

SUN ROOF - POWER

1998 Mitsubishi Montero

1998 ACCESSORIES & EQUIPMENT
Mitsubishi - Power Sun Roofs

Eclipse, Galant, Montero, Montero Sport, 3000GT

DESCRIPTION & OPERATION

Sun roof is actuated by an overhead console-mounted switch. Sun roof motor, located near switch, moves sun roof panel by means of drive cables. If necessary, sun roof can be closed manually using manual closure wrench stored in vehicle's tool pouch.

On vehicles equipped with Electronic Timer Alarm Control System (ETACS) ECU, sun roof can be operated up to 30 seconds after ignition switch is turned to OFF position.

Sun roof motor incorporates a safety feature that initially limits opening or closing of roof glass panel. Sun roof will not fully close from fully open position without first releasing and then depressing slide switch during operation. Sun roof initially stops about 8" short of fully closed position.

COMPONENT LOCATIONS

COMPONENT LOCATIONS TABLE

Component	Location
Data Link Connector (DLC) Under Left Side Of Dash, Below Steering Column
Sun Roof ECU	
Galant Inside Headliner, On Left Rear Of Sun Roof
Montero Sport Inside Headliner, On Right Front Of Sun Roof
Eclipse, Montero & 3000GT Inside Headliner, On Front Center Of Sun Roof
Sun Roof Motor Inside Headliner, Near ECU

SERVICING

LUBRICATION

NOTE: Only Lubrication procedures during reassembly of sliding roof assembly components are available from manufacturer at time of publication.

ADJUSTMENTS

SUN ROOF FIT

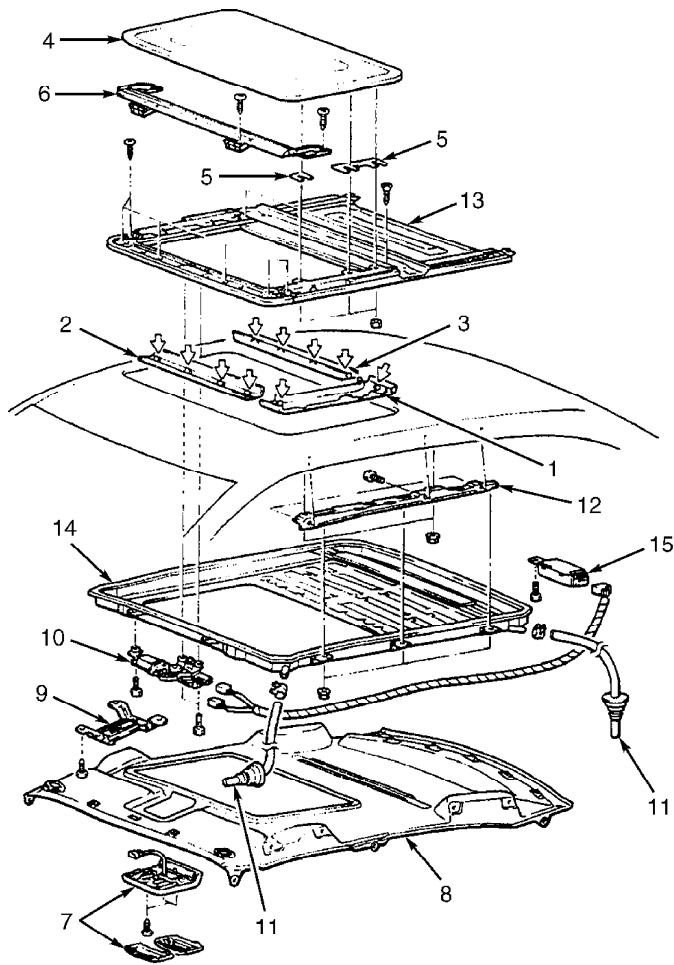
1) Fully close sun roof. Fully open sun shade. Remove side covers from underneath sun roof. Loosen 6 sun roof glass mounting nuts and adjust glass forward, backward or sideways, if necessary.

2) If adjustment cannot be made by loosening mounting nuts, check if sun roof glass or motor is in fully closed position. Readjust as necessary.

SUN ROOF GLASS FIT

1) Fully close sun roof. Ensure roof glass panel is parallel with roof opening. Sun roof glass panel parallelism should be within .04" (1 mm), above and below roof surface. If parallelism is not as specified, adjust glass panel by loosening sun roof glass panel attaching screws and repositioning glass panel. Tighten screws. See Fig. 1.

2) If adjustment cannot be made by loosening mounting screws, check if sun roof glass or motor is in fully closed position. Readjust as necessary.



- | | |
|-------------------------------------|---------------------------|
| 1. Side Trim Cover | 8. Headliner |
| 2. Front Trim Cover | 9. Light Bracket |
| 3. Rear Trim Cover | 10. Sun Roof Motor |
| 4. Roof Glass Panel | 11. Drain Hose Connection |
| 5. Adjust Plate | 12. Set Bracket |
| 6. Deflector | 13. Sliding Roof Assembly |
| 7. Sun Roof Switch & Light Assembly | 14. Housing Assembly |
| | 15. Sun Roof ECU |

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Fig. 1: Exploded View Of Sun Roof Assembly (Typical)
Courtesy of Mitsubishi Motor Sales of America

SUN ROOF MOTOR CLUTCH CHECK

Except Eclipse & Montero Sport

1) Remove sun roof motor. See DRIVE MOTOR R & I under REMOVAL & INSTALLATION. Using crank handle stored in tool pouch, place crank handle into drive motor shaft.

2) Place spring scale on crank handle about 3.92" (100 mm) from drive motor shaft. Ensure spring scale is at right angle to crank handle. On Galant, connect battery source to sun roof motor connector terminals No. 1 and 4 to rotate motor. See Fig. 4. On Montero, connect battery source to sun roof motor connector terminals No. 1 and 3 to rotate motor. See Fig. 5. On 3000GT, connect battery source to sun roof motor connector terminals No. 1 and 2 to rotate motor. See Fig. 6.

3) On Galant, spring scale should read 30-38 INCH lbs. (3.4-4.3 N.m). On Montero and 3000GT, spring scale should read 35-43 INCH lbs. (3.9-4.9 N.m). If clutch sliding force is not as specified, on Galant and Montero, adjust motor adjusting nut to left or right. On 3000GT, replace sun roof motor.

TROUBLE SHOOTING

Check following items listed below symptom to aid in diagnosis and repair of sun roof assembly.

SUN ROOF INOPERATIVE

- * Fusible link or multipurpose fuse.
- * Sun roof switch.
- * Drive motor.

ROOF GLASS PANEL DOES NOT OPERATE CORRECTLY

- * Foreign matter lodged in guide rail.
- * Drive motor drive gear not correctly indexed with drive cables.
- * Decrease in clutch slipping force of drive motor.
- * Misaligned roof glass panel causing binding.

NOISY MOTOR OPERATION

- * Drive motor drive gear not correctly indexed with drive cables.
- * Worn or damaged drive motor pinion bearing.
- * Worn or deformed drive cable.

NOISY ROOF PANEL OPERATION

- * Foreign matter lodged in guide rail.
- * Loose guide rail and lid.

WATER LEAKS

- * Dust accumulation in housing assembly.
- * Clogged drain hose.
- * Broken or disconnected drain hose.
- * Worn roof lid weatherstrip.
- * Excessive roof panel-to-roof opening clearance and/or incorrectly fitted weatherstrip.

WIND NOISE

- * Loose or deformed deflector.

COMPONENT TESTS

DRIVE MOTOR

Eclipse & Montero Sport

Remove drive motor. See DRIVE MOTOR R & I under REMOVAL & INSTALLATION. Using 12-volt power supply, apply voltage to 2-terminal connector. Reverse power supply leads to reverse motor direction. Replace motor as necessary.

Galant

Remove drive motor. See DRIVE MOTOR R & I under REMOVAL & INSTALLATION. Using 12-volt power supply, apply voltage to terminals No. 1 (Blue wire) and No. 4 (Blue/White wire) of 6-terminal drive motor connector. Reverse power supply leads to reverse motor direction. Replace motor as necessary.

Montero

Remove drive motor. See DRIVE MOTOR R & I under REMOVAL & INSTALLATION. Using 12-volt power supply, apply voltage to terminals No. 1 (Green wire) and No. 3 (Green/Red wire and Black wire) of 4-terminal drive motor connector. Reverse power supply leads to reverse motor direction. Replace motor as necessary.

3000GT

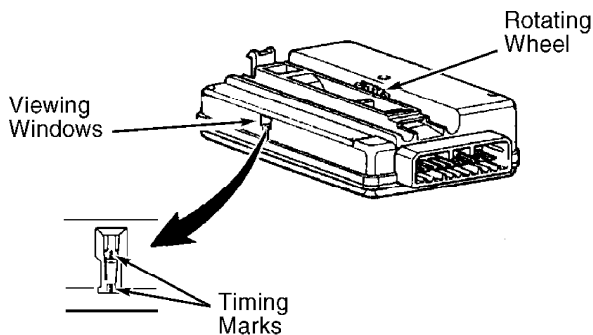
Remove drive motor. See DRIVE MOTOR R & I under REMOVAL & INSTALLATION. Using 12-volt power supply, apply voltage to terminals No. 1 (Red/Blue wire) and No. 2 (Red/Yellow wire) of 8-terminal drive motor connector. Reverse power supply leads to reverse motor direction. Replace motor as necessary.

DRIVE MOTOR LIMIT SWITCH

Eclipse & Montero Sport

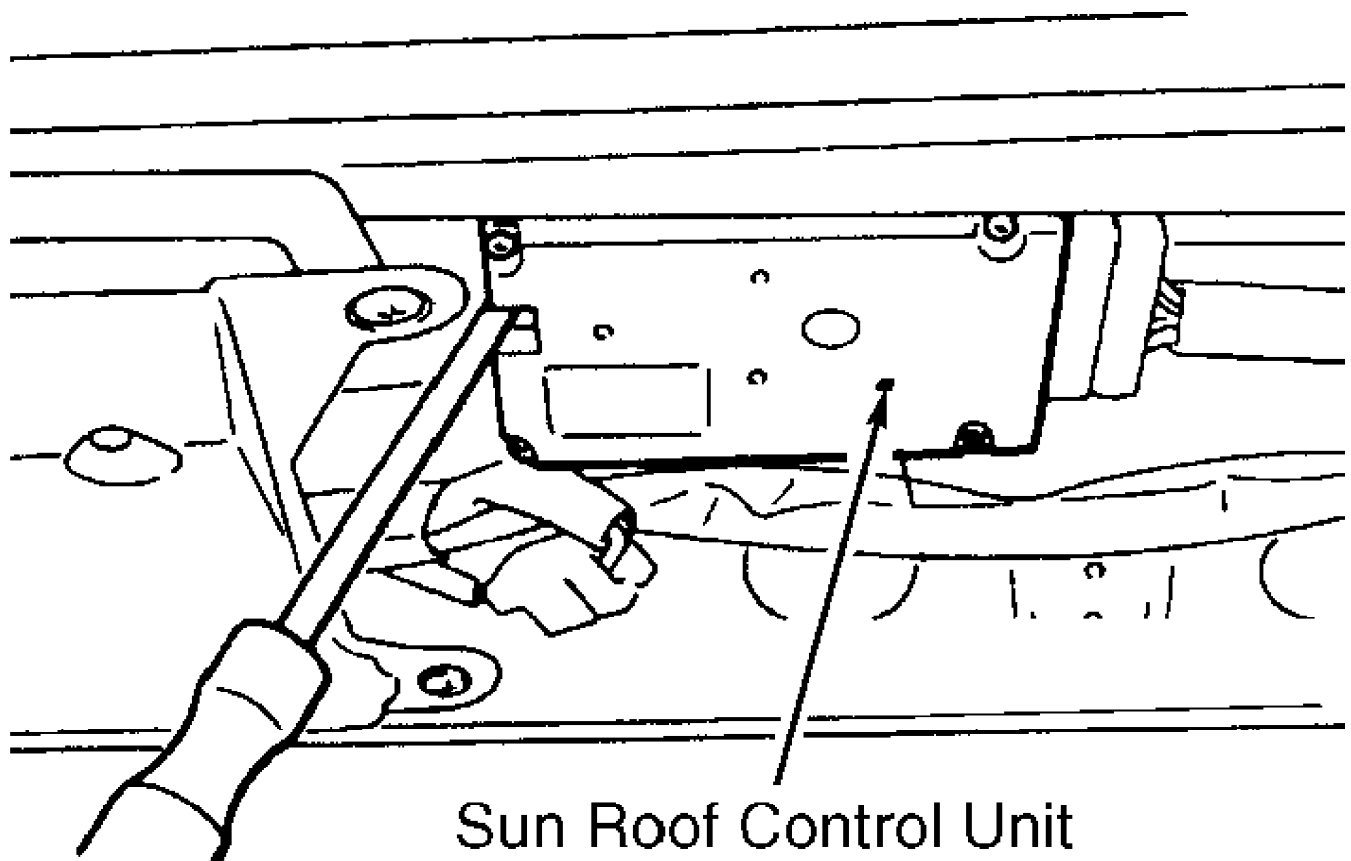
1) Remove sun roof ECU. Look into viewing windows while turning rotating wheel. See Fig. 2. Turn rotating wheel until White marks appear. When White marks appear in viewing windows at same time, stop turning rotating wheel.

2) Close sun roof fully. Install timed sun roof control unit. Ensure wiring connector is properly inserted into control unit. Insert a flat-blade screwdriver, place on tab and press to right, being careful not to pinch wiring. See Fig. 3.



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Fig. 2: Timing Sun Roof ECU (Eclipse & Montero Sport)
Courtesy of Mitsubishi Motor Sales of America

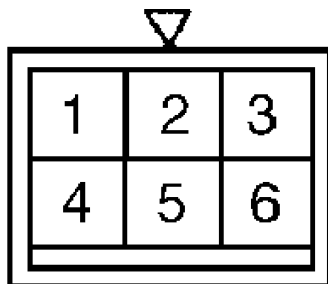


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Fig. 3: Installing Sun Roof ECU (Eclipse & Montero Sport)
Courtesy of Mitsubishi Motor Sales of America

Galant

Remove limit switches from drive motor. Using ohmmeter, check continuity of each switch. Continuity should exist between terminals No. 3 (Blue/Red wire) and No. 5 (Black wire) for switch No. 1, and terminals No. 5 (Black wire) and No. 6 (Blue/Black wire) for switch No. 2. Replace switches as necessary. See Fig. 4.



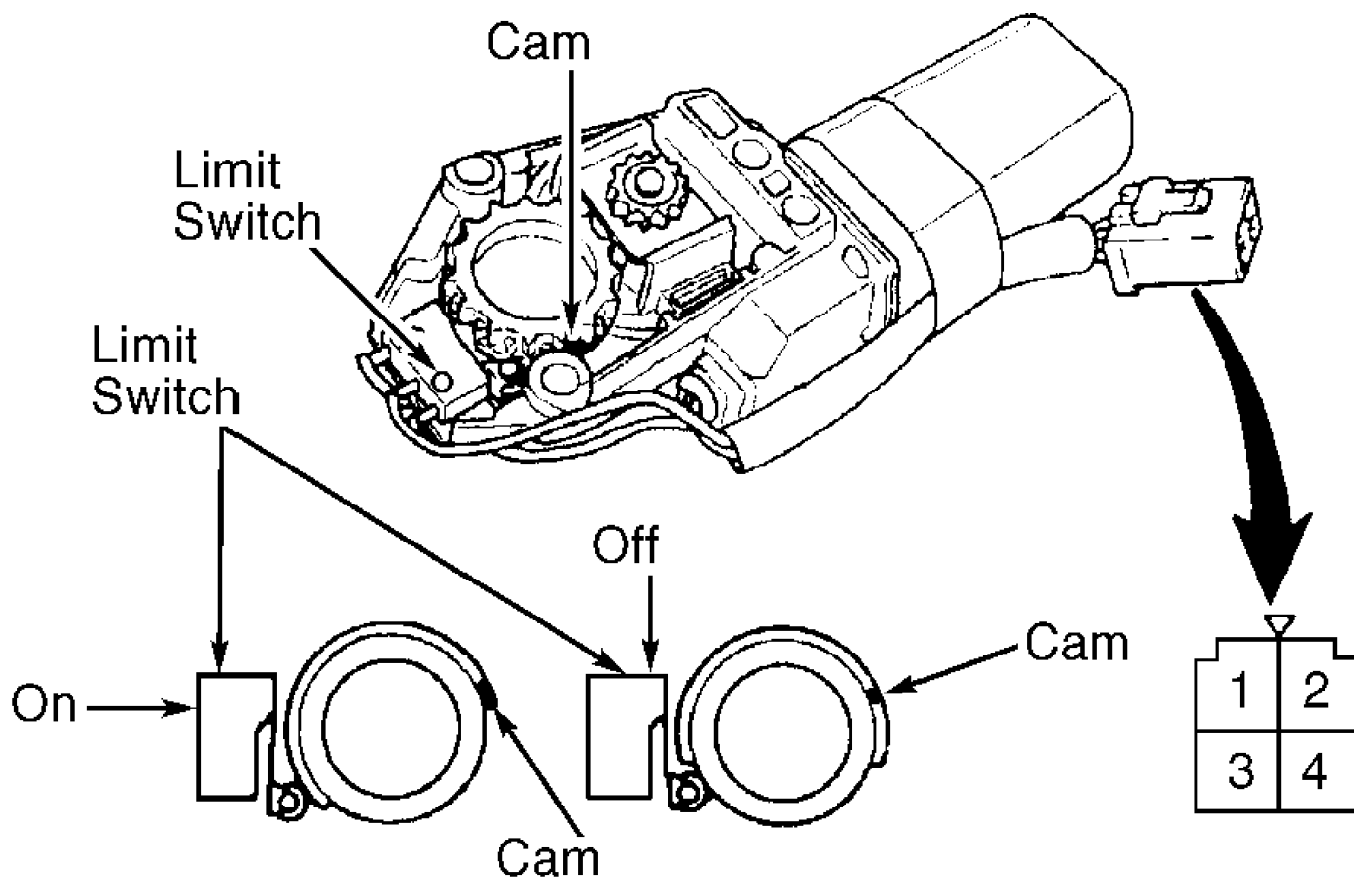
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Fig. 4: Identifying Sun Roof Motor Connector (Galant)
Courtesy of Mitsubishi Motor Sales of America

Montero

Using ohmmeter, check continuity of limit switch. When

intermittent gear cam of drive motor depresses switch lever, continuity should exist between right side terminals (No. 2 and 4) of drive motor 4-terminal connector (connector latch upward). Replace drive motor if switch fails test. See Fig. 5.

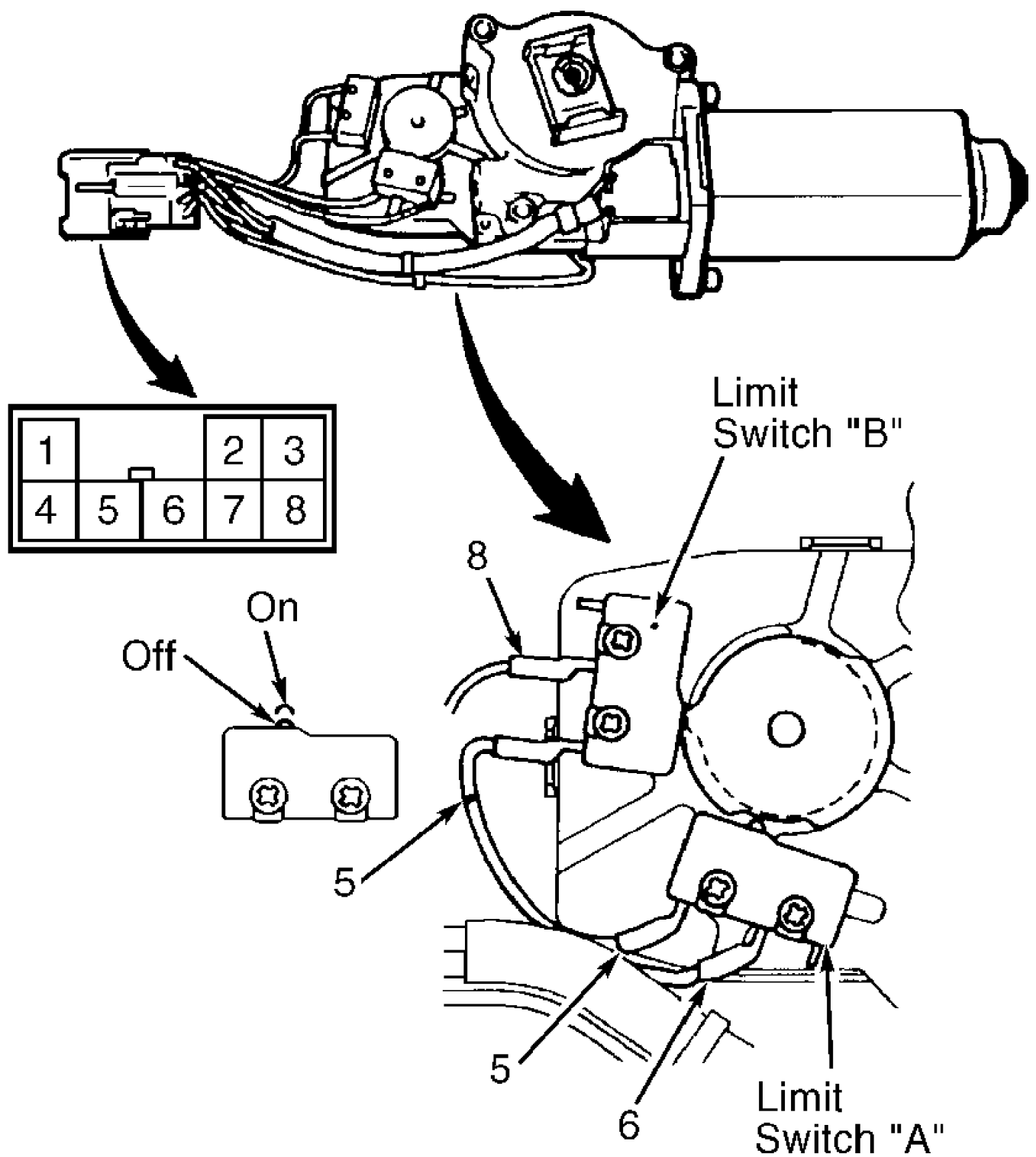


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Fig. 5: Inspecting Sun Roof Limit Switches (Montero)
Courtesy of Mitsubishi Motor Sales of America

3000GT

Remove limit switches from drive motor. Using ohmmeter, check continuity of each switch. Continuity should exist between terminals No. 5 and 6 for switch "A", and terminals No. 5 and 8 for switch "B". Replace switches as necessary. See Fig. 6.

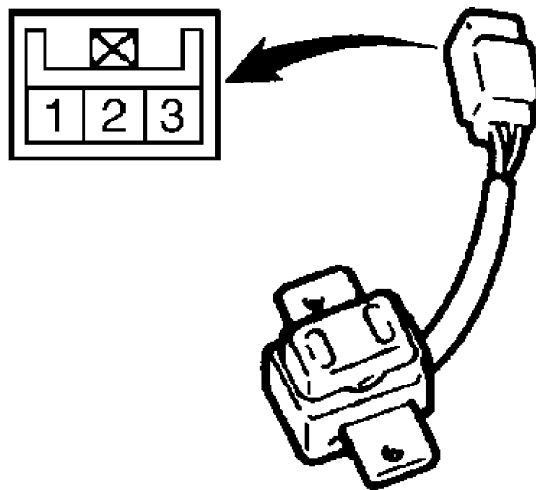


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Fig. 6: Inspecting Sun Roof Limit Switches (3000GT)
 Courtesy of Mitsubishi Motor Sales of America

SUN ROOF SWITCH

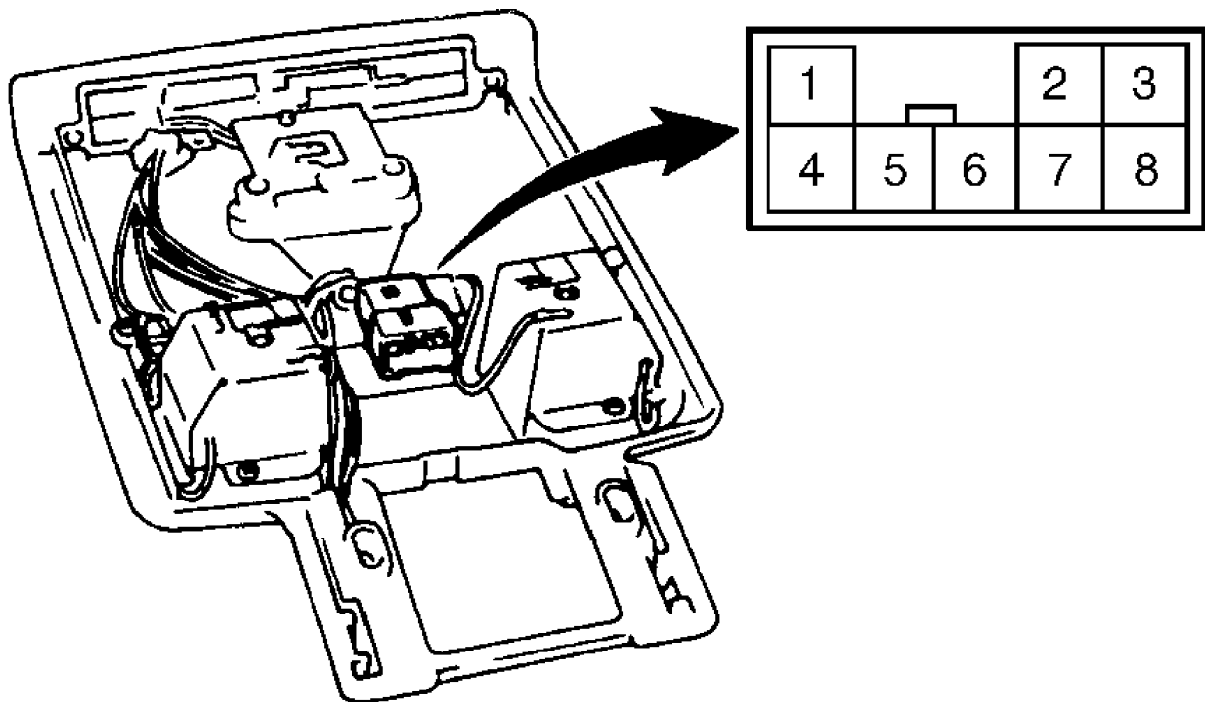
Using ohmmeter, check continuity between selected switch terminals. See Fig. 7, 8, 9 or 10. Replace switch as necessary.



Switch position	Terminal No.		
	1	2	3
Open	○ —	○	
OFF			
Close		○ —	○

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Fig. 7: Inspecting Sun Roof Switch Continuity (Eclipse & 3000GT)
 Courtesy of Mitsubishi Motor Sales of America



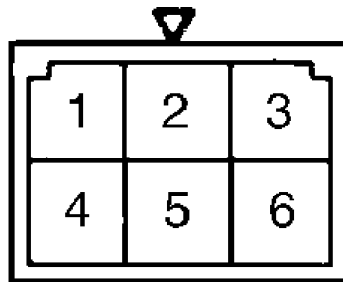
Switch \ Terminal		2	3	5	7	8
Slide switch	Open	○ — ○				
	Closed			○ — ○		
Tilt switch	Up		○ — ○			
	Down			○ — ○		○ — ○

NOTE

○ — ○ indicates that there is continuity between the terminals.

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Fig. 8: Inspecting Sun Roof Switch Continuity (Galant)
 Courtesy of Mitsubishi Motor Sales of America



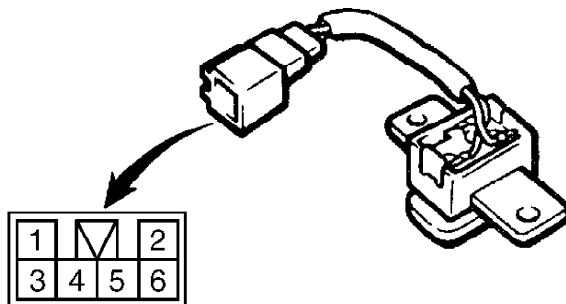
Switch \ Terminal	1	2	3	5	6
OPEN	○	○	○	○	○
OFF		○	○	○	○
CLOSED	○	○	○	○	

NOTE

○—○ Indicates that there is continuity between the terminals.

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Fig. 9: Inspecting Sun Roof Switch Continuity (Montero)
Courtesy of Mitsubishi Motor Sales of America



SWITCH POSITION	TERMINAL NO.		
	1	3	4
OPEN		○	○
OFF			
CLOSE	○		○

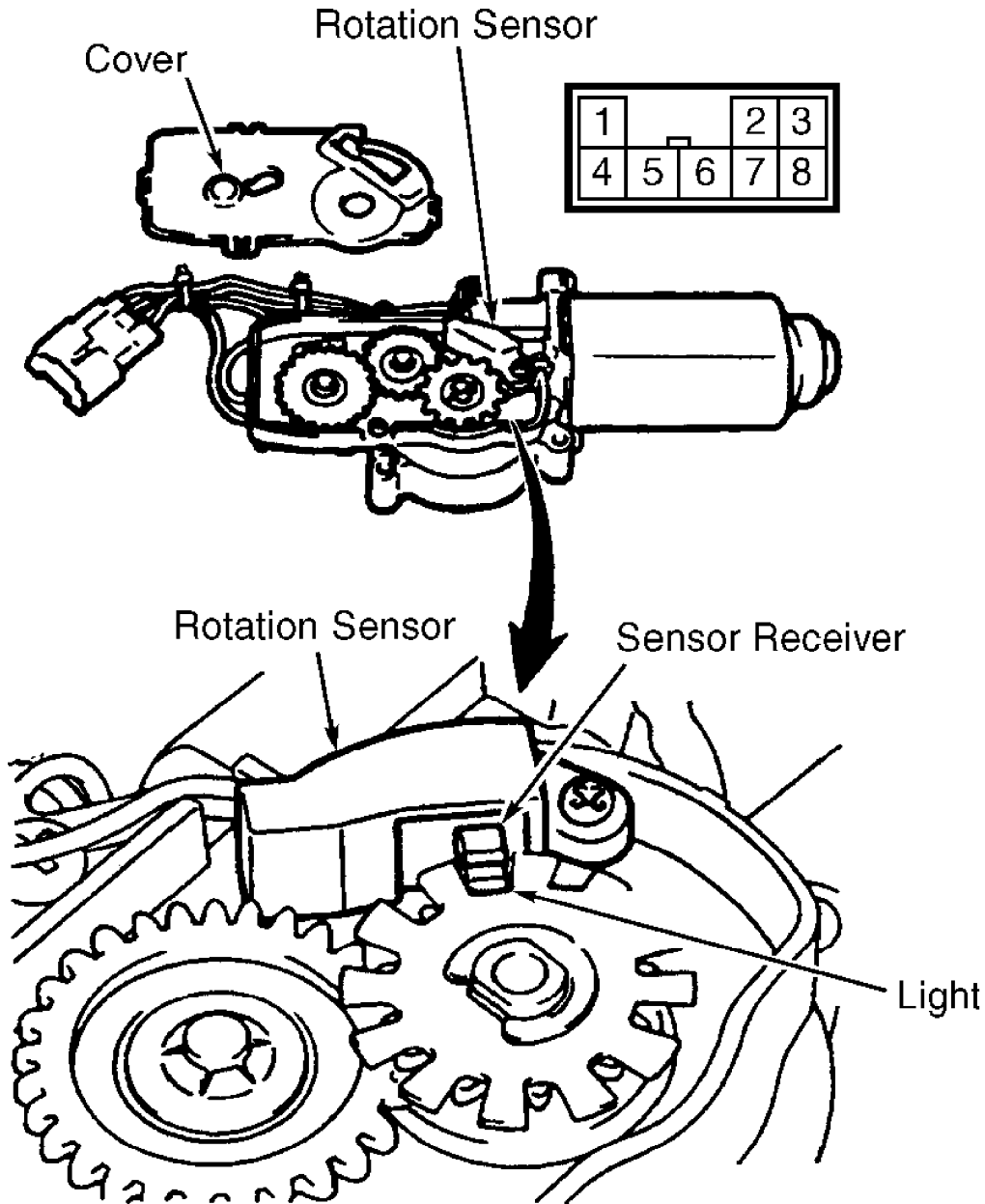
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Fig. 10: Inspecting Sun Roof Switch Continuity (Montero Sport)
Courtesy of Mitsubishi Motor Sales of America

MOTOR ROTATION SENSOR CHECK (3000GT)

1) Connect ohmmeter negative lead to terminal No. 3 and positive lead to terminal No. 8. See Fig. 11. Continuity should exist. Reverse ohmmeter leads. Continuity should not exist.

2) Remove motor cover. Connect ohmmeter negative lead to terminal No. 7 and positive lead to terminal No. 8. See Fig. 11. Continuity should not exist. Continuity should exist when light is shone onto sensor receiver. Replace rotation sensor if continuity is not as specified.



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Fig. 11: Checking Motor Rotation Sensor (3000GT)
Courtesy of Mitsubishi Motor Sales of America

REMOVAL & INSTALLATION

DRIVE CABLES

NOTE: Drive cable removal and installation information for 3000GT not available from manufacturer at time of publication.

Removal & Installation (Eclipse & Galant)

1) Remove sliding roof assembly. See SUN ROOF R & I under REMOVAL & INSTALLATION. Remove sun shade and stopper at rear end of drive rail. Remove sliding roof drive cable assembly from rear part of guide rail. Depress assembly into guide rail to slide past notches if necessary.

2) Once sliding assembly is removed, DO NOT lose plastic sliding shoes attached to assembly. Ensure guide rail, sliding assembly and drive cables are clean before reassembly.

3) To install components, reverse removal procedure. Apply multipurpose grease to all moving components. To install sliding roof assembly, reverse removal procedure.

Removal & Installation (Montero)

1) Remove sliding roof assembly. See SUN ROOF R & I under REMOVAL & INSTALLATION. Remove plastic mounting cover and roof glass panel. Remove front guide bracket and deflector assembly. Remove front guide rail end cover. Remove set plate and guide rail assembly. Remove sun shade and drive cable tube. Remove lifter assembly and slider assembly from housing assembly.

2) Ensure guide rail, sliding assembly and drive cables are clean before installation. To install components, reverse removal procedure. Apply multipurpose grease to all moving components. To install sliding roof assembly, reverse removal procedure.

Removal & Installation (Montero Sport)

Tilt sun roof guide assembly. Remove sun roof guide rail rod holder. Close sun roof guide assembly and disconnect drive cable end from sun roof guide assembly. To install components, reverse removal procedure. Always replace cables in pairs. Apply multipurpose grease to all moving components.

DRIVE MOTOR R & I

Removal (Eclipse & Galant)

1) To remove sun roof drive motor, lower headliner enough to gain access to motor. Remove overhead switch assembly. Remove front and rear door scuff plate.

2) Remove center pillar lower and upper trim. Remove roof rail and sun roof trim strips. Remove front pillar trim. Remove assist handle (if necessary). Lower headliner to gain access to motor assembly. Disconnect motor harness connector. Remove motor mounting bolts and remove motor.

Inspection

Check each drive gear tooth for abrasion or wear. Check both drive cables for wear. Replace as necessary.

Installation

Ensure sun roof glass panel is fully closed. Sun roof drive cables must be properly indexed to drive motor drive gear. Remove drive motor cam gear cover. Using crank handle (included in tool pouch), rotate motor to correct position. For Galant, see Fig. 12. Install motor. To complete installation, reverse removal procedure.

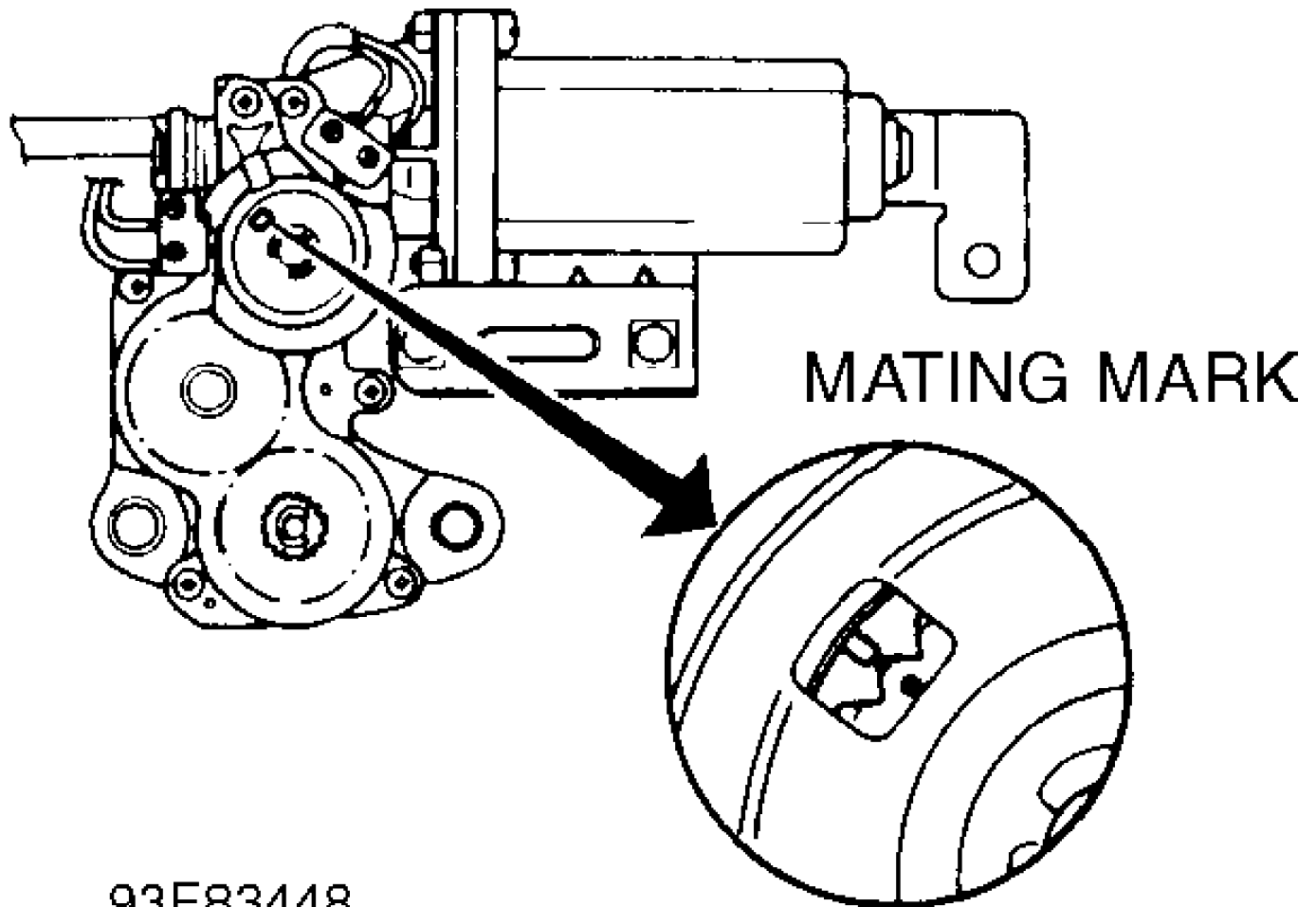
Removal & Installation (Montero)

Remove sun roof switch assembly. Remove drive motor. To

install, open roof glass panel about 7.9" (200 mm). Using crank handle, rotate drive motor until alignment hole of intermittent gear is aligned with center of drive gear. See Fig. 13. To complete installation, reverse removal procedure.

Removal & Installation (Montero Sport & 3000GT)

Remove sun roof switch and dome light assembly. Remove bracket. Remove headliner. Remove drive motor. To install, reverse removal procedure.



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Fig. 12: Inspecting Drive Gear Position (Galant)
Courtesy of Mitsubishi Motor Sales of America

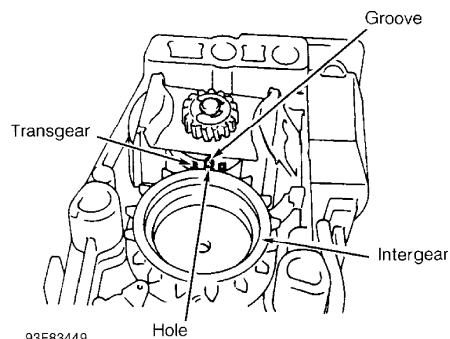


Fig. 13: Inspecting Drive Gear Position (Montero)
Courtesy of Mitsubishi Motor Sales of America

SUN ROOF R & I

Removal & Installation (Eclipse & Galant)

1) Remove side trim covers by lightly pulling panels straight down. Unbolt and remove roof glass panel with adjust plates. See Fig. 1. Operate sun roof drive cable assembly to fully open position. Remove deflector. Remove guide rail cover. Operate sun roof drive cable assembly to fully closed position and remove rear drip channel.

2) Remove overhead switch assembly. Remove rear seat. Push down on rear seat cushion and pull seat release lever. Unbolt and remove seat back. Remove front and rear door scuff plate.

3) Remove center pillar lower and upper trim. Remove roof rail and sun roof trim strips. Remove front and rear pillar trim. Remove assist handle. Remove headliner. Disconnect motor harness connector. Remove motor mounting bolts and remove motor.

4) Attach protective tape around roof opening. Pull sliding roof assembly forward through roof opening. Disconnect drain hoses. If drain hoses need replacement, attach cord to exterior end of drain hose. Pull drain hose from interior end. Remove housing assembly and set brackets.

5) To install components, reverse removal procedure. Sun roof drive cables must be properly indexed to drive motor drive gear. Remove drive motor cam gear cover. Using manual closure wrench (included in tool pouch), rotate motor to correct position. See Fig. 12. Install motor. Install remaining components. To adjust roof glass panel, see SUN ROOF GLASS FIT under ADJUSTMENTS.

Removal & Installation (Montero)

1) Remove trim covers. Unbolt roof glass panel from sliding assembly and remove. Remove sun roof switch assembly and drive motor. Remove front and rear door scuff plate.

2) Remove center pillar lower and upper trim. Remove roof rail and sun roof trim strips. Remove front and rear pillar trim. Remove assist handle. Remove headliner. Remove rear set bracket. Remove sun roof assembly. Disconnect drain hoses.

3) If drain hoses need replacement, attach cord to exterior end of drain hose. Pull drain hose from interior end. To install components, reverse removal procedure. See DRIVE MOTOR R & I for installation procedures.

Removal & Installation (Montero Sport & 3000GT)

Remove sun roof switch and dome light assembly. Remove bracket behind dome light. Remove headliner. Remove drain hose retaining clips and remove drain hose. Remove sun roof assembly. To install, reverse removal procedure.

WIRING DIAGRAMS

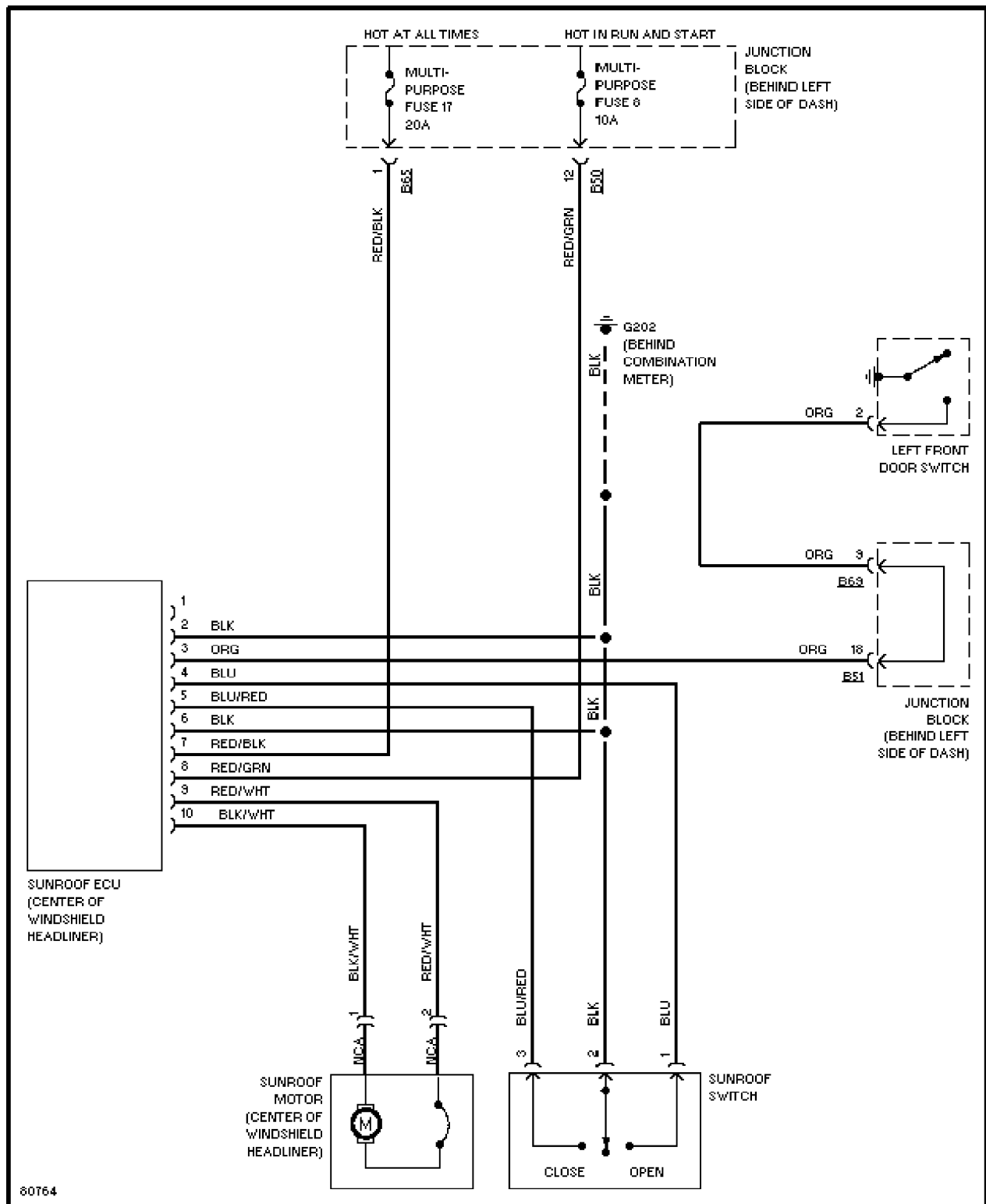


Fig. 14: Power Sun Roof System Wiring Diagram (Eclipse)

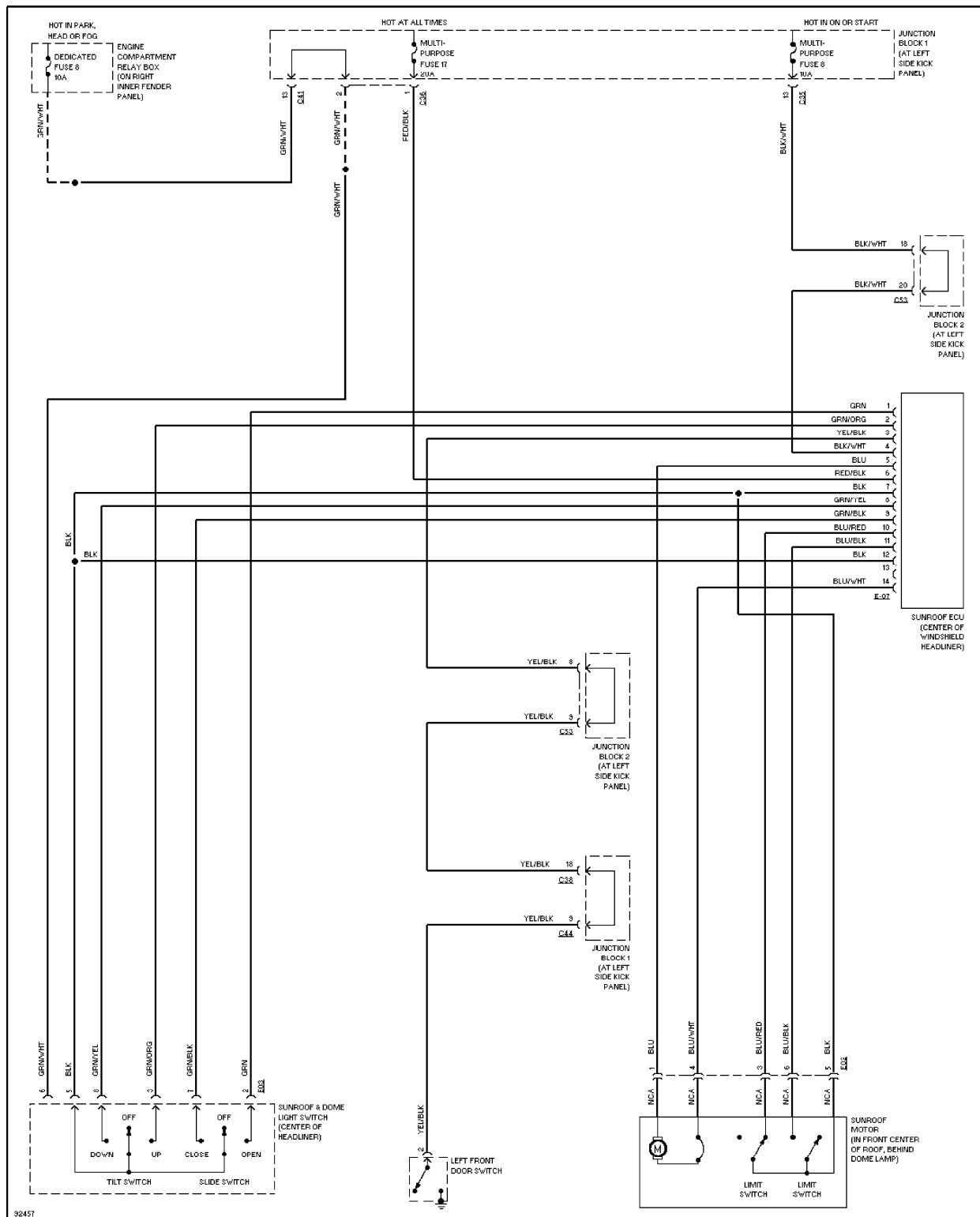


Fig. 15: Power Sun Roof System Wiring Diagram (Galant)

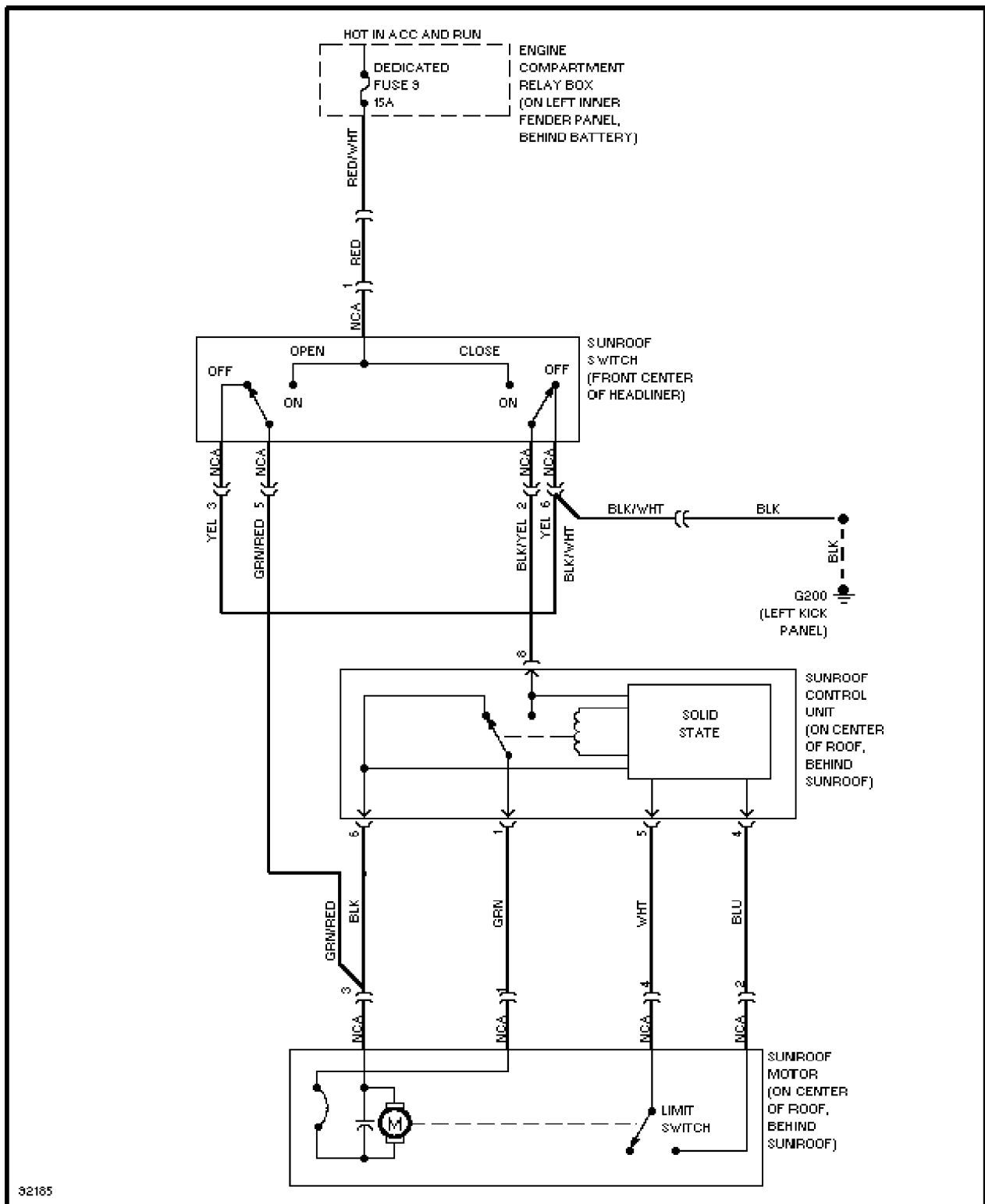


Fig. 16: Power Sun Roof System Wiring Diagram (Montero)

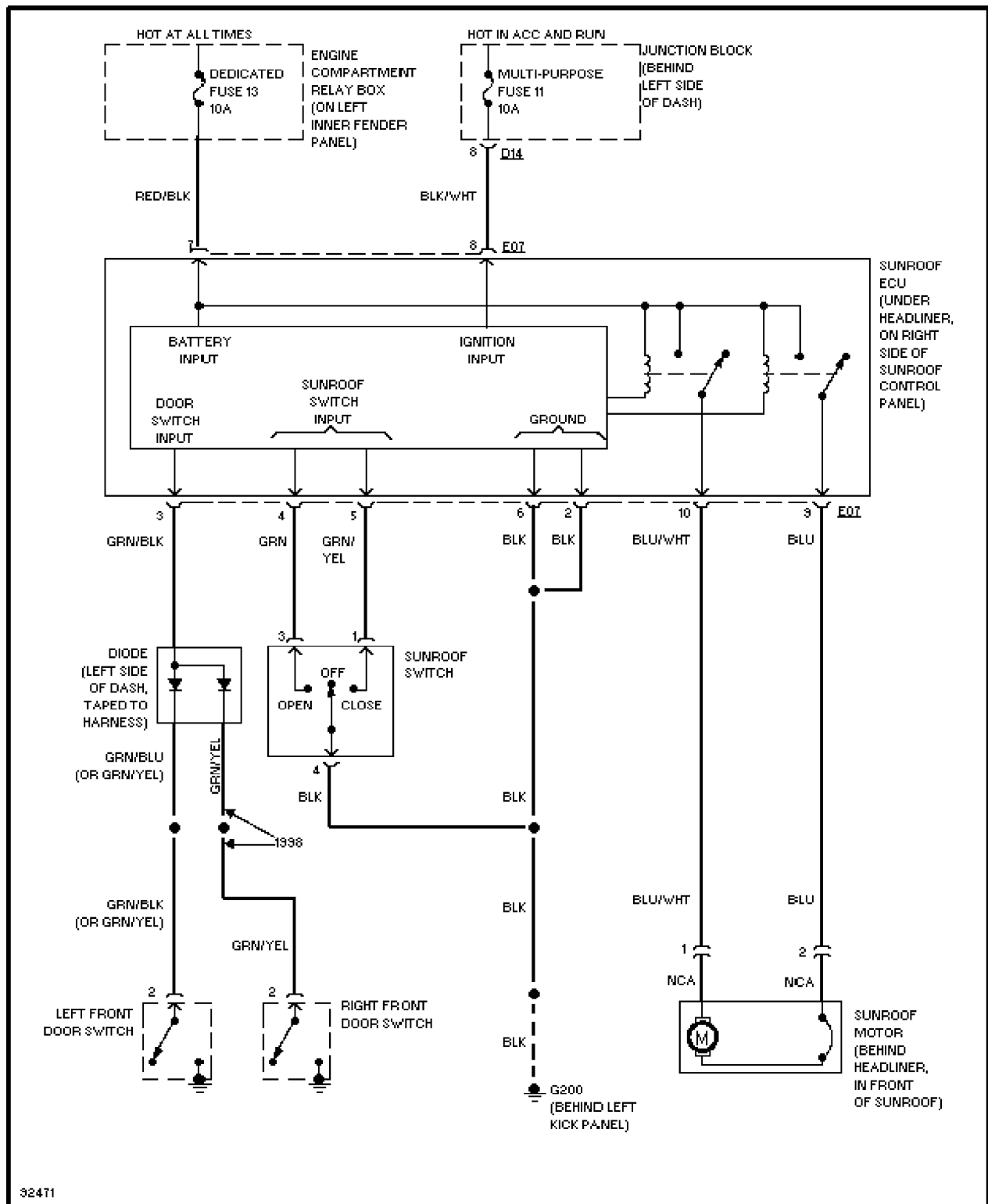


Fig. 17: Power Sun Roof System Wiring Diagram (Montero Sport)

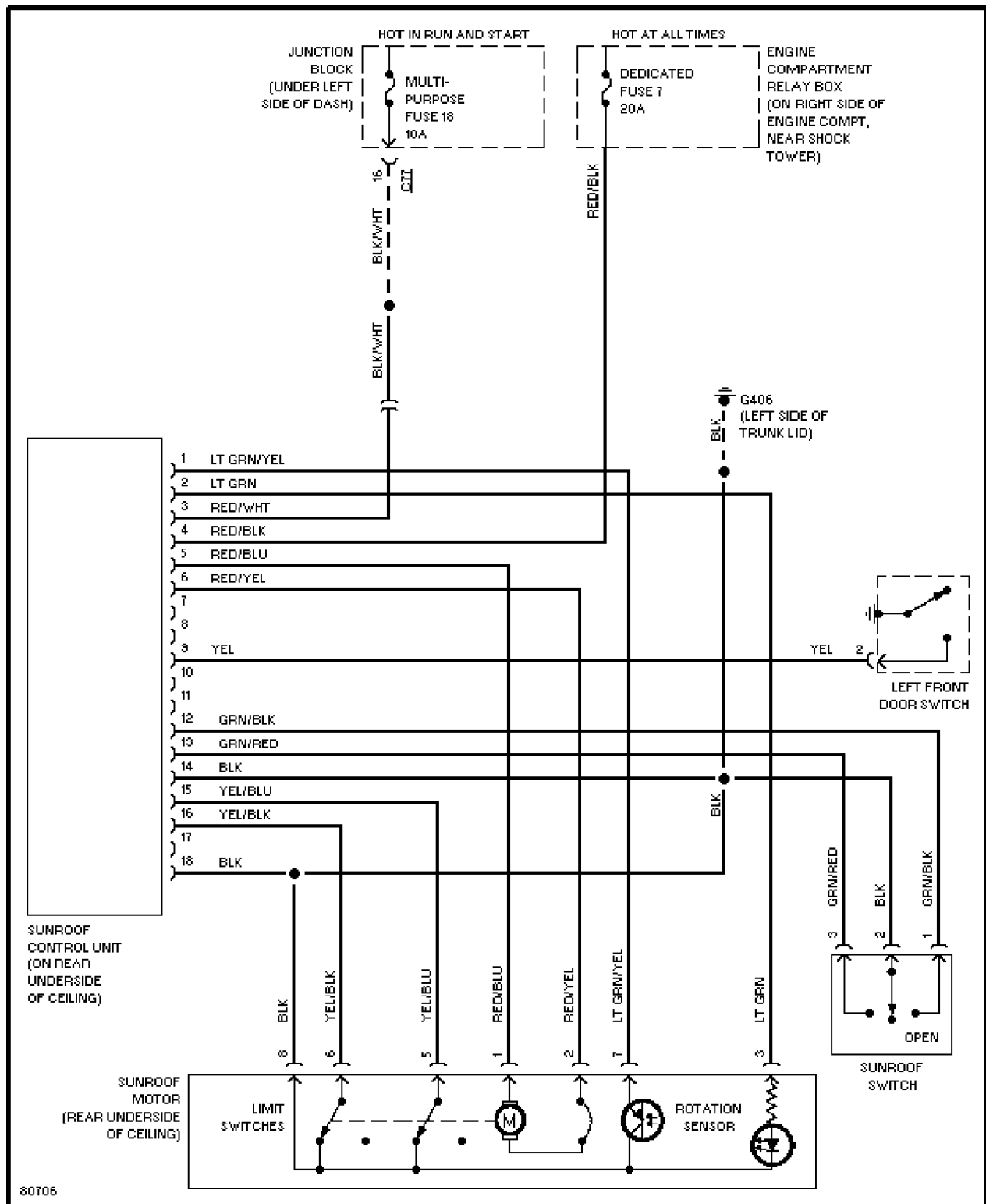


Fig. 18: Power Sun Roof System Wiring Diagram (3000GT)