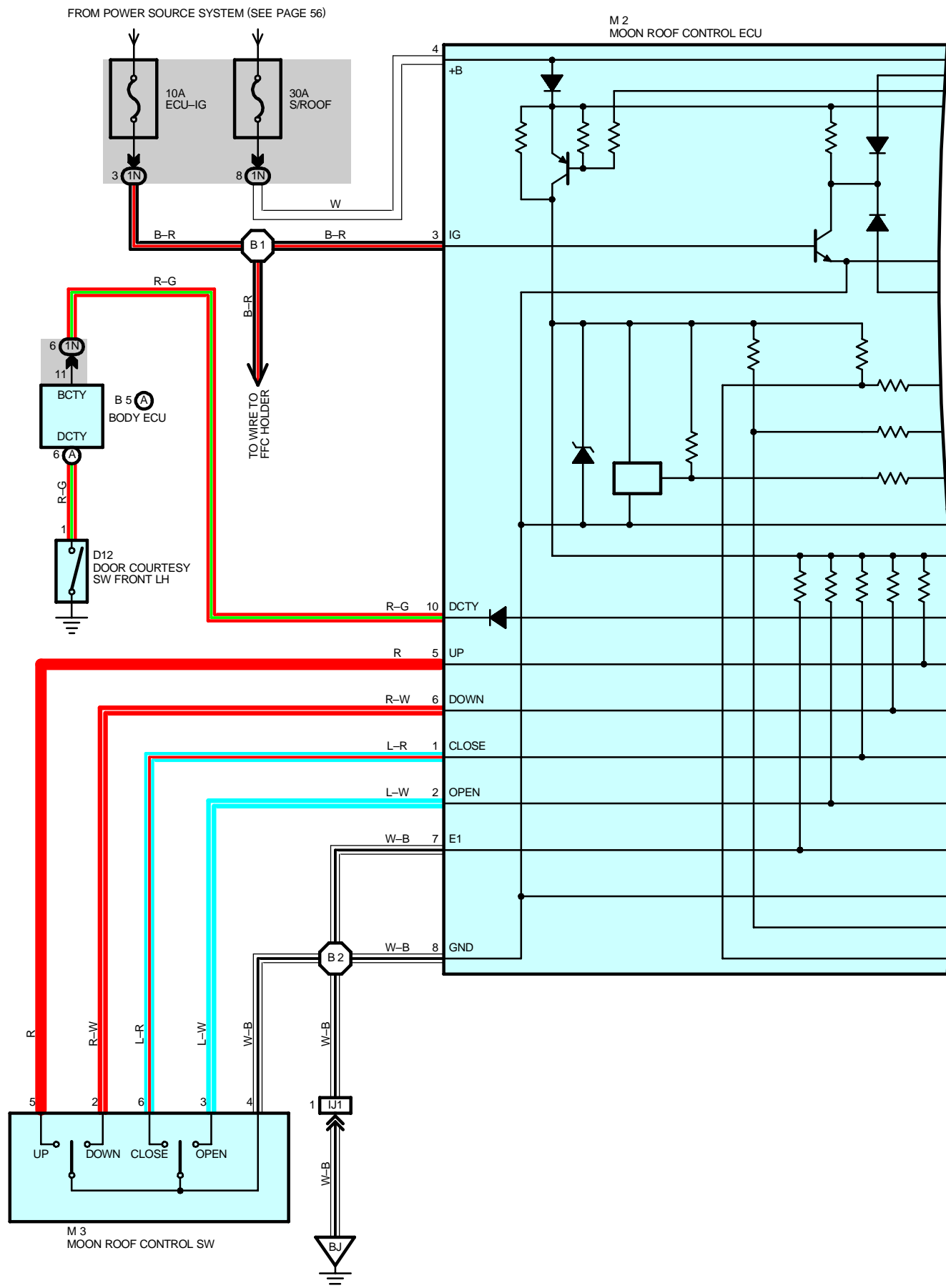
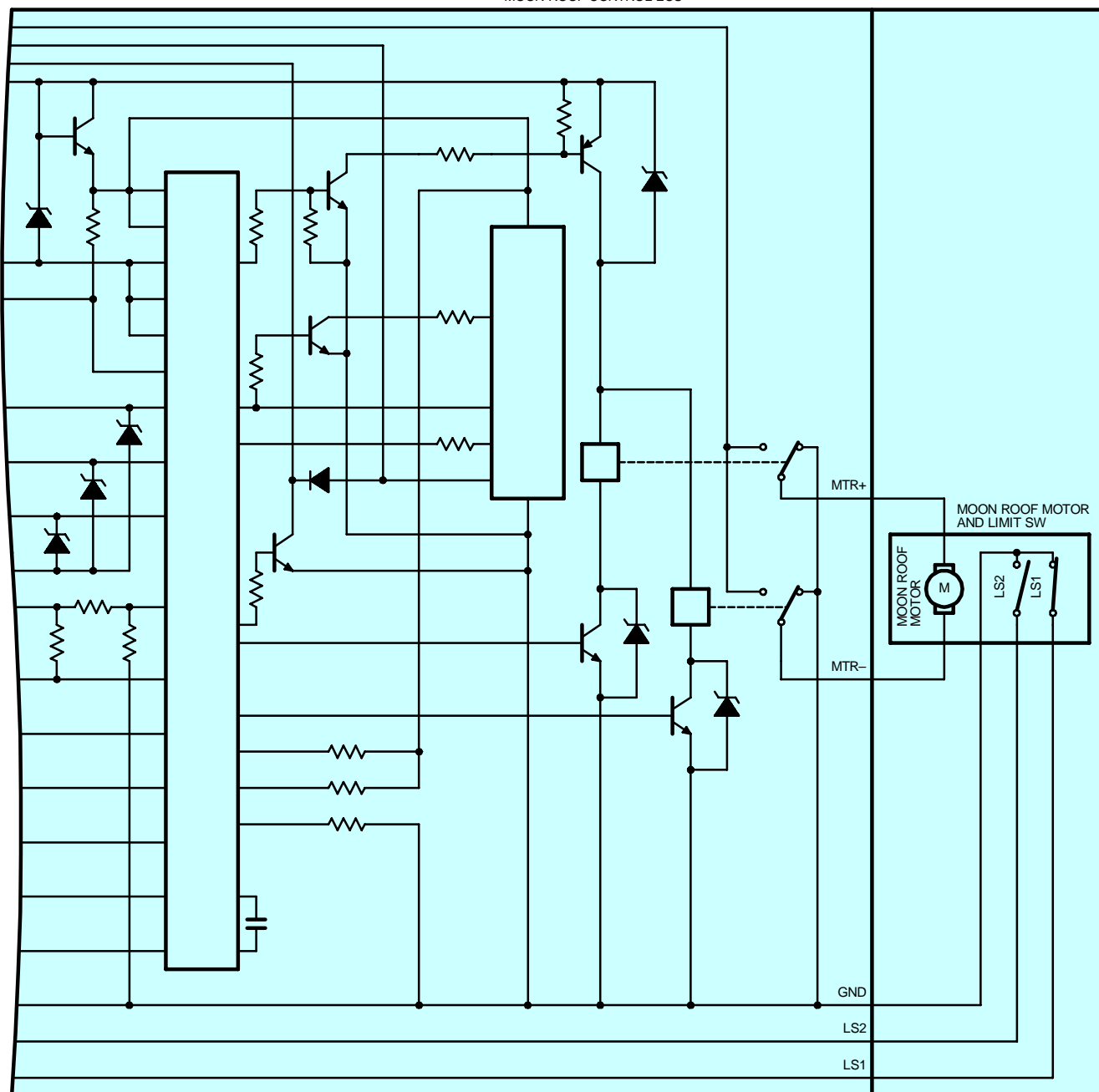


MOON ROOF



M 2
MOON ROOF CONTROL ECU



MOON ROOF

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 4 of the moon roof control ECU. When the ignition SW is turned to ON, the voltage is applied from the ECU-IG fuse to TERMINAL 3 of the moon roof control ECU.

1. SLIDE OPEN OPERATION

When the moon roof control SW is pressed to OPEN position (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 2 of the moon roof control ECU. This activates the relay 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 relay, and it determines that the moon roof is opened (30 mm from the fully opened position), and stops the motor rotation. After that, when the moon roof control SW is pressed to OPEN position again, the moon roof is fully open. If other operation SW or open SW is operated while the moon roof is being opened, the relay 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 pressed to CLOSE position (The limit SW No.1 is off and limit SW No.2 is off), the signal is input from TERMINAL 6 of the moon roof control SW to TERMINAL 1 of the moon roof control ECU. This activates the relay 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 relay, 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 relay is activated to stop the moon roof operation.

3. TILT UP OPERATION

When the moon roof control SW is pressed to TILT UP position (The limit SW No.1 is off and limit SW No.2 is on), the signal is input from TERMINAL 5 of the moon roof control SW to TERMINAL 5 of the moon roof control ECU. This activates the relay and rotates the motor to automatically tilt up the moon roof. If the pulse signal sent from the HALL IC is not input when the moon roof is fully tilted up, the relay 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 relay 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 pressed to TILT DOWN position (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 6 of the moon roof control ECU. This activates the relay 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 relay, 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 relay 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 is opened during this time, the operation is canceled.

7. 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

M2 MOON ROOF CONTROL ECU

- 4-GROUND : Always approx. **12** volts
- 3-GROUND : Approx. **12** volts with the ignition SW at **ON** position
- 7-GROUND : Always continuity

M3 MOON ROOF CONTROL SW

- 5-4 : Closed with the moon roof control SW at **TILT UP** position
- 2-4 : Closed with the moon roof control SW at **TILT DOWN** position
- 3-4 : Closed with the moon roof control SW at **OPEN** position
- 6-4 : Closed with the moon roof control SW at **CLOSE** position
- 4-GROUND : Always continuity

○ : PARTS LOCATION

Code		See Page	Code	See Page	Code	See Page
B5	A	34	M2	37 (S/D)	M3	39 (W/G)
D12		36 (S/D)		39 (W/G)		
		38 (W/G)	M3	37 (S/D)		

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1N	24	Roof Wire and Driver Side J/B (Left Kick Panel)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IJ1	46	Roof Wire and Floor No.2 Wire (Left Side of the Instrument Panel)

▽ : GROUND POINTS

Code	See Page	Ground Points Location
BJ	48 (S/D)	Front Floor Panel LH
	50 (W/G)	

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
B1	48 (S/D)	Roof Wire	B2	48 (S/D)	Roof Wire
	50 (W/G)			50 (W/G)	