



INSTRUCTIONS and PARTS LIST

SERIES 6UVX-187R

WARNING

**READ THIS INSTRUCTION BOOK AND CA-1 BEFORE
INSTALLATION, OPERATION OR MAINTENANCE**

Instructions 6UVX-(R-4)

This manual now is
identified as part no.
SRM00030

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FOREWORD

This manual covers the 6UVX-187R series IMO pump. The pump model is indicated on the nameplate (031) found on the pump. It is primarily used as a shaft mounted fuel injection pump for gas turbines. This design's construction utilizes Viton "O" Rings and a John Crane Type 21 Viton Bellows mechanical seal with a Buna lip seal as a back-up.

OPERATIONAL SAFETY PRECAUTIONS

Structural Limits

Operating conditions, such as speed, fluid viscosity, inlet pressure, discharge pressure, temperature, filtration, duty cycle, mounting, drive type, etc. are interrelated. Due to these variable conditions, the specific application limitation may be differed from that of the structural limitations. This equipment must not be operated without verification that operating requirements are within published capabilities as shown in the appropriate pump data book (available from local IMO Pump Division offices and representatives).

Under no circumstances are the following structural limitations to be exceeded.

Maximum Discharge Pressure — 1000 PSIG

(NOTE: Under controlled conditions with factory approval)

Maximum Inlet Pressure — PSIG:50 (discharge pressure must always be 25 PSI above suction pressure).

Maximum Fluid Temperature — 200°F

MAINTENANCE

When the pump is installed properly, it should operate satisfactorily with very little attention other than periodic check of the suction strainer, bearing (020), mechanical seal (018) and oil seal (092). A seal leak detection line is provided at the inboard end of pump and through the mounting flange.

When a loss of flow or pressure is indicated, an inspection of all components should be made after first checking that the problem is not due to system malfunction as previously explained.

ASSEMBLY AND DISASSEMBLY PROCEDURES

Disassembly of Pump

Step 1 – Close off suction and discharge piping to pump. Disconnect piping and uncouple pump from its driver. Drain pump case by allowing oil to spill from the outlet. Rotate rotors to drain oil trapped in rotors. Remove pump and place on a bench or suitable support.

Step 2 – Remove taper pull pins (093) by tightening nuts (094). Remove nuts (004), capscrews (003), inlet head (002) and gasket (006) together with assembled parts as follows: Outboard end cover (045), seal housing (087), dowel pins (088), lip seals (086), retainer (096), capscrews (091) and (095) and gaskets (046).

Step 3 – Remove setscrews (085) and use a puller to remove coupling (084) from end of power rotor (010). Remove "O" ring (097). Remove lip seals (086) and retainer (096). The coupling, lip seals and retainer will normally not be required and may be discarded. In the event it is necessary to connect a sine-wave generator to the pump again, it is recommended they be replaced.

Step 4 – Remove capscrews (027), thrust plate (028) and spacers (041) (spacers are a matched set and should remain together for reassembly as a pair). Screw out idler rotors (011).

Step 5 – Remove capscrews (009), bearing retainer (008) and oil seal (092). Pull power rotor assembly out of inboard end. The power rotor assembly consists of the power rotor (010), ball bearing (020), bearing spacer (019), mechanical seal (018) and retaining rings (021).

Step 6 – Refer to page 4 for disassembly of power rotor assembly.

Step 7 – An inspection of the housing bores and the rotors may now be made. When it is necessary to remove the rotor housing (015), remove capscrews (017) and housing (015). The two piece clamp ring (036), spring pin (042), back-up ring (035) and "O" ring (016) will be removed with the housing. The floating bushing (007), spacer (043), idler stop plate (014) and capscrews (044) may remain assembled in outlet cover (083) unless replacement is necessary.

Reassembly

Inspect and clean parts before reassembly. New gaskets, mechanical seal (018), oil seal (092) and bearing (020) should be installed whenever the pump is rebuilt SAE 30 oil or equal should be used to assist pump reassembly. DO NOT USE GREASE.

Step 1 – Install new "O" ring (016) and back-up ring (035) into groove on rotor housing (015). Position back-up ring on side of groove toward clamp ring slot. Install two piece clamp ring (036) into slot on rotor housing with the top half located on pin (042). Coat outside diameter of housing inboard end with oil and install into outlet cover (083). Secure clamp ring to outlet cover with capscrews (017). Lubricate capscrew threads and torque to 130 foot pounds \pm 10 foot pounds.

Step 2 – Refer to page 5 for reassembly of power rotor.

Caution: In handling the seal, do not let the carbon sealing washer drop. Take particular care not to scratch the lapped faces on the washer and stationary seal.

Step 3 – Install new gasket furnished with mechanical seal into counterbore of outlet cover (083). Apply a light coat of oil and slide assembled power rotor into outlet cover. Bolt bearing retainer (008) to cover using capscrews (009), lubricate threads and torque to 25 foot pounds \pm 2 foot pounds. Install oil seal (092) wet with oil, into counterbore of bearing retainer (wrap shim stock around shaft to cover keyway when installing the seal).

Step 4 – Apply a light coat of oil and screw idler rotors (011) into housing. Bolt thrust plate (028) and spacers (041) to end of housing (015) using capscrews (027) with lubricated threads. Torque to 80 foot pounds \pm 4 foot pounds.

Step 5 – Both inlet head (002) and gasket (006) to assembled outlet cover (083) with capscrews and nuts (003) (004). Lubricate threads and torque to 53 pounds \pm 2 foot pounds.

After reassembly, check that the rotors turn freely before placing pump into service. Check "Installation" section when installing pump and "Operation" section before starting pump.

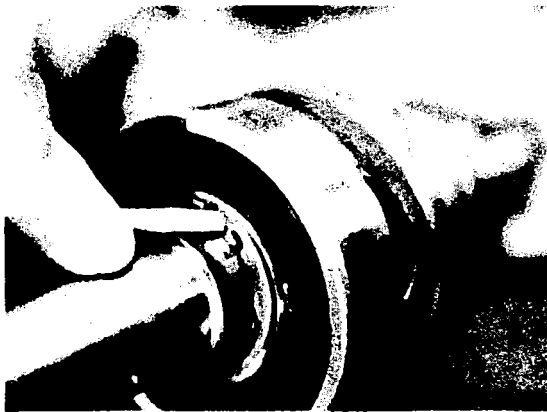


Figure 1.

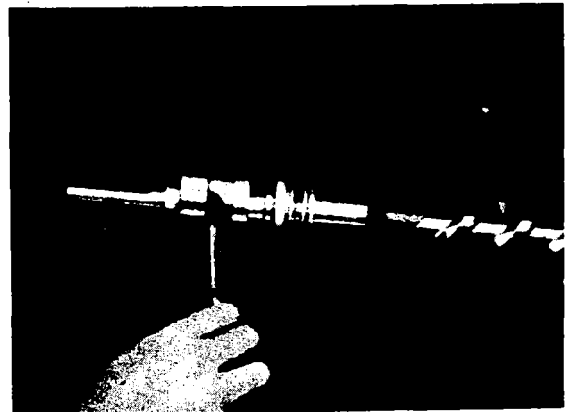


Figure 2.

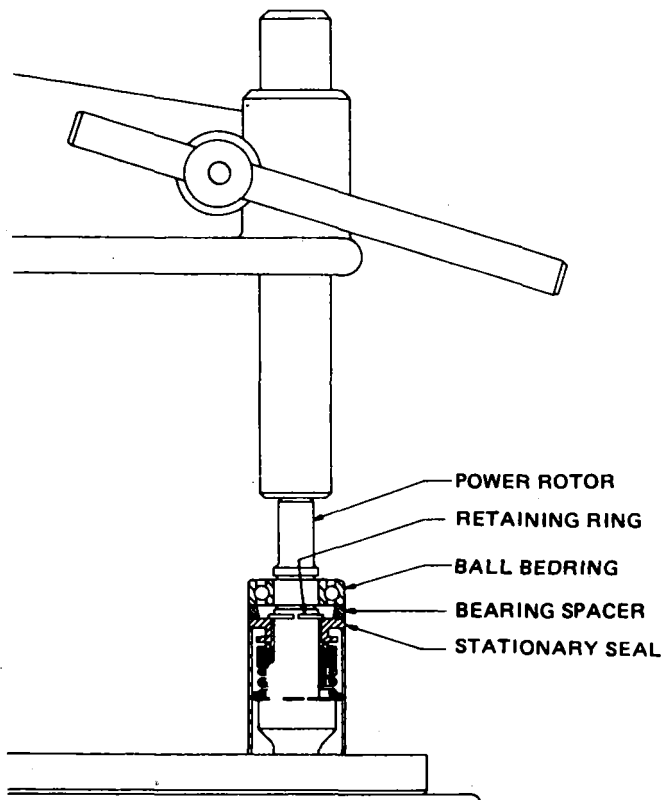


Figure 3.

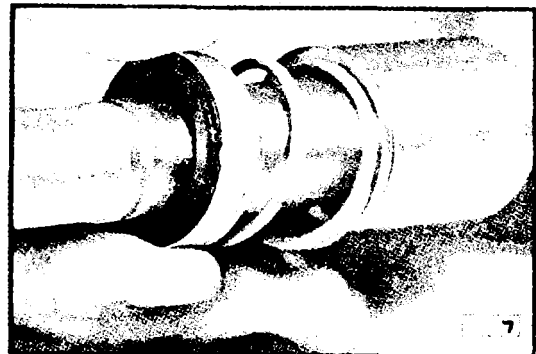


Figure 4.

**DISASSEMBLY
BEARING & MECHANICAL SHAFT SEAL
6U PUMPS**

Step

1. If it is still in place, remove the coupling hub from the drive shaft.
2. Remove the outer retaining ring from the power rotor with a screw driver. (Fig. 1)
3. Remove the inner retaining ring from its groove by pulling back the mechanical seal and prying with a screw driver (Fig. 2).
4. Insert the power rotor assembly into a press and press off the bearing spacer and stationary seat of the mechanical seal - Fig. 3).
5. Remove seal subassembly (Fig. 4) and gasket from under the stationary seat.
6. Inspect the shaft. If the shaft is pitted or badly scratched or the retaining ring grooves damaged, replace the power rotor.
7. Discard the old seal, bearing and retaining rings

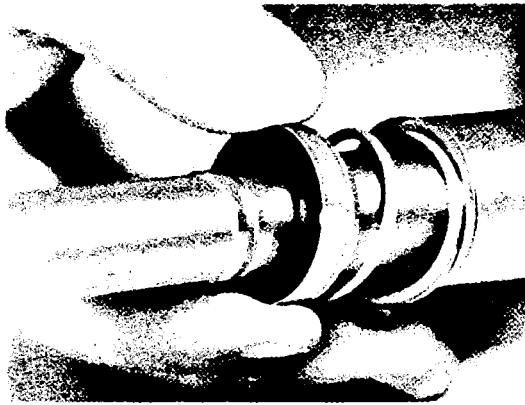


Figure 5.

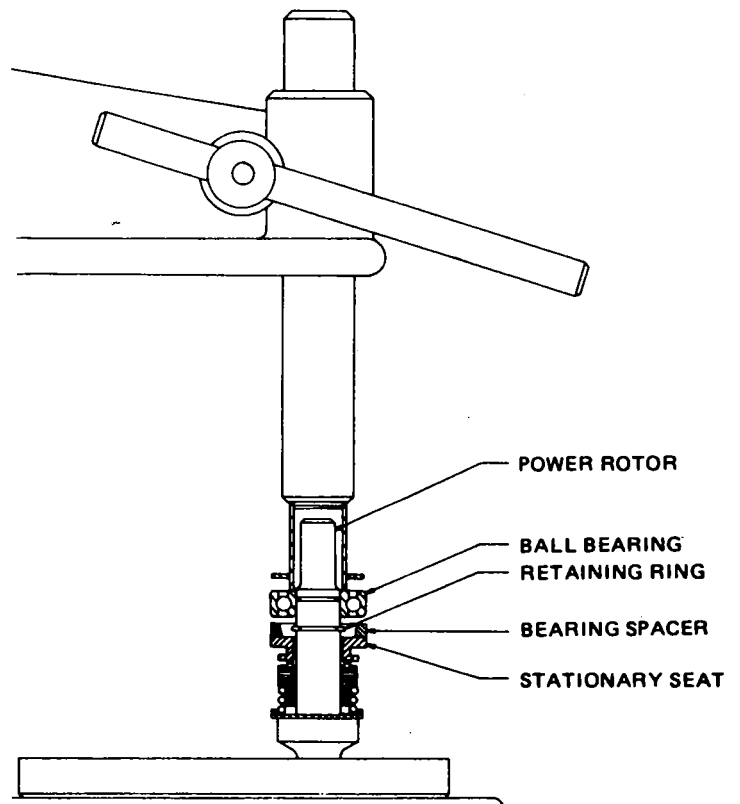


Figure 6.

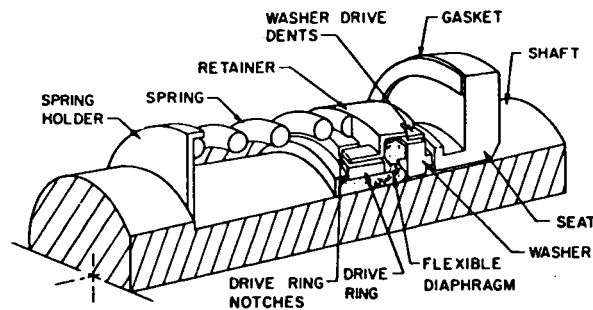


Figure 7.

ASSEMBLY BEARING & MECHANICAL SHAFT SEAL 6U PUMPS

Step

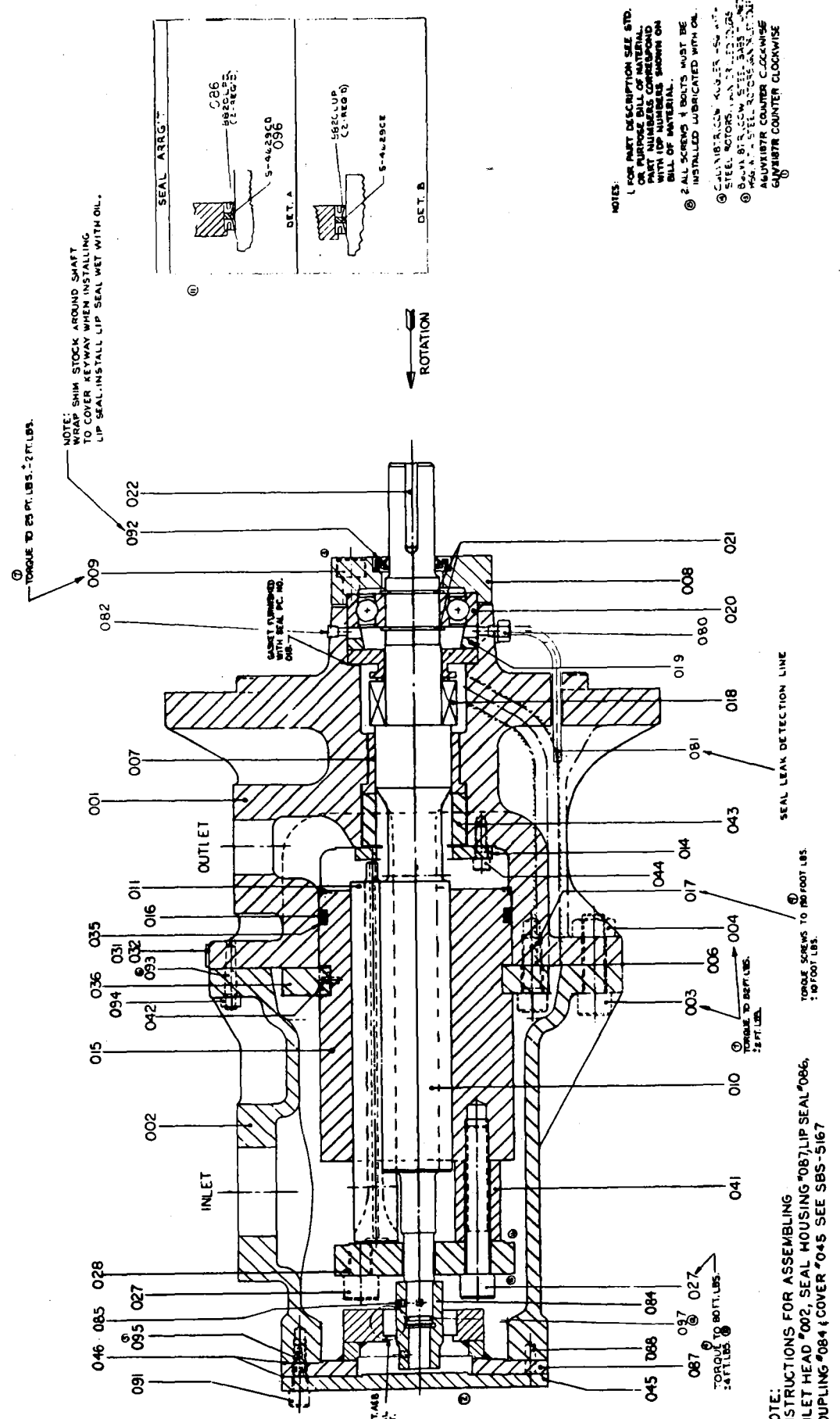
1. Clean the power rotor shaft and snap ring grooves prior to installing the new seal and bearing. Wash the shaft in solvent to remove dirt and grease. Use only new bearing, seal, and retaining rings.
2. Place the spring holder and spring on the shaft.
3. Lubricate the shaft with clean, 500 ssu, hydraulic fluid.
4. Grasp the seal subassembly as shown in Fig. 5 and, using a rotating motion, gently slide the seal subassembly over the shaft. Use care not to cut the flexible diaphragm and drive ring. A piece of shim stock wrapped around the power rotor shaft to cover the snap ring grooves and shoulder of the seal diameter may be used for this purpose. If shim stock is used, twist the seal subassembly in the same direction as the wrap of the shim stock when installing it.
5. Install the seat with gasket and bearing spacer.
6. Install the inner retaining ring.
7. Place the ball bearing on the shaft. Using a hollow tube and *pressing on the inner race*, seat the bearing firmly against the snap ring (Fig. 6). **DO NOT PRESS THE BEARING ON THE OUTER RACE.**
8. Check the mechanical seal. Referring to Fig. 7, the flexible diaphragm must show evenly above the drive ring, and the drive lugs on the retainer must engage the drive ring to their full length. Adjust the mechanical seal if necessary.
9. Install the outer snap ring.
10. Lubricate the threads and install the power rotor assembly into the outlet cover (001).

PARTS LIST

Drawing SD-5454

| <u>NO.</u> | <u>NAME</u> | <u>NO.</u> | <u>NAME</u> | <u>NO.</u> | <u>NAME</u> |
|------------|-----------------------|------------|----------------------|------------|--------------------|
| 001 | Outlet Cover - Flange | 020 | Ball Bearing X | 081 | Tubing |
| 002 | Inlet Head | 021 | Retaining Ring X (2) | 082 | Pipe Plug |
| 003 | Capscrew (8) | 022 | Key | 084 | Coupling XX |
| 004 | Nut (8) | 027 | Capscrew (2) | 085 | Setscrew (2) |
| 006 | Gasket X | 028 | Thrust Plate XX | 086 | Lip Seal (2) X |
| 007 | Bushing XX | 031 | Name Plate | 087 | Seal Housing |
| 008 | Bearing Retainer | 032 | Rivet (2) | 088 | Dowel Pin (2) |
| 009 | Capscrew (4) | 035 | Back-Up Ring X | 091 | Capscrew (6) |
| 010 | Power Rotor XX | 036 | Clamp Ring XX | 092 | Oil Seal X |
| 011 | Idle Rotor XX (2) | 041 | Spacer (2) | 093 | Taper Pull Pin (2) |
| 014 | Idle Stop XX | 042 | Spring Pin XX | 094 | Nut (2) |
| 015 | Rotor Housing XX | 043 | Spacer | 095 | Capscrew (4) |
| 016 | "O" Ring X | 044 | Capscrew (2) | 096 | Retainer |
| 017 | Capscrew (16) XX | 045 | End Cover (Outboard) | 097 | "O" Ring X |
| 018 | Mechanical Seal X | 046 | Gasket X (2) | | |
| 019 | Spacer XX | 080 | Ermeto M. Conn. | | |

All parts marked X make up a minor Repair Kit
 All parts marked X & XX make up a major Repair Kit
 All quantities are one unless marked in parentheses



- NOTES:
- ① FOR PART DESCRIPTION SEE STD. OR PURPOSE BILL OF MATERIAL. PART NUMBERS SHOWN ON BILL OF MATERIAL.
 - ② ALL SCREWS & BOLTS MUST BE INSTALLED LUBRICATED WITH OIL.
 - ③ CALIBRATION NUMBER FOR STEEL ROTORS AND STEEL BALLS.
 - ④ BALLS BY SCOW STEEL BALLS.
 - ⑤ 456 A - STEEL ROTORS AND BALLS.
 - ⑥ 456 B - STEEL ROTORS AND BALLS.
 - ⑦ 456 C - STEEL ROTORS AND BALLS.

NOTE: INSTRUCTIONS FOR ASSEMBLING INLET HEAD #002, SEAL HOUSING #087, LIP SEAL #086, COUPLING #084 & COVER #045 SEE SBS-5167