Stif-Jak Hydraulic Unit Repair Manual

Version R1.0

Table of Contents

Exploded View

Seal kit contents

Replacement seals come in two colors. There is NO difference in the seals other than the color.

Tools You Will Need

1: Slip Joint Pliers
2: Adjustable Wrench
3: 4mm and 6mm Metric Allen Wrenches
4: Piston Holding Handle & Locknut or some other method for preventing the piston from rotating
5: Hammer
6: Punch
7: Small Flat Blade Screwdriver (used as pry bar or punch)
8: Metric Thread File or M24 x 1.5 Threading Die and a M24 x 1.5 Bottoming Tap
9: A Spring Hook/Tweezers or some other tool for inserting o-rings into grooves down inside a bore.
10: An Inch Pound or Newton Meter torque wrench.

Piston Seal Replacement

Start by unscrewing the piston shoe.

Use a punch or flat blade screwdriver and a hammer to unscrew the copper piston lower end bushing.

Screw the piston holding handle all the way onto the piston threads.

WARNING: Twisting the piston with the bolt in the center tight will damage the retract spring!

Tighten the locknut against the piston holding handle. Be careful to NOT let the piston rotate!

WARNING: Twisting the piston with the bolt in the center tight will damage the retract spring!

Use the 4mm allen wrench to remove the bolt from the center of the piston. This bolt screws into the retract spring.

Loosen the tube fitting on the cylinder ONLY. You will lose very little hydraulic oil, maybe only a few drops. If this is the case, you won't need to refill the reservoir unless it is already low.

Pull the piston up out of the cylinder.

Use the screwdriver to pry the old piston seal up and over the end of the piston. Note that some early versions of this pump shipped with an o-ring as a piston seal. That has been replaced with the new style that comes in our rebuild kit.

Put the new piston seal in a cup or mug with about 3-½ ounces/100ml of water and heat it in a microwave for about one minute, or just until the water is boiling. Use a screwdriver to fish the seal out of the water.

CAUTION! This will be HOT.
Be careful to not burn yourself!

Immediately work the new piston seal on while it is still hot and pliable.

Make CERTAIN to install the new piston seal with the lips facing away from the threaded end of the piston or it won't seal!

The new seal in place. Note the flared lip is facing up, or toward the short end of the piston

Dip the end of the piston with the seal in some hydraulic oil.

Work the new seal into the bore of the cylinder and then push the piston all the way in.

Screw the copper piston lower bushing in place and tighten using the hammer and punch or screwdriver.

Put one of the new metal sealing washers on the socket head cap screw.

WARNING: Letting the piston twist while tightening the bolt will damage the retract spring!

Hold the piston with the handle and tighten the Socket head cap screw. Recommended maximum torque values are 156 inch-pounds/17.6 Nm if dry, or 116 inch-pounds/13.1 Nm if the threads and shoulder of the bolt head are lubricated with oil. It is important to get this bolt properly tightened or you will have a leak.

Screw the piston shoe back on. Do NOT twist the piston! If your's is an early version without a set-screw, see the section "Feedback and Reported Fixes" on page 14.

Tighten the tube fitting you loosened at the cylinder. Stand the unit upright. Pump the piston out all the way and release it twice to purge the air out of the cylinder. It is now ready to remount.

Pump Plunger Seals

The pump plunger will leak because of 2 reasons. One cause is the reservoir bleed screw being closed, so check that first. The other thing is worn out o-rings.

Remove a clip and the pin holding the handle adaptor to the pump plunger.

Pull the pump plunger out.

This is a two step well. The upper o-ring and back-up ring are pretty easy to do. The lower pair will take some patience and finesse.

Use a spring hook or probe to gently work the old o-ring out of the groove. Caught out in the field without the right tools, one fellow actually did this job by making a tool out of a paper clip!

Be careful to NOT scratch the aluminum body!

Lift the o-ring out.

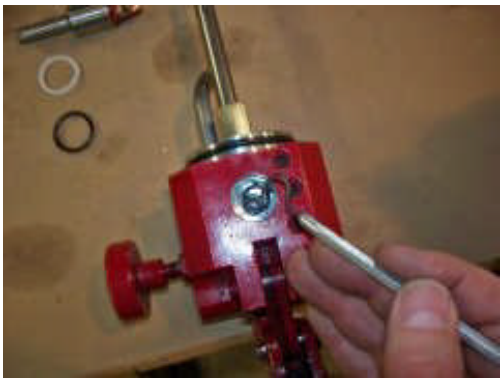
Remove the back-up ring.

Note the back-up rings are split with the ends beveled. When installing the new back-up rings make sure the beveled ends nest together properly!

Remove the lower set.

Work the upper o-ring into the groove with your finger.

Wind the back-up ring into the groove on top of the o-ring.



Use the spring hook to work the lower o-ring and back-up ring into place. This is easier said than done!

Make sure the back-up rings are above the o-rings, or closer to the outside of the bore.

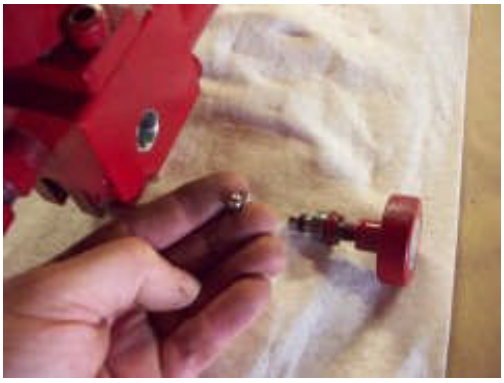
Oil the pump plunger before inserting it into the new seals. Reinstall the handle adaptor, pin and clip and this part is finished.

Release Valve, Top of Cylinder, Reservoir

There are two other places the pump might leak,
as well as some o-rings in the reservoir end.

The release valve: Open the valve, and use the adjustable wrench to unscrew the hex shoulder bushing out of the body.

Replace the O-ring. Oil the new o-ring before reinstalling the release valve.



Keep the valve in the open position for reinstallation. Also, make sure that you don't lose the check ball!

Leaking at the top of the cylinder:

Begin by unscrewing the oil line at the cylinder and remove the 2 bolts holding the cylinder adaptor plate to the pump body.

Slide the cylinder away from the oil line.

Remove the two bolts holding the adaptor plate onto the cylinder.

Remove the cylinder upper retract spring bolt.

Put a new metal sealing washer on the socket head cap screw. Recommended maximum torque values are 156 inch-pounds/17.6 Nm if dry, or 116 inch-pounds/13.1 Nm if the threads and shoulder of the bolt head are lubricated with oil. It is important to get this bolt properly tightened or you will have a leak.

Reservoir Seals: Remove the acorn nut from the reservoir end cap.

Clamp the pump body in a vise so the reservoir is vertical. Keep a firm hold on the reservoir body and work the end cap off.

If you accidentally pull the reservoir body off at the pump body end you will spill hydraulic fluid and have a mess!

There are 2 o-rings on the reservoir end cap. One is inside the center hole to seal the stud.

After pouring the hydraulic fluid into a suitable container, you can then remove the reservoir body from the pump body to replace that o-ring.

Refill the reservoir with 7 ounces/210ml of clean AW32 or AW46 hydraulic fluid or hydraulic jack oil.

Reinstall the reservoir end cap. Place the bleed screw assembly just off the 12 o'clock position so the pump handle doesn't hit it when the jack is in use.

Feedback From Customers and Reported Fixes

Two problems that occur often enough to need to be addressed are loss of the bleeder screw and the piston shoe coming unscrewed, causing the shoe and piston to become damaged.

To prevent bleeder screw loss: Remove the bleeder assembly. Drill a hole in the head of the bleeder screw and put on a lanyard.

Screw the bleeder screw back into the bleeder adaptor and loop the lanyard around the threads. on the bleeder adaptor. Reinstall the bleeder assembly using fresh pipe dope or teflon tape on the threads.

To prevent the piston shoe from coming unscrewed: This is easiest done during a piston seal replacement! Chuck the piston shoe up in a drill press. Drill a hole in the side the appropriate size for whatever set screw you are going to use.

Without disturbing the piston shoe in your vise, screw the piston in all the way. Then run your drill bit back in to make a dimple in the piston threads for your set screw to seat in.

You don’t need much of a dimple, just enough so the set screw won’t foul the threads making later removal of the piston shoe difficult.

Use a 1.5 pitch metric thread file or a M24 x 1.5 threading die to clean up the threads.

Tap the hole in the piston shoe with an appropriate tap for the set screw you are going to use.

Run the set screw in to push any shavings or burrs to the inside of the shoe, then back it out.

Use a M24 x 1.5 bottoming tap to chase the threads inside the piston shoe. Once the shoe is back on the piston, tighten the set screw.