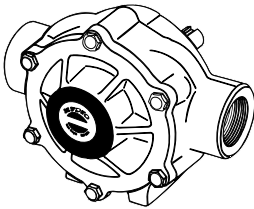


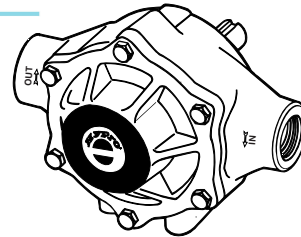
## Repair Manual

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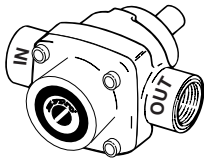
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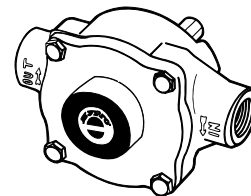
**Series 1502  
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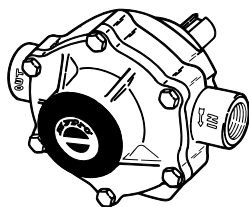
**Series 1700  
5-Roller Pump**



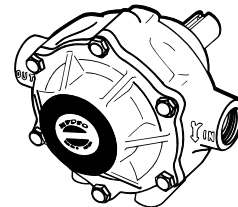
**Series 4001 & 4101  
4-Roller Pump**



**Series 6500  
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**Series 7560  
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**Series 7700  
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# REPAIR

## Repair Instructions

### To Take the Pump Apart

1. Remove the adapter from the pump shaft, if equipped.
2. File off any burrs on the pump shaft.
3. Using a screwdriver, pry off the bearing cover on the endplate and pump body.
4. Remove the endplate bolts.
5. Support the pump at its ports in a support fixture with the endplate down. Wood blocks may be used. Place on press bed. Center press on pump shaft and apply pressure to press the pump apart (See Figure 9).

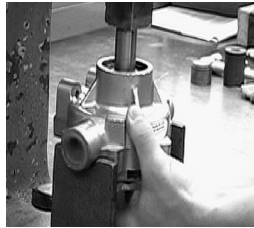


Figure 9



6. With the rollers exposed, remove them. When replacing damaged rollers, always replace the full set.
7. To remove the rotor with shaft from the endplate, support the endplate in a support fixture with the rotor down. Center a 3/8" bolt on pump shaft. Apply pressure to press shaft out of ball bearing (See Figure 9).
8. To remove the ball bearing, place the endplate in a support fixture with the front of the endplate down (See Figure 10). Center bearing support tool, and slowly press bearing out of casting. Repeat procedure to remove bearing from pump body (See Figure 10).
9. After removing the ball bearing, check the seals in both endplate and pump body. If wear is evident or leakage has been noticed, punch the seals out with a screwdriver and hammer. Seals cannot be removed without damaging them.



Figure 10



10. To press the shaft out of the rotor, first carefully wash the rotor and shaft - removing all traces of rust and other foreign matter. Use steel wool or emery cloth, rinsing parts afterward to wash off all emery dust. Remove the Allen set screw. Support the rotor in the press through the slot in the base and press shaft through.

### While the Pump is Apart

Carefully inspect all parts for wear, such as:

- Undersize or swollen rollers in both length and diameter.
- Worn seals.
- Worn shaft at drive end, and pitted or grooved at the seal area.
- Rough bearings and loss of grease from the bearings.
- Undersize rotor and/or worn roller slots.
- Excessive wear in body - both on inside diameter and at back face.
- Body cracks at the bolt holes and at the o-ring sealing area.
- End wear (body, endplate and rotor).
- Damaged o-ring in the endplate.

After the above parts have been checked and the various points have been considered, decide if the pump is repairable. If repairing the pump, be sure to inspect inside of endplate. If a groove is noticeable, the endplate should be replaced.

**ATTENTION: If an attempt has been made to pry the pump apart with a screwdriver, be sure to file off all nicks, burrs and other damage marks around the bolt holes.**

## Repair Instructions - cont'd.

### Re-Assembly

#### Replace Seals and Bearings

Carefully place the seal in the pump body with crimped side down. Press the seal to the bottom of the cavity. Then put the bearing in position in the pump body and press into place (Figure 11). Repeat the above procedure with the endplate. Seat the o-ring in the groove. If necessary, make sure the o-ring stays in place by stretching it.

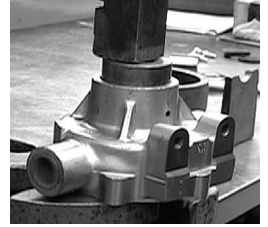


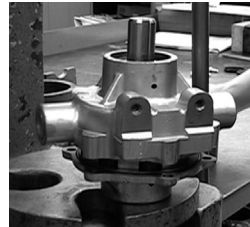
Figure 11

#### Assemble Rotor and Shaft to Endplate

1. Install the shaft rotor assembly by carefully pushing the short end of the shaft rotor assembly through the shaft seal into the endplate. Place in the arbor press with the drive end of the shaft pointed down and press the assembly together (Figure 12). Leave just enough clearance between the rotor and endplate so that rotor can be turned by hand. If it turns too freely, sand a little more off the body end that faces the endplate. You should notice a slight drag, but be able to turn shaft with an adapter on it, by hand. The "slight drag" will wear off after the pump has been used a short time. Installing new rollers, seals, bearings and shafts will not prove entirely satisfactory for volume and pressure unless end clearance is taken up.



Figure 12



**ATTENTION:** Before new parts are installed, all burrs should be removed, particularly in the rotor slots and body. Do not machine clean the body casting. A more satisfactory job can be done by hand cleaning with an emery cloth.

2. Remove the assembled portion from the arbor press and invert it on the press table. Then place rollers in the roller slots as close to center of rotor as possible. Place the pump body over rotor and shaft, and carefully ease the end of the shaft past the lips of the seal in pump body (Figure 12). Slowly press the pump body down to fit the endplate (Figure 13).
3. Turn pump over; line up bolt holes and replace assembly bolts. Alternately and evenly tighten the bolts as shown (Figure 13).

**ATTENTION:** After bolts have been tightened, check to see if rotor is centered in pump case. Try to turn the pump shaft, using a crescent wrench on the shaft as a lever.

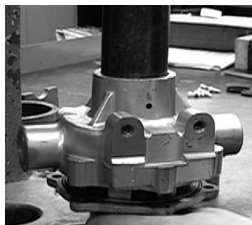
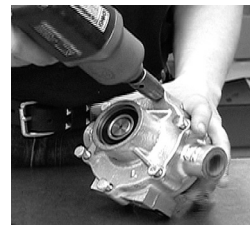


Figure 13



#### Center Rotor in Pump Case

If pump turns hard:

1. Place short brass rod (or hardwood dowel) against end of shaft (Figure 14). Center rod on shaft (not on bearing). Tap lightly with hammer. Try turning shaft again.



Figure 14

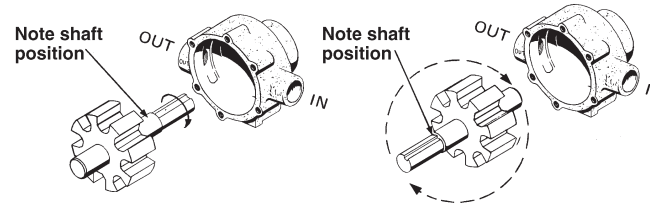
2. If this fails to center the rotor to where it can be turned freely, tap other end of shaft, protecting it as above. When the shaft can be turned by hand, using wrench as above, it is not binding.

## Reversing Rotation

1. Determine the rotor type of your pump by referring to exploded drawing on the parts list. The three types of rotors are NON-SCOOP, SCOOPED, and SLANTED SLOT.
2. Follow the steps listed in Repair Instructions for disassembly of the pump.
3. If your pump has a NON-SCOOP rotor (4001, 4101, 6500, 7560), it can be reversed merely by turning the rotor/shaft assembly around intact (without changing the position of the rotor on the shaft). Reassemble the pump with the driving end of shaft out the endplate side of the pump. (Standard pump rotors are driven from the body side.)
4. If your pump has a SCOOPED rotor (1500, 1700) or a SLANTED SLOT (7700) rotor, follow the following steps for reversing the shaft in the rotor.
  - a. Loosen and remove the rotor set screw.
  - b. Press the shaft out of the rotor.
  - c. Reassemble the shaft and rotor with the driving end of shaft on the opposite side of the rotor from standard assembly.
  - d. Before installing the rotor on the shaft, be sure it is positioned in the correct location on the shaft (diameter of shaft is slightly larger at rotor position). Center punch the shaft through rotor set screw hole. Then with a drill smaller than set screw - spot drill shaft so that set screw will hold securely. (Don't drill too deep - just enough so set screw will bite into shaft).
  - e. Reassemble the pump with driving end of shaft extending out of **endplate** side of pump. (The standard pump rotor is driven from the **body** side.) Remember, the rotor position remains the same - the shaft only is reversed - "end for end."

**Note: Configuration is opposite from above for 4001 and 4101 series.**

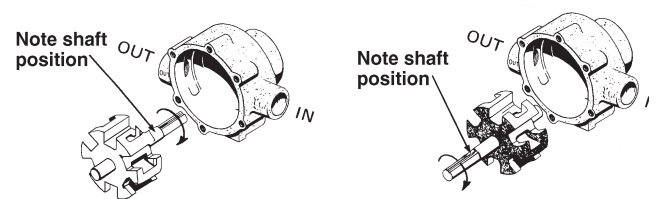
### Standard NON-SCOOP Rotor



Standard **CCW** rotation to **CW** rotation

**Figure A**

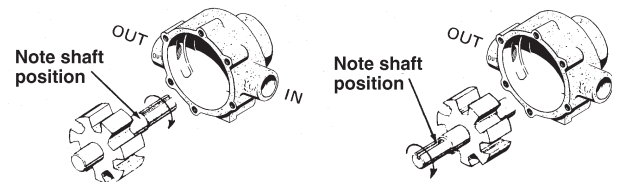
### SCOOPED Rotor



Standard **CCW** rotation to **CW** rotation

**Figure B**

### SLANTED SLOT Rotor



Standard **CCW** rotation to **CW** rotation

Diagram of 7-roller rotor with special slanted, wide roller slots (Series

7700). Note that slots should slant back from rotation direction.

**Figure C**