

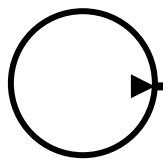
**HARTMANN**

**PUMPS - MOTORS - CONTROLS**

Repair  
Information for  
PVX Series Pumps



*Hydraulic pumps & motors with a **hart of gold**™*



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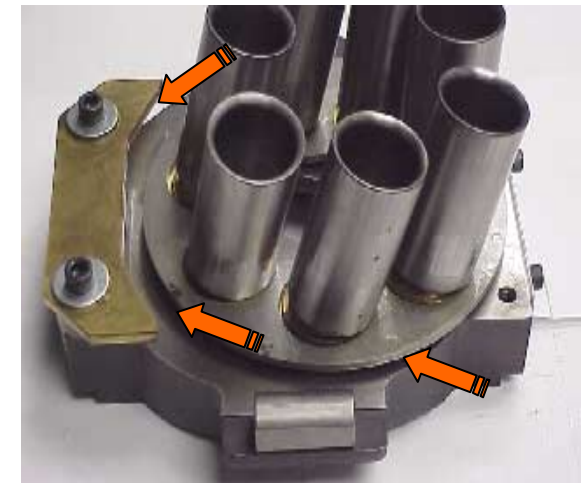
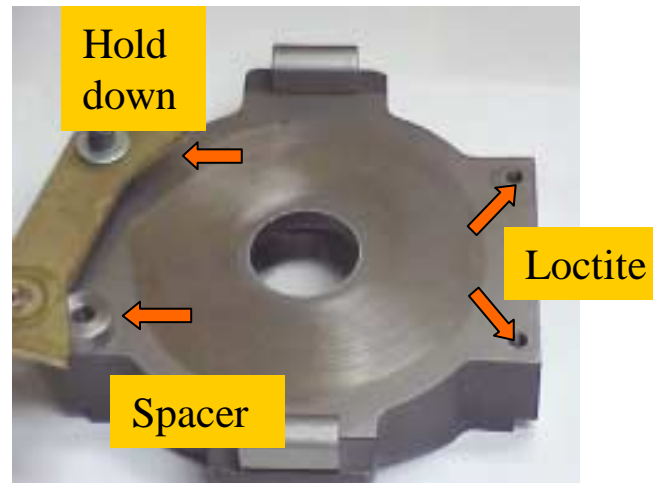
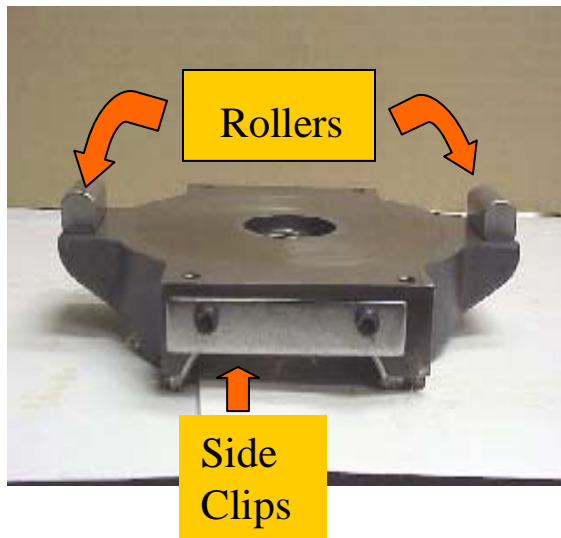
**URL: [www.hartmanncontrols.com](http://www.hartmanncontrols.com)**

**E-mail: [sales@hartmanncontrols.com](mailto:sales@hartmanncontrols.com)**

# Pump Assembly



# PVX Pump Assembly

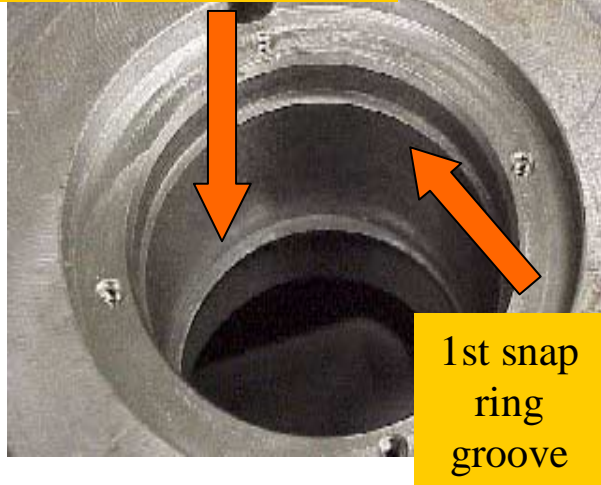


- ⌘ Put Loctite in the tapped holes.
- ⌘ Install side clips and rollers onto the swashplate.
- ⌘ Install only one hold down on the swash-plate (at this time).
- ⌘ Slide retaining ring under the hold down clip.
- ⌘ Install second hold down onto the swash plate
- ⌘ **This completes swash plate assembly.**



# PVX Pump Assembly

2nd snap ring groove



1st snap ring



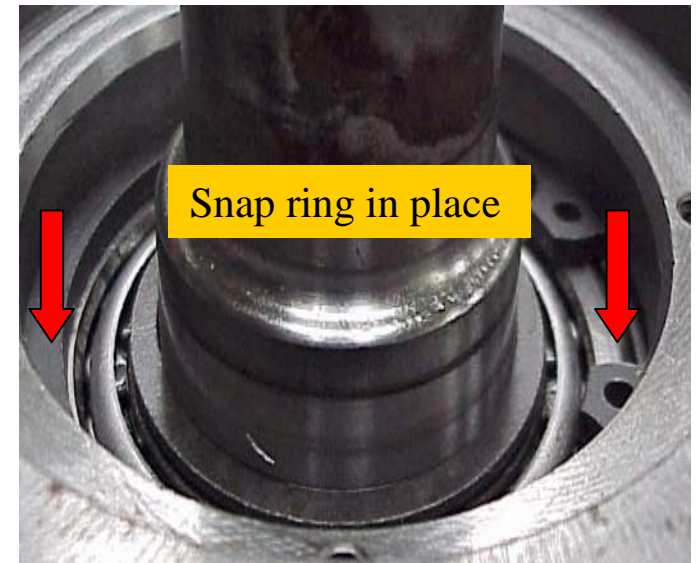
Bearing cone installed



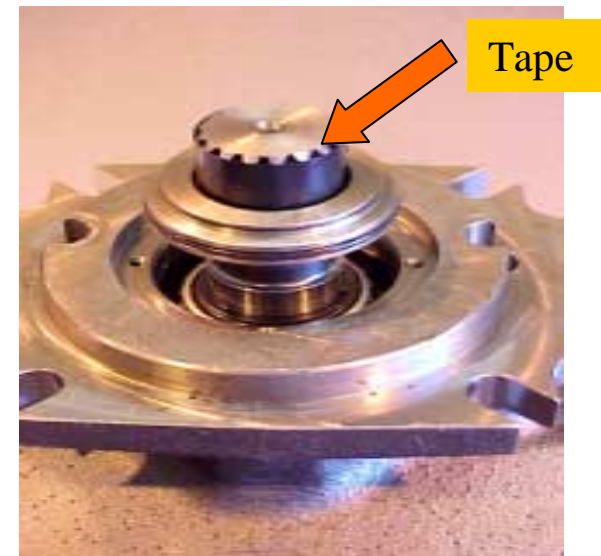
- ⌘ Place drive cover on a flat surface, mounting-pad up.
- ⌘ Install a snap ring into the 2nd snap ring groove inside the drive cover.
- ⌘ Install 1st bearing cone inside the drive cover.
- ⌘ Use the drive shaft assembly to press the bearing cone into its place (it should contact the snap ring).
- ⌘ Insert drive shaft assembly.



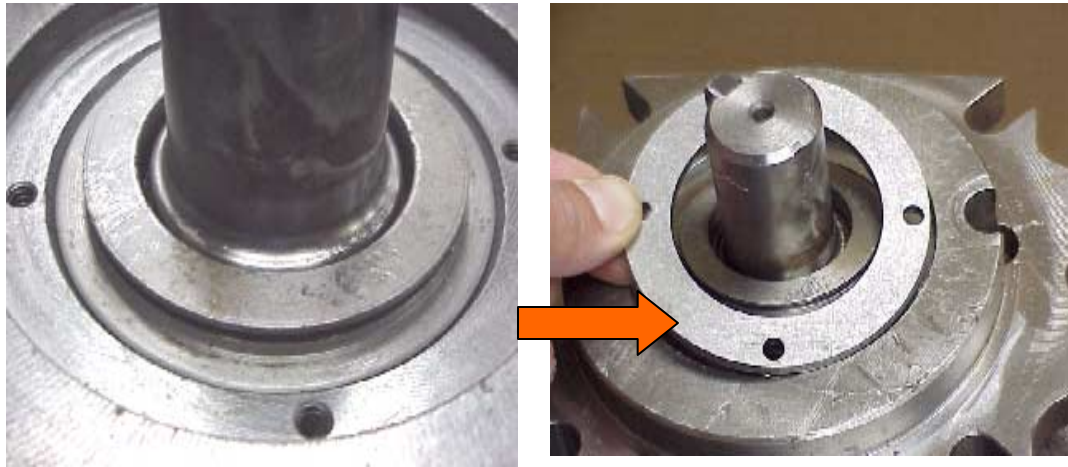
# PVX Pump Assembly



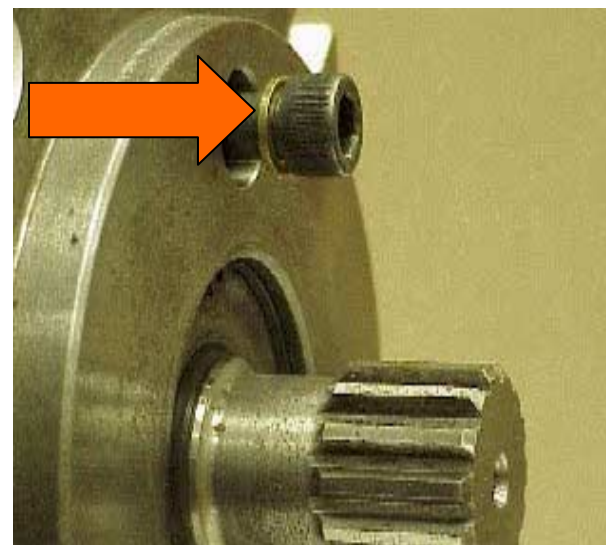
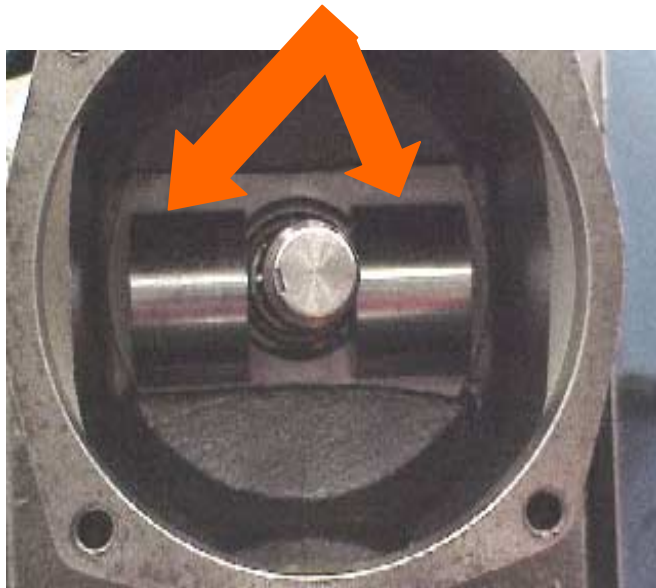
- ⌘ Install 2nd bearing cone inside the drive cover.
- ⌘ Install 2nd snap ring.
- ⌘ Place tape around the front-end of the drive shaft to reduce the risk of damaging shaft seal.
- ⌘ Slip shaft seal over drive shaft and press it down into place.



# PVX Pump Assembly

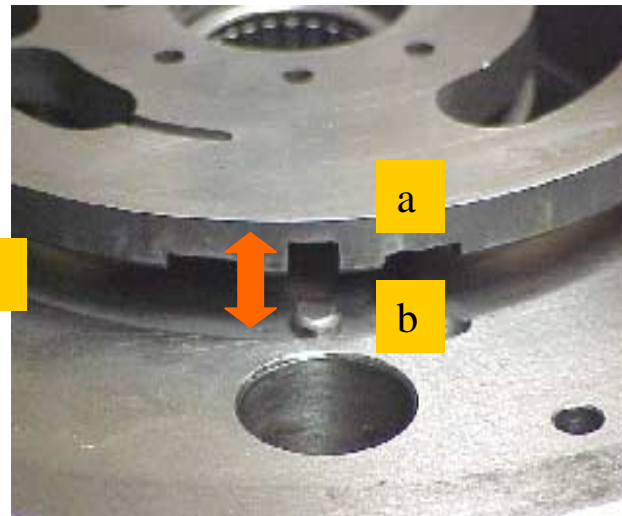
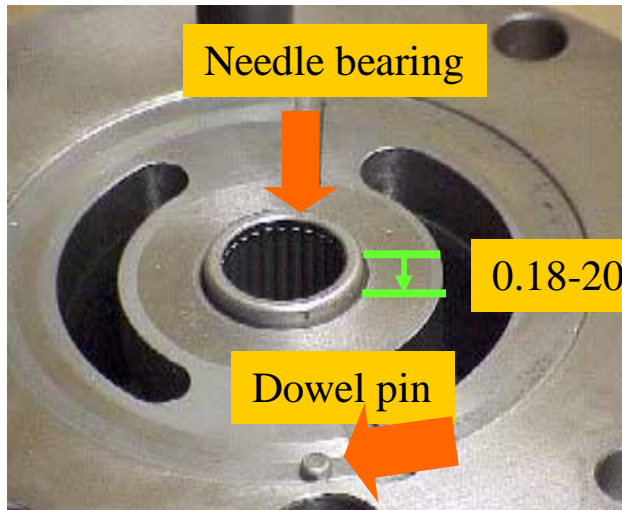


- ⌘ Install shaft seal in place in the drive cover.
- ⌘ Place seal retaining ring into place.
- ⌘ Install the four screws to hold seal in place.

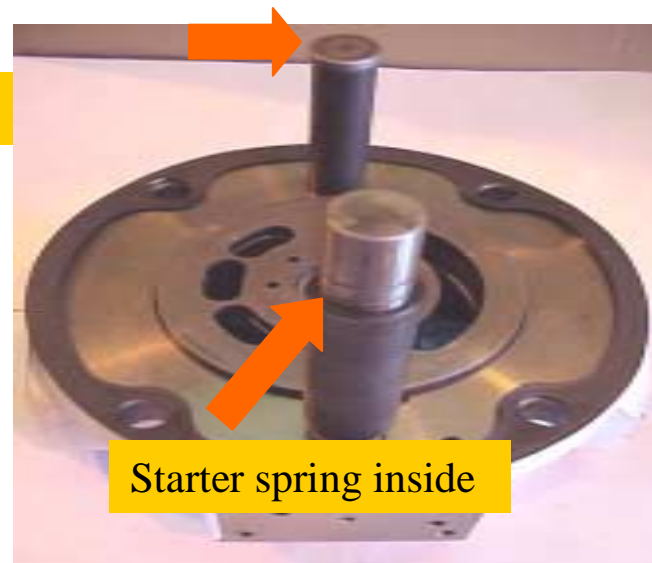
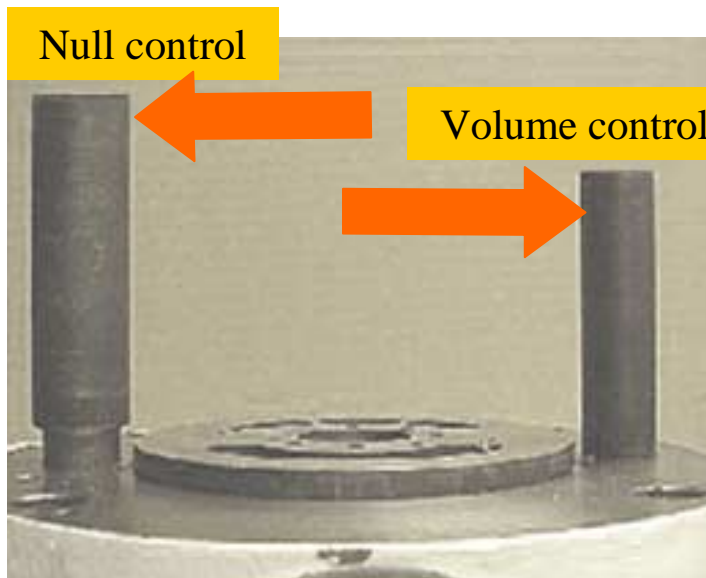


- ⌘ Install bearing blocks into the drive cover.
- ⌘ Make sure to have brass crush washers placed between the drive cover and bolt heads.
- ⌘ Tighten bolts just enough so blocks can still pivot.

# PVX Pump Assembly

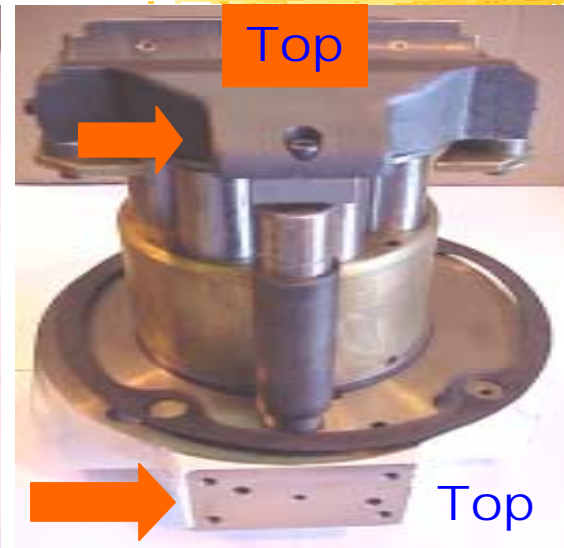
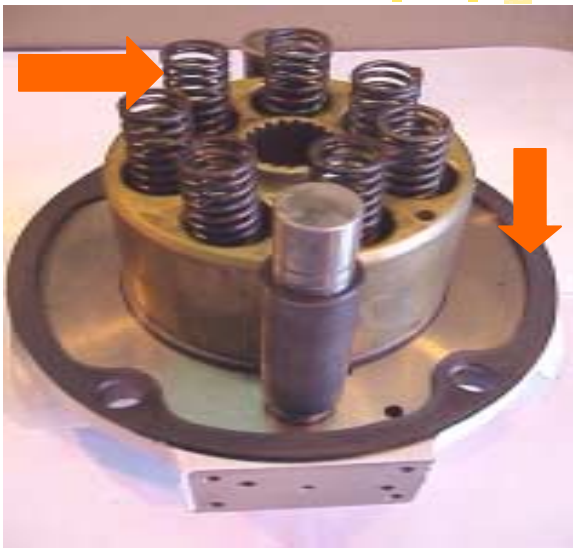


- ⌘ Press needle bearing into port end cover so that its top is 0.18-0.20" above the flat surface.
- ⌘ Install locating dowel pin for the valve plate.
- ⌘ Place valve plate on the port end cover, making sure the center groove on valve plate lines up with the dowel pin.

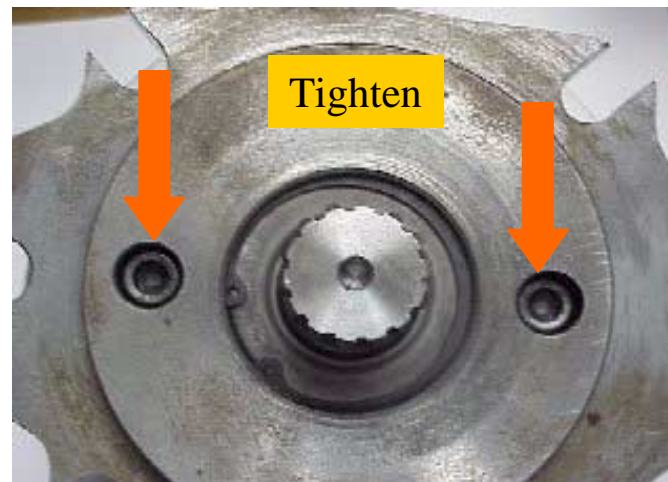


- ⌘ Install null control stem at the top of the pump.
- ⌘ Install volume control stem at the bottom of the pump.
- ⌘ Put starter spring into the null control piston.
- ⌘ Install control pistons into the control stems.

# PVX Pump Assembly



- ⌘ Carefully place rotor on the valve plate and add springs.
- ⌘ Place gasket on port end cover.
- ⌘ Place swash plate assembly on the rotor.
- ⌘ Make sure the roller marked with "T" goes toward the top of the pump.
- ⌘ Slide pistons smoothly into their bores in the rotor.



- ⌘ Place drive cover over the swashplate assembly. Make sure the shaft is snugly engaged within the port end cover.
- ⌘ Install four bolts.
- ⌘ After the drive cover is in place and secured to the port end cover with bolts, tighten bearing block bolts.

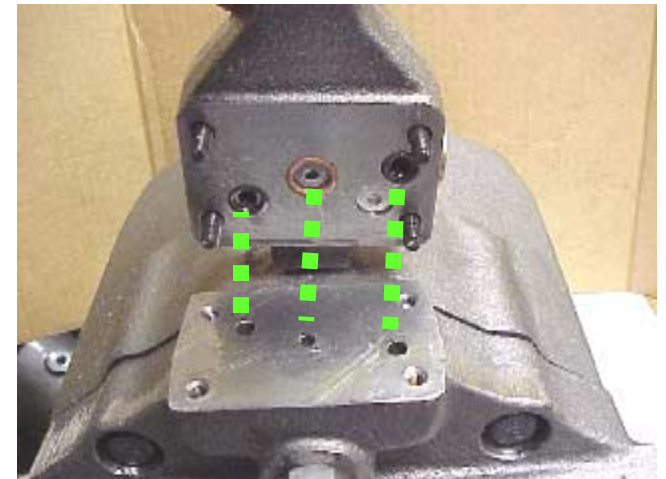


# PVX Pump Assembly

## Assembly Bolt Torquing Requirements

- ⌘ PVX Frame 0 Pumps: 45-62 ft-lbs
- ⌘ PVX Frame 1 Pumps: 85 ft-lbs
- ⌘ PVX Frame 2 Pumps: 150 ft-lbs
- ⌘ PVX Frame 3 Pumps: 170 ft-lbs
- ⌘ PVX Frame 4 Pumps: 105 ft-lbs

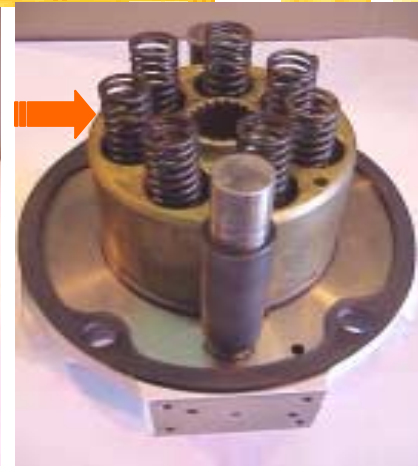
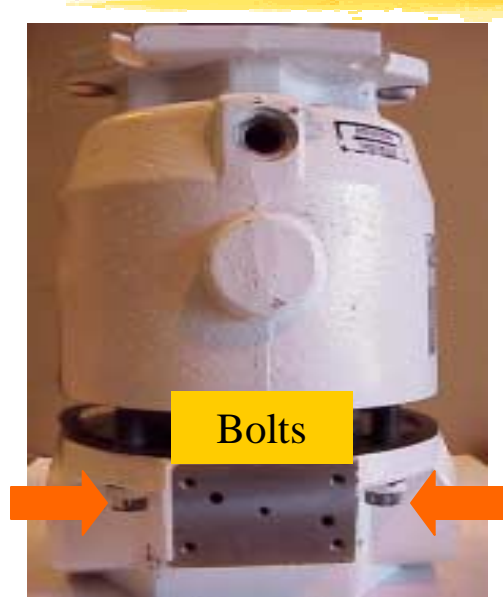
- ⌘ Install controls on the pump.
- ⌘ Make sure O-rings are in place.
- ⌘ Make sure control holes line up with pump holes.



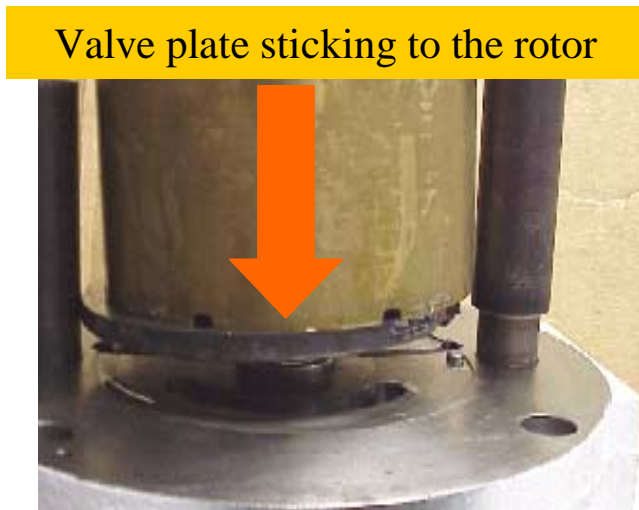
# Pump Disassembly



# PVX Pump Disassembly

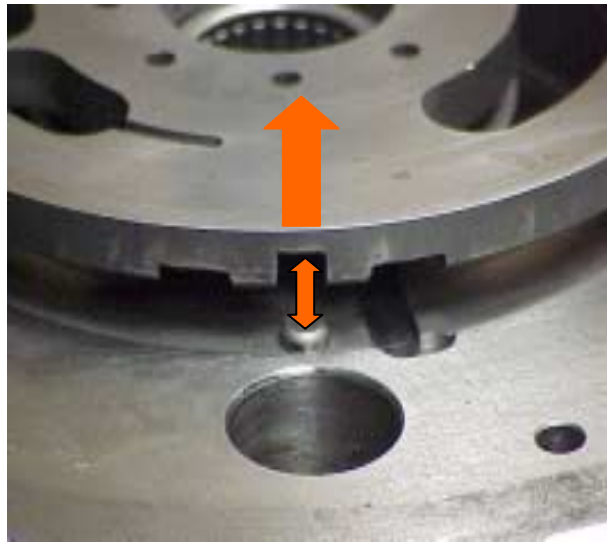
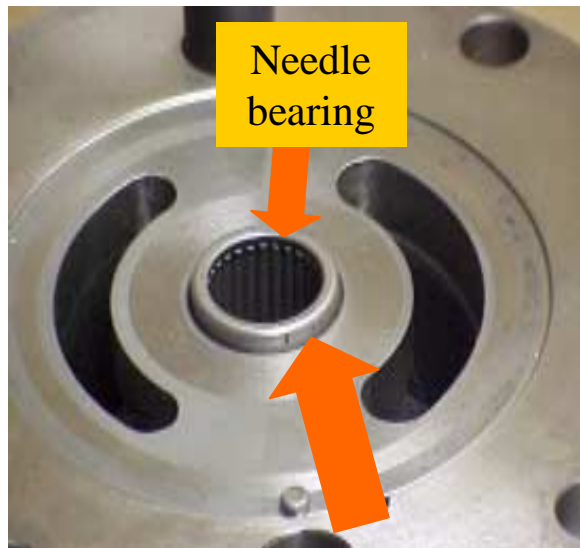


- ⌘ Remove controls without losing the O-rings.
- ⌘ Untorque and remove the four bolts holding drive cover and port end cover together.
- ⌘ Carefully lift drive cover straight up.

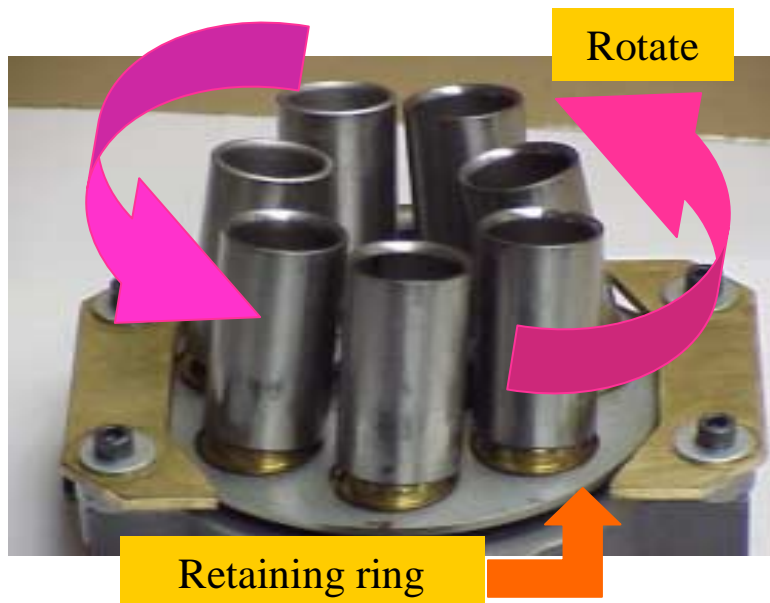


- ⌘ Remove swash plate by lifting it straight up. Be careful not to damage rotor surface.
- ⌘ Remove springs from piston bores and set them aside.
- ⌘ Remove rotor from the port end cover. Be careful not to damage rotor surface.
- ⌘ Note the valve plate might stick to the rotor, so be careful not to drop it. If this happens, damage may occur to the valve plate.

# PVX Pump Disassembly

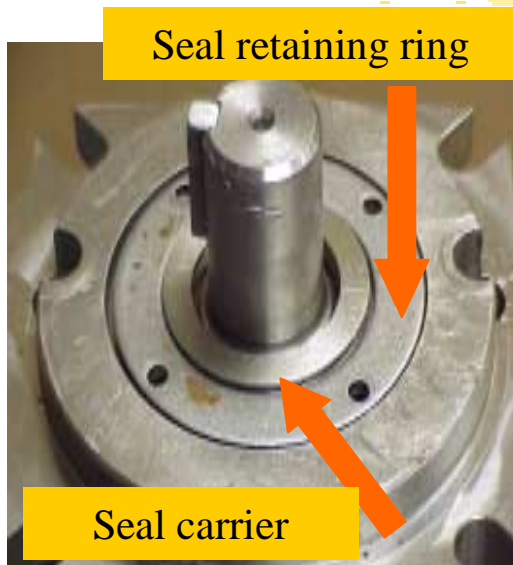


- ⌘ Lift valve plate off the port end cover.
- ⌘ Make sure dowel pin remains in its groove.
- ⌘ Do not remove controls unless fluid was leaking out of stem bores.

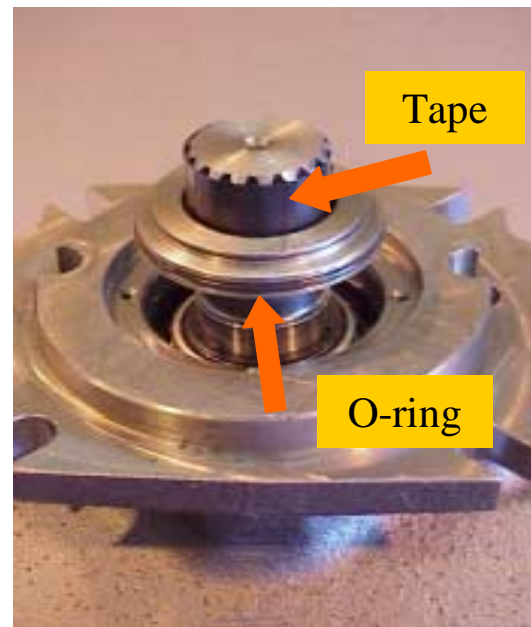


- ⌘ Inspect needle bearing in the port end cover for a possible wear or damage.
- ⌘ Inspect port end cover for any damage. Take the swashplate assembly and make sure the pistons rotate freely.
- ⌘ If the pistons do not move freely, take swashplate assembly apart.
- ⌘ Check retaining ring to make sure it is not bent.

# PVX Pump Disassembly



- ⌘ Take the drive cover and remove the retaining ring of the seal.
- ⌘ Note: only frame sizes 3 and 4 have a seal carrier that can be removed this way.



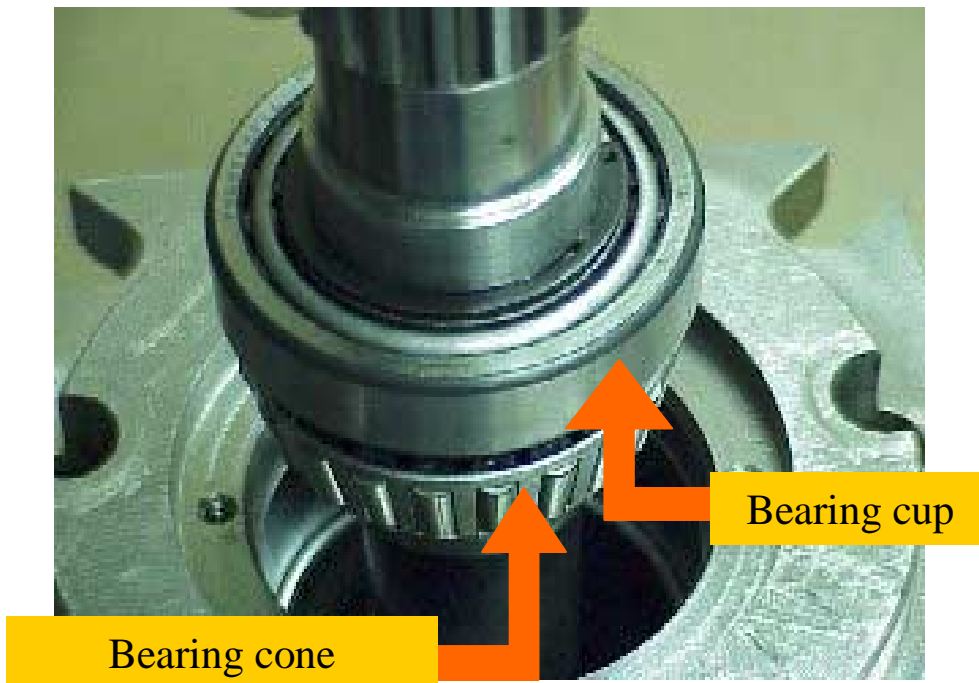
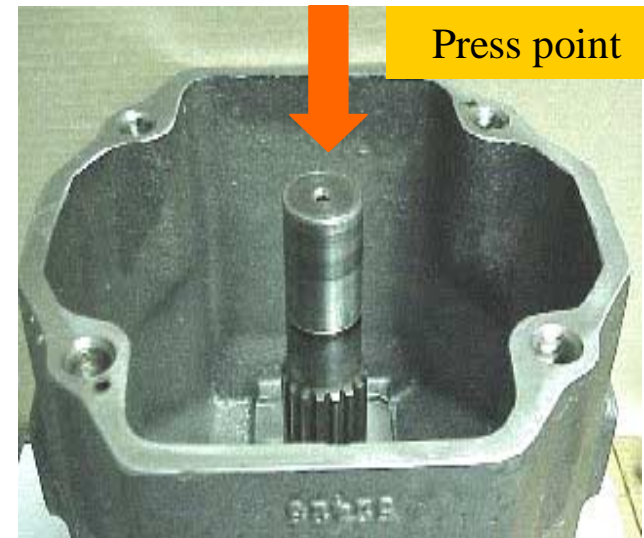
- ⌘ After removing the retaining ring, place tape around the shaft. It will prevent damage to the seal when removing it.
- ⌘ Inspect the O-ring on seal carrier for any cuts.



- ⌘ Remove the snap ring after the seal carrier has been taken out.

# PVX Pump Disassembly

- ⌘ Set drive cover upright and place front shaft end above an trapped opening.
- ⌘ Press drive shaft down gently. When the shaft begins to come out, catch it. Make sure the front end does not hit the floor or a hard surface .

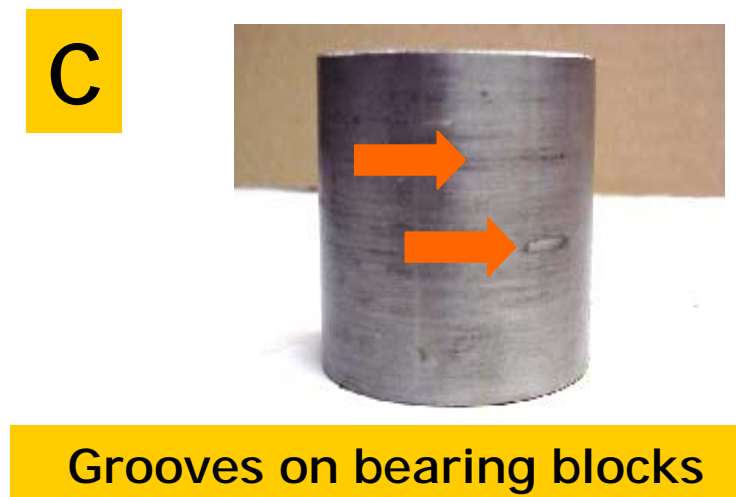
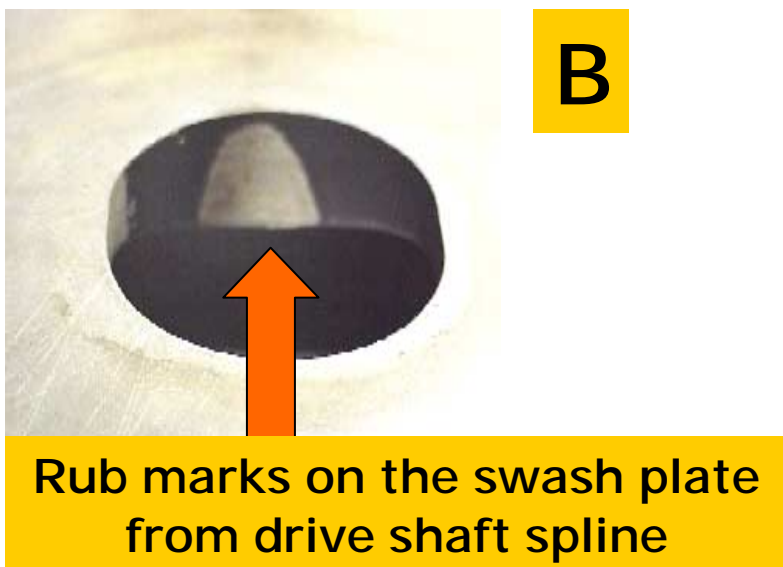
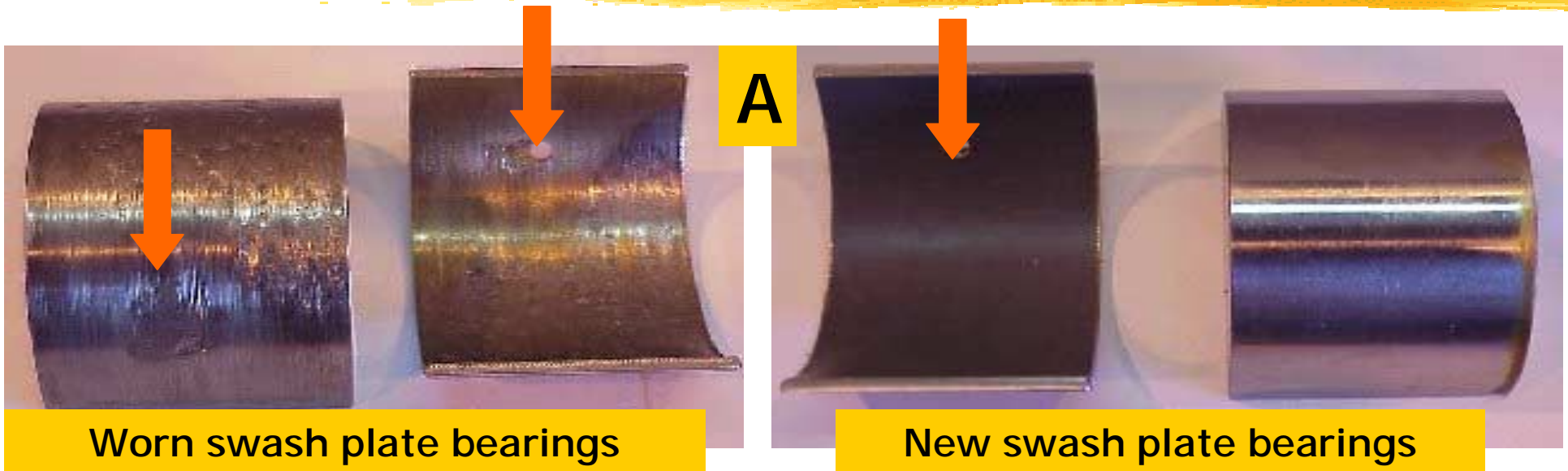


- ⌘ Once the shaft is completely out, inspect the bearings and bearing cups.

# Things To Look For

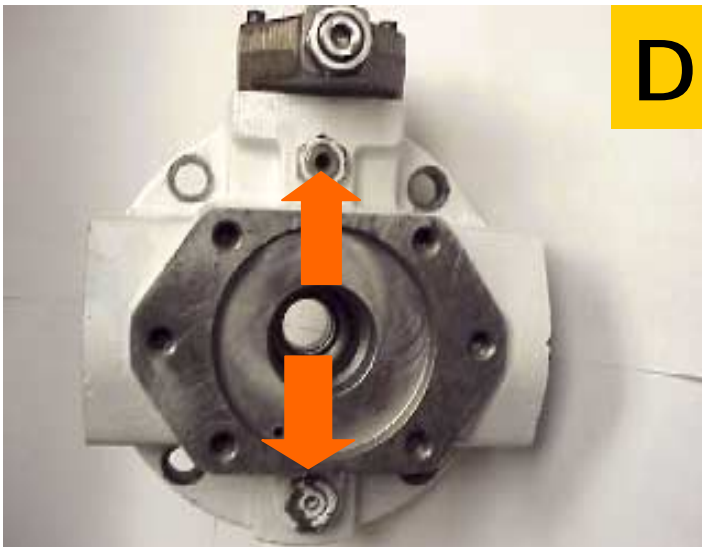


# Things to look for





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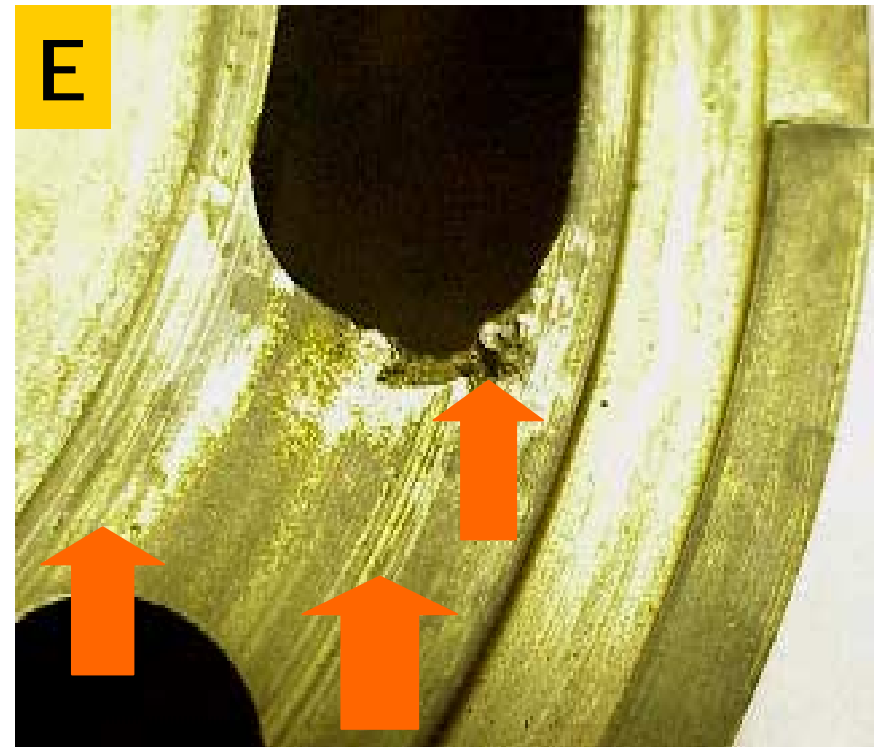


**D**

Fluid leaking or dripping out at the control sites



Take apart the pump and inspect/replace o-rings and backup rings on the controls



**E**

Cavitation marks next to rotor kidneys and/or deep scratches on the contact surface

# Things to look for

Gouging in the spotface area and in the bore itself

(this happens when a hardened bolt is torqued into a softer material)

Re-spotface the area and deburr it  
Replace bolts if the original are worn-out

Use a hardened washer and re-torque only to the level specified

