

## Description:

The **Warthog WS-1/2-J** Rotary Sewer Nozzle was designed for cleaning 4 to 6 inch pipes and sewer lines with elbows. Jet thrust powers rotation of the head and pulls the tool thru the line. The WS-J has a 2 foot hose attached to a swiveling ball joint, with a 1/2 npt female thread on the other end. This flexible arrangement allows the tool to go around elbows and enter thru cleanouts. A Super Centralizer (WS 084) is available for use when cleaning larger pipe sizes; it is 4.5" diameter.

The swivel is a straight flow through design with a single high pressure seal. The WS-J is capable of working pressures up to 4800 psi and flow rates of 7 to 20 gpm, with rotation speeds from 200 to 500 rpm. The unit is filled with a thick viscous fluid that controls the rotation speed.

The nozzle head and nozzle orifice sizes should match the operating conditions of pressure and flow desired. Hose length and size must be known to correctly determine the proper head and orifice sizes. Contact your distributor or [www.sewernozzles.com](http://www.sewernozzles.com) to help in nozzle selection. If the wrong head is used, it may not provide enough torque to rotate the swivel, or it may provide too much torque resulting in excessive rotation speed and rapid seal wear.

## Operation:

Before connecting the tool to the end of the hose, flush the jetter hose to remove debris. Pass hose end through the hose guard or Tiger Tail if one is being used. Attach the tool to the end of the hose; we recommend using teflon tape to seal the threads. Position the tool within the pipe to be cleaned; bring the pump up to pressure, making certain that the Warthog begins to pull it's way in the proper direction into the pipe. Once the pump is up to pressure, feed the Warthog at a reasonable rate to allow the jets time to clean the pipe. If roots are present, feeding at a slower rate will improve the cleaning results. Depending on the amount of debris in the pipe, it may be necessary to occasionally pull the Warthog back toward the pipe entrance to prevent large buildups behind the tool.



**Do not use the WS-J in 8 inch or larger pipe sizes, as the tool can turn around and come back toward the operator, causing serious injury or death.**

When finished cleaning, shut down and secure pump before removing Warthog from line. Secure the hose reel and Warthog to keep it from dragging on the ground. If the Warthog will be removed from the line and stored for more than several days, blow out water with compressed air to prolong the life of the internal components. **The most important item in maintaining the WS-J is keeping the tool full of viscous fluid. We recommend that this is done after every 40 to 50 hours of operation. If the tool is spinning much faster than when new, this is an indication that it needs fluid.**

## Troubleshooting:

**Head will not rotate:** First try rotating head by hand and see if it feels rough or gritty to turn. If it does, the tool must be disassembled and repaired; it likely has bad bearings, seals and fluid. If the tool feels okay, check to see if any nozzles are plugged; even if a nozzle is only partially blocked it can keep the head from rotating. Nozzles must be removed from the head to properly clean them; it does not do any good to poke the material plugging the nozzle back into the head, as it will just replug a nozzle.

**Head spins too fast:** It is likely that the swivel is low on viscous fluid, or the viscous fluid has water in it. The best thing to do is drain all the fluid, wipe the parts clean and refill with the proper fluid. Check that the shaft seals are still good and will keep the fluid from leaking out.

**Seal Leak:** The seal may leak initially at low pressure, but should pop closed as pressure is increased. If operating pressure is reached and the seal is leaking continuously, the high pressure seal may need to be replaced. Refer to the maintenance below.

**Seals wear out quickly:** The tool must be disassembled and inspected. The brass seat should be checked for being installed in the right direction, and it should be replaced any time the high pressure seal is replaced. The bore of the shaft where the high pressure seal is located should be checked for grooving. If it is worn larger than .383", the shaft will need to be replaced.

## Maintenance:

**The most important item in maintaining the WS-J is keeping the tool full of viscous fluid. We recommend that this is done after every 40 to 50 hours of operation. If the tool is spinning much faster than when new, this is an indication that it needs fluid. \*Blow out all water with compressed air before storing tool!**

To fill the WS-J with viscous fluid:

1. Fill the Syringe (BC 410) with viscous fluid. This is best done by unscrewing the handle from the tube and pulling out the plunger. Pour fluid into tube and reassemble.

2. Remove the Port Screw (BJ 026) from the Body. Hold the swivel with the hose tailupward as shown. Thread syringe into port, slowly squeeze fluid into swivel; excess fluid will come out the weep holes. Keep squeezing in new fluid until it comes out clean.

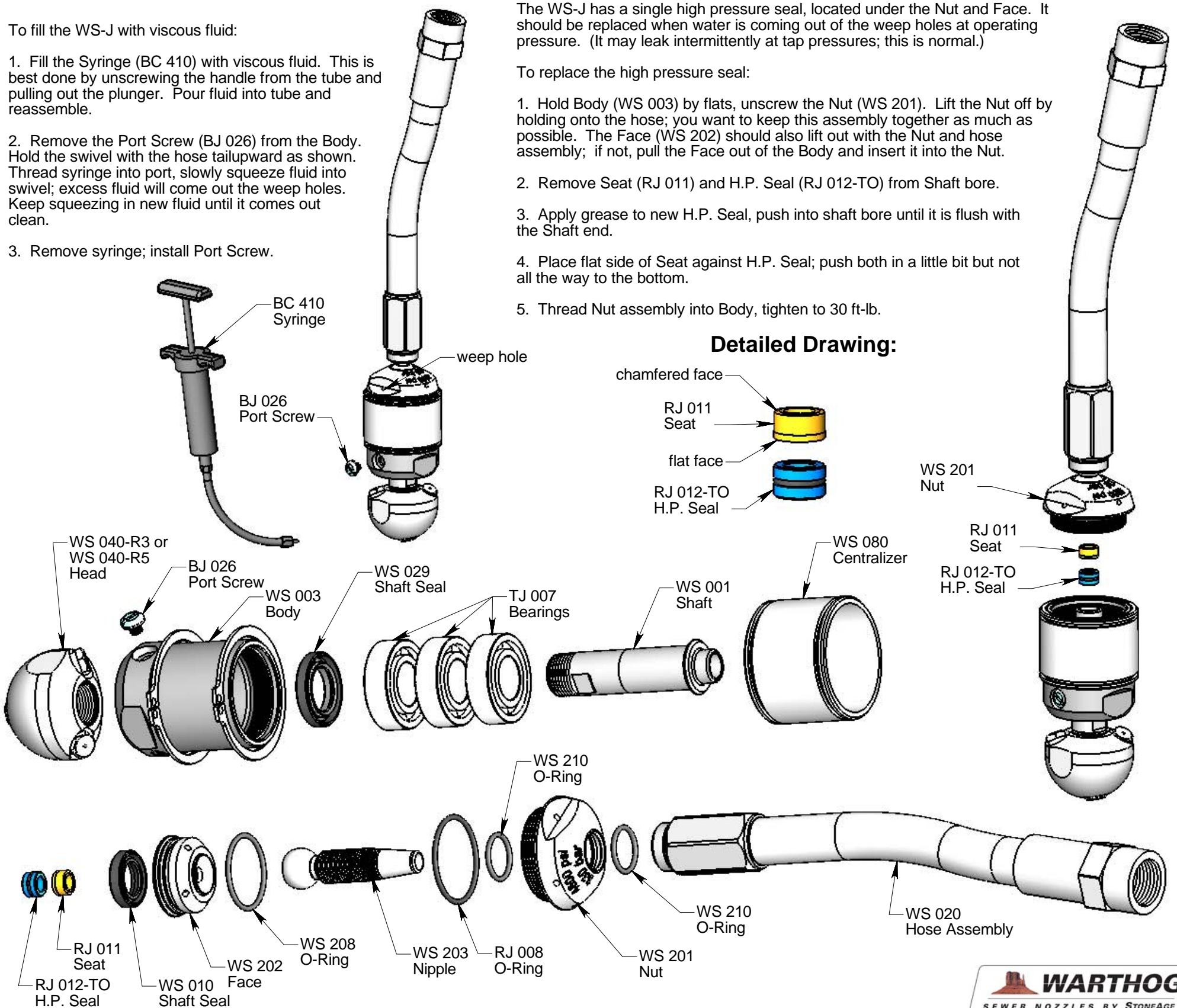
3. Remove syringe; install Port Screw.

The WS-J has a single high pressure seal, located under the Nut and Face. It should be replaced when water is coming out of the weep holes at operating pressure. (It may leak intermittently at tap pressures; this is normal.)

To replace the high pressure seal:

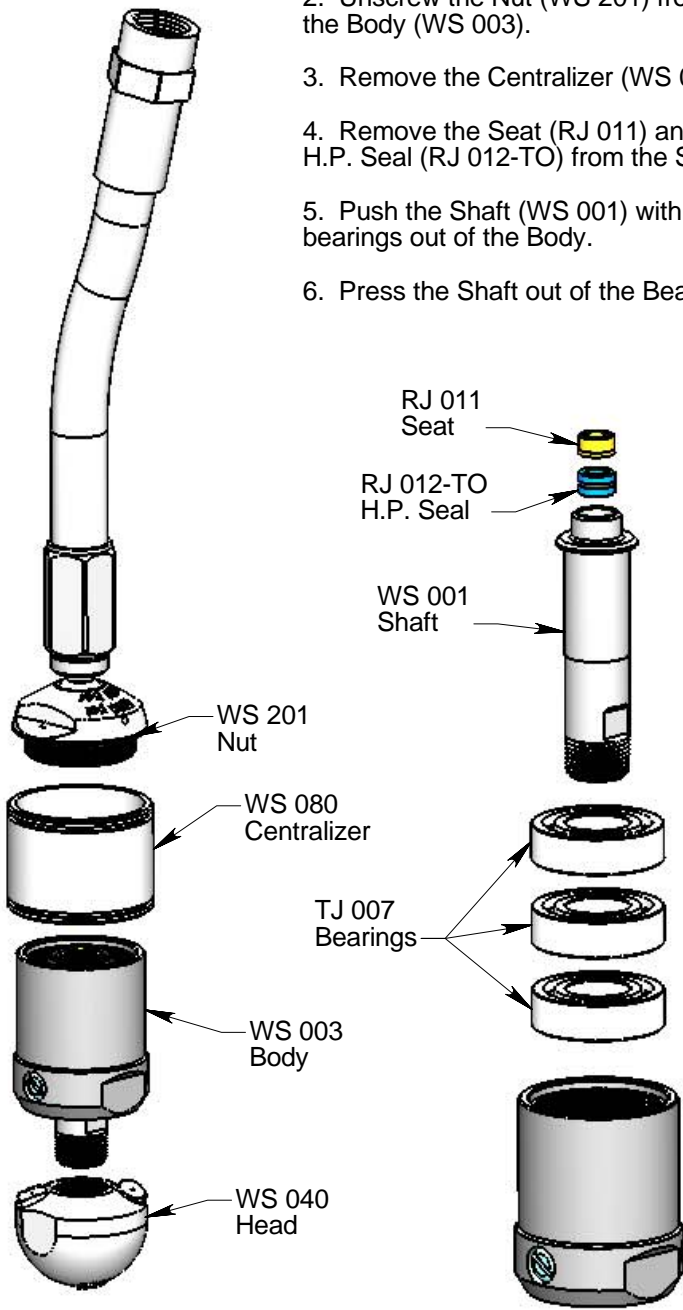
1. Hold Body (WS 003) by flats, unscrew the Nut (WS 201). Lift the Nut off by holding onto the hose; you want to keep this assembly together as much as possible. The Face (WS 202) should also lift out with the Nut and hose assembly; if not, pull the Face out of the Body and insert it into the Nut.
2. Remove Seat (RJ 011) and H.P. Seal (RJ 012-TO) from Shaft bore.
3. Apply grease to new H.P. Seal, push into shaft bore until it is flush with the Shaft end.
4. Place flat side of Seat against H.P. Seal; push both in a little bit but not all the way to the bottom.
5. Thread Nut assembly into Body, tighten to 30 ft-lb.

## Detailed Drawing:

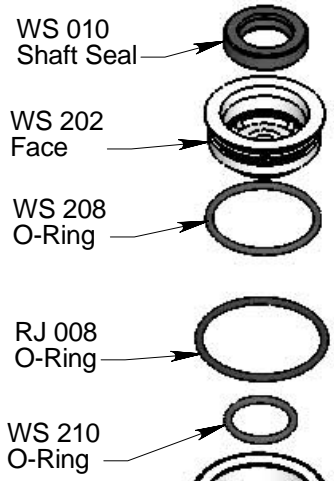
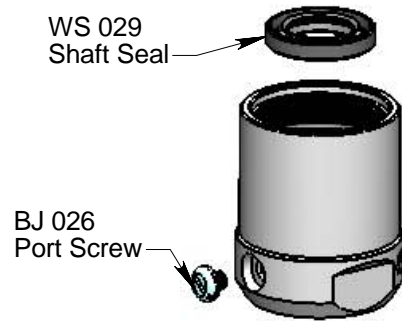


## Disassembly:

1. Remove the Head (WS 040).
2. Unscrew the Nut (WS 201) from the Body (WS 003).
3. Remove the Centralizer (WS 080).
4. Remove the Seat (RJ 011) and H.P. Seal (RJ 012-TO) from the Shaft.
5. Push the Shaft (WS 001) with bearings out of the Body.
6. Press the Shaft out of the Bearings.

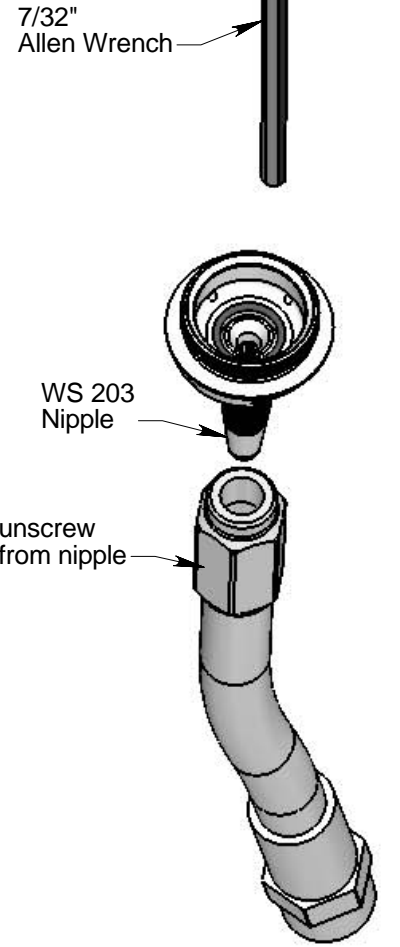


7. Remove the Face (WS 202) from the Nut.
8. The Shaft Seal (WS 010) can be removed from the Face if it needs replacing.
9. Inspect the O-Rings for damage, replace if necessary.
10. Remove the Shaft Seal (WS 029) from the Body if it is damaged.
11. Remove the Port Screw (BJ 026).



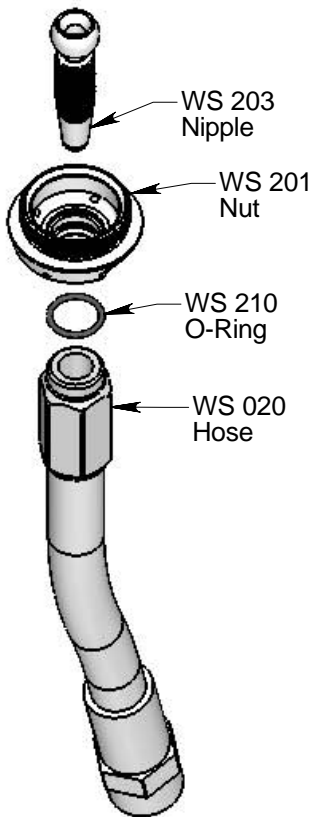
The hose (WS 020) should be replaced if wire braids are broken or frayed. (Do not disassemble hose if you are not replacing it.)

1. Insert 7/32 Allen Wrench into end of Nipple (WS 203).
2. Unscrew Hose from Nipple.
3. Remove Nipple from Nut; inspect O-Rings (WS 210) and replace if damaged.

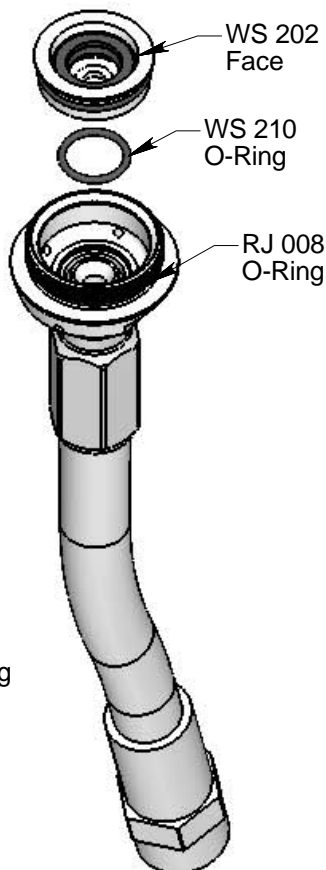


## Assembly:

1. If the hose assembly is being replaced, begin by inserting O-Ring (WS 210) into the groove inside of the Nut (WS 201). Install the Nipple (WS 203) thru the Nut.
2. Apply a lot of lubricating oil (10W-40 will work) to the threads of the Nipple and inside of the hose.
3. Use a 7/32 Allen Wrench inserted into the ball end of the Nipple to screw on the hose. If it gets very difficult to turn, take it apart and add more oil. Thread hose on nipple until the nipple threads cannot be seen.



4. Insert Shaft Seal (WS 010) into the Face (WS 202) with the lip with spring facing into the Face as shown.
5. Install O-Ring (WS 208) into groove on outside of Face.
6. Install O-Ring (WS 210) into Nut.
7. Push Face into Nut.
8. Install O-Ring (RJ 008) around threads of Nut.
9. Install Shaft Seal (WS 029) into Body (WS 003). The lip with the spring faces up as shown.



10. Press Bearings (TJ 007) onto Shaft (WS 001) one at a time. It is best to push only on the inner race of the bearings.
11. Push Shaft/bearing assembly into the Body. It is easiest to turn the shaft to thread the pipe threads thru the shaft seal in Body.
12. Slide the Centralizer (WS 080) onto the Body.
13. Install the H.P. Seal (RJ 012-TO) and Seat (RJ 011) into the shaft bore, as shown in the Maintenance Section.
14. Thread the Nut assembly into the Body, tighten to 40 ft-lb.
15. Fill the tool with viscous fluid as shown in Section 6.0; install the Port Screw (BJ 026).

