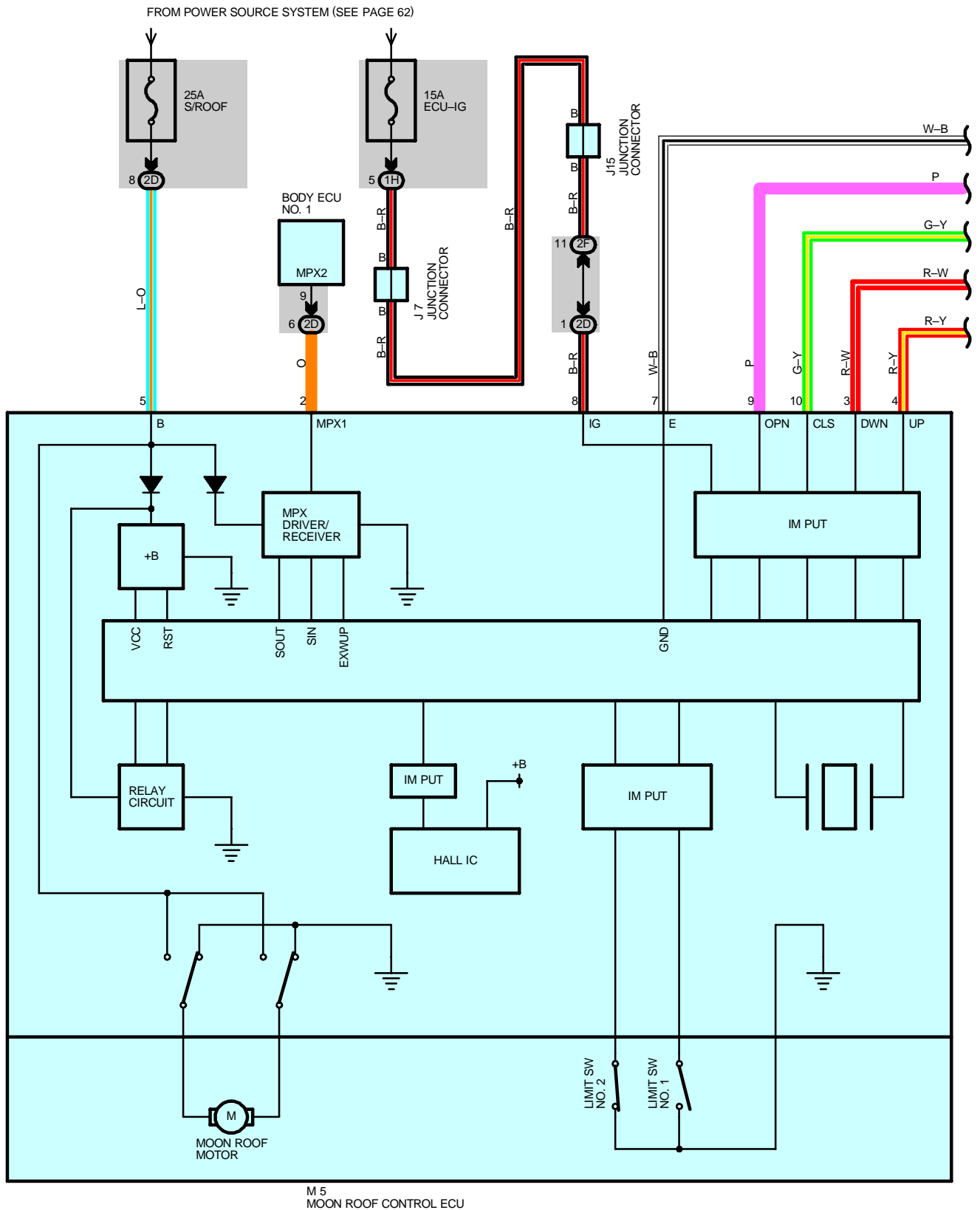
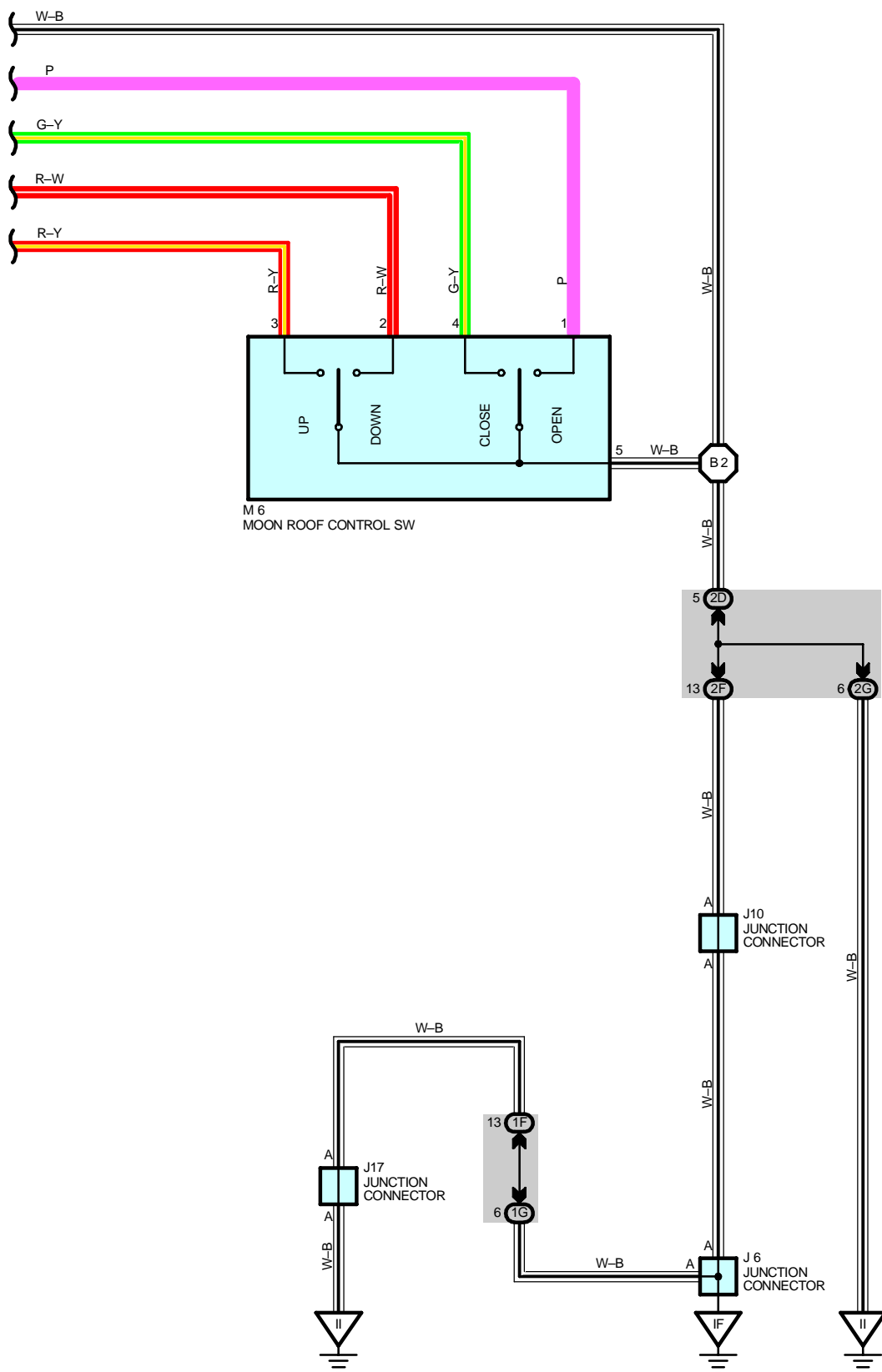


# MOON ROOF





# 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 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

After the ignition SW is turned from ON to OFF, communication control of the body ECU and door ECU etc. allows the moon roof operation for 45 sec. However, when the driver or front passenger door is opened during above moon roof operation, the moon roof operation is stopped even though 45 sec. have not elapsed.

## 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

### M5 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

### M6 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
J6	43	J15	43	M6	45
J7	43	J17	43		
J10	43	M5	45		

## ○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	28	Cowl Wire and Driver Side J/B (Left Kick Panel)
1G	29	
1H		
2D	30	Roof Wire and Passenger Side J/B (Right Kick Panel)
2F	30	Cowl Wire and Passenger Side J/B (Right Kick Panel)
2G	31	

## ▽ : GROUND POINTS

Code	See Page	Ground Points Location
IF	52	Left Kick Panel
II	52	Right Side of the Cowl Panel

## ○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
B2	56	Roof Wire			