



**INSTRUCTION MANUAL
AND
PARTS LIST
FOR
AK6DHZ AND K6DHZ PUMPS**



WARNING

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

This manual now is
identified as part no.
SRM00040


Manual No. AK/K6DHZ


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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>
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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.

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A. GENERAL INSTRUCTIONS

The instructions found herein cover the disassembly, assembly and parts identification of Series AK6DHZ and K6DHZ pumps.

NOTE: Individual contracts may have specific provisions 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/Customer 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.

In applications where equipment furnished by Imo Pump is to become part of processing machinery, these instructions should be thoroughly reviewed to ensure proper fit of said equipment into overall plant operational procedures.



WARNING

If installation, operation, and maintenance instructions are not correctly and strictly followed and observed, injury to personnel or serious damage to pump could result. Imo Pump cannot accept responsibility for unsatisfactory performance or damage resulting from failure to comply with instructions.

B. INTRODUCTION

This instruction manual covers K6DHZ and AK6DHZ Imo pumps. This series of pumps has been designed for use in hydraulic, lubricating and seal applications requiring high inlet pressure capabilities. The model, and design construction of each pump can be identified by the designator code on the pump nameplate. Definitions of model designators are identified in Figure 1.

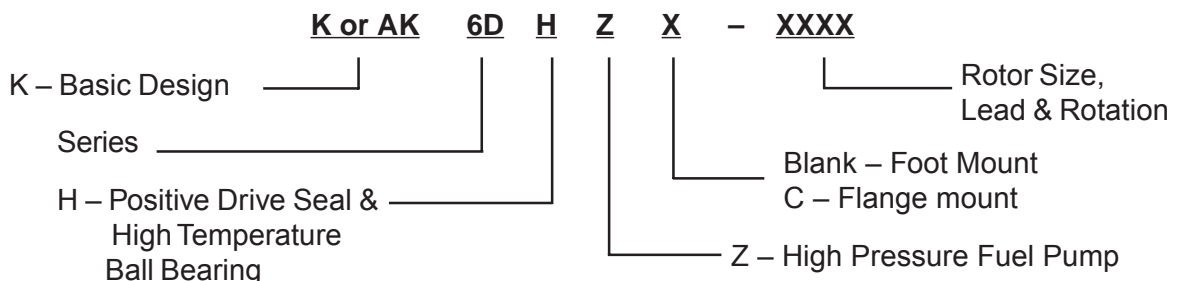
C. DESCRIPTION OF EQUIPMENT

The K6DHZ and AK6DHZ pumps are positive displacement, rotary screw pumps consisting of a precision bored housing that encloses a driven screw (power rotor) and four intermeshing following screws (idler rotors). These screws when rotating form a succession of closures or cavities. As they rotate, the fluid is moved axially from the inlet port to the outlet port in a continuous, uniform flow with minimum fluid pulsation and pump noise.

D. PUMP MODEL IDENTIFICATION

This instruction manual covers the Imo K6DHZ and AK6DHZ pumps. The model of each pump is identified on the pump nameplate. Refer to Figure 1 and Table 1 for instructional keys when using this manual.

Figure 1 – Model Designator Definitions



E. ORDERING INSTRUCTIONS

When corresponding with Imo Pump regarding K6DHZ and AK6DHZ pumps, refer to the pump nameplate, this instruction manual, and the assembly drawing as instructed below:

1. From pump nameplate, record the pump model number, serial number and manufactured date.
2. Record instruction manual number, revision and date.
3. From the instruction manual, record the figure numbers that apply to the replacement part(s).
4. From the assembly drawing or parts list (see Figures 2, 3 and Table 2) provide the IDP number(s) and names for the replacement part(s).
5. Give the above information to your Imo service representative.

Imo sales and service representatives are listed herein and in General Instruction Manual, CA-1.

F. OPERATION

F.1 LIQUID LIMITATIONS

Never operate with thin liquids such as solvents or water. The pump is designed for liquids having the general characteristics of oil.

F.2 OPERATING LIMITS

CAUTION	ATTENTION
<p>Operating conditions, such as speed, fluid viscosity, temperature inlet pressure, discharge pressure, filtration, duty cycle, drive type, mounting, etc., are interrelated. Due to these variable conditions, the specific application limits may be different from that of the operational limitations. This equipment must not be operated without verifying system's operating requirements are within the pump's capabilities.</p>	

Under no circumstances are the following operating limits (specified in Table 1) to be exceeded without specific approval from Imo Pump.

Table 1 – Normal Pump Operating and Structural Limits

MAXIMUM SPEED	3600 RPM
VISCOSITY	1 cSt Minimum – 3000 SSU (650 cSt) Maximum
MINIMUM – MAXIMUM LIQUID TEMPERATURE	0 to 250° F (-18 to 121° C)
MAXIMUM INLET PRESSURE	150 psig
MAXIMUM DISCHARGE PRESSURE	1500 psig, Cont. Duty
FILTRATION	(See General Instruction Manual, CA-1)
DRIVE	Direct only
MOUNTING	Foot or Flange mounted in any attitude


G. PARTS LIST


Table 2 – Pump Parts List

IDP	QTY	DESCRIPTION	KIT	IDP	QTY	DESCRIPTION	KIT
1	1	Case		38	1	Seal Sleeve	
2	1	Inlet Head		41	2	Nilos Rings (AK design only)	
4	8	Bolt		42	2	Retaining Ring	X
6	1	Stop Pin	XX	43	1	Retainer	
7	1	Dyna Seal	X	46	1	Inboard Cover	
8	2	Retaining Ring	XX	47	4	Bolt	
9	2	O-Ring	X	48	1	Spacer	XX
10	1	Spacer Pin	XX	49	1	Ball Bearing	X
21	2	Idler	XX	63	1	Power Rotor	XX
23	2	Idler Balance Piston Housing	XX	67	2	Plug	
24	1	Housing	XX	70	1	Elbow	
25	1	Seal	X	71	1	Seal Pipe	
26	1	Tube	XX	74	1	Elbow	
27	2	O-Ring	X	79	1	Bushing	XX
28	1	O-Ring	X	80	1	Idler Stop	XX
29	1	Cage	XX	81	2	Socket Head Capscrew	
31	1	Key		83	1	O-Ring	X
33	1	Nameplate		91	4	Washer	
34	3	Drive Screw		92	8	Washer	
35	2	Discharge Idler	XX				

X = Minor Repair Kit Items.
 XX = Major Repair Kit Items. (Items marked (X) are included in Major Repair Kit).

H. PUMP MAINTENANCE

	WARNING
<p>Failure to observe precautions while installing, inspecting, and maintaining the pump can cause injury to personnel from accidental handling of liquids that may harm skin or clothing, or fire hazard risks from flammable liquids, or injury from high pressure fluid jets.</p>	

	DANGER
<p>BEFORE working on equipment, make sure all power to the equipment is disconnected and locked-out.</p>	

H.1 GENERAL COMMENTS

NOTE: Part number identifiers (IDPs) contained within parenthesis such as (10) refer to the circled numbers shown on the assembly drawing. See Figure 2 and 3 and Table 2.

H.2 TOOLS REQUIRED

The procedures described in this manual require common mechanics hand tools, a torque wrench, dial indicator and suitable lifting device (such as) slings, straps, etc.

H.3 DISASSEMBLY PROCEDURES

SPECIAL NOTE: To service mechanical seal and ball bearings ONLY, perform H.3, Steps 1, 9, 10 and 11, and H.4 Steps 8, 9, 10 and 11 ONLY.

	CAUTION
<p>Fluid leakage from disassembly of pump may make the floor slippery and can cause personal injury.</p>	

1. Close suction and discharge piping to pump and disconnect piping. Remove seal piping (71). Remove drain plugs (67), and drain unit. Remove pump from driver, coupling and base plate. Remove coupling hub and key (31).
2. Remove bolts (4) on inlet side and inlet head (2).
3. Remove O-ring (9) from inlet head (2) groove.
4. Remove retaining rings (8) from grooves in case (1).
5. Remove thrust cage (29).
6. Remove oil balance tube (26) with O-rings (27) from either cage (29) or housing (73). Remove O-rings (27) from tube (26).
7. Remove idler balance piston housings (23) from idlers (21).
8. Remove suction idlers (21) by unscrewing them from inlet end of pump.
9. Remove remaining idlers (35) by rotating power rotor (63) in a counterclockwise direction.

CAUTION

Do not permit idlers (21,35) to drop as they emerge from housing (24).

10. Remove bolts (47), bearing retainer (43) (and Nilos ring (41) (AK design only)) from inboard cover (46).
11. Remove assembled power rotor (63). Removal of power rotor (63) includes removal of Truarc rings (42), ball bearing (49), seal seat adapter (48), spacer (38), mechanical seal (25) and (Nilos ring (41) (AK design only)).
12. Disassemble power rotor (63) as follows :
 - a. Using a flat nosed tool, such as a screw driver, remove the Truarc rings (42) located on both sides of the ball bearing (49) from their grooves in power rotor (63).
 - b. The sealed ball bearing is assembled to the power rotor (63) with a light press fit. The ball bearing (49) may be removed by using a bearing puller or a vertical arbor press. When using the press, two pieces of key stock are to be placed through the openings of the mechanical seal seat adapter (48) underneath the ball bearing (49) on both sides of the power rotor shaft. The key-stock should be long enough to support the power rotor (63) as it is placed in the press. The press ram is to be positioned against the power rotor (63) coupling end face. Gently press the power rotor (63) through the ball bearing (49).
 - c. (Remove the Nilos ring (41) from the power rotor (63) (AK Design Only)).

CAUTION

Ensure the power rotor (63) does not fall to the floor once the ball bearing (49) is off of its diameter.

- d. Remove the seal seat adapter (48) from the power rotor (63), then remove the mechanical seal stationary seat from the seal seat adapter (48). Loosen the set screws on the mechanical seal rotating assembly body and remove from the power rotor (63). Remove the spacer (38) from the power rotor (63).
13. Remove the O-ring (83) from the inboard end cover (46).
14. Remove bolts (4) and inboard cover (46). Removal of inboard cover (46) will include removal of floating balance piston (79) and idler stop (80).
15. Remove O-ring (9) from inboard cover (46).
16. Remove pin (26) or (10) from housing (24) or idler stop (80), whichever is applicable.
17. Remove idler stop (80) from inboard cover (46) by removing cap screw (81). Then remove floating balance piston (79) from inboard cover (46).
18. Remove stop pin (6) and Dyna seal (7) from case (1).
19. Remove housing (24) from case (1) and O-ring (28) from housing (24).

CAUTION

Do not permit housing (24) to drop as it is removed from pump.

H.4 PUMP ASSEMBLY PROCEDURE

Note: Prior to reassemble of pump, all parts should be cleaned and inspected for nicks and burrs. Replace all worn or damaged parts. Imo Pump recommends replacement of all O-rings, the Dyna seal and mechanical seal and ball bearing when these parts are disturbed from their previously installed positions. Coat all parts with light lubricating oil to assist in assembly.

1. Install O-ring (28) in groove of housing (24)
2. Install housing (24) in pump case (1) properly aligning groove in housing (24) to stop pin hole in case (1). Install stop pin (6) with Dyna seal (7) in case (1).
3. Install pin ((10) in inboard end of housing (1).
4. Install floating balance piston (79) in inboard cover (46).
5. Install idler stop (80) onto inboard cover (46) with cap screws (81). Torque cap screws to value on assembly drawing.
6. Install O-ring (9) in groove in inboard cover (46).
7. Install inboard cover (46) on case (1) using bolts (4). Be sure that pin hole in inboard cover (46) lines up with pin (10) in housing (1). Torque bolts to proper value on assembly drawing.
8. Assemble power rotor (63) and mechanical seal (25) as follows (see seal insert for drawing numbers).
 - a. Install O-ring (b) in groove of mechanical seal (25) stationary seat (a). Install mechanical stationary seat (a) in seal spacer (48) ensuring that spring pin is properly positioned to engage slot in seal seat.
 - b. Install spacer (38) on power rotor (63) when required.
 - c. Install mechanical seal (25) and rotating assembly (3) on to power rotor (63) next to spacer (38). Tighten set screws (3F).
 - d. Wipe mechanical seal rotating and stationary faces with a clean, lint free cloth before assembling the faces together.
 - e. Install assembled bearing spacer (48), with stationary seat (1), to power rotor shaft next to mechanical seal rotating face.
 - f. (Install Nilos ring (41) onto power rotor (63) with sharp edge facing bearing (49) on AK design only)).
 - g. Install inner Truarc ring (42) in groove of power rotor (63).
 - h. Press bearing (49) on power rotor (63), pressing only on inner race of ball bearing (49) until it is located next to the inner truarc ring (42).
 - i. Install outer Truarc ring (42) in groove of power rotor (63).
9. Install O-ring (83) in seal bore of inboard cover (46).
10. Install assembled power rotor (63) in pump, centering all parts as they enter inboard cover (46). Align one of the openings in spacer (48) over the drain in inboard cover (46).
11. (Install second Nilos ring (41) on inboard cover (46) with sharp edge facing bearing (49). Be sure Nilos ring (41) is centered against bearing (49) (on AK design only)).
12. Install bearing retainer (43) on inboard cover (46) using bolts (47). Torque bolts to proper value on assembly drawing.
13. Install idlers (21) the (35) into housings from suction end by meshing the threads with the power rotor thread and screwing them into the housing idler bores.
14. Install idler balance piston housings (23) to the ends of the suction idlers (21).
15. Install O-rings (27) on oil balance tube (26) and oil balance tube (26) in housing (24).
16. Install thrust cage (29) in pump case (1), ensuring that the pin hole in thrust cage (29) engages balance tube (26) in housing (24).

17. Install retaining rings (8) to pump case (1).
18. Install O-ring (9) to groove in inlet head (2).
19. Install inlet head (2) using bolts (4). Torque bolts to proper value on assembly drawing.
20. Install seal piping (71) and drain plug (67).

Note: Inlet head (2) can be rotated and repositioned in 90° increments to suit suction piping. To change the inlet position, disconnect seal piping (71), remove bolts (4) and rotate inlet head to the desired position. Install bolts (4), and torque to proper value. Reconnect seal piping (71).

21. Install coupling hub key (31). Install and align pump and driver as specified in General Instruction Manual, CA-1.

I. TROUBLESHOOTING

For assistance with troubleshooting see General Instruction Manual, CA-1.

J. FIELD AND FACTORY SERVICE AND PARTS

Imo Pump maintains a staff of trained service personnel that can provide pump installation, pump start-up, maintenance/overhaul and troubleshooting supervision as well as installation and maintenance training.

Our factories provide maintenance as well as overhaul and test facilities in the event the user prefers to return pumps for inspection or overhaul. Pumps that have been factory-overhauled are normally tested and warranted “as-new” for a period of one year from date of shipment. For either field service or factory overhaul assistance, contact your local Imo Sales Office or representative at the Technical/Customer Service Department in Monroe, NC, USA.

Most pumps have repair kits available. Minor Repair Kits are used to repair leaking seals, bad bearings and/or for re-assembly after pump tear-down. They include (as applicable) pump shaft seals, packing, all gaskets/O-rings and bearings. Major Repair Kits are sufficient to rebuild completely worn-out pumps to “as-new” condition. They include all parts found in Minor Repair Kits plus all major internal parts subject to wear. Since kits have all the necessary parts, it is preferred that they be purchased rather than selecting individual parts. When parts are individually selected from the Parts List, some needed components are often overlooked. In addition, mixing worn or used parts with new parts risks rapid wear and shortened service life from the new parts.

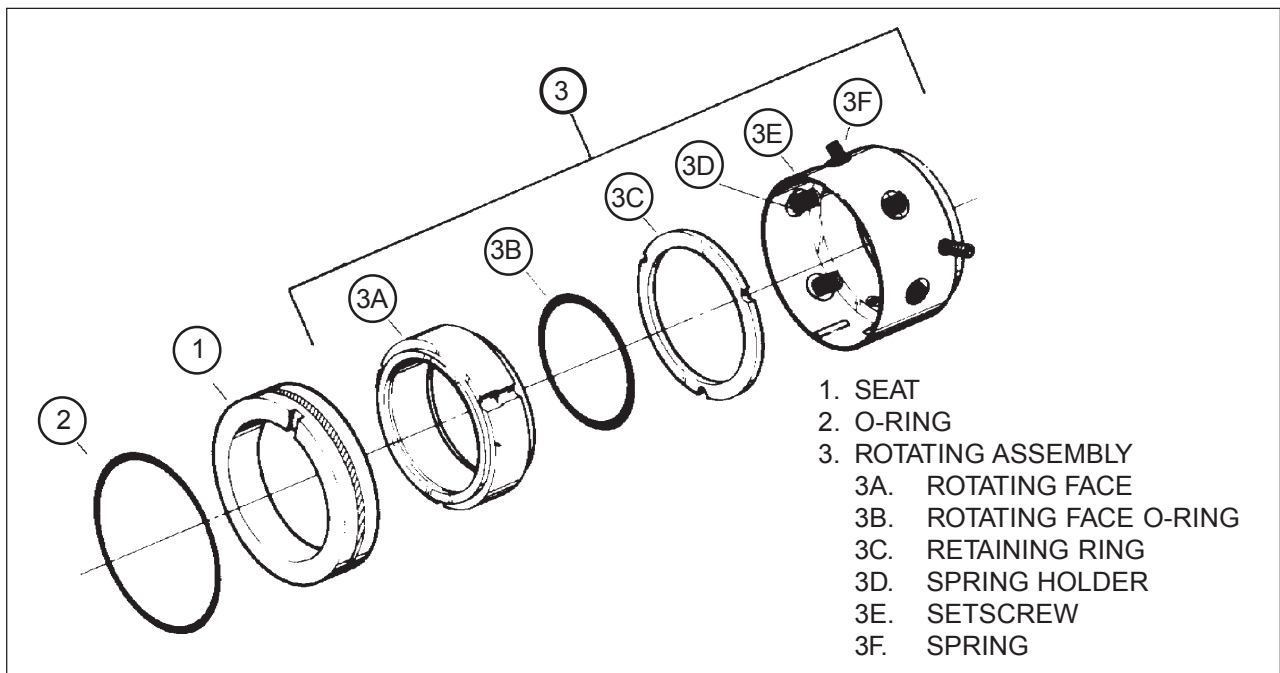


Figure 2 – Borg Warner Type Q Mechanical Seal or Crane Type 8-1 Mechanical Seal

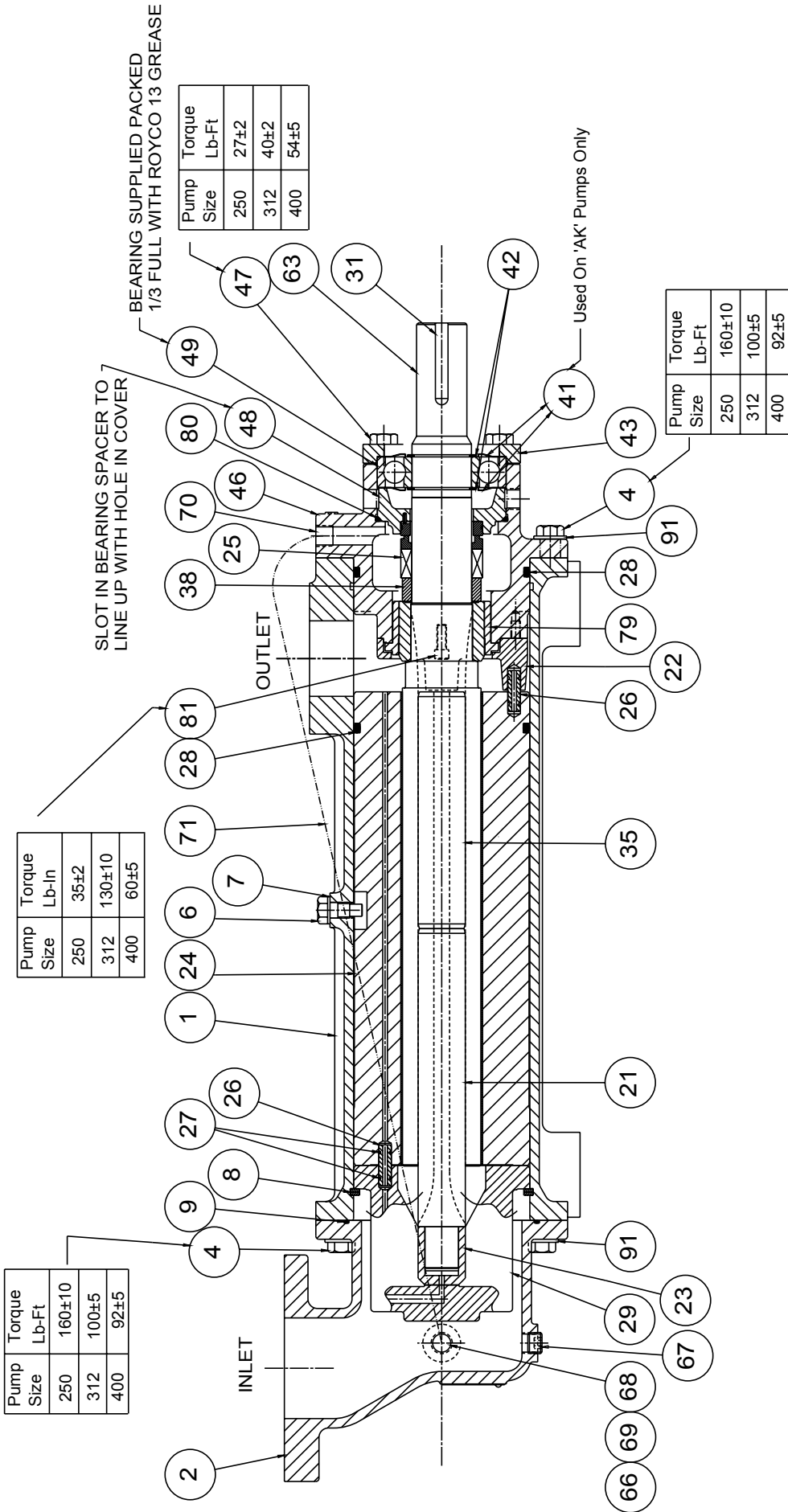


Figure 3 – AK6DHz and K6DHz Pump Assembly Drawing



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