

# BODY

## CONTENTS

<b>GENERAL</b> .....	<b>2</b>	<b>KEYLESS ENTRY SYSTEM</b> .....	<b>12</b>
Outline of Changes .....	2	Troubleshooting .....	12
<b>SUNROOF</b>		Keyless Entry System .....	15
<b>&lt;POWER SLIDE WITH TILT-UP TYPE&gt;</b> .....	<b>2</b>	How to Register a Secret Code .....	16
Service Specifications .....	2		
Troubleshooting .....	2		
Service Adjustment Procedures .....	4		
Sunroof <Power Slide with Tilt-up Type> .....	5		

## GENERAL

### OUTLINE OF CHANGES

- For vehicles with standard wheelbase, an electric sliding sunroof has been used as option. With this, the service procedure has been added.
- Service points of maintenance have been established to correspond to the adoption of a keyless entry system.

## SUNROOF <POWER SLIDE WITH TILT-UP TYPE>

### SERVICE SPECIFICATIONS

Items	Standard value
Roof lid glass sliding resistance N	108 or less
Sunroof motor clutch slippage force N	29 – 59

### TROUBLESHOOTING

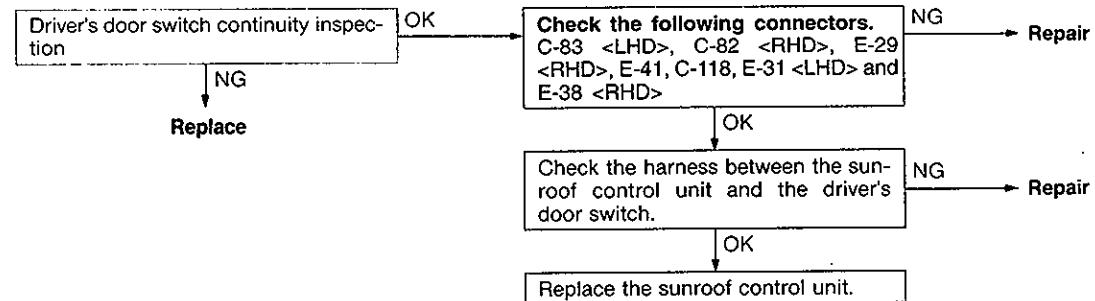
#### INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure	Reference page
Sunroof does not operate within 30 seconds after driver's door is opened.	1	42-2
Sunroof does not operate at all.	2	42-2

#### INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

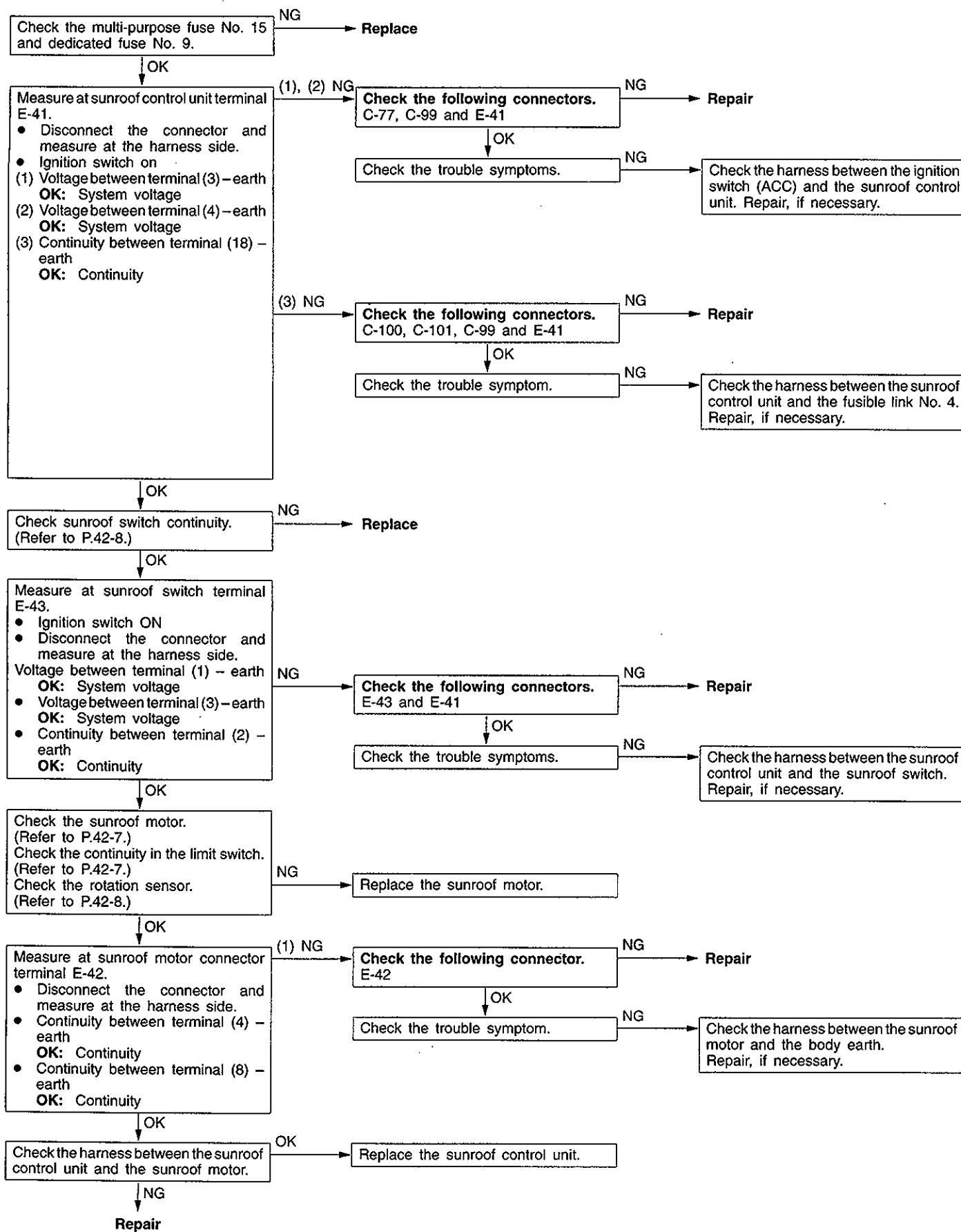
##### Inspection Procedure 1

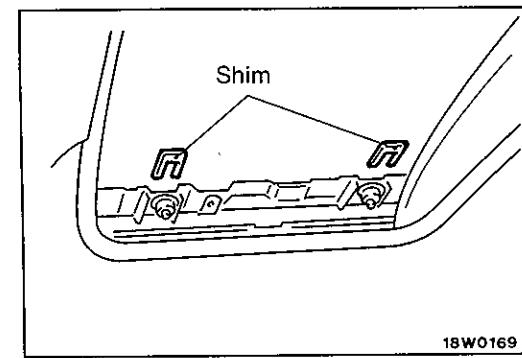
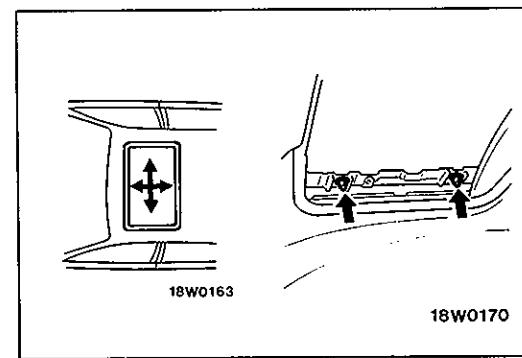
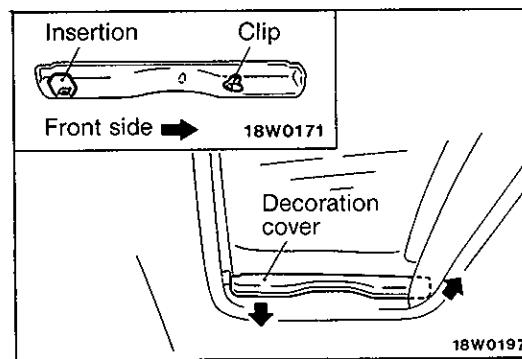
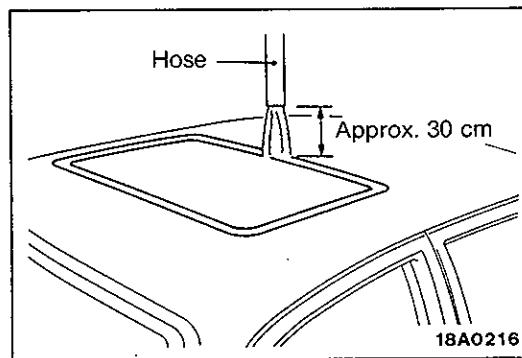
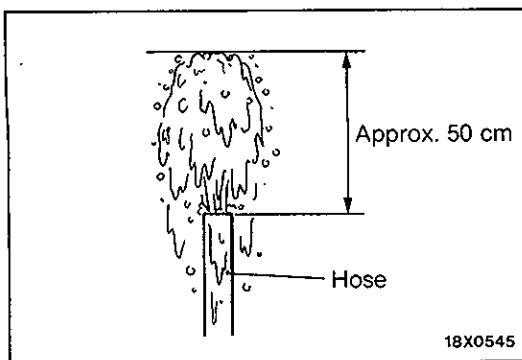
Sunroof does not operate within 30 seconds after driver's door is opened.	Probable cause
After the driver's door is opened within 30 seconds after the ignition switch is turned off, the sunroof can still be operated for a further 30 seconds. If it is impossible, the driver's door switch or the front sunroof control unit may be defective.	<ul style="list-style-type: none"> <li>Malfunction of door switch (driver's side)</li> <li>Malfunction of front sunroof control unit</li> <li>Malfunction of wiring harness or connector</li> </ul>



##### Inspection Procedure 2

Sunroof does not operate at all.	Probable cause
One of the following items may be defective. Sunroof switch Sunroof motor Sunroof control unit Power supply circuit (including the fuse)	<ul style="list-style-type: none"> <li>Malfunction of sunroof switch</li> <li>Malfunction of sunroof motor</li> <li>Malfunction of sunroof control unit</li> <li>Malfunction of wiring harness or connector</li> </ul>





## SERVICE ADJUSTMENT PROCEDURES

### SUNROOF LEAKAGE INSPECTION

Check if there are any leaks in the sunroof by the following procedure.

- (1) Fully close the roof lid glass.
- (2) Adjust the water pressure so that water comes out of the hose to a height of approximately 50 cm when the hose is held vertically facing upwards.

- (3) Hold the end of the hose approximately 30 cm above the roof and let the water run onto the weatherstrip for 5 minutes or more.
- (4) While doing this, check if any water leaks through into the passenger compartment from around the roof lid glass.

### SUNROOF FIT ADJUSTMENT

1. Fully close the roof lid glass.
2. Fully open the sunshade.
3. Lower the front edge of the decoration cover and then pull the rear edge into the passenger compartment to remove the decoration cover.
4. Loosen the four roof lid glass assembly mounting nuts to adjust the roof lid glass assembly forward and back or to the left and right.

#### NOTE

If impossible by the above step, adjust the sunroof motor by tilting up the sunroof fully. (Refer to P.42-8.)

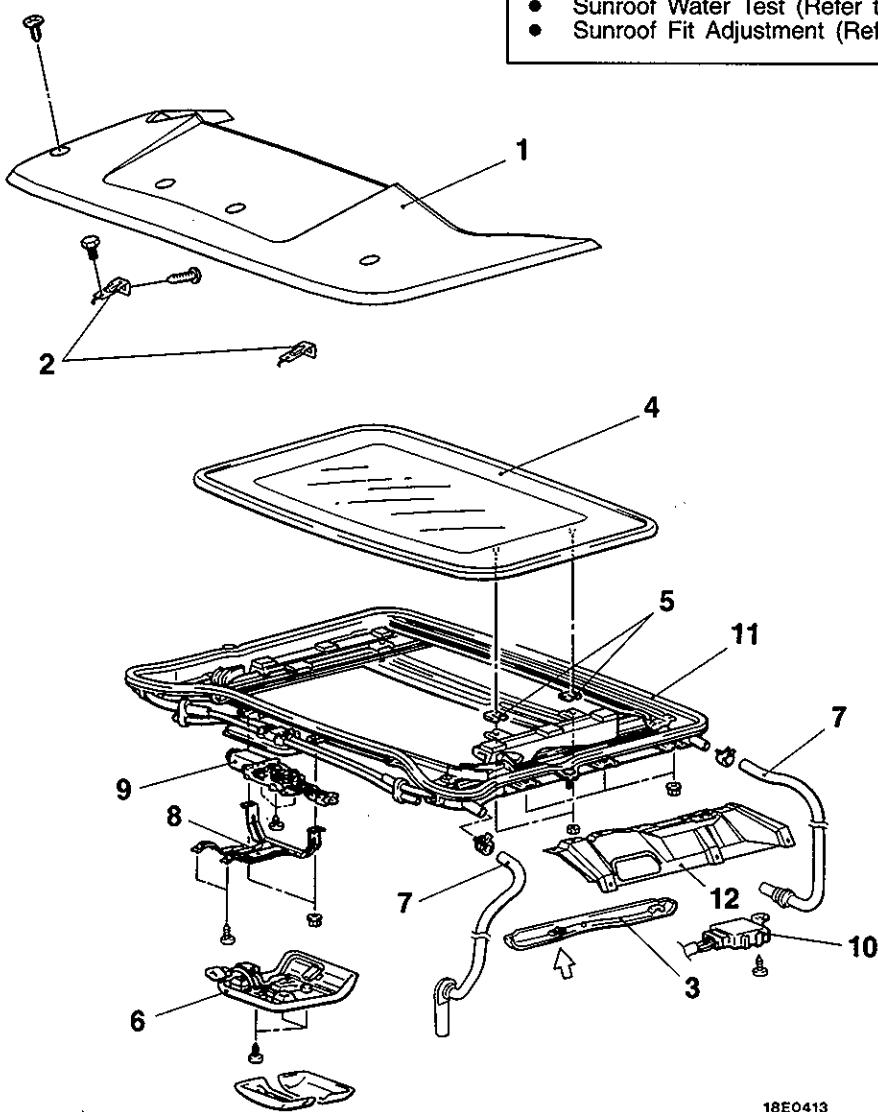
5. To adjust the height of the roof lid glass, loosen the four roof lid glass assembly mounting nuts. Then change the shims between the roof lid glass assembly and the lifter.
6. Check that the sunroof operates smoothly.

## SUNROOF &lt;Power Slide with Tilt-up Type&gt;

## REMOVAL AND INSTALLATION

## Post-installation Operation

- Sunroof Water Test (Refer to P.42-4.)
- Sunroof Fit Adjustment (Refer to P.42-4.)



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## Deflector removal steps

1. Deflector
2. Deflector bracket

## Roof lid glass assembly removal steps

3. Decoration cover
4. Roof lid glass assembly
5. Shims

## Sunroof switch and room lamp assembly removal step

6. Sunroof switch and room lamp assembly

## Drain hose removal steps

- Headlining
- 7. Drain hose

◀A▶

◀C▶ ▶A◀

## Sunroof motor and sunroof control unit removal steps

- Headlining
- 8. Room lamp bracket
- 9. Sunroof motor
- 10. Sunroof control unit

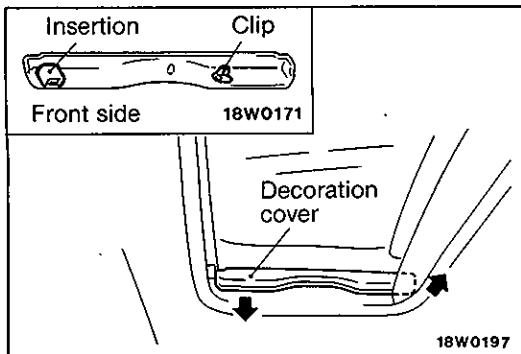
## Sunroof assembly removal steps

- Headlining
- 7. Drain hose connection
- 8. Room lamp bracket
- 11. Sunroof assembly
- 12. Set bracket

## NOTE

The ← mark indicates the sheet metal clip position.

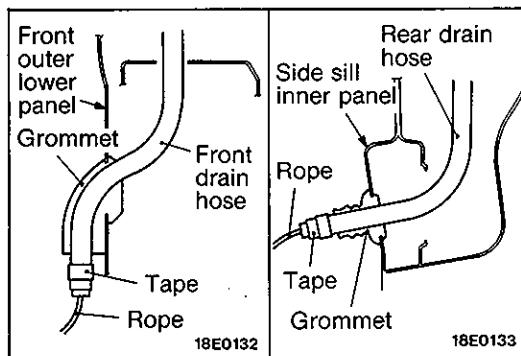
◀B▶ ▶B◀



## REMOVAL SERVICE POINTS

### ◀A▶ DECORATION COVER REMOVAL

Lower the front edge of the decoration cover and then pull the rear edge into the passenger compartment to remove the decoration cover.



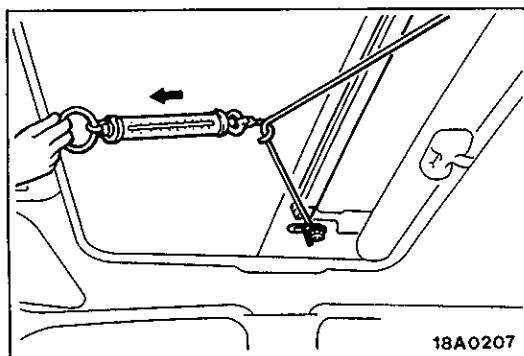
### ◀B▶ DRAIN HOSE REMOVAL

Tie a rope to the end of the drain hose, wind a tape around it so that there is no unevenness, and pull the drain hose into the inside of the passenger compartment.

### ◀C▶ SUNROOF MOTOR REMOVAL

#### Caution

Always tilt up the roof lid glass fully before removing the sunroof motor. Otherwise, the sunroof will not operate properly after reinstalling the motor.



## INSPECTION

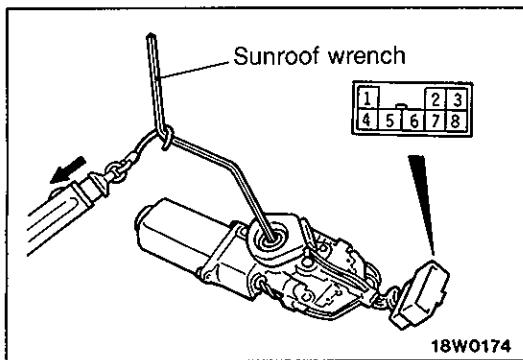
### SLIDING RESISTANCE OF ROOF LID GLASS CHECK

Remove the sunroof motor, and then check the sliding resistance of the roof lid glass by the following procedure.

- (1) Remove the headlining. [Refer to BASIC MANUAL (Looseleaf edition) GROUP 52A – Headlining.]
- (2) Remove the decoration cover.
- (3) Loosen the roof lid glass front mounting nuts and tie a rope to them.
- (4) Tilt up the roof lid glass fully and then remove the sunroof motor.
- (5) Use a spring balance to measure the sliding resistance of the roof lid glass.

#### Standard value: 108 N or less

- (6) If the sliding resistance of the roof lid glass is higher than the standard value, check the following.
  - Sunroof assembly installation, warping or jamming by foreign materials
  - Drive cable connection
  - Tilt of roof lid glass
- (7) Tilt up the roof lid glass fully, and set the sunroof motor to the specified position, and then install the sunroof motor.



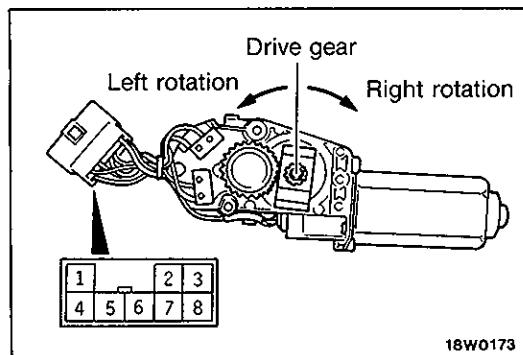
### SLIDING FORCE OF SUNROOF MOTOR'S CLUTCH CHECK

1. Insert the sunroof wrench of the on-board tools into the hexagonal hole in the motor drive shaft, and hook a spring balance as shown in the illustration.
2. Apply battery voltage between terminals (1) and (2) of the sunroof motor connector to operate the motor.
3. Measure the load on the spring balance at the point where the rotation torque of the motor matches the spring force of the spring balance.

**Standard value: 29 – 59 N**

#### Caution

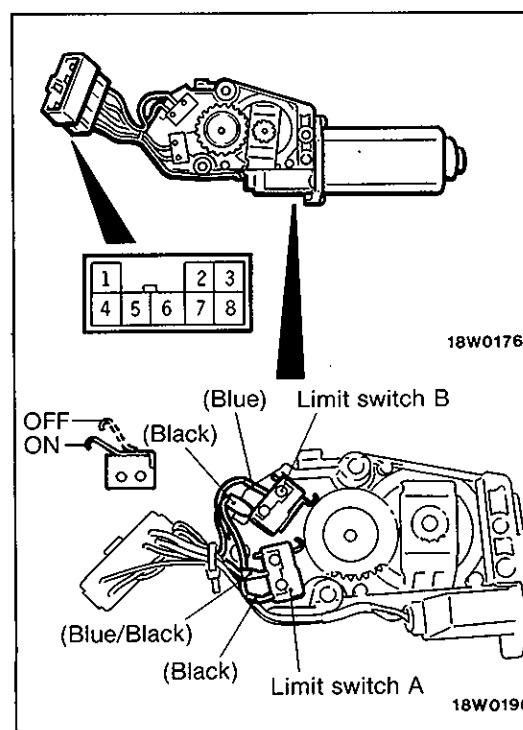
1. The spring balance should be kept at a right angle to the sunroof wrench.
2. If a wrench other than that in the on-board tools is used, the value for the clutch sliding force will be different, so only the on-board tool should be used.
4. If the clutch sliding force is outside the standard value, turn the motor adjuster to adjust it.



### SUNROOF MOTOR CHECK

Check the direction of rotation of the drive gear when the battery is connected to the connector.

Battery connection terminal		Drive gear rotation direction
1	2	
–	+	Left
+	–	Right

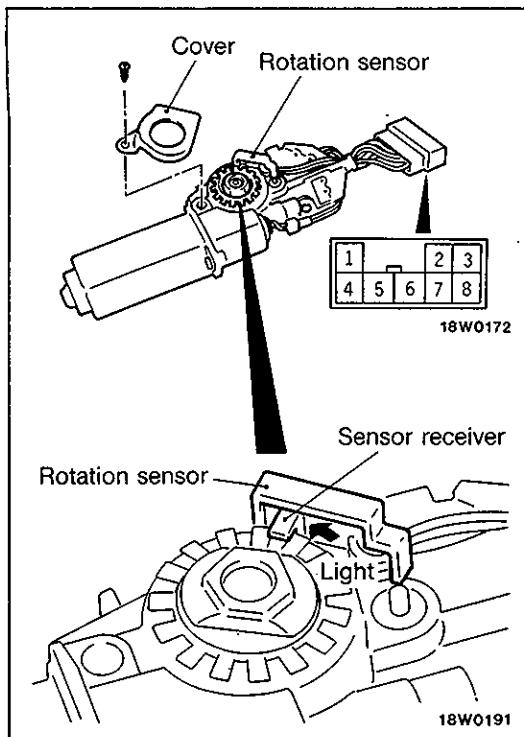


### LIMIT SWITCH CONTINUITY CHECK

1. Remove the limit switches from the sunroof motor, and then check the operation of the limit switches.

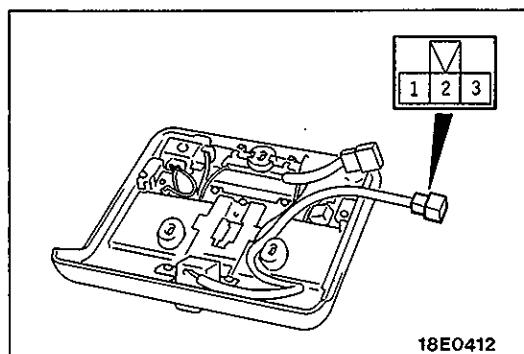
Switch	Terminal No.		
	4	5	6
Limit switch A	ON	<input type="circle"/>	<input type="circle"/>
	OFF		
Limit switch B	ON	<input type="circle"/>	<input type="circle"/>
	OFF		

2. Check the identification colours. Then install the limit switches as shown in the illustration.



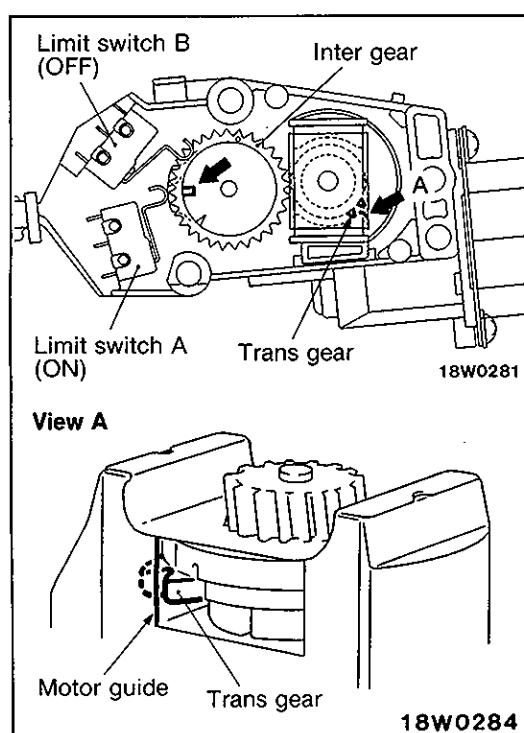
### ROTATION SENSOR INSPECTION

1. When connecting an ohmmeter negative probe to terminal (3) and the positive probe to terminal (8), there should be continuity. When the probes are reversed, there should be no continuity.
2. Remove the cover, and then check that there is no continuity when connecting the negative probe to terminal (7) and the positive probe to terminal (8). Also check that there is continuity when the probes are connected to the same terminals and light is shined onto the sensor receiver.



### SUNROOF SWITCH CONTINUITY INSPECTION

Switch position	Terminal No.		
	1	2	3
Open	○	○	
Close		○	○

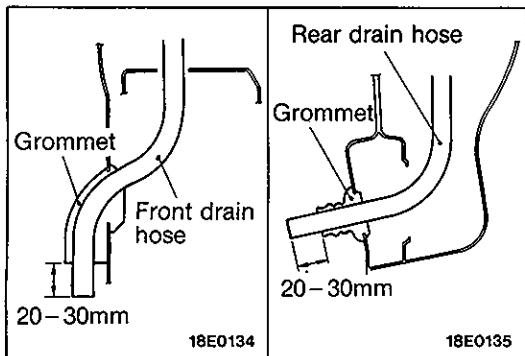


### INSTALLATION SERVICE POINTS

#### ►A SUNROOF MOTOR INSTALLATION

Use the sunroof wrench to set the sunroof motor to the full tilt-up position by the following procedure.

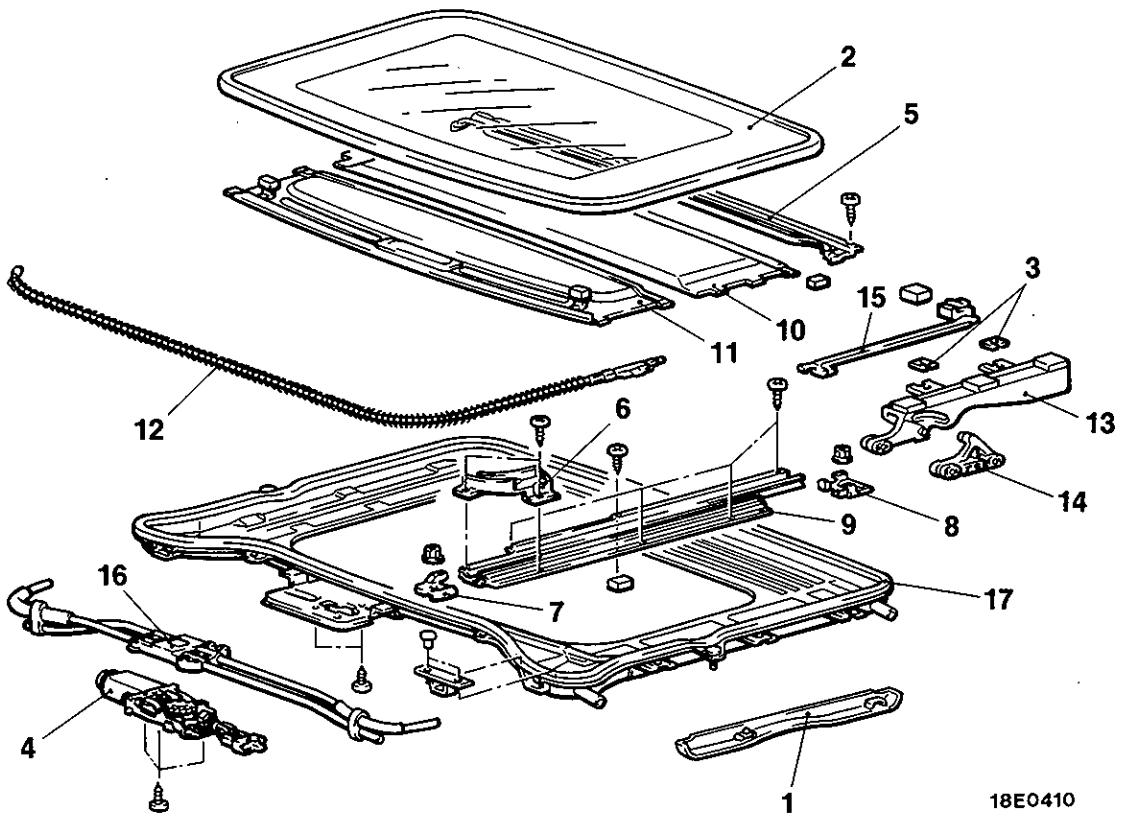
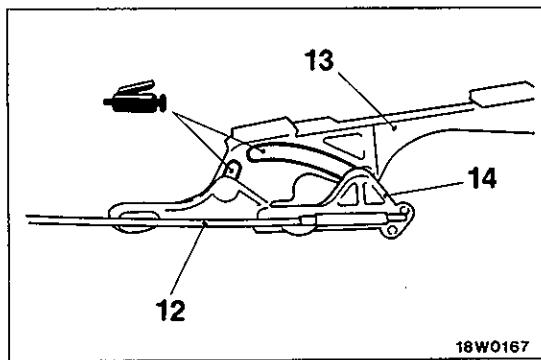
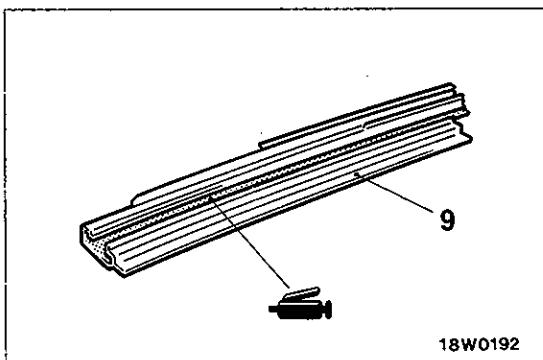
- (1) Align the pawl (Square mark) of the inter gear with the on position of limit switch (A).
- (2) Align the groove of the trans gear with the corner of the motor guide.



### ►B DRAIN HOSE INSTALLATION

- (1) Tie the rope that was used during removal to the end of the drain hose, and wind tape around it so that there is no unevenness.
- (2) Pull the rope to pull the drain hose through.
- (3) Pull the drain hose until the protruding length from the grommet is as shown in the figure.

## DISASSEMBLY AND REASSEMBLY



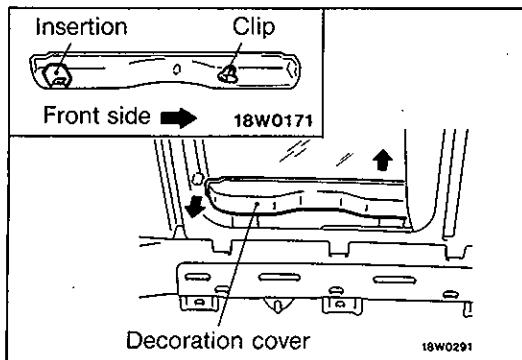
## Disassembly steps

◀A▶

1. Decoration cover
2. Roof lid glass assembly
3. Shim
4. Sunroof motor
5. Drip rail
6. Front drip
7. Front holder
8. Rear holder
9. Rail assembly

◀B▶ ▶A◀

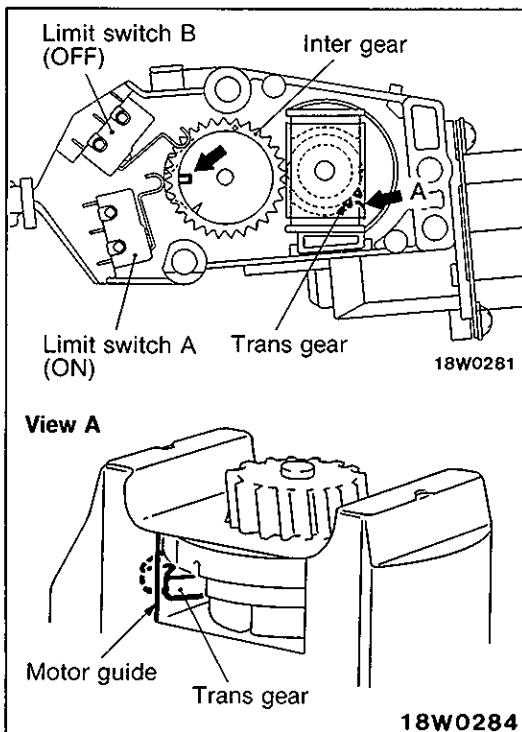
10. Sunshade (B)
11. Sunshade (A)
12. Drive cable
13. Lifter assembly
14. Slider assembly
15. Timing rear assembly
16. Drive unit assembly
17. Frame assembly



## DISASSEMBLY SERVICE POINTS

### ◀A▶ DECORATION COVER REMOVAL

Lower the front edge of the decoration cover and then pull the rear edge into the passenger compartment to remove the decoration cover.



## REASSEMBLY SERVICE POINT

### ▶A◀ SUNROOF MOTOR INSTALLATION

Use the sunroof wrench to set the sunroof motor to the full tilt-up position by the following procedure.

- (1) Align the pawl (Square mark) of the inter gear with the on position of limit switch (A).
- (2) Align the groove of the trans gear with the corner of the motor guide.

## KEYLESS ENTRY SYSTEM

### TROUBLESHOOTING

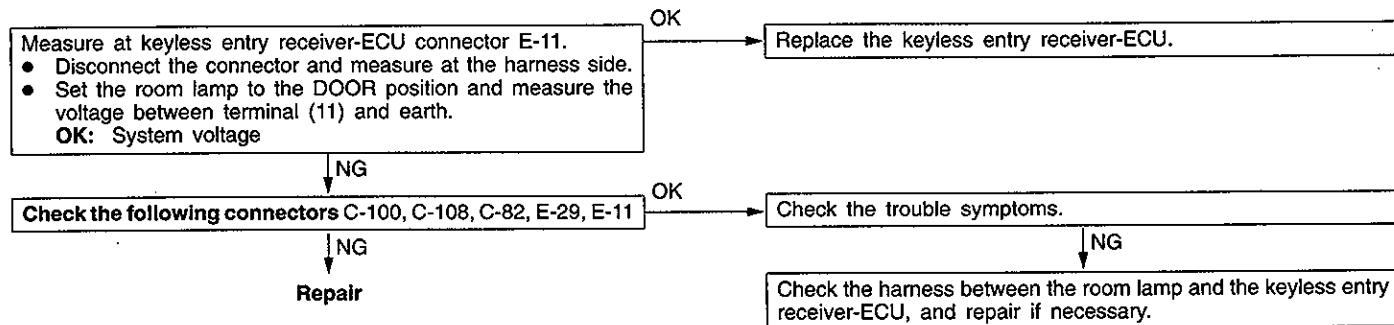
#### INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble Symptom	Inspection Procedure No.	Reference Page
All doors can be locked and unlocked, but the room lamp does not flash or illuminate (but the room lamp operates as normal when the doors are opened and closed).	1	42-12
None of the doors can be locked or unlocked.	The LED does not illuminate when the transmitter send switch is pressed.	2
	Signals are being sent from the transmitter (the LED illuminates) but the system does not operate.	3
Some of the doors cannot be locked or unlocked.	4	42-13

#### INSPECTION PROCEDURE FOR TROUBLE SYMPTOM

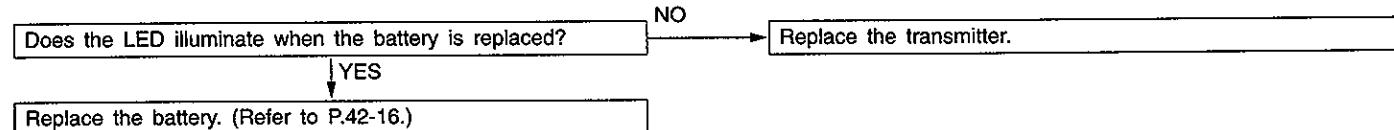
##### Inspection Procedure 1

All doors can be locked and unlocked, but the room lamp does not flash or illuminate (but the room lamp operates as normal when the doors are opened and closed).	Probable cause
If the room lamps operates normally when the doors are opened and closed, there may be a malfunction of the keyless entry receiver-ECU or a malfunction in the harness between the room lamp and the keyless entry receiver-ECU.	<ul style="list-style-type: none"> <li>Malfunction of keyless entry receiver-ECU</li> <li>Malfunction of harness or connector</li> </ul>



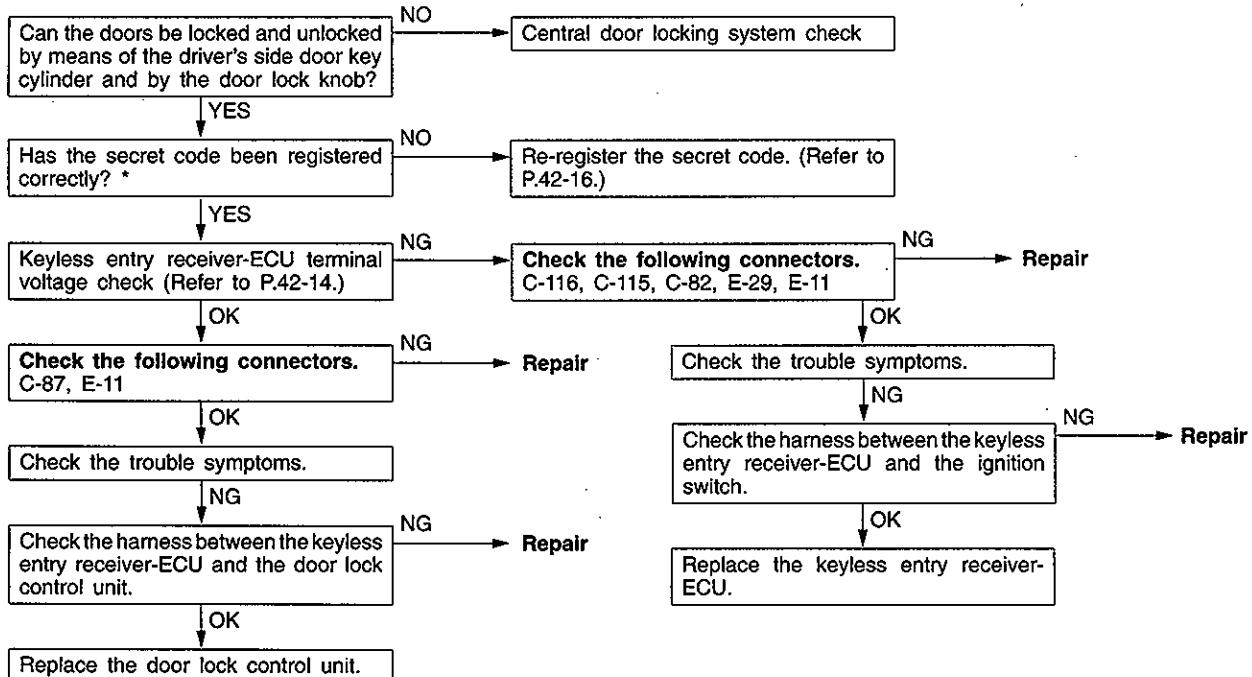
##### Inspection Procedure 2

The LED does not illuminate when the transmitter send switch is pressed.	Probable cause
If the LED on the transmitter does not illuminate, the cause may be a flat battery or a malfunction of the transmitter.	<ul style="list-style-type: none"> <li>Flat transmitter battery</li> <li>Malfunction of transmitter</li> </ul>



## Inspection Procedure 3

Signals are being sent from the transmitter (the LED illuminates) but the system does not operate.	Probable cause
If the keyless entry system does not operate even though a signal is being sent from the transmitter, and if the central door locking system is normal, the cause may be a problem with the antenna reception, or the lock and unlock signals are not being input to the door lock control unit.	<ul style="list-style-type: none"> <li>• Malfunction of central door locking system</li> <li>• Malfunction of keyless entry receiver-ECU</li> </ul>



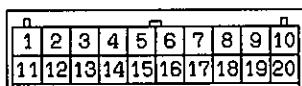
## NOTE

\*: Carry out this check if the transmitter or the keyless entry receiver-ECU has been replaced or if the secret code is not properly registered.

## Inspection Procedure 4

Some of the doors cannot be locked or unlocked.	Probable cause
If some of the doors cannot be locked or unlocked, the cause may be a malfunction of the harness between the door lock control unit and one of the door lock actuators.	<ul style="list-style-type: none"> <li>• Malfunction of door lock actuator</li> <li>• Malfunction of harness or connector</li> </ul>
Check the door lock actuator of the door that will not lock or unlock. [Refer to BASIC MANUAL (Looseleaf edition) GROUP 42 – Door Handle and Latch.]	NG --> P[Replace the door lock actuator.]     OK --> Q[Check the following connectors. C-87, C-86, F-13, C-32, F-06, C-82, E-32, F-10, E-29, E-39, F-09, E-17, G-12]
Q -- NG --> R[Repair]	
Q -- OK --> S[Check the trouble symptoms.]	
S -- NG --> T[Check the harness between the door lock control unit and the door lock actuator of the door that will not lock or unlock, and replace if necessary.]	

## INSPECTION AT KEYLESS ENTRY RECEIVER ECU TERMINALS



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- (1) Remove the combination meter. [Refer to BASIC MANUAL (Looseleaf edition) GROUP 54 – Combination Meter.]
- (2) Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

Terminal	Signal name	Conditions		Terminal voltage
2	Door switch	Room lamp switch: OFF or ON	One or more doors are open (Door switch: ON)	0 V
			All doors are closed (Door switch: OFF)	0 V
		Room lamp switch: DOOR	One or more doors are open (Door switch: ON)	0 V
			All doors are closed (Door switch: OFF)	System voltage
6	Door lock actuator switch (driver's side)	LOCK		5 V and pulse output*
		UNLOCK		0 V
8	Key remainder switch	OFF (When ignition key is inserted)		5 V and pulse output*
		ON (When ignition key is removed)		0 V
9	Ignition switch	Ignition switch: ACC or ON		System voltage
		Ignition switch: OFF		0 V
10	Receiver power supply	At all times		System voltage
11	Room lamp output	All doors are closed (Door switch: OFF)	Room lamp switch: OFF or ON	0 V
			Room lamp switch: DOOR	System voltage
12	Door lock output	During door lock control unit output, or door lock switch: LOCK		0 V
		Other than above		System voltage
14	Door unlock output	During door lock control unit output, or door lock switch or door lock key cylinder: UNLOCK		0 V
		Other than above		System voltage
20	Earth	At all times		0 V

## NOTE

Values marked with \* should be measured using an oscilloscope. (The value will alternate between 0 V and 0.03 V if a circuit tester is used.)

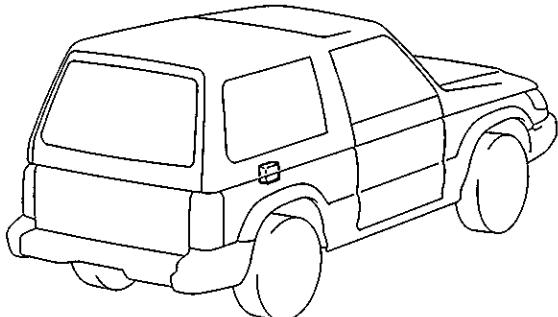
## KEYLESS ENTRY SYSTEM

### REMOVAL AND INSTALLATION

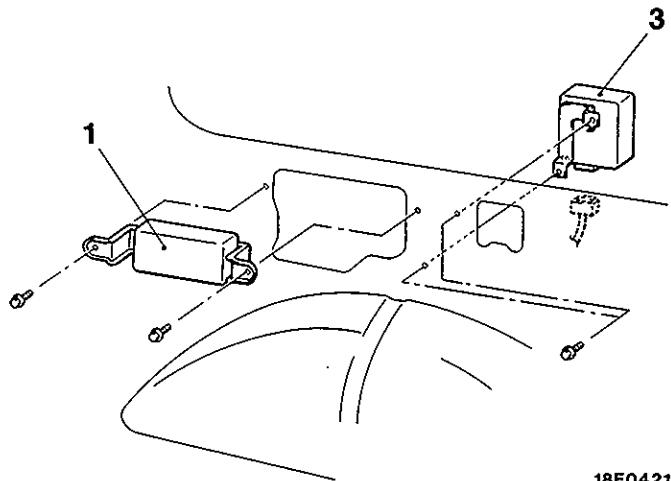
#### Pre-removal and Post-installation Operation

- Removal and Installation of the Quarter Trim, Lower (R.H.)

<Standard wheelbase>

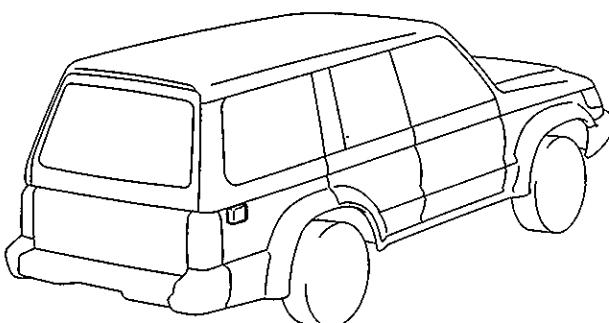


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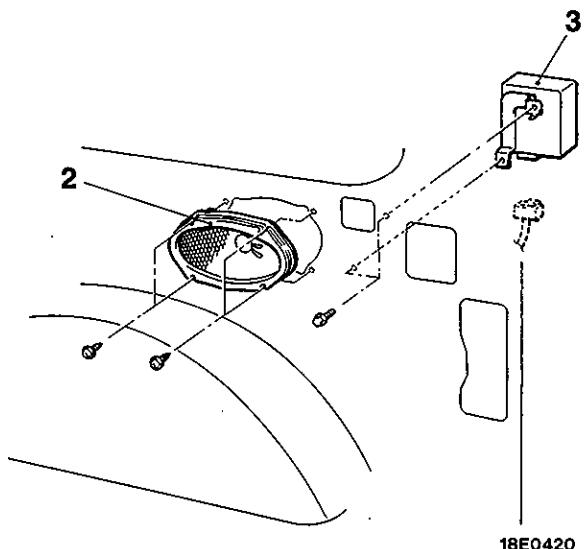


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<Long wheelbase>



18E0423



18E0420

#### Removal steps

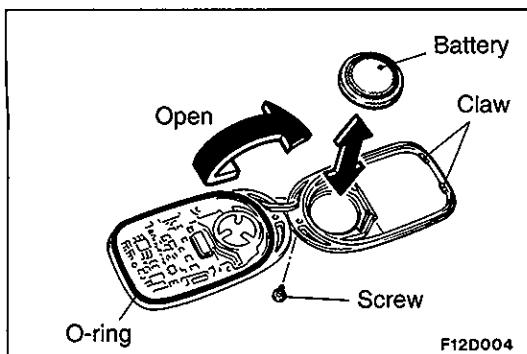
<Standard wheelbase>

- Rear seat belt retractor (R.H.)
- 1. ABS control unit  
<Vehicles with ABS>
- 3. Keyless entry receiver ECU

#### Removal steps

<Long wheelbase>

- 3rd seat belt retractor (R.H.)
- 2. Rear speaker and speaker cover  
<Vehicles with rear speaker>
- 3. Keyless entry receiver ECU



## INSPECTION

### HOW TO REPLACE A BATTERY OF THE TRANSMITTER

1. Remove the set screw to remove the battery from the transmitter.
2. Install a battery with its (+) side face-down.
3. Insert the claw first, and with care not to displace the O-ring, assemble the transmitter.
4. Check to see if the keyless entry system operates.

#### NOTE

- (1) Do not let water or dust stick to the inside of the transmitter when its open. Also, do not touch the precision electronic device.
- (2) If the O-ring is displaced during the assembly of the transmitter, water or dust penetrates in it, causing trouble.

## HOW TO REGISTER A SECRET CODE

Since the transmitter is memorized by each individual code, it is necessary to register a code on EEPROM in the keyless entry receiver ECU if the transmitter or keyless entry receiver ECU is replaced, or cause of the trouble is presumed to be due to faulty registration of the code. Since two different codes at the most can be memorized in the memory space of EEPROM, the old code will become unable to be used if the following registration operation is repeated twice. Meanwhile, register a code after confirming that an ordinary door lock function can be worked through key operation.

1. Connect the MUT-II to the diagnosis connector (16 pin.).

#### NOTE

Terminal (1) of the diagnosis connector will be earthed at this time and the mode will switch to the secret code registration preparation mode.

#### Caution

**Connection and disconnection of the MUT-II should always be carried out with the ignition switch in the OFF position.**

2. Close all of the doors.
3. Turn the ignition switch to ACC and then to OFF.

#### NOTE

The doors will lock and then unlock at this time, and the mode will then switch to the secret code registration mode.

4. After pressing any switch on the transmitter once, and then press it two more times within 10 seconds. The secret code will then be registered.
5. After registration is completed, the doors will lock and then unlock once.

#### NOTE

If there are two transmitters, register the secret code for the first one, and then within one minute after doing this, register the secret code for the second one by following the same procedure as given above.

6. After registration for the second transmitter has been completed, the doors will lock and then unlock once.
7. The registration mode will be cleared under any of the following conditions.
  - After the secret codes have been registered for two transmitters
  - After one minute elapses since registration mode was set
  - If the MUT-II is disconnected (if the earth connection is broken)
  - If the ignition switch is turned to ON
  - If any of the doors are opened