

# GROUP 51

# EXTERIOR

## CONTENTS

<b>SPECIFICATIONS</b> .....	<b>51-2</b>	STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING .....	51-26
SERVICE SPECIFICATIONS .....	51-2	TROUBLE SYMPTOM CHART .....	51-26
LUBRICANT .....	51-2	SYMPTOM PROCEDURES .....	51-27
ADHESIVE .....	51-2	DATA LIST REFERENCE TABLE .....	51-71
<b>FRONT BUMPER ASSEMBLY AND RADIATOR GRILLE</b> .....	<b>51-3</b>	ON-VEHICLE SERVICE .....	51-72
REMOVAL AND INSTALLATION .....	51-3	WINDSHIELD INTERMITTENT WIPER INTERVAL CHECK .....	51-72
DISASSEMBLY AND ASSEMBLY .....	51-4	LIGHTING CONTROL SENSOR (RAIN SENSOR) INSPECTION .....	51-72
<b>REAR BUMPER ASSEMBLY</b> .....	<b>51-6</b>	INTELLIGENT WASHING FUNCTION INSPECTION .....	51-72
REMOVAL AND INSTALLATION .....	51-6	DELAYED FINISHING WIPE FUNCTION INSPECTION .....	51-72
<b>GARNISHES AND MOLDINGS</b> .....	<b>51-7</b>	CUSTOMIZATION FUNCTION .....	51-73
SPECIAL TOOL .....	51-7	WINDSHIELD WIPER .....	51-74
REMOVAL AND INSTALLATION .....	51-7	REMOVAL AND INSTALLATION .....	51-74
<b>DOOR SASH TAPE</b> .....	<b>51-9</b>	INSPECTION .....	51-78
SPECIAL TOOL .....	51-9	WINDSHIELD WASHER .....	51-80
REMOVAL AND INSTALLATION .....	51-9	REMOVAL AND INSTALLATION .....	51-80
<b>SIDE AIR DAM</b> .....	<b>51-13</b>	INSPECTION .....	51-81
REMOVAL AND INSTALLATION .....	51-13	LIGHTING CONTROL SENSOR .....	51-84
<b>UNDER COVER</b> .....	<b>51-15</b>	REMOVAL AND INSTALLATION .....	51-84
REMOVAL AND INSTALLATION .....	51-15	ADAPTATION .....	51-84
<b>REAR SPOILER</b> .....	<b>51-16</b>	<b>MARK</b> .....	<b>51-85</b>
REMOVAL AND INSTALLATION .....	51-16	REMOVAL AND INSTALLATION .....	51-85
<b>WINDSHIELD WIPER AND WASHER</b> .....	<b>51-18</b>	<b>DOOR MIRROR</b> .....	<b>51-87</b>
GENERAL INFORMATION .....	51-18	GENERAL INFORMATION .....	51-87
SPECIAL TOOLS .....	51-24	HEATED DOOR MIRROR DIAGNOSIS .....	51-87
WINDSHIELD WIPER AND WASHER DIAGNOSIS .....	51-26	TROUBLESHOOTING STRATEGY .....	51-87
		SYMPTOM CHART .....	51-87
		SYMPTOM PROCEDURES .....	51-88
		DOOR MIRROR .....	51-97
		REMOVAL AND INSTALLATION .....	51-97
		INSPECTION .....	51-99

**SPECIFICATIONS****SERVICE SPECIFICATIONS**

M1511000301102

Item	Standard value
Stop position of the windshield wiper arm/blade assembly mm (in)	A (Passenger's side): Ceramic end line $\pm 5$ (0.20)
	B (Driver's side): Front deck garnish end $45 \pm 5$ (1.77 $\pm 0.20$ )

**LUBRICANT**

M1511000400151

Item	Specified lubricant	Quantity
Wiper motor link rod Contact joint between link rod and wiper motor link plate	Multipurpose grease SAE J310, NLGI No.2 or equivalent	As required
Degrease agent Grease and dirt removal from parts surface	3M™ AAD Part No. 8906 or equivalent	As required

**ADHESIVE**

M1511000502262

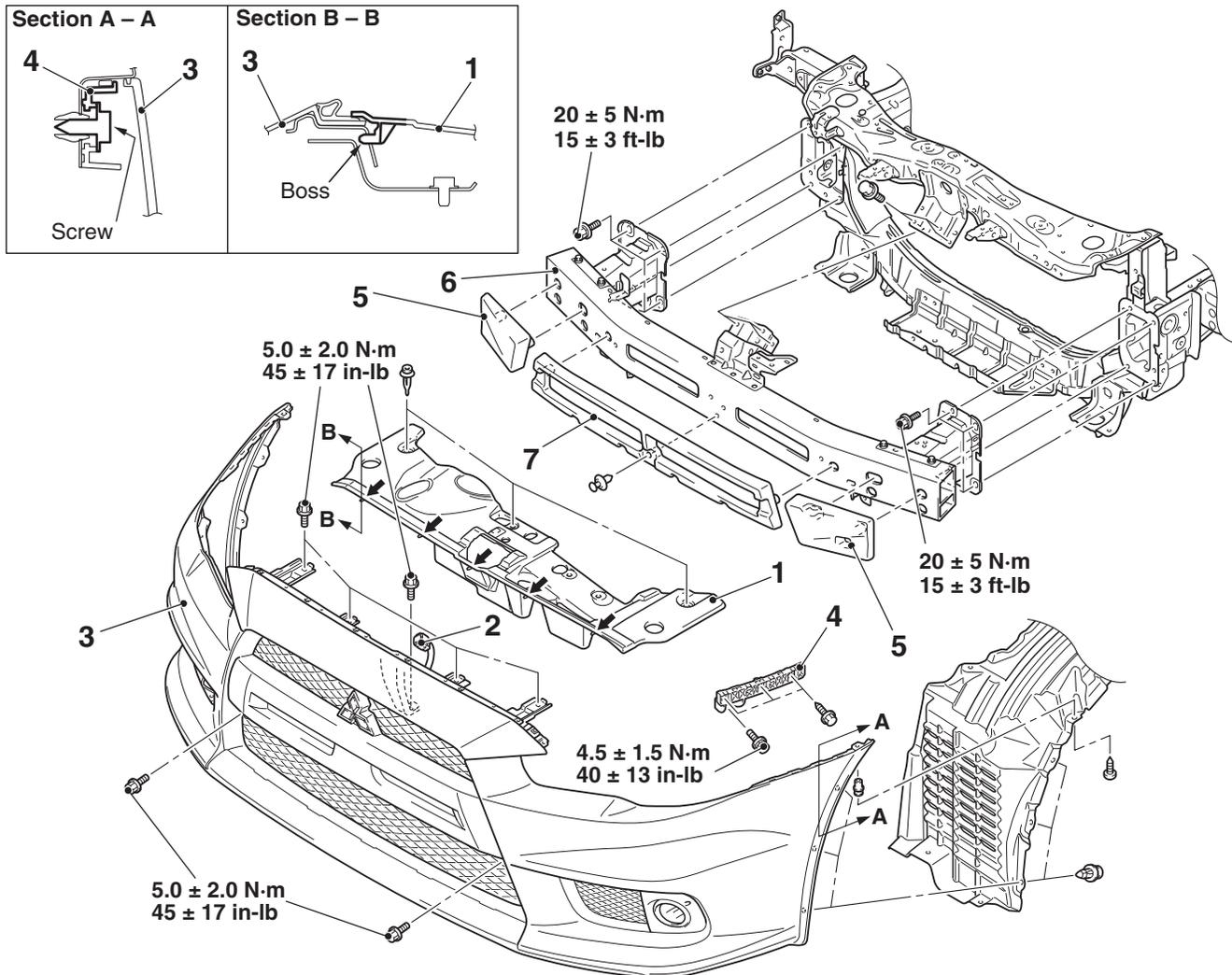
Item	Specification
Front and rear three-diamond mark mm (in)	Adhesive tape: Double-sided tape 0.6 (0.02) thickness
Side air dam mm (in)	Adhesive tape: Double-sided tape 4 (0.16) width and 1.6 (0.06) thickness Adhesive tape remover (degrease agent): 3M™ AAD Part number 8906 or equivalent

# FRONT BUMPER ASSEMBLY AND RADIATOR GRILLE REMOVAL AND INSTALLATION

M1511025400619

### Pre-removal and post-installation operation

- Engine room under cover front A and engine room under cover center removal and installation (Refer to P.51-15.)
- Air cleaner intake duct removal and installation (Refer to GROUP 15, Air cleaner P.15-11)



◀ : Bosses (triangle marks indicating the boss locations are inscribed on the top surface)

AC708707AB

### Removal steps

1. Headlight support panel cover
2. Front bumper harness connector connection
3. Front bumper and radiator grille assembly
4. Front bumper side bracket
  - Horn (Refer to GROUP 54A, Horn P.54A-289)

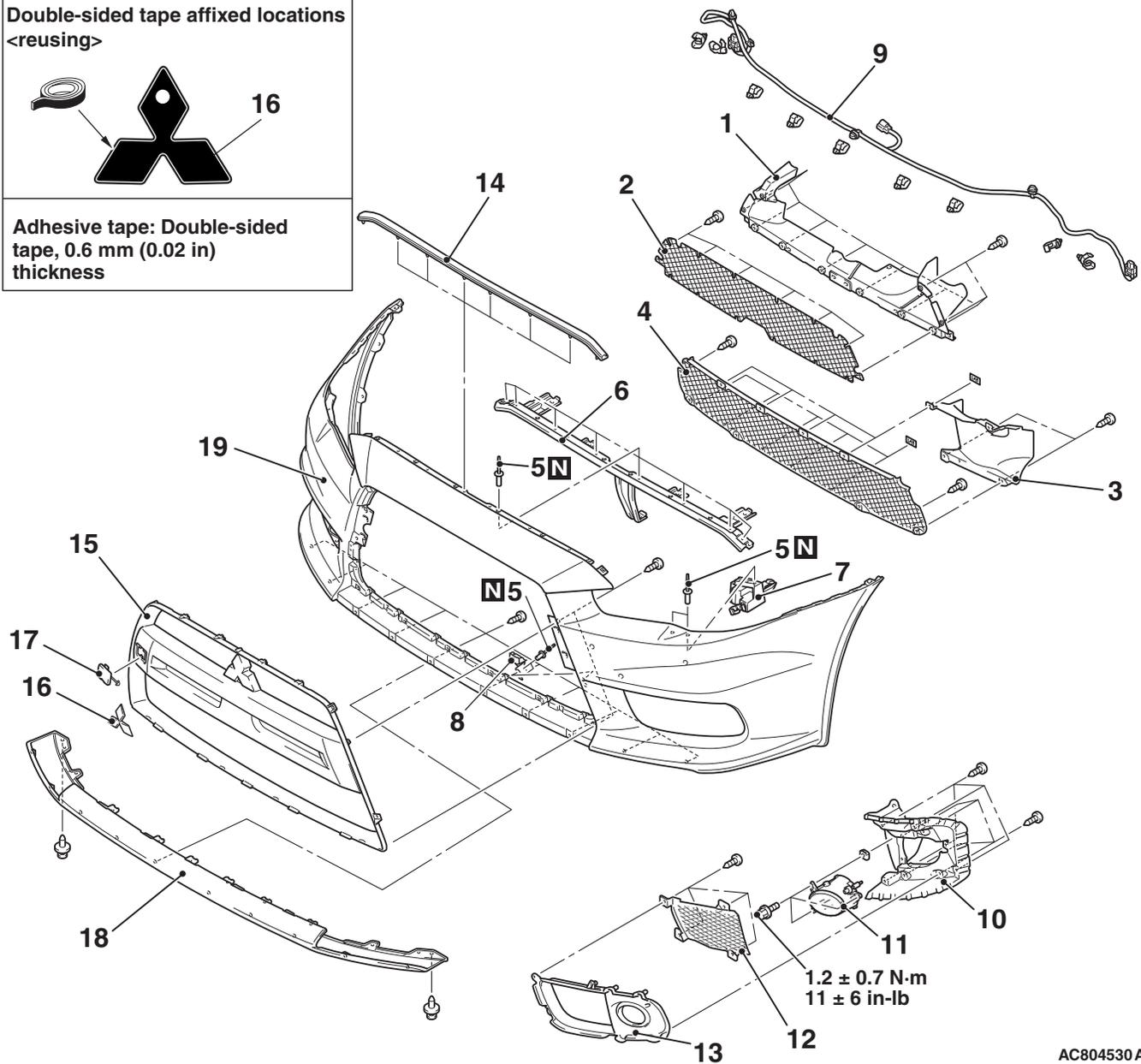
### Removal steps (Continued)

- Ambient temperature sensor (Refer to GROUP 55, Ambient temperature sensor P.55-178)
- 5. Front bumper core
- 6. Front bumper reinforcement
- 7. Front bumper air guide center duct

DISASSEMBLY AND ASSEMBLY

Double-sided tape affixed locations  
<reusing>

Adhesive tape: Double-sided tape, 0.6 mm (0.02 in) thickness



AC804530 AB

**Disassembly steps**

1. Front bumper grille cover A
2. Front bumper net A
3. Front bumper grille cover B
4. Front bumper net B
5. Rivet
6. Front bumper reinforcement
7. Front bumper support
8. Front bumper bracket
9. Front fog light harness
10. Front fog light bracket

**Disassembly steps (Continued)**

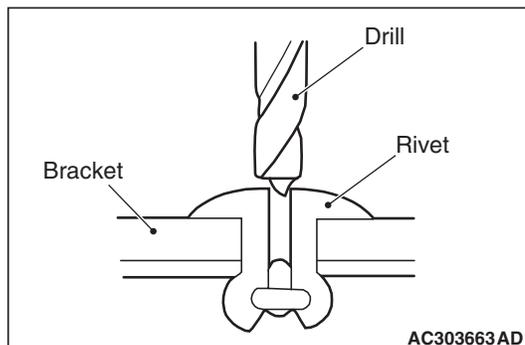
11. Front fog light assembly
12. Front bumper net C
13. Front bumper garnish
14. Hood weather strip front
15. Radiator grille
16. Front three-diamond mark
17. Front bumper cover
18. Air dam skirt panel
19. Front bumper face

<<A>> >>A<<

### DISASSEMBLY SERVICE POINT

#### <<A>> RIVETS REMOVAL

Use a drill [ $\phi$  4.0 mm(0.16 in)] to make a hole in the rivet to break it, and remove the rivet.

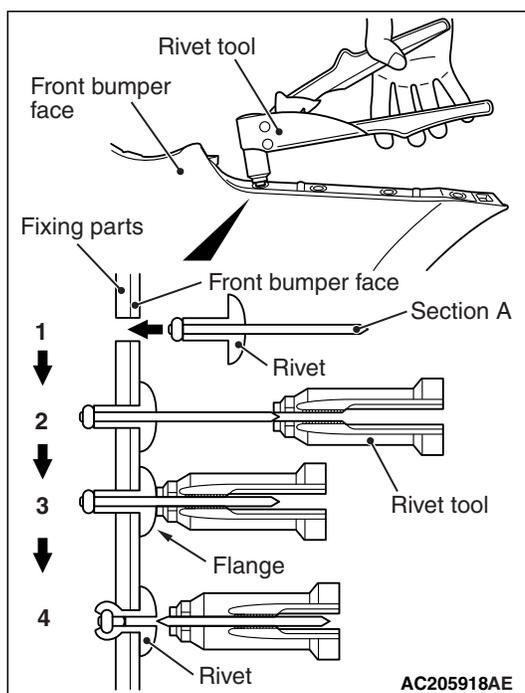


### ASSEMBLY SERVICE POINT

#### >>A<< RIVETS INSTALLATION

Use a rivet tool 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 section 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 section A of the rivet will be cut off and the parts is fixed in position.



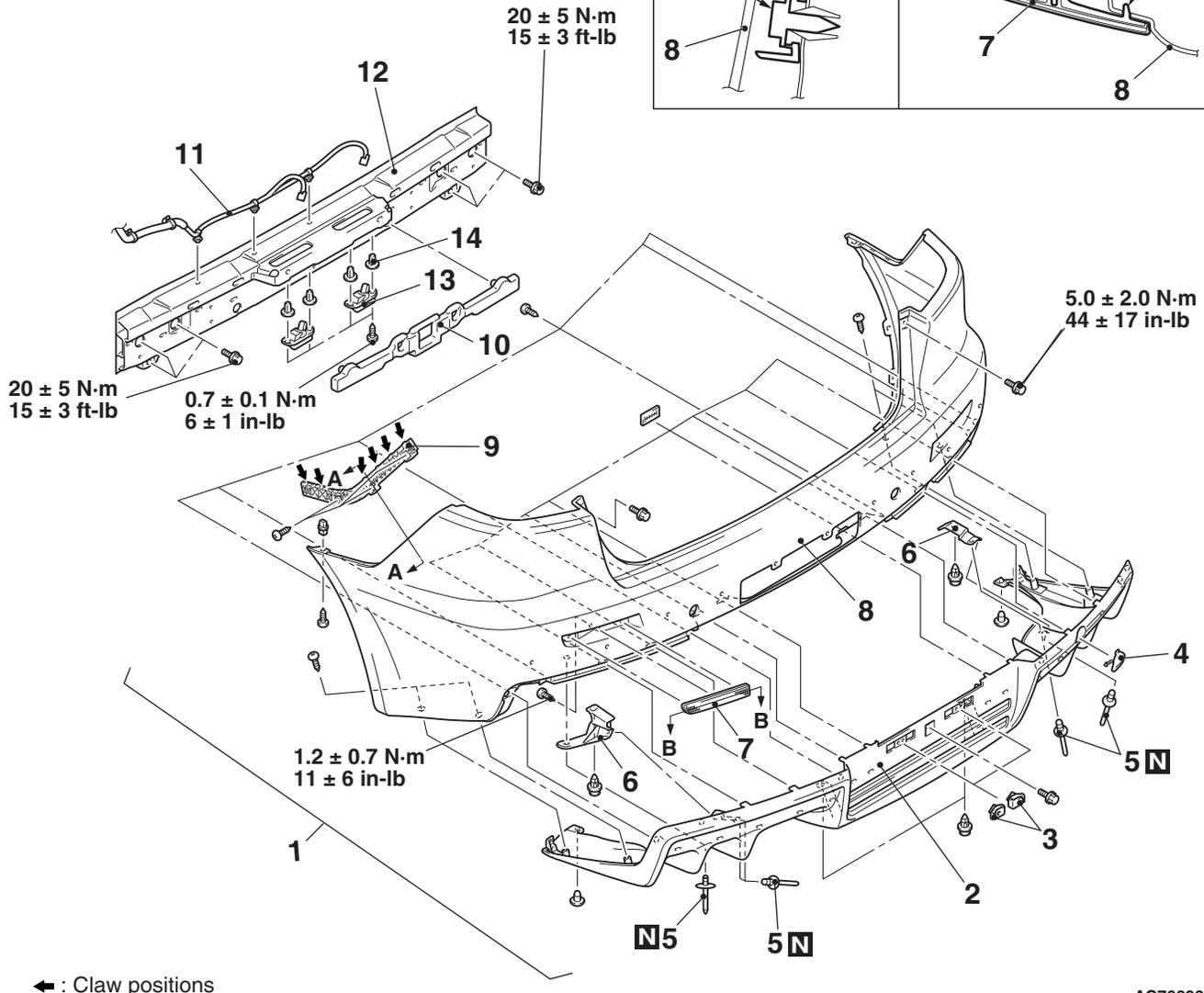
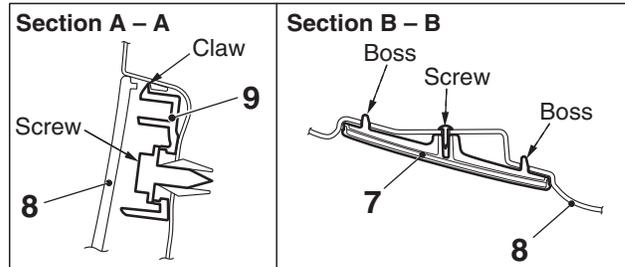
# REAR BUMPER ASSEMBLY

## REMOVAL AND INSTALLATION

M1511001902155

**Pre-removal and post-installation operation**

- Rear splash shield removal and installation (Refer to GROUP 42A-Splash shield P.42A-12)
- Rear combination light removal and installation (Refer to GROUP 54A-Rear combination light P.54A-237)



AC708933AD

**Removal steps**

1. Rear bumper assembly
2. Rear bumper extension
3. License plate bracket
4. Rear bumper cover
5. Rivet
6. Rear bumper garnish side bracket
7. Reflector

**Removal steps (Continued)**

8. Rear bumper face
9. Rear bumper side bracket
10. Rear bumper core lower
11. Rear floor harness
12. Rear bumper reinforcement
13. License plate light assembly
14. Grommet

<<A>> >>A<<

**REMOVAL SERVICE POINT**

**<<A>> RIVETS REMOVAL**

Refer to FRONT BUMPER DISASSEMBLY SERVICE POINT (P.51-4).

**INSTALLATION SERVICE POINT**

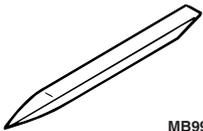
**>>A<< RIVETS INSTALLATION**

Refer to FRONT BUMPER ASSEMBLY SERVICE POINT (P.51-4).

**GARNISHES AND MOLDINGS**

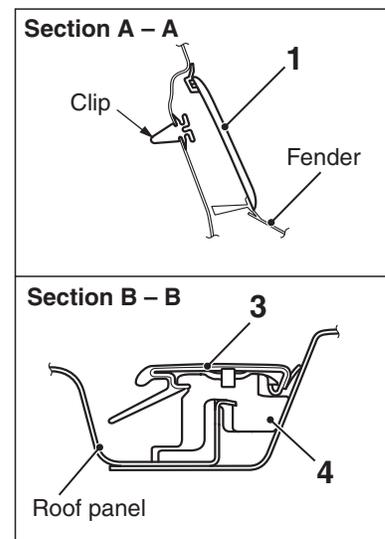
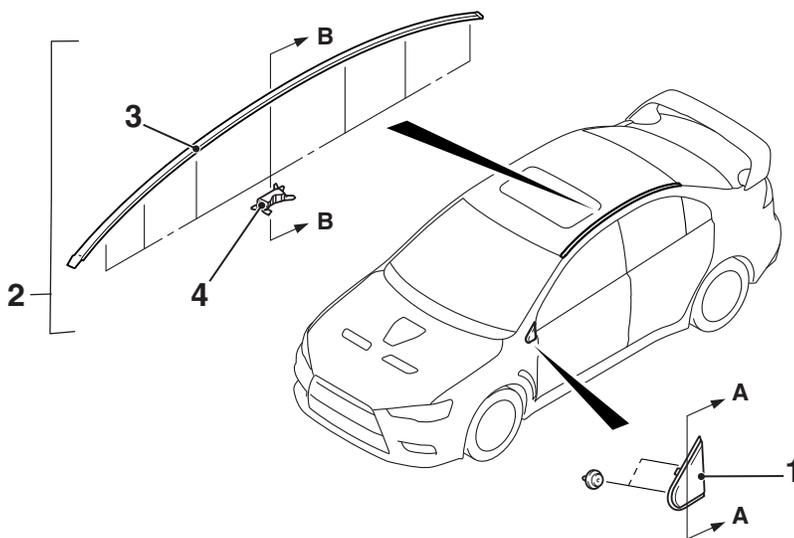
**SPECIAL TOOL**

M1511000602292

Tool	Tool number and name	Supersession	Application
 MB990784	MB990784 Ornament remover	General service tool	Removal of front delta garnish

**REMOVAL AND INSTALLATION**

M1511004701469



AC705108 AK

- Removal**
- Front delta garnish removal**
- <<A>> 1. Front delta garnish
- Roof drip molding removal steps**
- <<B>> 2. Roof drip molding assembly

- Roof drip molding removal steps**
- >>A<< 3. Roof drip molding
- >>A<< 4. Clip

**Required Special Tool:**

- MB990784: Ornament remover

## REMOVAL SERVICE POINTS

## &lt;&lt;A&gt;&gt; FRONT DELTA GARNISH REMOVAL

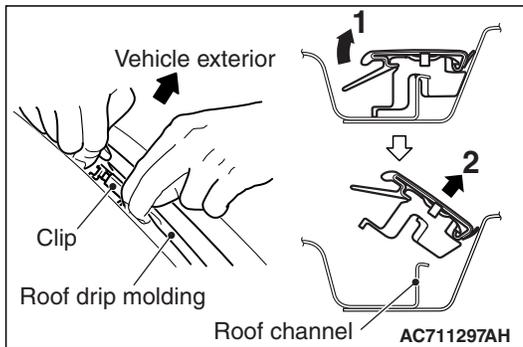
Use the special tool ornament remover (MB990784) to pry out the front delta garnish.

## &lt;&lt;B&gt;&gt; CLIPS/ ROOF DRIP MOLDING REMOVAL

**⚠ CAUTION**

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

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



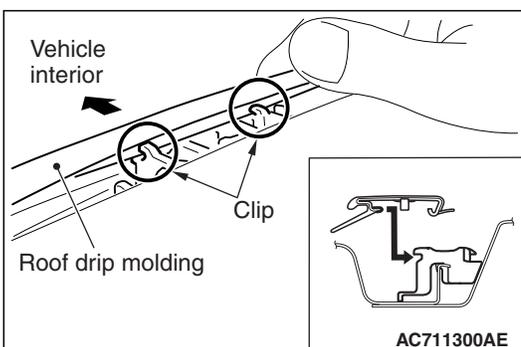
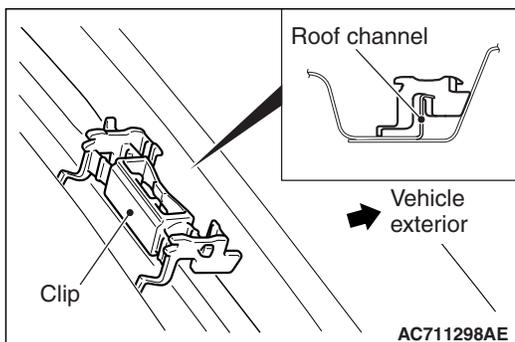
## INSTALLATION SERVICE POINT

## &gt;&gt;A&lt;&lt; CLIPS/ ROOF DRIP MOLDING INSTALLATION

**⚠ CAUTION**

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

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



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

# DOOR SASH TAPE

## SPECIAL TOOL

M1511000602300

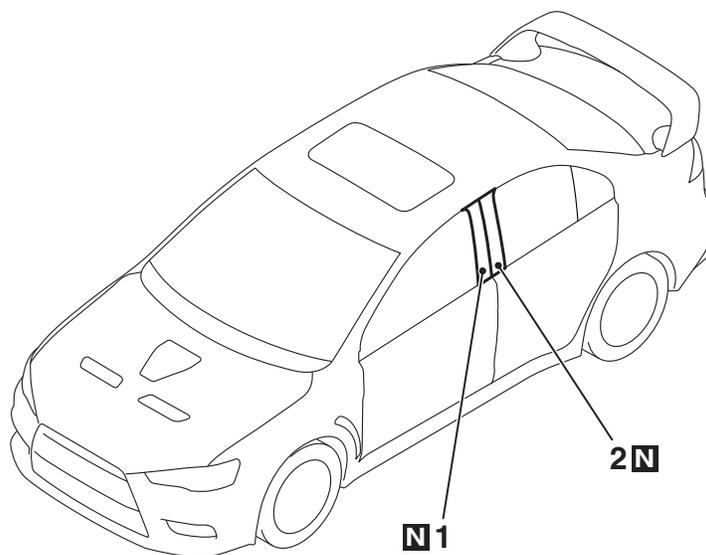
Tool	Tool number and name	Supersession	Application
 <p>MB990528</p>	<p>MB990528 Stripe tape spatula</p>	<p>General service tool</p>	<p>Installation of door sash tape</p>

## REMOVAL AND INSTALLATION

M1511024100905

### Pre-removal and post-installation operation

- Door Window Glass Runchannel Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip [P.42A-142](#)).
- Door Beltline Molding Removal and Installation (Refer to GROUP 42A –Window Glass Runchannel and Door Opening Weatherstrip [P.42A-142](#)).



AC706342AB

<<A>> >>A<<  
<<A>> >>A<<

### Removal steps

1. Front door sash tape, rear
2. Rear door sash tape, front

### Required Special Tool:

- MB990528: Stripe tape spatula

## REMOVAL SERVICE POINT

## &lt;&lt;A&gt;&gt; DOOR SASH TAPES REMOVAL

**⚠ CAUTION**

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

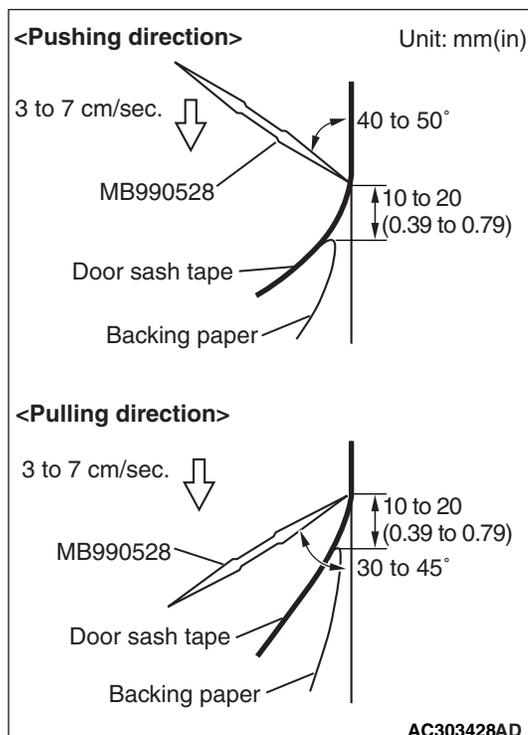
1. Use a hair drier to warm the tape.
2. Peel the tip of the tape with your finger, and then peel off the tape in parallel with the application surface.

## INSTALLATION SERVICE POINT

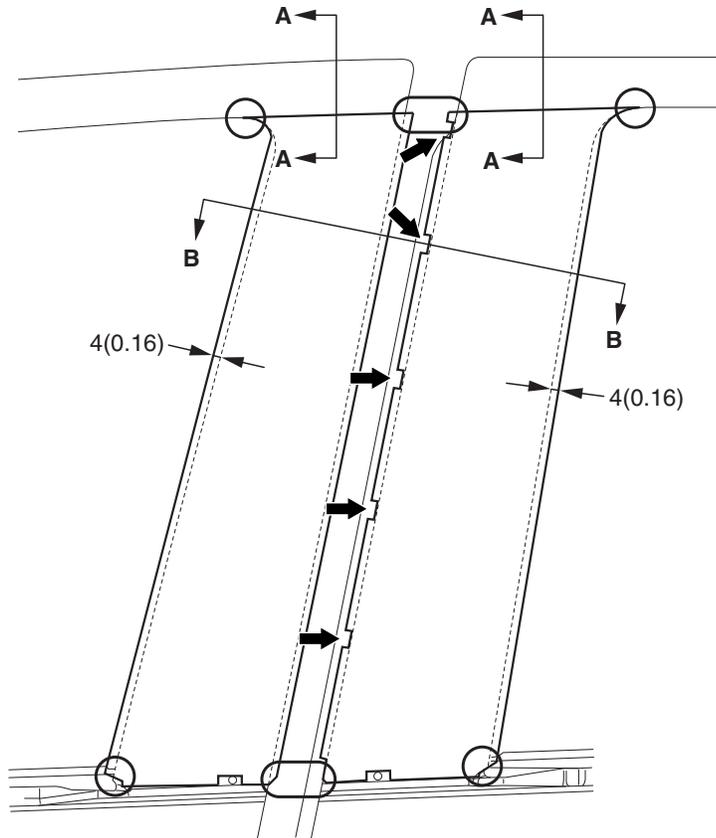
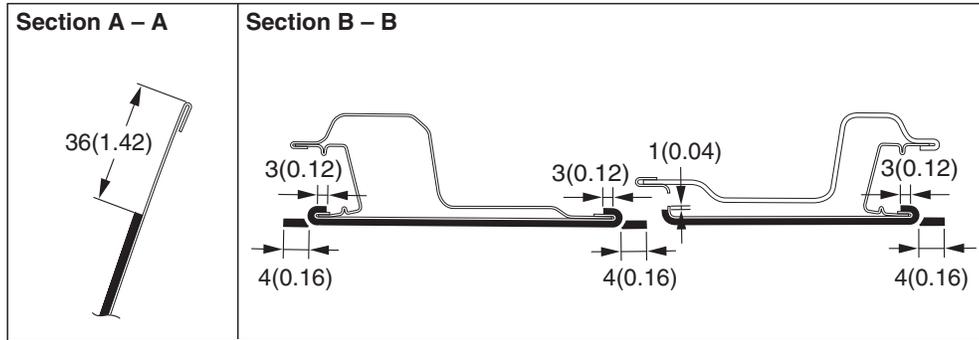
## &gt;&gt;A&lt;&lt; DOOR SASH TAPES INSTALLATION

**⚠ CAUTION**

- The ambient temperature should be 20(68° F) to 30° C(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(68) to 30° C(86° F). If ambient temperature is 35° C(95° F) or higher, cool down them. The adhesive property of the tape is deteriorated at low temperature, so the tape may come loose easily. Meanwhile, it gets softened at hot 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.
- Use the special tool MB990528 to apply the tape with a steady pace and pressure. If you do not apply the tape with a steady pace or pressure, or abort the application, a shallow groove (lateral groove called as "Shock line") may be present on the tape surface. Meanwhile, if you apply it too quickly, air bubbles may be formed under the tape.



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

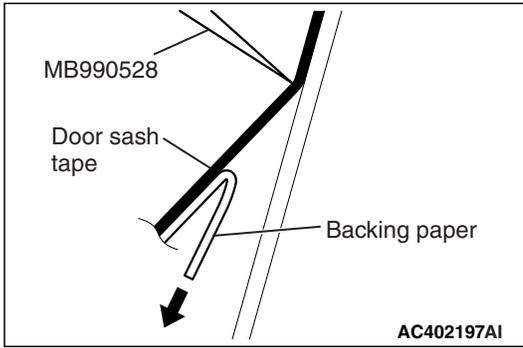


Unit: mm (in)

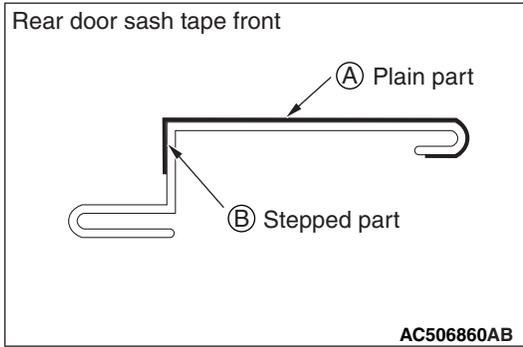
- : Tape locating points
- ➔ : T-stud for door opening weatherstrip attaching locations (5 places in all).

AC607960AG

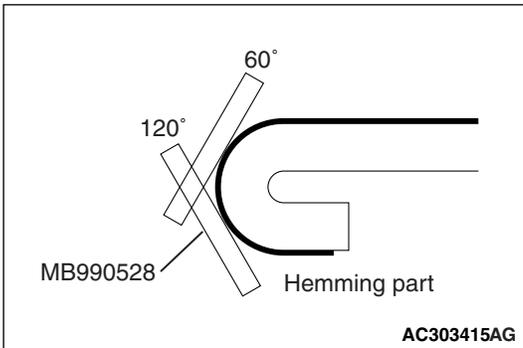
4. Apply the door sash tape according to the procedure below.
  - (1) Position the tape at the upper and lower locating points.
  - (2) Peel of backing strip from the top of the tape and attach it temporarily.
  - (3) Peel off the backing strip to the half length of the tape.



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



(5) For the rear door sash tape, apply the tape to the plain part (A), next apply to the stepped part (B).

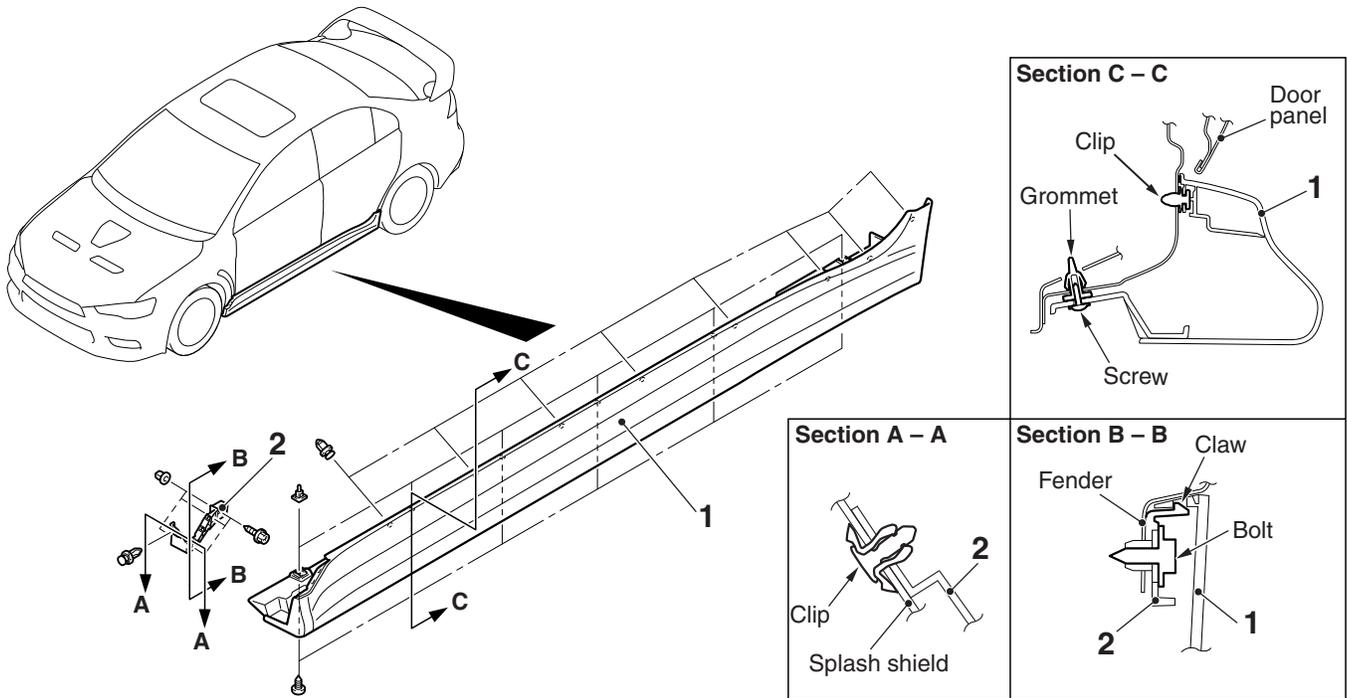


(6) Press the folded area of the tape by three stages (60°, 120° and holding), rolling in toward the vehicle inside direction.

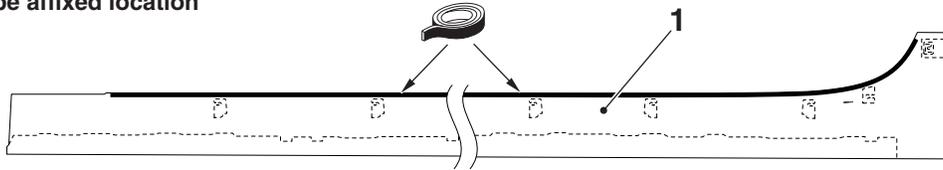
# SIDE AIR DAM

## REMOVAL AND INSTALLATION

M1511005501015



Double-sided tape affixed location



Double-sided tape:  
4 mm (0.16) width and 1.6 (0.06) mm thickness

AC900038AD

### Removal steps

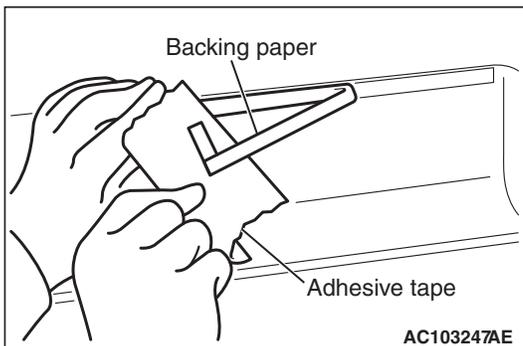
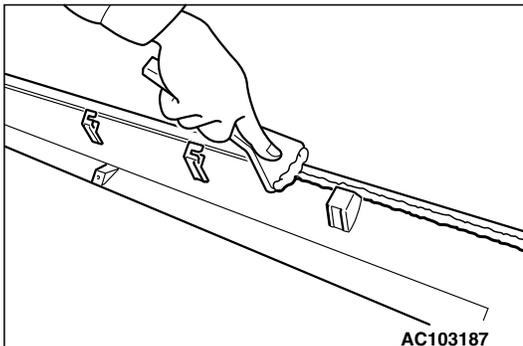
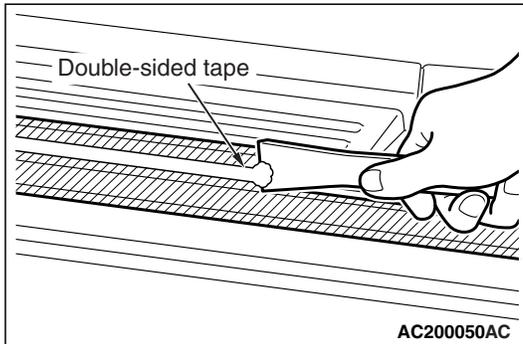
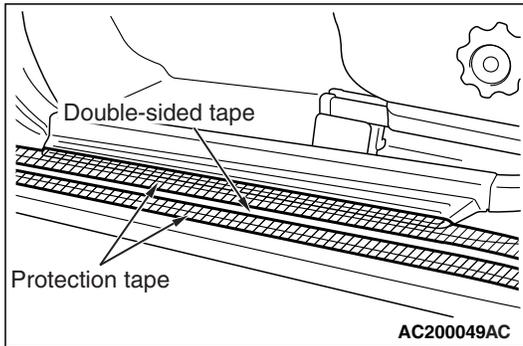
- <<A>> >>A<<
1. Side air dam
  2. Side air dam bracket

## 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.

1. Remove double-sided tape remaining on the body surface (when replacing side air dam).



- (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 possible.
- (3) Peel off the protection tape.
- (4) Use a shop towel moistened with 3M™ AAD Part number 8906 or equivalent to wipe the body.

2. 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 amount of the residual adhesive.
  - (4) Apply the primer as specified on the residual adhesive.
  - (5) 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: Attach the adhesive tape to the edge of the backing paper makes the backing paper tear off easier.*

2. Install the side air dam.

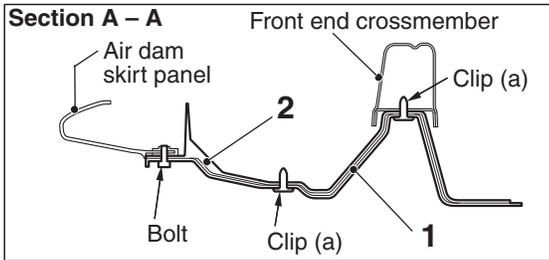
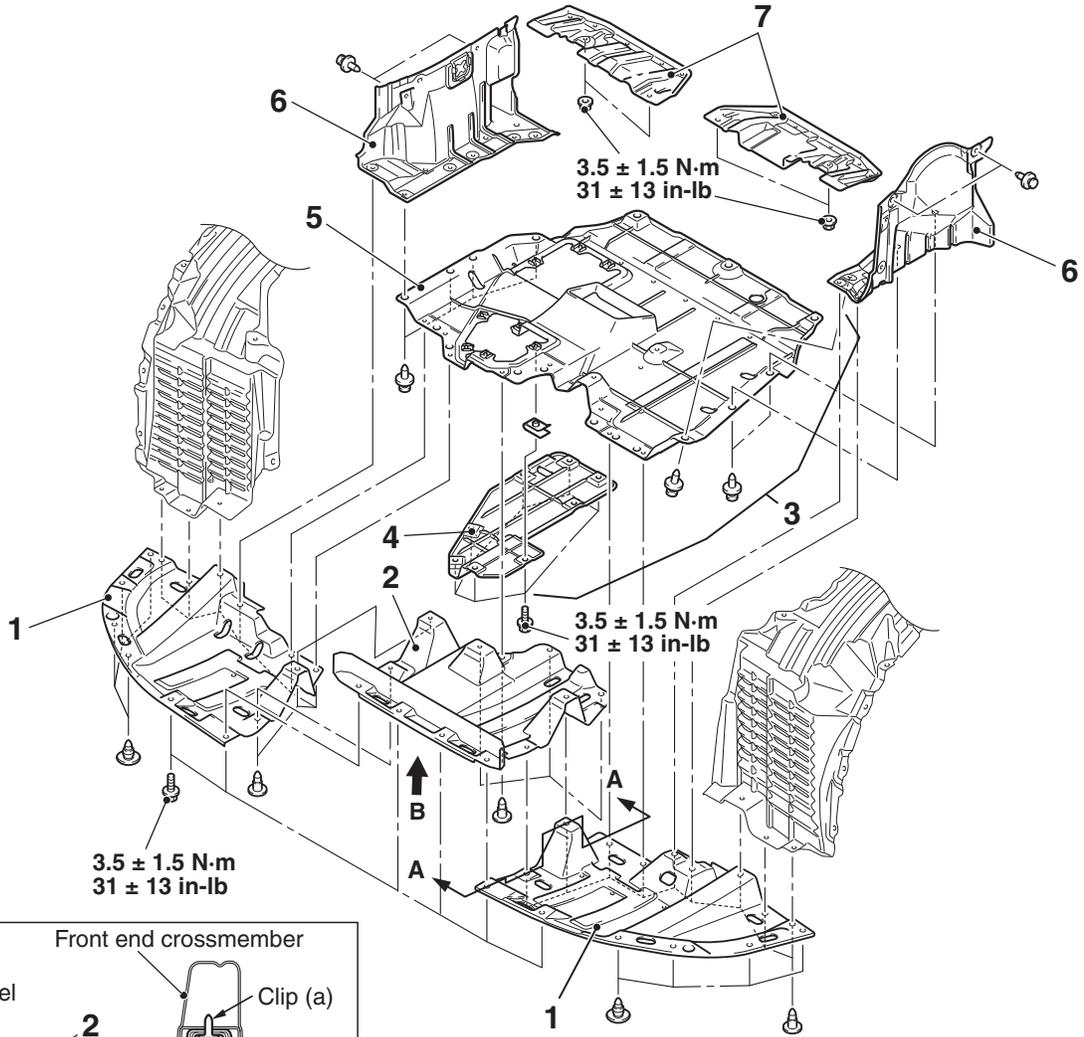
*NOTE: If the double-sided tape is difficult to affix in cold temperature, etc., warm the bonding surfaces of the body and side air dam to about 40 -60 °C (104 -140 °F) before affixing the tape.*

3. Firmly press in the side air dam to the body.

# UNDER COVER

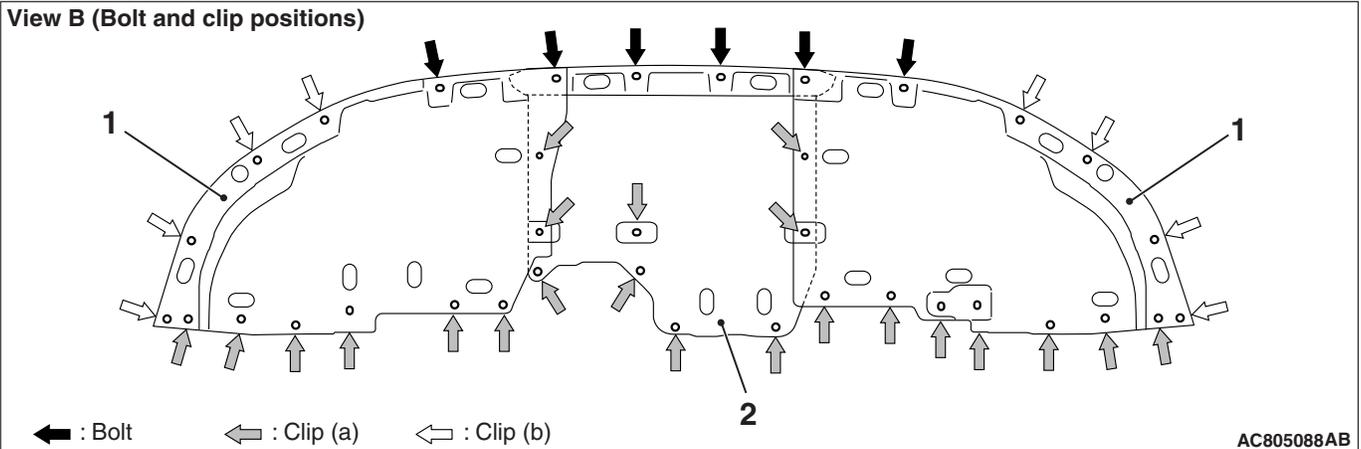
## REMOVAL AND INSTALLATION

M1511019600744



AC805051 AB

**View B (Bolt and clip positions)**



AC805088 AB

**TSB Revision**

**Removal steps**

1. Engine room under cover front A
2. Engine room under cover center
3. Engine room under cover front B assembly
4. Engine room under cover extension

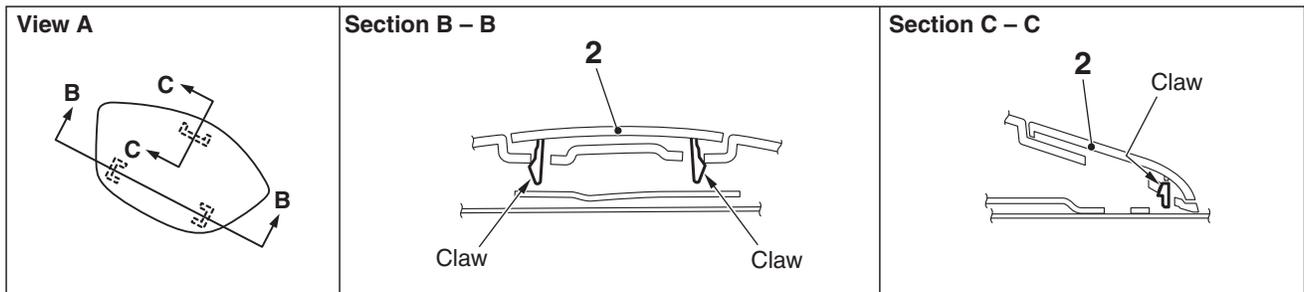
**Removal steps (Continued)**

5. Engine room under cover front B
6. Engine room side cover
7. Front floor under cover

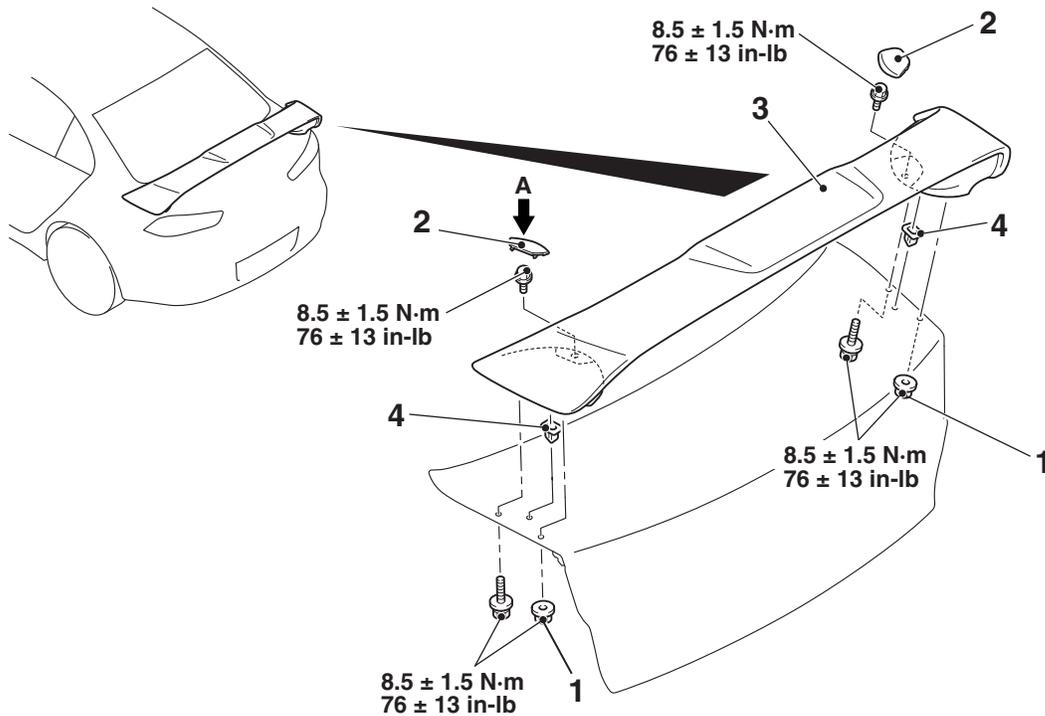
# REAR SPOILER

## REMOVAL AND INSTALLATION

M1511006100318



<MR>



AC708776 AD

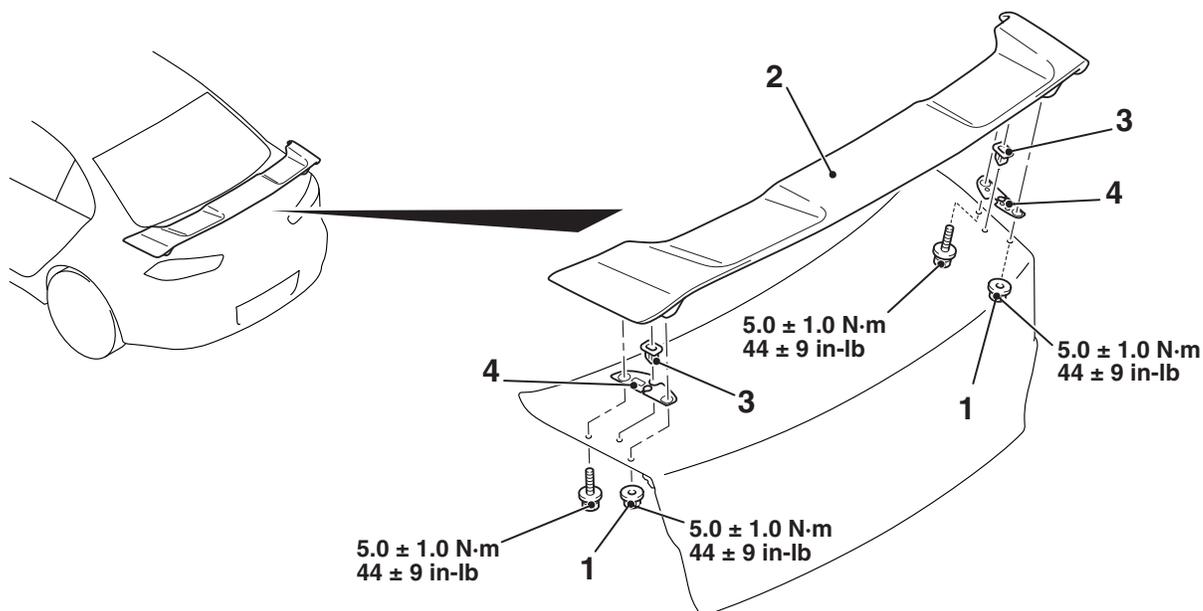
**Removal steps**

1. Nut
2. Cap

**Removal steps (Continued)**

3. Rear spoiler assembly
4. Grommet

<GSR>



AC705243 AE

**Removal steps**

1. Nut
2. Rear spoiler assembly

**Removal steps (Continued)**

3. Grommet
- >>A<< 4. Tape

**INSTALLATION SERVICE POINT**

**>>A<< TAPE INSTALLATION**

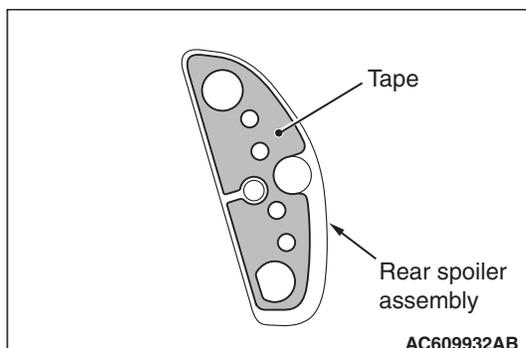
1. Installation position

**⚠ CAUTION**

- The ambient temperature should be 15 (59) to 40° C (104° F). Ensure that the working area is clean.
- If ambient temperature is less than 15° C (59° F), heat the tape and application surface to a temperature of 15 (59) to 40° C (104° F).
- Be careful that air bubbles are not formed under the tape.

2. Installation procedure

- (1) Wipe the tape application surface and clean it with a rag moistened with isopropyl alcohol.
- (2) Remove backing paper from the tape, and apply it to the rear spoiler assembly.



# WINDSHIELD WIPER AND WASHER

## GENERAL INFORMATION

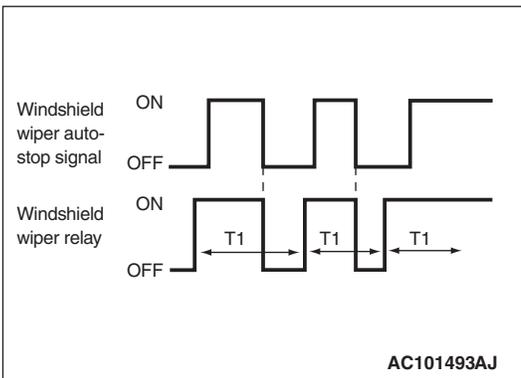
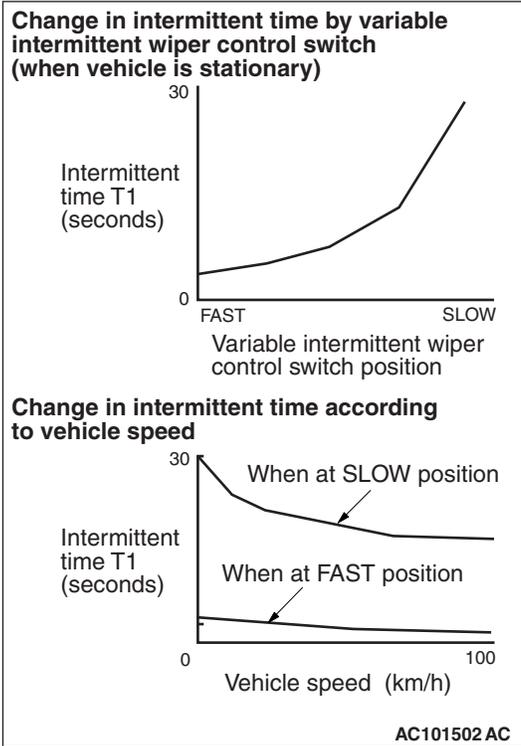
M1511000101993

## 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).

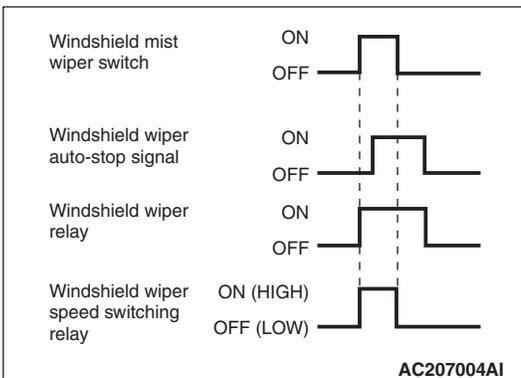
*NOTE: Using the customization function, the vehicle speed-dependent intermittent function can be invalidated (Refer to P.51-73).*



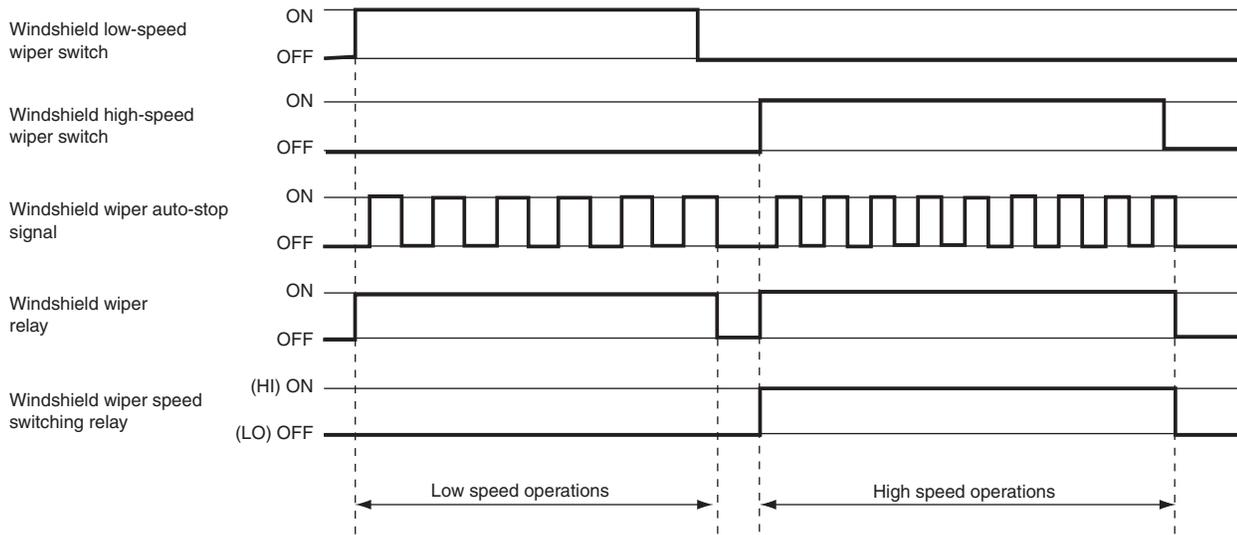
2. When ETACS receives the ON signal of the windshield intermittent wiper switch, it turns the windshield wiper relay ON. When the wiper reaches the stop position, the windshield wiper auto-stop signal turns OFF, and the windshield wiper relay turns OFF. When the intermittent time T1 calculated by step 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**

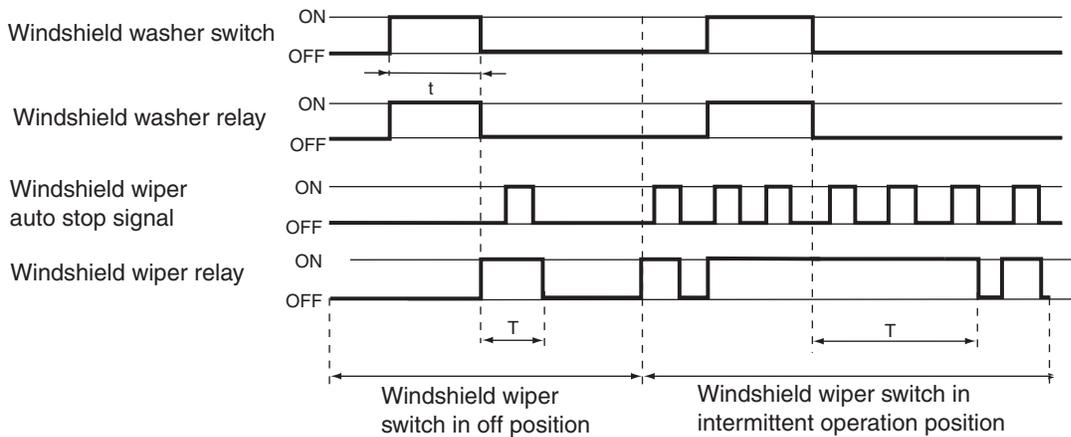


AC506610AH

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
	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	
Washer switch ON time (t)											-
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.51-73](#)).
- 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.

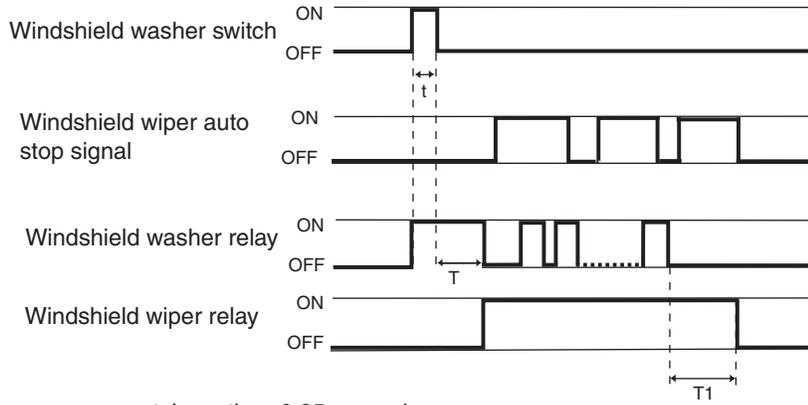
Wiper switch	Washer-linked wiper: Enabled		Washer-linked wiper: Disabled	
	Vehicle speed less than 130km/h	Vehicle speed 130km/h or more	Vehicle speed less than 130km/h	Vehicle speed 130km/h or more
OFF	Intermittent washer and wiping	1-second washer and wiping	1-second washer	1-second washer
INT	Intermittent 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.51-73.)

- 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

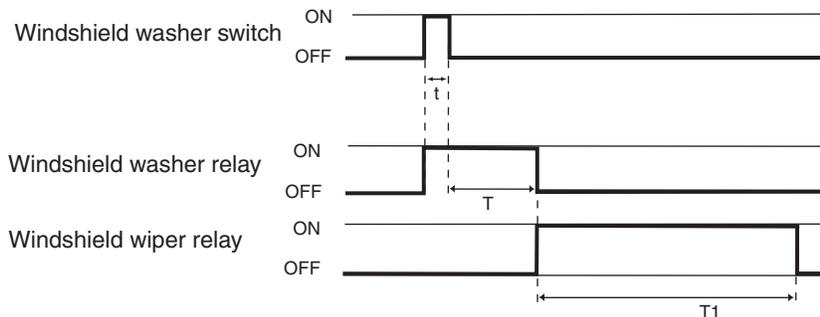
The intermittent washer and wiping operate as follows:

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.

**1-second washer and wiping**



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

AC802442 AD

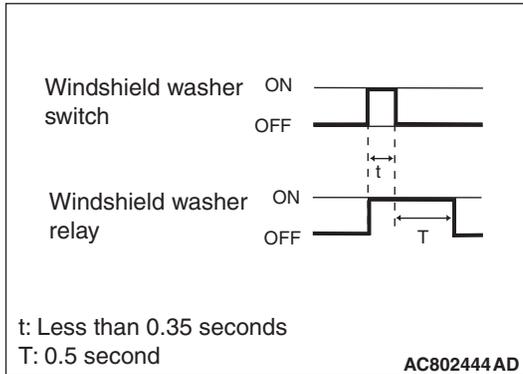
When the windshield washer switch is turned ON for less than 0.35 second, the windshield washer operates for 1 second. The windshield washer operates for 1 second, and then the windshield wipers operate for 3 seconds.

**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.

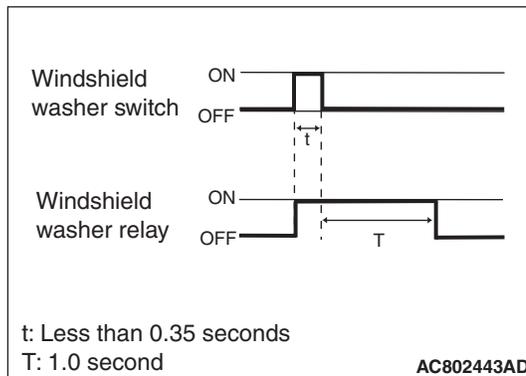
**0.5-second washer**

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

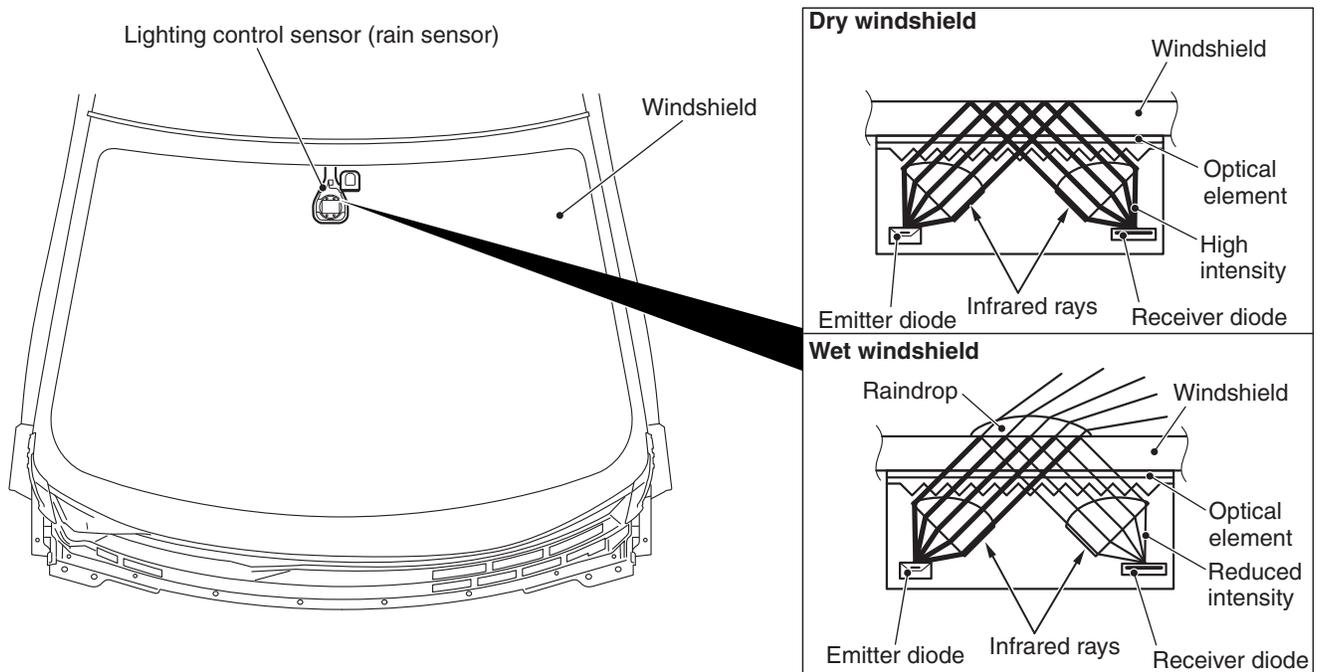


**1-second washer**

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



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



AC708778 AB

- 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.

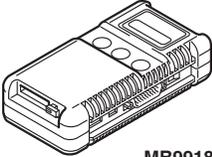
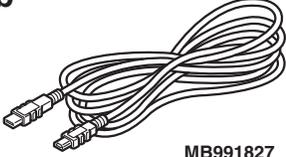
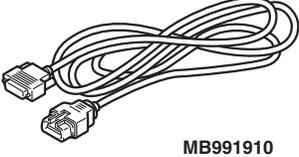
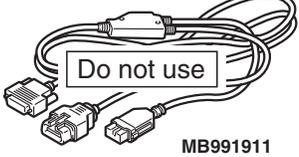
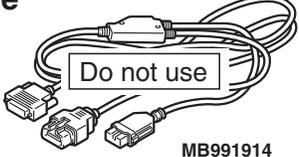
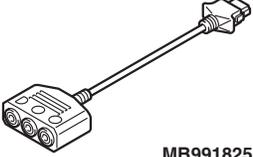
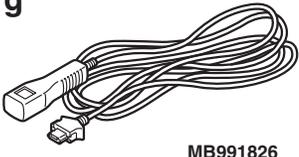
*NOTE: Using the customization function, the rain sensitive wiper function can be invalidated (Refer to P.51-73).*

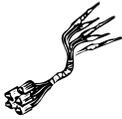
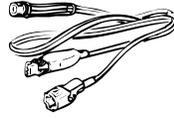
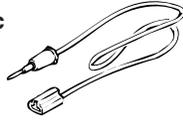
### **Delayed finishing wipe function <Initial condition: without function>**

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.51-73).*

SPECIAL TOOLS

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

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

**WINDSHIELD WIPER AND WASHER DIAGNOSIS****STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING**

M1511014600318

Refer to GROUP 00 –Contents of Troubleshooting

[P.00-7](#).**TROUBLE SYMPTOM CHART**

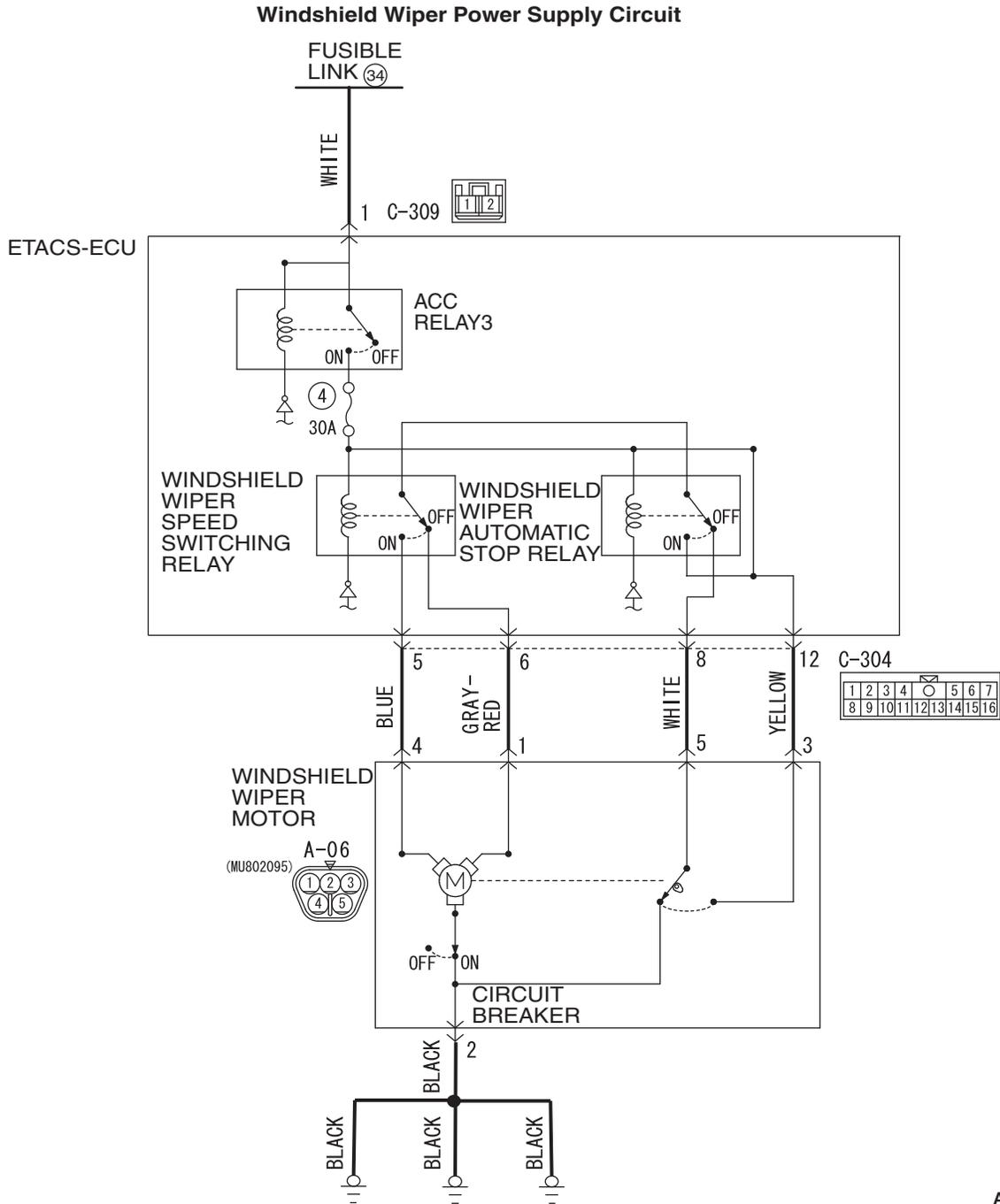
M1511015001594

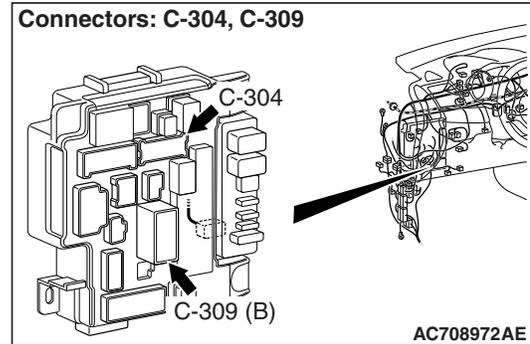
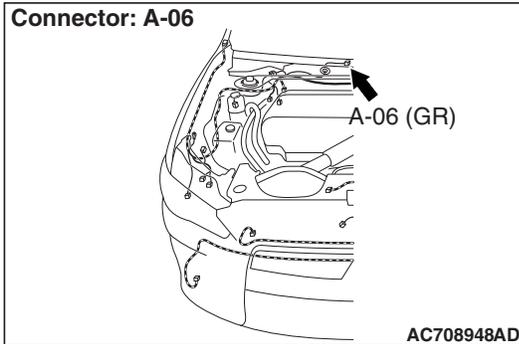
<b>TROUBLE SYMPTOM</b>	<b>Inspection procedure No.</b>	<b>Reference page</b>
The windshield wipers do not work at all.	1	<a href="#">P.51-27</a>
The windshield wipers do not work when the wiper switch is at the "INT", "Washer" or "Mist" position. However, the wipers work at low speed when the switch is at the "Lo" or "Hi" position.	2	<a href="#">P.51-35</a>
Windshield wipers do not stop at the specified park position.	3	<a href="#">P.51-38</a>
Windshield wipers do not work normally.	4	<a href="#">P.51-41</a>
The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control switch.	5	<a href="#">P.51-47</a>
The windshield intermittent wiper interval is not changed according to the vehicle speed.	6	<a href="#">P.51-50</a>
The rain sensitive AUTO wiper function does not work at all <Vehicles with lighting control sensor>.	7	<a href="#">P.51-52</a>
The rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>.	8	<a href="#">P.51-57</a>
Sometimes the rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>.	9	<a href="#">P.51-60</a>
The windshield washer does not work normally.	10	<a href="#">P.51-63</a>
The intelligent washing function does not work normally.	11	<a href="#">P.51-68</a>
Delayed finishing wipe function does not work normally	12	<a href="#">P.51-69</a>

*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.





## 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

---

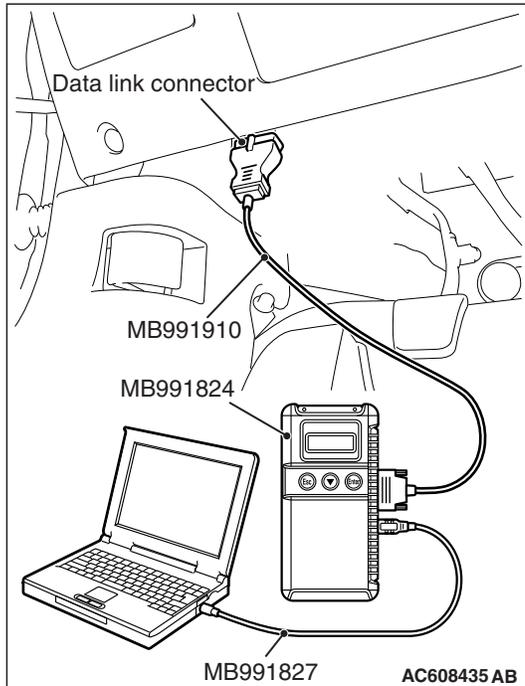
### STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-643](#)."

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

**YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."

**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	
		AUTO	ON and OFF
		INTO	ON and OFF
		MIST	ON
Item 288	ACC switch		ON

**OK: Normal condition is displayed.**

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

**YES <Normal conditions are displayed for all items> :**

Go to Step 3.

**NO <Normal condition is not displayed for item No. 235>**

: 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-703](#).

**NO <Normal condition is not displayed for item No. 288>**

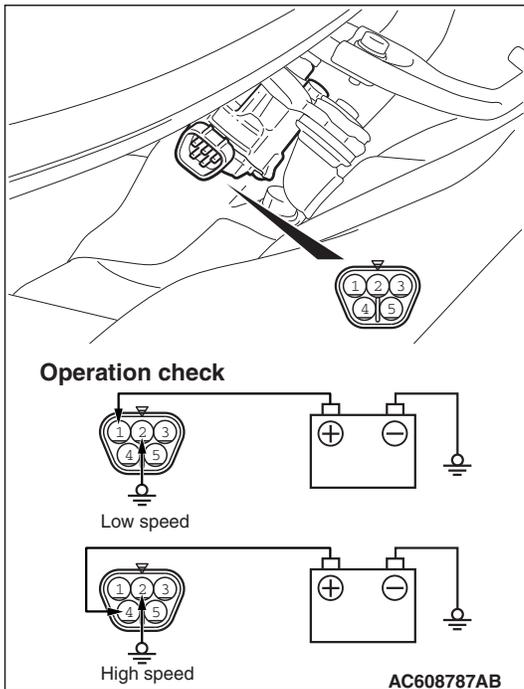
: Refer to GROUP 54A, ETACS, Diagnosis - Inspection Procedure 1 "The ignition switch (ACC) signal is not received" [P.54A-704](#).

**STEP 3. Check windshield wiper motor connector A-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-06 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.



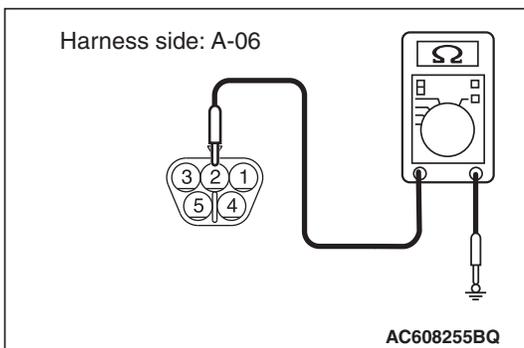
**STEP 4. Check the windshield wiper motor.**

- (1) Disconnect windshield wiper motor connector A-06.
- (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-06.**

- (1) Disconnect windshield wiper motor connector A-06 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the resistance value between terminal 2 and ground.
  - The resistance should be 2 ohms or less.

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

**YES :** Go to Step 7.

**NO :** Go to Step 6.

**STEP 6. Check the wiring harness between windshield wiper motor connector A-06 (terminal 2) and ground.**

- Check the ground wires for open circuit.

**Q: Is the wiring harness between windshield wiper motor connector A-06 (terminal 2) 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.

**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-309 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.

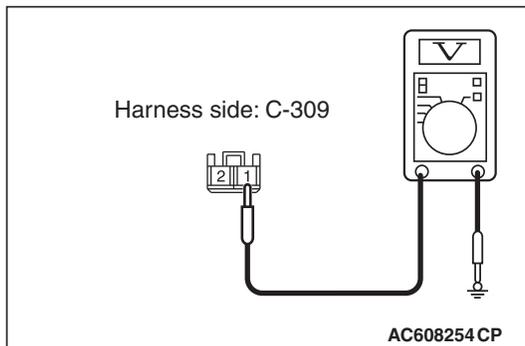
**STEP 8. Measure the voltage at ETACS-ECU connector C-309.**

- (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 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 11.

**NO :** Repair the damaged connector.

**STEP 11. Measure the voltage at ETACS-ECU connector C-304.**

(1) Disconnect ETACS-ECU connector C-304 and measure the resistance available at the wiring harness side of the connector.

(2) Ignition switch: ACC

(3) windshield wiper switch: HI

(4) Measure the voltage between C-304 ETACS-ECU connector terminal No. 5 and body ground.

**OK: Battery positive voltage**

(5) windshield wiper switch: LO

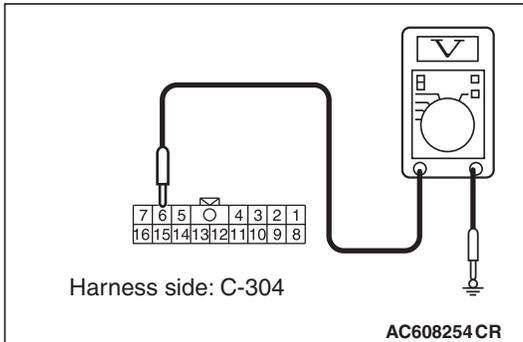
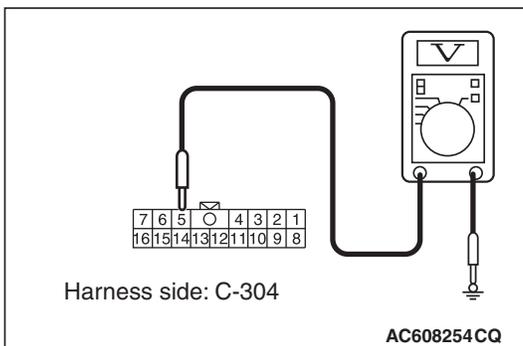
(6) Measure the voltage between C-304 ETACS-ECU connector terminal No. 6 and body ground.

**OK: Battery positive voltage**

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

**YES :** Go to Step 13.

**NO :** Go to Step 12.



---

**STEP 12. Check the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-06 (terminals 4, 1).**

- 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-06 (terminals 4, 1) in good condition?**

**YES :** Go to Step 13.

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

---

**STEP 13. Retest the system.**

Check that the windshield wipers work normally.

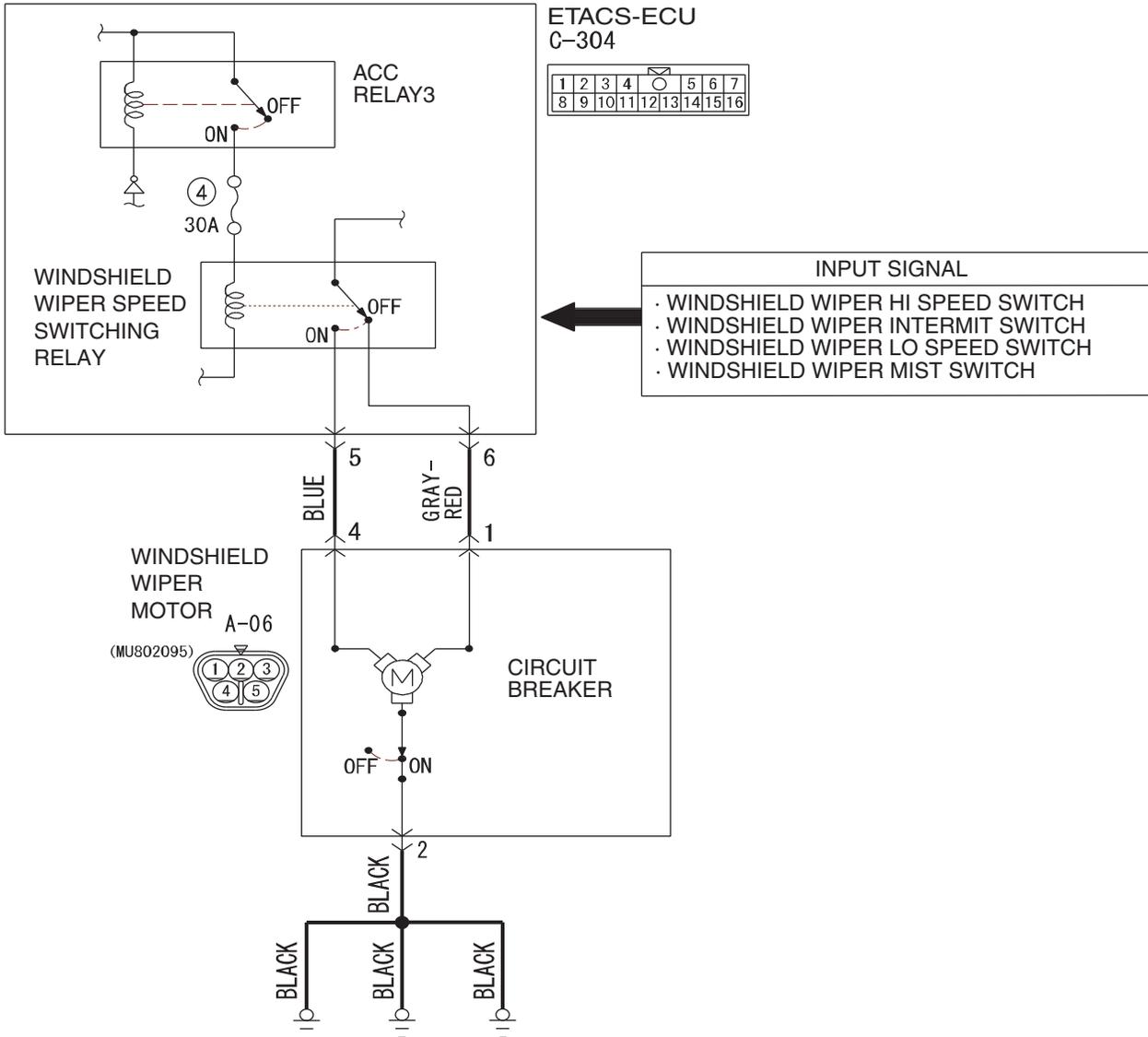
**Q: Is the check result normal?**

**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



AC708841AB

**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:**

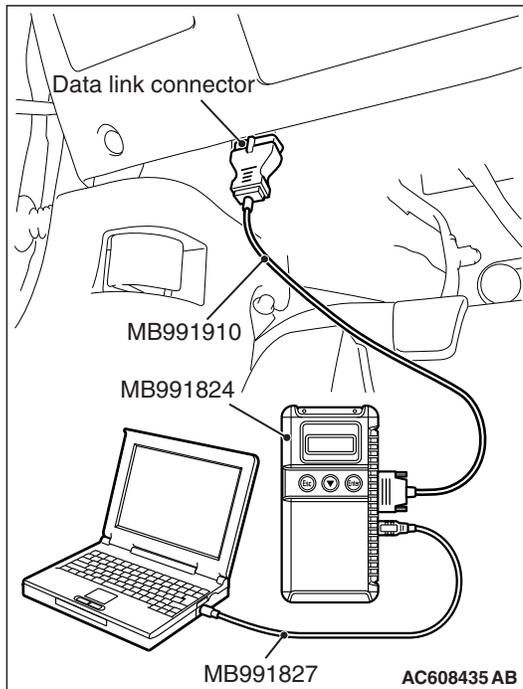
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

**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, "How to connect the scan tool (M.U.T.-III) [P.54A-643](#)."

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

- YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."
- 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	
		AUTO	ON and OFF
		INTO	ON and OFF
		MIST	ON
Item 236	Front wiper Lo/Hi	LO	OFF
		HI	ON
		AUTO	OFF
		INTO	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-703](#).

**STEP 3. Retest the system.**

Check that the windshield wipers work normally.

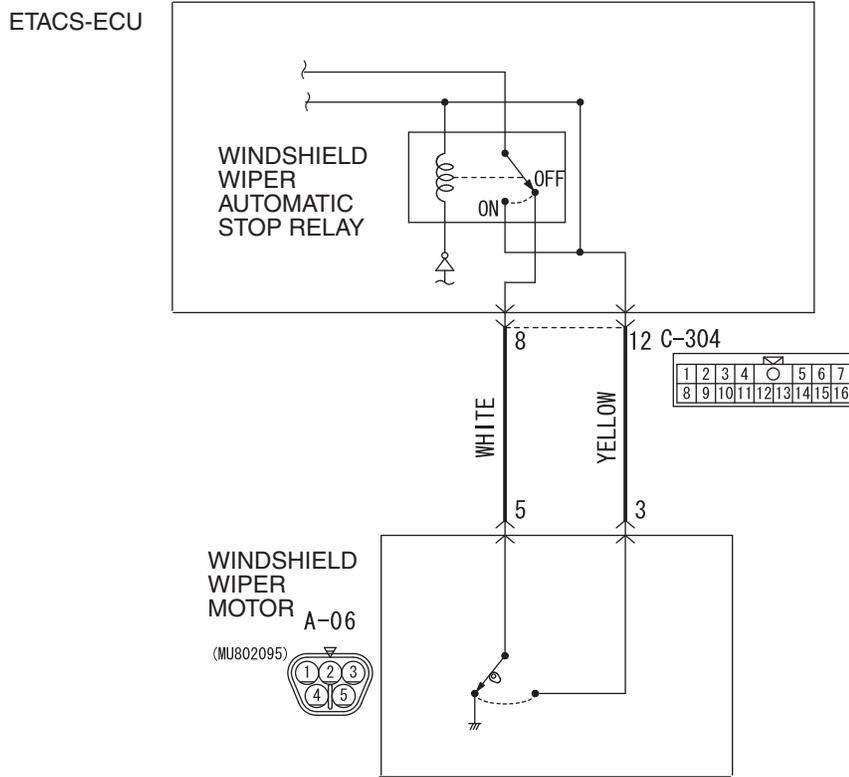
**Q: Is the check result normal?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-15](#).

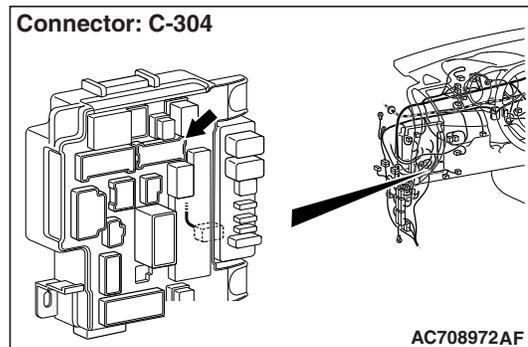
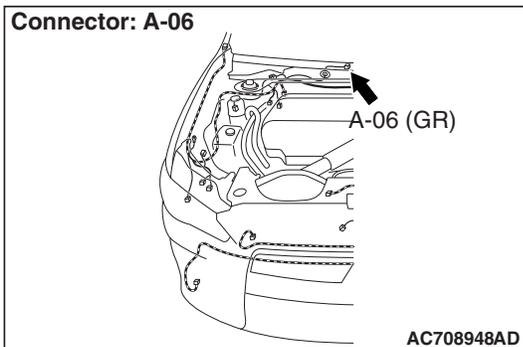
**NO :** Replace the ETACS-ECU.

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

Windshield Wiper Automatic Stop Relay Circuit



AC708843AB



**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.

**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-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-06 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.

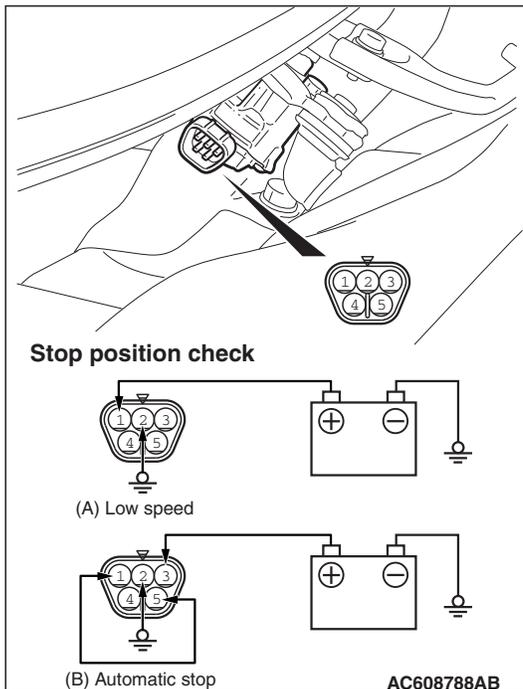
### STEP 2. Check the windshield wiper motor.

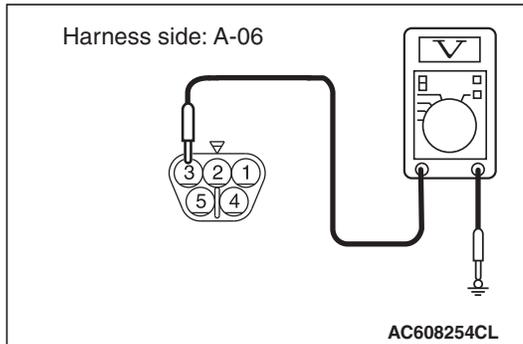
- (1) Disconnect windshield wiper motor connector A-06.
- (2) Connect the vehicle battery to the windshield wiper motor connector as shown, and operate the windshield wiper at low speed. While the windshield wiper is working, disconnect the battery at positions other than the specified park position 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 ground circuit to the windshield wiper motor. Measure the resistance at the windshield wiper motor connector A-06.**

- (1) Disconnect windshield wiper motor connector A-06 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 3 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 6.

**NO :** Go to Step 4.

**STEP 4. 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 5.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**STEP 5. Check the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-06 (terminals 5, 3).**

- Check the output lines for open or short circuit.

**Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-06 (terminals 5, 3) in good condition?**

**YES :** Go to Step 6.

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

**STEP 6. Retest the system.**

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

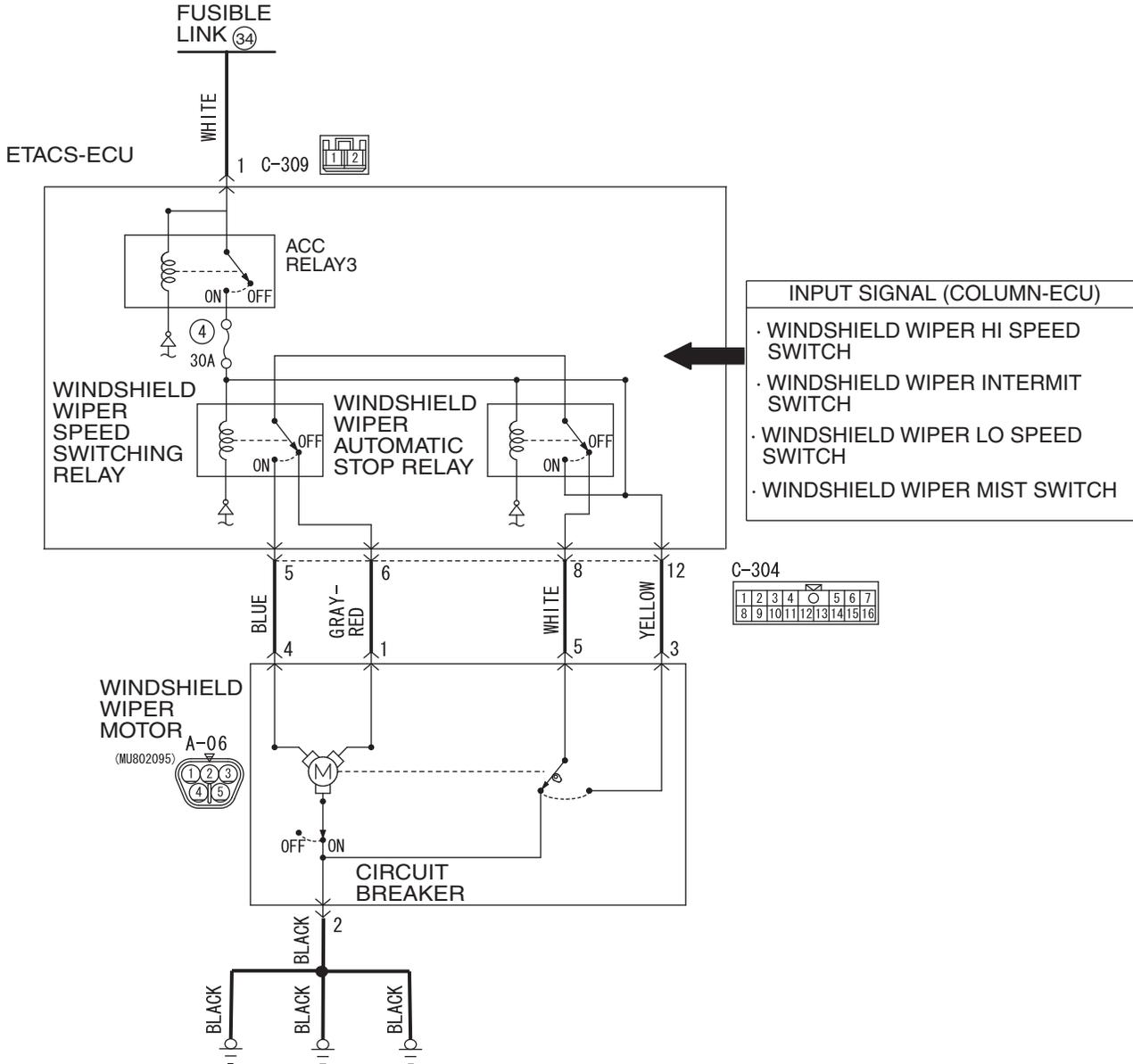
**Q: Is the check result normal?**

**YES :** Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-15](#).

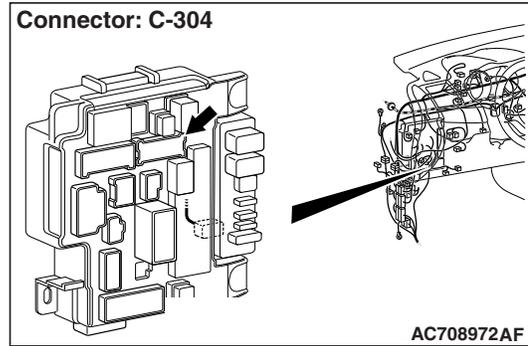
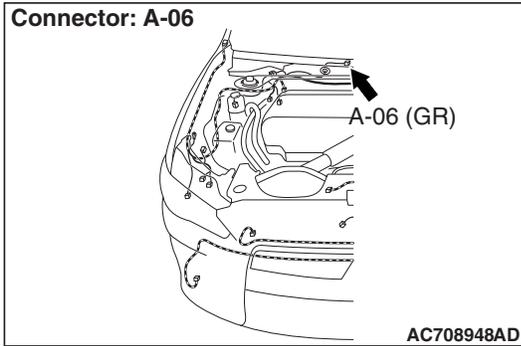
**NO :** Replace the ETACS-ECU.

INSPECTION PROCEDURE 4: Windshield Wipers do not work normally.

Windshield Wiper Power Supply Circuit



AC805121AB



### 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

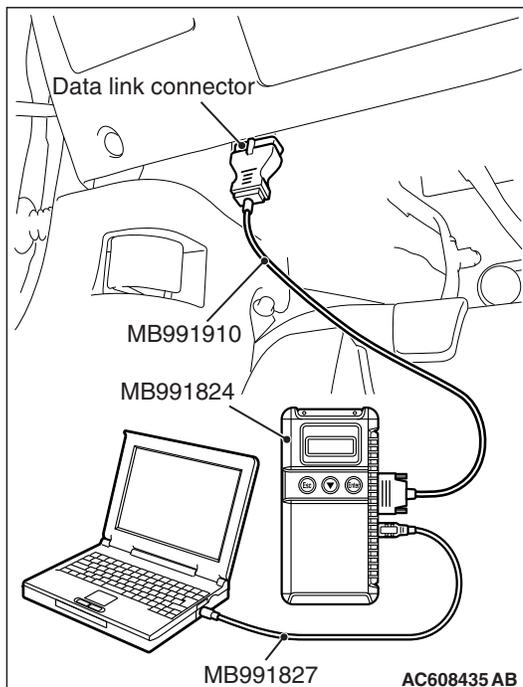
#### STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

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-646."

**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	
		AUTO	ON and OFF
		INTO	ON and OFF
		MIST	ON
Item 236	Front wiper Lo/Hi	LO	OFF
		HI	ON
		AUTO	OFF
		INTO	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-703](#).

**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-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-06 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.

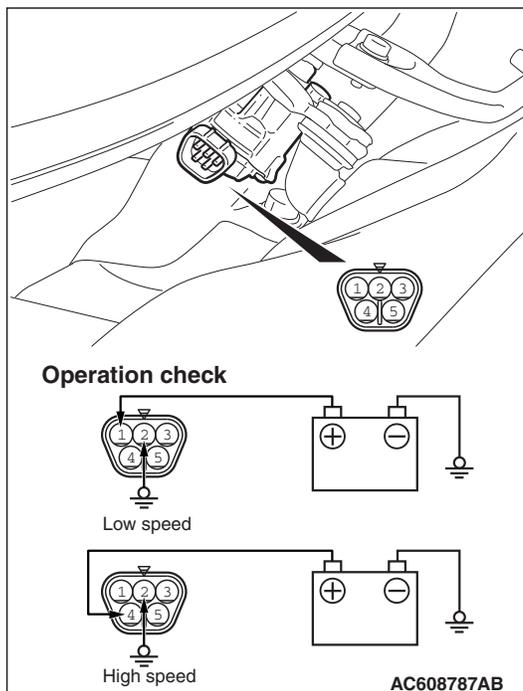
**STEP 5. Check the windshield wiper motor.**

- (1) Disconnect windshield wiper motor connector A-06.
- (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-06**

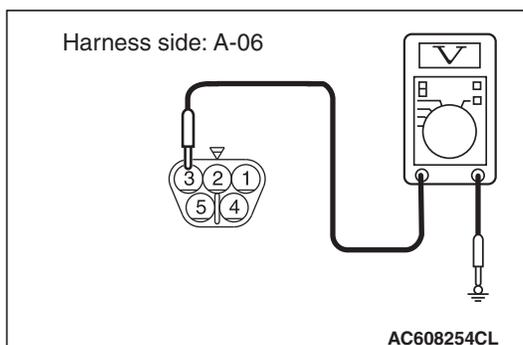
- (1) Disconnect the connector, and measure the voltage at the wiring harness side.
- (2) Ignition switch: ACC
- (3) windshield wiper switch: LO
- (4) Measure the voltage between A-06 windshield wiper motor connector terminal No. 3 and body ground.

**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.

---

**STEP 8. Check the wiring harness between windshield wiper motor connector A-06 (terminals 1) and ETACS-ECU connector C-304 (terminals 6).**

- Check the output lines for open or short circuit.

**Q: Is the wiring harness between windshield wiper motor connector A-06 (terminals 1) and ETACS-ECU connector C-304 (terminals 6) 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.

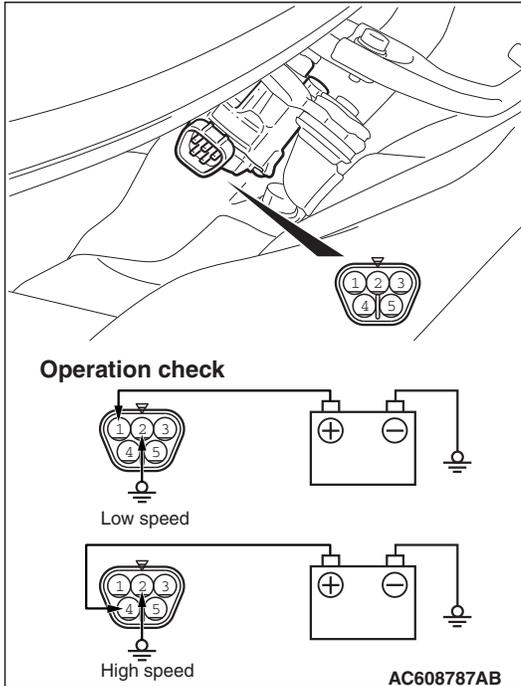
---

**STEP 10. Check the A-06 windshield wiper motor connector**

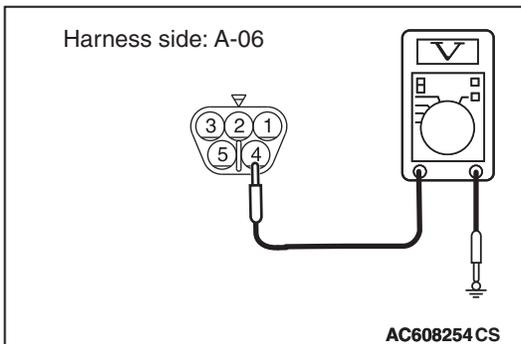
**Q: Is the check result normal?**

**YES :** Go to Step 11.

**NO :** Repair the connector concerned.

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

- (1) Disconnect windshield wiper motor connector A-06.
- (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-06 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-06 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. 5 and A-06 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.**

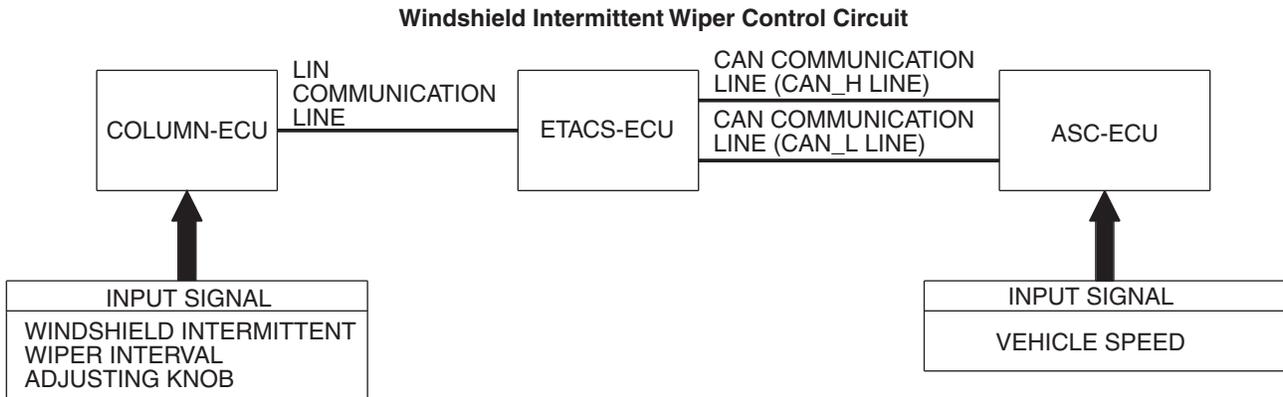
Check that the windshield wipers work normally by moving the switch to each position.

**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 interval control switch.**



AC609166 AD

### 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 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

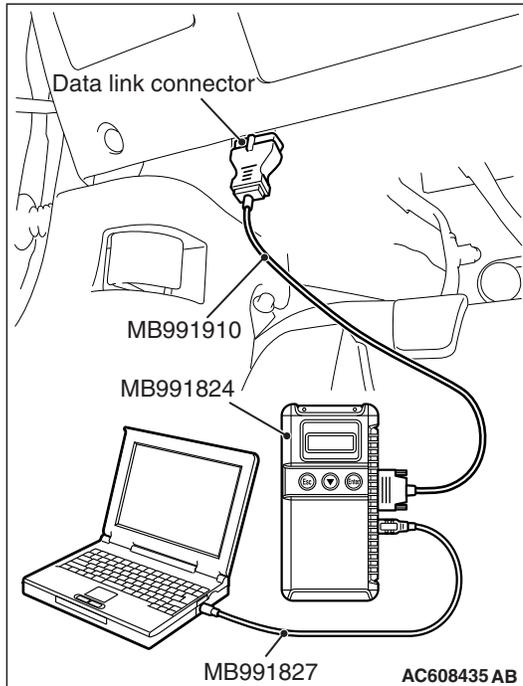
**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-643.](#)"

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

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646.](#)"

**NO :** Go to Step 2.

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

Use the ETACS customization 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 customization function to set "Front wiper operation" to "variable INT" or "Speed sensitive". (Refer to [P.51-73.](#))

**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.**

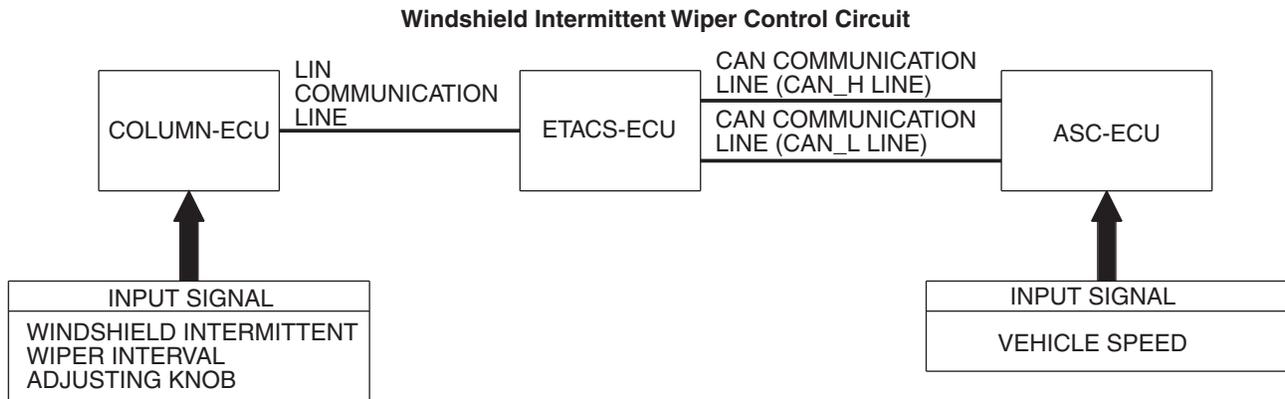
Check that the windshield wiper interval changes when the windshield wiper interval control is rotated.

**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.



AC609166 AD

### 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 customization 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.51-47](#).

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

Use the ETACS customization 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 customization function to set "Front wiper operation" to "variable INT" or "Speed sensitive". (Refer to [P.51-73.](#))

**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.

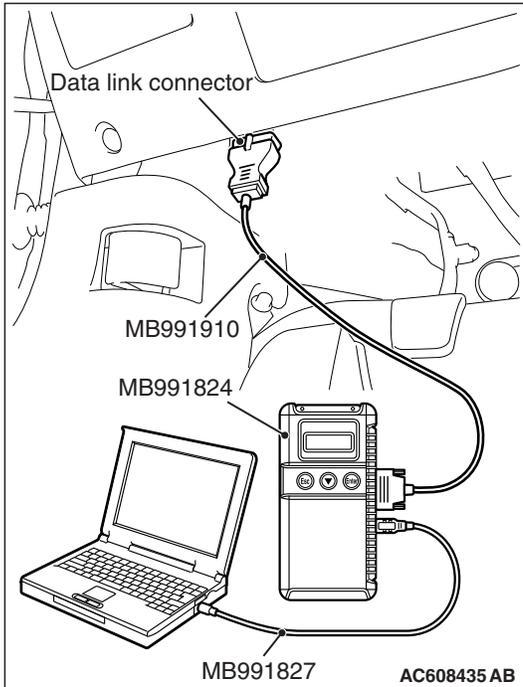
Item No.	Display on scan tool	Check condition	Normal condition
Item 80	speedometer	Speedometer and scan tool displays meet	

**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 -The combination meter, Diagnosis - Inspection Procedure 2: "The speedometer does not work (the other meters work)."[P.54A-74](#))



**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.](#)

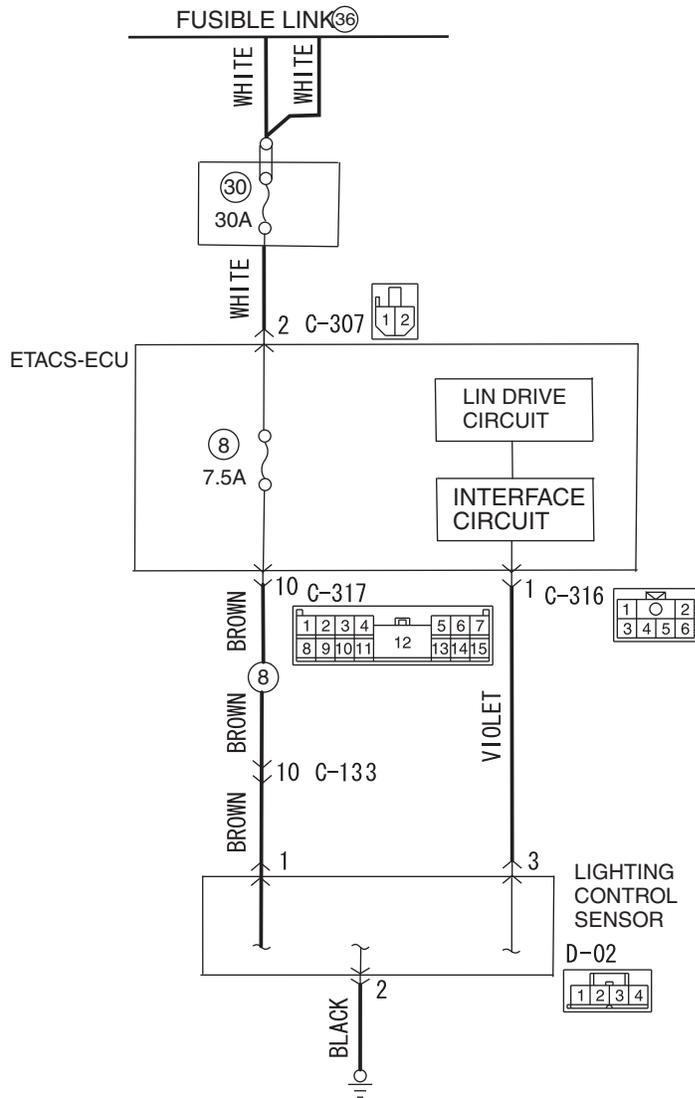
**NO :** Replace the ETACS-ECU.

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

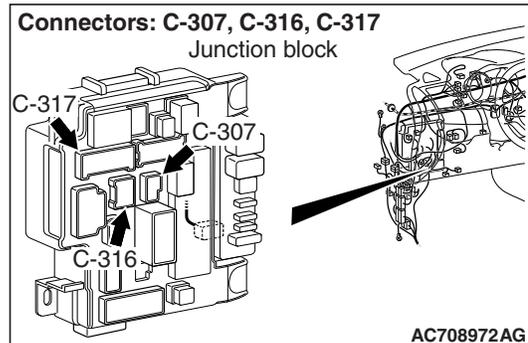
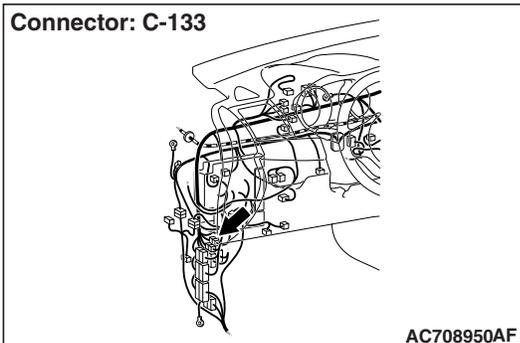
**CAUTION**

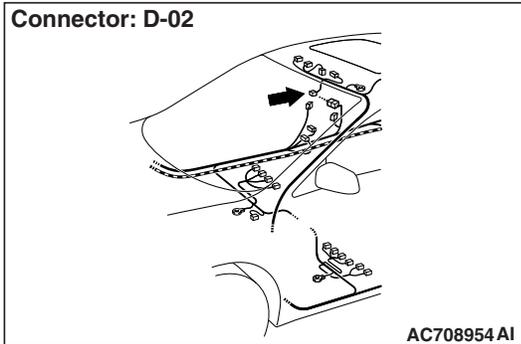
Whenever ECU is replaced, ensure that the input and output signal circuits are normal.

Raindrops Sensing Wiper Function Control Circuit



AC708845AB





### 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 mm (0.20 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-18](#)).

**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.51-26](#).

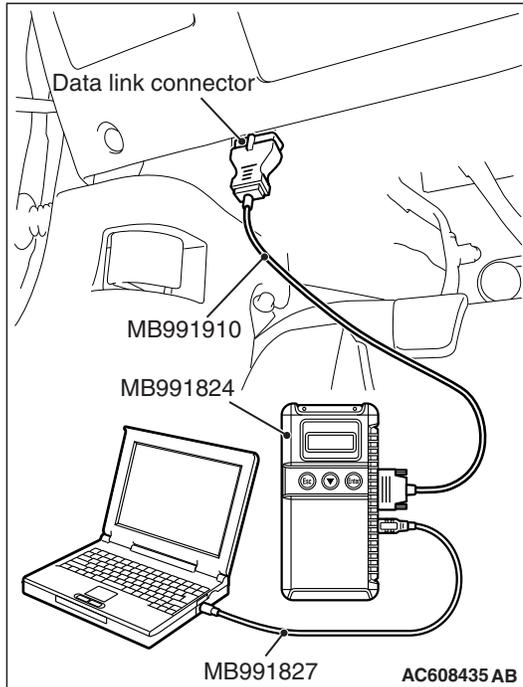
**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-643](#)."

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

**YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."

**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-643](#)."

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

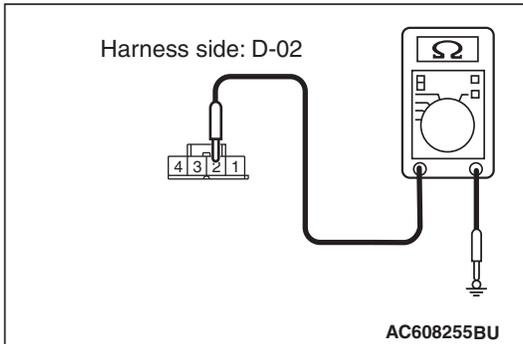
**YES** : Diagnose the lighting control sensor. [Diagnostic Trouble Code: (Refer to GROUP 54A –Diagnostic Trouble Code Chart [P.54A-119](#)) or Service Data ([P.51-71](#)).]

**NO** : Go to Step 5.

**STEP 5. Connector check: D-02 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-02 lighting control sensor connector**

- (1) Disconnect the connector, and measure the resistance at the wiring harness.
- (2) Measure the resistance between D-02 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.

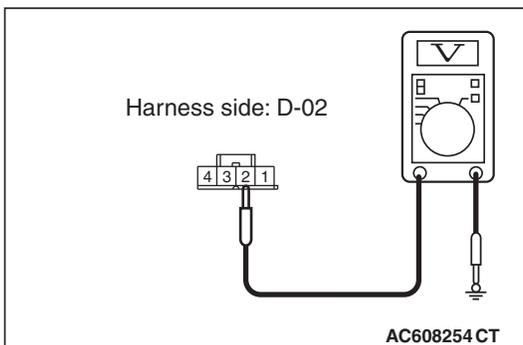
**STEP 7. Check the wiring harness between D-02 lighting control sensor connector terminal No.2 and body ground.**

- 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-02 lighting control sensor connector**

- (1) Disconnect the connector, and measure the voltage at the wiring harness side.
- (2) Measure the voltage between D-02 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-02 lighting control sensor connector terminal No.1 and fusible link (36).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-133, 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.**

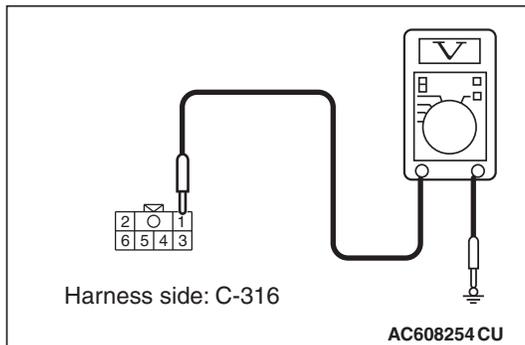
- (1) Disconnect the connector, and measure the voltage at the wiring harness side.
- (2) Measure the voltage between C-316 ETACS-ECU connector terminal No. 1 and body ground.

**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-02 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.)

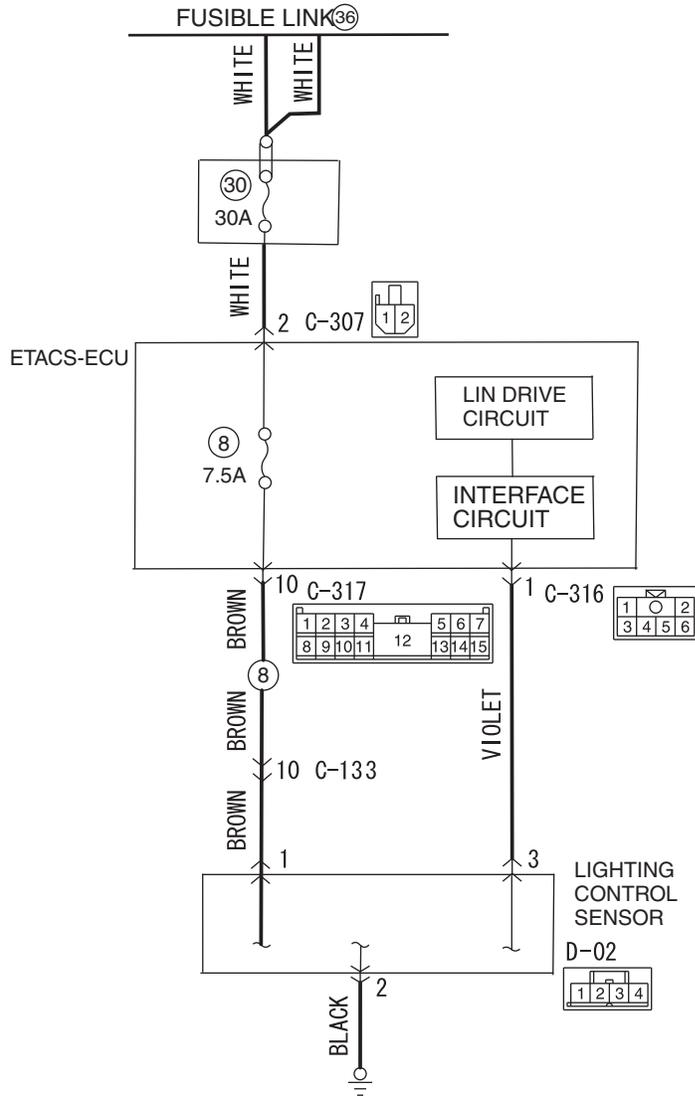
**NO :** Repair the wiring harness.

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

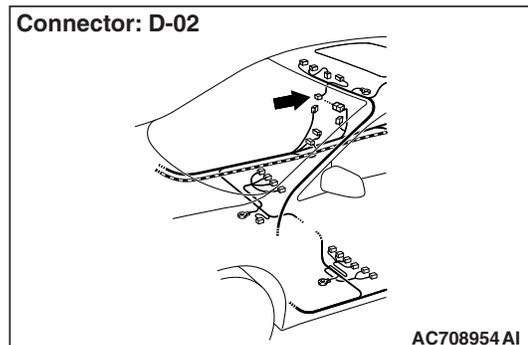
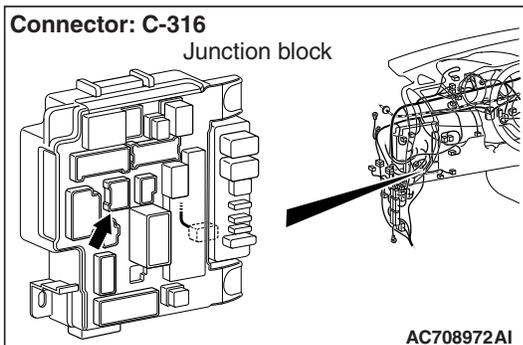
**CAUTION**

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

Raindrops Sensing Wiper Function Control Circuit



AC708845AB



**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 mm (0.20 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-18](#)).

---

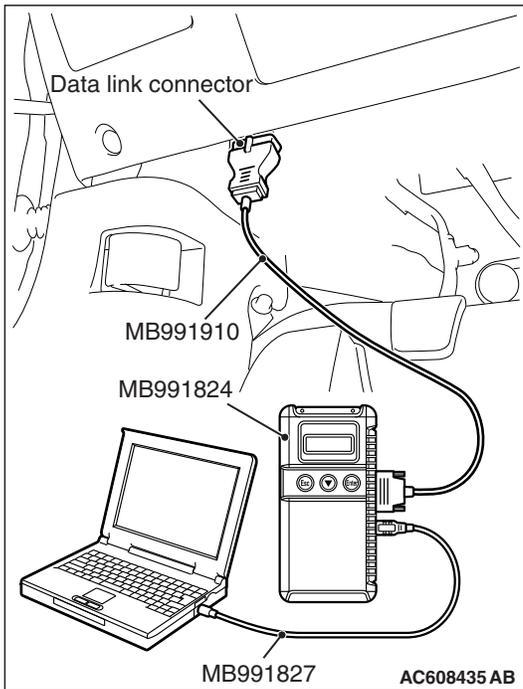
**STEP 2. Windshield wiper operation check**

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.51-38](#).



**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-643."

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

**YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-646."

**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-643."

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

**YES** : Diagnose the lighting control sensor. [Diagnostic Trouble Code: (Refer to GROUP 54A –Diagnostic Trouble Code Chart P.54A-119) or service data (P.51-71).]

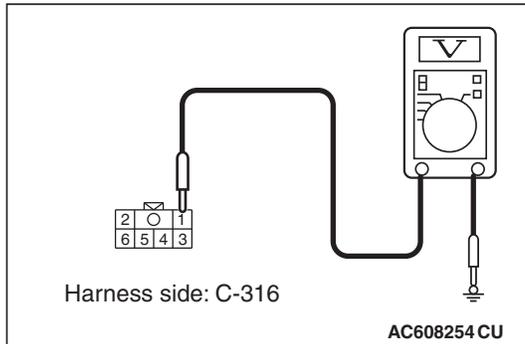
**NO** : Go to Step 5.

**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-02 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 mm (0.20 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-18](#)).

---

**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.51-38](#).

---

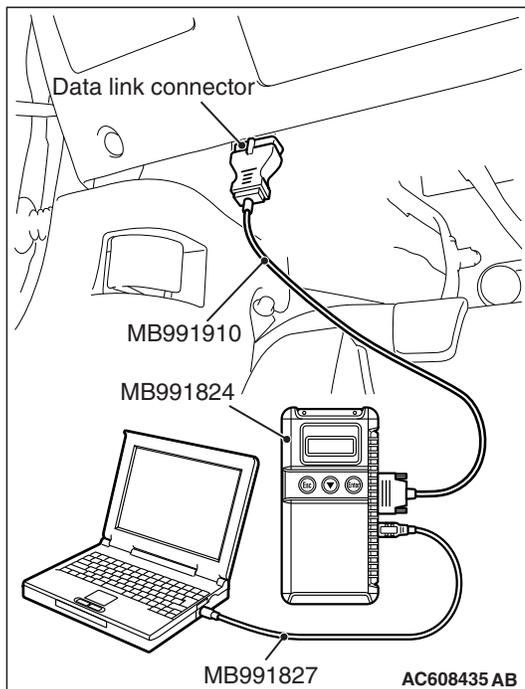
**STEP 3. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-643](#)."

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

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."

**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-643](#)."

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

**YES :** Diagnose the lighting control sensor. [Diagnosis Code: (Refer to GROUP 54A –Diagnosis Code Chart [P.54A-119](#)) or service data ([P.51-71](#)).]

**NO :** Go to Step 5.

---

**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-206](#)).

---

**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 water onto the windshield glass surface where the lighting control sensor is installed.

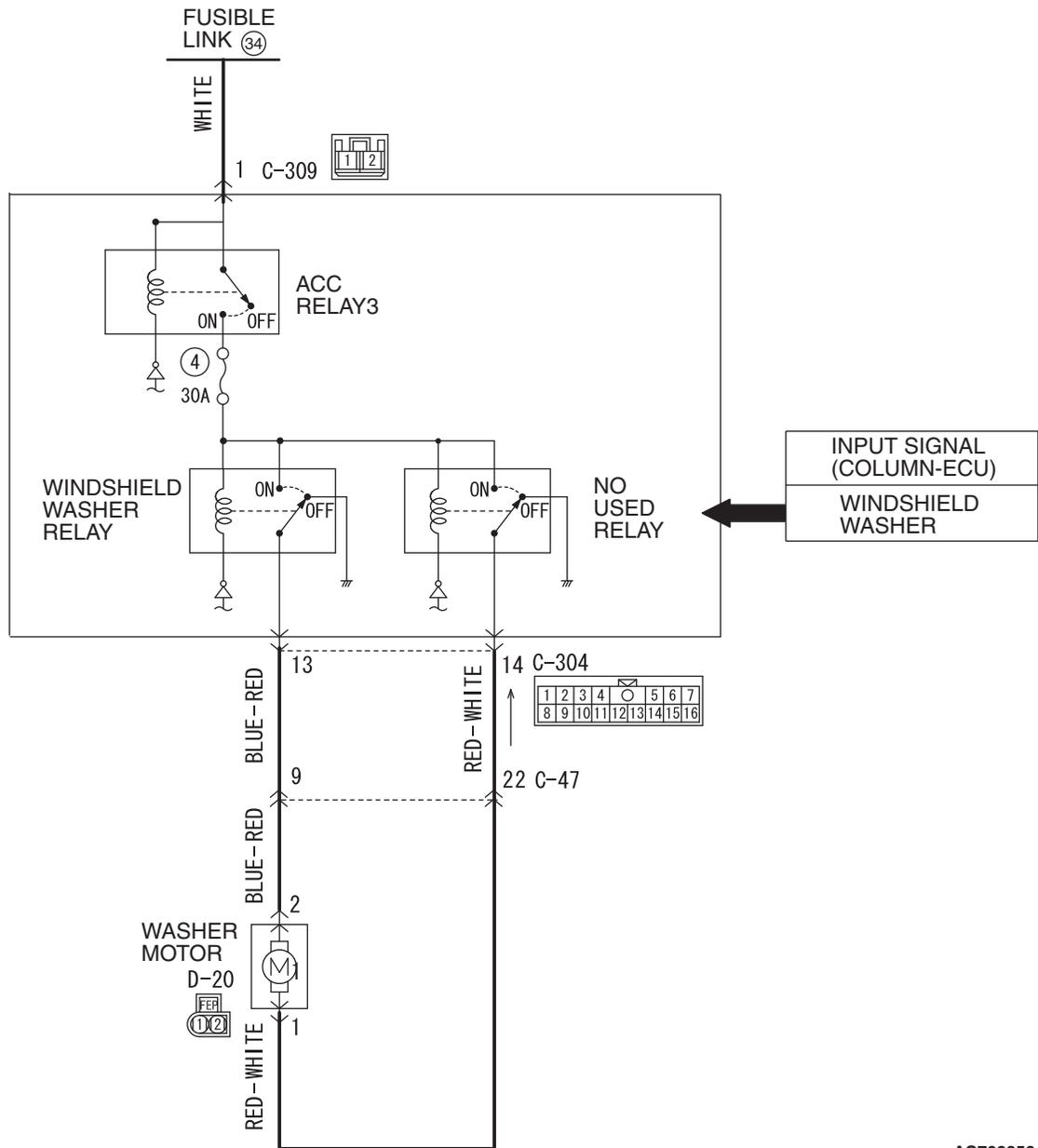
**Q: Does the windshield wiper operate?**

**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](#)).

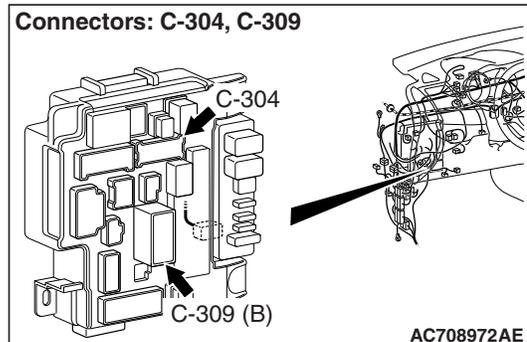
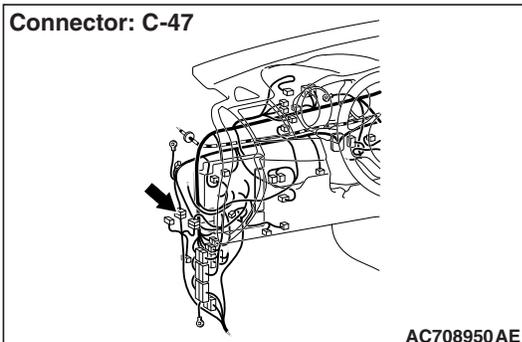
**Does not operate** : Troubleshoot the rain sensitive wiper function (Refer to Inspection procedure 7 [P.51-52](#)).

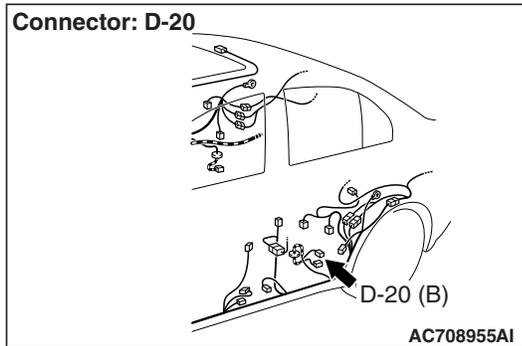
INSPECTION PROCEDURE 10: The windshield washer does not work normally.

Windshield Washer Motor Circuit



AC708856AB





## 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:

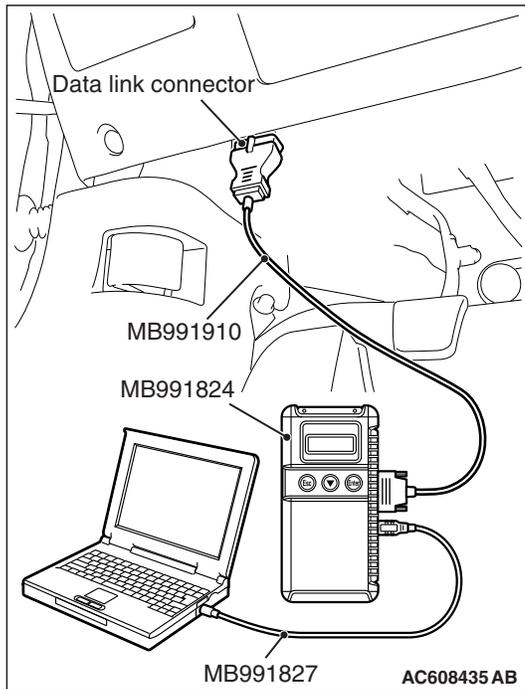
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

### 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.51-27](#)."



**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, "How to connect the scan tool (M.U.T.-III) P.54A-643."

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

- YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart P.54A-646."
- 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.	Display on scan tool	Normal condition
Item 237	Front washer	ON

**OK: Normal condition is displayed.**

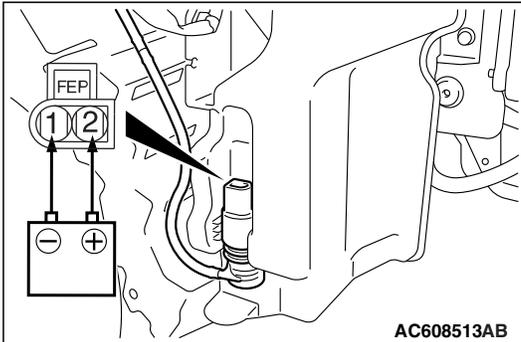
**Q: Is the check result normal?**

- NO :** Go to Step 4.
- YES :** Refer to GROUP 54A –ETACS, Input signal chart P.54A-703.

**STEP 4. Check windshield washer motor connector D-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield washer motor connector D-20 in good condition?**

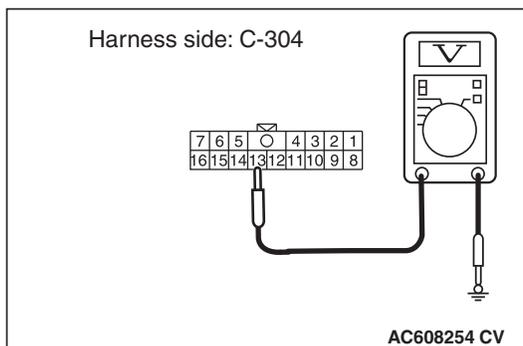
- YES :** Go to Step 5.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the windshield wiper works normally.

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

- (1) Disconnect windshield washer motor connector D-20 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 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 7.**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 7. Measure the voltage at ETACS-ECU connector C-304.**

- (1) Disconnect ETACS-ECU connector C-304 and measure the resistance available at the wiring harness side of the connector.
- (2) Ignition switch: ACC
- (3) windshield washer switch: ON
- (4) Measure the voltage between C-304 ETACS-ECU connector terminal No. 13 and body ground.

**OK: Battery positive voltage****Q: Is the measured voltage approximately 12 volts (battery positive voltage)?****YES :** Go to Step 10.**NO :** Go to Step 8.

---

**STEP 8. Check the wiring harness between windshield washer motor connector D-20 (terminal 2) and ETACS-ECU connector C-304 (terminal 13).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-47 and repair if necessary.*

- Check the input lines for open or short circuit.

**Q: Is the wiring harness between windshield washer motor connector D-20 (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 D-20 (terminal 1) and ETACS-ECU connector C-304 (terminal 14).**

*NOTE: Prior to the wiring harness inspection, check intermediate connector C-47 and repair if necessary.*

- Check the input lines for open or short circuit.

**Q: Is the wiring harness between windshield washer motor connector D-20 (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

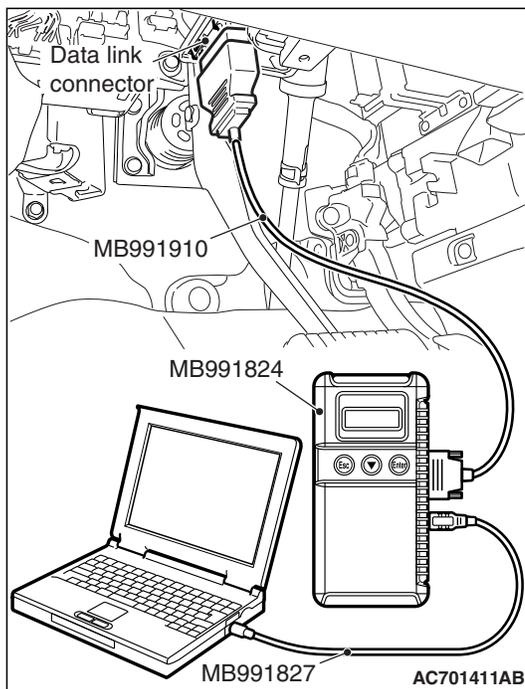
**STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function [P.54A-643](#)."

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

**YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."

**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.51-73](#).)

---

**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.51-26](#).

---

**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.51-63](#)."

---

**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.

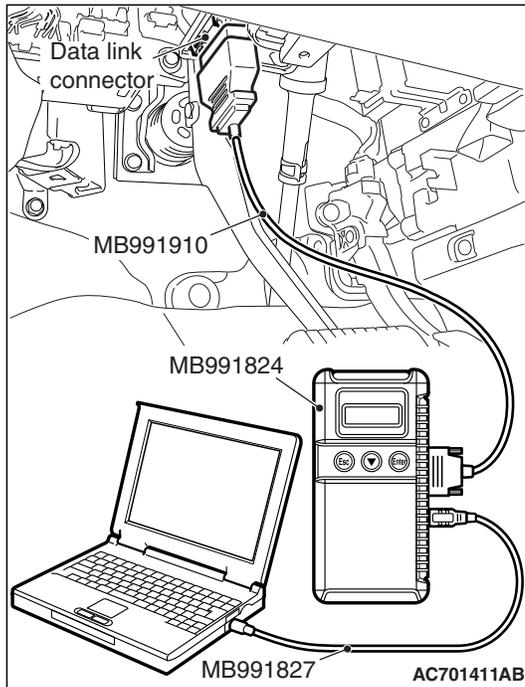
**PROBABLE CAUSES**

- 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-643](#)."

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

**YES :** Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-646](#)."

**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.51-73](#).)

---

**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.51-26](#).

---

**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.51-63](#)."

**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 INTERVAL CHECK**

M1511023600112

1. Check that the intermittent wiper interval is changed as the windshield intermittent wiper interval control is operated.
2. Turn the windshield intermittent wiper switch to the intermittent operation position. Use scan tool MB991958 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.51-47](#))

**LIGHTING CONTROL SENSOR (RAIN SENSOR) INSPECTION**

M1511028400049

Under a 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 pouring 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.51-26](#)).

**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.51-68](#).)  
*NOTE: Check that the intelligent washer function is set to "Enabled" with the customization function. (Refer to [P.51-73](#).)*

**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.51-68](#).)  
*NOTE: Check that the delayed finishing wipe function is set by the customization function. (Refer to [P.51-73](#).)*

**CUSTOMIZATION FUNCTION**

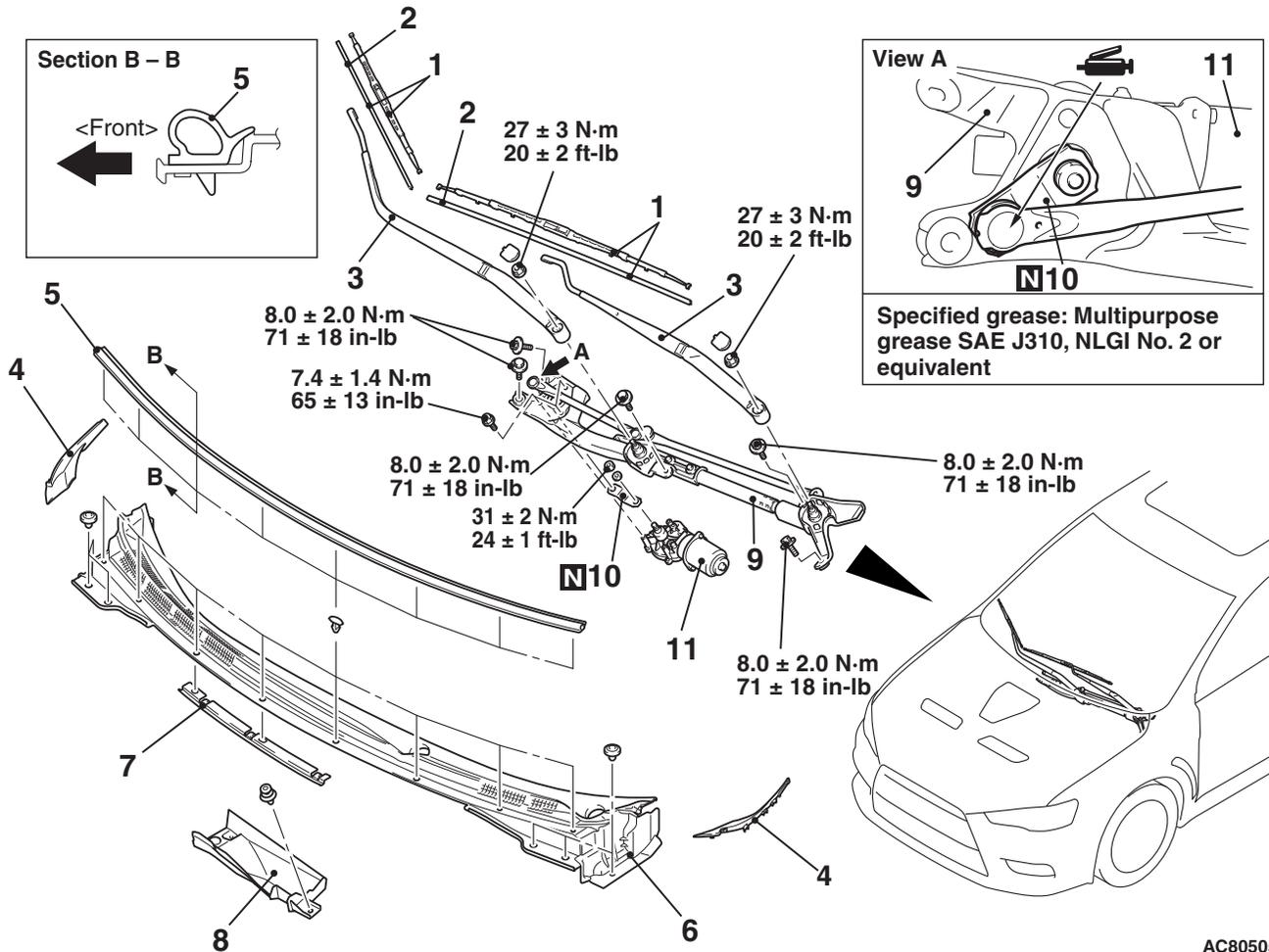
M1511027401351

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

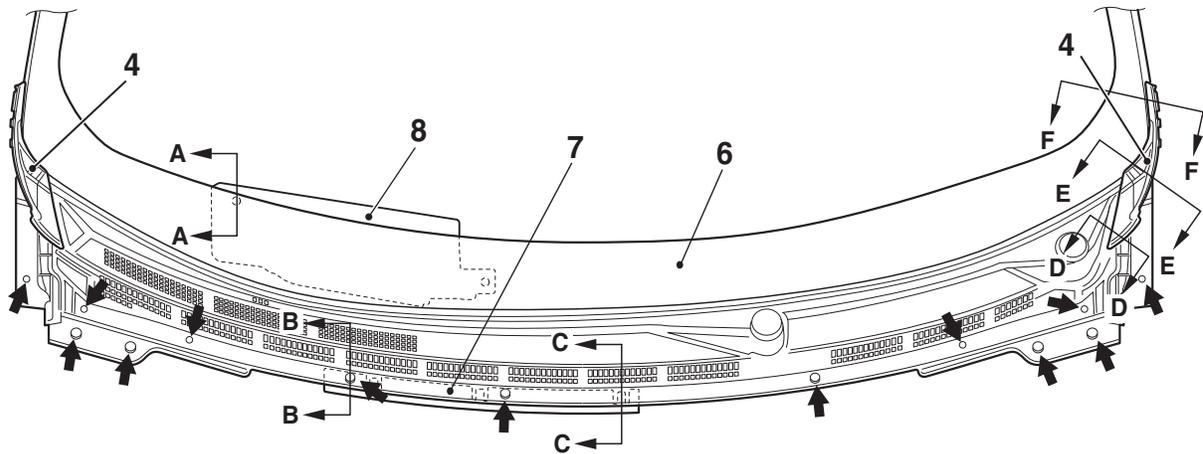
<b>Adjustment item (scan tool MB991958 display)</b>	<b>Adjustment item</b>	<b>Adjusting contents (scan tool MB991958 display)</b>	<b>Adjusting contents</b>
Front wiper operation	Adjustment of the intermittent windshield wiper operation <vehicles without auto light>	Normal INT	Intermittent wiper interval 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
Washer & Wiper			With function: Without delayed finishing wipe function (Initial condition)
Intelligent washer	With/without intelligent washer function	Disable	No function
		Enable	With function (initial condition)

WINDSHIELD WIPER  
REMOVAL AND INSTALLATION

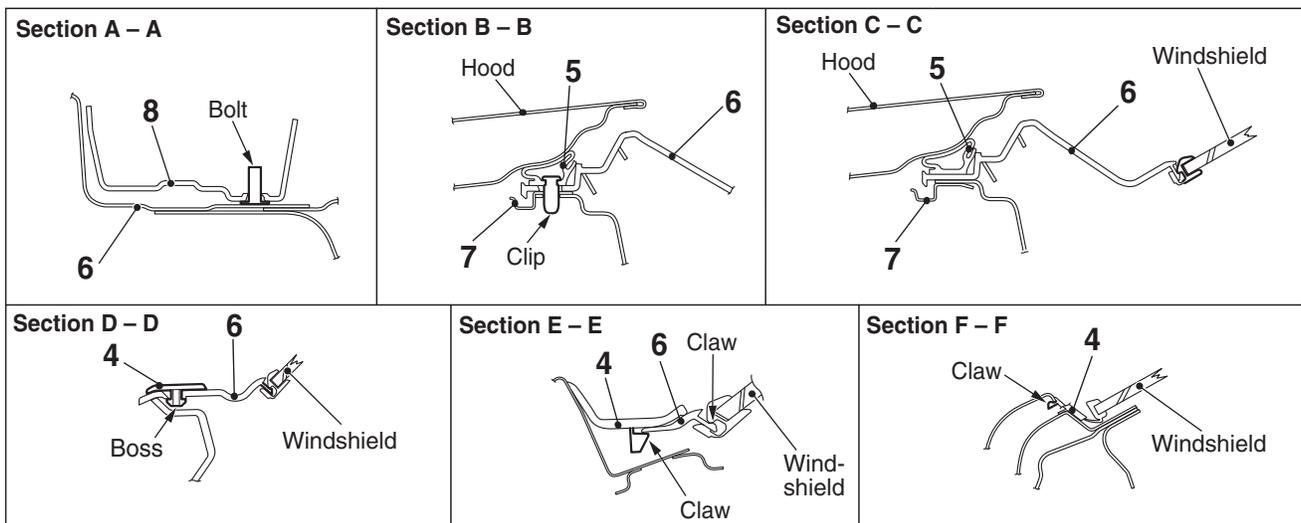
M1511007901086



AC805052AB



← : Clip positions



AC709005AF

**Wiper blade removal steps**

- >>C<< 1. Wiper blade assembly
- >>A<< 2. Wiper blade

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

- >>C<< 3. Wiper arm
- 4. Front deck garnish cover A
- 5. Hood weatherstrip
- 6. Front deck garnish
- 7. Front deck garnish cover B
- 8. Front deck cover
- <<A>> >>B<< 9. Wiper link assembly

**Windshield wiper motor and wiper link assembly removal steps (Continued)**

- <<B>> 10. Wiper motor link plate
- <<B>> 11. Windshield wiper motor

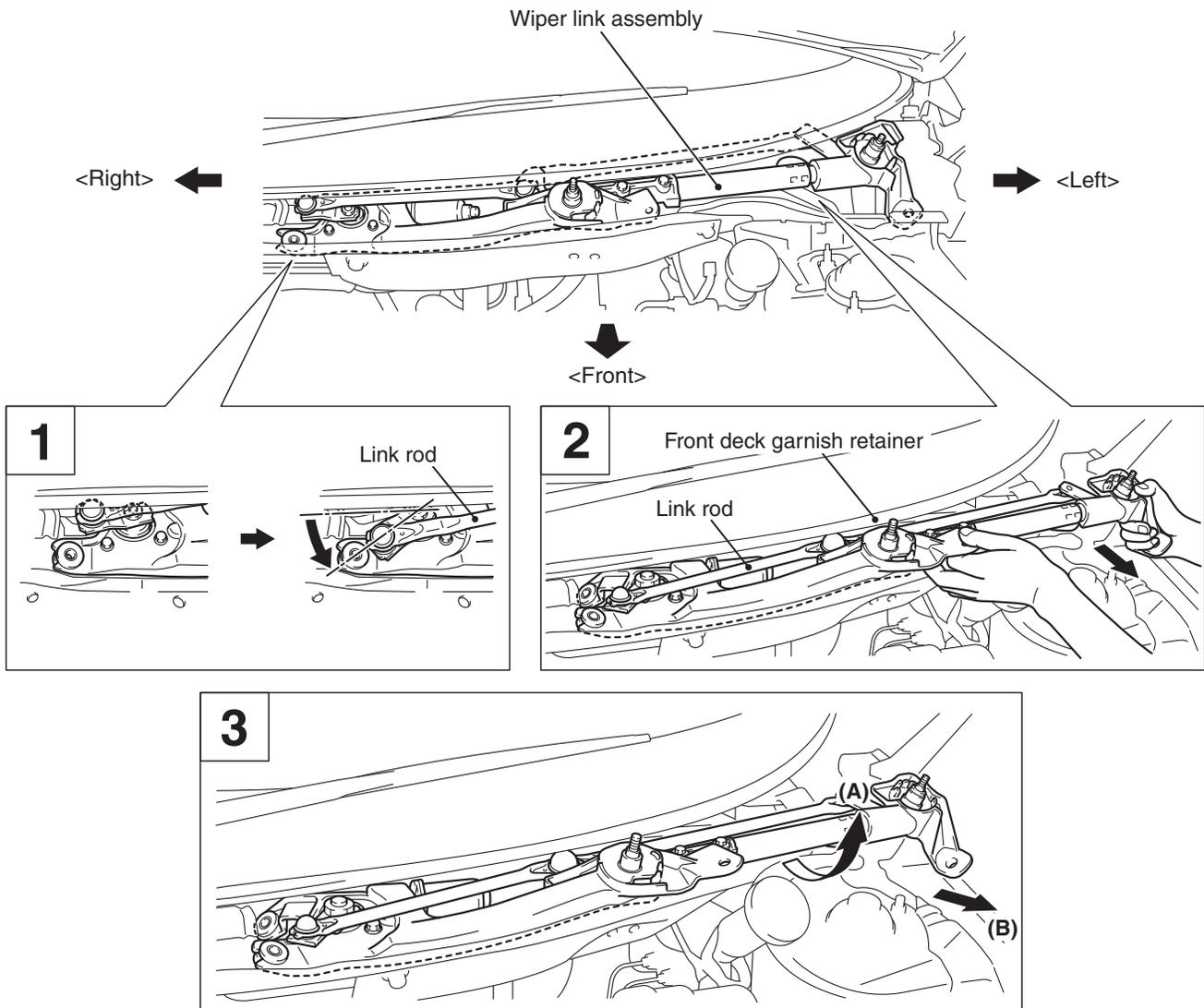
**Required Special Tool:**

- MB991958: M.U.T.-III sub-assembly
- MB991223: Harness set
- MB992006: Extra fine probe

*NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54A, Column switch P.54A-312.*

## REMOVAL SERVICE POINTS

## &lt;&lt;A&gt;&gt; WIPER LINK ASSEMBLY REMOVAL



AC609130AE

1. Manually turn the link rod of the wiper link assembly forward to the position indicated in the figure.

**⚠ CAUTION**

Another mechanic fully pushes up the hood so that the left side of link assembly is pulled out easily.

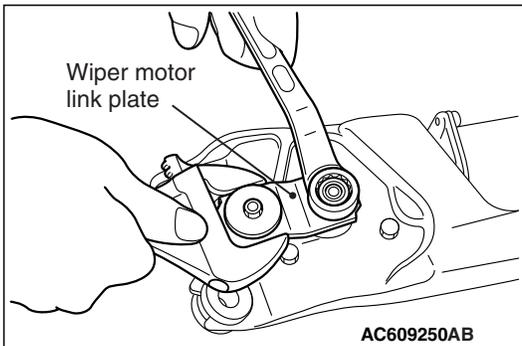
2. Pull out the attachment section of the left side of wiper link assembly forward until the link rod bumps against the front deck garnish retainer.

**⚠ CAUTION**

When pulling out the link assembly forward, be careful not to make a contact with the windshield glass.

3. While turning the link assembly upward (A), pull out the entire link assembly diagonally forward left (B).

<<B>> WIPER MOTOR LINK PLATE/WINDSHIELD WIPER MOTOR REMOVAL



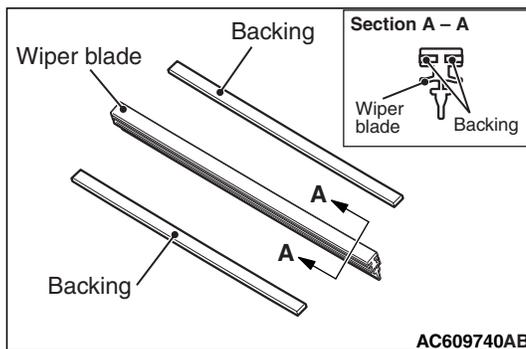
1. To disconnect the wiper motor link plate from the wiper motor shaft, use an appropriate tool to counter-hold the plate to prevent it from turning.
2. Remove the wiper motor from the wiper link assembly.

INSTALLATION SERVICE POINTS

>>A<< WIPER BLADE INSTALLATION

**CAUTION**

For good windshield wiper wiping performance, use windshield wipers without a curve in the backing of the wiper blade.



>>B<< WIPER LINK ASSEMBLY/WIPER MOTOR LINK PLATE/WINDSHIELD WIPER MOTOR INSTALLATION

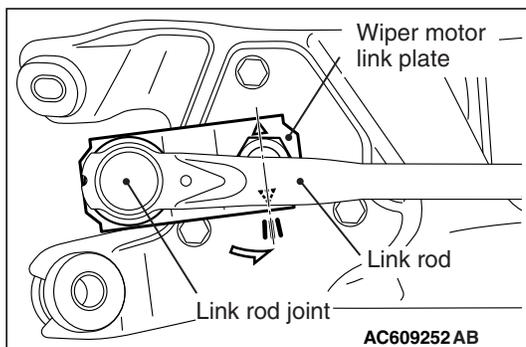
1. Confirm that the wiper motor has set to automatic stop position (Refer to P.51-78).

**CAUTION**

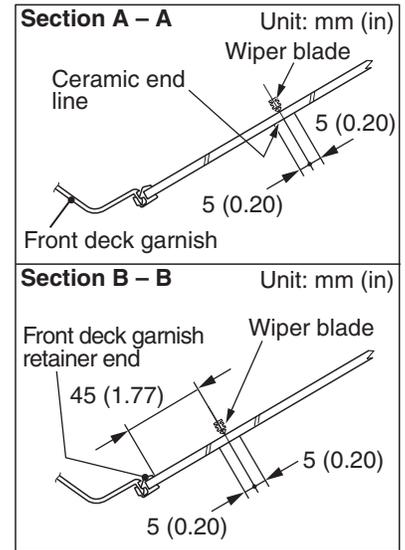
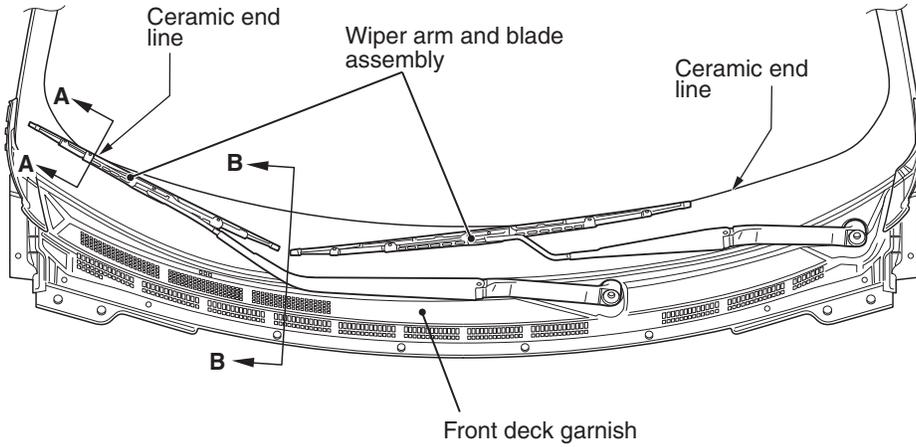
**Always replace the wiper motor link plate with new one.**

2. Set the wiper motor link plate onto the wiper motor shaft; aligning the triangle mark on the plate to the center line (of 3 lines) on the wiper link assembly as shown in the illustration.
3. Tighten the attaching nut of wiper motor link plate and wiper motor shaft. Use an appropriate tool to counter-hold the plate to prevent it from turning.
4. Apply grease to the inside of link rod joint (as required) and connect the link rod to wiper motor link plate.

**Specified grease: Multipurpose grease SAE J310, NLGI No.2 or equivalent**



>>C<< WIPER ARM AND BLADE ASSEMBLY  
INSTALLATION



AC612983AD

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

**A(Passenger's side): Ceramic end line  
± 5 mm(0.20 in)**

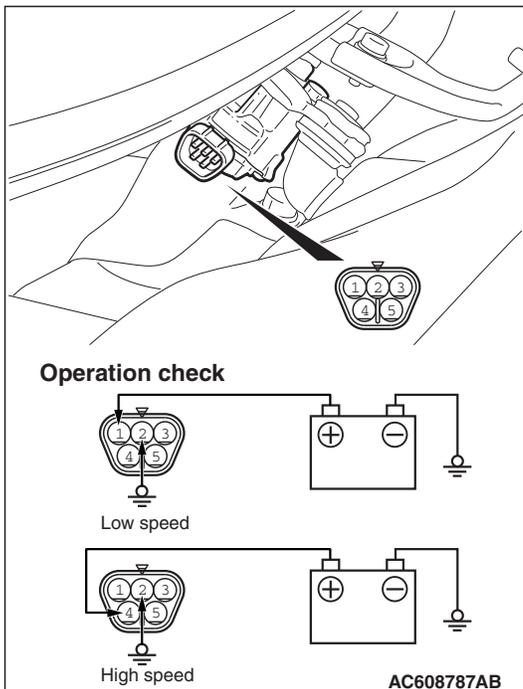
**B(Driver's side): Front deck garnish end  
45 ± 5 mm (1.77 ± 0.20 in)**

INSPECTION

M1511008000458

WINDSHIELD WIPER MOTOR CHECK

The windshield wiper motor assembly should be installed to the vehicle body and the harness connector should be disconnected when checking the wiper motor.



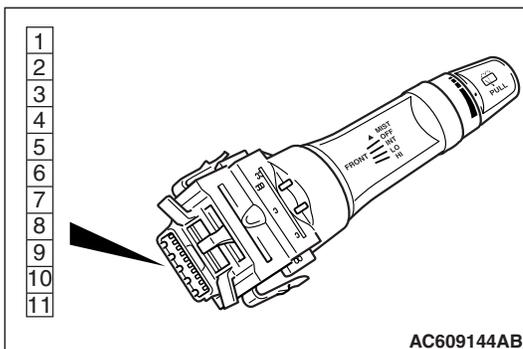
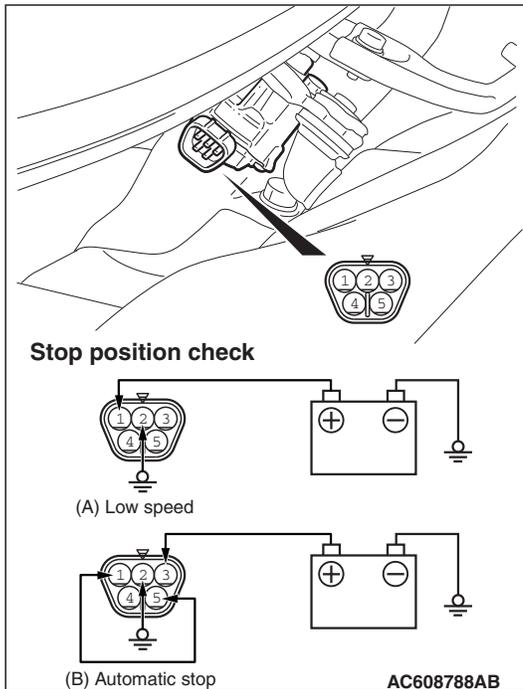
AC608787AB

### 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.



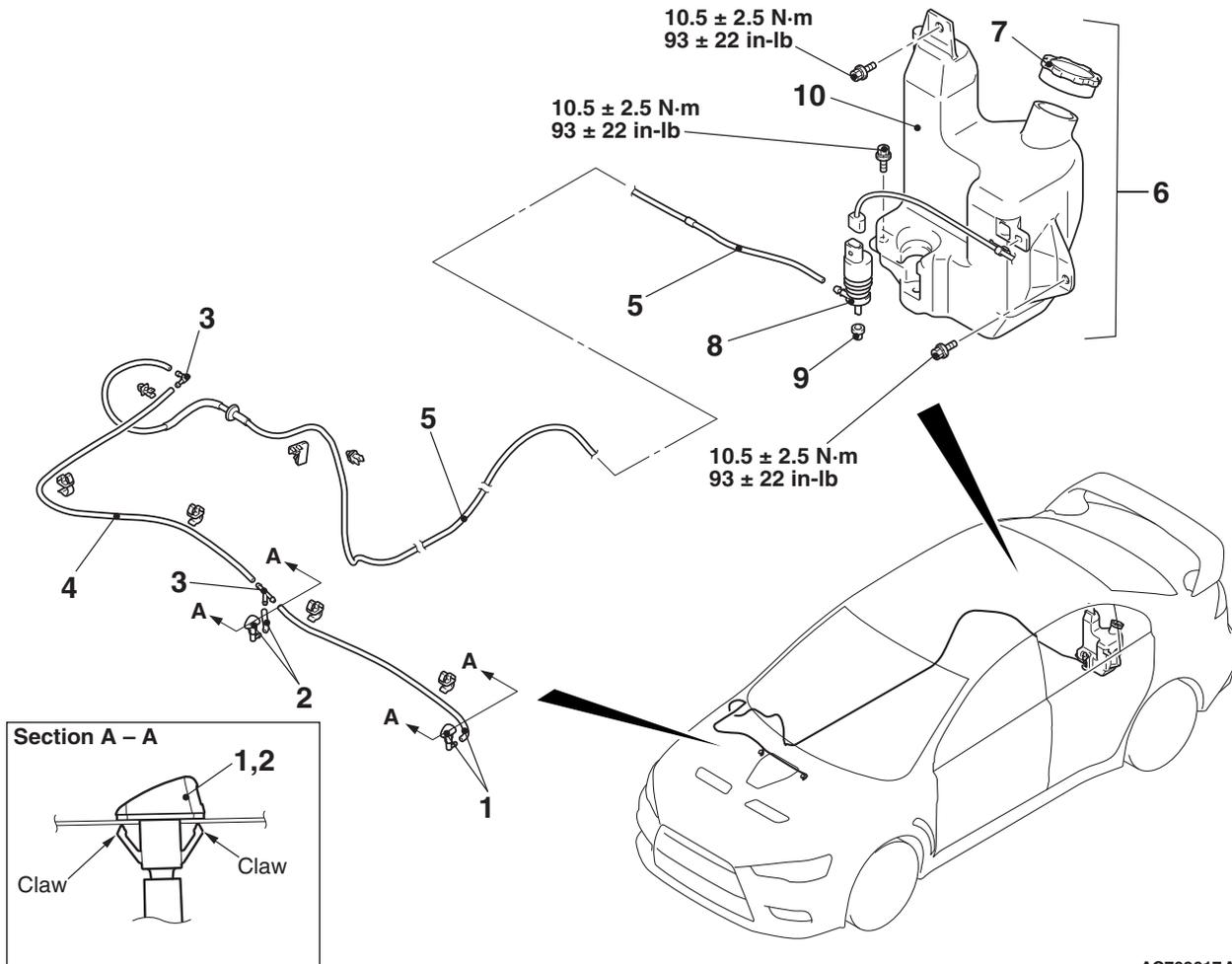
### WINDSHIELD WIPER SWITCH CHECK

Check the continuity between the switch terminals.

Switch position	Tester connection	Specified condition
OFF	6 -11, 6 -10, 6 -9, 6 -8	Open circuit
Windshield mist wiper switch	6 -11	Continuity exists (2 Ω or less)
Windshield intermittent wiper switch	6 -10	
Windshield low-speed wiper switch	6 -9	
Windshield high-speed wiper switch	6 -8	

**WINDSHIELD WASHER  
REMOVAL AND INSTALLATION**

M1511008201079



AC709017 AB

**Windshield washer nozzle removal steps**

- Connection of windshield washer hose A
- Hood insulator A and B (Refer to GROUP 42A, Hood P.42A-7)
- 1. Windshield washer nozzle assembly (LH)
- 2. Windshield washer nozzle assembly (RH)
- 3. Joint

<<A>>

**Windshield washer hose removal steps**

- Front scuff plate, rear scuff plate, center pillar trim lower, trunk room trim front (Refer to GROUP 52A, Interior trim P.52A-12)
- Connection of washer nozzle/washer motor
- 3. Joint
- 4. Windshield washer hose A
- 5. Windshield washer hose B

**Windshield washer tank removal steps**

- Trunk room trim front (Refer to GROUP 52A, Interior trim P.52A-12)
- Connection of windshield washer hose
- Windshield washer motor connector connection
- 6. Windshield washer tank assembly
- 7. Washer tank cap
- 8. Windshield washer motor
- 9. Grommet
- 10. Windshield washer tank

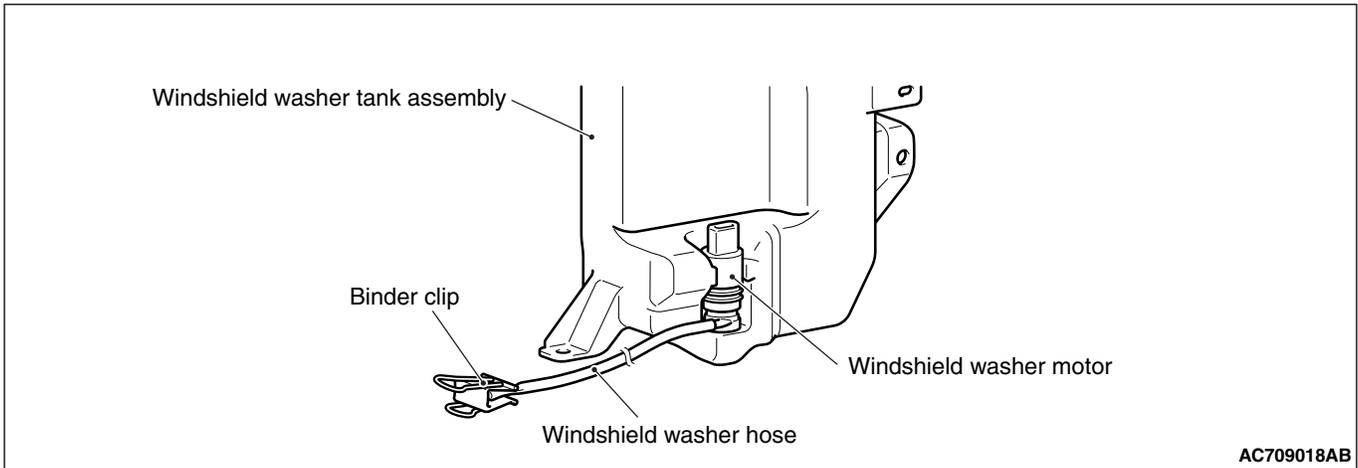
**Windshield washer motor removal steps**

- Connection of windshield washer hose B
- Windshield washer motor connector connection
- 8. Windshield washer motor
- 9. Grommet

**NOTE:** For removal and installation of the wiper and washer switch, refer to GROUP 54A, Column switch P.54A-312.

REMOVAL SERVICE POINT

<<A>> WINDSHIELD WASHER TANK ASSEMBLY  
REMOVAL



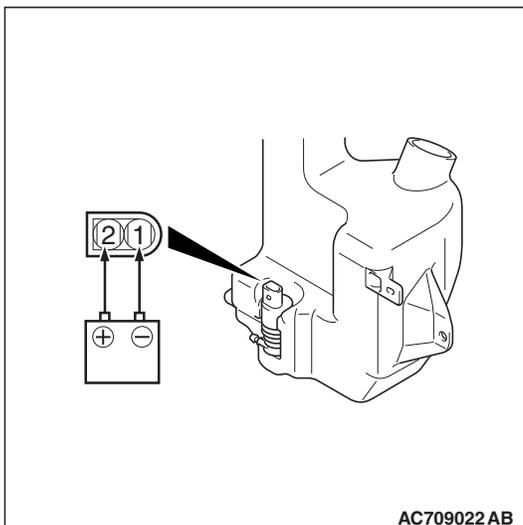
When removing the windshield washer tank assembly, close the windshield washer hose by a binder clip as shown, to prevent the windshield washer from flowing out.

INSPECTION

M1511008300664

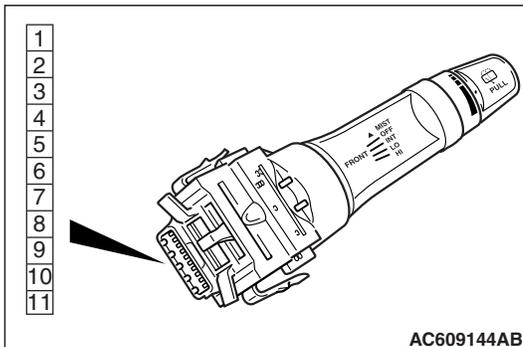
WINDSHIELD WASHER MOTOR CHECK

1. Remove the washer tank assembly with the washer hose attached. Then fill the washer tank with water.
2. Check to see that the water is vigorously sprayed when connecting the positive battery terminal to terminal number 2 and terminal number 1 to ground.



**WINDSHIELD WASHER SWITCH CHECK**

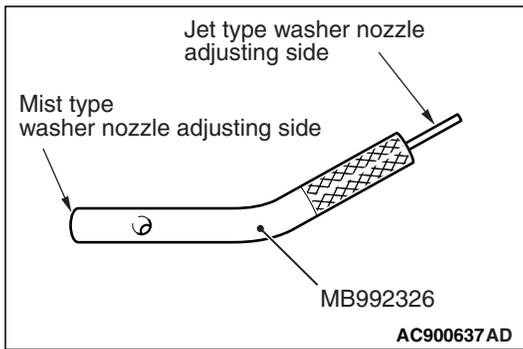
Check the continuity between the switch terminals.



Switch position	Tester connection	Specified condition
OFF	6 -7	Open circuit
Windshield washer switch ON	6 -7	Continuity exists (2 Ω or less)

**WINDSHIELD WASHER FLUID EJECTION CHECK**

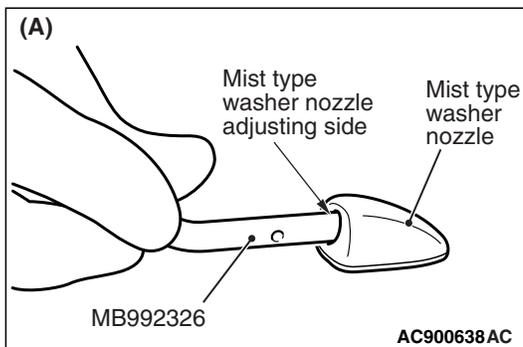
*NOTE: Use the special tool, washer nozzle adjustment tool (MB992326) to adjust the splashing points of the washer nozzles if necessary.*



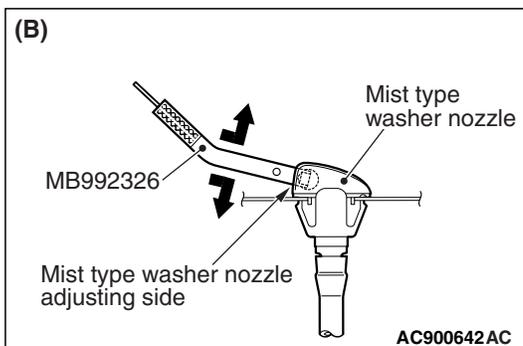
**Adjustment of the mist type washer nozzle injection position**

**CAUTION**

- Do not use tools other than the special tool (MB992326) to adjust the injection angle because the washer nozzle may get damaged.
- Adjust the splashing position within the specified adjustment range, otherwise the windshield cannot be washed properly.



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

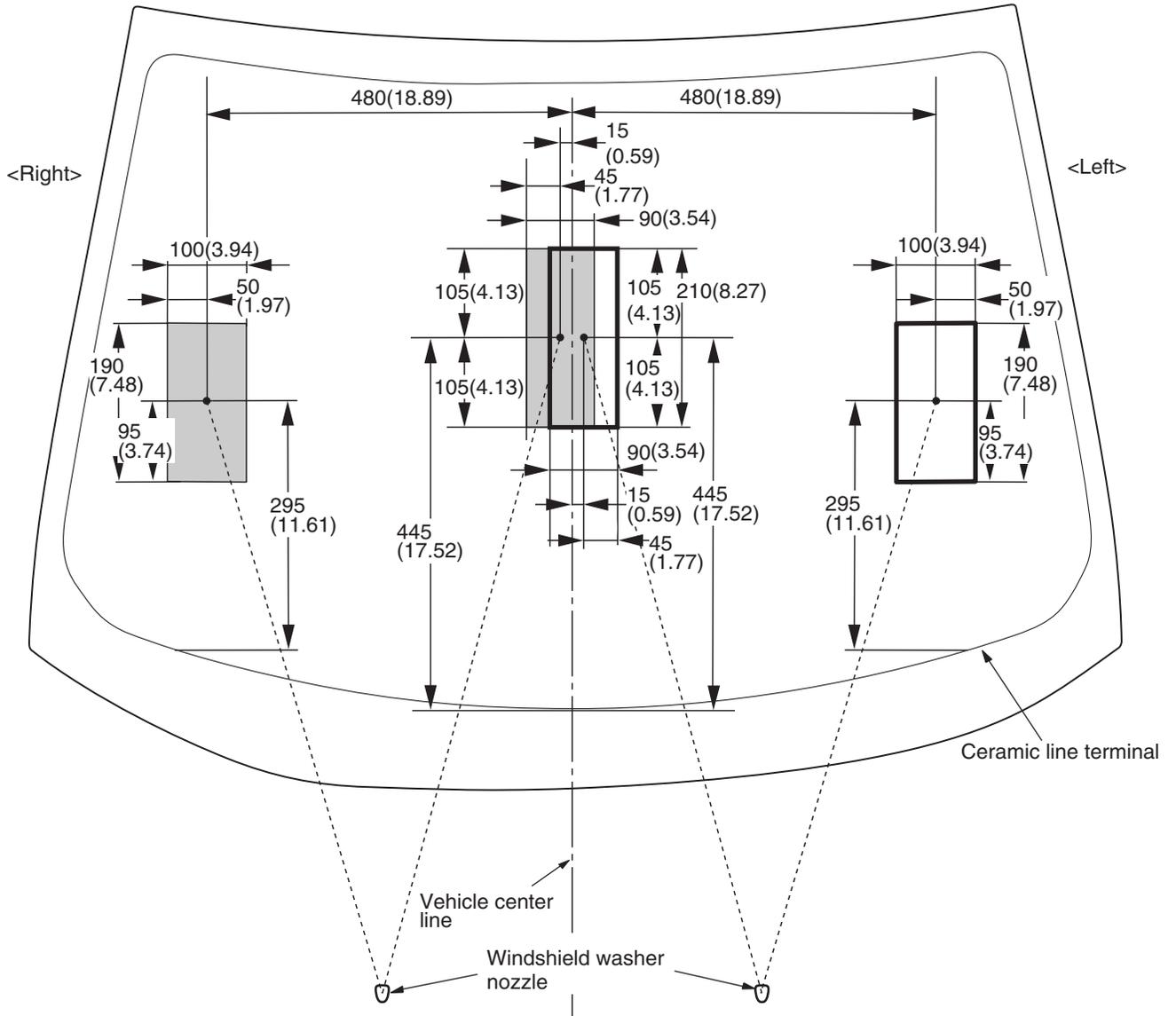


3. Move the special tool (MB992326) up and down to adjust the angle of the washer nozzle as shown in the figure (B).  
*NOTE: If the washer nozzle cannot be moved smoothly, adjust the angle while pressing the special tool (MB992326) against the washer nozzle.*

EXTERIOR  
WINDSHIELD WIPER AND WASHER

51-83

Unit: mm(in)



■ : Right side washer

□ : Left side washer

AC707936 AB

## LIGHTING CONTROL SENSOR

### REMOVAL AND INSTALLATION

Refer to GROUP 54A-Lighting control sensor (P.54A-206 ).

M1511028300020

### 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-119).
  - 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.

**⚠ CAUTION**

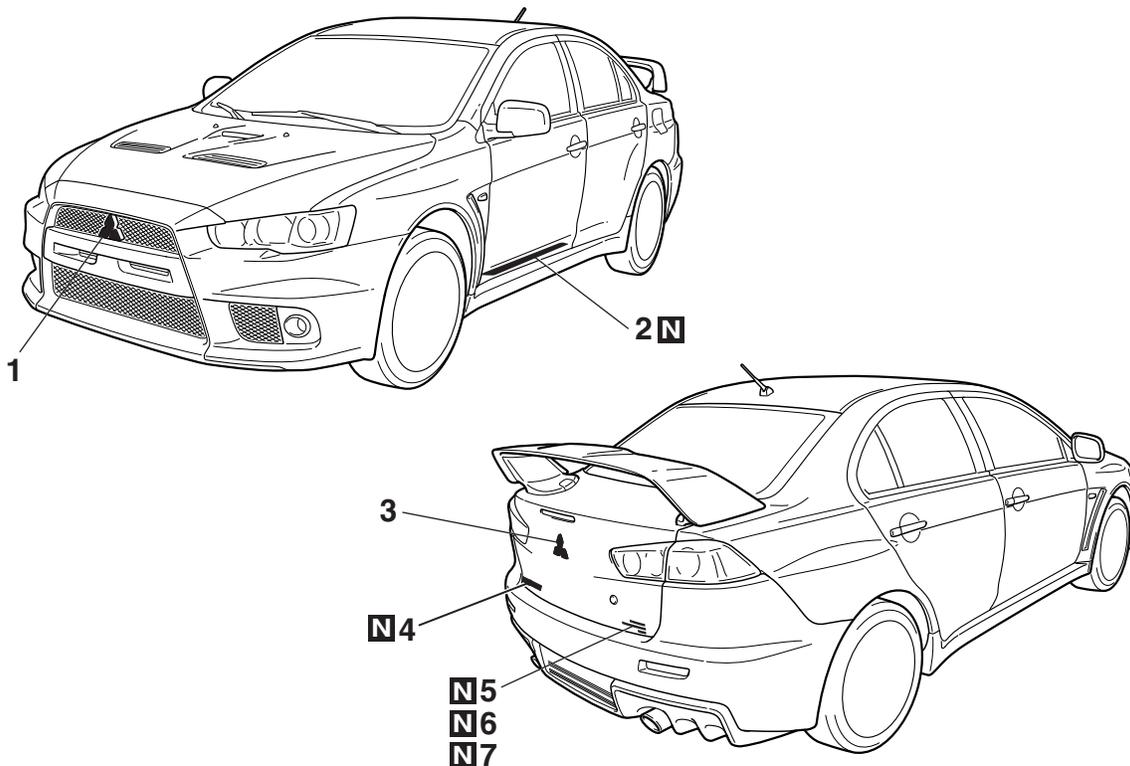
**Before connecting or disconnecting scan tool MB991958, always turn the ignition switch to the LOCK (OFF) position.**

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.

MARK

REMOVAL AND INSTALLATION

M1511011803389



AC708418AH

**Removal**

- 1. Front three-diamond mark (Refer to P.51-4.)
- >>A<< 2. Front step plate
- >>A<< 3. Rear three-diamond mark (Refer to P.51-4.)

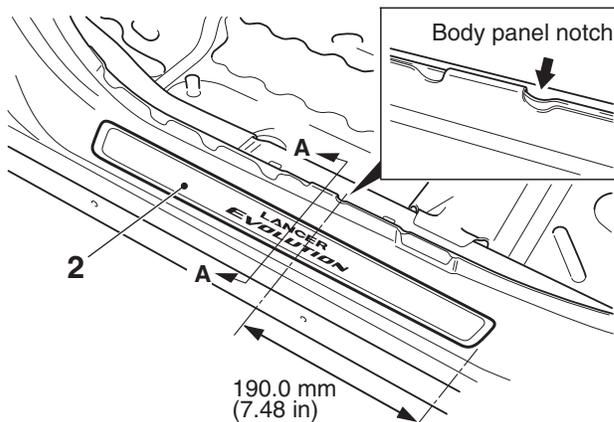
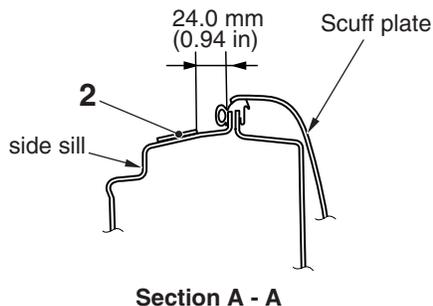
**Removal (Continued)**

- >>A<< 4. MITSUBISHI mark
- >>A<< 5. LANCER mark
- >>A<< 6. EVOLUTION mark
- >>A<< 7. MR mark <MR>

**INSTALLATION SERVICE POINT**

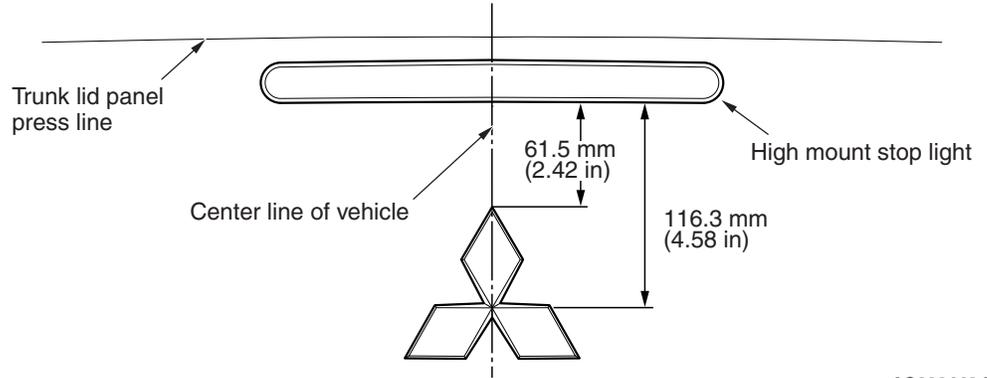
**>>A<< MARK INSTALLATION**

**2. Front step plate**



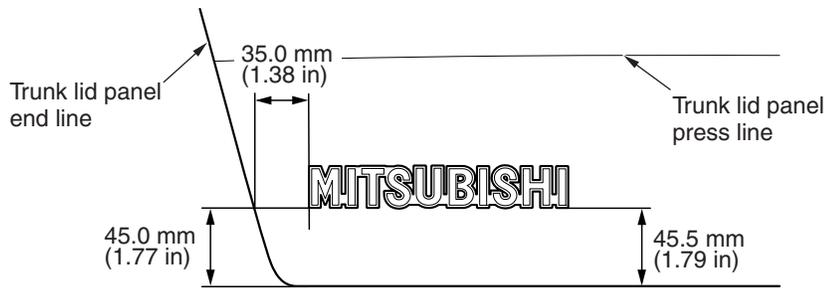
AC704761AB

3. Rear three-diamond mark



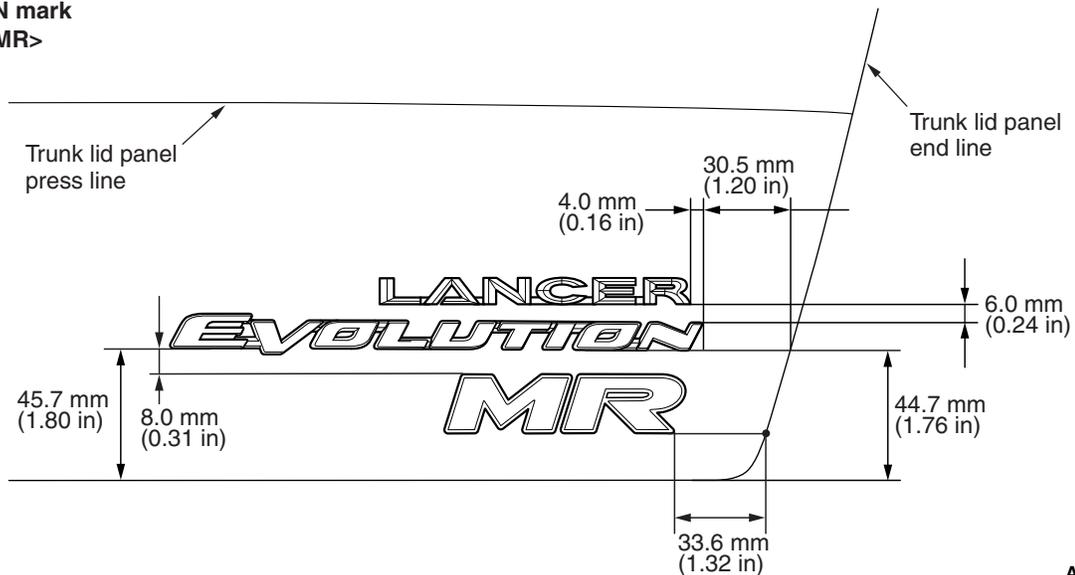
AC609448AE

4. MITSUBISHI mark



AC609134AJ

- 5. LANCER mark
- 6. EVOLUTION mark
- 7. MR mark <MR>



AC804513AC

1. Installation position  
Attach each mark to the position shown in the illustration.
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 (68 –100° F) and the air should be completely free of dust. If the ambient temperature is lower than 20° C (68° F), the marks and the places on the vehicle body where the marks are to be attached should be heated to 20 –30° C (68 –86° F).

- (2) Peel off the protection sheet on the back of the mark to affix it in position.

## DOOR MIRROR

### GENERAL INFORMATION

#### DOOR MIRROR OPERATION

##### 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 sup-

M1511000101250

plied to the rear window defogger, and the heater of the door mirror (heated door mirror) starts operation. 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

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.

M1511014600523

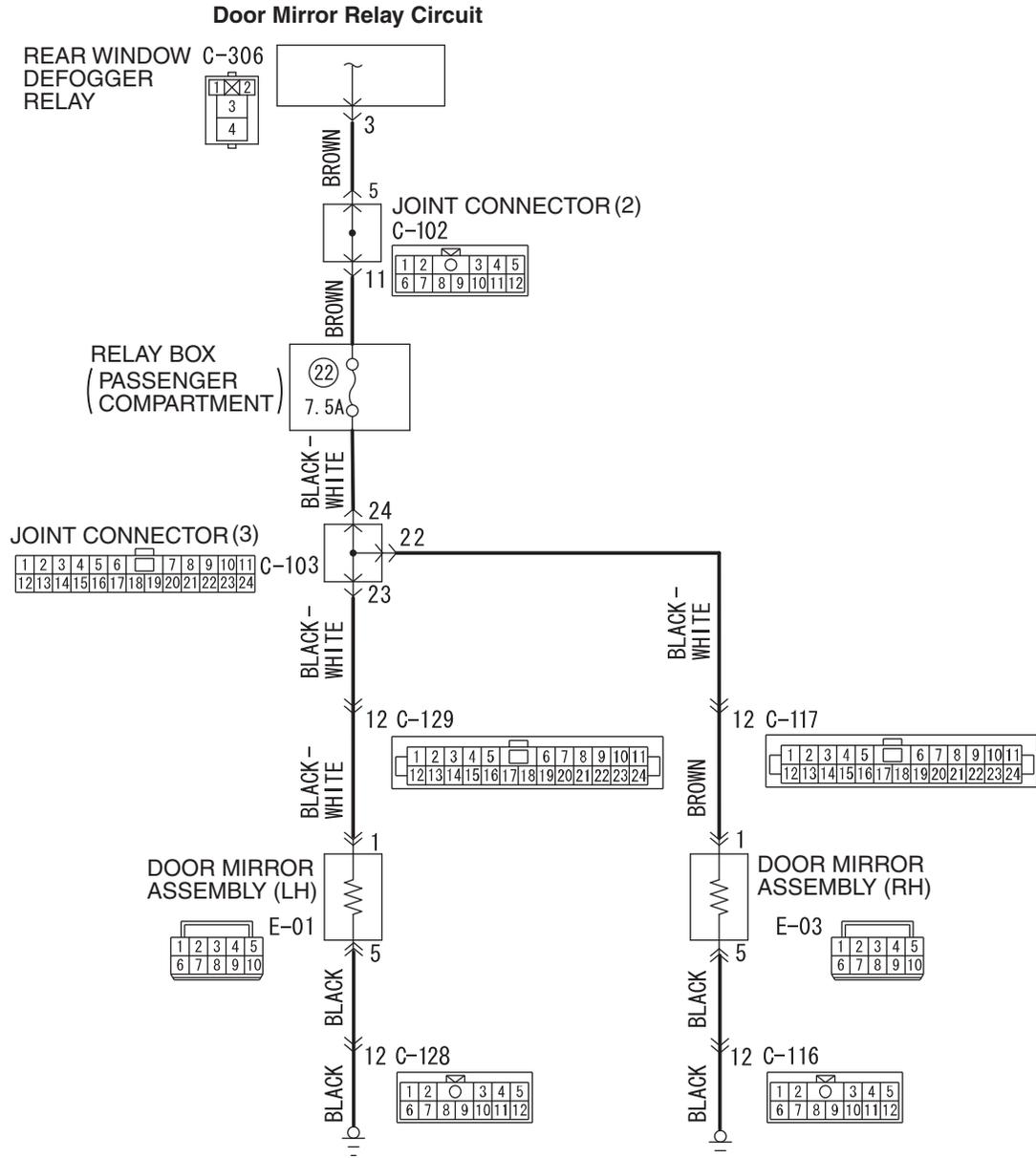
#### SYMPTOM CHART

M1511015001248

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
None of the heated door mirrors operate	1	P.51-88
Either of the heated door mirror does not operate	2	P.51-91

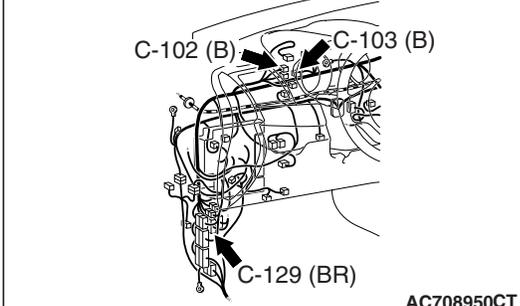
SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: None of the Heated Door Mirrors Operate



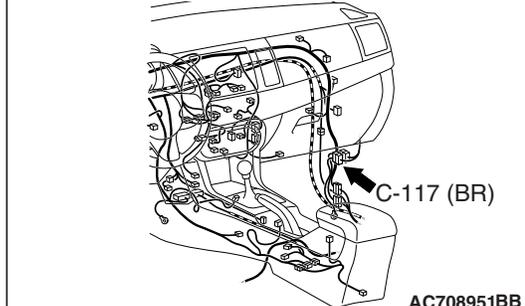
AC901477AB

Connectors: C-102, C-103, C-129

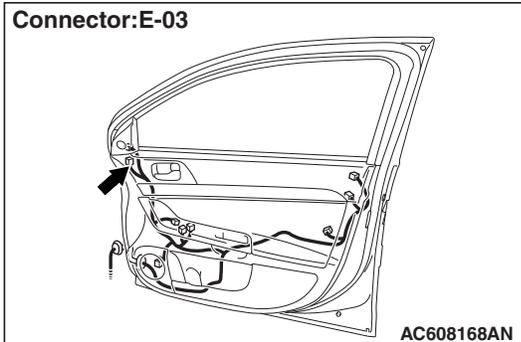
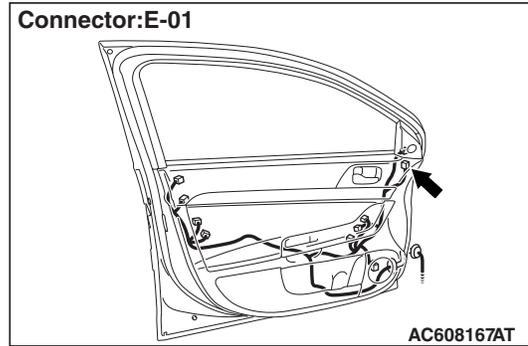
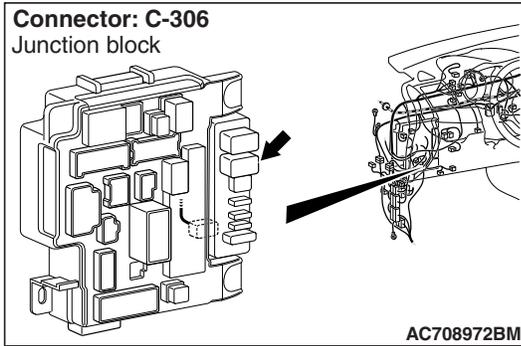


AC708950CT

Connector: C-117



AC708951BB



## CIRCUIT OPERATION

If none of the door mirror heaters 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.

- (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 55, Manual A/C Diagnosis P.55-10).

**STEP 2. Check the door mirror (RH) connector E-03 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-03 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-03 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-117 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-03 (terminal 1) 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-01.**

**Q: Is the door mirror (LH) connector E-01 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-01 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).**

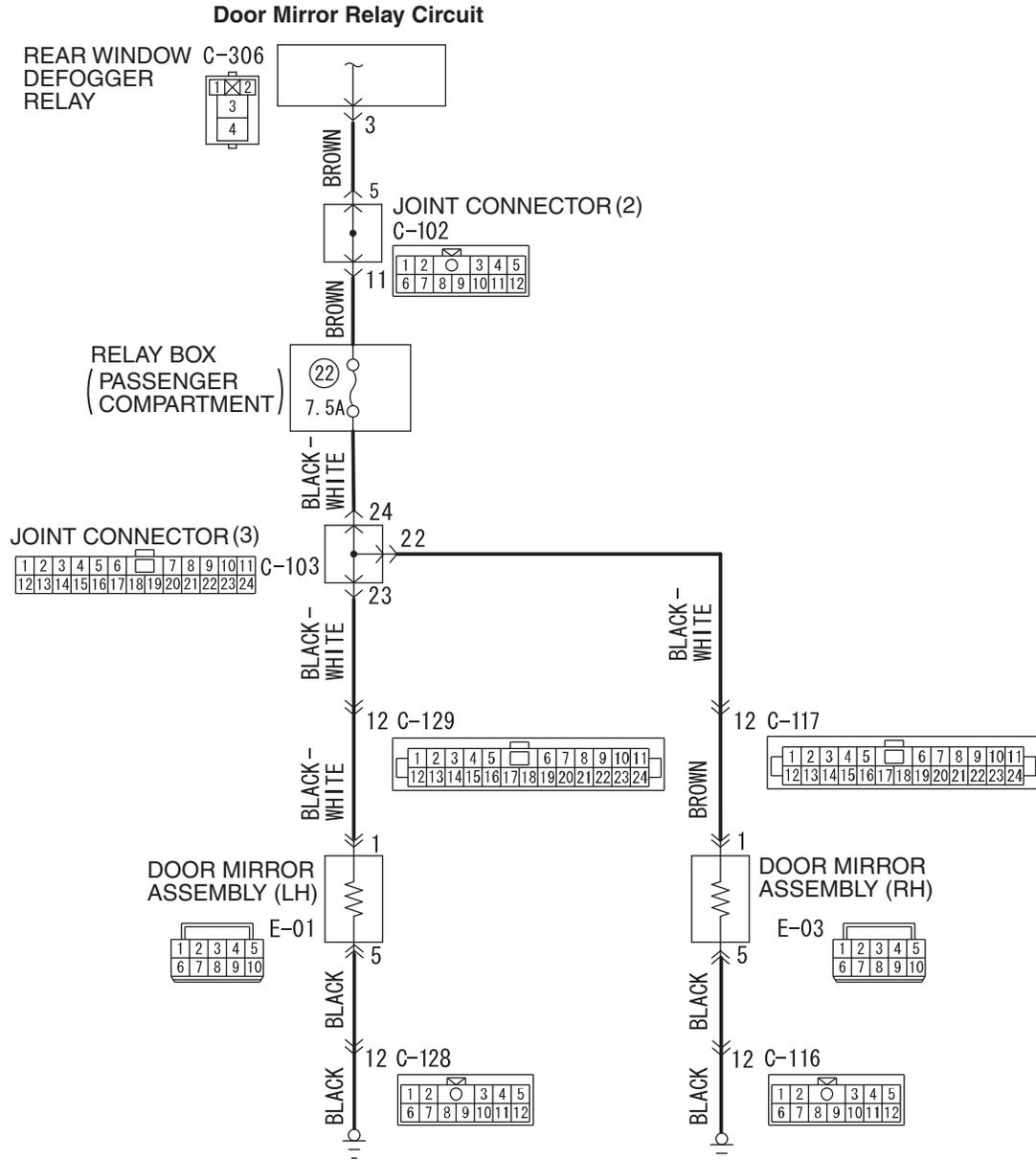
*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-129 is damaged, repair 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-01 (terminal 1) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

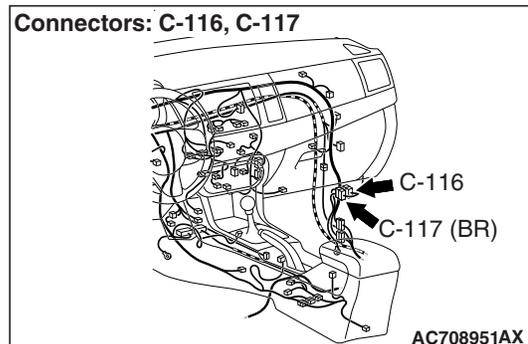
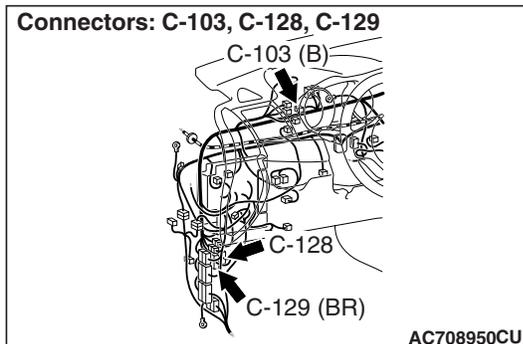
**YES :** The procedure is complete.

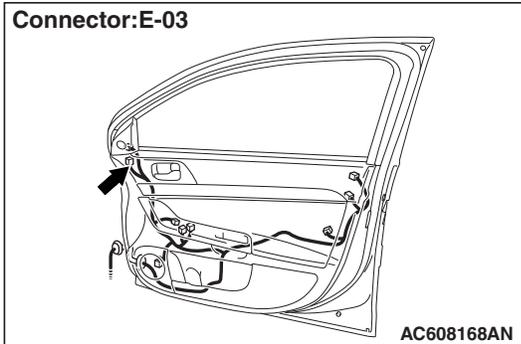
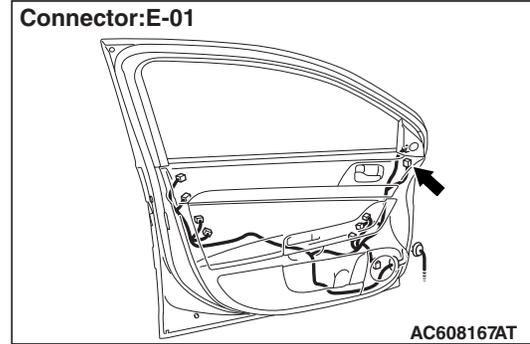
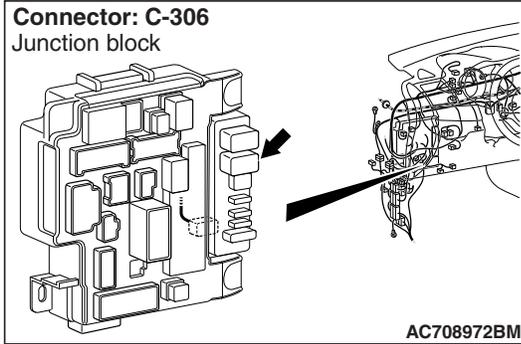
**NO :** Repair the wiring harness as necessary. Check if all heated door mirrors work normally.

INSPECTION PROCEDURE 2: Either of the Heated Door Mirror does not Operate



AC901477AB





## CIRCUIT OPERATION

If either of the heated door mirror does 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-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is door mirror (LH) connector E-01 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.

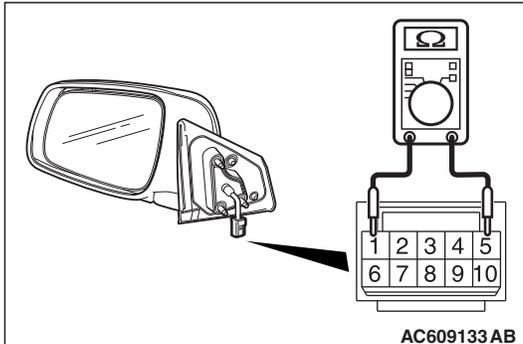
Check to see that the resistance between terminal 1 and 5 of the door mirror (LH) connector E-01.

- The resistance should be  $8.4 \pm 1.2 \Omega$  at  $25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ ).

**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-01 and ground for open circuit. Measure the resistance at door mirror (LH) connector E-01.**

(1) Disconnect door mirror (LH) connector E-01 and check at the wiring harness side connector.

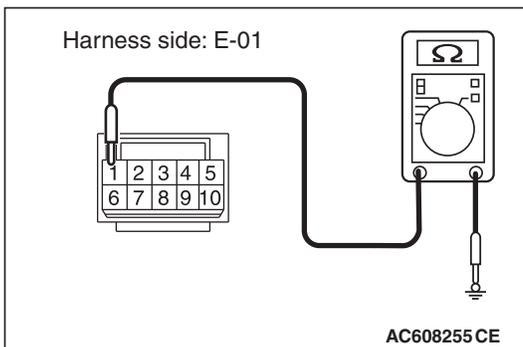
(2) Measure the resistance value between terminal 1 and ground.

- The resistance should be 2 ohms or less.

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

**YES :** Go to Step 6.

**NO :** Go to Step 5.



**STEP 5. Check the wiring harness between door mirror (LH) connector E-01 (terminal 5) and ground.**

*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-128 and C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-128 and C-129 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-01 (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-01 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-129 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-129 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-01 (terminal 1) 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-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is the door mirror (RH) connector E-03 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.

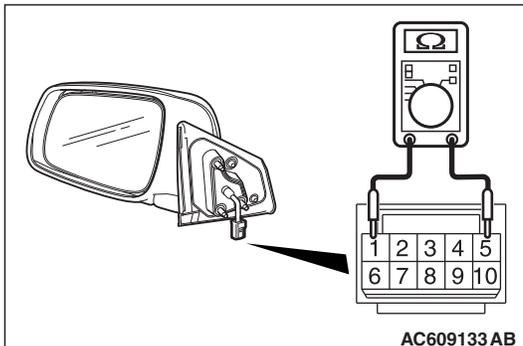
Check to see that the resistance between terminal 1 and 5 of the door mirror (RH) connector E-03.

- The resistance should be  $8.4 \pm 1.2 \Omega$  at  $25^\circ \text{C}$  ( $77^\circ \text{F}$ ).

**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-03 and ground for open circuit. Measure the resistance at door mirror (RH) connector E-03.**

(1) Disconnect door mirror (RH) connector E-03, and check at the wiring harness side connector.

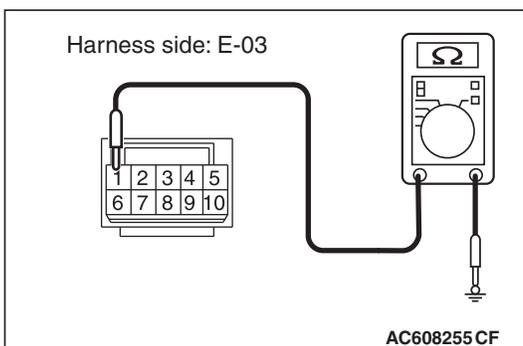
(2) Measure the resistance value between terminal 1 and ground.

- The resistance should be 2 ohms or less.

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

**YES :** Go to Step 12.

**NO :** Go to Step 11.



**STEP 11. Check the wiring harness between door mirror (RH) connector E-03 (terminal 5) and ground.**

*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-116 and C-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-116 and C-117 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-03 (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.

---

**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-03 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).**

*NOTE: Also check the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If the joint connector (2) C-102, joint connector (3) C-103 and intermediate connector C-117 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

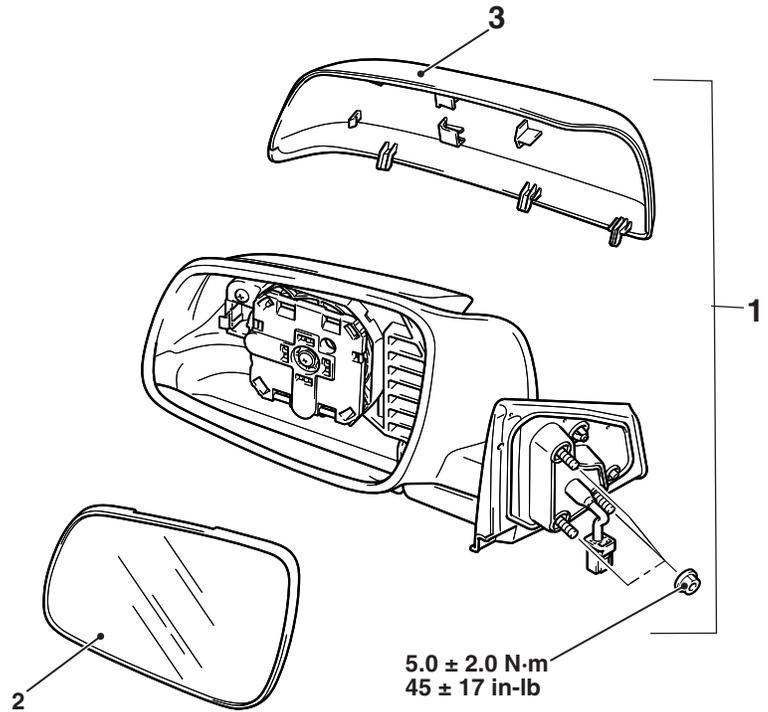
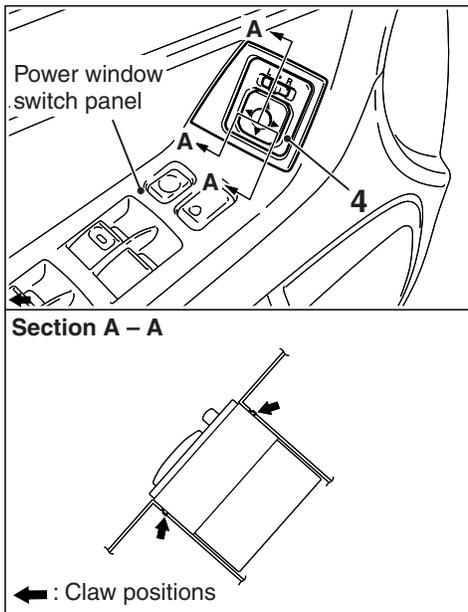
**Q: Is the wiring harness between door mirror (RH) connector E-03 (terminal 1) and rear window defogger relay connector C-306 (terminal 3) in good condition?**

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

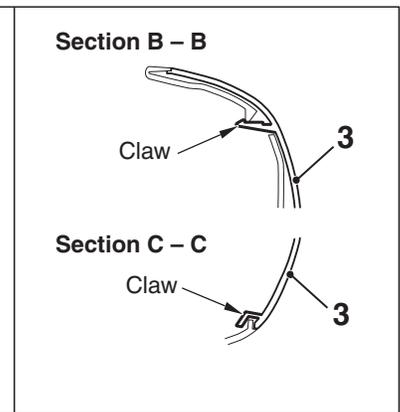
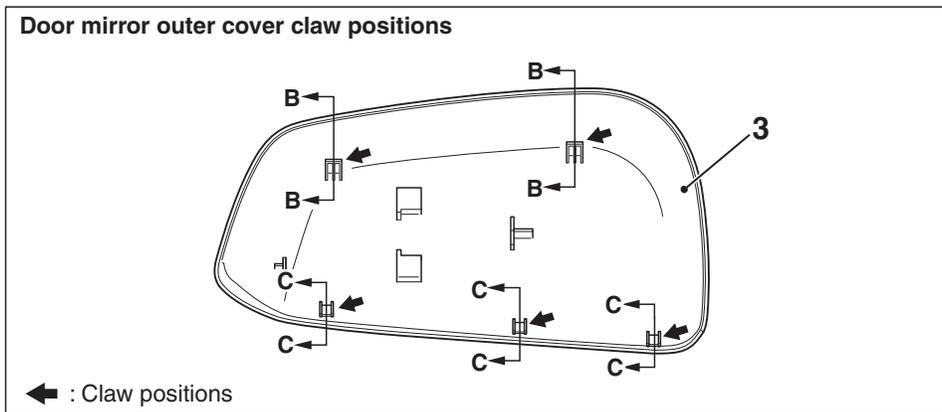
**NO** : Repair the wiring harness as necessary. And then check to see that the heater function of the door mirror (RH) operates normally.

**DOOR MIRROR  
REMOVAL AND INSTALLATION**

M1511006401271



AC607955AB



AC807579 AD

**Door mirror assembly removal steps**

- Tweeter (Refer to GROUP 54A, Speaker P.54A-638)
- Door mirror connector connection
- 1. Door mirror assembly

<<A>>  
<<B>> >>A<<

**Door mirror outer cover removal steps**

- 2. Mirror
  - 3. Door mirror outer cover
- Remote controlled mirror switch removal steps**
- Front door trim (Refer to GROUP 52A, Door Trim P.52A-16)
  - 4. Remote controlled mirror switch

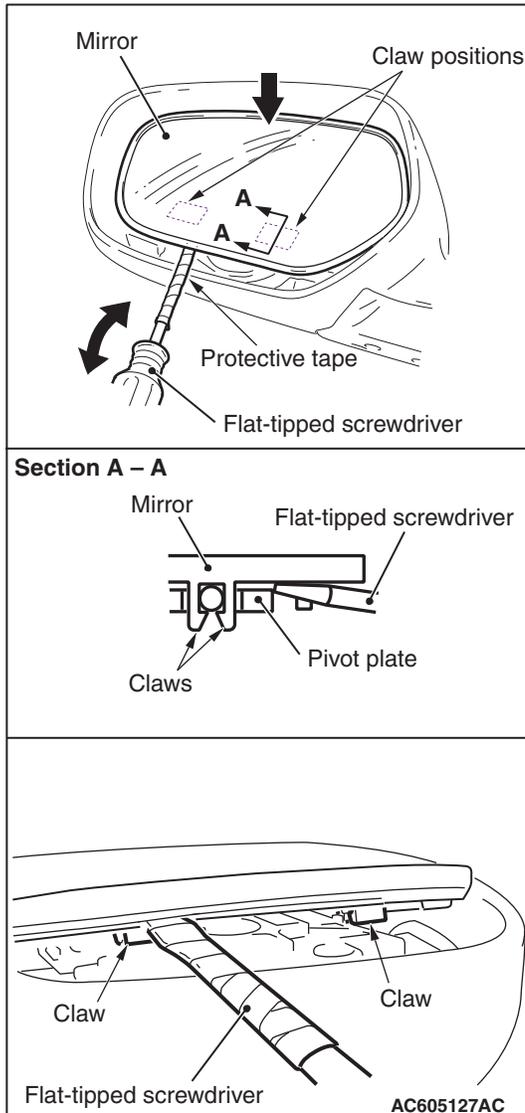
## REMOVAL SERVICE POINTS

## &lt;&lt;A&gt;&gt; MIRROR REMOVAL

**⚠ CAUTION**

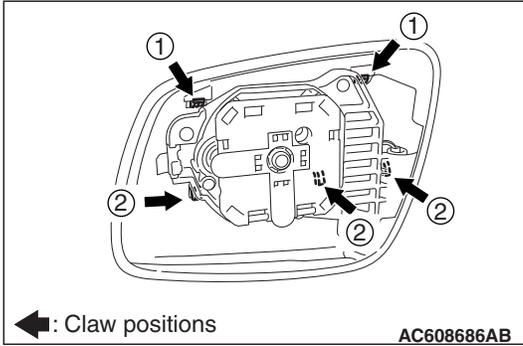
The tab of the mirror is prone to breakage when working in cold temperatures. Always use a hair drier or the like to warm up the mirror tab and its periphery to 20° C (68 ° F) or higher prior to works. When the mirror is heated too quickly from its cold state, it may be broken.

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



**<<B>> DOOR MIRROR OUTER COVER REMOVAL**

Remove the door mirror outer cover by disengaging the claws in the numerical order of the illustration from the mirror body side.



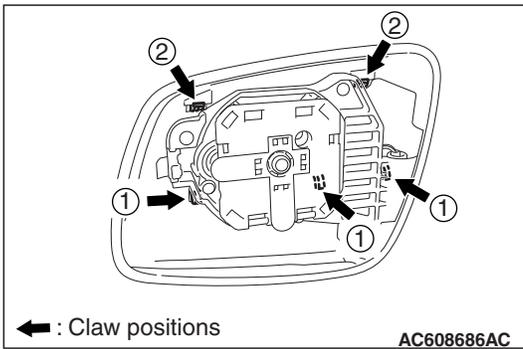
**INSTALLATION SERVICE POINT**

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

**⚠ CAUTION**

Tap the claw positions securely to confirm that they are engaged securely.

Install the door mirror outer cover by engaging the claws in the numerical order of the illustration.

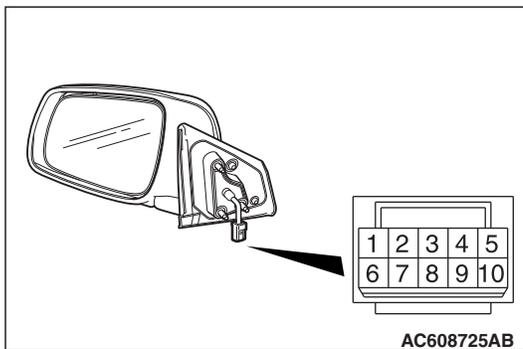


**INSPECTION**

M1511006500673

**REMOTE CONTROLLED MIRROR OPERATION CHECK**

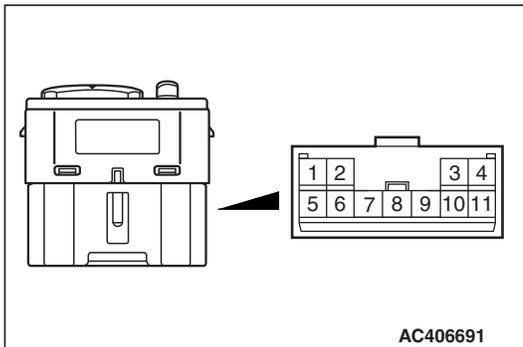
Check that the mirror moves as described in the table when each terminal is connected to the battery.



BATTERY CONNECTION	DIRECTION OPERATION
<ul style="list-style-type: none"> <li>Connect terminal 8 to the negative battery terminal.</li> <li>Connect terminal 6 to the positive battery terminal.</li> </ul>	Up
<ul style="list-style-type: none"> <li>Connect terminal 8 to the positive battery terminal.</li> <li>Connect terminal 6 to the negative battery terminal.</li> </ul>	Down
<ul style="list-style-type: none"> <li>Connect terminal 8 to the negative battery terminal.</li> <li>Connect terminal 7 to the positive battery terminal.</li> </ul>	Right
<ul style="list-style-type: none"> <li>Connect terminal 8 to the positive battery terminal.</li> <li>Connect terminal 7 to the negative battery terminal.</li> </ul>	Left

**DOOR MIRROR CONTROL SWITCH CONTINUITY CHECK**

Check the continuity between the switch terminals.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION	
OFF	9 -2, 9 -3, 9 -6, 9 -10, 9 -11, 1 -2, 1 -3, 1 -6, 1 -10, 1 -11	Open circuit	
Left side	OFF	9 -6, 9 -10, 9 -11, 1 -6, 1 -10, 1 -11	Open circuit
	Up	1 -6, 9 -11	Continuity exists (2 Ω or less)
	Down	1 -11, 6 -9	
	Right	1 -6, 9 -10	
Left	1 -10, 6 -9		
Right side	OFF	9 -2, 9 -3, 9 -6, 1 -2, 1 -3, 1 -6	Open circuit
	Up	1 -6, 3 -9	Continuity exists (2 Ω or less)
	Down	1 -3, 6 -9	
	Right	1 -6, 2 -9	
Left	1 -2, 6 -9		

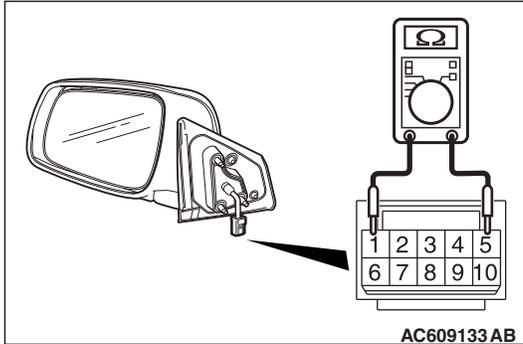
## HEATED DOOR MIRROR CHECK

**⚠ 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:  $8.4 \pm 1.2 \Omega$  at  $25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ )**



---

## NOTES