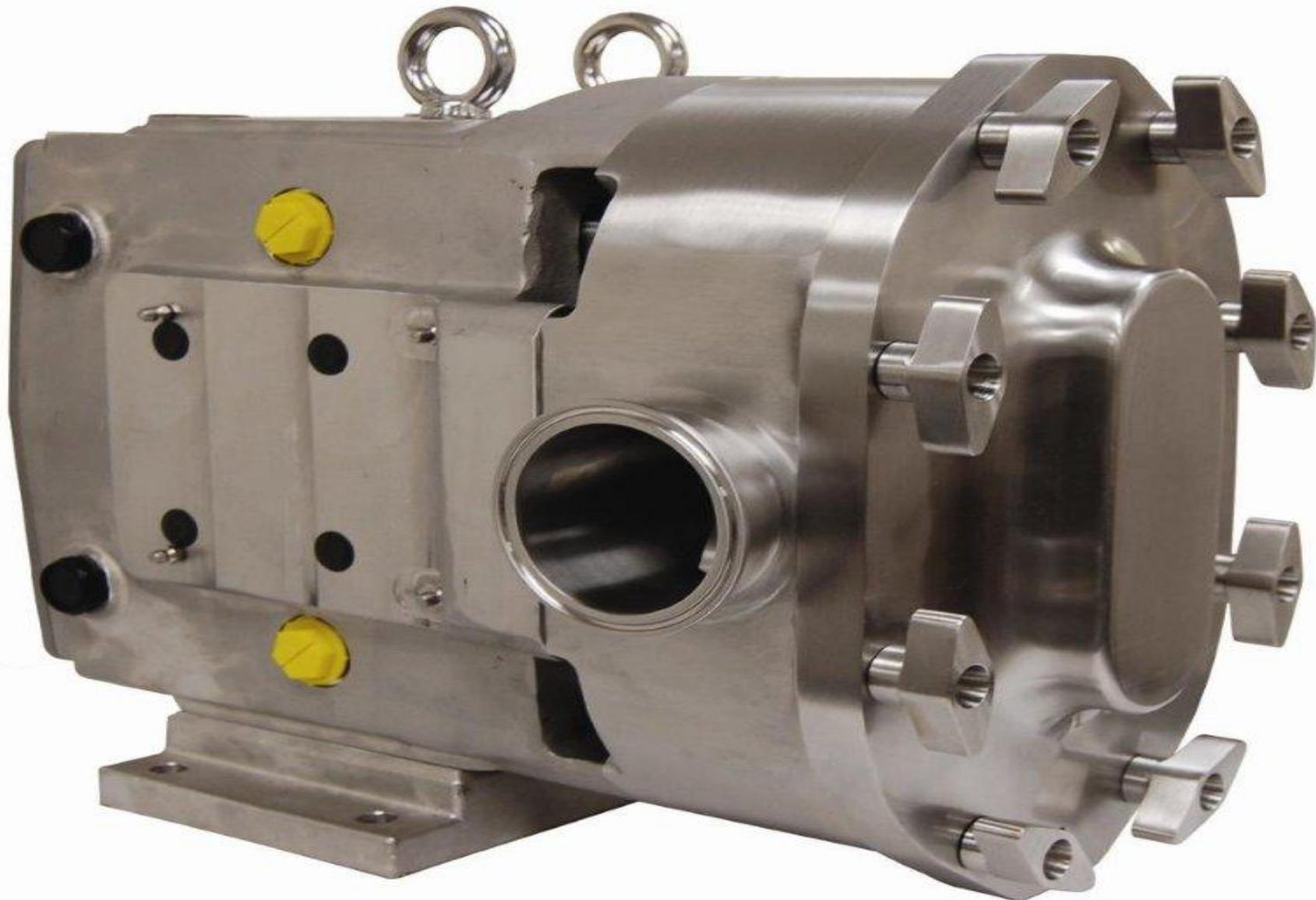


ZP Pump Assembly training



ZP Sub Assembly



Assemble shaft cartridge:

Slide front bearing over shaft, bearing spacer and rear bearing.

Place shaft into press, with spline facing down. Use a sleeve that mates up to the inner race of the rear bearing and press until front bearing is seated all the way to shaft shoulder. You'll hear a loud pop when seated. Also, check with a shim to make sure bearing is properly seated.



(24,25,22,20,19)

ZP Pump Sub-Assembly

Shim Gearcase

Formula used to measure
shim count:

$$A - B = X$$

$$C + X = Y$$

$Y - D + \text{rear clearances} =$
Shimming required.

Place shim kit into shaft
bore, and rest on
shoulder in gearcase.
Use sleeve to ride on
inner race of bearing
and press shaft
carriage into gearcase
until fully seated.

(21,10,13)



ZP Pump Sub-Assembly

Bearing retainer Kit

Use new style “3A” bearing retainer and press in lip seal. Make sure cup is facing inward toward bearing. (Cup should always face what are trying to hold in)

(26,27)



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ZP Pump Sub-Assembly

Silicone and press in retainer kit.

Put a nice bead of silicone around entire retainer. Place over shaft and align to bolt pattern. Try not to turn retainer once seated over shaft as it will spread silicone and possibly lose seal.

Bolt down evenly until tightly secured.



ZP Pump Sub-Assembly

Gear Spacer/Woodruff key.

**Slide spacer over shaft.
Insert woodruff key into
slot. Use light weight
hammer to press into
machined slot...put a
slight angle on key to allow
gear to slide over easier.**

(18,9)



ZP Pump Sub-Assembly

Insert Oil lip seal

Slide lip seal over gear spacer and press into bore evenly until flush with bore face. Cup should be facing up.

Insert Gears

Place right hand gear on first over drive shaft (one dot). Slide left hand gear over short shaft (two dot). Make sure to align dots to match that in the diagram.

*This must be held for timing of rotors.

(11,7,8)



ZP Pump Sub-Assembly

Gear/lockwasher/lock-nut assembly

Place the lockwasher over shaft...tab slides into machine groove

Thread locknut onto shaft. Use locknut tool and torque wrench to properly torque nut to defined torque values. They are listed in Maintenance Manual.

Once set bend tab from washer into nut slot.

(5,6)



ZP Pump Sub-Assembly

Backplate alignment:

Silicone back of gearcase. Use backplate alignment tool to hold shaft concentricity. Do not move plate around once on gearcase, as it could displace silicone and allow leaking. Bolt down evenly.

Press seal into backplate. Cup facing down.

(1,2,4)



ZP Pump Sub assembly



Install the sealed cleanout hole plugs. Install Oil plugs, and fill sub with the proper amounts of oil. See Manual...amounts very by shaft position.
Grease Bearings...see manual

ZP1 Fluid End Seal Options.

Seal Options:

1. Single O-ring



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2. Double O-ring

3. Single mechanical



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4. Double Mechanical



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ZP1 Fluid End Seal Assembly

Single O-ring Assembly

Put O-ring on
shaft groove
closest to spline

Slide sleeve over
shaft. Make sure
prongs slide past
the drive pin.

If notch, make
sure pin goes
inside of slot.



ZP1 Fluid End Seal-Assembly

Double O-ring:

Insert body O-ring and outer O-ring into carrier and seat it in the back of body shaft bore. Make sure slot goes into seal pin.



ZP1 Fluid End Seal-Assembly

Single Mechanical:

Place O-ring in shaft groove furthest from shaft spline



Slide Seal seat over shaft; make sure seal notch fits over drive pin.



ZP1 Fluid End Seal-Assembly

Mechanical seals:

Place wave spring over inner seal. Press inner seal into shaft bore on back of body. Make sure seal pin and notch in seal are aligned.



For a double seal place O-ring on outer diameter of outer seal and press into back of body outside of inner seal. Make sure seal pin and notch in seal are aligned.



ZP2 Fluid End Seal-Assembly

Single Mechanical:

Insert O-ring into shaft groove. There is no drive pin on the ZP2. The shaft shoulder is machined to match up to seal profile.



ZP2 Fluid End Seal-Assembly

Single mechanical:

**Slide wave spring over inner seal.
Insert O-ring into inner seal groove.
Place inner seal into back of body.
Press into shaft bore; make sure notch in seal matches up to seal pins.**



ZP2 Fluid End Sub-Assembly

Double Mechanical:

On the ZP2 there is an outer wave spring. Place wave spring into seal bore. Insert O-ring into outer diameter of outer seal, press into seal bore on top of wave spring. Make sure notches in seal aligns with seal pins



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ZP Fluid End Assembly

Seal bore differences:

The seal bore on the ZP1 has an O-ring groove machined into the shaft bore and has one seal pin.



The seal bore on the ZP2 has no groove machined into the shaft bore. The O-ring is incorporated into the inner seal. Also has three seal pins.



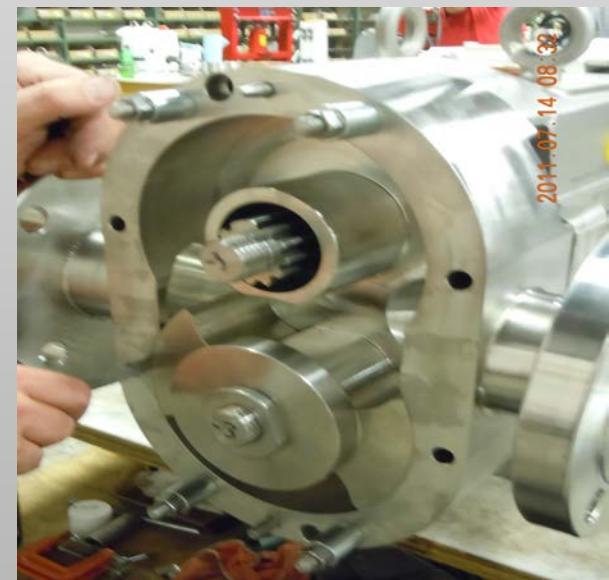
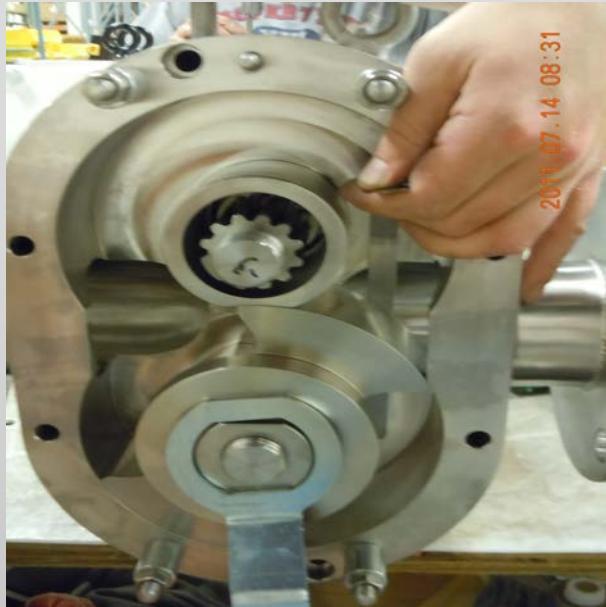
ZP Fluid End Assembly

Internal clearances:

Use feeler gage and check backface. BF is the most important clearance in pump.

Use feeler gage to check radial clearances, and crossover.

Use depth mic to determine cover clearance.



ZP Fluid End Assembly

Body O.D. adjustments:

**Hit body pin
(opposite direction)
to move body to
center clearance.
Re-check clearances
again. Repeat steps
if needed.**



**If rotor rubs on
cover, hit front
dowel pins (same
direction) to center
cover. Re-check
clearances again.
Repeat steps if
needed.**

