



INSTRUCTIONS AND PARTS LIST

SERIES G3DB/AG3DB ELEVATOR



WARNING

This manual, and GENERAL INSTRUCTIONS MANUAL, CA-1, should be read thoroughly prior to pump installation, operation or maintenance.

SRM00059

Rev. 05 (20-0051)

February 2020

(was G3DB/AG3DB Elevator)

READ THIS ENTIRE PAGE BEFORE PROCEEDING

FOR THE SAFETY OF PERSONNEL AND TO PREVENT DAMAGE TO THE EQUIPMENT, THE FOLLOWING NOMENCLATURE HAS BEEN USED IN THIS MANUAL:

	DANGER
Failure to observe the precautions noted in this box can result in severe bodily injury or loss of life.	

	WARNING
Failure to observe the precautions noted in this box can cause injury to personnel by accidental contact with the equipment or liquids. Protection should be provided by the user to prevent accidental contact.	

CAUTION	ATTENTION
Failure to observe the precautions noted in this box can cause damage or failure of the equipment.	

Non-compliance of safety instructions identified by the following symbol could affect safety for persons: <div style="text-align: center;"></div>	Safety instructions where electrical safety is involved are identified by: <div style="text-align: center;"></div>	Safety instructions which shall be considered for reasons of safe operation of the pump and/or protection of the pump itself are marked by the sign: <div style="text-align: center;">ATTENTION</div>
---	--	---

ATTENTION
If operation of this pump is critical to your business, we strongly recommend you keep a spare pump or major repair kit in stock at all times. As a minimum, a minor repair kit (o-rings, gaskets, shaft seal and bearings) should be kept in stock so pump refurbishment after internal inspection can be accomplished.

CONTENTS

Safety and Table of Contents	A
General Instructions	1
Ordering Instructions	1
Introduction	1
Maintenance	3
Bearing and Mechanical Shaft Seal Disassembly	4
Bearing and Mechanical Shaft Seal Resassembly	5

GENERAL INSTRUCTIONS

The instructions found herein cover the disassembly, assembly and parts identification of Series G3DB and AG3DB pumps.

NOTE: Individual contracts may have specific provision that vary from this manual. Should any questions arise which may not be answered by these instructions, refer to the General Instructions Manual, CA-1, provided with your order. For further detailed information and technical assistance please refer to Imo Pump, Technical Service Department at (704) 289-6511.

This manual cannot possibly cover every situation connected with the installation, operation, inspection and maintenance of the equipment supplied. Every effort was made to prepare the text of the manual so that engineering and design data is transformed into the most easily understood wording. Imo Pump must assume the personnel assigned to operate and maintain the supplied equipment and apply this instruction manual have sufficient technical knowledge and are experienced to apply sound safety and operational practices which may not be otherwise covered by this manual.

ORDERING INSTRUCTIONS

All correspondence pertaining to renewal parts for the equipment must refer to the instruction manual number and should be addressed to the nearest Imo representative. The handling of renewal orders will be greatly facilitated if the following directions are carefully observed:

1. Give the number of the instruction manual.
2. Give the model number of the pump for which the part is desired. This number appears on the nameplate.
3. Designate the desired part by the IDP number and name as listed in Table 1 and pump assembly drawing in this instruction manual.

INTRODUCTION

This manual covers all sizes of type G3DB and AG3DB Imo pumps for hydraulic elevator service. Field repairs are generally limited to replacing the mechanical seal and bearing. This manual provides instructions covering these operations.

INLET POSITION

To remove inlet head, remove the cap screws or bolts (10) and rotate the inlet head to the desired position, taking care not to damage the gasket (8). A damaged gasket must be replaced. To reassemble, replace the inlet head, lubricate the threads with oil and retorquing the bolts (value given for the particular size pump in Table 1, page 3).

PIPING

Piping to the pump must be independently supported and not allowed to impose strains on the pump. Such strains, if imposed, may cause distortion and malfunction of the pump.



WARNING

Prior to adding oil and start-up of your new or replacement pump, clean the tank and flush all lines free of debris that will have accumulated during fabrication and installation. One large particle can fail the pump in a fraction of a second.

PRIMING

For those units that do not have an overhead tank, a priming connection in the suction line should be provided. Prime the pump before initial start-up by pouring hydraulic fluid into the priming point or pump suction. Rotate the pump slowly by hand until the rotors are wet and the suction line is as full of fluid as possible.

SUCTION LINE

All joints in the suction line must be tight and sealed to prevent air from being drawing into the pump with negative suction pressure. Position the suction line and/or inlet head so the fluid cannot drain from the pump while shut down.

SUCTION STRAINER

A suction strainer with adequate flow rate and minimum pressure drop should be used to keep contamination from entering the pump and system. The maximum pressure drop (when dirty) across the strainer plus all other losses in the pump suction line at maximum fluid viscosity, including static lift, must not exceed the suction lift capability of the pump. Regular cleaning of the suction strainer must be included in the maintenance of the machine.

Note: Keeping the fluid and system clean is essential in achieving maximum pump life.

BELT DRIVEN PUMPS – ALIGNMENT

Mount the sheaves as close to the bearing retainer as possible. This minimizes the overhung load on the shaft.

Align the sheaves with a straight edge so their faces are parallel with no offset. Misaligned sheaves can cause noise, shorten belt life, and may reduce the bearing life of the pump and/or motor.

Apply belt tension according to the belt manufacturer's recommendations. After tension is applied, recheck sheave alignment. Do NOT overtension belts. While loose belts slip and wear excessively, excessive belt tension may cause misalignment, belt failures, and in extreme cases, a shaft failure.

For smooth, quiet, high speed operation, sheaves must be balanced and shaft bores must be concentric with belting grooves.

When matched belts are removed, they should be kept in sequence and replaced exactly in the grooves from which they were removed.

DIRECT DRIVEN PUMPS – ALIGNMENT

All pump-driver sets must be checked for proper alignment when the unit is installed and after all piping has been connected to the pump. Factory alignment will most likely be disturbed during shipment and installation.

A flexible coupling is not intended to permit permanent misalignment. Proper alignment must be established and maintained to obtain maximum pump life. Follow these steps:

1. Install the pump and/or motor.
2. Before aligning the units, be sure that all stresses are removed from the pump and that the foot of the pump case fully conforms to its support.
3. Set the coupling end face gap as specified by the coupling manufacturer.
4. Perform rough alignment of the face and rim of the coupling using feelers and a straight edge.
5. Perform the final alignment of the pump and driver shaft using dial indicators. Acceptable alignment has been obtained when the F.I.R. is less than or equal to .005" in both the face (angularity) and the rim (parallelism) checks while rotating both shafts together 360°.
6. In special cases, "hot alignment" when the pump and motor are at operating temperature may be required.

Periodically check the alignment of the pump and its driver. Realign as necessary. Maintaining proper alignment is necessary for quiet operation and maximum equipment life.

ROTATION

Before connecting the belts our coupling, check the driver rotation to be sure it matches the required rotation of the pump. Extended reverse rotation may cause damage.

When the coupling is connected and shafts are correctly aligned, the pump should turn freely by hand.

On initial start-up, it is suggested that the driver be "jogged" quickly before continuous operation to be sure the system and pump and motor are functioning properly and rotating in the intended direction.

FLUID

Use only hydraulic fluid recommended for use with the pump. Supplementary oil additives are not recommended. Regular checks should be made of the condition of the hydraulic fluid and the fluid level in the reservoir, and establishing when the fluid is to be changed. When adding or replacing fluid, use enough fluid to return the fluid level in the tank to its normal operating point. Be sure the fluid temperature is controlled so that the minimum allowable viscosity at maximum operating conditions is not exceeded and that the maximum viscosity at cold start does not cause the suction lift limits to be exceeded.



CAUTION

When replacing or adding fluid, be careful to keep foreign material from entering the fluid and system.

Check the fluid level in the tank before and after start-up to be sure it is within operating limits. If the fluid is low, or drops as the system fills on start-up, add sufficient clean hydraulic fluid to the tank to bring the fluid to its normal operating level.

VALVES

Before starting, check all valves to be sure they are in proper position and that there is no possibility of starting the pump with a blocked suction or discharge line and that the pump is filled with oil.

Using a bleed point at the high point in the system, vent air from the system on start-up.

The relief valve should be about 5% above maximum system operating pressures. Do NOT set the relief valve higher than the maximum pressure rating of the pump.

MAINTENANCE

GENERAL

If the installation and alignment instructions have been carefully followed, the pump should operate satisfactorily with very little attention. Field maintenance is generally limited to the periodic maintenance checks and the replacement of seals, gaskets and bearings. Major repair of elevator pumps in most cases is not economical.

IDP	Description	IDP	Description
1	Case	16	Key
2	Rotor Housing	17	Bearing Retainer Plate
3	Pipe Plug	18	Retainer Bolt (4)
4	Tube	19	Idler Rotor (2)
5	Tube O Ring (2)	20	Idler Balance Piston Housing (2)
6	Housing O Ring	21	Thrust Plate
7	Cover O Ring	22	Spacer (2)
8	Gasket	23	Hex Bolt (2)
9	Inboard Cover (all except 350 size)	24	Lockwasher (2)
10	Cover Bolt (8) up to 250 size (16) above 250 size	25	Mechanical Seal
		26	Inlet Head
11	Power Rotor	27	Spacer Ring
13	Retaining Ring (2)	35	Seal Retaining Ring (250 size only)
14	Bearing Spacer	47	Balance Piston Housing (350 size only)
15	Bearing		
All quantities are one except when noted in parentheses			

Table 1 – List of Material

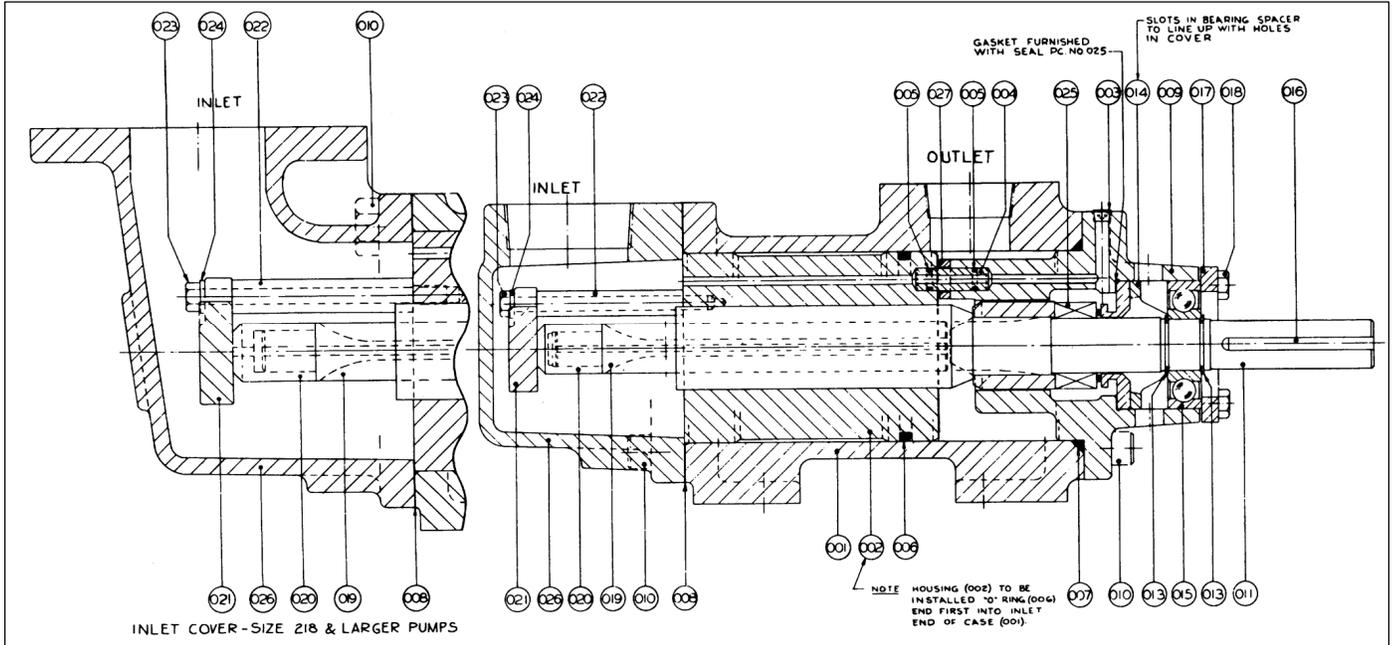
PART NO.	ROTOR SIZE					
	187	218	250	275	312	350
10 (inboard end)	35 ± 5	50 ± 5	70 ± 5	54 ± 5	78 ± 5	100 ± 5
10 (suction end)	90 ± 5	140 ± 5	145 ± 5	54 ± 5	78 ± 5	100 ± 5
18	18 ± 2	20 ± 2	20 ± 2	16 ± 5	38 ± 2	38 ± 2
23	10 ± 2	15 ± 2	15 ± 2	26 ± 2	30 ± 2	55 ± 5

Table 2 – Bolt Torque Values (LB-FT)



WARNING

When inspecting/servicing the shaft seal and/or bearing, the power rotor with these components installed can be removed as a subassembly. If for any reason the pump is disassembled further than this, it is possible the idler rotor balance piston housings (20) may fall off. The idler rotor balance piston housings **MUST** be properly in place at reassembly. If idler rotor balance piston housings are not properly installed on the idler rotors, the pump **WILL** experience catastrophic failure.



Assembly Drawing

DISASSEMBLY OF BEARING AND MECHANICAL SHAFT SEAL

1. Remove the power rotor assembly.

Power rotor assembly consists of power rotor, bearing, bearing spacer, retaining rings and mechanical seal.

- a. Remove coupling or sheave.
 - b. Remove hex bolts (18).
 - c. Remove bearing retainer (17).
 - d. Pull power rotor assembly out of pump case.
2. Remove the outer retaining ring from the power rotor with a screwdriver (13).
 3. Remove the inner retaining ring from its groove by pulling back the mechanical seal and prying with a screwdriver (13).
 4. Press the bearing, spacer and stationary seat off the power rotor (Figure 1).
 5. Remove seal subassembly (Figure 3) 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.

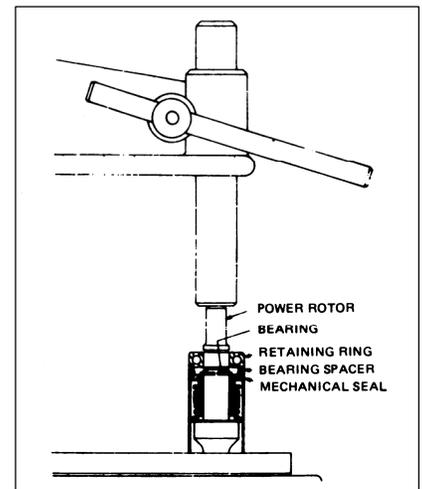


Figure 1

REASSEMBLY OF BEARING AND MECHANICAL SHAFT SEAL

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. Make sure that retaining ring (35) furnished on rotor size 250 and seal spacer (38) for rotor size 275 and 350 is installed on power rotor. Place the spring holder and spring on rotor shaft.
3. Lubricate the shaft with clean hydraulic fluid.
4. Grasp the seal subassembly, 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. Insert seal gasket furnished with new mechanical seal into the bore of inboard end cover (46). Clean and lubricate the face of the carbon ring in the mechanical seal and place the stationary seat and bearing spacer on the power rotor.
6. Install inner retaining ring.
7. Place the ball bearing on the shaft. Using a hollow tube and pressing on the inner race, set the bearing firmly against the inner retaining ring (Figure 2). Do not press the bearing on the outer race!
8. Check the mechanical seal. Referring to (Figure 3), 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 retaining ring (13).
10. With a clockwise rotating motion insert power rotor assembly into pump.
11. Install bearing retainer (17).
12. Install hex bolts (18) and torque per Table 2.

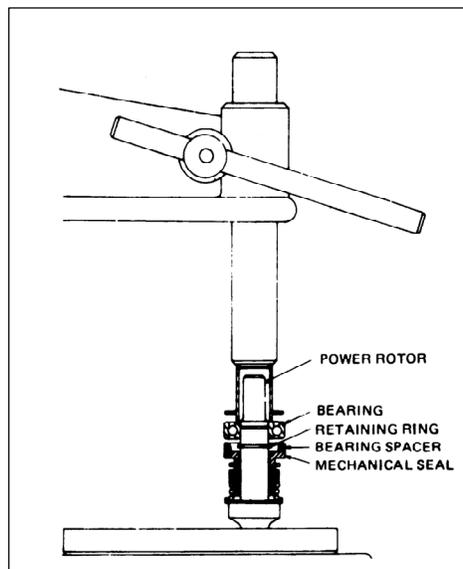


Figure 2

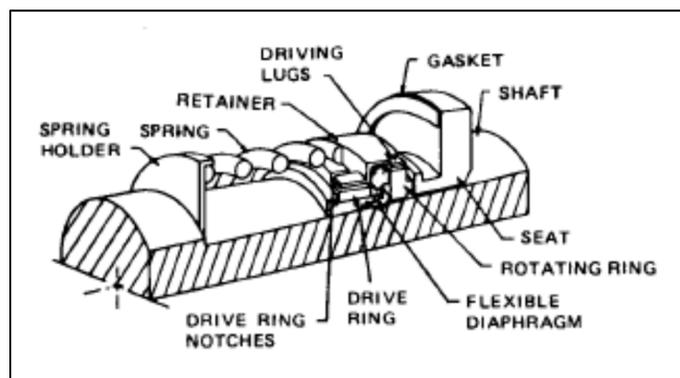
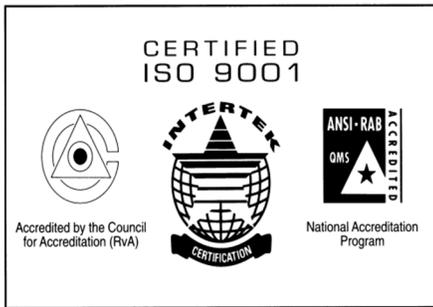


Figure 3 – Mechanical Seal Assembly



CIRCOR

1710 Airport Road
PO Box 5020
Monroe, NC USA
28111.5020

Tel: +1. 877.853.7867

Email: cc@circor.com

Web: www.circorpt.com

