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## REPAIR & MAINTENANCE PROCEDURE FOR THE FOLLOWING PNEUMATIC POWER PACKS

Models: SP-005 and SP-008 2-Stage Power Packs

Proper maintenance and repair is important to insure long service life for these pneumatic tools. This document will provide you with step-by-step procedures to provide preventative maintenance and repair on the power packs (pneumatic cylinders), as well as the jaws and jaw housings. It is VERY IMPORTANT that all of these tools be used in conjunction with in-line air lubricators and water filters to insure the internal O-rings and components remain well lubricated. They do NOT require much oil volume, so small micro-bursts of oil is all that's needed. If lubricated and maintained properly, internal O-rings and components should not require replacement for 300,000 – 500,000 cycles.

## PREPARE TOOL FOR REPAIR

### TOOLS REQUIRED



Bench Vice  
Rubber and aluminum vise pads  
Wire brushes  
Vise Grip  
Spanner wrench  
Small picks  
9/64" Allen Wrench  
1/8" Allen Wrench  
Clamp Blocks for securing shaft assembly in vise  
Internal & External Snap Ring Pliers (small tips)  
#2 Phillips Screwdriver  
Propane Torch  
Parts Cleaner  
Loctite 290 (or equal)  
Light machine oil  
Light Grease

**To begin the repair, you will need to separate the power pack from the jaw / jaw housing assembly**

Connect the power pack to your air source and activate the tool to fully extend the piston. Do not release the activation lever... just disconnect the tool from the air source so the piston stays in the fully extended position.

Remove the jaw / jaw housing assembly from the power pack by turning counter-clockwise. Some jaw housings will have a locking set screw near the bottom of the housing. Loosen that set screw, then separate the jaw housing from the power pack.



Set the jaw / jaw housing assembly aside, as the following procedure only applies to the power pack.

### POWER PACK REPAIR

While maintaining the piston in the full extended position, disconnect the tool from the air source and the piston will remain fully extended.

To fully disassemble the power pack and have access to all of the internal O-rings, the piston cam must first be removed. This cam is assembled with thread sealant, so the cam must be heated (using a propane torch) to break it loose. Fabricate a small block fixture (as shown) so the piston shaft can be secured in a vise and tightened without damaging the shaft. **DO NOT CLAMP THE SHAFT** in a vise grip or similar tool, as you will score the shaft surface.

Heat the cam area (not the shaft) using a propane torch for about 30-45 seconds, as it must get quite hot to soften the thread sealant. Using a wrench or vise grip, turn the cam counter-clockwise to separate it from the piston shaft. If the cam does not loosen, continue heating. The cam will be hot, so place it somewhere to safely cool.



Once the cam has been removed, clean the shaft threads using a soft wire brush to remove any residual thread sealant.



Remove the tool and shaft clamp block from the vise.

Carefully and securely clamp the power pack body in a vise using rubber or urethane vise jaw pads with the piston facing UP. It's best to clamp the power pack near the bottom 1/3 of the housing as shown. Using a spanner wrench, remove the end cap from the housing and slide it off the shaft. Set the cap aside for now.



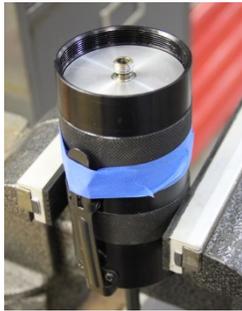
***(Reference photos on page 4)***

The SP-005 and SP-008 power packs are equipped with an **upper** and **lower** set of piston plates and shafts. Once the power pack end cap and cam have been removed, the next step is to remove the upper piston shaft and upper piston plate. The upper piston shaft is attached to the lower shaft using a thread sealant (Loctite 290). To remove the upper shaft, follow this procedure:

1. Depress the hand lever control and wrap the tool with a strap, masking tape or rubber band to keep the lever handle in the closed position.
2. Connect the air hose to the tool but NOT to the air source at this time.
3. Clamp the power pack in a vise using rubber or urethane vise inserts.
4. Set your air pressure to 40-60 psi. in preparation for the shaft removal.
5. Secure the clamp block (used during cam removal) to the shaft using a Vise Grip.
6. Once the clamp is secure, use a propane torch to heat the lower section of the shaft (30-45 seconds) in the area close to the piston plate.
7. Once the shaft is heated, connect your air hose to the source. This will assist in preventing the piston plate from rotating while you turn the shaft (counter-clockwise). You will hear air leakage during this step, but that is normal. Carefully rotate the shaft counter clockwise 2-3 full revolutions. Disconnect the air source. Turn the shaft counter-clockwise to determine if it has released the thread sealant. If it has released, remove the shaft with the air pressure off. If it has not released, reconnect your air source and repeat that procedure until the thread sealant has released.



Once the upper shaft has been removed, you can now remove the upper piston plate. It's often easier to connect your air source (40-60 psi) and let the air pressure dislodge the piston plate. Reconnect the tool to your air source and the upper plate should dislodge as shown below.



With the upper shaft and piston plate removed, you will see the lower piston plates sitting just below a large snap ring. Remove the snap ring. NOTE the position of the lower piston plate. It is actually sitting in the snap ring groove. When reinstalling the lower piston plates, DO NOT push this plate "below" that groove. The snap ring groove is wide enough to accept both the plate and the snap ring.



Once again, it's often easier to remove the 2 lower piston plates and shaft by using air pressure to dislodge the assembly. Connect the tool to the air source and let the air pressure push the assembly up,

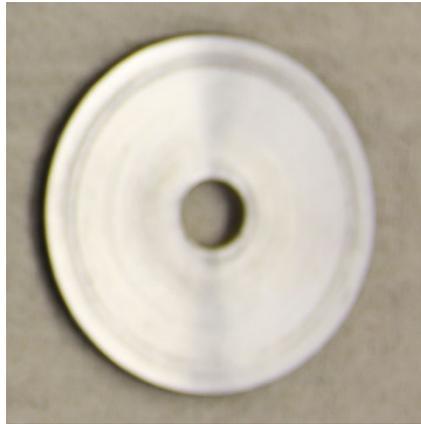


Once the piston shafts and plates have been removed, clean the inside of the power pack housing to remove any residual debris and lubricate it with a small amount of light machine oil.

### REPLACING INTERNAL O-RINGS

Complete O-Ring repair kits are available through CPS. A specific kit should be ordered for the specific power pack model being repaired.

The SP-005 and SP-008 have 3 piston plates. Two of the plates have 2 O-rings and one plate (attached to the lower shaft) has 1 O-ring. Replace and lubricate each O-ring with light machine oil or grease.



The lower piston shaft also has a small O-ring located “inside” the shaft. Replacing this internal O-ring can be a challenge, but it should always be replaced as it is often the O-ring that is causing air leakage. The pointer in the image below shows the location of the O-ring inside the shaft.



The power pack end cap also has 2 O-rings. Replace and lubricate with light machine oil or grease.



**Replacing the lever valve O-rings and spring:** *(Note: F-style power packs will be footswitch controlled and will not have a manual lever valve. Skip this step if your power pack is footswitch controlled)*  
**ALL of the hand lever control power packs use the same basic design as shown below, so the process and components are very similar. Be sure to specify the power pack model being repaired, as the internal springs may be different.**



Remove the lever handle from the housing by removing the 2 Phillips screws  
Tip the housing on its side and tap out the plastic valve spacer, exposing a small snap ring underneath.  
Remove the internal snap ring  
Remove the valve assembly (spool, spool spring and washer)  
Replace the (2) small O-rings on the spool valve  
Replace the spool spring, if necessary  
Lubricate the O-rings with light grease or oil and reassemble the valve in reverse order. (make certain the washer is installed “below” the snap ring)

### **Reinstalling Piston Plates and Shafts**

The lower shaft (with 2 piston plates) will be installed first. It is recommended that you apply a liberal amount of oil or grease to the piston plate O-rings, and apply a liberal amount of grease to the threads at the top of the power pack housing. This will allow the piston plate O-rings to easily slip past the threads without dislodging the O-rings from the plates.

Carefully slide both lower piston plates & lower shaft into the housing being careful not to dislodge the O-rings. Slide the plates into the housing until the upper plate seats into the snap ring groove. **DO NOT PUSH THE TOP PLATE BELOW THE SNAP RING GROOVE.** This will most certainly result in an internal air leak.



Once the plate is seated, reinstall the snap ring and make certain it is fully seated in the groove.

With the piston fully extended, apply a liberal amount of grease to the upper piston plate O-ring and carefully work the plate past the threads at the top of the power pack. It is relatively easy to dislodge this O-ring during this process, and you won't know if it's been dislodged until you actually complete the assembly and test the tool. If dislodged, an obvious air leak will be detected and you will need to remove the plate and reinstall.

**THIS STEP IS VERY IMPORTANT:** *Testing for leaks before completing assembly.* Once the upper plate is installed, the upper shaft can be installed. Although this shaft must be installed using Loctite 290 (or equal), it's best to simply hand tighten the shaft WITHOUT applying the Loctite so the remaining installation process can be completed and you can test the tool for air leaks. Reinstall the end cap and tighten. Do NOT reinstall the cam at this time. Test for air leaks. If no air leaks are detected, simply remove the end cap again and remove the upper shaft. If air leaks ARE detected, it is most likely the O-ring on the upper plates has dislodged. Remove the plate, check the O-ring and reinstall. Then move to the next step.

With the shaft and end cap removed, reposition the tool in the vise to a slightly downward position from horizontal (shaft angled towards the floor), apply Loctite 290 (or equal) to both the upper and lower shaft threads and tighten. Reinstall the end cap and tighten. Apply Loctite 290 to the cam and shaft. Install the cam as tight as you can or until the piston plates starts to turn in the housing. Allow the sealant to cure for at least 1 hour before removing the tool from the vise. The downward tool position prevents the thread sealant from wicking down the shaft and plugging one of the bleed holes.



Once the thread sealant has cured, reposition the tool in the vise to vertical and check the end cap for tightness. This cap does NOT need to be torqued down too tight. Over-tightening the end cap may make it more difficult to remove in the future.

This completes the O-ring replacement procedure.