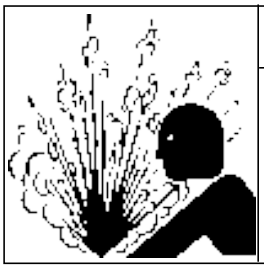
MAINTENANCE

TYPE D OR F SEALS EXTERNAL BALANCED

DISASSEMBLY, CLEANING (GENERAL)



⚠ WARNING

Before servicing pump, disconnect electrical power source, carefully relieve all pressure and drain all fluids from pump and connected piping.

It is necessary to disassemble parts of the pump for cleaning and sanitizing. For Tri-Clover pumps equipped with the “Groove-In-Shaft” design (types D, DG, or F seals only), it is not necessary to disassemble if used in Clean-In-Place installation.

The extent of disassembly will depend on the application, and the type of seal used in your pump. To disassemble, disconnect the suction and discharge piping. Remove seal guard assembly with a wrench of appropriate size. Turn the wing nut on the clamp assembly until tension on the clamp saddle is relieved. Open the saddles and remove the casing. At this point the disassembly varies depending on the impeller retaining system applicable to your pump.

For floating retainer models

Push back on the impeller and center the retainer in the stub shaft. Slide the impeller forward and remove it. Do not try to remove retainer before removing impeller as this will cause damage to the retainer, shaft and impeller.

For threaded shaft models

Remove cotter pin and turn castellated nut in counterclockwise direction. Remove washer's and impeller.

For both models

1. Rotate the backplate until the backplate pins clear the pins in the adapter and remove the backplate.
2. Remove the casing gasket.

Note: Protect the sealing surface of the backplate against nicks and scratches while removing, cleaning and reassembling.

3. Remove the carbon seal, o-ring seal, seal cup, and spring.

DG/FG CLAMPED IN SEAT

1. Remove four bolt/screws from backplate. Inspect DG seat insert, gland ring, and gaskets for damage or wear, and replace as required.

Note: #80P outboard and #80R inboard gaskets are NOT INTERCHANGEABLE. #80R (thicker) gasket MUST be inboard-between backplate and seal seat. Care must be taken to protect the sealing face of the backplate for D and F seals and the seal seat for DG seals from nicks and scratches.

2. Remove the carbon seal and o-ring seal. Examine and replace as necessary.

MAINTENANCE

REPAIR

It is recommended that periodic inspection of all parts of the pump be made to prevent malfunctions caused by worn or broken parts. Disassembly for repair is the same procedure as for cleaning.

Note: Protect the sealing surface of the backplate against nicks and scratches while removing, cleaning and reassembling.

1. For D and F seals, examine the backplate sealing surface carefully for any defects that will shorten seal life.
2. Remove the carbon seal, o-ring seal, cup and spring. Remove the drive collar by loosening set screws and sliding collar off the stub shaft.
3. The balanced seal is designed for outside application. Sealing of the process fluid along the shaft is accomplished by action of the process pressure on an o-ring seal installed in a groove in the carbon seal. The same action pressurizes the o-ring groove and augments the spring tension in keeping a tight joint at the sealing faces. The location or width of the sealing face controls the balancing of the seal.
4. Carefully inspect the o-ring seal and carbon seal for signs of abrasions, cuts or other wear that would cause leakage. When the extension of the carbon seal face extends less than $^{1}/_{32}$" from the body, it is advisable that the carbon seal be replaced.
5. Remove the cascading water attachment if included. Remove the rubber shaft deflector by prying it gently from the rear, while sliding it forward. Examine the deflector for tearing, loose fit, or other defects that would allow fluid leakage into the motor along the armature shaft.
6. Remove the bolts securing the adapter to the motor frame and remove the adapter. Loosen the 4 set screws securing the stub shaft to the motor armature. Remove the stub shaft by prying from the back with a flat bar. The stub shaft is a tight fit but can be removed by evenly applying pressure around the periphery of the shaft with the pry bar.
7. Examine the stub shaft sealing surface for nicks or scratches which can cause excessive o-ring seal wear or leaking.
8. Attach a hoist to the motor if necessary, and remove the bolts securing the motor to the adjusting leg brackets. Remove the set screws securing the adjustable legs and remove the legs.

Note: The metal displaced by the set screws on the adjustable legs makes it necessary to tap the legs out with a soft hammer. Rough spots should be filed down prior to reassembly.

9. Inspect casing clamp for damage or wear and replace as required. Inspect the adjusting legs, adjusting leg brackets, adapter and casing and replace if necessary. Motor maintenance, repair and wiring are not covered in this manual. For specific information contact the motor manufacturer.

MAINTENANCE

REASSEMBLY

1. Assemble the adjusting legs to the adjusting leg brackets, and assemble the brackets to the motor. Level the motor by individually adjusting the legs and locking them in place with the set screws.
2. Install the adapter to the motor, with the drain cavity at the bottom. Insert the four bolts securing the adapter to the motor. Tighten the bolts securely.
3. Assemble the stub shaft to the motor armature shaft. Do not tighten set screws.
4. Install the backplate by rotating it until the pins in the backplate engage the pins in the adapter bracket.

For floating retainer models

Rotate the shaft until the floating pin hole is in a horizontal position. Insert the floating retainer, center it in the shaft, and slide the impeller on the shaft. Hold the impeller tight against the shoulder on the shaft and rotate the shaft one-fourth turn until the floating retainer drops and engages the impeller.

For threaded shaft models

Slide the impeller on the shaft and replace washer and castellated nut and cotter pin.

For both models

1. Assemble the clamp to the adapter, and install the casing.
2. Push the stub shaft onto the motor shaft until the impeller strikes the inside front face of the backplate. Locate the stub shaft on the motor shaft allowing $^{1}/_{16}$" (1.5mm) maximum clearance between the rear face of the impeller and the inside face of the backplate. Tighten the four set screws on the stub shaft. Remove casing, impeller, impeller pin and backplate.
3. Slide the rubber deflector on the shaft until it seats the groove in the shaft.

Note: If the deflector cannot be forced on with the fingers, a blunt instrument can be used to provide additional force at the I. D. of the deflector.

4. Slide drive collar onto stub shaft, and locate per setting instructions in next section. Assemble the spring, seal cup, o-ring seal and carbon seal, and install as a unit, taking care that slot in seal cup is aligned with pin in drive collar. Gentle finger pressure will overcome o-ring resistance on the shaft.

Note: Do not lubricate seal with any type of oil or grease. The seal faces are lubricated by product being pumped.

For floating retainer models

Install the backplate by rotating it until the pins in the backplate engage the pins in the adapter. Rotate the shaft until the floating pin hole is in a horizontal position. Insert the floating retainer, center it in the shaft, and slide the impeller on the shaft. Hold the impeller tight against the shoulder on the shaft and rotate the shaft one-fourth turn until the floating retainer drops and engages the impeller.

For threaded shaft models

Install the backplate by rotating it until the pins in the backplate engage the pins in the adapter. Slide the impeller on the shaft. Install washer's and thread the castellated nut to the shaft in a clockwise direction until impeller hub contacts shaft shoulder. Use a combination of washers if needed to ensure that the castellated nut is tight on the impeller before inserting and securing cotter pin.

For both models

1. Install gasket on backplate.
2. Place the casing in position and close and tighten the clamp while lightly tapping the clamp with a hammer to ensure even tightening. Assemble seal guard and tighten nut.
3. Assemble the cascading water attachment, if so equipped, to the adapter. Close and tighten the clamp. Assemble the suction and discharge piping to the pump. Check for strain on the casing. Adjust as necessary.

EXTERNAL BALANCED SEALS - SETTING SEAL DRIVE COLLAR LOCATION

The balanced seal is designed for outside applications, and is available with cascading water attachment. Sealing of the process fluid along the shaft is accomplished by action of the process pressure on an o-ring seal installed in a groove in the carbon seal. The same action pressurizes the o-ring groove and augments the spring tension in keeping a tight joint at the sealing faces. The width of the seal face controls balancing of the seal. This type of seal should be replaced when the clearance between the carbon seal face and the backplate is less the $^{1}/_{32}$" (.79mm), or when leakage is noted.

To replace the seal:

1. Disconnect the suction and discharge piping, and remove the casing, impeller and backplate.
2. Assemble the spring, seal cup, o-ring seal and carbon seal, and install as a unit, taking care that slot in seal cup is aligned with pin on drive collar. Gentle finger pressure will overcome o-ring resistance on the shaft.

When the carbon seal is replaced, the location of the drive collar should be checked and relocated if necessary, by one of the two following methods.