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Mercury Cougar

SUN ROOF PANEL SERVICE PROCEDURES



SERVICE DEPARTMENT

LINCOLN-MERCURY DIVISION



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SUN ROOF PANEL-1968 COUGAR

DESCRIPTION AND OPERATION

A sun roof panel feature is available as an option on the 1968 Cougar. Refer to figures 1, 2 and 3. This sun roof panel is an electrically operated motor driven device with a two-way control switch located on the lower edge of the instrument panel just below the ash tray or in the console on units so equipped. Refer to figure 4. When the control switch is actuated (to open), the roof panel retracts down and rearward. It moves from the flush roof mounted position (figure 1) on guide rails into a storage space located between the headlining and the stationary roof panel, exposing an opening over the front seat area (figures 2 and 3).

When the control switch is actuated in the opposite direction the sun roof panel moves forward in the guide rails. Near the end of the forward travel, the rear portion of the roof panel moves upward on two ramps. Refer to figure 5. This action positions the panel flush with the roof and seals it tightly in the roof opening.



Fig. 1 - Sun Roof Panel-Closed

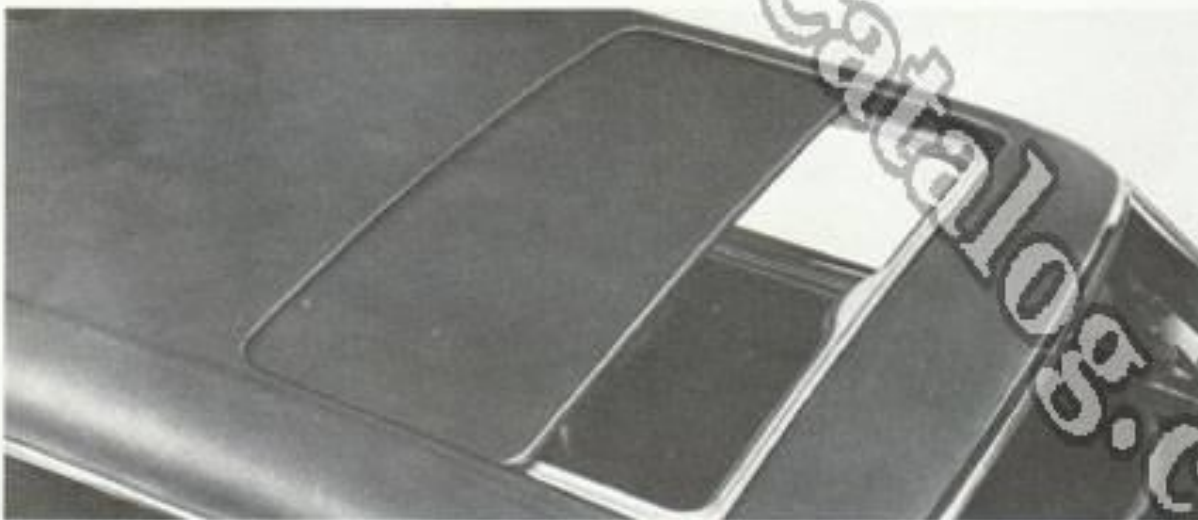


Fig. 2 - Sun Roof Panel-Partially Open

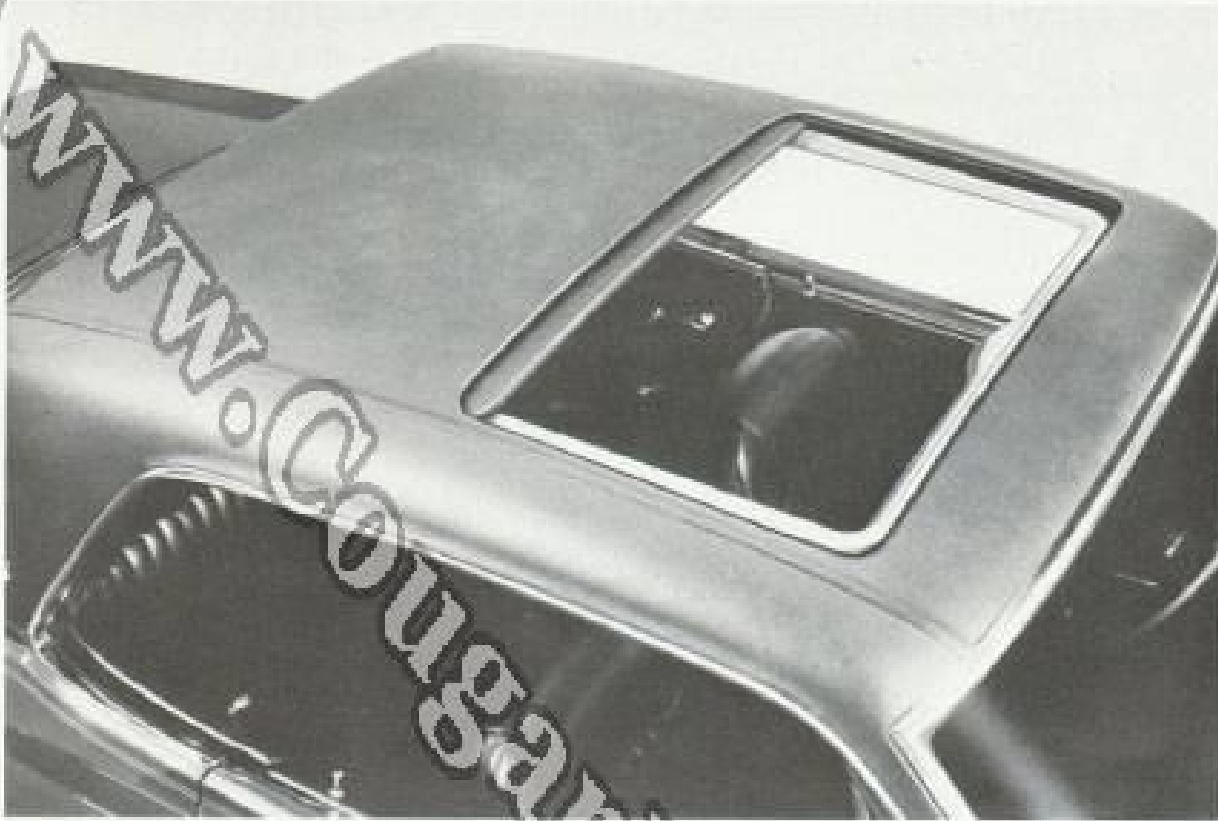
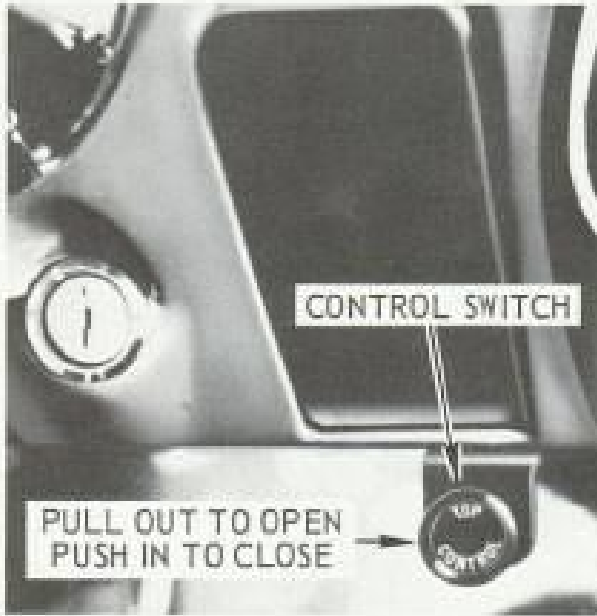
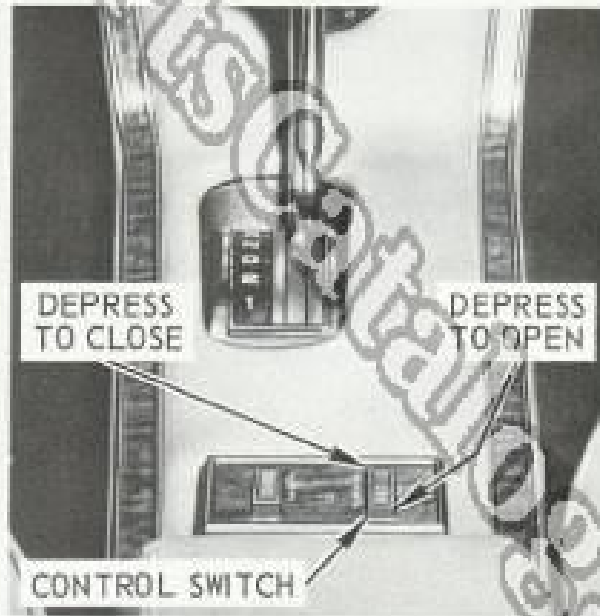


Fig. 3 - Sun Roof Panel - Full Open



INSTRUMENT PANEL INSTALLATION



CONSOLE INSTALLATION

Fig. 4 - Sun Roof Panel-Control Switch

DESCRIPTION AND OPERATION (CONT.)

The sun roof panel is actuated by a two-way electric motor mounted to the left of center in the header area. Refer to figure 6. The motor, through a flexible cable, drives an auxiliary drive with a gear on the output shaft. This gear, in turn, drives flexible drive cables that are attached to the roof panel. The cables control the movement of the panel. Refer to figure 7.

Two drain tubes are incorporated in the "A" pillar area and two in the blind roof quarter area to catch water seepage which may by-pass the weatherstrip seal around the roof opening. The two forward plastic drain tubes are routed from the roof panel trough down through the right and left "A" pillars, and out through the cowl side panels. Refer to figures 5 and 6. The lower end of the drain tubes are visible between the cowl side panel and fender with the door opened.

The rear drain tubes are routed through the blind quarter roof panel and emerge through the wheelhouse to the outside. The ends of the tubes have a dust cover installed.



Fig. 5 - Sun Roof Panel Ramps and Drain Tubes

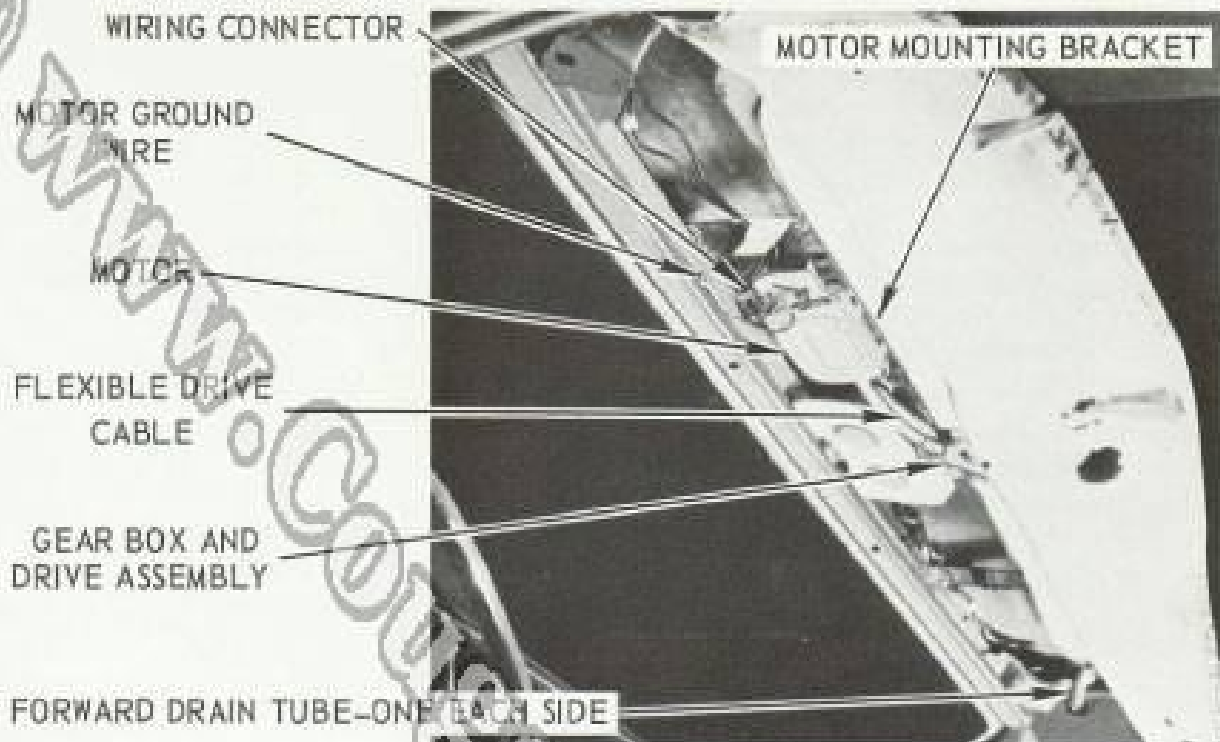


Fig. 6 - Sun Roof Panel Motor

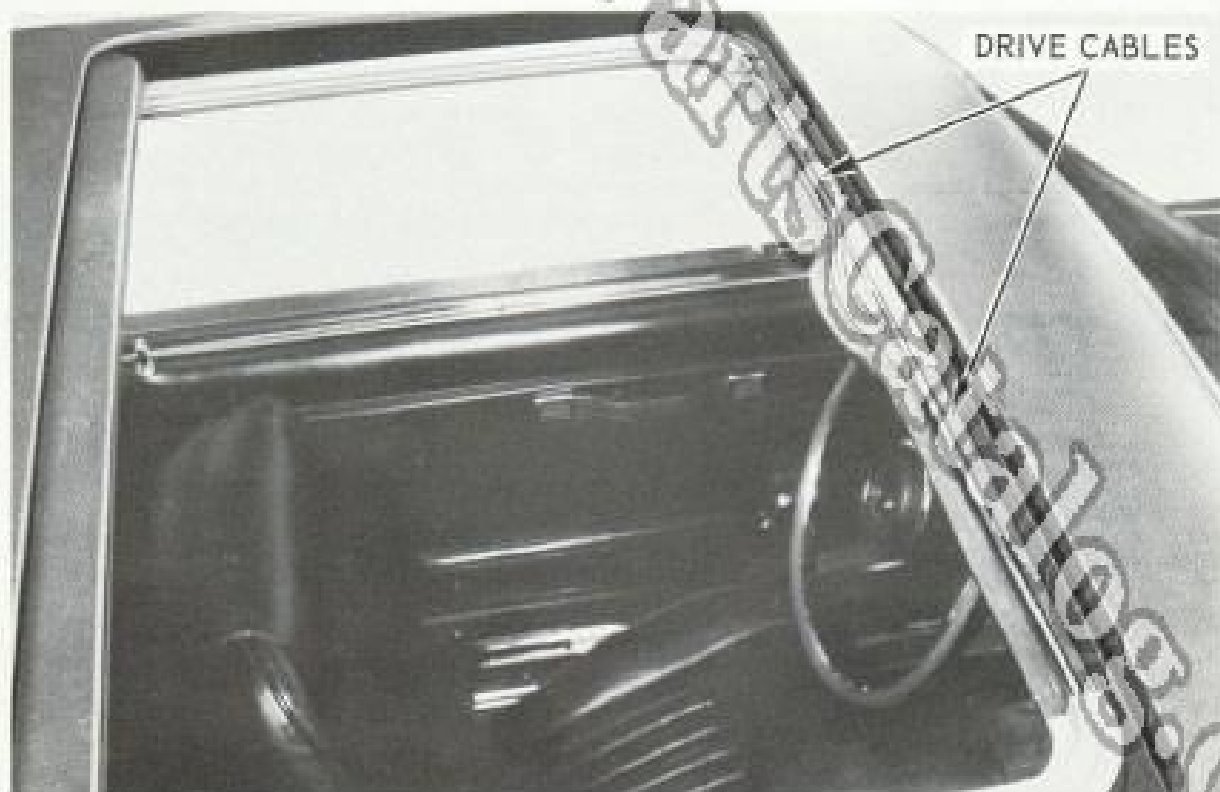


Fig. 7 - Sun Roof Panel Drive Cables

ELECTRICAL SYSTEM

The electrical system for the sun roof panel is protected by a 25 amp circuit breaker which is located just below the fuse panel inside the passenger compartment. Refer to figure 8. Power for the system originates at the battery side of the starter relay. From the relay, a black wire is routed along the right fender apron and across the dash panel to the center of the engine compartment. The black wire is then routed through the dash panel to the 25 amp circuit breaker. Another black wire is routed from the circuit breaker to the switch on the instrument panel or the console. Refer to figure 9. Two wires for the open and close cycle are routed from the control switch up through the "A" pillar and across the header to the motor. Refer to figures 6 and 8. A third wire from the motor is grounded to the header by a screw.

NOTE: On vehicles with the console mounted switch, the open and close cycle wires are routed through the right "A" pillar to the motor. On early production vehicles with the instrument panel mounted switch, the wires are routed through the left "A" pillar. On later production vehicles the wires will be routed through the right "A" pillar on all installations.

MAINTENANCE

LUBRICATION

During cable replacement, lubricate cables with petroleum jelly or vaseline. It is not necessary to lubricate the top surface of the guide rail covers or the slide tracks. Periodically, clean off residue that may accumulate on the guide rail covers.

DRAIN TUBES

During regular maintenance, check to see that the two drainage holes at the front corners of the roof panel frame are open and free of foreign material. If the drains are plugged, they may be cleaned with an air hose or with a flexible wire. If the drain tubes cannot be cleaned in this manner, they must be replaced. To clean the rear drain tubes, if necessary, they can be cleaned with an air hose or with a flexible wire from the bottom end of the drains.

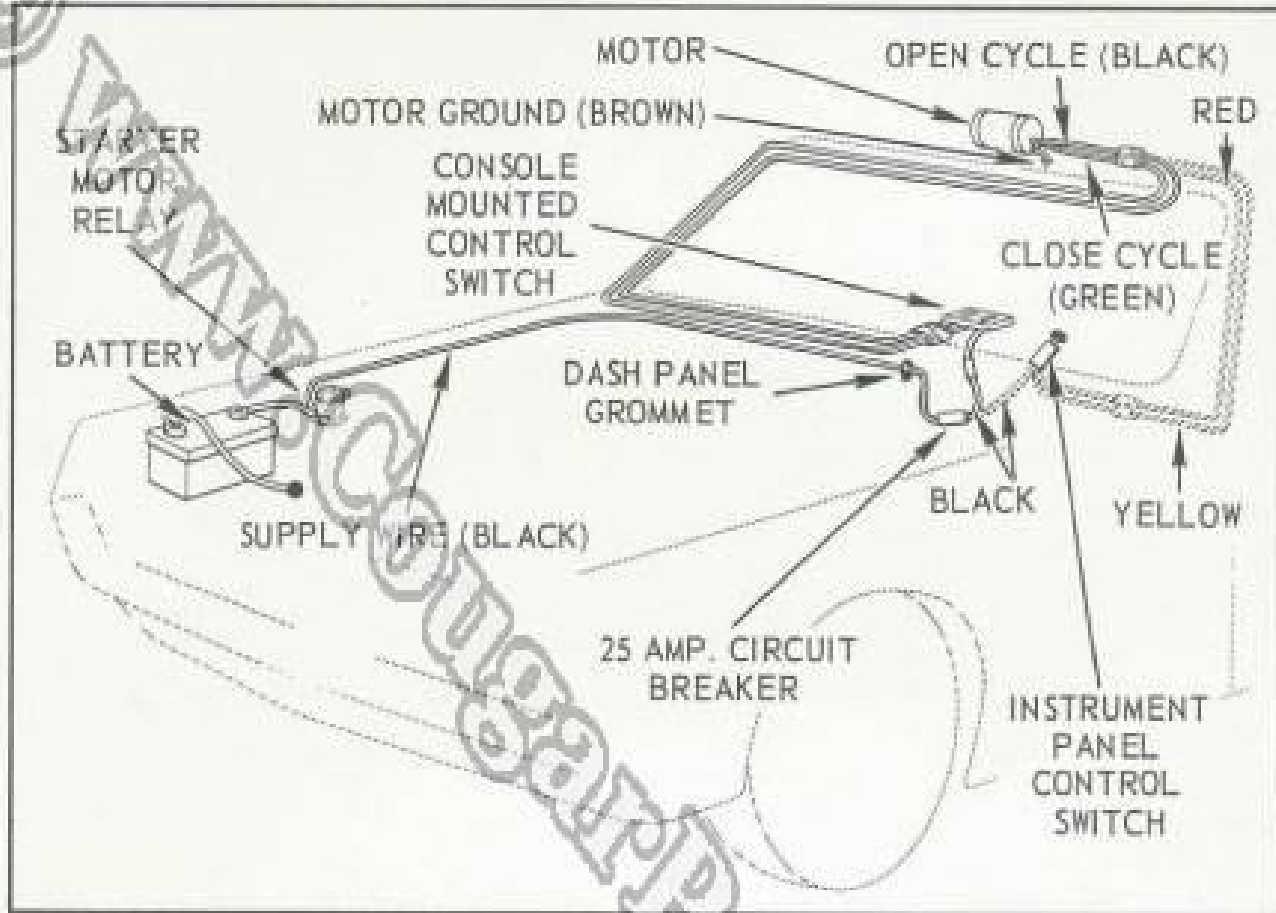
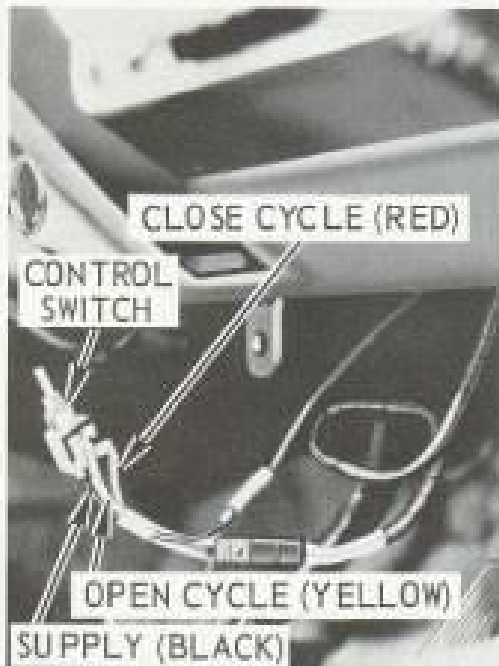
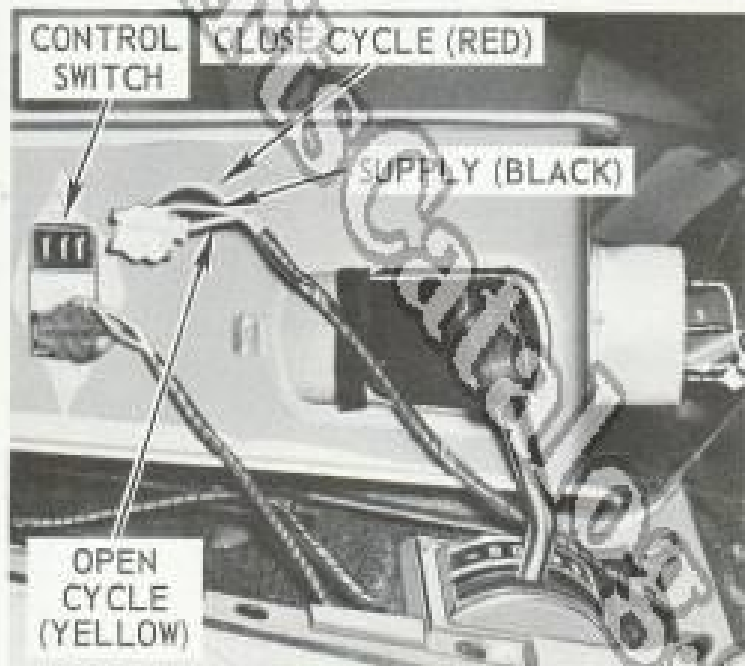


Fig. 8 - Electrical Wiring Installation



INSTRUMENT PANEL INSTALLATION



CONSOLE INSTALLATION

Fig. 9 - Control Switch Wires

MANUAL OPERATION

The sun roof panel may be closed manually in case of electrical power failure. Should the power actuation fail, remove the auxiliary drive cover which is located in the middle of the headlining close to the front edge of the roof opening. (See figure 10). To remove the cover, grasp with fingers and pull outward. Then remove the screw which is visible when the cover is removed.

CAUTION: Note the number and type of washers which are removed with the screw. The screw and washers provide adjustment for the auxiliary drive clutch.

To close the roof panel use the crank handle provided in the glove box. Insert the threaded end of the crank handle into the socket in the winding gear (See Figure 11). Turn the crank handle clockwise to close the roof.

After performing these operations, remove the crank handle, install the screw with washers, and install the auxiliary drive cover.

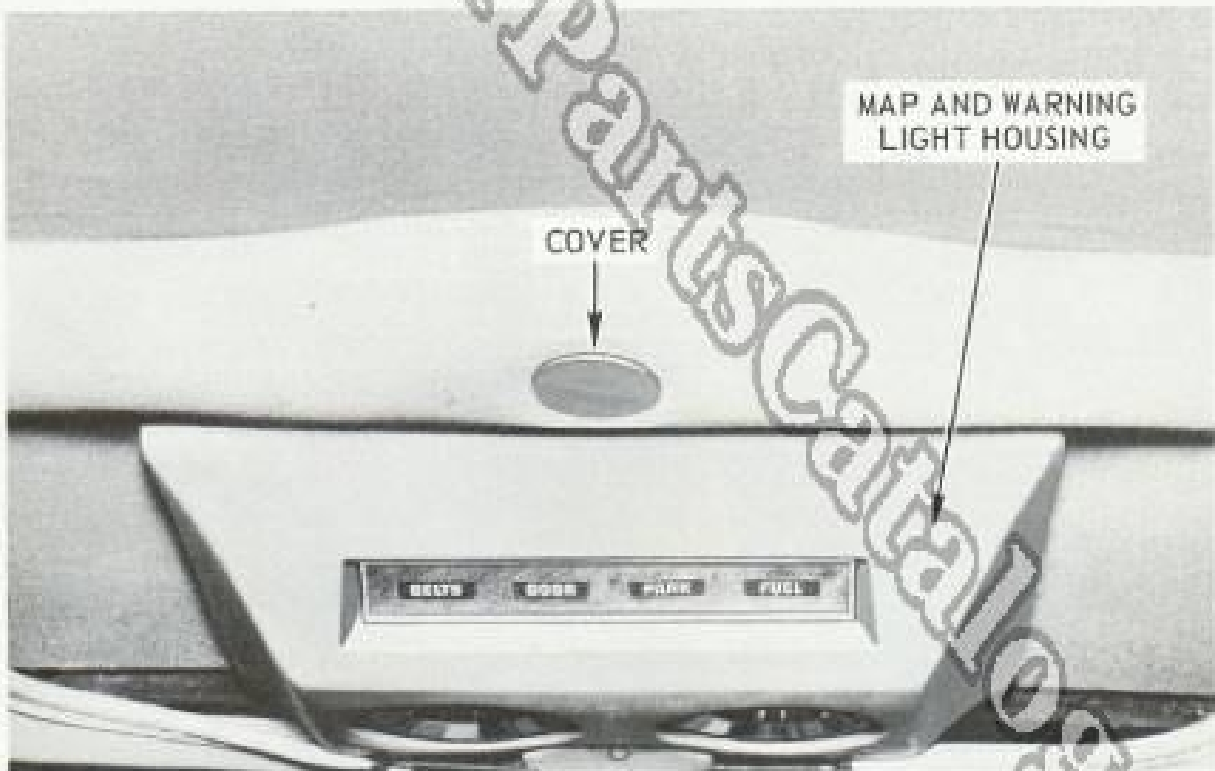


Fig. 10 – Auxiliary Drive Cover

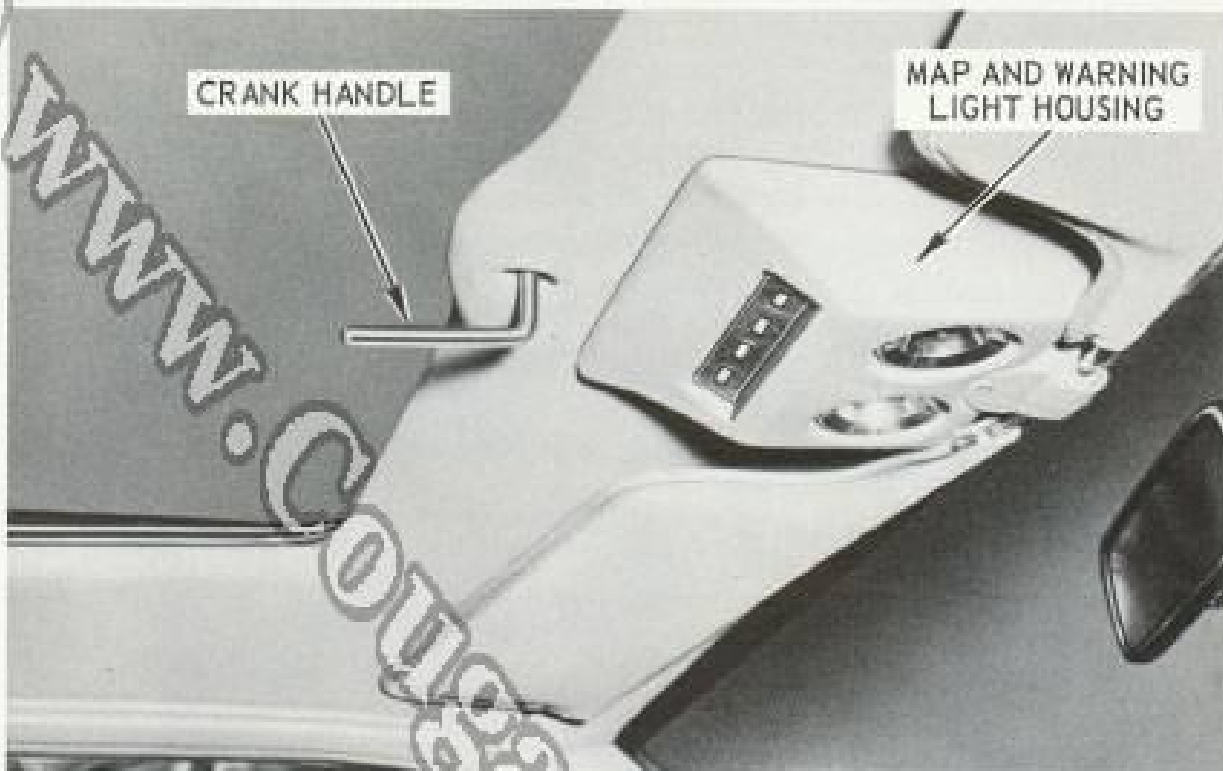


Fig. 11 – Manual Operation of Sun Roof Panel

REMOVAL AND INSTALLATION PROCEDURES

NOTE: Refer to figures 13 and 14 for disassembly views of the major components, which should be used when performing the following procedures:

MOTOR AND/OR FLEXIBLE DRIVE CABLE- REPLACEMENT

REMOVAL

1. Disconnect the battery ground cable.
2. *Remove both sun visor assemblies and center sun visor bracket. Remove the map and warning light housing if so equipped. (Refer to figure 10 and 11).
- 2A. **Remove the map and warning light housing if so equipped, and the sun visor center bracket. (See figure 12).

*Vehicles not equipped with Roof Panel Motor Access Panel.

**Vehicles equipped with Roof Panel Motor Access Panel.

3. *Carefully pull down the headlining from behind the windshield weatherstrip in the front roof panel area to gain access to the roof panel motor and flexible drive cable. (Refer to figure 6).
- 3A. **Remove six screws at front edge of the roof panel motor access panel. (See figure 12). Pull access panel rearward until free of the retaining clips.
4. Disconnect the two motor wires from the wiring connector.
5. Disconnect the motor ground wire from the windshield header.
6. Using an adjustable wrench* remove two motor nuts, and lock washers. Using a screwdriver, pry drive cable from motor, and remove motor assembly.
7. To replace the drive cable, use a screwdriver, and pry cable from the gear box and drive assembly.
8. When replacing the motor, transfer bracket and dampener vibration pad from the old to the new motor. (See figure 13).

*Vehicles not equipped with Roof Panel Motor Access Panel.

**Vehicles equipped with Roof Panel Motor Access Panel.

NOTE: The metric wrench size for the motor attaching nuts is 10MM.

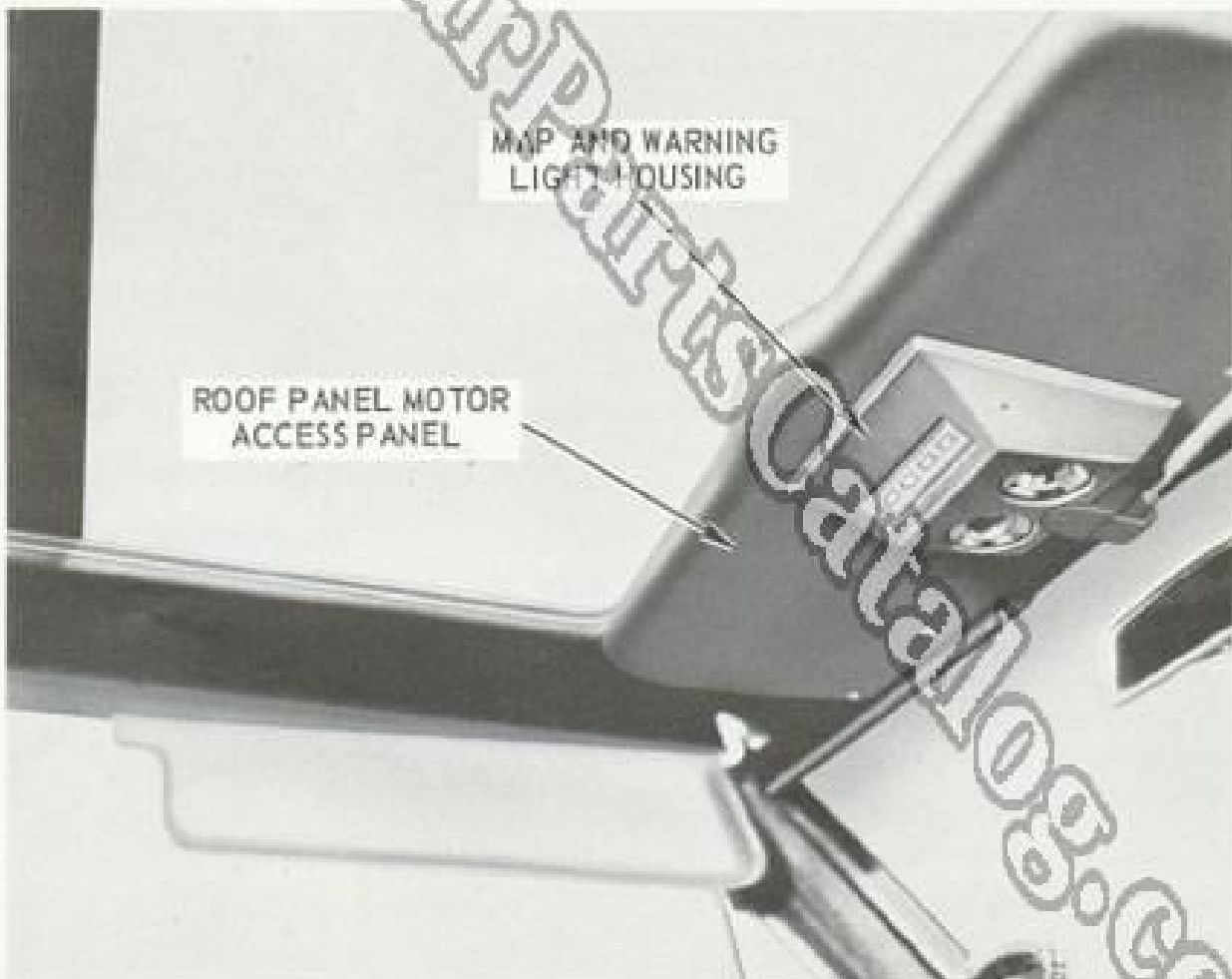


Fig. 12 – Roof Panel Motor Access Panel

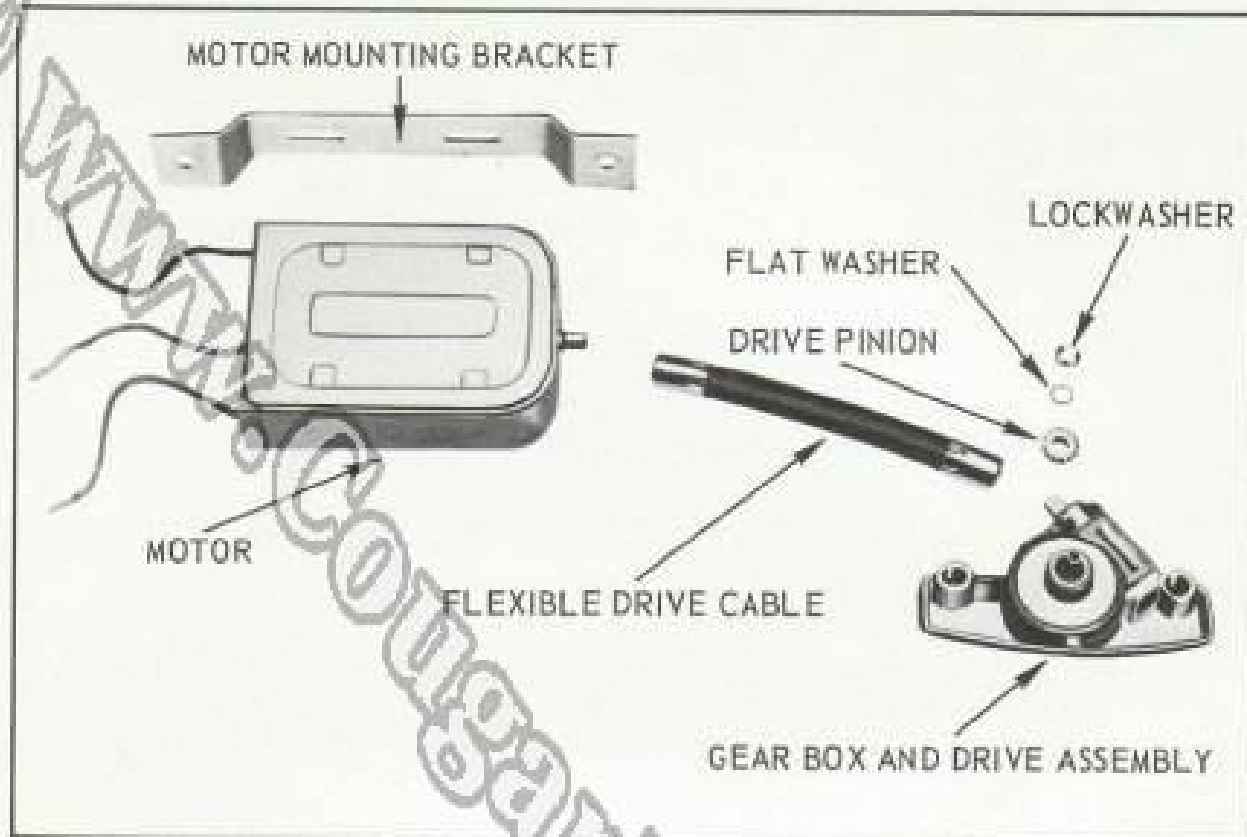


Fig. 13 – Sun Roof Panel Motor, Gear Box and Drive Assembly and Associated Parts

INSTALLATION

1. Assemble drive cable to the gear box and drive assembly. (Refer to figure 6).
2. Connect motor to drive cable and install motor. Adjust motor attaching bracket to allow for proper alignment of motor and cable to the gear box and drive assembly. Adjustment provides proper routing of cable and eliminates kinks, etc.
3. Connect motor wires and battery and check operation of system.
4. *Apply cement to the forward edge of the headlining. Starting at center, position headlining to the windshield header. Retain in position with the windshield weatherstrip.
- 4A. **Install the roof panel motor access panel.
5. Install the map and warning light housing if so equipped.
6. *Install the right and left sun visors and center bracket.
- 6A. **Install the sun visor center bracket.

*Vehicles not equipped with Roof Panel Motor Access Panel.

**Vehicles equipped with Roof Panel Motor Access Panel.

CONTROL SWITCH-REPLACEMENT INSTRUMENT PANEL MOUNTED SWITCH

REMOVAL

1. Disconnect battery.
2. Loosen switch knob retaining allen screw and remove switch knob.
3. Remove nut retaining switch to mounting bracket. Lower switch and disconnect wires.
4. To install, reverse the removal procedure.

CONSOLE MOUNTED SWITCH

REMOVAL

1. Disconnect battery.
2. Remove the four screws and console compartment door lock pin which retain the console cover to the console. Carefully lift the console cover upward and turn over on its side. Refer to figures 4 and 9.
3. Disconnect the wiring plug connector from the switch.
4. Remove the two switch assembly retaining screws and remove the switch.
5. To install, reverse the removal procedure.

GEAR BOX AND DRIVE ASSEMBLY AND/OR DRIVE PINION-REPLACEMENT

REMOVAL

1. Open the sun roof panel to the full open position.
2. Remove the drive cable housing cover. (Refer to figure 14).
3. Remove right and left upper front guide connections.
4. Remove the drive cable retaining clip.
5. Remove right and left upper elbow guides.
6. Pull drive cables out of guides and place forward on roof.
NOTE: If only necessary to replace the drive pinion, remove lockwasher, flat washer and drive pinion. (Refer to figures 13 and 14). Install replacement drive pinion, flat washer and lock washer. Reinstall above parts and check operation.
7. Remove three screws retaining the cable drive housing and remove housing.
8. *Remove both sun visors and center bracket. Remove the map and warning light housing if so equipped. (Refer to figures 10 and 11).
- 9A. **Remove the map and warning light housing if so equipped, and the sun visor center bracket. (Refer to figure 12.)
9. *Carefully pull down the headlining from behind the windshield weatherstripping in the roof panel area to gain access to the gear box and drive assembly. (Refer to figure 6).
- 9A. **Remove six screws at front edge of the roof panel motor access panel. (See figure 12). Pull access panel rearward until free of retaining clips.

*Vehicles not equipped with Roof Panel Motor Access Panel.

**Vehicles equipped with Roof Panel Motor Access Panel.

REMOVAL (CONT.)

10. From the top area, remove two gear box drive assembly retaining screws. Pry the flexible drive cable from the gear box and drive assembly and remove assembly.
11. When replacing the gear box and drive assembly it will be necessary to transfer the drive pinion and washers.
12. To install, reverse the removal procedure.

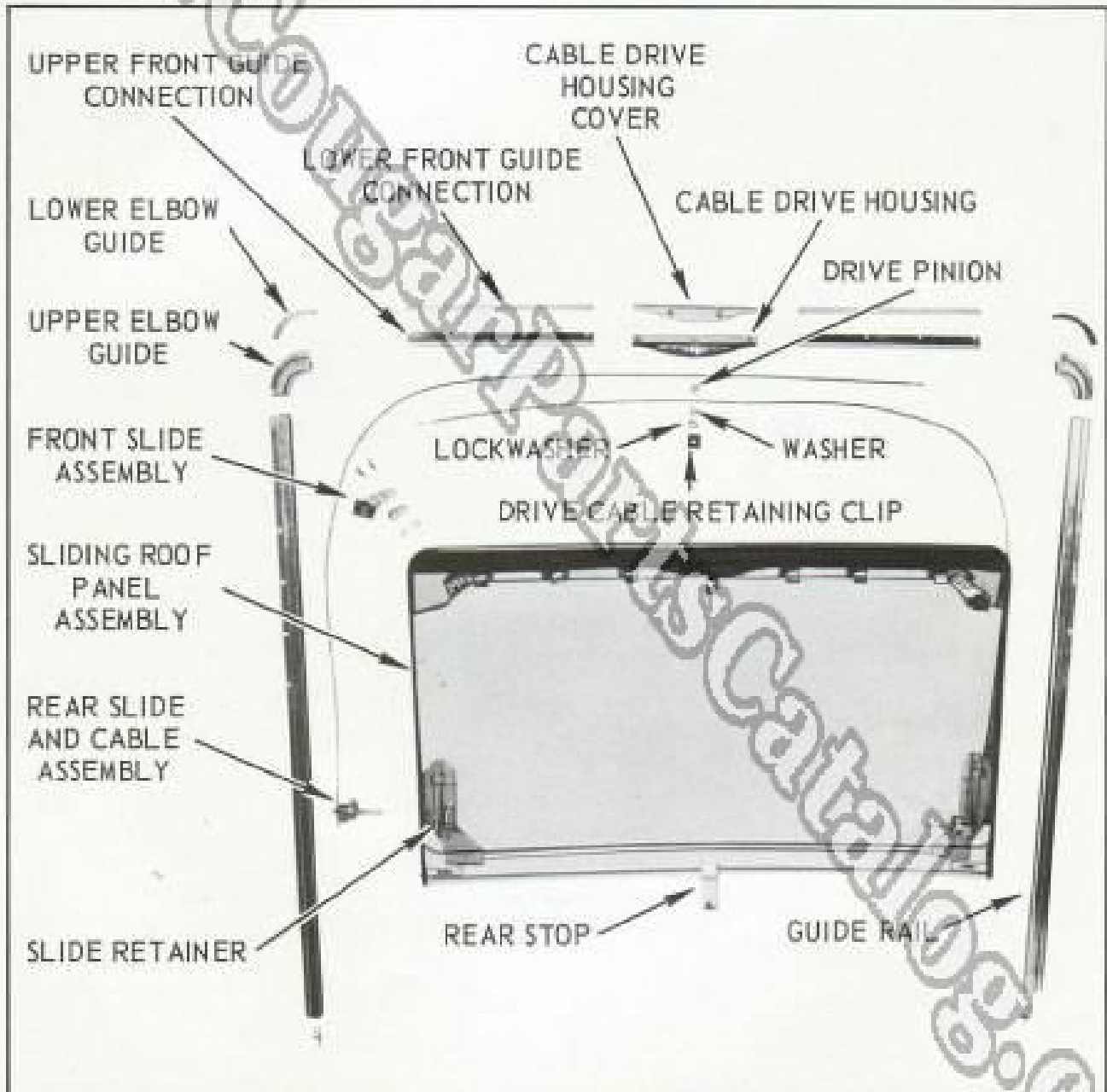


Fig. 14 - Sun Roof Panel-Disassembled View

SUN ROOF PANEL AND/OR REAR SLIDE AND CABLE REPLACEMENT

ROOF PANEL REMOVAL

1. Open roof panel approximately three inches.
2. Remove two screws securing headlining panel to roof panel at front corners.
3. Slide headlining panel forward and out of seven retaining clips mounted on roof panel front edge. See figure 15. Push panel to full rearward position.
4. Remove the outboard screw from each front slide assembly.
5. Loosen inboard slide screw and rotate each slide assembly inboard to clear guide rail. See figure 16.
6. Lift each rear slide and cable assembly inboard and out of the guide retainer hole. See figure 17.
7. Lift roof panel at front edge and actuate switch to move rear slide and cable assemblies forward approximately one inch.
8. Pull roof panel forward and out of the roof opening. See figure 18.



Fig. 15 – Headlining Panel Removal

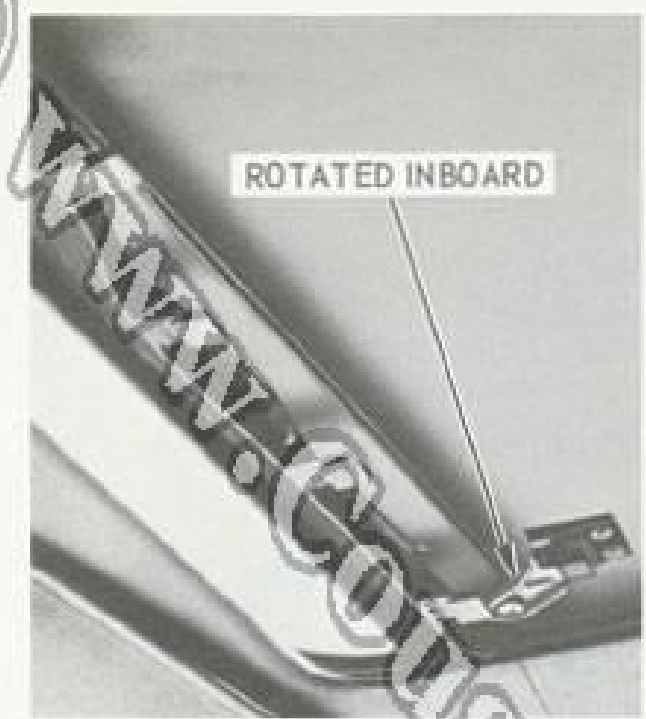


Fig. 16 – Front Slide Assembly, Pushed Off Guide Rail

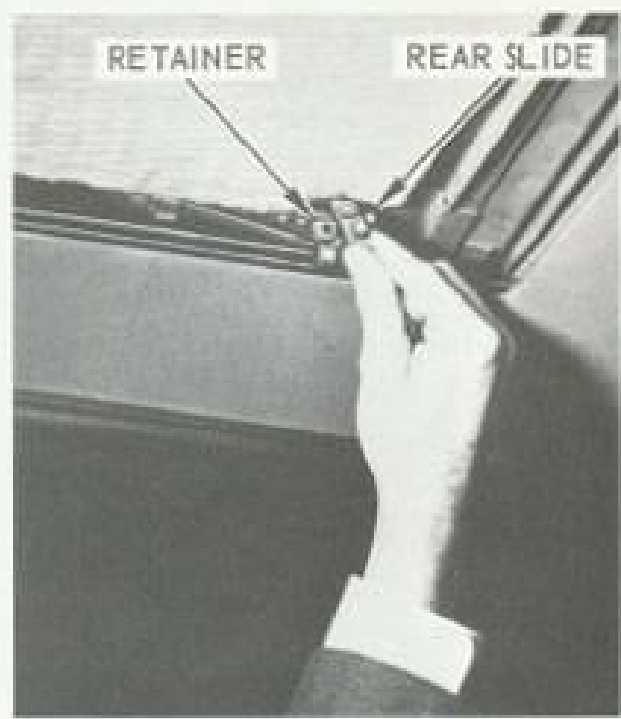


Fig. 17 – Rear Slide and Cable Assembly Removal Out of Retainer

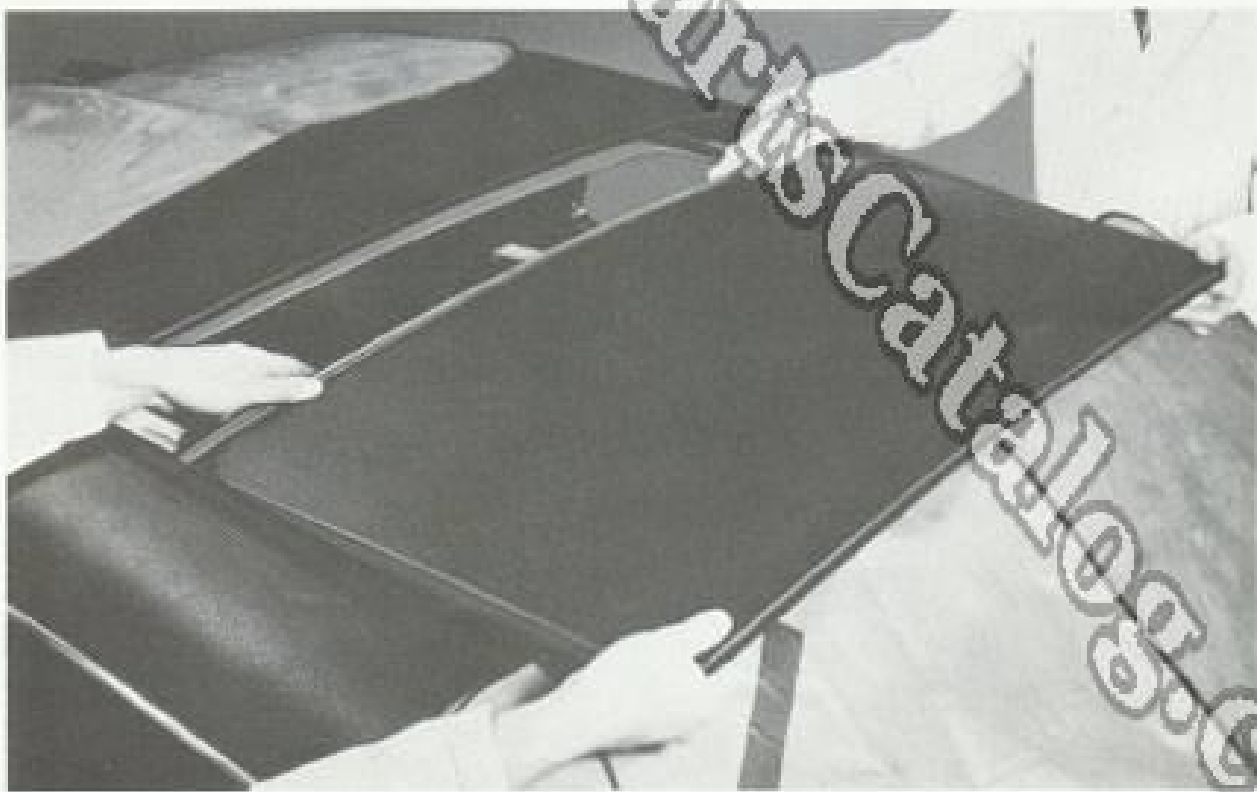


Fig. 18 – Roof Panel Removal Out of Opening

SUN ROOF PANEL AND/OR REAR SLIDE AND CABLE REPLACEMENT (CONT.)

REAR SLIDE AND CABLE REMOVAL

NOTE: Even if only one cable is defective, replace both, thereby assuring a parallel travel of the roof panel.

- Remove front center cable drive housing cover. Refer to figure 14.
- Remove both front corner upper elbow guides.
- Using a screwdriver, pry off the drive cable retaining clip. See figure 19.

CAUTION: The retainer clip is designed of spring steel. When removing, hold hand over clip to prevent pop-up.

- From center opening, pull one cable free end out of the guide rail and out of the center opening. Pull cable and rear slide assembly forward to front corner. See figure 20. Remove slide from guide track and pull slide and cable out of front guide connection. See figure 21.
- Remove opposite cable in same manner.



Fig. 19 – Drive Cable Retaining Clip Removal

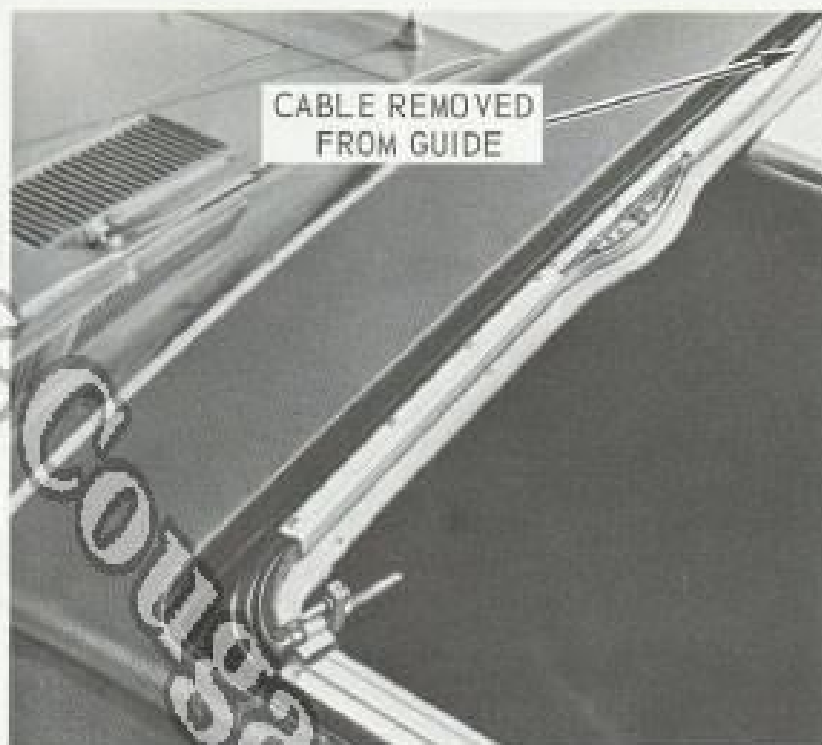


Fig. 20 - Rear Slide and Cable Pulled to Front Corner of Roof Opening

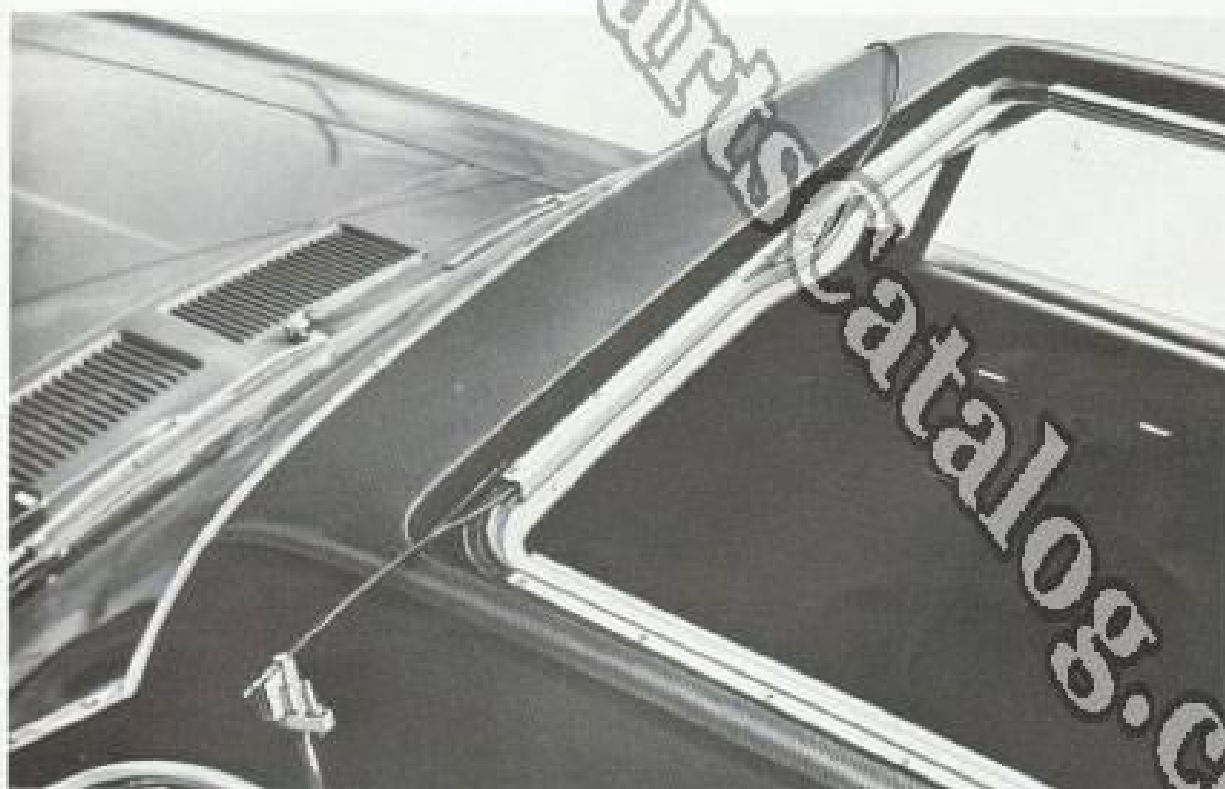


Fig. 21 - Rear Slide and Cable Removal Out of Front Guide Connection

**SUN ROOF PANEL AND/OR REAR SLIDE
AND CABLE REPLACEMENT (CONT.)**

REAR SLIDE AND CABLE INSTALLATION

14. Position the left rear slide on guide track (see figure 22) and move slide and cable assembly back until slide is in center line with the 5th side guide rail screw from the front. See figure 24.
15. Slide free end of cable into the front guide connection and route cable through the curved front center track and into lower track on the right side. Do not engage cable in drive pinion teeth. See figure 23.
16. Install the right slide and cable assembly in the same manner as the left except that the right cable is routed in the straight center track and into the lower track on the left side. See figure 23. Make sure that the right slide is centered with the 5th screw from the front on the right side rail. Do not engage cable in drive pinion teeth.
17. Check both front corner lower elbow guides for alignment with front and side guides. If necessary, shim lower elbow guide to move guide inboard for alignment with adjacent guides.
18. Install both front corner upper elbow guides.
19. Recheck rear slides for centered position with the 5th screw from front on the side guide rails. See figure 24.
NOTE: With the slides in this position engage the cables in the drive pinion teeth. This operation is critical to assure roof panel alignment and preclude cable breakage.
20. Install drive cable retaining clip.
NOTE: The narrow (notched) edge of the plate is positioned to front of vehicle.
21. Install cable drive housing cover. Start the two attaching screws with fingers to assure that screws do not cross-thread. Then tighten with screwdriver. Do not overtighten.
22. Actuate switch to check cable operation. After checking cable operation, return the rear slides to the 5th screw from front of guide rail location.



Fig. 22 – Rear Slide and Cable Installation on Side Guide Rail

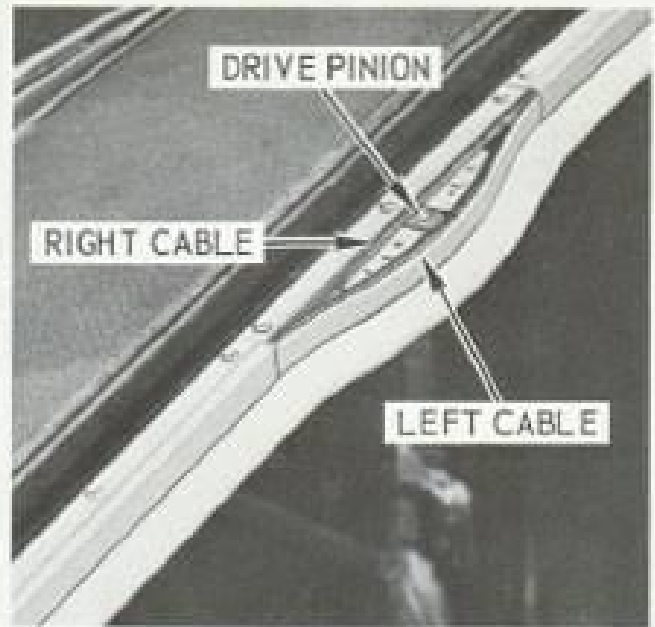


Fig. 23 – Drive Cable Installation



Fig. 24 – Rear Slides in Centered Position With 5th Side Guide Rail Screw

SUN ROOF PANEL AND/OR REAR SLIDE AND CABLE REPLACEMENT (CONT.)

ROOF PANEL INSTALLATION

Install roof panel into roof opening.

CAUTION: Hold roof panel in a rear horizontal position when placing panel into roof opening to assure that the stop on the center rear edge of the roof panel does not damage the rear passenger compartment headlining.

24. Move front slides outboard and install the slides on guide rail upper tracks.
25. Install outboard screws and tighten both screws on each slide. Refer to figure 25.
26. Push roof panel to full forward position by hand.
27. Lift rear of roof panel upward and actuate control switch to position rear slides into alignment with holes on slide retainers. Refer to figure 17.
28. Engage each slide pin into retainer hole and install retainer spring plate on slide.
29. Actuate switch and check operation of roof panel and note fit of panel to roof.

ADJUSTMENTS

The following adjustments can be made, with roof panel closed, to provide flushness of the sun roof panel with the roof and to assure proper closing of the roof panel.

30. To obtain a flush fit on one side of the rear of the roof panel with the roof, use an adjustable wrench¹, and loosen lock nut on the rear slide. See figure 26. Using a screwdriver, turn adjusting screw clockwise to raise roof panel or counterclockwise to lower panel. After desired flushness is obtained, tighten lock nut. Adjust opposite rear slide in the same manner, if required.
31. To obtain a flush fit on one side of the front of the roof panel to roof, loosen both screws on the front slide and turn the knurled caps clockwise to raise the roof panel and counterclockwise to lower the panel. See figure 27. After desired flushness is obtained, tighten screws. Adjust opposite front slide in the same manner, if required.
32. If the roof panel does not rise into the roof opening during the closing cycle, open the roof panel to the full rearward position and (refer to figure 28) examine the ramps in the drainage channel to determine if they are properly aligned with the lifting elements at the rear of the panel. The point where the lifting element makes contact with the ramp can be clearly seen on the rearward slope of the ramp. Using a screwdriver or similar tool, pry the ramp up and/or move ramp side to side so it is centered with the lifting element. Close roof panel and note the lifting action of the panel. If necessary, readjust ramps up or down and/or side to side until proper lifting action of roof panel is achieved.
33. Install headlining panel. With roof panel in a partially open position, slide headlining panel forward of roof panel and then to the rear until front edge of headlining panel is engaged in the seven retaining clips mounted on the roof panel. Install two screws to secure headlining panel at each front corner.
34. Close roof panel assembly.

¹**NOTE:** The metric wrench size for the lock nut is 8MM.

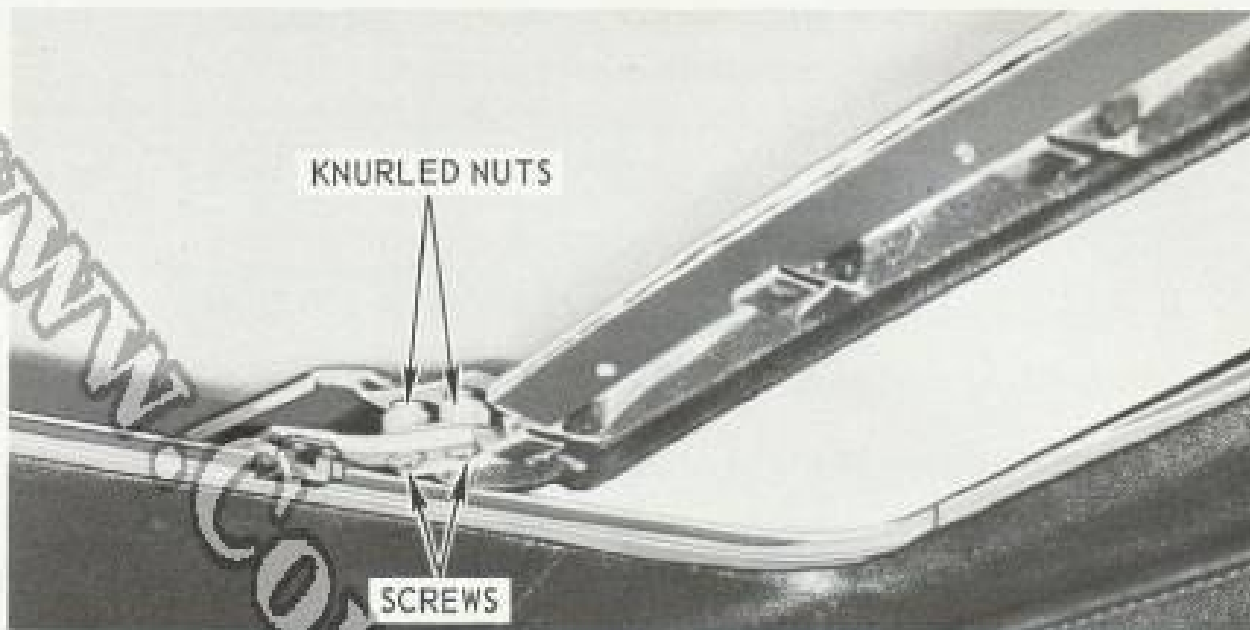


Fig. 25 - Front Slide Installation on Guide Rail Upper Track

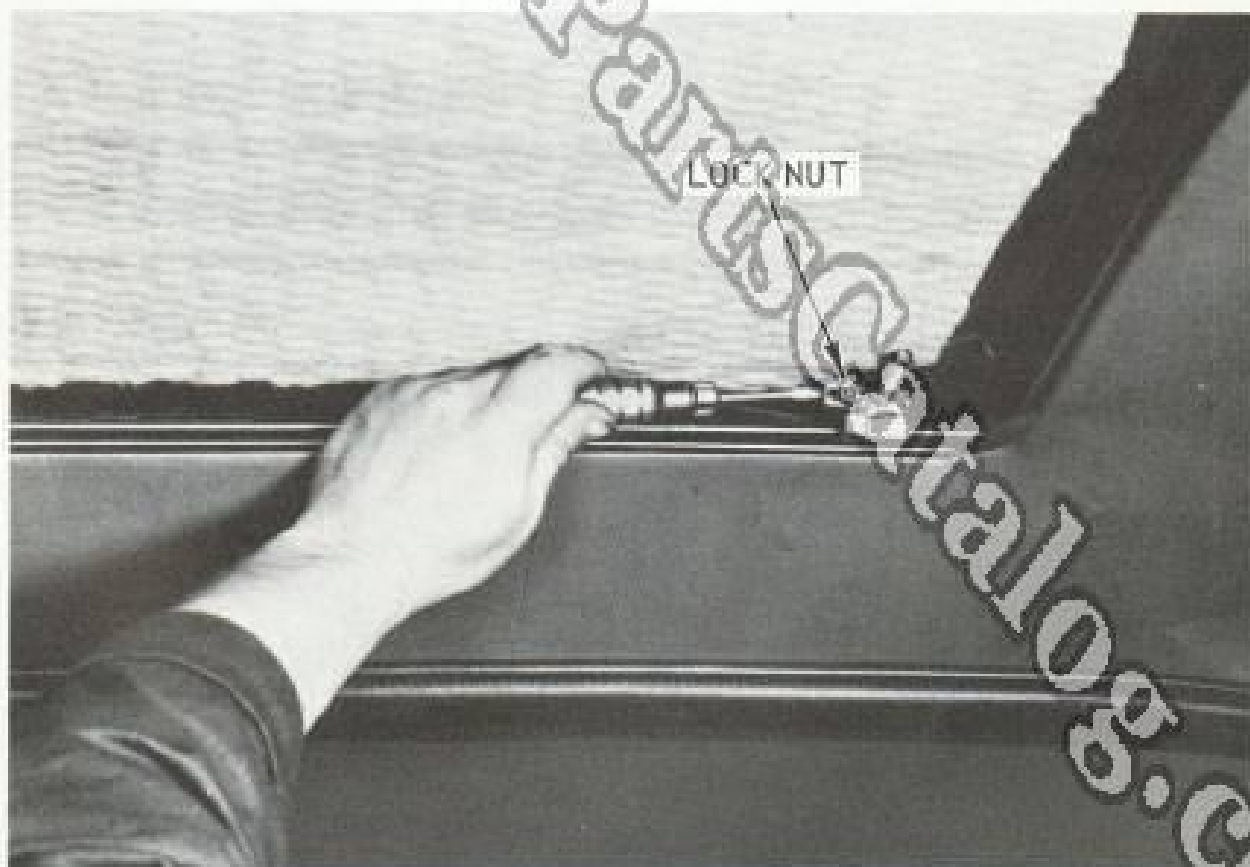


Fig. 26 - Adjusting Rear Slide to Provide Flush Fit of Roof Panel With Roof

HEADLINING PANEL REPLACEMENT

1. Open roof panel approximately three inches.
2. Remove two screws securing headlining panel to roof panel at front corners.
3. Slide headlining panel forward and out of seven retaining clips mounted on the roof panel front edge. Refer to figure 15.
4. Retract roof panel assembly to the full open position.
5. Remove headlining panel reinforcement bow off the headlining by sliding it forward and off the headlining material. See figure 27.
6. Grasp headlining panel front edge and pull it forward and out of the side guide rail lower tracks.
7. To install, reverse the removal procedure.

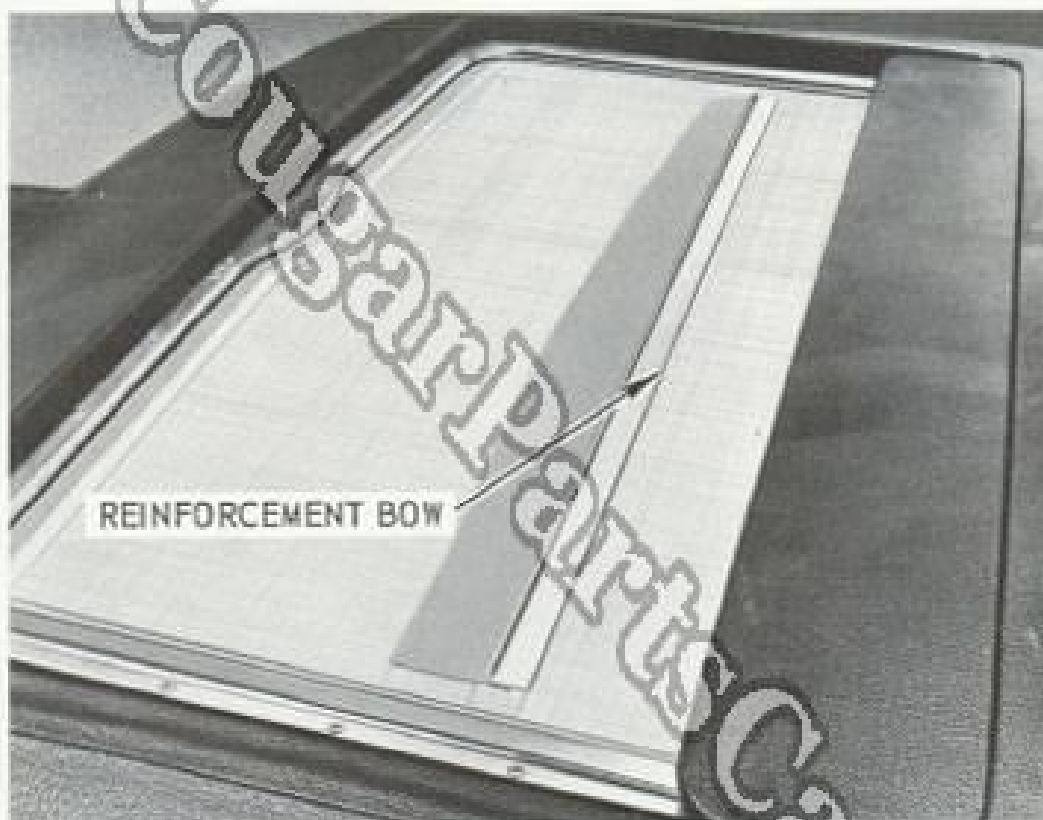


Fig. 27 - Headlining Panel Replacement

FRONT DRAIN HOSE REPLACEMENT

Accessibility for replacement of either front drain hose is obtained by lowering the forward end of the inside headlining. (Refer to figure 6.) Remove cowl side trim panel. Remove hose clamp at top neck. Using a piece of flexible wire or cord attach new hose to lower end of old hose. Pull the new hose into position while removing the old hose.

REAR DRAIN HOSE REPLACEMENT

Pull down headlining at rear corner to gain access to hose. Remove dust cap from lower end, and clamp at top neck. Using a piece of flexible wire or cord attach new hose to lower end of old hose. Pull the new hose into position while removing the old hose.

ROOF OPENING AND ROOF PANEL WEATHERSTRIP REPLACEMENT

1. With sun roof panel closed, mark the joint of the roof opening weatherstrip rear edge and the roof panel weatherstrip front edge on the sun roof panel and roof at both sides of vehicle.
2. Remove roof panel assembly out of vehicle.
3. Remove weatherstrips off roof panel opening and the rear edge of roof panel.
4. Clean surfaces using a suitable cement solvent.
5. Apply weatherstrip cement to both surfaces.
6. Position roof opening weatherstrip slightly below flush of roof and align one end of weatherstrip with mark on roof assembly. Cement weatherstrip to roof opening.
7. Install weatherstrip on rear edge of roof panel in the same manner, by aligning one end of weatherstrip with mark on roof panel and positioning weatherstrip slightly below flush of roof panel. Cement weatherstrip to rear edge of roof panel.
8. Install roof panel assembly into roof opening.

REPAIR AND ADJUSTMENTS

1. ADJUSTMENT OF PANEL ALIGNMENT

A. FRONT – LEFT OR RIGHT

To obtain a flush fit on one side of the front of the roof panel to roof, loosen both front slide screws and turn the knurled nuts clockwise to raise the roof panel, and counterclockwise to lower the panel. See figure 25. After desired flushness is obtained, tighten screws. Adjust the opposite front slide in the same manner, if required.

B. REAR – LEFT OR RIGHT

To obtain a flush fit on one side of the rear of the roof panel with the roof, use an adjustable wrench,[†] and loosen the lock nut on the rear slide. See figure 26. Using a screwdriver, turn the adjusting screw clockwise to raise roof panel or counterclockwise to lower panel. After desired flushness is obtained, tighten lock nut. Adjust opposite rear slide in the same manner, if required.

2. PANEL RISES ON ONE SIDE ONLY OR DOES NOT RISE ON EITHER SIDE

If the roof panel does not rise into the roof opening during the closing cycle, remove the headlining panel and open the roof panel to the full rearward position. Examine the ramps in the drainage channel (refer to figure 5) to determine if they are properly aligned with the lifting elements at the rear of the panel. The point where the lifting element makes contact with the ramp can be clearly seen on the rearward slope of the ramp. Using a screwdriver or similar tool, pry the ramp up and/or move ramp side to side so it is centered with the lifting element. Close roof panel and note the lifting action of the panel. If necessary readjust ramps up or down and/or side to side until proper lifting action of roof panel is achieved.

[†]NOTE: The metric wrench size for the lock nut is 8MM.

3. PANEL DOES NOT RUN TRUE

Close the roof panel. Determine which side of the panel jams. Open the roof panel. Remove the drive housing center cover. Pry off the drive cable retaining clip. Refer to figure 19. To move the righthand side of the roof panel forward, lift the right cable at the front of the pinion and pull it one or more teeth to the left and install the retaining clip and the drive housing cover and check operation. To move the left-hand side of the roof panel forward perform the same operation on the left cable.

NOTE: Do not accidentally move the panel while the cable is off the pinion.

4. ALIGNMENT OF CABLE GUIDES

If one side of roof panel does not raise or roof panel jams up during its travel, check both front corner lower elbow guides for alignment with front and side guides. If necessary, shim the lower elbow guides to move guide inboard for alignment with adjacent guides.

5. MOTOR RUNS, PANEL JAMS OR FAILS TO RISE

A. Panel does not run true mechanical resistance. See 3 and 4 above. Drive cables may be disconnected or broken.

B. Front slides may be tilted and therefore require re-alignment. (See 1A on preceding page.)

C. The joints of the cable slides are out of alignment (guide rail, corner and connector guides and cable drive housing) and are jamming the cable drive.

Loosen the screws retaining the guide rails, corner and connector rails and cable drive housing a few turns. Re-tighten the screws one by one, continually activating the drive mechanism. Where necessary re-align those points where resistance is felt.

D. Check the alignment of the ramp and lifting elements. (See 2 on preceding page.)

*E. Slipping clutch engages too easily. Remove the auxiliary drive cover. (See figure 10.) Unscrew the slotted-head screw and add another 11.8 x 9.1 x 0.2MM washer to those already in position. Replace screw and check operation. Tighten the slotted-head screw well.

6. MOTOR FAILS TO RUN

A. Check circuit breaker, and wiring connections up to control switch.

B. Check control switch to assure electrical continuity to motor.

C. Check wiring and connections to motor. Check motor ground wire.

D. Replace motor.

*Using a micrometer, measure existing washers for exact measurement to make sure that the same washer thickness is used when making this adjustment.

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