

CENTERLINE MANUFACTURING CO.

“Water Wells Done Right”

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Hydraulic cylinder resealing procedures for **STEEL headed, standard pressure** model pumps – **models MSPA, DSPA, TSPA, MSPD, DSPD, TSPD**: The 3.5” bore cylinder has a 55 MM rod on the shifter end which has the 5/8” tapped hole - shown on the left side of the cylinder drawing, and a 2.25” rod on the drive end which has the 1½” tapped hole - is shown on the right side of drawing 1026949 INS. Note: These instructions do not apply to the ALUMINUM headed cylinders.

1. Do not remove the cylinder from the pump or disassemble the cylinder.

Complete head gland resealing can be done with the cylinder assembled and in place. Removal of the cylinder from its mounted position on the pump is not necessary and will create a need for a critical cylinder realignment procedure. Also, do not unscrew/disassemble the two cylinder rods (2 & 3) from each other - static seals 25 and 26 need not be replaced. Disconnect fluid end rod and position the end of the 2.25” rod (drive end) to about 2” out from the head gland.

2. Only if o-ring 16 is leaking around the cylinder tubing should the cylinder be disassembled. If that is the case, disassemble the cylinder, remove flanges 4 & 5 and replace o-ring 16 and backup ring 17 in both flanges (they use the same sizes). Use lubricating oil on the seal surfaces. In this case, you will need to follow cylinder realignment / torquing procedures as outlined in the owners manual when reassembling the cylinder.

3. Remove the wiper/scrapper retaining ring (9) first by removing the 4 screws (14), then remove head glands 6 & 7 carefully with the custom tool available from Centerline. Use smooth motions to remove the head glands, rather than hard jerking actions so as to avoid thread galling. Remove all seals carefully. Use blunt, rounded tools rather than sharp-ended tools or screw drivers that may scratch or dent the seal grooves. Use solvent to clean the head glands.

4. Install secondary o-ring 31 inside of flanges 5 and 6 per fig A and cylinder drawing.

5. On the 55mm head gland (shifter end):

- a. Install wiper 24 in the wiper seal groove per cylinder drawing.
- b. Install backup ring 23 in the center seal groove. (Note: This backup ring is almost identical in size to backup ring 29 having about the same outside diameter, but has a slightly smaller inside diameter).
- c. Install seal 22 (55mm) adjacent to the backup ring leaving the backup ring on the wiper (24) side of the groove with the “heel” or flat back side of seal 22 butted against backup ring 23. On the heel of this seal, the letters “55 MM” are visible (may need magnifying glass). Orient seal cup toward the cylinder tubing. See fig B and cylinder drawing.
- d. Install backup 18 on the shoulder of the head gland as shown in fig C. Place a solid film of heavy petroleum grease all the way around the face of the backup ring to form a sticky surface to retain the o-ring in place. Install o-ring 19 against the backup ring and grease film.
- e. Install buffer seal 21 on the 55 MM shaft 2” or so past the wrench flat and follow with the plastic backup ring 21 that belongs with this seal (these two items are one part number). This backup ring is thicker through section than some of the other plastic backup rings in the seal kit and fits loosely in the back of the buffer seal. See fig A.
- f. After checking that any sharp edges have been removed on the end of the rod and the edges of the wrench flat, lubricate the seals and the 55 MM rod.

Install the head gland on the rod and slide forward to overtake the buffer seal. Push the buffer seal into the seal groove. The backup ring should be on the wiper (24) side of the buffer seal. The correctly installed buffer seal should appear as per fig C.

- g. Screw the gland into cylinder flange. It should stop suddenly when it seats with no added torque required when the head gland becomes flush with the flange. If it does not, o-ring 19 has come out of position and become pinched between the parts in an incorrect position. Remove the head gland, inspect o-ring for damage and replace the o-ring per step D. Re-install to achieve correct assembly.

6. On the 2.25" head gland (drive end):

- a. Install backup ring 29 in the center seal groove. (Note: This backup ring is almost identical in size to backup ring 23 having about the same outside diameter, but has a slightly bigger inside diameter).
- b. Install seal 28 (2.25") adjacent to the backup ring leaving the backup ring on the wiper/scrapper (30) side of the groove with the "heel" or flat back side of seal 28 butted against backup ring 29. On the heel of this seal, the numbers "2.250" are visible (may need magnifying glass). Orient seal cup toward the cylinder tubing.
- c. Install backup 18 on the shoulder of the head gland as shown in fig C. Place a solid film of heavy petroleum grease all the way around the face of the backup ring to form a sticky surface to retain the o-ring in place. Install o-ring 19 against the backup ring and grease film.

Note: The 2.25" buffer seal was installed backwards on a number of early model cylinders. The new buffer seal should be installed per these instructions and not according to how the old seal was installed.

- d. Install buffer seal 27 on the 2.25" rod 2" or so past the wrench flat and follow with the plastic backup ring 21 that belongs with this seal (these two items are one part number). This plastic backup ring is thicker through section than some of the other plastic rings in the seal kit and fits snugly into the back of the buffer seal. See cylinder drawing.
- e. After checking that any sharp edges have been removed on the end of the rod and the edges of the wrench flat, lubricate the seals and the 2.25" rod. Install the head gland on the rod and slide forward to overtake the buffer seal. Push the buffer seal into the seal groove. The plastic backup ring should be on the wiper/scrapper (30) side of the buffer seal. The correctly installed buffer seal should appear as per fig F.
- f. Screw the gland into cylinder flange. It should stop suddenly when it seats with no added torque required when the head gland becomes flush with the flange. If it does not, o-ring 19 has come out of position and become pinched between the parts in an incorrect position. Remove the head gland, inspect o-ring for damage and replace per step C. Re-install to achieve correct assembly.
- g. Install wiper/scrapper 30 into the groove on the front of the head gland. It may be necessary to remove the rubber jacket off of the scraper first, install the bronze coil on the rod and then replace the rubber jacket around the bronze coil. Install the retainer plate 9 with four cap screws to 30 ft. lbs torque. Note: The seal kits include all the seals and o-rings for every part of the hydraulic cylinder. If you are only resealing the head glands, there will be a number of items in the kit that are not used.

Hydraulic cylinder resealing procedures for **STEEL headed, high pressure** model pumps – **models MHPA, DHPA, THPA, MHPD, DHPD, THPD**: The 4” bore cylinder has a 2.25” rod on the shifter end which has the 5/8” tapped hole and is shown on the left side of the cylinder drawing, and a 60mm rod on the drive end which has the 1½” tapped hole and is shown on the right side of drawing 1026850 INS. Note: These instructions do not apply to the ALUMINUM headed cylinders.

3. Do not remove the cylinder from the pump or disassemble the cylinder.

Complete head gland resealing can be done with the cylinder assembled and in place. Removal of the cylinder from its mounted position on the pump is not necessary and will create a need for a critical cylinder realignment procedure. Disconnect the fluid end rod and position the end of the 60mm rod (drive end) to about 2” out from the head gland.

4. Only if o-ring 16 is leaking around the cylinder tubing should the cylinder be disassembled. If that is the case, disassemble the cylinder, remove flanges 4 & 5 and replace o-ring 16 and backup ring 17 in both flanges (they use the same sizes). Use lubricating oil on the seal surfaces. In this case, you will need to follow cylinder realignment and torquing procedures as per the owner’s manual when reassembling the cylinder.

3. Remove the wiper/scrapper retaining ring (9) first by removing the 4 screws (14), then remove head glands 6 & 7 carefully with the custom tool available from Centerline. Use smooth motions to remove the head glands, rather than hard jerking actions so as to avoid thread galling. Remove all seals carefully. Use blunt, rounded tools rather than sharp-ended tools or screw drivers that may scratch or dent the seal grooves. Use solvent to clean the head glands.

7. Install secondary o-ring 31 inside of flanges 5 and 6 per fig A and cylinder drawing.

8. On the 2.25” head gland (shifter end):

- a. Install wiper 24 in the wiper seal groove per cylinder drawing.
- b. Install backup ring 23 in the center seal groove. (Note: This backup ring is smaller in size than backup ring 29 having a smaller inside and outside diameter).
- c. Install seal 22 (2.25”) adjacent to the backup ring leaving the backup ring on the wiper (24) side of the groove with the “heel” or flat back side of seal 22 butted against backup ring 23. On the heel of this seal, the numbers “2.250” are visible (may need magnifying glass). Orient seal cup toward the cylinder tubing. See fig B and cylinder drawing.
- d. Install backup 18 on the shoulder of the head gland as shown in fig C. Place a solid film of heavy petroleum grease all the way around the face of the backup ring to form a sticky surface to retain the o-ring in place. Install o-ring 19 against the backup ring and grease film.
- e. Install buffer seal 21 on the 2.25” shaft about 2” or so past the wrench flat and follow with the plastic backup ring 21 that belongs with this seal (these two items are one part number). This backup ring is thicker through section than some of the other plastic backup rings in the seal kit and fits snugly in the back of the buffer seal. See fig A.

Note: The 2.25” buffer seal was installed backwards on a number of early model cylinders. The new buffer seal should be installed per these instructions and not according to how the old seal was installed.

- f. After checking that any sharp edges have been removed on the end of the rod and the edges of the wrench flat, lubricate the seals and the 2.25” rod. Install the head gland on the rod and slide forward to overtake the buffer seal. Push the buffer seal into the seal groove. The backup ring should be

on the wiper (24) side of the buffer seal. The correctly installed buffer seal should appear as per fig C.

- e. Screw the gland into the cylinder flange. It should stop suddenly when it seats as the front of the head gland becomes flush with the flange. If the gland starts to tighten in a “squishy” manner while still 1/16” or more from being flush with the flange, o-ring 19 has come out of position and become pinched between the parts. If so, remove the head gland, inspect o-ring for damage and replace the o-ring per step D. Re-install to achieve correct assembly.

9. On the 60 MM head gland (drive end):

- a. Install backup ring 29 in the center seal groove. (Note: This backup ring is larger in size than backup ring 23 having a larger inside and outside diameters).
- b. Install seal 28 (60 MM) adjacent to the backup ring leaving the backup ring on the wiper/scrapper (30) side of the groove with the “heel” or flat back side of seal 28 butted against backup ring 29. On the heel of this seal, the numbers “60 MM” are visible (may need magnifying glass). Orient seal cup toward the cylinder tubing.
- c. Install backup 18 on the shoulder of the head gland as shown in fig F. Place a solid film of heavy petroleum grease all the way around the face of the backup ring to form a sticky surface to retain the o-ring in place. Install o-ring 19 against the backup ring and grease film.
- d. Install buffer seal 27 on the 60 MM rod 1” or so past the wrench flat and follow with the plastic backup ring 21 that belongs with this seal (these two items are one part number). This plastic backup ring is thicker through section than some of the other plastic rings in the seal kit and fits loosely into the back of the buffer seal. See cylinder drawing.
- e. After checking that any sharp edges have been removed on the end of the rod and the edges of the wrench flat, lubricate the seals and the 60 MM rod. Install the head gland on the rod and slide forward to overtake the buffer seal. Push the buffer seal into the seal groove. The plastic backup ring should be on the wiper/scrapper (30) side of the buffer seal. The correctly installed buffer seal should appear as per fig F.
- f. Screw the gland into the cylinder flange. It should stop suddenly when it seats as the front of the head gland becomes flush with the flange. If the gland starts to tighten in a “squishy” manner while still 1/16” or more from being flush with the flange, o-ring 19 has come out of position and become pinched between the parts. If so, remove the head gland, inspect o-ring for damage and replace the o-ring per step D.
- g. Install wiper/scrapper 30 into the groove on the front of the head gland. It may be necessary to remove the rubber jacket off of the scraper first, install the bronze coil on the rod and then replace the rubber jacket around the bronze coil. Install the retainer plate 9 with four cap screws to 30 inch / lbs torque.

Note: Seal kits include all the seals and o-rings for every part of the hydraulic cylinder. If you are only resealing the head glands, there will be a number of items in the kit that are not used.