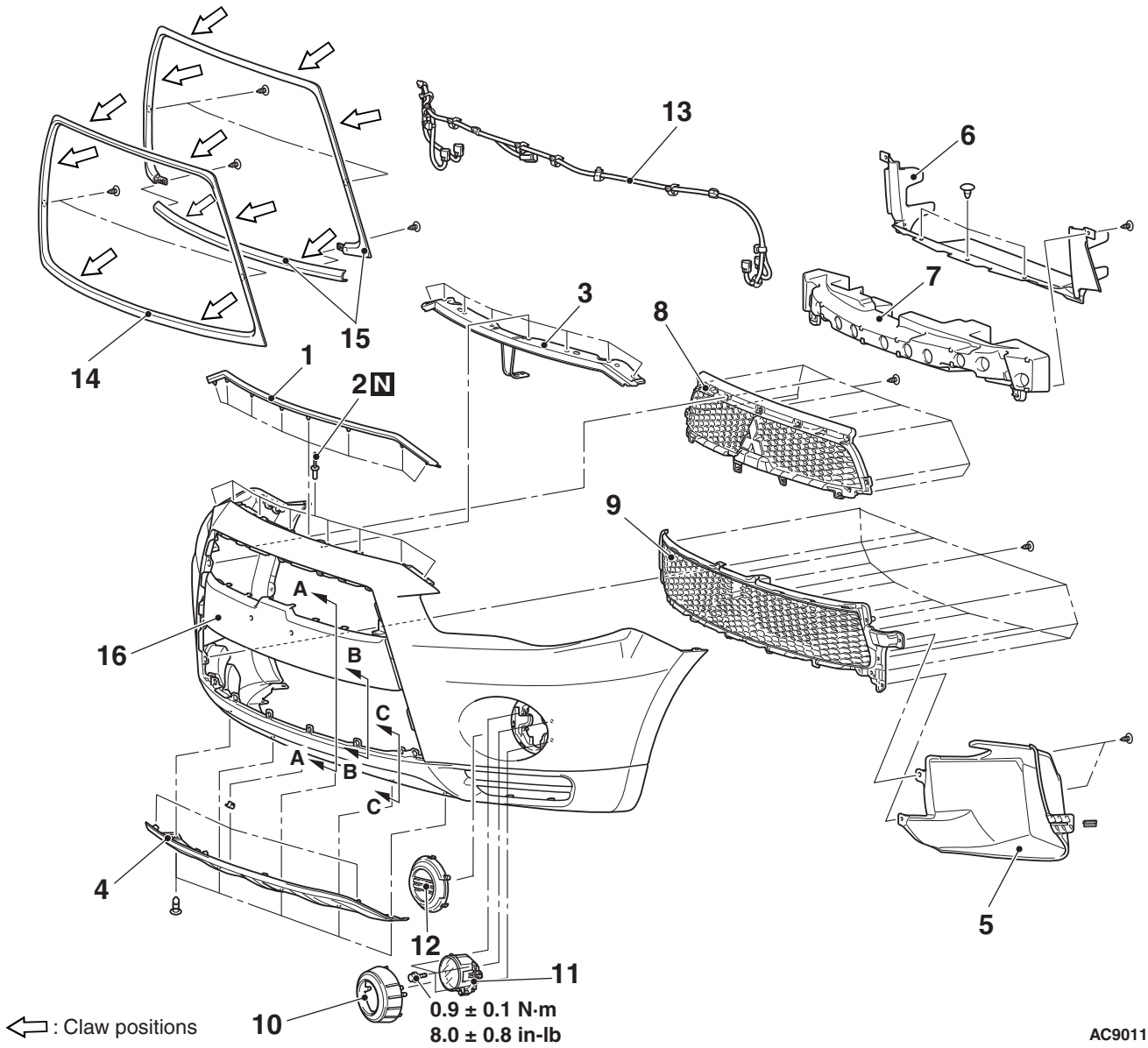
## DISASSEMBLY AND REASSEMBLY

M1511001602198




TSB Revision

**Disassembly steps**

1. Hood weatherstrip front
<<A>> >>A<< 2. Rivet
3. Front bumper reinforcement
4. Front bumper extension A <Some models>
6. Oil cooler duct <Vehicles with oil cooler>
6. Front bumper air guide duct
7. Front bumper core
8. Radiator grille
9. Front bumper grille

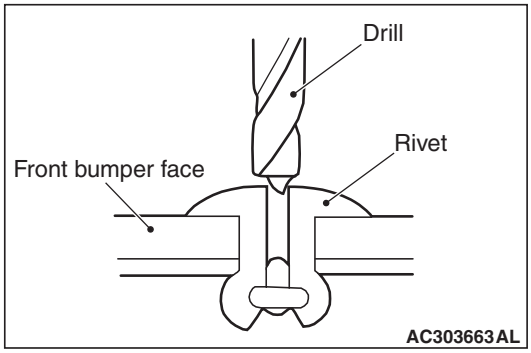
**Disassembly steps (Continued)**

10. Front fog light bezel <Vehicles with front fog lights>
11. Front fog light <Vehicles with front fog light>
12. Front bumper light hole cover <Vehicles without front fog light>
13. Front bumper harness
14. Front bumper center garnish <Type 1: Material color>
15. Front bumper center garnish <Type 2: Chromium plating>
16. Front bumper face

## DISASSEMBLY SERVICE POINT

### <<A>> RIVETS REMOVAL

Use a drill [(ϕ4.0 mm(0.16 in)] to make a hole in the rivet to break it, and remove the rivet.

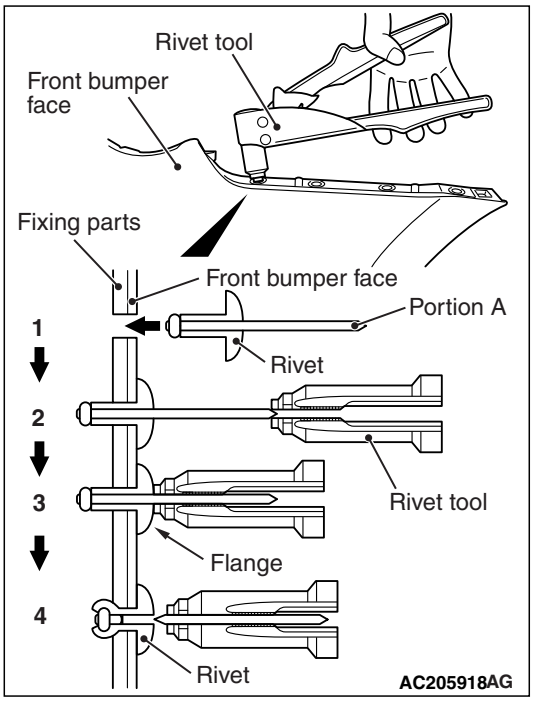



## REASSEMBLY SERVICE POINT

### >>A<< RIVETS INSTALLATION

Use a rivet tool shown as in the illustration to connect the parts with rivets by the following procedures:

1. Insert the rivet into a corresponding location.
2. Set the rivet tool at a portion A of rivet.
3. While pushing the flange surface of the rivet onto parts to be fixed with the rivet tool, press the handle of the tool.
4. Thin part of portion A of the rivet will be cut off and the parts is fixed in position.

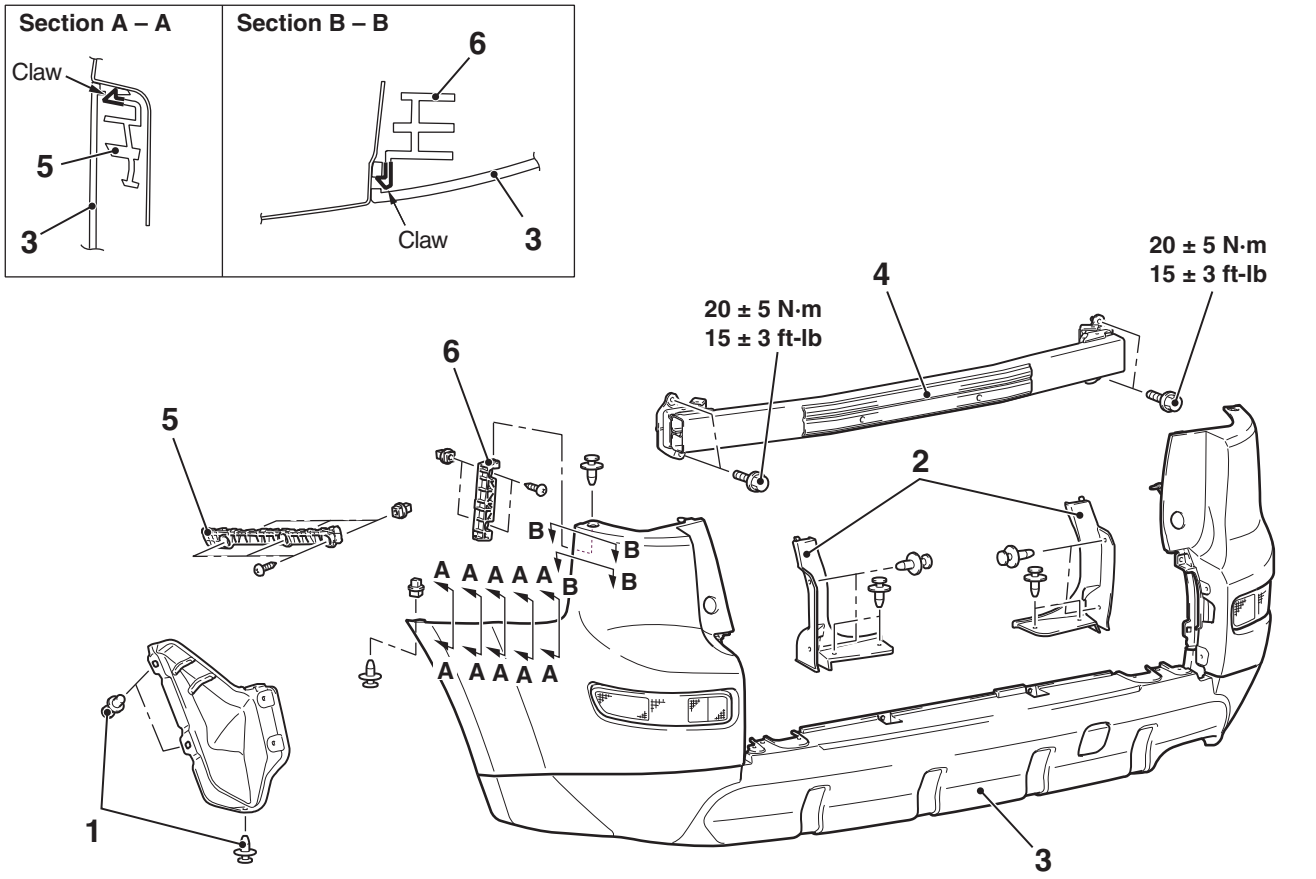



TSB Revision

# REAR BUMPER ASSEMBLY

## REMOVAL AND INSTALLATION

M1511001901969




AC702393AE

**Removal steps**

- Rear combination light (Refer to GROUP 54A, Rear combination light P.54A-258)
- Rear bumper harness connector connection

**Removal steps (Continued)**

1. Splash shield mounting clips
2. Rear bumper cover
3. Rear bumper assembly
4. Rear bumper beam assembly
5. Rear bumper side bracket
6. Rear bumper face side bracket

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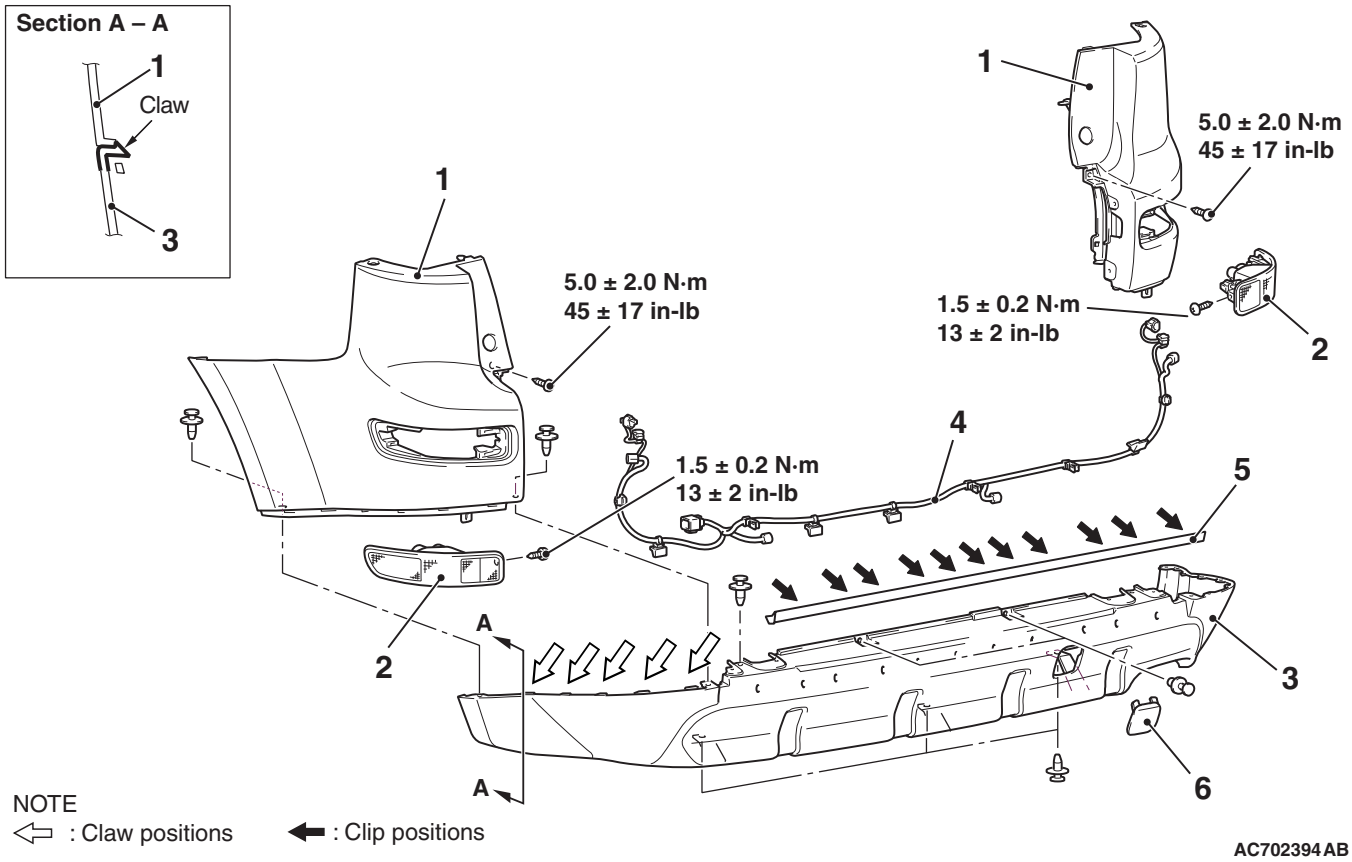
## DISASSEMBLY AND ASSEMBLY

M1511002100822




**Disassembly steps**

- Rear side marker light connector connection

1. Rear corner bumper
2. Rear side marker light

**Disassembly steps (Continued)**

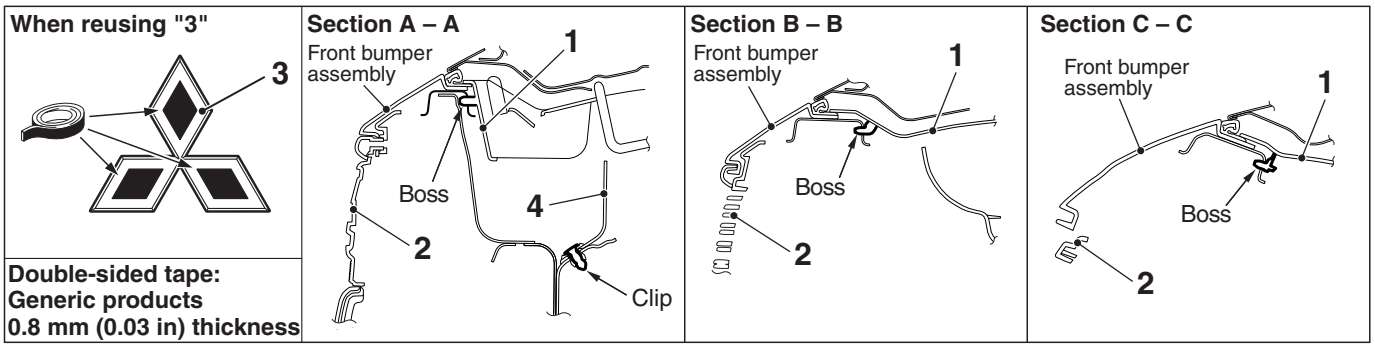
3. Rear bumper face
4. Rear bumper harness
5. Rear bumper weatherstrip
6. Towing cover

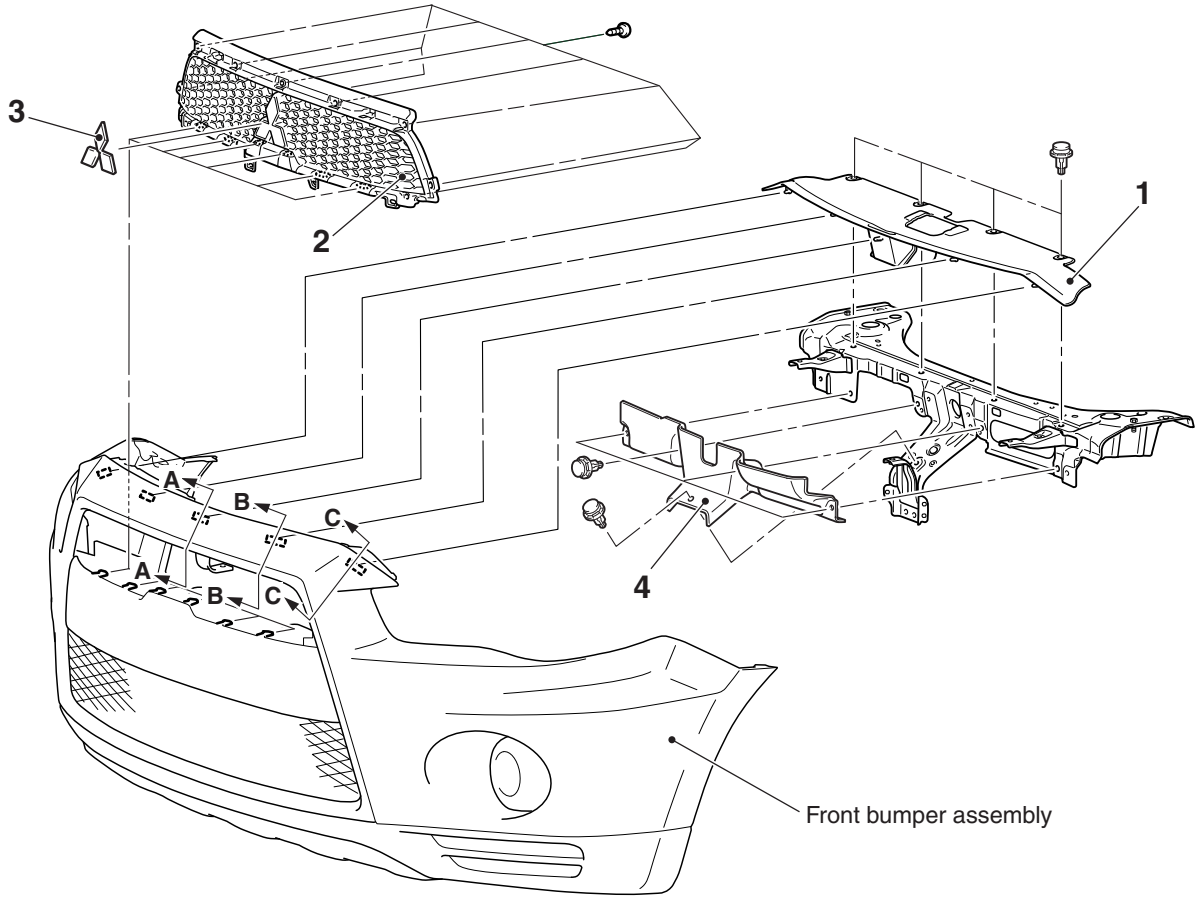
**TSB Revision**

# RADIATOR GRILLE

## REMOVAL AND INSTALLATION

M1511002901199




AC808602AB

**Removal steps**

1. Headlight support panel cover
- Front bumper assembly (Refer to P.51-4)

**Removal steps (Continued)**

2. Radiator grille
3. Front-three diamond mark
4. Headlight support upper panel cover

**TSB Revision**

# MOLDINGS

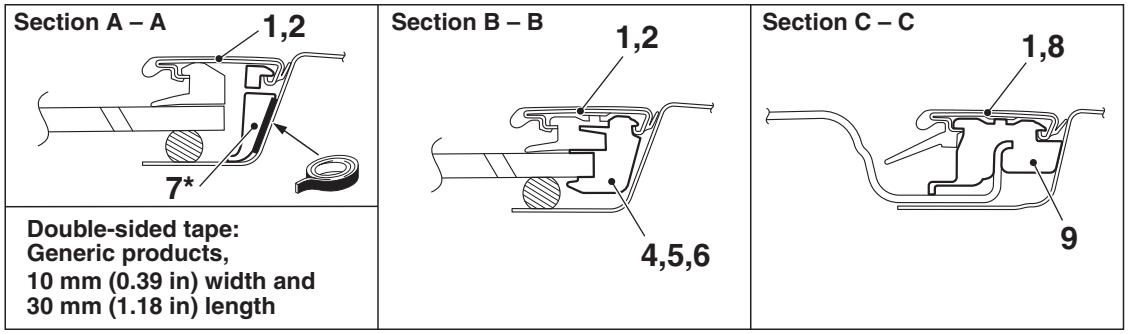
## REMOVAL AND INSTALLATION

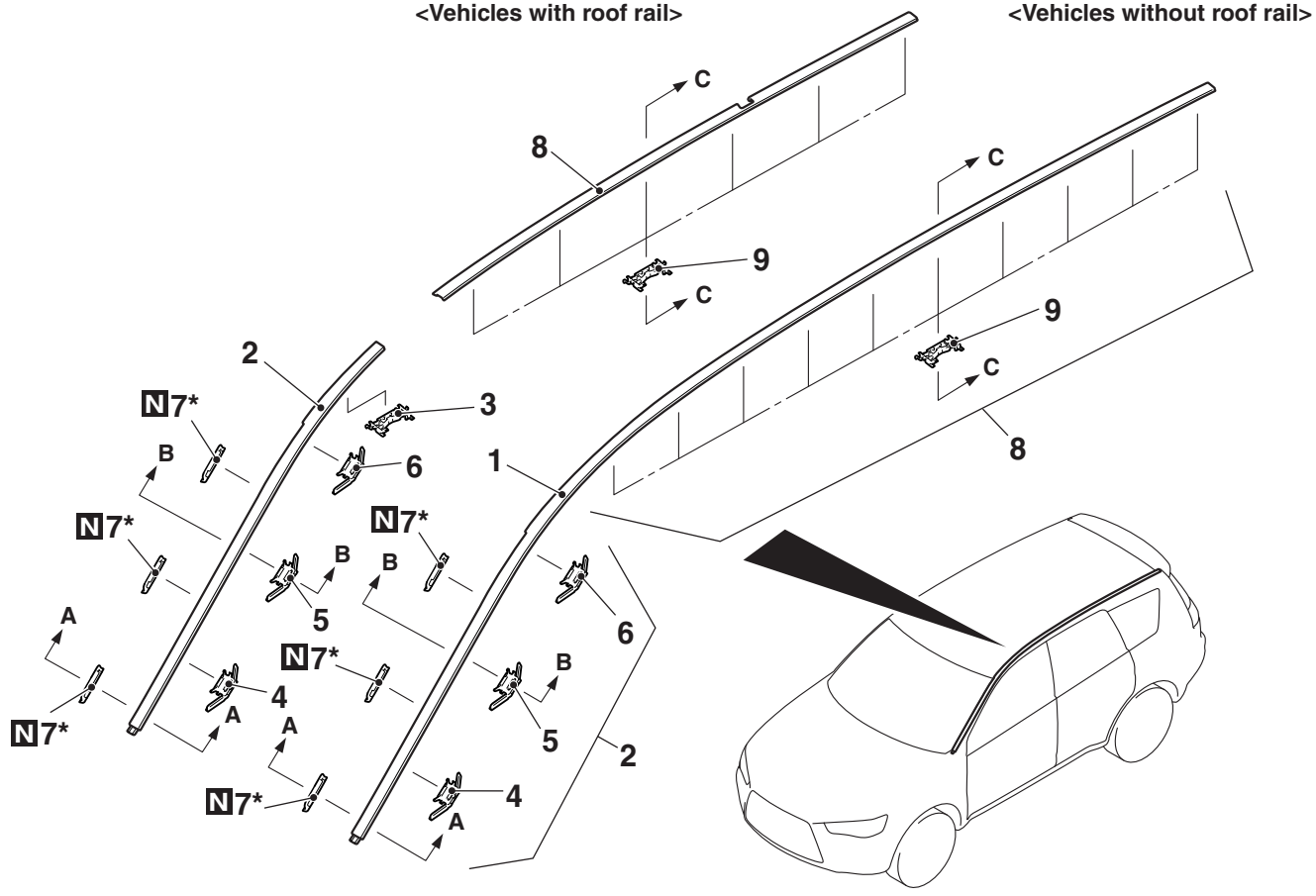
M1511004701629

**Pre-removal and Post-installation Operation**
- Roof Rail Removal and Installation

**⚠ CAUTION**

**Before installing the roof drip molding, the windshield adhesive remained on the clip installation points should be removed 3 to 5 mm (0.1to 0.2 in) from the edge of the glass. However, if the windshield adhesive has not been cured yet, it is not necessary to remove it.**




AC901392 AB

| | | | Roof drip molding removal steps | | | Roof drip molding removal steps (Continued) |
|---|---|---|---|---|---|---|
| | | 1. | Roof drip molding assembly | <<A>> | 4. | Clip B (Red) |
| <<A>> | >>A<< | 2. | Roof drip molding A | <<A>> | 5. | Clip C (Orange) |
| <<A>> | >>A<< | 3. | Clip A | <<A>> | 6. | Clip D (Pink) |

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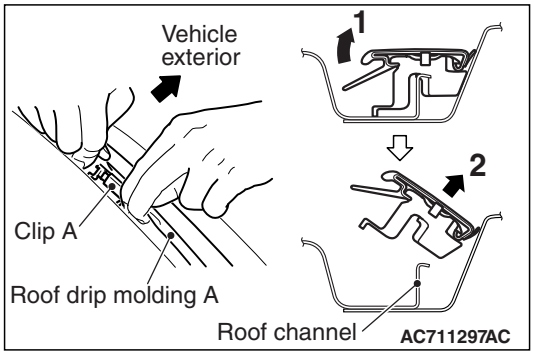
**Roof drip molding removal steps (Continued)**

**<<B>> >>A<<** 7. Clip E
**<<C>> >>B<<** 8. Roof drip molding B
**<<C>> >>B<<** 9. Clip A

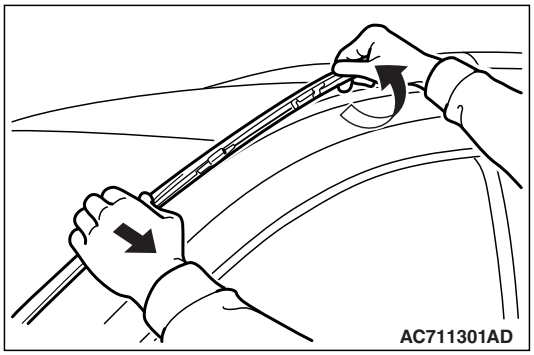
## REMOVAL SERVICE POINTS

### <<A>> ROOF DRIP MOLDING A/ CLIPS A, B, C AND D REMOVAL

**⚠ CAUTION**
**Remove the roof drip molding A from front to rear or opposite direction in order.**



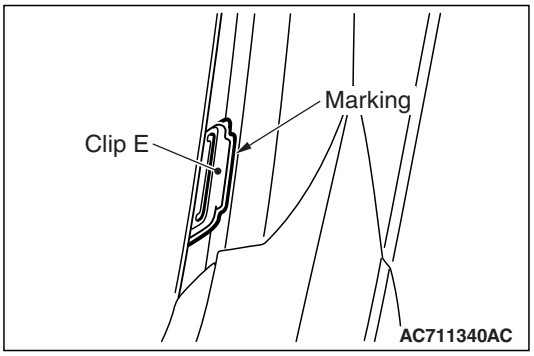

1. Pull up the inner side of roof drip molding A rear end to remove the clip A beneath it attached on the roof channel <vehicles with roof rail>.




2. Twist the roof drip molding A rear end as shown in the illustration. At the same time, pull the molding to vehicle exterior from rear to front so that the clips B, C and D can be remove from the front pillar. Then, remove the molding from the body.

### <<B>>CLIPS E POSITION MARKING TO FRONT PILLAR

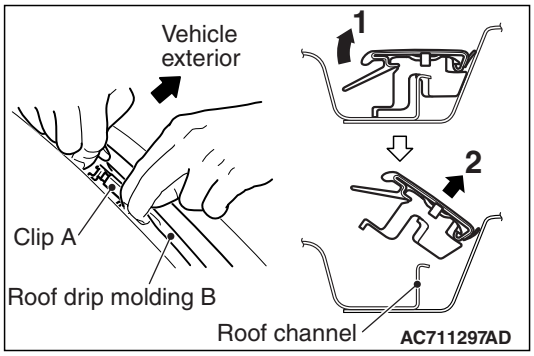
**⚠ CAUTION**
**When replacing the clips E, mark installation position of the clips to the front pillar before removing them.**



## <<C>> ROOF DRIP MOLDING B/ CLIPS A REMOVAL

**⚠ CAUTION**

**Remove the roof drip molding B from front to rear or opposite direction in order.**



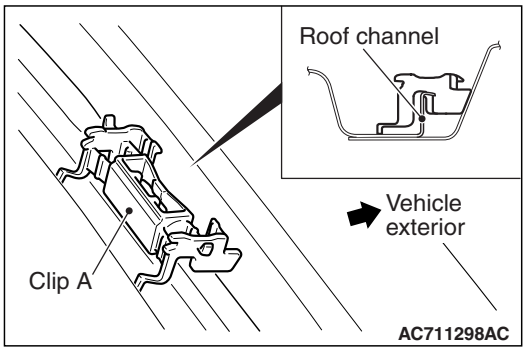

1. Pull up the roof drip molding B inner side to remove the clips A beneath it attached on the roof channel.
2. Rotate the roof drip molding B together with clips A toward vehicle exterior and remove them from roof channel.

## INSTALLATION SERVICE POINTS

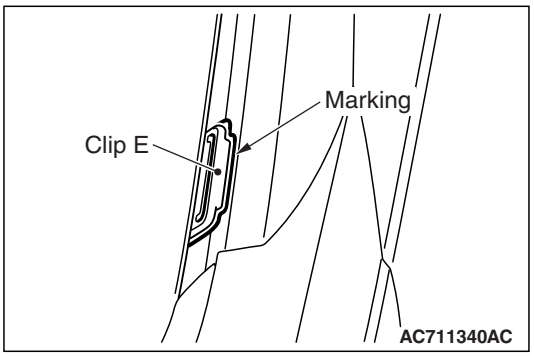
## >>A<< CLIPS A AND E/ ROOF DRIP MOLDING A INSTALLATION

**⚠ CAUTION**

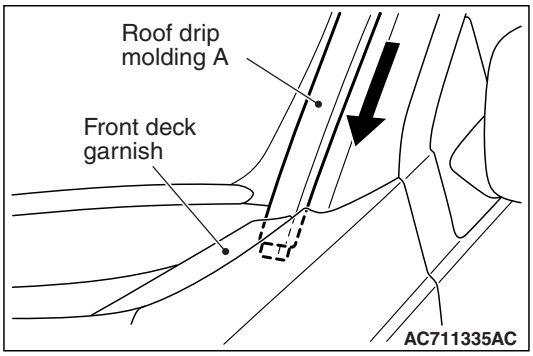
**Install the roof drip molding A from rear to front in order.**



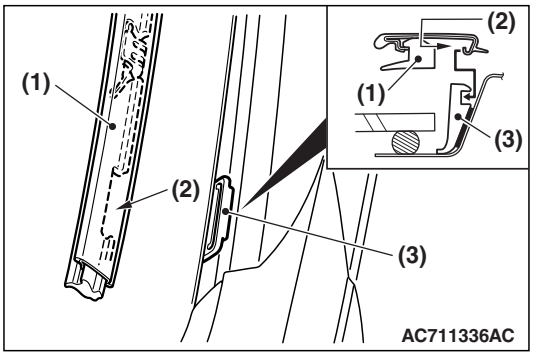

1. Remove the clip A from the roof drip molding A rear end and attach it to the roof channel <vehicles with roof rail>.




2. When replacing the clips E, install new clips according to the markings drawn at the removal time.




3. Install the roof drip molding A so that its front end is inserted under the front deck garnish.




**⚠ CAUTION**

**Make certain that the roof drip molding A rear end is not overlapped with roof rail <vehicles with roof rail>.**

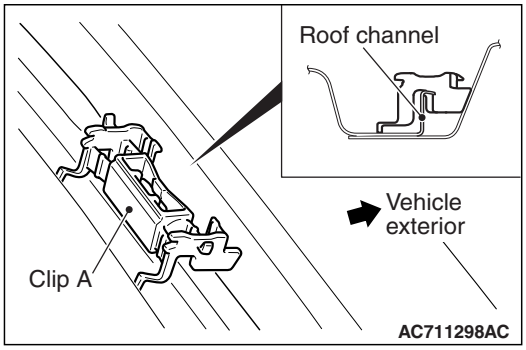
4. Set the roof drip molding A (1) to the front pillar so that cut-out (2) of the molding A (1) is engaged with clip E (3).
5. Push down the roof drip molding A securely so that it is installed to the clip A <vehicles with roof rail> and clips E.

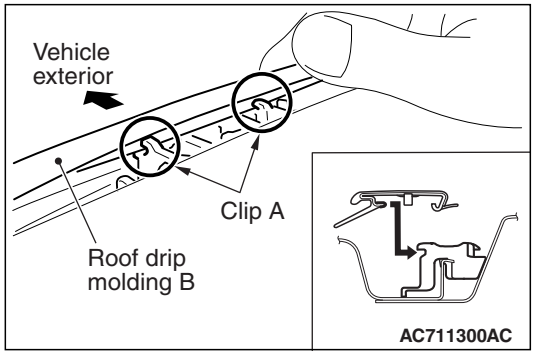
## >>B<< CLIPS A/ ROOF DRIP MOLDING B INSTALLATION

**⚠ CAUTION**

**Install the roof drip molding B from front to rear or opposite direction in order.**

1. Remove the clips A from the roof drip molding B and attach them to the roof channel.



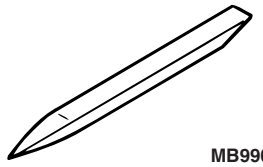




2. Engage the projected portion of the roof drip molding B to the 2 recessed portions of each clip A.
3. Push down the roof drip molding B securely so that it is installed to the clips A on the roof channel.

# GARNISHES

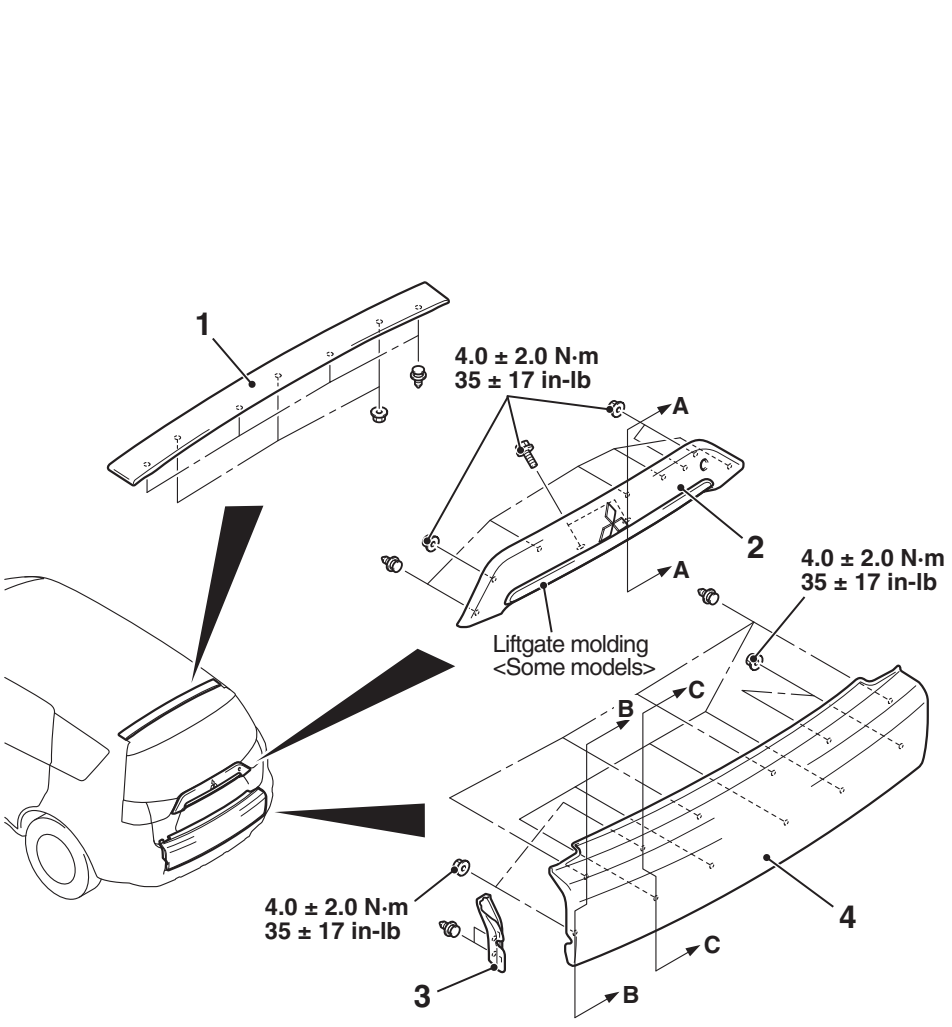
## SPECIAL TOOL

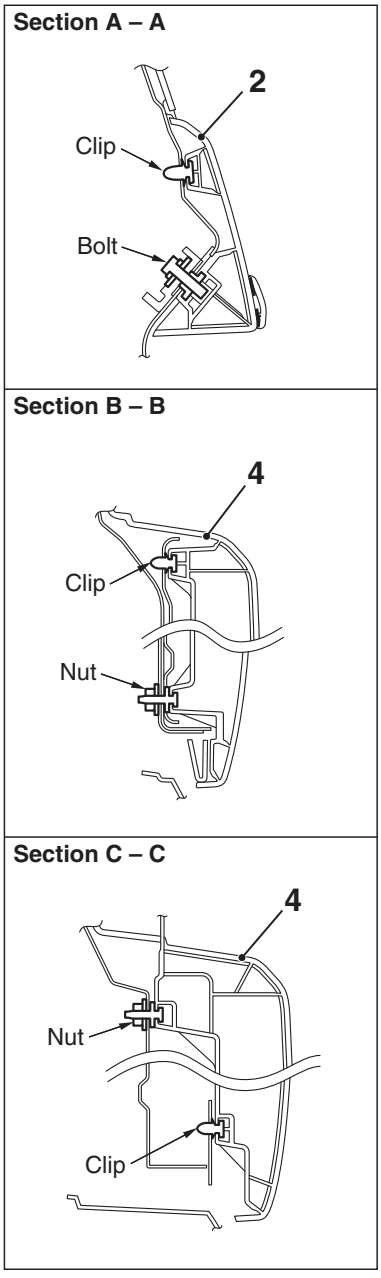
M1511000602195

| Tool | Tool number and name | Supersession | Application |
|---|---|---|---|
|  MB990784 | MB990784 Ornament remover | General service tool | Removal of garnishes |

## REMOVAL AND INSTALLATION

M1511004100817

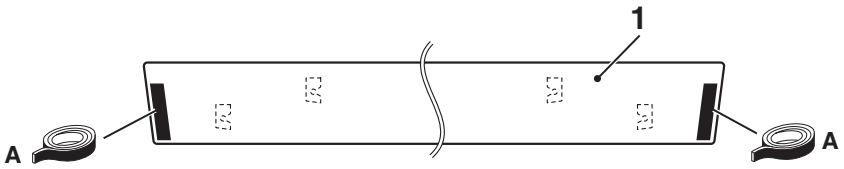



AC900210AB

TSB Revision

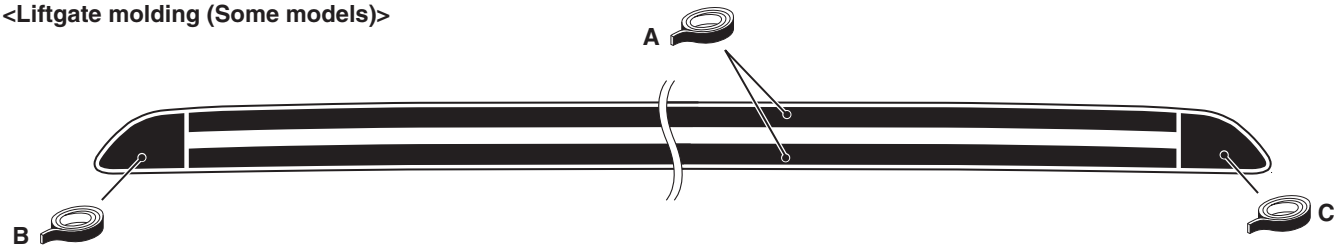
**Double-sided tape affixed locations**
**<Rear roof garnish>**




**Double-sided tape: Generic products, 10 mm (0.39 in) width and 1.2 mm (0.05 in) thickness**

AC900211AB

**Double-sided tape affixed locations**
**<Liftgate molding (Some models)>**




**Double-sided tape: Generic products, A : 10 mm (0.39 in) width and 1.2 mm (0.05 in) thickness,**
**B, C : 1.2 mm (0.05 in) thickness**

AC803566AD

**Rear roof garnish removal**
- Roof rail (Refer to P.51-23)
- Headlining (Refer to GROUP 52A, Headlining P.52A-15)

1. Rear roof garnish

**Liftgate garnish removal**
- Rear wiper motor (Refer to P.51-101)
- Liftgate trim (Refer to GROUP 52A, Liftgate trim P.52A-14)

>>A<< 2. Liftgate garnish

**Liftgate lower garnish removal**
- Liftgate lower trim (Refer to GROUP 52A, Liftgate lower trim P.52A-14)

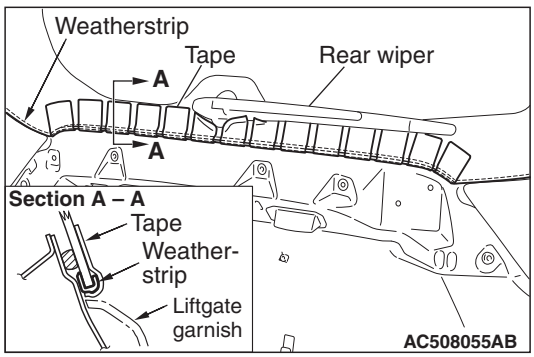
3. Liftgate garnish cover
4. Liftgate lower garnish

**Required Special Tool:**
- MB990784: Ornament remover

## INSTALLATION SERVICE POINT

## >>A<< LIFTGATE GARNISH INSTALLATION

**⚠ CAUTION**
**When installing the Liftgate garnish, roll up the weather-strip and secure it by a tape as shown to avoid trapping it.**

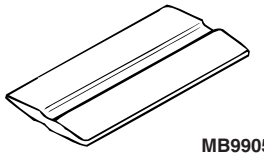



TSB Revision

# DOOR SASH TAPE

## SPECIAL TOOL

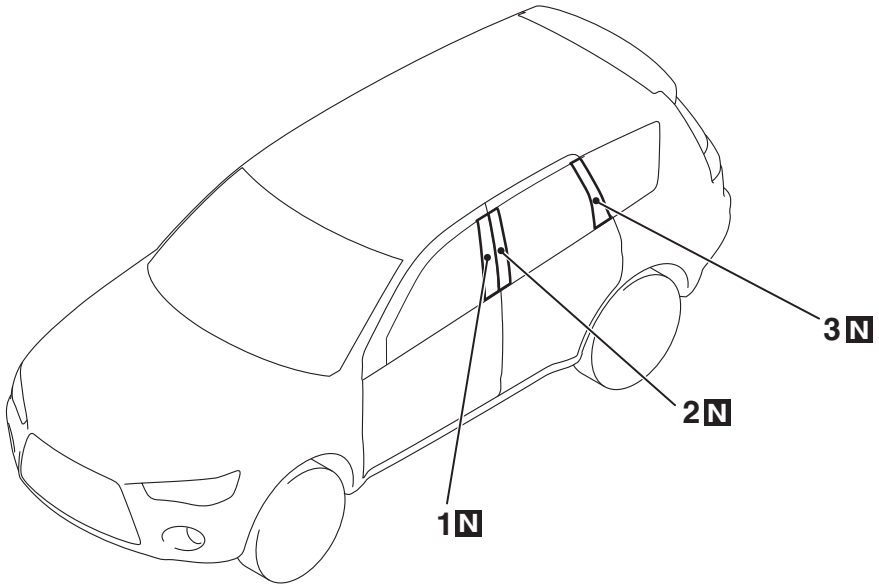
M1511000602203

| Tool | Tool number and name | Supersession | Application |
|---|---|---|---|
|  MB990528 | MB990528 Stripe tape spatula | General service tool | Installation of door sash tape |

## REMOVAL AND INSTALLATION

M1511024100875

**Pre-removal and post-installation operation**
- Door Trim Assembly Removal and Installation (Refer to GROUP 52A –Door Trim, P.52A-11).
- Door Beltline Weatherstrip Inner Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip P.42A-152).
- Door Opening Weatherstrip Outer Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip P.42A-152).
- Door Window Glass Runchannel Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip P.42A-152).
- Door Beltline Molding Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip P.42A-152).




AC808574 AD

**Removal steps**

<<A>> >>A<< 1. Front door sash tape, rear
<<A>> >>A<< 2. Rear door sash tape, front
<<A>> >>A<< 3. Rear door sash tape, rear

**Required Special Tool:**
- MB990528: Stripe Tape Spatula

**TSB Revision**

## REMOVAL SERVICE POINT

## <<A>> DOOR SASH TAPES REMOVAL

**⚠ CAUTION**

**Pay attention to keep from getting burned by hot door panel or tapes.**

1. Use a hair drier to warm the tape.
2. Peel the tip of the tape with your finger, and then peel off the tape in parallel with the application surface.

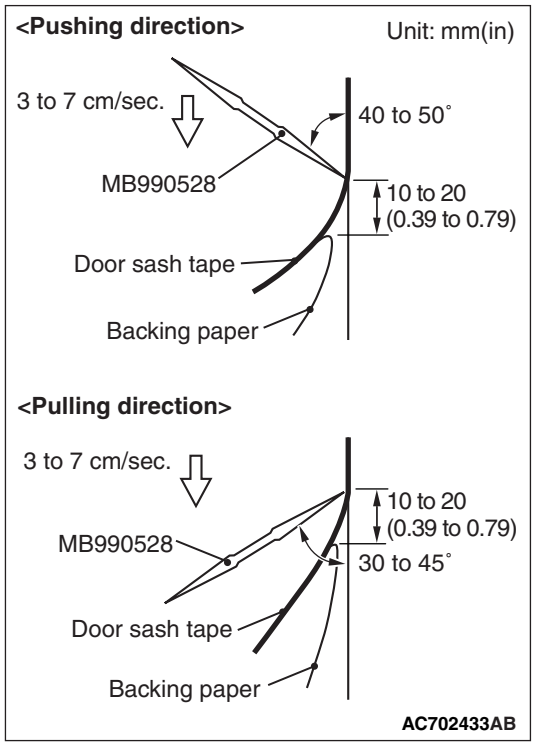
## INSTALLATION SERVICE POINT

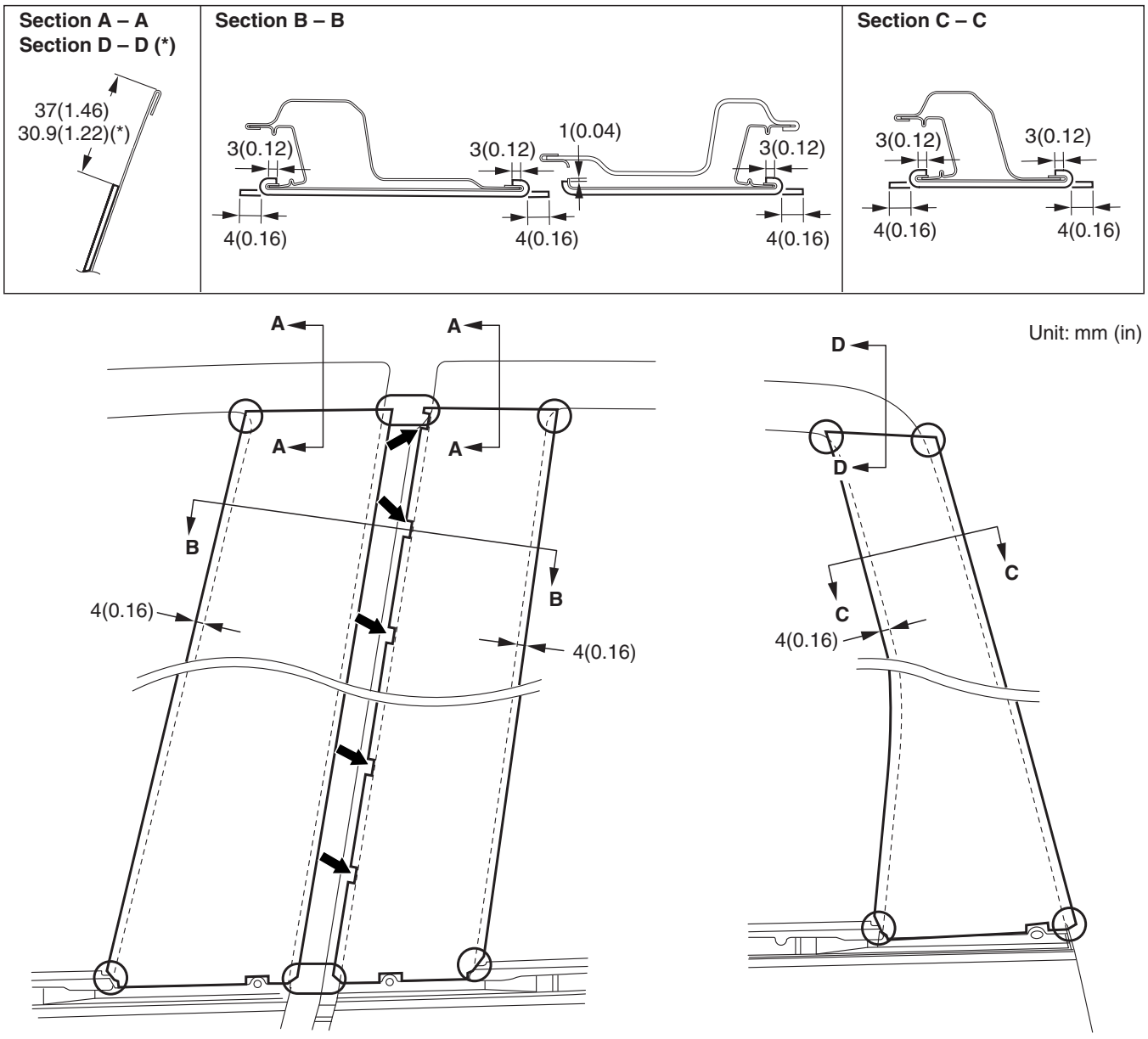
## >>A<< DOOR SASH TAPES INSTALLATION

**⚠ CAUTION**

- **The ambient temperature should be 20 −30 °C(68 − 86° F). Ensure that the working area is clean. Ideally, the tape application should be done at ambient temperature of 25° C(77° F).**
- **If ambient temperature is less than 15° C(59° F, heat the tape and application surface to a temperature of 20 −30 °C(68 −86° F). Alternatively, allow it to cool if it is 35° C(95° F) or higher. The adhesive property of the tape is deteriorated at low temperature, so the tape may come adrift easily. Meanwhile, the tape will be softened excessively at high temperature.**
- **When beginning to apply the tape, pay particular attention. If the end of the tape cannot be applied to the specified position with an accuracy of less than 1 mm(0.04 in), it may cause the poor appearance or adhesion.**
- **When using the special tool, stripe tape spatula (MB990528) to apply the tape, be sure to move it steadily, evenly and without interruption. If you fail to do so, a groove (usually known as shock line) may be left on the tape surface. Meanwhile, if you move it too slowly, air bubble may be left inside the tape. Keep even pressure, constant speed and steady application angle when moving the special tool.**

1. Wrap a soft cloth (synthetic fiber) around the tip of the special tool.
2. Use 3M™ AAD Part number 8906 or equivalent to clean the tape application surfaces.
3. Wipe away dirt from the tape.






4. Apply the door sash tape according to the procedure below.
   (1) Position the tape at the upper and lower locating points.
   (2) Peel of backing strip from the top of the tape and attach it temporarily.
   (3) Peel off the backing strip to the half length of the tape.

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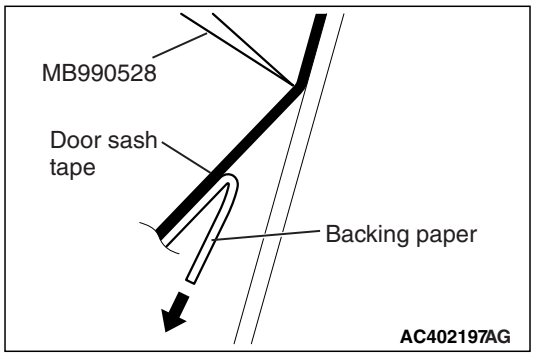
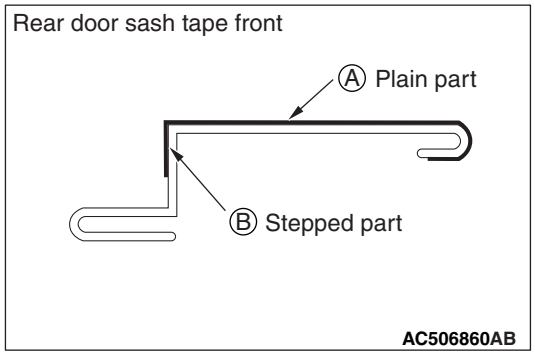
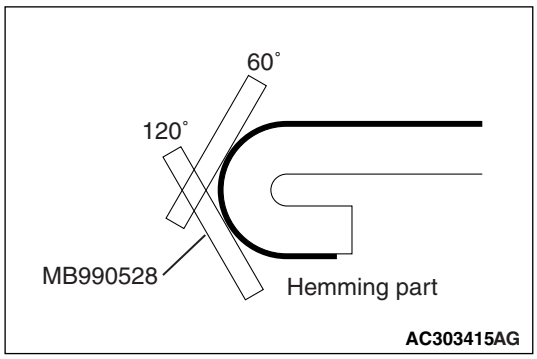



(4) Apply the tape using the special tool while peeling off the remaining backing strip.




(5) For the front rear door sash tape, apply it to plain surface (A). Then apply it to stepped surface (B).

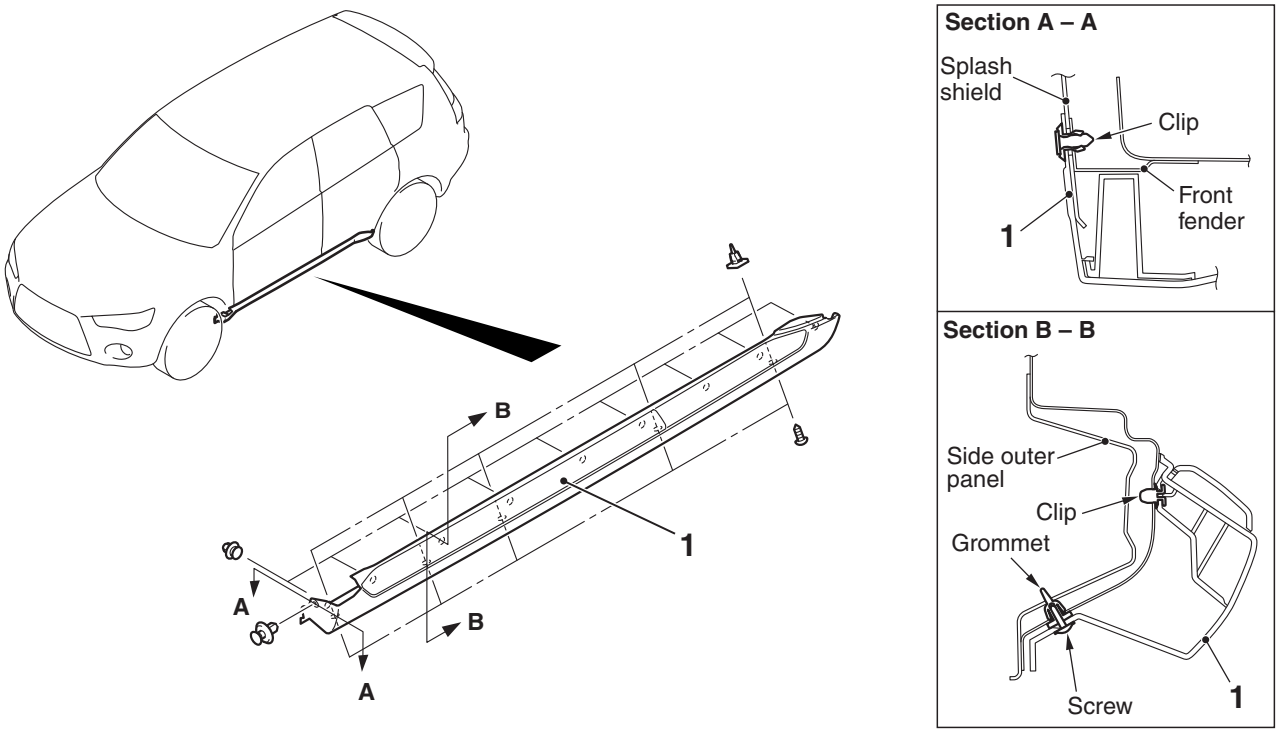



(6) Press the folded area of the tape by three stages (60°, 120° and holding), rolling in toward the vehicle inside direction.

# SIDE AIR DAM

## REMOVAL AND INSTALLATION

M1511005500993




AC901159AB

**Removal**

**<<A>> >>A<<** 1. Side air dam

## REMOVAL SERVICE POINT

### <<A>> SIDE AIR DAM REMOVAL

Gently lift and remove the side air dam. If there is any double-sided tape remaining on the side air dam, remove according to the following instructions.
Remove double-sided tape remaining on the body surface (when replacing side air dam).

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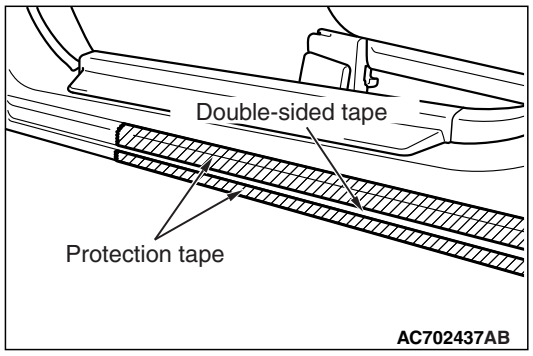
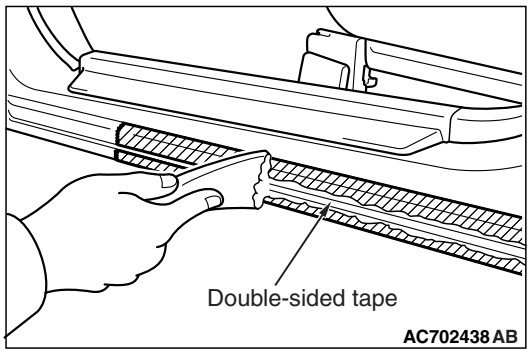
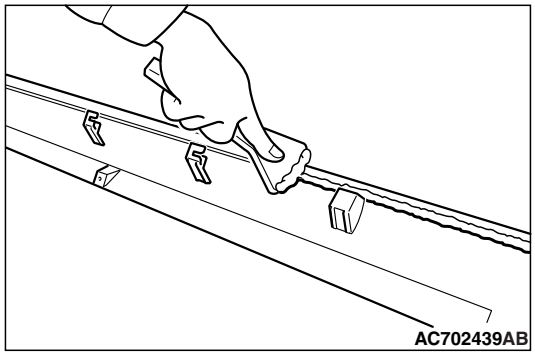



1. Attach protection tape all the way along the edges of the double-sided tape which is still adhering to the body.




2. Scrape off the double-sided tape with a resin spatula as much as possible.
3. Peel off the protection tape.
4. Wipe the body surface and clean it with a rag moistened with 3M™ AAD Part number 8906 or equivalent.

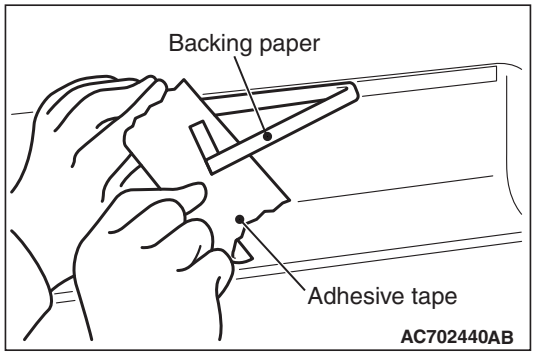
Remove double-sided tape remaining on side air dam and adhere double-sided tape (when re-using side air dam).




1. Scrape off the double-sided tape on the side air dam with a resin spatula as much as possible.
2. Wipe the side air dam surface and clean it with a rag moistened with 3M™ AAD Part number 8906 or equivalent.
3. Remove only a small portion of the residual adhesive.
4. Adhere the double-sided tape as specified on the side air dam.

## INSTALLATION SERVICE POINT

## >>A<< SIDE AIR DAM INSTALLATION




1. Tear off the double-sided tape backing paper.

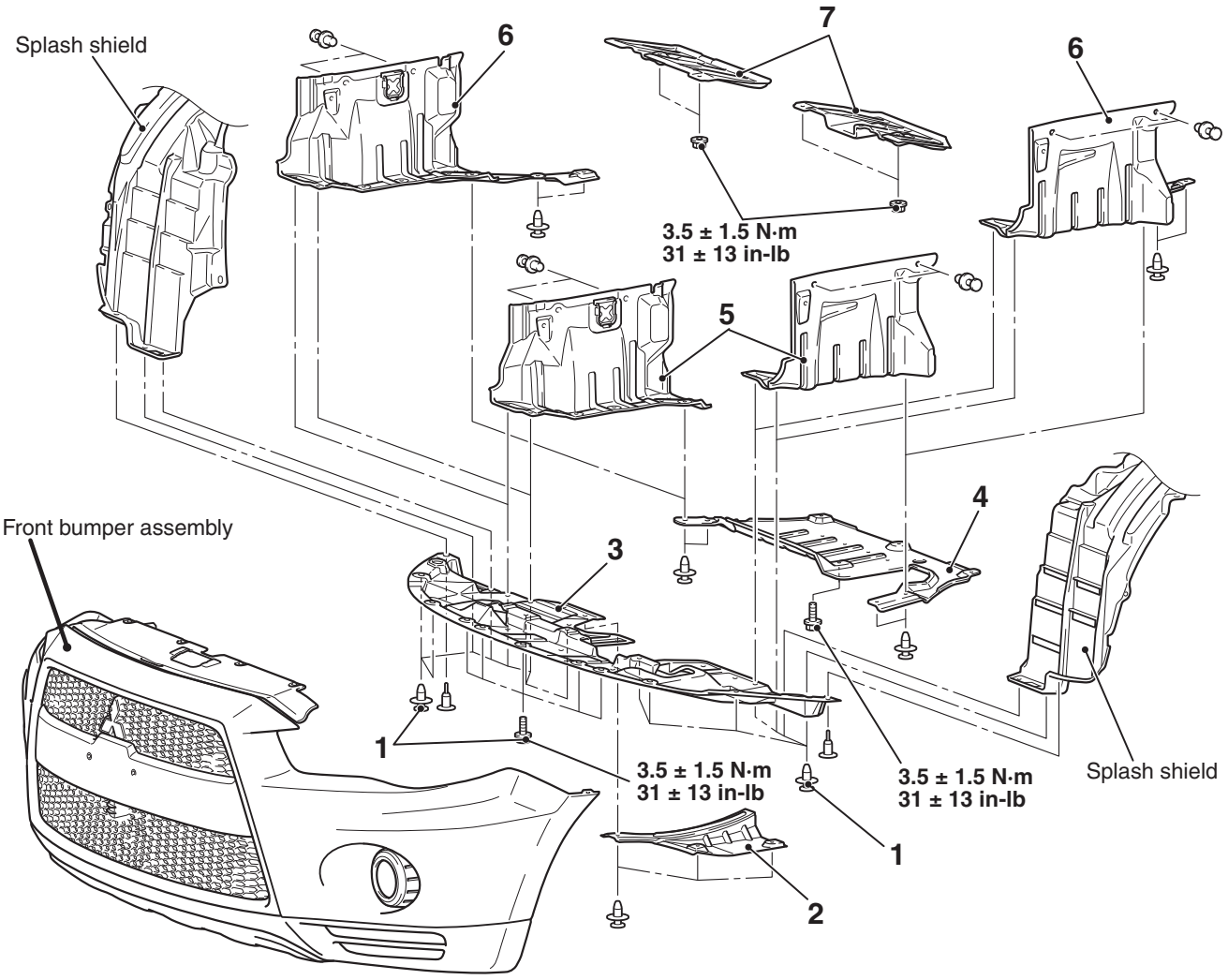
   *NOTE: If attach the adhesive tape to the edge of the backing paper, it will be easy to tear off.*
2. Install the side air dam.

   *NOTE: If the double-sided tape is difficult to affix in cold temperature, etc., warm the bonding surfaces of the body and side air dam to about 40 –60 °C (104 –140 °F) before affixing the tape.*
3. Firmly press in the side air dam.

# UNDER COVER

## REMOVAL AND INSTALLATION

M1511019600948




AC900755 AD

**Removal steps**

1. Front bumper mounting clips and bolts
2. Engine room under cover front A <2400 4WD>
3. Engine room under cover front B

**Removal steps (Continued)**

4. Engine room under cover front C <2400>
5. Engine room side cover <2400>
6. Engine room side cover <3000>
7. Front floor under cover

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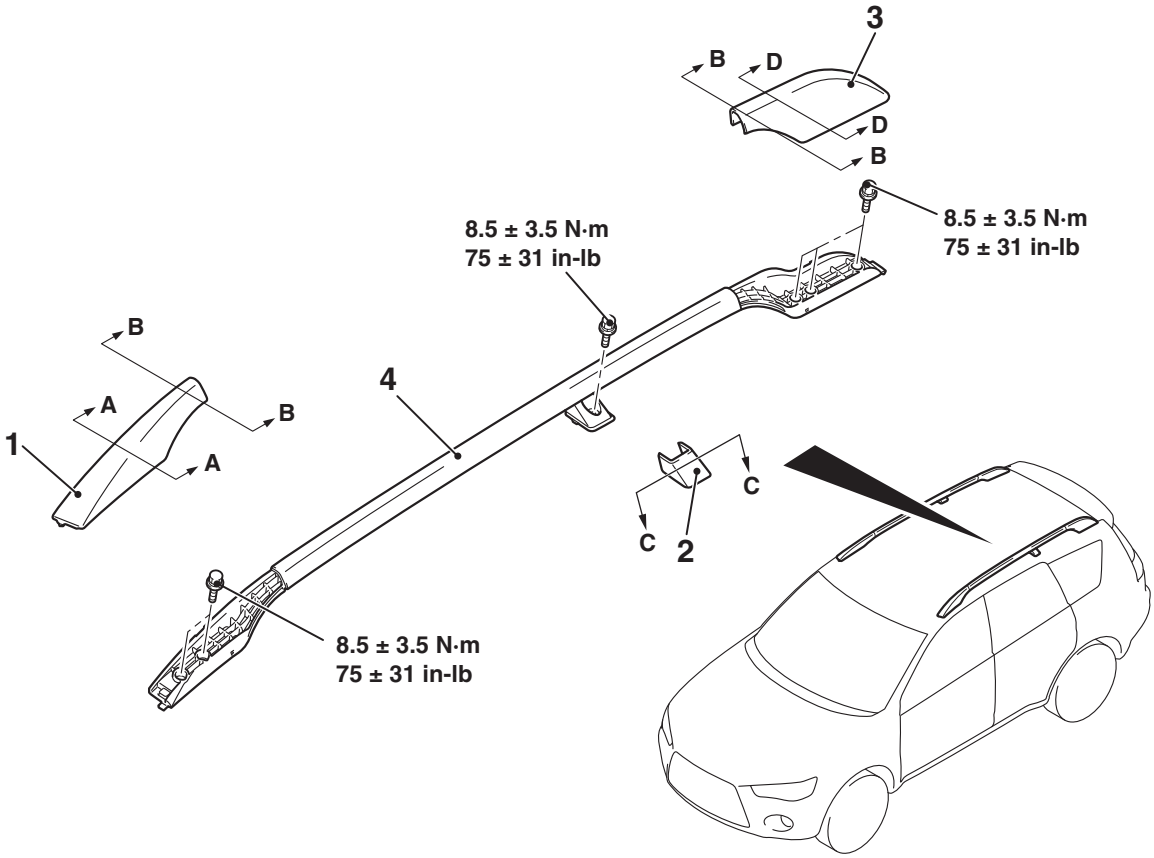
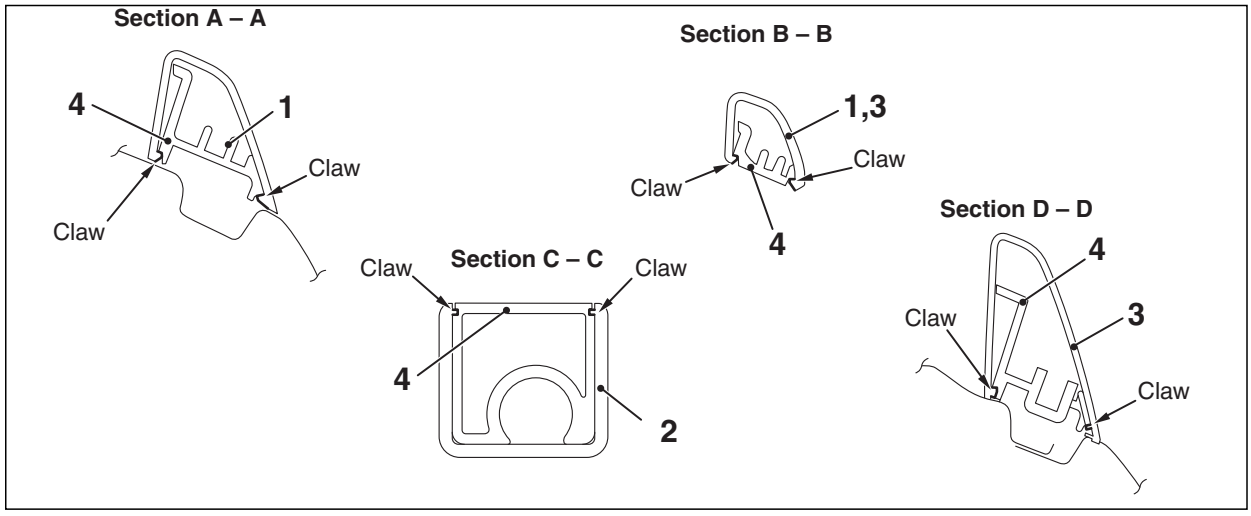
# ROOF RAIL

## REMOVAL AND INSTALLATION

M1511016600604




AC808576 AC

**Removal steps**

- Roof drip molding front (Refer to P.51-10)

1. Front roof rail cover

**Removal steps (Continued)**

2. Center roof rail cover
3. Rear roof rail cover
4. Roof rail

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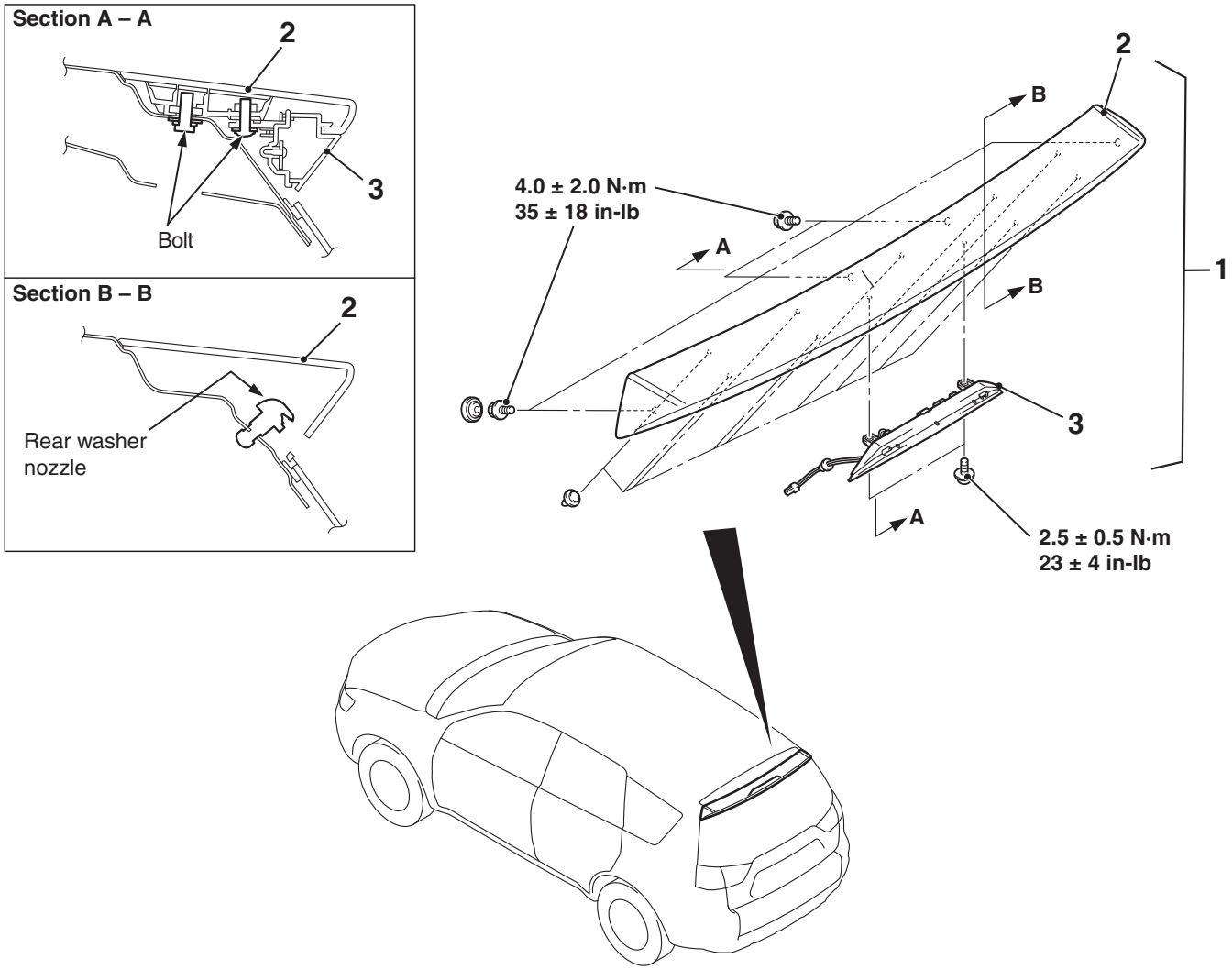
# LIFTGATE SPOILER

## REMOVAL AND INSTALLATION

M1511019900529




AC808577 AC

**Removal steps**

- Liftgate upper trim (Refer to GROUP 52A, Liftgate trim P.52A-14)
- High-mount stop light connector connection

**Removal steps (Continued)**

1. Liftgate spoiler assembly
2. Liftgate spoiler
3. High-mount stop light assembly

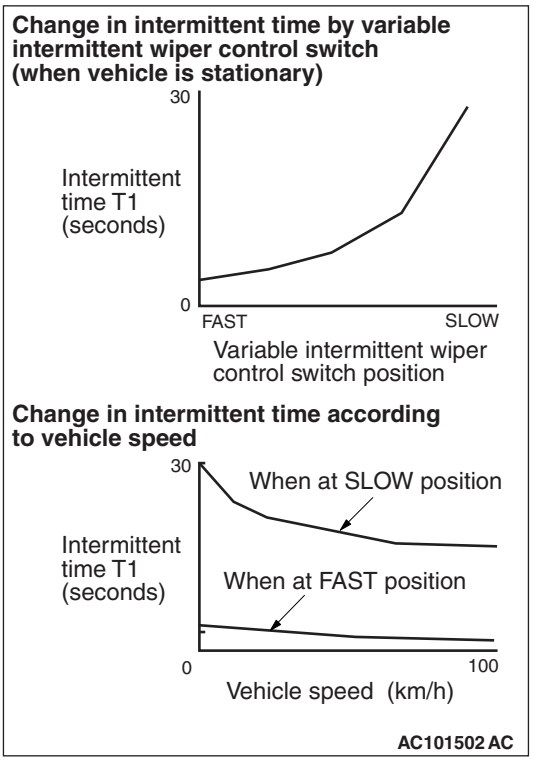
TSB Revision

# WINDSHIELD WIPER AND WASHER

## GENERAL INFORMATION

M1511000101993

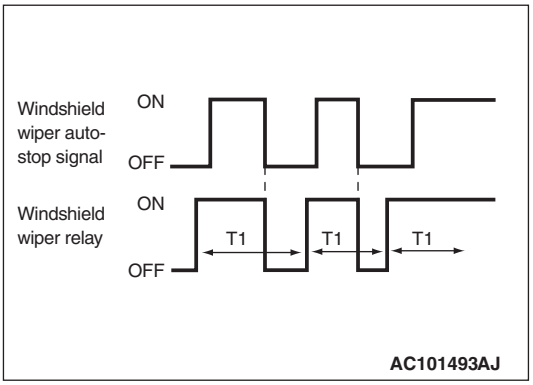
## WINDSHIELD WIPER AND WASHER OPERATION




### Intermittent control (Vehicle speed-dependent variable type) <Initial condition: with function>

1. ETACS calculates the windshield intermittent wiper interval T1 from the position of the windshield intermittent wiper switch on the column switch and the vehicle speed signal (sent from the combination meter to ETACS via CAN communication).

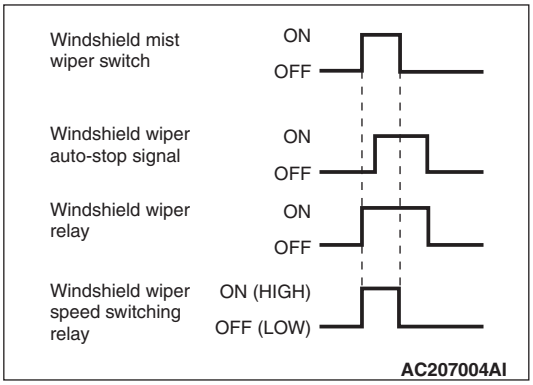
   *NOTE: Using the customization function, the vehicle speed-dependent intermittent function can be invalidated (Refer to P.51-75).*



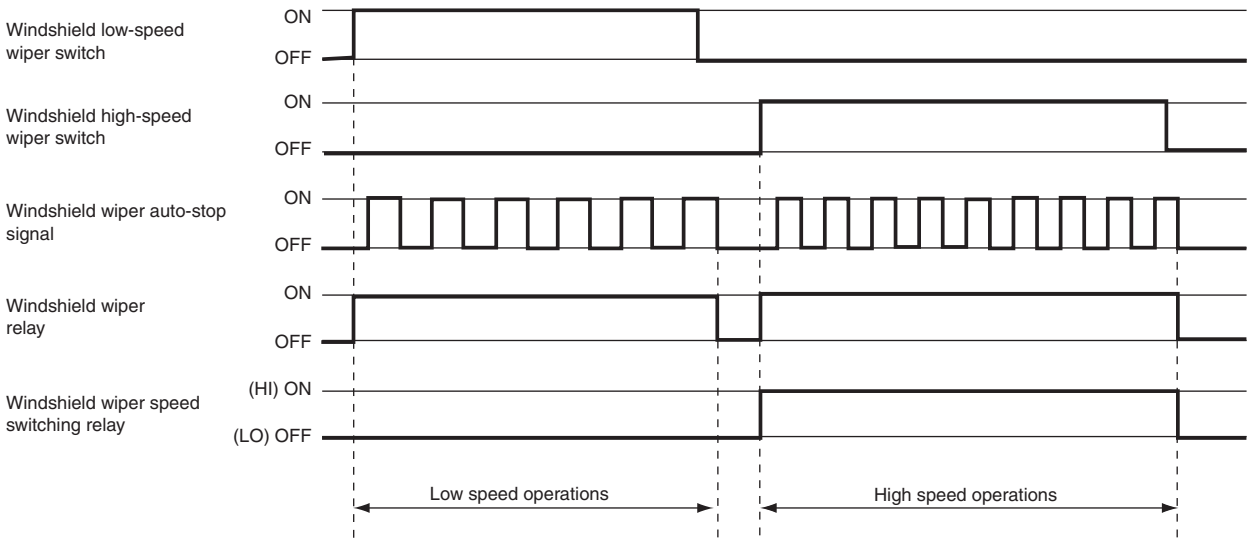

2. When ETACS receives the ON signal of the windshield intermittent wiper switch, it turns the windshield wiper relay ON. When the wiper reaches the stop position, the windshield wiper auto-stop signal turns OFF, and the windshield wiper relay turns OFF.
   When the intermittent time T1 calculated by step 1 has elapsed after the windshield wiper relay ON, the windshield wiper relay turns ON again, and the above-mentioned operation is repeated.

### Mist wiper control

When the windshield wiper mist switch on the column switch is turned ON while the ignition switch is in ACC or ON position, the column switch turns the windshield wiper relay ON. At the same time, the wiper speed switching relay turns ON (HI). When the windshield mist wiper switch is ON, the windshield wiper operates at high speed.



## Low speed wiper and high speed wiper control

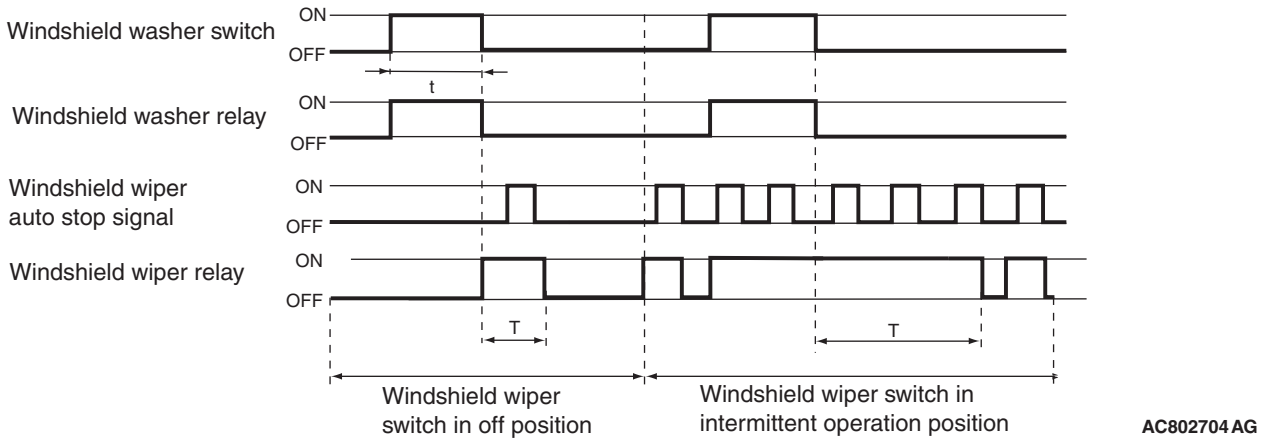



AC506610AH

When the windshield low speed wiper switch on the column switch is turned ON while the ignition switch is in ACC or ON position, the column switch turns the windshield wiper relay ON. Also, the wiper speed switching relay turns OFF (LO), and the windshield wiper operates at low speed.

When the windshield high speed wiper switch is turned ON, the windshield wiper relay turns ON. Also, the wiper speed switching relay turns ON (HI), and the windshield wiper operates at high speed.

## Windshield wiper linked with washer function <Initial condition: with function>




AC802704 AG

t: Less than 0.35 seconds
T: Windshield wiper operation time

| Wiper switch | OFF position | | | INT position | | | AUTO position | | | | LO, HI, MIST position |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Washer switch ON time (t) | Less than 0.35 second | 0.35 second to less than 0.5 second | 0.5 second or more | Less than 0.35 second | 0.35 second to less than 0.5 second | 0.5 second or more | Less than 0.35 second | 0.35 second to less than 0.5 second | 0.5 second to less than 0.75 second | 0.75 second or more | - |
| Windshield wiper operation time (T) | 0 second | 1 second | 3 seconds | 1 second | 1 second | 3 seconds | 1 second | 0 second | 1 second | 3 seconds | 3 seconds |

When the windshield washer switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the windshield washer relay ON.
When the windshield washer switch is kept ON for 0.35 second or longer, the windshield wiper relay (the wiper relay output time varies depending on the conditions. For details, see the table.) is turned ON, and the windshield wiper operates at high speed.
The windshield wiper is turned OFF with 3 seconds delay after the windshield washer switch is turned OFF.
Even when the windshield washer switch is turned ON while the windshield wiper is operating intermittently, the intermittent action starts again after the linked operation is finished.

If the ignition switch is turned to ACC position while the windshield washer switch is ON, the windshield washer relay turns ON, but the windshield wiper does not perform the linked operation. When the windshield washer switch is turned OFF and then ON, the windshield wiper starts the linked operation.

*NOTE:*

- *Using the customization function, the washer linked windshield wiper function can be invalidated (Refer to P.51-75).*
- *Using the customization function, when the washer linked windshield wiper function is invalidated, only the washer operates. It is useful to melt ice from the frozen windshield.*

## Intelligent washer function

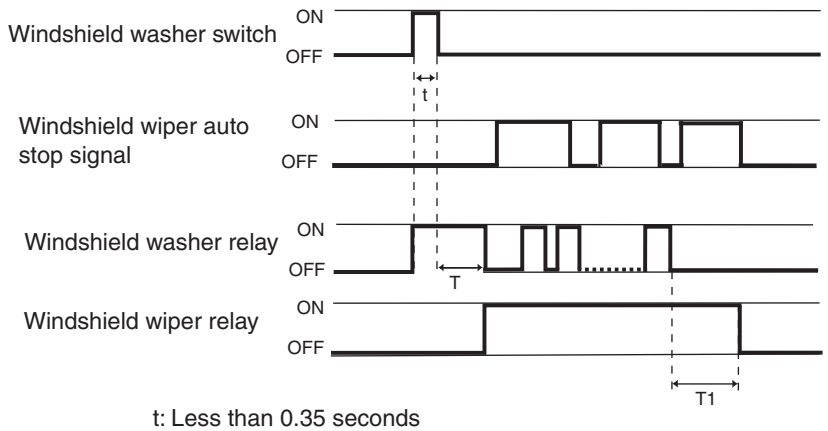
The table below shows the switch operations of the intelligent washer.

| Wiper switch | Washer-linked wiper: Enabled | | Washer-linked wiper: Disabled | |
|---|---|---|---|---|
| | Vehicle speed less than 130km/h | Vehicle speed 130km/h or more | Vehicle speed less than 130km/h | Vehicle speed 130km/h or more |
| OFF | Intermittent washer and wiping | 1-second washer and wiping | 1-second washer | 1-second washer |
| INT | Intermittent washer and wiping | 1-second washer and wiping | 1-second washer | 1-second washer |
| AUTO | Intermittent washer and wiping | 1-second washer and wiping | Intermittent washer and wiping | 1-second washer and wiping |
| LO | Intermittent washer and wiping | 0.5-second washer | Intermittent washer and wiping | 0.5-second washer |
| HI or MIST | 1-second washer | 1-second washer | 1-second washer | 1-second washer |

*NOTE:*

- *The intelligent washer function can be disabled by the customization function.(Refer to P.51-75.)*
- *When the windshield wiper switch is operated while the intelligent washer function is activated, the intelligent washer function will be suspended.*

## Intermittent washer and wiping




t: Less than 0.35 seconds
T: 1.0 second
T1: 3.0 second

AC802531AE

The intermittent washer and wiping operate as follows:

1. Turn on the windshield washer switch for less than 0.35 second.
2. The windshield washer operates for 0.5 seconds.
3. The windshield washer operates intermittently 4 to 6 times, and the windshield wipers operate, linked with the windshield washer operation.
4. The windshield wipers operate for 3 seconds.

*NOTE:*

- *If the windshield washer switch is turned ON for less than 0.35 second when the windshield washer is injecting washer fluid for 0.5 seconds and when the windshield washer is injecting washer fluid intermittently 4 to 6 times, the intermittent washer and wiping will stop.*
- *If the windshield washer switch is turned ON for less than 0.35 second when the windshield wipers are operating for 3 seconds, the windshield washer operates intermittently 4 to 6 times again.*

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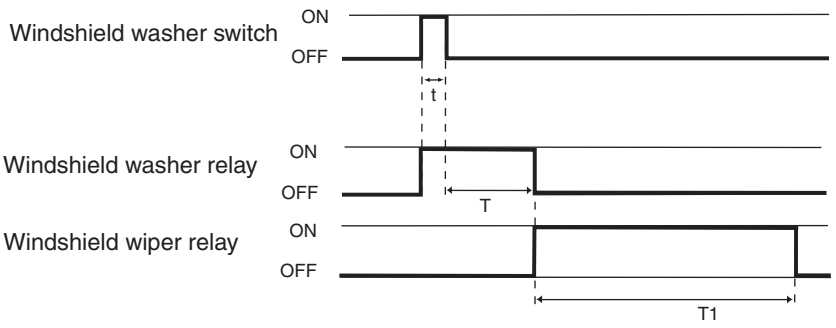
## 1-second washer and wiping




t: Less than 0.35 seconds
T: 1.0 second
T1: 3.0 second

AC802442 AD

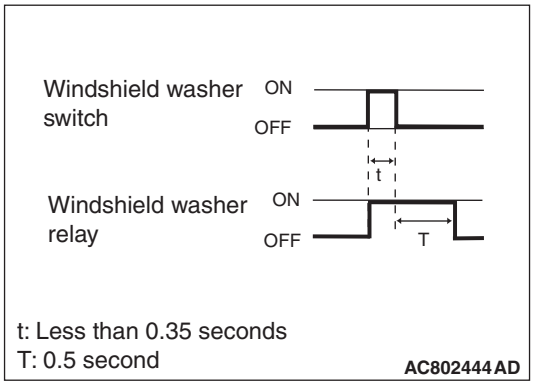
When the windshield washer switch is turned ON for less than 0.35 second, the windshield washer operates for 1 second. The windshield washer operates for 1 second, and then the windshield wipers operate for 3 seconds.

*NOTE:*

- *If the windshield washer switch is turned ON for less than 0.35 second when the windshield wipers are operating for 3 seconds, the windshield washer operates for 1 second again.*

### 0.5-second washer

When the windshield washer switch is turned ON for less than 0.35 second, the windshield washer operates for 0.5 second.

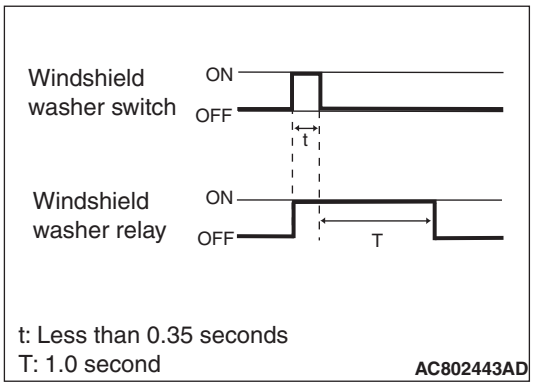



t: Less than 0.35 seconds
T: 0.5 second

AC802444 AD

### 1-second washer

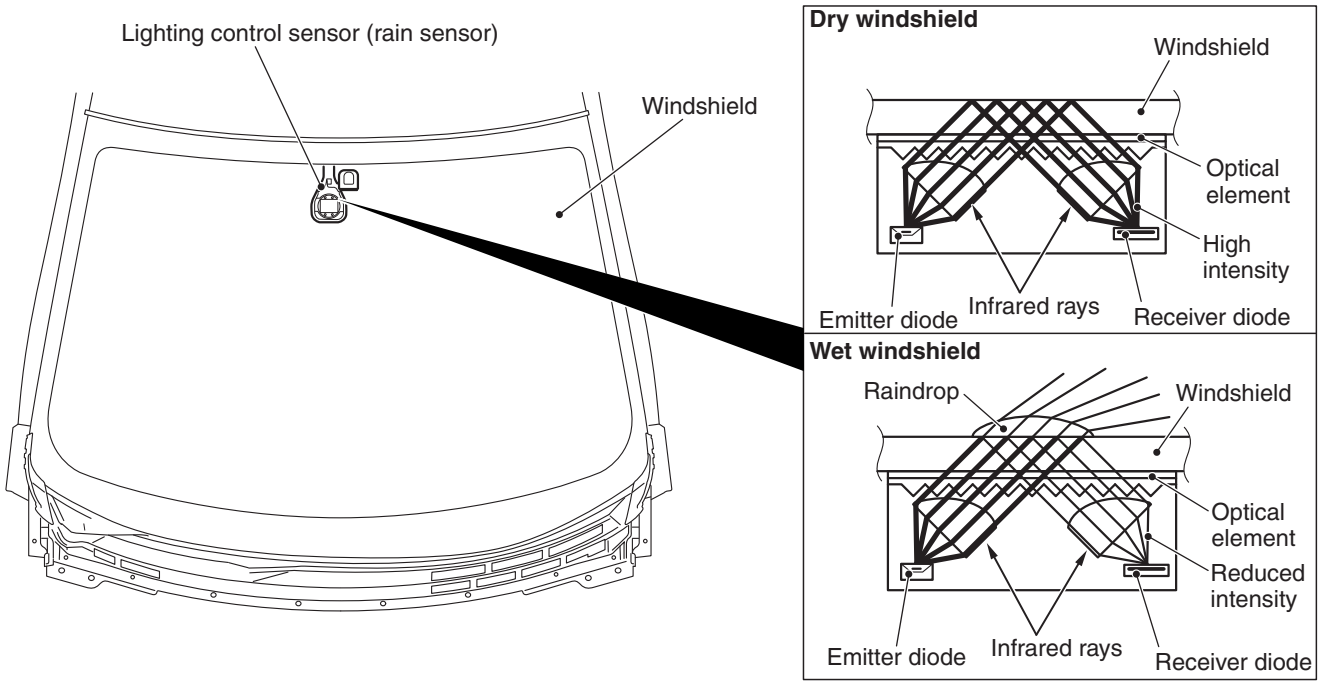
When the windshield washer switch is turned ON for less than 0.35 second, the windshield washer operates for 1 second.




t: Less than 0.35 seconds
T: 1.0 second

AC802443AD

## Rain sensitive wiper function (Optional for some models)




- Lighting control sensor (rain sensor) has been installed in the upper part of the windshield to sense the raindrops and windshield wiper can be operated when the ignition switch is at ON and wiper switch is at AUTO position.
- The lighting control sensor detects the raindrops on the windshield surface using the optical element, and it automatically switches the windshield wiper operation, depending on the amount of rainfall, to the intermittent or LO/HI operation.
- The lighting control sensor detects the raindrops using the reflections of infrared rays, and depending on the amount of rainfall, it automatically adjusts the wiping speed.
- Dry windshield: All infrared rays emitted from the emitter diode are reflected by the windshield and directed to the receiver diode as they are.
- Wet windshield: Part of the infrared rays emitted from the emitter diode are transmitted to outside of the windshield through the raindrops, and the infrared rays with reduced intensity are directed to the receiver diode.

*NOTE: Using the customization function, the rain sensitive wiper function can be invalidated (Refer to P.51-75).*

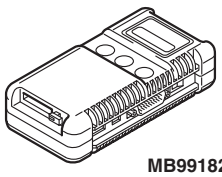
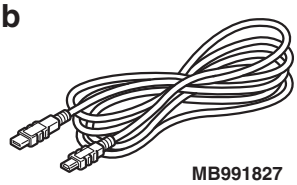
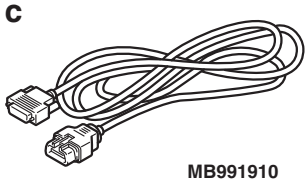
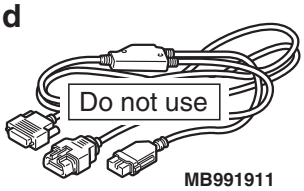
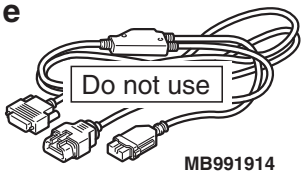
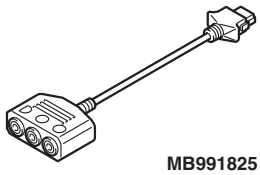
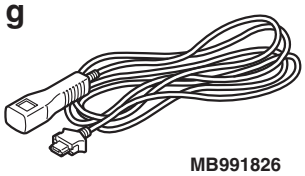
## Delayed finishing wipe function <Initial condition: without function>

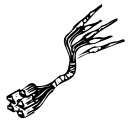
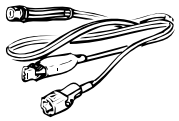
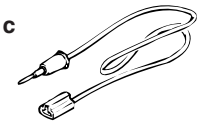
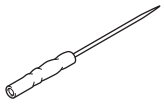
With the ignition switch in the ACC or ON position, when the washer lever of the column switch is operated for 0.5 second or more, or the comfort washer function is enabled, the washer fluid is injected and the wiper operates. The wiper operates once again for 6 seconds after the wiper operation is stopped to prevent the washer fluid from running down.

*NOTE: Using the customization function, the delayed finishing wipe function can be invalidated (Refer to P.51-75).*

## SPECIAL TOOLS

M1511000602708

| Tool | Tool number and name | Supersession | Application |
|---|---|---|---|
| MB992326 | MB992326<br>Washer nozzle adjustment tool | General service tool | Injection angle adjustment of the washer nozzle |
| a  MB991824<br>b  MB991827<br>c  MB991910<br>d  MB991911<br>e  MB991914<br>f  MB991825<br>g  MB991826<br>MB991958 | MB991958<br>a. MB991824<br>b. MB991827<br>c. MB991910<br>d. MB991911<br>e. MB991914<br>f. MB991825<br>g. MB991826<br>M.U.T.-III sub assembly<br>a. Vehicle communication interface (V.C.I.)<br>b. M.U.T.-III USB cable<br>c. M.U.T.-III main harness A (Vehicles with CAN communication system)<br>d. M.U.T.-III main harness B (Vehicles without CAN communication system)<br>e. M.U.T.-III main harness C (for Daimler Chrysler models only)<br>f. M.U.T.-III measurement adapter<br>g. M.U.T.-III trigger harness | MB991824-KIT<br>*NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.* | **⚠ CAUTION**<br>**M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.**<br>Windshield wiper intermittent time check |

| Tool | Tool number and name | Supersession | Application |
|---|---|---|---|
| a<br>  <br>b<br>  <br>c<br>  <br>d<br> <br><br>MB991223 | MB991223<br>a. MB991219<br>b. MB991220<br>c. MB991221<br>d. MB991222<br>Harness set<br>a. Test harness<br>b. LED harness<br>c. LED harness adaptor<br>d. Probe | General service tools | Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.<br>a. Connector pin contact pressure inspection<br>b. Power circuit inspection<br>c. Power circuit inspection<br>d. Commercial tester connection |
|  <br>MB992006 | MB992006<br>Extra fine probe | – | Making voltage and resistance measurement during troubleshooting |

# WINDSHIELD WIPER AND WASHER DIAGNOSIS

## TROUBLESHOOTING STRATEGY

M1511014600589

1. Gather the information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by the following Symptom Chart.
4. Verify the malfunction is eliminated.

## TROUBLE SYMPTOM CHART

M1511015001594

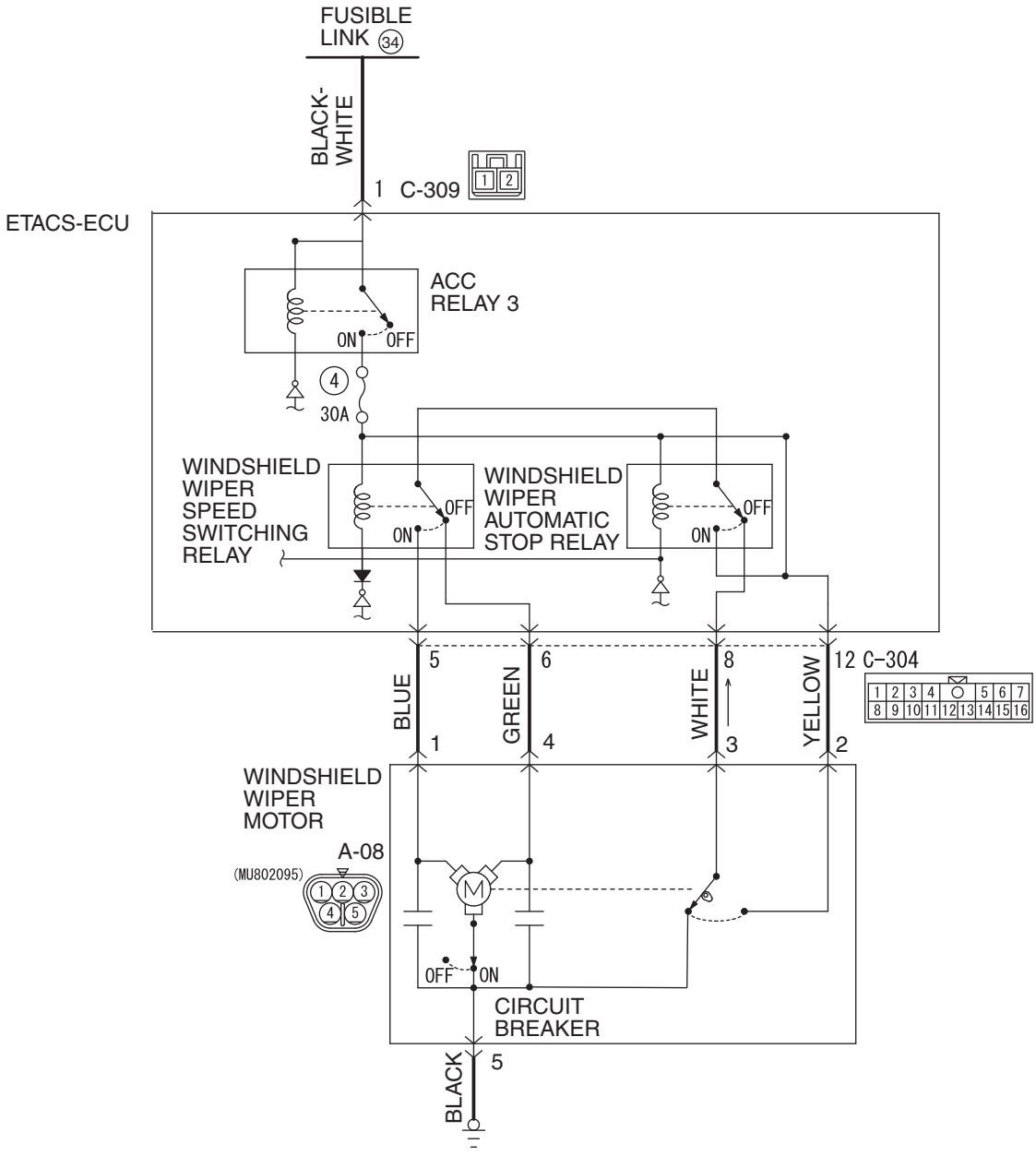
| TROUBLE SYMPTOM | Inspection procedure No. | Reference page |
|---|---|---|
| The windshield wipers do not work at all. | 1 | P.51-34 |
| The windshield wipers do not work when the wiper switch is at the "INT", "Washer" or "Mist" position. However, the wipers work at low speed when the switch is at the "Lo" or "Hi" position. | 2 | P.51-39 |
| Windshield wipers do not stop at the specified park position. | 3 | P.51-41 |
| Windshield wipers do not work normally. | 4 | P.51-44 |
| The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control switch. | 5 | P.51-50 |
| The windshield intermittent wiper interval is not changed according to the vehicle speed. | 6 | P.51-52 |
| The rain sensitive AUTO wiper function does not work at all <Vehicles with lighting control sensor>. | 7 | P.51-55 |
| The rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>. | 8 | P.51-60 |
| Sometimes the rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>. | 9 | P.51-63 |
| The windshield washer does not work normally. | 10 | P.51-66 |
| The intelligent washing function does not work normally. | 11 | P.51-70 |
| Delayed finishing wipe function does not work normally | 12 | P.51-71 |

*NOTE: Even when the ETACS-ECU has failed, the windshield wipers can work at low speed as fail-safe mode.*

# SYMPTOM PROCEDURES

## INSPECTION PROCEDURE 1: The windshield wipers do not work at all.

**Windshield Wiper Power Supply Circuit**

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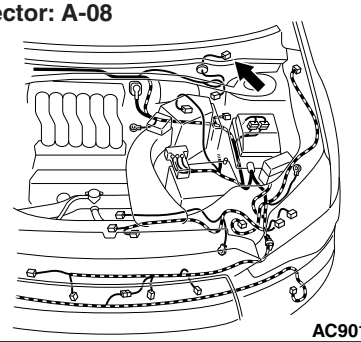
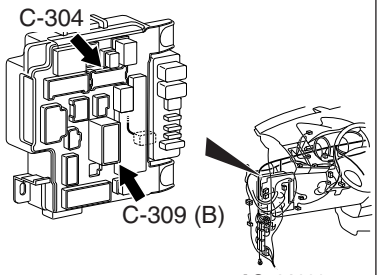
TSB Revision

Connector: A-08



AC901214 AB

Connectors: C-304, C-309




AC701632 AL

## CIRCUIT OPERATION

- The windshield wiper and washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a windshield wiper and washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the windshield wiper and washer motor to be turned on.
- If the LIN communication line is defective, the ETACS-ECU operates windshield wiper motor by using the other communication lines (wiper backup circuit) instead of that line. In this case, the windshield wiper works at low speed regardless of the windshield wiper and washer switch positions ("LO" or "HIGH").

## TECHNICAL DESCRIPTION (COMMENT)

If the windshield wiper does not work at all, the windshield wiper motor, column switch (windshield wiper and washer switch) or the ETACS-ECU may be defective.

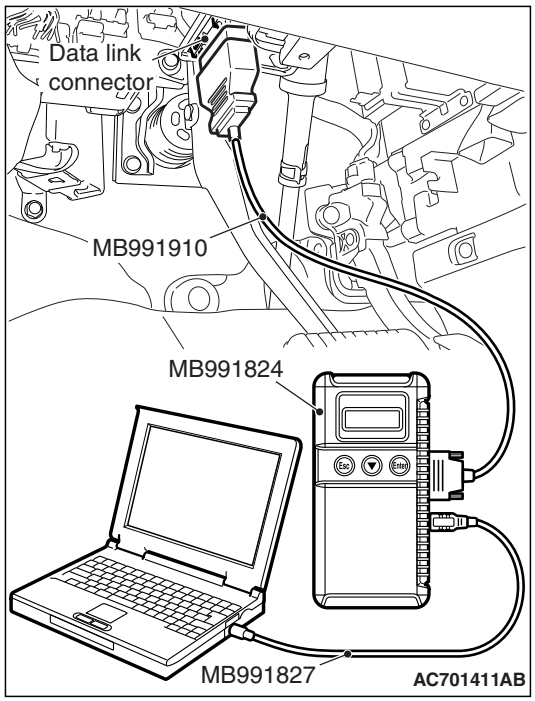
## TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The wiper motor may be defective
- The column switch may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 2.

**STEP 2. Check the input signal related to the windshield wiper operation.**

- Ignition switch: ACC

| Item No. | Item name | Normal condition |
|---|---|---|
| Item 288 | ACC switch | ON |
| Item 235 | Front wiper ACT | ON |

**OK: Normal condition is displayed.**

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

**NO :** Go to Step 3.

**YES :** Refer to GROUP 54A –ETACS, Input signal procedures P.54A-796.

**STEP 3. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-08 in good condition?**

**YES :** Go to Step 4.

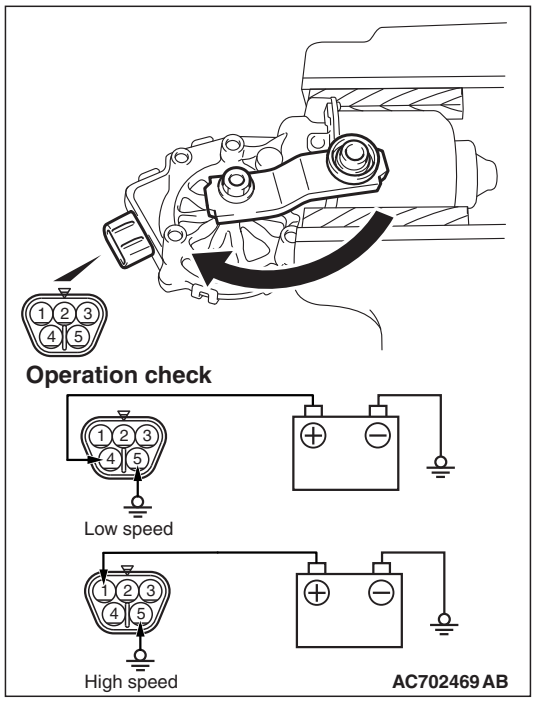
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

**STEP 4. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-08.
(2) Connect a battery to the windshield wiper motor as shown. Then check that the windshield wiper motor operates normally at high and low speeds.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 5.
**NO :** Replace the windshield wiper motor. Verify that the windshield wiper works normally.

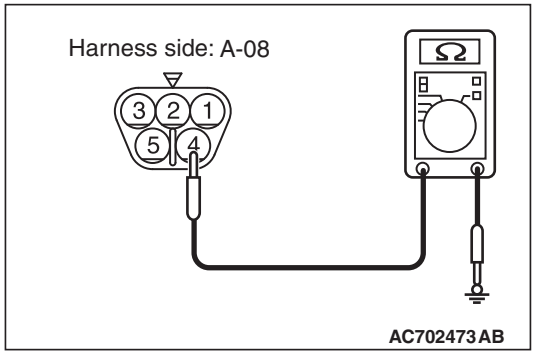



**STEP 5. Check the ground circuit to the windshield wiper motor. Measure the resistance at the windshield wiper motor connector A-08.**

(1) Disconnect windshield wiper motor connector A-08 and measure the resistance available at the wiring harness side of the connector.
(2) Measure the resistance value between terminal 5 and ground.
    • The resistance should be 2 Ω or less.

**Q: Is the measured resistance 2 Ω or less?**

**YES :** Go to Step 7.
**NO :** Go to Step 6.




**STEP 6. Check the wiring harness between windshield wiper motor connector A-08 (terminal 5) and ground.**

**Q: Is the wiring harness between windshield wiper motor connector A-08 (terminal 5) and ground in good condition?**

**YES :** No action is necessary and testing is complete.
**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify the windshield wiper works normally.

**TSB Revision**

**STEP 7. Check ETACS-ECU connector C-309 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 8.

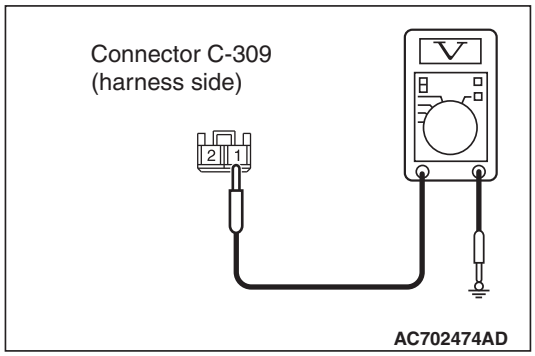
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

**STEP 8. Measure the voltage at ETACS-ECU connector C-309.**

(1) Disconnect ETACS-ECU connector C-309 and measure the resistance available at the wiring harness side of the connector.

(2) Measure the voltage between terminal 1 and ground.

- The voltage should measure approximately 12 volts (battery positive voltage).




**Q: Is the measured voltage approximately 12 volts (battery positive voltage)?**

**YES :** Go to Step 10.

**NO :** Go to Step 9.

**STEP 9. Check the wiring harness between ETACS-ECU connector C-309 (terminal 1) and the fusible link (34).**

- Check the power supply line for open circuits.

**Q: Is the wiring harness between ETACS-ECU connector C-309 (terminal 1) and the fusible link (34) in good condition?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-12.

**STEP 10. Check the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-08 (terminals 1, 4).**

- Check the input and output lines for open or short circuit.

**Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-08 (terminals 1, 4) in good condition?**

**YES :** Go to Step 11.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-12.

**STEP 11. Retest the system.**
Check that the windshield wipers work normally.

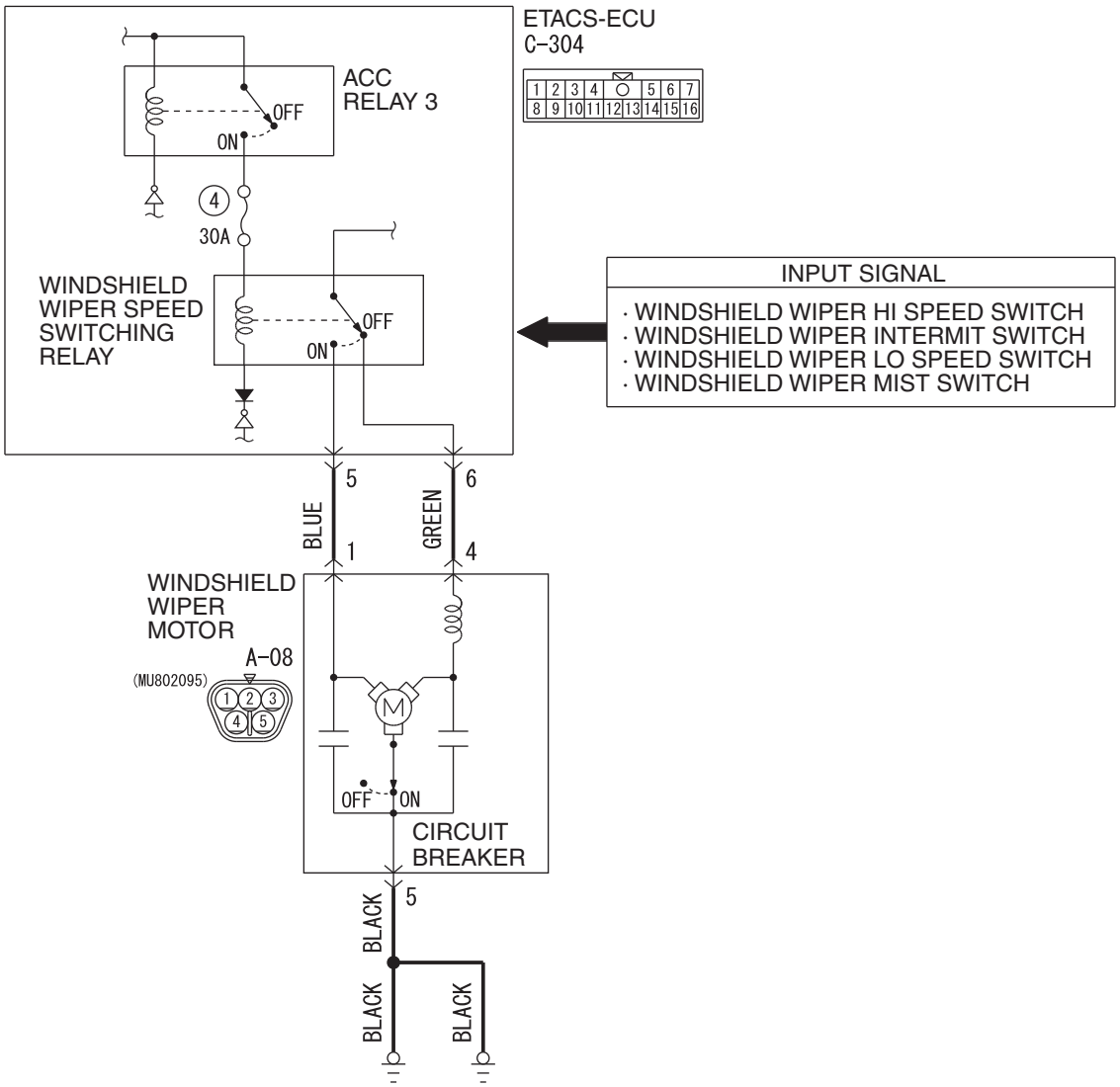
**Q: Is the check result normal?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

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

**INSPECTION PROCEDURE 2: The windshield wipers do not work when the wiper switch is at the "INT", "Washer" or "Mist" position. However, the wipers work at low speed when the switch is at the "Lo" or "Hi" position.**

**Windshield Wiper Motor Circuit**

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**TSB Revision**

## TECHNICAL DESCRIPTION (COMMENT)

This system may be at fail-safe mode if the LIN communication line is defective.
If the system cannot receive any signal from the column switch (windshield wiper and washer switch) due to a open circuit in the LIN communication line or other reasons, the system will enter the fail-safe mode when the ignition switch is at the "ACC" position.

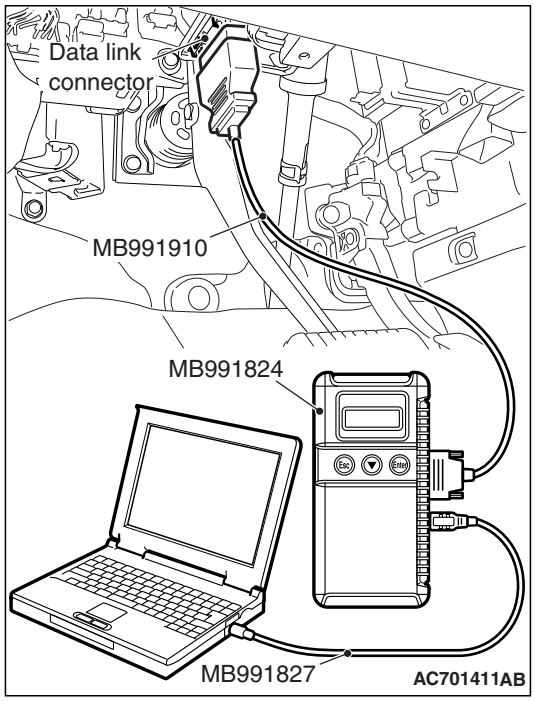
## TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The column switch may be defective
- The ETACS-ECU may be defective
- The LIN bus line may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**
Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."
**NO :** Go to Step 2.

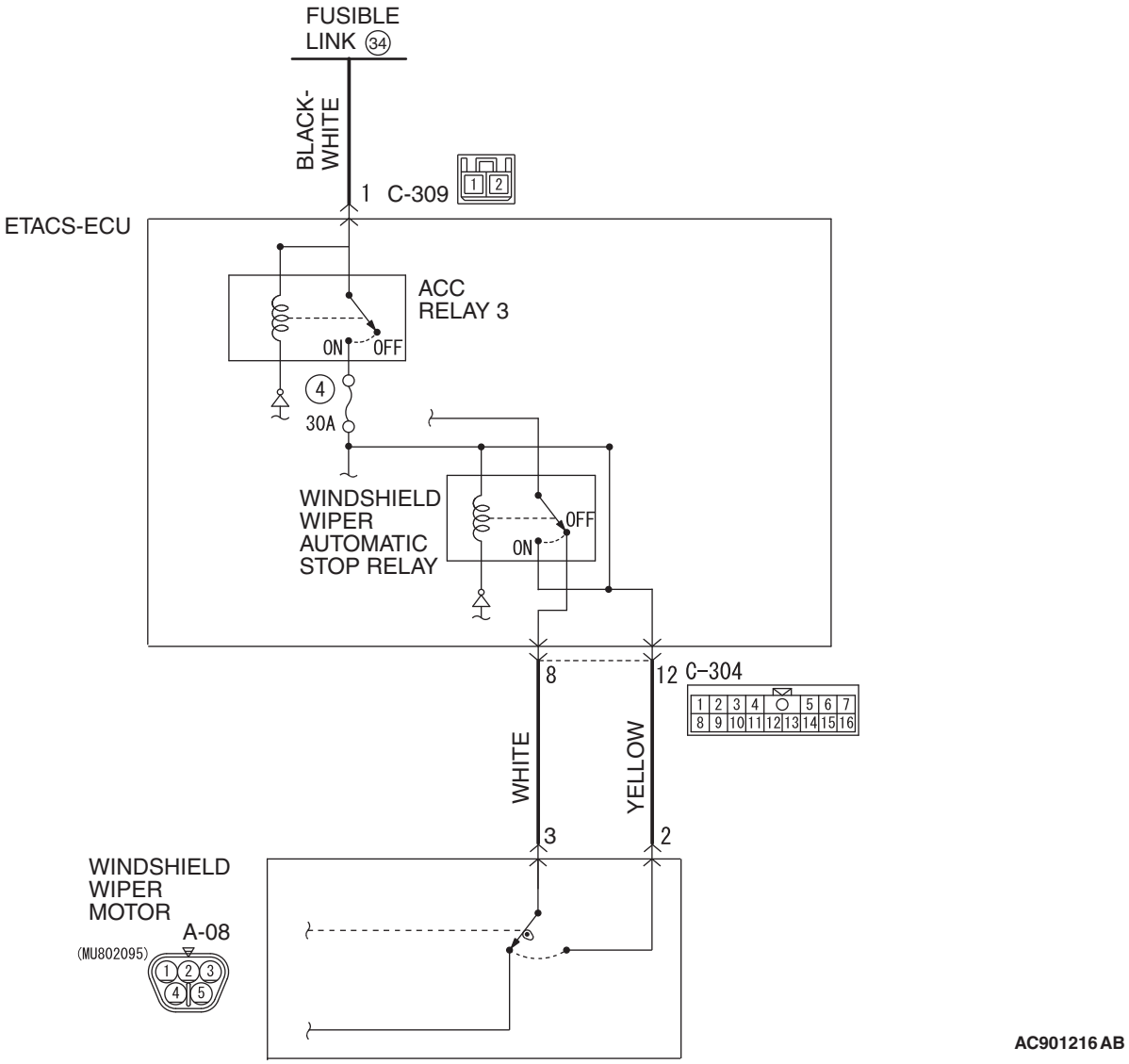
**STEP 2. Retest the system.**
Check that the windshield wipers work normally.

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

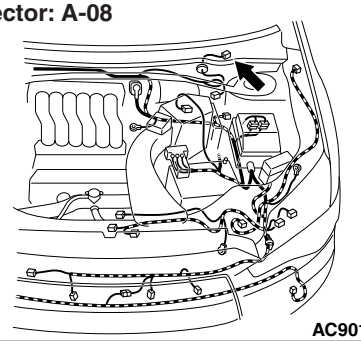
**YES :** Intermittent malfunction. Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15.
**NO :** Replace the ETACS-ECU.

## INSPECTION PROCEDURE 3: Windshield wipers do not stop at the specified park position.

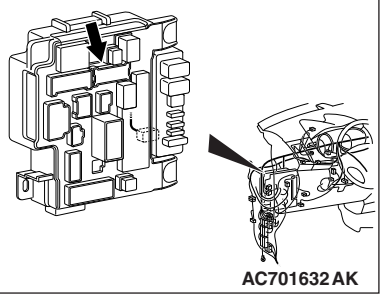
**Windshield Wiper Automatic Stop Relay Circuit**




**Connector: A-08**




**Connector: C-304**




## TECHNICAL DESCRIPTION (COMMENT)

If the windshield wipers do not stop at predetermined park position, the windshield wiper motor or the ETACS-ECU may be defective.

**TSB Revision**

## TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The windshield wiper motor may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe

**STEP1. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-08 in good condition?**

**YES :** Go to Step 2.

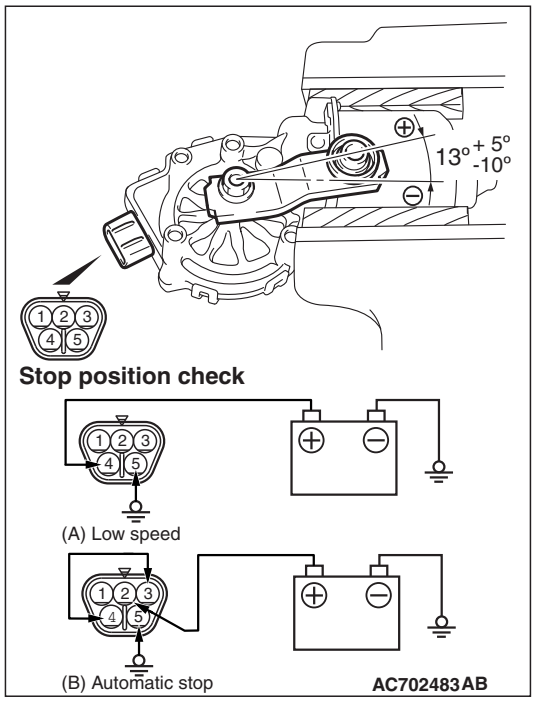
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

**STEP 2. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-08.

(2) Connect the vehicle battery to the windshield wiper motor connector as shown, and operate the windshield wiper at low speed. While the windshield wiper is working, disconnect the battery at positions other than the specified park position to stop the windshield wiper motor.

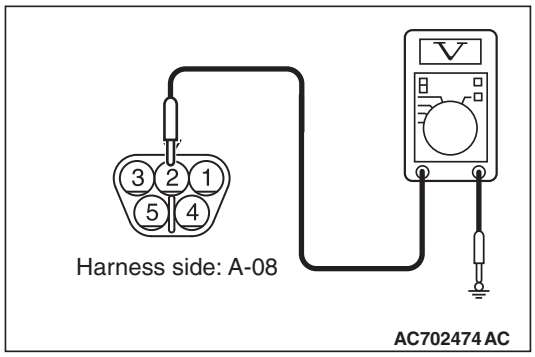
(3) When the battery is connected as shown, the motor should run at low speed, and then stop at the specified park position.




**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 3.

**NO :** Replace the windshield wiper motor. The windshield wiper should now stop at the specified park position.




**STEP 3. Check the fusible link (34) circuit to the windshield wiper motor. Measure the voltage at windshield wiper motor connector A-08.**

(1) Disconnect windshield wiper motor connector A-08 and measure the voltage available at the wiring harness side of the connector.
(2) Turn the ignition switch to the "ACC" position.
(3) Measure the voltage between terminal 2 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

**Q: Is the measured voltage approximately 12 volts (battery positive voltage)?**

**YES :** Go to Step 5.
**NO :** Go to Step 4.

**STEP 4. Check the wiring harness between windshield wiper motor connector A-08 (terminal 2) and the fusible link (34).**

- Check the power supply line for open circuits.

**Q: Is the wiring harness between windshield wiper motor connector A-08 (terminal 2) and the fusible link (34) in good condition?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and Wire Check P.00E-12.

**STEP 5. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 6.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

**STEP 6. Check the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-08 (terminals 3, 2).**

- Check the output lines for open or short circuits.

**Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-08 (terminals 3, 2) in good condition?**

**YES :** Go to Step 7.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and Wire Check P.00E-12.

**STEP 7. Retest the system.**

Check that the windshield wipers stops at the specified park position.

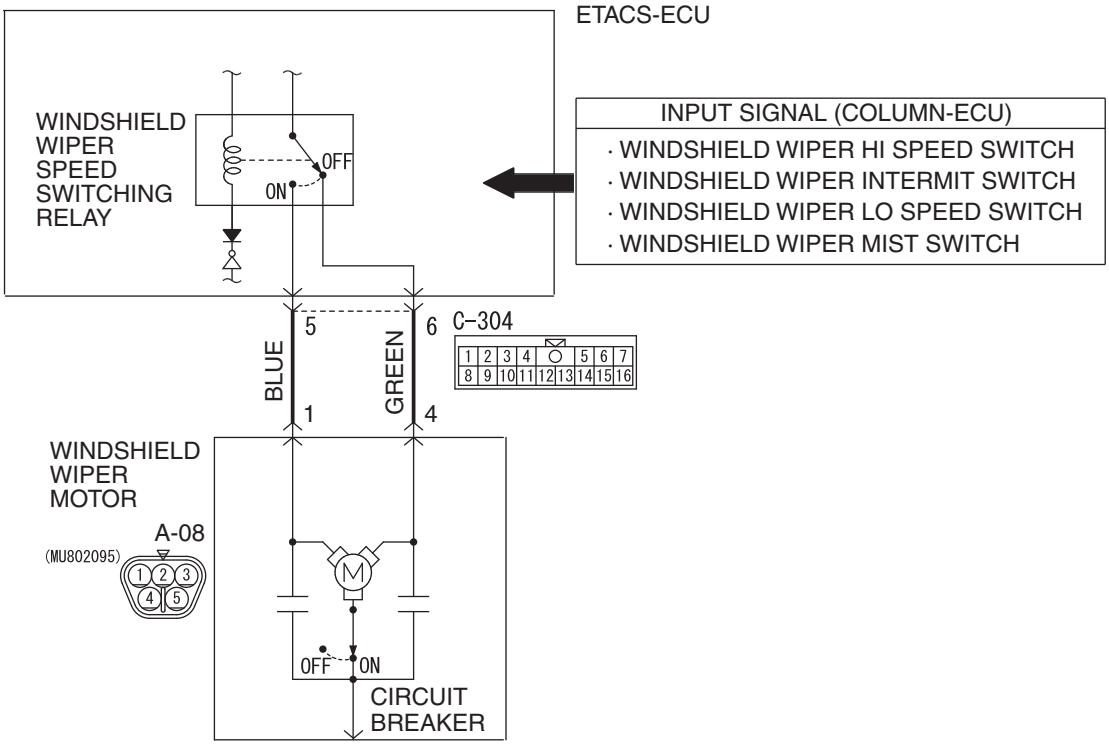
**Q: Is the check result normal?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15.

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

## INSPECTION PROCEDURE 4: Windshield Wipers do not work normally.

**Windshield Wiper Motor Drive Circuit**

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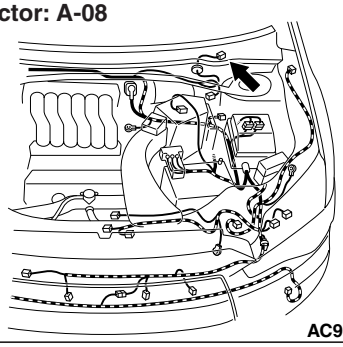
**Connector: A-08**



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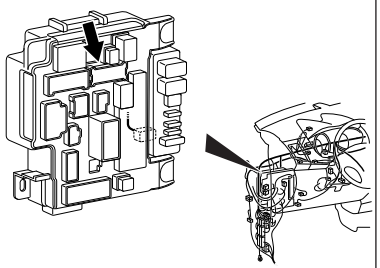
**Connector: C-304**



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## TECHNICAL DESCRIPTION (COMMENT)

If either of the windshield wiper switch positions is defective, the windshield wiper motor, column switch (windshield wiper and washer switch) or the ETACS-ECU may be defective.

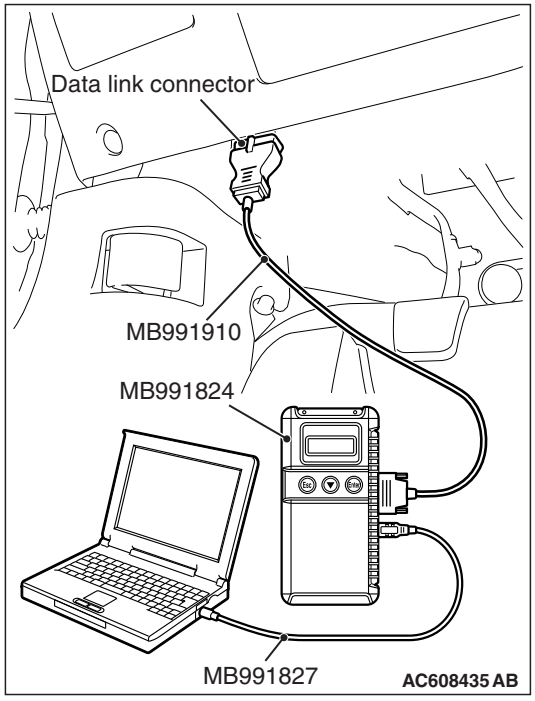
## TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The wiper motor may be defective
- The column switch may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to "How to connect the scan tool (M.U.T.-III) P.54B-4."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 2.

**STEP 2. Using scan tool MB991958, check data list.**
Check the input signal related to the windshield wiper operation.
- Ignition switch: ACC
- Operate the windshield wiper switch at each switch position.

| Item No. | Item name | Windshield wiper switch position | Normal condition |
|---|---|---|---|
| Item 235 | Front wiper ACT | LO | ON |
| | | HI | |
| | | INT | ON and OFF |
| | | MIST | ON |
| Item 236 | Front wiper Lo/Hi | LO | OFF |
| | | HI | ON |
| | | INT | OFF |
| | | MIST | ON |

**OK: Normal condition is displayed.**

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

**YES :** Go to Step 3.
**NO :** Troubleshoot the ETACS-ECU. Refer to ETACS, Diagnosis - Inspection Procedure 12 "ETACS-ECU does not receive any signal from the column switch signal." P.54A-796.

**STEP 3. Check that the windshield wipers work.**
Check that the windshield wipers work at high speed and the mist mode.

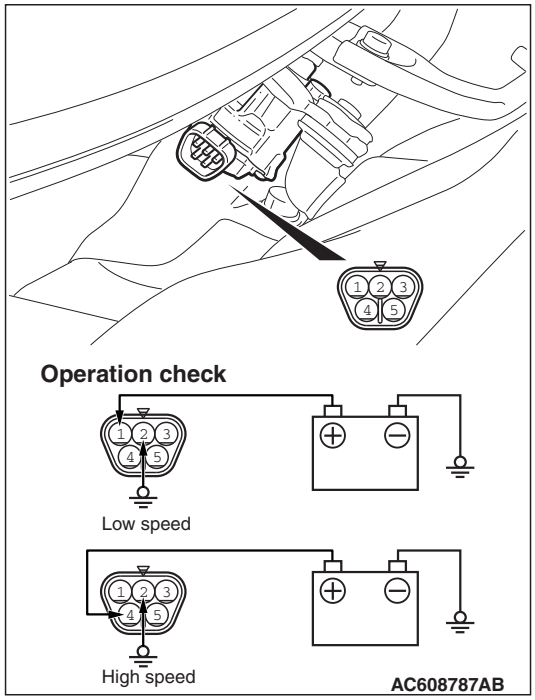
**Q: Is the check result normal?**

**YES :** Go to Step 4.
**NO :** Go to Step 10.

**STEP 4. Check windshield wiper motor connector A-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-08 in good condition?**

**YES :** Go to Step 5.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

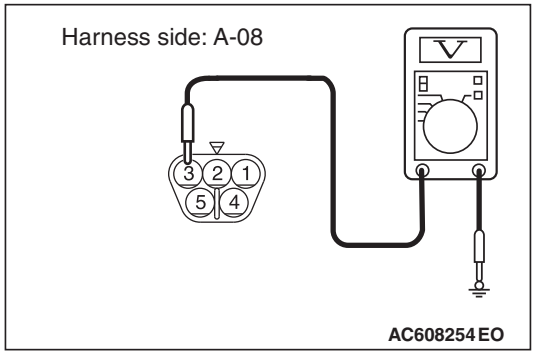



**STEP 5. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-08.
(2) Connect a battery to the windshield wiper motor as shown. Then check if the windshield wiper motor operates normally at high and low speeds.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 6.
**NO :** Replace the windshield wiper motor. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.




**STEP 6. Measure the voltage at windshield wiper motor connector A-08**

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Ignition switch: ACC
(3) windshield wiper switch: LO
(4) Measure the voltage between A-08 windshield wiper motor connector terminal No. 3 and body ground.

**OK: Battery positive voltage**

**Q: Is the measured voltage approximately 12 volts (battery positive voltage)?**

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
**NO :** Go to Step 7.

**STEP 7. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 8.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

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**STEP 8. Check the wiring harness between windshield wiper motor connector A-08 (terminals 1) and ETACS-ECU connector C-304 (terminals 5).**

- Check the output lines for open or short circuit.

**Q: Is the wiring harness between windshield wiper motor connector A-08 (terminals 1) and ETACS-ECU connector C-304 (terminals 5) in good condition?**

**YES :** Go to Step 9.

**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

**STEP 9. Retest the system.**

Check that the windshield wipers work normally by moving the switch to each position.

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

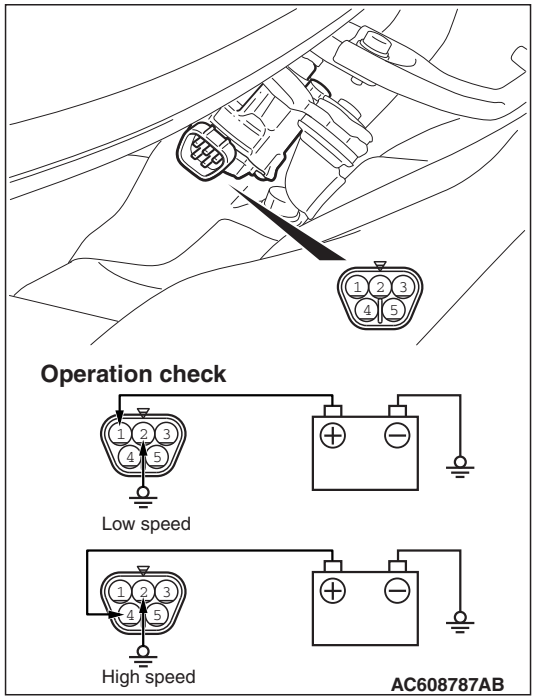
**NO :** Replace the ETACS-ECU.

**STEP 10. Check the A-08 windshield wiper motor connector**

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

**YES :** Go to Step 11.

**NO :** Repair the connector concerned.

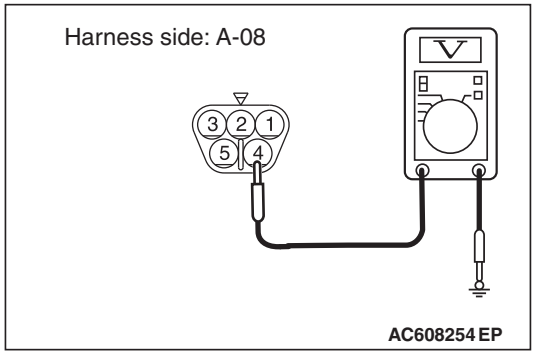



**STEP 11. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-08.
(2) Connect a battery to the windshield wiper motor as shown. Then check if the windshield wiper motor operates normally at high and low speeds.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 12.
**NO :** Replace the windshield wiper motor. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.




**STEP 12. Measure the voltage at the A-08 windshield wiper motor connector.**

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Ignition switch: ACC
(3) Windshield wiper switch: HI,MIST
(4) Measure the voltage between A-08 windshield wiper motor connector terminal No.4 and body ground.

**OK: Battery positive voltage**

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
**NO :** Go to Step 13.

**STEP 13. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 14.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

**STEP 14. Check the wiring harness wires between C-304 ETACS-ECU connector terminal No. 6 and A-08 windshield wiper motor connector terminal No.4.**

- Check the output lines for open or short circuit.

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

**YES :** Go to Step 15.
**NO :** Repair the wiring harness.

**STEP 15. Retest the system.**

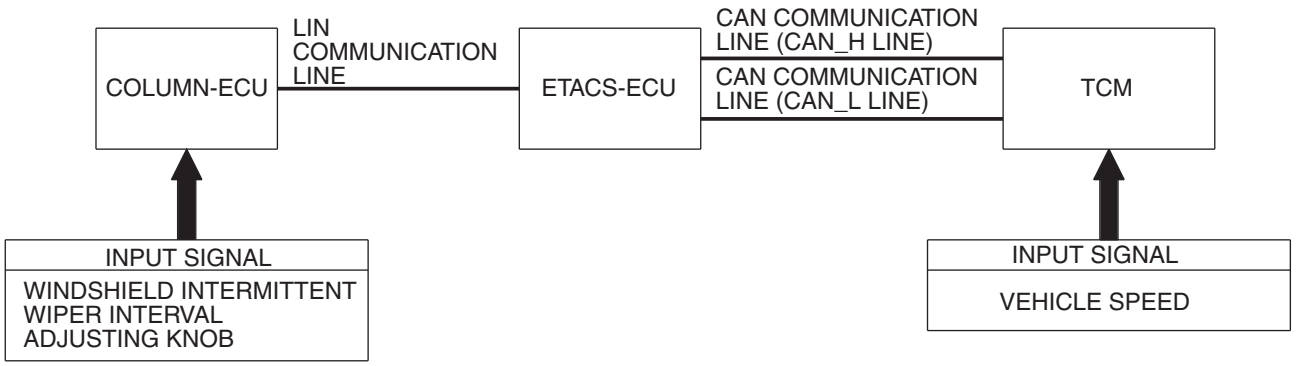
Check that the windshield wipers work normally by moving the switch to each position.

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
**NO :** Replace the ETACS-ECU.

## INSPECTION PROCEDURE 5: The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control switch.

**Windshield Intermittent Wiper Control Circuit**

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## TECHNICAL DESCRIPTION (COMMENT)

If the windshield intermittent wiper interval is not changed by operating the windshield intermittent wiper interval adjusting knob or according to the vehicle speed, the column switch or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

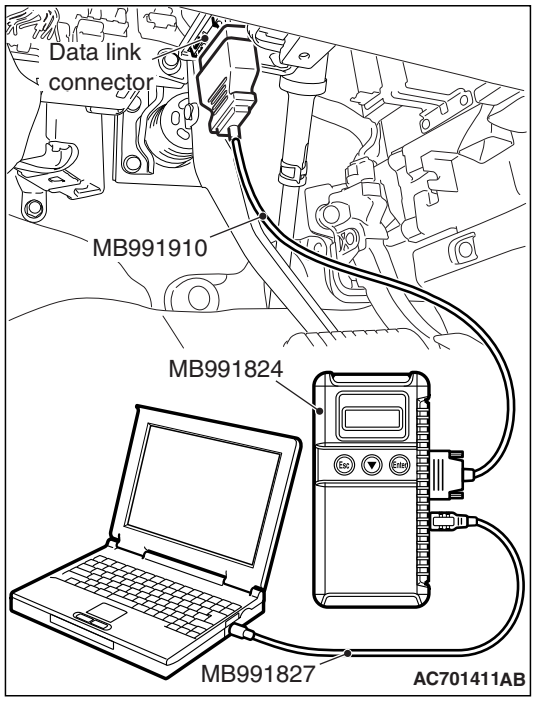
**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 2.




**STEP 2. Check the ETACS configuration function.**

Use the ETACS configuration function to check that "Front wiper operation" is set to "variable INT" or "vehicle speed dependent".

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

**YES :** Go to Step 3.

**NO :** Use the ETACS configuration function to set "Front wiper operation" to "variable INT" or "vehicle speed dependent". Refer to P.51-75.

**STEP 3. Using scan tool MB991958, check data list.**
Check the input signal related to the windshield wiper operation.
- Ignition switch: ACC
- Rotate the windshield wiper interval control from (+) to (−) side.

| Item No. | Display on scan tool | Check conditions | Normal condition |
|---|---|---|---|
| Item 359 | Front wiper (interval volume) | Rotate the windshield wiper interval control from (+) to (−) side. | Value changes from (+) to 254 (−) |

**OK: Normal condition is displayed.**

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

**NO :** Go to Step 4.
**YES :** Replace the column switch.

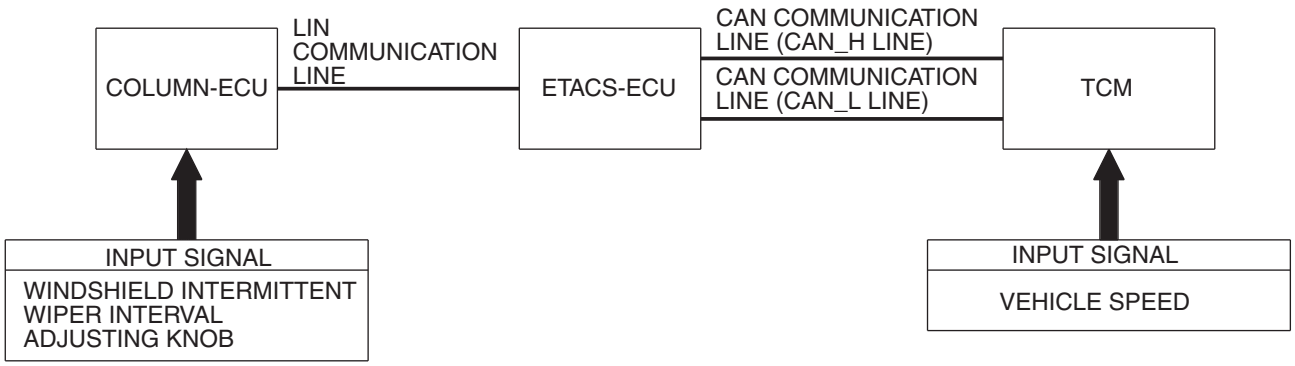
**STEP 4. Retest the system.**
Check that the windshield wiper interval changes when the windshield wiper volume control is rotated.

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

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.
**NO :** Replace the ETACS-ECU.

## INSPECTION PROCEDURE 6: The windshield intermittent wiper interval is not changed according to the vehicle speed.

**Windshield Intermittent Wiper Control Circuit**

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## TECHNICAL DESCRIPTION (COMMENT)

If the intermittent wiper interval does not depend on the vehicle speed, the input circuit of the vehicle speed signal and the ETACS-ECU may be defective. Alternatively, the vehicle speed-dependent wiper may be set to "disabled" by using the configuration function.

## TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The combination meter may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**STEP 1. Retest the system.**

Check that the windshield intermittent wiper interval can be adjusted by operating the windshield intermittent wiper interval control switch.

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

**YES :** Go to Step 2.

**NO :** Refer to Inspection Procedure 5 "The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper interval control switch" P.51-50.

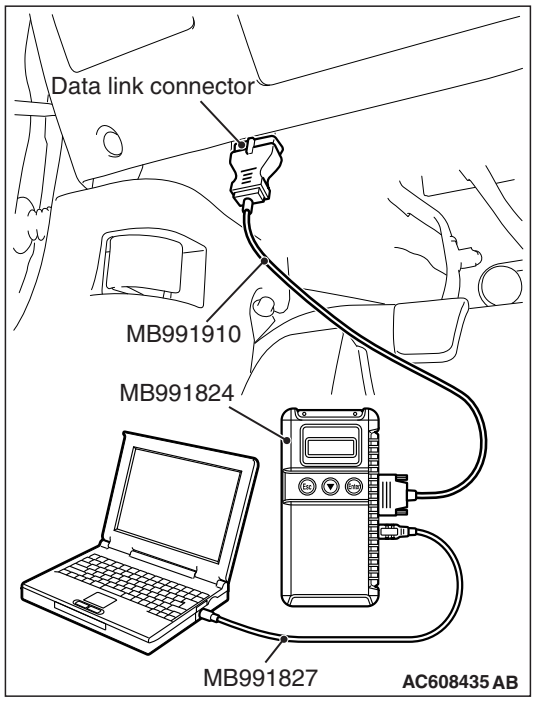
**STEP 2. Check the ETACS configuration function.**

Use the ETACS configuration function to check that "Front wiper operation" is set to "Variable INT" or "Speed sensitive".

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

**YES :** Go to Step 3.

**NO :** Use the ETACS configuration function to set "Front wiper operation" to "variable INT" or "Speed sensitive". (Refer to P.51-75.)




**STEP 3. Using scan tool MB991958, check data list.**

Check the input signal related to the combination meter.

- Drive the vehicle and change vehicle speed.

| Item No. | Display on scan tool | Check condition | Normal condition |
|---|---|---|---|
| Item 80 | speedometer | Speedometer displayed value and scan tool displayed value agree with each other | |

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

**YES :** Go to Step 4.

**NO <Normal condition is not displayed for item No. 80.> :** Troubleshoot the speedometer (Refer to GROUP 54A –Combination Meter, Diagnosis - Inspection Procedure 2: "The speedometer does not work (the other meters work)"P.54A-76 .)

**STEP 4. Retest the system.**

Check that the intermittent wiper interval depends on the vehicle speed.

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

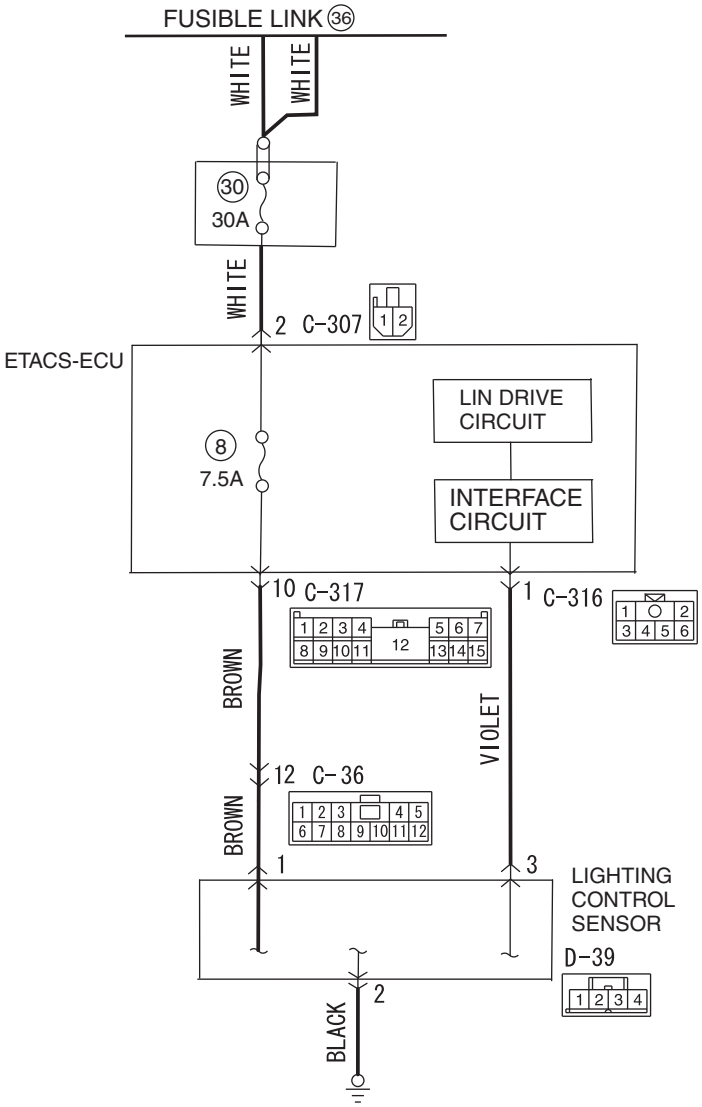
**YES :** Intermittent malfunction. Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15.

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

**INSPECTION PROCEDURE 7: The rain sensitive AUTO wiper function does not work at all <Vehicles with lighting control sensor>.**

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

**Raindrops Sensing Wiper Function Control Circuit**

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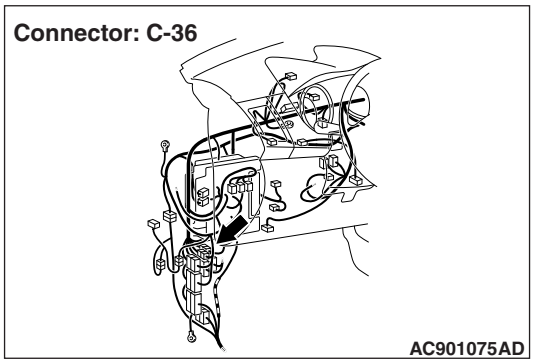
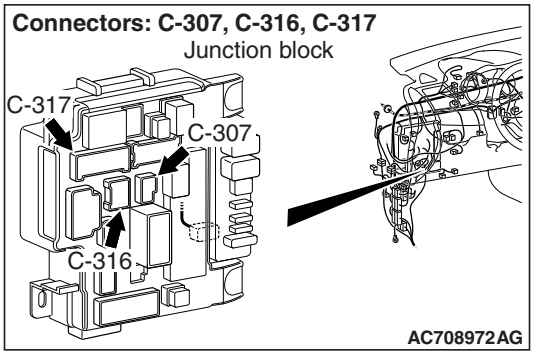
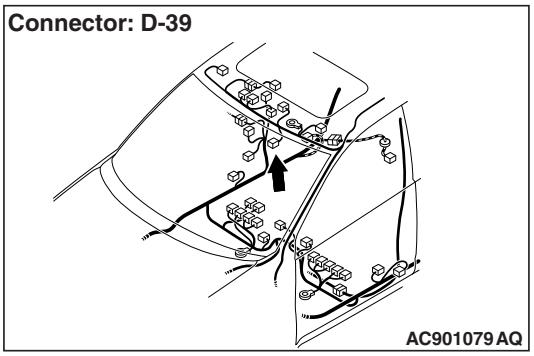



## CIRCUIT OPERATION

When the column switch is in the AUTO position, this function automatically adjusts the wiping speed of windshield wiper by detecting the rain fall through lighting control sensor.

## TECHNICAL DESCRIPTION (COMMENT)

The windshield wiper motor, the column switch, the lighting control sensor, the harness connector, or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- Defective column switch (column-ECU)
- Malfunction of the lighting control sensor
- Defective windshield wiper motor
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**STEP 1. Lighting control sensor installation surface check**
Visually check the presence of scratches or air bubbles [(diameter of 5.0 mm(0.2 in) or more] on the windshield to which the lighting control sensor is installed.

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

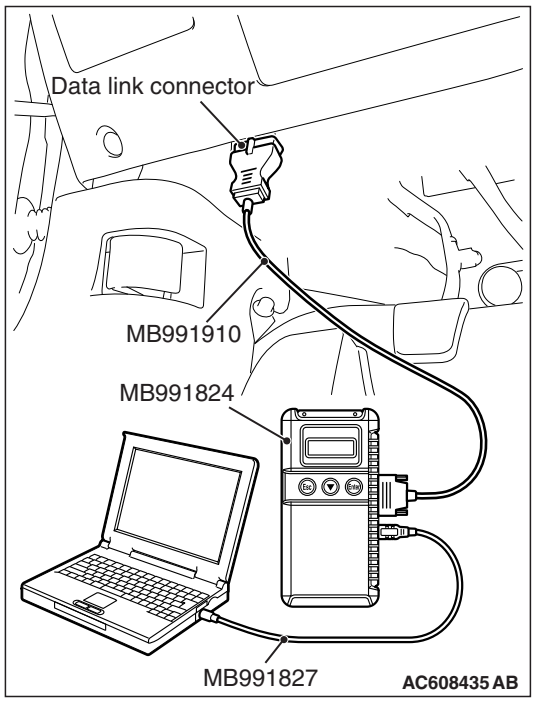
**YES :** Go to Step 2.
**NO :** Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation P.42A-15).

**STEP 2. Windshield wiper operation check**
Check that the windshield wipers work normally.

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

**YES :** Go to Step 3.
**NO :** Refer to trouble symptom chart P.51-33.

**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**
Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."




**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."
**NO :** Go to Step 4.

**STEP 4. Using scan tool MB991958, read the lighting control sensor diagnostic trouble code.**
Check if a lighting control sensor diagnostic trouble code is set.
Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the lighting control sensor. [Diagnostic Trouble Code: (Refer to GROUP 54A –Diagnosis Code Chart P.54A-132) or Service Data (P.51-73).]
**NO :** Go to Step 5.

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**STEP 5. Connector check: D-39 Lighting control sensor connector**

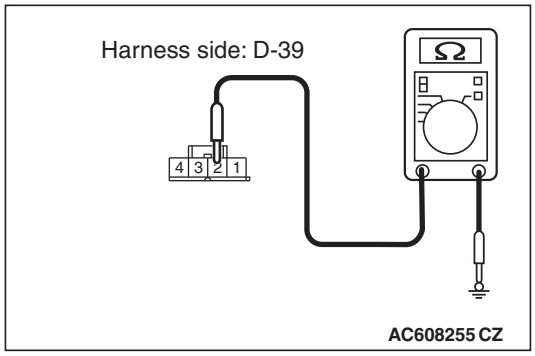
**Q: Is the check result normal?**

**YES :** Go to Step 6.
**NO :** Repair the damaged connector.

**STEP 6. Resistance measurement at the D-39 lighting control sensor connector**

(1) Disconnect the connector, and measure the resistance at the wiring harness.
(2) Measure the resistance between D-39 lighting control sensor connector terminal No.2 and body ground.

**OK: Continuity exists (2 Ω or less)**




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

**YES :** Go to Step 8.
**NO :** Go to Step 7.

**STEP 7. Check the wiring harness between D-39 lighting control sensor connector terminal No.2 and body ground.**

- Check the ground wires for open circuit.

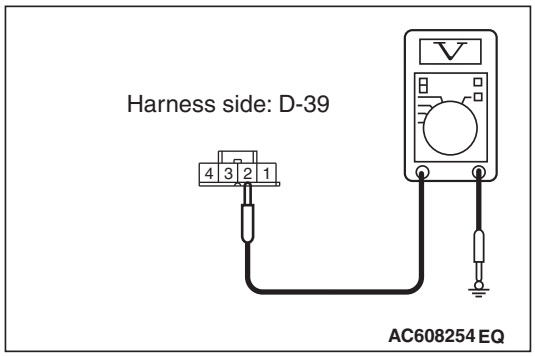
**Q: Is the check result normal?**

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15.)
**NO :** Repair the wiring harness.

**STEP 8. Voltage measurement at the D-39 lighting control sensor connector**

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Measure the voltage between D-39 lighting control sensor connector terminal No.1 and body ground.

**OK: Battery positive voltage**




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

**YES :** Go to Step 10.
**NO :** Go to Step 9.

**STEP 9. Check the wiring harness between D-39 lighting control sensor connector terminal No.1 and fusible link (36).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-36, ETACS-ECU connectors C-307 and C-317, and repair if necessary.*

- Check the power supply line for open circuit.

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15.)

**NO :** Repair the wiring harness.

**STEP 10. Connector check: C-316 ETACS-ECU connector**

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

**YES :** Go to Step 11.

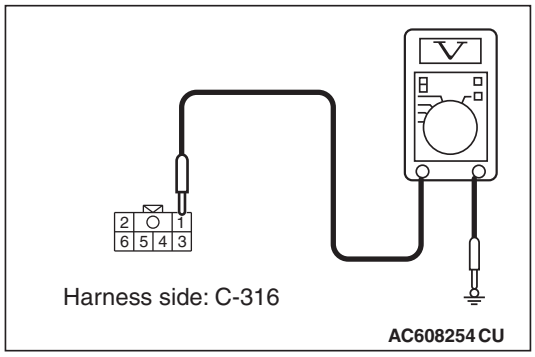
**NO :** Repair the damaged connector.

**STEP 11. Measure the voltage at the C-316 ETACS-ECU connector.**

(1) Disconnect the connector, and measure the voltage at the wiring harness side.

(2) Measure the voltage between C-316 ETACS-ECU connector terminal No. 1 and body ground.

**OK: Battery positive voltage**




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

**YES :** Replace the Lighting control sensor.

**NO :** Go to Step 12.

**STEP 12. Check the wiring harness between C-316 ETACS-ECU connector terminal No.1 and D-39 lighting control sensor connector terminal No.3.**

- Check the input and output lines for open or short circuit.

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

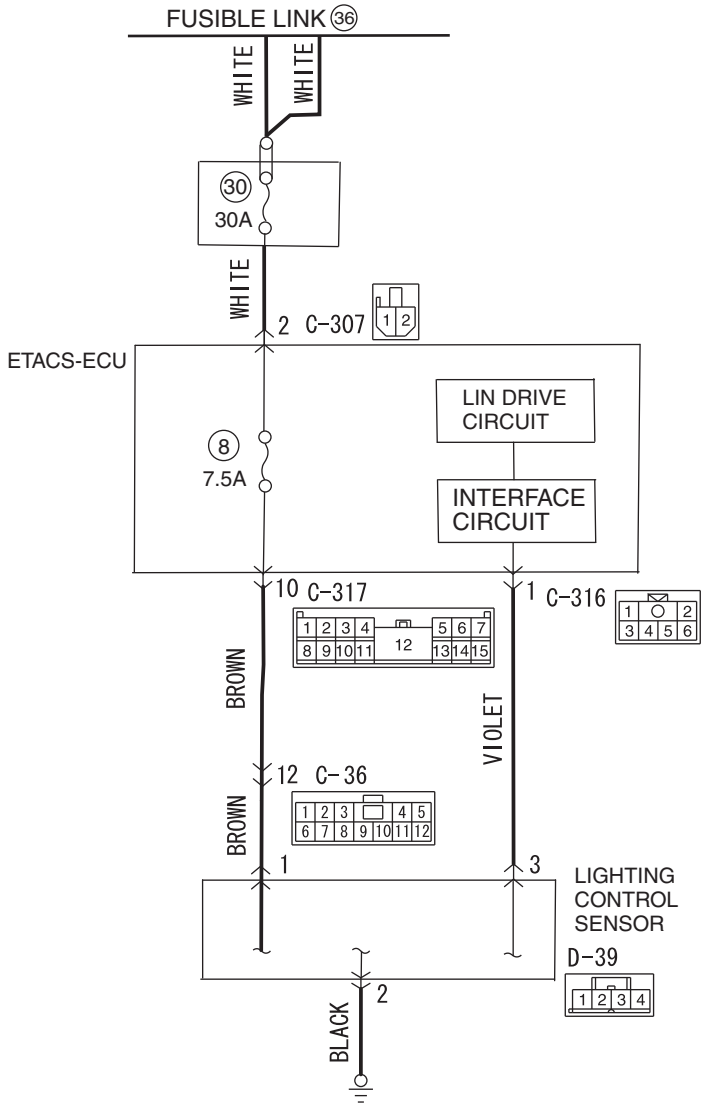
**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15.)

**NO :** Repair the wiring harness.

**INSPECTION PROCEDURE 8: The rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>.**

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

**Raindrops Sensing Wiper Function Control Circuit**

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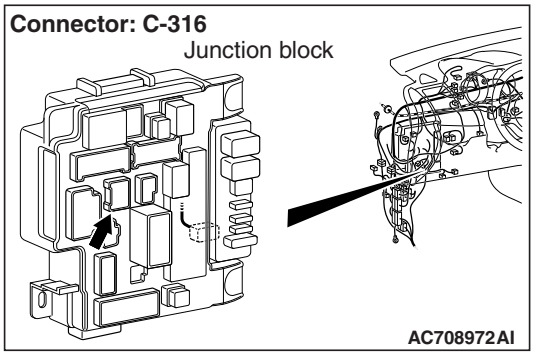


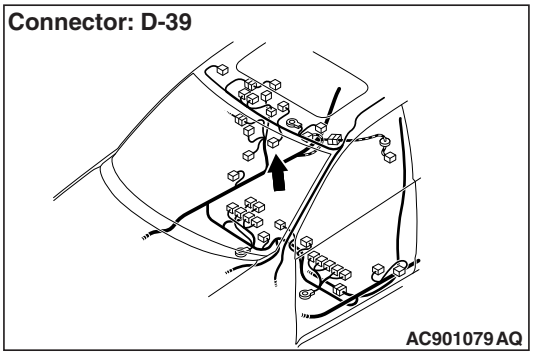


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## TECHNICAL DESCRIPTION (COMMENT)

The lighting control sensor, the harness connector, or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- Malfunction of the lighting control sensor
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**STEP 1. Lighting control sensor installation surface check**

Visually check the presence of scratches or air bubbles [(diameter of 5.0 mm(0.2 in) or more] on the windshield to which the lighting control sensor is installed.

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

**YES :** Go to Step 2.

**NO :** Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation P.42A-15).

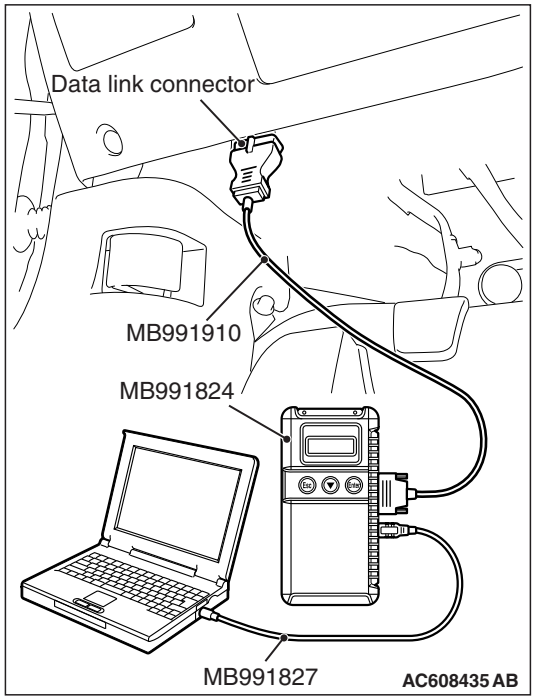
**STEP 2. Windshield wiper operation check**

Check that the windshield wipers work normally.

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

**YES :** Go to Step 3.

**NO :** Refer to Inspection procedure 3 P.51-41.




**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 4.

**STEP 4. Using scan tool MB991958, read the lighting control sensor diagnostic trouble code.**

Check if a lighting control sensor diagnostic trouble code is set. Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the lighting control sensor. [Diagnosis Code: (Refer to GROUP 54A –Diagnosis Code Chart P.54A-132) or service data (P.51-73).]

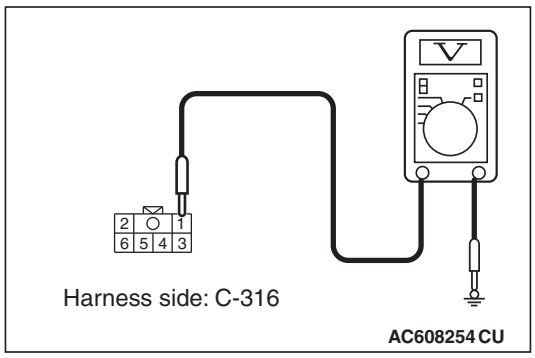
**NO :** Go to Step 5.

**STEP 5. Connector check: C-316 ETACS-ECU connector**

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

**YES :** Go to Step 6.

**NO :** Repair the damaged connector.




**STEP 6. Measure the voltage at the C-316 ETACS-ECU connector.**

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Measure the voltage between C-316 ETACS-ECU connector terminal No. 1 and body ground.

**OK: Battery positive voltage**

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

**YES :** Replace the Lighting control sensor.
**NO :** Go to Step 7.

**STEP 7. Check the wiring harness between C-316 ETACS-ECU connector terminal No.1 and D-39 lighting control sensor connector terminal No.3.**

- Check the input and output lines for open or short circuit.

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15.)
**NO :** Repair the wiring harness.

**INSPECTION PROCEDURE 9: Sometimes the rain sensitive AUTO wiper function works even though there is no rainfall < Vehicles with lighting control sensor>.**

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

## TECHNICAL DESCRIPTION (COMMENT)

The lighting control sensor may be defective or a failure in the lighting control sensor (rain sensor) adaptation is suspected.

## TROUBLESHOOTING HINTS

- Malfunction of the lighting control sensor
- Lighting control sensor (rain sensor) adaptation failure

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**STEP 1. Lighting control sensor (rain sensor) installation surface check**

Visually check the presence of scratches or air bubbles [(diameter of 5.0 mm(0.2 in) or more] on the windshield to which the lighting control sensor is installed.

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

**YES :** Go to Step 2.

**NO :** Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation P.42A-15).

**STEP 2. Windshield wiper operation check**

Check that the windshield wipers work normally.

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

**YES :** Go to Step 3.

**NO :** Refer to Inspection procedure 3 P.51-41.

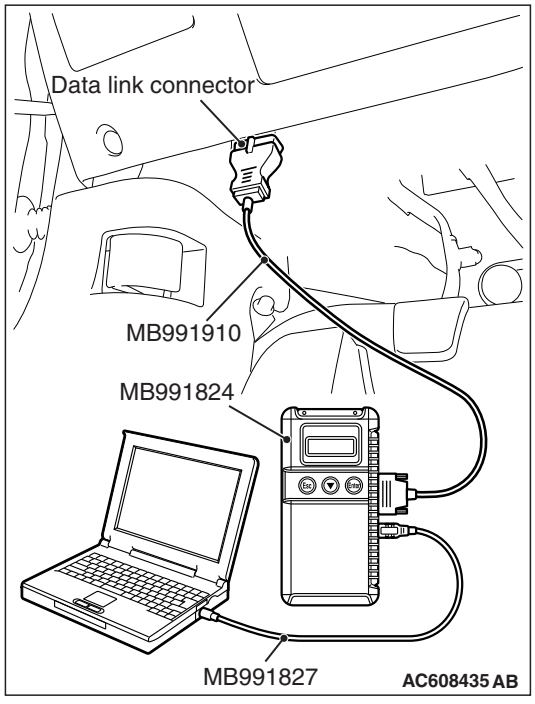
**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 4.




**STEP 4. Using scan tool MB991958, read the lighting control sensor diagnostic trouble code.**

Check if a lighting control sensor diagnostic trouble code is set. Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the lighting control sensor. [Diagnosis Code: (Refer to GROUP 54A –Diagnosis Code Chart P.54A-132) or service data (P.51-73).]

**NO :** Go to Step 5.

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**STEP 5. Lighting control sensor (rain sensor) installation surface check**

Check that the lighting control sensor (rain sensor) is installed to the windshield glass firmly.

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

**YES :** Go to Step 6 after completion of the lighting control sensor (rain sensor) adaptation (P.51-84).

**NO :** Install the lighting control sensor (rain sensor) to the windshield glass correctly (Refer to GROUP 54A – Lighting control sensor removal and Installation P.54A-222).

**STEP 6. Retest the system.**

Check the lighting control sensor (rain sensor) after completion of the lighting control sensor (rain sensor) adaptation

(1) Check that the windshield glass surface is dry.

(2) Pour the windshield glass surface where the lighting control sensor is installed.

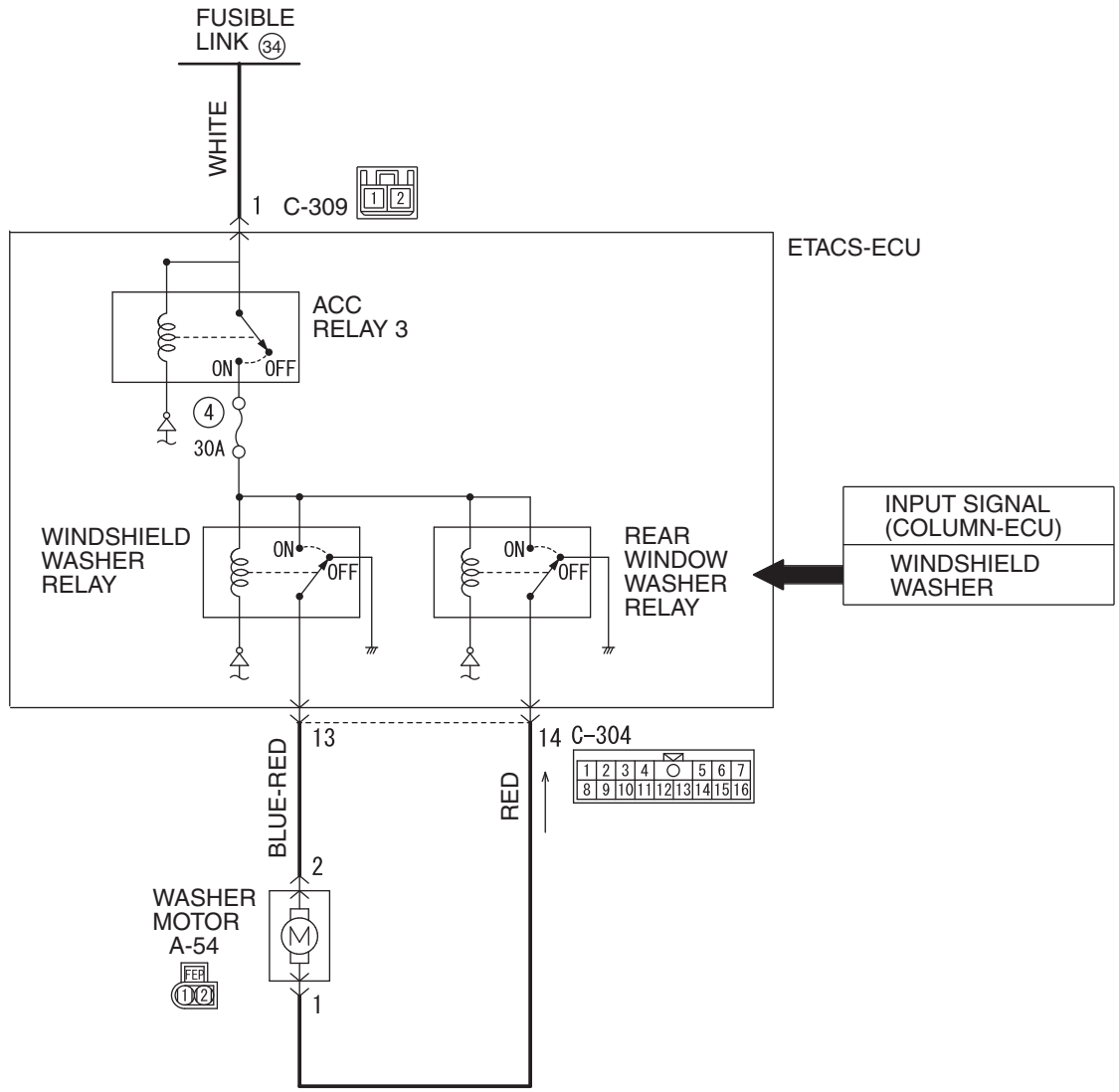
**Q: Does the windshield wiper operate?**

**Operate one or more :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

**Does not operate :** Troubleshoot the rain sensitive wiper function (Refer to Inspection procedure 7 P.51-55).

## INSPECTION PROCEDURE 10: The windshield washer does not work normally.

**Windshield Washer Motor Circuit**

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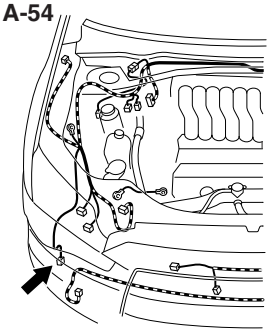
**Connector: A-54**



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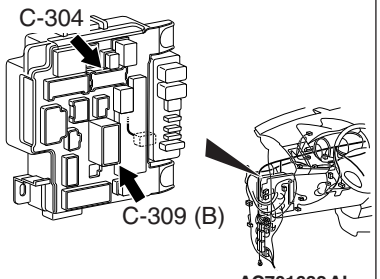
**Connectors: C-304, C-309**

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## CIRCUIT OPERATION

The windshield washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a windshield washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the washer motor to be turned on.

## TECHNICAL DESCRIPTION (COMMENT)

If the windshield washer does not work normally, the washer motor, the column switch (windshield wiper and washer switch) or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The washer motor may be defective
- The column switch may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**STEP 1. Verify the windshield wiper operation.**

**Q: Does the windshield wiper operate normally?**

**YES :** Go to Step 2.

**NO :** Refer to Inspection Procedure 1 "The windshield wipers do not work at all P.51-34?."

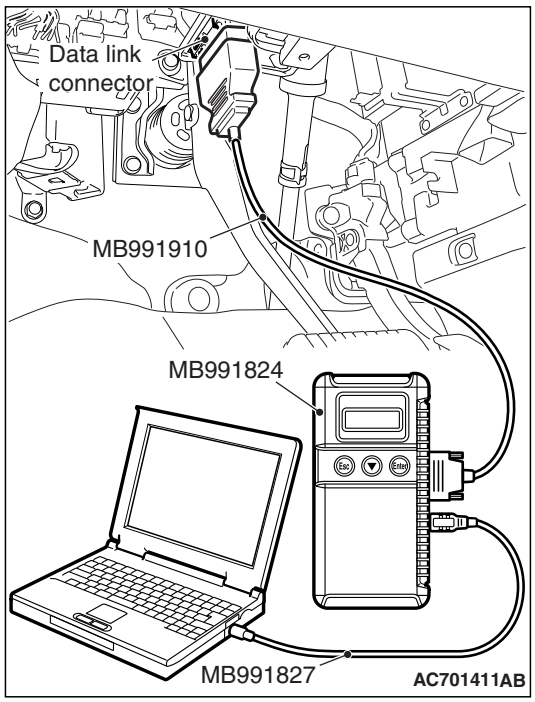
**STEP 2. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 3.



**STEP 3. Check the input signal related to the windshield washer operation.**

- Ignition switch: ACC
- Windshield washer switch: ON

| Item No. | Item name | Normal condition |
|---|---|---|
| Item 237 | Front washer | ON |

**OK: Normal condition is displayed.**

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

**NO :** Go to Step 4.

**YES :** Refer to GROUP 54A –ETACS, Input Signal Procedures P.54A-796.

**STEP 4. Check windshield washer motor connector A-54 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

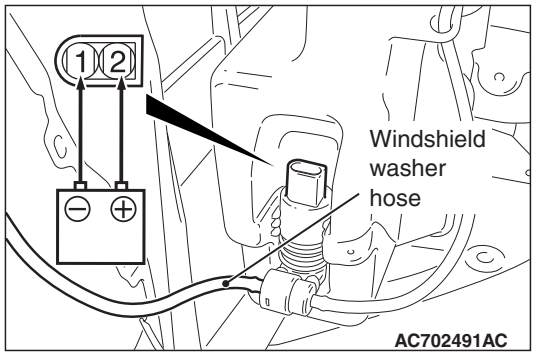
**Q: Is windshield washer motor connector A-54 in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

**STEP 5. Check the operation of windshield washer motor.**

(1) Disconnect windshield washer motor connector A-54 and check at windshield washer motor connector side.
(2) Fill the windshield washer tank with washer fluid.
(3) When battery voltage is applied between terminals 1 and 2, washer fluid should spray out.




**Q: Does the washer motor operate normally?**

**YES :** Go to Step 6.

**NO :** Replace the washer motor. Verify that the windshield washer works normally.

**STEP 6. Check the operation of rear washer.**

Check that rear washer works.

**Q: Does the rear washer operate normally?**

**YES :** Go to Step 7.

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

**STEP 7. Check ETACS-ECU connector C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

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

**YES :** Go to Step 8.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield washer works normally.

**STEP 8. Check the wiring harness between windshield washer motor connector A-54 (terminal 2) and ETACS-ECU connector C-304 (terminal 13).**

- Check the input lines for open or short circuit.

**Q: Is the wiring harness between windshield washer motor connector A-54 (terminal 2) and ETACS-ECU connector C-304 (terminal 13)in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and Wire Check P.00E-12.

**STEP 9. Check the wiring harness between windshield washer motor connector A-54 (terminal 1) and ETACS-ECU connector C-304 (terminal 14).**

- Check the input lines for open or short circuit.

**Q: Is the wiring harness between windshield washer motor connector A-54 (terminal 1) and ETACS-ECU connector C-304 (terminal 14) in good condition?**

**YES :** Go to Step 10.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and Wire Check P.00E-12.

**STEP 10. Retest the system.**

Check that the windshield washers work normally.

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

**YES :** Intermittent malfunction. Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15.

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

**Inspection Procedure 11: The intelligent washing function does not work normally.**

**⚠ CAUTION**
**Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**

## TECHNICAL DESCRIPTION (COMMENT)

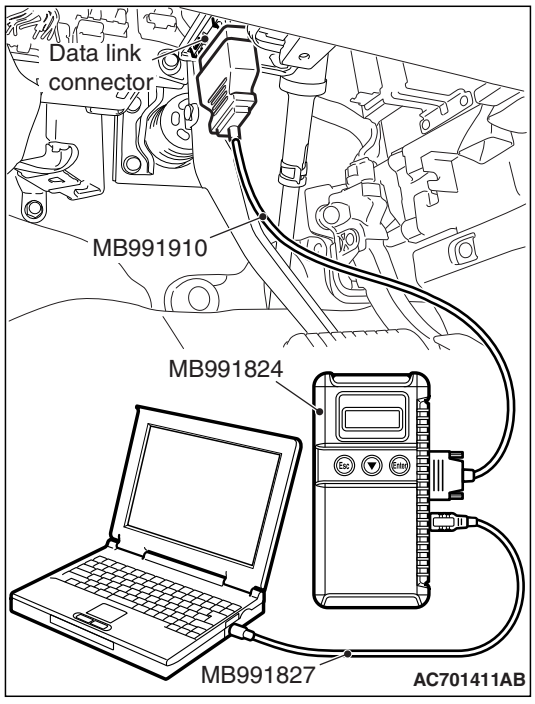
If the intelligent washer function does not work normally, the windshield wiper switch input circuit(s), the windshield washer switch input circuit(s) and ETACS-ECU may have a problem.

## TROUBLESHOOTING HINTS

- Malfunction of column switch
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

## DIAGNOSIS

**Required Special Tools:**
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**
Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."
**NO :** Go to Step 2.

**STEP 2. Check the ETACS customization function.**
Use the ETACS-ECU customization function to check that the "intelligent washer" is set to "Enabled."

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

**YES :** Go to Step 3.
**NO :** Use the ETACS-ECU customization function to set "intelligent washer" to "Enabled." (Refer to P.51-75.)

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**STEP 3. Windshield wiper operation check**
Check that the windshield wipers work normally.

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

**YES :** Go to Step 4.
**NO :** Refer to trouble symptom chart P.51-33.

**STEP 4. Windshield washer operation check**
Check that the windshield washer works normally.

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

**YES :** Go to Step 5.
**NO :** Refer to Inspection Procedure 10 "The windshield washer does not work normally P.51-66."

**STEP 5. System retest**
Check that the intelligent washer function works normally.

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

**YES :** Intermittent malfunction (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.)
**NO :** Replace the ETACS-ECU.

## Inspection Procedure 12: Delayed finishing wipe function does not work normally.

**⚠ CAUTION**
**Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**

### COMMENT ON TROUBLE SYMPTOM

If the delayed finishing wipe function does not properly operate, the input circuit of windshield wiper switch, the input circuit of windshield washer switch, or ETACS-ECU may be defective.

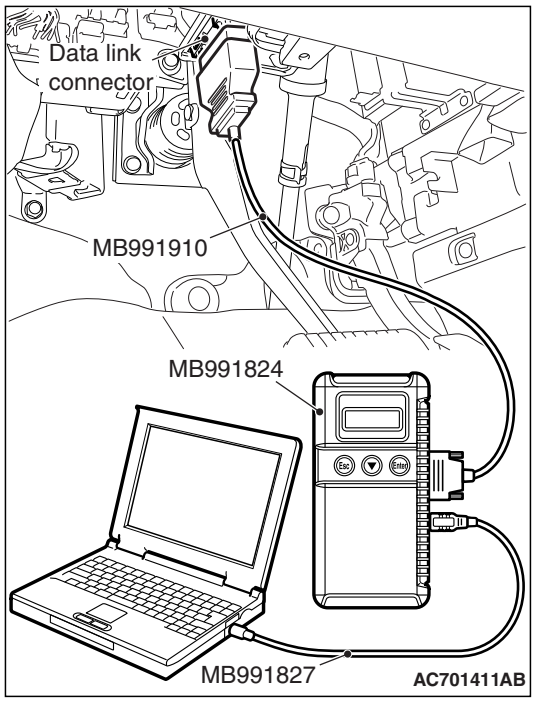
### PROBABLE CAUSES

- Malfunction of column switch
- Malfunction of ETACS-ECU
- Damaged harness wires and connectors

### DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**
Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."
**NO :** Go to Step 2.

**STEP 2. Check the ETACS-ECU customization function.**
Use the ETACS-ECU customization function to check that the "front wiper washer" is set to "On with delayed finishing wipe function."

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

**YES :** Go to Step 3.
**NO :** Use the ETACS-ECU customization function to set the "front wiper washer" to "On with delayed finishing wipe function." (Refer to P.51-75.)

**STEP 3. Windshield wiper operation check**
Check that the windshield wipers work normally.

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

**YES :** Go to Step 4.
**NO :** Refer to trouble symptom chart P.51-33.

**STEP 4. Windshield washer operation check**
Check that the windshield washers work normally.

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

**YES :** Go to Step 5.
**NO :** Refer to Inspection Procedure 10 "Windshield washers do not work normally P.51-66."

**STEP 5. Retest the system**
Check that the delayed finishing wipe function works normally.

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

**YES :** Intermittent malfunction. (Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-15.)

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

## DATA LIST REFERENCE TABLE

M1511015100048

## LIN (LIGHTING CONTROL SENSOR)

| Item No. | Scan tool display | Check condition | Normal condition |
|---|---|---|---|
| 7005 | RLS Rain sensor ON/OFF | When the wiper switch is AUTO position | ON |
| | | When a switch (except the wiper switch) is AUTO position | OFF |
| 7006 | RLS Rain sensor sensitivity | Changes from 1 to 5 according to the wiper volume. | 1, 2, 3, 4, 5 |
| 7008 | RLS Wiper auto stop SW | When the windshield wiper is in operation | Park |
| | | Other than above | Outside park |
| 7013 | RLS Wiper control output | When the operation is not requested from lighting control sensor (rain sensor). | OFF |
| | | When the LO operation is requested from lighting control sensor (rain sensor) | LO |
| | | When the HI operation is requested from lighting control sensor (rain sensor) | HI |
| 7020 | RLS RS measurement value(RS1) | When the lighting control sensor (rain sensor) detects raindrops | The sensor 1 detects raindrops and the value changes. |
| 7021 | RLS RS measurement value(RS2) | When the lighting control sensor (rain sensor) detects raindrops | The sensor 2 detects raindrops and the value changes. |
| 7022 | RLS RS adaptation value(RS1) | When initializing after the adaptation (sensor 1) | The amount of output when initializing (sensor 1) |
| 7023 | RLS RS adaptation value(RS2) | When initializing after the adaptation (sensor 2) | The amount of output when initializing (sensor 2) |
| 7024 | RLS RS adaptation gain level | When initializing after the adaptation | The calibrated value of initializing |

# ON-VEHICLE SERVICE

## WINDSHIELD INTERMITTENT WIPER INSPECTION

M1511023600145

1. Check that the intermittent wiper interval is changed as the windshield intermittent wiper volume is operated.
2. Turn the windshield intermittent wiper switch to the intermittent operation position. Use the scan tool to set a simulated vehicle speed with the wiper volume held. The intermittent wiper interval should be changed as the simulated vehicle speed is changed.
3. If either of above is defective, carry out the troubleshooting. (Refer to P.51-50)

## LIGHTING CONTROL SENSOR (RAIN SENSOR) INSPECTION

M1511028400049

Under clear weather (windshield glass is dry), turn the ignition switch to "ON" position and wiper switch to "AUTO" position. Check that the wiper works when applying water to the upper part of the windshield glass where the lighting control sensor is installed. If there is a malfunction, perform the troubleshooting (Refer to P.51-33).

## INTELLIGENT WASHING FUNCTION INSPECTION

M1511029600080

1. Operate the windshield washer switch for less than 0.35 second with the ignition switch in the ACC or ON position to check whether the intelligent washer function works normally.
2. If not, carry out the troubleshooting. (Refer to P.51-70.)

*NOTE: Check that the intelligent washer function is set to "Enabled" with the customization function. (Refer to P.51-75.)*

## DELAYED FINISHING WIPE FUNCTION INSPECTION

M1511029800040

1. When the washer lever of the column switch is operated for 0.5 second or longer with the ignition switch in the ACC or ON position, or when the intelligent washer function is enabled, the delayed finishing wipe function injects the washer fluid and operates the wiper. The wiper operates once for 6 seconds after the wiper operation is stopped. Check that the delayed finishing wipe function works normally.
2. If not, carry out the troubleshooting. (Refer to P.51-70.)

*NOTE: Check that the delayed finishing wipe function is set by the customization function. (Refer to P.51-75.)*

## CONFIGURATION FUNCTION

M1511027401306

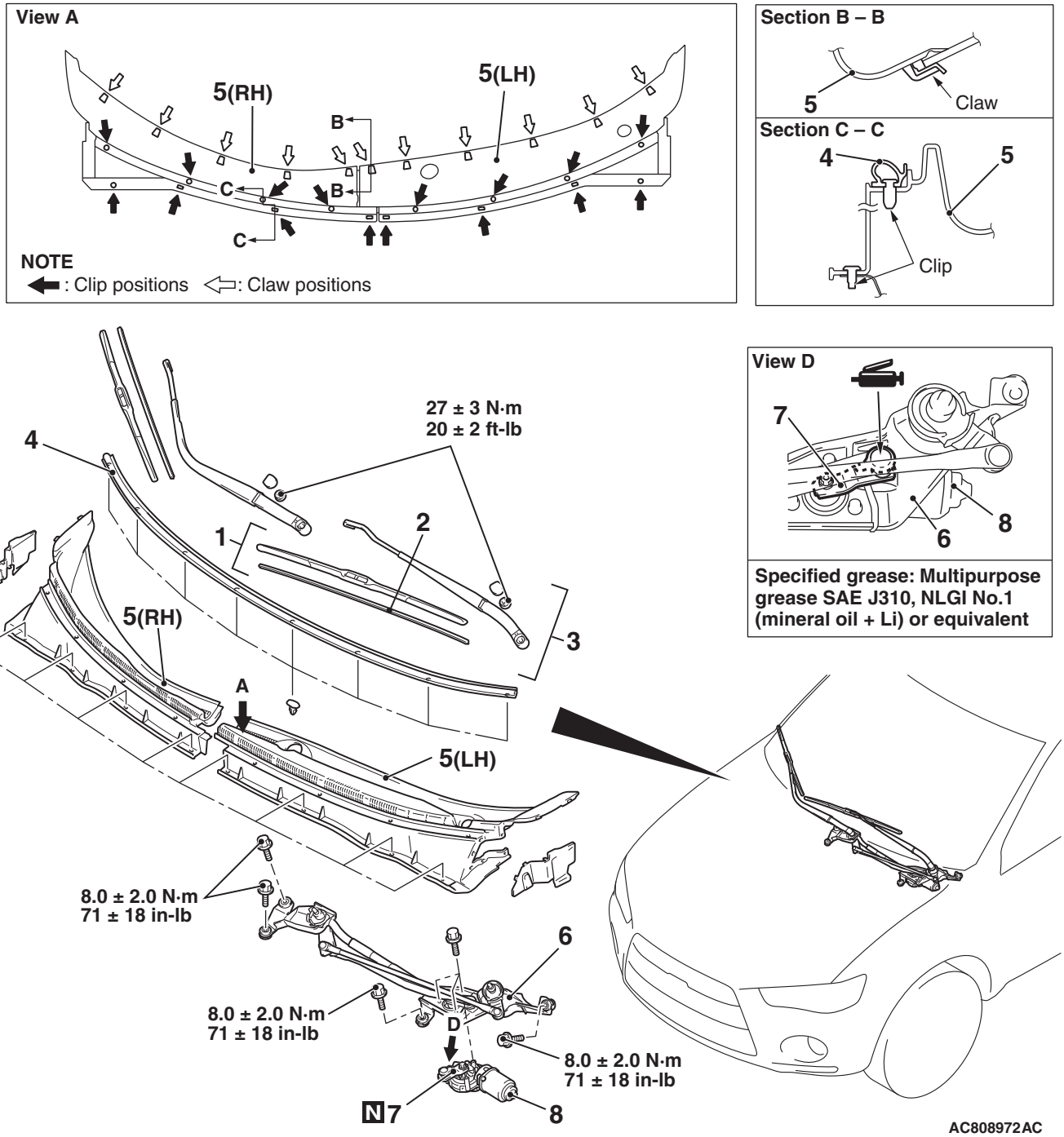
Using the ETACS system of scan tool MB991958, the following functions can be programmed. The programmed information is held even when the battery is disconnected.

| Adjustment item (scan tool MB991958 display) | Adjustment item | Adjusting contents (scan tool MB991958 display) | Adjusting contents |
|---|---|---|---|
| Front wiper operation | Adjustment of the intermittent windshield wiper operation <vehicles without auto light> | Normal INT | Intermittent wiper interval is fixed to 4 seconds. |
| | | Variable INT | Intermittent wiper interval is calculated only by the wiper volume control. |
| | | Speed Sensitive | Intermittent wiper interval is calculated according to the intermittent wiper volume control and vehicle speed (initial condition). |
| | Adjustment of the intermittent windshield wiper operation <vehicles with auto light> | Normal INT | Intermittent wiper interval is fixed to 4 seconds. |
| | | Variable INT | Intermittent wiper interval is calculated only by the wiper volume control. |
| | | Speed Sensitive | Intermittent wiper interval is calculated according to the intermittent wiper volume control and vehicle speed. |
| | | Rain Sensitive | Intermittent wiper interval is calculated according to the intermittent wiper volume control and lighting control sensor (initial condition). |
| Front wiper washer | Disabling or enabling washer-linked wiper function | Only Washer | No function |
| | | Washer & Wiper | With function: Without delayed finishing wipe function (Initial condition) |
| | | With after wipe | With function: With delayed finishing wipe function |
| Intelligent washer | With/without intelligent washer function | Disable | No function |
| | | Enable | With function (initial condition) |

# WINDSHIELD WIPER

## REMOVAL AND INSTALLATION

M1511007901213




**Wiper blade removal steps**

1. Wiper blade assembly

**>>C<<** 2. Wiper blade

**Windshield wiper motor and link assembly removal steps**

**>>B<<** 3. Wiper arm and blade assembly
4. Hood weatherstrip rear
5. Front deck garnish
6. Windshield wiper link

**Windshield wiper motor and link assembly removal steps**

7. Wiper motor link plate

**<<A>> >>A<<** 8. Windshield wiper motor

**Required Special Tool:**

- MB991955: M.U.T.-III sub-assembly
- MB991223: Harness set

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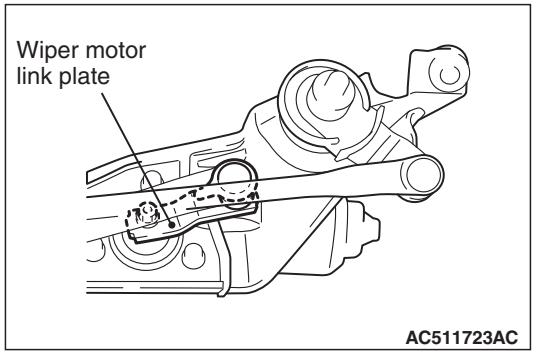
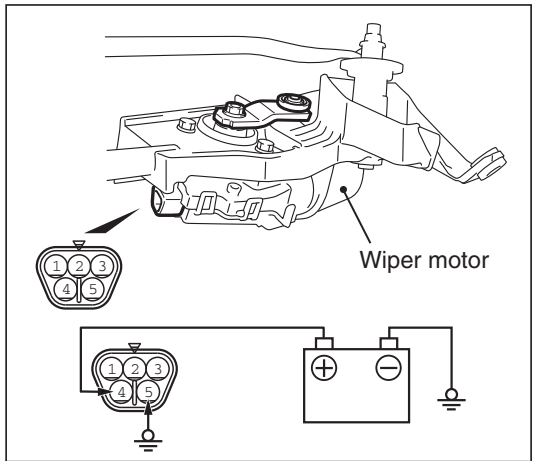
*NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54A, Column switch P.54A-328.*

## REMOVAL SERVICE POINT

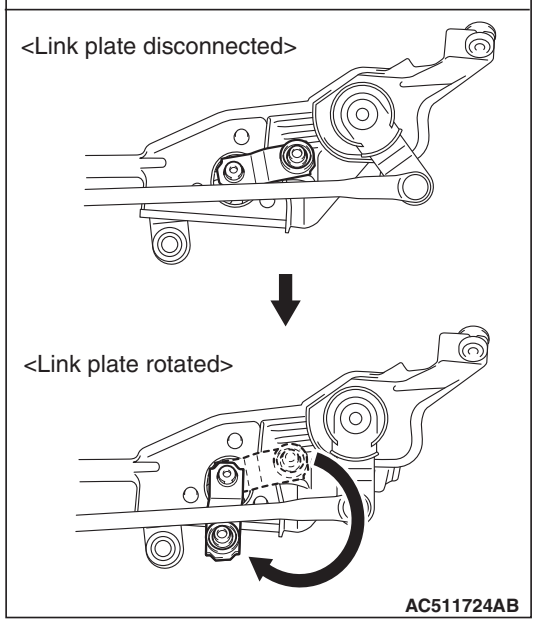
### <<A>> WINDSHIELD WIPER MOTOR REMOVAL

1. Remove the wiper link rod joint from the wiper motor link plate.
2. Connect the wiper motor to a battery, and rotate the link plate as shown.



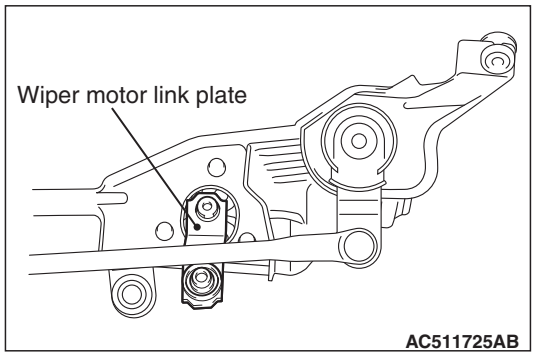




3. In this position, withdraw the link plate from the wiper link assembly.



## INSTALLATION SERVICE POINT

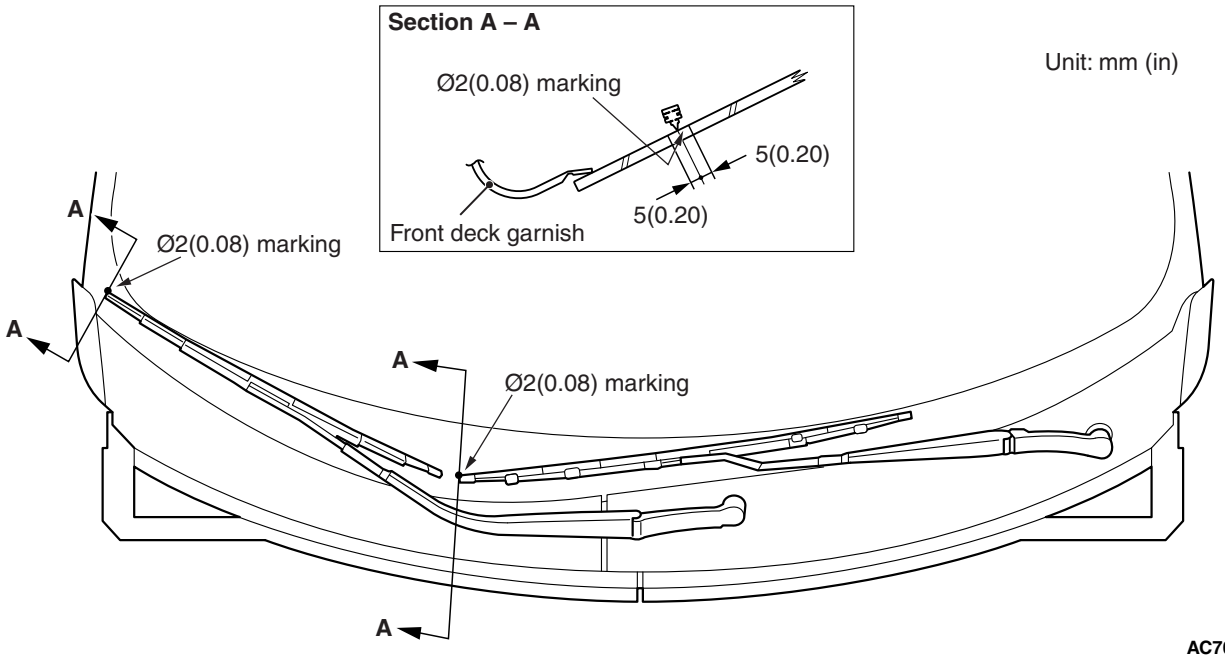
### >>A<< WINDSHIELD WIPER MOTOR INSTALLATION




1. Position the wiper motor link plate as shown, and assemble it to the wiper link assembly.

   *NOTE:*
   - *The link plate can be assembled to the wiper link assembly only at this position. If not, rotate the link plate to this position (Refer to Stop Position Check, P.51-79).*
   - *Wiper motor replacement parts are supplied with the link plate positioned as shown.*
2. Connect the assembled wiper motor to a battery, and set it to the automatic stop position (Refer to Stop Position Check, P.51-79).
3. Apply grease to the inside of link rod joint (as required) and connect the link rod to wiper motor link plate.

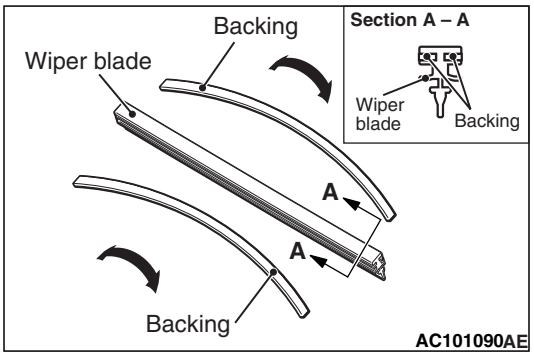
### >>B<< WIPER ARM AND BLADE ASSEMBLY INSTALLATION




Install the wiper arm and blade assembly at the specified positions.

**(A): ϕ2(0.08 in) marking ±5 mm(0.20 in)**

## >>C<< WIPER BLADE INSTALLATION




**⚠ CAUTION**

**Use a curved backing like that shown for the backing of a wiper blade to ensure sustained wiper wiping performance.**

## INSPECTION

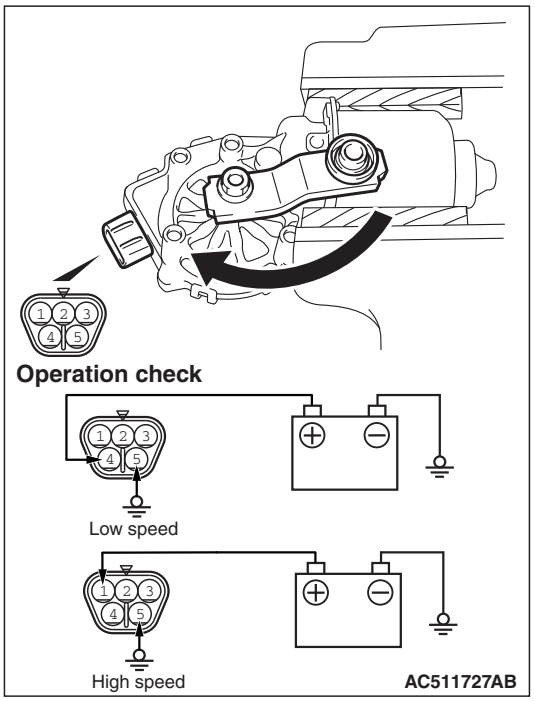
M1511019101991

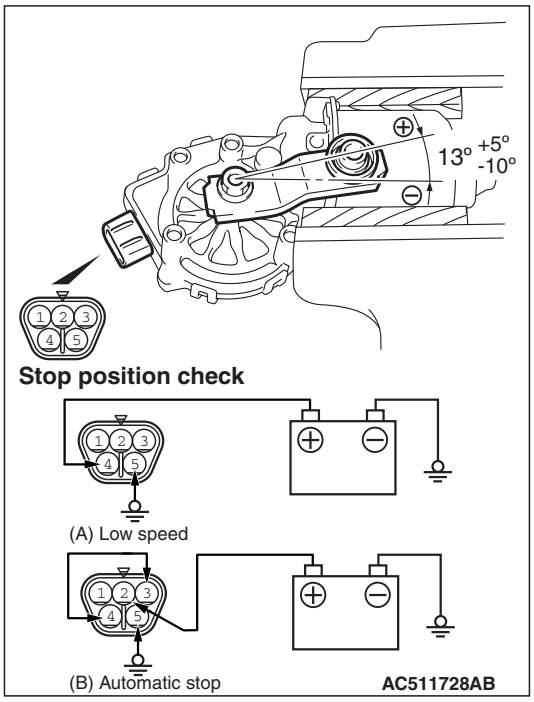
### WINDSHIELD WIPER MOTOR CHECK

Remove the windshield wiper motor and inspect it at the harness connector.

### WINDSHIELD WIPER MOTOR AT LOW OR HIGH SPEED OPERATION

Connect the battery to the windshield wiper motor to inspect the operation of motor rotation at low or high speed.






## WINDSHIELD WIPER MOTOR AT STOP POSITION OPERATION

1. Connect the battery to the windshield wiper motor as shown in the illustration (A).
2. Run the windshield wiper motor at low speed, then disconnect the battery in the middle of the motor rotation and check to see that the motor stops.
3. Connect the battery to the windshield wiper motor as shown in the illustration (B).
4. Connect the terminals of the windshield wiper motor connector as shown in the illustration (B).
5. Check to see that the windshield wiper motor runs at low speed and then stops at the automatic stop position.

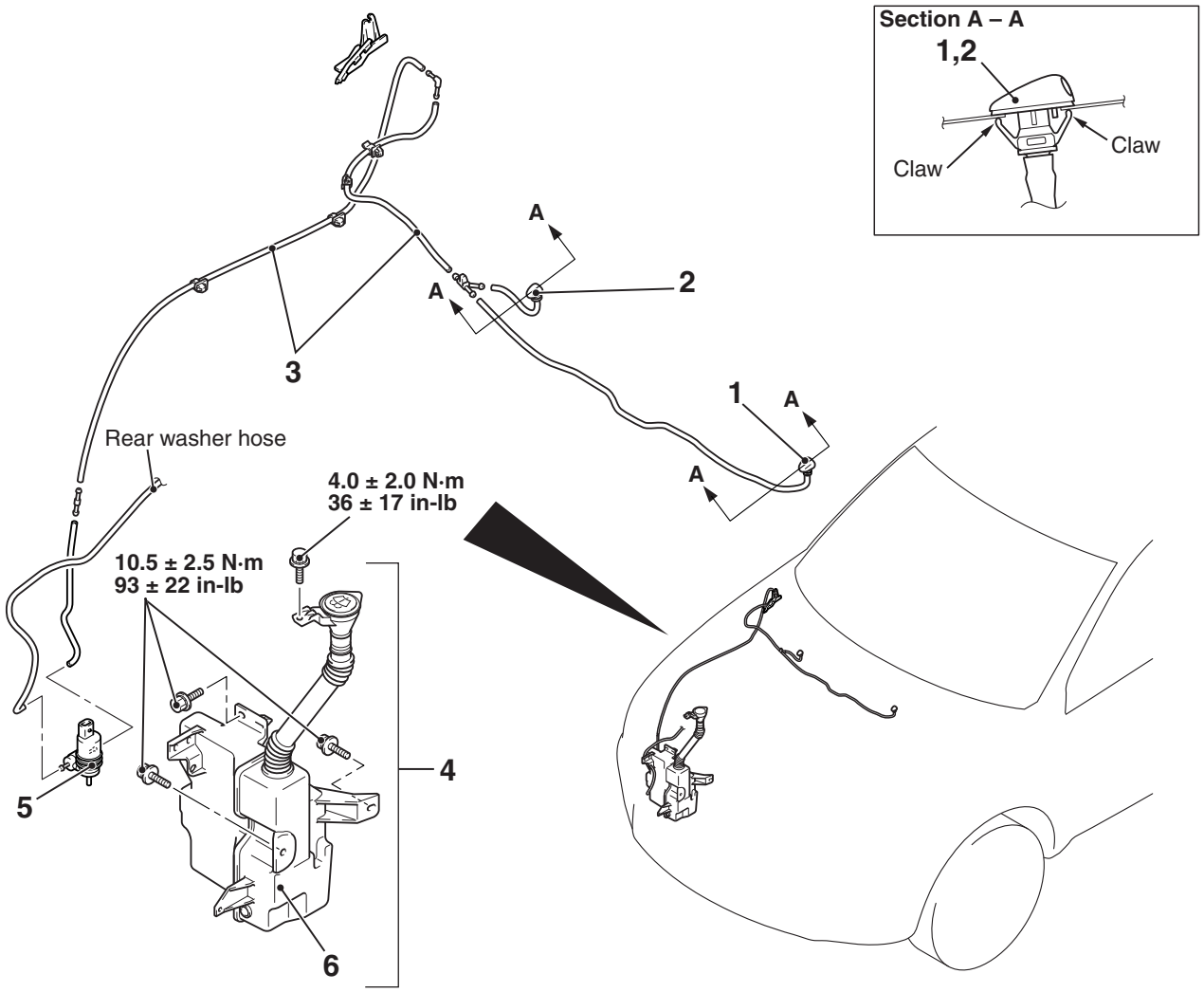
## WINDSHIELD WIPER SWITCH CHECK

Check the windshield wiper switch (mist, intermittent, low speed and high speed) from the ETACS diagnosis codes for proper operations.(Refer to GROUP 54A, Diagnostic trouble code chart P.54A-742.)

# WINDSHIELD WASHER

## REMOVAL AND INSTALLATION

M1511008201400




AC809563 AD

**Windshield washer nozzle removal steps**

- Connection of windshield washer hose

1. Windshield washer nozzle assembly <LH>
2. Windshield washer nozzle assembly <RH>

**Washer hose removal steps**

- Splash shield (RH) mounting clips
- Connection of washer nozzle/washer motor

3. Windshield washer hose

**Washer tank removal steps**

- Engine room under cover front (Refer to P.51-22)
- Splash shield (RH) mounting clips
- Connection of front/rear washer hose

4. Windshield washer tank assembly
5. Windshield washer motor
6. Windshield washer tank

**Washer motor removal steps**

- Engine room under cover front (Refer to P.51-22)
- Connection of front/rear washer hose

5. Windshield washer motor

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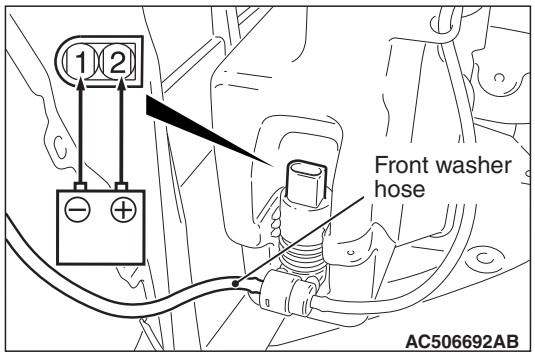
## INSPECTION

M1511019102897

### FRONT WASHER MOTOR INSPECTION

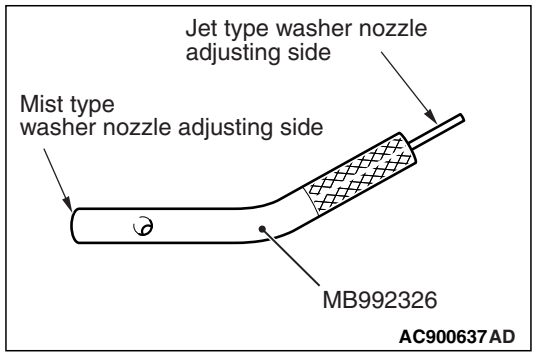



1. The front washer motor must be checked with the washer tank installed and the washer fluid filled.
2. Connect the battery to the washer motor connector as shown. Check that the washer motor delivers washer strongly to the front washer hose side.

### WINDSHIELD WASHER FLUID EJECTION CHECK

*NOTE: The splashing point cannot be adjusted by the nozzle. If the splashing point of the washer fluid is different from the figure below, replace the nozzle.*

*NOTE: Use special tool Adjustment tool, washer nozzle (MB992326) to adjust the splashing points of the nozzle.*




### ADJUSTMENT OF THE MIST TYPE WASHER NOZZLE INJECTION POSITION

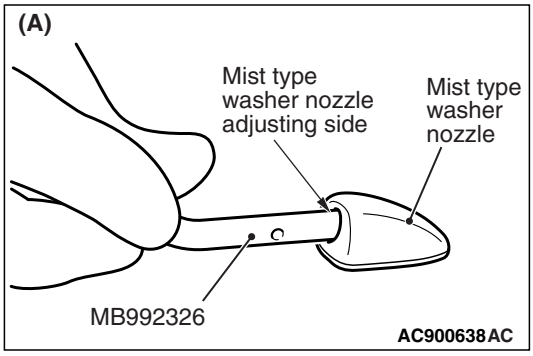
**⚠ CAUTION**

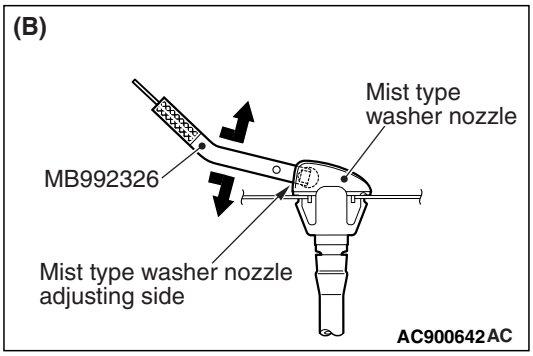
**Do not use tools other than the special tool (MB992326) to adjust the injection angle because the washer nozzle may get damaged.**

**⚠ CAUTION**

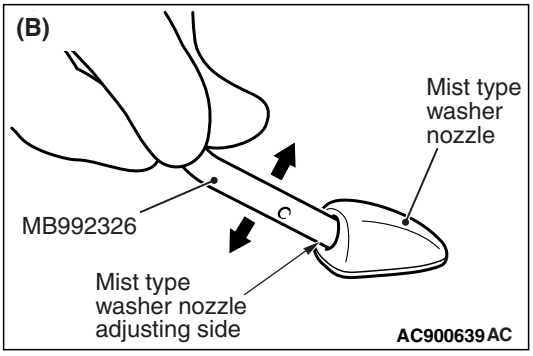
**Adjust the splashing position within the specified adjustment range, otherwise the windshield cannot be washed properly.**

1. Use special tool Adjustment tool, washer nozzle (MB992326) to adjust the splashing points of the nozzle.
2. Insert the mist type washer nozzle adjusting side of the special tool Adjustment tool, washer nozzle (MB992326) into the injection part of the mist type washer nozzle as shown in figure (A).

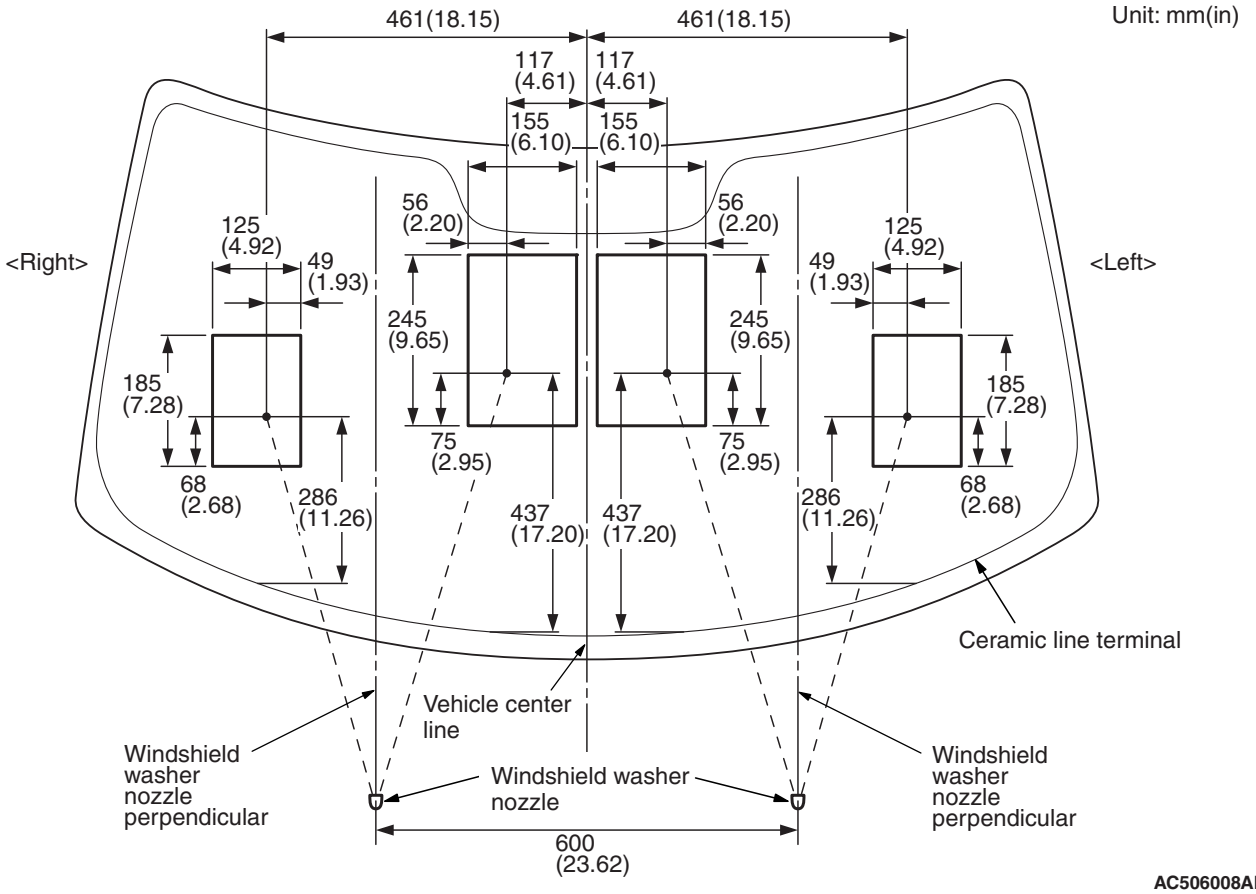



3. Move the special tool Adjustment tool, washer nozzle (MB992326) up and down to adjust the angle of the washer nozzle as shown in figure (B).




*NOTE: If the washer nozzle cannot be moved smoothly, adjust the angle while pressing the special tool Adjustment tool, washer nozzle (MB992326) against the washer nozzle.*




## WINDSHIELD WASHER SWITCH CHECK

Check the windshield washer switch from the ETACS diagnosis codes for proper operation.(Refer to GROUP 54A, ETACS P.54A-742)

# LIGHTING CONTROL SENSOR

## REMOVAL AND INSTALLATION

M1511028300020

Refer to GROUP 54A-Lighting control sensor (P.54A-222 ).

## ADAPTATION

M1511028600010

**⚠ CAUTION**

- **Before performing the adaptation, check if the lighting control sensor (rain sensor)-related diagnostic trouble code is set. (if set, refer to GROUP 54A, Headlight Diagnostic Trouble Code Chart P.54A-132).**
- **Turn the wiper switch to the OFF position.**

1. Clean the windshield in fine weather.
2. Wipe the surface of the windshield thoroughly, and check that the surface is dry.
3. Turn the ignition switch to the ON position.
4. Turn the ignition switch to the LOCK (OFF) position.

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⚠ CAUTION
**Before connecting or disconnecting scan tool MB991958, always turn the ignition switch to the LOCK (OFF) position.**

5. Connect the scan tool MB991958 to the data link connector.
6. Turn the ignition switch to the ON position.
7. Wipe the windshield surface of the lighting control sensor section thoroughly, and check that the surface is dry.
8. Select "LIN" on the "System Select" screen, and press the "OK" button.
9. Select "Rain light sensor" on the "System Select" screen, and press the "OK" button.
10. Select "Special Function" on the "Rain light sensor" screen.
11. Select "Rain Sensor Adaptation" on the "Special Function" screen.
12. Press the "OK" button, and execute the "Rain Sensor Adaptation."
13. Press the "OK" button after the execution screen is displayed.
14. Press the "OK" button after "Completed" is displayed.

# REAR WIPER AND WASHER

## GENERAL INFORMATION

M1511000101584

## REAR WIPER AND WASHER

## REAR WIPER OPERATION

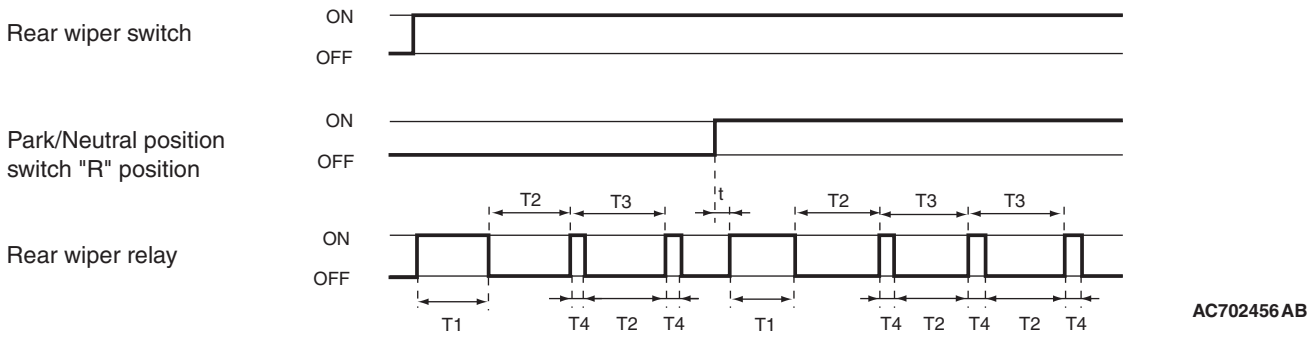
- If the rear wiper and washer switch is turned to the "INT" position with the ignition switch at "ACC" or "ON" position, the ETACS-ECU causes the rear wiper to operate continuously 2 times, then intermittently at 8-second intervals.
- If the selector lever (or gearshift lever) is moved to the "R" position when the rear wiper and washer switch is turned to the "INT" position and the ignition switch at "ACC" or "ON" position, the transmission range switch (or backup light switch) "R" turns ON. 1 second later, the ETACS-ECU causes the rear wiper to operate continuously 2 times to ensure good rearward visibility. The ETACS-ECU then causes the rear wiper to operate intermittently again at 8-second intervals.

## REAR WASHER OPERATION

- If the rear wiper and washer switch is turned to the ON (washer) position with the ignition switch at "ACC" or "ON" position, the rear washer ON signal is sent to the ETACS-ECU, causing the rear wiper signal to turn on after 0.9 second. After the rear washer switch signal turns off, the rear wiper signal turns off in 3 seconds.
- If the rear wiper and washer switch is turned to the ON (washer) position while the rear wiper is at intermittent mode, the rear washer works for that period when the washer switch remains on. Then the rear wiper returns to the intermittent mode.

## DESCRIPTION OF CONSTRUCTION AND OPERATION

### Rear wiper control [Initial condition: 8 seconds (without successive operations)]

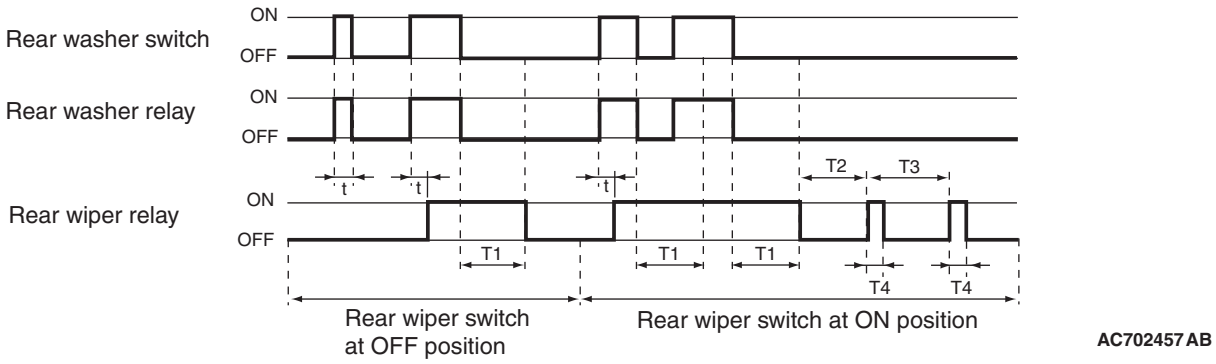



t: 1.0 second
T1: 3.0 seconds
T2: 7.4 seconds
T3: 8.0 seconds
T4: 0.6 second

1. When the rear wiper switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the rear wiper relay ON for 3 seconds (for approximately 2 cycles) and operates the intermittent action in 8 seconds interval.
   When the selector lever is moved to R (reverse) position during the rear wiper operation, the transmission range switch R (reverse) turns ON, and one second after that, ETACS turns the rear wiper relay ON for 3 seconds (for approximately 2 cycles), and operates the intermittent action in 8 seconds interval again.
2. By the special operation of the rear wiper switch on the column switch (2 consecutive operations), the rear wiper can operate continuously regardless on the set intermittent time.

*NOTE: Using the customization function, the rear wiper intermittent time can be adjusted. (Refer to P.51-100.)*

## Rear wiper linked with washer function Initial condition: with function




t : 0.3 second
T4 : 0.6 second
T1 : 3 seconds
T2 : 7.4 seconds
T3 : 8 seconds

When the rear washer switch on the column switch is turned ON while the ignition switch is in ACC or ON position, ETACS turns the rear washer relay ON. The rear washer relay turns ON after the rear washer switch has been ON for 0.3 seconds, then turns the rear wiper relay ON to operate the rear wiper simultaneously. When the rear washer switch is turned OFF, after 3 seconds the rear wiper is turned OFF.

If the rear washer switch is turned ON during the rear wiper operation, 7.4 seconds after turning OFF the rear wiper relay turns OFF, the intermittent action is resumed in 8 seconds interval.

*NOTE: Using the customization function, the washer linked rear wiper function can be invalidated. (Refer to P.51-100.)*

## SPECIAL TOOL

M1511000602690

| TOOL | TOOL NUMBER AND NAME | SUPERSESSION | APPLICATION |
|---|---|---|---|
| MB992326 | MB992326 Adjustment tool, washer nozzle | General service tool | Injection angle adjustment of the washer nozzle |

# REAR WIPER AND WASHER DIAGNOSIS

## TROUBLESHOOTING STRATEGY

M1511014600590

Gather the information from the customer.

1. Verify that the condition described by the customer exists.
2. Find the malfunction by the following Symptom Chart.
3. Verify the malfunction is eliminated.

## TROUBLE SYMPTOM CHART

M1511015000803

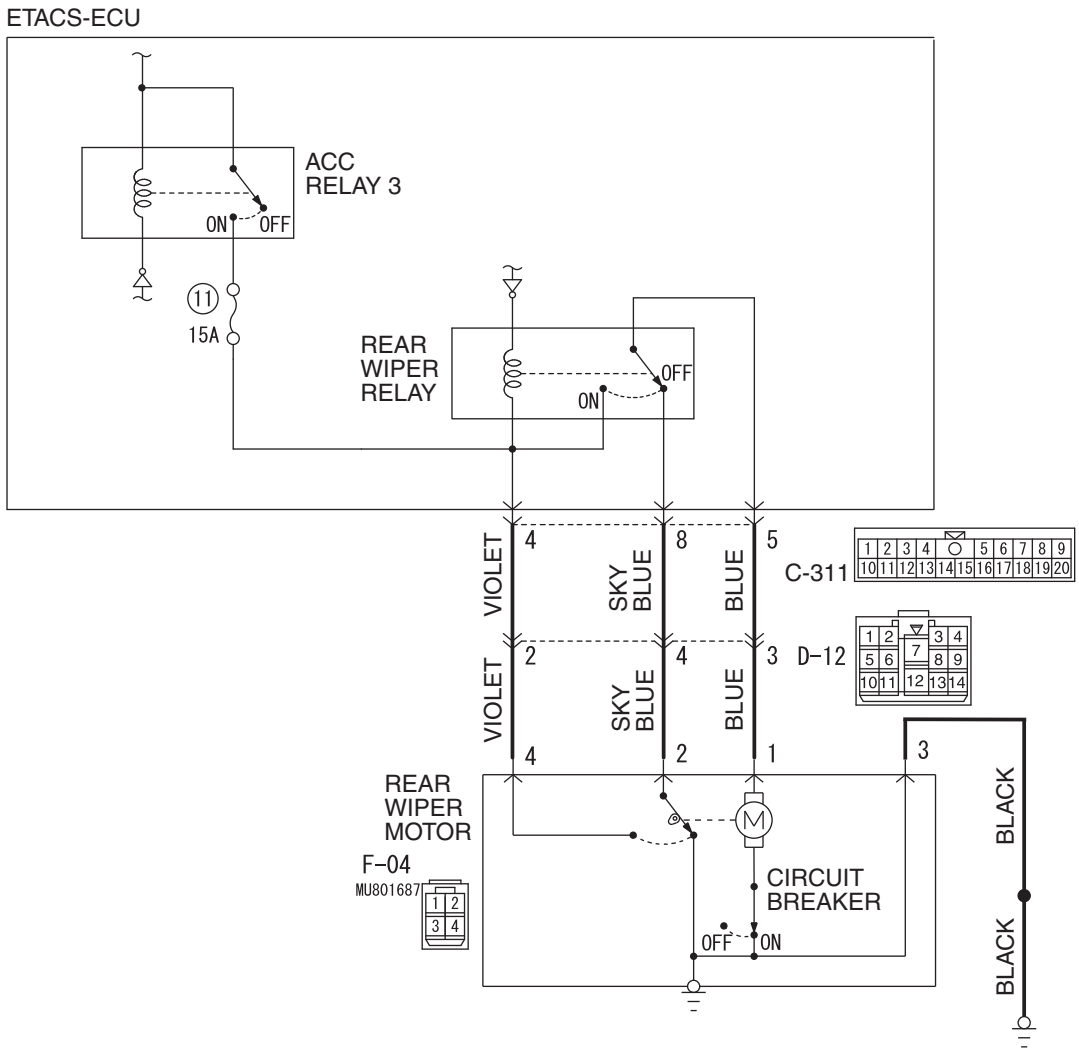
| TROUBLE SYMPTOM | Inspection procedure No. | Reference page |
|---|---|---|
| Rear wiper does not work at all | 1 | P.51-88 |
| Rear wiper does not stop at the specified park position | 2 | P.51-93 |
| When the selector lever is moved to "R" position during the rear wiper operation, the rear wiper does not operate at the continuous mode | 3 | P.51-96 |
| Rear washer does not work normally. | 4 | P.51-98 |

**TSB Revision**

# SYMPTOM PROCEDURES

## INSPECTION PROCEDURE 1: Rear wiper does not work at all.

**Rear Wiper Motor Circuit**

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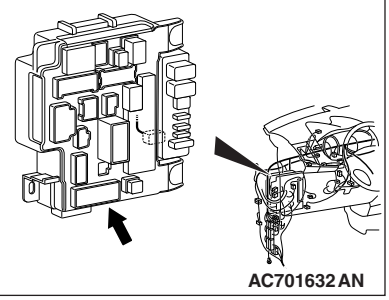
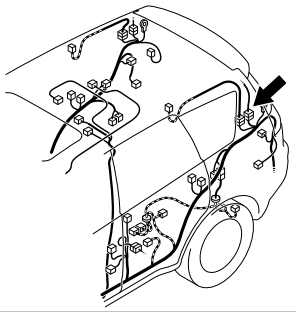
**Connector: C-311**



AC701632AN

**Connector: D-12**



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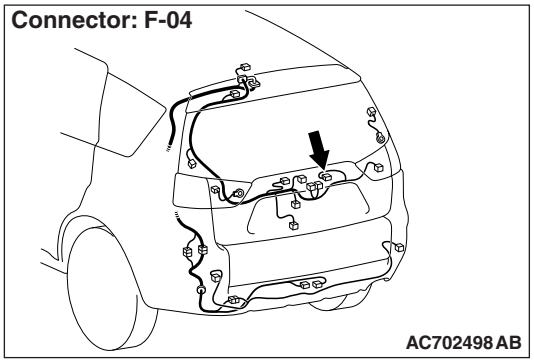
**TSB Revision**




## CIRCUIT OPERATION

- The rear wiper switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a rear wiper switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the rear wiper motor to be turned on.
- The ETACS-ECU operates the rear wiper according to the following switches:
  - Ignition switch (ACC)
  - Rear wiper switch

## TECHNICAL DESCRIPTION (COMMENT)

If the rear wiper does not work normally, the input circuit system from the switches, the rear wiper motor, the column switch (windshield wiper and windshield washer switch) or the ETACS-ECU may be defective.

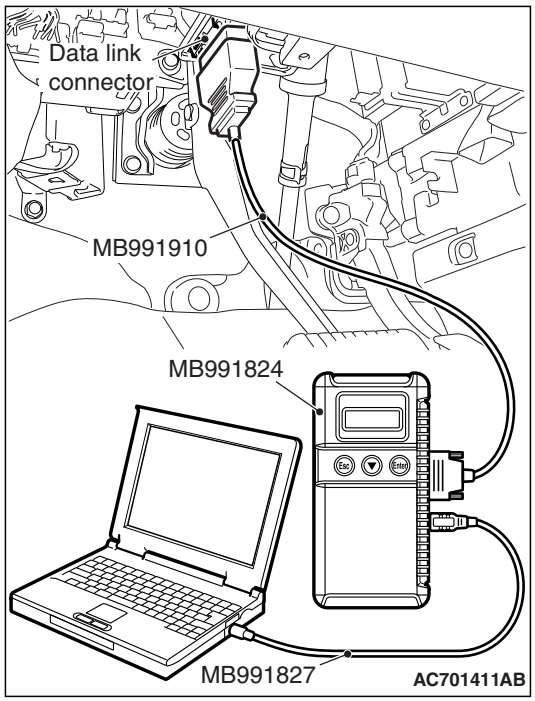
## TROUBLESHOOTING HINTS

- The rear wiper motor may be defective
- The column switch (windshield wiper and washer switch) may be defective
- The ETACS-ECU may be defective
- The wiring harness may be damaged or the connectors may have loose, corroded or damaged terminals, pushed back in the connector

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles communication interface (V.C.I.)
  - MB991827: M.U.T.-III USB cable
  - MB991911: M.U.T.-III Main harness B




**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 2.

**STEP 2. Check the input signal related to the rear wiper operation.**

- Ignition switch: ACC

| Item No. | Item name | Normal condition |
|---|---|---|
| Item 239 | Rear wiper | ON |
| Item 288 | ACC switch | ON |

**OK: Normal condition is displayed.**

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

**NO :** Go to Step 3.

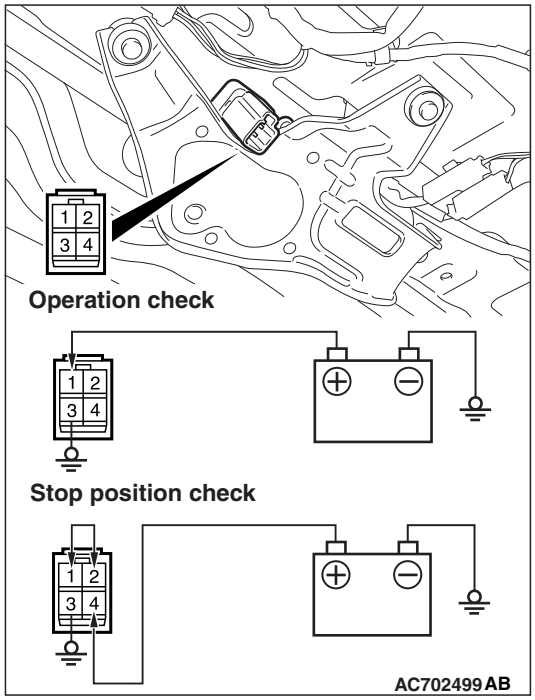
**YES :** Refer to GROUP 54A –ETACS, Input signal procedures P.54A-796.

**STEP 3. Check the rear wiper motor connector F-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear wiper motor connector F-04 in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear wiper works normally.

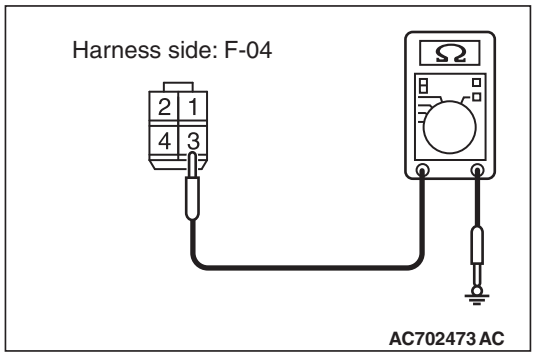



**STEP 4. Check the rear wiper motor.**

(1) Disconnect rear wiper motor connector F-04.
(2) Connect a battery to the wiper motor as shown in the illustration and inspect the motor operation.

**Q: Is the rear wiper motor in good condition?**

**YES :** Go to Step 5.
**NO :** Replace the rear wiper motor. Verify that the rear wiper works normally.




**STEP 5. Check the ground circuit to the rear wiper motor. Measure the resistance at the rear wiper motor connector F-04.**

(1) Disconnect rear wiper motor connector F-04 and measure the resistance available at the wiring harness side of the connector.
(2) Measure the resistance value between terminal 3 and ground.
- The resistance should be 2 Ω or less.

**Q: Is the measured resistance 2 Ω or less?**

**YES :** Go to Step 7.
**NO :** Go to Step 6.

**STEP 6. Check the wiring harness between rear wiper motor connector F-04 (terminal 3) and ground.**

**Q: Is the wiring harness between rear wiper motor connector F-04 (terminal 3) and ground in good condition?**

**YES :** No action is necessary and testing is complete.
**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the rear wiper works normally.

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**STEP 7. Check ETACS-ECU connector C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is ETACS-ECU connector C-311 in good condition?**

**YES :** Go to Step 8.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the rear wiper works normally.

**STEP 8. Check the wiring harness between rear wiper motor connector F-04 (terminal 1) and ETACS-ECU connector C-311 (terminal 5).**

*NOTE: Also check junction block connector D-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

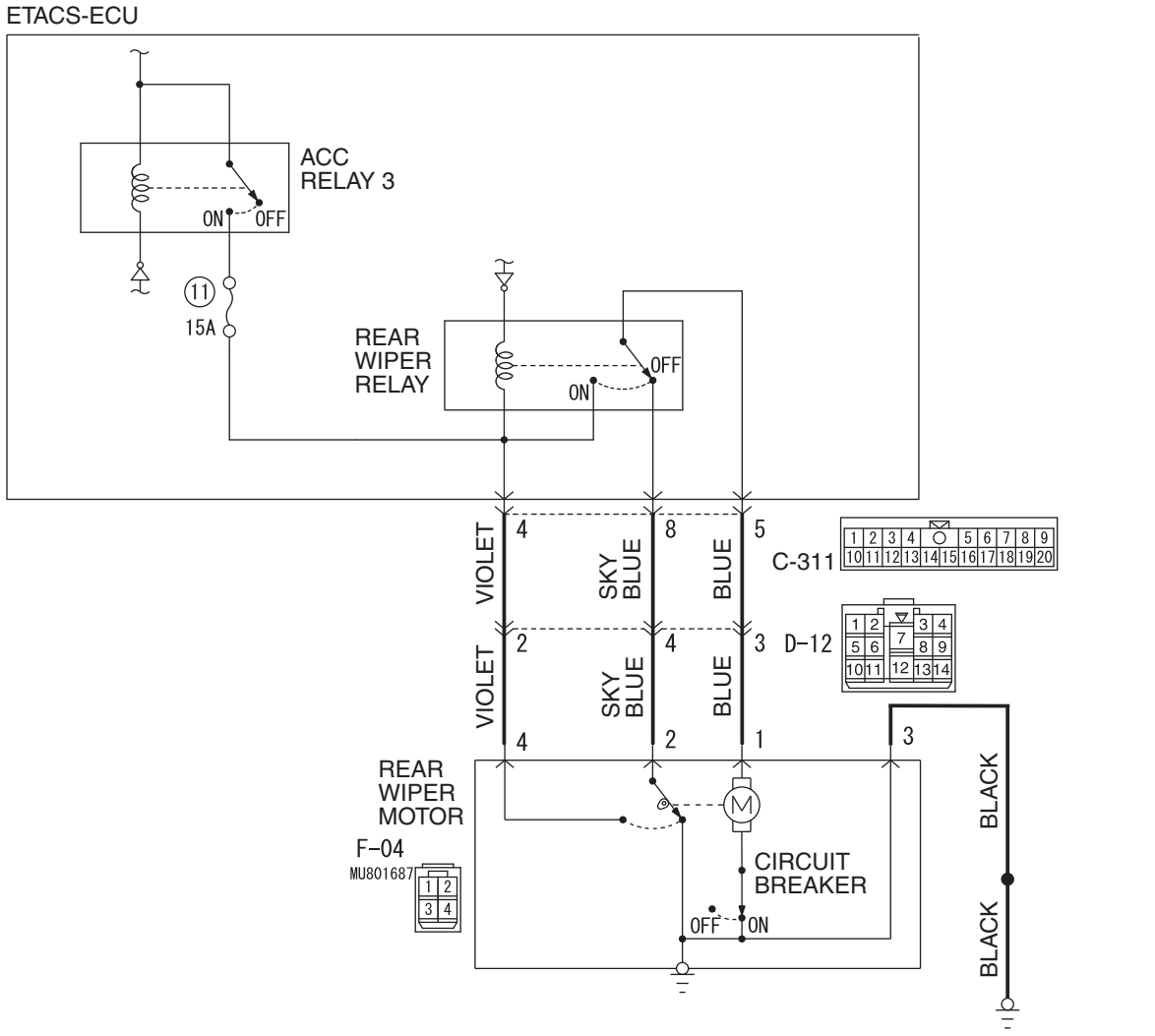
**Q: Is the wiring harness between rear wiper motor connector F-04 (terminal 1) and ETACS-ECU connector C-311 (terminal 5) in good condition?**

**YES :** Replace the ETACS-ECU. Verify that the rear wiper works normally.

**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the rear wiper works normally.

## INSPECTION PROCEDURE 2: Rear wiper does not stop at the specified park position.

**Rear Wiper Motor Circuit**

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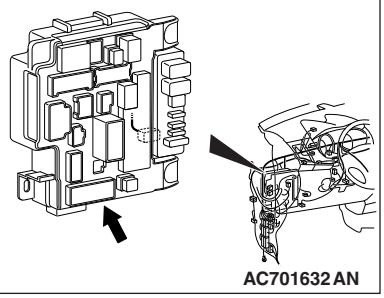
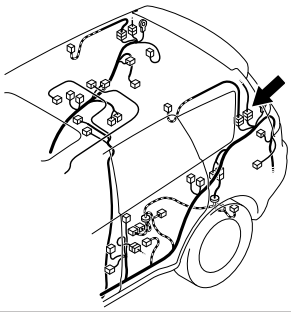
**Connector: C-311**



AC701632 AN

**Connector: D-12**



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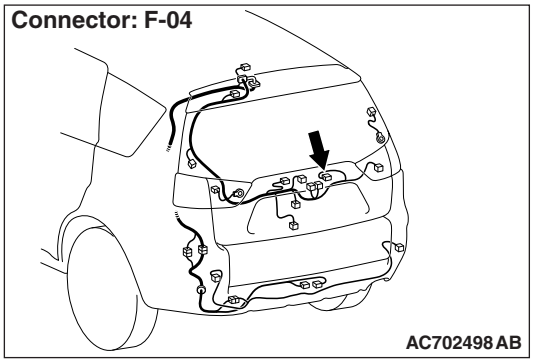
**TSB Revision**




## TECHNICAL DESCRIPTION (COMMENT)

If the rear wipers do not stop at predetermined park position, the rear wiper motor or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- The rear wiper motor may be defective
- The ETACS-ECU may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

## DIAGNOSIS

**Required Special Tools:**

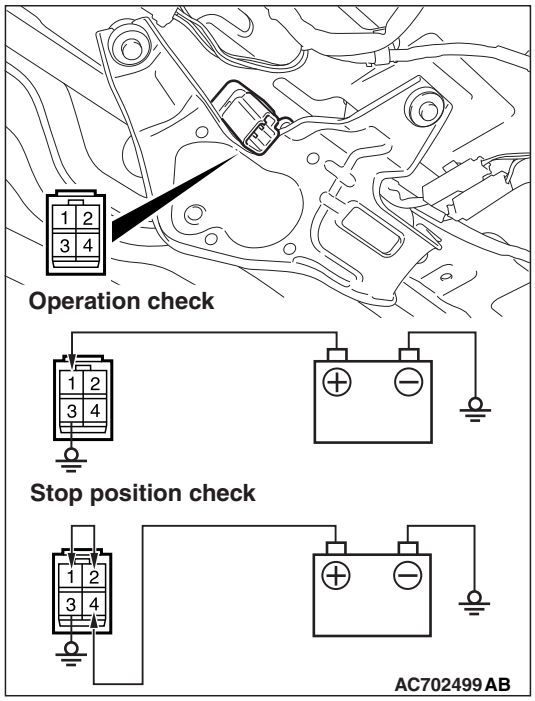
- MB991223: Harness Set
- MB992006: Extra Fine Probe

**STEP1. Check rear wiper motor connector F-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear wiper motor connector F-04 in good condition?**

**YES :** Go to Step 2.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.




**STEP 2. Check the rear wiper motor.**

(1) Disconnect rear wiper motor connector F-04.
(2) Connect the vehicle battery to the rear wiper motor connector as shown, and operate the rear wiper. While the rear wiper is working, disconnect the battery at positions other than the specified park position to stop the rear wiper motor.
(3) When the battery is connected as shown, the motor should run and then stop at the specified park position.

**Q: Does the rear wiper motor operate normally?**

**YES :** Go to Step 3.
**NO :** Replace the rear wiper motor. The rear wiper should now stop at the specified park position.

**STEP 3. Check rear wiper motor connector F-04 and ETACS-ECU connector C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear wiper motor connector F-04 and ETACS-ECU connector C-311 in good condition?**

**YES :** Go to Step 4.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

**STEP 4. Check the wiring harness between rear wiper motor connector F-04 (terminals 2,4) and ETACS-ECU connector C-311 (terminals 8, 4).**

*NOTE: Also check intermediate connector D-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.*

**Q: Is the wiring harness between rear wiper motor connector F-04 (terminals 2,4) and ETACS-ECU connector C-311 (terminals 8, 4) in good condition?**

**YES :** Go to Step 5.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Cables and wire check P.00E-12.

**STEP 5. Check the input signal related to the rear wiper operation.**

- Ignition switch: ACC or ON
- Rear wiper: In operation

| Item No. | Item name | Normal condition |
|---|---|---|
| Item 292 | Rear wiper auto-stop switch | ON |

*NOTE: Confirm that the scan tool displays ON to OFF when rear wiper stops at the specified park position.*

**OK: Normal condition is displayed.**

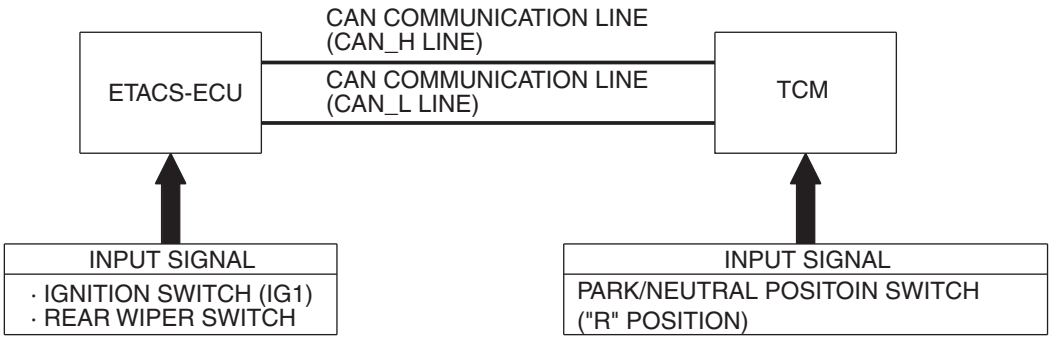
**Q: Is the check result normal?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

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

**INSPECTION PROCEDURE 3: When the selector lever is moved to "R" position during the rear wiper operation, the rear wiper does not operate at the continuous mode.**

**"R" Position During Wiper Operation Circuit**

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## CIRCUIT OPERATION

The ETACS-ECU operates the rear wiper consecutively when the selector lever is moved to "R" position while the rear wiper is turned on.

## TECHNICAL DESCRIPTION (COMMENT)

If the rear wiper does not work consecutively, the transmission range switch ("R" position) or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- The back-up light switch may be defective
- The ETACS-ECU may be defective
- The wiring harness may be damaged or the connectors may have loose, corroded or damaged terminals, pushed back in the connector

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles communication interface (V.C.I.)
  - MB991827: M.U.T.-III USB cable
  - MB991911: M.U.T.-III Main harness B

**STEP 1. Verify the rear wiper.**

Check that the rear wiper system works normally by operating the rear wiper switch.

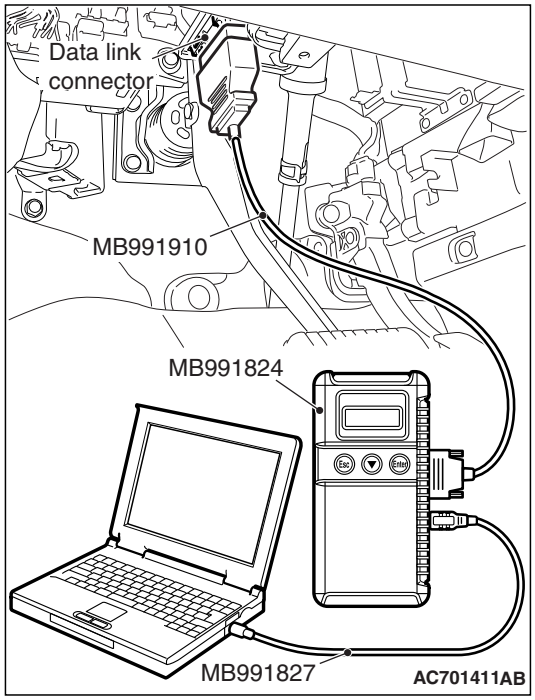
**Q: Does the rear wiper operate?**

**YES :** Go to Step 2.

**NO <Rear wiper does not work.> :** Refer to Inspection Procedure 1 "Rear wiper does not work at all P.51-88."

**STEP 2. Use the scan tool MB991958 to diagnose the CAN bus lines.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."




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

**YES :** Go to Step 3.

**NO :** Repair the CAN bus line (Refer to GROUP 54C –CAN bus diagnosis chart P.54C-17).

**STEP 3. Use the scan tool MB991958 to diagnose other system diagnostic trouble code**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

Check that the TCM sets a bus-off diagnostic trouble code.

**Q: Is the diagnostic trouble code set?**

**YES :** A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the TCM and the ETACS-ECU (Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

**NO :** Go to Step 4.

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**STEP 4. Retest the system.**

Check that the rear wiper operates continuously when the selector lever is moved to the R position during the rear wiper operation.

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

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

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

## INSPECTION PROCEDURE 4: Rear washer does not work normally.

### CIRCUIT OPERATION

The rear washer switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a rear washer switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the relay (incorporated in the ETACS-ECU), thus causing the windshield and rear washer motor to be turned on.

### TECHNICAL DESCRIPTION (COMMENT)

If the rear washer does not work normally, the windshield and rear washer motor, the column switch (windshield wiper and washer switch) or the ETACS-ECU may be defective.

### TROUBLESHOOTING HINTS

- The windshield and rear washer motor may be defective
- The column switch (windshield wiper, washer switch) may be defective
- The ETACS-ECU may be defective

### DIAGNOSIS

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles communication interface (V.C.I.)
  - MB991827: M.U.T.-III USB cable
  - MB991911: M.U.T.-III Main harness B

**STEP 1. Verify the windshield washers.**

**Q: Does the windshield washers operate?**

**YES :** Go to Step 2.

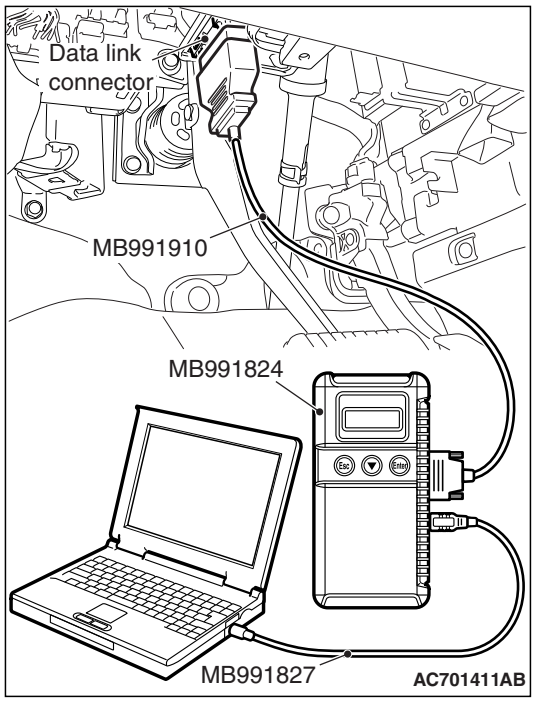
**NO :** Refer to Inspection Procedure 7 "Windshield washer does not work. P.51-66."

**STEP 2. Verify the rear wiper.**

**Q: Does the rear wiper operate?**

**YES :** Go to Step 3.

**NO :** Refer to Inspection Procedure 1 "Rear wiper does not work. P.51-88."




**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function P.54A-738."

**Q: Is the diagnostic trouble code set?**

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-742."

**NO :** Go to Step 4.

**STEP 4. Check the input signal related to the rear washer operation.**

- Ignition switch: ACC
- Rear washer switch: ON

| Item No. | Item name | Normal condition |
|---|---|---|
| Item 238 | Rear washer | ON |

**OK: Normal condition is displayed.**

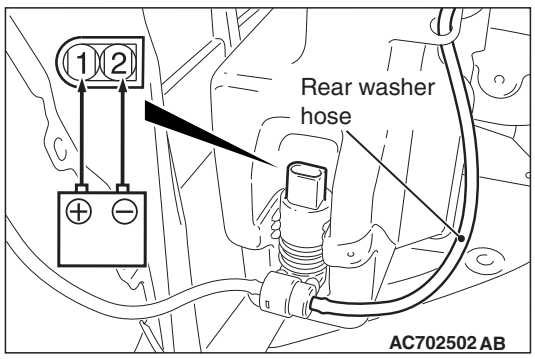
**Q: Is the check result normal?**

**NO :** Go to Step 5.

**YES :** Refer to GROUP 54A –ETACS, Input signal procedures P.54A-796.

**STEP 5. Check the washer motor.**

(1) Disconnect the washer motor connector A-54.
(2) Fill the windshield washer tank with washer fluid.
(3) When battery voltage is applied between terminals 1 and 2, washer fluid should spray out.




**Q: Does the washer motor operate normally?**

**YES :** Go to Step 6.

**NO :** Replace the washer motor. Verify that the rear washer works normally.

**STEP 6. Replace the ETACS-ECU, and then check its operation.**

Replace the ETACS-ECU, and then check that the rear washer works normally.

(1) Replace the ETACS-ECU.
(2) Ignition switch: ON
(3) The rear washer should now work normally.

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

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-15.

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

## ON-VEHICLE SERVICE

### OPERATION CHECK OF REVERSE GEAR-LINKED OPERATION OF REAR WIPER

M1511022600108

1. When the selector lever is moved to the "R" position with the rear wiper switch at the "INT" position, the wiper should operate twice or three times at low speed after approximately one second.
2. If not, carry out the troubleshooting. (Refer to P.51-50)

### CONFIGURATION FUNCTION

M1511027401317

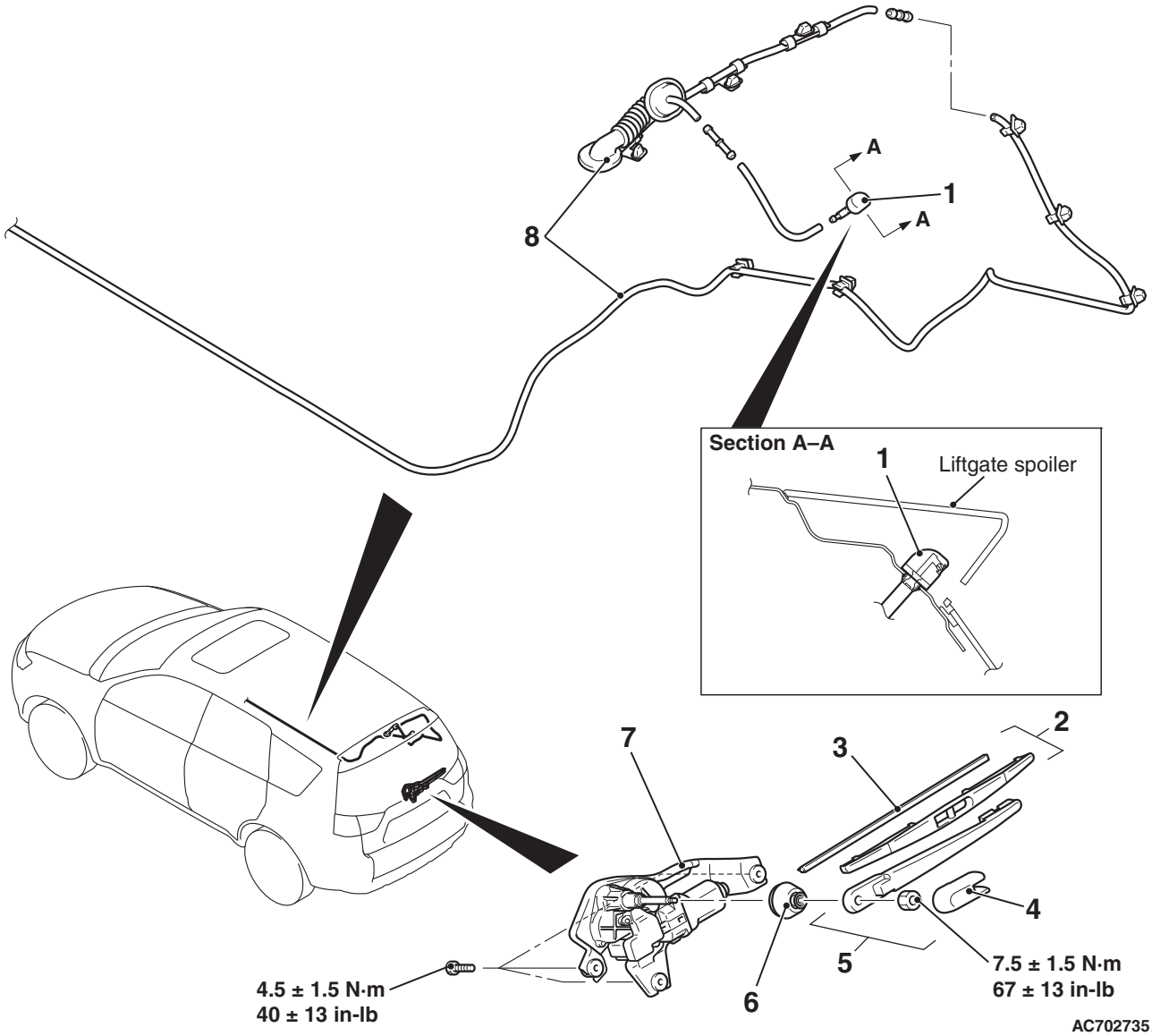
Using the ETACS system of scan tool MB991958, the following functions can be programmed. The programmed information is held even when the battery is disconnected.

| Adjustment item (scan tool MB991958 display) | Adjustment item | Adjusting contents (scan tool MB991958 display) | Adjusting contents |
|---|---|---|---|
| Intermittent time of rear wiper | Adjustment of rear wiper interval | 0 sec | No wiper interval |
| | | 4 sec | 4 seconds |
| | | 8 sec | 8 seconds (default) |
| | | 16 sec | 16 seconds |
| Rear wiper low speed mode | Disabling or enabling rear wiper continuous operation | Disabled | Without function (default) |
| | | Enabled | With function |

# REAR WIPER AND WASHER

## REMOVAL AND INSTALLATION

M1511008500873




- Washer tank (Refer to P.51-81)
- Washer motor (Refer to P.51-81)

**Rear washer nozzle removal steps**

- Liftgate spoiler (Refer to P.51-24)
- High-mounted stop light assembly (Refer to P.51-24)

1. Rear washer nozzle assembly

**Rear wiper blade removal steps**

2. Rear wiper blade assembly

>>A<< 3. Rear wiper blade

**Rear wiper motor removal steps**

4. Cover

>>B<< 5. Rear wiper arm assembly

- Liftgate trim (Refer to GROUP 52A, Liftgate Trim P.52A-14)

**Rear wiper motor removal steps**

6. Grommet
7. Rear wiper motor assembly

**Rear washer hose removal steps**

- Front/rear scuff plate, cowl side trim, quarter trim (Refer to GROUP 52A, Interior Trim P.52A-9)
- Liftgate trim (Refer to GROUP 52A, Liftgate Trim P.52A-14)

8. Rear washer hose

*NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54A, Column Switch P.54A-328.*

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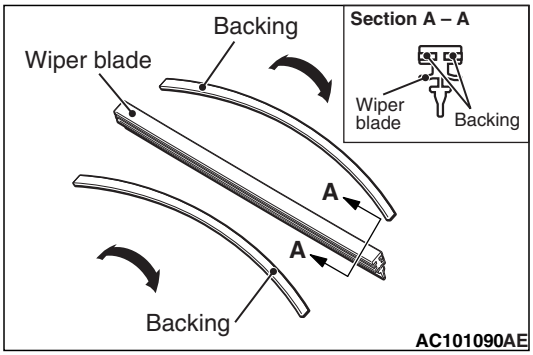
## INSTALLATION SERVICE POINTS

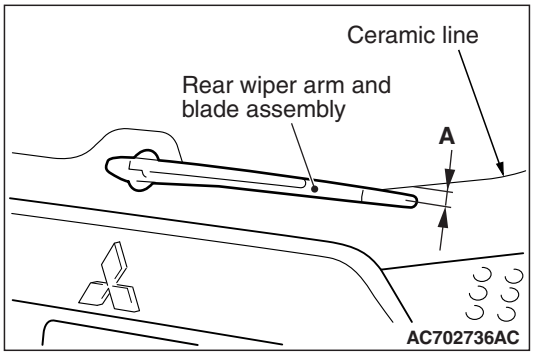
### >>A<< REAR WIPER BLADE INSTALLATION




⚠ CAUTION

**Use a curved backing like that shown for the backing of a wiper blade to ensure sustained wiper wiping performance.**

### >>B<< REAR WIPER ARM AND BLADE ASSEMBLY INSTALLATION



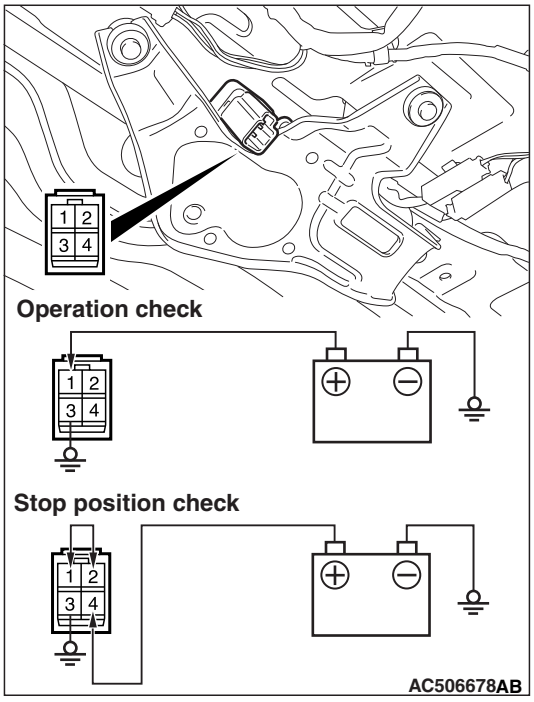

Install the rear wiper arm and blade assembly so that it stops at the specified position.

**(A): 0 to 20 mm (0 to 0.79 in) from the ceramic line**

## INSPECTION

M1511019102905

### REAR WIPER MOTOR CHECK




Inspect the rear wiper motor by disconnecting the harness connector with the motor attached to the vehicle.

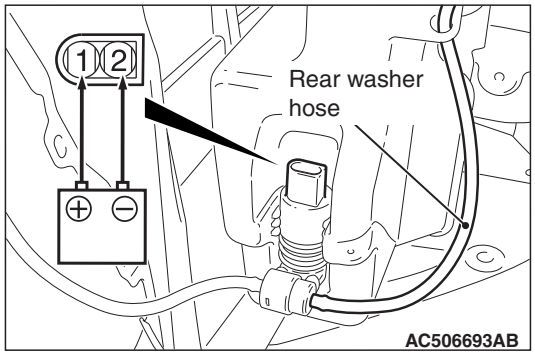
### REAR WIPER MOTOR OPERATION CHECK

Connect the battery to the rear wiper motor to inspect the motor operation as shown in the illustration.

### REAR WIPER MOTOR STOP POSITION CHECK

1. Connect the battery to the rear wiper motor as shown in the illustration.
2. Disconnect the battery in the middle of the motor rotation and check to see that the motor stops.
3. Reconnect the battery.
4. Check to see that the rear wiper motor runs and then stops at the automatic stop position.

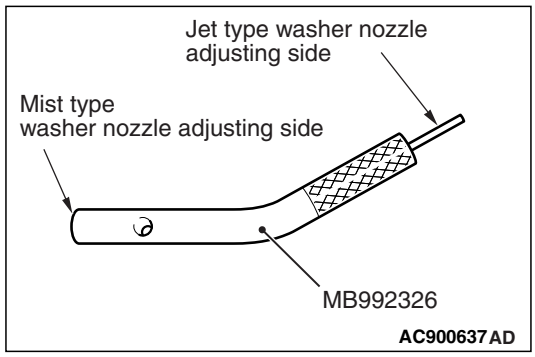
## REAR WASHER MOTOR INSPECTION




1. The rear washer motor must be checked with the washer tank installed and the washer fluid filled.
2. Connect the battery to the washer motor connector as shown. Check that the washer motor delivers washer strongly to the rear washer hose side.

## CHECKING THE REAR WASHER NOZZLE INJECTION DIRECTION

*NOTE: Use special tool Adjustment tool, washer nozzle (MB992326) to adjust the splashing points of the nozzle.*

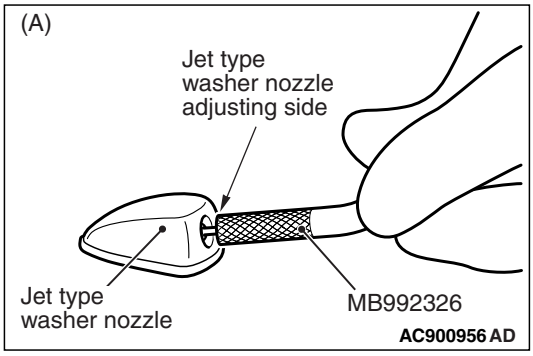


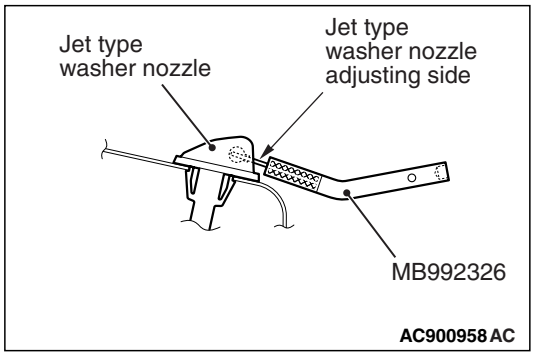

## ADJUSTMENT OF THE JET TYPE WASHER NOZZLE INJECTION POSITION

**⚠ CAUTION**

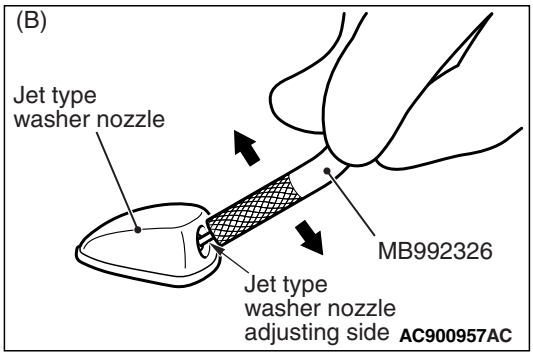
**Adjust the splashing position within the specified adjustment range, otherwise the windshield cannot be washed properly.**

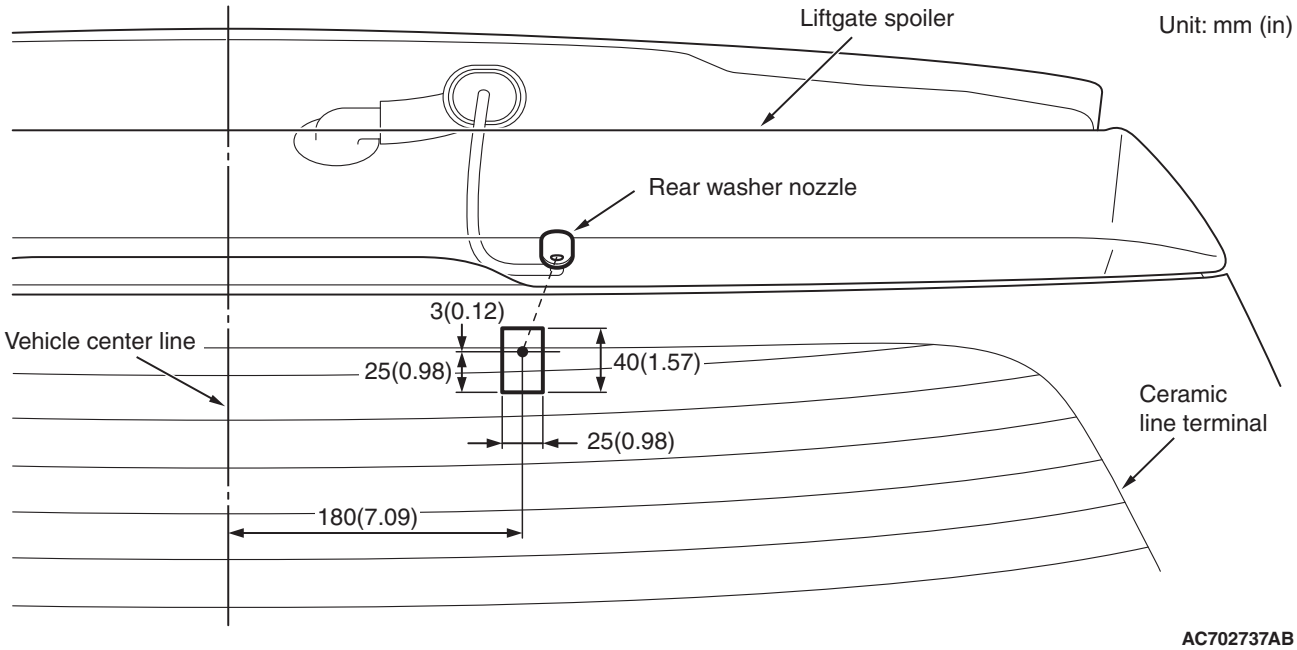
1. Use special tool Adjustment tool, washer nozzle (MB992326) to adjust the splashing points of the nozzle.
2. Insert the jet type washer nozzle adjusting side of the special tool Adjustment tool, washer nozzle (MB992326) into the injection part of the washer nozzle as shown in figure (A).




3. Move the special tool Adjustment tool, washer nozzle (MB992326) up and down to adjust the angle of the washer nozzle as shown in figure (B).

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## CHECKING THE REAR WIPER AND WASHER SWITCH

The rear wiper and washer switch can be checked for proper operation by confirming ETACS diagnosis trouble code. (Refer to GROUP 54A - ETACS P.54A-742)

# MARK

## REMOVAL AND INSTALLATION

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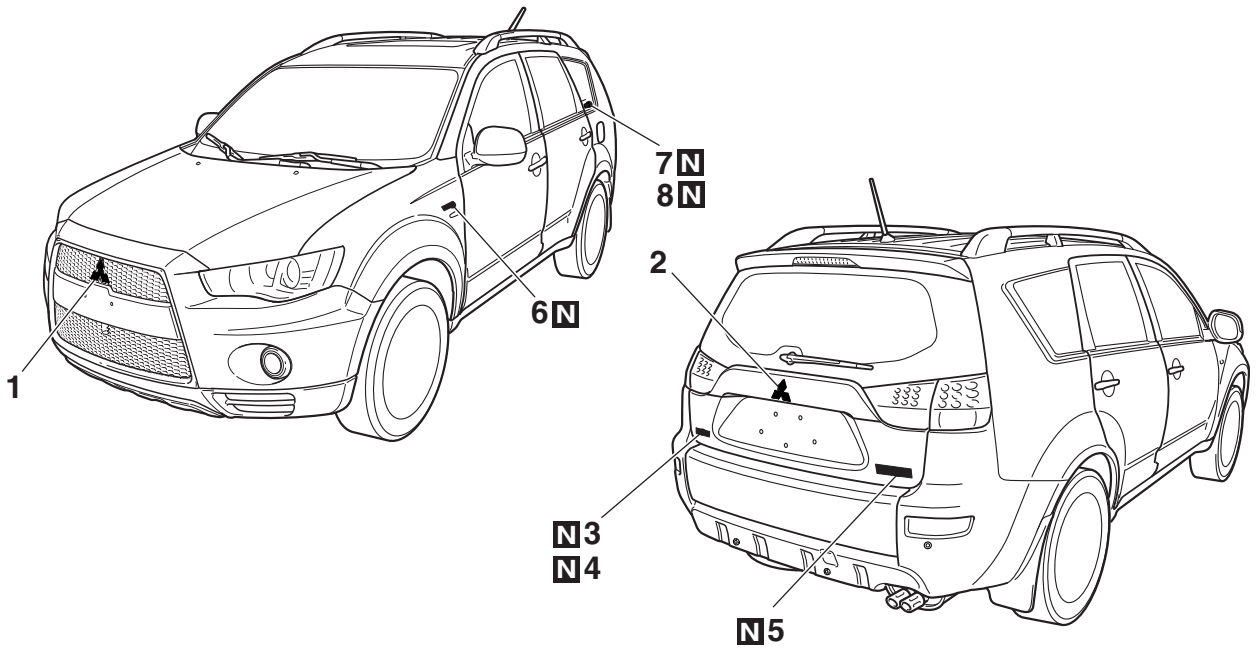



AC901270 AB

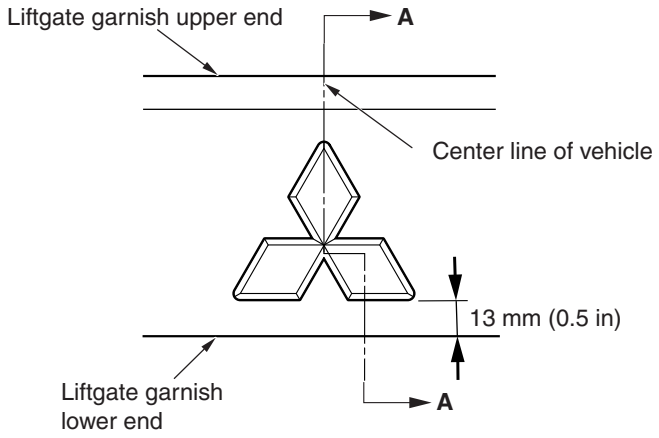
| | | |
|---|---|---|
| | 1. | Front three-diamond mark (Refer to P.51-9) |
| >>A<< | 2. | Rear three-diamond mark (Refer to P.51-9) |
| >>A<< | 3. | MITSUBISHI mark <Vehicles for USA and Canada> |
| >>A<< | 4. | OUTLANDER mark <Vehicles for Puerto Rico> |
| >>A<< | 5. | OUTLANDER mark <Vehicles for USA and Canada> |
| >>A<< | 6. | V6 mark <3000> |
| >>A<< | 7. | ULEV (ULTRA LOW EMISSIONS VEHICLE) mark (LH) <Vehicles for California (3000)> |
| >>A<< | 8. | PZEV (PARTIAL ZERO EMISSIONS VEHICLE) mark (LH) <Vehicles for California (2400)> |

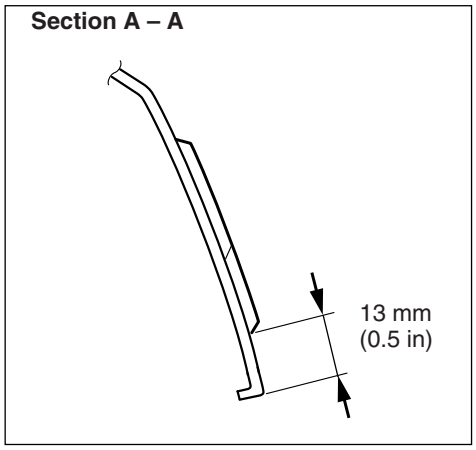
## INSTALLATION SERVICE POINT

## >>A<< MARK APPLICATION

1. Installation position
   Attach each mark to the position shown in the illustration.

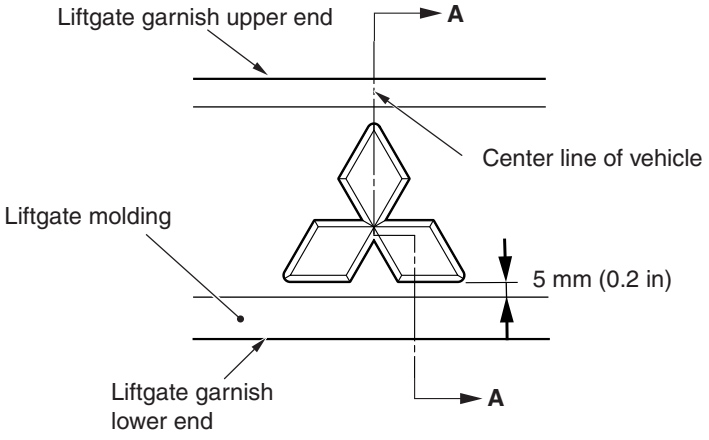
**2. Rear three-diamond mark <Vehicles without liftgate molding>**

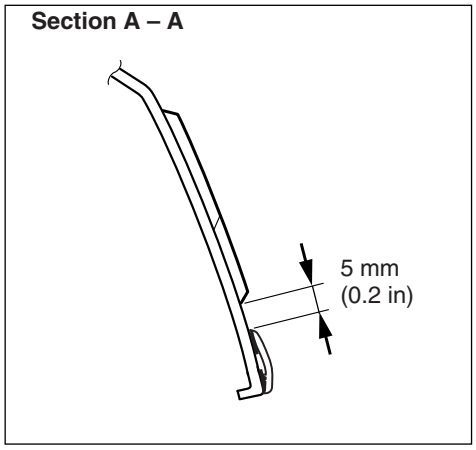



AC809542 AC

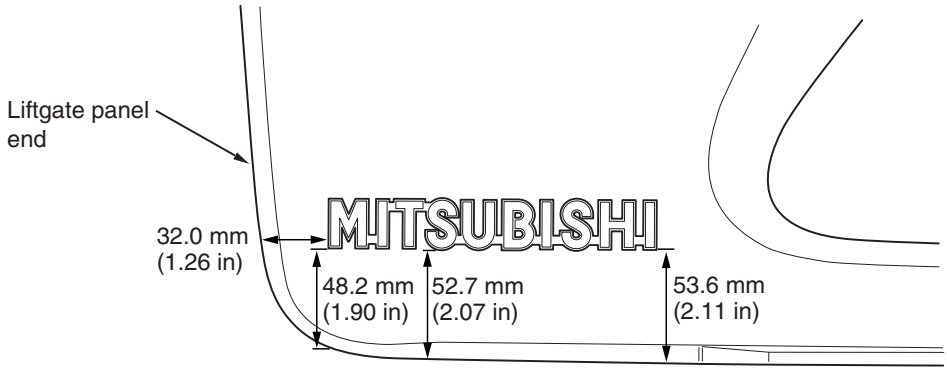
**2. Rear three-diamond mark <Vehicles with liftgate molding>**



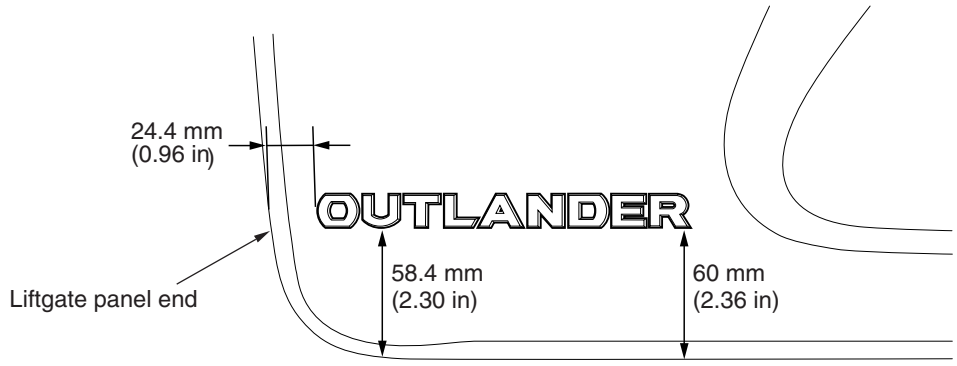

AC809543 AC

**3. MITSUBISHI mark (Vehicles for USA and Canada)**



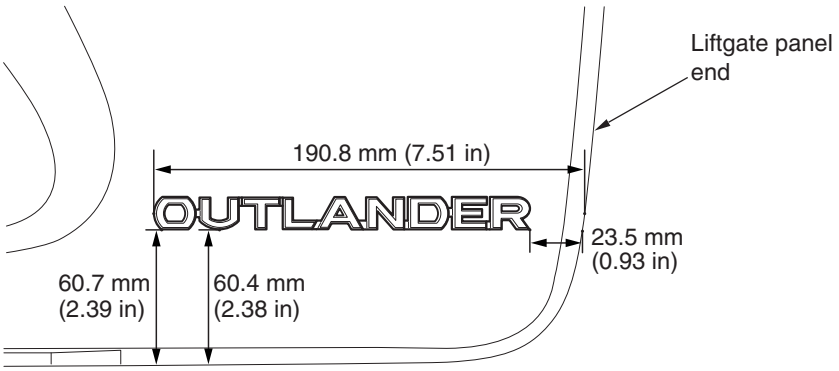

AC702742 AB

**4.OUTLANDER mark <Vehicles for Puerto Rico>**



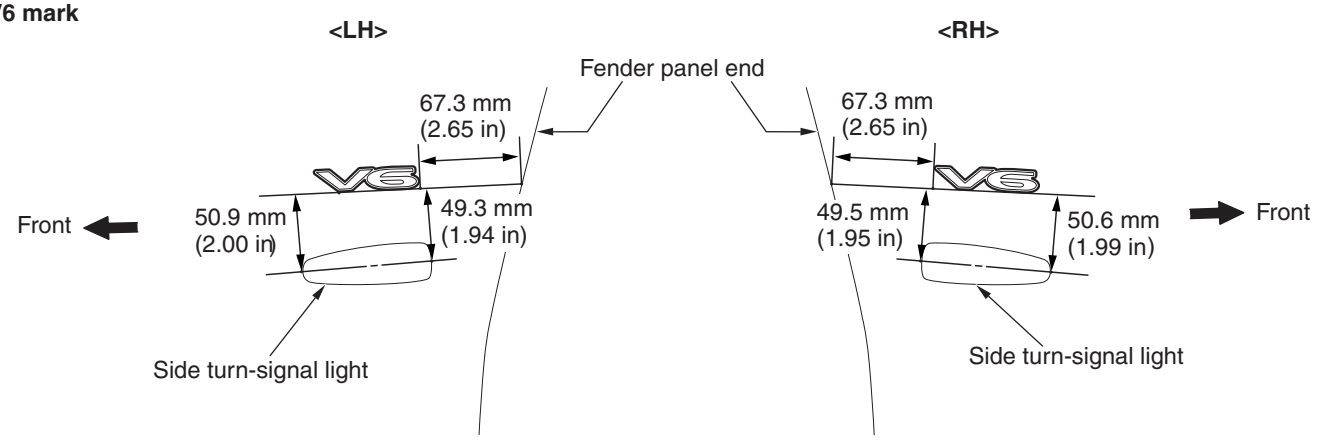

AC709768AB

**5. OUTLANDER mark (Vehicles for USA and Canada)**



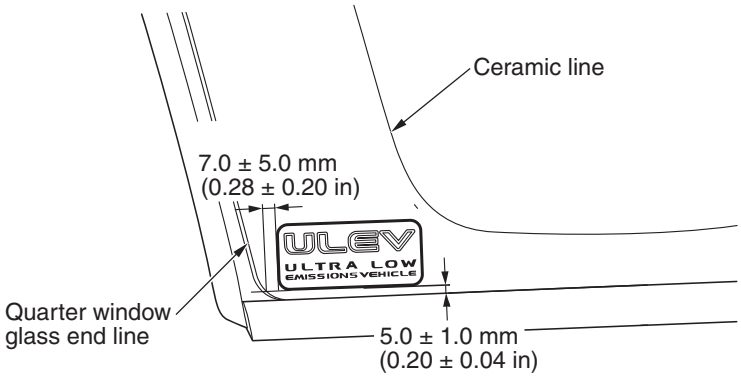

AC704104AE

**6. V6 mark**



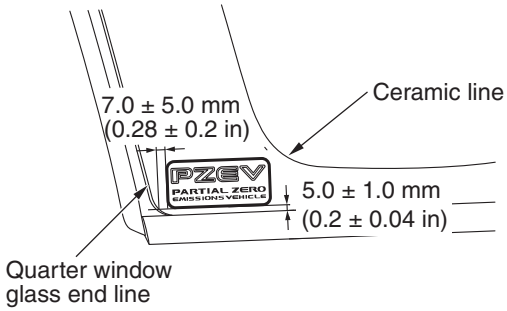

AC704106AE

**7. ULEV (ULTRA LOW EMISSIONS VEHICLE) mark (LH) <Vehicles for California (3000)>**




AC802546 AC

**8. PZEV (PARTIAL ZERO EMISSIONS VEHICLE) mark (LH) <Vehicles for California (2400)>**




AC702744 AD

2. Installation procedure
   (1) Use 3M™ AAD Part number 8906 or equivalent to clean the mark installation surfaces on the body.

**⚠ CAUTION**

**When attaching the marks, the ambient temperature should be 20 –38° C (60 –100° F) and air should be completely free of dust. If the ambient temperature is lower than 20° C (60° F), the marks and places on the body where the marks are to be attached should be heated to 20 –30° C (60 –86° F).**

   (2) Peel off the protection sheet on the back of the marks to paste it on the installation position.

# OUTSIDE MIRROR

## GENERAL INFORMATION

## DOOR MIRROR OPERATION

M1511000101368

### Remote Controlled Mirror Operation

- The mirror on the door mirror moves up/down and left/right by operating the remote controlled door mirror switch when the ignition switch is at the "ON" or "ACC" position.

### Heated Door Mirror Operation

- The rear window defogger relay switch is activated (ON) by turning on the A/C-ECU built-in rear window defogger switch when the ignition switch is in the "ON" position. When the rear window defogger relay is turned ON, power is supplied to the rear window defogger and door mirror, and the heater of the door mirror (heated door mirror) starts operations. The rear window defogger comes with a timer function and will automatically turn OFF the switch approximately 20 minutes after the rear window defogger switch is turned ON. The heated door mirror operations are also terminated along with the rear window defogger, at this time.

## HEATED DOOR MIRROR DIAGNOSIS

## TROUBLESHOOTING STRATEGY

M1511014600523

Diagnosis should be carried out by the following procedures.

1. Gather the information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by the following Symptom Chart.
4. Verify the malfunction is eliminated.

## TROUBLE SYMPTOM CHART

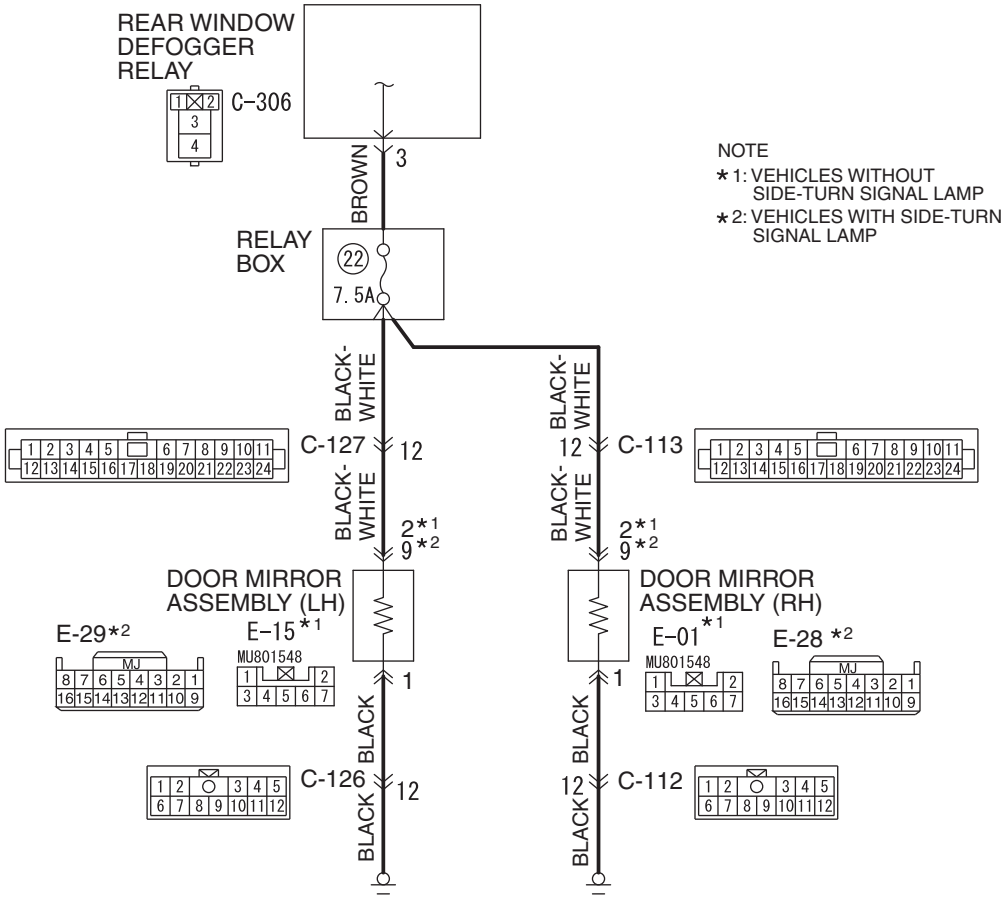
M1511015001271

| Trouble symptom | Inspection procedure No. | Reference page |
|---|---|---|
| None of the heated door mirrors operate | 1 | P.51-110 |
| Left or right side heated door mirror does not operate | 2 | P.51-114 |

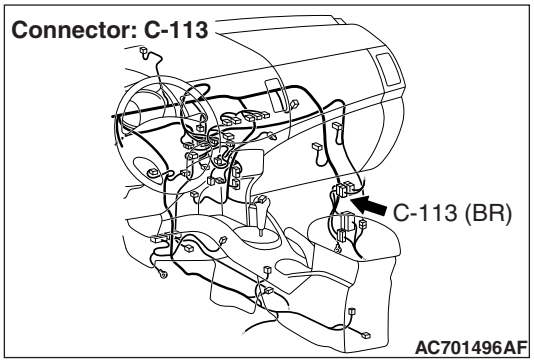
# SYMPTOM PROCEDURES

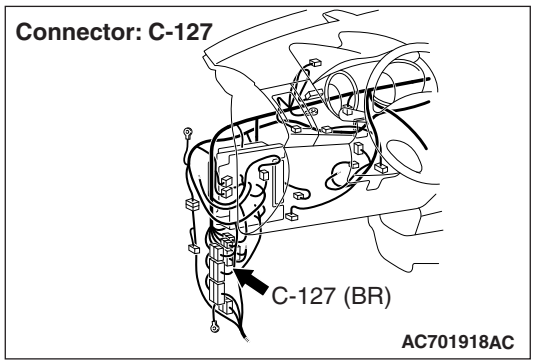
## INSPECTION PROCEDURE 1: None of the Heated Door Mirrors Operate

**Heated Door Mirror Circuit**



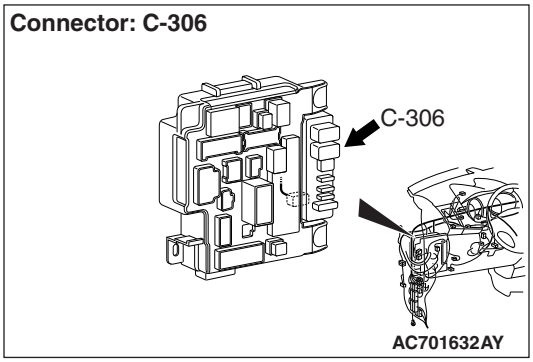

AC901278 AB



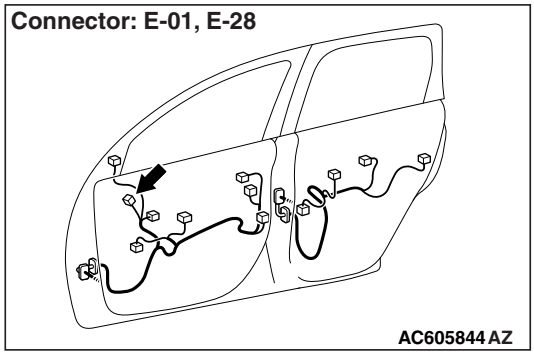




**TSB Revision**

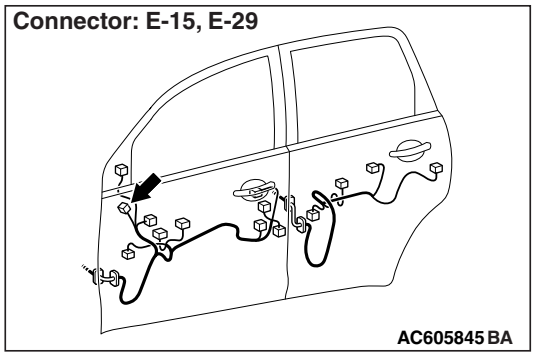
Connector: C-306




Connector: E-01, E-28




Connector: E-15, E-29




## CIRCUIT OPERATION

If both of the door mirror heaters do not operate normally it may be due to a malfunction in the rear window defogger system.

## TROUBLESHOOTING HINTS

- Malfunction of the rear window defogger system
- The wiring harness or connectors may have loose, corroded or damaged terminals, or terminals pushed back in the connector.

## DIAGNOSIS

**Required Special Tools:**

- MB991223: Test Harness Set

**STEP 1. Check the rear window defogger.**

Check that the rear window defogger works normally as follows.

(1) Turn the ignition switch to the "ON" position.
(2) Push the rear window defogger switch to operate the defogger.

**Q: Does the defogger work normally?**

**YES :** Go to Step 2.
**NO :** Because of malfunction of the rear window defogger, carry out the troubleshooting (Refer to GROUP 55A, Manual A/C Diagnosis P.55A-65).

**STEP 2. Check the door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly and rear window defogger relay connector C-306 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is the door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly and rear window defogger relay connector C-306 in good condition?**

**YES :** Go to Step 3.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check if the door mirrors works normally.

**STEP 3. Check the wiring harness between the door mirror (RH) connector E-01 <without side turn-signal light> (terminal 2) or E-28 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check intermediate connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-113 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between door mirror (RH) connector E-01 <without side turn-signal light> (terminal 2) or E-28 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

**YES :** Go to step 4.

**NO :** Repair the wiring harness as necessary. Check if all heated door mirrors work normally.

**STEP 4. Check door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly .**

**Q: Is the door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace the damaged component(s). Check if all heated door mirrors work normally.

**STEP 5. Check the wiring harness between door mirror (LH) connector E-15 <without side turn-signal light>(terminal 2) or E-29 <with side turn-signal light> (terminal 9) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check intermediate connector C-127 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-127 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

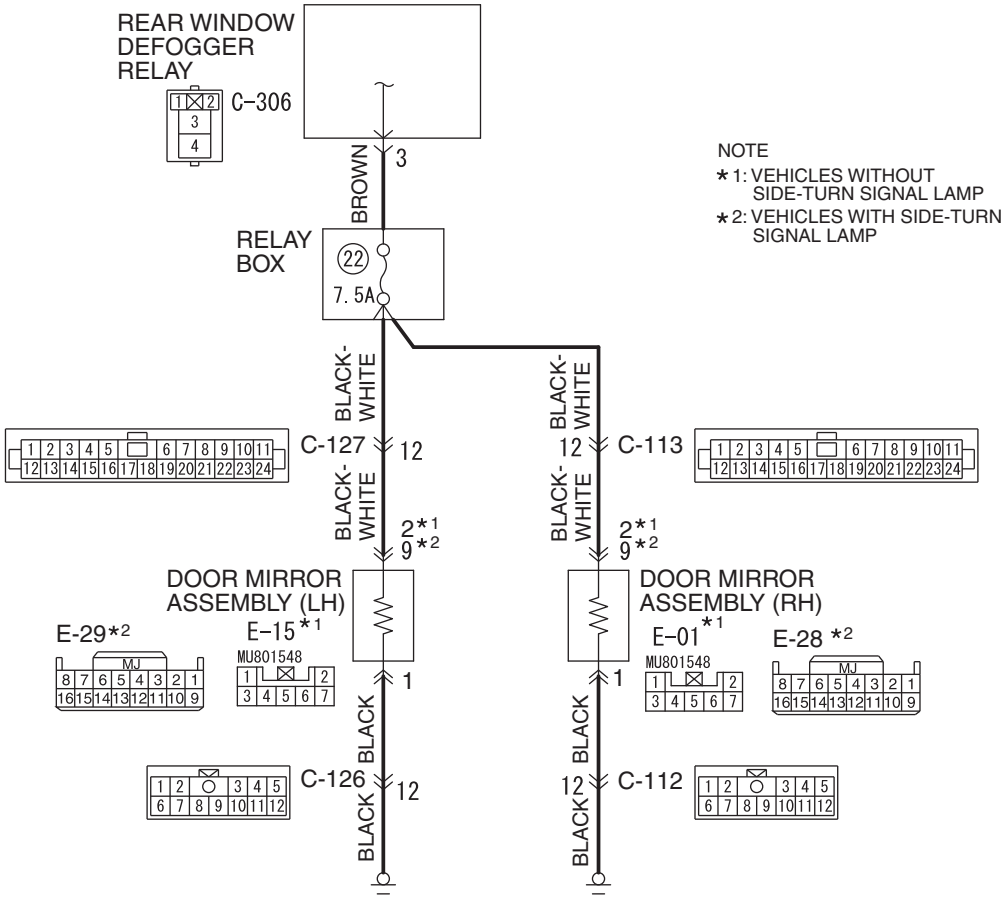
**Q: Is the wiring harness between door mirror (RH) connector E-15 <without side turn-signal light> (terminal 2) or E-29 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

**YES :** The procedure is complete.

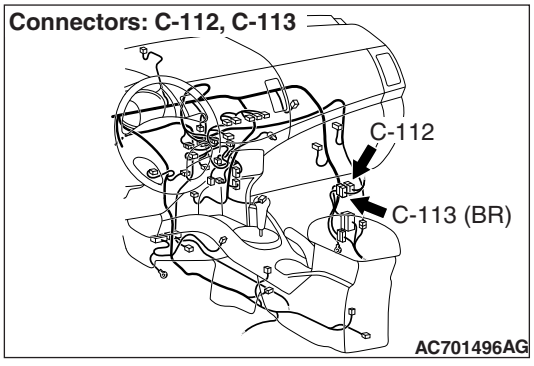
**NO :** Repair the wiring harness as necessary. Check if the all heated door mirrors work normally.

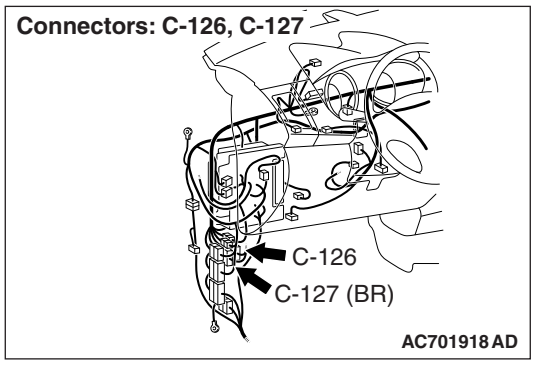
## INSPECTION PROCEDURE 2: Left or right side heated door mirror does not operate

**Heated Door Mirror Circuit**



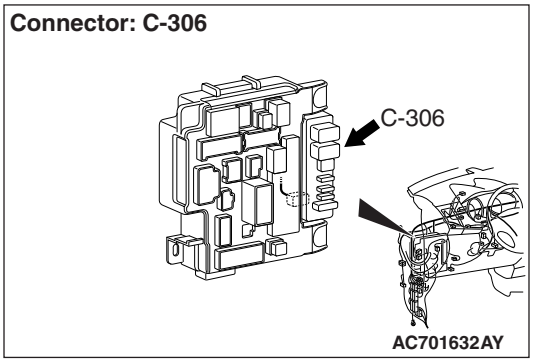

AC901278AB



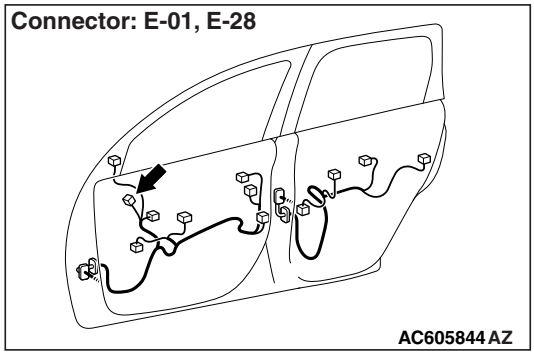




**TSB Revision**

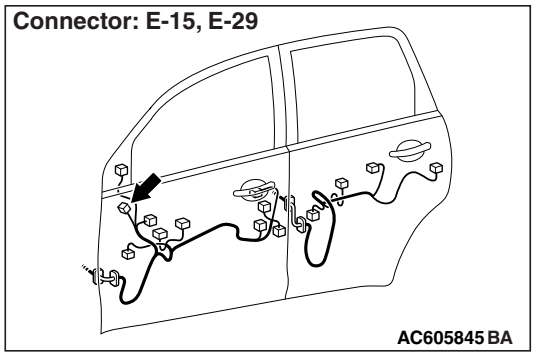
Connector: C-306




Connector: E-01, E-28




Connector: E-15, E-29




## CIRCUIT OPERATION

If either of the heated door mirror do not operate normally, it may be due to malfunctions in the heated door mirror circuit or door mirror.

## TROUBLESHOOTING HINTS

- Malfunction of the heated door mirror circuit
- Malfunction of the door mirror
- The wiring harness or connectors may have loose, corroded or damaged terminals, or terminals pushed back in the connector.

## DIAGNOSIS

**Required Special Tools:**
- MB991223: Test Harness Set

**STEP 1. Verify the operation of each heated door mirror.**

**Q: Which door mirror does not heat?**

**Door mirror (LH) :** Go to Step 2.
**Door mirror (RH) :** Go to Step 8.

**STEP 2. Check door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

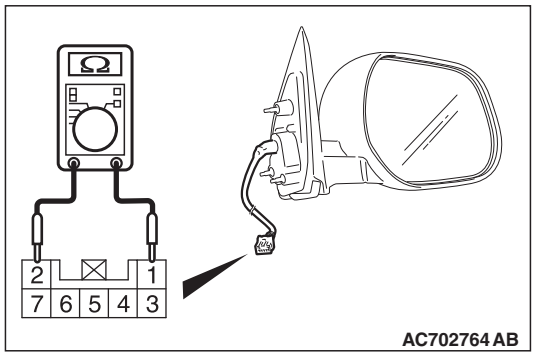
**Q: Is door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly in good condition?**

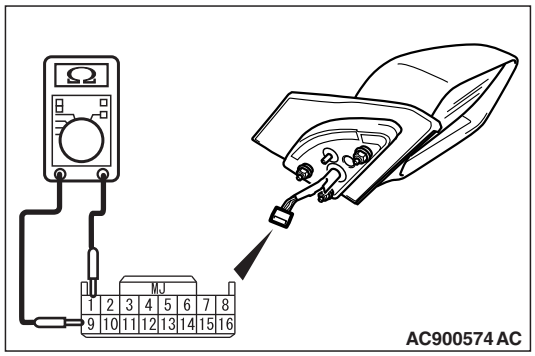
**YES :** Go to Step 3.
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. And then check to see that the heater function of the door mirror (LH) operates normally.

**STEP 3. Check the heater of the door mirror (LH).**

**⚠ CAUTION**

**When relocating the car between locations of extremely different temperatures (warm and cold), leave the car in a location for a while to adapt to the temperature prior to checking it.**




Check to see that the resistance between terminal 1 and 2 of the door mirror (LH) connector E-15 <without side turn-signal light> or 9 of E-29 <with side turn-signal light> door mirror assembly.

- The resistance should be 7.2 ± 1.4 Ω at 25° C (77° F).

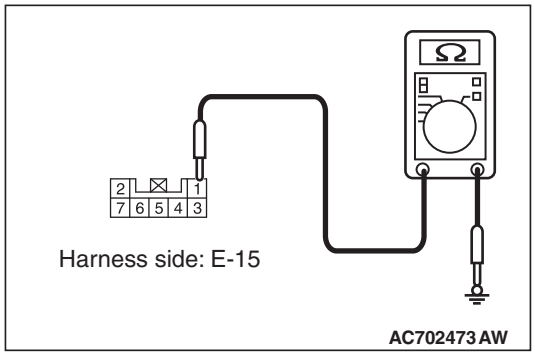
**Q: Is the resistance normal?**

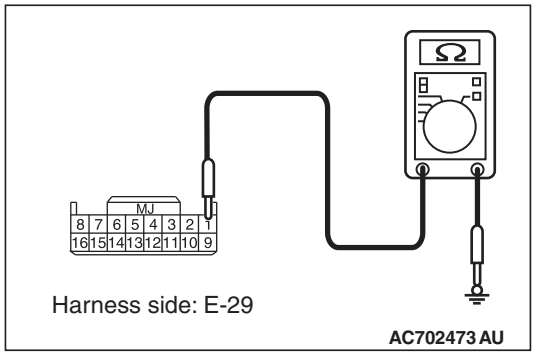
**YES :** Go to Step 4.

**NO :** Replace the door mirror (LH). And then check to see that the heater function of the door mirror (LH) is operating normally.

**STEP 4. Check the ground circuit between door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly and ground for open circuit. Measure the resistance at door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly.**

(1) Disconnect door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly and check at the wiring harness side connector.




(2) Measure the resistance value between terminal 1 and ground.
- The resistance should be 2Ω or less.

**Q: Is the measured resistance 2Ω or less?**

**YES :** Go to Step 6.
**NO :** Go to Step 5.

**STEP 5. Check the wiring harness between door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly (terminal 1) and ground.**

*NOTE: Also check intermediate connector C-126 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-126 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between door mirror (LH) connector E-15 <without side turn-signal light> or E-29 <with side turn-signal light> door mirror assembly (terminal 1) and ground in good condition?**

**YES :** No action is necessary and testing is complete.
**NO :** The wiring harness may be damaged. Repair the wiring harness as necessary. And then check to see that the heater function of the door mirror (LH) operates normally.

**STEP 6. Check rear window defogger relay connector C-306 for loose, corroded or damaged terminal, or terminals pushed back in the connector.**

**Q: Is rear window defogger relay connector C-306 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. And then check to see that the heater function of the door mirror (LH) operates normally.

**STEP 7. Check the wiring harness between door mirror (LH) connector E-15 <without side turn-signal light> (terminal 2) or E-29 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check intermediate connector C-127 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-127 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between door mirror (LH) connector E-15 <without side turn-signal light> (terminal 2) or E-29 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

**YES :** No action is necessary and testing is complete.

**NO :** Repair the wiring harness as necessary. And then check to see that the heater function of the door mirror (LH) operates normally.

**STEP 8. Check the door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is the door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly in good condition?**

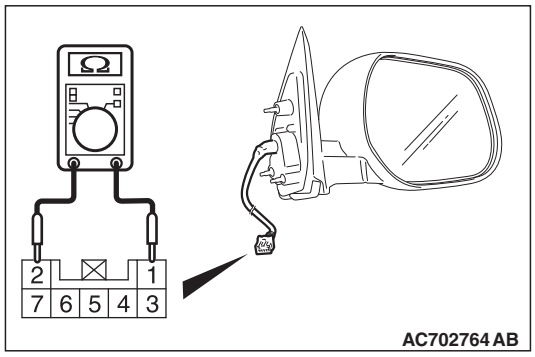
**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. And then check to see that the heater function of the door mirror (RH) operates normally.

**STEP 9. Check the heater function of the door mirror (RH).**

**⚠ CAUTION**

**When relocating the car between locations of extremely different temperatures (warm and cold), leave the car in a location for a while to adapt to the temperature prior to checking it.**



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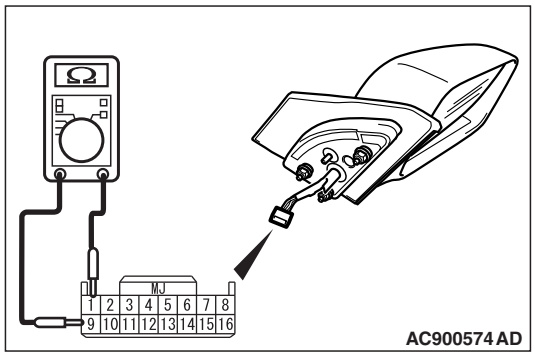


AC900574 AD

Check to see that the resistance between terminal 1 and 2 of the door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly.

- The resistance should be 7.2 ± 1.4 Ω at 25° C (77° F).

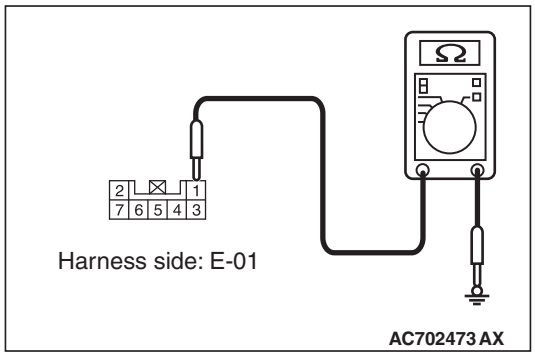
**Q: Is the resistance normal?**

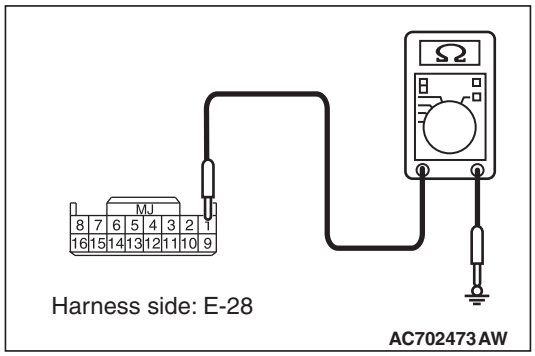
**YES :** Go to Step 10.

**NO :** Replace the door mirror (RH). And then check to see that the heater function of the door mirror (RH) operates normally.

**STEP 10. Check the ground circuit between door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly and ground for open circuit. Measure the resistance at door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly.**

(1) Disconnect door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly, and check at the wiring harness side connector.




(2) Measure the resistance value between terminal 1 and ground.
- The resistance should be 2Ω or less.

**Q: Is the measured resistance 2Ω or less?**

**YES :** Go to Step 12.
**NO :** Go to Step 11.

**STEP 11. Check the wiring harness between door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly (terminal 1) and ground.**

*NOTE: Also check intermediate connector C-112 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-112 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between door mirror (RH) connector E-01 <without side turn-signal light> or E-28 <with side turn-signal light> door mirror assembly (terminal 1) and ground in good condition?**

**YES :** No action is necessary and testing is complete.
**NO :** The wiring harness may be damaged. Repair the wiring harness as necessary. And then check to see that the heater function of the door mirror (RH) operates normally.

**TSB Revision**

**STEP 12. Check rear window defogger relay connector C-306 for loose, corroded or damaged terminal, or terminals pushed back in the connector.**

**Q: Is rear window defogger relay connector C-306 in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. And then check to see that the heater function of the door mirror (RH) operates normally.

**STEP 13. Check the wiring harness between door mirror (RH) connector E-01 <without side turn-signal light> (terminal 2) or E-28 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check intermediate connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-113 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between door mirror (RH) connector E-01 <without side turn-signal light> (terminal 2) or E-28 <with side turn-signal light> door mirror assembly (terminal 9) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

**YES :** No action is necessary and testing is complete.

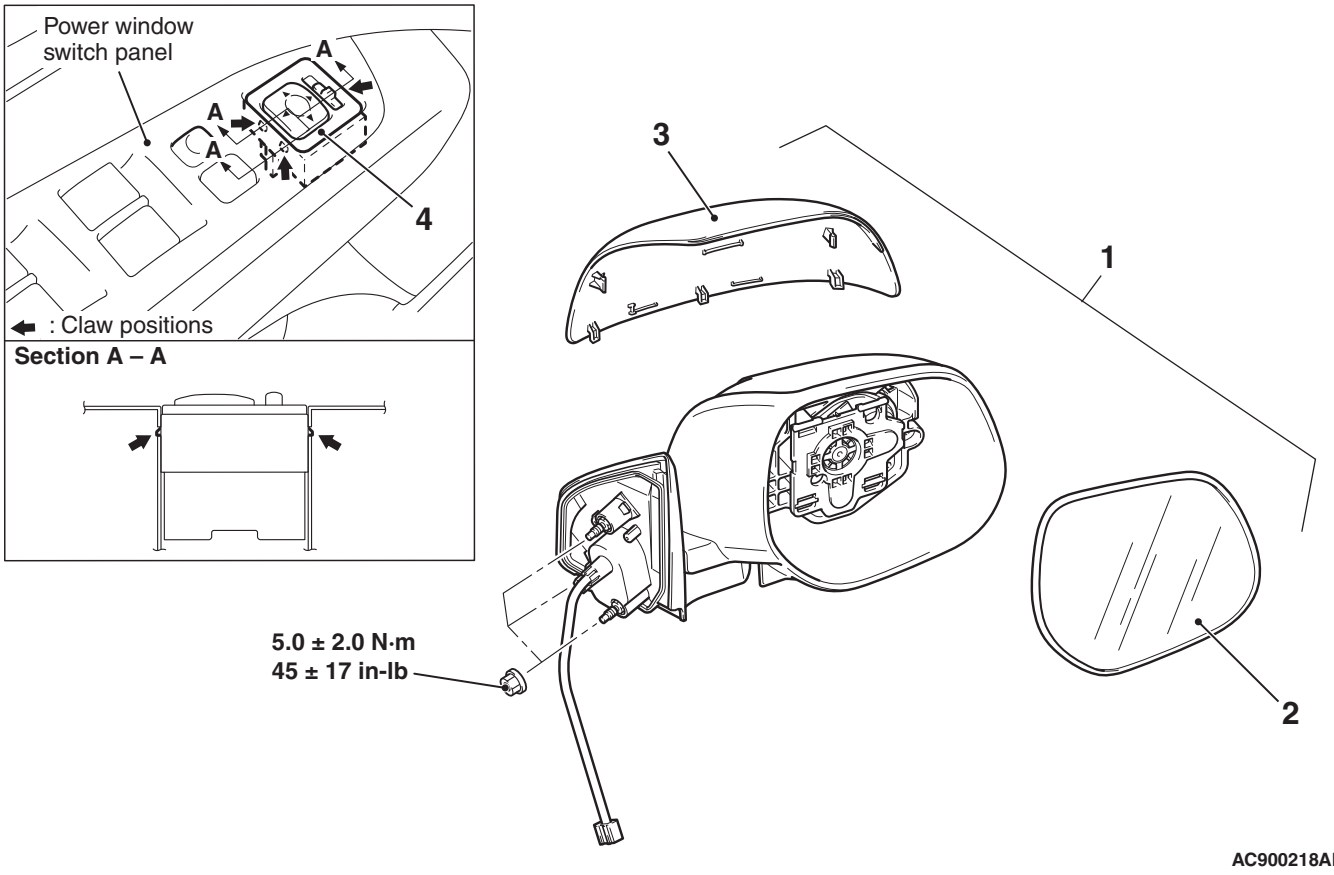
**NO :** Repair the wiring harness as necessary. And then check to see that the heater function of the door mirror (RH) operates normally.

# OUTSIDE MIRROR

## REMOVAL AND INSTALLATION

M1511006401215

## TYPE 1 (WITHOUT SIDE TURN-SIGNAL LIGHT)

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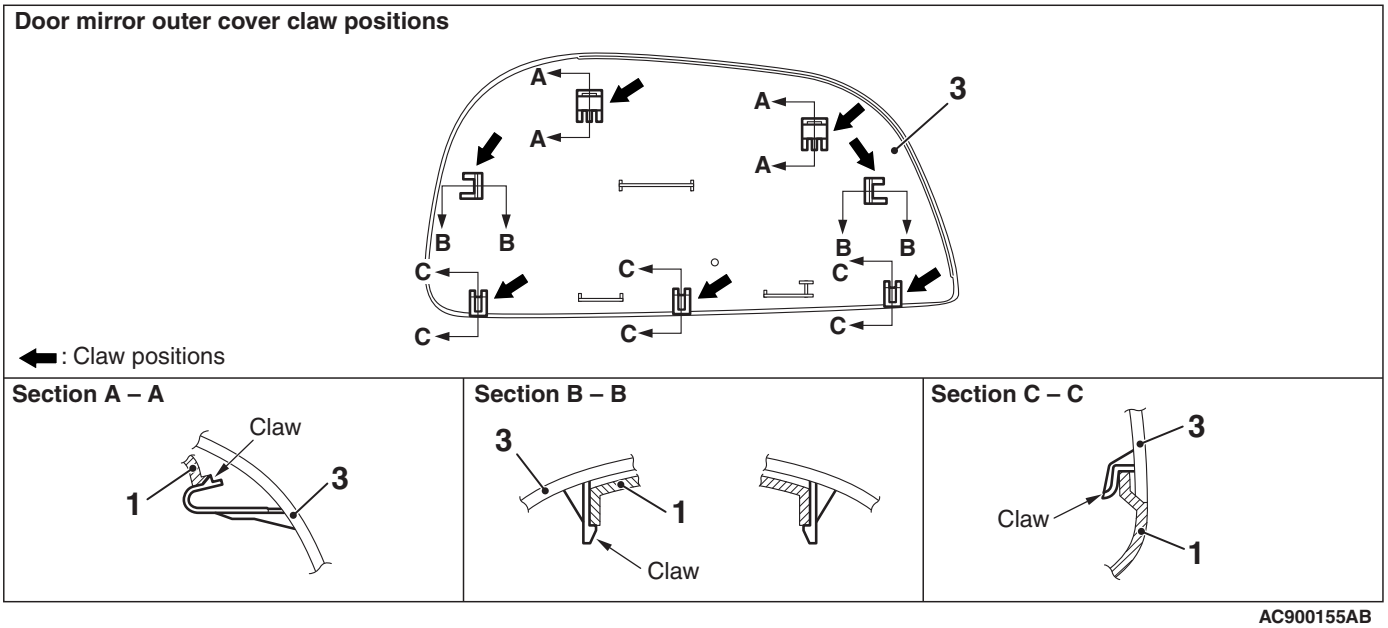


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**Door mirror assembly removal steps**

- Front door trim (Refer to GROUP 52A, Door Trim P.52A-11.)

1. Door mirror assembly

**<<A>>**

**Mirror removal**

2. Mirror

**TSB Revision**

**Door mirror outer cover removal steps**

<<A>> 2. Mirror

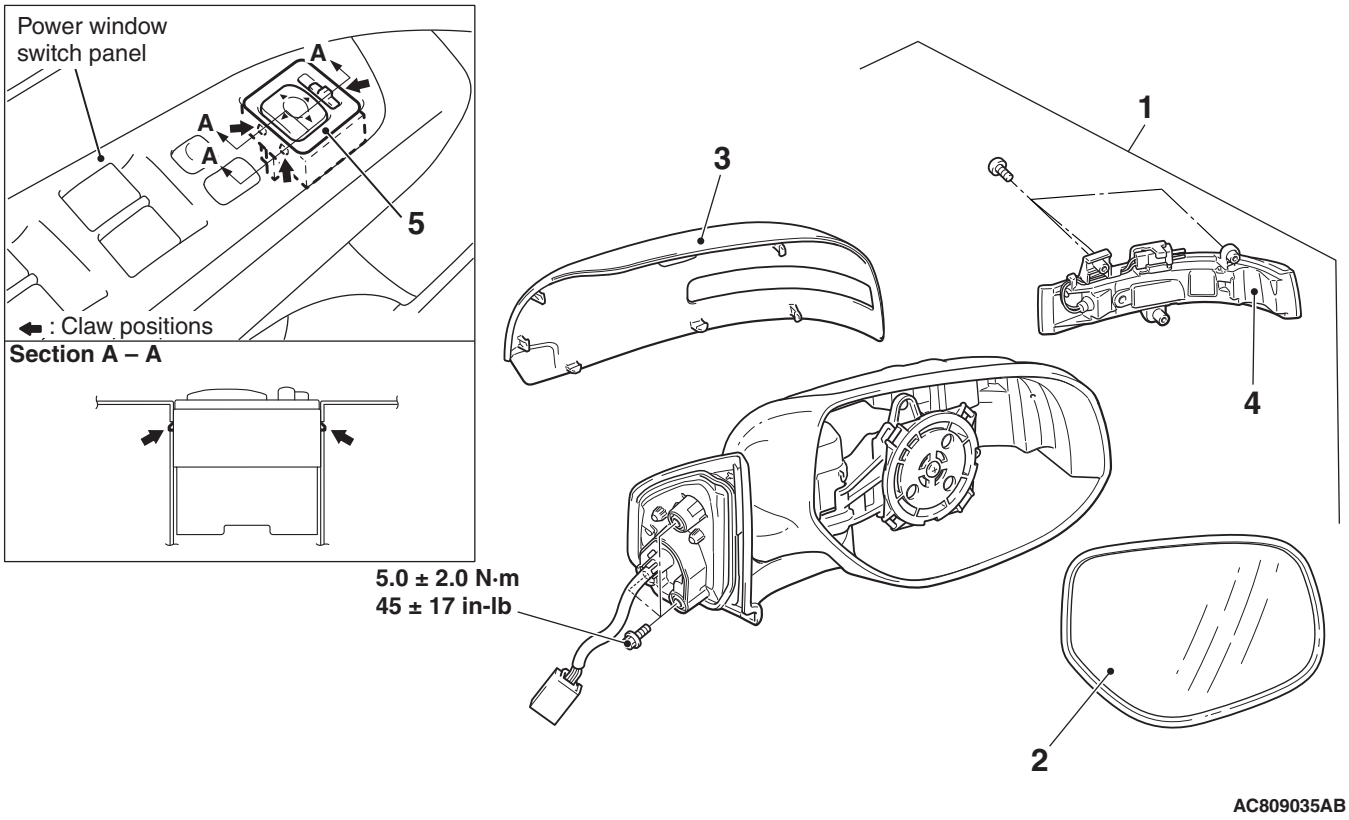
<<B>> >>A<< 3. Door mirror outer cover

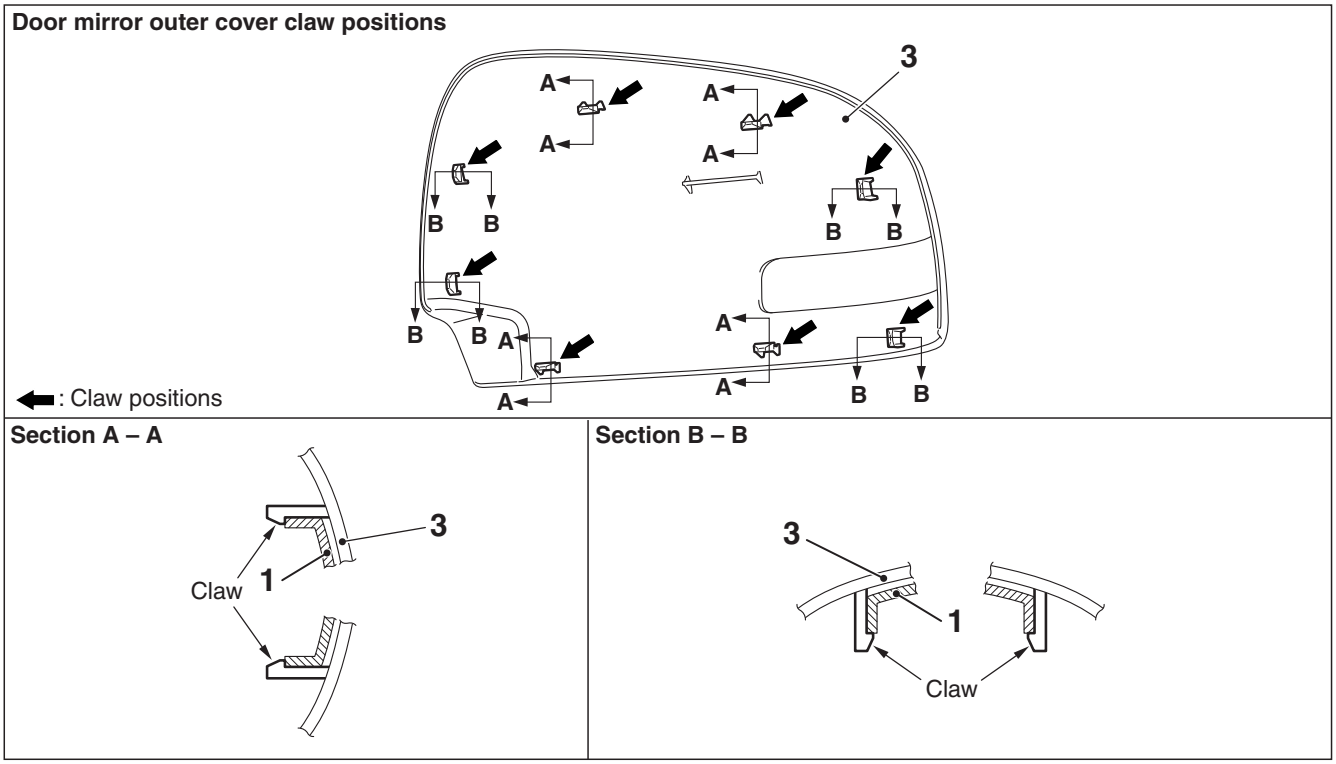
**Remote controlled mirror switch removal steps**

- Front door trim (Refer to GROUP 52A, Door Trim P.52A-11.)

4. Remote controlled mirror switch

## TYPE 2 (WITH SIDE TURN-SIGNAL LIGHT)



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**Door mirror assembly removal steps**
- Front door trim (Refer to GROUP 52A, Door Trim P.52A-11.)

1. Door mirror assembly

**Mirror removal**
- Connection of heated mirror connector

<<A>> 2. Mirror

**Door mirror outer cover removal steps**

<<A>> 2. Mirror

>>A<< 3. Door mirror outer cover

<<A>>
<<C>> >>A<<

**Side turn-signal light assembly removal steps**
- Connection of heated mirror connector

2. Mirror
3. Door mirror outer cover
- Connection of side turn-signal light connector

4. Side turn-signal light assembly

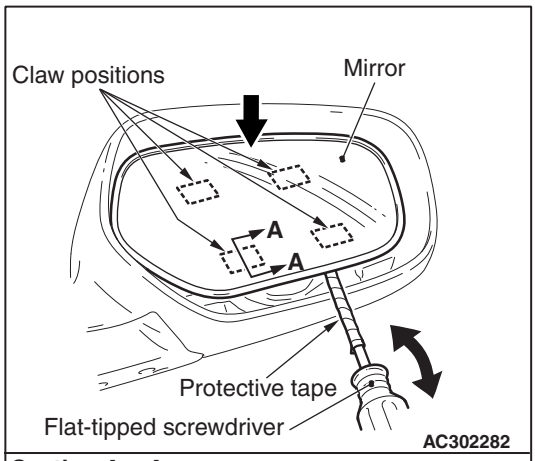
**Remote controlled mirror switch removal steps**
- Front door trim (Refer to GROUP 52A, Door Trim P.52A-11.)

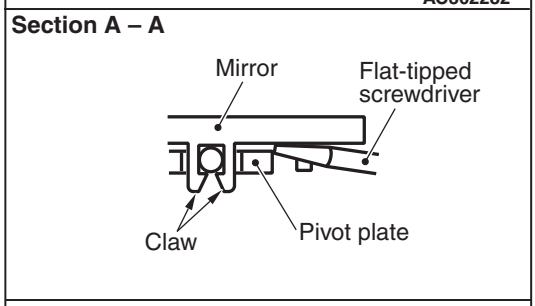
5. Remote controlled mirror switch

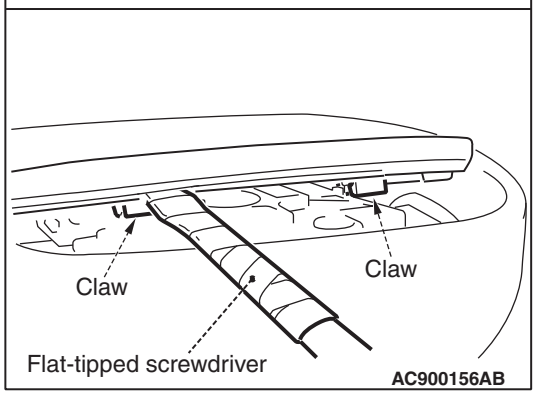
**TSB Revision**

## REMOVAL SERVICE POINTS

### <<A>> MIRROR REMOVAL



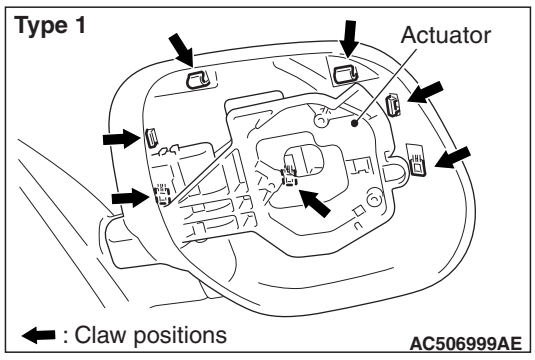




**⚠ CAUTION**

**The tab of the mirror is prone to breakage when working in cold temperatures. Always use a hair drier or the like to warm up the mirror tab and its periphery to 20° C (68° F) or higher prior to works. When the mirror is heated too quickly from its cold state, it may be broken.**

1. Slant the mirror upward with your hands. Then insert a flat-tipped screwdriver wrapped with protective tape between the pivot plate and mirror. Now pry off the mirror claws and release the lower side of the mirror as shown in the illustration.
2. Release the upper side of the mirror claws while pulling out the mirror.
3. Disconnect the connectors of the heated mirror.

### <<B>> DOOR MIRROR OUTER COVER REMOVAL <TYPE 1>

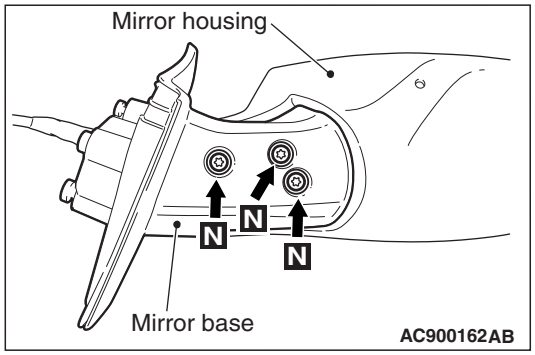



1. Remove the mirror (Refer to the step A of the REMOVAL SERVICE POINTS).
2. Remove the door mirror outer cover claws as shown in the figure and remove the outer cover from the door mirror housing.

*NOTE: If claw(s) are difficult to disengage, remove the actuator mounting screws to release the actuator and disengage the claws.*

## <<C>> DOOR MIRROR OUTER COVER REMOVAL <TYPE 2>

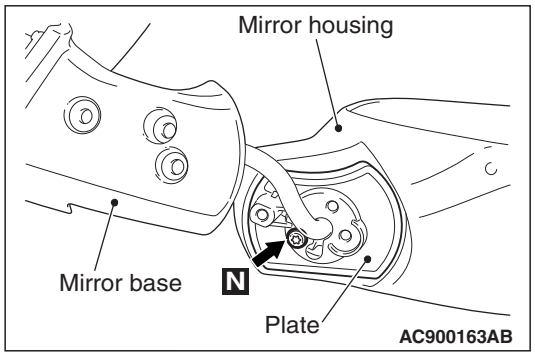
1. Remove the mirror (Refer to the step A of the REMOVAL SERVICE POINTS).




**⚠ CAUTION**

**When installing, always use new Torx screws.**

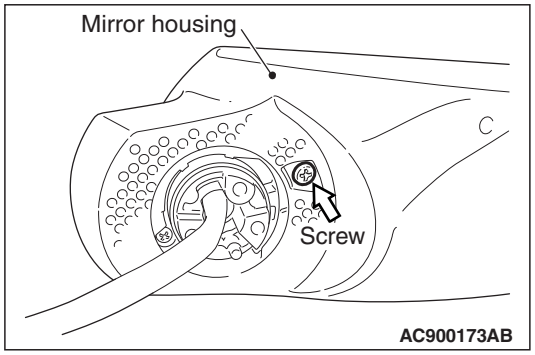
2. Remove the 3 Torx screws connecting the mirror base and mirror housing.
3. Pull out the mirror housing from the mirror base; taking care not to damage the door mirror harness and connector.



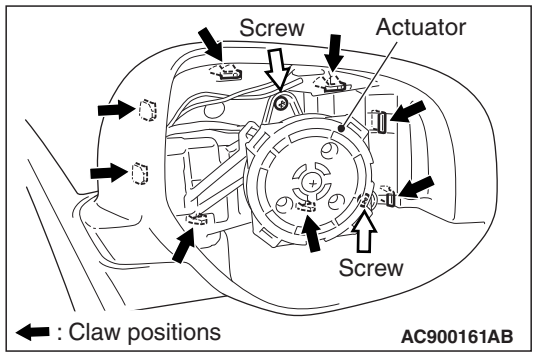

**⚠ CAUTION**

**When installing, always use new Torx screw.**

4. Remove the Torx screw connecting the plate and mirror housing.




5. Remove the screw connecting the mirror housing and actuator lower part.




6. Remove the 2 screws connecting the actuator and mirror housing.
7. Slide the actuator and disengage the door mirror outer cover claws as shown in the figure. Remove the outer cover from the door mirror housing.

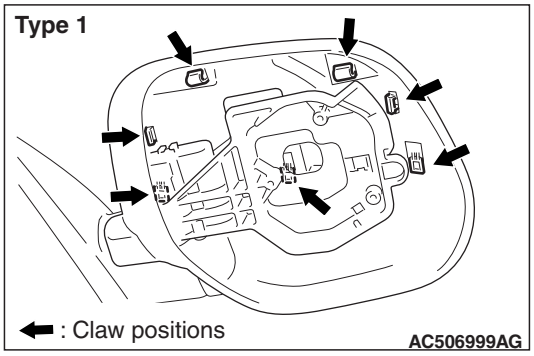
## INSTALLATION SERVICE POINT

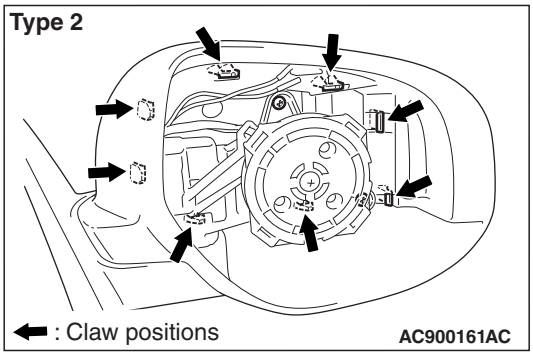
### >>A<< DOOR MIRROR OUTER COVER INSTALLATION

**⚠ CAUTION**

**Tap the claw positions to confirm that they are engaged and the door mirror outer cover is installed securely.**

Install the door mirror outer cover by engaging the claws as shown in the figure.




## INSPECTION

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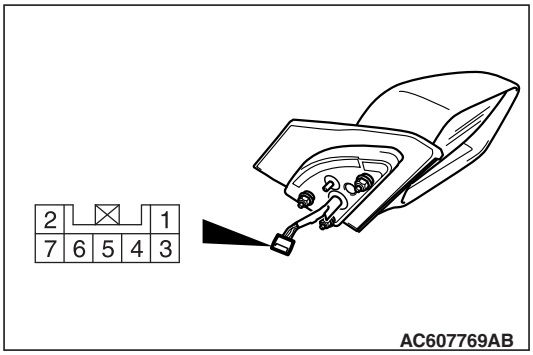
### DOOR MIRROR ASSEMBLY OPERATION CHECK <TYPE 1 (WITHOUT SIDE TURN-SIGNAL LIGHT)>

Remove the door trim, and then connect the battery to the door mirror assembly connector to check that the door mirror operates.

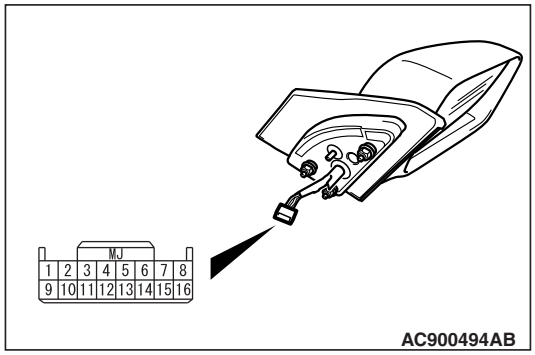



| Battery connection | Operation direction |
|---|---|
| • Connect terminal 5 to the negative battery terminal.<br>• Connect terminal 7 to the positive battery terminal. | Up |

| Battery connection | Operation direction |
|---|---|
| • Connect terminal 5 to the positive battery terminal.<br>• Connect terminal 7 to the negative battery terminal. | Down |
| • Connect terminal 5 to the negative battery terminal.<br>• Connect terminal 6 to the positive battery terminal. | Right |
| • Connect terminal 5 to the positive battery terminal.<br>• Connect terminal 6 to the negative battery terminal. | Left |

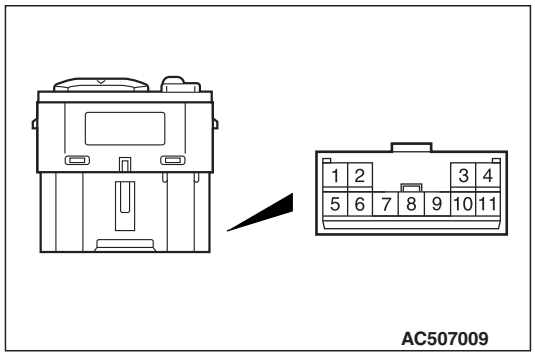
## <TYPE 2 (WITH SIDE TURN-SIGNAL LIGHT)>

Remove the door trim, and then connect the battery to the door mirror assembly connector to check that the door mirror operates.




| Battery connection | Operation direction |
|---|---|
| • Connect terminal 13 to the negative battery terminal.<br>• Connect terminal 4 to the positive battery terminal. | Up |
| • Connect terminal 13 to the positive battery terminal.<br>• Connect terminal 4 to the negative battery terminal. | Down |
| • Connect terminal 13 to the negative battery terminal.<br>• Connect terminal 12 to the positive battery terminal. | Right |
| • Connect terminal 13 to the positive battery terminal.<br>• Connect terminal 12 to the negative battery terminal. | Left |

## REMOTE CONTROLLED MIRROR SWITCH CONTINUITY CHECK




| Switch position | | Tester connection | Specified condition |
|---|---|---|---|
| Left side | Up | 1 –6, 9 –11 | Continuity (Less than 2 Ω) |
| | Down | 1 –11, 6 –9 | |
| | Right | 1 –6, 9 –10 | |
| | Left | 1 –10, 6 –9 | |
| Right side | Up | 1 –6, 3 –9 | |
| | Down | 1 –3, 6 –9 | |
| | Right | 1 –6, 2 –9 | |
| | Left | 1 –2, 6 –9 | |

## HEATED DOOR MIRROR CHECK

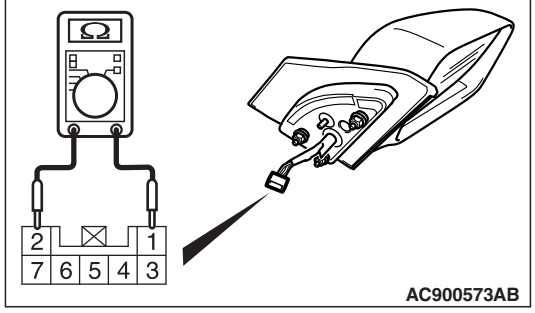
**⚠ CAUTION**

**When relocating the car between locations with extremely different temperatures (warm and cold), leave the car in the location for a while to adapt to the temperature prior to checking it.**

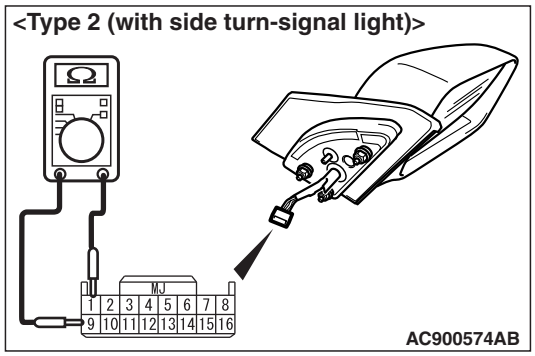
Check that the resistance value between the connector terminals is at the standard value.

**Standard value: 7.2 ± 1.4 Ω at 25° C (77° F)**

**<Type 1 (without side turn-signal light)>**




**<Type 2 (with side turn-signal light)>**



**NOTES**