

# Thermo Scientific Orion Pump Seal Replacement, Cat. No. 177050 and 170959

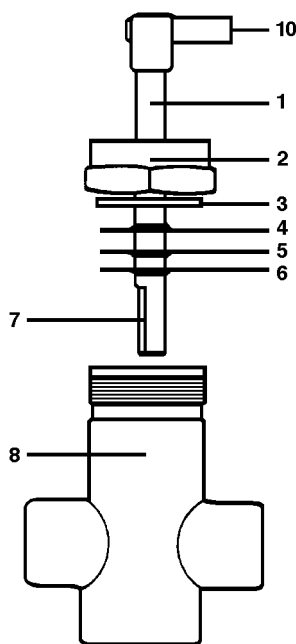
Check the tubing on the discharge side of sample and reagent pumps for air bubbles. If no air bubbles at the pump inlet are visible, but air is noted in the discharge, the pump seals need to be replaced. Occasional bubbles from minor leaks or degassing will not affect the monitor. A drop or two of liquid detergent on the piston shaft of the pump will help wet new seals and prevent air in-leakage.

### To Replace Pump Seals:

1. Remove the pump head from the pump motor spindle. See **Figure 1**.
2. Loosen and remove the cylinder nut, 2, and at the same time remove the piston, 1, gland washer, 3, and seals, 4, 5, 6. Discard the old seals.
3. Extreme care must be taken when installing the new seals so as not to damage the seals lips. Keeping the cylinder nut, 2, and gland washer, 3, in their place around the piston, 1, replace the first seal, 4, as follows:
  - a. Place the seal at the base of the piston with the lip facing away from the cylinder nut.
  - b. Use care not to distort the lip, and gently pull the seal over the base of the piston while rotating the piston with your fingers. This is most easily done if you use the leading edge of the notch, 7, in the piston base to carefully widen the hole while rotating the piston.
  - c. Check that the seal is firmly on the piston, then rotate the piston through the seal until the piston is past the lip of the seal. The seal lip should seat snugly and uniformly around the piston shaft.
  - d. Remove the widened seal from the piston shaft by first placing two fingers around the piston shaft, between the gland washer, 3, and the first seal, 4, and second by rotating the piston as you pull the piston back through the seal.
  - e. Reverse the orientation of the seal so the lip of the seal is pointing towards the cylinder nut.
  - f. Slowly and carefully work the piston through the lip of the seal by using the leading edge of the piston notch to grip the lip of the seal. Rotate the piston while working it through the lip. Once the lip surrounds the piston shaft, rotate the piston shaft through the seal until the seal is about midway up the shaft. The first seal, 4, is now in place.

- g. Check to make sure that the lip of the seal is not damaged or distorted and that it fits around the piston shaft with uniform snugness.
4. Replace the second seal, 5, in the same manner as described in steps 1 through 3. Move the second seal to a position close to that of the first seal, 4. Replace the third seal, 6, in the same manner as the second seal, 5.
5. When all three seals are properly oriented (the first seal, 4, is lip up on the piston shaft and the second and third seals, 5 and 6, are lips down on the piston shaft) wet the piston, the three seals and the cylinder hole with deionized water or non-abrasive liquid hand soap. Rotate the piston into the cylinder hole until all three seals are resting directly on top of each other while touching the top of the cylinder, 8.
6. Position the gland washer on top of the seals and screw the cylinder nut back in place. Firm up the nut with channel-lock pliers or a wrench, depending on the type of cylinder nut your pump head has (i.e., knurled or hexagonal flats).
7. Re-install the pump head on its motor base.
8. Plug the suction port with an appropriate plug (1/4" or 3/8" plastic dowel) and tighten the fitting. Turn the pump on for ten seconds and then turn it off. This re-seats the seals.
9. Reconnect the plumbing and check for air and fluid leaks. Recalibrate the pump to its proper flow rate.

**Figure 1– Pump Head**



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