
BODY

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GENERAL OUTLINE OF CHANGE

- The descriptions of the troubleshooting using on MUT-II tester have been incorporated.

KEYLESS ENTRY SYSTEM

SPECIAL TOOL

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	Recording secret codes

TROUBLESHOOTING

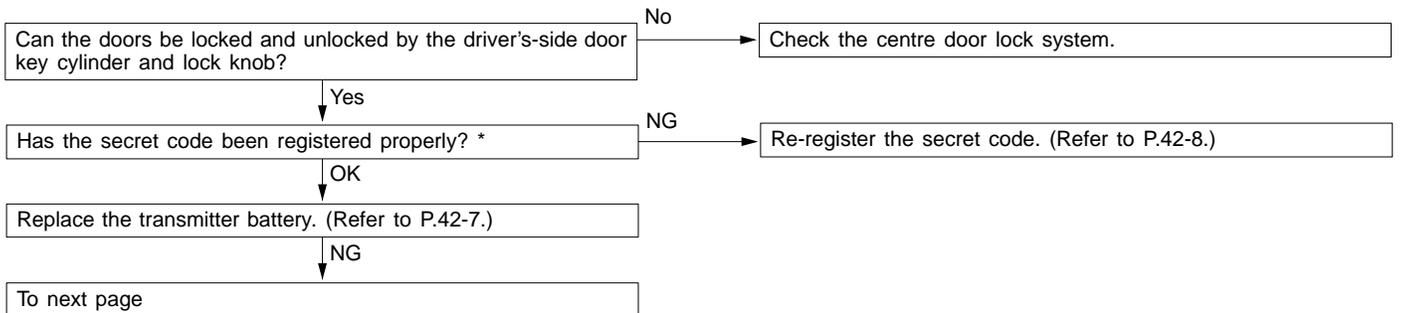
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Reference page
None of the doors can be locked or unlocked using the transmitter.	1	42-2
All of the doors can be locked and unlocked using the transmitter, but the room lamp does not flash or illuminate. (However, the room lamp operates normally when the doors are opened and closed.)	2	42-4
Secret codes cannot be registered.	3	42-4

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

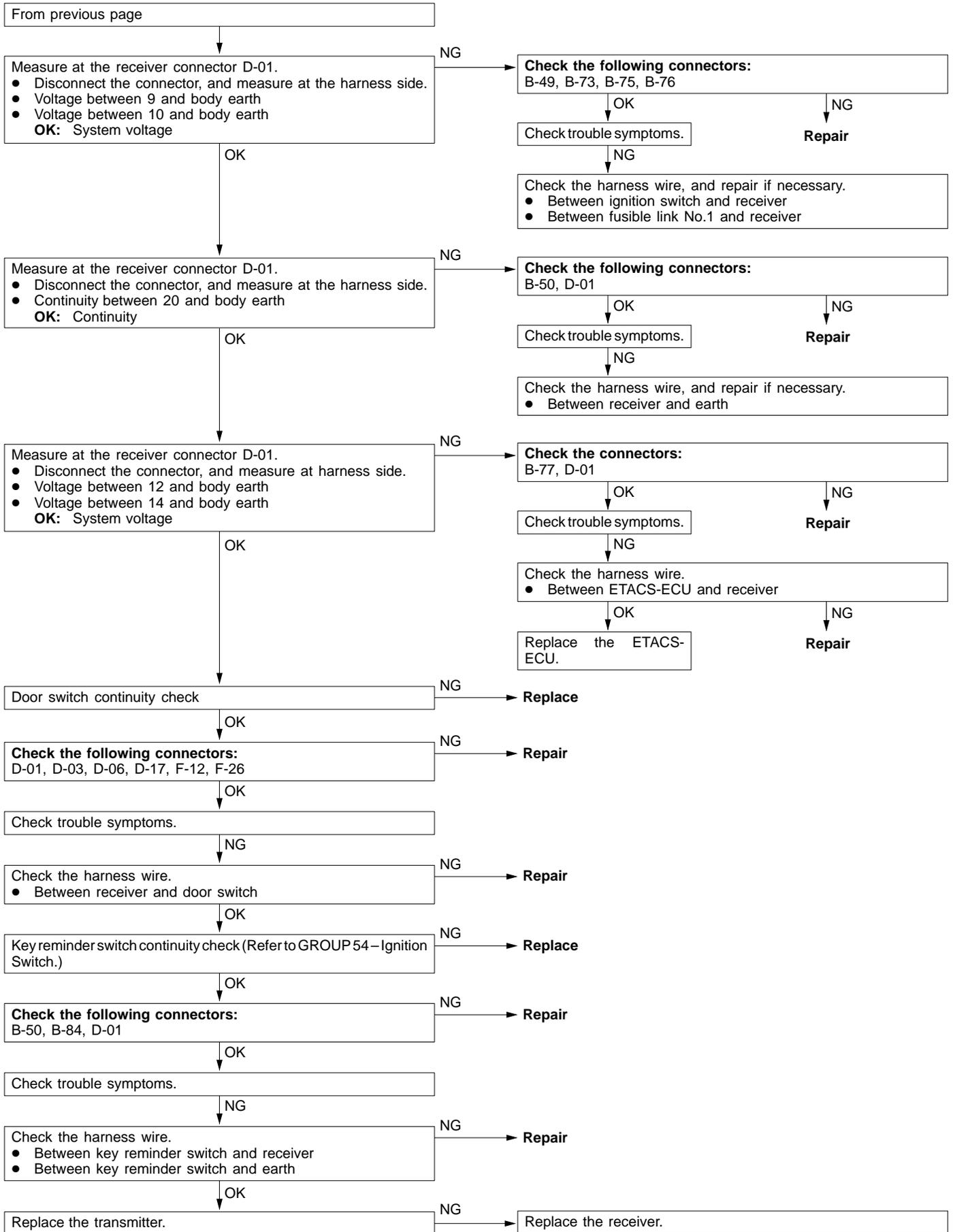
INSPECTION PROCEDURE 1

None of the doors can be locked or unlocked using the transmitter.	Probable cause
The cause may be a malfunction of the transmitter, a malfunction of the receiver or the lock and unlock signals are not being input to the ETACS-ECU.	<ul style="list-style-type: none"> Malfunction of transmitter Malfunction of receiver Malfunction of ETACS-ECU Malfunction of wiring harness or connector Malfunction of key reminder switch Malfunction of door switch



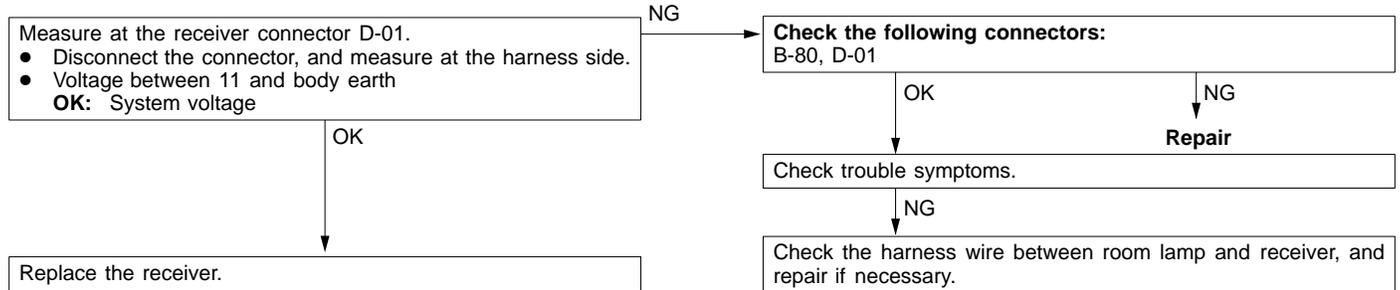
NOTE

*: This should be done if a transmitter or receiver has been replaced, and if a secret code has not been registered properly.



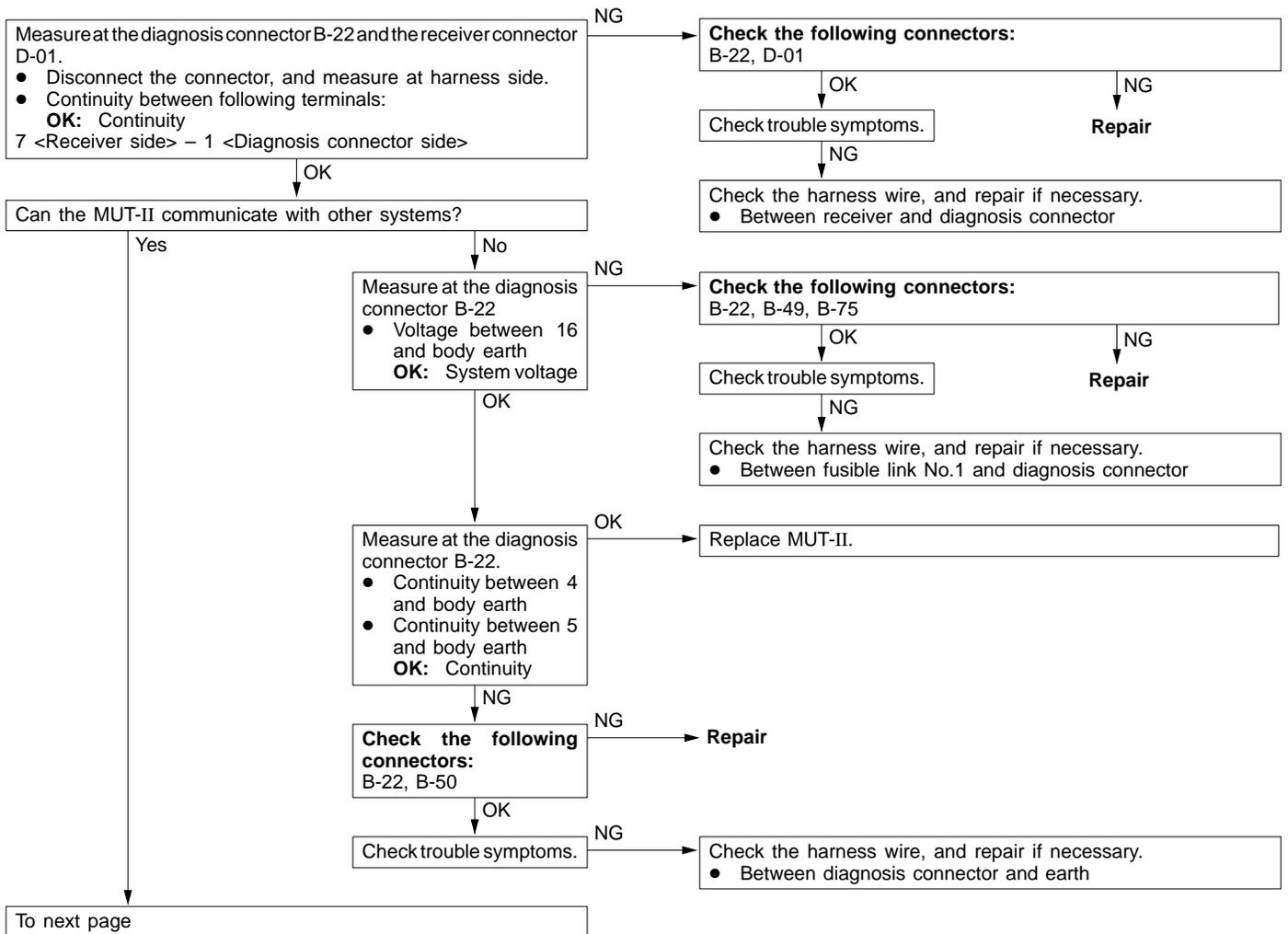
INSPECTION PROCEDURE 2

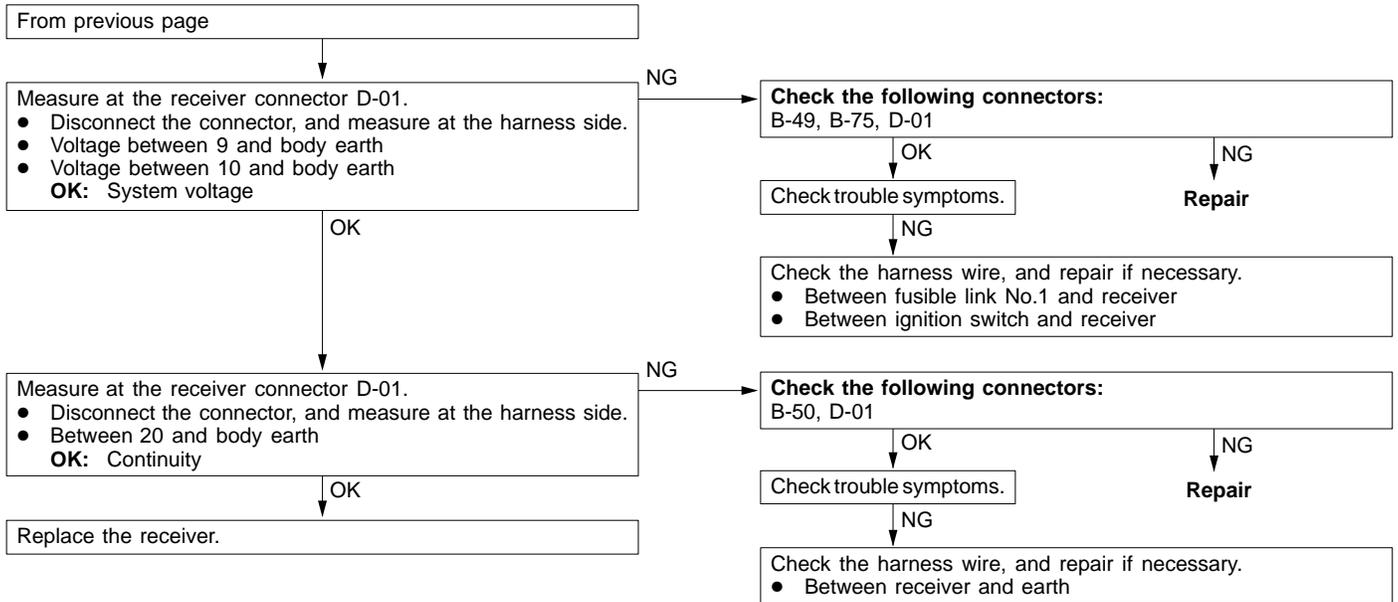
<p>All of the doors can be locked and unlocked using the transmitter, but the room lamp does not flash or illuminate. (However, the room lamp operates normally when the doors are opened and closed.)</p>	<p>Probable cause</p>
<p>If the room lamp operates normally when the doors are opened and closed, the cause of the problem may be a malfunction of the receiver or a malfunction of the harness between the room lamp the receiver.</p>	<ul style="list-style-type: none"> • Malfunction of receiver • Malfunction of connector or wiring harness



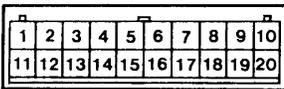
INSPECTION PROCEDURE 3

<p>Secret codes cannot be registered.</p> <p>The cause may be a malfunction of the diagnosis connector, a malfunction of the power supply or earth circuit of the receiver, a malfunction of the earth circuit or a malfunction of the diagnosis output circuit.</p>	<p>Probable cause</p> <ul style="list-style-type: none"> • Malfunction of receiver • Malfunction of MUT-II • Malfunction of connector or wiring harness
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INSPECTION OF RECEIVER TERMINAL VOLTAGE



18W0311

Terminal	Signal name	Conditions	Terminal voltage
2	Door switch	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
7	Diagnosis changeover input	When MUT-II is connected	0 V
		When MUT-II is disconnected	System voltage
8	Key reminder 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	One or more door are open (Door switch: ON)	0 V
		All doors are closed (Door switch: OFF)	System voltage

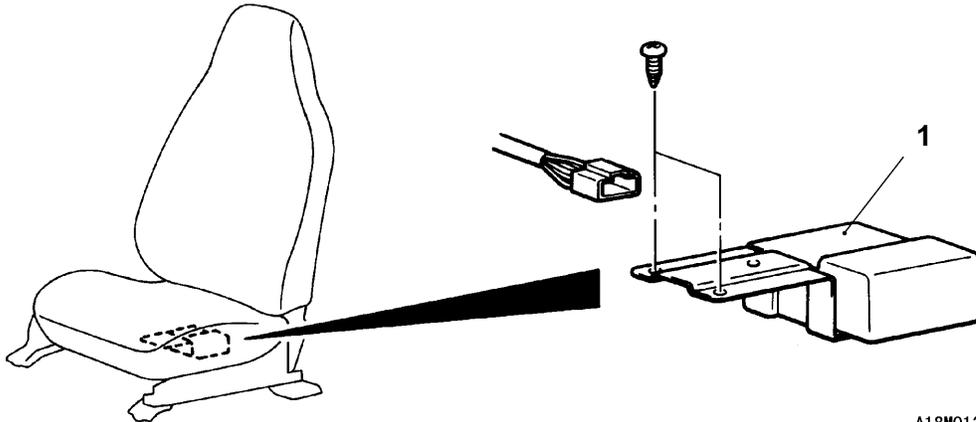
Terminal	Signal name	Conditions	Terminal voltage
12	Door lock output	When activated	0 V
		When not activated	System voltage
14	Door unlock output	When activated	0 V
		When not activated	System voltage
20	Earth	At all times	0 V

NOTE

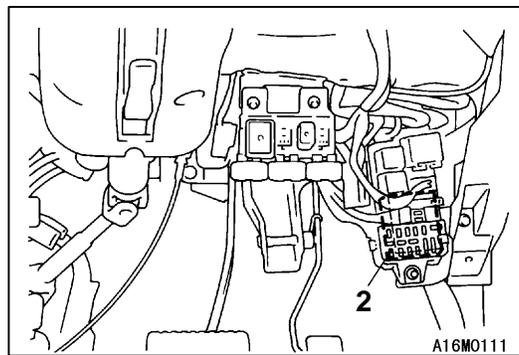
Values marked with * should be measured using an oscilloscope. (The value will alternate between 0 V and 0.03 V if a circuit tester is used.)

KEYLESS ENTRY SYSTEM

REMOVAL AND INSTALLATION



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Keyless entry receiver removal steps

- Front seat assembly (driver's side)
- 1. Keyless entry receiver

ETACS-ECU removal

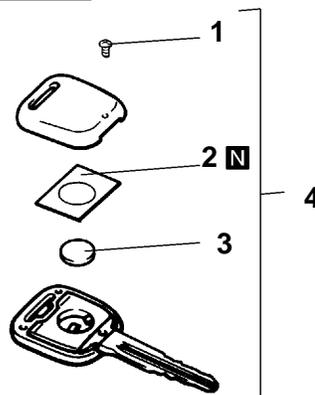
- 2. ETACS-ECU

TRANSMITTER

DISASSEMBLY AND REASSEMBLY

Post-assembly Operation

- Transmitter operation check



A18M0134

Disassembly steps

- 1. Screw
- 2. Tape



- 3. Battery
- 4. Master key assembly

ASSEMBLY SERVICE POINTS**▶A◀ BATTERY INSTALLATION**

Install a new battery with (+) side upward.

**Battery required for replacement:
Lithium battery CR1216**

SECRET CODE REGISTRATION METHOD

Each individual secret code is registered inside the transmitter, and so it is necessary to register these codes with the EEPROM inside the receiver in the following cases.

- When either the transmitter or receiver is replaced;
- If it appears that a problem is occurring because of faulty registration of a code.

A maximum of two different codes can be stored in the memory area of the EEPROM (two different transmitters can be used). When the code for the first transmitter is registered, the previously-registered codes for two transmitters are cleared. Therefore, if you are using two transmitters or are adding a second transmitter, the codes for both transmitters must be registered at the same time. Before beginning with the registration, check that the doors lock normally when the key is used.

1. Connect the MUT-II to the diagnosis connector.

NOTE

This will connect terminal (1) of the diagnosis connector to earth, and the system will be in secret code registration standby mode.

Caution

Always turn the ignition switch to OFF before connecting and disconnecting the MUT-II.

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

NOTE

The doors will lock and unlock once at this time and the system will switch to registration mode.

4. Press the transmitter switch, and then press it two times within 10 seconds of the first press. This will register the code.
5. After registration is completed, the doors will be automatically locked and unlocked once.
6. If you are using two transmitters or have added a second transmitter, the same registration procedure should be carried out for the second transmitter, and it should be carried out within one minute after registration of the code for the first transmitter has been completed. After the second registration is completed, the doors will be automatically locked and unlocked once.
7. Registration mode will be cancelled if one of the following conditions is met.
 - When the secret codes for two transmitters have been registered;
 - When 1 minute has passed after registration mode started;
 - If the MUT-II is disconnected (the earth connection is broken);
 - If the ignition switch is turned to ON;
 - If any of the doors are opened;
8. After registration is completed, carry out the following to check if the keyless entry system is operable properly.
 - Remove the ignition key.
 - Close all the doors.

SUNROOF

SERVICE SPECIFICATIONS

Items	Standard value
Roof lid glass operating current A (at 20°C)	7 or less
Sunroof motor clutch slippage torque Nm	4.7 – 6.2

SEALANT

Item	Specified sealant
Rail cover assembly	3M ATD Part No.8531 or 3M Part No.8646 or equivalent

TROUBLESHOOTING

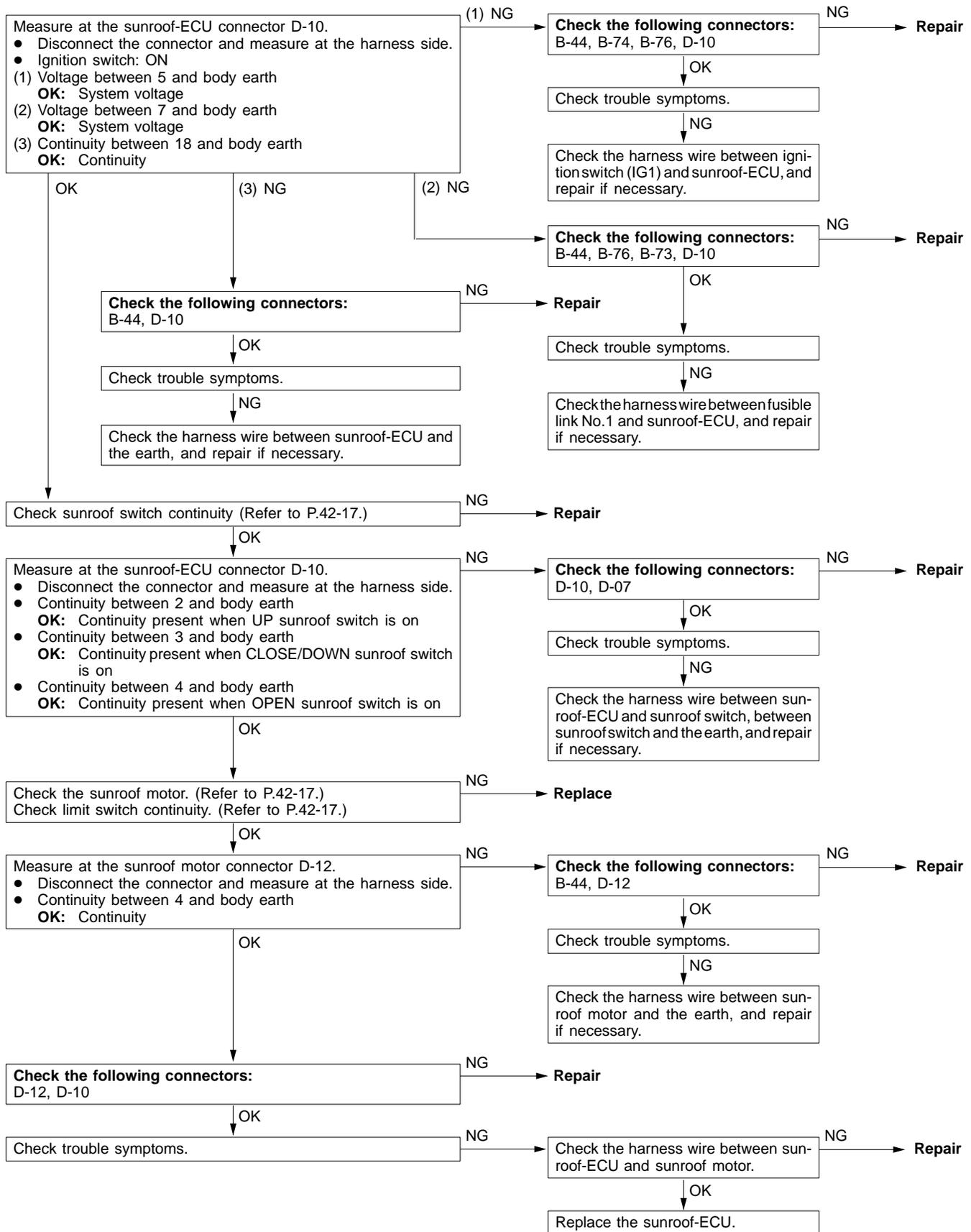
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure	Reference page
The sunroof can not be operated when the ignition switch is in ON position.	1	42-9
The motor does not reverse its direction when a load of 140 N or more is applied while the sunroof is closing.	2	42-11
The timer does not operate for 30 seconds after the ignition switch is turned to OFF.	3	42-11
Opening or closing of the sunroof is possible for 30 seconds after turning the ignition switch to OFF, but the timer function is not extended when the driver's side door is opened within this period.	4	42-11

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

Inspection Procedure 1

The sunroof can not be operated when the ignition switch is in ON position.	Probable cause
One of the following items may be defective. <ul style="list-style-type: none"> ● Sunroof switch ● Sunroof motor ● Sunroof-ECU power supply circuit ● Earth circuit 	<ul style="list-style-type: none"> ● Malfunction of sunroof switch ● Malfunction of sunroof motor ● Malfunction of sunroof-ECU ● Malfunction of wiring harness or connector



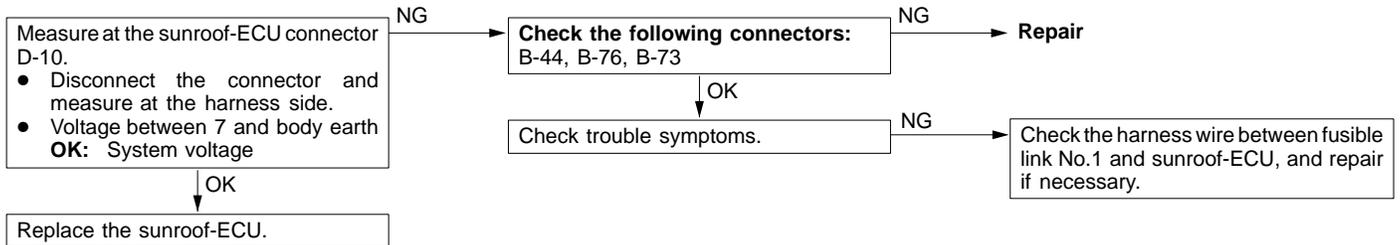
Inspection Procedure 2

<p>The motor does not reverse its direction when a load of 140 N or more is applied while the sunroof is closing.</p>	<p>Probable cause</p>
<p>The sunroof-ECU monitors the load conditions from the amount of current flowing to the motor. If more than the constant amount of current is flowing, the direction of motor operation is reversed to prevent jamming. If the motor does not reverse direction even when an excessive load is being applied, the cause may be a malfunction of the sunroof-ECU.</p>	<ul style="list-style-type: none"> • Malfunction of sunroof-ECU

Replace the sunroof-ECU.

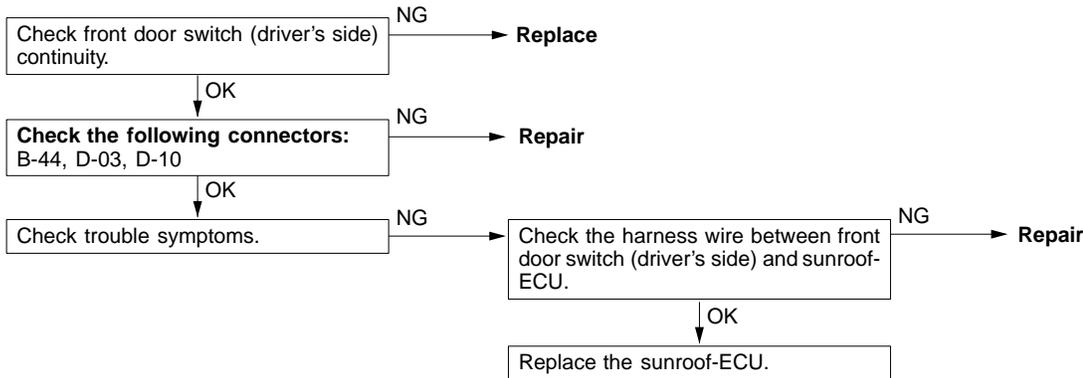
Inspection Procedure 3

<p>The timer does not operate for 30 seconds after the ignition switch is turned to OFF.</p>	<p>Probable cause</p>
<p>The sunroof-ECU has a timer function which operates for 30 seconds after the ignition switch is turned to OFF. If the timer does not operate, the cause may be a malfunction of the sunroof-ECU or of the wiring harness or connector.</p>	<ul style="list-style-type: none"> • Malfunction of sunroof-ECU • Malfunction of wiring harness or connector



Inspection Procedure 4

<p>Opening or closing of the sunroof is possible for 30 seconds after turning the ignition switch to OFF, but the timer function is not extended when the driver's side door is opened within this period.</p>	<p>Probable cause</p>
<p>The sunroof timer operation period is extended when an on signal is output from the driver's-side door switch. Because of this, if the timer operation period is not extended, the cause may be a malfunction of the door switch input circuit.</p>	<ul style="list-style-type: none"> • Malfunction of the front door switch (driver's side) • Malfunction of sunroof-ECU • Malfunction of wiring harness or connector



TERMINAL VOLTAGE CHART

1	2	3	4	A	5	6	7	8	
9	10	11	12	13	14	15	16	17	18

18P0142

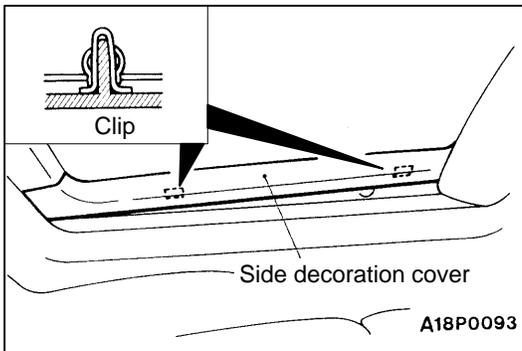
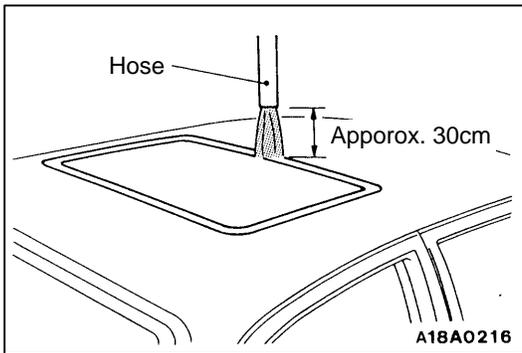
Terminal No.	Check Item	Check Condition	Normal Condition	
1	Door switch input	Driver's door switch	ON	0 V
			OFF	System voltage
2	Sunroof switch (up) input	Sunroof switch (up position)	ON	0 V
			OFF	System voltage
3	Sunroof switch (close or down) input	Sunroof switch (close position or down position)	ON	0 V
			OFF	System voltage
4	Sunroof switch (open input)	Sunroof switch (open position)	ON	0 V
			OFF	System voltage
5	ECU power supply	Ignition switch: ON	System voltage	
6	Motor output (When sunroof is opening)	While sunroof is opening or moving down	System voltage	
		Other than the above	0 V	
7	Timer operation power supply	Always	System voltage	
8	Motor output (When sunroof is closing)	While sunroof is closing or moving up	System voltage	
		Other than the above	0 V	
9	Limit switch 3 input	In tilt up condition and fully-open condition	0 V	
		Other than the above	System voltage	
10	Limit switch 1 input	In tilt up condition	System voltage	
		In fully-closed and fully-open conditions	0 V	
		In slide-closing condition	0 V → System voltage → 0V.	
12	Limit switch 2 input	In tilt up condition and fully-closed condition	System voltage	
		Other than the above	0 V	
18	Earth	Always	0 V	

ON-VEHICLE SERVICE

WATER TEST

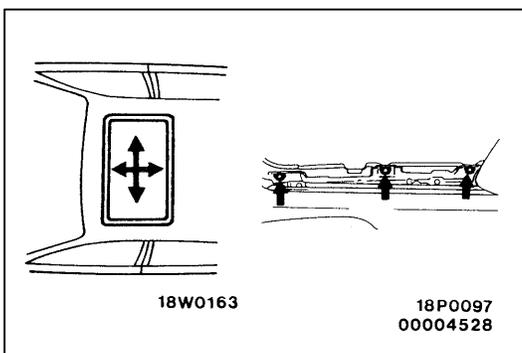
Check if there are any leaks in the sunroof by the following procedure.

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

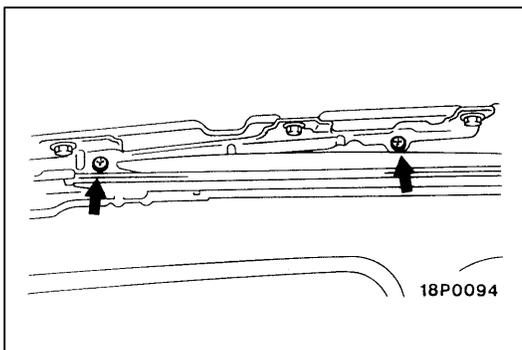
1. Fully close the roof lid glass.
2. Fully open the sunshade.
3. Remove the side decoration cover.



4. To adjust the forward, backward and sideways position of the roof lid glass, loosen the six roof lid glass assembly mounting nuts and then adjust the glass forward, backward or sideways.

NOTE

If the adjustment cannot be made by loosening the adjustment nuts, the fully closed position of the roof lid glass may not match that of the motor. If so, adjust them to match their fully closed positions.



5. To adjust the height of the roof lid glass, loosen the four guide (A) assembly mounting screws and then move the roof lid glass assembly along the slot in the guide (A) assembly.
6. After adjustment, check to be sure that the sunroof operates smoothly.

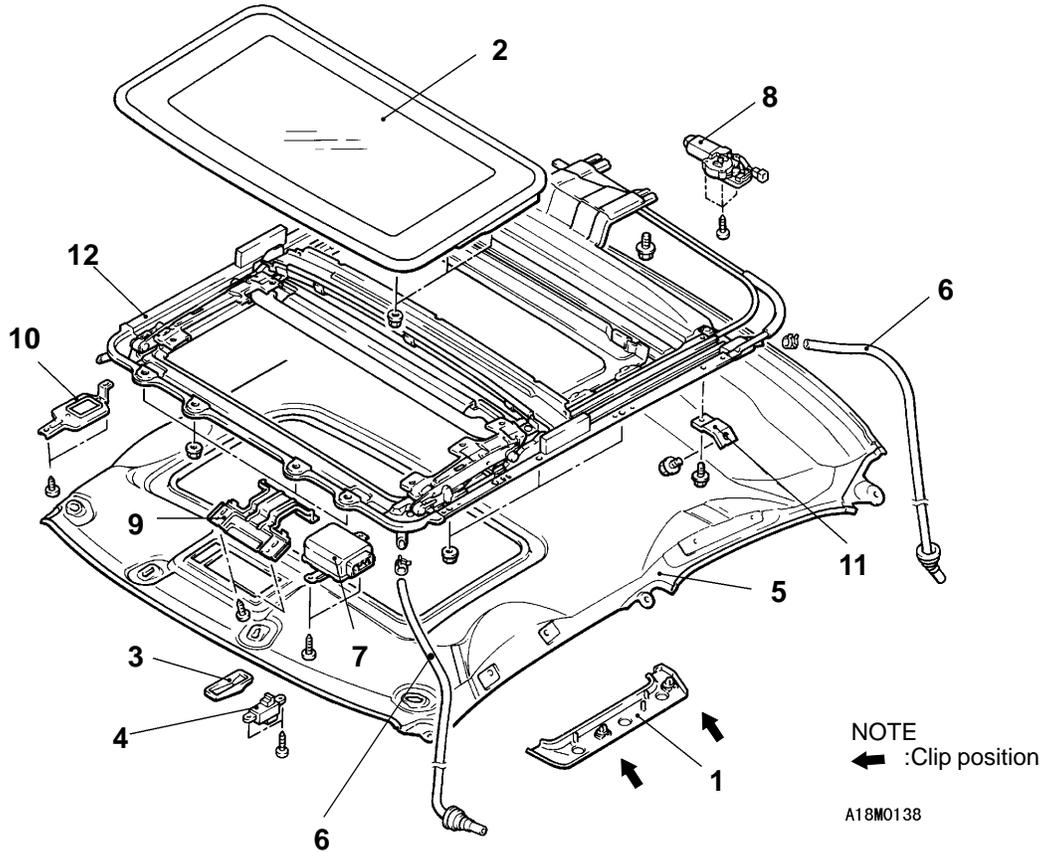
SUNROOF

REMOVAL AND INSTALLATION

Post-installation Operation

<Roof lid glass assembly, Sunroof assembly>

- Sunroof Water Test (Refer to P.42-13.)
- Sunroof Fit Adjustment (Refer to P.42-13.)



◀A▶

Roof lid glass assembly removal steps

1. Side decoration cover
2. Roof lid glass assembly

Sunroof switch removal steps

3. Sunroof switch cover
4. Sunroof switch

Drain hose removal steps

- Splash shield (Front drain hose)
- 5. Headlining
- 6. Drain hose

◀B▶ ▶B▶

Sunroof-ECU removal steps

5. Headlining
7. Sunroof-ECU

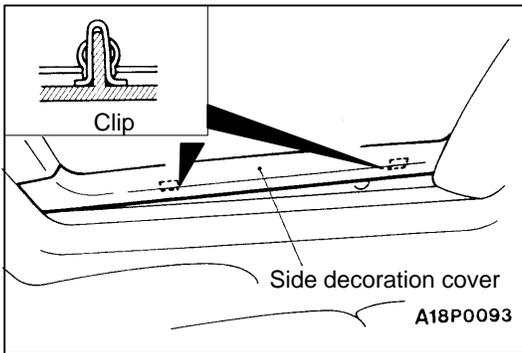
Sunroof motor removal steps

5. Headlining
8. Sunroof motor

◀C▶ ▶A▶

Sunroof assembly removal steps

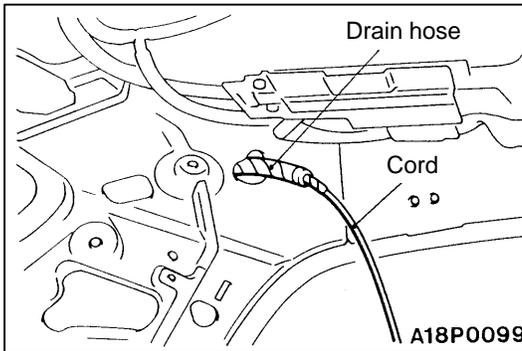
5. Headlining
6. Drain hose connection
9. Room lamp bracket
10. Sunroof switch bracket
11. Set bracket
12. Sunroof assembly



REMOVAL SERVICE POINTS

◀A▶ SIDE DECORATION COVER REMOVAL

Remove the clips, and then remove the side decoration cover.



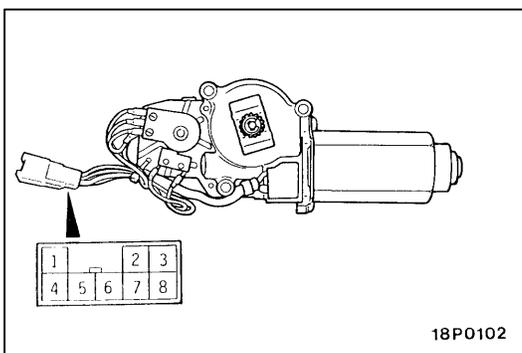
◀B▶ DRAIN HOSE REMOVAL

Tie a cord to the end of the drain hose, and wind tape around the tie until it is smooth. Then pull the drain hose out from the passenger compartment.

◀C▶ SUNROOF MOTOR REMOVAL

Caution

Always close the roof lid glass fully before removing the sunroof motor. If the fully-closed positions of the roof lid glass and the sunroof motor are not the same, the sunroof will not operate properly.

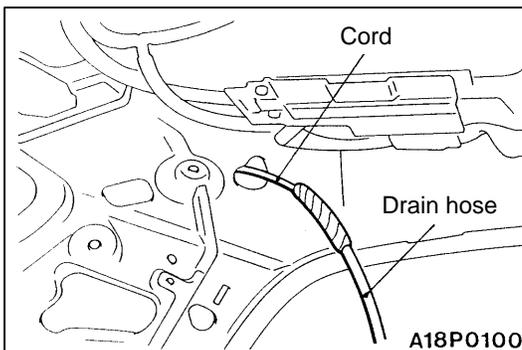


INSTALLATION SERVICE POINTS

▶A▶ SUNROOF MOTOR INSTALLATION

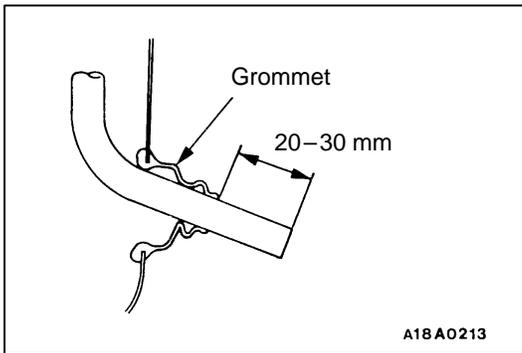
If the fully-closed position of the sunroof motor is incorrect, set the motor to the fully-closed position by the procedure given below before installing the motor.

1. Connect a circuit analyser between terminals (4) and (6) of the motor connector.
2. Operate the motor until the position is reached at which continuity switches from on to off or from off to on, and then install the motor.

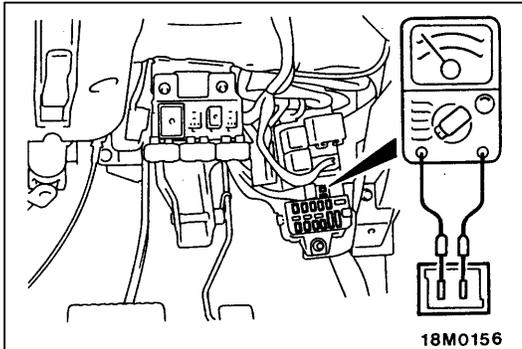


▶B▶ DRAIN HOSE INSTALLATION

1. Tie the cord 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 cord to pass through the drain hose



3. Make the drain hose protrusion from the grommet as shown in the illustration.



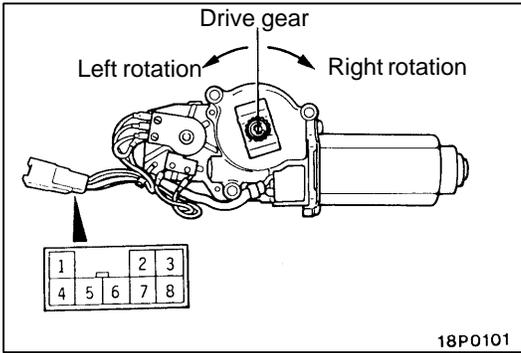
INSPECTION

ROOF LID GLASS OPERATION CURRENT CHECK

1. Remove the sunroof fuse and connect a circuit analyser as shown in the illustration.
2. Press the sunroof switch to the ON position, and then measure the operation current in the intervals between the points when the sunroof starts to operate, when it is fully open, when it is fully closed and when it is fully tilted up.

Standard value: 7 A or less (at 20°C)

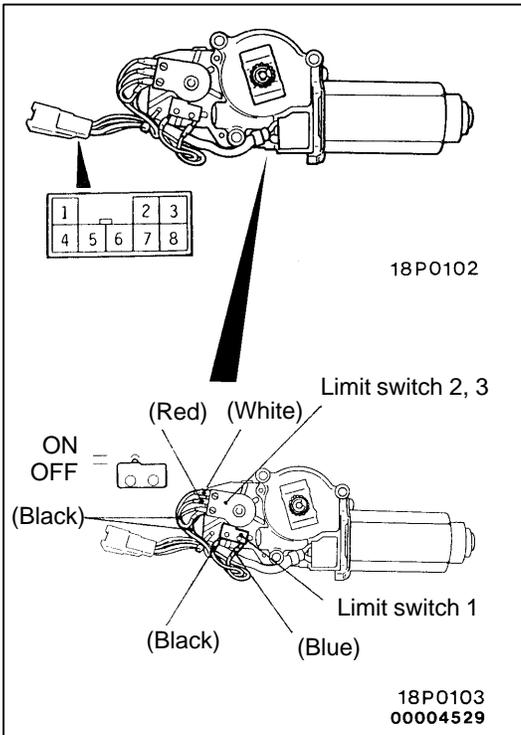
3. If the operation current is outside the standard value, check the following points.
 - Installation condition, warping or jamming of sunroof assembly
 - Sticking of drive cable
 - Tilt of roof lid glass



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

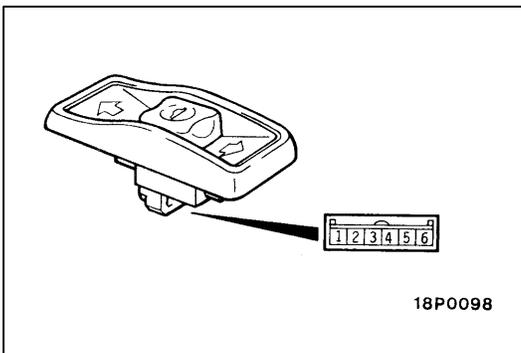


LIMIT SWITCH CONTINUITY CHECK

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

Switch position		Terminal No.			
		4	5	6	7
Limit switch 1	ON	○	○		
	OFF				
Limit switch 2	ON	○		○	
	OFF				
Limit switch 3	ON	○			○
	OFF				

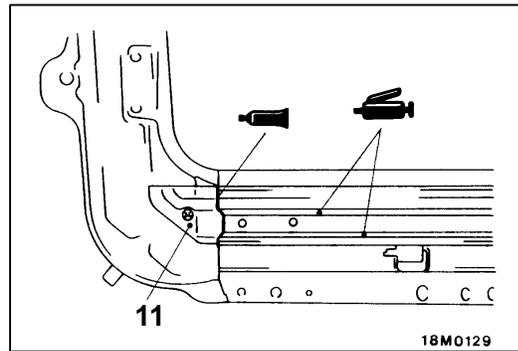
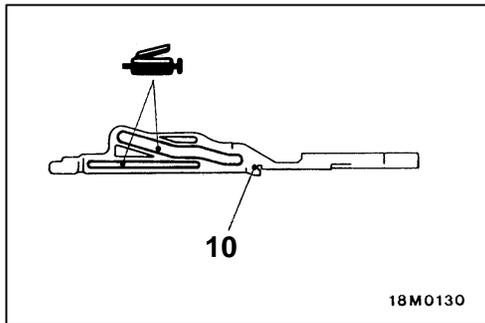
2. Check the identification colours. Then install the limit switches as shown in the illustration.



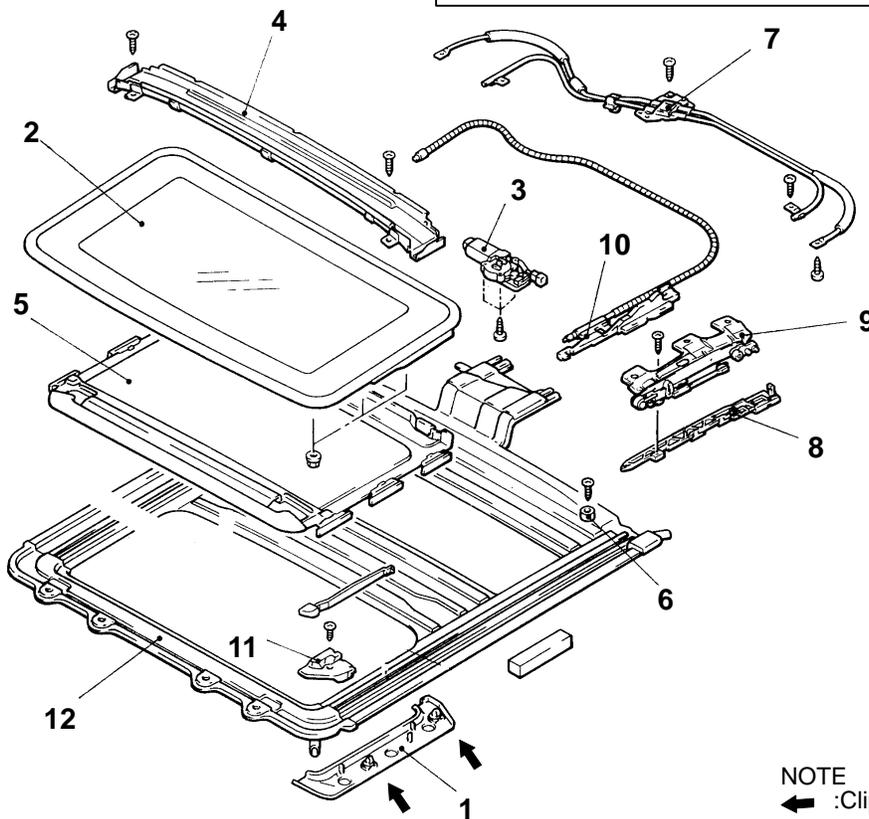
SUNROOF SWITCH CONTINUITY CHECK

Switch position	Terminal No.			
	3	4	5	6
Slide open		○	○	
Off				
Tilt up	○	○		
Slide close, Tilt down		○		○

DISASSEMBLY AND REASSEMBLY



Sealant:
3M ATD Part No.8531 or 3M Part
No.8646, or equivalent



NOTE
← :Clip position

18M0139
00004534

Disassembly steps

- | | |
|---|-------------------------|
| 1. Side decoration cover
(Refer to P.42-15.) | 7. Drive unit assembly |
| 2. Roof lid glass assembly | 8. Decoration link |
| 3. Sunroof motor | 9. Guide (A) assembly |
| 4. Drip rail assembly | 10. Slider assembly |
| 5. Sunshade assembly | 11. Rail cover assembly |
| 6. Cushion (B) assembly | 12. Frame sub assembly |