



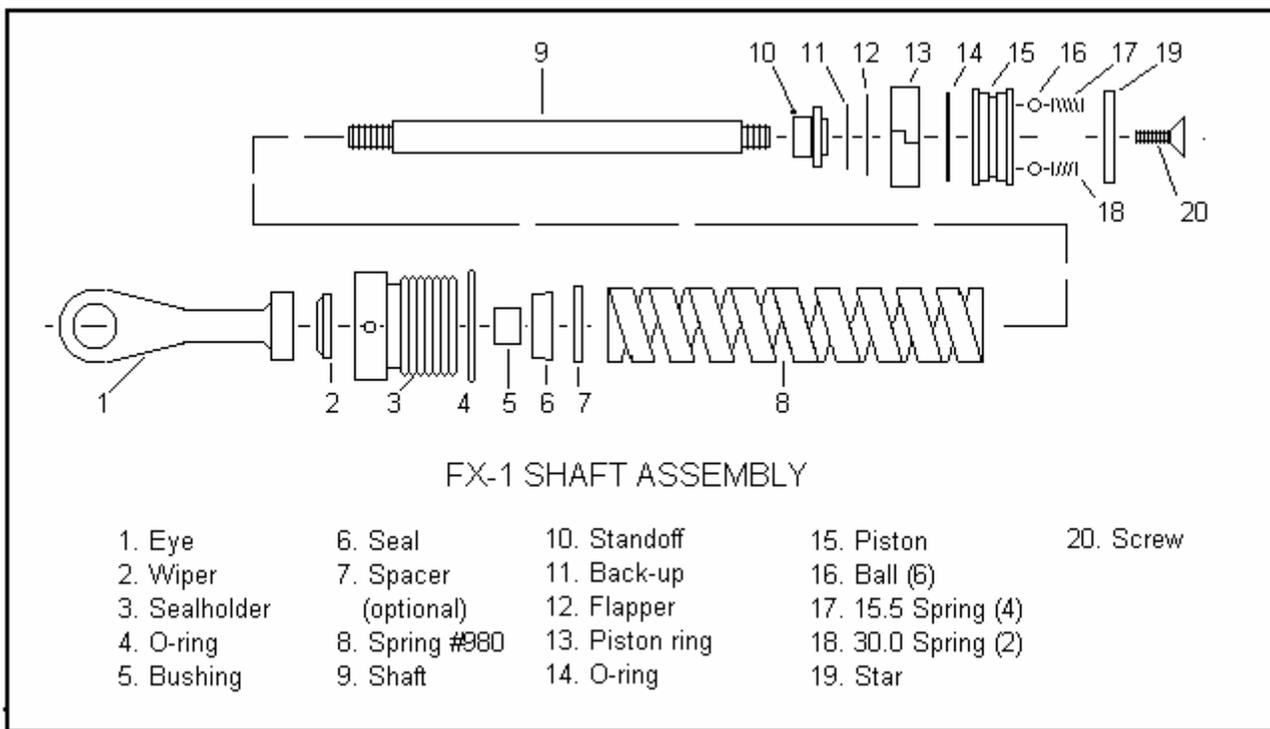
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OVERHAUL INSTRUCTIONS FOR  
 RIDE-HEIGHT ADJUSTABLE SHOCKS  
 FOR H-D SOFTAIL

NOMENCLATURE:

This shock system includes two shocks. The elevator shock is fitted with the reservoir and height adjustment knob and is referred to in these instructions as the "FX-2". The other shock is referred to as the FX-1.

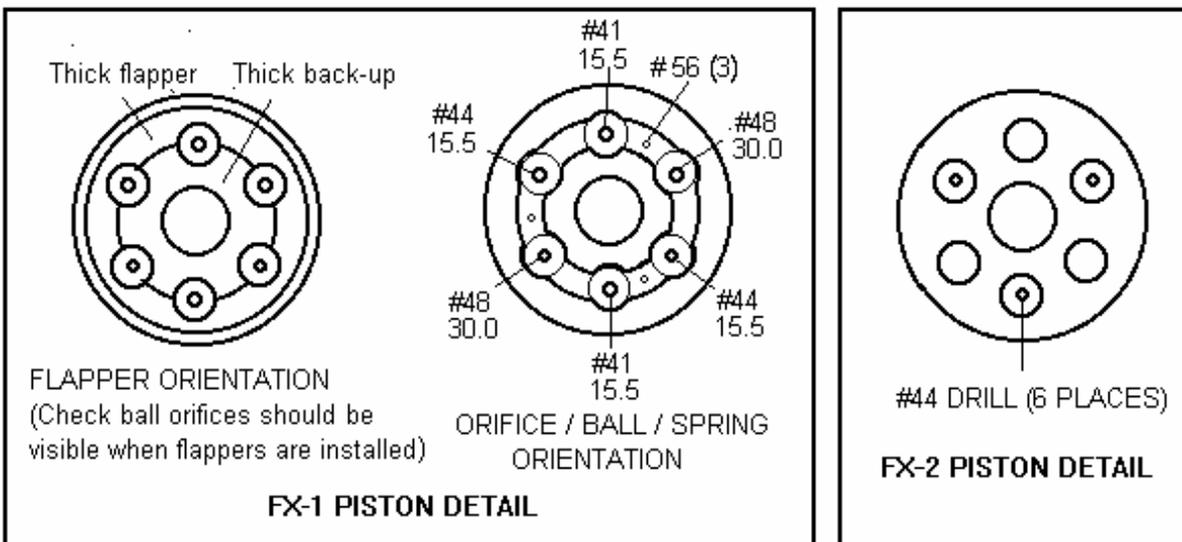
WARNING: Do not clamp the shock body by the outside diameter. Always secure the body at the eye when removing or tightening the seal holder.



FX-1 DISASSEMBLY

1. With the body eye in a vise, remove the seal holder with a suitable spanner. This is a right-hand, standard thread. Unscrew the seal holder and withdraw the shaft assembly.
2. Place the shaft eye in a vise. Remove the piston ring (a stepped, split type), and O-ring.
3. The socket head fastener in the end of the shaft is secured with thread locking compound. It will be necessary to use a heat gun to break the bond. Remove the fastener.
4. Lift the valve spring cap (star) off. Remove each of the valve springs, noting the order and placement in the piston.
5. With an appropriate spanner, unscrew the piston from the shaft. As the piston is unscrewed note the position of the flappers on the bottom side of the piston. Normally, these will stay attached to the shaft. Dump the check balls out of the piston.

6. Remove the flappers-- noting the order of placement and the top of each--followed by the spring standoff. There may still be some spring tension on these components. By turning the flappers and the spring these will unscrew.
7. Remove the spring.
8. Clamp the shaft in aluminum V-blocks in a press, and heat the end of the eye where it meets the shaft. This will break the bond on the thread locking compound.
9. Unscrew the eye from the shaft.
10. Inspect the shaft for scratches, pits or corrosion from the edge of the threads down 2 inches. A damaged shaft must be replaced to prevent leakage.
11. Using a plastic pick, remove the seal from the lower side of the seal holder, and the wiper from the upper side. Be careful to avoid scratching the mating surfaces below the seals. Remove the O-ring using the same precautions.
12. Grease and install the new seals by hand. The open side of the seal should face towards the inside of the assembly. Do not use any metal object or tool to push or pry because of possible damage to the seals.
13. Inspect the piston springs for breakage. Make sure that the flappers are not badly distorted, creased or warped.
14. Inspect the thermoplastic (dark grey) bushings in the shaft and body eyes. Press in new pieces if visibly torn or cracked.

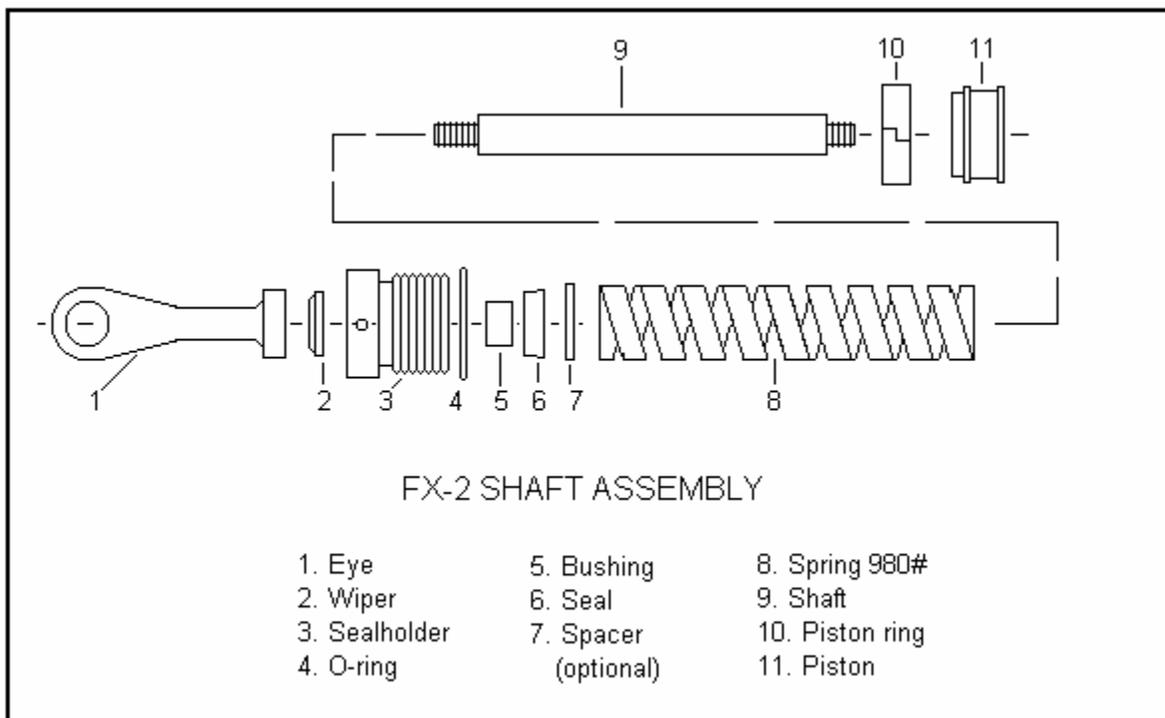


#### FX-1 ASSEMBLY

1. Clamping the shaft in the soft V-blocks, install the spring standoff followed by the small diameter flapper and the large diameter flapper.
2. Screw the piston onto the shaft only so far as to allow the flappers to turn. Line up the holes in the flappers with the ball pocket holes. Carefully tighten the piston with a spanner, ensuring that the flappers do not rotate over the ball pocket holes. This can be tricky. Sometimes it is necessary to rotate the flappers away from the holes so that as the assembly tightens, they will line up. A small c-clamp is helpful to keep the flappers phased together during this operation. Check the flappers for flatness to the piston. A .003" feeler should not easily slide in.
3. Remove the shaft assembly from the clamps. Lightly grease the ends and inside edges at the end of the spring. Install it onto the shaft. If this assembly includes a steel spacer, install it as well.
4. Grease the bore of the seal holder and very carefully install the seal holder over the shaft and onto the top of the spring.
5. Put a small amount of thread locking compound inside the threaded bore of the eye. A small amount is sufficient. Screw the eye down by hand to the top of the seal holder.

6. Invert the shaft assembly in a press against a suitable bearing press. Use the press ram to collapse the spring and push the shaft assembly out of the seal holder. Continue to screw the eye onto the shaft to the shoulder. Remove from the press.
7. Clamp the eye in a vise and tighten the piston/shaft and eye together with the spanner.
8. Check the flappers again with the feeler gauge (step 2).
9. Install the check balls, followed by the springs over the appropriate holes. Place the star on the piston so that the solid part between the holes is over the valving springs. Insert the socket head fastener and tighten in place.
10. Install the O-ring and piston ring.
11. Remove the outer O-ring from the seal holder. (DO NOT use a metal object, such as a screw driver, to remove the O-ring. Use a plastic awl or the removable end from a ball-point pen. Any scratches on the O-ring groove will cause leakage.) Pour suspension fluid into a clean, dry body to about 5 inches from the top edge of the body tube.
12. Coat the piston ring with suspension fluid and insert the shaft assembly into the body. The piston should contact the oil (it will get almost solid) with the seal holder approximately 1/4" from the top edge of the body. Push the shaft assembly in (it will be very slow and stiff) until the seal holder almost touches the top of the body tube. Cock the assembly over to one side and pour the rest of the shock oil in the body tube.
13. Push the shaft assembly down until the threads make contact. Thread the seal holder by hand at first, then screw it all the way down slowly with the spanner. This will enable the trapped air to escape past the threads. Excess oil should flow out of the assembly along with air bubbles. When the seal holder is just about tight, there should only be oil bleeding from the assembly--no air.
14. Once the seal holder is snug against the body tube, unscrew it 1/4 turn. Remove the shock from the vise, and turn it on its side so that the hole for the spanner wrench is pointing up. Drain the excess oil that is trapped in the O-ring groove.
15. Put the shock back in the vise and unscrew the seal holder just enough to see the O-ring groove. With a clean shop towel, wipe the excess oil from the O-ring groove. Install the O-ring over the outside of the seal holder and into the groove. Tighten the seal holder firmly into the body.

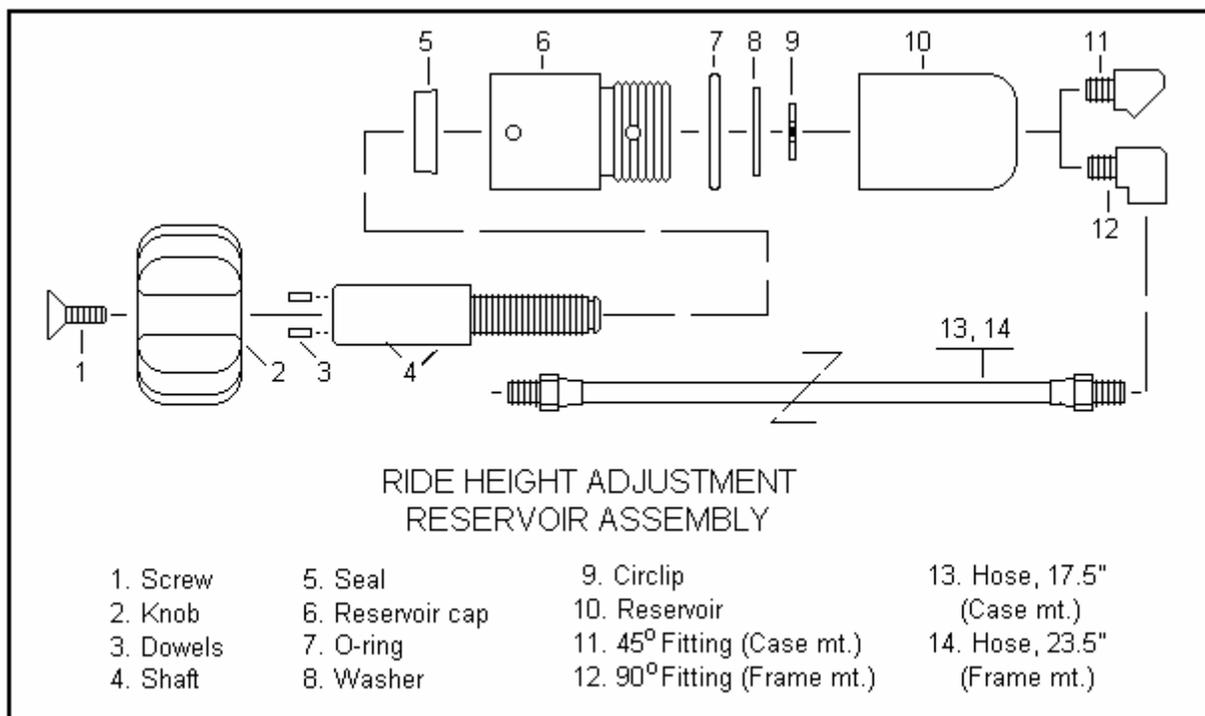
NOTE: If the shaft assembly pops out after the seal holder is tightened, it means that there is too much oil. This is usually caused by unscrewing the seal holder too far and excess oil that should have been absorbed by the shop towel was sucked back down inside the shock. Unscrew the seal holder, remove the O-ring and repeat steps 13-15.



## FX-2 DISASSEMBLY

NOTE: If the elevator knob and shaft assembly is stuck in the "in" position (bike lowered), it may not be possible to remove the reservoir from the case mount bracket. It may be necessary to loosen a hose fitting to release oil and allow the reservoir to "relax." Then it can be withdrawn from the bracket.

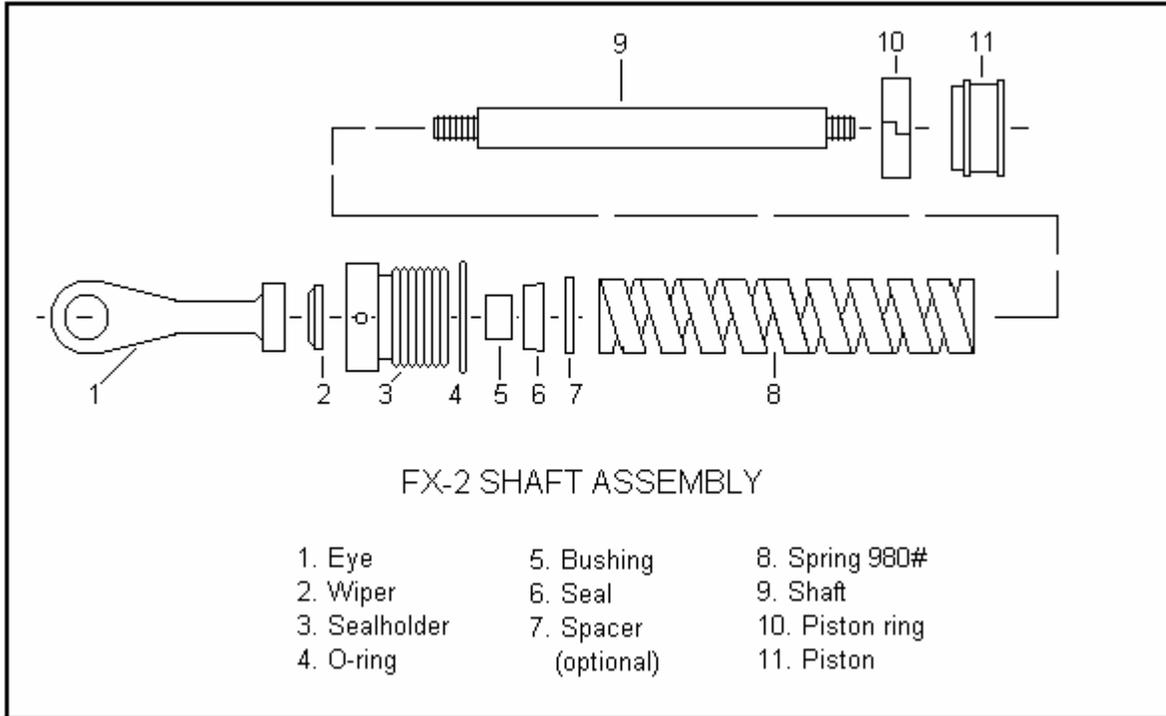
1. With the body eye in a vise, remove the seal holder with a suitable spanner. This is a right-hand, standard thread. Unscrew the seal holder and withdraw the shaft assembly.
2. Place the shaft eye in a vise. Remove the piston ring (a stepped, split type).
3. With an appropriate spanner, unscrew the piston from the shaft. Remove the spring.
4. Clamp the shaft in aluminum V-blocks in a press, and heat the end of the eye where it meets the shaft. This will break the bond on the thread locking compound.
5. Unscrew the eye from the shaft.



NOTE: Before proceeding with the next step, note the orientation of the reservoir to the body with the hose stretched out straight. If the hose is replaced, the orientation will have to be duplicated.

6. If the hose is frayed, damaged or leaks from above the fitting, it will need to be replaced. With the body eye in a vise, unscrew the hose with a flare nut wrench.
7. To remove the hose from the reservoir, carefully clamp the fitting and unscrew the hose. This will help avoid cracking the fitting where it goes into the reservoir.
8. Wrap the reservoir in a thick towel and clamp the lower third in a vise. Use a spanner to unscrew the reservoir cap and shaft assembly from the reservoir.
9. Remove the retaining ring and washer on the end of the reservoir shaft and unscrew the shaft from the reservoir cap.
10. Inspect the shock shaft and the reservoir shaft for scratches, pits or corrosion. A damaged shaft must be replaced to prevent leakage.
11. Using a plastic or soft metal pick, remove the seal from the lower side of the seal holder, and the wiper from the upper side. On the reservoir cap, remove the shaft seal. Be careful to avoid scratching the mating surfaces below the seals. Remove the outer O-ring on both components using the same precautions.

12. Grease and install the new seals by hand. The open side of the seal should face towards the inside of the assembly. Do not use any metal object or tool to push or pry because of possible damage to the seals.
13. Inspect the thermoplastic (dark grey) bushings in the shaft and body eyes. Press in new pieces if visibly torn or cracked.
14. Put anti-seize on the reservoir shaft threads and thread into the reservoir cap. Install the washer and retaining ring. Screw the shaft in to about 1/4" from the edge of the cap.



FX-2 ASSEMBLY

1. Clamping the shaft in the soft V-blocks, put thread locking compound on the inside of the piston threads and screw onto the shaft. Tighten with the spanner.
2. Remove the shaft assembly from the clamps. Lightly grease the ends and inside edges at the end of the spring and install it onto the shaft. If this assembly includes a steel spacer, install it as well.
3. Grease the bore of the seal holder and very carefully install the seal holder over the shaft and onto the top of the spring.
4. Put a small amount of thread locking compound inside the threaded bore of the eye. A small amount is sufficient. Screw the eye down by hand to the top of the seal holder.
5. Invert the shaft assembly in a press against a suitable bearing press. Use the press ram to collapse the spring and push the shaft assembly out of the seal holder. Continue to screw the eye onto the shaft to the shoulder. Remove from the press.
6. Clamp the eye in a vise and tighten the piston/shaft and eye together with the spanner.
7. Install the piston ring.
8. Wrap Teflon thread sealing tape around each end of the hose and the external threads on the fitting.
9. Screw the reservoir fitting into the reservoir body.
10. Clamp the fitting and install the hose into the fitting.

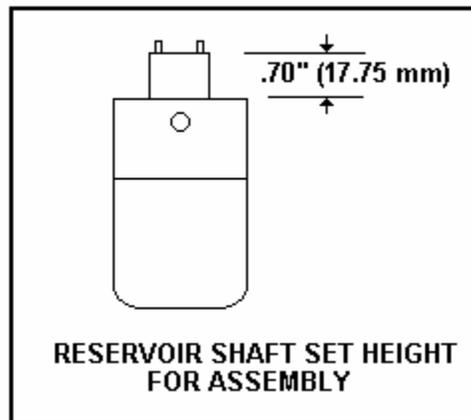
11. Clamp the shock body eye and install the hose/reservoir assembly. Orient the reservoir to the body as noted in the note before step 7 in FX-2 disassembly. Fittings should be snug.

12. With the shock body upright in the vise, hold the reservoir higher than the top of the shock body. Pour suspension fluid into the reservoir until it comes out inside the body to the depth of about 2 inches. Make sure that there is still fluid in the reservoir and covering the hose opening. Lower the reservoir to the level of the shock.

13. With the fluid level stabilized, thread the reservoir cap assembly into the reservoir. Lower the reservoir as you screw in the reservoir cap so that the shock oil bleeds out the hole in the threads. The bleeding should be constant until the reservoir cap is snug to the reservoir.

14. Unscrew the reservoir shaft fully to pull oil into the area around the shaft. Invert the reservoir and screw the shaft in and out a few times to push any trapped air out into the reservoir.

15. Check to make sure that there is still oil in the body and that it covers the hose outlet hole. Let the reservoir dangle below the body. Any trapped air bubbles should float up the line to the body. Let it sit for a few minutes.



16. Screw the reservoir shaft in until the end of the shaft is .70 inches from the reservoir cap. Lay the reservoir off to the side.

17. Fill the shock body to approximately 3-1/2" from the top edge of the shock tube.

18. Insert the shaft assembly and thread in. Before the O-ring reaches the top edge of the body, oil should start bleeding out of the hole in the threads. If no oil is bleeding out, the oil level is too low. Add oil and insert the shaft again.

19. As the O-ring makes contact with the top of the body the assembly will get very stiff. Do not force the seal holder. With the O-ring firmly sealed with the top edge of the body, unscrew the reservoir shaft fully.

20. Continue to screw in the seal holder until tight. If the shaft pops out, then the distance measured at the reservoir shaft (step 15) should be decreased to .650 inches. (Then repeat from step 16 with a dry shaft assembly, especially the seal holder threads and O-ring.)

21. Fit the knob to the reservoir shaft. Turn the knob in. It should be fairly easy for about 3/4 to 1-1/2 full turns before it gets rigid. The number of turns determines how much trapped air is in the system. Two turns is OK. If the knob turns 4 or more turns, then the shocks will not extend to the fullest. This problem is caused by the reservoir shaft being too far in, or improper bleeding sequence.

22. Clamp the reservoir in the towel and vise and tighten the reservoir cap.

23. Install the shocks according to the installation instructions.

