



SYSTEM OUTLINE

In this system, the HALL IC in the moon roof control ECU detects the changes in motor rotation, and allows opening/closing, tilting up/down of the moon roof by one touch operation.

In addition, catching prevention function during moon roof operation is also provided.

Voltage is constantly applied from POWER fuse to moon roof control ECU TERMINAL 5 and POWER RELAY TERMINAL 5.

1. SLIDE OPEN OPERATION

When the moon roof control SW is kept pressed to OPEN position for approx. 0.3 seconds or longer (Limit SW No.1 off, limit SW No.2 on), a signal is input from moon roof control SW TERMINAL 5 to moon roof control ECU TERMINAL 9. This activates the moon roof control ECU and rotates the motor to open the moon roof automatically. Then, when the limit SW No.1 is turned on and then turned off again, the pulse signal sent from the HALL IC activates the moon roof control ECU, and determines that the moon roof is fully open, and stops the motor. If other operation SW or the open SW is operated while the moon roof is being opened, the moon roof control ECU is activated to stop the moon roof operation. In addition, 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 approx. 0.3 seconds or longer (Limit SW No.1 off, limit SW No.2 off), a signal is input from moon roof control SW TERMINAL 4 to moon roof control ECU TERMINAL 10. This activates the moon roof control ECU and rotates the motor to close the moon roof automatically. Then, when the limit SW No.2 is turned on, the pulse signal sent from the HALL IC activates the moon roof control ECU, and determines that the moon roof is closed fully, and stops the motor. If other operation SW or the close SW is operated while the moon roof is being closed, the moon roof control ECU is activated to stop the moon roof operation.

3. TILT UP OPERATION

When the moon roof control SW is kept pressed to UP position for approx. 0.3 seconds or longer (Limit SW No.1 off, limit SW No.2 on), a signal is input from moon roof control SW TERMINAL 1 to moon roof control ECU TERMINAL 4. This activates the moon roof control ECU and rotates the motor to tilt up the moon roof automatically. If the pulse signal is not input from the HALL IC for 0.5 seconds or longer, it determines that the moon roof is fully tilted up, and stops the motor. If other operation SW or the tilt up SW is operated while the moon roof is being tilted up, the moon roof control ECU is activated to stop the moon roof operation. In addition, when the moon roof is opened, the tilt up operation does not function.

4. TILT DOWN OPERATION

When the moon roof control SW is kept pressed to DOWN position for approx. 0.3 seconds or longer (Limit SW No.1 on, limit SW No.2 on), a signal is input from moon roof control SW TERMINAL 2 to moon roof control ECU TERMINAL 3. This activates the moon roof control ECU and rotates the motor to tilt down the moon roof automatically.

Then, when the limit SW No.1 is turned off, the pulse signal sent from the HALL IC activated the moon roof control ECU, and determines that the moon roof is closed fully, and stops the motor.

If other operation SW or the tilt down SW is operated while the moon roof is being tilted down, the moon roof control ECU is activated to stop the moon roof operation.

5. CATCHING PREVENTION FUNCTION

During slide close or tilt down operation, if the moon roof control ECU detects a catching load from the changes in the rotation of the motor, the operation is stopped, and the motor is rotated in the reverse direction.

* Slide close operation

The moon roof is moved approx. 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 approx. 200 mm, the reverse movement is stopped.

* Tilt down operation

If a catching load is detected, the moon roof is moved in the reverse direction until fully tilted up.

6. KEY OFF MOON ROOF OPERATION

Within approx. 45 seconds after the ignition SW is turned from on to off, the moon roof can be operated. However, if the driver or front passenger door is opened during this period of time, the moon roof operation is stopped even though 45 seconds have not elapsed.

7. FAIL-SAFE FUNCTION

If the moon roof is operated continuously in the same direction, the current flowing to the motor is cut off when the time shown below has elapsed after the motor operation has been started.

* Slide open/close operation by the moon roof SW approx. 20 seconds

* Tilt up/down operation by the moon roof SW approx. 2 second

* Slide open operation for reverse movement in case of catching prevention function approx. 20 seconds

* Tilt up operation for reverse movement in case of catching prevention function approx. 2 seconds

SERVICE HINTS

M2 MOON ROOF CONTROL ECU

- 5-GROUND : Always approx. **12** volts
- 8-GROUND : Approx. **12** volts with ignition SW at **ON** or **ST** position
: Approx. **12** volts with key off moon roof operation
- 7-GROUND : Always continuity

M3 MOON ROOF CONTROL SW

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

POWER RELAY

- 5-3 : Closed with ignition SW at **ON** or **ST** position
: Closed with key off moon roof operation

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
D19	42	J4	41	J25	41
D20	42	J15	41	J26	41
I19	A 40	J17	41	M2	43
I21	C 40	J20	41	M3	43
J3	41	J24	41		

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	23	Engine Room No.2 Wire and Engine Room J/B (Engine Compartment Left)
2A	26	Roof Wire and Cowl Side J/B LH (Left Kick Panel)
2B	26	Dash Wire and Cowl Side J/B LH (Left Kick Panel)
2N	26	Floor Wire and Cowl Side J/B LH (Left Kick Panel)
2P	28	Instrument Panel Integration Wire and Cowl Side J/B LH (Left Kick Panel)
3E	32	Floor No.2 Wire and Cowl Side J/B RH (Right Kick Panel)
3I	32	Instrument Panel Integration Wire and Cowl Side J/B RH (Right Kick Panel)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IE1	48	Dash Wire and Roof Wire (Left Kick Panel)
IU4	52	Instrument Panel Integration Wire and Dash Wire (Behind the Glove Box)
IW1	54	Engine Room No.2 Wire and Dash Wire (Behind the Glove Box)

: GROUND POINTS

Code	See Page	Ground Points Location
IF	48	Set Bolt of Cowl Side J/B LH
IH	48	Set Bolt of Cowl Side J/B RH

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I1	50	Dash Wire	B5	58	Roof Wire