INSTRUCTION MANUAL

VERTICAL MOUNTED
DEEPWELL CARGO PUMP

PUMP TYPE 413IC-800JD

WARNING

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

FOREWORD

This instruction manual covers operating limits, disassembly and assembly of Imo Industries Inc., IMO Pump Division, Pump Type 413IC-800JD. This pump has been designed specifically for deepwell cargo service either as a new installation unit or as a replacement for existing centrifugal pumps. When installed in an existing deepwell column, a bell adapter and coupled stub shaft are used to locate and connect pump to deepwell discharge column flange and drive shaft. With pilot centered column drive shaft and machined centered pump/column adapter flanges, no axial or parallel alignment of pump is required.

OPERATING STRUCTURAL LIMITS

Operating conditions such as speed, fluid viscosity and temperature are interrelated. Due to variable conditions, specific application limitations may vary from operating structural limitations. Under no circumstances are the following operating structural limitations to be exceeded:

Maximum Speed, RPM	1450
Design Pressure (@Column Deck Flange) PSIG	150
Normal Minimum Viscosity, SSU	100
BHP (Maximum Power @1450 RPM)	525

DISASSEMBLY AND ASSEMBLY PROCEDURES

DISASSEMBLY (Refer to Assembly Drawing, Figure 1, during disassembly)

NOTE

Loctite Grade 222 was applied to all capscrews and bolts during assembly. Large bolt fastening strength of Loctite Grade 222 is removed when heated to 400 degrees F. Heating of small bolts should not be required during removal.

1. With pump removed from column, remove bolts (21) and inlet strainer (20) from pump.

2. Using a sling, support thrust assembly (parts 12 through 18) and evenly loosen bolts (19) until thrust assembly is free from housing (5). NOTE: Weight of thrust plate assembly is approximately 145 lbs.

3. Slide spacers (18) from bolts (19) and slide bolts (19) from thrust block (13).

4. If removal of thrust blocks (17) from thrust block (13) is required, remove each capscrew (14) and lift thrust blocks (17) from block (13). Do Not bend or damage anti-rotation spring pins (16) during removal.

5. Rotate power rotor (7) until each idler (10) extends from housing (5) sufficiently to hand grasp each idler. Rotate one idler (10) at a time to "unscrew" idler from its housing (5) bore. Remove remaining two idlers. NOTE: Weight of each idler is approximately 80 lbs.

6. Slide power rotor (7), pushing from coupling end, from pump inlet a sufficient distance to wrap a support sling around end of power rotor. Continue sliding and adding support slings on power rotor (7) until it is removed from housing (5). NOTE: Weight of power rotor is approximately 375 lbs.

7. Insert three support eyebolts and three 3/4-10 UNC x 3½-inch jacking bolts evenly spaced in inboard

cover subassembly (1). Attach supporting straps to eyebolts to support inboard cover subassembly during its removal. NOTE: Weight of inboard cover subassembly is approximately 360 lbs.

8. Remove twelve capscrews (6) from inboard cover subassembly (1). Using three installed jacking bolts, remove inboard cover subassembly (1) from housing (5).

9. Remove truarc ring (3) from inboard cover subassembly (1).

10. Press sleeve bearing (4) from inboard cover subassembly (1). NOTE: Loctite Grade 222 was applied to both ends of sleeve bearing and inboard cover subassembly at beveled edges during assembly.

ASSEMBLY (Refer to Assembly Drawing, Figure 1, during assembly)

NOTE: Clean and inspect each part for burrs or nicks. Using a buffing wheel, remove all burrs. Wipe all rotating surfaces (idlers, power rotor and housing bore) with lubricating oil (SAE-30) prior to installing for ease in assembly. All capscrews and bolts are to be wiped with Loctite Grade 222 before installation.

1. Install truarc ring (3) in inboard cover subassembly (1).

2. Press sleeve bearing (4) into inboard cover subassembly (1) until it contacts installed truarc ring (3). NOTE: Oil grooves in sleeve bearing (4) are to be installed nearest adapter flange side of inboard cover, i.e. opposite side of truarc ring (3). Revised sleeve bearing design contains no oil grooves

3. Remove truarc ring (3) from inboard cover subassembly (1). Remove all traces of oil, grease or other oil base substances from area of installed sleeve bearing and inboard cover subassembly sleeve bearing bore.

4. Spread Loctite Grade 222 in V-groove created by beveled edge ends of sleeve bearing (4) and bearing bore of inboard cover subassembly (1). NOTE: Loctite Grade 222 will surface dry after 20 minutes and fully harden after six hours.

5. Install truarc ring (3) in inboard cover subassembly (1) after Loctite is dry.

6. If bolt (15) was removed from block (13), reinstall as follows:

   a. Clean all oil substances from thread area of nut (12), bolt (15) and block (13).

   b. Apply Loctite Grade 222 to thread area of bolt (15). Thread nut (12) on bolt to top of machined thread.

   c. Thread bolt (15) into center hole of block (13) until exposed bolt length is 6-1/4-inch [+ 1/8, — 0-inch], then lock bolt (15) into position using nut (12). Verify bolt length, then tighten nut (12) to 120 lbs. ft. (± 20 lbs. ft.). Allow Loctite to dry. NOTE: Bolt (15) and nut (12) is to be installed on same side of thrust block (13) as thrust block (17), capscrews (14) and spring pin (16).

7. Install spring pins (16) in block (13). Install thrust block (17) on thrust block (13) using capscrews (14) that are coated with Loctite Grade 222. Tighten capscrews (14) to a torque value of 30 lbs. ft. (± 5 lbs. ft.).

8. Verify that lifting eyebolts do not extend through flange, then install inboard cover subassembly (1)

on housing (5) using capscrews (6) coated with Loctite Grade 222. Tighten capscrews (6) to a torque value of 75 lbs. ft. (± 5 lbs. ft.). NOTE: Weight of inboard cover subassembly is approximately 360 lbs.

9. Spray housing (5) rotor bores and wipe power rotor (7) and idlers (10) with lubricating oil. Slide power rotor (7) in housing until coupling end of power rotor extends fully from inboard cover subassembly (1). NOTE: Weight of power rotor is approximately 375 lbs.

10. Slide one idler (10) into housing (5) bore turning idler as it threads next to power rotor (7). Repeat procedure to install remaining two idlers (10). NOTE: Weight of each idler is approximately 80 lbs.

11. Slide bolts (19) through thrust block (13) and slide spacers (18) on bolts (19). Wipe exposed ends of bolts (19) with Loctite Grade 222, then install assembled thrust block (13) on housing (5). Tighten bolts (19) to a torque value of 85 lbs. ft. (± 5 lbs. ft.).

12. Install inlet strainer (20) using Loctite Grade 222 coated bolts (21). Tighten bolts (21) to a torque value of 20 lbs. inch (± 5 lbs. inch).

NOTE: DO NOT use strainer screen to support unit. Unit may be supported vertically on bolt (19) heads.

13. After pump is installed, power rotor must be "lifted" to installed running position. Refer to pump Outline Drawing, Figure 2, for installed running position.

LIST OF MATERIAL

413IC-800JD
CODE 3039/014

ITEM	DESCRIPTION	QTY.	REPAIR PART
1	Inboard Cover Subassembly (Includes Items 2, 3 and 4)	1	
2	Inboard Cover (Part of Item 1)	1	
3	Truarc Ring (Part of Item 1)	1	X
4	Sleeve Bearing (Part of Item 1)	1	X
5	Rotor Housing	1	X
6	Capscrew 60 3/4-10NC x 2-1/4-inch	12	
7	Power Rotor (Includes Item 8)	1	X
8	Balance Piston (Part of Item 7)	1	
10	Idler Rotor (Includes Item 11)	3	X
11	Thrust Shoe (Part of Item 10)	3	
12	Nut 1-8NC-inch	1	
13	Thrust Block	1	
14	Capscrew 60 1/2-13NC x 1-inch	3	
15	Bolt, FAS 1-8NC x 7-inch	1	
16	Spring Pin 1/4 x 3/4-inch	3	
17	Thrust Block	3	X
18	Spacer	3	
19	Bolt 1-8NC x 12-inch	3	
20	Inlet Strainer	1	
21	Bolt 3/8-16NC x 1/2-inch	3	
22	Name Plate (Pump Data)	1	
23	Name Plate (Rotation)	1	
24	Drive Screw U No. 6 x 1/4-inch	6	

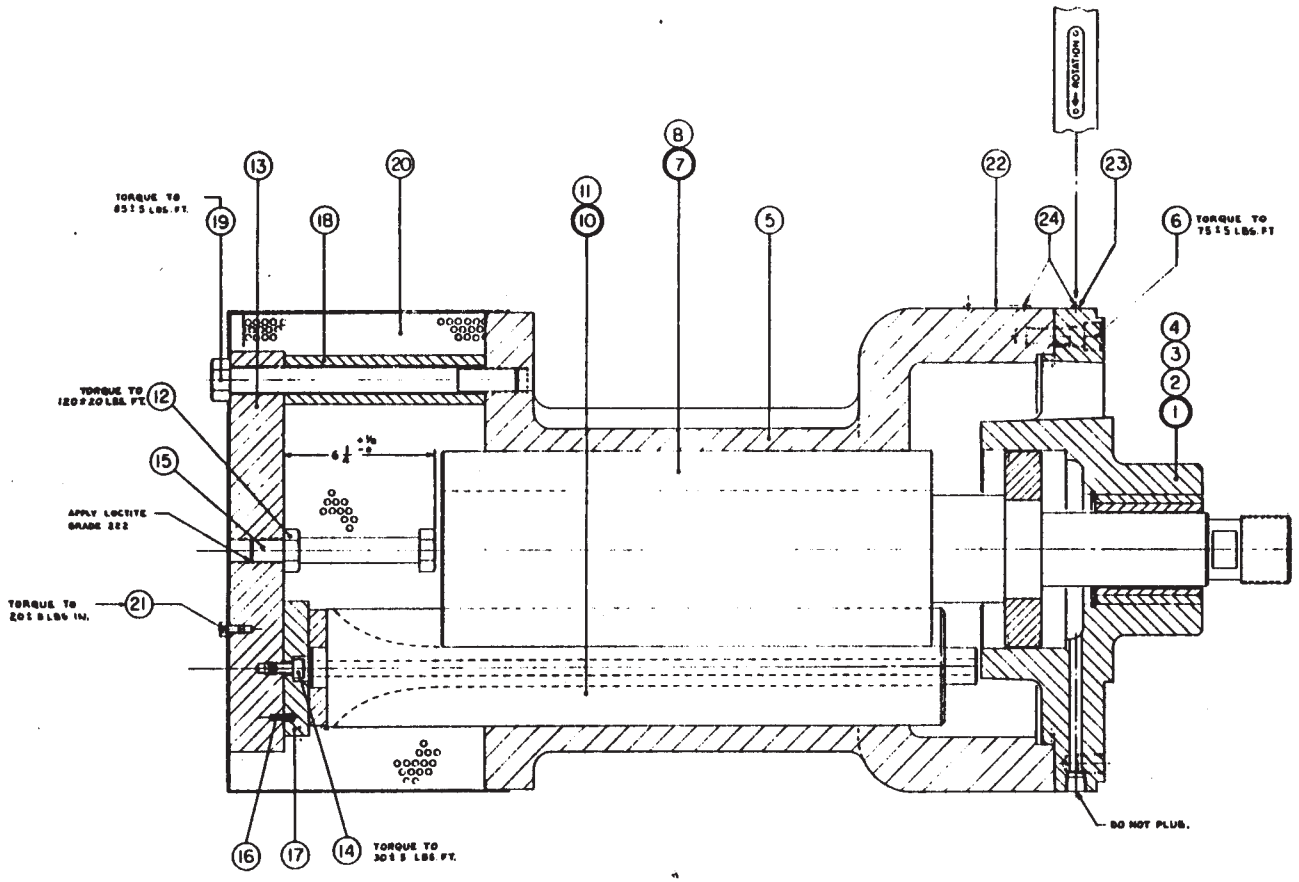

Figure 1

TYPE 413IC-800JD
SF5796

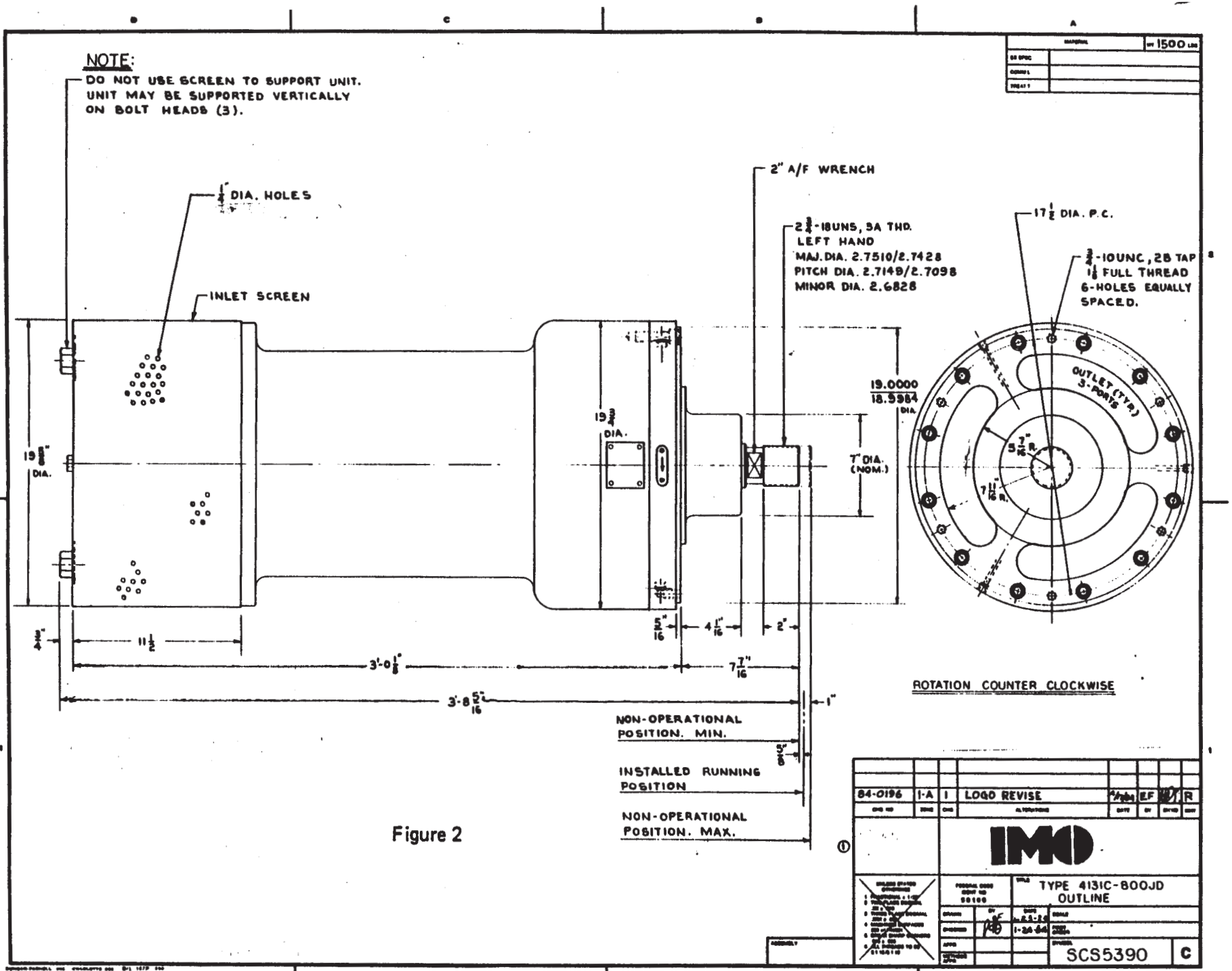

Figure 2

84-0196	1-A	1	LOGO REVISE	4/28/84	EF

IMO

TYPE 4131C-800JD OUTLINE

1-26-84

SCS5390 C