GROUP 51

EXTERIOR

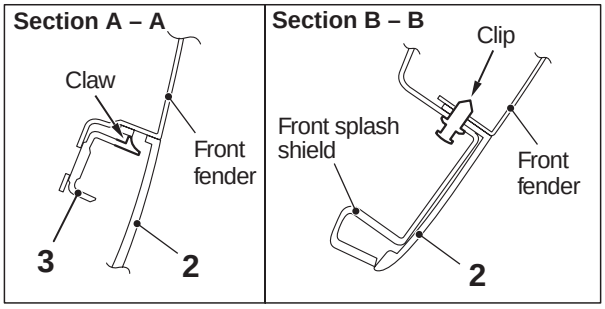
CONTENTS

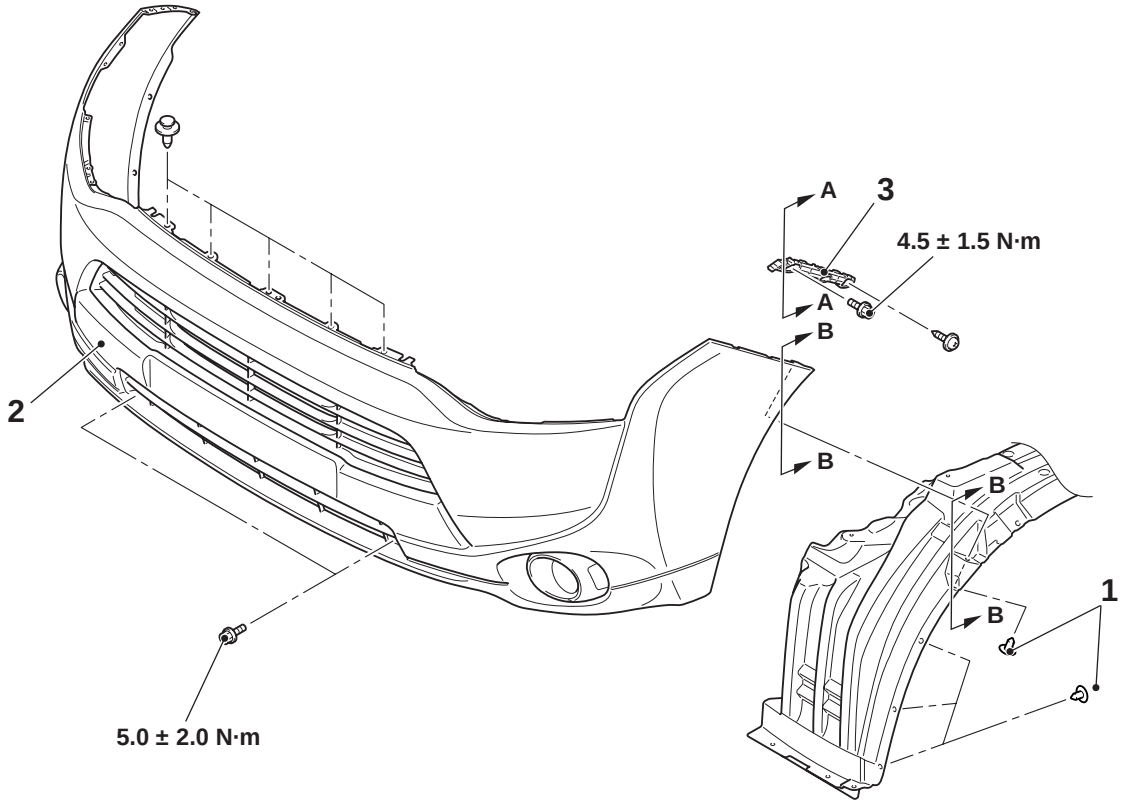
FRONT BUMPER ASSEMBLY

REMOVAL AND INSTALLATION

M1511001402417

Pre-removal and post-installation operation
- Radiator grill removal and installation (Refer to P.51-9.)
- Engine room under cover front removal and installation (Refer to P.51-19.)





ACC00451AB

Removal steps
- Headlamp washer draining <Vehicles with headlamp washer>
- Headlamp washer hose connection <Vehicles with headlamp washer>

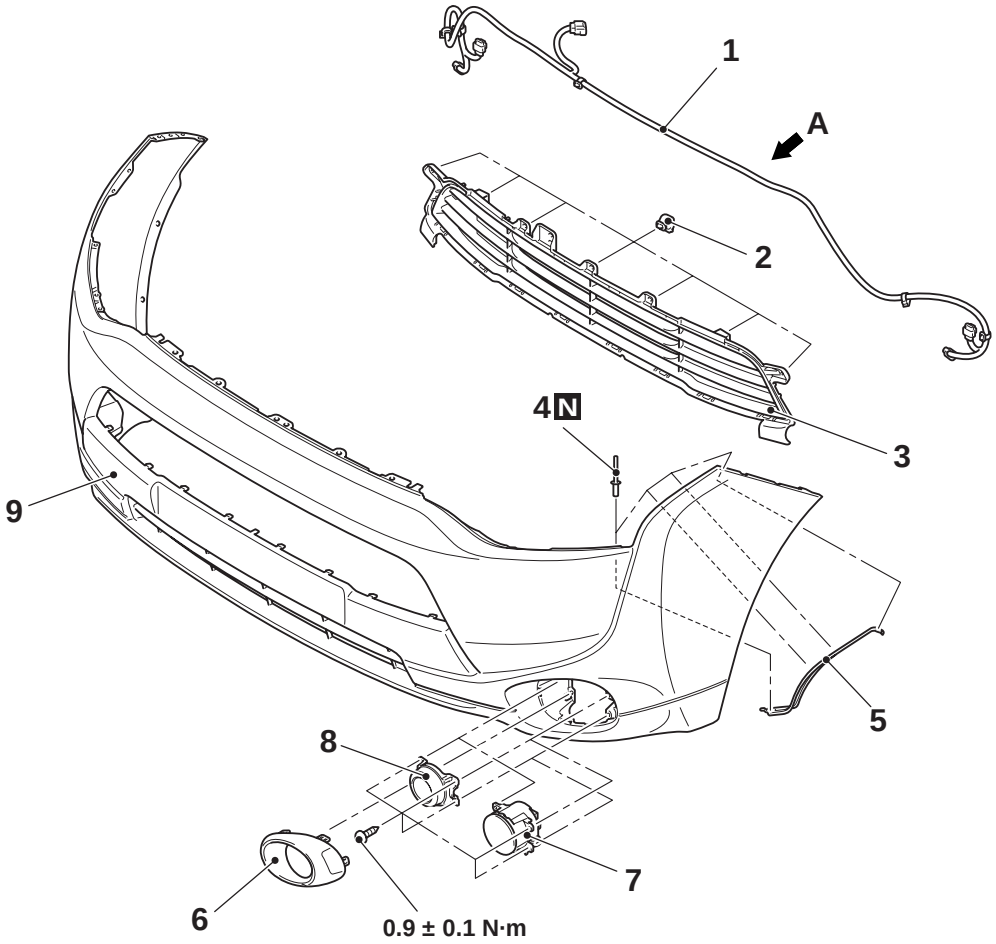
Removal steps (Continued)
- Front wiring harness and fog lamp wiring harness combination <Vehicles with fog lamp>

1. Splash shield mounting clips
2. Front bumper assembly
3. Front bumper side bracket

DISASSEMBLY AND REASSEMBLY

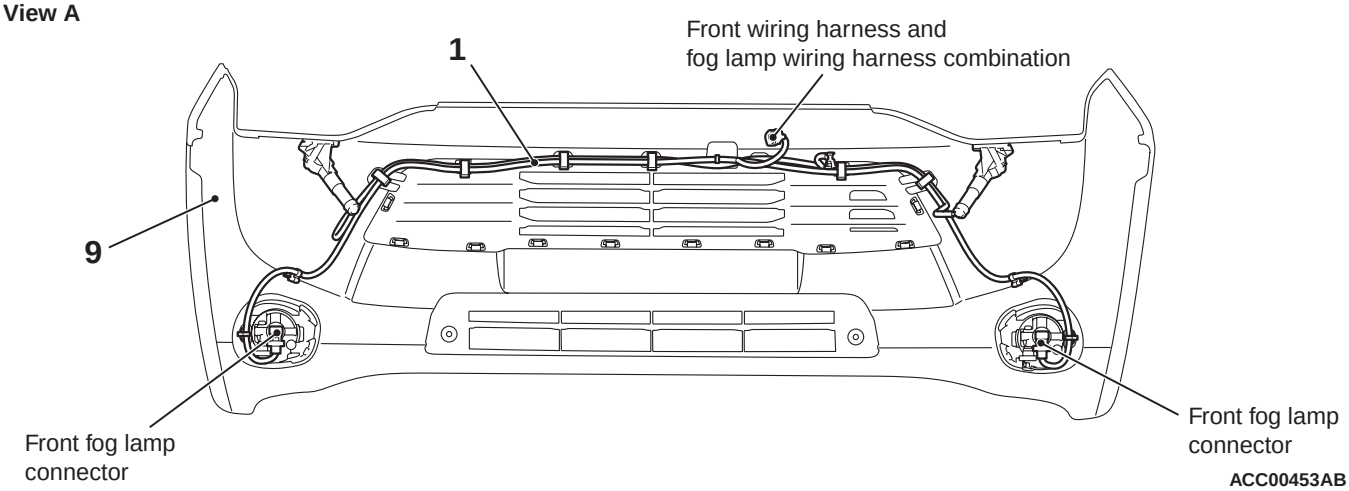
M1511001602637

Pre-removal and post-installation operation
- Headlamp washer removal and installation (Refer to P.51-62.)



ACC00452AB

View A



ACC00453AB

Disassembly steps
1. Front fog lamp wiring harness
2. Harness clamp
3. Radiator grille

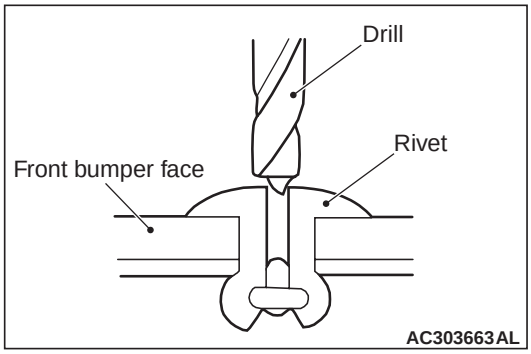
Disassembly steps (Continued)
<<A>> >>A<< 4. Rivet
5. Front bumper reinforcement

Disassembly steps (Continued)

6. Front fog lamp bezel <Vehicles with front fog lamps>
7. Front fog lamp <Vehicles with front fog lamp>
8. Front bumper lamp hole cover <Vehicles without front fog lamp>
9. Front bumper face

DISASSEMBLY SERVICE POINT

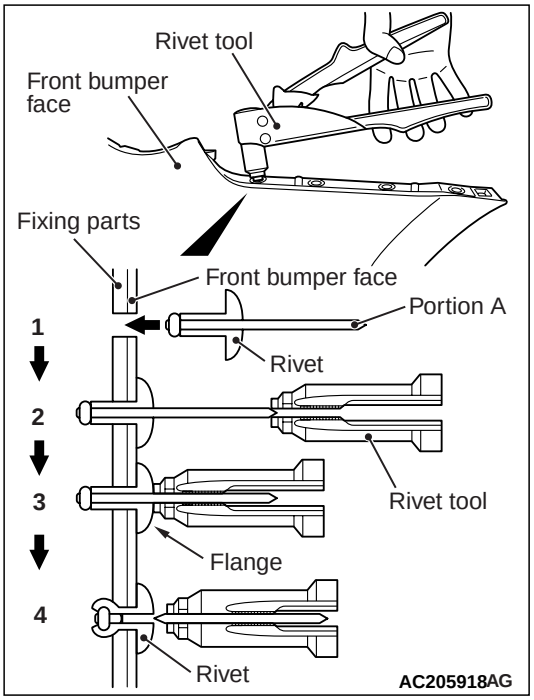
<<A>> RIVETS REMOVAL



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



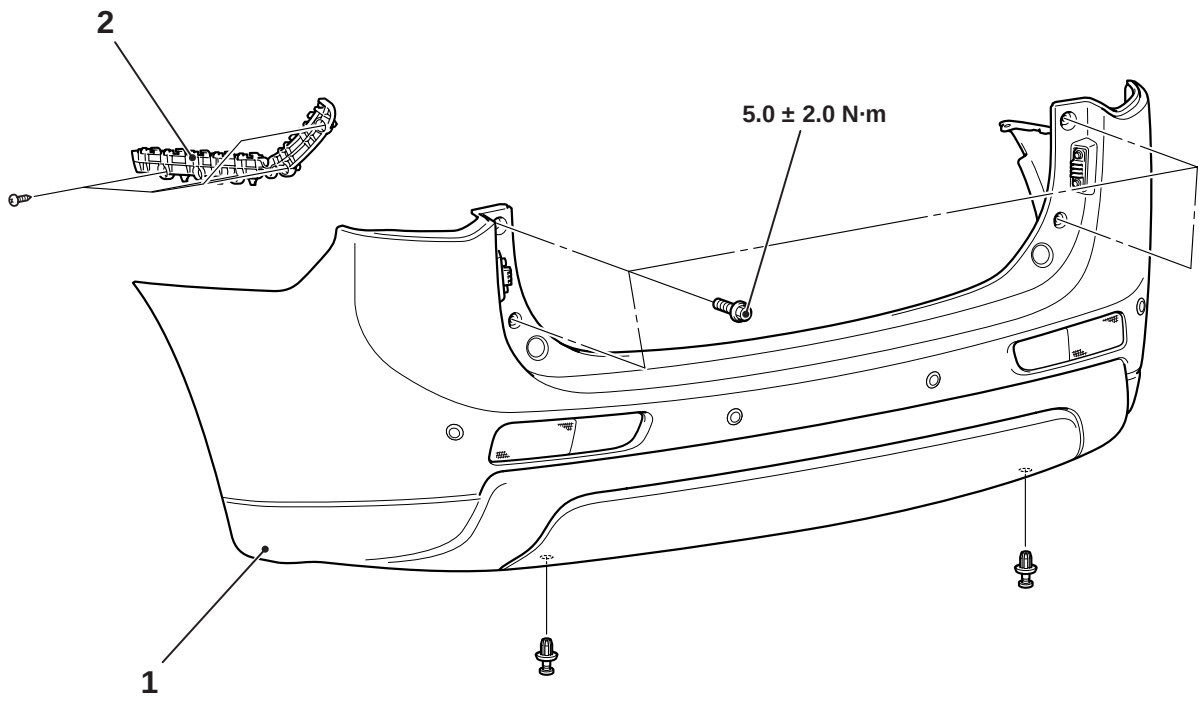
Use a rivet tool shown as in the illustration to connect the parts with rivets by the following procedures:

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

REAR BUMPER ASSEMBLY

REMOVAL AND INSTALLATION

M1511001902757



ACB05413AB

Removal steps

- Rear combination lamp assembly (Refer to GROUP 54A, Rear combination lamp)
- Splash shield rear (rear bumper side) (Refer to GROUP 42A, Splash shield)

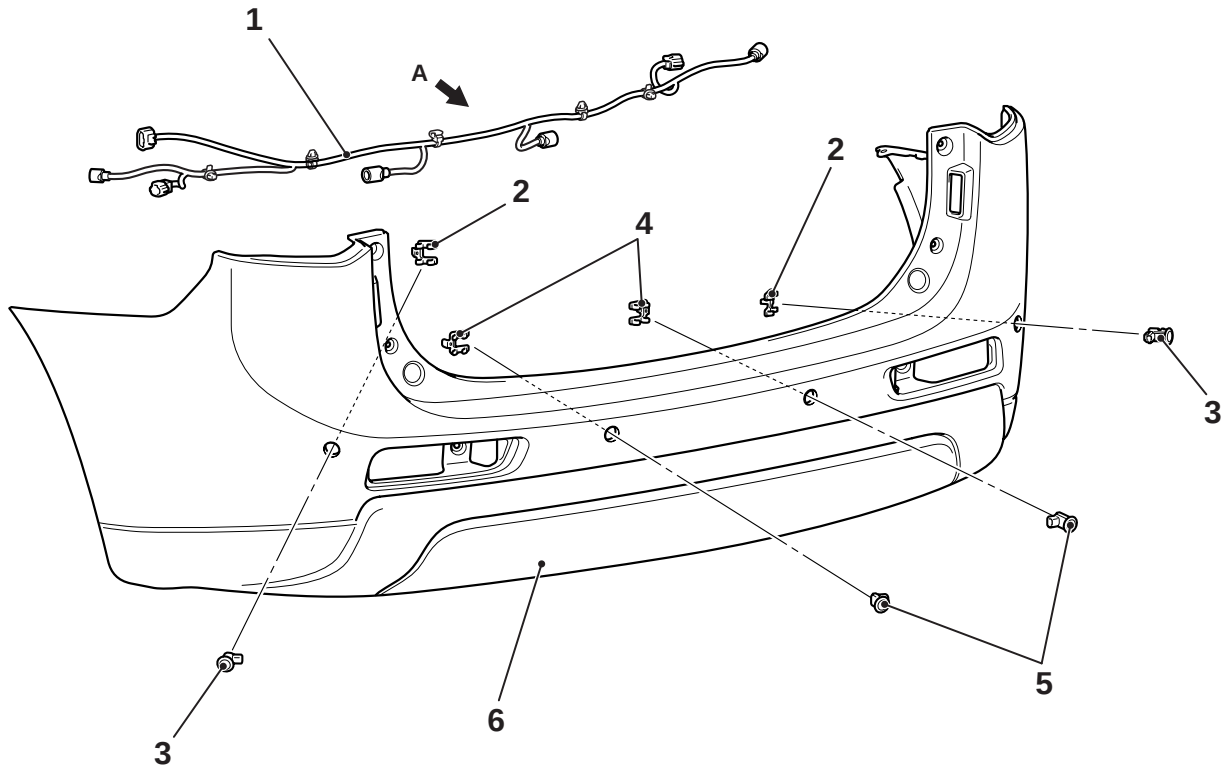
Removal steps (Continued)

- Rear end wiring harness and rear bumper wiring harness combination

1. Rear bumper assembly
2. Rear bumper face support bracket

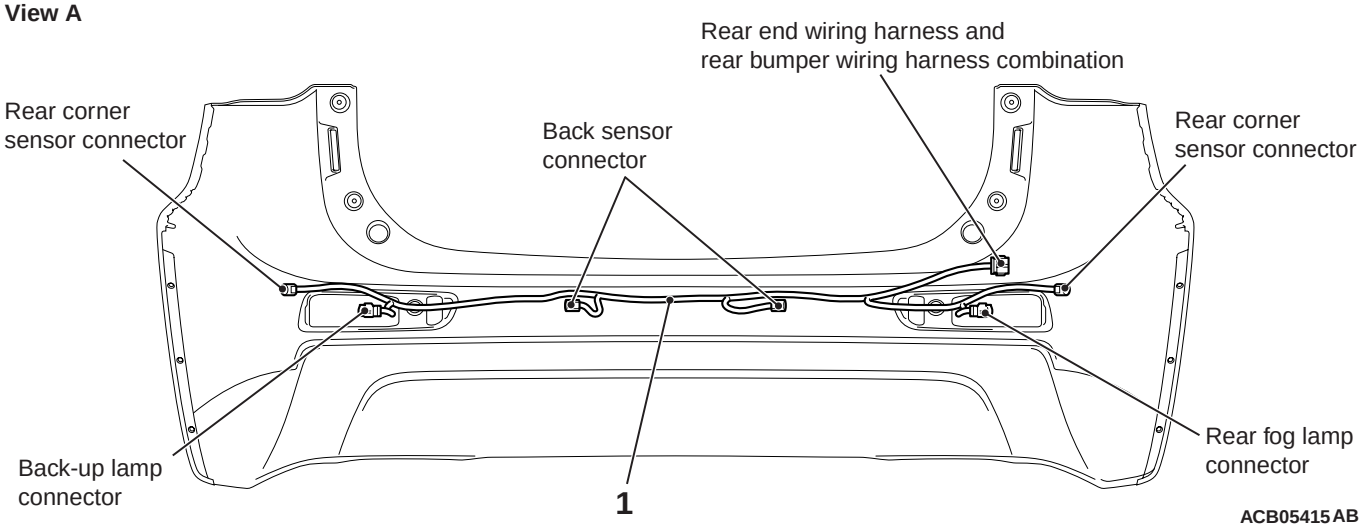
DISASSEMBLY AND REASSEMBLY

M1511002101074



ACB05414AB

View A



ACB05415AB

Removal steps

1. Rear bumper wiring harness
- Damper <Vehicles without electric tailgate> (Refer to GROUP 42A, Tail gate)
- Damper <Vehicles with electric tailgate> (Refer to GROUP 42A, Tail gate)
- Back-up lamp assembly (Refer to GROUP 54A, Back-up lamp)

Removal steps (Continued)

- Rear fog lamp assembly (Refer to GROUP 54A, Rear fog lamp)

2 Clip

3 Rear corner sensor <Vehicles with reversing sensor system>

4 Clip

5 Back sensor <Vehicles with reversing sensor system>

6. Rear bumper face

RADIATOR GRILLE

ADHESIVE

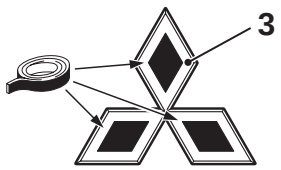
M1511000502808

Application	Specified adhesive
Front three-diamond mark	Double-sided tape: Generic products, 0.8 mm thickness
	Specified primer: 3M K-500

REMOVAL AND INSTALLATION

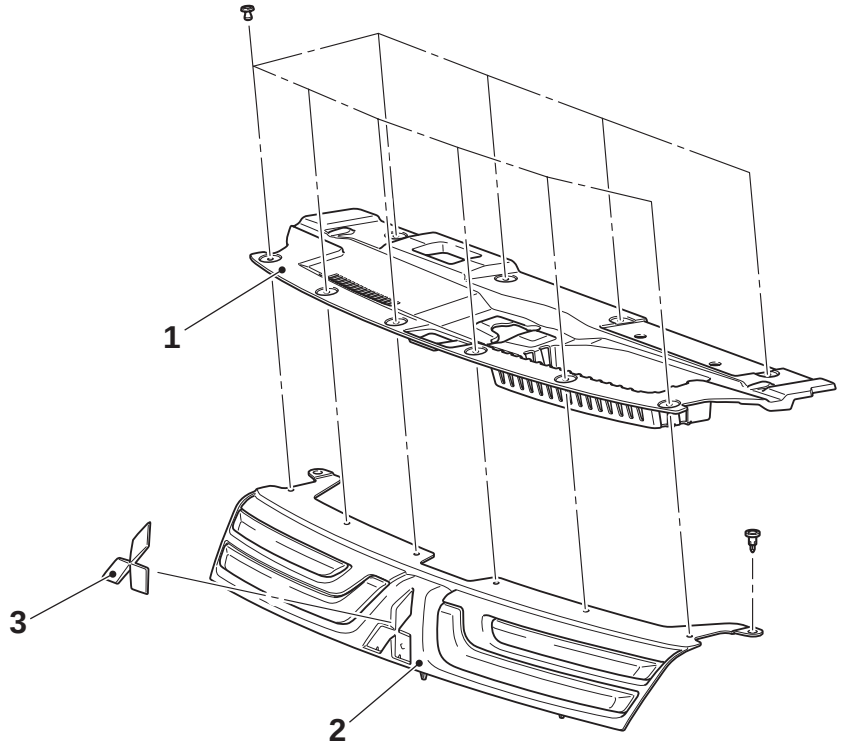
M1511002901382

When reusing "3"



Double-sided tape: Generic products, 0.8 mm thickness

Specified primer: 3M K-500



ACC00082AB

Removal steps

- Air cleaner intake duct (Refer to GROUP 15, Air cleaner)

1. Headlamp support upper panel cover

Removal steps (Continued)

2. Radiator grille
3. Front-three diamond mark

MOULDINGS

ADHESIVE

M1511000502842

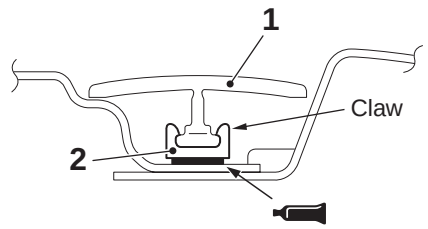
Application	Specified adhesive
Roof drip moulding clip	Specified adhesive: 3M-DP-8010
	Specified primer: 3M K-500

REMOVAL AND INSTALLATION

M1511004701908

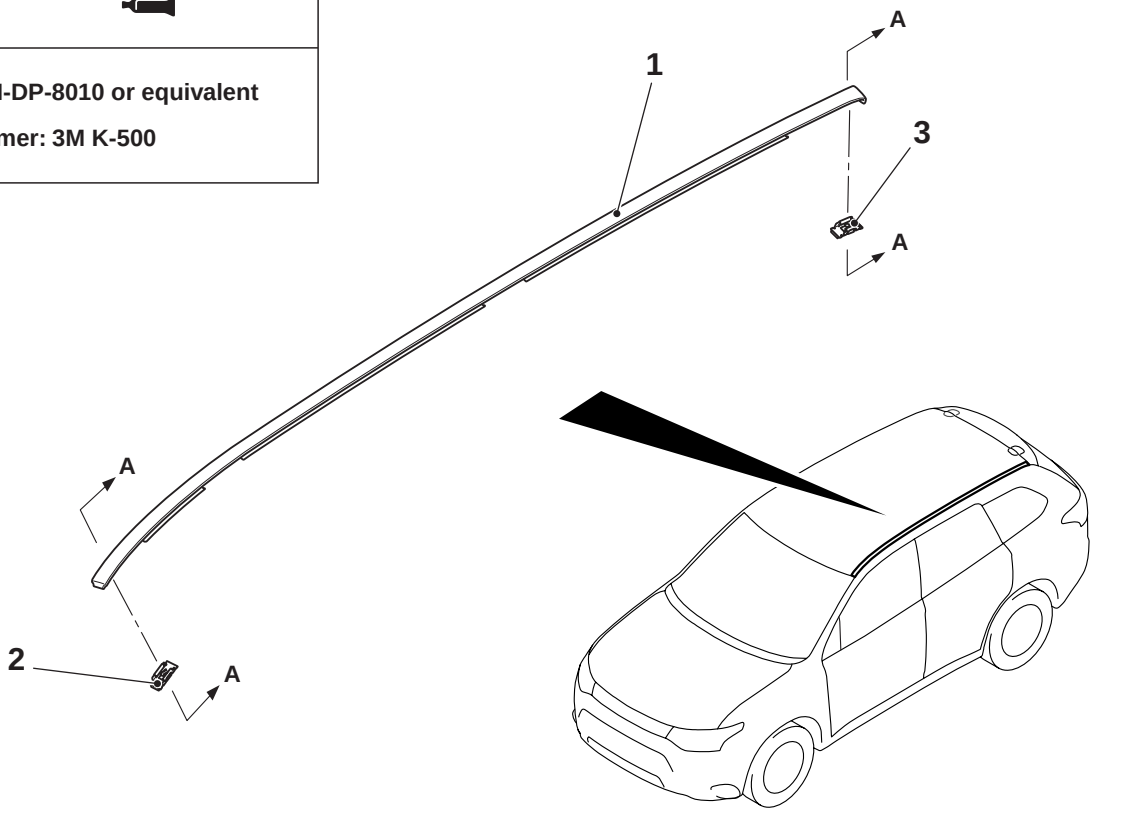
Pre-removal and Post-installation Operation
- Roof Rail Removal and Installation (Refer to P.51-20)

Section A – A

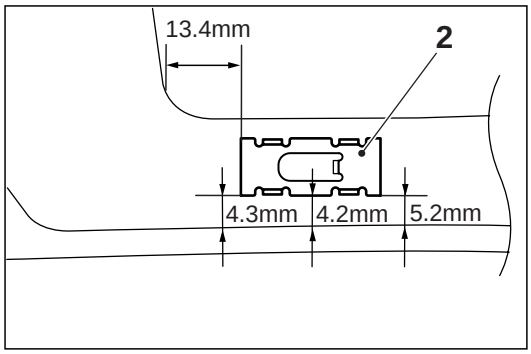


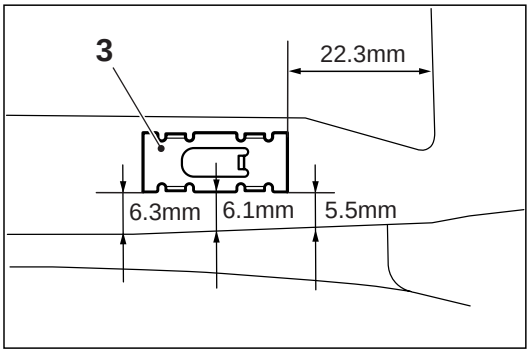
Adhesive: 3M-DP-8010 or equivalent

Specified primer: 3M K-500



ACC00084AB





ACC00502AB

Roof drip moulding removal steps

1. Roof drip moulding assembly
>>**A**<< 2. Roof drip moulding clip (FRONT)
>>**A**<< 3. Roof drip moulding clip (REAR)

INSTALLATION SERVICE POINT

>>A<< ROOF DRIP MOULDING CLIP INSTALLATION

Apply the specified sealant to the roof drip moulding clip surface, and install the roof drip moulding clip.

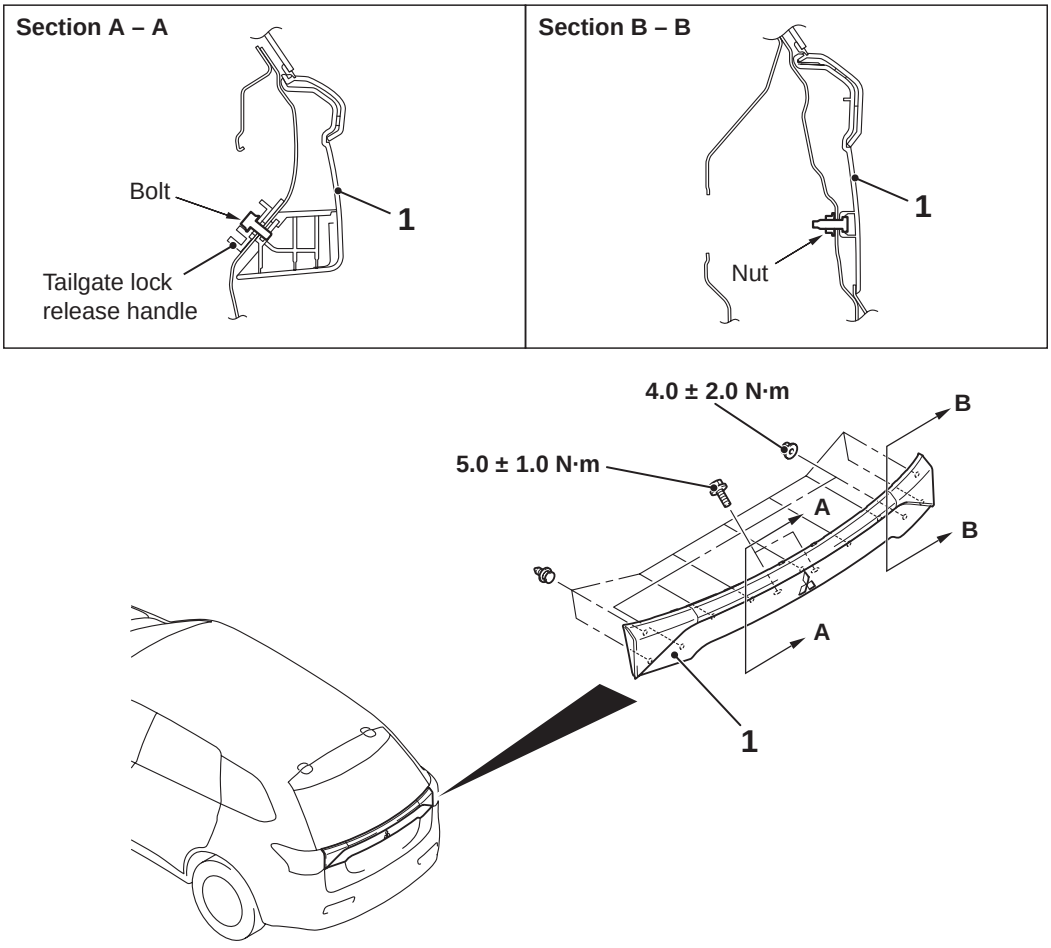
Specified Adhesive: 3M-DP-8010 or equivalent

TAILGATE GARNISH

REMOVAL AND INSTALLATION

M1511025000075

Post-installation operation
- Rear wiper motor bracket (Refer to P.51-54)



ACC00119AB

Removal step
- Tailgate lock release handle <Vehicles without electric tailgate> (GROUP 42A, Tailgate handle and latch)

Removal step (Continued)
- Tailgate lock release handle <Vehicles with electric tailgate> (GROUP 42A, Tailgate handle and latch)

1. Tailgate garnish

DOOR SASH TAPE

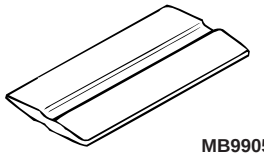
LUBRICANT

M1511000400258

Item		Specified lubricant	Quantity
Degrease agent	Grease and dirt removal from parts surface	Parts cleaner (MZ100387 or equivalent)	As required

SPECIAL TOOL

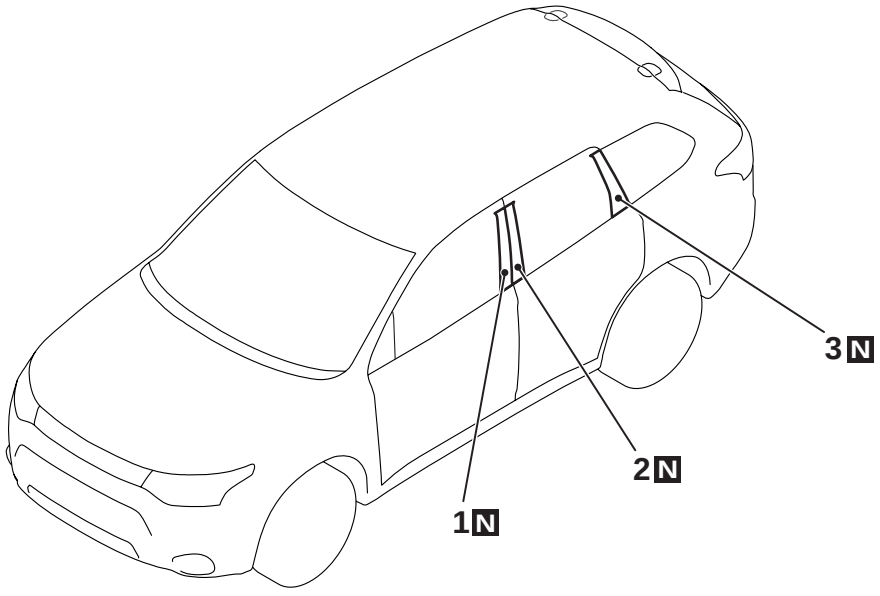
M1511000603262

Tool	Number	Name	Use
 MB990528	MB990528	Stripe tape spatula	Installation of door sash tape

REMOVAL AND INSTALLATION

M1511024101168

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



ACB05480AB

REMOVAL STEPS

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

REMOVAL SERVICE POINT

<<A>> DOOR SASH TAPES REMOVAL

⚠ CAUTION

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

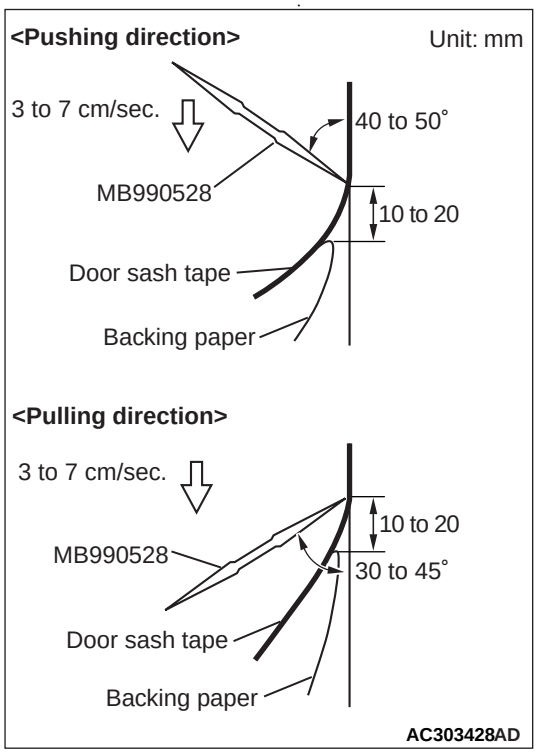
1. Use a hair drier to warm the tape.
2. Peel the tip of the tape with your finger, and then peel off the tape in parallel with the application surface.

INSTALLATION SERVICE POINT

>>A<< DOOR SASH TAPES INSTALLATION

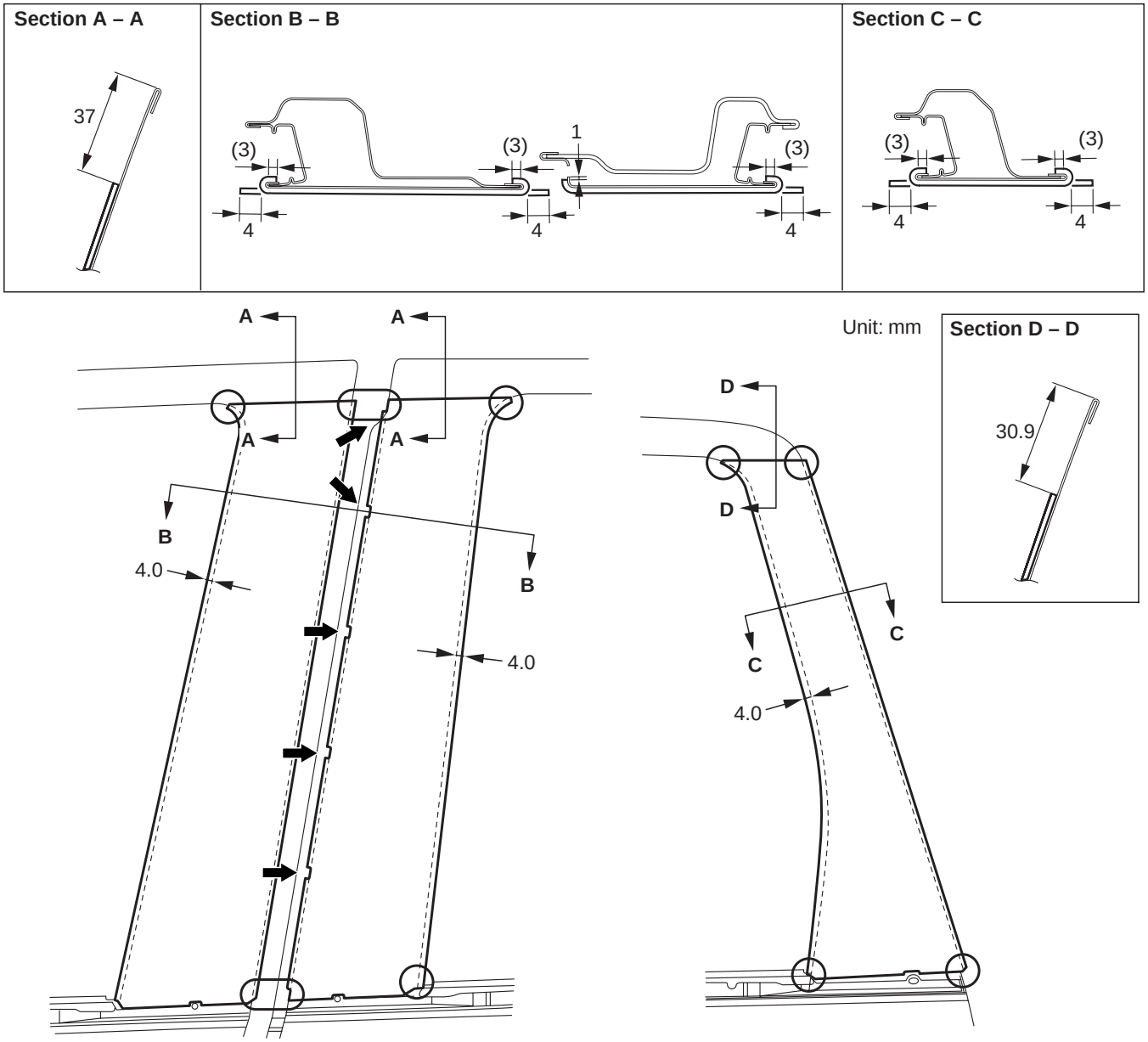
⚠ CAUTION

- **The ambient temperature should be 20 to 30°C. Ensure that the working area is clean. Ideally, the tape application should be done at ambient temperature of 25°C.**
- **If ambient temperature is less than 15°C, heat the tape and application surface to a temperature of 20 to 30°C. Alternatively, allow it to cool if it is 35°C or more. The adhesive property of the tape is deteriorated at low temperature, so the tape may come adrift easily. Meanwhile, the tape will be softened excessively at high temperature.**
- **When beginning to apply the tape, pay particular attention. If the end of the tape cannot be applied to the specified position with an accuracy of less than 1 mm, it may cause the poor appearance or adhesion.**

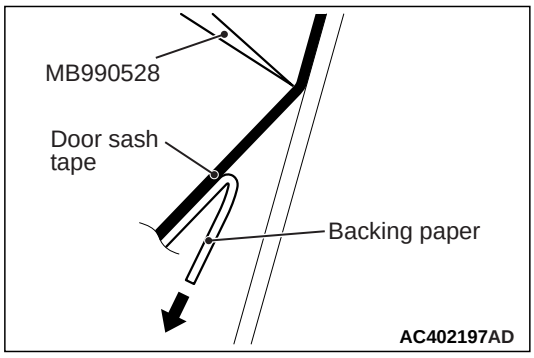


Use the special tool MB990528 to apply the tape with a steady pace and pressure. If you do not apply the tape with a steady pace or pressure, or abort the application, a shallow groove (lateral groove called as "Shock line") may be present on the tape surface. Meanwhile, if you apply it too quickly, air bubbles may be formed under the tape.

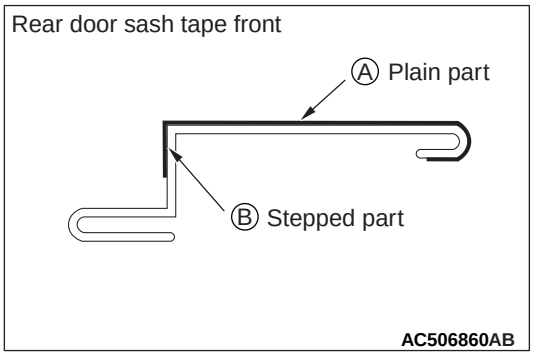
1. Wrap a soft cloth (synthetic fibre) around the tip of the special tool.
2. Use Parts Cleaner (MZ100387 or equivalent) to degrease the tape application surface.
3. Wipe away dirt from the tape.



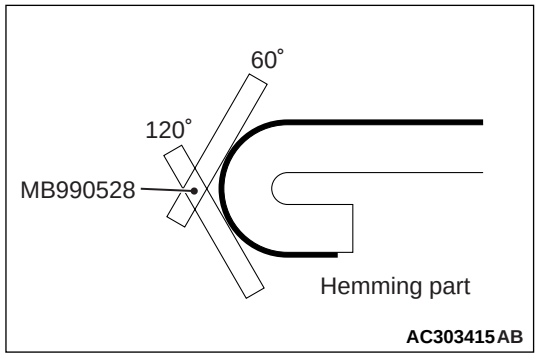
4. Apply the door sash tape according to the procedure below.
   (1) Position the tape at the upper and lower locating points.
   (2) Peel of backing strip from the top of the tape and attach it temporarily.
   (3) Peel off the backing strip to the half length of the tape.



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



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

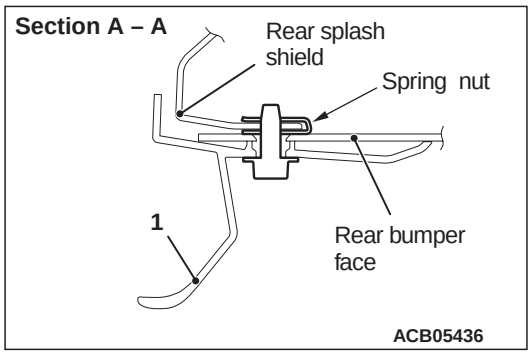


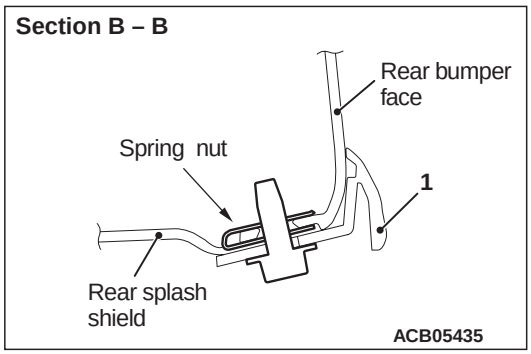
(6) Press the folded area of the tape by three stages (60 degrees, 120 degrees, and holding), rolling in toward the vehicle inside direction.

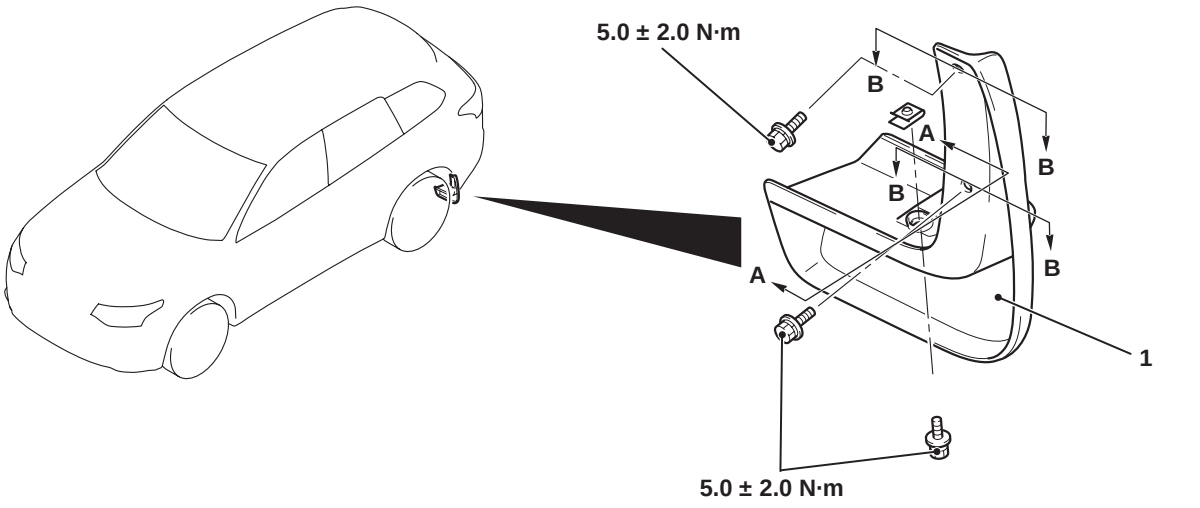
MUD GUARD

REMOVAL AND INSTALLATION

M1511011200560







Removal step

1. Rear mud guard

SIDE AIR DAM

ADHESIVE

M1511000501269

Application	Specified adhesive
Side air dam	Double-sided tape: Generic products, 4.0 mm width and 1.2 mm thickness
	Specified primer: 3M K-500

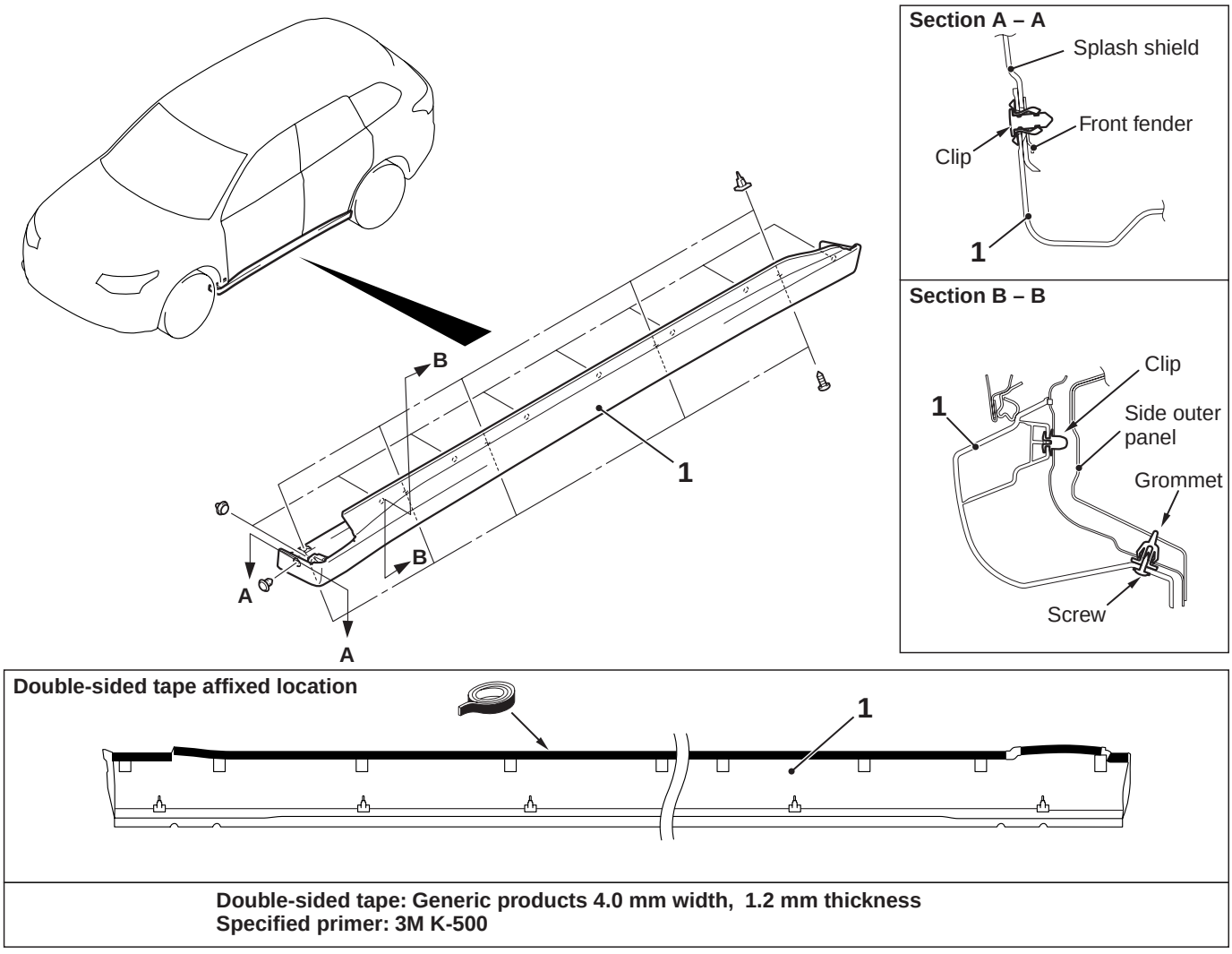
LUBRICANT

M1511000400140

Item		Specified lubricant	Quantity
Degrease agent	Grease and dirt removal from parts surface	Parts cleaner (MZ100387 or equivalent)	As required

REMOVAL AND INSTALLATION

M1511005501468



ACB06004AB

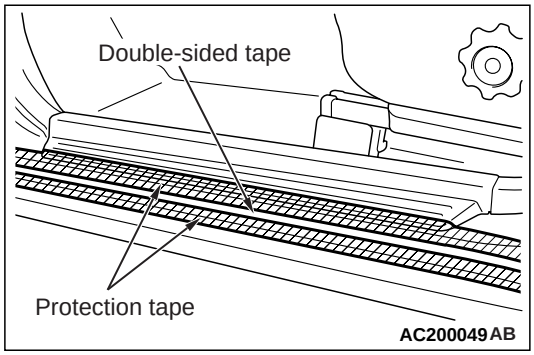
Removal step

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

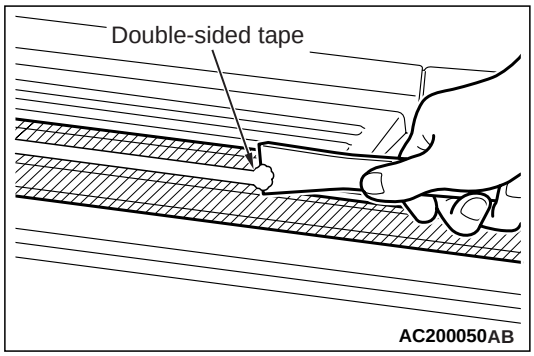
REMOVAL SERVICE POINT

<<A>> SIDE AIR DAM REMOVAL

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

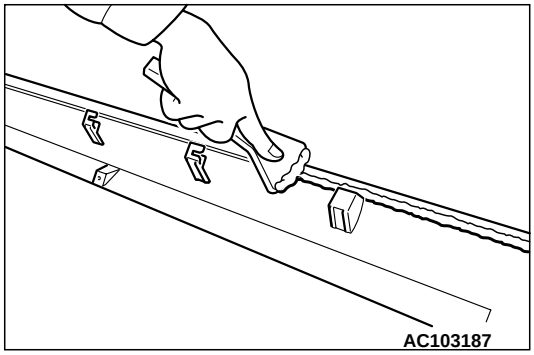


1. Attach protection tape all the way along the edges of the double-sided tape which is still adhering to the body.



2. Scrape off the double-sided tape with a resin spatula as much as possible.
3. Peel off the protection tape.
4. Wipe the body surface and clean it with a rag moistened with Parts Cleaner (MZ100387 or equivalent).

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



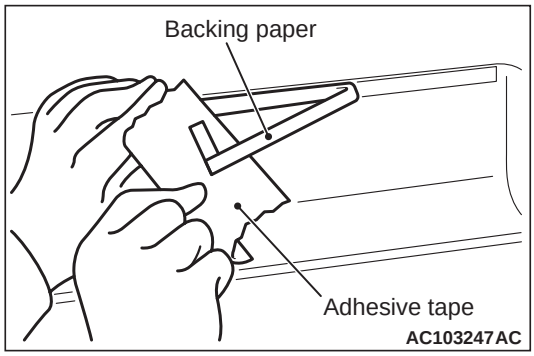
1. Scrape off the double-sided tape on the side air dam with a resin spatula as much as possible.
2. Wipe the side air dam surface and clean it with a rag moistened with Parts Cleaner (MZ100387 or equivalent).
3. Remove only a small portion of the residual adhesive.
4. Adhere the double-sided tape as specified on the side air dam (Refer to double-sided tape adherence location).

INSTALLATION SERVICE POINT

>>A<< SIDE AIR DAM INSTALLATION

1. Use the parts cleaner (MZ100387 or equivalent) wipe off the adhesion surface to decrease it.
2. Apply the specified primer to the double-sided adhesive tape surface. Then dry it off swfficiently.

   Specified primer : 3M K-500



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

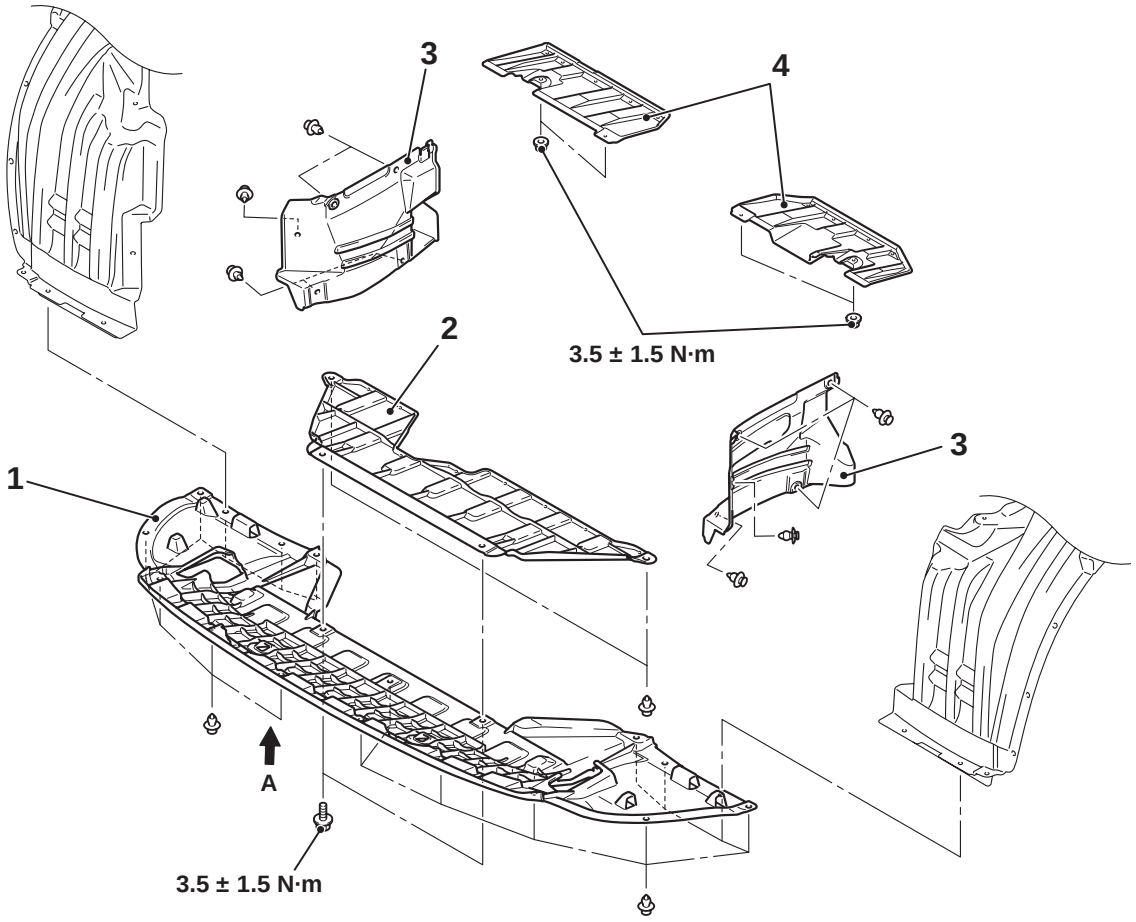
   NOTE: If attach the adhesive tape to the edge of the backing paper, it will be easy to tear off.
4. Install the side air dam.

   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℃ before affixing the tape.
5. Firmly press in the side air dam.

UNDER COVER

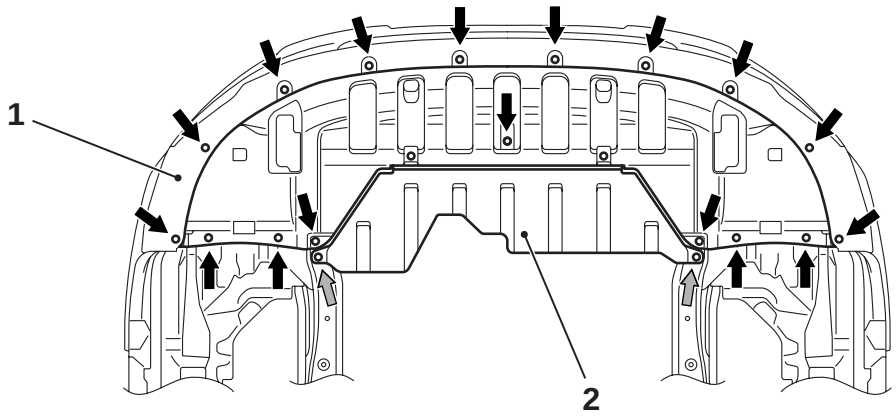
REMOVAL AND INSTALLATION

M1511019601286



ACB05521AB

View A (Kinds of clips used)



: Clip(a) : Clip(b)

ACB05522AB

Removal steps

1. Engine room under cover front A
2. Engine room under cover front B

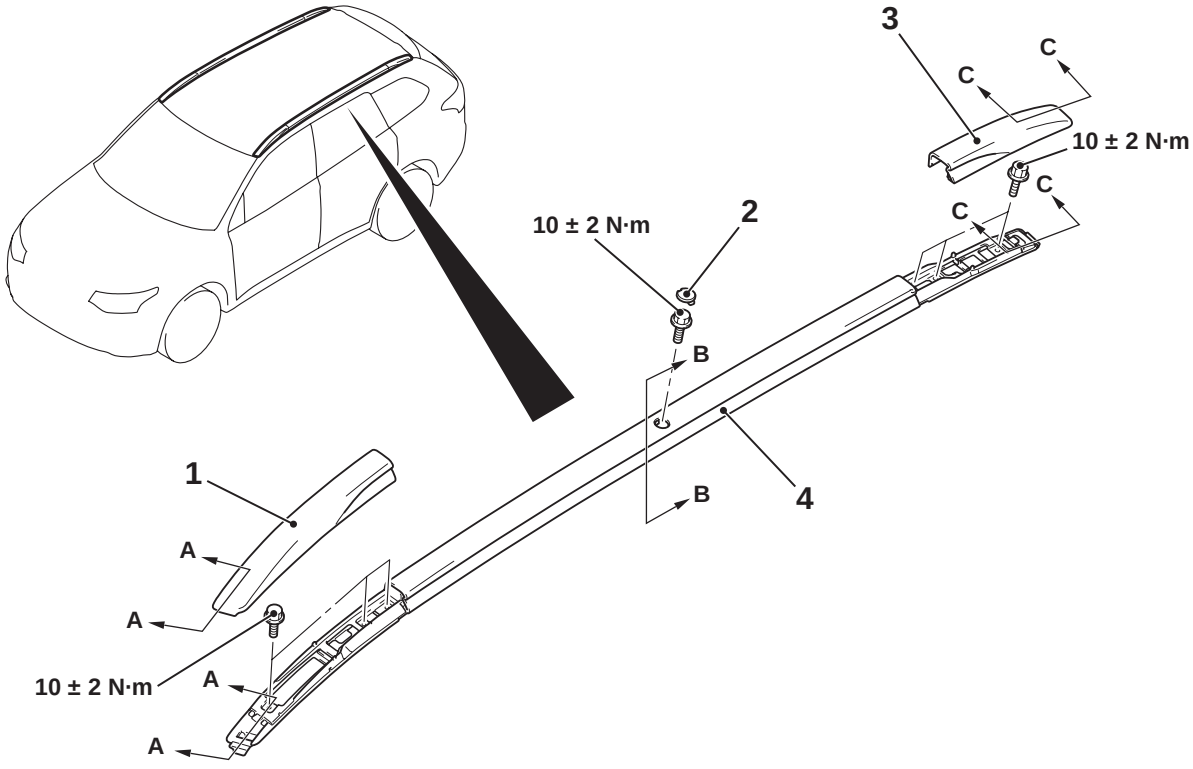
Removal steps (Continued)

3. Engine room side cover
4. Rear floor under cover

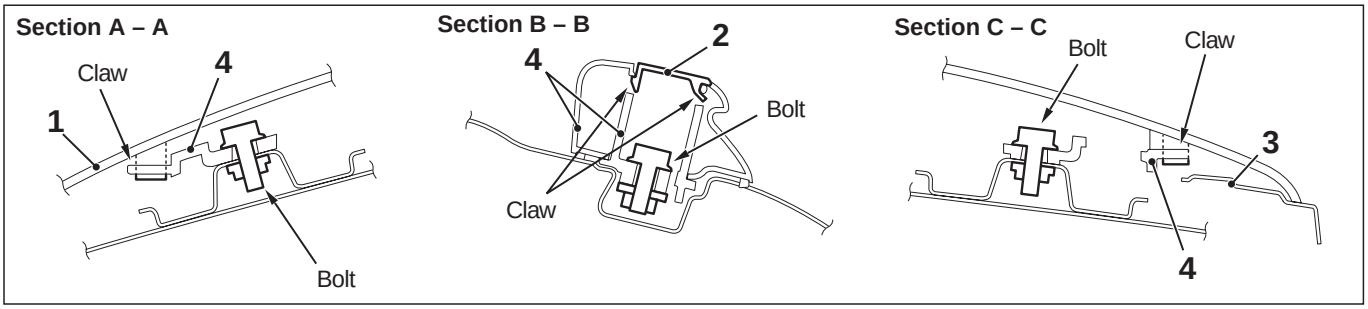
ROOF RAIL

REMOVAL AND INSTALLATION

M1511016600701



ACB05438AB



ACB05439AB

Removal steps

1. Front roof rail cover
2. Centre roof rail cover

Removal steps (Continued)

3. Rear roof rail cover
4. Roof rail

WINDSHIELD WIPER AND WASHER

SERVICE SPECIFICATION

M1511000301533

Item	Standard value
Stop position of the windshield wiper arm/blade assembly mm	A: ϕ 2 marking ± 5

LUBRICANT

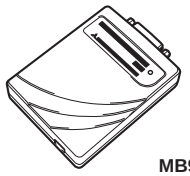
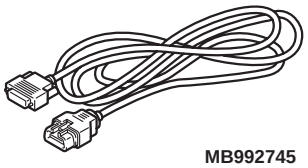
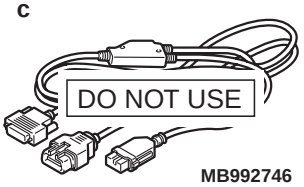
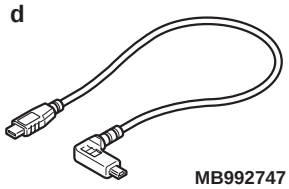
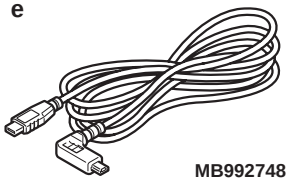
M1511000400270

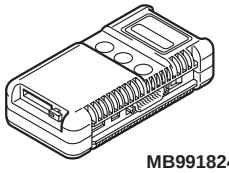
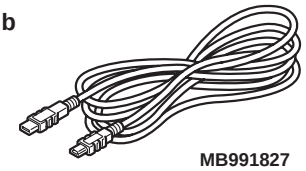
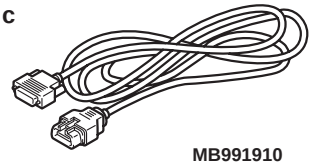
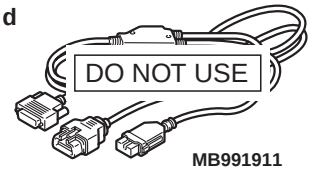
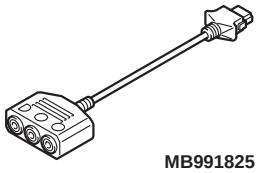
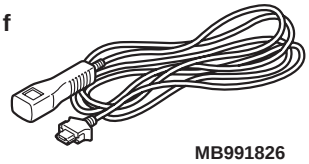
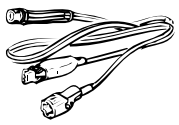
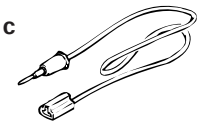
Item		Specified lubricant	Quantity
Wiper motor link rod	Contact joint between link rod and wiper motor link plate	Multipurpose grease SAE J310, NLGI No.2 or equivalent	As required

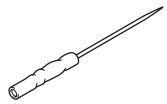
SPECIAL TOOLS

M1511000603273

Tool	Number	Name	Use
 MB992326	MB992326	Adjustment tool, washer nozzle	Injection angle adjustment of the washer nozzle

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991825 f: MB991826	M.U.T.-III sub-assembly a: Vehicle Communication Interface (V.C.I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III measure adapter f: M.U.T.-III trigger harness	⚠ CAUTION **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.** Checking windshield wiper intermittent time Lighting control sensor (rain sensor) adaptation
a  b  c  d  MB991223	MB991223 a: MB991219 b: MB991220 c: MB991221 d: MB991222	Harness set a: Check harness b: LED harness c: LED harness adapter d: Probe	Continuity check and voltage measurement at harness wire or connector a: For checking connector pin contact pressure b: For checking power supply circuit c: For checking power supply circuit d: For connecting a locally sourced tester

Tool	Number	Name	Use
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

TROUBLE SYMPTOM CHART

M1511015002230

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1511014600802

Refer to GROUP 00 – Contents of Troubleshooting .

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
The windshield wipers do not work at all.	1	P.51-24
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" and "Hi" position.	2	P.51-26
The windshield wipers do not stop at the specified park position.	3	P.51-27
The windshield wipers do not work normally.	4	P.51-27
The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control.	5	P.51-29
The intermittent wiper interval is not changed according to the vehicle speed.	6	P.51-30
The rain sensitive AUTO wiper function does not work at all <Vehicles with lighting control sensor>.	7	P.51-30
The rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>.	8	P.51-32
Sometimes the rain sensitive AUTO wiper function works even though there is no rainfall <Vehicles with lighting control sensor>.	9	P.51-33
The windshield washer does not work.	10	P.51-33
The comfort washing function does not work normally	11	P.51-35
Delayed finishing wipe function does not work normally.	12	P.51-35

NOTE: If the ETACS-ECU failed, the windshield wiper will operate only at low speed as a fail-safe measure.

Inspection Procedure 1: The windshield wipers do not work at all.

⚠ CAUTION

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

COMMENTS ON TROUBLE SYMPTOM

The windshield wiper motor, the column switch (column-ECU) or ETACS-ECU may be defective. Check the wiper backup circuit (between the column switch WB/U and the ETACS-ECU WB/U), and repair if necessary.

PROBABLE CAUSES

- Defective windshield wiper motor
- Malfunction of ETACS-ECU
- Defective column switch (column-ECU)
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose the ETACS-ECU (Refer to GROUP 54A – ETACS, Trouble Symptom Chart).

NO : Go to Step 2.

STEP 2. M.U.T.-III data list

Check the input signal related to the windshield wiper operation.

- Turn the ignition switch to the ACC position.
- Operate the windshield wiper switch at each switch position.

Item No.	Item name	Windshield wiper switch position	Normal condition
Item 235	Front wiper ACT	LO	ON
		HI	
		INTO	ON and OFF
		MIST	ON
Item 288	ACC switch		ON

OK: Normal condition is displayed.

Q: Is the check result normal?

YES <Normal conditions are displayed for all items> : Go to Step 3.

NO <Normal condition is not displayed for item No. 235> : GROUP 54A – ETACS, Diagnosis - Inspection Procedure 11 "Column switch signal is not received." .

NO <Normal condition is not displayed for item No. 288> : GROUP 54A – ETACS, Diagnosis - Inspection Procedure 1 "The ignition switch (ACC) signal is not received" .

STEP 3. Check the windshield wiper motor.

Check that the windshield wiper motor works normally. Refer to P.51-42.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the windshield wiper motor.

STEP 4. Measure the resistance at windshield wiper motor connector.

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

(2) Measure the resistance between the windshield wiper motor connector earth terminal and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Check the wiring harness between windshield wiper motor connector and body earth.

Q: Is the check result normal?

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

NO : Repair the connector(s) or wiring harness.

STEP 6. Measure the voltage at ETACS-ECU connector.

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

(2) Measure the voltage between the ETACS-ECU(+B1 terminal) and the body earth.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 8.

NO : Go to Step 7.

STEP 7. Check of open in power supply line between fusible link and ETACS(+B terminal).

Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, – How to Cope with Intermittent Malfunctions .)

NO : Repair the connector(s) or wiring harness.

STEP 8.Check of open, short circuit in W.LO, HI line between windshield wiper motor connector and ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 9. Check the trouble symptom.
Check that the windshield wipers work normally.

Q: Is the check result normal?

YES : Intermittent malfunction. Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, – How to Cope with Intermittent Malfunctions .)
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" and "Hi" position.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

COMMENTS ON TROUBLE SYMPTOM

It is assumed that the windshield wipers are in the fail-safe mode due to the LIN bus lines failure.

PROBABLE CAUSES

- Faulty LIN bus line
- Malfunction of ETACS-ECU
- Defective column switch (column-ECU)
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. Refer to GROUP 54A – ETACS .
NO : Go to Step 2.

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

STEP 2. M.U.T.-III data list
Check the input signal related to the windshield wiper operation.
- Turn the ignition switch to the ACC position.
- Operate the windshield wiper switch at each switch position.

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

OK: Normal condition is displayed.

Q: Is the check result normal?
YES <Normal conditions are displayed for all items> : Go to Step 3.
NO <Normal condition is not displayed for item Nos. 235 and/or 236> : Troubleshoot the ETACS-ECU. Refer to ETACS, Diagnosis - Inspection Procedure 11 "Column switch signal is not received." .

STEP 3. Retest the system.
Check that the windshield wipers work normally.

Q: Is the check result normal?
NO : Replace the ETACS-ECU.

Inspection Procedure 3: The windshield wipers do not stop at the specified park position.

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

COMMENTS ON TROUBLE SYMPTOM

The windshield wiper motor or the ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective windshield wiper motor
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the windshield wiper motor.
Check that the windshield wiper motor works normally. Refer to P.51-42.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the windshield wiper motor.

STEP 2. Measure the voltage at windshield wiper motor connector.
(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Set the ignition switch to the ACC position.
(3) Measure the voltage between the windshield wiper motor connector (ACC terminal) and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of open, short circuit in power supply line between windshield wiper motor connector and ignition switch (ACC).

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness

STEP 4. Check of open, short circuit in W.AS, WACC line between windshield wiper motor connector and ETACS-ECU connector

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness

STEP 5. Retest the system.
Check that the windshield wipers stop at the specified park position.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

Inspection Procedure 4: The windshield wipers do not work normally.

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

COMMENTS ON TROUBLE SYMPTOM

The windshield wiper motor, the column switch or the ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective windshield wiper motor
- Defective column switch (column-ECU)
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. (Refer to GROUP 54A – ETACS, Trouble Symptom Chart .)
NO : Go to Step 2.

STEP 2. M.U.T.-III data list

Check the input signal related to the windshield wiper operation.

- Turn the ignition switch to the ACC position.
- Operate the windshield wiper switch at each switch position.

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

OK: Normal condition is displayed.

Q: Is the check result normal?
YES <Normal conditions are displayed for all items> : Go to Step 3.
NO <Normal condition is not displayed for item Nos. 235 and/or 236> : Troubleshoot the ETACS-ECU. Refer to ETACS, Diagnosis - Inspection Procedure 11 "Column switch signal is not received." .

STEP 3. Check that the windshield wipers work.

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

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 8.

STEP 4. Check the windshield wiper motor.

Check that the windshield wiper motor works normally (Refer to P.51-42).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the windshield wiper motor.

STEP 5. Measure the voltage at windshield wiper motor connector.

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Ignition switch: ACC
(3) Windshield wiper switch: LO
(4) Measure the voltage between the windshield wiper motor connector power supply terminal and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Go to Step 6.

STEP 6. Check of open, short circuit in W.LO line between windshield wiper motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Retest the system.

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

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

STEP 8. Measure the voltage at windshield wiper motor connector.

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Ignition switch: ACC
(3) Windshield wiper switch: HI,MIST
(4) Measure the voltage between the windshield wiper motor connector power supply terminal and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Go to Step 9.

STEP 9. Check of open, short circuit in W.HI line between windshield wiper motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the connector(s) or wiring harness.

STEP 10. Retest the system.
Check that the windshield wipers work normally by moving the switch to each position.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

Inspection Procedure 5: The windshield intermittent wiper interval cannot be adjusted by operating the windshield intermittent wiper volume control.

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

COMMENTS ON TROUBLE SYMPTOM
The column switch or the ETACS-ECU may be defective.

PROBABLE CAUSES
- Defective column switch (column-ECU)
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code.
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. (Refer to GROUP 54A – ETACS, Trouble Symptom Chart .)
NO : Go to Step 2.

STEP 2. Check the ETACS customisation function.
Use the ETACS customise function to check that "Front wiper operation" is set to "variable INT" or "vehicle speed dependent".

Q: Is the check result normal?
YES : Go to Step 3.
NO : Use the ETACS customise function to set "Front wiper operation" to "variable INT" or "vehicle speed dependent". Refer to P.51-37.

STEP 3. M.U.T.-III data list
Check the input signal related to the windshield wiper operation.
- Ignition switch: ACC
- Rotate the windshield wiper interval control from (+) to (–) side.

Item No.	Display on M.U.T.-III	Check conditions	Normal condition
Item 359	Front wiper (interval volume)	Rotate the windshield wiper interval control from (+) to (–) side.	Value changes from 0(+) to 254 (–)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the column switch.

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

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

Inspection Procedure 6: The intermittent wiper interval is not changed according to the vehicle speed.

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

OPERATION
The ETACS-ECU calculates the intermittent wiper interval according to the vehicle speed signal which is sent by the ABS-ECU <Vehicles without ASC> or ASC-ECU <Vehicles with ASC>.

COMMENTS ON TROUBLE SYMPTOM
If the intermittent wiper interval does not depend on the vehicle speed, the input circuit of the vehicle speed signal (combination meter) and the ETACS-ECU may be defective. Alternatively, the vehicle speed-dependent wiper may be set to "disabled" by using the customise function.

PROBABLE CAUSES
- Defective combination meter
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the operation of windshield intermittent wiper volume control.
Check that the windshield intermittent wiper interval can be adjusted by operating the windshield intermittent wiper volume control.

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 volume control" P.51-29.

STEP 2. Check the ETACS customise function.
Use the ETACS customise function to confirm that "FRONT WIPER OPERATION" is set to "VEHICLE SPEED DEPENDENT".

Q: Is the check result normal?
YES : Go to Step 3.
NO : Use the ETACS customise function to set "FRONT WIPER OPERATION" to "VEHICLE SPEED DEPENDENT" (Refer to P.51-37).

STEP 3.Check the speedometer.
(1) Connect the M.U.T.-III to the diagnosis connector.
(2) Use the M.U.T.-III to enter simulated vehicle speed.
- Item No.1: Speedometer (Refer to .)

OK: The speedometer shows that simulated vehicle speed.

Q: Is the check result normal?
YES : Go to Step 4.
No : Perform the troubleshooting to the speedometer (Refer to GROUP 54A – Combination Meter, Inspection Procedure 5 "Speedometer does not work." Refer to .)

STEP 4. Retest the system.
Check that the intermittent wiper interval depends on the vehicle speed.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

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

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

OPERATION
The raindrops sensitive wiper function automatically adjusts the wiping speed of windscreen wiper by detecting the rainfall through lighting control sensor when the ignition switch is in the ON position and the column switch is in the AUTO position.

COMMENTS ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Lighting control sensor installation surface check

Visually check the presence of scratches or air bubbles (diameter of 5 mm or more) on the windshield to which the lighting control sensor is installed.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation).

STEP 2. Windshield wiper operation check

Check that the windshield wipers work normally.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to trouble symptom chart P.51-24.

STEP 3. M.U.T.-III diagnosis code

Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU (Refer to GROUP 54A – ETACS).
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code

Check if a lighting control sensor-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the lighting control sensor. (Refer to GROUP 54A – Diagnosis Code Chart .)
NO : Go to Step 5.

STEP 5. Resistance measurement at lighting control sensor connector

(1) Disconnect the connector, and measure the resistance at the wiring harness.
(2) Measure the resistance between lighting control sensor connector (earth terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check of open circuit in body earth line between lighting control sensor connector and the body earth.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Repair the wiring harness.

STEP 7. Voltage measurement at lighting control sensor connector (BUP1 terminal).

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Measure the voltage between the lighting control sensor connector (BUP1 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check of open circuit in BUP1 line between ETACS-ECU and lighting control sensor connector.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Repair the wiring harness.

STEP 9. Measure the voltage at ETACS-ECU connector (LIN2 terminal).

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Measure the voltage between ETACS-ECU connector (LIN2 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Replace the Lighting control sensor.
NO : Go to Step 10.

STEP 10. Check of short to power supply, short to earth and open circuit in LIN2 line between ETACS-ECU connector and lighting control sensor connector.

Q: Is the check result normal?

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

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

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

COMMENTS ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Lighting control sensor installation surface check

Visually check the presence of scratches or air bubbles (diameter of 5 mm or more) on the windshield to which the lighting control sensor is installed.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation).

STEP 2. Windshield wiper operation check

Check that the windshield wipers work normally.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to trouble symptom chart P.51-24.

STEP 3. M.U.T.-III diagnosis code

Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose the ETACS-ECU (Refer to GROUP 54A – ETACS).
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code

Check if a lighting control sensor-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the lighting control sensor (Refer to GROUP 54A – Diagnosis Code Chart).
NO : Go to Step 5.

STEP 5. Measure the voltage at ETACS-ECU connector (LIN2 terminal).

(1) Disconnect the connector, and measure the voltage at the wiring harness side.
(2) Measure the voltage between ETACS-ECU connector (LIN2 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Replace the Lighting control sensor.
NO : Go to Step 6.

STEP 6. Check of short to power supply, short to earth, and open circuit in LIN2 line between ETACS-ECU connector and lighting control sensor connector.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Repair the wiring harness.

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

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

COMMENTS ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Lighting control sensor installation surface check
Visually check the presence of scratches or air bubbles (diameter of 5 mm or more) on the windshield to which the lighting control sensor is installed.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the windshield (Refer to GROUP 42A – Windshield Removal and Installation).

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

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to trouble symptom chart P.51-24.

STEP 3. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU. Refer to GROUP 54A – ETACS .
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code
Check if a lighting control sensor diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the lighting control sensor. (Refer to GROUP 54A – Diagnosis Code Chart).
NO : Go to Step 5.

STEP 5. Lighting control sensor (rain sensor) installation surface check
Check that the lighting control sensor (rain sensor) is installed to the windshield glass correctly.

Q: Is the check result normal?
YES : Go to Step 6 after completion of the lighting control sensor (rain sensor) adaptation (P.51-46).
NO : Install the lighting control sensor (rain sensor) to the windshield glass correctly (Refer to GROUP 54A – Lighting Control Sensor Removal and Installation).

STEP 6. Retest the system.
Check the lighting control sensor (rain sensor) after completion of the lighting control sensor (rain sensor) adaptation
(1) Windshield glass surface should be dry.
(2) Pour water to the windshield glass surface where the lighting control sensor is installed.

Q: Does the windshield wiper operate?
Operate once or more : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
Does not operate : Troubleshoot the rain-sensitive wiper function (Refer to Inspection procedure 7 P.51-30).

Inspection Procedure 10: The windshield washer does not work.

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

COMMENTS ON TROUBLE SYMPTOM

The windshield washer motor, the column switch or the ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective windshield washer motor
- Defective column switch
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the operation of the windshield wipers.
Check that the windshield wipers work normally.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to Inspection Procedure 1 "Windshield wipers do not work at all P.51-24."

STEP 2. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. Refer to GROUP 54A – ETACS .
NO : Go to Step 3.

STEP 3. M.U.T.-III data list
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?
YES : Go to Step 4.
NO : Refer to GROUP 54A – ETACS, Inspection Procedure 11 "The column switch signal is not received ."

STEP 4. Check the washer motor.
Check that the windshield washer motor works normally (Refer to P.51-44).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the washer motor.

STEP 5. Measure the voltage at ETACS-ECU connector (W.WA terminal).
(1) Disconnect the connector, and measure the voltage at the wiring harness-side.
(2) Ignition switch: ACC
(3) Windshield washer switch: ON
(4) Measure the voltage between C-304 ETACS-ECU connector (W.WA terminal) and body earth.

OK: System voltage

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

STEP 6. Check of open, short to power supply, short to earth circuit in WASH line between washer motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Check of open, short to power supply, short to earth circuit in W.WA line between washer motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the wiring harness.

STEP 8. 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 Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

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

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

COMMENTS ON TROUBLE SYMPTOM

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

NOTE: Without function as a default (Refer to P.51-37.)

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

STEP 1. Check the ETACS-ECU customisation function.
Use the ETACS-ECU customise function to check that the "Intelligent/ Comfort washer" is set to "Enable."

Q: Is the check result normal?
YES : Go to Step 2
NO : Use the ETACS-ECU customise function to set "Intelligent/ Comfort washer" to "Enable." (Refer to P.51-37.)

STEP 2. M.U.T.-III diagnosis code
Check that ETACS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Carry out the troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Diagnosis Code Chart .)
NO : Go to Step 3

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

Q: Is the check result normal?
YES : Go to Step 4
NO : Refer to trouble symptom chart P.51-24.

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

Q: Is the check result normal?
YES : Go to Step 5
NO : Refer to Inspection Procedure 10 "The windshield washer does not work normally P.51-33."

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

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction .)
NO : Replace the ETACS-ECU.

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

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

COMMENT ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

STEP 1. Check the ETACS-ECU customisation function.
Use the ETACS-ECU customise function to check that the "front wiper washer" is set to "On with Delayed finishing wipe function."

Q: Is the check result normal?

YES : Go to Step 2.
NO : Use the ETACS-ECU customise function to set the "front wiper washer" to "On with Delayed finishing wipe function." (Refer to P.51-37.)

STEP 2. M.U.T.-III diagnosis code
Check if the ETACS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Carry out the troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Diagnosis Code Chart .)
NO : Go to Step 3.

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

Q: Is the check result normal?
YES : Go to Step 4.
NO : Refer to trouble symptom chart P.51-24.

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

Q: Is the check result normal?
YES : Go to Step 5.
NO : Refer to Inspection Procedure 10 "Windshield washers do not work normally P.51-33."

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

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction .)
NO : Replace the ETACS-ECU.

DATA LIST REFERENCE TABLE

M1511015100101

LIN (LIGHTING CONTROL SENSOR)

Item No.	M.U.T.-III display	Check condition	Normal condition
7005	RLS rain sensor ON/OFF	When wiper switch is in any position other than AUTO	OFF
		When wiper switch is in AUTO position	ON
7006	RLS rain sensor sensitivity	Changes from 1 to 6 according to the wiper volume.	1,2,3,4,5,6
7008	RLS wiper auto stop SW	Windshield wipers are in operation.	Park position
		Other than above	Other than Park position
7013	RLS wiper control output	No operation request is received from lighting control sensor (rain sensor).	OFF
		LO operation request is received from lighting control sensor (rain sensor).	Lo
		HI operation request is received from lighting control sensor (rain sensor).	Hi
7020	RLS RS measurement value (RS1)	Lighting control sensor (rain sensor) detects rain drops.	The value changes when sensor 1 detects rain drops.
7021	RLS RS measurement value (RS2)	Lighting control sensor (rain sensor) detects rain drops.	The value changes when sensor 2 detects rain drops.
7022	RLS RS adaptation value (RS1)	Initializing after adaptation (Sensor 1)	Output amount when initializing (Sensor 1)
7023	RLS RS adaptation value (RS2)	Initializing after adaptation (Sensor 2)	Output amount when initializing (Sensor 2)
7024	RLS RS adaptation gain level	Initializing after adaptation	The calibrated value of initialising

ON-VEHICLE SERVICE

WINDSHIELD INTERMITTENT WIPER INSPECTION

M1511023600231

1. Check that the intermittent wiper interval is changed as the windshield intermittent wiper volume is operated.
2. Turn the windshield intermittent wiper switch to the intermittent operation position. Use the 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.51-29)

LIGHTING CONTROL SENSOR (RAIN SENSOR) INSPECTION

M1511028400113

Under clear weather (windshield glass is dry), turn the ignition switch to "ON" position and wiper switch to "AUTO" position. Check that the wiper works when applying water to the upper part of the windshield glass where the lighting control sensor is installed. If there is a malfunction, perform the troubleshooting (Refer to P.51-24).

COMFORT WASHING FUNCTION INSPECTION

M1511029600198

1. Operate the windshield washer switch for less than 0.25 second with the ignition switch in the ACC or ON position to check whether the comfort washer function works normally.
2. If not, carry out the troubleshooting. (Refer to P.51-35.)

NOTE: Check that the comfort washer function is set to "Enabled" with the customise function. (Refer to P.51-53.)

DELAYED FINISHING WIPE FUNCTION INSPECTION

M1511029800158

1. When the washer lever of the column switch is operated for 0.5 seconds or longer with the ignition switch in the ACC or ON position, or when the intelligent washer function is enabled, the Delayed finishing wipe function injects the washer fluid and operates the wiper. The wiper operates once 6 seconds after the wiper operation is stopped. Check that the Delayed finishing wipe function works normally.
2. If not, carry out the troubleshooting. (Refer to P.51-35.)

NOTE: Check that the Delayed finishing wipe function is set by the customisation function. (Refer to P.51-53.)

CUSTOMISATION FUNCTION

M1511027402291

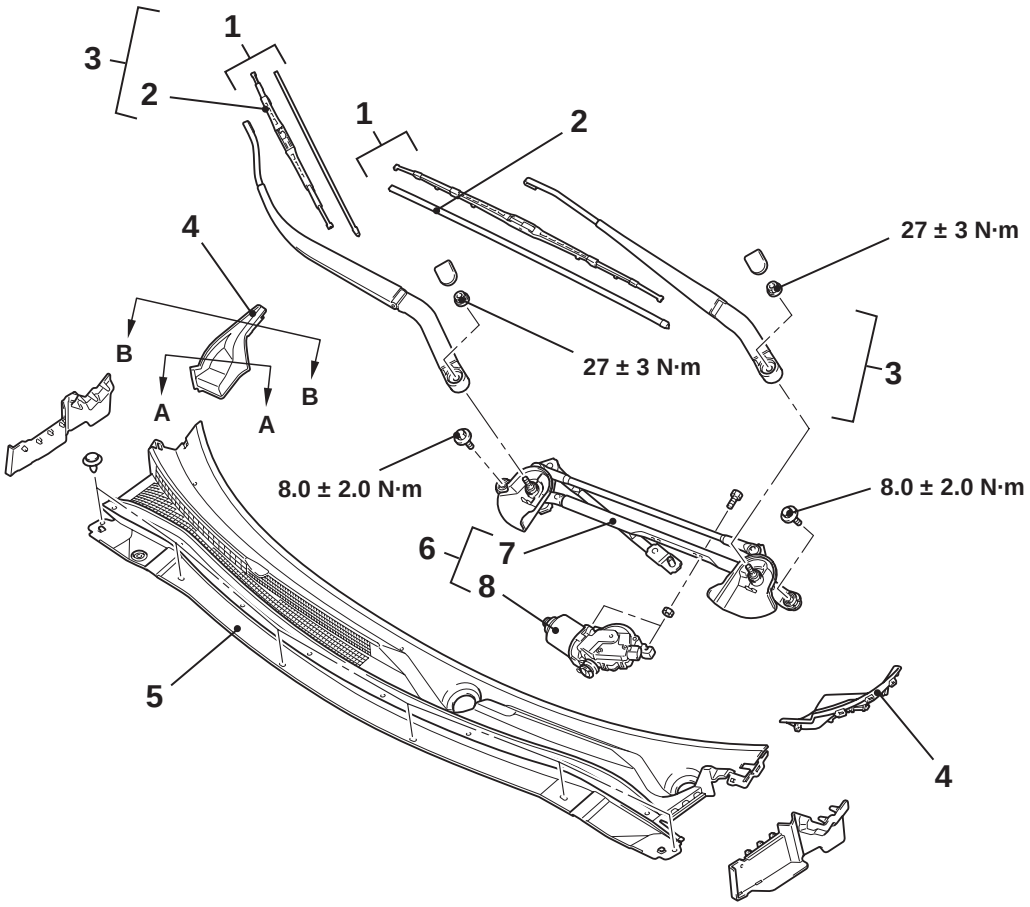
By operating the M.U.T.-III ETACS system, the following functions can be customised. The programmed information is held even when the battery is disconnected.

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

WINDSHIELD WIPER

REMOVAL AND INSTALLATION

M1511007901525



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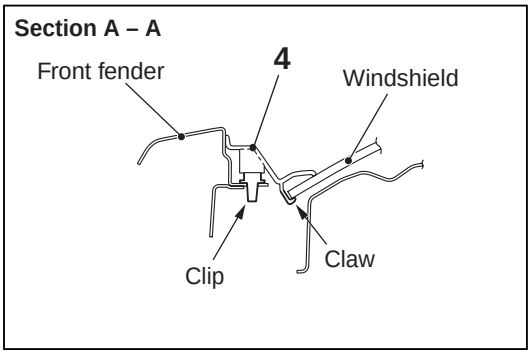
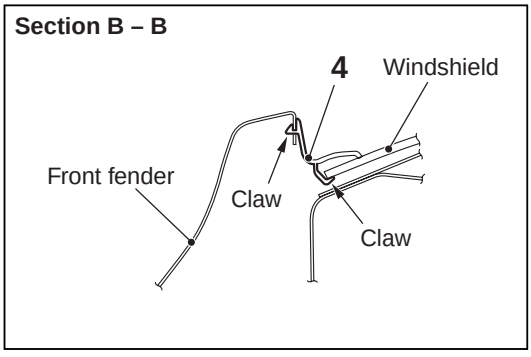




ACC00219AB

Wiper blade removal steps

1. Wiper blade assembly

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

Windshield wiper motor removal steps

>>**B**<< 3. Wiper arm and blade assembly

4. Front deck garnish cover

5. Front deck garnish

<<**A**>> >>**A**<< 6. Windshield wiper link assembly

Windshield wiper motor removal steps (Continued)

7. Windshield wiper link

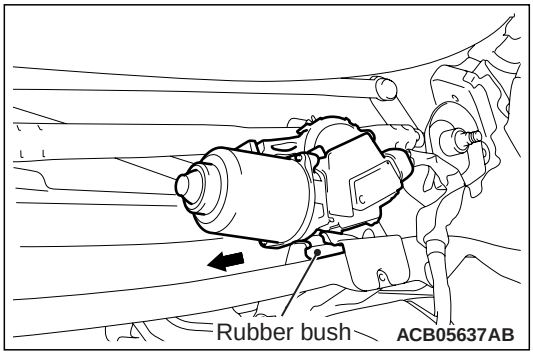
8. Windshield wiper motor

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

REMOVAL SERVICE POINT

<<A>> WINDSHIELD WIPER LINK ASSEMBLY REMOVAL

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



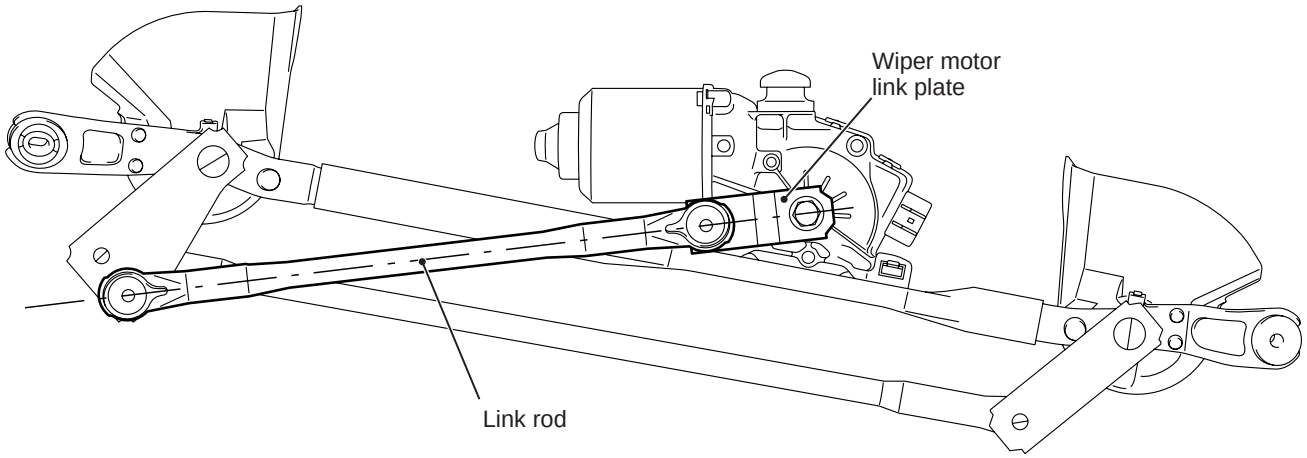
1. Remove the rubber bushing of the windshield wiper link assembly in the direction of the arrow from the windshield wiper bracket.

INSTALLATION SERVICE POINTS

>>A<< WINDSHIELD WIPER LINK ASSEMBLY INSTALLATION

1. Confirm that the wiper motor has set to automatic stop position (Refer to P.51-42).

⚠ CAUTION
Always replace the wiper motor link plate with new one.

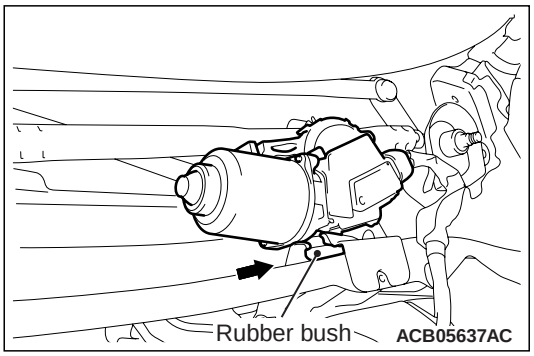


ACC00454AB

2. Set the wiper motor link plate onto the wiper motor shaft. When doing this, the wiper motor link plate and the wiper link rod should be in line as shown.

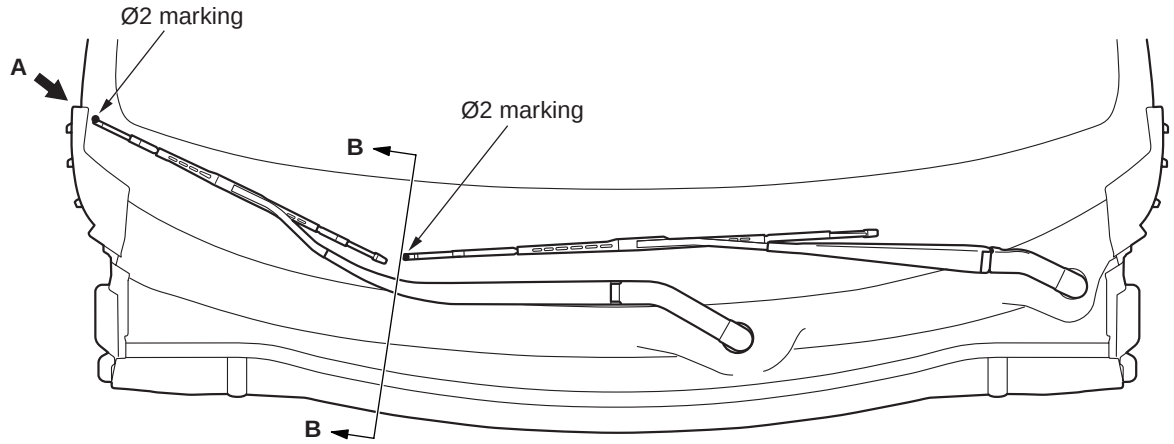
   NOTE: When the wiper motor link plate has slipped by even only one tooth on the wiper motor assembly, they cannot be in line.
3. Tighten the attaching nut of wiper motor link plate and wiper motor shaft. Use an appropriate tool to counter-hold the plate to prevent it from turning.
4. Apply grease to 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



5. Make sure that the rubber bushing of the windshield wiper linkage assembly is secured in the windshield wiper bracket.

>>B<< WIPER ARM AND BLADE ASSEMBLY INSTALLATION



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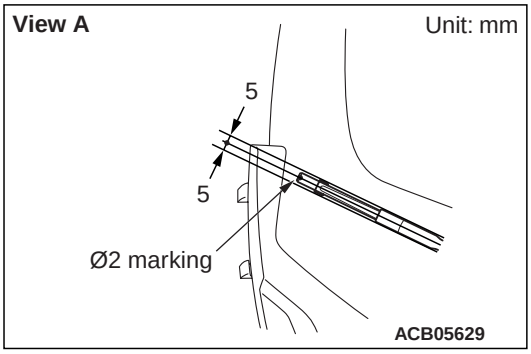
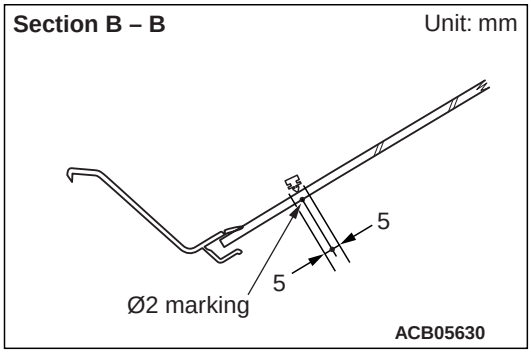


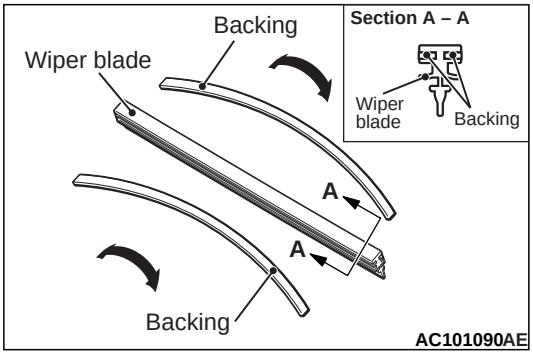


ACC00474AB

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

Standard value
(A): ϕ 2 marking ± 5 mm

>>C<< WIPER BLADE INSTALLATION

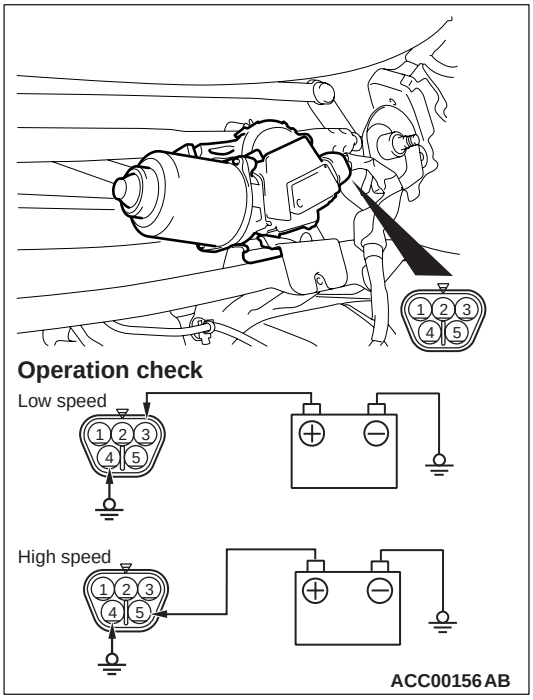


⚠ CAUTION
Use a curved backing like that shown for the backing of a wiper blade to ensure sustained wiper wiping performance.

INSPECTION

M1511019103674

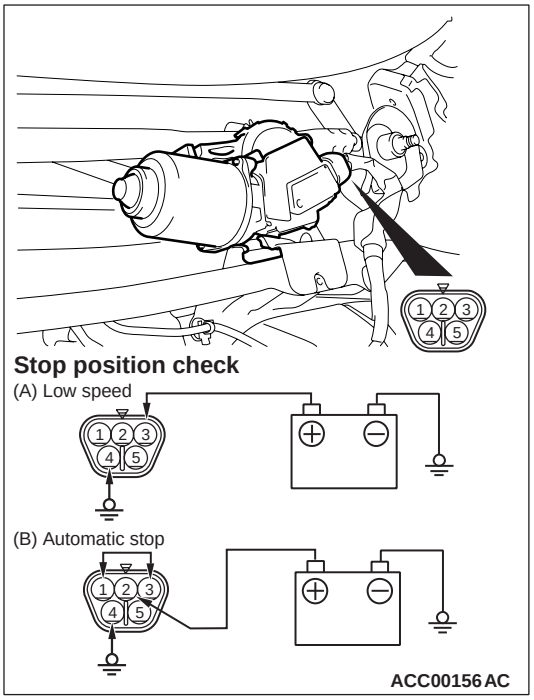
WINDSHIELD WIPER MOTOR CHECK



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

WINDSHIELD WIPER MOTOR AT LOW OR HIGH SPEED OPERATION

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



WINDSHIELD WIPER MOTOR AT STOP POSITION OPERATION

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

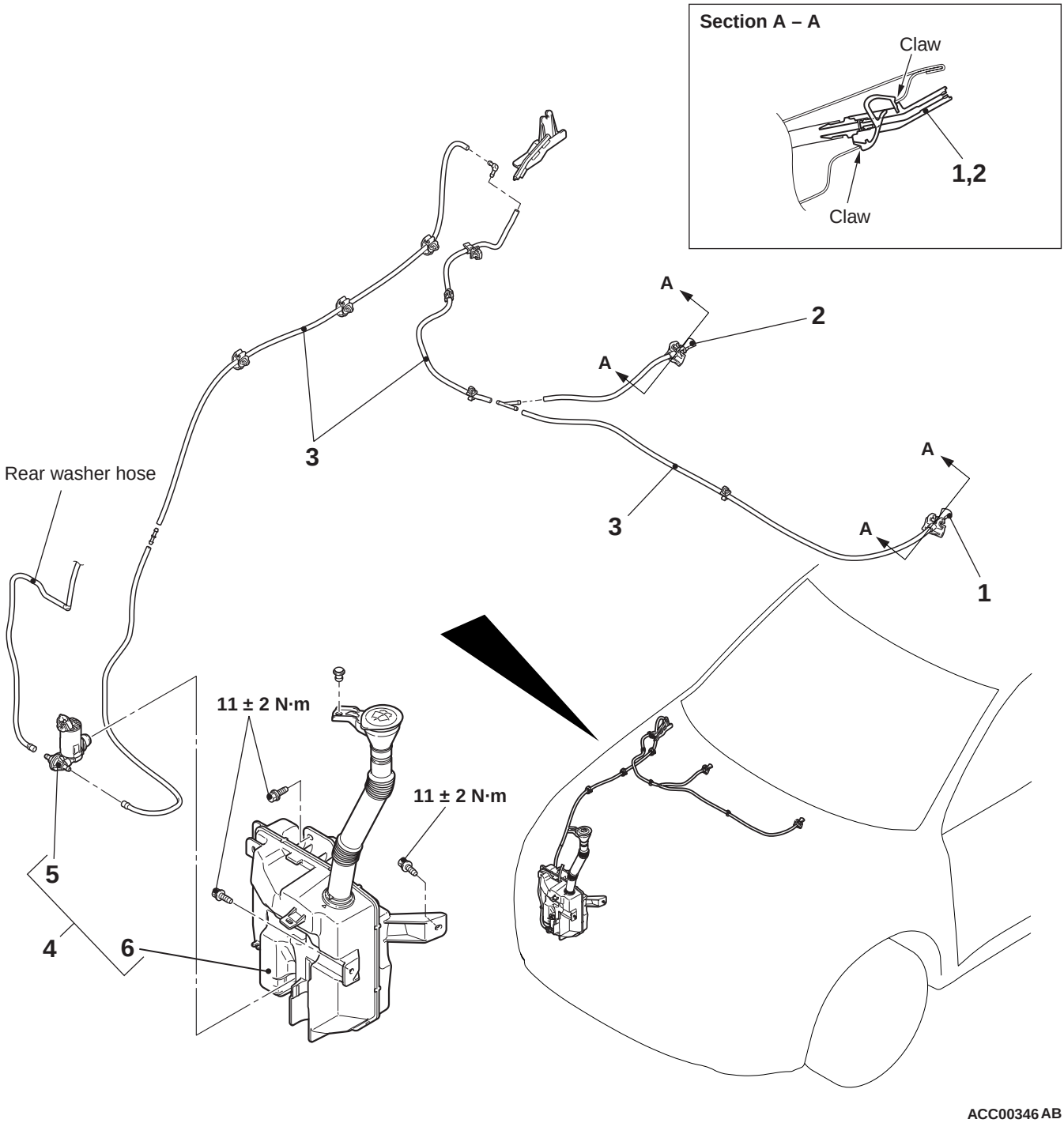
WINDSHIELD WIPER SWITCH CHECK

Check the windshield wiper switch (mist, intermittent, low speed and high speed) from the ETACS diagnosis codes for proper operations(Refer to GROUP 54A, ETACS).

WINDSHIELD WASHER

REMOVAL AND INSTALLATION

M1511008201626



ACC00346 AB

Windshield washer nozzle removal steps

- Connection of windshield washer hose

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

Washer hose removal steps

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

3. Windshield washer hose

Washer tank removal steps

- Front bumper assembly (Refer to P.51-4)
- Engine room side cover (Refer to P.51-19)
- Splash shield (RH) mounting clips
- Connection of front/rear washer hose

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

Washer motor removal steps

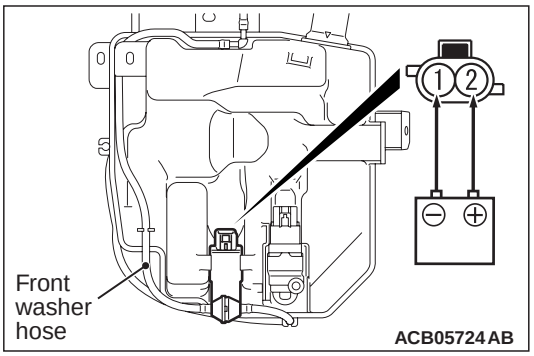
- Front bumper assembly (Refer to P.51-4)
- Connection of front/rear washer hose

5. Windshield washer motor

INSPECTION

M1511019103685

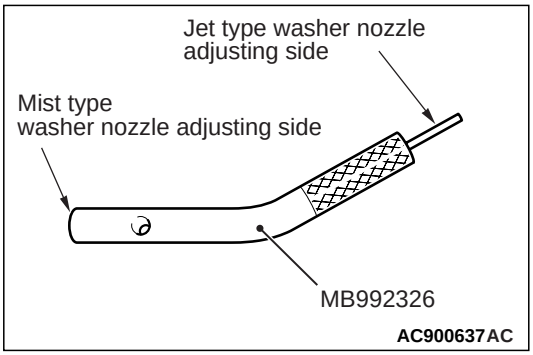
FRONT WASHER MOTOR INSPECTION



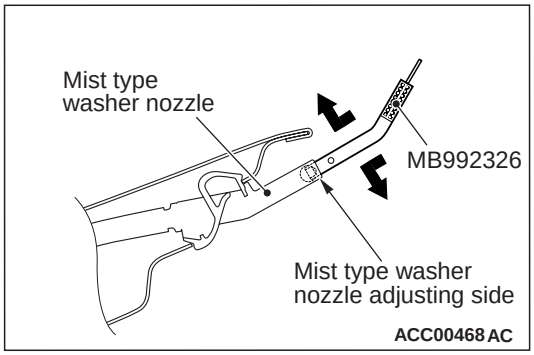
1. The front washer motor must be checked with the washer tank installed and the washer fluid filled.
2. Connect the battery to the washer motor connector as shown. Check that the washer motor delivers washer strongly to the front washer hose side.

WINDSHIELD WASHER FLUID EJECTION CHECK

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



Adjustment of the jet type washer nozzle injection position

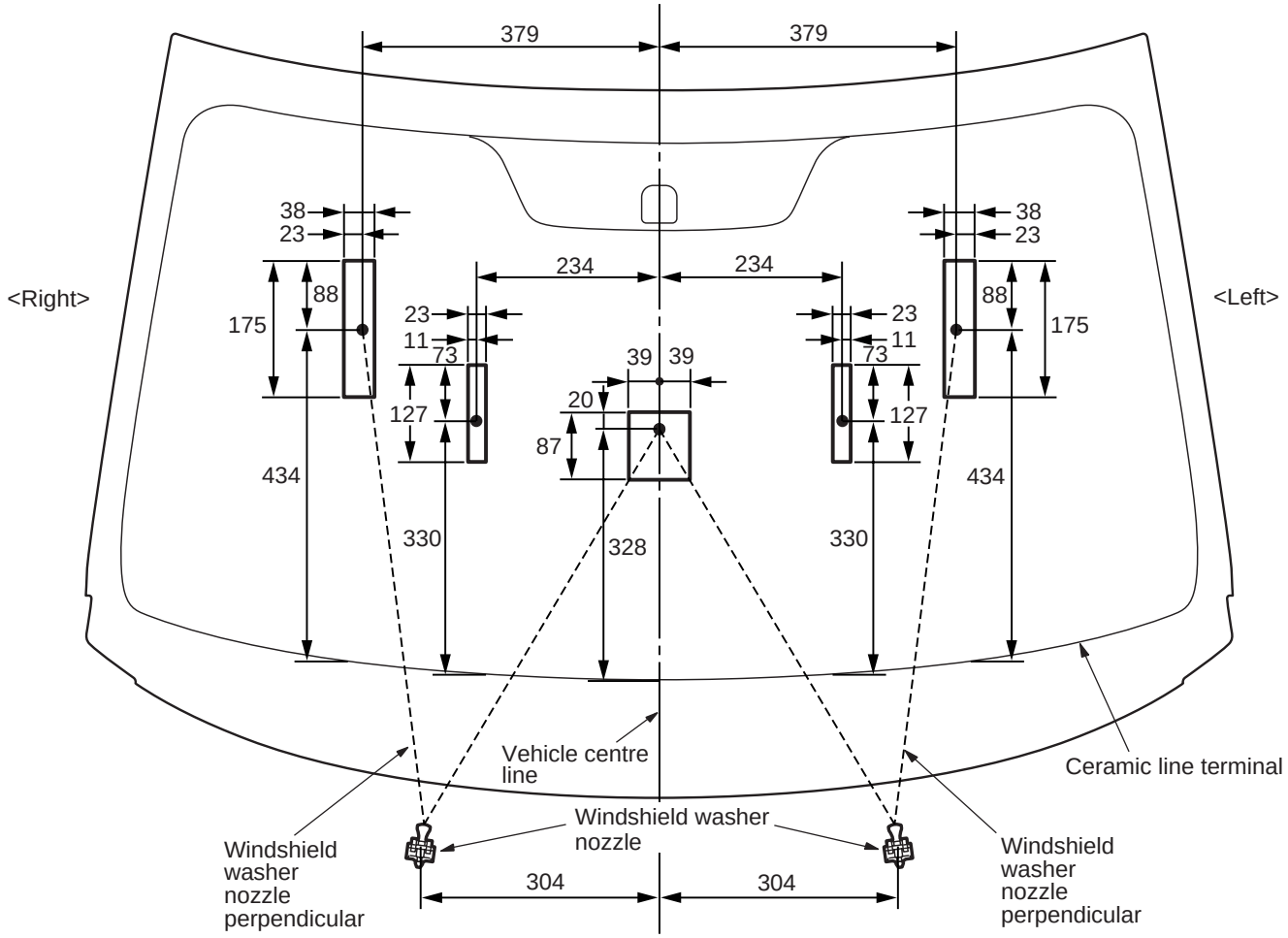


⚠ CAUTION

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

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

Unit: mm



ACC00351AB

WINDSHIELD WASHER SWITCH CHECK

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

LIGHTING CONTROL SENSOR

LIGHTING CONTROL SENSOR REMOVAL AND INSTALLATION

M1511028300097

For removal and installation, refer to GROUP 54A, Lighting control sensor .

Lighting control sensor (rain sensor) adaptation

M1511028600139

⚠ CAUTION

- **Before performing the adaptation, check if the lighting control sensor (rain sensor)-related diagnosis code is set. (if set, refer to GROUP 54A, HEADLAMP DIAGNOSIS CODE CHART).**
- **Turn the wiper switch to the OFF position.**

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

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

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

REAR WIPER AND WASHER

SERVICE SPECIFICATION

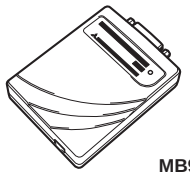
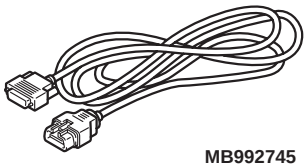
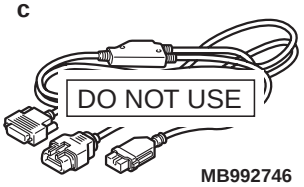
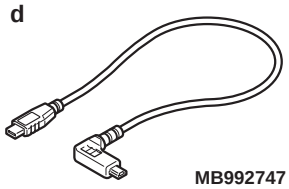
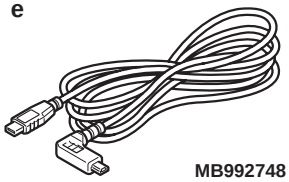
M1511000301544

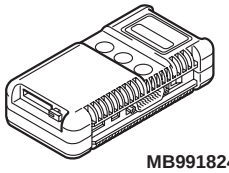
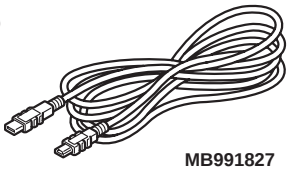
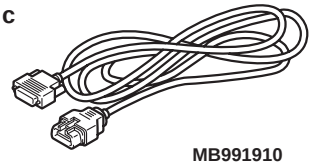
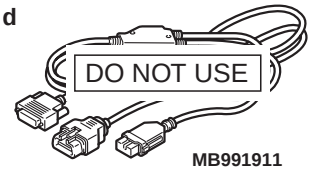
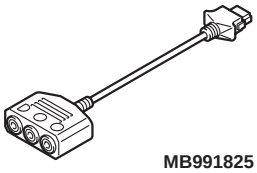
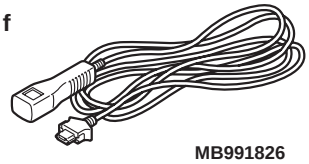
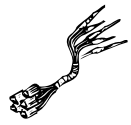
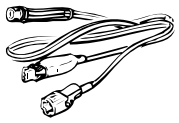
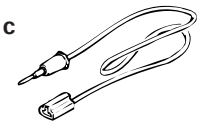
Item	Standard value
Stop position of rear wiper arm/blade assembly (Distance from the edge of the wiper blade to the edge of the ceramic line on the tailgate glass) mm	A: ϕ 2 marking $\pm$ 5

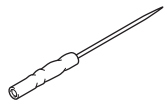
SPECIAL TOOLS

M1511000603284

Tool	Number	Name	Use
 MB992326	MB992326	Adjustment tool, washer nozzle	Injection angle adjustment of the washer nozzle

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991825 f: MB991826	M.U.T.-III sub-assembly a: Vehicle Communication Interface (V.C.I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III measure adapter f: M.U.T.-III trigger harness	**⚠ CAUTION** **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.**
a  b  c  d  MB991223	MB991223 a: MB991219 b: MB991220 c: MB991221 d: MB991222	Harness set a: Check harness b: LED harness c: LED harness adapter d: Probe	Continuity check and voltage measurement at harness wire or connector a: For checking connector pin contact pressure b: For checking power supply circuit c: For checking power supply circuit d: For connecting a locally sourced tester

Tool	Number	Name	Use
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1511014600813

Refer to GROUP 00 – Contents of Troubleshooting .

TROUBLE SYMPTOM CHART

M1511015002241

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
Rear wiper does not work at all.	1	P.51-49
The rear wiper does not stop at the specified park position.	2	P.51-50
When the selector lever is moved to "R" position during the rear wiper operation, the rear wiper does not operate at the continuous mode.	3	P.51-51
The rear washer does not work normally.	4	P.51-52

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

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

OPERATION

The ETACS-ECU operates the rear wiper in accordance with the input signals below.

- Ignition switch (ACC)
- Rear wiper switch

COMMENTS ON TROUBLE SYMPTOM

If the rear wiper does not work normally, the input signal circuits from the ignition switch (ACC), the column switch (column-ECU), the rear wiper motor or ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective rear wiper motor
- Defective column switch (column-ECU)
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Troubleshoot the ETACS. Refer to .
NO : Go to Step 2.

STEP 2. M.U.T.-III data list

Check the input signal related to the rear wiper operation.

- Turn the ignition switch to the ACC position.

Item No.	Item name	Normal conditions
Item 288	ACC switch	ON

OK: Normal condition is displayed.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Refer to GROUP 54A – ETACS, Inspection Procedure 1 "The ignition switch (ACC) signal is not received ."

STEP 3. Check the rear wiper motor.
Refer to GROUP 51 – Rear Wiper and Washer P.51-55.

Q: Is the rear wiper motor normal?
YES : Go to Step 4.
NO : Replace the rear wiper motor.

STEP 4. Measure the resistance at rear wiper motor connector.
(1) Disconnect the connector, and measure the resistance at the wiring harness.
(2) Measure the resistance between rear wiper motor connector (earth terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check of open circuit in earth line between rear wiper motor connector and body earth.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Check of short to the power supply, short to earth and open circuit in RWLO line between rear wiper motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness.

STEP 7. Retest the system.
Check that the rear wiper works normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

INSPECTION PROCEDURE 2: The rear wiper does not stop at the specified park position.

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

COMMENTS ON TROUBLE SYMPTOM

The rear wiper motor or the ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective rear wiper motor
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the rear wiper motor.
Refer to P.51-55.

Q: Is the rear wiper motor normal?
YES : Go to Step 2.
NO : Replace the rear wiper motor.

STEP 2. Measure the voltage at rear wiper motor connector.
(1) Disconnect the connector, and measure the voltage at the wiring harness-side connector.
(2) Measure the voltage between rear wiper motor connector RWIF terminal and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of short to the power supply, short to earth and open circuit in RWAS line between rear wiper motor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. M.U.T.-III data list

- Check the input signal related to the rear wiper operation.
- Ignition switch: ACC or ON
- When rear wiper is operating

Item No.	Item name	Normal conditions
Item 292	Rear wiper auto stop switch	ON

NOTE: Confirm that the M.U.T.-III displays from "ON" to "OFF" when rear wiper stops at the predetermined park position.

OK: Normal condition is displayed.

Q: Is the check result normal?

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

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

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

COMMENTS ON TROUBLE SYMPTOM

If the rear wiper does not operate continuously when the selector lever is moved to the R position during the rear wiper operation, the shift position signal input circuit or the ETACS-ECU may be defective.

PROBABLE CAUSES

- Malfunction of the inhibitor switch
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the operation of the rear wiper.
Check that the rear wiper system works normally by operating the rear wiper switch.

Q: Is the check result normal?
YES : Go to Step 2
NO : Refer to Inspection Procedure 1 "Rear wiper does not work at all P.51-49."

STEP 2. M.U.T.-III data list

- Check the input signal related to the rear wiper operation.
- Ignition switch: ON
- Move the selector lever to the "R" (reverse) position.

Item No.	Item name	Normal conditions
Item 289	Backup lamp or shift reveres SW	ON

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Go to Step 3

STEP 3. Check of short to power supply, short to earth, and open circuit in BLP1 line between ETACS-ECU connector and inhibitor switch connector

Q: Is the check result normal?
YES : Go to Step 4
NO : Repair the connector(s) or wiring harness.

STEP 4. Retest the system.
Check that the rear wiper operates continuously when the selector lever is moved to the R position during the rear wiper operation.

Q: Is the check result normal?

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

INSPECTION PROCEDURE 4: The rear washer does not work normally.

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

COMMENTS ON TROUBLE SYMPTOM

The input circuit from the rear washer switch, the washer motor or ETACS-ECU may be defective.

PROBABLE CAUSES

- Defective washer motor
- Defective column switch
- Malfunction of ETACS-ECU
- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check that the windshield washers work.
Check that the windshield washers work normally.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to Inspection Procedure 10 "Windshield washer does not work P.51-33."

STEP 2. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. Refer to .
NO : Go to Step 3.

STEP 3. M.U.T.-III data list
Check the input signal related to the rear washer operation.

- Ignition switch: ACC
- Rear washer switch: ON

Item No.	Item name	Normal conditions
Item 238	Rear washer	ON

OK: Normal condition is displayed.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Refer to GROUP 54A – ETACS, Inspection Procedure 11 "The column switch signal is not received ."

STEP 4. Check the washer motor.
Check that the washer motor works normally (Refer to P.51-55).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the washer motor.

STEP 5. Retest the system.
Check that the rear washer works normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

ON-VEHICLE SERVICE

OPERATION CHECK OF REVERSE GEAR-LINKED OPERATION OF REAR WIPER

M1511022100169

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

CUSTOMISATION FUNCTION

M1511027402309

By operating the M.U.T.-III ETACS system, the following functions can be customised. The programmed information is held even when the battery is disconnected.

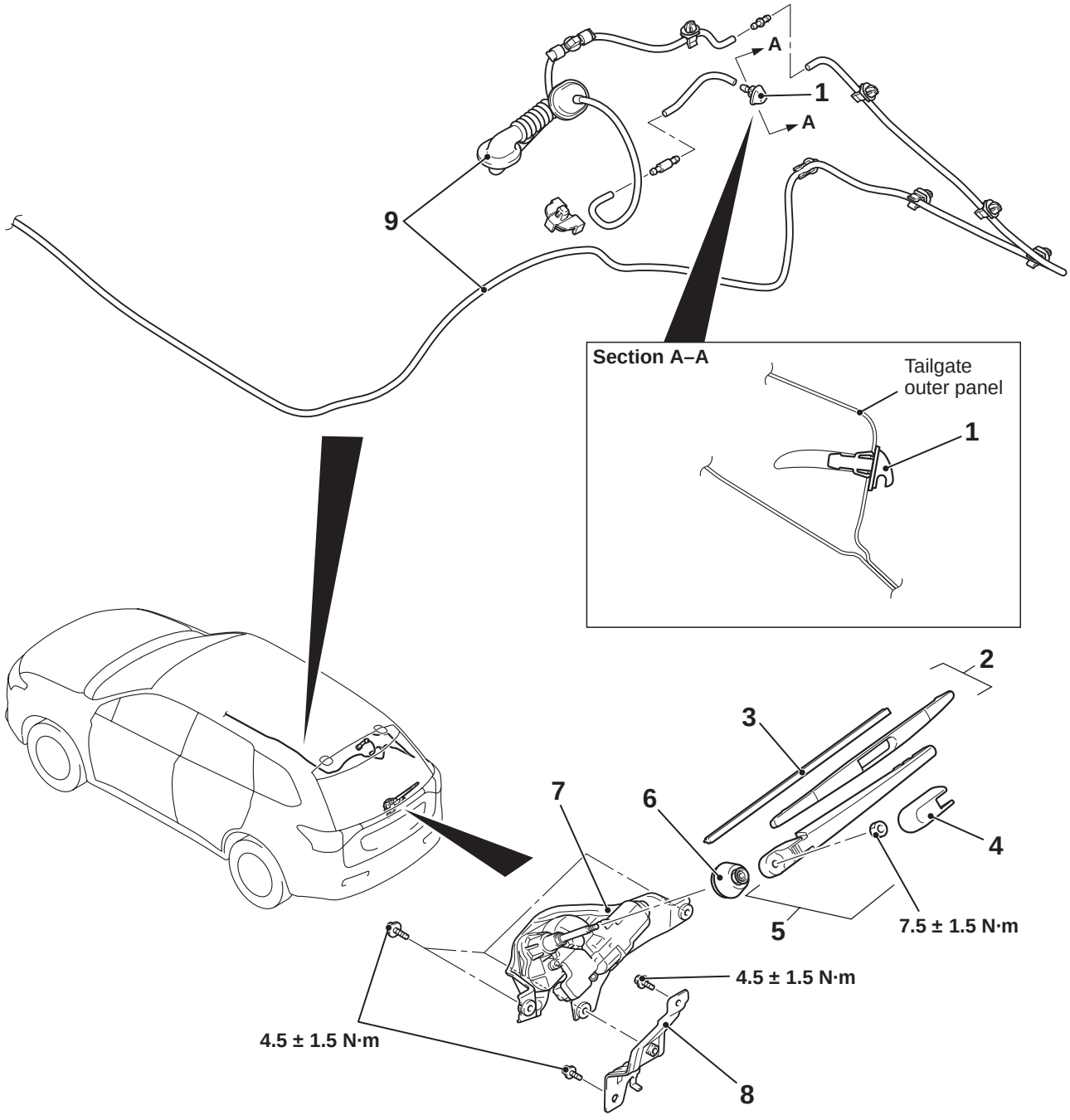
Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
Intermittent time of rear wiper	Adjustment of rear wiper interval	0 sec	No wiper interval
		4 sec	4 seconds
		8 sec	8 seconds (initial condition)
		16 sec	16 seconds
Front /rear wiper washer	Disabling or enabling washer-linked wiper function	Only Washer	No function
		Washer & Wiper	With function: Without delayed finishing wipe function <Initial condition>
		With after wipe	With function: With delayed finishing wipe function
Rear wiper Low speed mode	Disabling or enabling rear wiper continuous operation	Disable	No function
		Enable	With function (initial condition)
Rear wiper (linked reverse gear)	Adjustment of automatic rear window wiper operation with reverse gear engaged	Enable(R wip.ON)	Operates only when the rear wiper switch is ON.
		Enable(R/F wip.)	Operates only when the front or rear wiper switch is ON (initial condition).

REAR WIPER AND WASHER

REMOVAL AND INSTALLATION

M1511008501069

Pre-removal and post-installation operation
- Washer tank removal and installation (Refer to P.51-19.)
- Washer motor removal and installation.)



ACC00121AB

Rear washer nozzle removal step
1. Rear washer nozzle assembly

Rear wiper blade removal steps
2. Rear wiper blade assembly

>>A<< 3. Rear wiper blade

Rear wiper motor removal steps

4. Cover
>>B<< 5. Rear wiper arm assembly
- Tailgate trim (Refer to GROUP 52A, Tailgate Trim)

6. Grommet
7. Rear wiper motor assembly
8. Rear wiper motor bracket

Rear washer hose removal steps

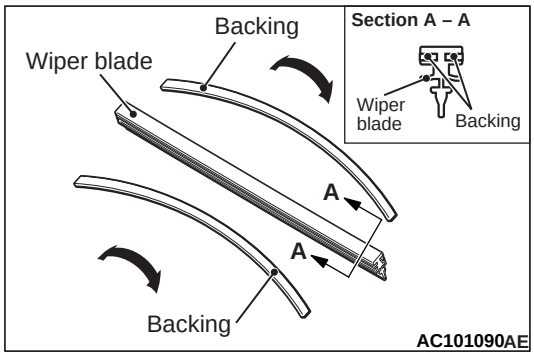
- Front/rear scuff plate, cowl side trim, quarter trim (Refer to GROUP 52A, Interior Trim)
- Tailgate trim (Refer to GROUP 52A, Tailgate Trim)

9. Rear washer hose

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

INSTALLATION SERVICE POINTS

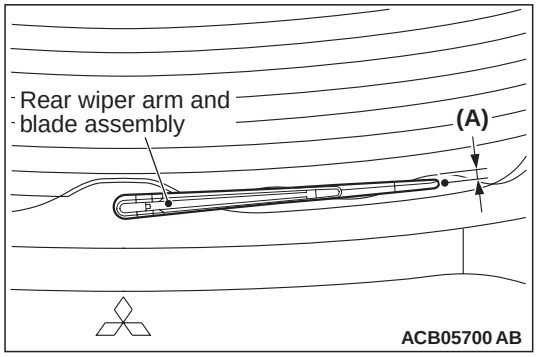
>>A<< REAR WIPER BLADE INSTALLATION



⚠ CAUTION

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

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



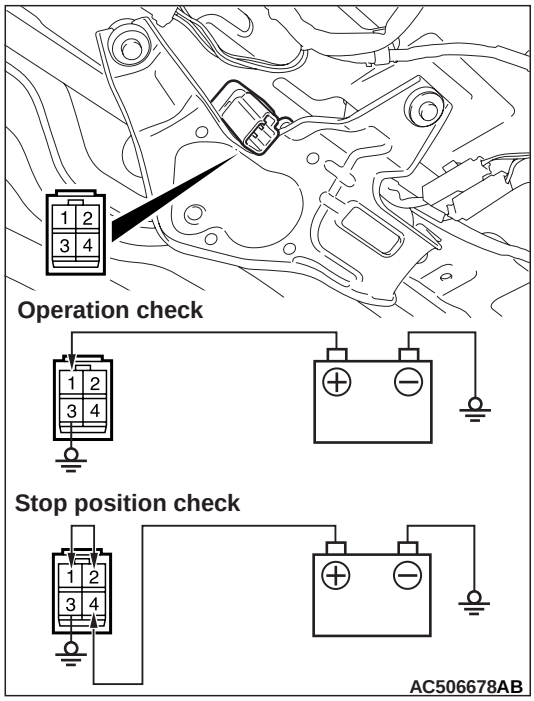
Assemble the wiper blade so that their edge stops at the specified position.

Standard value:
(A): ϕ 2 marking ± 5 mm

INSPECTION

M1511019103696

REAR WIPER MOTOR CHECK



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

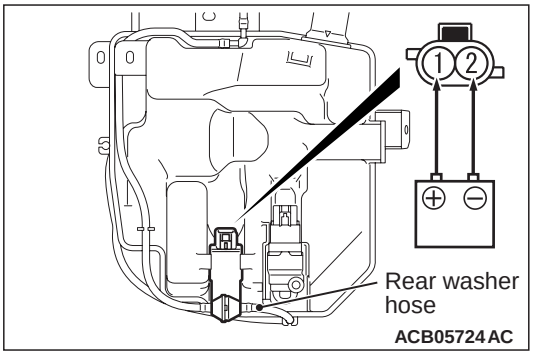
REAR WIPER MOTOR OPERATION CHECK

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

REAR WIPER MOTOR STOP POSITION CHECK

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

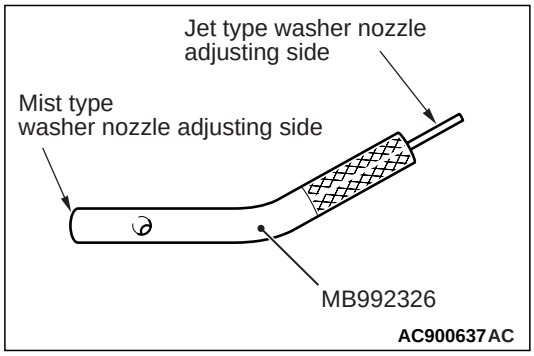
REAR WASHER MOTOR INSPECTION



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

CHECKING THE REAR WASHER NOZZLE INJECTION DIRECTION

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

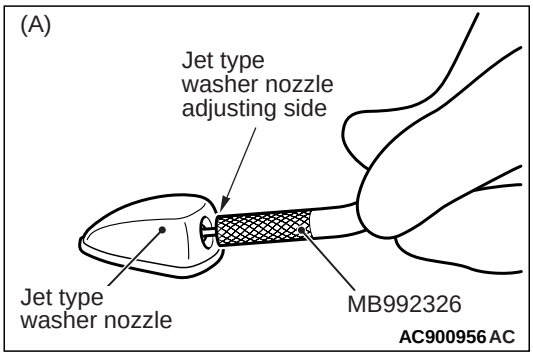


ADJUSTMENT OF THE JET TYPE WASHER NOZZLE INJECTION POSITION

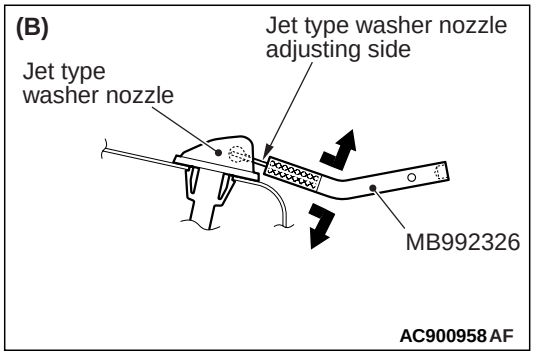
⚠ CAUTION

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

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

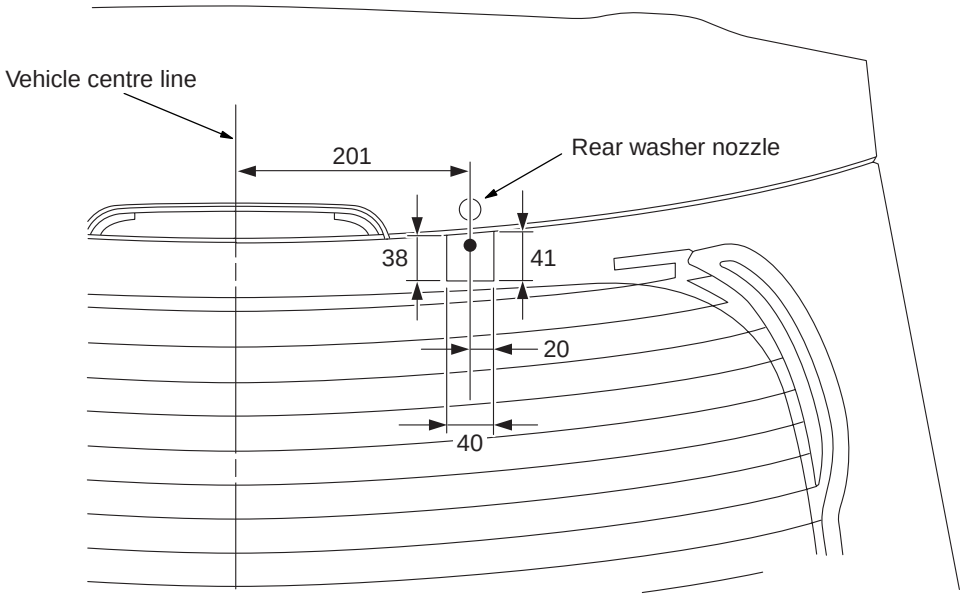


2. Insert the jet type washer nozzle adjusting side of the special tool Adjustment tool, washer nozzle (MB992326) into the injection part of the washer nozzle as shown in figure (A).



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

Unit: mm



ACC00125 AB

CHECKING THE REAR WIPER AND WASHER SWITCH

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

WIPER DEICER

SERVICE SPECIFICATION

M1511000301555

Item	Standard value
Wiper deicer resistance value Ω	2.4 ± 0.24 (at 25 °C)

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1511014600824

Refer to GROUP 00 – Contents of Troubleshooting .

INSPECTION PROCEDURE: The wiper deicer does not work at all.

COMMENTS ON TROUBLE SYMPTOM

The wiper deicer should work for approximately 20 minutes when the rear defogger switch is turned on. If the wiper deicer does not work for the specified period, the defogger relay circuit (wiper deicer power supply circuit) may be defective. If the rear window defogger switch does not work normally, the rear window defogger relay (wiper deicer relay) may be defective.

PROBABLE CAUSES

- Defective wiper deicer
- Defective wiper deicer relay

- Malfunctions of the wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the rear window defogger
Check that the rear window defogger works normally (Refer to GROUP 54A - Printed heater check).

Q: Is the check result normal?
YES : Go to Step 2.
NO : Diagnose the rear window defogger (Refer to GROUP 55 - Check chart for trouble symptoms).

STEP 2. Check the wiper deicer relay
Check that the wiper deicer relay works normally (Refer to P.51-59).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the wiper deicer relay concerned.

STEP 3. Check the wiper deicer
Check that the wiper deicer works normally (Refer to P.51-59).

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the wiper deicer (windshield). (Refer to GROUP 42A - windshield glass).

STEP 4. Measure the resistance at wiper deicer relay connector (DEFR terminal).
(1) Disconnect the connector, and measure the resistance at the relay box.
(2) Measure the resistance between wiper deicer relay connector (DEFR terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check of open circuit in DEFR line between wiper deicer relay connector and body earth.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

STEP 6. Measure the voltage at wiper deicer relay connector (earth terminal).
(1) Ignition switch: ON.
(2) Rear window defogger switch: ON.
(3) Disconnect the connector, and measure the voltage at the relay box side.
(4) Measure the voltage between wiper deicer relay connector (earth terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check of short to open circuit in DEFR line between wiper deicer relay connector and ETACS-ECU.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction)
NO : Repair the wiring harness.

STEP 8. Measure the resistance at wiper deicer connector (earth terminal).
(1) Disconnect the connector, and measure the resistance at the relay box.
(2) Measure the resistance between wiper deicer connector (earth terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check of open circuit in body earth line between wiper deicer connector and body earth.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction.
NO : Repair the wiring harness.

STEP 10. Measure the voltage at wiper deicer relay connector (power supply terminal).
(1) Ignition switch: ON.
(2) Rear window defogger switch: ON.
(3) Disconnect the connector, and measure the voltage at the relay box side.
(4) Measure the voltage between wiper deicer relay connector (power supply terminal) and body

earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 12.
NO : Go to Step 11.

STEP 11. Check of the open circuit in power supply line between wiper deicer relay connector and fusible link (4).

Q: Is the check result normal?
YES : Go to Step 12.
NO : Repair the wiring harness.

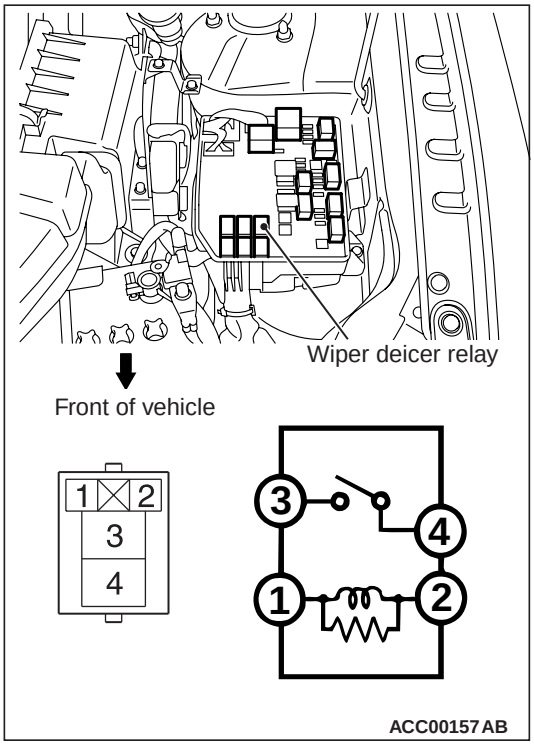
STEP 12. Check of short to power supply and open circuit in power supply line between wiper deicer connector and wiper deicer relay connector.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

ON-VEHICLE SERVICE

M1511000801226

WIPER DEICER RELAY INSPECTION



Battery voltage	Terminal No.	Specified condition
Not applied	3 - 4	Open circuit
Connect terminal No.1 to battery (-) terminal. Connect terminal No.2 to battery (+) terminal.		Continuity (Less than 2 Ω)

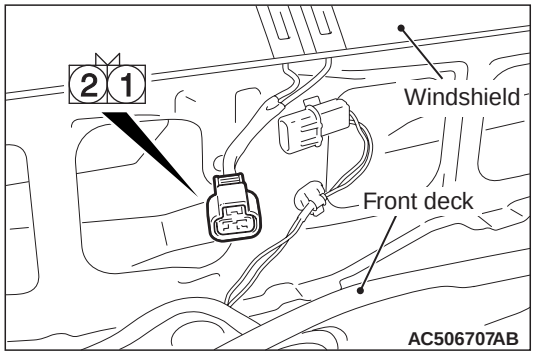
INSPECTION

WIPER DEICER INSPECTION

M1511010100139

⚠ 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.

1. Remove RH side of front deck garnish (Refer to P.51-39).



2. Check that the resistance value between the connector terminals shown in the illustration is at the standard value.

Standard value: 2.4 ± 0.24 Ω at 25°C

HEADLAMP WASHER

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1511014600835

Refer to GROUP 00 - Contents of Troubleshooting .

Inspection Procedure: The headlamp washer does not work.

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

COMMENTS ON TROUBLE SYMPTOM

The headlamp washer motor, the headlamp washer relay, the column switch or the ETACS-ECU may be defective.

POSSIBLE CAUSES

- Malfunction of the headlamp washer motor
- Malfunction of the headlamp washer relay
- Malfunction of the column switch
- Malfunction of the ETACS-ECU
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code.
When the ignition switch is turned to the LOCK (OFF) position, check that the ETACS-ECU does not set the diagnosis code.

Q: Is the diagnosis code set?
YES : Refer to GROUP 54A, Diagnosis Code Chart .
NO : Go to Step 2.

STEP 2. M.U.T.-III data list
Check the input signals below which are related to the headlamp washer.

- Ignition switch: ON
- Headlamp washer switch: ON

Item No.	Item name	Normal condition
214	Head lamp washer	ON
254	IG voltage	System voltage

OK: Normal conditions are displayed for all the items.

Q: Is the check result normal?
All the signals are received normally. : Go to Step 3.
The headlamp washer switch signal is not received. : Refer to GROUP 54A, Input signal procedure 11 "The column switch signal is not received ."
The ignition switch (IG1) signal is not received. : Refer to GROUP 54A, Input signal procedure 2 "The ignition switch (IG1) signal is not received ."

STEP 3. Check the headlamp washer motor assembly.
Refer to P.51-63.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the headlamp washer motor.

STEP 4. Resistance measurement at headlamp washer motor connector (earth terminal).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Continuity between headlamp washer motor connector (earth terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check of open circuit in earth line between headlamp washer motor connector and body earth.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

STEP 6. Check the headlamp washer relay.
Refer to P.51-63.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the headlamp washer relay.

STEP 7. Voltage measurement at headlamp washer relay connector (power supply line).
(1) Remove the headlamp washer relay, and measure at wiring harness side.
(2) Check the voltage between headlamp washer relay connector (power supply terminals) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check of the open circuit in power supply line between headlamp washer relay connector and the fusible link (4).

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the wiring harness.

STEP 9. Check of the open circuit in HWA line between ETACS-ECU connector and headlamp washer relay connector.

Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the wiring harness.

STEP 10. Check of the open circuit in power supply line between headlamp washer motor connector and headlamp washer relay connector.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the wiring harness.

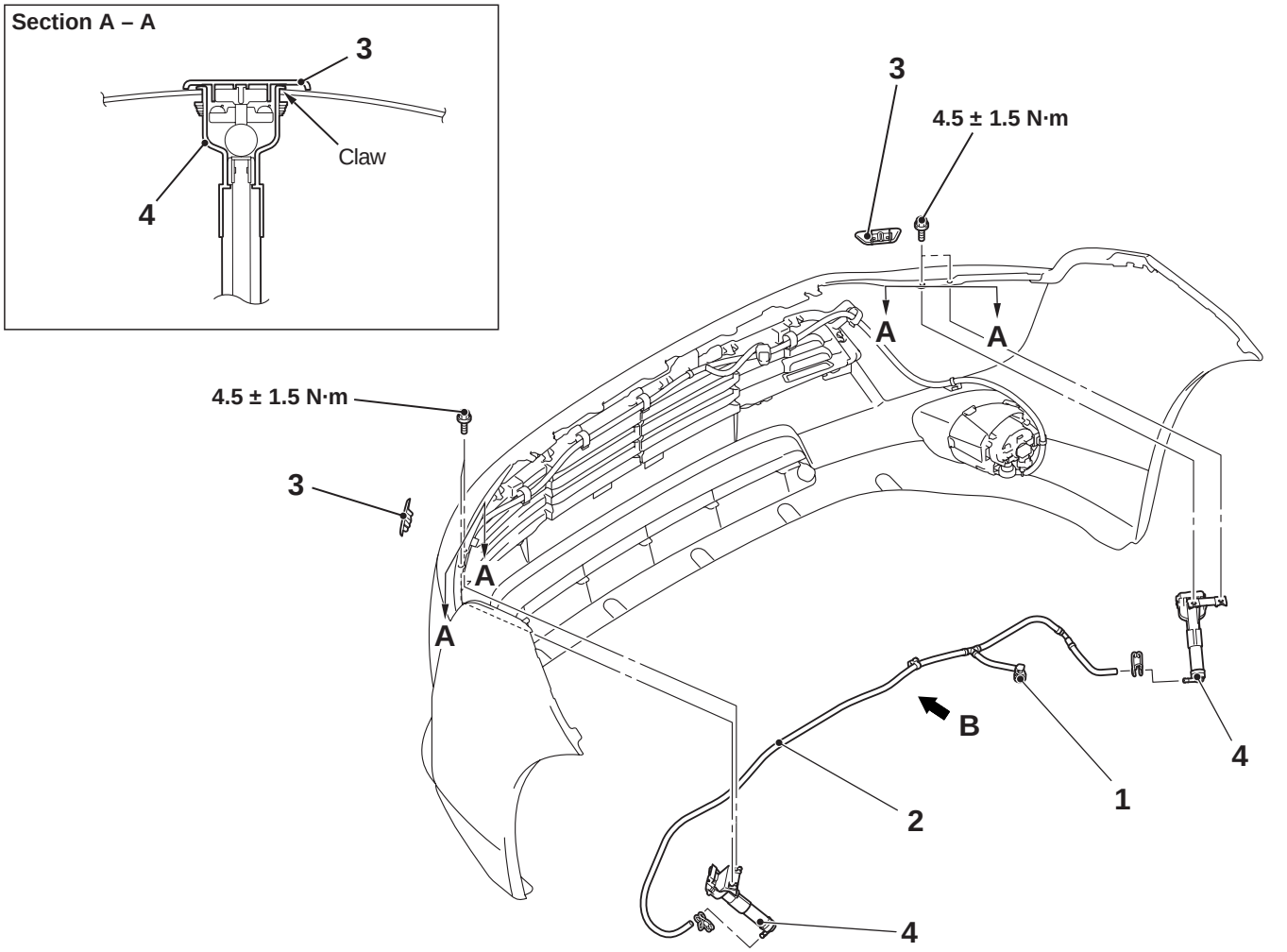
STEP 11. Retest the system.
The headlamp washer should now work normally.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU. Then write the Chassis Number (Chassis No.) of immobiliser system (Refer to GROUP 00, Precautions Before Service - How to Perform Chassis Number (Chassis No.) Writing).

HEADLAMP WASHER

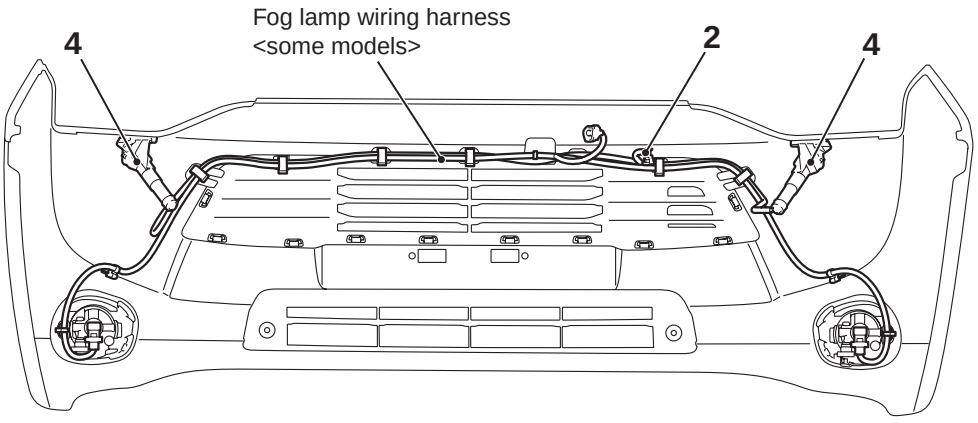
REMOVAL AND INSTALLATION

M1511009700438



ACB06024AB

View B



ACB05058AB

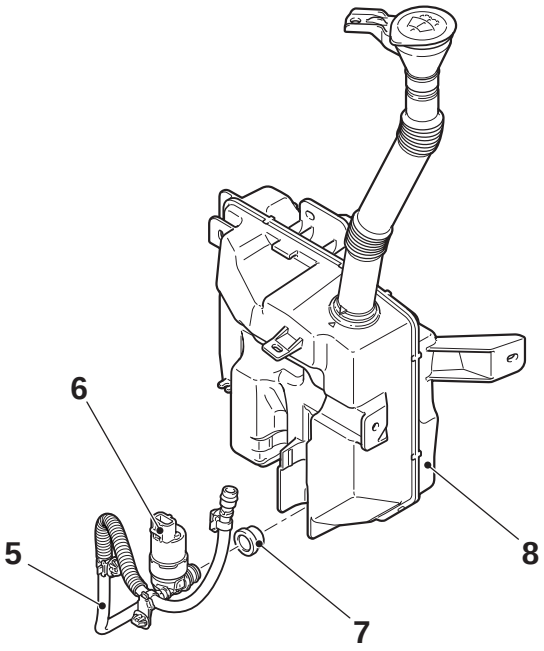
Headlamp washer actuator assembly Removal

- Front bumper assembly (Refer to P.51-4)

1. Headlamp washer hose connection (bumper side)
2. Headlamp washer hose

Headlamp washer actuator assembly Removal (Continued)

3. Headlamp washer cover
4. Headlamp washer actuator assembly



ACB05721AB

Washer tank removal steps

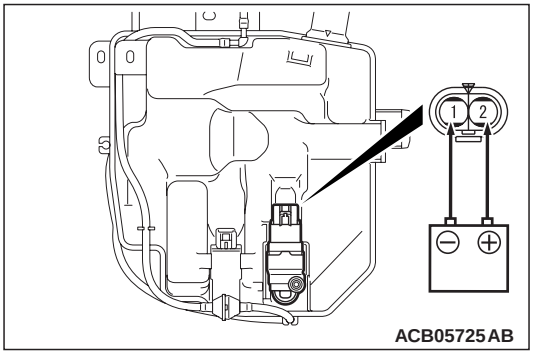
- Front bumper assembly (Refer to P.51-4)

5. Headlamp washer hose (body side)
6. Headlamp washer motor
7. Headlamp washer motor packing
8. Windshield washer tank (Refer to P.51-43)

INSPECTION

M1511009800156

HEADLAMP WASHER MOTOR CHECK



1. Remove the headlamp washer motor connector.
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 the negative battery terminal.

MARK

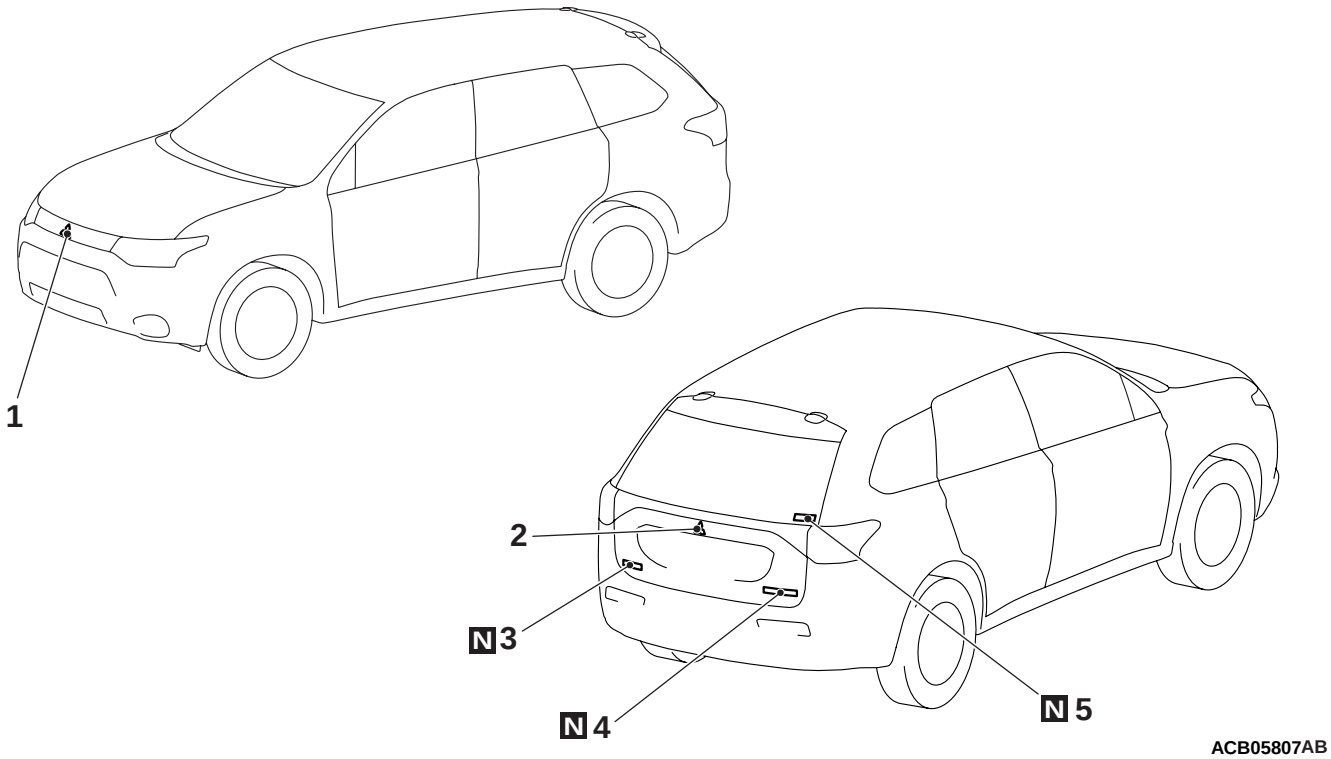
LUBRICANT

M1511000400140

Item		Specified lubricant	Quantity
Degrease agent	Grease and dirt removal from parts surface	Parts cleaner (MZ100387 or equivalent)	As required

REMOVAL AND INSTALLATION

M1511011803884



	1.	Front three-diamond mark (Refer to P.51-9)
>>A<<	2.	Rear three-diamond mark (Refer to P.51-9)
>>A<<	3.	MITSUBISHI mark
>>A<<	4.	OUTLANDER mark
>>A<<	5.	4WD mark <4WD>

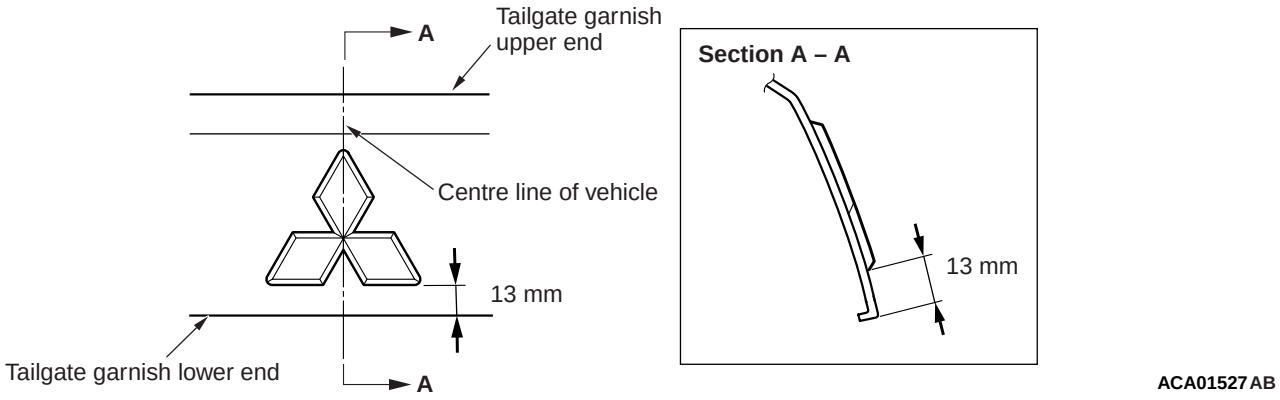
INSTALLATION SERVICE POINT

>>A<< MARK APPLICATION

1. Installation position

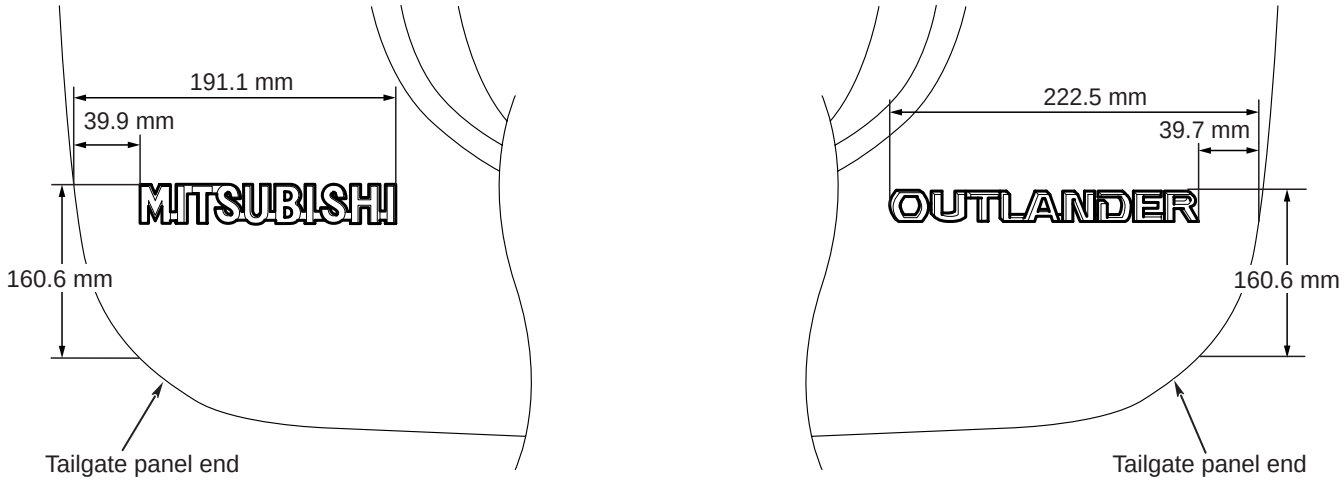
   Attach each mark to the position shown in the illustration.

2. Rear three-diamond mark



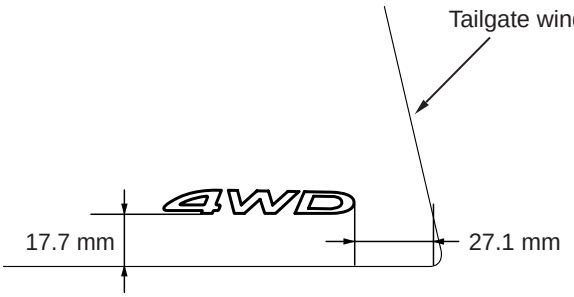
ACA01527AB

3. MITSUBISHI mark
4. OUTLANDER mark



ACB05772AB

5. 4WD mark <4WD>



ACC00072AB

2. Installation procedure
   (1) Use Parts Cleaner (MZ100387 or equivalent) to clean the mark installation surfaces on the body.

⚠ CAUTION
When attaching the marks, the ambient temperature should be 20 – 38°C and the air should be completely free of dust. If the ambient temperature is lower than 20°C, the marks and the places on the vehicle body where the marks are to be attached should be heated to 20 – 30°C.

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

OUTSIDE MIRROR

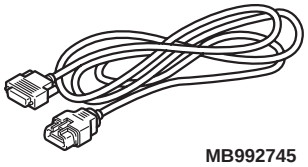
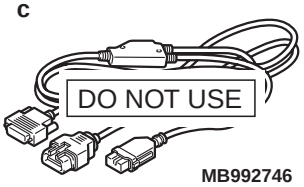
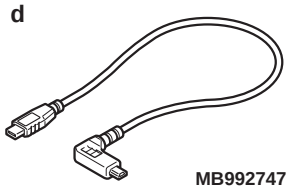
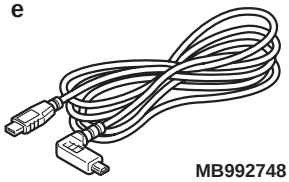
SERVICE SPECIFICATION

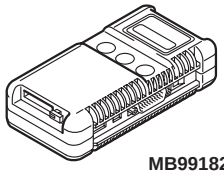
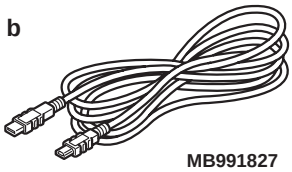
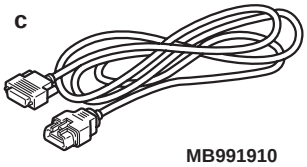
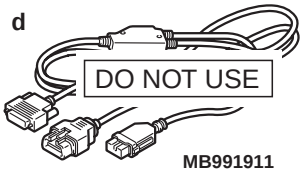
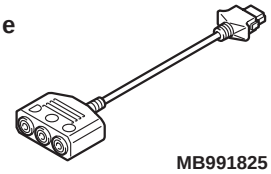
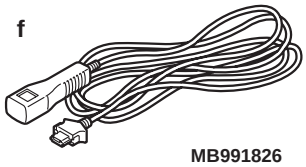
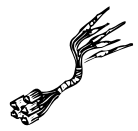
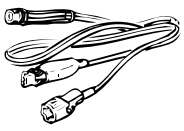
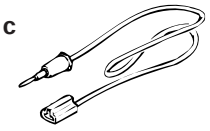
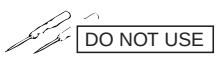
M1511000301566

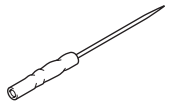
Item	Standard value
Heated door mirror resistance value Ω	7.2 ± 1.4 (at 25 °C)

SPECIAL TOOLS

M1511000603295

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	Check the vehicle speed-dependent automatic unfolding function of the outside rear-view mirrors

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (for vehicles with CAN communication) d. M.U.T.-III main harness B (for vehicles without CAN communication) e. Measuring adapter harness f. M.U.T.-III trigger harness	⚠ CAUTION **For vehicles with CAN communication, use the M.U.T.-III main harness A to send simulated vehicle speed. If you connect the M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Check the vehicle speed-dependent automatic unfolding function of the outside rear-view mirrors
a  b  c  d  MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222	Wiring harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester

Tool	Number	Name	Use
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1511014600846

Refer to GROUP 00 – Contents of Troubleshooting .

TROUBLE SYMPTOM CHART

M1511015002252

TROUBLE SYMPTOM	Inspection procedure No.	Reference page
Electric-folding door mirrors do no not work at all.	1	P.51-68
One of electric-folding door mirrors does not work	2	P.51-69
Electric-folding door mirror timer function does not work normally.	3	P.51-70
Vehicle speed-dependent unfolding function does not work normally.	4	P.51-71
Ignition-linked fold/unfold function does not work normally.	5	P.51-72
Keyless entry system-linked fold/unfold function does not work normally.	6	P.51-73
None of the heated door mirrors operate.	7	P.51-73
Either of the door mirror heater elements does not work.	8	P.51-74

Inspection Procedure 1: Electric-folding door mirrors do not work at all.

⚠ CAUTION

- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

OPERATION

The ETACS-ECU operates this function in accordance with the input signals below.

- Ignition switch (ACC)
- Electric remote controlled mirror switch (folding/unfolding switch)

YES : Troubleshoot the ETACS. (Refer to GROUP 54A – ETACS, Diagnosis Code Chart .)

COMMENTS ON TROUBLE SYMPTOM

If the system does not work, the input circuit from the ignition switch (ACC) or the remote controlled mirror switch (folding/unfolding switch), or the ETACS-ECU may be faulty.

PROBABLE CAUSES

- Defective remote controlled mirror switch
- Defective ignition switch (ACC)
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code

Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?

NO : Go to Step 2.

STEP 2. M.U.T.-III data list

Check the input signals which are related to the electric folding door mirrors.

- Ignition switch: ACC
- Electric remote controlled mirror switch (folding/unfolding switch): ON

Item No.	Item name	Normal conditions
Item 267	Mirror switch	ON
Item 288	ACC switch	ON

OK: Normal conditions are displayed for all the items.

Q: Is the check result normal?

Normal conditions are displayed for all the items. : Go to Step 3.

Normal condition is not displayed for item No. 267. : Refer to GROUP 54A – ETACS, Inspection Procedure 13 "The remote controlled mirror switch (fold switch) signal is not received." .

Normal condition is not displayed for item No. 288. : Refer to GROUP 54A – ETACS, Inspection Procedure 1 "The ignition switch (ACC) signal is not received." .

STEP 3. M.U.T.-III data list

Check the data list which are related to the electric folding door mirrors.

- Turn on the folding/unfolding switch when the door mirrors are folded.

Item No.	Item name	Normal conditions
Item 241	Hold mirror open	ON
Item 242	Hold mirror close	Off

- Turn on the folding/unfolding switch when the door mirrors are unfolded.

Item No.	Item name	Normal conditions
Item 241	Hold mirror open	Off
Item 242	Hold mirror close	ON

OK: Normal condition is displayed.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 4.

STEP 4. Check of short to power supply, short to earth, and open circuit in +B2 line between fusible link and ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the connector(s) or wiring harness.

STEP 5. Retest the system.

Check that the electric folding door mirrors work normally.

Q: Is the check result normal?

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

NO : Replace ETACS-ECU.

Inspection Procedure 2: One of electric-folding door mirrors does not work.

⚠ CAUTION

- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

COMMENTS ON TROUBLE SYMPTOM

If one of the electric folding door mirrors does not work, either door mirror assembly may be defective.

PROBABLE CAUSES

- Malfunction of the door mirror assembly

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

DIAGNOSTIC PROCEDURE

STEP 1. Determine a trouble spot.

Q: Which of the door mirrors cannot be folded/unfolded?
RH side door mirror : Go to Step 2.
LH side door mirror : Go to Step 4.

STEP 2. Check the door mirror assembly (RH).
Check that the door mirror assembly (RH) works normally (Refer to).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the door mirror assembly (RH).

STEP 3. Check of short to power supply, short to earth, and open circuit in MO-1&MO-2, MC-1&MC-2 line between ETACS-ECU connector and door mirror assembly (RH) connector

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the connector(s) or wiring harness.

STEP 4. Check the door mirror assembly (LH).
Check that the door mirror assembly (LH) works normally (Refer to).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the door mirror assembly (LH).

STEP 5. Check of short to power supply, short to earth, and open circuit in MO-1&MO-2, MC-1&MC-2 line between ETACS-ECU connector and door mirror assembly (LH) connector

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the connector(s) or wiring harness.

STEP 6. Retest the system.
Check that the electric folding door mirrors work normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Replace ETACS-ECU.

Inspection Procedure 3: Electric-folding door mirror timer function does not work normally.

⚠ CAUTION
- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

COMMENTS ON TROUBLE SYMPTOM
If the door mirrors can be operated by using the electric remote controlled mirror switch (folding/unfolding switch), the ETACS-ECU may be faulty.

PROBABLE CAUSES
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Check the operation of the electric-folding door mirror.
Check that the electric folding door mirrors can work normally with the ignition switch at ACC.
- Ignition switch: ACC

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to Inspection Procedure 1 "Electric-folding door mirrors do not work at all P.51-68."

STEP 2. M.U.T.-III diagnosis code
Check if an ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. (Refer To GROUP 54A – ETACS, Diagnosis Code Chart .)
NO : Go to Step 3.

STEP 3. Retest the system.
Check that the electric-folding door mirror timer function works normally.

Q: Is the check result normal?

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

Inspection Procedure 4: Vehicle speed-dependent unfolding function does not work normally.

⚠ CAUTION
- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

OPERATION
The ETACS-ECU calculates the intermittent wiper interval according to the vehicle speed signal which is sent by the ABS-ECU <Vehicles without ASC> or ASC-ECU <Vehicles with ASC>.
- Ignition switch (IG1)

COMMENTS ON TROUBLE SYMPTOM
If this function does not work normally, these input signal circuit(s) or the ETACS-ECU may be defective. Also, with a customise function, the door mirrors may be set to a mode in which the vehicle speed-dependent unfolding function is not activated.

PROBABLE CAUSES
- Faulty vehicle speed signal
- The CAN bus line is defective.
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Check the ETACS customise function.
Use the ETACS customise function to confirm that "AUTO FOLD MIRROR" is set to "VEHICLE SPEED DEPENDENT OPEN".

Q: Is the check result normal?

YES : Go to Step 2.
NO : Use the ETACS customise function to set "AUTO FOLD MIRROR" to "VEHICLE SPEED DEPENDENT OPEN" (Refer to).

STEP 2. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the CAN bus normal?
YES : Go to Step 3.
NO : Repair the CAN bus line. (Refer to GROUP 54C - Troubleshooting .)

STEP 3. M.U.T.-III diagnosis code.
Check that the ETACS-ECU sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS.(Refer to GROUP 54A – ETACS, Diagnosis Code Chart .)
NO : Go to Step 4.

STEP 4. M.U.T.-III other system diagnosis code
Check that the ABS-ECU<Vehicles without ASC> or ASC-ECU <Vehicles with ASC> sets a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose the ABS-ECU <Vehicles without ASC> (Refer to GROUP 35B – Diagnosis Code Chart) or ASC-ECU <Vehicles with ASC> (Refer to GROUP 35C – Diagnosis Code Chart .
NO : Go to Step 5.

STEP 5. Retest the system.
Check that the vehicle speed-dependent unfolding function of the door mirrors works normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction .)
NO : Replace ETACS-ECU.

Inspection Procedure 5: Ignition-linked fold/unfold function does not work normally.

⚠ CAUTION

- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

OPERATION

The ETACS-ECU operates this function in accordance with the input signals below.

- Ignition switch (IG1)
- Driver's door switch

COMMENTS ON TROUBLE SYMPTOM

If this function does not work normally, these input signal circuit(s) or the ETACS-ECU may be defective. Also, with the customise function, the door mirrors may be set to a mode in which the ignition interlock fold/unfold function is not activated.

PROBABLE CAUSES

- Malfunction of the driver's door switch
- Malfunction of the ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the ETACS customise function.

Use the ETACS customise function to confirm that "AUTO FOLD MIRROR" is set to "IG OPEN OR CLOSE".

Q: Is the check result normal?

YES : Go to Step 2.

NO : Use the ETACS customise function to set "AUTO FOLD MIRROR" to "IG OPEN OR CLOSE" (Refer to).

STEP 2. M.U.T.-III data list

Check an input signal related to ignition-linked folding/unfolding function.

- Driver's door: open
- Ignition switch: ON

Item No.	Item name	Normal conditions
Item 254	IG voltage	System voltage
Item 256	Dr door ajar switch	Open

OK: Normal conditions displayed for all the items

Q: Is the check result normal?

Normal conditions displayed for all the items : Go to Step 3.

Normal condition is not displayed for item No. 254. : Refer to GROUP 54A – ETACS, Inspection Procedure 2 "The ignition switch (IG1) signal is not received" .

Normal condition is not displayed for item No. 256. : Refer to GROUP 54A – ETACS, Inspection Procedure 5 "The front door switch (driver's side) signal is not received" .

STEP 3. Retest the system.

Check that the ignition-liked fold/unfold function for the door mirrors works normally.

Q: Is the check result normal?

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

NO : Replace the ETACS-ECU.

Inspection Procedure 6: Keyless entry system-linked fold/unfold function does not work normally.

⚠ CAUTION
- **Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID)**

OPERATION
The ETACS-ECU operates this function in accordance with the keyless entry transmitter input signals.

COMMENTS ON TROUBLE SYMPTOM
If this function does not work normally, keyless entry transmitter input signal circuit or the ETACS-ECU may be defective. Also, with the customise function, the door mirrors may be set other than to the keyless entry interlock fold/unfold function.

PROBABLE CAUSES
- Defective keyless entry transmitter
- Malfunction of the ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check the ETACS customise function.
Use the ETACS customise function to confirm that "AUTO FOLD MIRROR" is set to "KEYLESS OPEN OR CLOSE".

Q: Is the check result normal?
YES : Go to Step 2.
NO : Use the ETACS customise function to set "AUTO FOLD MIRROR" to "KEYLESS OPEN OR CLOSE" (Refer to).

STEP 2. Check the keyless entry operation.
Check that the keyless entry system works normally.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to GROUP 42 – KOS, Inspection Procedure 8 "Keyless entry function does not work." .

STEP 3. Retest the system.
Check that the keyless entry interlock fold/unfold function for the door mirrors works normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

Inspection Procedure 7: None of the heated door mirrors operate

COMMENTS ON TROUBLE SYMPTOM
The heated door mirrors should work when the rear defogger switch is turned on. If the mirror heater does not work for the specified period, the defogger relay circuit (heated door mirror power supply circuit) may be defective.

POSSIBLE CAUSES
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

Step 1. Check the rear window defogger.
Check that the rear window defogger system should work normally. (Refer to GROUP 54A, Printed heater check .)

Q: Is the check result normal?
YES : Intermittent malfunction. Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, – How to Cope with Intermittent Malfunctions .)
NO : Carry out the troubleshooting for the rear window defogger. (Refer to GROUP 55, Troubleshooting .)

Inspection Procedure 8: Either of the door mirror heater elements does not work.

COMMENTS ON TROUBLE SYMPTOM

If one of the door mirror heater elements does not work, the power supply or earth to the element, or the element itself may be defective.

PROBABLE CAUSES

- Door mirror heater elements failed
- Wiring harness or connector failure

DIAGNOSTIC PROCEDURE

STEP 1. Determine a trouble spot.

Q: Which of door mirror heater elements does not work?
RH side door mirror : Go to Step 2.
LH side door mirror : Go to Step 8.

STEP 2. Check of the heater element of the door mirror (RH)

Check the heater element of the door mirror (RH). (Refer to Heater Element Check .)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the mirror glass of the door mirror assembly (RH).

STEP 3. Measure the resistance at the door mirror assembly (RH) connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between door mirror assembly (RH) connector (earth terminal) and body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check of open circuit in earth line between the door mirror assembly (RH) connector and body earth.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

STEP 5. Measure the voltage at the door mirror assembly (RH) connector.

(1) Turn the ignition switch to the ON position.
(2) Turn on the rear window defogger switch.
(3) Disconnect the connector, and measure at the wiring harness side.
(4) Measure the voltage between door mirror assembly (RH) connector (power supply terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Go to Step 6.

STEP 6. Check of open circuit in DEFO-1&DEFO-2 line between door mirror assembly (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector(s) or wiring harness.

STEP 7. Retest the system.

Check that the heater element of the door mirror (RH) functions normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the door mirror assembly (RH).

STEP 8. Check of the heater element of the door mirror (LH)

Check the heater element of the door mirror (LH). (Refer to Heater Element Check .)

Q: Is the check result normal?
YES : Go to Step 9.
NO : Replace the mirror glass of the door mirror assembly (LH).

STEP 9. Measure the resistance at the door mirror assembly (LH) connector.

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

(2) Measure the resistance between door mirror assembly (LH) connector (earth terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 10.

STEP 10. Check of open circuit in earth line between the door mirror assembly (LH) connector and body earth.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

STEP 11. Measure the voltage at the door mirror assembly (LH) connector.
(1) Turn the ignition switch to the ON position.
(2) Turn on the rear window defogger switch.
(3) Disconnect the connector, and measure at the wiring harness side.
(4) Voltage between door mirror assembly (LH) connector (power supply terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Go to Step 12.

STEP 12. Check of open circuit DEFO-1&DEFO-2 line between door mirror assembly (LH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 13.
NO : Repair the connector(s) or wiring harness.

STEP 13. Retest the system.
Check that the heater element works normally.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the door mirror assembly (LH).

ON-VEHICLE SERVICE

CHECK THE VEHICLE SPEED-DEPENDENT AUTOMATIC UNFOLDING FUNCTION OF THE OUTSIDE REAR-VIEW MIRRORS

M1511023300229

1. Check that the outside rear-view mirrors are unfolded when you set simulated vehicle speed of 30 km/h or more by using the M.U.T.-III with the mirrors folded.
2. If not, carry out the troubleshooting (Refer to P.51-71).

CHECK THE IGNITION-LIKED FOLD AND UNFOLDING FUNCTION OF THE OUTSIDE REAR-VIEW MIRRORS

M1511023400646

1. When the ignition switch is turned on with the driver's door closed and the door mirrors folded, the mirrors should be unfolded. When the ignition switch is turned off and the driver's door is opened with the mirrors unfolded, they should be folded.
2. If not, carry out the troubleshooting (Refer to P.51-72).

NOTE: The electric folding outside rear-view mirrors are set to the vehicle speed-dependent unfolding as default setting. Prior to this check, confirm whether the ignition-linked function is enabled or not (Refer to).

DOOR MIRROR KEYLESS ENTRY FUNCTION OR KOS-LINKED FOLDING AND UNFOLDING FUNCTION CHECK

M1511023500610

1. When you use the keyless entry system or the KOS to unlock the doors with the mirrors folded, they should be unfolded. When the keyless entry system locks the doors with the mirrors unfolded, they should be folded.
2. If not, carry out the troubleshooting (Refer to P.51-73).

NOTE: The electric folding outside rear-view mirrors are set to the vehicle speed-dependent unfolding as default setting. Prior to this check, confirm whether the keyless entry system-linked function is enabled or not (Refer to).

CHECK OF DOOR MIRROR TIMER FUNCTION

M1511021700265

1. Turn the ignition switch to the "LOCK" (OFF) position. Then check that the door mirrors can be folded and unfolded for approximately 30 seconds.
2. If not, carry out the troubleshooting (Refer to P.51-70).

CUSTOMISATION FUNCTION

M1511027402310

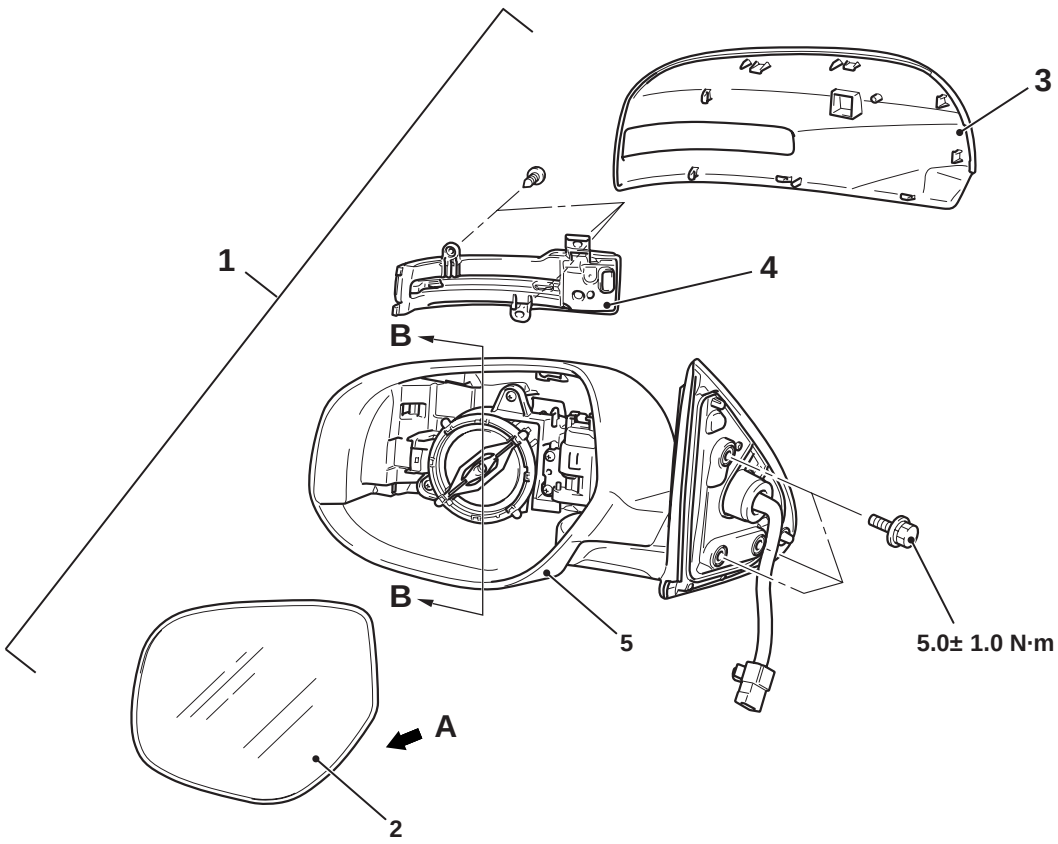
By operating the M.U.T.-III ETACS system, the following functions can be customised. The programmed information is held even when the battery is disconnected.

Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
Auto fold mirror	Electric folding door mirror automatic unfolding function <vehicles with electric retractable remote controlled door mirrors>	Not Auto	No synchronised operation
		Open Vehicle SPD	Vehicle speed-dependent operation
		Open/Close by IG	Ignition switch linked operation
		OPN/CLS Keyless	Keyless entry linked operation (initial condition)

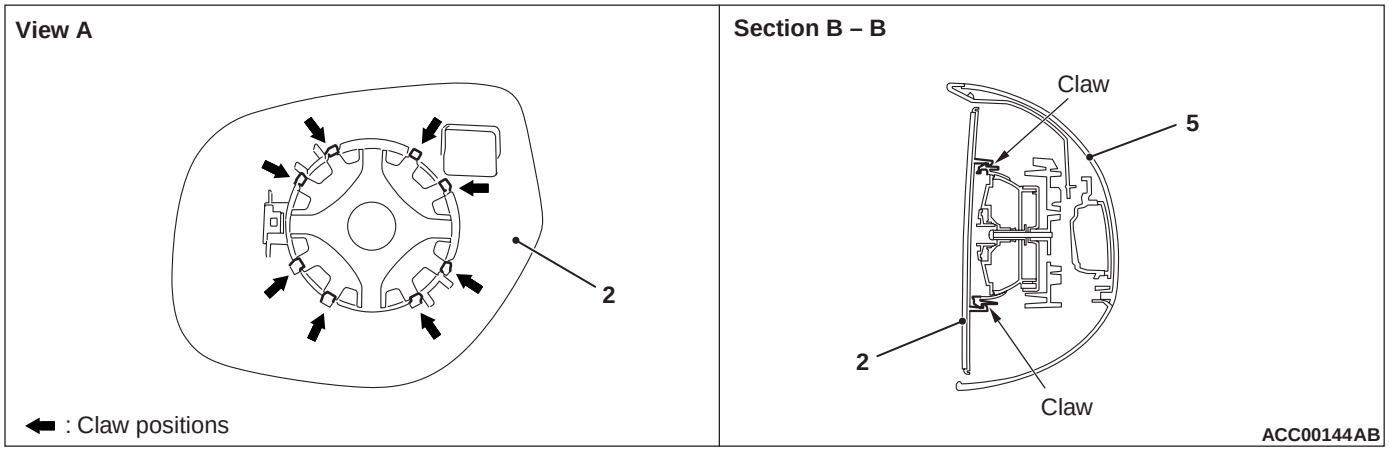
OUTSIDE MIRROR

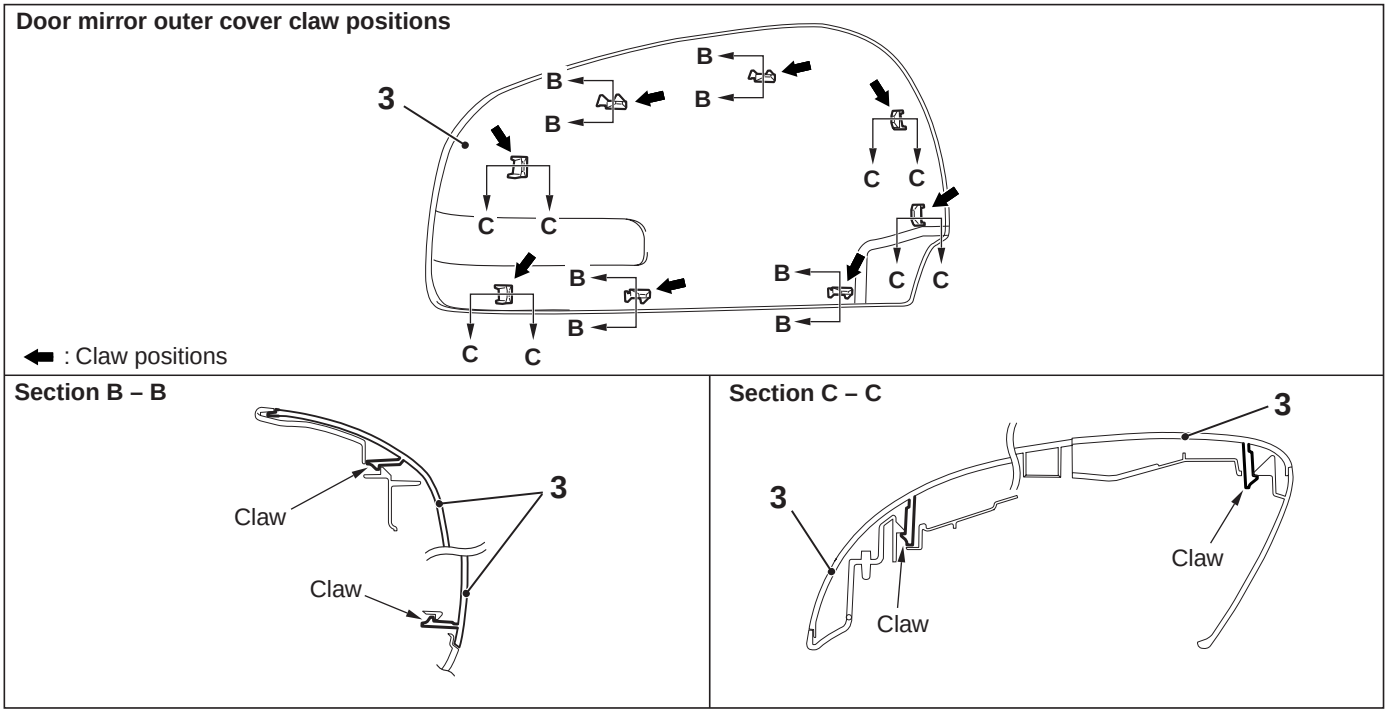
REMOVAL AND INSTALLATION

M1511006401497



ACB05790AB





Door mirror assembly removal steps

- Front door delta inner cover (Refer to GROUP 52A, Door Trim)
- Front door trim (Refer to GROUP 52A, Door Trim)
- Door mirror connector connection

1. Door mirror assembly

<<A>>

Door mirror housing removal steps

2. Mirror
3. Door mirror outer cover
4. Side turn-signal lamp assembly <With side turn-signal lamp>
5. Door mirror housing

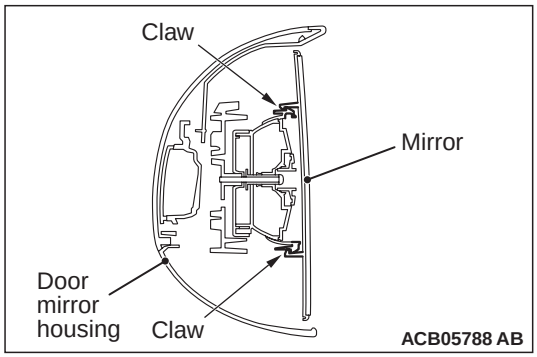
Remote controlled mirror switch removal steps

- Remote controlled mirror switch (Refer to GROUP 52A, Door Trim .)

REMOVAL SERVICE POINT

<<A>> MIRROR REMOVAL

⚠ CAUTION



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

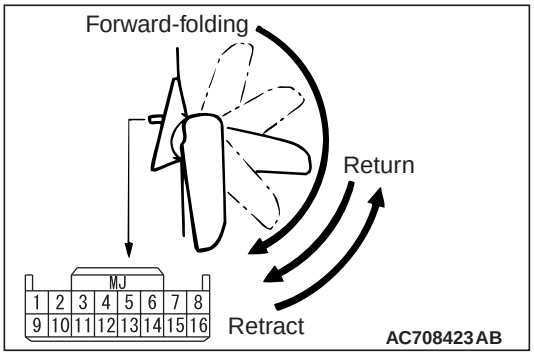
1. Disengage the tab behind the mirror from the door mirror housing.
2. Disconnect the connectors of the heated mirror.

INSPECTION

M1511019103704

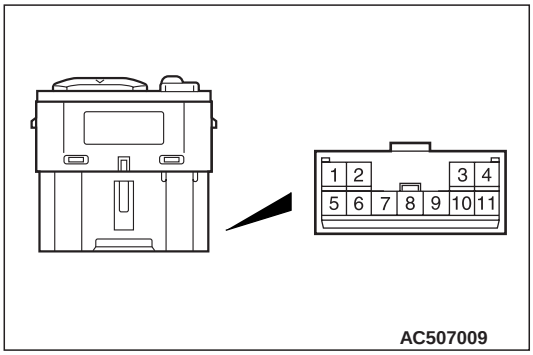
DOOR MIRROR ASSEMBLY OPERATION CHECK

Remove the door trim, and then connect the battery to the door mirror assembly connector to check that the door mirror operates.



Battery connection	Operation direction
• Connect terminal 12 to the negative battery terminal. • Connect terminal 5 to the positive battery terminal.	Up
• Connect terminal 12 to the positive battery terminal. • Connect terminal 5 to the negative battery terminal.	Down
• Connect terminal 13 to the negative battery terminal. • Connect terminal 12 to the positive battery terminal.	Right
• Connect terminal 13 to the positive battery terminal. • Connect terminal 12 to the negative battery terminal.	Left
• Connect terminal 11 to the positive battery terminal. • Connect terminal 4 to the negative battery terminal.	Retract
• Connect terminal 11 to the negative battery terminal. • Connect terminal 4 to the positive battery terminal.	Return

REMOTE CONTROLLED MIRROR SWITCH CONTINUITY CHECK

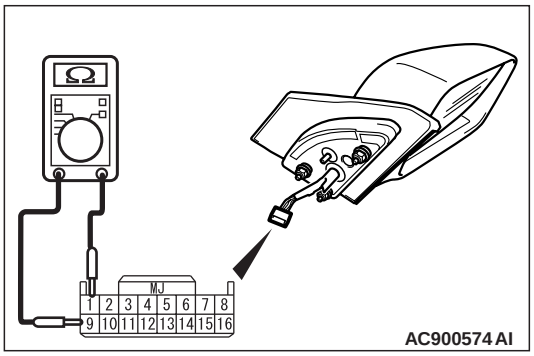


Switch position		Tester connection	Specified condition
Left side	Up	1 – 6, 9 – 11	Continuity exists(2 Ω or less)
	Down	1 – 11, 6 – 9	
	Right	1 – 6, 9 – 10	
	Left	1 – 10, 6 – 9	
Right side	Up	1 – 6, 3 – 9	
	Down	1 – 3, 6 – 9	
	Right	1 – 6, 2 – 9	
	Left	1 – 2, 6 – 9	
Retract and return		1 – 4	

HEATED DOOR MIRROR CHECK

⚠ CAUTION

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



Check that the resistance value between the connector terminals is at the standard value.

Standard value: 7.2 ± 1.4 Ω at 25°C