SYSTEM OUTLINE

In this system, the HALL IC in the moon roof control ECU detects changes in the motor rotation to allow opening/closing and tilting up/down of the moon roof using one touch operation. Additionally, catching prevention mechanism during moon roof operation is also provided.

Voltage is always applied from the **S–ROOF** fuse to **TERMINAL 5** of the moon roof control ECU. When the ignition SW is turned to ON, the voltage is applied from the **EUG–IG** fuse to **TERMINAL 8** of the moon roof control ECU.

1. SLIDE OPEN OPERATION

When the moon roof control SW is kept pressed to **OPEN** position for approximately **0.3** sec. or longer (The limit SW No.1 is off and limit SW No.2 is on), the signal is input from **TERMINAL 1** of the moon roof control SW to **TERMINAL 9** of the moon roof control ECU. This activates the ECU and rotates the motor to open the moon roof. After that, when the limit SW No. 1 is turned on, and then turned off again, the pulse signal sent from the HALL IC activates the ECU, and it determines that the moon roof is fully opened, and stops the motor rotation. If other operation SW or open SW is operated while the moon roof is being opened, the ECU is activated to stop the moon roof operation. Additionally, when the moon roof is tilted up, the slide open operation does not function.

2. SLIDE CLOSE OPERATION

When the moon roof control SW is kept pressed to **CLOSE** position for approximately **0.3** sec. or longer (The limit SW No.1 is off and limit SW No.2 is off), the signal is input from **TERMINAL 4** of the moon roof control SW to **TERMINAL 10** of the moon roof control ECU. This activates the ECU and rotates the motor to automatically close the moon roof. After that, when the limit SW No.2 is turned on, the pulse signal sent from the HALL IC activates the ECU, and it determines that the moon roof is fully closed, and stops the motor rotation. If other operation SW or close SW is operated while the moon roof is being closed, the ECU is activated to stop the moon roof operation.

3. TILT UP OPERATION

When the moon roof control SW is kept pressed to **TILT UP** position for approximately **0.3** sec. or longer (The limit SW No.1 is off and limit SW No.2 is on), the signal is input from **TERMINAL 3** of the moon roof control SW to **TERMINAL 4** of the moon roof control ECU. This activates the ECU and rotates the motor to automatically tilt up the moon roof. If the pulse signal sent from the HALL IC is not input for **0.5** sec. or longer when the moon roof is fully tilted up, the ECU determines that the motor has stopped, and stops the current flowing into the motor.
If other operation SW or tilt up SW is operated while the moon roof is being tilted up, the ECU is activated to stop the moon roof operation. Additionally, when the moon roof is open, the tilt up operation does not function.

4. TILT DOWN OPERATION

When the moon roof control SW is kept pressed to **TILT DOWN** position for approximately **0.3** sec. or longer (The limit SW No.1 is on and limit SW No.2 is on), the signal is input from **TERMINAL 2** of the moon roof control SW to **TERMINAL 3** of the moon roof control ECU. This activates the ECU and rotates the motor to automatically tilt down the moon roof. When the limit SW No.1 is turned off, the pulse signal sent from the HALL IC activates the ECU, and it determines that the moon roof is fully closed, and stops the motor rotation.
If other operation SW or tilt down SW is operated while the moon roof is being tilted down, the ECU is activated to stop the moon roof operation.

5. CATCHING PREVENTION FUNCTION

If the moon roof control ECU detects a catching load from changes in the motor rotation during slide close or tilt down operation, the operation is stopped, and then the motor is rotated in the reverse direction.
Slide close operation
The moon roof is moved approximately **200** mm in the reverse direction (Slide open) after a catching load has been detected. However, if the full open position is detected before moving approximately **200** mm completely, the reverse movement is stopped.
Tilt down operation
If a catching load is detected during tilt down operation, the moon roof is fully tilted up.

6. KEY OFF MOON ROOF OPERATION

The moon roof can be operated for approximately **45** seconds, when the ignition SW is turned from ON to OFF with all doors closed. However, when the driver side door or front passenger side door is opened during this time, the operation is canceled.

7. MOON ROOF OPERATION LINKED WITH TRANSMITTER

When the unlock SW on the transmitter of the ignition key is kept pressed for **1.5** sec. or longer, the slide open operation of the moon roof functions through communication control of the body ECU and door ECU etc.

8. MOON ROOF OPERATION LINKED WITH DOOR KEY LOCK AND UNLOCK SW

When the ignition key is inserted into the driver door key cylinder and kept turned to the lock or unlock position for approximately **1.5** sec. or longer, the slide open or close operation of the moon roof functions through communication control of the body ECU and door ECU etc.

9. FAIL SAFE FUNCTION

If the moon roof is operated continuously in the same operating direction, the current flowing into the motor is cut off when the time shown below has elapsed after the motor operation has been started.
Slide open/close operation with the moon roof control SW Approximately **20** sec.
Tilt up/down operation with the moon roof control SW Approximately **2** sec.
Slide open operation for reverse movement in case of activation of the catching prevention function Approximately **20** sec.
Tilt open operation for reverse movement in case of activation of the catching prevention function Approximately **2** sec.

SERVICE HINTS

M4 MOON ROOF CONTROL ECU

5–GROUND : Always approx. **12** volts
8–GROUND : Approx. **12** volts with ignition SW at **ON** or **ST** position
7–GROUND : Always continuity

M5 MOON ROOF CONTROL SW

3–5 : Closed with moon roof control SW at **TILT UP** position
2–5 : Closed with moon roof control SW at **TILT DOWN** position
1–5 : Closed with moon roof control SW at **OPEN** position
4–5 : Closed with moon roof control SW at **CLOSE** position
5–GROUND : Always continuity

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
J7 A	74 (LHD)	J32	88 (RHD)	M4	92 (RHD)
J8	74 (LHD)	J37	88 (RHD)	M5	78 (LHD)
J10	74 (LHD)	J41 B	88 (RHD)		92 (RHD)
J16 A	74 (LHD)	J42	88 (RHD)		
J31 B	88 (RHD)	M4	78 (LHD)		

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1H	59 (LHD)	Cowl Wire and Driver Side J/B (Left Kick Panel)
	59 (RHD)	Cowl Wire and Driver Side J/B (Right Kick Panel)
2D	60 (LHD)	Roof Wire and Passenger Side J/B (Right Kick Panel)
	60 (RHD)	Roof Wire and Passenger Side J/B (Left Kick Panel)
2F	60 (LHD)	Cowl Wire and Passenger Side J/B (Right Kick Panel)
	60 (RHD)	Cowl Wire and Passenger Side J/B (Left Kick Panel)
2G	61 (LHD)	Cowl Wire and Passenger Side J/B (Right Kick Panel)
	61 (RHD)	Cowl Wire and Passenger Side J/B (Left Kick Panel)

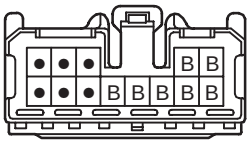
: GROUND POINTS

Code	See Page	Ground Points Location
IF	98 (LHD)	Left Kick Panel
	108 (RHD)	
II	98 (LHD)	Right Side of the Cowl Panel
	108 (RHD)	Cowl Side Panel RH

: SPLICE POINTS

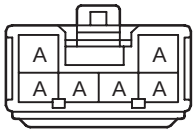
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
B2	102 (LHD)	Roof Wire	B2	112 (RHD)	Roof Wire

J7 (A) GRAY



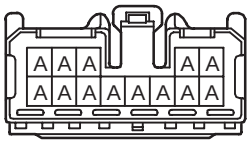
(Hint : See Page 7, 23, 39)

J8



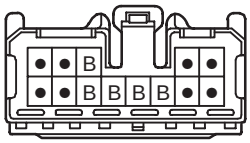
(Hint : See Page 7, 23, 39)

J10 ORANGE



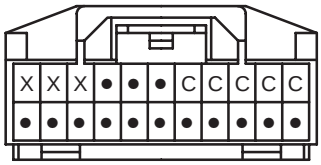
(Hint : See Page 7, 23, 39)

J16 (A)



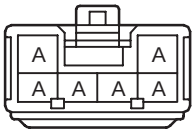
(Hint : See Page 7, 23, 39)

J31 (B)



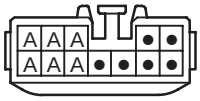
(Hint : See Page 7, 23, 39)

J32



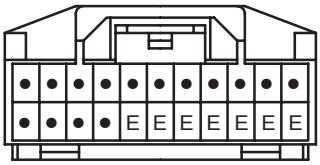
(Hint : See Page 7, 23, 39)

J37



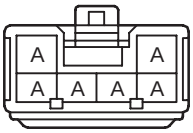
(Hint : See Page 7, 23, 39)

J41 (B)



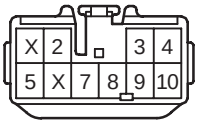
(Hint : See Page 7, 23, 39)

J42



(Hint : See Page 7, 23, 39)

M4



M5