

WINCH ASSEMBLY

Starcraft 1985 & Newer Lift System & most 83 & 84'S

INTRODUCTION

Starcraft has added a mechanical lifter stop to the winch on 1985 fold-down camping trailers and truck campers.

Correct operation of the lifter system and roof height adjustments are dependent on the proper installation of the winch and the adjustment of the mechanical stop(s).

Please read all the directions before starting.

The procedures listed in the following sections and the preparatory steps listed below are for the removal and replacement of the winch. For other repairs, some variation in the detailed procedure and the preparatory steps will be encountered.

The preparatory steps should be performed before the repairs are attempted.

PREPARATORY STEPS

NOTE: THE ROOF MUST BE IN THE DOWN POSITION.

Lower the front end of the camper as far as possible to gain extra working room under the frame at the rear.

CHANGING THE WINCH

Disconnect the turnbuckles and the crank shaft, unbolt the winch plate, and lower the winch assembly to the floor.

Remove the guard plate for the stop assembly.

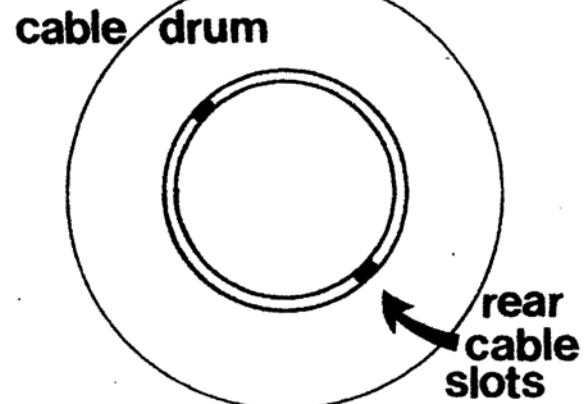
Disconnect the winch cable(s) from the cable drum.

With the new winch bolted to the winch plate (torque bolts to 11 ft/lbs), PLACE THE WINCH FLAT ON THE FLOOR underneath the camper frame close to the mounting point, the mechanical stop to the right and proceed as follows:

DETERMINING THE STARTING POSITION

1. By hand, turn cable drum until the rear winch cable slots are pointing up toward the rear of the camper at approximately 45°; enough to gain easy access to the cable slots.

2. Make sure that the rear winch cables are threaded through the pulley assemblies, and insert the ball ends into the cable slots in the winch drum.

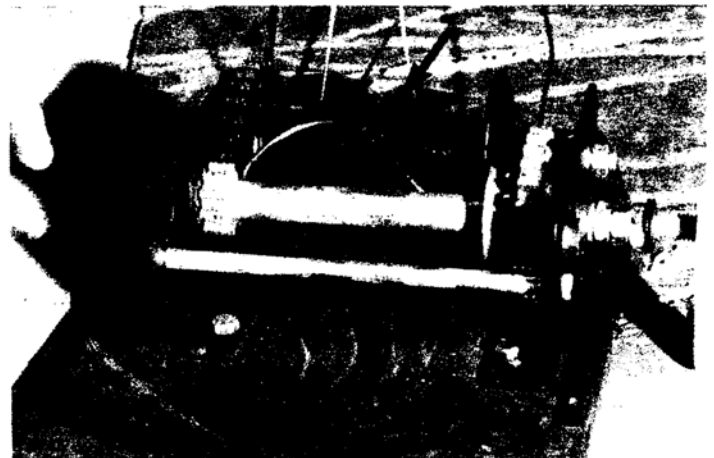


114. This is the correct position for the rear winch cable slots.

The ball ends of the cables should be snug against the inner wall of the drum.

3. Apply Loc-tite to the set-screw threads and fasten the rear winch cables in place.

CAUTION: IF THE SET SCREWS ARE TURNED TOO FAR INTO THE DRUM THEY CAN FALL LOOSE INSIDE. LEAVE 1/16" OF THREAD SHOWING.



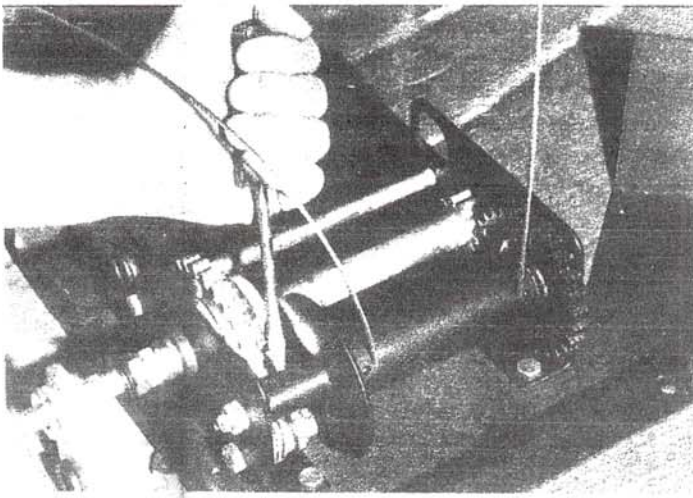
115. Both sets of winch cables (front and rear) have been installed; the front cable slot is facing upwards at 45 degrees.

4. Rotate the cable drum 180° to bring the front winch cable slots (one hole in the center of the drum) into position.

5. Route the front winch cables underneath the winch drum and fasten the ball ends in place.

Use Loc-tite on the set screw threads; leave 1/16" of thread showing outside the drum.

6. Using a screwdriver, pry down on the front of the big gear to release the inertia brake.

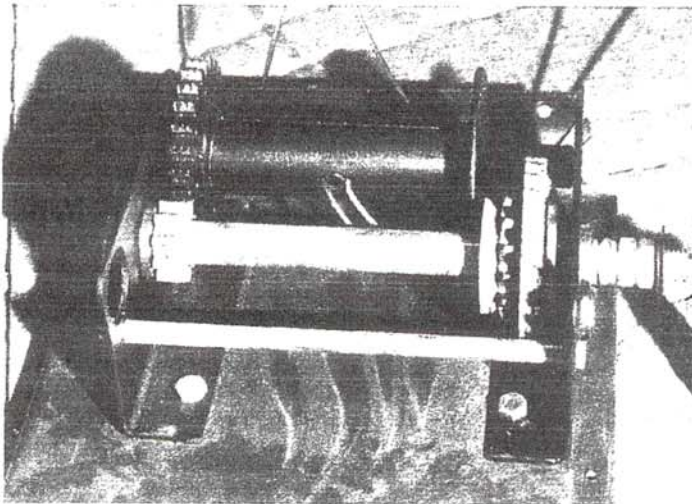


116. A screwdriver is being used to release the pawl from engagement with the ratchet.

7. Rotate the cable drum backwards one-half or three-quarters of a turn; then forward until the front winch cable slots are pointing straight back toward the rear of the camper.

At this point, the inertia brake should have re-engaged and it will not be possible to rotate the drum backward without releasing the inertia brake again.

If the brake has not engaged, or if the drum is not in the correct position, repeat Steps 6 and 7. Turn the drum farther backwards so the inertia brake has a chance to engage before the cable slots reach the horizontal position.



117. This shows the starting position of the winch drum. The stop nuts have not been adjusted and the drive shaft has not been installed.

ATTENTION!! ONCE THIS POSITION HAS BEEN REACHED, DO NOT CHANGE THE POSITION OF THE DRUM!!

THIS IS THE STARTING POSITION AND SHOULD NOT BE CHANGED UNTIL YOU ARE INSTRUCTED TO DO SO.

Now, proceed to adjust the mechanical stop.

ADJUSTING ROOF HEIGHT

The adjustment of the "down-position" stop nuts is interrupted **BEFORE** the final setting and completed **AFTER** the "up-position" stop nuts and the roof height adjustment have been made.

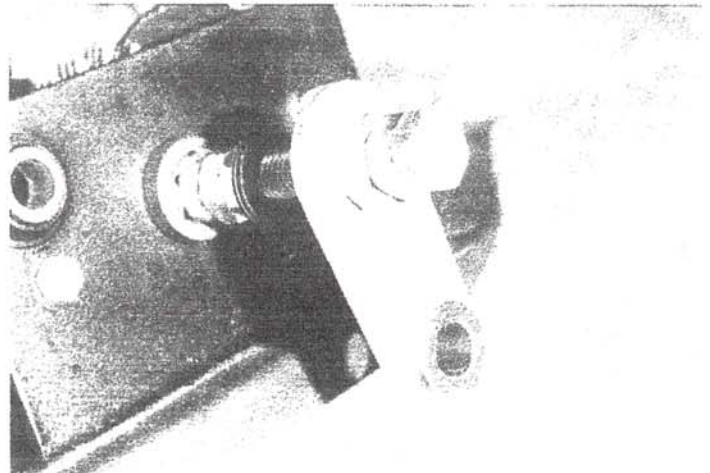
1. Run the down-position stop nuts out to the end of the threaded shaft.

The outside nut should engage the threaded rod for only about one-half the width of the nut.

This will ensure enough room for adequate stop travel when the roof is raised.

2. Spin the stop arm around the threaded rod until it is just touching the down position stop nuts.

Use Caution. Because of the geared advantage it is very easy to move the winch drum out of position.



118. The stop nuts have been run out to the ends of the threads and the stop arm has been run against the "down-position" stop nuts.

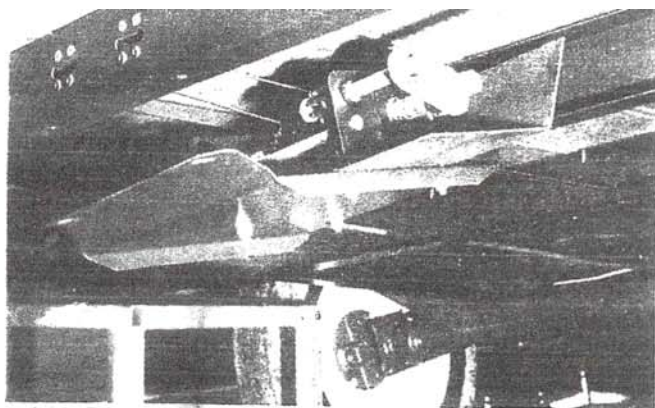
3. Slide the drive shaft into the winch until the end of the shaft just clears the winch bushing.

4. Move the stop arm just enough to allow the bushing at the other end of the stop arm to align with the drive shaft.

5. Slide the drive shaft over until the handle end passes through the bushing in the stop arm and the ends of the shaft will clear the main rails on each side of the winch.

6. Bolt the winch plate (w/winch) to the frame. Torque bolts to 11 ft/lbs.

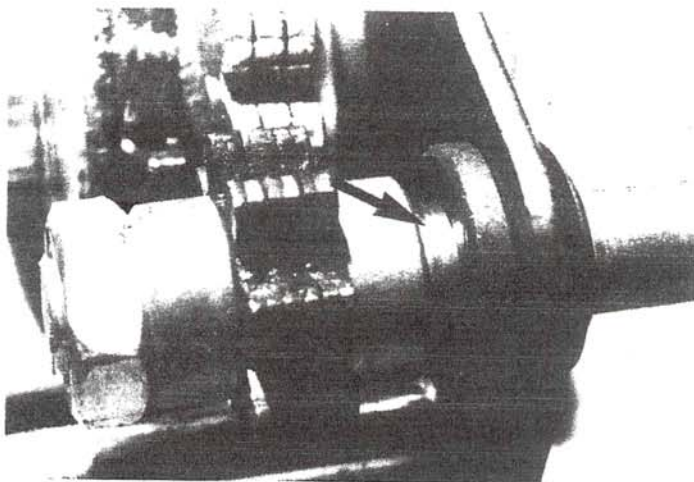
7. Slide the drive shaft over until it passes through the bushing in the main rail.



119. The winch has been bolted to the camper frame and the drive shaft has been slid through the bushing in the stop arm.

8. Put the stop collar on the drive shaft and slide the shaft over until the gears engage.

Make sure there is approximately 1/32" of end-play between the shaft gear and the winch bushing.



120. This shows where the end play should be between the gears on the drive shaft and the bushing on the winch.

9. Fasten the stop collar in place against the main rail with the allen screw.

10. Connect the turnbuckles, taking care that the cables are not crossed or twisted.

Screw the eyebolts into the turnbuckles until approximately 1/8" of the threaded end of the eyebolt is showing on the inside of the turnbuckle.

The roof height measured at each lifter must be within the plus or minus 1/4" tolerance listed in the roof height chart.

11. Before making the actual roof height adjustments, the camper must be leveled from side-to-side and from front-to-rear.

Check the side-to-side level first.

To level, use a step ramp or pieces of scrap wood under the low-side tire.

Do not attempt to level the camper by jacking up the frame.

Use the dolly wheel jack to level the camper from front to rear.

12. Crank the camper roof up until the roof height measured at one of the lifters (usually the right rear) is at the correct height.

13. Using the turnbuckles, adjust the remaining lifters up or down to match the height of the right rear lifter.

ROOF HEIGHT CHART

| Model | Roof Height |
|---|--------------------|
| Starmaster 21, Galaxy 24, Constellation 24, Stardust 24, Nova 24 | 42" |
| Starflyer 19, StarLite 21, StarLite 21 TD, StarLite 21 SD, StarLite 24 SD | 44 5/8" |
| StarLite 14, 16, 17 SLE 16, 17, 19, 19 Aerostar (1984) | 48 5/8" |

REFER TO THE LIFTER SECTION OF THE SERVICE MANUAL FOR MORE INFORMATION ON ROOF HEIGHT ADJUSTMENT.

Crank the roof up and down 2-3 times and then check the roof height again. If necessary, repeat steps 12 and 13.

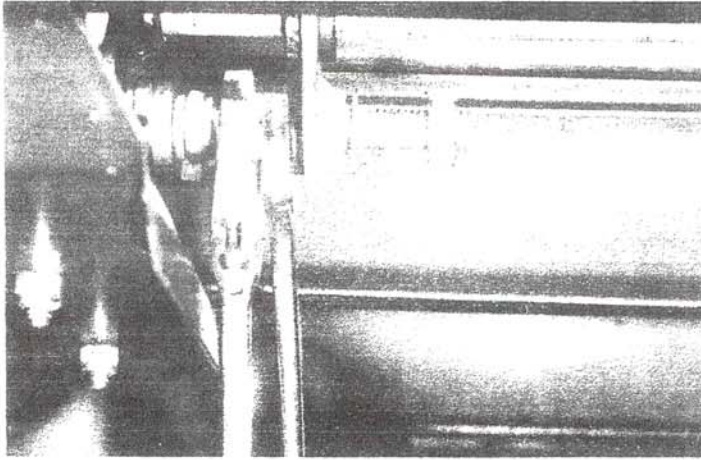
Make any re-adjustments that are necessary.

CHECK THE CABLES WITH THE ROOF DOWN TO MAKE SURE THAT THE CABLES ARE NOT LOOSE AND FLOPPY.

CHECK THE CABLE DRUM WITH THE ROOF UP TO MAKE SURE THAT THE CABLES ARE WRAPPING ON-TO THE DRUM CORRECTLY AND NOT OVERLAPPING WHICH WOULD CAUSE THE ROOF HEIGHT ADJUSTMENT PROBLEMS.

SETTING UP-POSITION STOP NUTS

With the roof height measured and all four lifters within tolerance and the roof in the up position, run the up-position stop nuts against the stop arm and tighten the two nuts together with a force of 90 ft/lbs.



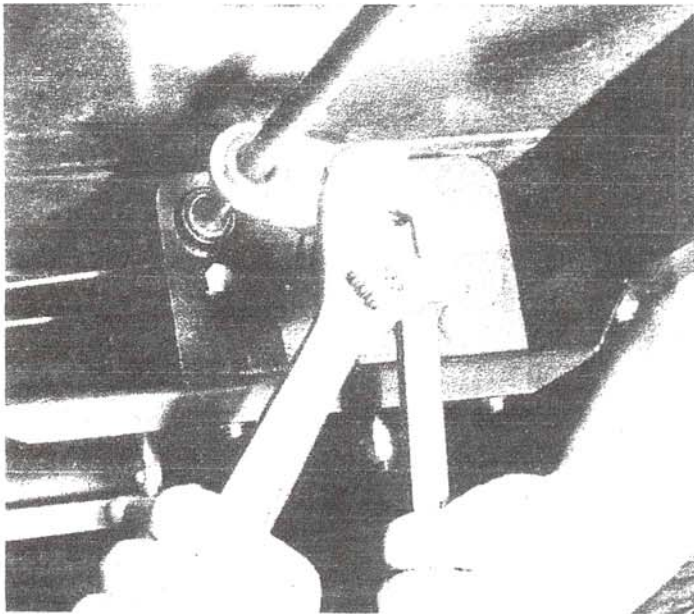
121. The "up-position" stop nuts have been adjusted and are being locked together.

SETTING DOWN-POSITION STOP NUTS

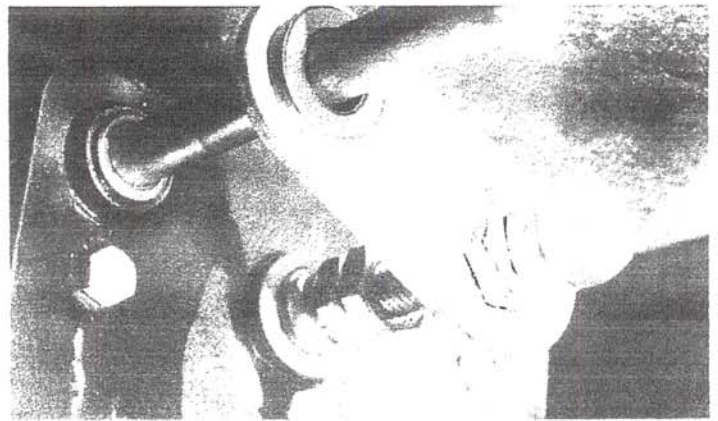
1. Lower the roof until it just touches the camper body or until the roof reaches its lowest point.

DO NOT BACK WIND THE WINCH PAST THIS POINT.

2. Push the roof down against the camper (if necessary) and fasten the roof latches.
3. Run the down-position stop nuts against the stop arm and lock the two nuts together with a force of 90 ft/lbs.



122. The "down-position" stop nuts have been adjusted and are being locked together.



123. Both "down-position" stop nuts show full engagement on the threaded rod.

4. Check the cable drum and make sure that there is at least one-quarter turn of each of the winch cables around the drum.
5. Run the roof up and down and then check the roof height a final time. Readjust the roof height and reset the stop nuts if necessary.
6. Replace the metal plate which is screwed to the winch plate to protect the mechanical stop.

Winch Assembly Truck Campers

INTRODUCTION

When assembling the winch and cables prior to installation on 1985 AeroStar truck campers, the starting positions of the winch drum and the components of the adjustable stop are critical to subsequent roof adjustments.

Once the correct starting position has been determined, the cable drum should not be moved until the winch is mounted securely to the truck camper and the turnbuckles have been connected.

CABLE IDENTIFICATION

For easy identification of the winch and lifter cables, mark the cables with tape, felt tip marker, etc., on each side of the turnbuckle.

Unless changing winch cables, avoid removing the cables from the main cable bracket if at all possible.

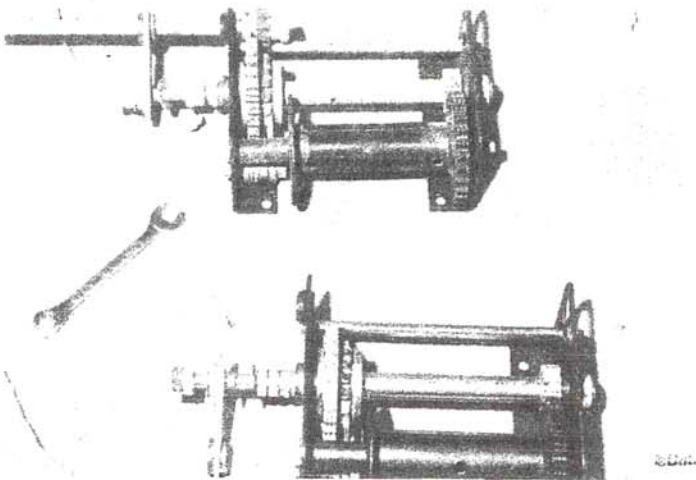
REMOVING THE OLD WINCH

With the roof in the down position, proceed as follows:

1. Loosen the jamb nuts and disconnect the turn-buckles.
2. Remove the two screws that hold the drive shaft bracket in place.
3. Remove the four nuts and bolts that hold the winch to the side of the camper and lower the winch to the floor.

The bolts will probably have to be driven out of the sidewall from the inside of the truck camper with a punch.

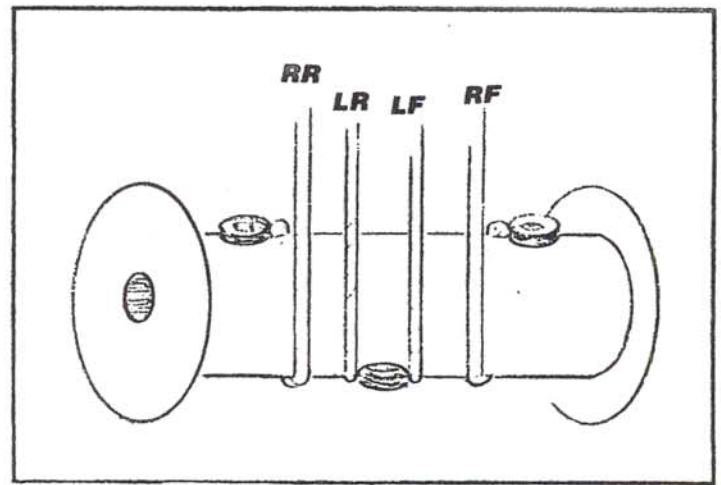
4. Remove the stop collar and the drive shaft support bracket and slide the drive shaft out of the winch.
5. Remove the allen set screws that hold the winch cables in the cable drum and remove the cables.
6. Set the old winch aside.
7. Position the new winch flat on the floor close to the main pulley bracket with the stop mechanism pointing toward the rear of the camper.



124. The old winch (with the drive shaft still in place) has been removed and the new winch is in the foreground.

8. Slide the drive shaft into the winch and through the winch bushing, but not through the stop arm.
9. Turn the cable drum by hand until the two right-side cable slots are pointing horizontally away from the camper as the winch sets on the floor.

NOTE: If the winch was bolted to the truck camper at this point, the right-side cable slots would be pointing straight down. The drawing below shows the drum in the starting position with the left-side cable slots pointing down which is the correct position after Step 11 has been completed.



Truck Camper Cable Routing

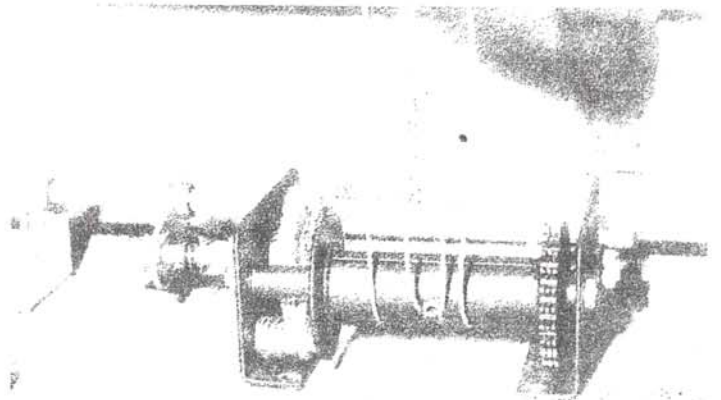
10. Insert the right rear and right front cables into their respective slots and fasten them in place with allen screws.

Use Loc-tite on the screw threads. Leave about 1/16" of thread showing outside the cable drum to prevent the set screw from falling loose inside the cable drum.

11. Rotate the cable drum 180° to bring the left-side cable slots into place.

The two LEFT-SIDE CABLES are attached to the drum at the one center hole (there are two cable slots) which is on the opposite side of the drum from the right-side cable attachment points.

NOTE: This is the STARTING POSITION. Do not change the position of the cable drum until told to do so.



125. The winch cables have been attached to the cable drum and the drum is in the starting position.

2. Insert the left-side front and rear cables into their respective slots, in the winch drum and fasten them in place.

Use Loc-tite on the screw threads and leave 1/16" of thread showing outside the drum.

3. Run the up-position stop nuts over against the winch.

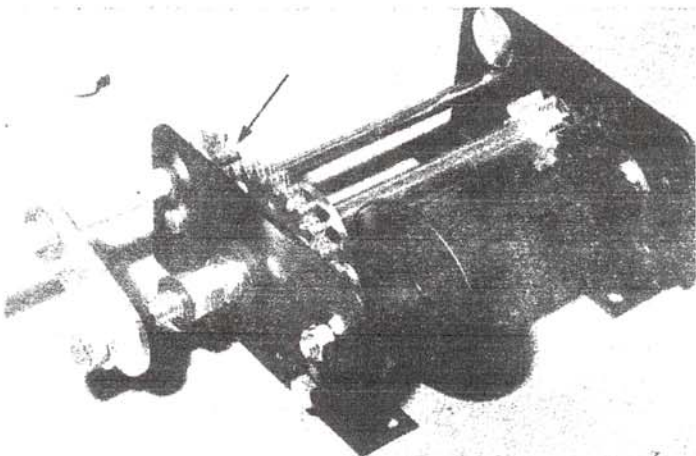
4. Run the down-position stop nuts out to the end of the threaded shaft.

The threads on both nuts should show full engagement with the threaded shaft.

5. Run the stop arm over against the down-position stop nuts.

6. Slide the drive shaft through the bushing in the stop arm and then slide the shaft over until the gear on the shaft engages the big gear on the winch.

Be careful and do not move the drum.



126. The gears on the drive shaft have engaged the gears on the winch.

17. Put the drive shaft support bracket and the slip collar on the drive shaft.

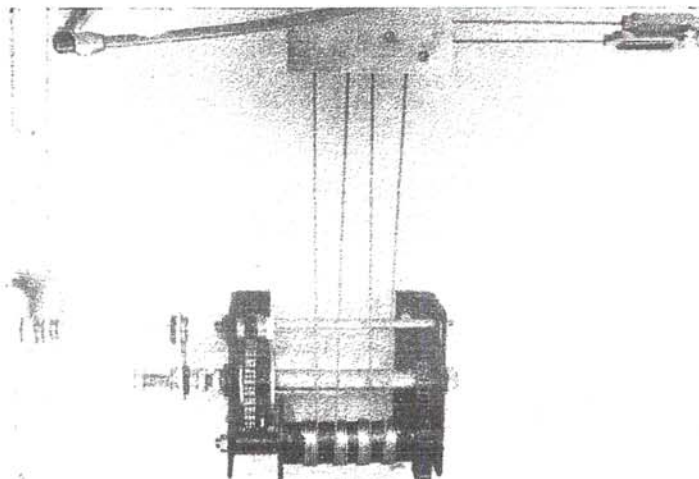
18. Mount the winch on the camper, and fasten the shaft support bracket in place.

19. Set the stop collar to leave about 1/32" of clearance between the drive shaft and the winch bushing.

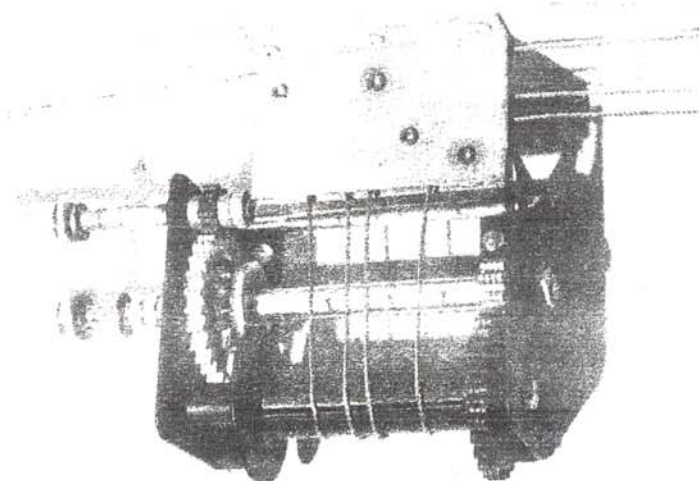
20. Fasten the stop collar in place with its set screw. Use Loc-tite on the threads.

21. Connect the turnbuckles, taking care that the cables do not become twisted.

Screw the turnbuckle onto the eyebolt until 1/8" of the threaded end of the eyebolt shows on the inside of the turnbuckle.



127. Newer units are constructed with more space between the main cable bracket and the winch; the procedures for winch adjustment remain the same.



128. The winch cables and the lifter cables have been connected and the fact that the cables are not wrapped around the drum shows that the roof is in the down position.

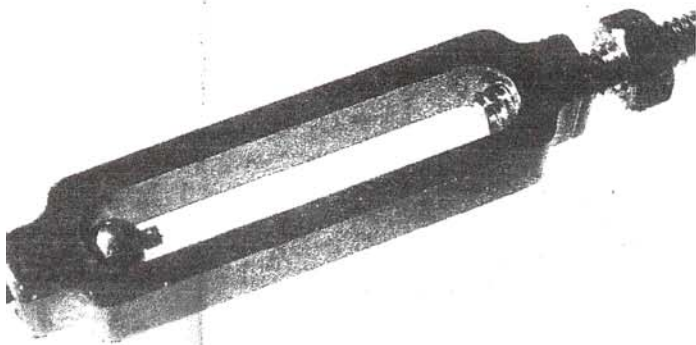
22. Crank the roof up until the correct roof height can be measured at one corner.

23. Using the turnbuckles, adjust the remaining lifters to the correct height but do not tighten the jamb nuts on the turnbuckles.

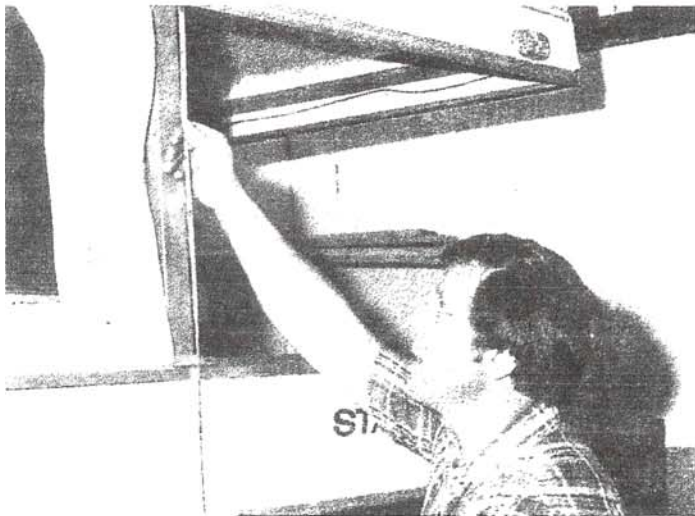
24. Run the up-position stop nuts against the stop arm and tighten the nuts together.

25. Lower the roof to its lowest position, or until it just touches the truck camper.

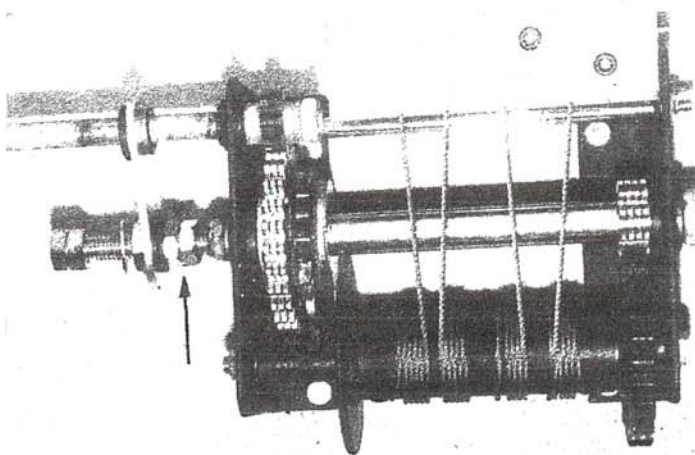
26. Push the roof down against the truck camper (if necessary) and fasten the roof latches.



129. This shows correct engagement of the turnbuckle and the eyebolt; approximately $\frac{1}{8}$ " (2-3 threads) are showing on the inside of the turnbuckle.



130. Measuring roof height at the right front lifter.

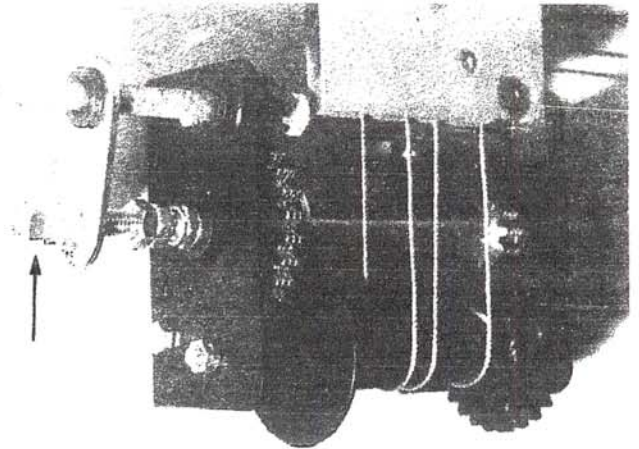


131. The "up-position" stop nuts have been adjusted against the stop arm. The cable wrap is good and shows that the roof is in the up position.

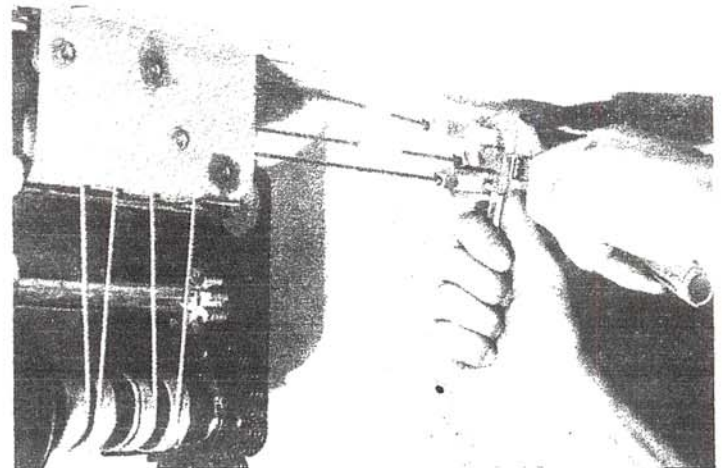
27. Run the down-position stop nuts over against the stop arm and lock the two nuts together.

28. Cycle the roof two or three times and recheck the roof height at all four lifters.

29. If necessary, readjust the lifter height and then tighten the jamb nuts on the turnbuckles.



132. The roof is in the down position and the "down-position" stop nuts have been adjusted against the stop arm.



133. The jamb nuts on the turnbuckle are being tightened.

TRUCK CAMPER ROOF HEIGHT CHART

| Model | Front Lifter Height | Rear Lifter Height |
|---------|---------------------|--------------------|
| AS 700 | 23 $\frac{1}{2}$ " | 23 $\frac{1}{4}$ " |
| AS 800 | 21" | 20 $\frac{3}{4}$ " |
| AS 1000 | 21" | 20 $\frac{3}{4}$ " |

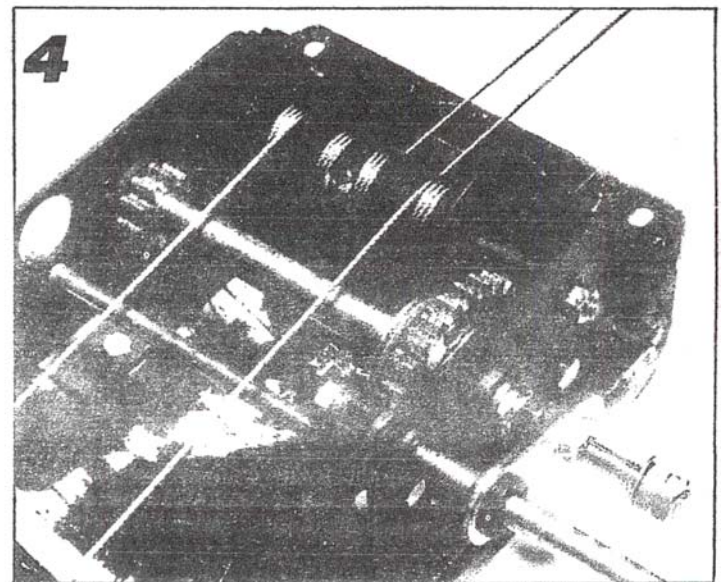
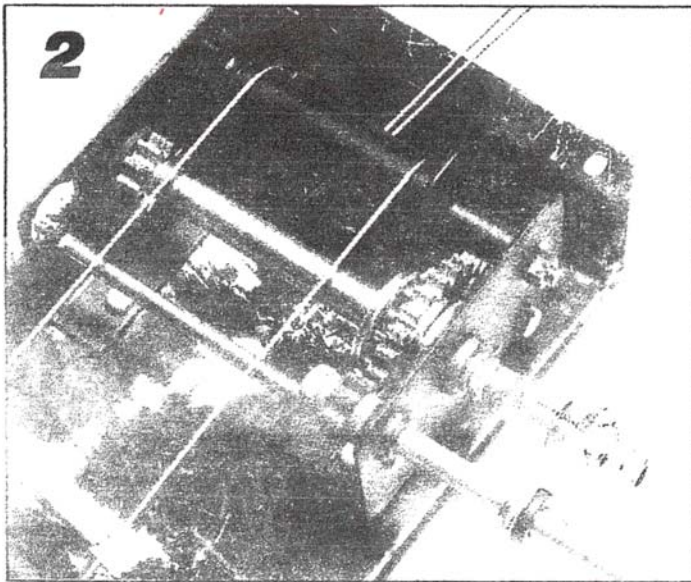
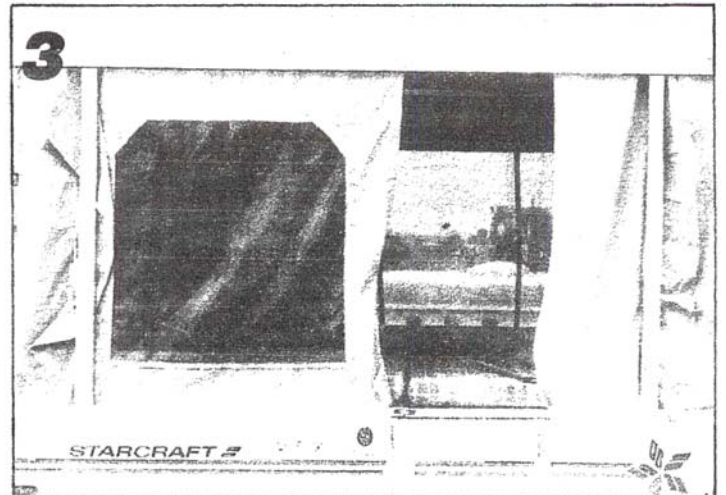
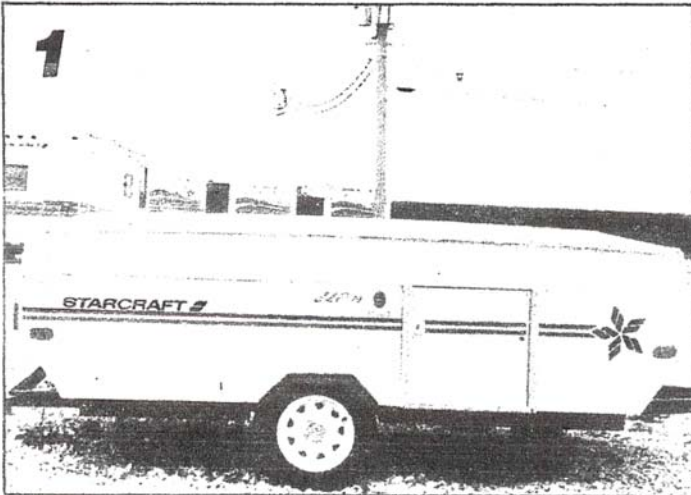
ROOF-WINCH POSITION CHART

The following photo-sequence chart shows the relationship between the roof, the winch cables, and the stop arm with the roof in both the up and the down positions. There are two sequences; one which shows the Fold-Down Camping Trailer, and one which shows the Truck Camper. The last two photographs show the routing of the winch cables on the three different truck camper models where the cables go through the main cable bracket.

FOLD-DOWN CAMPING TRAILER

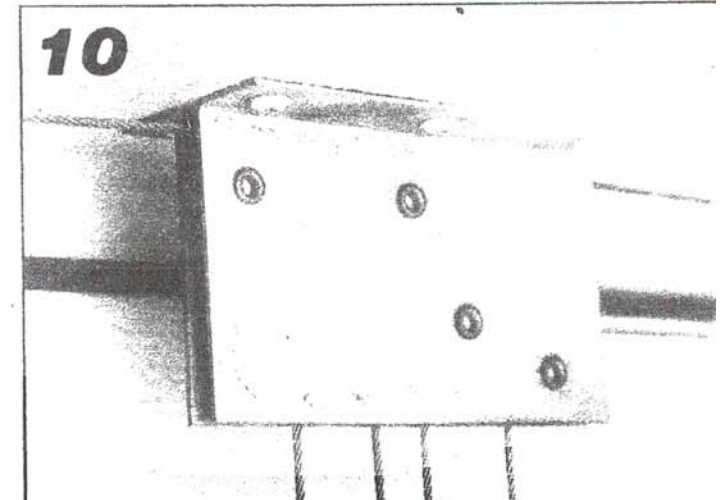
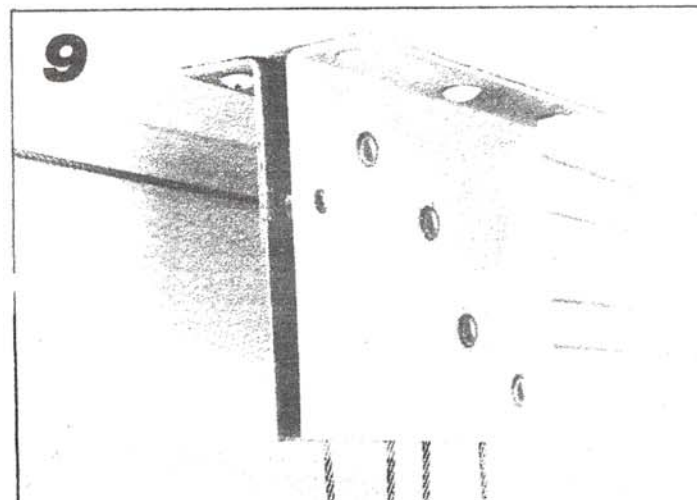
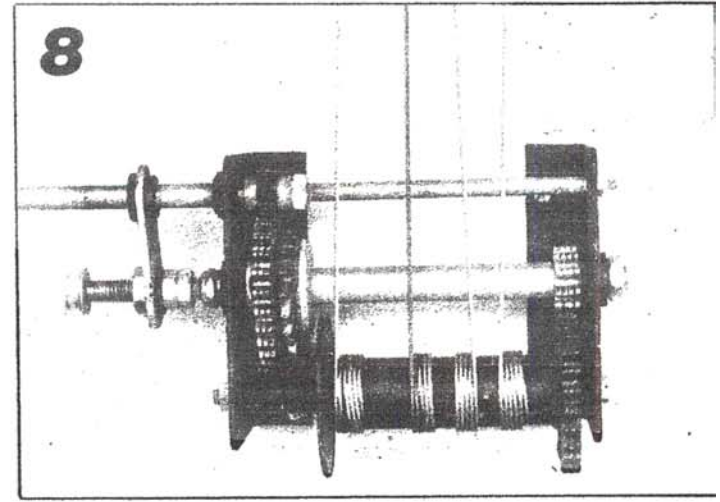
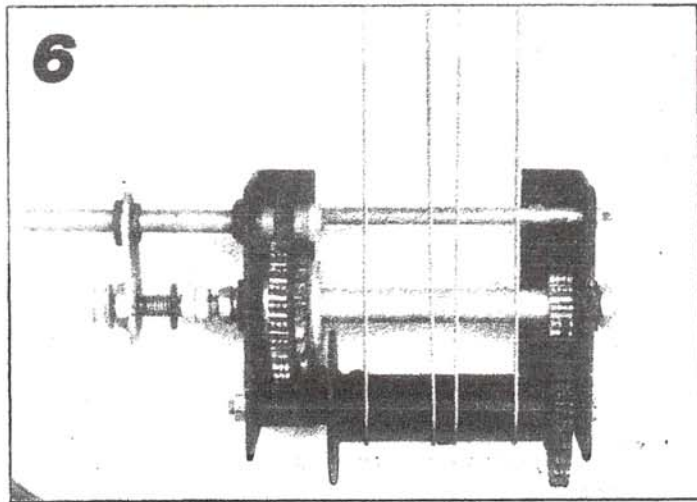
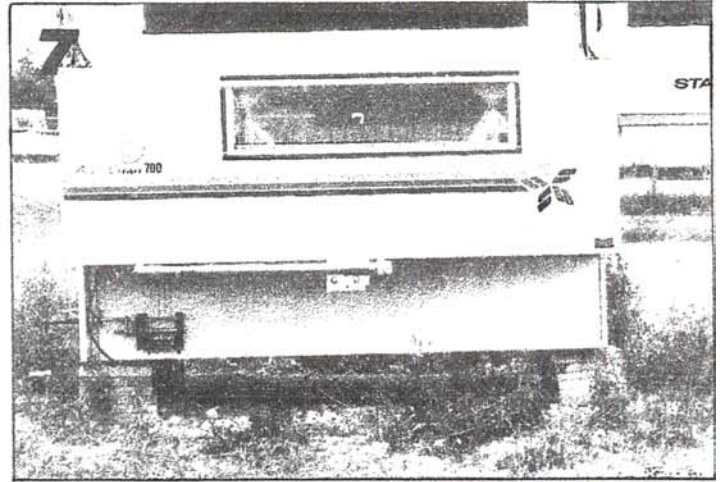
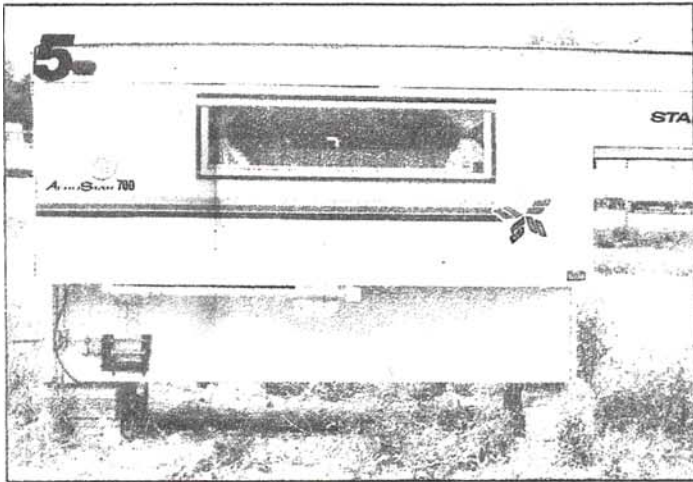
Photograph 1 shows the roof in the down position, while Photograph 2 shows the corresponding position of the winch cables and the stop arm. Photograph 3

shows the roof in the up position and Photograph 4 shows how the cables and stop arm are positioned then.



TRUCK CAMPER

Photographs 5-8 show the operation of the winch and the stop arm when the roof is raised and lowered on the Truck Camper. Photograph 6 shows the cables and stop arm when the roof is in the down position, while Photograph 8 shows the cables and stop arm when the roof is in the up position.



CABLE ROUTING

Photograph 9 shows how the winch cables are routed through the main cable bracket on model 700 and 800 truck campers. Photograph 10 shows the routing on the model 1000 truck camper.

VINCH CABLES

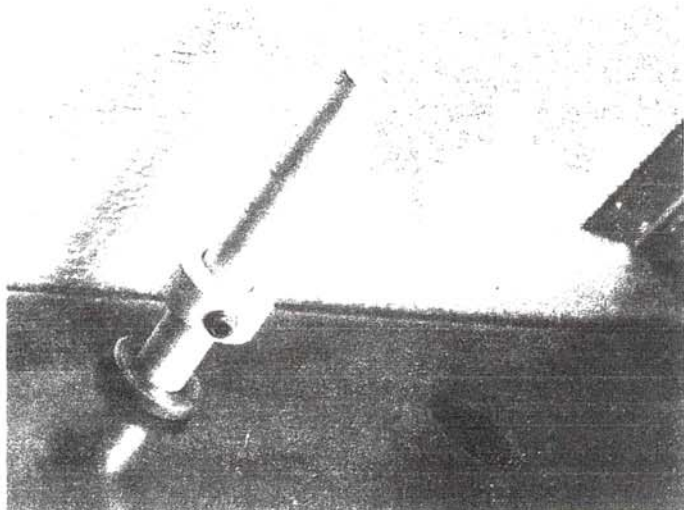
Release the dolly wheel jack clamp and lower the front of the camper to gain clearance at the back, then proceed as follows:

REMOVE DRIVE SHAFT

1. Using the winch handle, backwind the winch until all tension is removed from the cables and there are no cables wrapped around the drum.

2. Loosen the set screw which holds the drive shaft retaining collar in place and slide the shaft toward the left side of the camper until the shaft clears the bushing in the main beam.

NOTE: If the set screw in the retaining collar has left a burr on the shaft which makes it difficult to slide the shaft through the bushing, the burr can be removed with a small file.



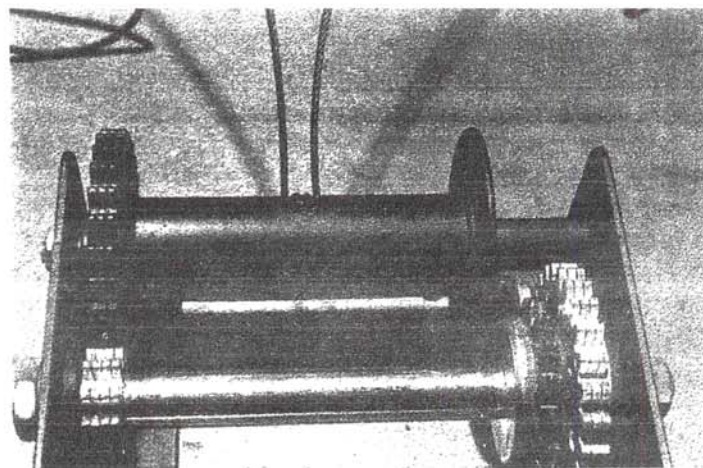
134. The retaining collar has been loosened and the winch drive shaft is being removed.

DROP WINCH PLATE

3. Remove the two bolts which hold the rear of the winch plate to the camper frame. This should allow the plate to drop down far enough to allow access to the set screws which hold the cables in place in the winch drum. If there is not enough room to reach the cables after removing the two rear bolts, go ahead and remove the two front bolts as well.

REMOVE DAMAGED WINCH CABLE

4. Remove the set screw which holds the ball end (of the cable to be changed) in place in the drum. Loosen the jamb nut and disconnect the turn buckle and the eyebolt. Take care not to twist the cables when loosening the turnbuckle; hold the eyebolt stationary and rotate the turnbuckle portion. Remove the cable by threading the ball end out through the pulley and the hole(s) in the frame member(s).



135. The two front winch cables have been secured in the cable drum and the set screw has been left with 1/16" of thread outside the drum.

INSTALL NEW WINCH CABLE

5. Thread the new cable in place and fasten the ball end of the cable in place in the winch drum with the allen set screw.

Use 242 Loc-Tite on the screw threads. Leave 1/16" of thread showing outside the drum.

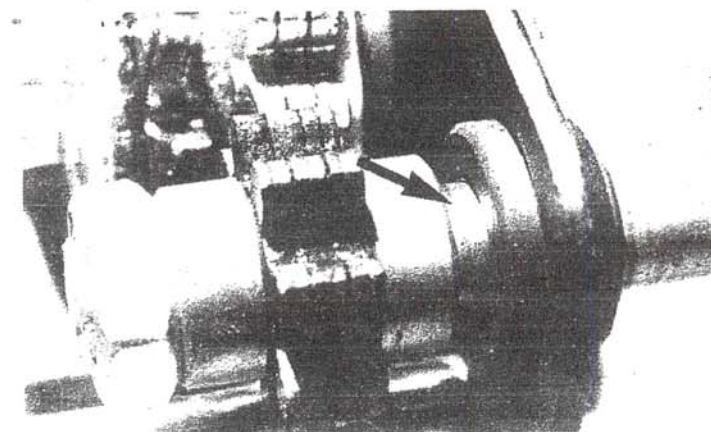
RESET THE WINCH PLATE

6. Slide the drive shaft through the hole in the left side of the winch frame and into the bushing. Slide the shaft over until the winch is in the middle of the shaft. This will allow the ends of the shaft to clear the frame rails.

REPLACE DRIVE SHAFT

7. Fasten the winch plate to the camper frame, tightening the four mounting bolts to the torque setting of 11 ft./lbs.

Slide the shaft over until the gears on the shaft and the winch mesh.

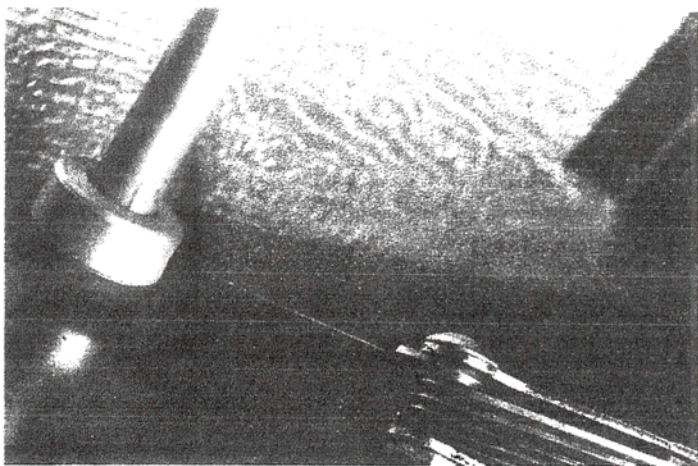


136. The gears on the drive shaft and the winch are engaged and the arrow shows where the end play should be.

NOTE: To insure that the shaft turns freely, allow 1/32" of end play between the inner

shaft collar and the bushing in the winch frame.

Make sure that the retaining collar and the bushing are in place on the shaft. Push the retaining collar against the main beam and tighten the set screw to lock the collar in place.



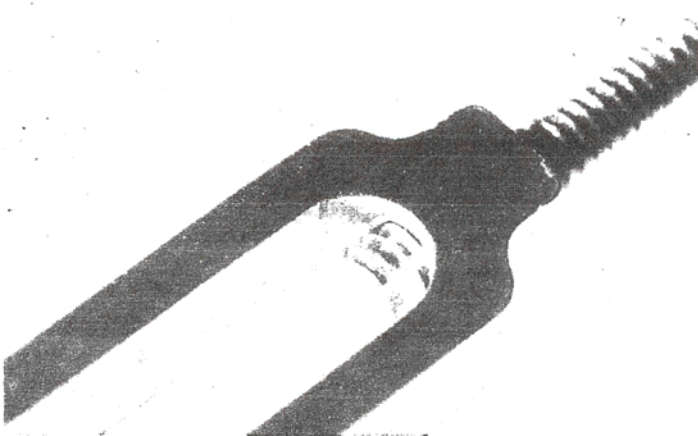
137. The drive shaft has been replaced and the set screw in the retaining collar is being tightened.

CONNECT EYEBOLT

8. Screw the eyebolt into the turnbuckle until 2 or 3 threads are showing on the inside. **DO NOT TWIST THE CABLES.**

WARNING: DO NOT CROSS CABLES. DAMAGE TO THE LIFTER SYSTEM WILL RESULT.

DO NOT TIGHTEN THE JAMB NUT AT THIS TIME.



138. Correct engagement of the turnbuckle and eye bolt is shown.

ADJUST ROOF HEIGHT

9. Adjust the roof height by following the procedures listed in the Winch Section of this manual.

LIFTER CABLES

There are four lifter cables, two front and two rear, and the procedure for changing them is the same, except for the problem of access to the anchor bolt which attaches the lifter cable to the lifter.

In some cases, this bolt can be reached by removing a small piece of paneling (a cover plate) which conceals the bottom of the lifter from view on the inside of the camper.

In StarLite campers it is only necessary to disconnect the top stage of the lifter from the roof and to separate the appropriate winch and lifter cable to be able to collapse the lifter and remove it from the lifter pocket.

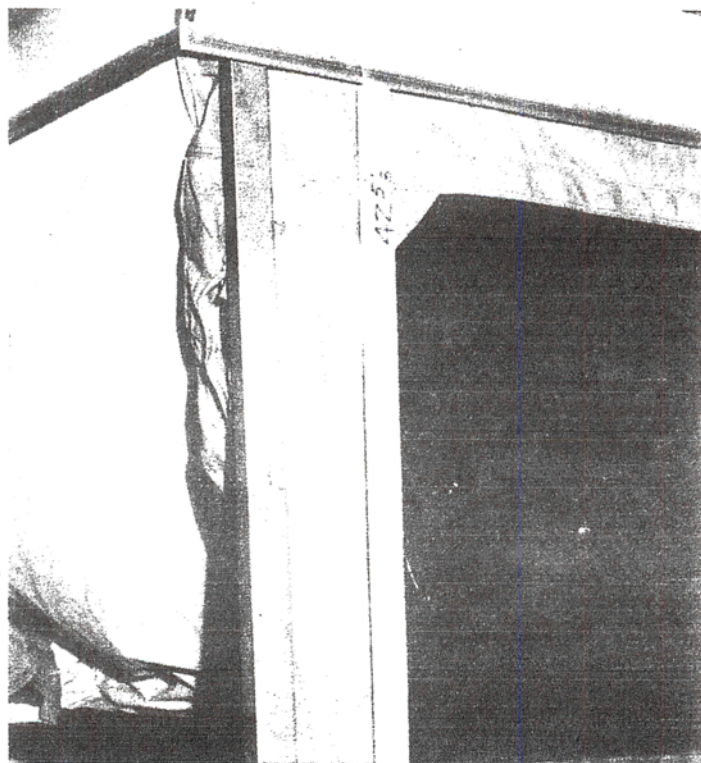
On some campers, it may be necessary to loosen a section of bed track and pry it away from the sidewall to gain enough clearance so the lifter assembly can be removed.

Proceed as follows:

PROP BROKEN CORNER

1. Raise the camper roof to within an inch or two of the correct height and prop up the broken corner.

Hold up the broken corner by hand as the roof is cranked up to prevent over-stressing the other cables.

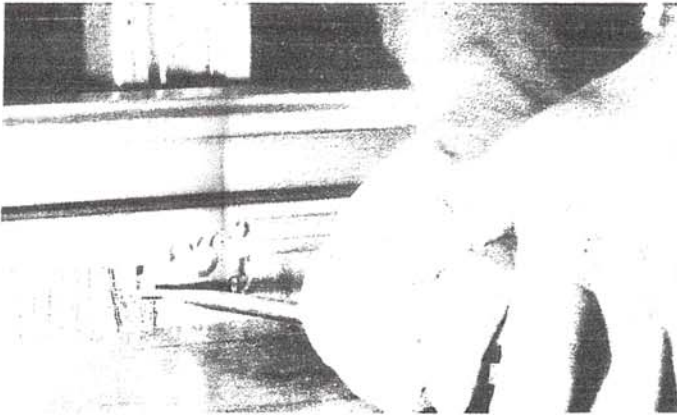


139. The corner of the camper with the broken lifter cable has been propped up with a stick that is the correct roof height.

REMOVE DAMAGED LIFTER CABLE

Slide out the bunk end and remove the side canvas far enough to expose the lifter.

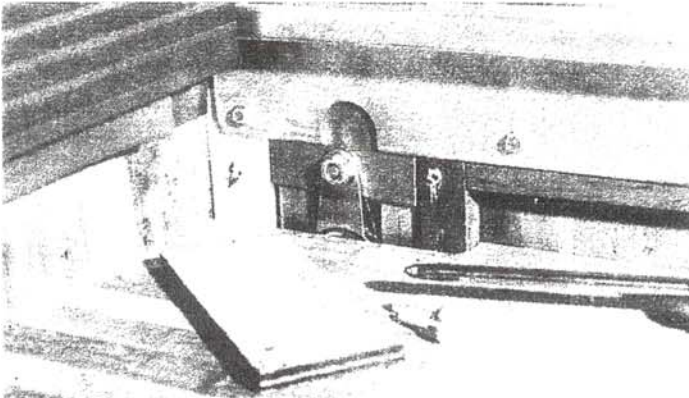
Using a screw driver or similar tool, raise the first stage of the lifter until the anchor bolt is clear of the sidewall.



140. A screwdriver is being used to raise the first stage of the lifter out of the lifter pocket.

NOTE: On StarLite models, the seal at the top of the lifter pocket must be broken before the lifter can be removed.

On some models there are cover plates which must be removed to give access to the anchor bolt.

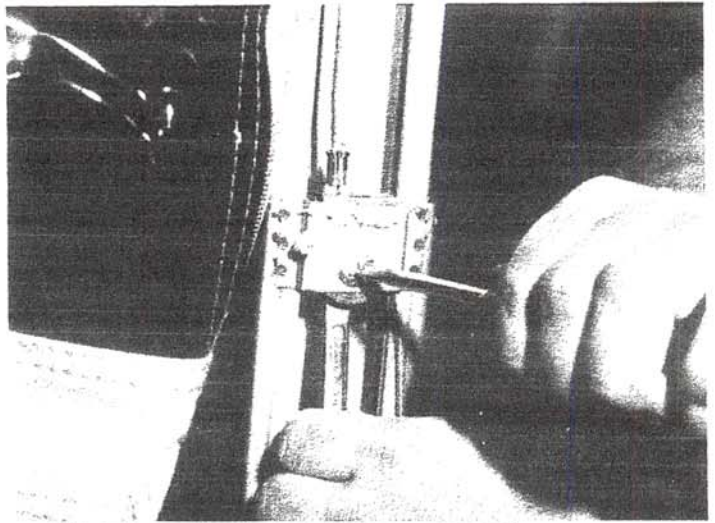


141. The cover plate has been removed exposing the anchor bolt of the first stage pulley.

Also, it may be necessary to remove 4 or 5 of the screws that hold the bed track to the sidewall so there will be enough clearance for the lifter pulley when sliding the lifter out of the lifter pocket.

4. Remove the bolt that holds the pulley in place at the top of the first stage

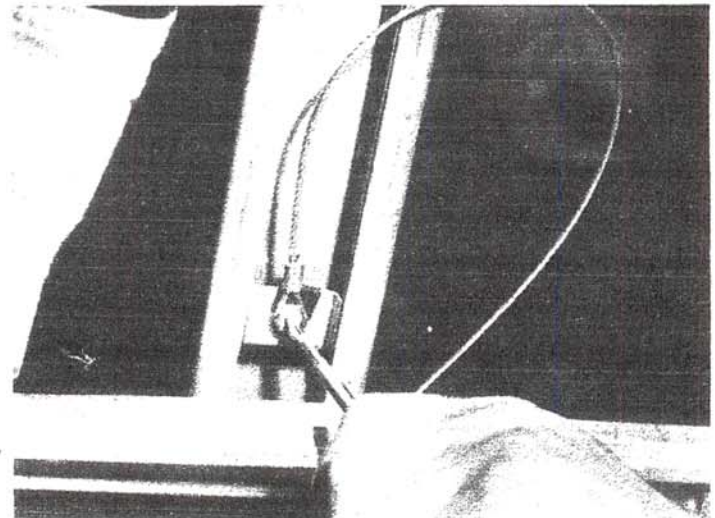
On three-stage lifters, the looped end of the lifter cable can be threaded through the pulley assembly so the pulley will not have to be removed.



142. The pulley bolt is being removed.

NOTE: To keep the nut from falling down inside the lifter pocket, wrap a piece of tape over the back of the wrench. Gray duct tape works fine.

5. Remove the anchor bolt that holds the looped end of the cable to the first stage of the lifter post.



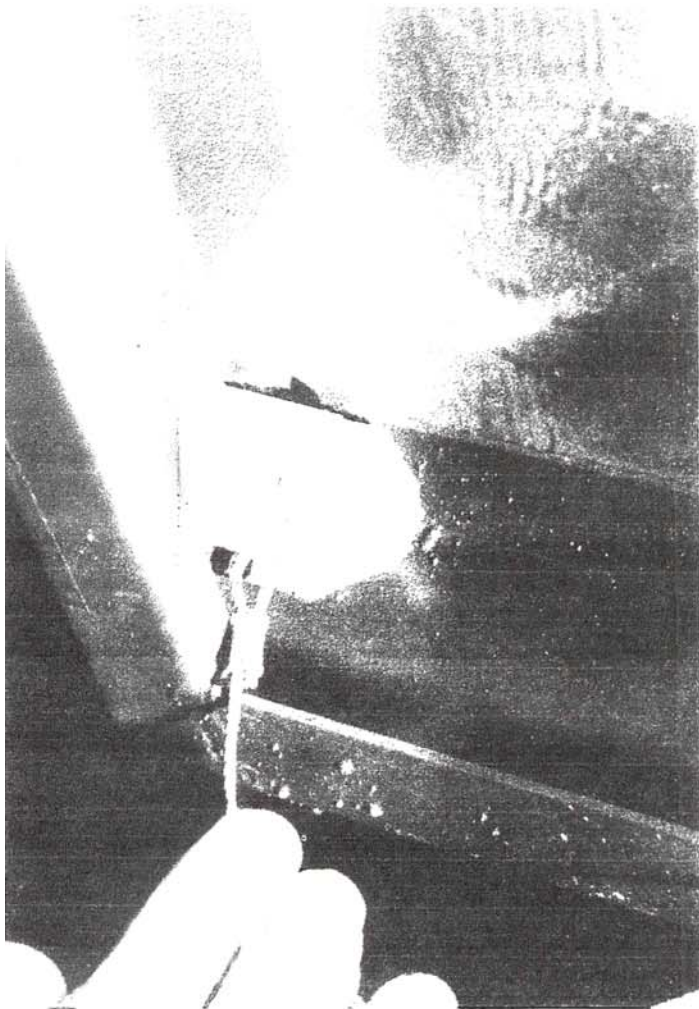
143. The bolt that holds the looped end of the lifter cable to the lifter is being removed.

6. When the cable is loose, pull it out through the bottom of the lifter pocket.

INSTALL NEW LIFTER CABLE

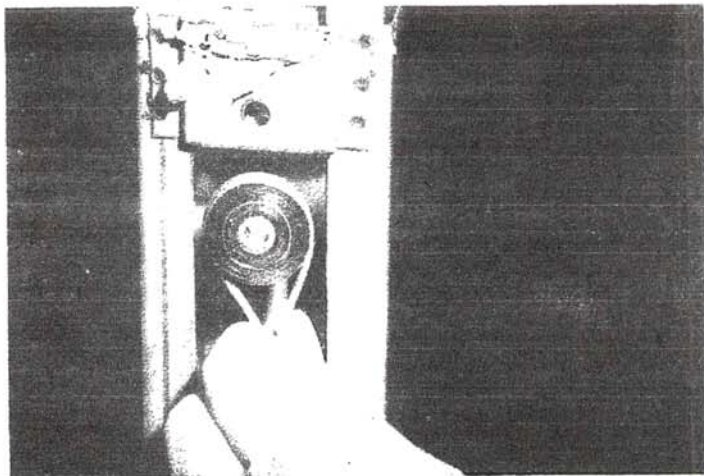
7. Thread the looped end of the new cable through the pulleys on the frame and up into the bottom of the lifter pocket.

CAUTION: DO NOT TWIST THE NEW CABLE WHEN THREADING IT IN PLACE!



144. A cable is being threaded through the pulley located beneath the lifter pocket.

Wrap the cable around the pulley and insert the pulley into the bracket at the top of the first stage of the lifter.

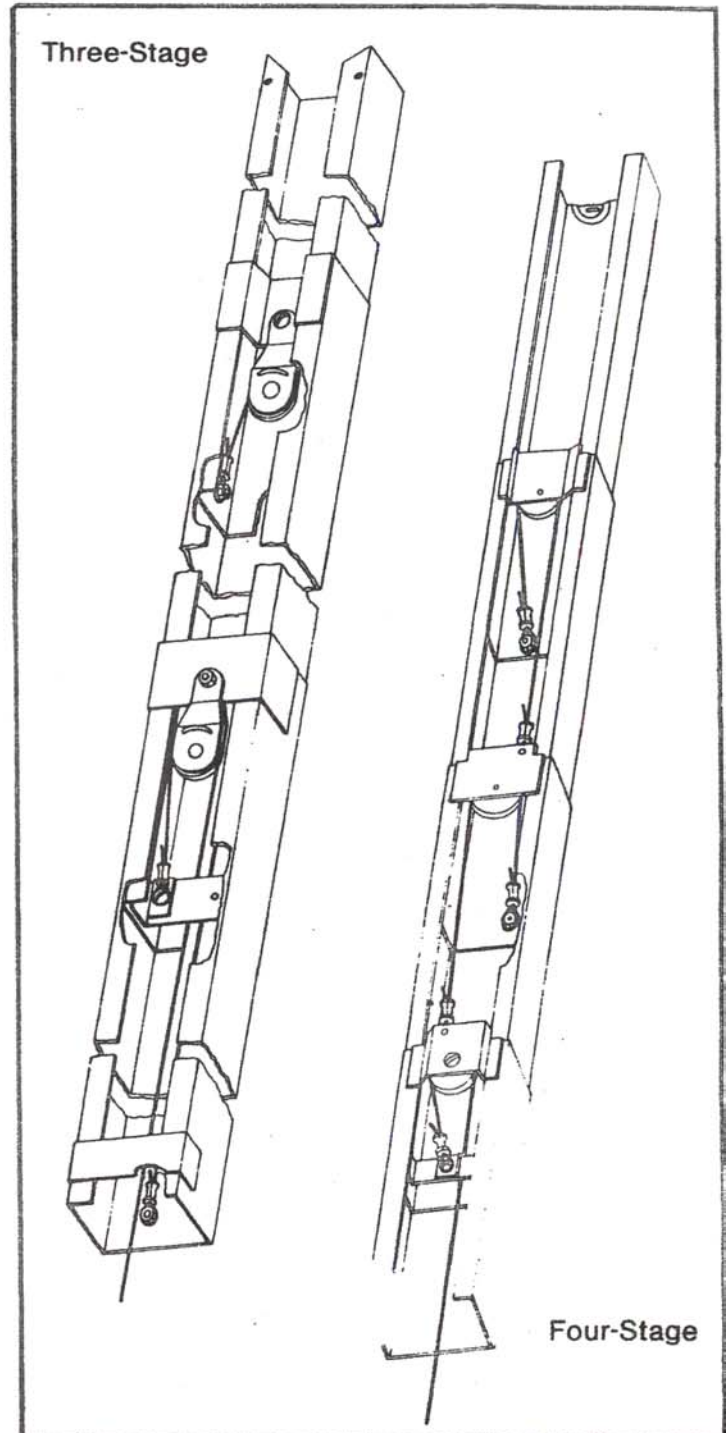


145. The lifter cable has been looped around a pulley and the pulley is being replaced in the lifter.

8. Tighten the nut and bolt that hold the pulley assembly together to 6 ft/lbs. The bolt that holds the looped end of the lifter cable the first stage should be torqued to 6 ft/lbs. also. Connect the lifter cable to the turnbuckle.

ADJUST ROOF HEIGHT

9. Adjust the roof height according to the procedures listed in the Winch Section of this manual.



FTER POSTS

noval and replacement of lifter posts follows the basic steps as the removal and replacement of lifter cable:

OP ROOF AT BROKEN CORNER

Raise the camper roof and prop up the broken corner.

ld up the broken corner by hand as the roof is cranked to prevent over-stressing the other cables.

MOVE LIFTER

Slide out the bunk end; remove canvas and lifter cover. If lifter cable is not already broken, disconnect abolt and turnbuckle.

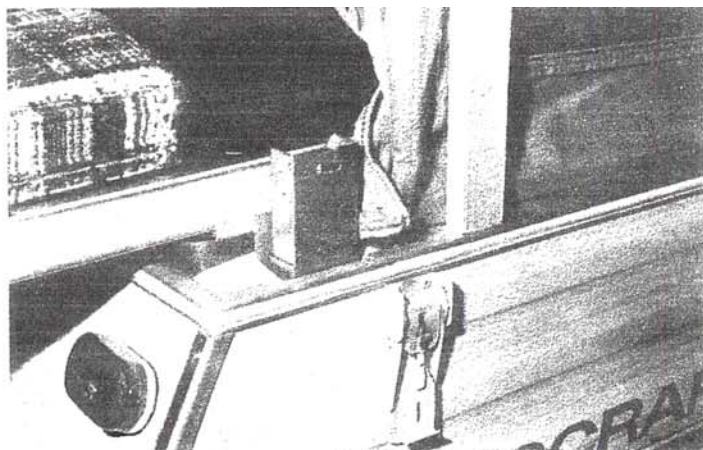
Remove the bolt that holds the top stage of the lifter st to the roof.

Collapse the lifter and remove it from the lifter cket.

Raise the first stage up in the lifter pocket until the lifter ble can be disconnected and the pulley at the top of e first stage can be removed.



146. The top stage of a lifter is being detached from the side board.

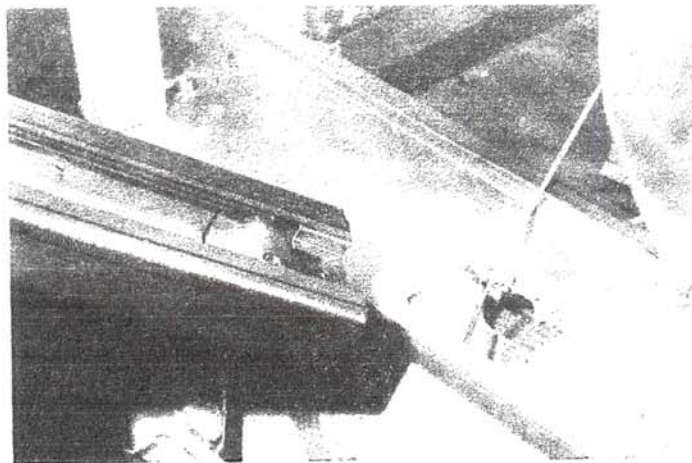


147. The lifter has been collapsed down into the lifter pocket in the sidewall.

INSTALL NEW LIFTER

6. Install the new lifter post in the lifter pocket and attach the lifter cable to the first stage of the lifter.

NOTE: When installing a new lifter post, the lifter cable can be threaded through the lifter pocket and connected to the lifter post before the post has been set in the pocket if the turnbuckle has been disconnected to provide the necessary slack in the cable.



148. The old lifter post has been removed and a new one is being installed. The lifter cable is visible coming out of the lifter pocket.

7. Extend the lifter post and attach the top stage to the roof.

8. Connect the turnbuckle and check the roof height adjustment.

NOTE: On 1984 models; if the right rear lifter post has been changed, a new STOP INDICATOR will have to be placed on the lifter.