

# CECO Fybroc

## **Fybroc<sup>®</sup> series 2530 mag-drive pumps**

INSTALLATION MANUAL



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### ORDERING REPLACEMENT PARTS

For future reference fill in the following information from the pump nameplate. This will be necessary to ensure accuracy when ordering replacement parts.

Model \_\_\_\_\_

Size \_\_\_\_\_

Serial Number \_\_\_\_\_

Impeller Diameter Installed \_\_\_\_\_

Bearing Material \_\_\_\_\_

Material of Construction \_\_\_\_\_

# CECO Fybroc

## WARRANTY

FYBROC pumps are warranted by the Company, insofar as the same are of its own manufacture, against defects in materials and workmanship under proper and normal use and service, for a period of one year from the date of original shipment from the factory. FYBROC's obligation is limited, however, to furnishing without charge, F.O.B. its factory, new parts to replace any similar parts of its own manufacture so proving defective within said period, provided the Buyer has given FYBROC immediate written notice upon discovery of such defect. No allowance will be made for labor charges. FYBROC shall have the option of requiring the return of the defective material, transportation prepaid, to establish the claim.

FYBROC makes no warranty or guarantee whatsoever, either express or implied, of prime mover, starting equipment, electrical apparatus, parts or material not manufactured by Fybroc, except to the extent that warranty is made by the manufacturer of such equipment and material.

FYBROC assumes no liability for damages or delays caused by defective material, and no allowance will be made for local repair bills or expenses without the prior written approval or authority of FYBROC.

Under no circumstances will FYBROC be liable for indirect, special or consequential loss or damage of any kind and the Buyer assumes all liability for the consequences of its use or misuse by the Buyer, his employees, or others.

## PERFORMANCE GUARANTEE

Is at the specified point of rating only and will not cover performance under conditions varying therefrom, nor for sustained performance over any period of time.

## ACCEPTANCE TESTS

If required, shall be conducted in accordance with the practices as set forth in the Hydraulic Institute Standards. The expense of any such tests shall be borne by the buyer.

## PERFORMANCE REPRESENTATIONS

Are based on shop laboratory tests with cold water as outlined in the Hydraulic Institute Standards.

## FIELD TESTING

Due to the inaccuracies of field testing, the results of any such tests conducted by or for the Buyer shall be interpreted as being only indicative of the actual field performance of the pump. No equipment will be furnished on the basis of acceptance by results of field tests. If the buyer, after such a test, questions the performance of the pump, he may at his option request a test to establish the performance. Such tests will be conducted in accordance with the above paragraph entitled "Acceptance Tests."

## ALL WARRANTIES

Are void if -

- a. Pipe strains are the cause of damage.
- b. Pump handles liquids other than those specified in detail.
- c. NPSH lower than required by pump impeller.
- d. Operating speed is higher than specified.
- e. Improper field installation.

## RECOMMENDATIONS FOR SPECIAL MATERIALS

To combat corrosion, abrasion, erosion, or pumping solids, foreign objects, or pumping liquids at elevated temperature, any such recommendations will be based on the best available experience of FYBROC and the supplier of the material and industry, BUT WILL NOT CONSTITUTE A GUARANTEE AGAINST THESE EFFECTS.

The foregoing warranty is made in lieu of all other warranties guarantees, obligations or liabilities, expressed or implied, by FYBROC or its representatives. All statutory or implied warranties, other than of title, are hereby expressly negated and excluded.

All illustrations and provisions in specifications are descriptive and are not intended as warranties. Penalty of any kind are not acceptable unless approved in writing by an officer of Met-Pro Corporation.

# INSTALLATION HORIZONTAL PUMPS

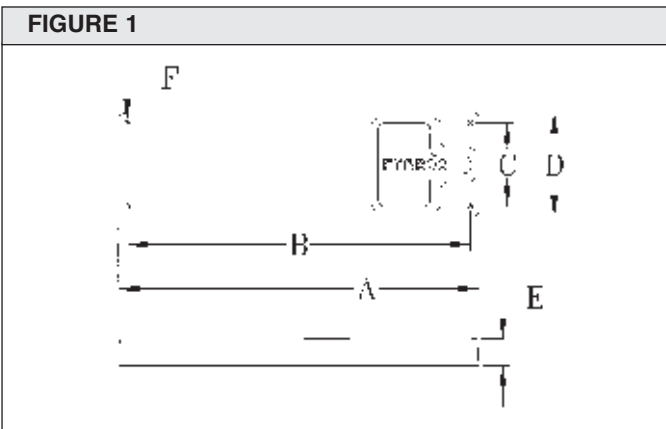
## LOCATION

The pump should ideally be placed as close as possible to the liquid supply source. Allow sufficient space on the sides and overhead to permit inspection and maintenance work to be performed.

## FOUNDATION

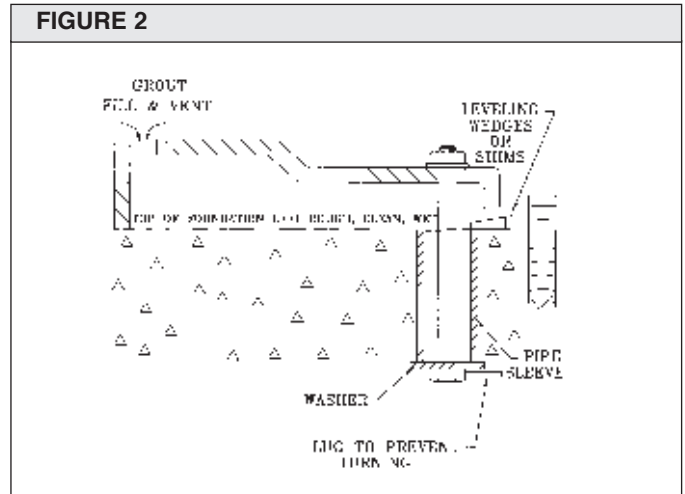
The foundation for the pump should be level, provide rigid support of pump and motor. It should also be of sufficient mass to dampen any vibrations developed. Typically this is accomplished by installing and grouting a Fybroc baseplate on a concrete foundation.

Foundation bolts of the proper size should be imbedded in the concrete with anti-rotation lugs, located by a drawing or template. (See Table 1 below for bolt-size and locations). A pipe sleeve larger than the bolt should be used to allow enough lateral movement for final positioning of the bolts. (See Figure 1 below). Leveling wedges or shims should be placed under the sides of the baseplate to level the unit and the foundation bolts slightly tightened.



Base Plate	A	B	C	D	E	F	Bolt Size
2T-28"	28	25 1/2"	9	12	2 7/8"	3/4"	1/2"
2T-31"	31	28 1/2"	9	12	2 7/8"	3/4"	1/2"

A wood form can now be built around the edge of the baseplate to contain the grout. The top of the rough concrete foundation should be wetted down prior to grouting. A good grade of non-shrinking grout can now be packed through the open end of the fiberglass baseplate. Once the grout has fully hardened, usually about 48 hours after pouring, the foundation bolts can be fully tightened.



## PIPING THE PUMP

All flanged connections to the pump should be full flat face with full contact gaskets. Raised face flanges or partial contact gaskets should not be used as excessive strains can be applied to the pump flanges upon tightening.

The pump has been designed with all necessary strength factors for long, reliable service life. However, due to the composite construction, care must be taken during installation to avoid unnecessary pipe strain. If severe piping strains are to be encountered, flexible connections are recommended in the suction and discharge lines. When lined piping is used, flange alignment should be carefully checked. Spacer ring gaskets are recommended to assure parallel alignment of pipe and pump flanges. The following flange bolt torque values should be used:

Flange Size	Bolt Torque
1"	9-12 ft-lbs.
1 1/2"	9-12 ft-lbs.
2"	18-24 ft-lbs.
3"	23-30 ft-lbs.

All piping must be supported independently of the pump. The piping should always line up naturally with the pump flanges. Never draw the piping to the suction or discharge flanges of the pump. Outside installations should be properly compensated for changes in ambient temperatures. Refer to pipe manufacturers standards for proper installation. Omission of this could result in severe strain transmitted to the pump flanges.

The piping should be as short and direct as possible. Avoid all unnecessary elbows, bends and fittings, as they increase friction losses in the piping.

### **SUCTION PIPING**

- A) To minimize friction loss, the length of the suction pipe (from process to pump inlet) should be as short as possible. It is important that NPSH available to the pump is greater than the NPSH required by the pump, long suction runs greatly affect NPSH and should be considered carefully. See pump performance curve for NPSH requirements.
- B) The diameter of the suction pipe should be as large as the pump suction. If long suction runs are encountered, the suction pipe diameter should be increased to reduce the NPSH required.
- C) Increases or reducers, if used, should be eccentric and installed with the eccentric side on the bottom of the pipe to prevent air traps.
- D) Elbows, fittings, valves or expansion joints should be avoided at the suction flange. Allow a straight run of at least 10 pipe diameters into the suction of the pump.
- E) If a valve is to be installed in the suction piping, only full flow valves offering a minimum flow disturbance should be used (ball, plug types). These valves should be for shut-off only when the pump is not running, and not for throttling or controlling flow. Centrifugal pumps should never be throttled on the suction side.
- F) Provisions for a suction pressure gauge should be included.

### **DISCHARGE PIPING**

- A) Installation of a valve in the discharge line that can be used as a block for inspection and maintenance is recommended. It should be of a design to allow throttling or flow control.
- B) The diameter of the discharge pipe should be as large or larger than the pump discharge.
- C) Provision for a discharge pressure gauge should be included.

### **ANCILLARY PIPING**

- A) Where the ancillary piping is connected to the pump only plastic fittings shall be used.

### **WARNING: FAILURE TO USE PLASTIC FITTINGS MAY RESULT IN DAMAGE TO THE PUMP.**

The pump shaft should turn freely by hand after the piping has been connected to the pump. This is to insure that the piping has not caused binding in the pump. If binding occurs, check for cause and correct.

### **ELECTRICAL CONNECTIONS**

- A) All electrical work done to the unit should be done by a qualified electrician. All local, state and federal electrical codes should be adhered to.
- B) Wire motor according to motor manufacturers instructions. Ensure that all connections and covers are tight and that proper sized wire and switch-gear are used.
- C) All pumps operate in a clockwise direction when viewed from the motor end, (see direction arrow on the pump motor adapter). Ensure the pump is flooded and connect electric motor to power supply and jog motor to check rotation. If motor is operating in wrong direction, reverse leads and recheck.

### **WARNING: DO NOT START PUMP WITHOUT LIQUID IN THE CASING AS DAMAGE COULD RESULT FROM RUNNING THE PUMP WITHOUT THE PROCESS LIQUID TO LUBRICATE THE BEARINGS.**

# START-UP AND OPERATING PROCEDURES

## LUBRICATION

On a close coupled pump only the motor requires lubrication. Since all motors come from the factory pre-lubricated there is no action required.

## PRIMING

Suction valve must be fully open. The pump casing and suction pipe must always be full of liquid before the pump is started. Centerline discharge designs are self-venting therefore the discharge valve should be opened to release any air trapped in the pump and then left slightly open at start-up.

## STARTING

Prior to starting, turn motor shaft at fan end by hand to be sure rotating elements are free. If rubbing or binding occurs:

- A) Check for piping strains on casing flanges, or other loads on casing and correct.

Prior to starting pump recheck installation procedures with the operational start-up checklist found on page 13 of this manual.

Start pump and bring up to speed, open discharge valve to the rated flow.

**WARNING: DO NOT RUN PUMP WITH A CLOSED DISCHARGE VALVE AS THE LIQUID IN THE PUMP WILL RAPIDLY INCREASE IN TEMPERATURE, POSSIBLY CAUSING DAMAGE TO THE PUMP.**

## OPERATIONAL CHECK LIST

- A) Periodically check lubrication to the motor bearings.
- B) Periodically check for excessive vibrations. Correct if necessary.

## MAINTENANCE

Fybroc pumps are designed for a long service life. The only scheduled maintenance items are the lubrication intervals for the motor. Please refer to the lubrication procedures given below.

## MOTOR

The motor relubrication intervals are greatly influenced by the environment it is in and the length of time it runs. Refer to the following chart for typical relubrication values for motors. Standard duty is when the motor is operated eight hours a day and the environment is free from dust. Severe duty is when the motor runs twenty-four hours per day with exposure to dirt and dust.

Sync RPM Range	Motor Frame Range	Type of Service	
		Standard Duty	Severe Duty
3600	143TC - 256TC	5 Yrs	3 Yrs
	284TC - 286TC	1 Yr	4 Mos
	324TC - 365TC	9 Mos	3 Mos
1800	143TC - 256TC	7 Yrs	3 Yrs
	284TC - 326TC	4 Yrs	1.5 Yrs
1200	143TC - 256TC	7 Yrs	3 Yrs

### Instructions For Lubricating Motors

Before greasing, be sure fittings are clean and free from dirt. Remove grease relief plug or plate and using a low pressure grease gun pump in the required grease. Do not over-grease. After relubricating allow motor to run for an hour before replacing relief hardware.

## TROUBLE CHECK LIST

Refer to the following diagnostic section if hydraulic problems are encountered in the pump operation.

**PROBLEM:** Not enough liquid, or no liquid delivered.

**CHECK:** Suction pipe and/or pump casing not filled with liquid.

Speed too low.  
(Result, reduced TDH).

Suction lift too high or insufficient NPSHA. (Cavitation).

Impeller or suction pipe plugged with solids.

Wrong rotation.  
(Result, reduced TDH).

Air pockets in suction line.

Suction strainer plugged, if used in suction line.

**PROBLEM:** Not enough pressure.

**CHECK:** Speed too low.

Air or gases in the liquid.

Check impeller diameter.

Mechanical defects  
(impeller damaged).

Wrong rotation.

Pressure gauge in the wrong place.

**PROBLEM:** Pump runs but intermittently pumps liquid.

**CHECK:** Suction line leaks.

Air pocket in suction line.

Insufficient NPSH.

Air or gases in liquid.

**PROBLEM:** Pump takes too much power.

**CHECK:** Speed too high.

Head lower than rating; pumping beyond design point.

Liquid heavier than specified; check viscosity and specific gravity.

Mechanical defects (Damaged shaft, rotating element binds, misalignment).

# ASSEMBLY PROCEDURES FOR CLOSE COUPLED HORIZONTAL PUMPS

## GENERAL

The Fybroc pump is designed for easy inspection and service because of its back pullout construction. For inspection or replacement of certain parts, the work can be done in place, without the necessity to remove the complete pump to a maintenance area. Refer to applicable Sectional Drawing in this manual for item numbers mentioned below.

Before any work is done the following procedures and precautions should be taken:

- 1) The electric motor should be either disconnected from its power source, or the switch or circuit breaker must be secured in an "off" position so that the motor cannot be accidentally started.
- 2) Depending upon the fluid being pumped, the proper protective equipment should be worn (gloves, mask, respirator, goggles or safety glasses, etc.) to prevent contact with the fluid in the pump or pipelines.
- 3) Check the valves on the suction and discharge lines to be sure they are closed and secured.
- 4) The liquid trapped in the pump and piping should be drained. Care should be taken to either trap the fluid in a container or to divert it to a proper disposal area so that the area around the pump and base will not be contaminated.

**WARNING: THE MAGNETS USED IN THIS PUMP DEVELOP POWERFUL MAGNETIC FIELDS. PERSONS WHO ARE ASSISTED BY ELECTRONIC DEVICES COULD BE ADVERSELY AFFECTED BY THESE MAGNETIC FIELDS. ITEMS PRONE TO DAMAGE FROM MAGNETIC FIELDS SHOULD NOT BE BROUGHT IN CLOSE PROXIMITY OF THE PUMP.**

**WARNING: DO NOT USE STEEL OR IRON TOOLS NEAR THE MAGNETS. FAILURE TO DO SO MAY RESULT IN CONTACT WITH THE MAGNETS AND CAUSE THEM TO BREAK.**

**WARNING: STRONG MAGNETIC FORCES ARE DEVELOPED BETWEEN THE INNER AND OUTER MAGNET RINGS, USE PROPER DISASSEMBLY AND ASSEMBLY PROCEDURES WHEN WORKING ON THE PUMP AND KEEP PARTS SEPARATED WHEN REMOVED FROM THE PUMP.**

## DISASSEMBLY

### Complete Pump Removal

- 1) If the complete pump is to be removed to a maintenance area, remove the bolts holding the motor and casing to the baseplate. Remove the bolts on the suction and discharge flange connections. Remove the wiring from the motor and label the leads so that the proper rotation is maintained. Now the whole pump can be removed and placed in a convenient location to disassemble it.
- 2) Remove the secondary casing nuts (Item 1E) securing the composite pump end and motor adapter. Now the pump assembly can be pulled away from the motor adapter and removed. Two jackscrews (Item 71C) are provided to ease disassembly. Engage jackscrews evenly to prevent pump assembly from jamming against the close clearance of the outer magnet assembly (Item 232).
- 3) Rest the pump assembly on the back of the containment shell. Remove the casing bolts, nuts and washers securing the casing to the containment shell (Items 1C, 1D, 1E). The casing can now be lifted off of the containment shell.
- 4) Remove the containment shell o-ring (Item 73) and place in a container with the casing hardware.
- 5) Remove the inboard thrust bearing (Item 72) by sliding over the shaft (Item 6).
- 6) Remove the impeller assembly (Items 2, 230, 230A, 235 & 235A) by sliding over the shaft.
- 7) Remove the outboard thrust bearing (Item 72) by sliding over the shaft (Item 6).
- 8) Remove the shaft (Item 6) by sliding out of the containment shell bore.
- 9) Disassemble the impeller assembly by using a pair of snap ring pliers to rotate the retaining ring (Item 230A) clockwise until it is free to expand. Then using the pliers expand the retaining ring and remove it from the impeller assembly.
- 10) Remove the inner magnet (Item 230) by sliding it off of the rear of the impeller.
- 11) Remove the bearing pin (Item 235A) by reaching inside the sleeve bearing (Item 235) and pushing it out.



- 12) Remove the sleeve bearing (Item 235) by sliding it out the front of the impeller.
- 13) Remove the support web (Item 1A) from the casing by tapping on the nose of support web with a soft mallet. This will expose the casing pin (Item 1B) which can now be pulled free of the support web.
- 14) Remove the outer magnet assembly by removing the adapter plug (Item 71B) to expose the outer magnet assembly set screws (Item 232A). Loosen both set screws and remove the magnet assembly by sliding it off of the motor shaft.  
  
NOTE: If required, a puller may be constructed utilizing the 3/8-16 tapped holes in the outer magnet rotor which are located 1-3/4" on either side of the shaft centerline. Non-magnetic materials and tools are recommended as steel tools are strongly attracted to the magnets and could result in magnet damage upon impact.
- 15) Remove pump adapter (Item 71) by removing the four adapter screws (Items 71A).
- 3) Remove the containment shell o-ring (Item 73) and place in a container with the casing hardware.
- 4) Remove the inboard thrust bearing (Item 72) by sliding over the shaft (Item 6).
- 5) Remove the impeller assembly (Items 2, 230, 230A, 235 & 235A) by sliding over the shaft.
- 6) Remove the outboard thrust bearing (Item 72) by sliding over the shaft (Item 6).
- 7) Remove the shaft (Item 6) by sliding out of the containment shell bore.
- 8) Disassemble the impeller assembly by using a pair of snap ring pliers to rotate the retaining ring (Item 230A) clockwise until it is free to expand. Then using the pliers expand the retaining ring and remove it from the impeller assembly.
- 9) Remove the inner magnet (Item 230) by sliding it off of the rear of the impeller.
- 10) Remove the bearing pin (Item 235A) by reaching inside the sleeve bearing (Item 235) and pushing it out.

## **DISASSEMBLY**

### Casing Assembly Left In Place

- 1) If the casing is to be left in place, remove the wiring from the motor and label the leads so that the proper rotation is maintained. Next remove the screws holding the motor to the baseplate and then remove the secondary casing nuts (Item 1E) securing the composite pump end and motor adapter. Now the motor assembly can be pulled away from the pump assembly and removed. Two jackscrews (Item 71C) are provided to ease disassembly. Engage jackscrews evenly to prevent pump assembly from jamming against the close clearance of the outer magnet assembly (Item 232).
- 2) Remove the casing bolts, nuts and washers securing the casing to the containment shell (Items 1C, 1D, 1E). Holding the containment shell gently pull the assembly away from the casing and place on the back side of the containment shell. The jackscrews from the adapter can be installed in the threaded holes in the containment shell (Item 231) to facilitate removal. Watch to ensure that the inboard thrust bearing and impeller assembly do not fall out during disassembly.

- 11) Remove the sleeve bearing (Item 235) by sliding it out the front of the impeller.
- 12) Remove the outer magnet assembly by removing the adapter plug (Item 71B) to expose the outer magnet assembly set screws (Item 232A). Loosen both set screws and remove the magnet assembly by sliding it off of the motor shaft.  
  
NOTE: If required, a puller may be constructed utilizing the 3/8-16 tapped holes in the outer magnet rotor which are located 1-3/4" on either side of the shaft centerline. Non-magnetic materials and tools are recommended as steel tools are strongly attracted to the magnets and could result in magnet damage upon impact.
- 13) Remove pump adapter (Item 71) by removing the four adapter screws (Items 71A).

## **DISASSEMBLY**

### Pump Left in Place

- 1) If the wet end is to be left in place remove the wiring from the motor and label the leads so that the proper rotation is maintained. Next remove the screws holding the motor to the baseplate and then remove the secondary casing nuts

securing the composite pump end and motor adapter (Item 1E). Now the motor assembly can be pulled away from the pump assembly and removed. Two jackscrews (Item 71C) are provided to ease disassembly. Engage jackscrews evenly to prevent pump assembly from jamming against the close clearance of the outer magnet assembly (Item 232).

- 2) Remove the outer magnet assembly by removing the adapter plug (Item 71B) to expose the outer magnet assembly set screws (Item 232A). Loosen both set screws and remove the magnet assembly by sliding it off of the motor shaft.

**NOTE:** If required, a puller may be constructed utilizing the 3/8-16 tapped holes in the outer magnet rotor which are located 1-3/4" on either side of the shaft centerline. Non-magnetic materials and tools are recommended as steel tools are strongly attracted to the magnets and could result in magnet damage upon impact.

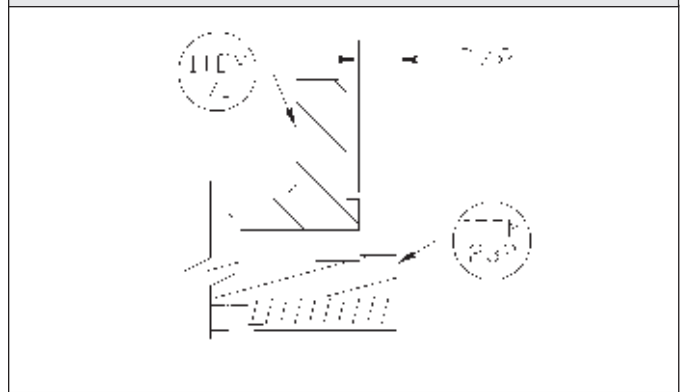
- 3) Remove pump adapter (Item 71) by removing the four adapter screws (Items 71A).

## ASSEMBLY

### Complete Pump Removal

- 1) Inspect casing, containment shell and impeller for any damage and make sure all sealing and bearing surfaces are free of dirt and scratches. Check motor shaft run-out. Excessive shaft run-out can result in damage to pump.
- 2) Install the adapter (Item 71) onto the motor. Ensure that the adapter is seated squarely on the motor before tightening adapter screws, this may require some sanding of the paint on the pilot diameters. Secure with adapter screws (Item 71A), torque to 25 ft-lbs.
- 3) Install the outer magnet assembly (Item 232). Slide assembly onto motor shaft until the edge of the magnet assembly is sticking past the adapter by 3/8" (See figure 1 below). Ensure that the motor shaft key is fully engaged on the motor shaft and outer magnet assembly, secure with both shaft set-screws (Items 232A).
- 4) Install the adapter jackscrews (Item 71C) and turn until they extend past the adapter approximately 1-1/2".
- 5) Place the containment shell on its back side and install the shaft (Item 6) into the contain-

**FIGURE 1**



ment shell (Item 231) so that the alignment pin on the shaft engages the slot in the shell bore.

- 6) Slide the thrust bearing (Item 72) over the shaft and align the slot in the bearing with the raised section in the containment shell. At this point the thrust bearing should not rotate.

**NOTE:** Front and rear thrust bearings are identical and may be interchanged.

- 7) Install the sleeve bearing (Item 235) into the impeller (Item 2) and rotate the bearing until the holes in the sleeve bearing and the impeller are lined up. Install the bearing pin (Item 235A) to lock the sleeve bearing in position.
- 8) Install the inner magnet assembly (Item 230) onto the rear of the impeller with the counter-bore side facing the rear of the impeller.
- 9) Using a pair of snap ring pliers expand the retaining ring (Item 230A) and install onto the groove on the rear of the impeller. Rotate the retaining ring counter-clockwise until the O.D. of the ring contacts the counter-bore in the inner magnet assembly.
- 10) Install the rotating assembly onto the shaft and shell assembly.
- 11) Slide the second thrust bearing (Item 72) over the shaft with the flat face against the sleeve bearing. Align the slot on the thrust bearing so that it is perpendicular with the flat on the containment shell flange.
- 12) Install the containment shell o-ring (Item 73) into the o-ring groove on the shell.
- 13) Ensure that the bearing flush path in the casing is clear of any blockages by inspecting both the inlet and outlet sides of the path. Additionally check to ensure that the path through the support web is also free of obstructions.

- 14) Install the shaft support web (Item 1A) into the casing (Item 1) by placing the casing pin (Item 1B) into the groove on the outside diameter of the support web and then place the assembly into the casing bore. This should be a tight fit and may require a soft mallet to be driven in.

**WARNING: DO NOT TAP ON THE DRIVE SLOT, AS DAMAGE TO THE DRIVE SLOT ON THE SUPPORT WEB MAY CAUSE THE THRUST BEARING TO SIT UNEVENLY AND LEAD TO BEARING DAMAGE.**

- 15) Ensure that the support web is completely seated in the casing by inspecting the gap between them when viewed from the suction flange of the casing.
- 16) Place the casing assembly over the can and impeller assembly and ensure that the drive slot on the support web is engaged properly into the forward thrust bearing. When properly engaged the casing and containment shell gap will be approximately 1/16". If the thrust bearing is not seated properly the gap will be 3/16".
- 17) Verify that the o-ring is still properly seated in its groove and secure the casing and containment shell with casing bolts, nuts, and washers (Items 1C, 1D, 1E). Torque to maximum of 10 ft-lbs. Ensure that the casing bolt heads are on the front of the casing.

**WARNING: ENSURE THAT THE JACKSCREWS ON THE ADAPTER ARE FULLY EXTENDED BEFORE PROCEEDING ANY FURTHER.**

- 18) Holding the pump assembly in a manner that will keep fingers clear of the jackscrews on the adapter, install the pump assembly on to the adapter by sliding it into the outer magnet ring.

**WARNING: ONCE THE MAGNETIC FIELDS ENGAGE, THE PUMP WILL BE PULLED INTO THE OUTER MAGNET ASSEMBLY. KEEP FINGERS CLEAR.**

- 19) Back the jackscrews out evenly on each side until they are completely removed and the containment shell is up against the adapter. Ensure that the pump assembly is seated squarely on the adapter before installing the secondary casing nuts, this may require some sanding of the paint on the pilot diameters. Install the secondary casing nuts and tighten to 10 ft-lbs.
- 20) Remove motor fan guard and manually spin motor shaft, while observing impeller through

pump suction. Pump impeller should rotate freely. If any rubbing or binding is encountered, correct as necessary. Replace fan guard.

## **ASSEMBLY**

### Casing Assembly Left in Place

- 1) Inspect casing, containment shell and impeller for any damage and make sure all sealing and bearing surfaces are free of dirt and scratches. Check motor shaft run-out. Excessive shaft run-out can result in damage to pump.
- 2) Install the adapter (Item 71) onto the motor. Ensure that the adapter is seated squarely on the motor before tightening adapter screws, this may require some sanding of the paint on the pilot diameters. Secure with adapter screws (Item 71A), torque to 25 ft-lbs.
- 3) Install the outer magnet assembly (Item 232). Slide assembly onto motor shaft until the edge of the magnet assembly is sticking past the adapter by 3/8"(See figure 1 above). Ensure that the motor shaft key is fully engaged on the motor shaft and outer magnet assembly, secure with both shaft set-screws (Items 232A).
- 4) Install the adapter jackscrews (Item 71C) and turn until they extend past the adapter approximately 1-1/2".
- 5) Place the containment shell on its back side and install the shaft (Item 6) into the containment shell (Item 231) so that the alignment pin on the shaft engages the slot in the shell bore.
- 6) Slide the thrust bearing (Item 72) over the shaft and align the slot in the bearing with the raised section in the containment shell. At this point the thrust bearing should not rotate.  
  
NOTE: Front and rear thrust bearings are identical and may be interchanged.
- 7) Install the sleeve bearing (Item 235) into the impeller (Item 2) and rotate the bearing until the holes in the sleeve bearing and the impeller are lined up. Install the bearing pin (Item 235A) to lock the sleeve bearing in position.
- 8) Install the inner magnet assembly (Item 230) onto the rear of the impeller with the counter-bore side facing the rear of the impeller.
- 9) Using a pair of snap ring pliers expand the retaining ring (Item 230A) and install onto the groove on the rear of the impeller. Rotate the

retaining ring counter-clockwise until the O.D. of the ring contacts the counter-bore in the inner magnet assembly.

- 10) Install the rotating assembly onto the shaft and shell assembly.
- 11) Slide the second thrust bearing (Item 72) over the shaft with the flat face against the sleeve bearing. Align the slot on the thrust bearing so that it is perpendicular with the flat on the containment shell flange.
- 12) Install the containment shell o-ring (Item 73) into the o-ring groove on the shell.
- 13) Ensure that the bearing flush path in the casing and support web is clear of any blockages.
- 14) Install the containment shell and impeller assembly onto the casing and ensure that the drive slot on the support web is engaged properly into the forward thrust bearing. When properly engaged the casing and containment shell gap will be approximately 1/16". If the thrust bearing is not seated properly the gap will be 3/16".
- 15) Verify that the o-ring is still properly seated in its groove and secure the casing and containment shell with casing bolts, nuts, and washers (Items 1C, 1D, 1E). Torque to maximum of 10 ft-lbs. Ensure that the casing bolt heads are on the front of the casing.

**WARNING: ENSURE THAT THE JACKSCREWS ON THE ADAPTER ARE FULLY EXTENDED BEFORE PROCEEDING ANY FURTHER.**

- 16) Holding the motor and adapter assembly in a manner that will keep fingers clear of the jackscrews on the adapter, slide the motor assembly to the pump.

**WARNING: ONCE THE MAGNETIC FIELDS ENGAGE, THE MOTOR MAY BE PULLED ONTO THE PUMP ASSEMBLY. KEEP FINGERS CLEAR.**

- 17) Back the jackscrews out evenly on each side until they are completely removed and the containment shell is up against the adapter. Ensure that the pump assembly is seated squarely on the adapter before installing the secondary casing nuts, this may require some sanding of the paint on the pilot diameters. Install the secondary casing nuts and tighten to 10 ft-lbs.

- 18) Remove motor fan guard and manually spin motor shaft. Pump impeller should rotate freely. If any rubbing or binding is encountered, correct as necessary. Replace fan guard.

## **ASSEMBLY**

### Pump Left in Place

- 1) Install the adapter (Item 71) onto the motor. Ensure that the adapter is seated squarely on the motor before tightening adapter screws, this may require some sanding of the paint on the pilot diameters. Secure with adapter screws (Item 71A), torque to 25 ft-lbs.
- 2) Install the outer magnet assembly (Item 232). Slide assembly onto motor shaft until the edge of the magnet assembly is sticking past the adapter by 3/8" (See figure 1 above). Ensure that the motor shaft key is fully engaged on the motor shaft and outer magnet assembly, secure with both shaft set-screws (Items 232A).
- 3) Install the adapter jackscrews (Item 71C) and turn until they extend past the adapter approximately 1-1/2".

**WARNING: ENSURE THAT THE JACKSCREWS ON THE ADAPTER ARE FULLY EXTENDED BEFORE PROCEEDING ANY FURTHER.**

- 4) Holding the motor assembly in a manner that will keep fingers clear of the jackscrews on the adapter, slide the motor assembly to the pump.

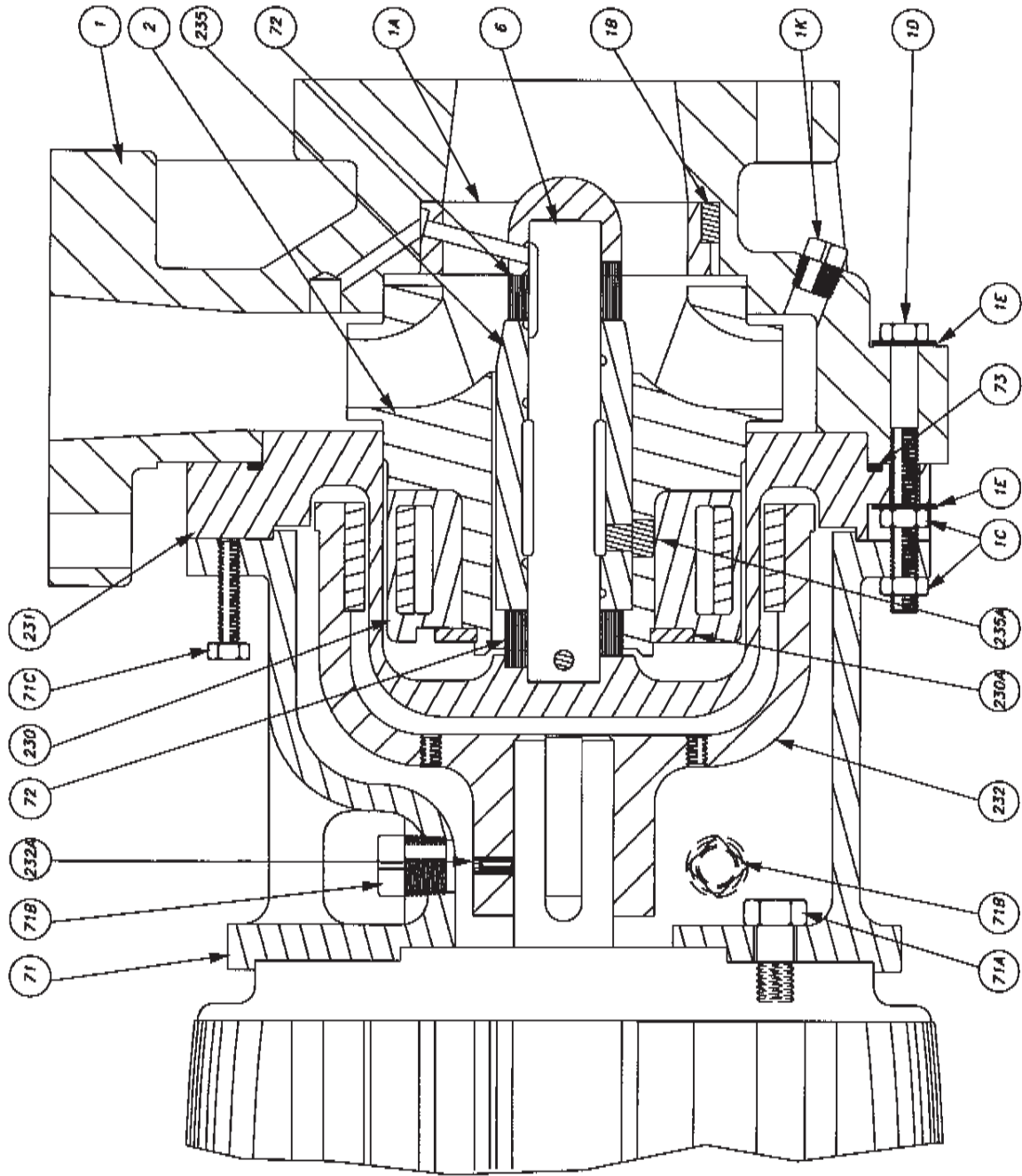
**WARNING: ONCE THE MAGNETIC FIELDS ENGAGE, THE MOTOR MAY BE PULLED ONTO THE PUMP ASSEMBLY. KEEP FINGERS CLEAR.**

- 5) Back the jackscrews out evenly on each side until they are completely removed and the containment shell is up against the adapter. Ensure that the pump assembly is seated squarely on the adapter before installing the secondary casing nuts, this may require some sanding of the paint on the pilot diameters. Install the secondary casing nuts and tighten to 10 ft-lbs.
- 6) Remove motor fan guard and manually spin motor shaft. Pump impeller should rotate freely. If any rubbing or binding is encountered, correct as necessary. Replace fan guard.

## **OPERATIONAL START-UP CHECKLIST**

- Foundation level and baseplate grouted.
- Foundation bolts tight.
- Motor and pump mounting bolts tight.
- Suction and discharge connections secure.
- Electrical connections secure and covered.
- Turn motor shaft by hand, ensure that no binding or rubbing is encountered.
- Suction valve is open, Discharge valve is slightly open.
- Ensure that pump is primed.
- Jog motor/Check rotation.
- Start pump and open discharge valve to desired flow rate.
- Check for excessive vibration.

# 2530 SERIES GROUP 1



PART #	DESCRIPTION	QTY.
1	CASING	1
1A	VEB. SHAFT SUPPORT	1
1B	PIN, CASING	1
1C	NUT, CASING	12
1D	BOLT, CASING	6
1E	WASHER, CASING	12
1K	PLUG, DRAIN (opt.)	1
2	IMPELLER	1
6	SHAFT	1
71	ADAPTER	1
71A	SCREW, ADAPTER	4
71B	PLUG, ADAPTER	2
71C	JACK SCREW, ADAPTER	2
72	BEARING, THRUST	2
73	O-RING, SHELL	1
230	MAGNET ASSEMBLY, INNER	1
230A	RETAINING RING	1
231	SHELL, COVER	1
232	MAGNET ASSEMBLY, OUTER	1
232A	SET SCREW	2
235	BEARING, SLEEVE	1
235A	PIN, BEARING	1

**NOTES**

**NOTES**



## NOTES



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