

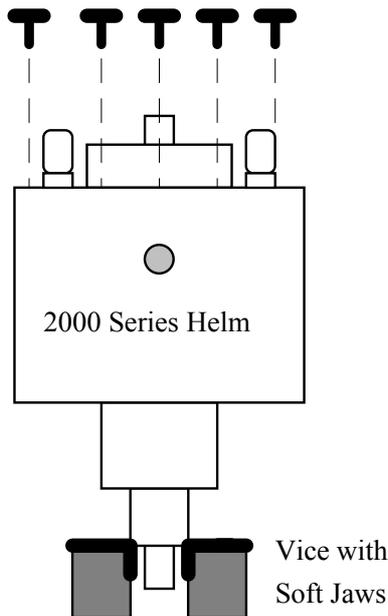
TECHNICAL BULLETIN 2000

SERVICE PROCEDURES - "2000" Series Helm Units -DISMANTLING

Great care should be taken when dismantling "2000" series helm pumps, as serious damage can be caused by incorrect procedures being followed. The drawings below and the detailed instructions will ensure simple and safe dismantling at all times.

Step 1. Remove the steering wheel retaining nut or bolt and place the helm pump in a vice with "soft-jaws" to avoid damage to the shaft. Hold firmly on the steering wheel portion of the shaft. Remove all the screws from the end-plate as shown. On very old models there may be a circlip on the auto-pilot shaft. this too should be removed.

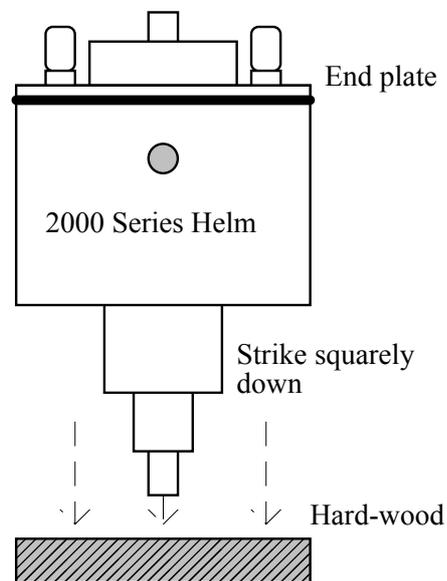
BASIC DISMANTLING Step 1



Step 2. Place a piece of hard wood on the floor or solid bench, and holding the pump vertically, strike the front shaft directly and squarely onto the piece of wood. The wood is to avoid damage to the steering shaft.

Strike firmly enough to dislodge the end-plate clearly from the pump body. You will see the

O-ring seal clearly through the gap. DO NOT use a screw driver to pry off the end-plate.
BASIC DISMANTLING Step 2

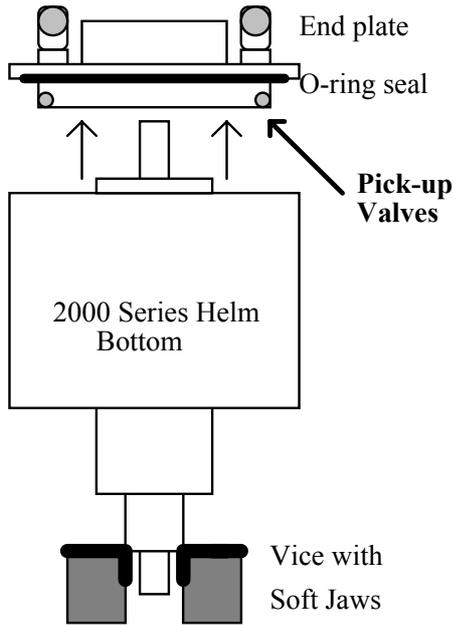


Step 3. Replace the pump in the vice, and then taking the end-plate in your hands pull it squarely up and off the autopilot shaft. A little oil will assist in passing over the shaft. Make sure there is no rust or paint build up on the shaft prior to doing this.

If the problem is simply dirt in the pick-up valves, then there is no need to proceed further with stripping the helm unit. You need simply inspect the valves which are located in the end-plate you now have in your hands. These valves can be simply washed and blown out while still located in the end-plate. They should only be removed from the casting if there is something trapped that cannot be blown out. Keep in mind these are not wearing

parts and it should never be necessary to replace them.

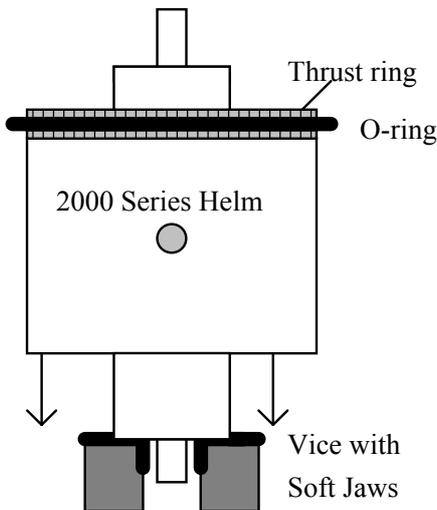
BASIC DISMANTLING Step 3



Step 4. Should it be necessary to strip the helm further then push down on the body of the pump unit until the casting touches the vice jaws. If you have the pump in the position shown, then the thrust ring will be partially exposed at this time.

Take the large O-ring from the seal kit and place it around the needle rollers on the thrust ring to keep them firmly in place. Failure to do this will result in over 100 needle rollers being spilled all over your floor.

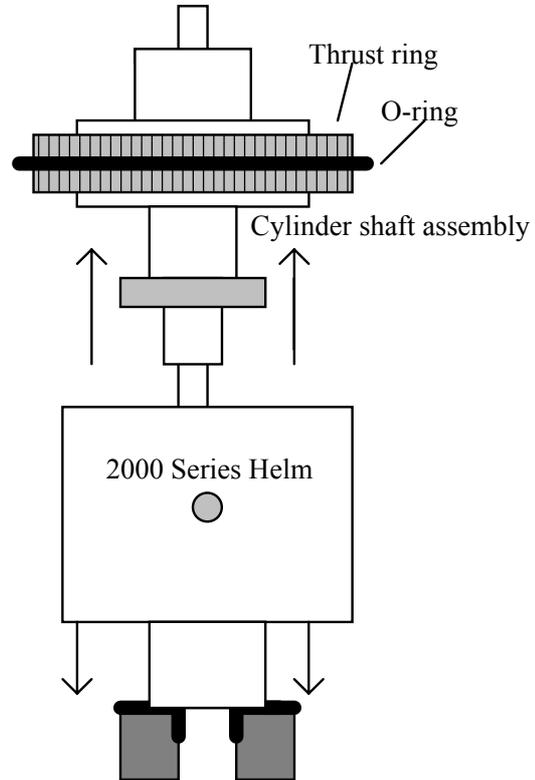
BASIC DISMANTLING Step 4



Step 5. Having locked the needle rollers into the thrust ring with the O-ring, now gently open the vice jaws and then pull the cylinder

shaft assembly completely out of the body. You will now have the entire cylinder shaft, thrust ring and pistons in one item. If you are simply replacing the seal in the front of an old model helm pump then do not dismantle the unit further. Simply replace the front seal and re-assemble the unit as per the later instructions.

BASIC DISMANTLING Step 5



Step 6. To remove the thrust ring from the cylinder shaft and pistons, replace the cylinder shaft in the vice. Holding the thrust ring in two hands, rotate the ring as if two of the pistons were an axle. This means that one hand will rise and the other will fall. This exposes two pistons which are spring-loaded and which must be caught during this process.

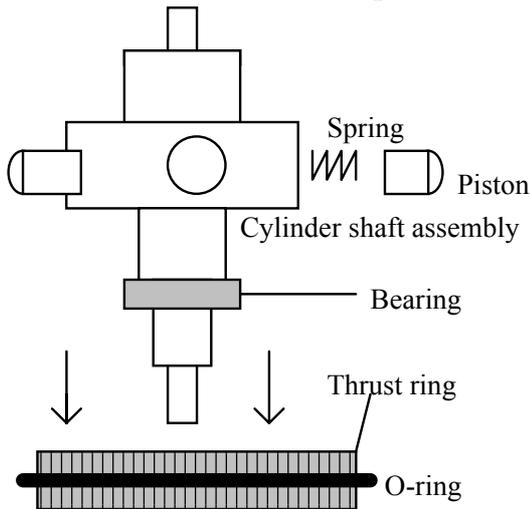
Having released two pistons, repeat for the other two and the ring will end up on top of the vice. Take care not to dislodge the O-ring from the thrust ring and release the needle rollers.

Some model pumps are fitted with bearings on the front shaft, and many early models are not. These bearings will probably never require replacement at any time due to their heavy duty design, so do not remove them.

Once dismantled, thoroughly clean the parts with clean turps or kerosine and wipe or blow

dry. Avoid contamination with fluff or lint from rags etc.

BASIC DISMANTLING Step 6



Re-assembly is a matter of reversing the order of dismantling exactly.

Firstly re-assemble the cylinder shaft assembly complete with pistons, springs and thrust ring.

When you attempt to install the cylinder shaft back into the pump body make sure that the O-ring and shaft is greased to avoid damage during re-introduction of the shaft.

Place the body over the vice with the jaws open, insert the shaft into the body until the thrust ring rests against the casting. You will see that the hole in the body is eccentric to the main bore. Simply push the thrust ring, compressing the springs on the pistons, until the thrust ring lines up with the pump bore, then it will slip into the body. Remove the O-ring when the thrust ring is almost fully introduced.

When the pump shaft is far enough through, grip the shaft in the vice. Now lift the body firmly up and rotate at the same time until you feel the body snap into place over the O-ring and the bearing (if fitted).

Now re-fit the end-plate, making sure that you grease the O-ring seals on the autopilot shaft and outside diameter. There is very close tolerance between the end-plate and the main steering shaft so be very careful to line it up. DO NOT FORCE IT ON - if it jams, take it off and start again. Steady hands and patience is essential. Use the pins in the body (or the end-plate) to align the position of the end-plate.

You will probably need the assistance of one other person to complete the task.

When the end-plate is loosely positioned with the 4 pins (2 on older models) located correctly and partially introduced into the mating holes, take firm grip with two hands on one side and two on the other, firmly pulling the end-plate and the body together. This is where the extra hands make it simpler.

Now that you have fitted the end-plate fully into the body, you can re-install the screws. BE CAREFUL when tightening the screws. DO NOT simply insert and tighten one at a time.

Instead, screw them all up until they only *just* touch the end-plate. Then when they are all at the same *light* tension, **GENTLY** tighten a bit firmer, and work **DIAGONALLY** tightening opposite screws in a constant rotation pattern until they are all evenly tight.

Because of the very fine tolerances in the end-plate, if you overtighten one side too soon, you can seize the pump or at best, make it very stiff to steer. Have patience and you will get it right the first time.

Follow these careful steps at all times, and you should never experience problems in dismantling HyDrive "2000" series helms.

The Skipper series are totally different and Bulletin 206-7 should be followed for them.