

allow reinstallation of top material to its original position with a minimum of refitting.

17. Install all previously removed trim and hardware.

BACK CURTAIN ZIPPER REPLACEMENT

If only the back curtain zipper is being replaced, use the Removal and Installation procedure for "Back Curtain Trim Assembly (Complete)" and perform the following additional operations after the back curtain assembly has been removed from body (After step 14 of removal procedure).

1. Using chalk or similar material, on old zipper tape mark location of zipper in relation to edges of back curtain vinyl.

2. Cut stitches securing zipper tape to back curtain assembly.

3. Transfer reference marks to new zipper assembly.

4. Sew new zipper tape to back curtain assembly.

NOTE: Zipper tape may be stapled to back curtain to aid in holding zipper in proper position during sewing operation.

5. Install back curtain assembly as described under installation procedure for "Back Curtain Trim Assembly (Complete)".

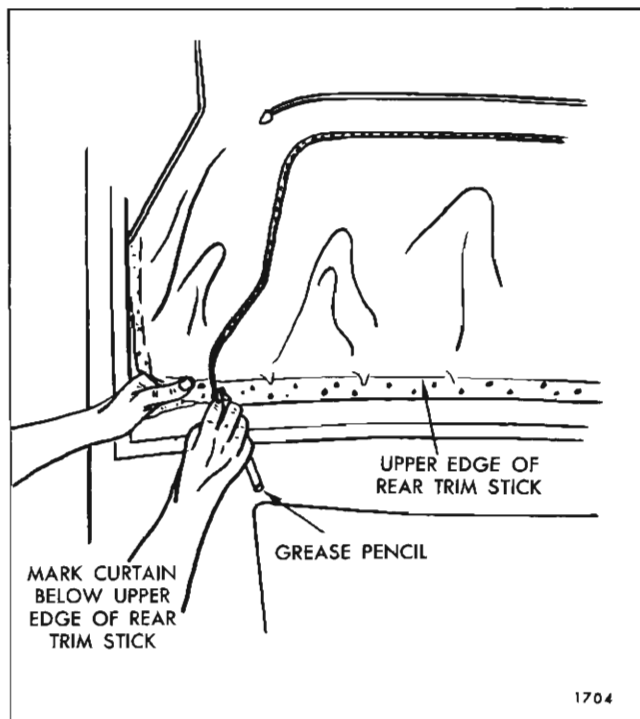


Fig. 2-1-48—Locating Edge of Top Material

BACK CURTAIN VINYL (INCLUDES EXTENSIONS) "67" STYLES

BACK CURTAIN VINYL REPLACEMENT (INCLUDES TRANSFER OF ZIPPER TO NEW VINYL)

Removal

1. Place protective covers on all exposed panels which may be contacted during procedure.

2. Remove rear seat cushion and back.

3. Remove folding top compartment side trim panel assemblies and side roof rail rear weatherstrips; then detach folding top quarter flaps from side roof rear rails.

4. Detach top compartment bag from seat back panel and remove all trim stick attaching bolts.

5. To establish the relationship of right and left inner vertical edge of old top material to back curtain assembly at rear trim stick location, mark back curtain vinyl at both locations with a grease pencil (Fig. 2I48).

Reference marks should be transferred to new back curtain when step 4 of installation procedure is performed.

6. Using a pencil, mark both ends of rear and rear quarter trim sticks on vinyl surface of top material. Reference marks should be used as a guide when installing top material to trim sticks after new back curtain has been installed.

7. Remove folding top material from rear and rear quarter trim sticks; then carefully slide top trim forward sufficiently to expose back curtain zipper.

8. Detach zipper tape from rear quarter trim stick.

9. Using a pair of wire cutting shears or other suitable tool, cut zipper stop along dotted line and remove both halves of stop from zipper (Fig. 2I49).

10. Operate slide fastener off of zipper assembly.

11. Detach nylon webbing from rear trim stick.

12. Remove rear and rear quarter trim sticks with attached back curtain and compartment bag material from body and place on a clean, protected surface.

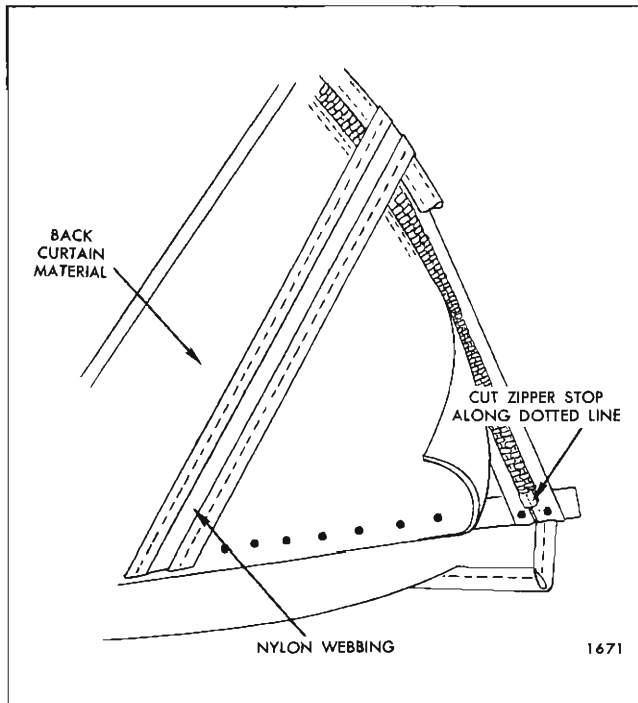


Fig. 2-1-49—Back Curtain Vinyl Replacement

13. Using chalk, or other suitable material, mark ends of rear and rear quarter trim sticks on vinyl surface of back curtain material (Fig. 2I50).

Reference marks for trim sticks should be transferred to new back curtain material when step 4 of installation procedure is performed.

14. Using chalk or similar material, mark zipper tape at upper edge of vinyl (Fig. 2I51).

15. Remove back curtain assembly from rear and rear quarter trim sticks.

16. As a bench operation, cut stitches securing half of zipper assembly to back curtain vinyl.

NOTE: Back curtain vinyl and extensions (less zipper) are available as a service part.

Installation

1. Using chalk mark as guide, locate rear half of zipper to new back curtain vinyl. Zipper tape may be stapled to new back curtain to aid in holding zipper in proper position during sewing operation.

2. Sew zipper to new back curtain assembly.

3. Place back curtain window assembly on clean covered work bench with interior (vinyl) surface of back window valance facing down.

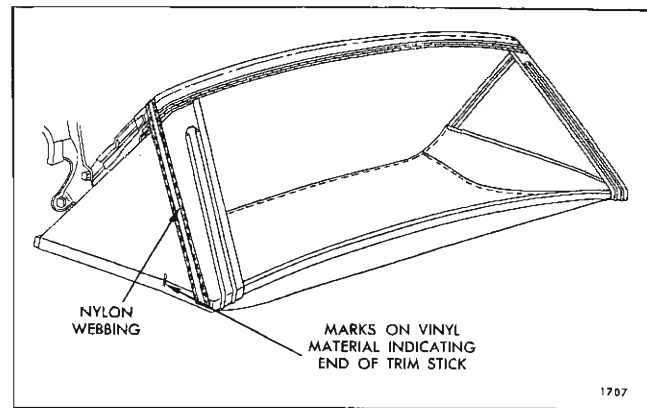


Fig. 2-1-50—Marking Back Curtain Material

4. Transfer marks on old back curtain to new back curtain assembly. See steps 5 and 13 of removal procedure.

5. Center and position back curtain assembly to rear trim stick over attached compartment bag.

NOTE: Notch in back curtain vinyl at lower edge indicates centerline of back curtain assembly. (See Fig. 2I51). In addition, back curtain lower edge should extend approximately 1/2" below lower edge of trim sticks.

6. Tack curtain to rear and rear quarter trim sticks.

7. Tacks securing back curtain assembly to trim sticks should be placed close to each side of every bolt hole in trim sticks. Then pierce or punch curtain assembly for each trim stick bolt.

8. Tack nylon webbing to rear trim stick. (Fig. 2I49).

9. Inspect rubber trim stick fillers cemented to body below pinch weld. Re-cement if necessary.

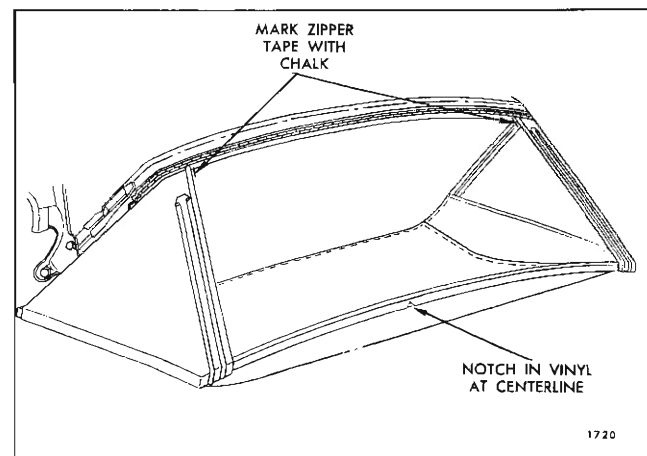


Fig. 2-1-51—Marking Back Curtain

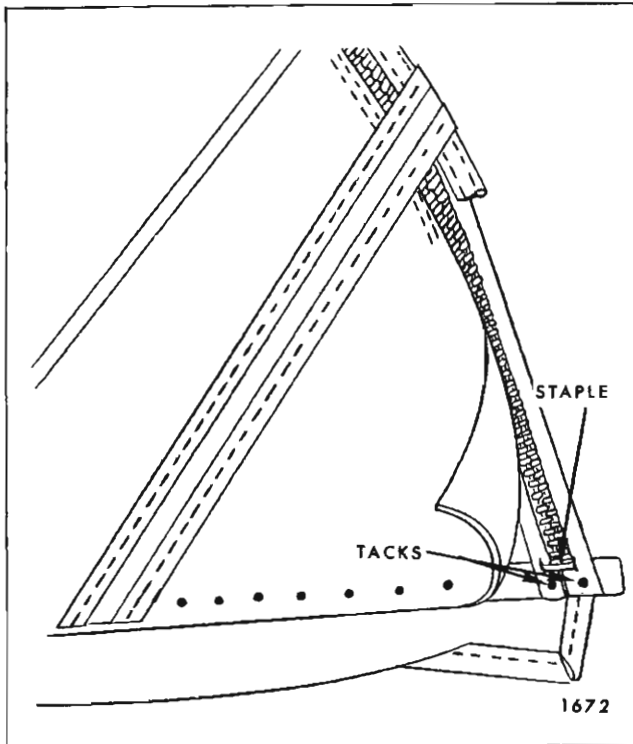


Fig. 2-I-52 — Zipper Installation At Rear Quarter Trim Stick

10. Install slide fastener onto zipper assembly.
 11. Staple both sections of zipper tape together. Staples will aid in preventing zipper scoops from disengaging and also serve as a stop for the slide fastener. (Fig. 2I52).
 12. Operate slide fastener to closed position.
 13. Tack zipper tape to rear quarter trim stick (Fig. 2I52). Zipper tape should not be pulled taut as zipper teeth may show through top material after top has been properly installed.
 14. Install trim sticks with attached back curtain assembly into body.
- NOTE:** Make sure that all trim stick bolts are driven completely in to represent finished condition.
15. Check contour of back curtain assembly at pinchweld molding. Where required, place reference chalk mark on outer surface of back curtain along pinchweld finishing molding. Re-adjust back curtain assembly by retacking curtain to rear or rear quarter trim sticks as required.
 16. Detach rear trim stick with attached back curtain assembly from body.
 17. Carefully replace top in position in rear quarter area.

18. Using nitrile cement or neoprene-type weatherstrip adhesive, fasten rear quarter flaps to side roof rear rails. Make sure that rear quarter flap seam is even with forward edge of side roof rear rail. Install side roof rail rear weatherstrip to help maintain position of quarter flaps while adhesive is drying.

19. Using previously marked lines (end of trim sticks) and bolt hole locations in top material as a locating reference, tack top material to rear and rear quarter trim sticks.

20. Install top material into body. Make sure rear and rear quarter trim stick attaching bolts are completely driven in to represent finished condition.

21. Check fit of top material. Rear quarter trim sticks may be adjusted downward to remove minor wrinkles in top material in rear quarter area.

22. Where required, re-mark top material; then make necessary adjustments to top material by repositioning rear quarter trim sticks or by re-tacking top material to rear or rear quarter trim sticks.

23. After desired fit of top material has been obtained, install trim sticks with attached top material into top compartment well and tighten side and rear trim stick attaching bolts.

24. Where required, remove side roof rail rear weatherstrips. Re-adjust top material at side roof rails and reinstall weatherstrips.

25. When completed, folding top and back curtain assembly should be free from all wrinkles and draws. Install all previously removed trim and hardware and clean any soilage from top material or back curtain assembly.

PINCHWELD FINISHING LACE

The upper rear pinchweld flange on the front roof rail assembly is covered by a one-piece snap-on pinchweld finishing lace (Fig. 2I53).

Removal and Installation

1. Unlock top from windshield header; then raise top assembly to half-open position.
2. To remove lace, carefully pull lace assembly loose from pinchweld flange.
3. To install, press lace assembly over pinchweld flange. Be sure each end of lace is concealed by upper inboard flange of side roof front rail assembly.

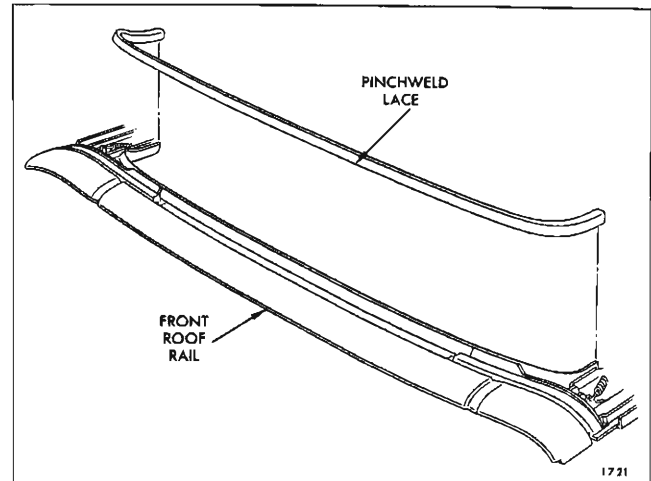


Fig. 2-I-53 — Pinchweld Finishing Lace

ADJUSTMENTS

DESCRIPTION

The following information outlines and illustrates procedures which may be used to correct misaligned folding top linkage. To correct some top variations, only a single adjustment is required; other top variations require a combination of adjustments. In conjunction with adjustment of the folding top, it may be necessary to adjust the door, door glass, rear quarter glass, trim sticks or side roof rail weatherstrips.

CAUTION: When operating a manually-operated folding top, hands must be kept clear of side roof rail hinges and connecting linkages.

ADJUSTMENT OF FOLDING TOP FRONT ROOF RAIL WEDGE PLATE

The folding top front roof rail wedge plates are designed to contact the side of the sunshade support and striker assembly thus aligning the front roof rail to the striker so that both side roof rail locks will easily engage with the strikers. In addition, the wedge plates act as a spacer between the front roof rail and windshield header when top is in the locked position.

If the front roof rail wedge plates do not contact the sunshade support and striker assemblies when top is locked to the windshield header, the wedge plates may be adjusted as follows:

1. Raise top assembly to half-open position.
2. Loosen wedge plate inboard attaching screw. (Fig. 2I54).

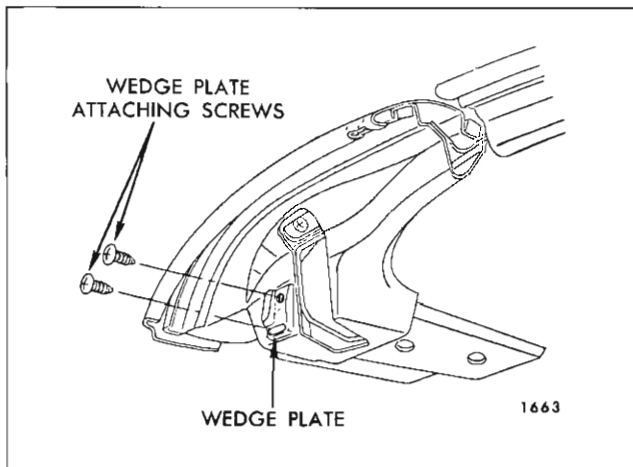


Fig. 2-I-54 — Wedge Plate Installation

3. Rotate wedge plate up or down sufficiently so that wedge plate will contact side of striker assembly when top is locked to windshield header.

4. Tighten inboard attaching screw.

5. Lock top to windshield header.

6. Readjust wedge plates until desired adjustment is obtained.

NOTE: The sunshade support and striker assembly is not adjustable.

ADJUSTMENT OF TOP AT FRONT ROOF RAIL

If the top, when in a raised position, is too far forward or too far rearward, the front roof rail may be adjusted as follows:

1. Unlatch top and raise it above windshield header. Remove side roof rail weatherstrip front attaching screws.

2. Loosen side roof front rail attaching screws and adjust front roof rail fore or aft as required. Repeat on opposite side if necessary. (See View "A", Fig. 2I55).

NOTE: If additional adjustment is required, it can be made at folding top male hinge.

3. When front roof rail is properly adjusted, tighten attaching screws. Check forward section of side roof rail front weatherstrip. Refit and re-attachment as required; then install weatherstrip attaching screws.

FRONT ROOF RAIL LOCK ASSEMBLY

Removal and Installation

1. Unlock top from windshield header.
2. With top in a half-open position, remove lock attaching screws; then remove lock assembly from front roof rail. (See View "A", Fig. 2I55).
3. To install, reverse removal procedure.

FRONT ROOF RAIL LOCK ADJUSTMENT

If the locking action of top is unsatisfactory, the hook on the lock assembly may be adjusted as follows:

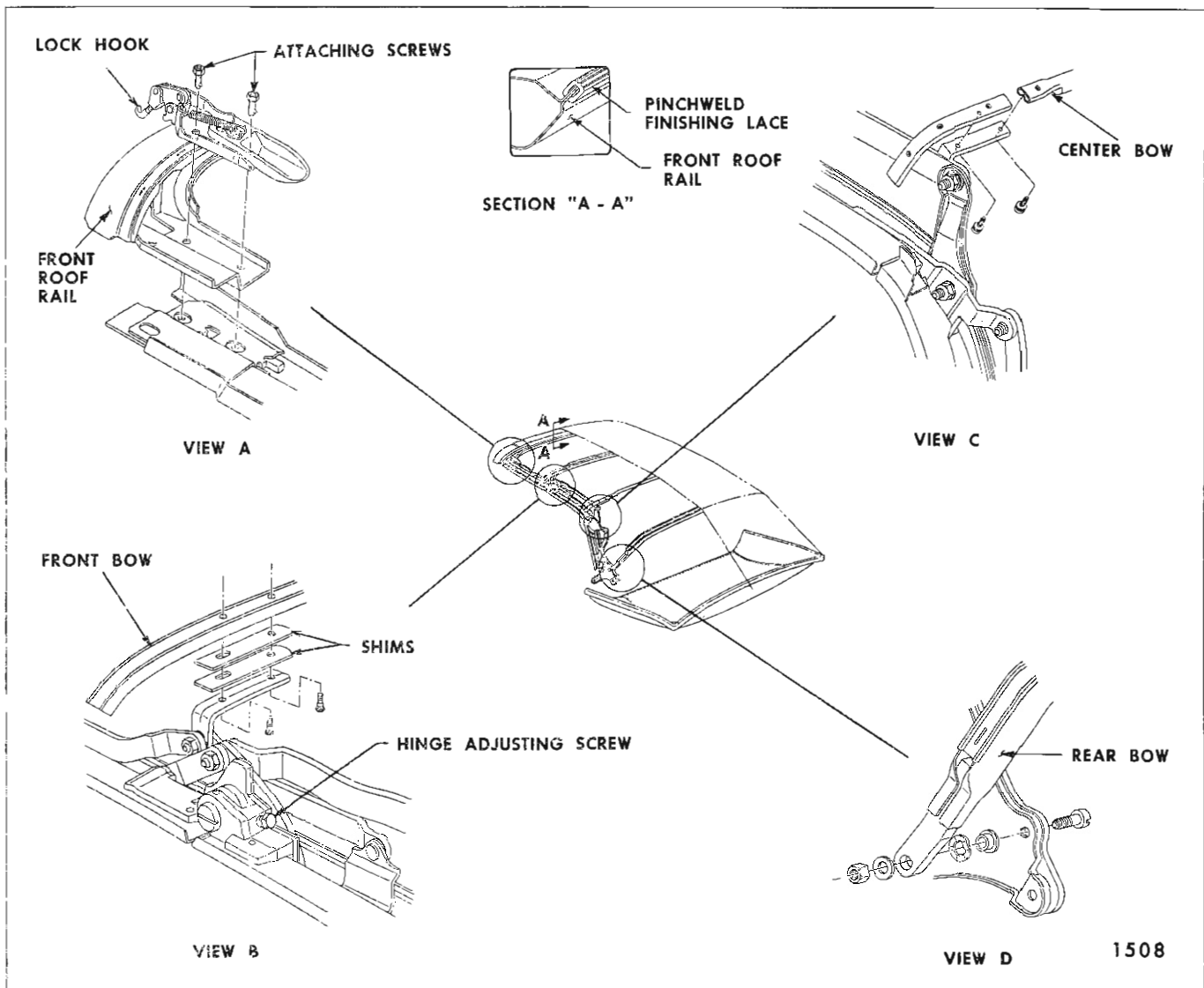


Fig. 2-1-55 — Folding Top Linkage

1. To tighten or increase locking action, turn lock hook clockwise.
2. To reduce or decrease locking action, turn lock hook counterclockwise.

ADJUSTMENT OF TOP CONTROL LINK ADJUSTING PLATE

1. With top in "up" position, if joint between front and center side roof rail is too high or too low, proceed as follows:
 - a. Remove folding top compartment side trim panel.
 - b. Scribe location of control link adjusting plate on folding top compartment brace.

- c. Loosen two bolts securing control link adjusting plate sufficiently to permit adjustment of plate. (See Fig. 2I56).
- d. Without changing fore and aft location of adjusting plate, adjust side roof rail up or down allowing adjusting plate to move up or down over serrations on support as required; then tighten bolts.
2. If top assembly does not stack properly when top is in down position, proceed as follows:

- a. Scribe location of control link adjusting plate on folding top compartment brace.
- b. Loosen bolts securing control link adjusting plate sufficiently to permit adjustment of plate.

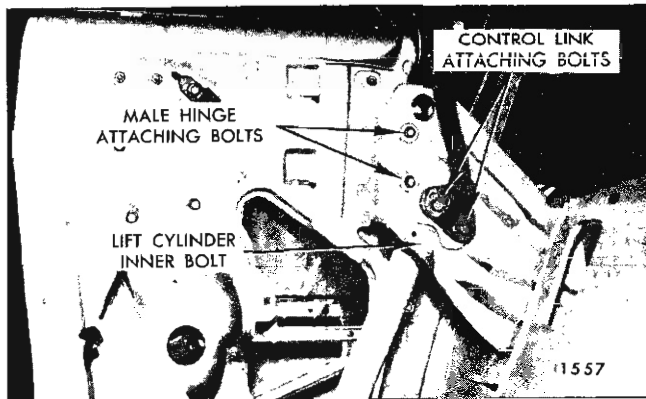


Fig. 2-1-56 — Lift Cylinder Attachment

c. Without changing the up or down location of adjusting plate, move adjusting plate forward or rearward (horizontally) over serrations as required to obtain desired height; then tighten bolts.

d. On styles equipped with manually operated folding top, adjust both folding top catch clips as required. (See "Manually Operated Folding Top Hardware").

ADJUSTMENT OF TOP AT MALE HINGE

Prior to making any adjustment of top linkage at male hinge, loosen two bolts securing folding top rear quarter trim stick to rear quarter panel. This will prevent any possible damage to top when it is raised after adjustment. After making an adjustment at male hinge, check folding top at rear quarter area for proper fit and, if necessary adjust trim stick assembly.

1. If there is an excessive opening between side roof rail rear weatherstrip and rear of rear quarter window, or if front roof rail is too far forward or rearward, proceed as follows:

a. Scribe location of male hinge attaching bolt washers and control link assembly on folding top compartment brace.

b. Loosen male hinge assembly and control link attaching bolts. (Fig. 2I56).

c. Move hinge fore or aft as required to obtain proper alignment between side roof rail

rear weatherstrip and rear quarter window, then tighten bolts.

d. Lock front roof rail to windshield, (where required, adjust front roof rail as previously described), and check fit of top material at rear quarter trim stick; then tighten trim stick attaching bolts.

e. Check top assembly for proper stack height. Where required, adjust control link adjusting plate as previously described. (See Step #2 under "Adjustment of Top Control Link Adjusting Plate").

f. On styles equipped with manually operated folding tops adjust both folding top catch clips as required. (See "Manually Operated Folding Top Hardware").

2. If side roof rail is too high or too low at rear quarter window area, proceed as follows:

a. Scribe location of male hinge attaching bolt washers and control link on folding top compartment brace.

b. Loosen male hinge assembly and control link attaching bolts. (See Fig. 2I56).

c. Without changing fore and aft location of male hinge, adjust male hinge up or down as required to obtain proper alignment between side roof rail and rear quarter window.

d. Tighten attaching bolts, while maintaining proper alignment of scribe marks.

e. Check fit of top material at rear quarter trim stick area and, if necessary, adjust trim stick. If adjustment is not necessary, tighten trim stick attaching bolts.

f. Check top assembly for proper stack height. Where required, adjust control link adjusting plate as previously described. (See Step #2 under "Adjustment of Top Control Link Adjusting Plate").

g. On styles equipped with manually-operated folding tops, adjust both folding top catch clips as required. (See "Manually Operated Folding Top Hardware").

DESCRIPTION

The following procedure describes and illustrates various types of folding top misalignment

conditions, their apparent causes and the recommended procedure for their correction.

CONDITION	APPARENT CAUSE	CORRECTION
A. Difficult locking action at front roof rail.	<ol style="list-style-type: none"> 1. Lock hook improperly adjusted. 2. Misaligned front roof rail front weatherstrip. 3. Front roof rail misaligned. 	<p>Adjust lock hook counterclockwise. (See View "A" in Fig. 2I57).</p> <p>Loosen, realign and retack front roof rail front weatherstrip.</p> <p>Adjust front roof rail. (View "A" in Fig. 2I57).</p>
B. Top does not lock tight enough to windshield header.	<ol style="list-style-type: none"> 1. Lock hook improperly adjusted. 2. Misaligned front roof rail front weatherstrip. 3. Front roof rail misaligned. 	<p>Adjust lock hook clockwise. (See View "A" in Fig. 2I57).</p> <p>Loosen, realign and retack front roof rail front weatherstrip.</p> <p>Adjust front roof rail.</p>
C. Top travels too far forward.	<ol style="list-style-type: none"> 1. Front roof rail misaligned. 2. Male hinge assembly misaligned. 	<p>Adjust front roof rail rearward (See View "A" in Fig. 2I57).</p> <p>Adjust male hinge assembly rearward. (Fig. 2I56).</p>
D. Top does not travel forward far enough.	<ol style="list-style-type: none"> 1. Front roof rail misaligned. 2. Male hinge assembly misaligned. 3. Improper spacing between rear trim stick and body metal. 	<p>Adjust front roof rail forward. (See View "A" in Fig. 2I57).</p> <p>Adjust male hinge assembly forward. (Fig. 2I56).</p> <p>Install an additional spacer between rear trim stick and body metal at each attaching bolt location.</p>
E. Side roof rail rear weatherstrip too tight against rear of rear quarter window.	<ol style="list-style-type: none"> 1. Male hinge assembly misaligned. 	<p>Adjust male hinge assembly rearward. (Fig. 2I56).</p>
F. Gap between side roof rail rear weatherstrip and rear of rear quarter window.	<ol style="list-style-type: none"> 1. Male hinge assembly misaligned. 	<p>Adjust male hinge assembly forward and/or shim side roof rail rear weatherstrip forward as required (Fig. 2I56).</p>
G. Side roof rail rear weatherstrip too tight against top of rear quarter window.	<ol style="list-style-type: none"> 1. Male hinge misaligned. 	<p>Adjust male hinge upward. (Fig. 2I56).</p>
H. Gap between side roof rail rear weatherstrip and top of rear quarter window.	<ol style="list-style-type: none"> 1. Male hinge misaligned. 	<p>Adjust male hinge downward and/or shim side roof rail rear weatherstrip downward as required. (Fig. 2I56).</p>

CONDITION	APPARENT CAUSE	CORRECTION
I. Sag at front to center side roof rail joint.	<ol style="list-style-type: none"> 1. Control link adjusting plate misaligned. 2. Center side roof rail hinge adjusting screw improperly adjusted. 	<p>Adjust control link adjusting plate downward. (Fig. 2I56).</p> <p>Adjust screw counterclockwise. (See View "B" in Fig. 2I57).</p>
J. Front and center side roof rails bow upward at hinge joint.	<ol style="list-style-type: none"> 1. Control link adjusting plate misaligned. 2. Center side roof rail hinge adjusting screw improperly adjusted. 	<p>Adjust control link adjusting plate upward. (Fig. 2I56).</p> <p>Adjust screw clockwise. (See View "B" in Fig. 2I57).</p>
K. Folding top dust boot is difficult to install.	<ol style="list-style-type: none"> 1. Improper stack height due to misaligned control link adjusting plate. 2. Misaligned folding top dust boot female fastener. 3. Rear seat back assembly is too far forward. 4. Excessive build-up of padding in side roof rail stay pads. 5. On manual tops, due to improperly adjusted catch clips. 	<p>Adjust control link plate rearward or forward as required. (Fig. 2I56).</p> <p>Where possible, align female with male fastener.</p> <p>Relocate rear seat back rearward until dimension between upper rear edge of rear seat back to forward edge of pinchweld finishing molding is $15 \frac{3}{16}'' \pm 1/16''$. The dimension is measured at approximate center line of body.</p> <p>Repair side stay pads as required.</p> <p>Adjust catch clips downward as required.</p>
L. Folding top dust boot fits too loosely.	<ol style="list-style-type: none"> 1. Improper stack height due to misaligned control link. 2. Rear seat back assembly is too far rearward. 3. On manual tops, due to improperly adjusted catch clips. 	<p>Adjust control link plate forward as required. (Fig. 2I56).</p> <p>Relocate rear seat back panel forward until dimension between upper rear edge of rear seat back to forward edge of pinchweld finishing molding is $15 \frac{3}{16}'' \pm 1/16''$. The dimension is measured at approximate center line of body.</p> <p>Adjust catch clips upward as required.</p>
M. Top material is too low over windows or side roof rails.	<ol style="list-style-type: none"> 1. Front roof bow improperly shimmed. 2. Excessive width in top material. 	<p>*Install one or two $1/8''$ shims between front roof bow and slat iron. (See View "B" in Fig. 2I57).</p> <p>If top is too large, detach binding along affected area, trim off excessive material along side binding as required; then hand sew binding to top material.</p>

CONDITION	APPARENT CAUSE	CORRECTION
N. Top material is too high over windows or side roof rails.	1. Front roof bow improperly shimmed.	*Remove one or two 1/8" shims from between front roof bow and slat iron. (See View "B" in Fig. 2I57).
O. Top material has wrinkles or draws.	1. Rear quarter trim stick improperly adjusted.	Adjust rear quarter trim stick on side affected.
	2. Top material improperly installed to center or rear quarter trim stick.	Retack top material as required.
P. Wind whistle or waterleak along front roof rail.	1. Top does not lock tight enough to windshield header.	Adjust lock hook clockwise.
	2. Misaligned front roof rail front weatherstrip.	Retack front weatherstrip to front roof rail.
Q. Wind whistle or air leak between top material and side roof rail stay pads.	1. Top material hold-down cables improperly adjusted.	Adjust top material hold-down cables as required.
<p>*When no shims are required or when installing only one shim, use attaching screw part #4412844 (1/4 - 20 x 5/8" oval head with external tooth lock washer, type "T-T" tapping screw, chrome finish).</p> <p>When two shims are required, use attaching screw part #4412619 (1/4 - 20 x 3/4" oval head with external tooth lock washer, type "T-T" tapping screw, chrome finish).</p>		

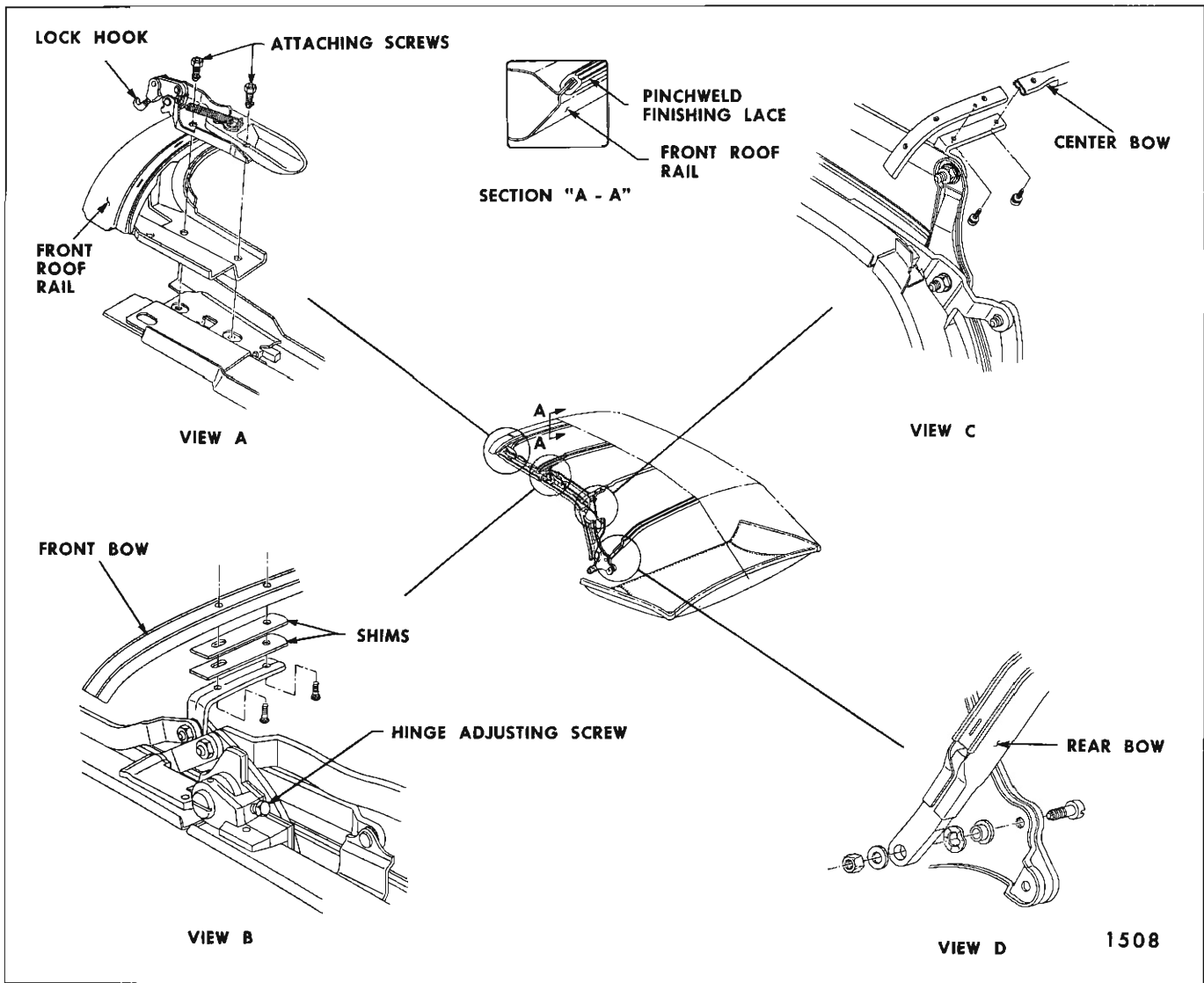


Fig. 2-1-57 — Folding Top Linkage

HYDRO-LECTRIC SYSTEM

The high pressure hydro-lectric unit used in the convertible bodies, consists of a 12 volt reversible type motor, a rotor-type pump, two hydraulic lift cylinders, and an upper and lower hydraulic hose assembly. The unit is installed in the body directly behind rear seat back. (Fig. 2I58).

Figure 2I59 illustrates and identifies the individual parts of the motor and pump assembly.

NOTE: When servicing the motor assembly or pump end plate assembly, it is extremely important that the small motor shaft "O" ring seal is properly installed over the motor armature shaft and into the pump end plate assembly prior to installing the pump rotors or the motor shaft drive ball.

MOTOR AND PUMP ASSEMBLY

Removal

1. Operate folding top to full "up" position.
2. Disconnect positive battery cable.
3. Place protective covering over rear seat cushion and back.
4. Working inside body, detach front edge of folding top compartment bag from rear seat back panel.
5. Working on inside of body over rear seat back, remove pump and motor shield attaching screws and remove shield.
6. Remove clips securing wire harness and hydraulic hose to rear seat back panel. (Fig. 2I58).
7. Disconnect motor leads from wire harness and ground attaching screws. (Fig. 2I58).
8. To facilitate removal, apply a rubber lubricant to pump attaching grommets; then carefully disengage grommets from floor pan. (Fig. 2I58).
9. Place absorbent rags below hose connections and end of reservoir.
10. With a straight-bladed screwdriver, vent reservoir by removing filler plug; then reinstall plug.

NOTE: Venting reservoir is necessary in this "sealed-in" unit to equalize air pressure in reservoir to that of the atmosphere. This operation prevents the possibility of hydraulic fluid

being forced under pressure from disconnected lines and causing damage to trim or body finish.

11. Disconnect hydraulic lines and cap open fittings to prevent leakage of fluid. (Fig. 2I58). Use a cloth to absorb any leaking fluid, then remove unit from rear compartment.

Installation

1. If a replacement unit is being installed, fill reservoir unit with specified Delco No. 11 Hydraulic Fluid (GM Hydraulic Brake Fluid Super No. 11 or its equivalent). See "Filling of Hydro-Lectric Reservoir".

2. Connect hydraulic hoses, engage attaching grommets in panel and connect wiring.

3. Connect battery and operate top through its up and down cycles until all air has been "bled" from hydraulic circuit. See "Filling of Hydro-Lectric Reservoir".

4. Check connections for leaks and recheck fluid level in reservoir.

5. Install all previously removed parts.

RESERVOIR TUBE

Disassembly from Motor and Pump Assembly

1. Remove motor and pump assembly from body.
2. Scribe a line across pump end plate and reservoir tube to insure a correct assembly of parts. See Fig. 2I60.

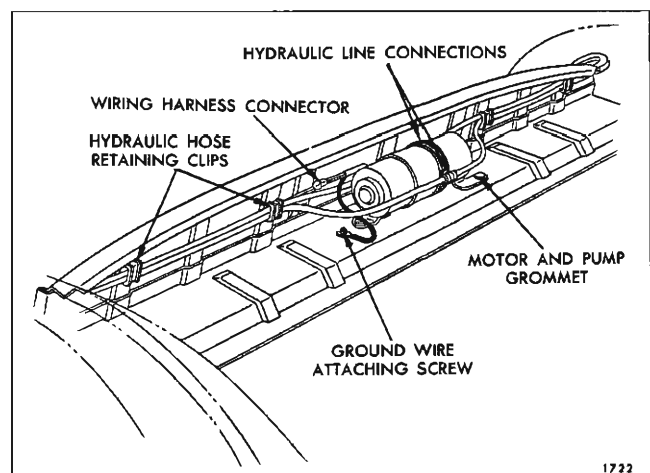


Fig. 2-I-58—Motor and Pump Assembly

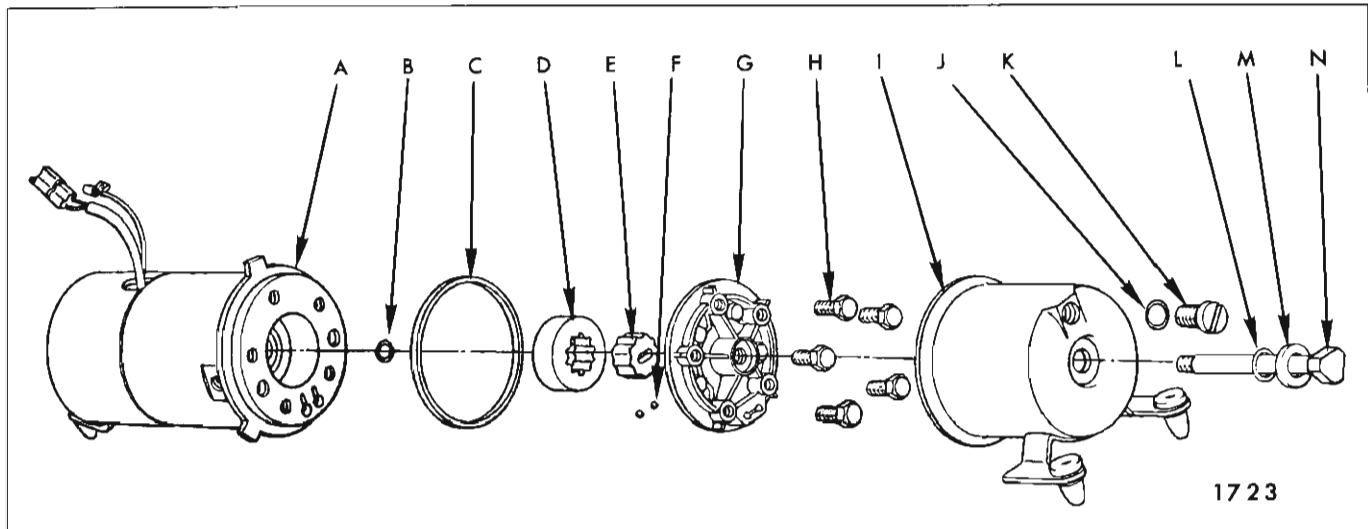


Fig. 2-I-59—Hydro-Lectric Motor and Pump Disassembled

- A. Motor Assembly
- B. Motor Shaft "O" Ring Seal
- C. Reservoir Seal
- D. Outer Pump Rotor
- E. Inner Pump Rotor
- F. Fluid Control Valve Balls
- G. Pump Cover Plate Assembly

- H. Pump Cover Attaching Screws
- I. Reservoir Tube and Bracket Assembly
- J. Reservoir Filler Plug "O" Ring Seal
- K. Reservoir Filler Plug
- L. Reservoir End Plate Attaching Bolt "O" Ring Seal
- M. Reservoir End Plate Attaching Bolt Washer
- N. Reservoir End Plate Attaching Bolt

3. With a straight-bladed screwdriver, remove reservoir filler plug. Note sealing ring around plug.

4. Drain fluid from reservoir into a clean container.

5. With suitable tool, remove bolt from end of assembly and remove reservoir tube. Note sealing rings around bolt and between end of reservoir tube and pump cover plate assembly.

Assembly to Motor and Pump Assembly

1. Position sealing ring on pump and assemble reservoir tube to pump according to scribe marks.

NOTE: Bracket assembly on tube should be located at outer end when tube is assembled to pump.

2. Install and tighten attaching bolt.

3. Place unit in horizontal position and fill with fluid until fluid level is within 1/4 inch of lower edge of filler plug hole.

4. Make sure that sealing ring is on filler plug before installing filler plug.

OPERATION OF FOLDING TOP

When the control switch is actuated to the "up" position, the battery feed wire is connected to the

red motor lead and the motor and pump assembly operate to force the hydraulic fluid through the hoses to the lower ends of the double-acting cylinders. The fluid forces the piston rods in the cylinders upward, thus raising the top. The fluid in the top of the cylinders returns to the pump for recirculation to the bottom of the cylinders. When the control switch knob is actuated to the "down" position, the feed wire is connected to the dark green motor lead and the motor and pump assembly operate in a reversed direction to force the hydraulic fluid through the hoses to the top of the cylinders. The fluid forces the piston rods in the cylinders downward, thus lowering the top. The fluid in the bottom of the cylinders returns to the pump for recirculation to the top of the cylinders.

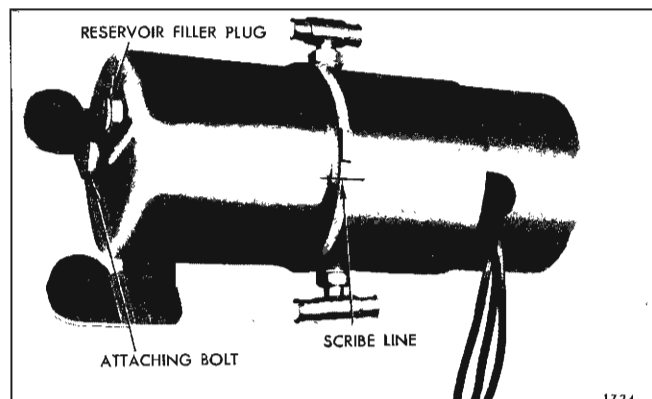


Fig. 2-I-60—Hydro-Lectric Motor and Pump Assembly

OPERATION OF PUMP ASSEMBLY

The motor type pump assembly is designed to deliver a maximum pressure in the range of 340 psi to 380 psi. The operation of the pump assembly when raising the top is as follows:

1. Raising the Top. When the red motor lead is energized the motor drive shaft turns the rotors clockwise as indicated by the large arrow in Figure 2I61. The action of the pump rotors forces the fluid under pressure to the bottom of each cylinder forcing the piston upward. This action causes the fluid above the piston in each cylinder to be forced into the pump, which recirculates the fluid to the bottom of the cylinders. The additional fluid required to fill the cylinder due to piston rod displacement is drawn from the reservoir.

2. Lowering the Top. When the green motor lead is energized the motor drive shaft turns the rotors counterclockwise as indicated by the large arrow in Figure 2I62. The action of the pump rotors forces the fluid under pressure to the top of each cylinder. This action causes the fluid below the piston in each cylinder to be forced into the pump which recirculates the fluid to the top of each cylinder. The surplus hydraulic fluid due to piston rod displacement flows into the reservoir.

FLUID CONTROL VALVE

The fluid control valve consists of a rocker arm installed in the pump cover plate, and two steel balls. Figure 2I63 shows the top surface of the pump coverplate. The dotted lines indicate the cavities on the bottom side of the coverplate. The cavities are designed to permit fluid flow between pump rotors and the reservoir. Figure 2I64 and Figure 2I65 illustrates the operation of the fluid control valve.

MECHANICAL CHECKING PROCEDURE

If there is a failure in the hydro-lectric system and the cause is not evident the mechanical oper-

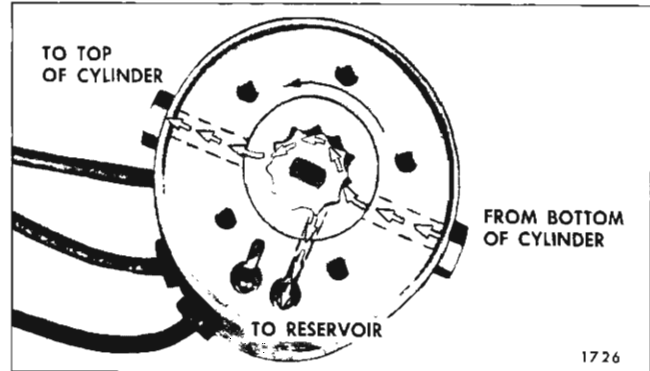


Fig. 2-I-62 — Operation of Pump To Lower Top

ation of the top should first be checked. If the folding top assembly appears to have a binding action disconnect the top lift cylinder piston rods from the top linkage and then manually raise and lower the top. The top should travel through its up and down cycle without any evidence of binding action. If a binding action is noted when the top is being locked at the header, check the alignment of the door windows, ventilators and rear quarter windows with relation to the side roof rail weatherstrips. Make all necessary adjustments for correct top alignment. See "Folding Top Adjustments". If a failure continues to exist after a check for mechanical failure has been completed, the hydro-lectric system should then be checked for electrical or hydraulic failures.

ELECTRICAL CHECKING PROCEDURE

If a failure in the hydro-lectric system continues to exist after the mechanical operation has been checked, the electrical system should then be checked. A failure in the electrical system may be caused by a low battery, breaks in wiring, faulty

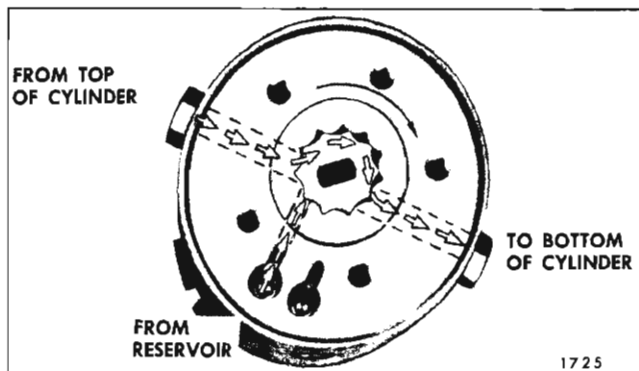


Fig. 2-I-61 — Operation of Pump To Raise Top

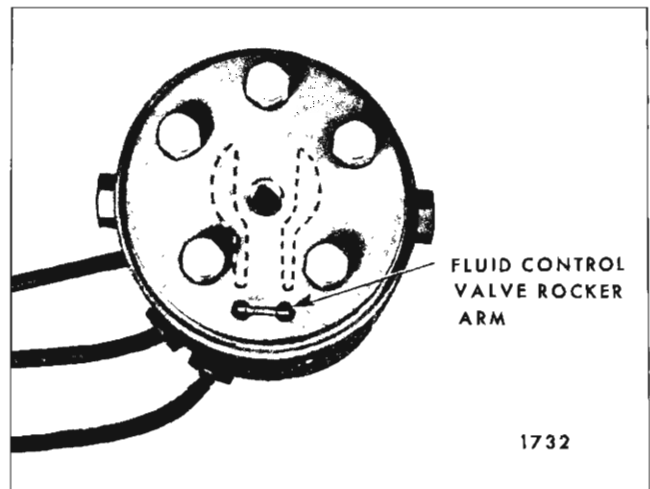


Fig. 2-I-63 — Pump Cover Plate

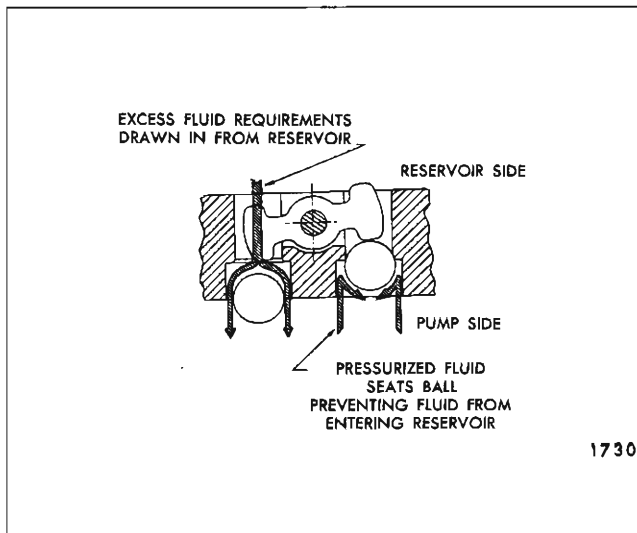


Fig. 2-I-64—Fluid Control Valve

connections, mechanical failure of an electrical component, or wires or components shorting to one another or to body metal. Before beginning checking procedures, check battery according to recommended procedure.

1. Check for Current at Folding Top Control Switch.

- a. Disengage terminal block from rear of switch.
- b. Connect light tester to central feed terminal of switch terminal block.

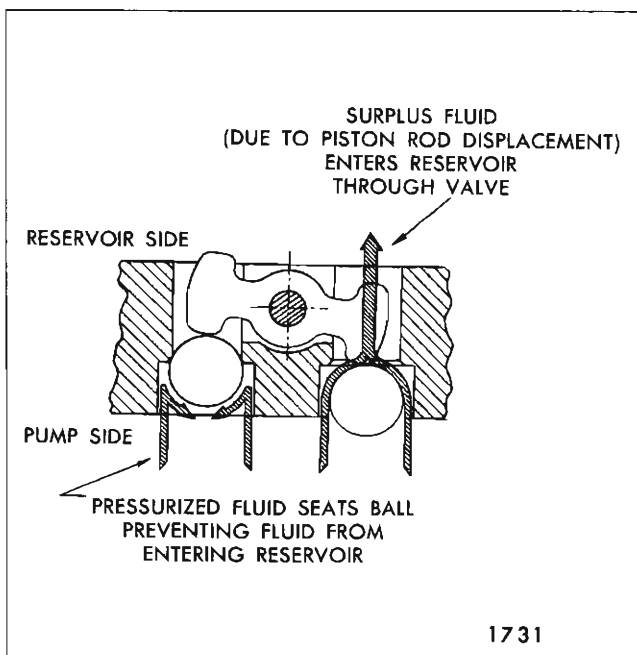


Fig. 2-I-65—Fluid Control Valve

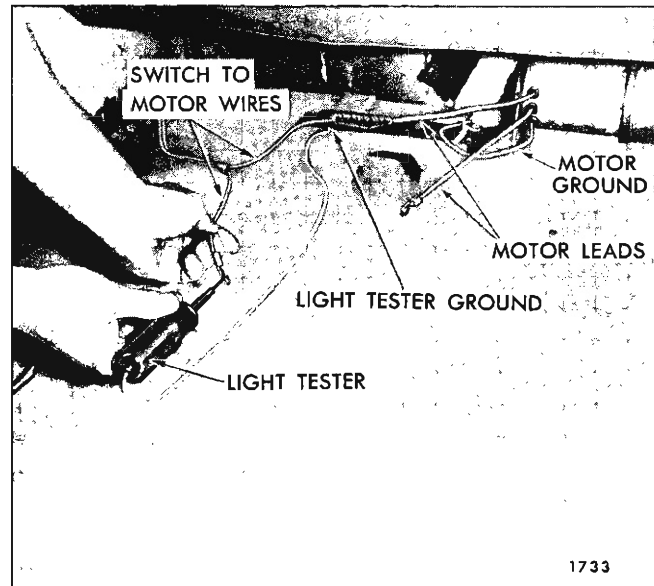


Fig. 2-I-66—Checking Motor Wiring

c. Ground light tester ground lead to body metal.

d. If light tester does not light, there is an open or short circuit between power source and switch.

2. Checking the Folding Top Control Switch.

If there is current at the feed wire terminal of the terminal block, operation of switch can be checked as follows:

a. Place a #12 jumper wire on switch terminal block between center terminal (feed) and one motor wire terminal. If motor operates with jumper wire, but did not operate with switch, switch is defective.

b. Connect jumper wire between center terminal and other motor wire terminal on switch terminal block. If motor operates with jumper wire, but did not operate with switch, switch is defective.

3. Checking Switch to Motor Lead Wires.

If switch is found to be operating properly, the switch to motor lead wires can be checked as follows: See Fig. 2I66.

a. Disconnect green switch-to-motor wire from motor lead in rear compartment.

b. Connect a light tester to green switch-to-motor wire terminal.

c. Ground light tester ground lead to body metal.

d. Actuate switch to "down" position. If tester does not light, there is an open or short circuit in wire.

e. Disconnect red switch-to-motor wire from motor lead.

f. Connect light tester to red switch-to-motor wire terminal.

g. Actuate switch to "up" position. If tester does not light, there is an open or short circuit in wire.

4. Checking the Motor Unit.

If a light tester indicates current at the motor lead terminals of the switch-to-motor wires, but motor unit does not operate from switch, a final check of the motor unit can be made as follows:

a. Check connection of motor ground wire to body metal. (See Fig. 2I58).

b. Connect a #12 jumper wire from battery positive pole to motor lead terminal that connects to green switch-to-motor wire. The motor should operate to lower top.

c. Connect jumper wire to motor lead terminal that connects to red switch-to-motor wire. The motor should operate to raise top.

d. If motor fails to operate on either or both of these checks, it should be repaired or replaced.

e. If motor operates with jumper wire but will not operate from switch-to-motor wires, the trouble may be caused by reduced current resulting from damaged wiring or poor connections.

HYDRAULIC CHECKING PROCEDURE

Failures in the hydraulic system can be caused by lack of hydraulic fluid, leaks in hydraulic system, obstructions or kinks in hydraulic hoses or faulty operation of a cylinder or pump.

1. Check Hydraulic Fluid Level in Reservoir.

a. Operate top to raised position.

b. At rear compartment, remove pump and motor shield.

c. Place absorbent rags below reservoir at filler plug.

d. With a straight-bladed screwdriver, remove filler plug. Fluid level should be within 1/4 inch of lower edge of filler plug hole.

e. If fluid is low, add Delco #11 Hydraulic Fluid (GM Hydraulic Brake Fluid Super #11 or its equivalent) to bring to specified level. See "Filling of Hydro-Lectric Reservoir".

f. Reinstall filler plug and pump and motor shield.

2. Checking Operation of Lift Cylinders.

a. Remove rear seat cushion and folding top compartment side panel assemblies.

b. Operate folding top control switch and observe lift cylinders during "up" and "down" cycles for these conditions:

(1) If movement of cylinder is uncoordinated or sluggish when the motor is actuated, check hydraulic hoses from motor and pump to cylinder for kinks.

(2) If one cylinder rod moves slower than the other, cylinder having slower moving rod is defective and should be replaced.

(3) If both cylinder rods move slowly or do not move at all, check the pressure of the pump. See "Checking the Pressure of the Pump".

NOTE: To insure proper operation of the lift cylinders, the top lift cylinder rods should be cleaned and lubricated at least twice a year. To perform these operations, raise top to "up" position and wipe exposed portion of each top lift cylinder piston rod with a cloth dampened with brake fluid to remove any oxidation and/or accumulated grime. With another clean cloth, apply a light film of brake fluid to the piston rods to act as a lubricant.

CAUTION: Exercise care so that brake fluid does not come in contact with any painted or trimmed parts of the body.

3. Checking Pressure at the Pump.

a. Remove motor and pump assembly from rear compartment.

b. Install plug in one port, and pressure gauge in port to be checked. See Fig. 2I67.

c. Actuate motor with applied terminal voltage within range of 9.5 volts to 11.0 volts. Pressure gage should show a pressure between 340 psi and 380 psi.

d. Check pressure in other port.

NOTE: A difference in pressure readings may

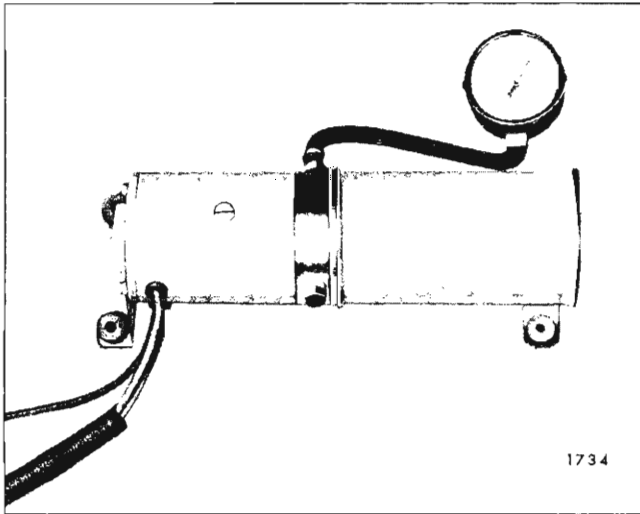


Fig. 2-1-67 — Checking Pump Pressure

exist between the pressure port for top of cylinders and pressure port for bottom of cylinders. This condition is acceptable if both readings are within the limit of 340 psi and 380 psi.

e. If the pressure is not within specified limits, unit is defective and should be repaired or replaced, as required.

FOLDING TOP LIFT CYLINDER

Removal and Installation

1. Lock top to windshield header.
2. Disconnect positive battery cable to prevent accidental operation of motor and pump, particularly when hydraulic hoses are disconnected from cylinder.
3. Remove rear seat cushion and seat back.
4. Remove folding top compartment side trim panel assembly on side affected.
5. Remove attaching nut, bolt, bushing and washer from upper end of cylinder.
6. Remove inner and outer bolt securing cylinder to male hinge. (Fig. 2I68).
7. Carefully move cylinder to inboard side of top compartment brace, exposing upper and lower hydraulic hose to cylinder connections.
8. Prior to disconnecting hydraulic connections, place suitable wiping rags under connections to absorb any drippage of hydraulic fluid.
9. Disconnect hydraulic connections from old cylinder and transfer to new cylinder assembly.

10. Install new cylinder to male hinge.
11. Connect positive battery cable to battery terminal.
12. Using power, raise cylinder piston rod to extended position.
13. Attach upper end of cylinder to folding top linkage using previously removed nut, bolt, bushing and washer.
14. Operate folding top assembly down and up several times; then check and correct level of hydraulic fluid in reservoir. See "Filling of Hydro-Lectric Reservoir".

FILLING OF HYDRO-LECTRIC RESERVOIR

This procedure virtually eliminates discharge or spillage of hydraulic fluid and possible trim damage while filling and bleeding system.

1. Filler Plug Adapter.

a. Drill 1/4 inch diameter hole through center of spare reservoir filler plug.

b. Install two inch length of metal tubing (1/4" O.D. x 3/16" I.D.) into center of filler plug and solder tubing on both sides of filler plug to form air tight connection. See Fig. 2I69.

2. Filling and Bleeding Reservoir.

a. With top in raised position, remove folding top compartment bag material from rear seat back panel. Remove pump and motor shield, where present.

b. Place absorbent rags below reservoir at filler plug. Using a straight-bladed screwdriver, slowly remove filler plug from reservoir.

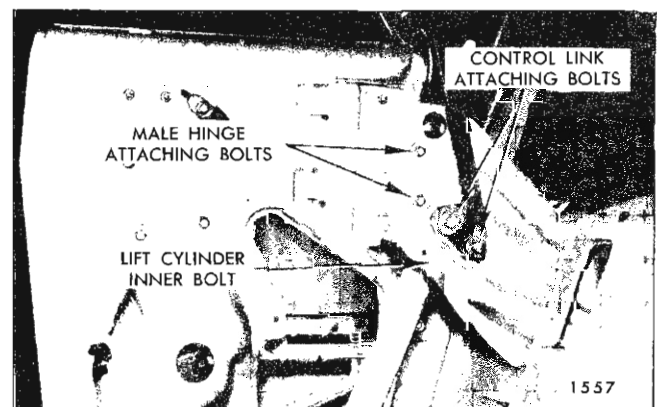


Fig. 2-1-68—Lift Cylinder Attachment

IMPORTANT: When installing new or over-hauled motor and pump assembly, as a bench operation, fill reservoir to specified level with hydraulic fluid. This operation is necessary as pump must be primed prior to operation to avoid drawing excessive amount of air into hydraulic system.

c. Install filler plug adapter to reservoir and attach four or five foot length of 3/16 inch I.D. rubber tubing or hose to filler plug tubing.

d. Install opposite end of hose into a container of GM Hydraulic Brake Fluid Super #11 or equivalent. See Fig. 2I70.

NOTE: Container should be placed in rear compartment area of body, below level of fluid in the reservoir. In addition, sufficient fluid must be available in container to avoid drawing air into hydraulic system.

e. Operate top to down or stacked position. After top is fully lowered, continue to operate motor and pump assembly (approximately 15 to 20 seconds), or until noise level of pump is noticeably reduced. Reduction in pump noise level indicates that hydraulic system is filling with fluid.

f. Operate top several times or until operation of top is consistently smooth in both up and down cycles.

g. Remove hose from filler plug tubing and remove filler plug adapter from reservoir.

h. Check level of fluid in reservoir and re-install original filler hole plug.

NOTE: Fluid level should be within 1/4 inch of lower edge of filler plug hole.

**FOLDING TOP MANUAL LIFT ASSEMBLY
ALL CONVERTIBLE STYLES WITH MANUALLY-
OPERATED FOLDING TOPS**

DESCRIPTION

The manual lift assembly incorporates a dual-action heavy duty spring which helps compensate

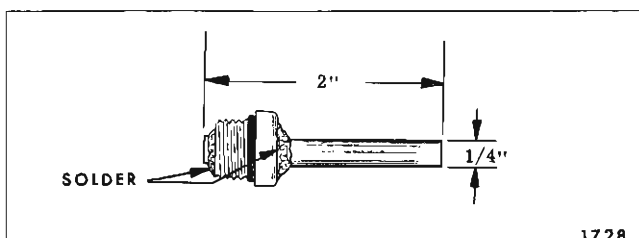


Fig. 2-I-69 — Reservoir Filler Plug Adapter

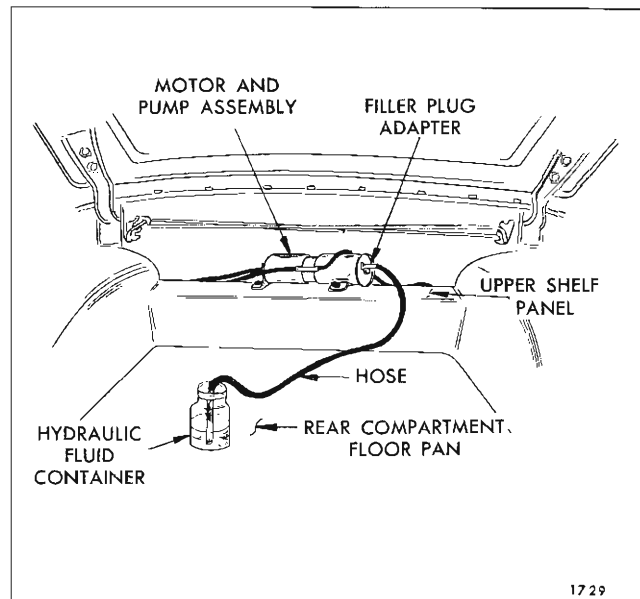


Fig. 2-I-70 — Filling Reservoir

for the weight of the folding top mechanism when the top is at or near the full up or full folded positions. When the top is in the up position, the spring is under compression; when it is in the folded or stacked position, the spring is under tension.

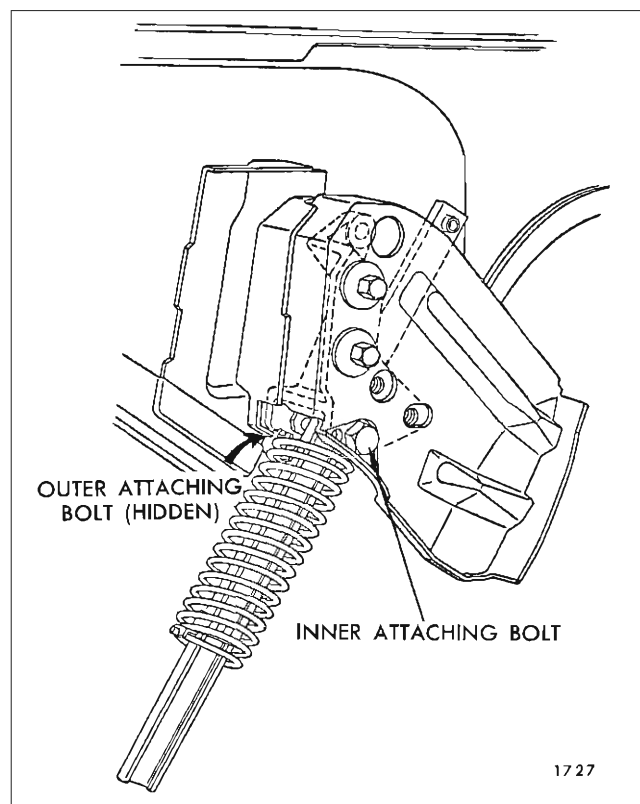


Fig. 2-I-71 — Manual Lift Assembly

CAUTION: Do not attempt to detach lift assembly when spring is under tension or compression.

Removal and Installation

1. Remove rear seat cushion and back and folding top compartment side trim panel assembly on side affected.

2. Move top to midway position to relieve the manual lift springs. If both lift assemblies are to be serviced, have helper support folding top or place supporting props under front roof rail.

3. Remove attaching nut, bolt, bushing and washer from upper end of lift assembly.

4. Remove inner and outer bolt securing lift assembly to male hinge; then remove assembly from body (Fig. 2I71).

5. To install manual lift assembly, reverse removal procedure. Operate folding top assembly down and up several times to insure proper operation.

FOLDING TOP CATCH CLIPS

DESCRIPTION

The folding top catch clips snap over the folding top side roof center rails when the top is being lowered to the folded or stacked position. The catch clips prevent the spring-loaded manual lift arms from raising the top from this position. In order to raise the top, both catch clips must be disengaged from the side roof center rails. Each catch clip is attached to the top compartment brace by two screws. Any adjustments made to change stack height of the folding top (See "Folding Top Adjustments") require corresponding adjustments to the catch clips.