

## **DISASSEMBLY PROCEDURES**

### **A. Before you begin...**

1. Operate pump (preferably with clean water) to ensure rotor and stator are lubricated.
2. Shut off pump.
3. Disconnect power source.
4. Drain any fluid in suction housing.

### **B. When removing stator...**

1. Complete Section A.
2. Remove discharge hose attached to discharge reducer (16).
3. Remove discharge reducer (16) by unthreading from stator (39 or 40).
4. Remove top half of stator support (28).
5. Secure conveyor tube (36) to prevent it from turning, unthread stator (39) from suction housing (10) and pull stator (39) off rotor (37).
6. Check rotor (37) and stator (39) for wear (See STATOR AND ROTOR WEAR Section for instructions).

## **OPEN THROAT STANDARD HARDWARE**

<b>DESCRIPTION</b>	<b>AMT</b>	<b>SIZE</b>
Stator Support Screw (Hex Head)	2	3/8-16 X 1 3/4
Bearing Housing Support Screw (Hex Head)	2	3/8-16 X 1 3/4
Suction Housing Support Screw (Hex Head)	2	3/8-16 X 7/8 (2C4 only)
Suction Housing Support Screw (Hex Head)	4	3/8-16 X 1 (2J4 only)
Packing Gland Stud	2	7/16-14 X 3 3/8
Packing Gland Nut	2	7/16-14
Bearing Housing Screw	4	1/2-13 X 2
Bearing Housing Lock Washer	4	1/2
Drain Plug	1	2 NPT (2TJ6)
Bearing Cover Plate Screw (Hex Head)	4	3/8-16 X 1
Bearing Cover Plate Screw LW	4	3/8
Pipe Plug - Bearing Housing	1	1/8 NPT
Pipe Plug - Stuffing Box	1	1/8 NPT
Zerk Fitting	2	1/8 NPT
Key	1	1/4 X 1/4 X 2 1/4

### **C. When removing rotor, drive train and/or intermediate drive shaft...**

1. Complete Sections A and B.
2. Slide drive shaft pin retainer (20) toward stuffing box to expose pin (19). Using a punch, drive out pin (19).
3. Loosen packing gland nuts and pull entire rotor, conveyor assembly and intermediate drive shaft assembly from pump.
4. If space is not allotted for the above, pull assembly free from suction housing (10) far enough so that the rotor pin (33) can be removed, disconnecting the rotor (37) from the conveyor assembly (36).

### **D. When disassembling rotor, conveyor assembly and/or intermediate drive shaft...**

1. Complete Section A, B and C.
2. Slide pin retainers (23) toward the conveyor assembly (36) to expose rotor pins (33). Using a punch, drive out pins (33), and separate rotor, intermediate drive shaft and conveyor assembly.
3. Remove "O" ring (22) from intermediate drive shaft (32) and one connecting rod washer (24) from each end of conveyor assembly.
4. Slide pin retainers (25) from each end of conveyor assembly. Using a punch, drive out connecting rod pins (35) and remove connecting rod ends (34) from conveyor tube (36).

### **E. When removing drive shaft and bearings...**

1. Complete Sections A and C-3.
2. Remove bearing cover (8) with thrust grease seal (7) from drive end of bearing housing (9).
3. Pull bearings and drive shaft from bearing housing.
4. Remove bearing locknut (4) and bearing lock washer (5). Using an arbor press, remove thrust bearing (2) and radial bearing (1). Inspect grease seals (7) and (6), replace if needed.

## **F. When removing packing....**

1. Stop pump.
2. Complete Section A.
3. Remove gland adjustment nuts and packing gland (29) from stuffing box.
4. Remove packing rings (30). This is best done by using flexible packing extractors. Use two extractors simultaneously on opposite sides of each ring. Pull evenly.
5. Remove lantern rings (21) in similar fashion. Twist split ring to remove from shaft. Remove remaining packing.

## **ASSEMBLY PROCEDURES**

The pump is reassembled in reverse order of dismantling. The following suggestions are offered:

Note: While pump is dismantled, check all gaskets, "O" rings and packing. Replace all worn items. Connecting rod washers (24) should be replaced each time conveyor assembly is disconnected from the rotor or intermediate drive shaft.

### **A. Bearing/Drive Shaft Assembly...**

1. Lubricate all bearing parts and pack bearings. The following is a list of approved lubricants:

Keystone Lubricating .....	Keystone #89
Texaco .....	Regal AFB2
Shell Oil Co .....	Cyprina #3
Humble Oil & Refining Co .....	Beacon #325
American Oil Co .....	Supermil
American Oil Co .....	Grease #A72832
Mobile .....	EP1
Shell Oil Co .....	Alvania #2
2. Bearings (1) and (2), with spacer (3), should be pressed onto drive shaft (18) with an arbor press applying pressure to inner races only. Make sure bearings are seated fully on shaft, install a new bearing lock washer down into wrenching slot to prevent loosening of nut.
3. Install new radial grease seal (6) in bearing housing (9) and new thrust grease seal (7) in bearing cover (8).
4. Carefully insert bearing shaft assembly into housing, so as not to damage the grease seal (6). Slide pin retainer (20) and packing gland (29) onto leading end of drive shaft, as it is extended through the grease seal.
5. Install the bearing cover plate (8) with grease seal (7). Tighten all cap screws evenly to prevent damage to bearing cover plate and grease seal.

## **B. Packing assembly...**

1. Insert packing rings (30) and lantern ring halves (21) into stuffing box and around the drive shaft (18), using quantities and positioning as shown in packing diagram for your specific size pump.
2. Insure that the packing rings are installed with splits staggered at 90 degree intervals and that the flat side of the lantern ring halves face the packing.
3. All but the last packing ring may fit into the stuffing box. As the pump operates, the packing will compress and the last ring can be added.

## **C. Assembly of rotor (37), conveyor tube (36) and/or intermediate drive shaft...**

1. Insert connecting rod ends (34) into ends of conveyor tube (36), aligning retaining pin holes and inserting lightly lubricated pins (35).

Note: Two sets of holes are provided in ends of the conveyor tube (36). Should one set of holes become elongated by wear, rotate the rod ends (34) to align with the unused holes.

2. Slide pin retainers (25) into place on each end of the conveyor tube (36).
3. Seat on connecting rod washers (24) on each end of the conveyor assembly.
4. Slip pin retainer (23) over end of conveyor assembly and insert that end of the conveyor assembly into intermediate shaft (32). Align pin holes and install lightly lubricated pin (33). Slide pin retainer (23) into place on intermediate shaft to secure the connecting pin.
5. If space is available to install all rotating parts as one unit, install the rotor (37) on the opposite end of conveyor assembly in the same manner as the intermediate shaft.

## **D. Installation of intermediate drive shaft (32), conveyor assembly (36), and rotor (37)...**

1. Lightly lubricate "O" ring (22) and seat on the intermediate drive shaft (32), next to the shoulder that will butt against end of drive shaft (18).
2. Space permitting, the complete rotating assembly can be installed as a unit, inserting the intermediate drive shaft end, through the suction housing (10) and seating in the drive shaft (18). Proceed to step 4, below.
3. Limited space that will not allow step 2, above, requires that the assembled intermediate drive shaft (18) and conveyor assembly (36) be partially inserted in the suction housing (10) and then install the rotor (37) to the conveyor assembly as instructed in Section C, above. Extreme limited space installations, may require that the stator be installed on the rotor before installing rotor on the conveyor assembly.
4. Align holes through drive shaft (18) and intermediate drive shaft (32). Install pin (19) and slide pin retainer (20) over pin holes.

### **E. *Installation of stator (FF)...***

1. Coat rotor (37) and interior of stator (39) with a generous amount of waterless hand cleaner, baby oil or other lubricant compatible with rubber. Grease or motor oil is not recommended.
2. Thread stator (39) onto rotor (37) and into suction housing (10).
3. Install top half of stator support (28).
4. Thread discharge reducer (16) on end of stator. Install all discharge hoses removed at disassembly.

## **MAINTENANCE**

The pump has been designed for a minimum of maintenance, the extent of which is routine lubrication of the bearings. The pump is one of the easiest to work on in that the main elements are very accessible and require few tools to disassemble.

### **Packing**

The packing is lubricated through a grease fitting in the stuffing box. Packing gland adjusting nuts should be evenly adjusted so they are little more than finger tight. Over-tightening of the packing gland may result in premature packing failure and possible damage to the shaft and gland. When the packing is new, frequent minor adjustments are recommended for the first few hours of operation in order to compress and seat the packing. Greasing the packing often but with limited quantities of grease is the best practice. This can be done through a grease fitting which leads to a lantern ring in the mid-section of the packing. Do not use a one-piece spiral wrap of packing.

### **Bearings**

The pump is equipped with ball bearings in the drive end. The bearings are lubricated at the factory and do not need additional lubrication for at least 1500 hours of normal operation.

When re-lubricating the bearings, the bearing-shaft assembly should be removed (See Disassembly instructions) and cleaned of old grease. Add only enough grease to fill the area between the bearings 1/3 full. Add a few drops of oil to bearings to run warm to the touch for the first few hours of operation.

Any type of EP Lithium soap base grease is satisfactory for bearing lubrication. The use of Sodium or Calcium base grease is not recommended.

## **ROTOR WEAR**

The rotor should be replaced if:

- a. The rotor pin hole is excessively worn.
- b. The rotor surface is cracked, pitted, deeply grooved (1/32" or more), corroded or if the finish has been worn off.

## **STATOR WEAR**

If stator is worn and in need of replacement, its surface may be worn. Test wear by noting how easily the rotor can be removed. If the rotor slips out too easily the stator should be replace.

## **RECOMMENDED SPARE PARTS**

The pump has been designed and built with all wearable parts replaceable. A recommended inventory of spare parts is dependent upon the application and importance of continued operation.

For the shortest possible downtime, we recommend the following parts to be stocked:

- 1 - Rotor
- 1 - Stator

The above is only a suggested list. For further assistance in determining what you'll need for your application contact your ChemGrout representative.