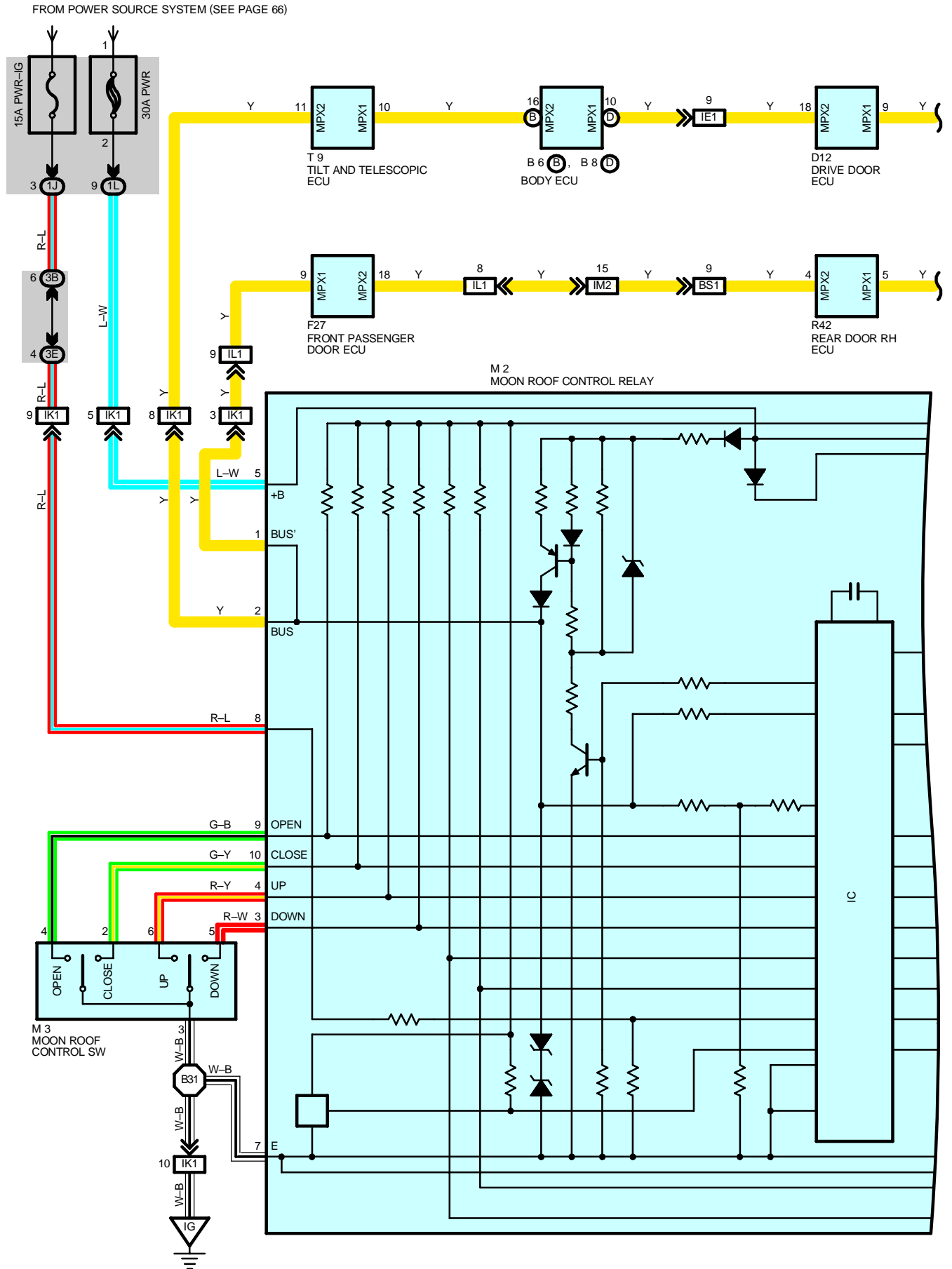
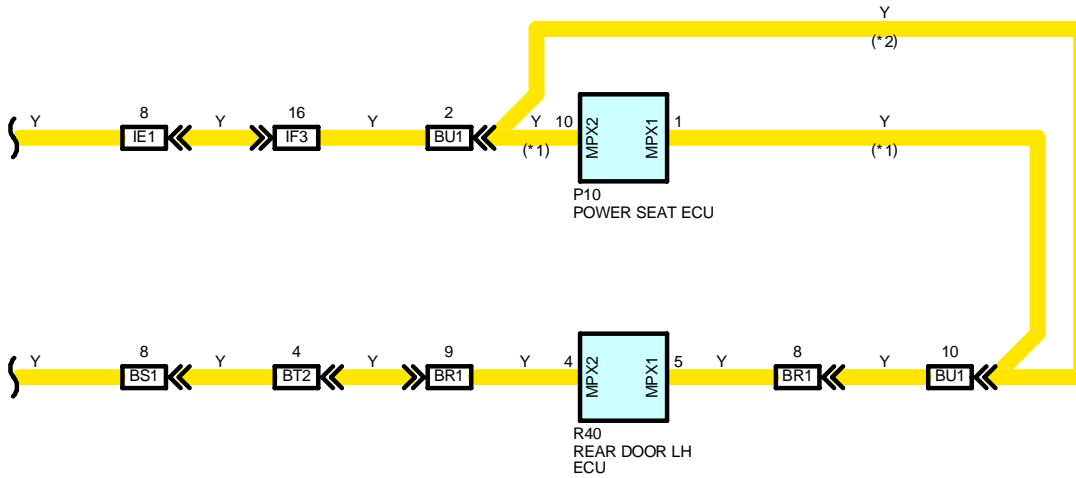


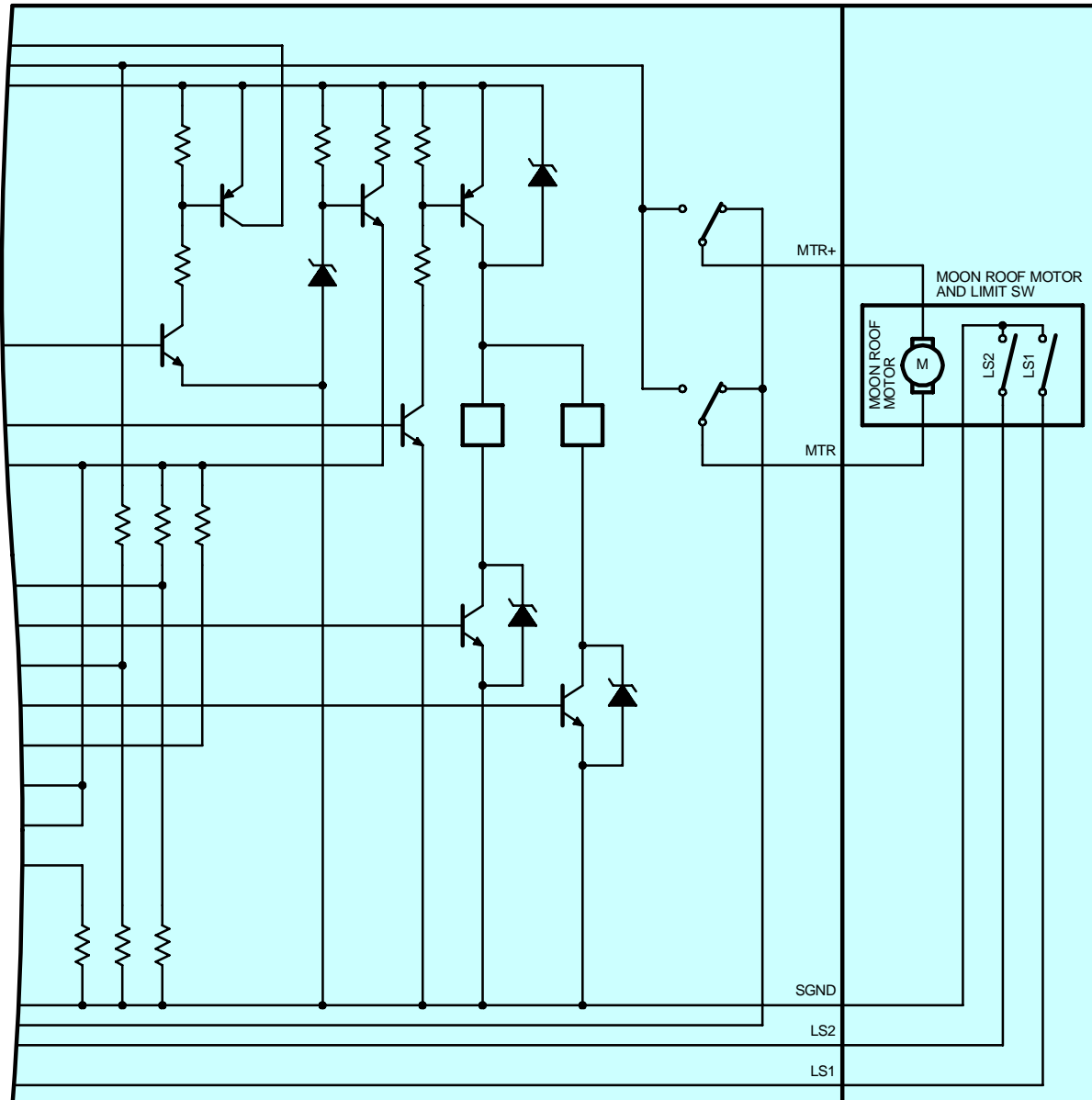
# MOON ROOF



\* 1 : W/ MEMORY  
 \* 2 : W/O MEMORY



M2  
 MOON ROOF CONTROL RELAY



# MOON ROOF

## SYSTEM OUTLINE

In this system, the HALL IC in the moon roof control relay 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 **PWR** fuse to **TERMINAL 5** of the moon roof control relay. When the ignition SW is turned to ON, the voltage is applied from the **PWR-IG** fuse to **TERMINAL 8** of the moon roof control relay.

### 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 LS1 is off and limit SW LS2 is on), the signal is input from **TERMINAL 4** of the moon roof control SW to **TERMINAL 9** of the moon roof control relay. This activates the relay and rotates the motor to open the moon roof. After that, when the limit SW LS1 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 fully opened, and stops the motor rotation. 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 kept pressed to **CLOSE** position for approximately **0.3** sec. or longer (The limit SW LS1 is off and limit SW LS2 is off), the signal is input from **TERMINAL 2** of the moon roof control SW to **TERMINAL 10** of the moon roof control relay. This activates the relay and rotates the motor to automatically close the moon roof. After that, when the limit SW LS2 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 kept pressed to **TILT UP** position for approximately **0.3** sec. or longer (The limit SW LS1 is off and limit SW LS2 is on), the signal is input from **TERMINAL 6** of the moon roof control SW to **TERMINAL 4** of the moon roof control relay. 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 for **0.5** sec. or longer 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 kept pressed to **TILT DOWN** position for approximately **0.3** sec. or longer (The limit SW LS1 is on and limit SW LS2 is on), the signal is input from **TERMINAL 5** of the moon roof control SW to **TERMINAL 3** of the moon roof control relay. This activates the relay and rotates the motor to automatically tilt down the moon roof. When the limit SW LS1 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 relay 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 closed 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

### M2 MOON ROOF CONTROL RELAY

5-GROUND : Always approx. **12 volts**

8-GROUND : Approx. **12 volts** with ignition SW at **ON** or **ST** position

7-GROUND : Always continuity

### M3 MOON ROOF CONTROL SW

6-3 : Closed with moon roof control SW at **TILT UP** position

5-3 : Closed with moon roof control SW at **TILT DOWN** position

4-3 : Closed with moon roof control SW at **OPEN** position

2-3 : Closed with moon roof control SW at **CLOSE** position

3-GROUND : Always continuity

## ○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page	
B6	B	32	M2	36	R42	37
B8	D	32	M3	36	T9	33
D12	36	P10	38			
F27	36	R40	37			

## ○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1J	20	Cowl Wire and Instrument Panel J/B (Rear of Parking Brake Release Lever)
1L		
3B	24	Cowl Wire and Center J/B (Behind the Combination Meter)
3E		

# MOON ROOF

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IE1	42	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IF3	42	Floor No.2 Wire and Cowl Wire (Left Kick Panel)
IK1	44	Cowl Wire and Roof Wire (Right Side of Instrument Panel)
IL1	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)
IM2	44	Floor Wire and Cowl Wire (Right Kick Panel)
BR1	48	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BS1	48	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)
BT2	48	Floor Wire and Floor No.2 Wire (Under the Left Rear Cushion)
BU1	50	Floor No.2 Wire and Front Seat LH Wire (Under the Driver's Seat)

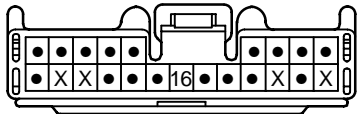
 : GROUND POINTS

Code	See Page	Ground Points Location
IG	42	Instrument Panel Brace RH

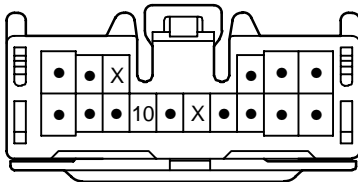
 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
B31	48	Roof Wire			

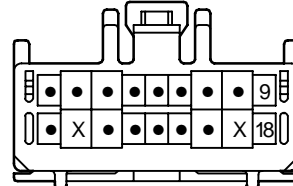
B6 (B)



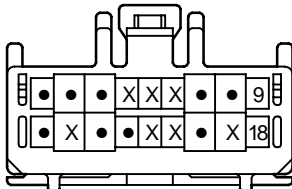
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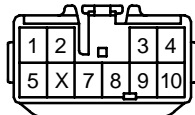
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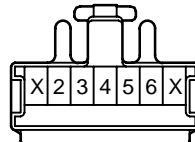
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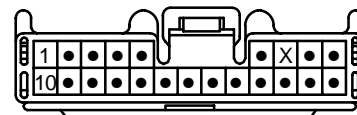
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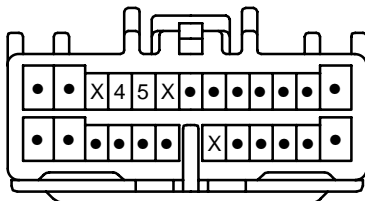
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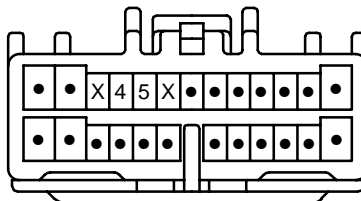
P10



R40



R42



T9 GRAY

