

GROUP 51

EXTERIOR

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SPECIFICATIONS

SERVICE SPECIFICATIONS

M1511000300949

Item	Standard value
Set position of windshield wiper arm/blade assembly mm (in)	Ceramic end line $\pm 5.0(0.20)$
Heated door mirror resistance value ohm	8.4 ± 1.2 at 25 °C (77° F)

LUBRICANT

M1511000400098

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

ADHESIVE

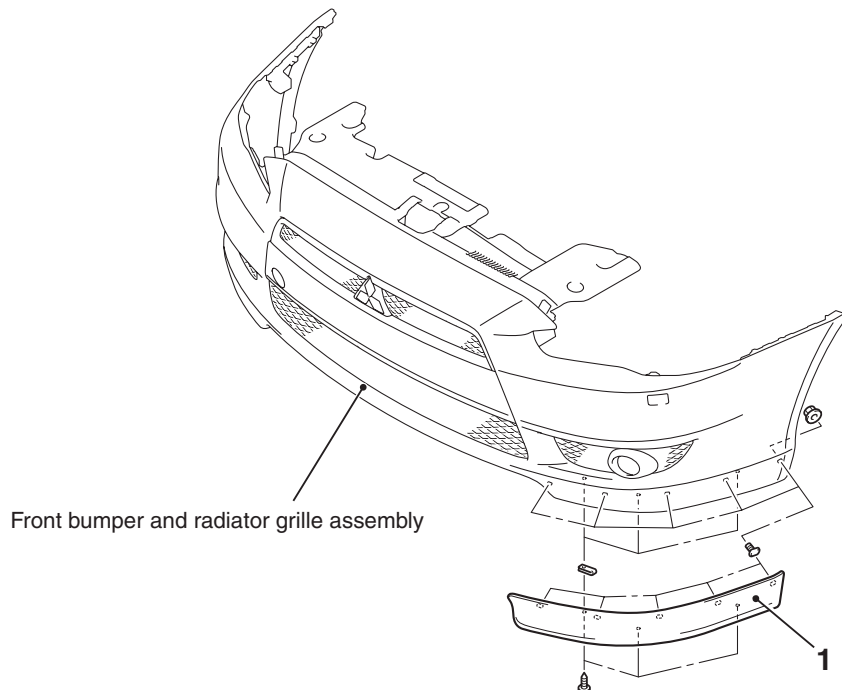
M1511000501656

ITEM	SPECIFICATION
Front three-diamond mark	Adhesive tape: Double-sided tape 0.6 mm (0.02 inch) thickness
Side air dam	Adhesive tape: Double-sided tape (a): 4 mm (0.16 in) width and 1.2 mm (0.05 in) thickness (b): 8 mm (0.32 in) width and 1.2 mm (0.05 in) thickness Adhesive tape remover: 3M™ AAD Part number 8906 or equivalent

AERO PARTS

REMOVAL AND INSTALLATION

M1511005000051

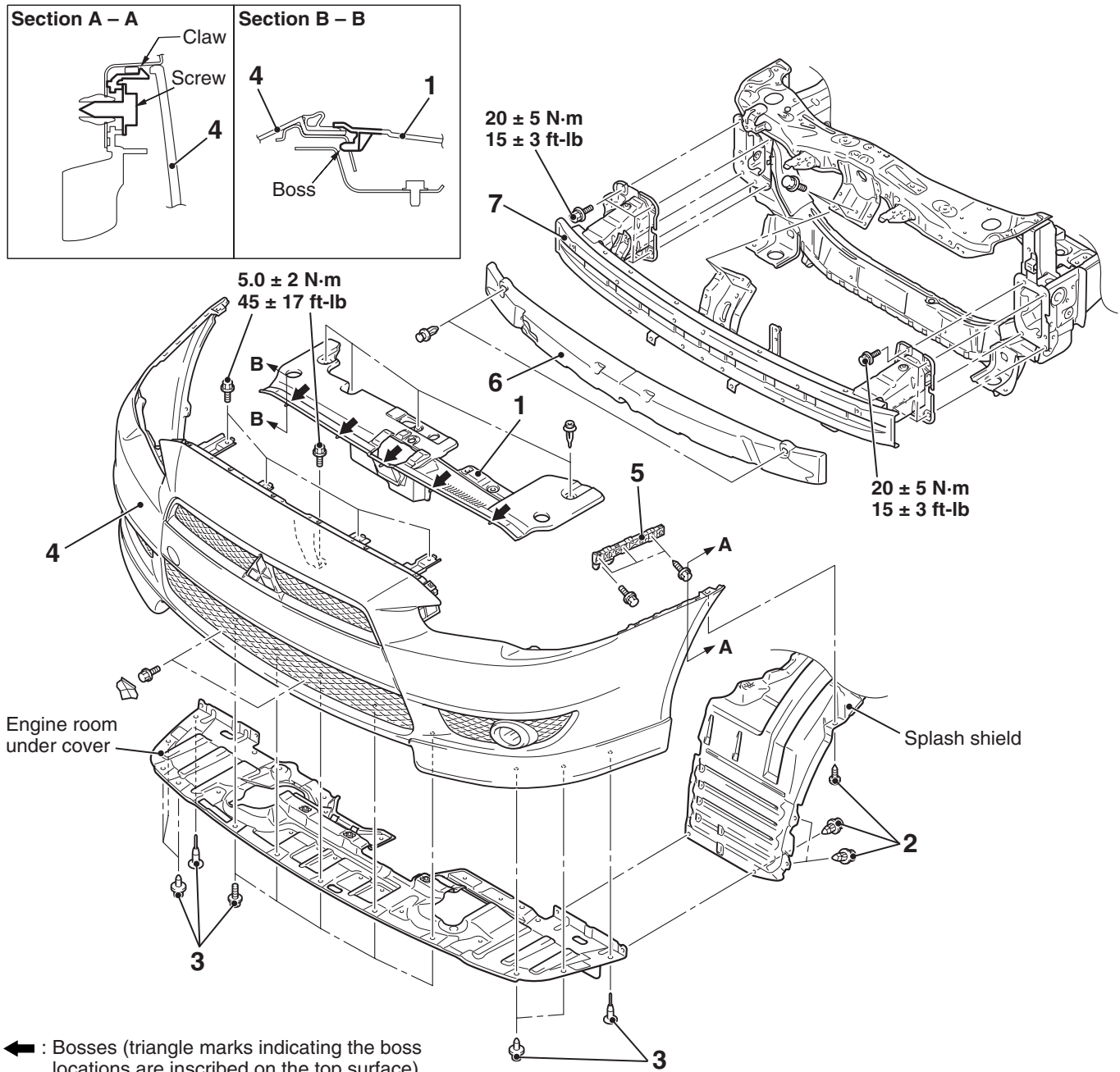


- Removal step**
- Under cover(Refer to [P.51-16](#))
1. Air dam skirt panel

AC608628 AB

FRONT BUMPER ASSEMBLY AND RADIATOR GRILLE REMOVAL AND INSTALLATION

M1511025400211



AC607932AB

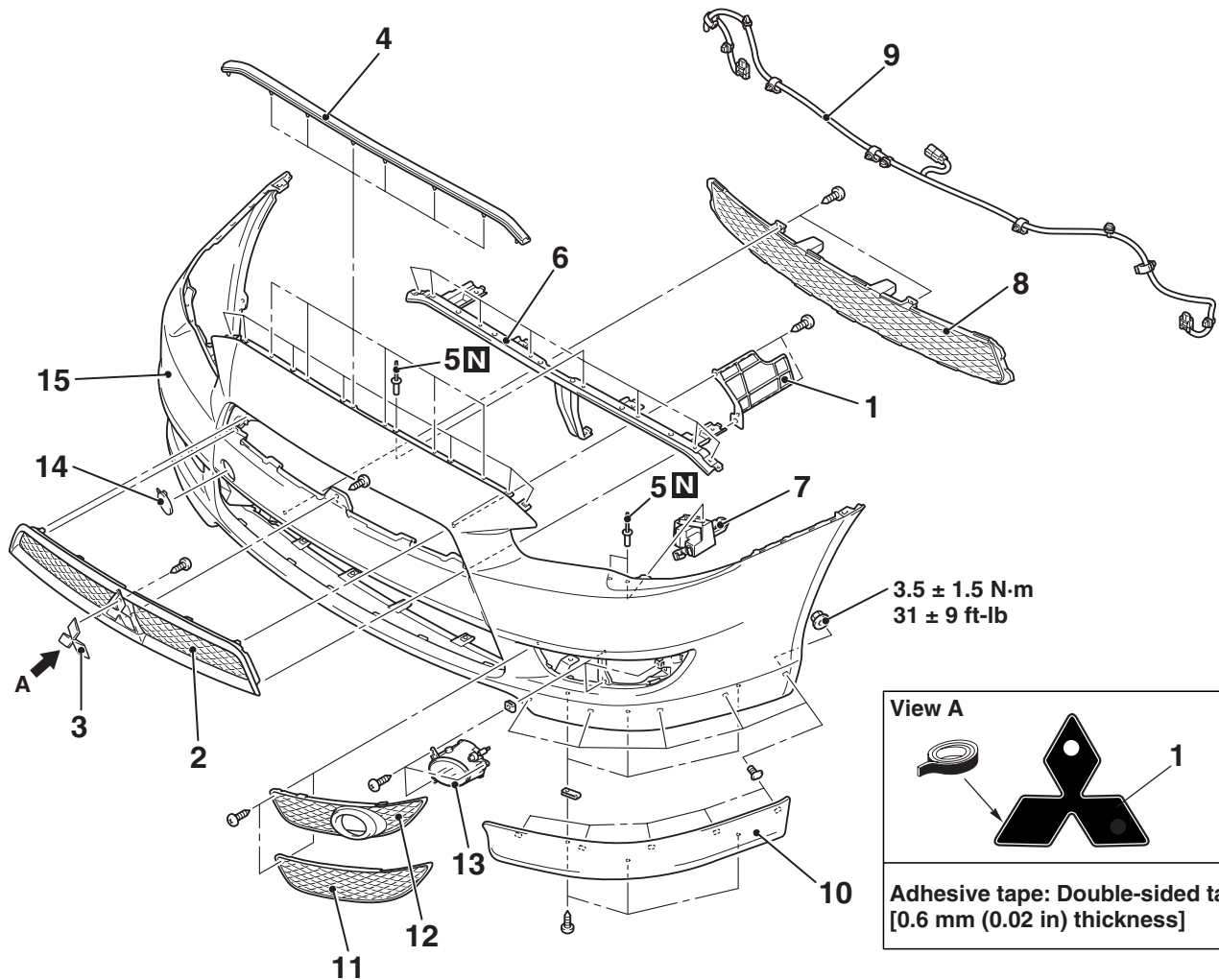
Removal steps

- Air cleaner intake duct (Refer to GROUP 15, Air cleaner P.15-4)
- 1. Headlamp support panel cover
- 2. Splash shield mounting clips and screws
- 3. Engine room under cover mounting clips and bolts
- Front bumper harness connector connection

Removal steps (Continued)

- 4. Front bumper and radiator grille assembly
- 5. Front bumper side bracket
- 6. Front bumper core
 - Horn (Refer to GROUP 54A, Horn P.54A-222)
 - Ambient temperature sensor (Refer to GROUP 55A, Ambient temperature sensor P.55A-126)
- 7. Front bumper reinforcement

DISASSEMBLY AND ASSEMBLY



<<A>> >>A<<

Disassembly steps

1. Front grille side cover
2. Radiator grille
3. Front three-diamond mark
4. Hood weatherstrip front
5. Rivet
6. Front bumper reinforcement
7. Front bumper support
8. Front bumper grille
- Front fog light connector connection
9. Front bumper harness

AC607933AB

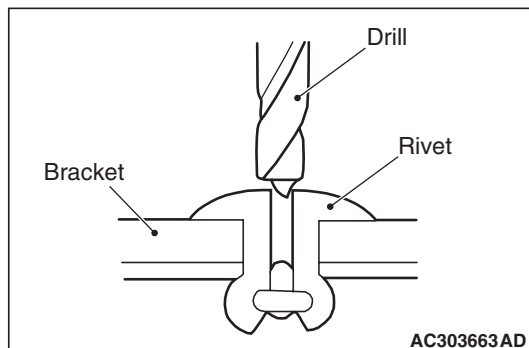
Disassembly steps (Continued)

10. Air dam skirt panel
11. Air intake bezel <Vehicles without front fog lights>
12. Front fog light bezel <Vehicles with front fog lights>
13. Front fog light <Vehicles with front fog lights>
14. Front bumper cover
15. Front bumper face

DISASSEMBLY SERVICE POINT

<<A>> RIVETS REMOVAL

Use a drill (ϕ 4.0 mm) to make a hole in the rivet to break it, and remove the rivet.

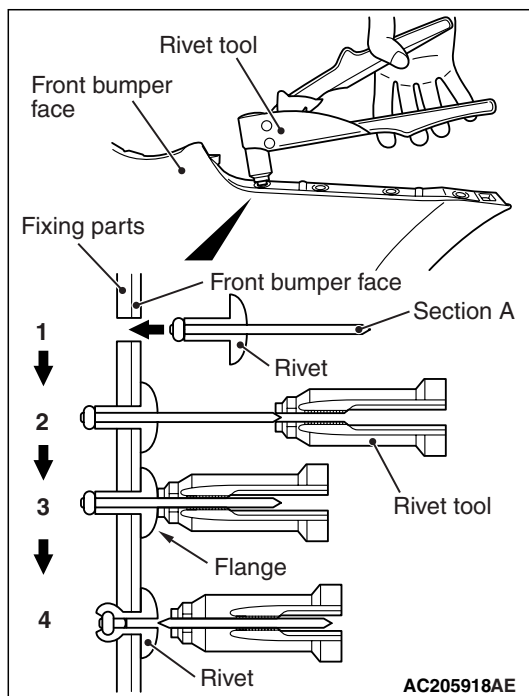


REASSEMBLY SERVICE POINT

>>A<< RIVETS INSTALLATION

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

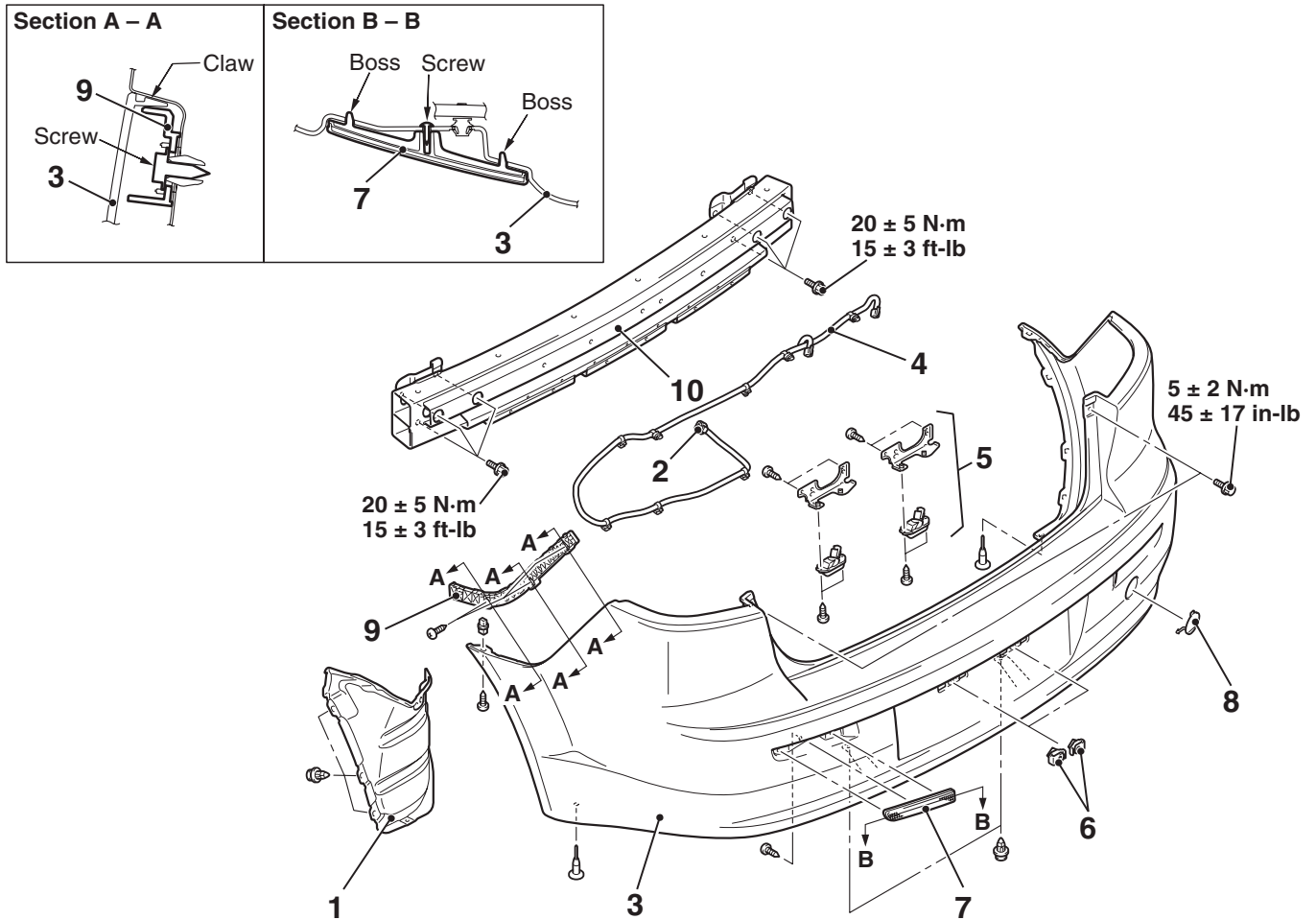
1. Insert the rivet into a corresponding location.
2. Set the rivet tool at a section A of rivet.
3. While pushing the flange surface of the rivet onto parts to be fixed with the rivet tool, press the handle of the tool.
4. Thin part of section A of the rivet will be cut off and the parts is fixed in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



REAR BUMPER ASSEMBLY

REMOVAL AND INSTALLATION

M1511001901431



AC607928AB

Removal steps

1. Rear splash shield
 - Rear combination light (Refer to GROUP 54A, Rear combination light P.54A-172)
2. Rear bumper harness connector connection
3. Rear bumper face
 - License plate light connector connection

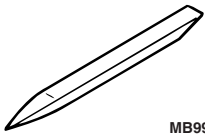
Removal steps (Continued)

4. Rear bumper harness
5. License plate light and bracket assembly
6. Bracket
7. Reflector
8. Rear bumper cover
9. Rear bumper face support bracket
10. Rear bumper reinforcement

GARNISHES AND MOLDINGS

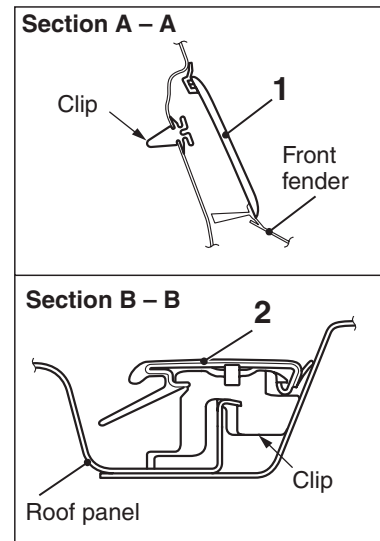
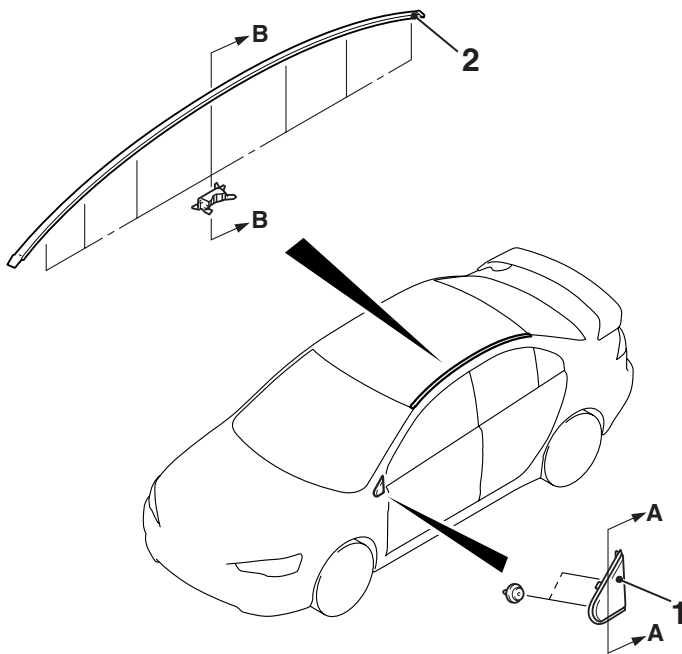
SPECIAL TOOL

M1511000602065

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 <p>MB990784</p>	<p>MB990784 Ornament remover</p>	<p>General service tool</p>	<p>Removal of front delta garnish</p>

REMOVAL AND INSTALLATION

M1511004700789



Removal
Front delta garnish removal
1. Front delta garnish

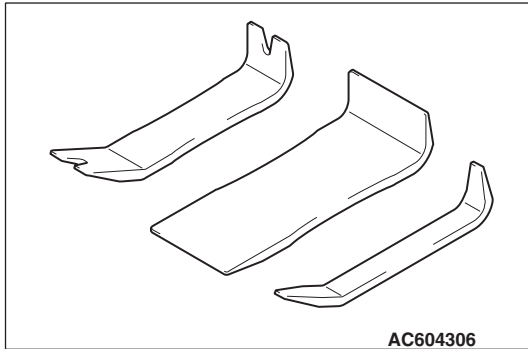
Roof drip molding removal
2. Roof drip molding

AC607963AB

Required Special Tool:
• MB990528: Stripe Tape Spatula

REMOVAL SERVICE POINT

<<A>> ROOF DRIP MOULDING REMOVAL



NOTE: Use a commercial available ornament remover (resin-made) as shown to pry out the roof drip moulding.

DOOR SASH TAPE

SPECIAL TOOL

M1511000601716

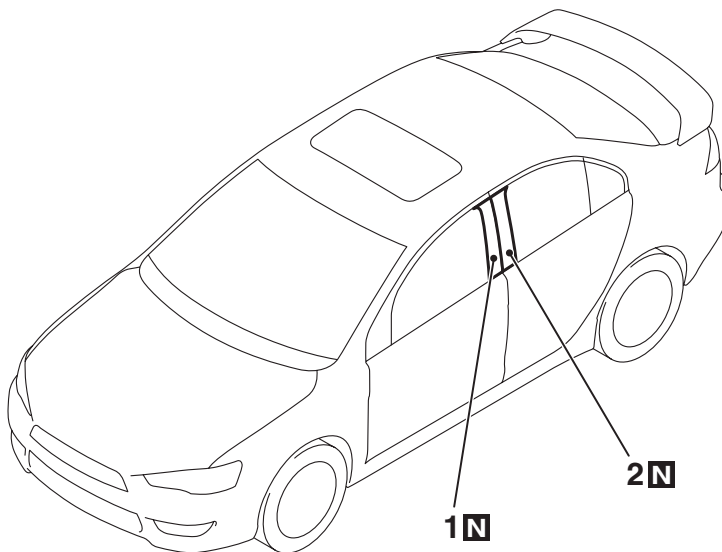
TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>MB990528</p>	<p>MB990528 Stripe tape spatula</p>	<p>General service tool</p>	<p>Installation of door sash tape</p>

REMOVAL AND INSTALLATION

M1511024100422

Pre-removal and post-installation operation

- Door Window Glass Runchannel Removal and Installation (Refer to GROUP 42 –Window Glass Runchannel and Door Opening Weatherstrip P.42A-164).
- Door Beltline Moulding Removal and Installation (Refer to GROUP 42 –Window Glass Runchannel and Door Opening Weatherstrip P.42A-164).



AC607959AB

Removal steps

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

Required Special Tool:

- MB990528: Stripe Tape Spatula

REMOVAL SERVICE POINT

<<A>> DOOR SASH TAPES REMOVAL

⚠ CAUTION

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

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

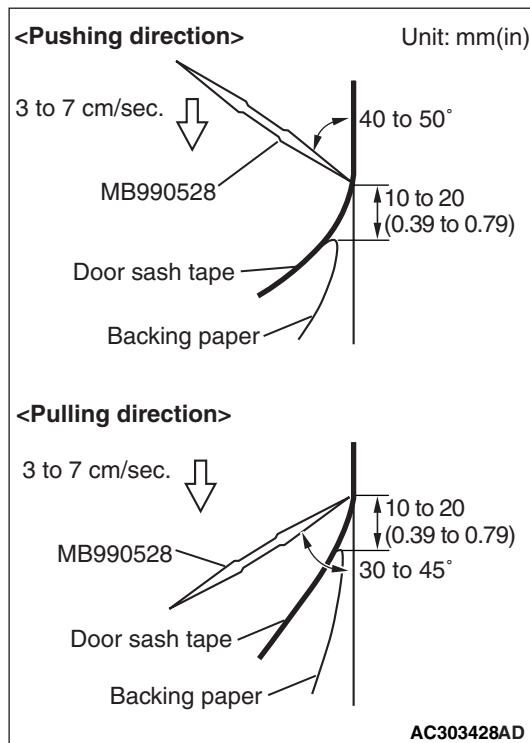
INSTALLATION SERVICE POINT

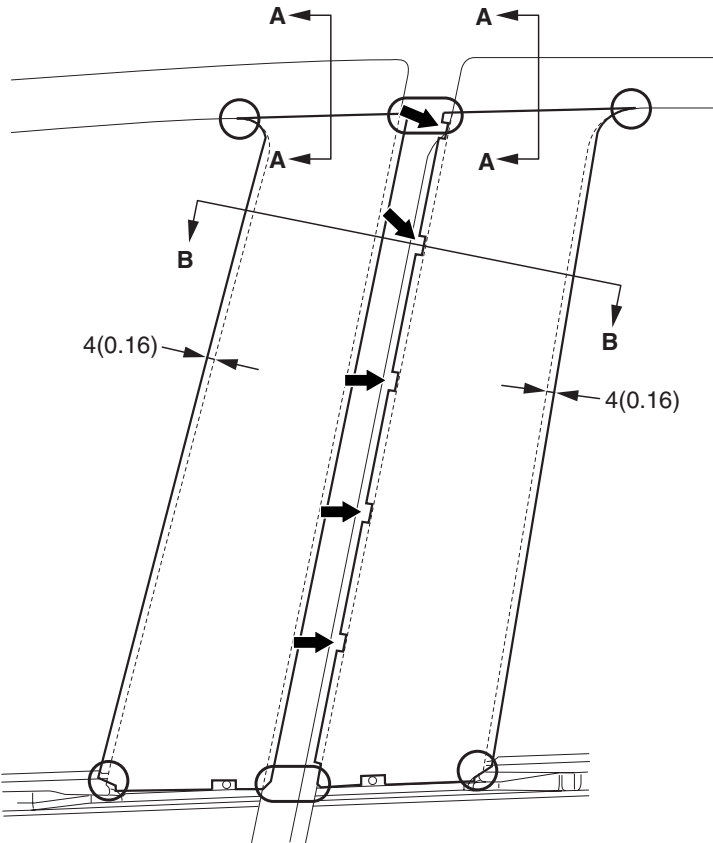
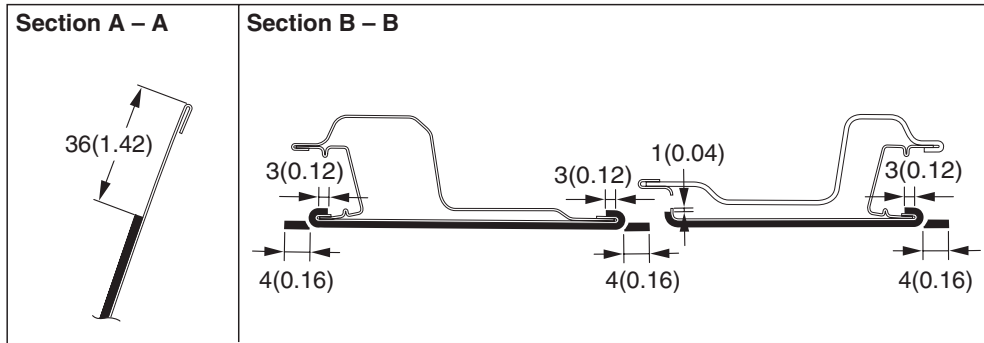
>>A<< DOOR SASH TAPES INSTALLATION

⚠ CAUTION

- The ambient temperature should be 20(68) 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 fibre) around the tip of the special tool.
2. Use white gasoline to degrease the tape application surface.
3. Wipe away dirt from the tape.



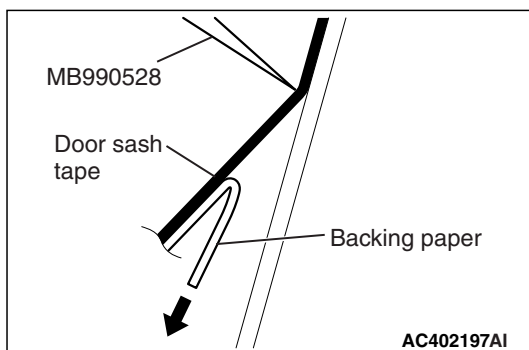


Unit: mm (in)

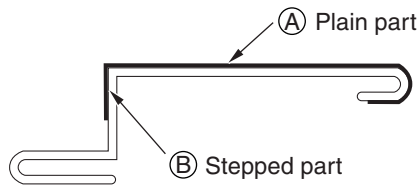
- : Tape locating points
- ➔ : T-stud for door opening weatherstrip attaching locations (5 places in all).

AC607960AB

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.

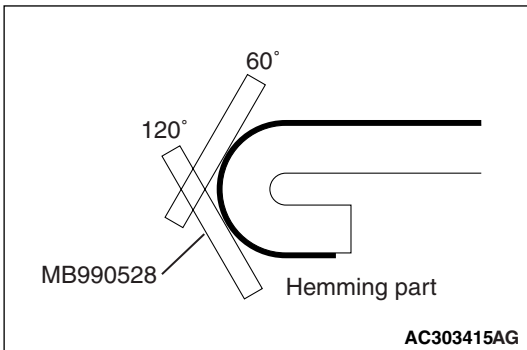


Rear door sash tape front



AC506860AB

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



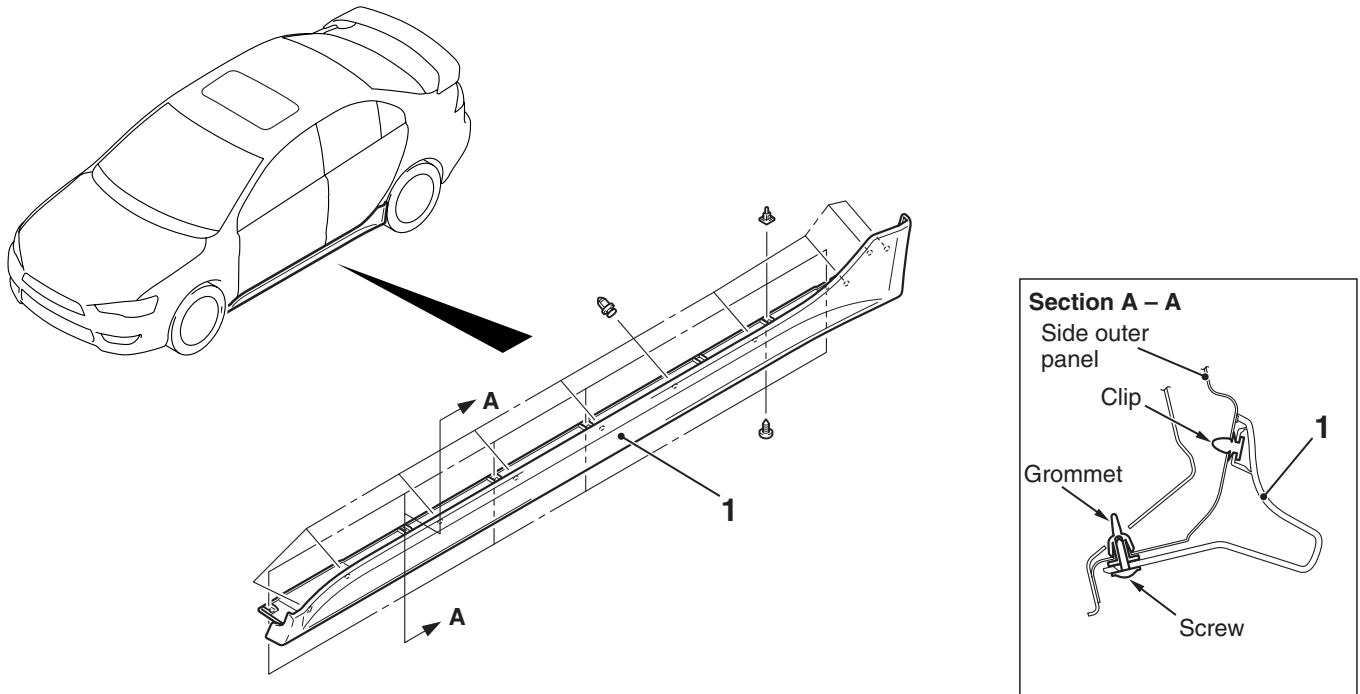
AC303415AG

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

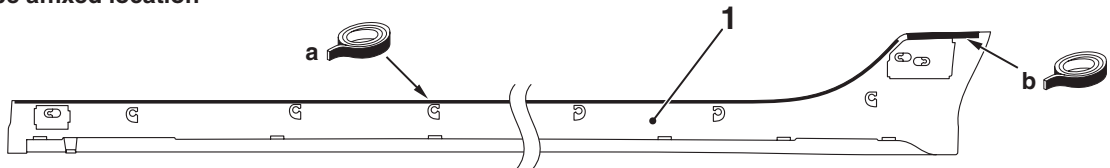
SIDE AIR DAM

REMOVAL AND INSTALLATION

M1511005500506



Double-sided tape affixed location



Double-sided tape:
a: 4 mm (0.16 in) width and 1.2 mm (0.05 in) thickness, b: 8 mm (0.32 in) width and 1.2 mm (0.05 in) thickness

AC607961AB

Removal

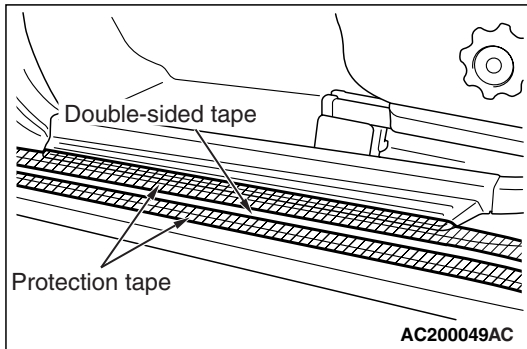
- <<A>> >>A<< 1. Side air dam

REMOVAL SERVICE POINT

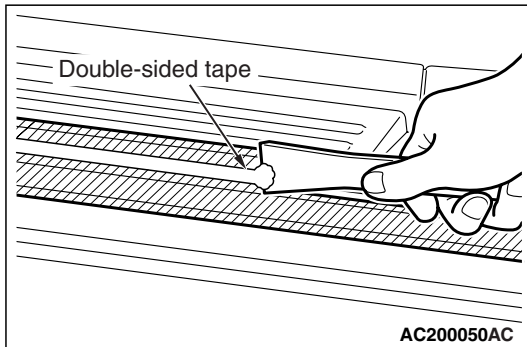
<<A>> SIDE AIR DAM REMOVAL

Gently lift and remove the side air dam. If there is any double-sided tape remaining on the side air dam, remove according to the following instructions.

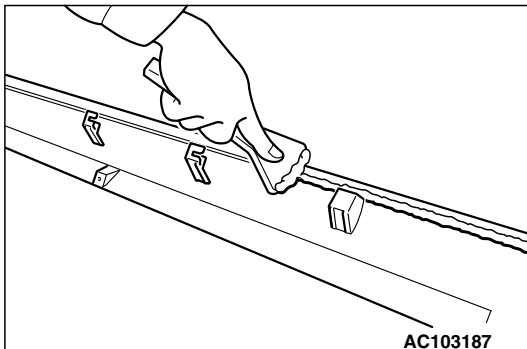
1. Remove double-sided tape remaining on the body surface



- (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 isopropyl alcohol.
 - (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

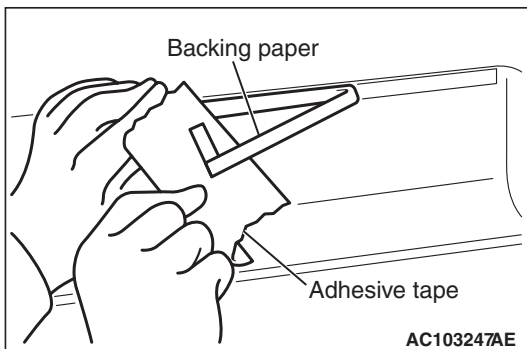
1. Tear off the double-sided tape backing paper.

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.

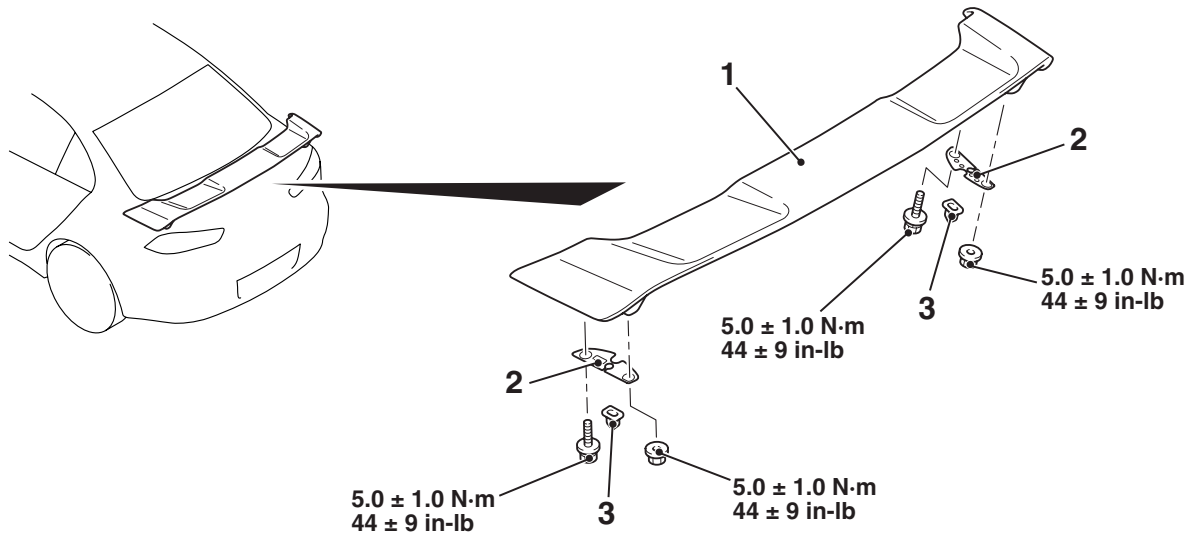
3. Firmly press in the side air dam.



REAR SPOILER

REMOVAL AND INSTALLATION

M1511006100299



AC607962AB

Removal steps

1. Rear spoiler assembly

Removal steps (Continued)

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

INSTALLATION SERVICE POINT

>>A<< TAPE INSTALLATION

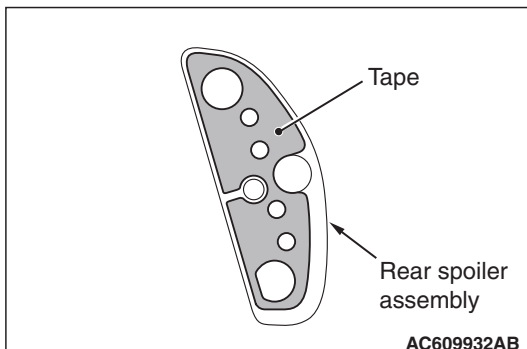
1. Installation position

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.

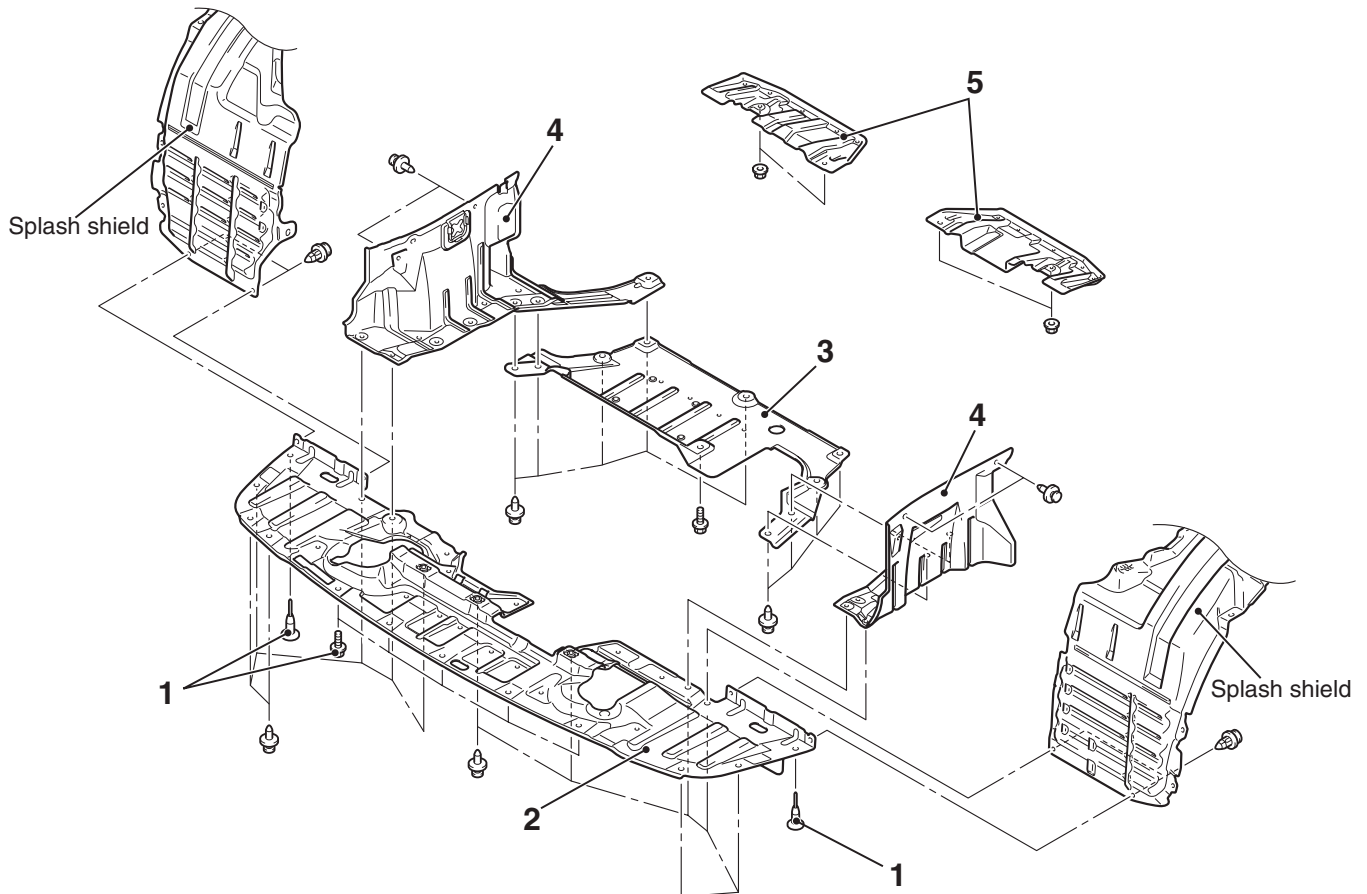
2. Installation procedure

- (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.



UNDER COVER**REMOVAL AND INSTALLATION**

M1511019600313



AC607925AB

Removal steps

1. Front bumper mounting clips and bolts
2. Engine room under cover front A

Removal steps (Continued)

3. Engine room under cover front B
4. Engine room side cover
5. Front floor panel rear

WINDSHIELD WIPER AND WASHER

GENERAL INFORMATION

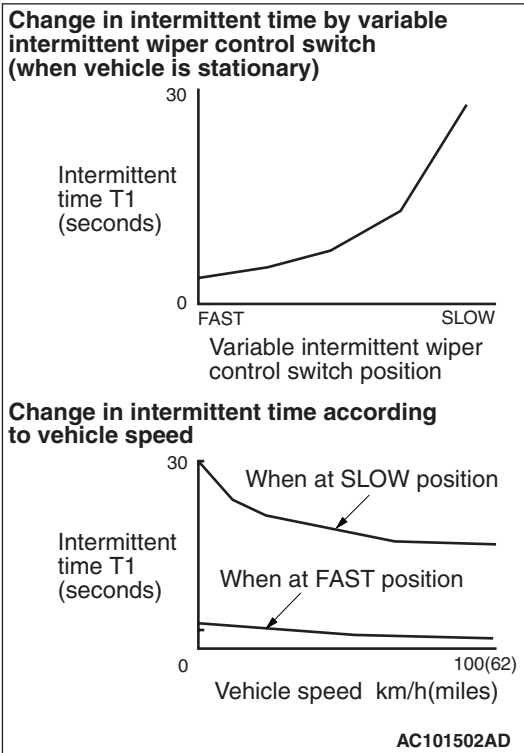
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WINDSHIELD WIPER AND WASHER OPERATION

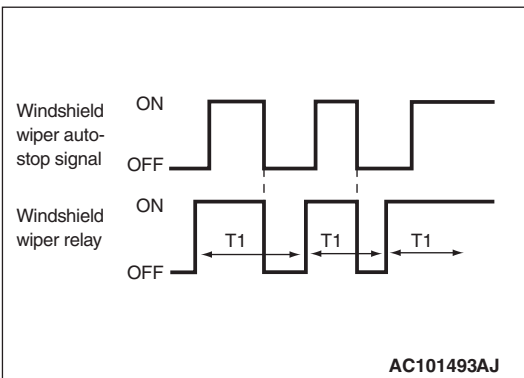
Intermittent control (Vehicle speed-dependent variable type) <Initial condition: with function>

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 configuration function, the vehicle speed-dependent intermittent function can be invalidated (Refer to P.51-46).

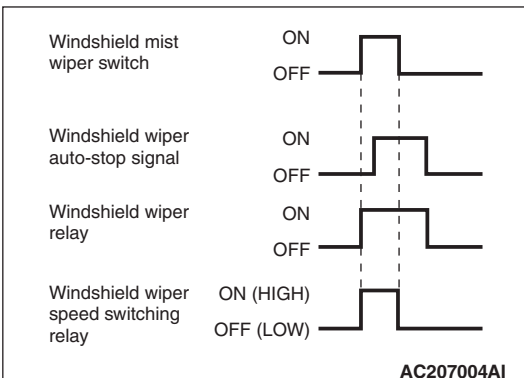


2. When ETACS receives the ON signal of the windshield intermittent wiper switch, it turns the windshield wiper relay ON. When the wiper reaches the stop position, the windshield wiper auto-stop signal turns OFF, and the windshield wiper relay turns OFF. When the intermittent time T1 calculated by step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

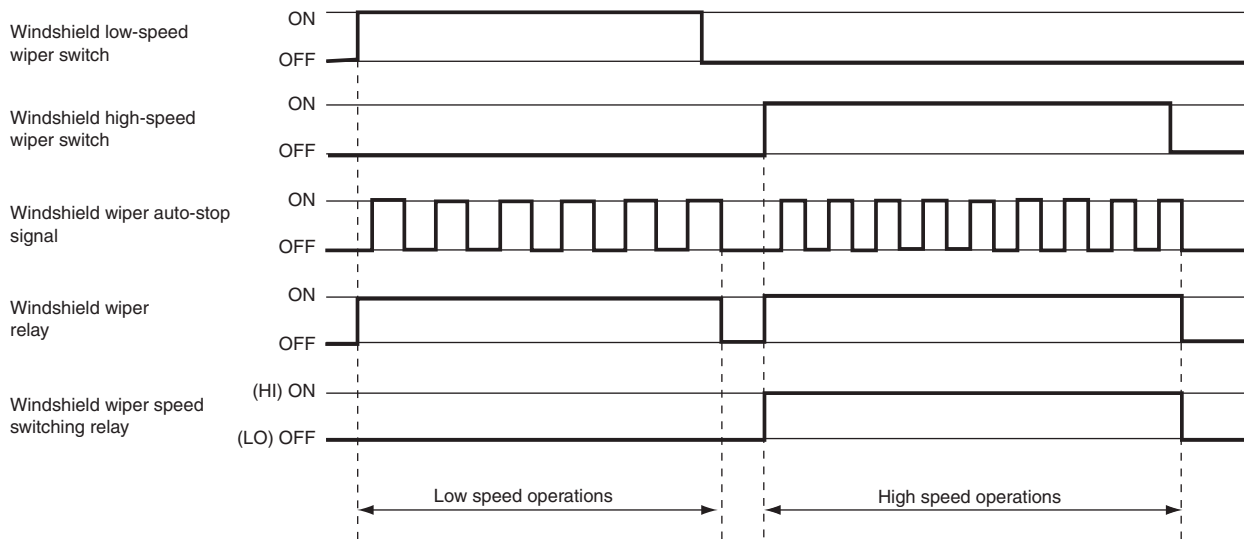


Mist wiper control

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

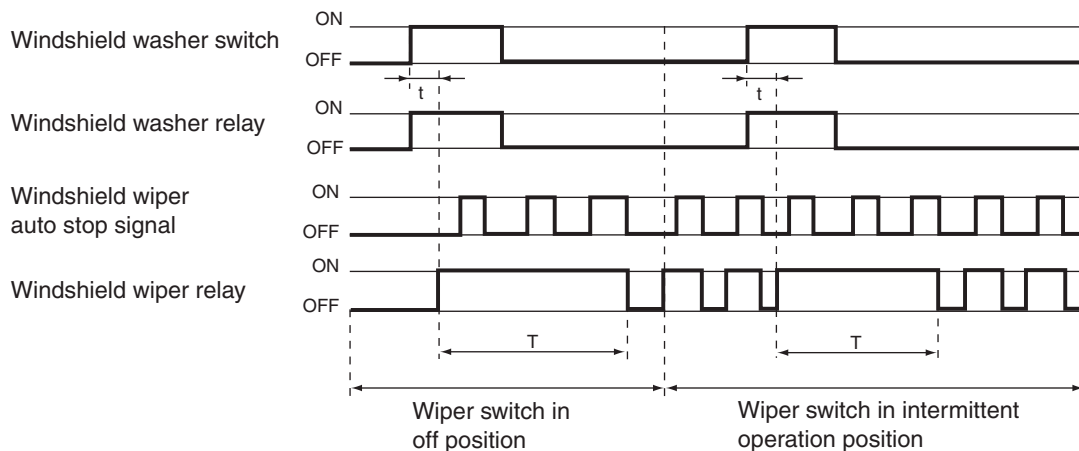


AC506610AH

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, with windshield washer check valve>



AC309988AJ

t: 0.3 second

T: Intermittent wiper intermittent time

Wiper switch	OFF position			Intermittent operation position				Low-speed or high-speed operation position
	0.3 second or less	0.3 to 0.5 second	0.5 second or more	0.2 second or less	0.2 to 0.4 second	0.4 to 0.6 second	0.6 second or more	
Washer switch ON time	0.3 second or less	0.3 to 0.5 second	0.5 second or more	0.2 second or less	0.2 to 0.4 second	0.4 to 0.6 second	0.6 second or more	-
Intermittent wiper time (T)	0 second	2 seconds	3 seconds	0 second	1 second	2 seconds	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.

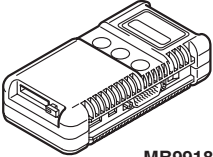
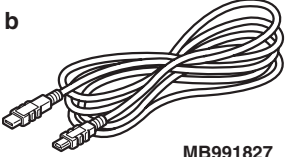
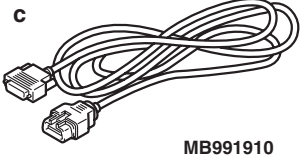
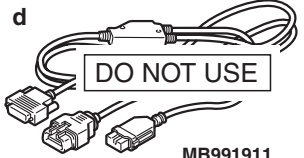
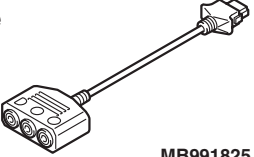
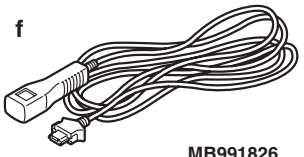
When the windshield washer switch is kept ON for 0.3 seconds or longer, the windshield wiper relay (the wiper relay output time varies depending on the conditions. For details, see the table.) is turned ON, and the windshield wiper operates at high speed. The windshield wiper is turned OFF with 3 seconds 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 configuration function, the washer linked windshield wiper function can be invalidated (Refer to [P.51-46](#)).
- Using the configuration function, when the washer linked windshield wiper function is invalidated, only the washer operates. It is useful to melt ice from a frozen windshield.

SPECIAL TOOLS

Tool	Number	Name	Use
<p>a</p>  <p>MB991824</p> <p>b</p>  <p>MB991827</p> <p>c</p>  <p>MB991910</p> <p>d</p>  <p>MB991911</p> <p>e</p>  <p>MB991825</p> <p>f</p>  <p>MB991826</p> <p>MB991955</p>	<p>MB991955</p> <p>a. MB991824</p> <p>b. MB991827</p> <p>c. MB991910</p> <p>d. MB991911</p> <p>e. MB991825</p> <p>f. MB991826</p>	<p>M.U.T.-III sub-assembly</p> <p>a. Vehicle Communication Interface (V.C.I.)</p> <p>b. M.U.T.-III USB cable</p> <p>c. M.U.T.-III main harness A (Vehicles with CAN communication system)</p> <p>d. M.U.T.-III main harness B (Vehicles without CAN communication system)</p> <p>e. M.U.T.-III measure adapter</p> <p>f. M.U.T.-III trigger harness</p>	<p>⚠ CAUTION</p> <p>For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.</p> <p>Windshield intermittent wiper check</p>

WINDSHIELD WIPER AND WASHER DIAGNOSIS

TROUBLESHOOTING STRATEGY

M1511014600534

Diagnosis should be carried out by the following procedures.

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

TROUBLE SYMPTOM CHART

M1511015000687

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
Windshield wipers do not work at all	1	P.51-23
Windshield wipers do not work when wiper switch is at "INT", "Washer" or "Mist" position. However, wipers work at low speed when switch is at "Lo" or "Hi" position	2	P.51-29
Windshield wipers do not stop at specified park position	3	P.51-31
Windshield wipers do not work normally	4	P.51-34
Windshield intermittent wiper interval cannot be adjusted by operating windshield intermittent wiper volume control switch	5	P.51-37
Windshield intermittent wiper interval is not changed according to vehicle speed	6	P.51-39
Windshield washer does not work normally	7	P.51-42

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

SYMPTOM PROCEDURES

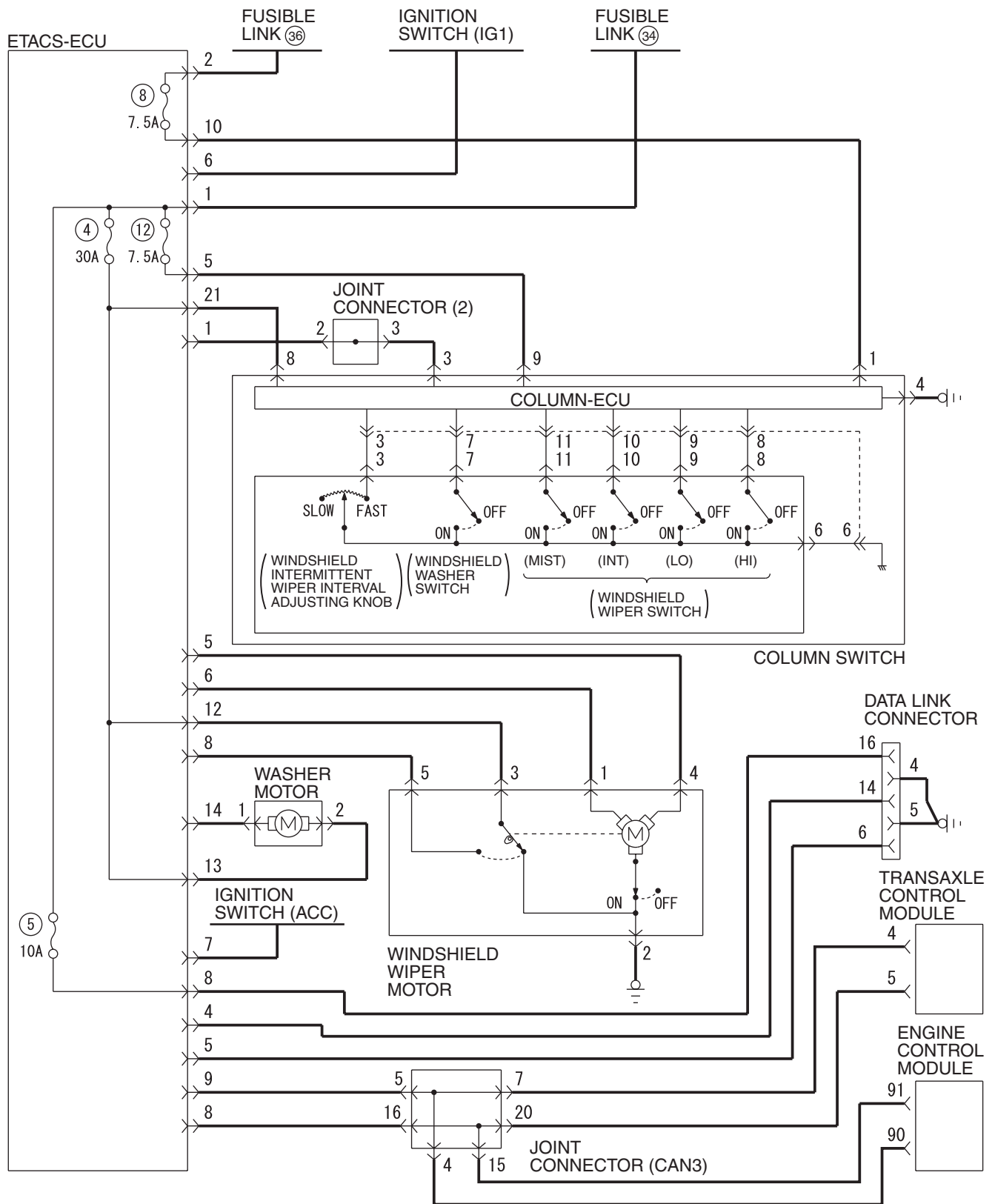
GENERAL DESCRIPTION CONCERNING THE WINDSHIELD WIPER AND WASHER

M1511000101272

The following ECUs affect the functions and control of the windshield wiper and washer.

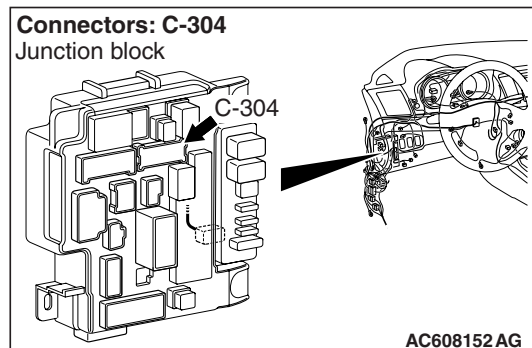
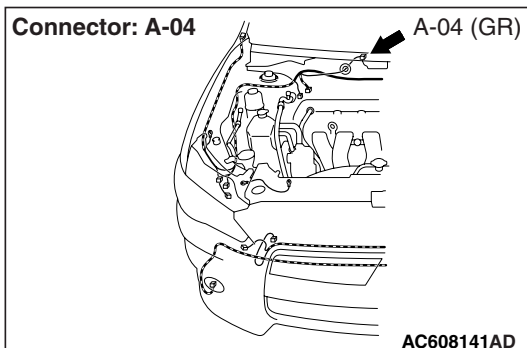
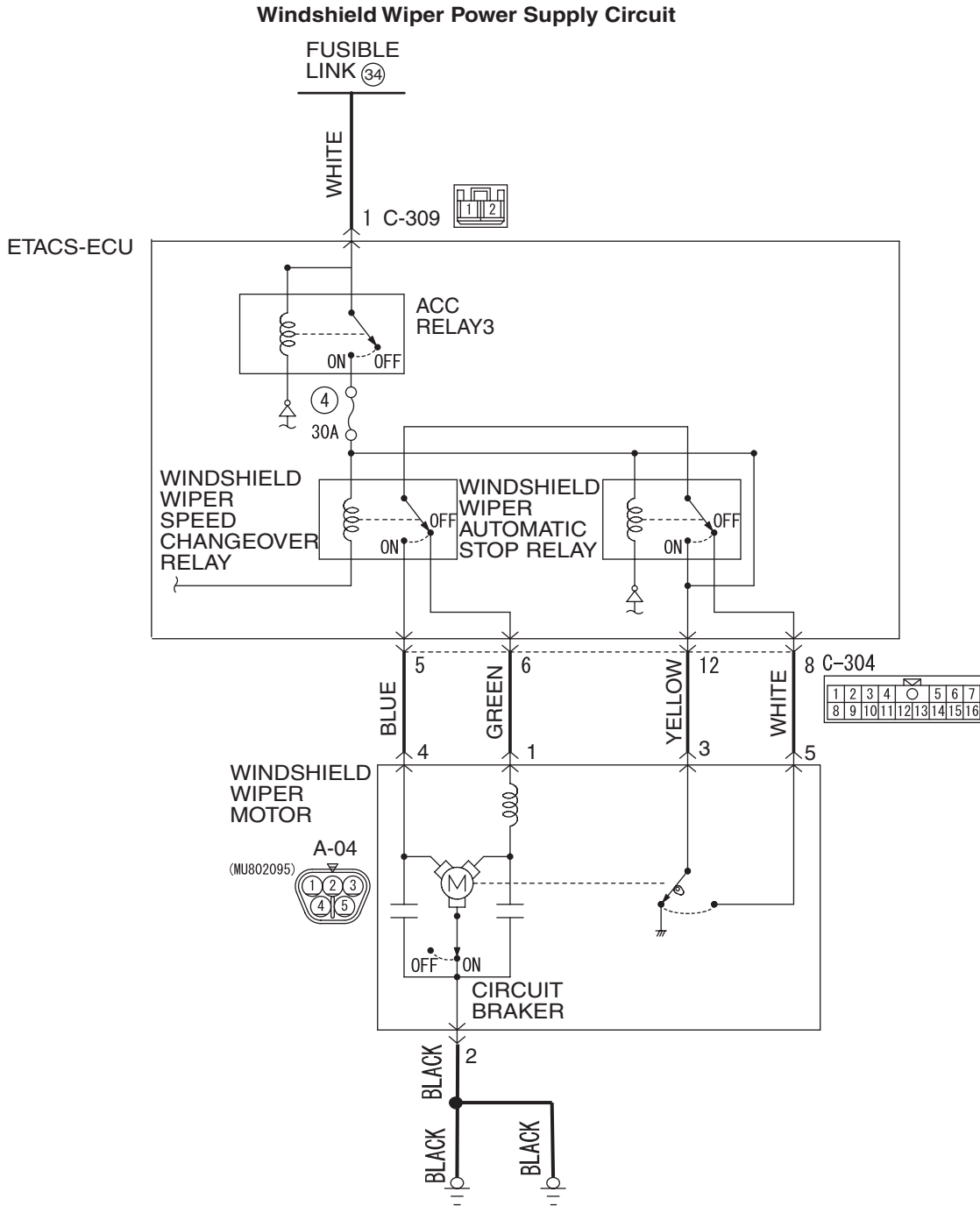
FUNCTION	CONTROL ECU	
Windshield wiper and washer control function	Intermittent control (Vehicle speed-dependent variable type)	ETACS-ECU, column switch
	Mist wiper control	ETACS-ECU, column switch
	Low speed wiper and high speed wiper control	ETACS-ECU, column switch
	Washer control	ETACS-ECU, column switch

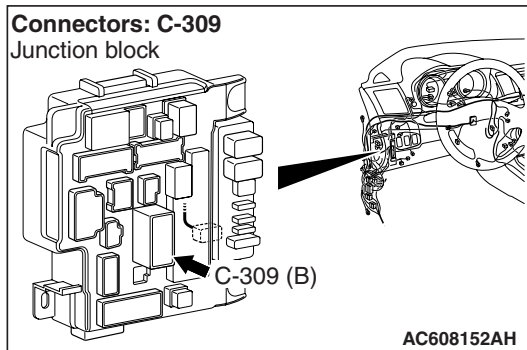
GENERAL CIRCUIT DIAGRAM FOR THE WINDSHIELD WIPER AND WASHER



W8G51M000A

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.

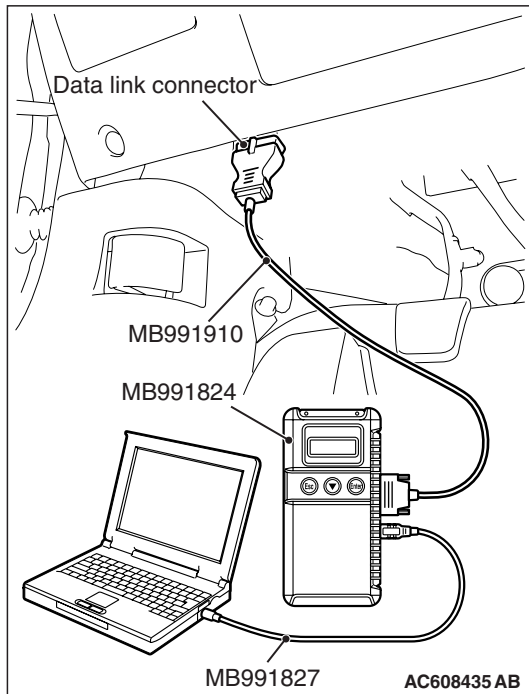
TROUBLESHOOTING HINTS

- 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-479](#)."

Q: Is the diagnostic trouble code set?

- YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-482](#)."
- NO** : Go to Step 2.

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

- Ignition switch: ACC

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

OK: Normal condition is displayed.

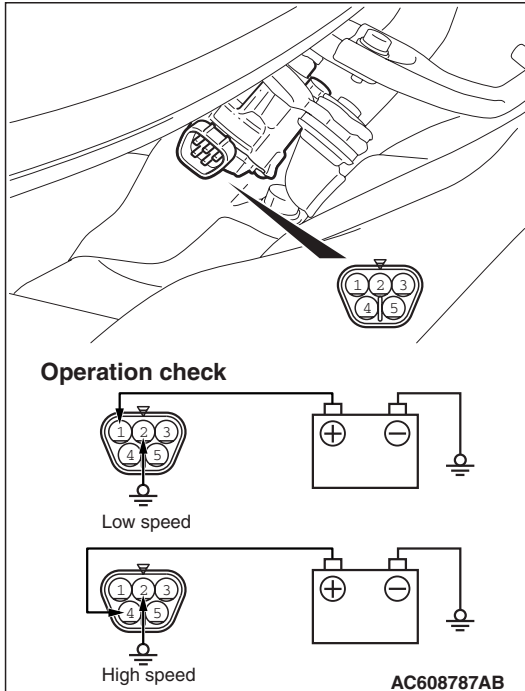
Q: Is the check result normal?

- NO** : Go to Step 3.
- YES** : Refer to GROUP 54A –ETACS, Input signal chart [P.54A-528](#).

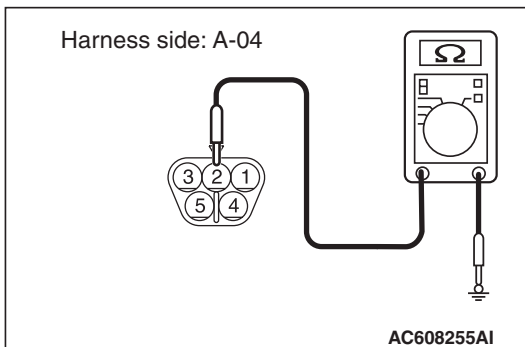
STEP 3. Check windshield wiper motor connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is windshield wiper motor connector A-04 in good condition?

- YES** : Go to Step 4.
- NO** : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the windshield wiper works normally.

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

- (1) Disconnect windshield wiper motor connector A-04.
- (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-04.**

- (1) Disconnect windshield wiper motor connector A-04 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-04 (terminal 2) and ground.****Q: Is the wiring harness between windshield wiper motor connector A-04 (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-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 works normally.

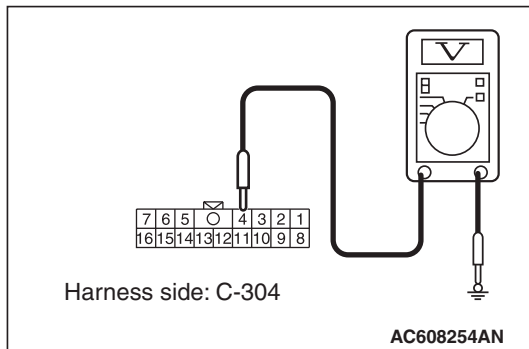
STEP 8. Measure the voltage at ETACS-ECU connector C-304.

- (1) Disconnect ETACS-ECU connector C-304 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the voltage between terminal 4 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.00-13](#).

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

STEP 10. Check the wiring harness between ETACS-ECU connector C-304 (terminals 5, 6) and windshield wiper motor connector A-04 (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-04 (terminals 4, 1) in good condition?

YES : Go to Step 11.

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

STEP 11. Retest the system.

Check that the windshield wipers work normally.

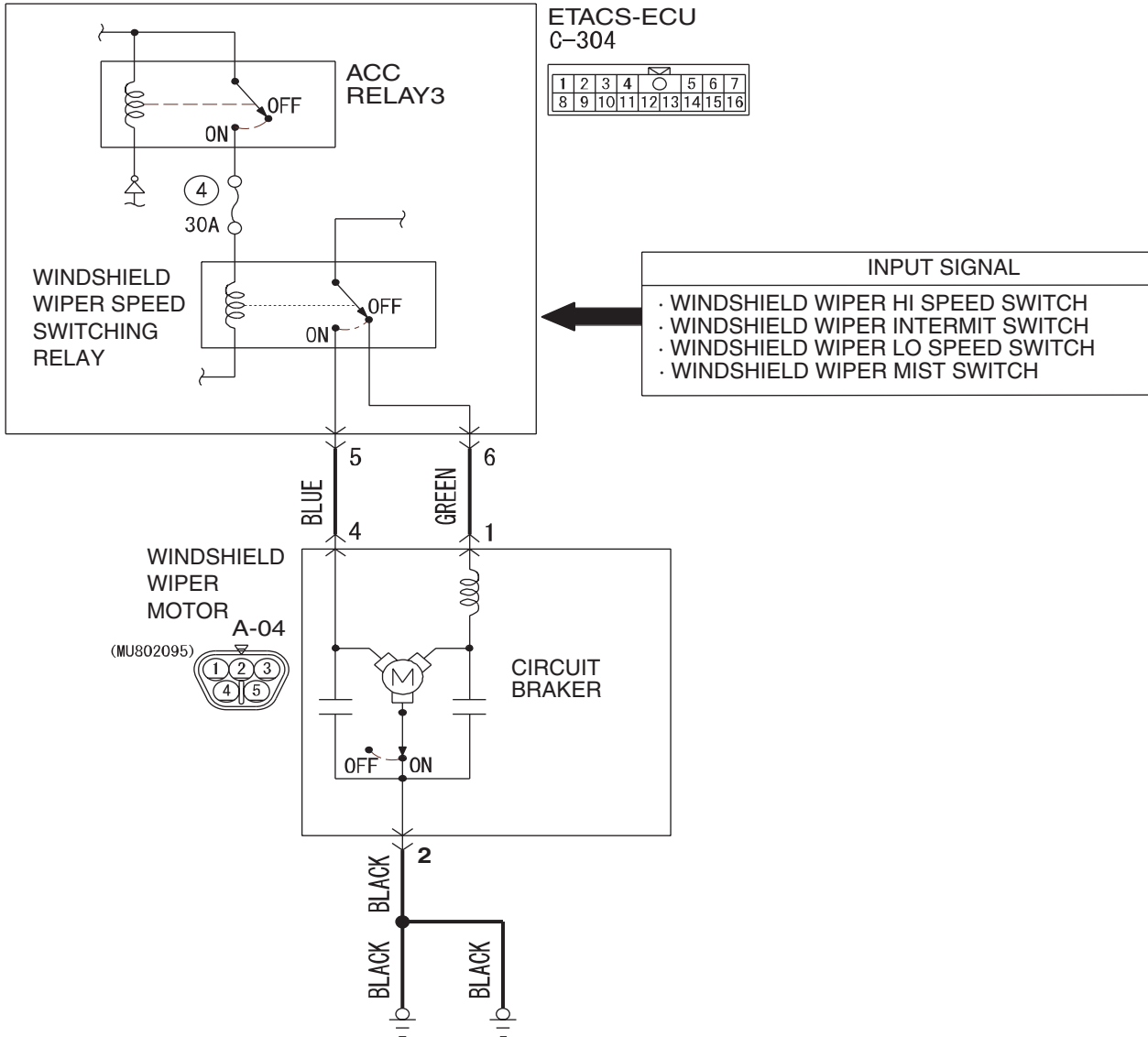
Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-13](#).

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



AC609153AB

TECHNICAL DESCRIPTION (COMMENT)

This system may be at fail-safe mode if the LIN communication line is defective.

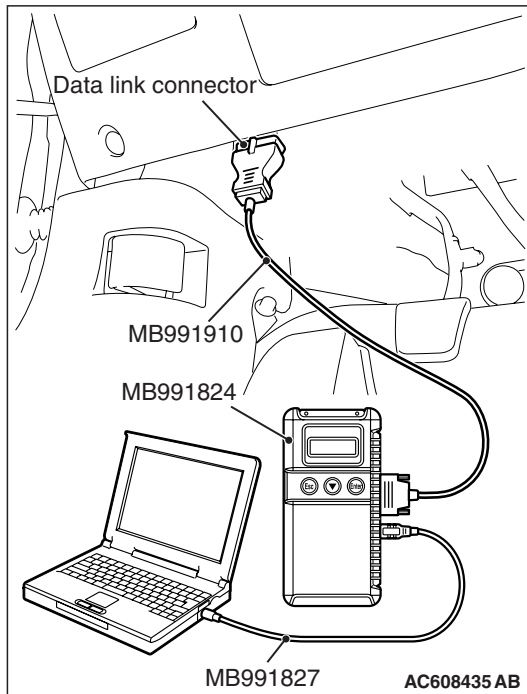
If the system cannot receive any signal from the column switch (windshield wiper and washer switch) due to an open circuit in the LIN communication line or other reasons, the system will enter the fail-safe mode when the ignition switch is at the "ACC" position.

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-479](#)."

Q: Is the diagnostic trouble code set?

- YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-482](#)."
- NO** : Go to Step 2.

STEP 2. Retest the system.

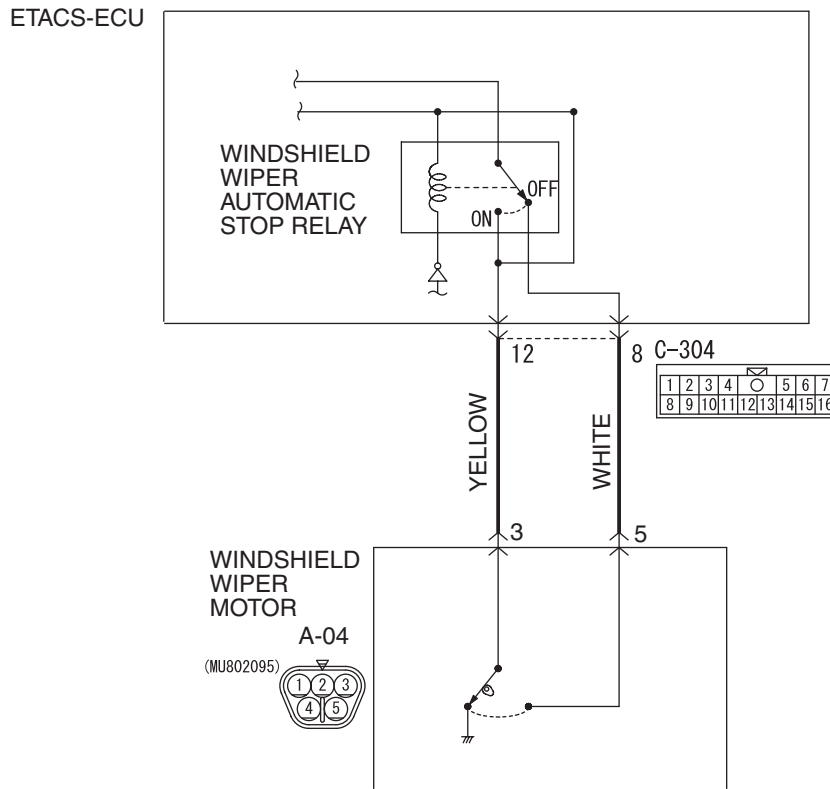
Check that the windshield wipers work normally.

Q: Is the check result normal?

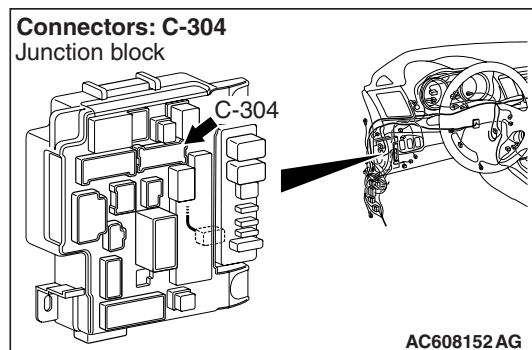
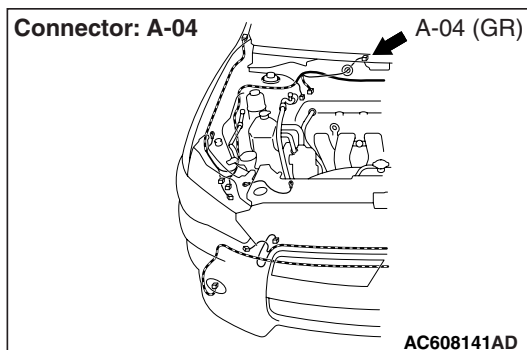
- YES** : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-13](#).
- NO** : Replace the ETACS-ECU.

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

Windshield Wiper Automatic Stop Relay Circuit



AC609162 AB



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-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is windshield wiper motor connector A-04 in good condition?

YES : Go to Step 2.

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

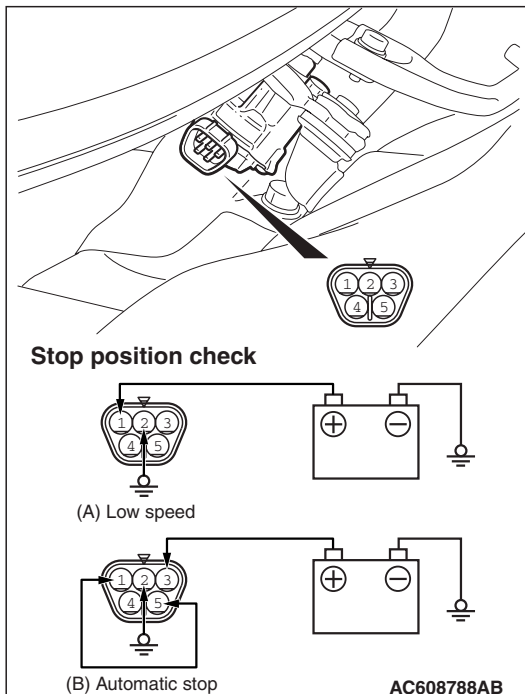
STEP 2. Check the windshield wiper motor.

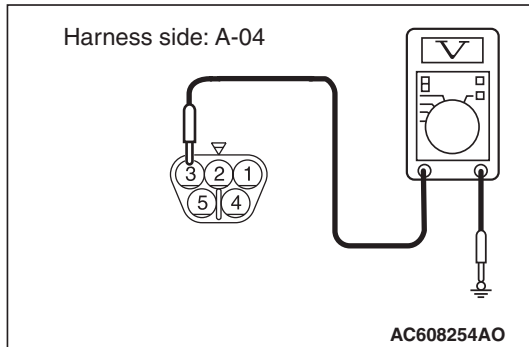
- (1) Disconnect windshield wiper motor connector A-04.
- (2) Connect the vehicle battery to the windshield wiper motor connector as shown, and operate the windshield wiper at low speed. While the windshield wiper is working, disconnect the battery at positions other than the specified park position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

Q: Does the windshield wiper motor operate normally?

YES : Go to Step 3.

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





STEP 3. Check the fusible link (34) circuit to the windshield wiper motor. Measure the voltage at windshield wiper motor connector A-04.

- (1) Disconnect windshield wiper motor connector A-04 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 5.

NO : Go to Step 4.

STEP 4. Check the wiring harness between windshield wiper motor connector A-04 (terminal 3) and the fusible link (34).

- Check the power supply line for open circuits.

Q: Is the wiring harness between windshield wiper motor connector A-04 (terminal 3) and the fusible link (34) in good condition?

YES : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-13](#).

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

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

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

YES : Go to Step 6.

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

STEP 6. Check the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-04 (terminals 3, 5).

- Check the output lines for open or short circuits.

Q: Is the wiring harness between ETACS-ECU connector C-304 (terminals 8, 12) and windshield wiper motor connector A-04 (terminals 3, 5) in good condition?

YES : Go to Step 7.

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

STEP 7. Retest the system.

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

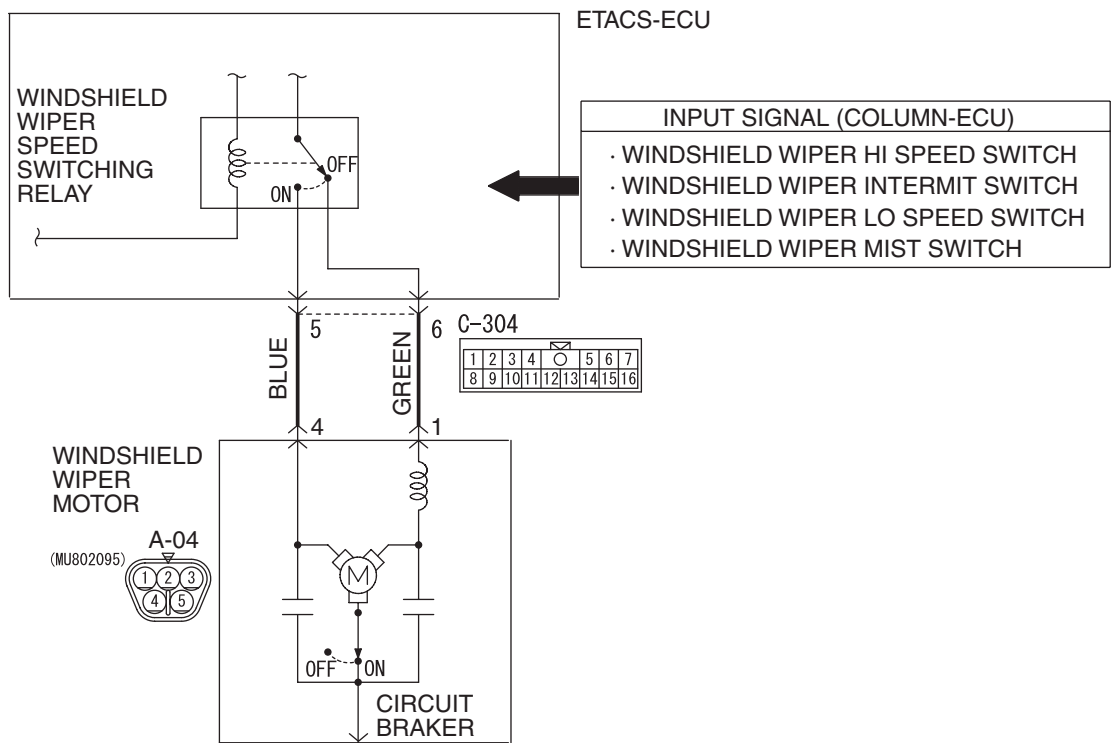
Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction P.00-13.

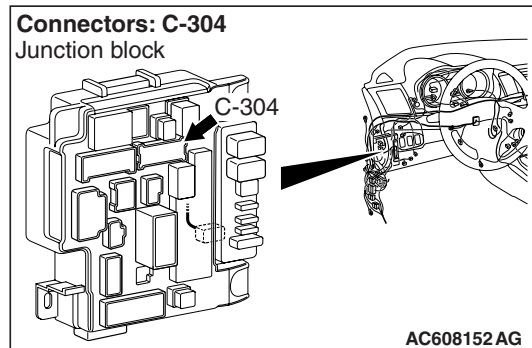
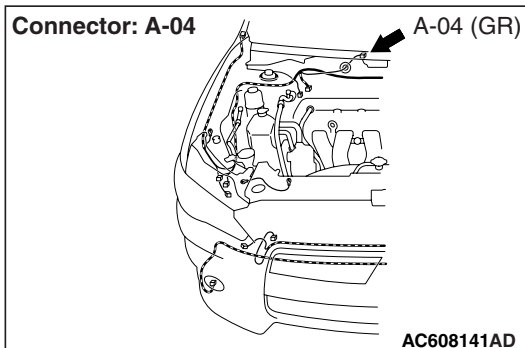
NO : Replace the ETACS-ECU.

INSPECTION PROCEDURE 4: Windshield Wipers do not work normally.

Windshield Wiper Motor Drive Circuit



AC609164 AB



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 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

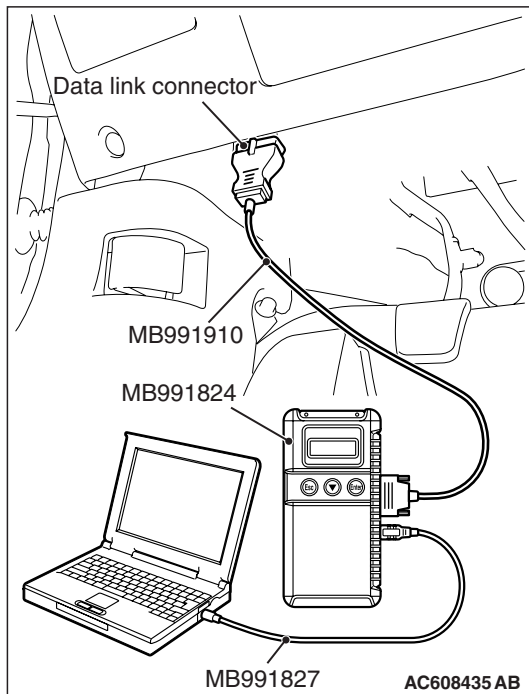
STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

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-482](#)."

NO : Go to Step 2.



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

- Ignition switch: ACC

Item No.	Item name	Normal condition
Item 235	Front wiper ACT	ON
Item 236	Front wiper Lo/Hi	ON

OK: Normal condition is displayed.

Q: Is the check result normal?

NO : Go to Step 3.

YES : Refer to GROUP 54A –ETACS, Input signal chart
[P.54A-528.](#)

STEP 3. Check windshield wiper motor connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**Q: Is windshield wiper motor connector A-04 in good condition?**

YES : Go to Step 4.

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

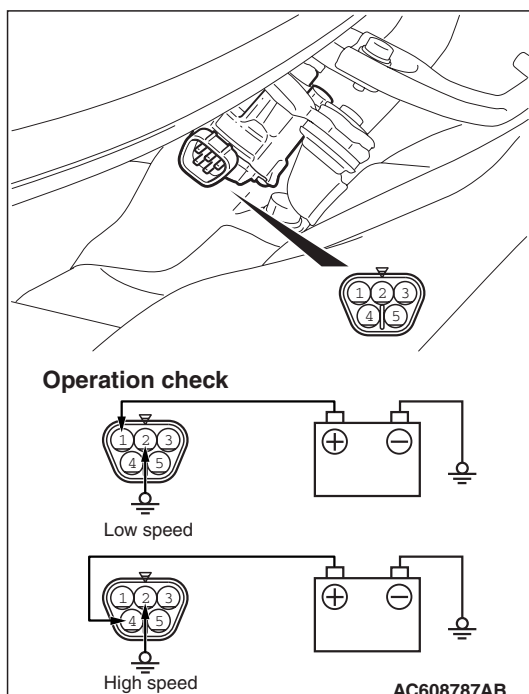
STEP 4. Check the windshield wiper motor.

- (1) Disconnect windshield wiper motor connector A-04.
- (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 5.

NO : Replace the windshield wiper motor. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.



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

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

YES : Go to Step 6.

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

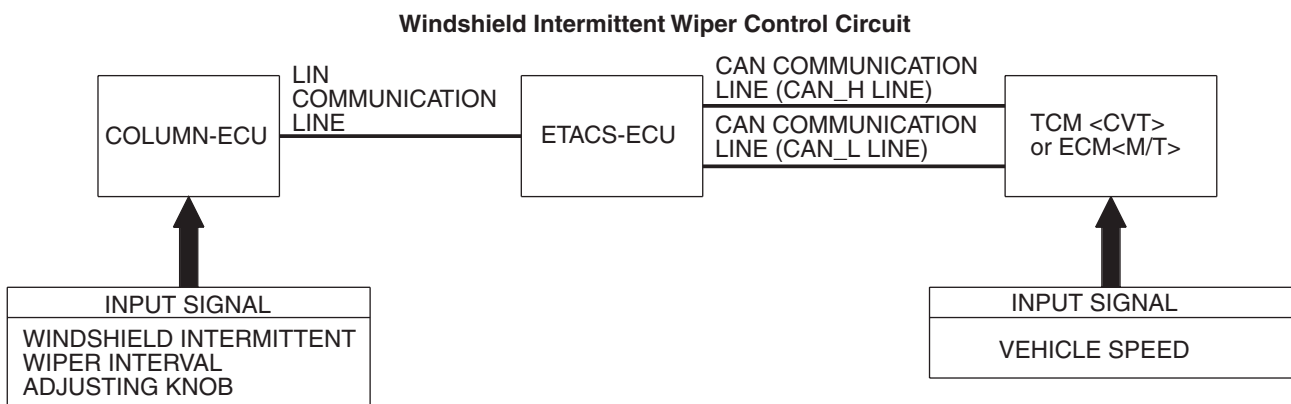
STEP 6. Check the wiring harness between windshield wiper motor connector A-04 (terminals 4 and 1) and ETACS-ECU connector C-304 (terminals 5 and 6).

Q: Is the wiring harness between windshield wiper motor connector A-04 (terminals 4 and 1) and ETACS-ECU connector C-304 (terminals 5 and 6) in good condition?

YES : No action is necessary and testing is complete.

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

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



AC609166AC

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

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

DIAGNOSIS**Required Special Tools:**

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

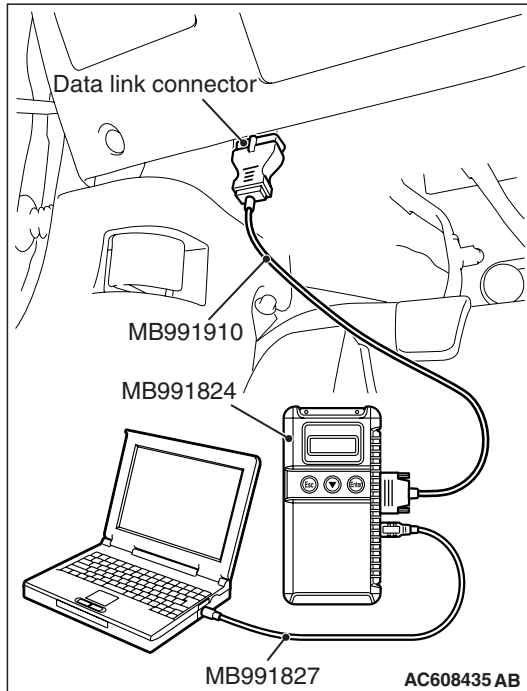
STEP 1. Use the scan tool MB991958 to check if an ETACS-related diagnostic trouble code is set.

Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-479.](#)"

Q: Is the diagnostic trouble code set?

YES : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-482.](#)"

NO : Go to Step 2.

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

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

Q: Is the check result normal?

YES : Go to Step 3.

NO : Use the ETACS configuration function to set "Front wiper operation" to "variable INT" or "Speed sensitive". (Refer to [P.51-46.](#))

STEP 3. Retest the system.

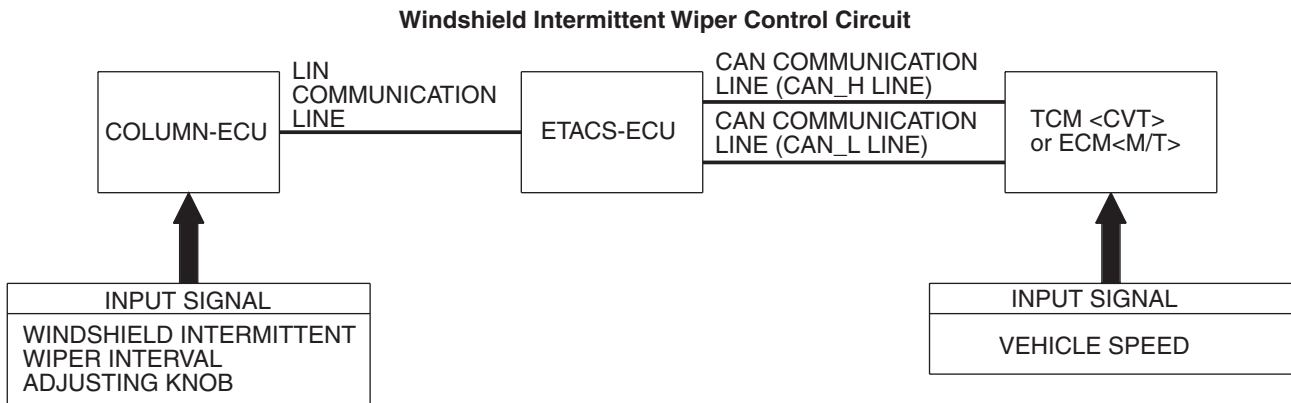
Check that the windshield wiper interval changes when the windshield wiper interval control is rotated.

Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-13.](#)

NO : Replace the ETACS-ECU.

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



AC609166AC

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The CAN bus line 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.51-37](#).

STEP 2. Check the ETACS configuration function.

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

Q: Is the check result normal?

YES : Go to Step 3.

NO : Use the ETACS configuration function to set "Front wiper operation" to "variable INT" or "Speed sensitive". (Refer to [P.51-46.](#))

STEP 3. Use the scan tool MB991958 to diagnose the CAN bus lines.

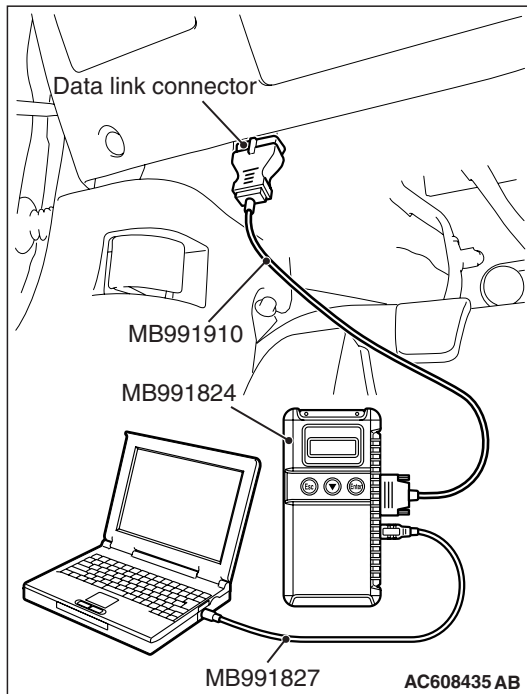
Connect the scan tool. Refer to GROUP 54A ETACS, "How to connect the scan tool (M.U.T.-III) [P.54A-479.](#)"

Q: Is the check result normal?

YES <CVT> : Go to Step 4.

YES <M/T> : Go to Step 5.

NO : Repair the CAN bus line (Refer to GROUP 54C –CAN bus diagnosis chart [P.54C-16.](#))

**STEP 4. Use the scan tool MB991958 to diagnose other system diagnostic trouble code**

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function [P.54A-479.](#)"

Check that the TCM sets a diagnostic trouble code.

Q: Is the diagnostic trouble code set?

YES : Diagnose the TCM (Refer to GROUP 23 –Diagnostic trouble code chart [P.23A-29.](#))

NO : Go to Step 6.

STEP 5. Use the scan tool MB991958 to diagnose other system diagnostic trouble code

Connect the scan tool. Refer to GROUP 54A ETACS, "Diagnostic function [P.54A-479](#)."

Check that the ECM sets a diagnostic trouble code.

Q: Is the diagnostic trouble code set?

YES : Diagnose the ECM (Refer to GROUP 13A – Diagnostic trouble code chart [P.13A-46](#)).

NO : Go to Step 6.

STEP 6. Retest the system.

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

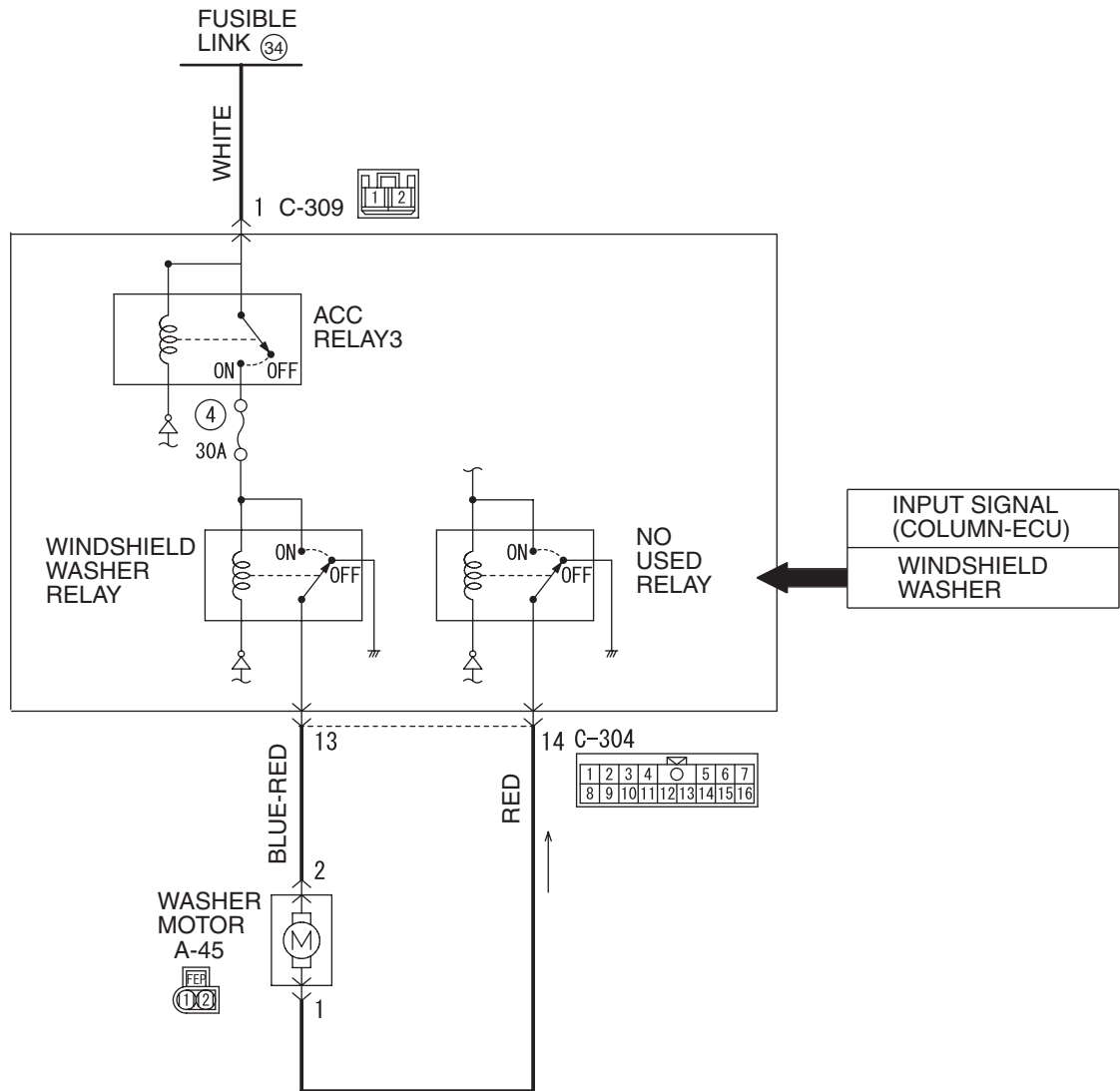
Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00, How to cope with intermittent malfunction [P.00-13](#).

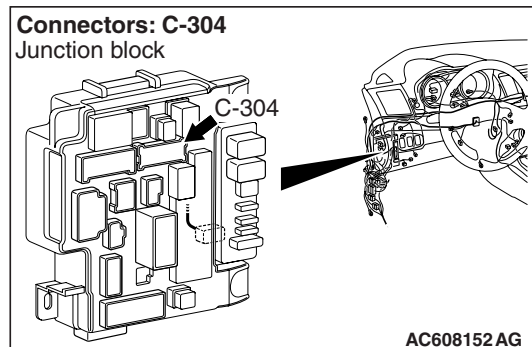
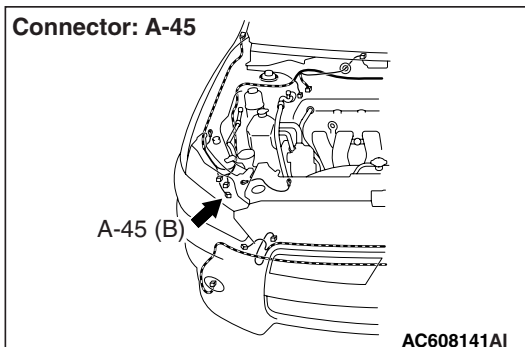
NO : Replace the ETACS-ECU.

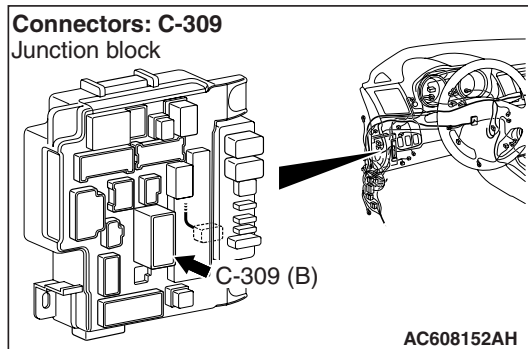
INSPECTION PROCEDURE 7: The windshield washer does not work normally.

Windshield Washer Motor Circuit



AC609470AB





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:

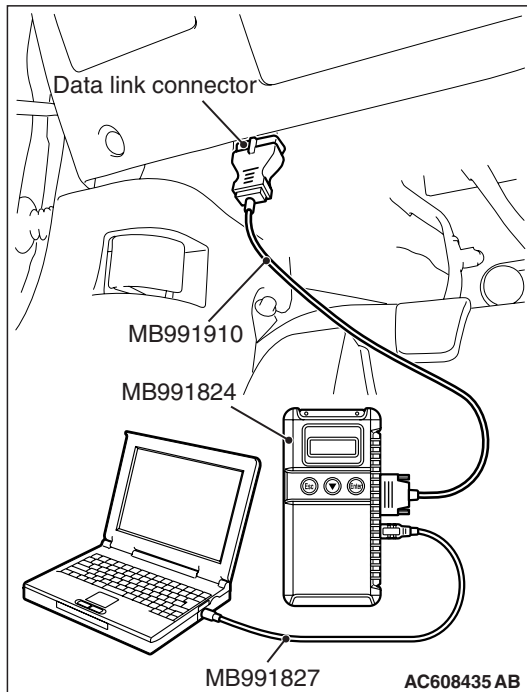
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

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.51-23](#)."



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-479](#)."

Q: Is the diagnostic trouble code set?

- YES** : Diagnose the ETACS-ECU. Refer to GROUP 54A ETACS, "Diagnostic trouble code chart [P.54A-482](#)."
NO : Go to Step 3.

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

- Ignition switch: ACC
- Windshield washer switch: ON

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

OK: Normal condition is displayed.

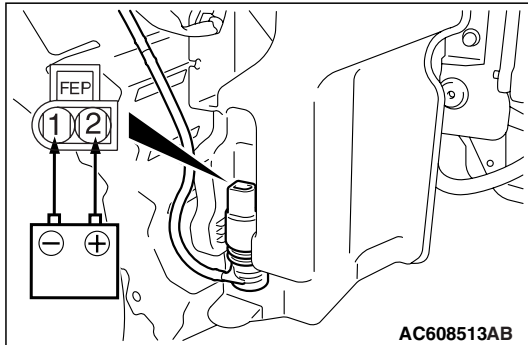
Q: Is the check result normal?

- NO** : Go to Step 4.
YES : Refer to GROUP 54A –ETACS, Input signal chart [P.54A-528](#).

STEP 4. Check windshield washer motor connector A-45 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is windshield washer motor connector A-45 in good condition?

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



STEP 5. Check the operation of windshield washer motor.

- (1) Disconnect windshield washer motor connector A-45 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. Check the wiring harness between windshield washer motor connector A-45 (terminal 2) and ETACS-ECU connector C-304 (terminal 13).

- Check the input lines for open or short circuit.

Q: Is the wiring harness between windshield washer motor connector A-45 (terminal 2) and ETACS-ECU connector C-304 (terminal 13) in good condition?

YES : Go to Step 8.

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

STEP 8. Check the wiring harness between windshield washer motor connector A-45 (terminal 1) and ETACS-ECU connector C-304 (terminal 14).

- Check the input lines for open or short circuit.

Q: Is the wiring harness between windshield washer motor connector A-45 (terminal 1) and ETACS-ECU connector C-304 (terminal 14) 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. 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.00-13](#).

NO : Replace the ETACS-ECU.

ON-VEHICLE SERVICE**WINDSHIELD INTERMITTENT WIPER INTERVAL CHECK**

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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 the M.U.T.-III 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.51-37](#))

CONFIGURATION FUNCTION

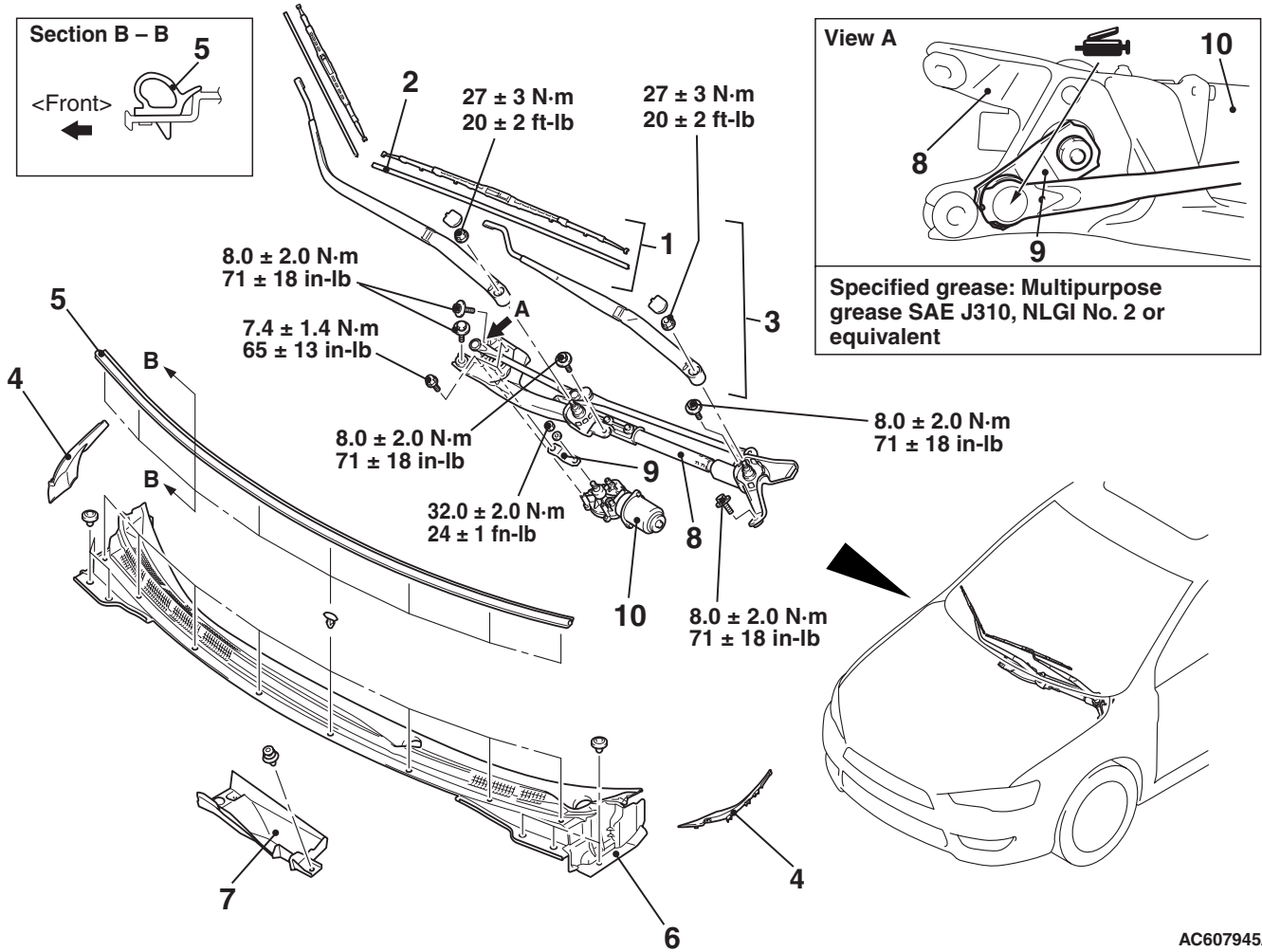
M1511027400217

Using the M.U.T.-III, the following functions can be programmed. The programmed information is held even when the battery is disconnected.

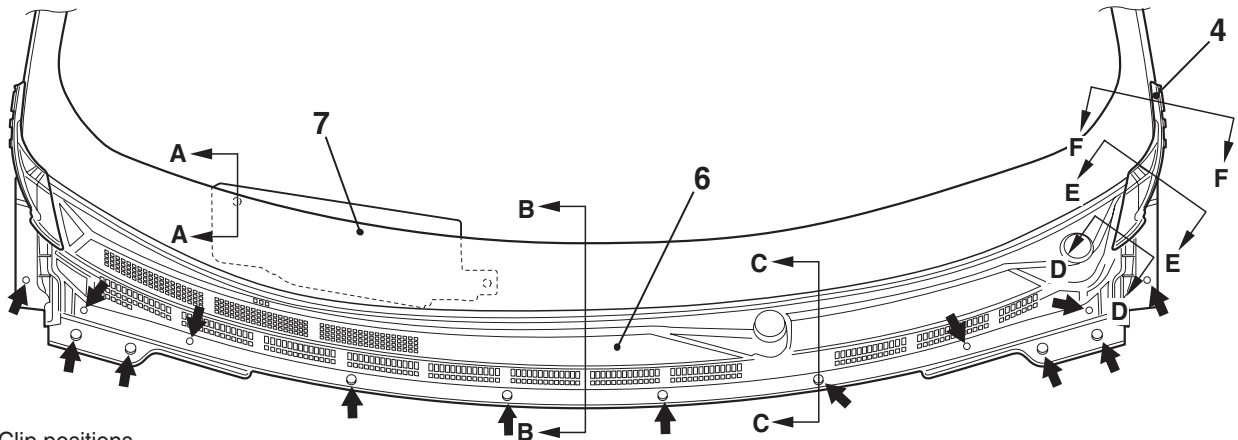
Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting contents (M.U.T.-III display)	Adjusting contents
Front wiper operation	Adjustment of the intermittent windshield wiper operation	Normal INT	Intermittent wiper interval is fixed to 4 seconds.
		Variable INT	Intermittent wiper interval is calculated only by the wiper interval control.
		Speed sensitive	Intermittent wiper interval is calculated according to the intermittent wiper interval control and vehicle speed (default).
Front wiper washer	Disabling or enabling washer-linked wiper function	Only washer	No function
		Washer and wiper	With function (default)

WINDSHIELD WIPER
REMOVAL AND INSTALLATION

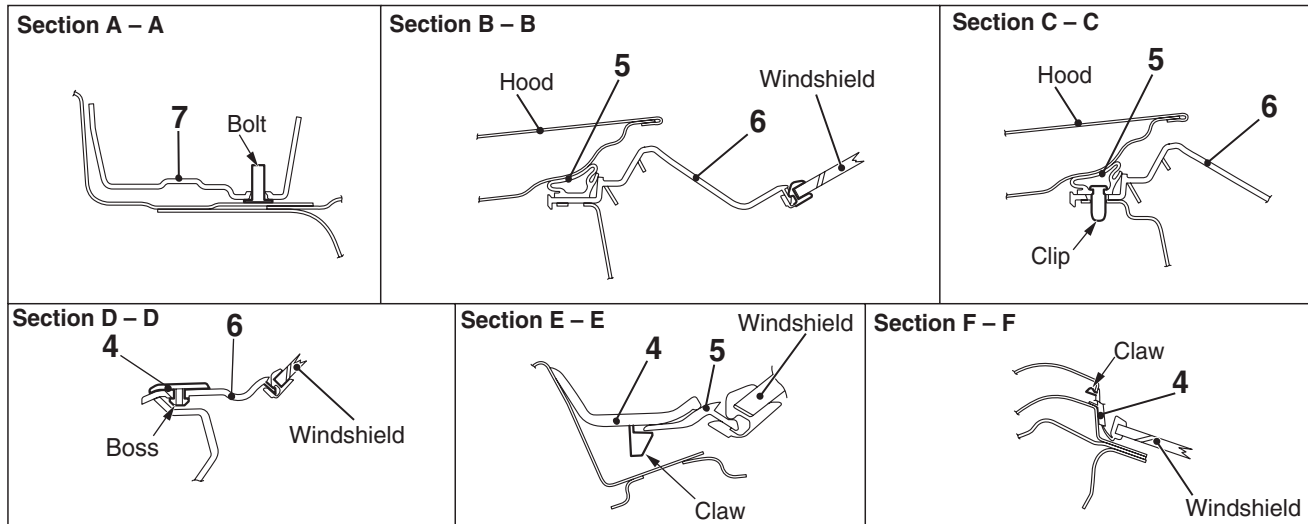
M1511007900663



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NOTE
← : Clip positions



AC607946AB

Wiper blade removal steps

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

Windshield wiper motor and wiper link assembly removal steps

- >>C<<
3. Wiper arm and blade assembly
 4. Front deck garnish cover
 5. Hood weatherstrip
 6. Front deck garnish

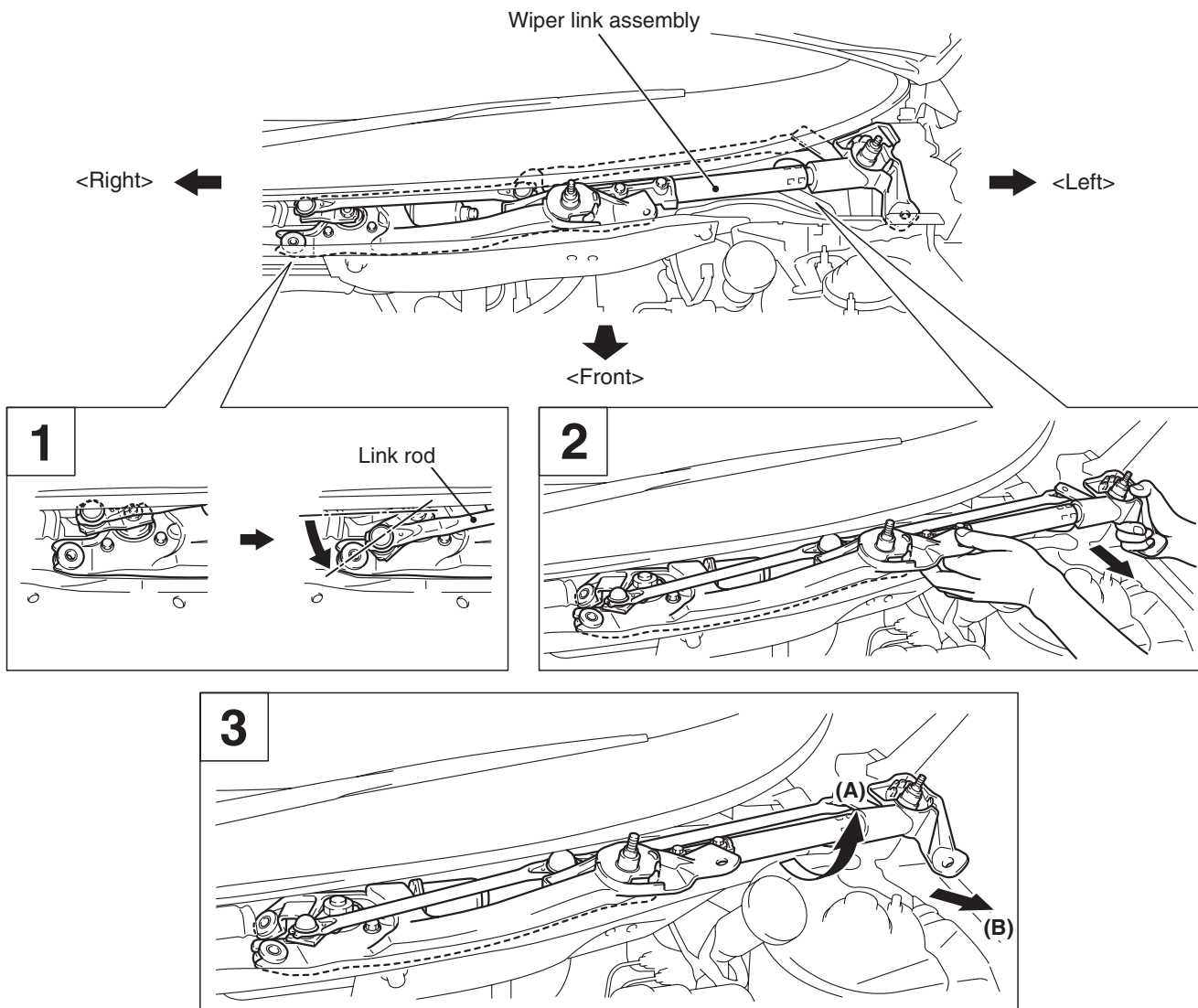
Windshield wiper motor and wiper link assembly removal steps (Continued)

- <<A>> >>B<<
7. Front deck cover
 8. Wiper link assembly
 9. Wiper motor link plate
 10. Windshield wiper motor

NOTE: For removal and installation of the wiper and washer switch, refer to GROUP 54A, Column switch P.54A-230.

REMOVAL SERVICE POINTS

<<A>> WIPER LINK ASSEMBLY REMOVAL



AC609130AB

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

⚠ CAUTION

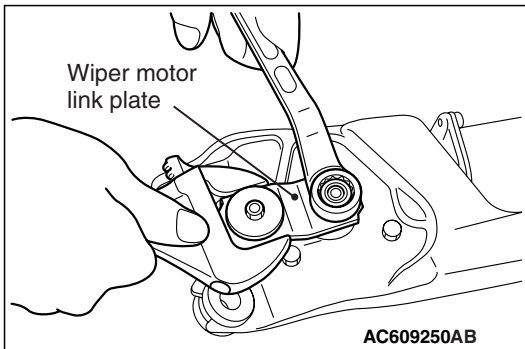
Another mechanic fully pushes up the hood so that the left side of link assembly is pulled out easily.

2. Pull out the attachment section of the left side of link assembly forward.

⚠ CAUTION

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

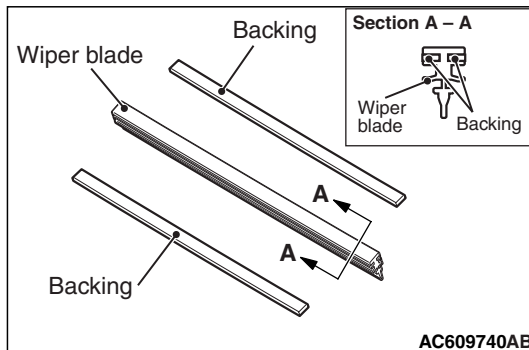
3. While turning the link assembly upward (A), pull out the entire link assembly diagonally forward left (B).

<> 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**

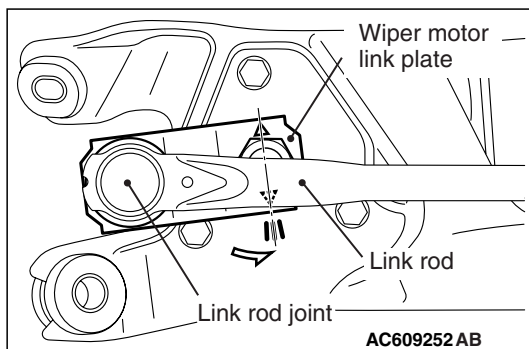
1. Confirm that the wiper motor has set to automatic stop position (Refer to [P.51-51](#)).

⚠ CAUTION

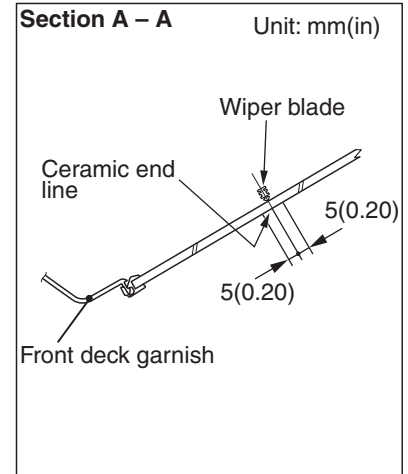
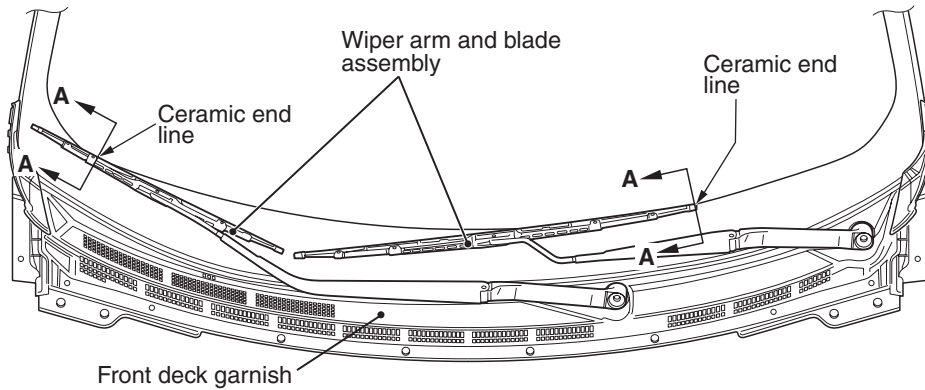
Always replace the wiper motor link plate with new one.

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



AC607947AB

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

(A): Ceramic end line ± 5.0 mm(0.20 in)

INSPECTION

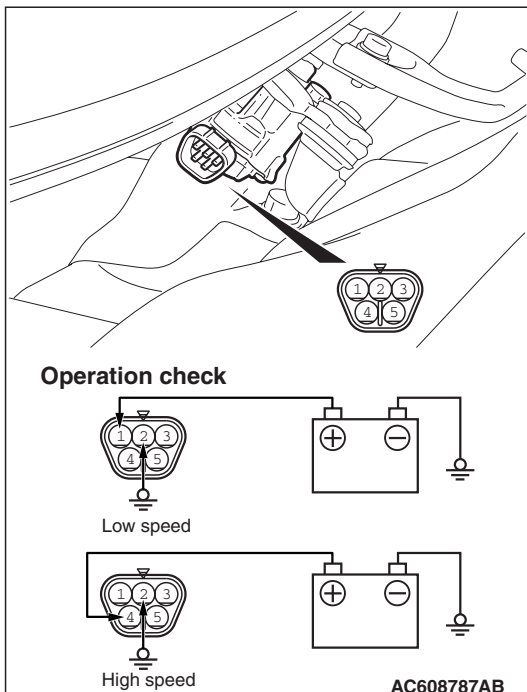
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WINDSHIELD WIPER MOTOR CHECK

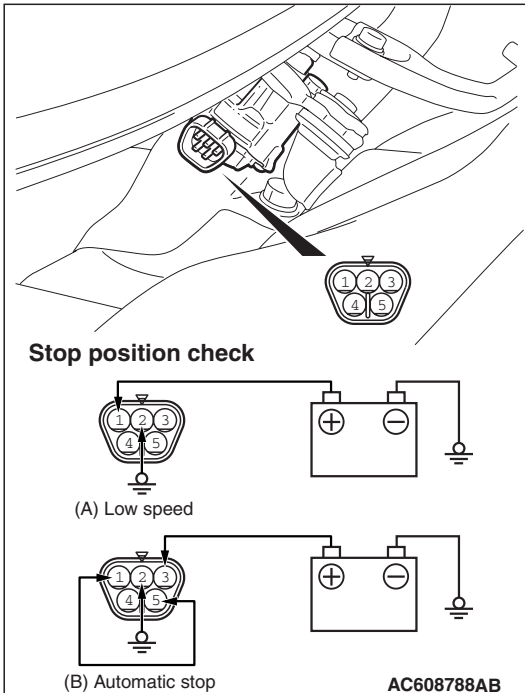
The windshield wiper motor assembly should be installed to the vehicle body and the harness connector should be disconnected when checking the wiper motor.

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.



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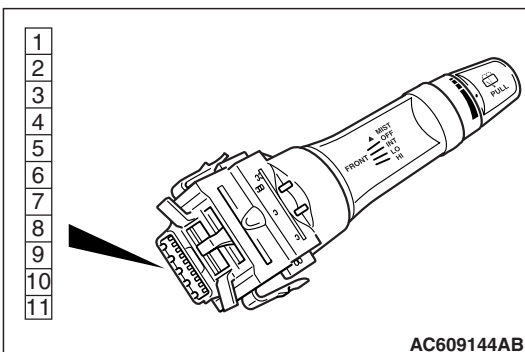


WINDSHIELD WIPER MOTOR AT STOP POSITION OPERATION

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

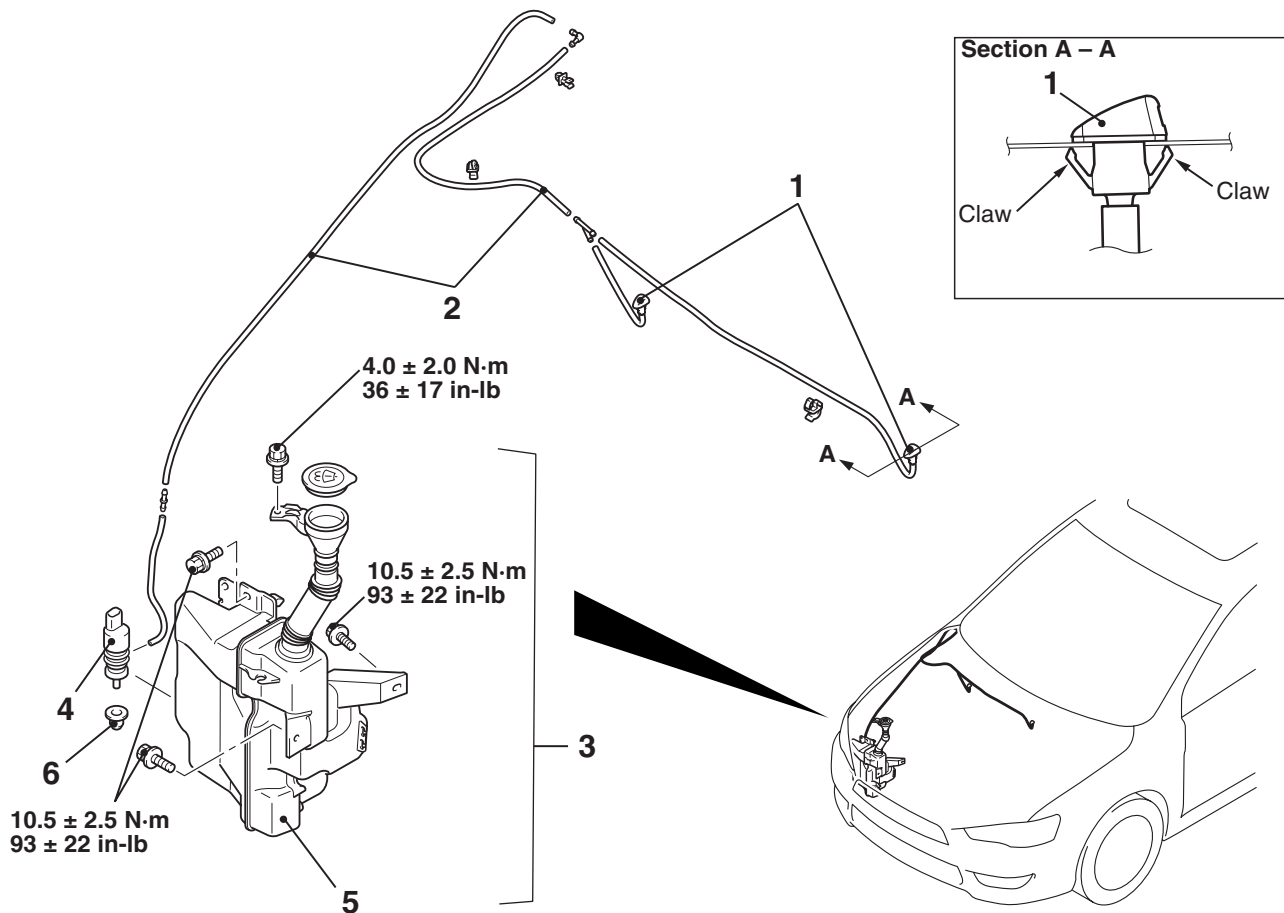
Check continuity between the switch terminals.



Switch position	Tester connection	Specified condition
OFF	6 – 11, 6 – 10, 6 – 9, 6 – 8	Open circuit
Windshield mist wiper switch	6 – 11	Continuity (Less than 2 ohms)
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**

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AC607948 AB

- Front bumper and radiator grille assembly (Refer to [P.51-3](#))

Windshield washer nozzle removal steps

- Connection of windshield washer hose

1. Windshield washer nozzle

Washer hose removal steps

- Front bumper and radiator grille assembly (Refer to [P.51-3](#))
- Connection of washer nozzle/washer motor

2. Windshield washer hose

Washer tank removal steps

- Front bumper and radiator grille assembly (Refer to [P.51-3](#))
- Connection of windshield washer hose

Washer tank removal steps

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

Washer motor removal steps

- Front bumper and radiator grille assembly (Refer to [P.51-3](#))
 - Connection of windshield washer hose
4. Windshield washer motor
 6. Grommet

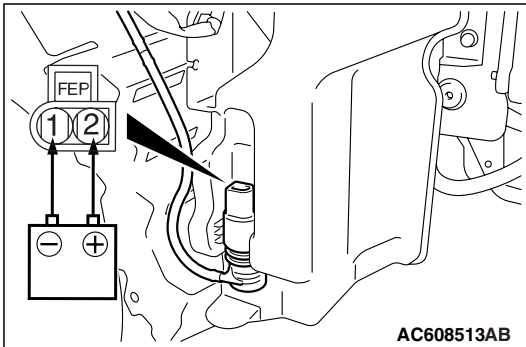
NOTE: For removal and installation of the wiper and washer switch, refer to **GROUP 54A, Column switch P.54A-230**.

INSPECTION

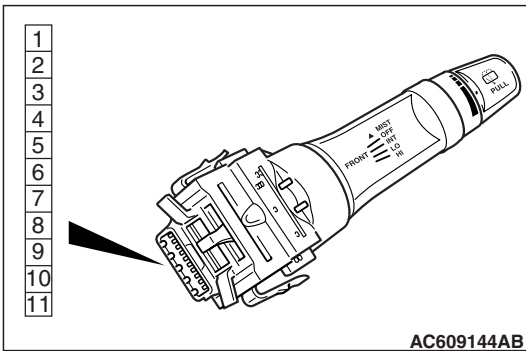
M1511008300363

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

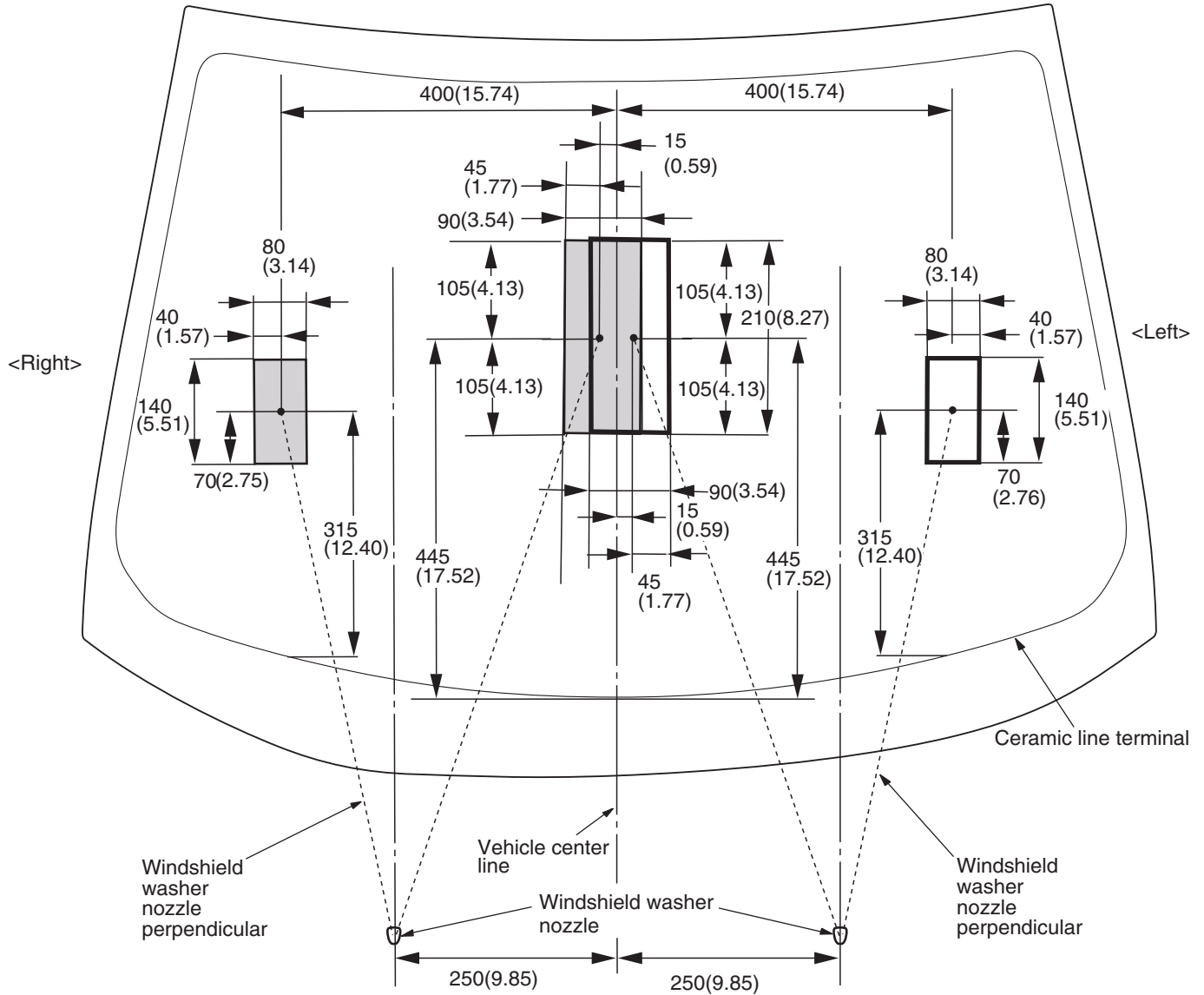


SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
OFF	6 -7	Open circuit
Windshield washer switch ON	6 -7	Continuity (Less than 2 ohms)

WINDSHIELD WASHER FLUID EJECTION CHECK

Move the nozzle to adjust the position so that the spray is in area shown in the area shown in the illustration.

Unit: mm(in)



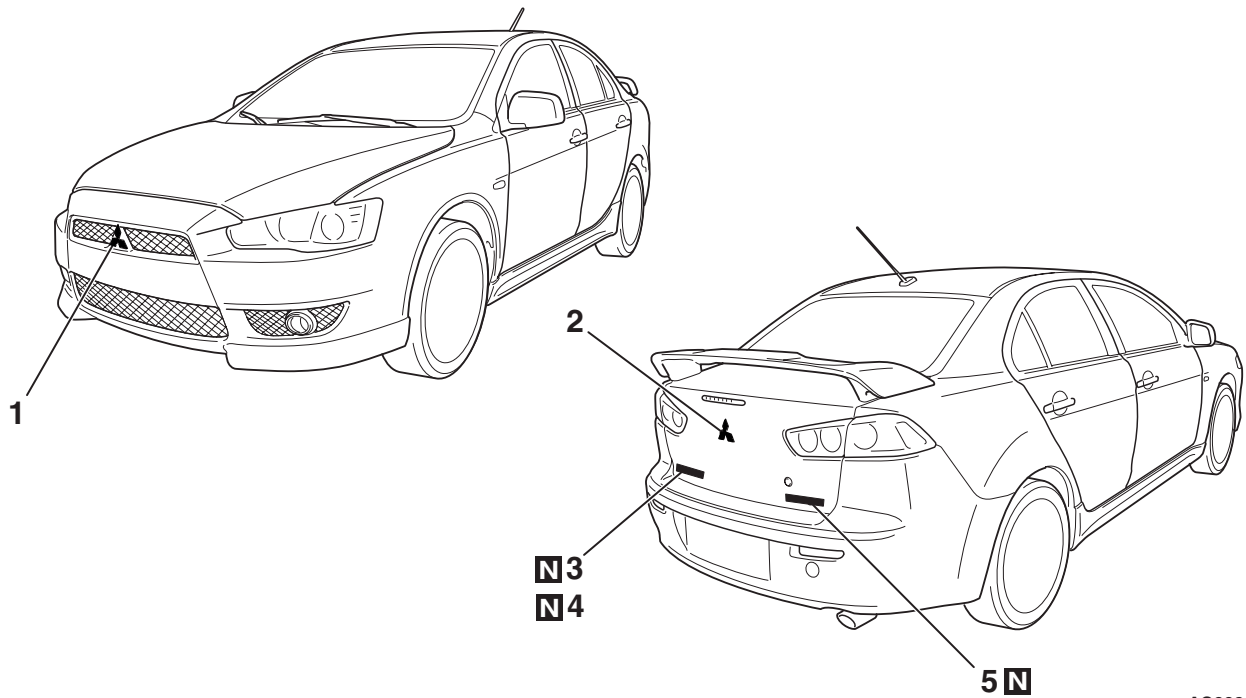
- : Right side washer
- : Left side washer

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MARK

REMOVAL AND INSTALLATION

M1511011801941

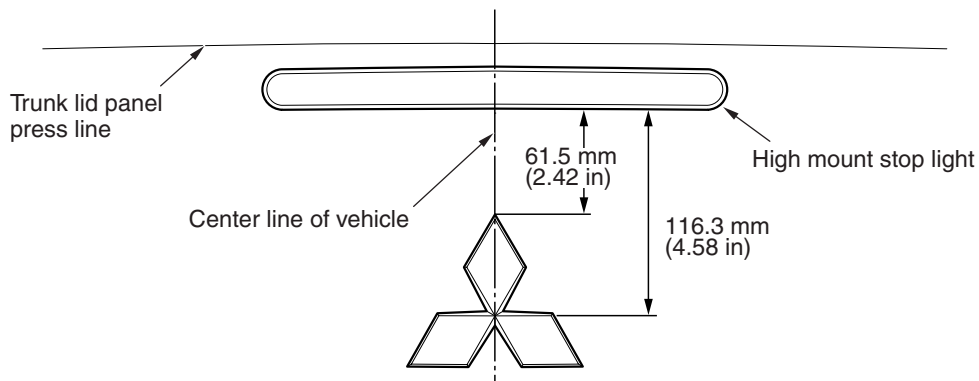


1. Front three-diamond mark (Refer to [P.51-4.](#))
- >>A<< 2. Rear three-diamond mark
- >>A<< 3. MITSUBISHI mark <Vehicles for USA and Canada>
- AC609420AB
- >>A<< 4. LANCER mark <Vehicles for Puerto Rico>
- >>A<< 5. LANCER mark <Vehicles for USA and Canada>

INSTALLATION SERVICE POINT

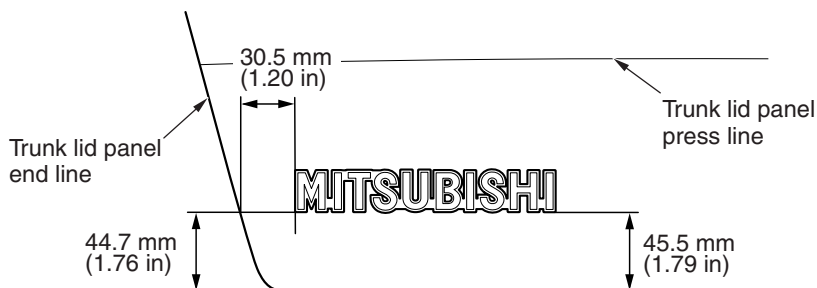
>>A<< MARK INSTALLATION

2. Rear three-diamond mark



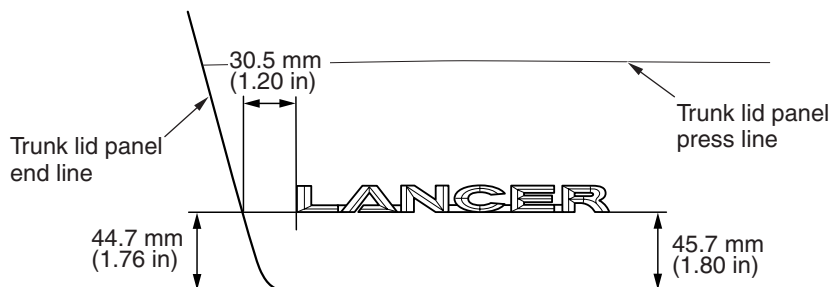
AC609448AB

3. MITSUBISHI mark <Vehicles for USA and Canada>



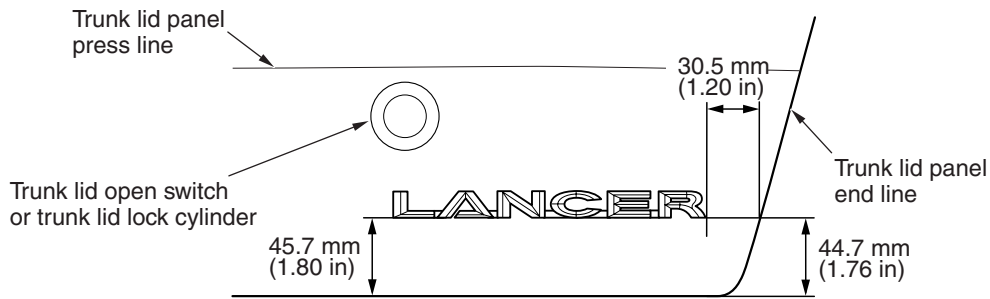
AC609134 AB

4. LANCER mark <Vehicles for Puerto Rico>



AC609254 AB

6. LANCER mark <Vehicles for USA and Canada>



AC609253 AB

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 (60° 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 marks 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.

SYMPTOM CHART

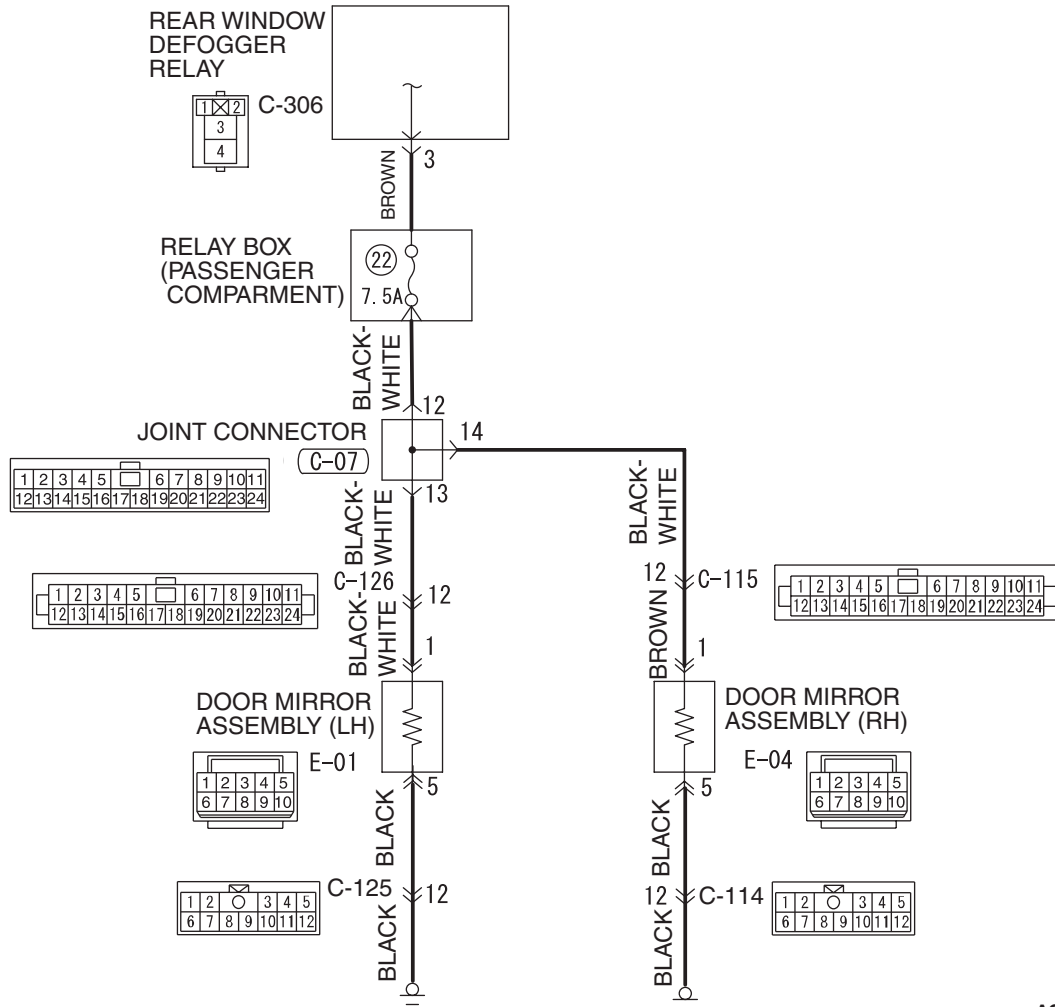
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SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
All heated door mirrors do not operate	1	P.51-60
The right or left heated door mirror does not operate	2	P.51-63

SYMPTOM PROCEDURES

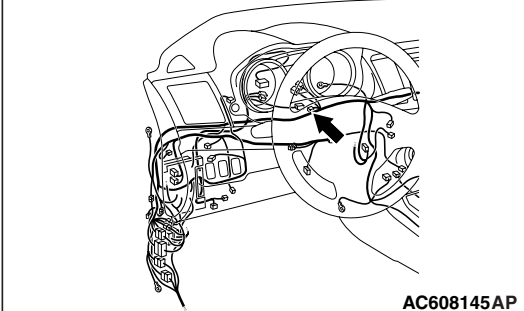
INSPECTION PROCEDURE 1: All Heated Door Mirrors do not Operate

Door Mirror Relay Circuit

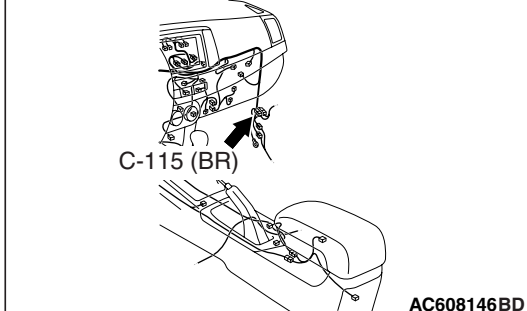


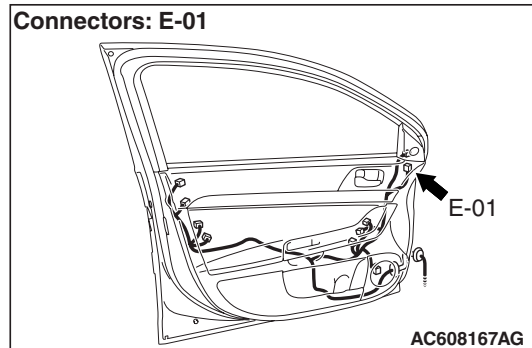
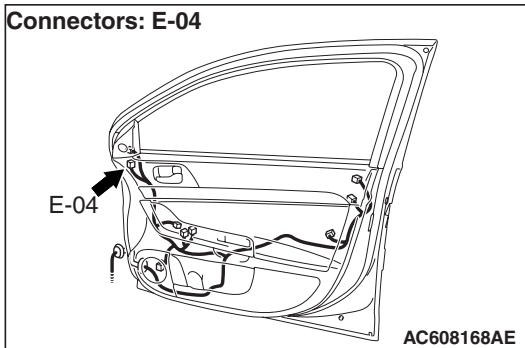
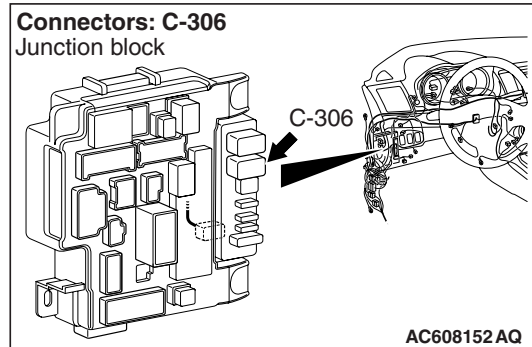
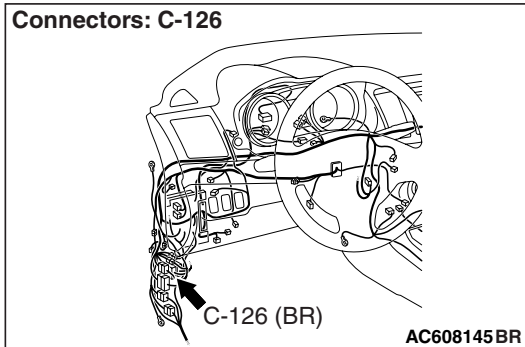
AC609477AB

Connector: C-07



Connector: C-115





CIRCUIT OPERATION

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

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set

STEP 1. Check the rear window defogger.

Check that the rear window defogger works normally as follows.

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

Q: Does the defogger work normally?

YES : Go to Step 2.

NO : Because of malfunction of the rear window defogger, carry out the troubleshooting (Refer to GROUP 55A, Manual A/C Diagnosis P.55A-8).

STEP 2. Check the door mirror (RH) connector E-04 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-04 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-04 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).

NOTE: Also check joint connector C-07 and intermediate connector C-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-115 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-04 (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 joint connector C-07 and intermediate connector C-126 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-126 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

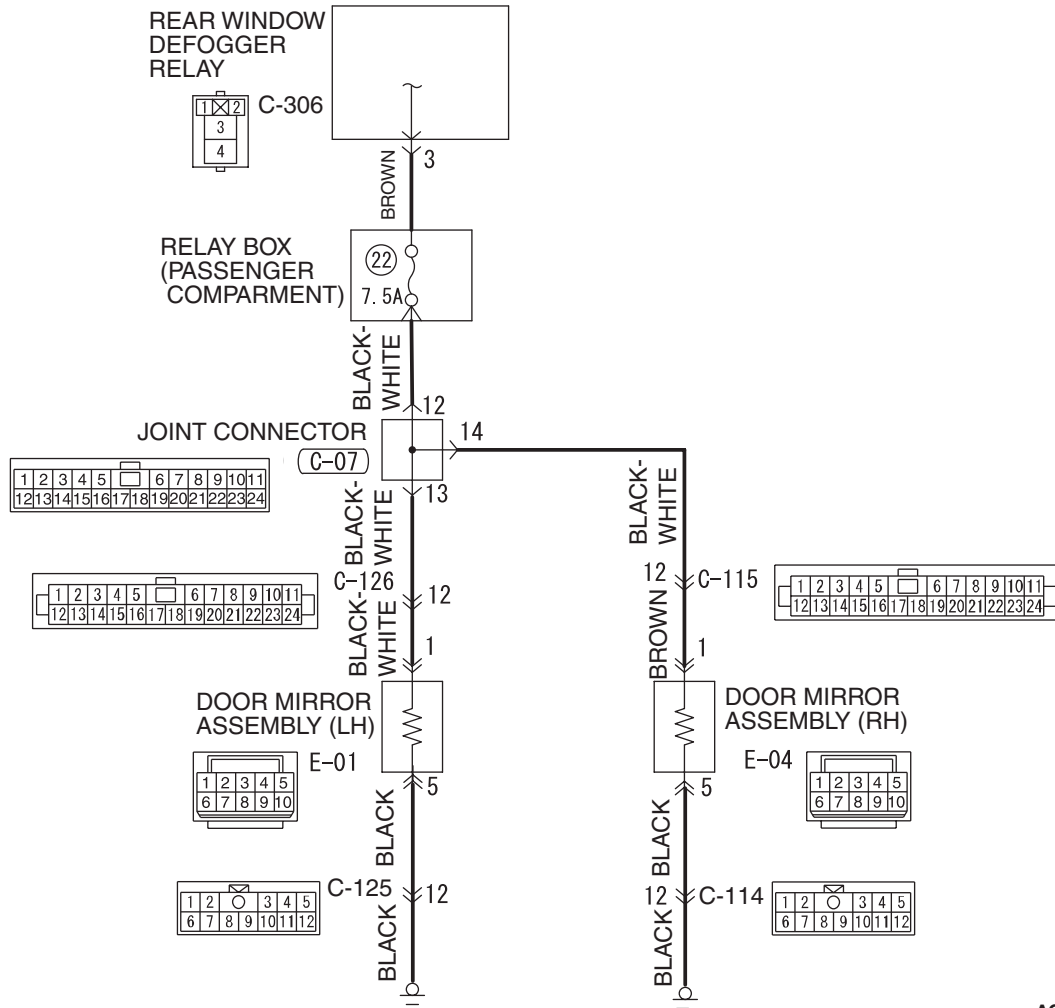
Q: Is the wiring harness between door mirror (LH) connector E-01 (terminal 1) and rear window defogger relay connector C-306 (terminal 3) in good condition?

YES : The procedure is complete.

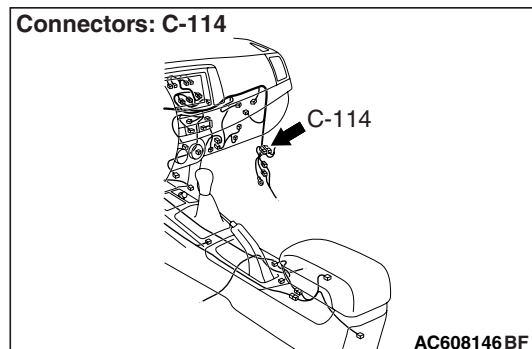
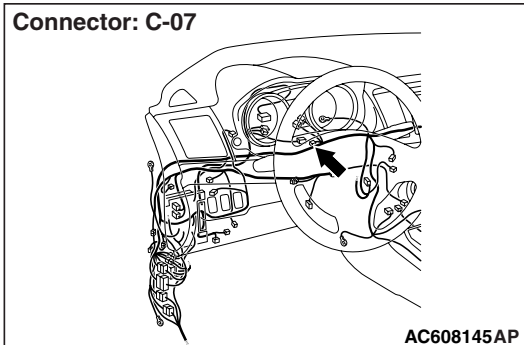
NO : Repair the wiring harness as necessary. Check if the all heated door mirrors work normally.

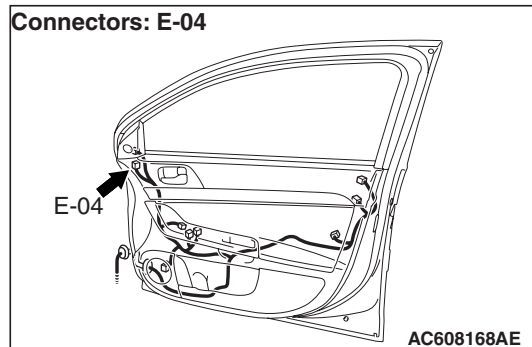
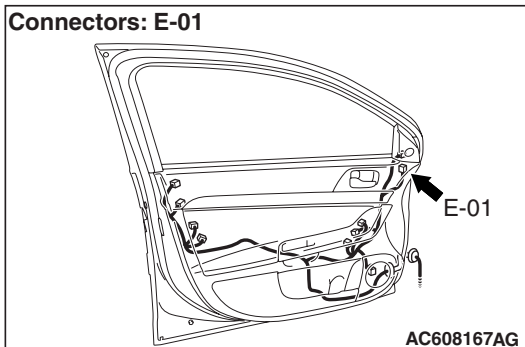
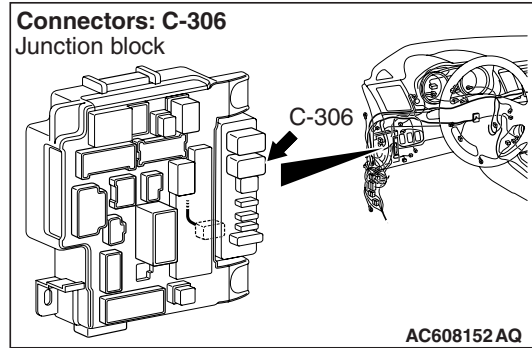
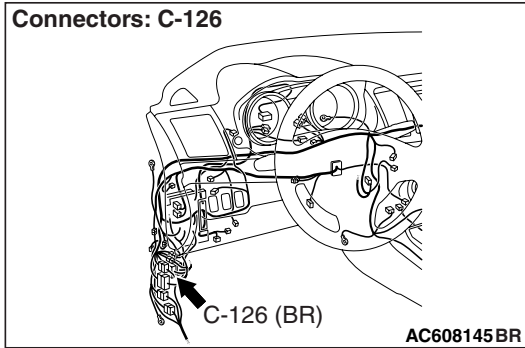
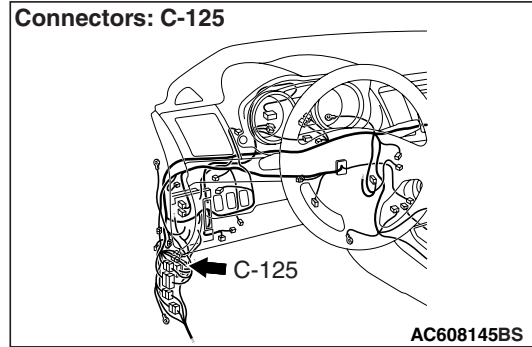
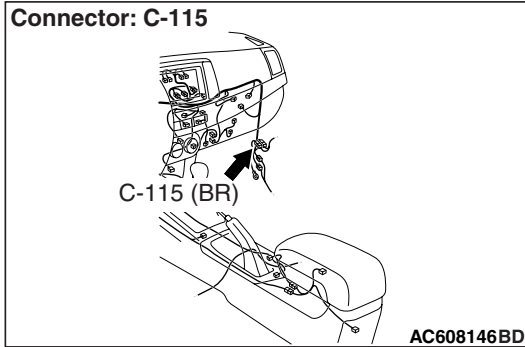
INSPECTION PROCEDURE 2: The Right or Left Heated Door Mirror does not Operate

Door Mirror Relay Circuit



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CIRCUIT OPERATION

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

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set

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

Q: Which door mirror does not heat?

Door mirror (LH) : Go to Step 2.

Door mirror (RH) : Go to Step 8.

STEP 2. Check door mirror (LH) connector E-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.

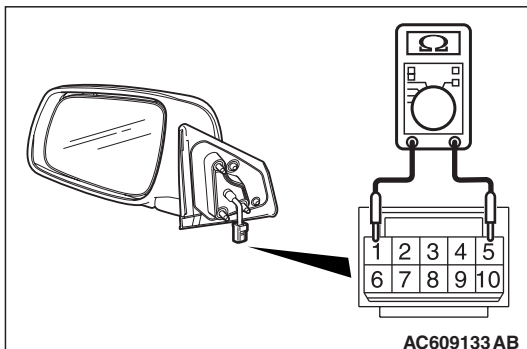
Check to see that the resistance between terminal 1 and 5 of the door mirror (LH) connector E-01.

- The resistance should be $8.4 \pm 1.2 \Omega$ at 25°C (77°F).

Q: Is the resistance normal?

YES : Go to Step 4.

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



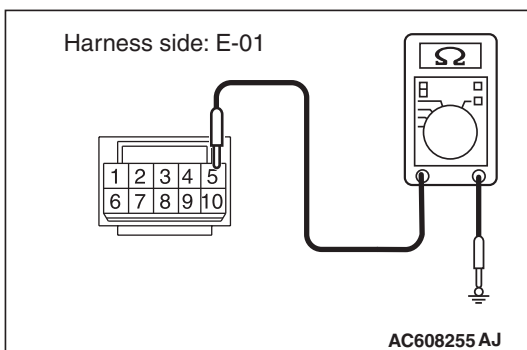
STEP 4. Check the ground circuit between door mirror (LH) connector E-01 and ground for open circuit. Measure the resistance at door mirror (LH) connector E-01.

- (1) Disconnect door mirror (LH) connector E-01 and check at the wiring harness side connector.
- (2) Measure the resistance value between terminal 5 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 joint connector C-07 and intermediate connector C-125 and C-126 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-125 and C-126 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between door mirror (LH) connector E-01 (terminal 5) 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 joint connector C-07 and intermediate connector C-126 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-126 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between door mirror (LH) connector E-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-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the door mirror (RH) connector E-04 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.

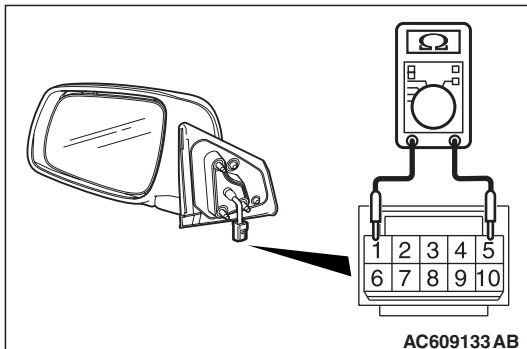
Check to see that the resistance between terminal 1 and 5 of the door mirror (RH) connector E-04.

- The resistance should be $8.4 \pm 1.2 \Omega$ at 25° C (77° F).

Q: Is the resistance normal?

YES : Go to Step 10.

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



STEP 10. Check the ground circuit between door mirror (RH) connector E-04 and ground for open circuit. Measure the resistance at door mirror (RH) connector E-04.

(1) Disconnect door mirror (RH) connector E-04, and check at the wiring harness side connector.

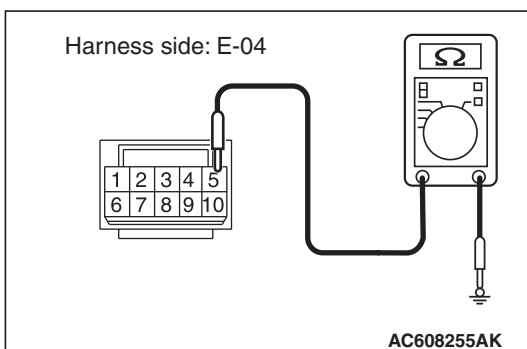
(2) Measure the resistance value between terminal 5 and ground.

- 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-04 (terminal 5) and ground.

NOTE: Also check joint connector C-07 and intermediate connector C-114 and C-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-114 and C-115 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-04 (terminal 5) 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-04 (terminal 1) and rear window defogger relay connector C-306 (terminal 3).

NOTE: Also check joint connector C-07 and intermediate connector C-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector. If joint connector C-07 and intermediate connector C-115 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

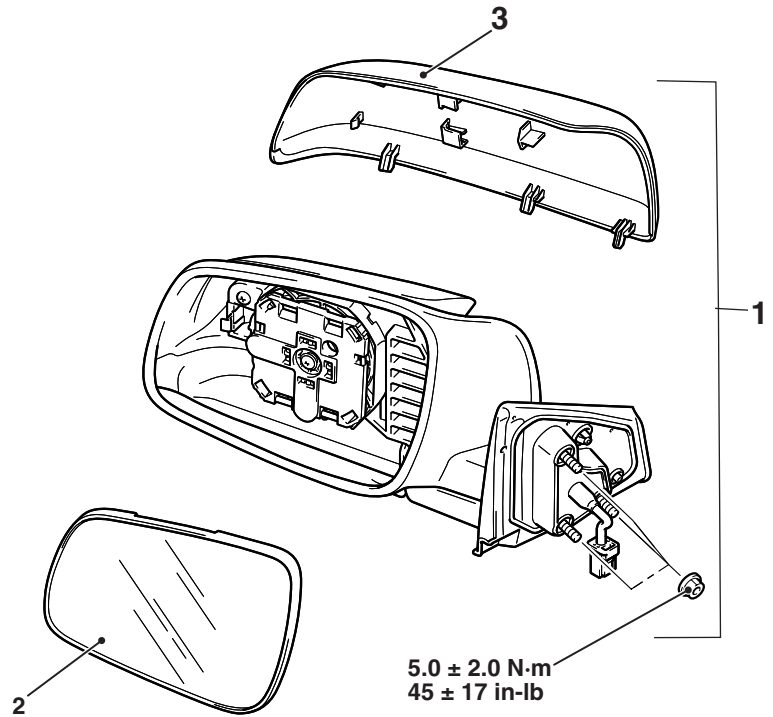
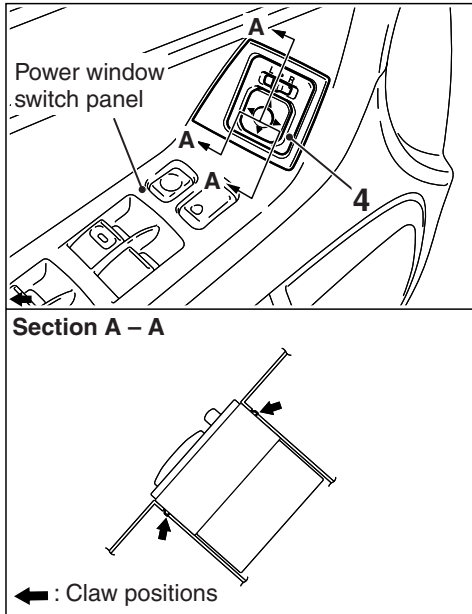
Q: Is the wiring harness between door mirror (RH) connector E-04 (terminal 1) and rear window defogger relay connector C-306 (terminal 3) in good condition?

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.

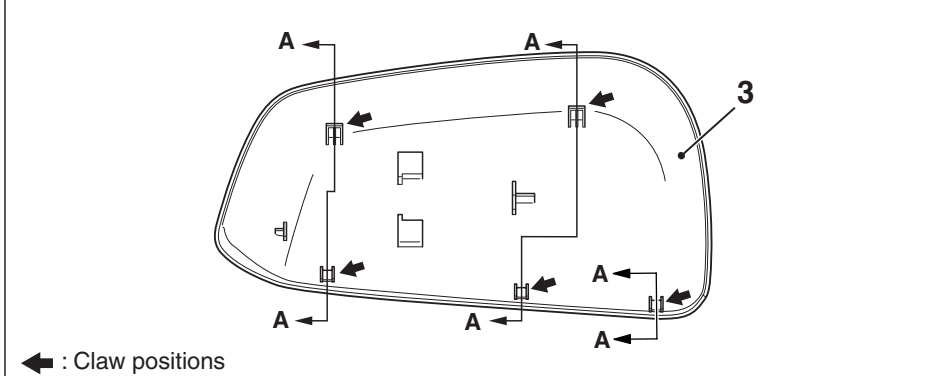
DOOR MIRROR
REMOVAL AND INSTALLATION

M1511006400870

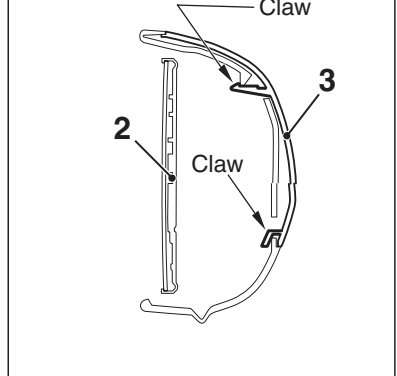


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Door mirror outer cover claw positions



Section A - A



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Door mirror assembly removal steps

- Tweeter (Refer to GROUP 54A, Speaker [P.54A-443](#))
- Door mirror connector connection
- 1. Door mirror assembly

<<A>> >>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-13](#))
 - 4. Remote controlled mirror switch

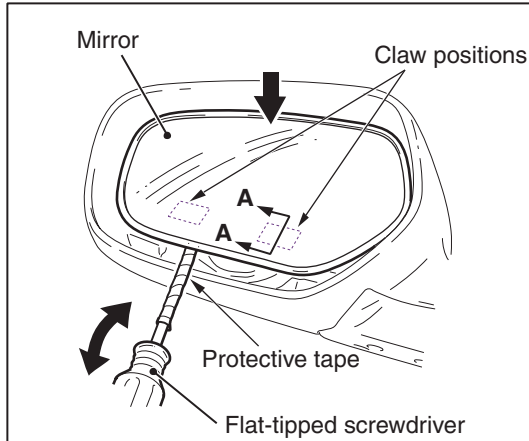
REMOVAL SERVICE POINT

<<A>> DOOR MIRROR OUTER COVER REMOVAL

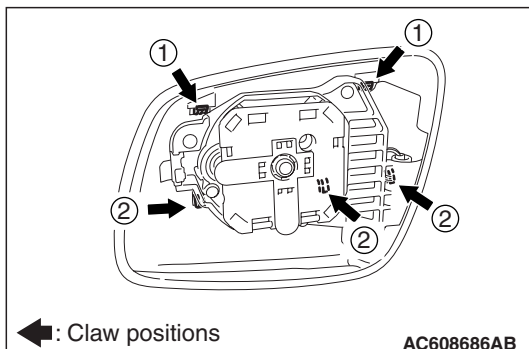
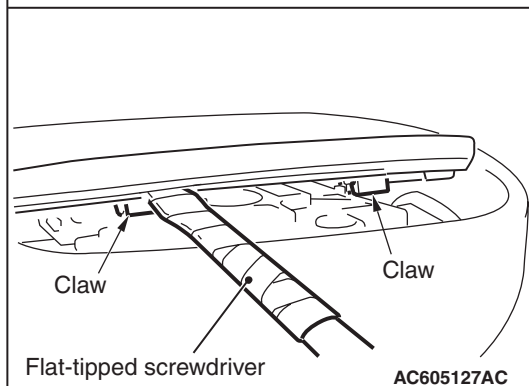
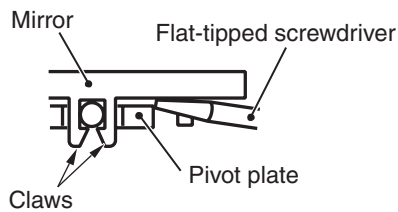
⚠ CAUTION

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 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.



Section A – A



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

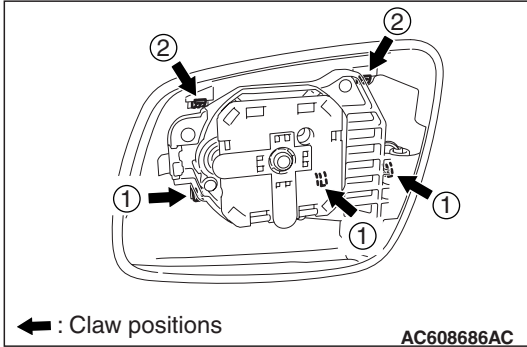
INSTALLATION SERVICE POINT

>>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.

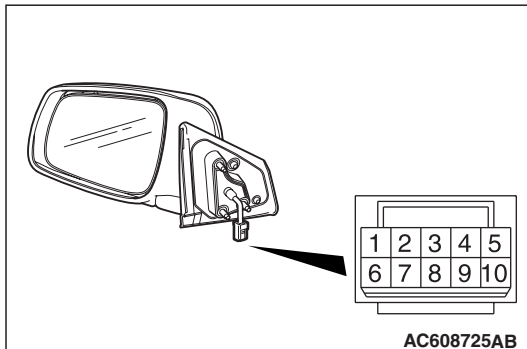


INSPECTION

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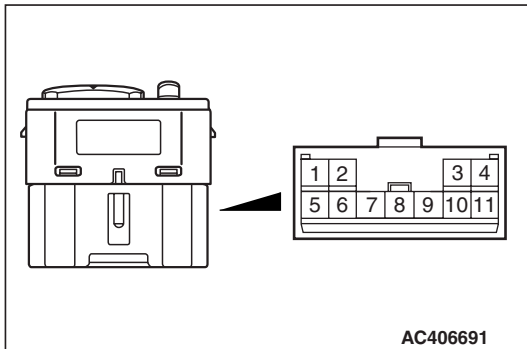
REMOTE CONTROLLED MIRROR OPERATION CHECK

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"> • Connect terminal 8 to the negative battery terminal. • Connect terminal 6 to the positive battery terminal. 	Up
<ul style="list-style-type: none"> • Connect terminal 8 to the positive battery terminal. • Connect terminal 6 to the negative battery terminal. 	Down
<ul style="list-style-type: none"> • Connect terminal 8 to the negative battery terminal. • Connect terminal 7 to the positive battery terminal. 	Right
<ul style="list-style-type: none"> • Connect terminal 8 to the positive battery terminal. • Connect terminal 7 to the negative battery terminal. 	Left

DOOR MIRROR CONTROL SWITCH CONTINUITY CHECK



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 (Less than 2 ohms)
	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 (Less than 2 ohms)
	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° C (77° F)

