

## SERIES 1 TRACTOR PUMP DISASSEMBLY, REBUILD AND ASSEMBLY PROCEDURE

### TO DISASSEMBLE & REASSEMBLE TRACTOR PUMP;

Remove any gear from pump input shaft.

Loosen the setscrews at the front of the pump. The 4 set screws (1/8" Allen) at the perimeter of the pump lock the studs that assemble and align the pump into place.

The easiest way to work on the pump from this point on is to drill a 3/4" hole through a flat surface like a table or bench top. Stick the drive shaft into that hole, and the pump is ready to work on from the back. Use acetone or lacquer thinner to clean the pump along one side and apply the stick-on numbers to each section. This will help with reassembly. Number the sections from front to back.

Remove the 3 screws (3/32" Allen) from the bearing cover and remove it.

Next if this is a 2 regulator pump with idler set screws in the rear regulator, remove the idler shaft set screws set in the back of the end regulator next to the bearing cap. There are 2 set screws on top of each other. The setscrew (3/32" Allen) helps locate and lock the idler shaft in place.

Unscrew and remove each of the 4 studs (1/4" Allen or 5/16" hex) that assemble the pump. Older pumps use a thin silicone film to seal between the sections. Newer pumps use o-rings.

Remove the snap ring from the back of the drive shaft and lift off the regulator housing.

Remove each section and gear set. Gear keys may have to be pulled out with pliers. Keys must be removed before the next section can be removed. Keep components together and in order.

Between sections pumping different fluids will be a double seal section. This seal section uses a cover plate to protect the 2 back-to-back seals installed on each shaft. The cover plate is sealed to the seal carrier with an o-ring. Pull the seal carrier off of the shaft with a slow rocking motion. Then remove the cover plate. Depending on the pump this plate is either .030" or .250" thick.

Pumps may also incorporate a bearing section between engine pressure sections or in conjunction with the seal section. These support the drive and idler shaft in high-pressure applications. Again a cover plate with an o-ring is used. Remove both from the pump assembly. Note that the bearing is on the drive shaft, and if the section incorporates a crossport, it is located on the outlet side of the pump.

If the pump is sealed with silicone, all silicone must be removed from each surface before reassembly. Flat sanding with solvent using 320 or finer paper on a granite plate, a ground surface or any really flat area is fine. Or clean by hand with Scotchbrite or similar scrubbing material. If the pump does not have o-rings, or in an emergency on an o-ringed pump, apply a thin coat of silicone to each of the bodies only as you reassemble the pump. If you are using silicone to assemble the pump be prepared to complete the assembly once you start. If the pump uses o-rings, make sure each o-ring is properly seated in its groove before assembling each piece. Originally the pump was designed without o-rings. When we retrofitted the o-rings it was necessary to use a custom, thin body o-ring in order to fit them into the bodies. As such they are more fragile than most, and care must be used in installing them. It is recommended that body o-rings always be replaced.

If the pump incorporates a front mounted regulator, install this onto the front body after inserting the drive shaft into the front body. The idler shaft will pocket into this regulator, rather than the front pump body. Then continue assembly of the pump, first the gears, then the body, then the next separator.

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Again at this point, please use great care to make sure the o-rings are properly seated in the grooves of each part before assembly. Oil or grease can be used to hold them in their respective grooves.

When assembling a bearing section into the pump, take care to make sure the bearing in the plate locates on the drive shaft, not the idler shaft. Also make sure that if a crossport is incorporated in the section, it is installed to the outlet side of the pump. Depending on the particular assembly the cover plate may be installed first or second relative to the bearing carrier plate. And use care to insure that the o-ring between the cover plate and carrier plate is installed properly.

For pumps with seal sections, remove all the seals from the plate. Lightly oil the bores of the seal section with oil to allow the seal to slide into the bore. Push the seals into the bores so that the open side of the seals face AWAY from each other. The closed side of the seals will face each other. Make sure they are bottomed in the bore and there is no part of the seal protruding past the face of the section. Install the shaft o-rings in the shaft bores. Grease the seals. Fill the small "V" created between the seals with grease. When assembling a seal section care must be taken to prevent damage to the seals when pushing the section over the ends of the drive and idler shaft. First assemble the cover plate on to the pump from the back end. It will always be a solid plate, without crossport. Install the section O-ring into the groove in the seal carrier. Then using grease or oil on the ends of the shaft, work the carrier plate over the ends of the shafts with a "walking" or "wiggling" motion gently to prevent cutting the seal. The idea is to 'walk' the leading edge of the front seals over the end of the shafts and the bearing step in the drive shaft. Once the seals are over those parts, it can be slipped home onto the cover plate. Again make sure that the o-ring is in place between the seal carrier and the cover plate.

Once the end regulator housing is reinstalled, push each of the studs through its hole until it stops at the front bearing body. Make sure there is a washer under the head of the nut on each stud. Once all 4 are pushed to the front of the pump, begin screwing the bolts in. Once all the slack is taken up check to make sure the pump spins freely on all 4. Then tighten all 4 evenly until they are hand tight with a normal short Allen wrench. If possible use a torque wrench to tighten to 45-50 inch pounds. Reinstall the snap ring and the rear bearing cover.

If equipped with rear regulator set screws, install the first setscrew. It should be at least 3/8" long. Turn it in with normal hand torque until it stops. We are not trying to load the idler shaft, just push it to bottom in the pocket at the other end of the pump. Then install the 2<sup>nd</sup> setscrew on top of the first. Set screws we supply use an applied sealer patch to seal and lock the setscrew in place. If not available, any sealer, such as silicon, will help prevent any leaks. Check the pump again.

If the pump uses a front idler shaft set screw, turn the pump around and tighten the idler shaft set screw hand tight (some older pumps do not have one). Then hand-tighten the 4 stud set screws. Again the setscrews we supply have an applied sealer to seal and lock the screw in place. Otherwise use a thread sealer or silicon to seal and lock the threads. Removable Loctite (blue) is OK.

**IF YOU HAVE ANY PROBLEMS OR QUESTIONS, CALL US!**