
Liquiflo

EQUIPMENT COMPANY

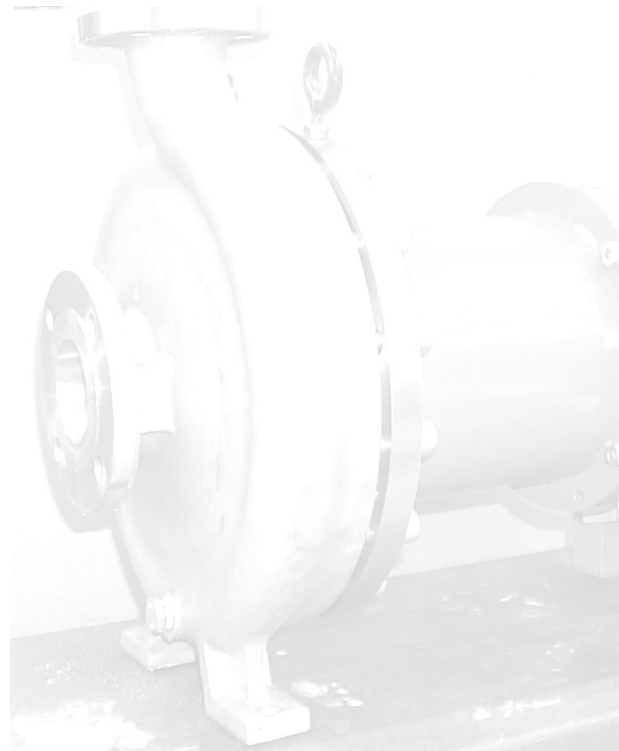
INSTALLATION and MAINTENANCE MANUAL

Group 2 MC series

ENDURA MC SEALLESS PUMPS

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GENERAL INSTRUCTIONS

This Manual covers the Group 2 series Mag drive pumps.

Upon receipt of your Liquiflo pump verify:

- A) The equipment has not been damaged in transit.
- B) The pump model number and serial number are stamped on the nameplate.

RECORD

Model: _____ **Serial No.** _____

SYMBOL EXPLANATION

- A) Work Safety Symbol



This symbol indicates remarks applicable to operational safety, where injury of personnel may be posed. All cautions should be passed on to other users.

- B) Attention Symbol

ATTENTION

Special attention must be paid in order to avoid damage to the pump and/or other plant equipment.

LIST OF TOOLS

Allen wrench set
(5/32 to 1/2)

5149-070

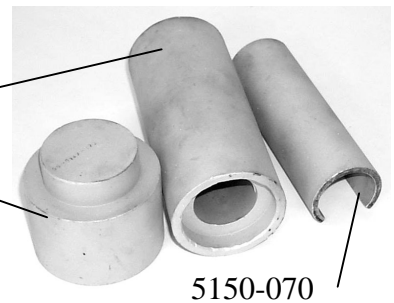
3/4 socket

5148-070

8" adjustable

safety glasses

high temperature gloves



special tools
(may be obtained from authorized distributor)

INSTALLATION OF PUMP AND MOTOR ASSEMBLY

ATTENTION

All items included in this section.

The following should be observed for proper installation of the pump.

- A) Pump should be accessible for servicing and inspection.
- B) The foundation area should be rigid and level for maintaining pump alignment.
- C) The inlet should be as close to the liquid source as practical and preferably below it.
- D) Piping should be supported. **Do not use** the pump as a pipe hanger.
- E) Install valves to isolate the pump during maintenance.
- F) Suction and discharge piping should be the same size or larger than the inlet and outlet ports.
- G) Clean piping as necessary to remove dirt, grit, weld slag, etc.
- H) If the pump was delivered as a complete assembly, it was properly aligned at the factory. Alignment should be checked by taking measurements at the coupling. Flexible couplings are not intended to compensate for misalignment. Therefore, both angularity and parallelism should be checked and corrected. If these are off, by more than 0.005 inches, the assembly should be realigned.
- I) For further instructions on mounting or installing your pump, refer to the Hydraulics Institute Handbook



START UP PRELIMINARY

BE CERTAIN MOTOR IS LOCKED OUT

- 1- Open suction and discharge valves.
- 2- Check unit for leaks.
- 3- Rotate unit by hand.
- 4- Be certain guards are in place.
- 5- Remove motor lock out.
- 6- Jog pump to check rotation.

RUNNING

- 1-Observe discharge and suction gages.
- 2-Monitor the unit for 15 minutes to make certain it is operating satisfactorily.
 - a) Check suction and discharge gages.
 - b) Check for unusual sound or vibration.

SHUTDOWN-SHORT TERM

- 1-Stop unit
- 2-Lock out motor
- 3-Leave suction and discharge valves open.

SHUTDOWN-LONG TERM

- Stop unit
- 2-Lock out motor
- 3-Close and lock out suction and discharge valves

MAINTENANCE AND REPAIR

The pump has internal bearings , which require replacement over time.

The selection of a seal-less pump may have been due to a concern for leakage of hazardous liquids. When performing maintenance on this pump, cautionary steps should be taken to ensure proper drainage or cleansing of the liquid inside the pump prior to disassembly.

WORK SAFETY

Magnetic drive pumps contain strong magnets, which pose health risks. Based on this the following must be observed.



- A) Individuals with cardiac pacemakers should avoid repairs on these units.
- B) Individuals with internal wound clips, metallic wiring, or other metallic prosthetic devices should avoid repairs on these units.
- C) Strong magnetic field can cause tools and parts to slam together; injuring hands and fingers.

Keep magnets away from credit cards, computers, computer discs and watches.

ATTENTION

REMOVAL FROM SYSTEM

When the pump is handling flammable, toxic or hazardous fluid, flush the pump prior to removal from the piping system. Prior to flushing and disassembly consult the Material Safety Data Sheet (MSDS) for the pumped fluid to ensure procedures and precautions as specified are adhered to. Exercise extreme care to avoid contact with the fluid.

ATTENTION

Insure the pump's motor switch is in the "*off*" position and locked out.

MAINTENANCE

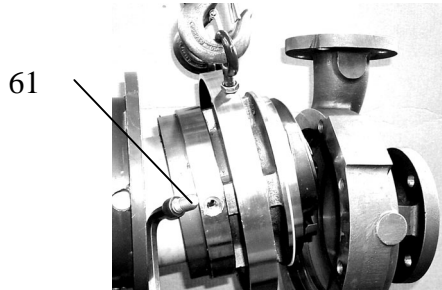
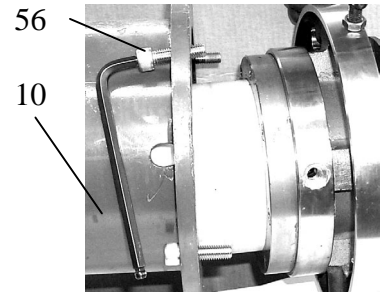
Flush the pump and drain the containment can by removing the 1/2-inch NPT pipe plug from the casing.

DISASSEMBLY

1-Remove bearing coolant lines from casing 1 to cover 3.

2-Remove bolts 56. Use 3/8 Allen wrench.

3-Remove motor mounting bolts to pull back bracket 10 and motor on close coupled models. Remove power frame on long coupled units.



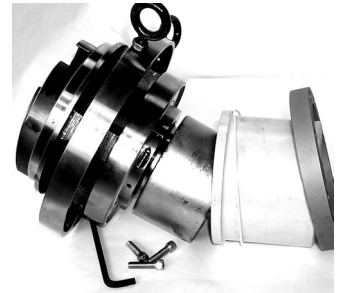
4-Remove bolts 61.

Use 1/2 Allen wrench.

5-Remove case cover 3 containment shell 6 impeller 2 and module assembly from casing.

6-Remove screws 49 and containment shell 6. Use 5/16 Allen wrench.

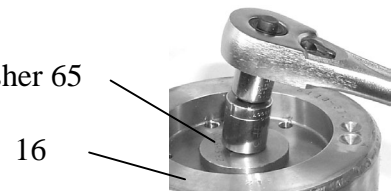
7-Remove hex bolt 94. Use 3/4 hex socket. Remove impeller 2 and impeller key 18.



8-Remove cover 3. Use caution module is loose .



9- Remove hex bolt 94. Use 3/4 hex socket. Remove magnet washer 65 and inner magnet 16.



10-View of module after removal of magnet and cover.

11-Separate rotor from bearing housing.



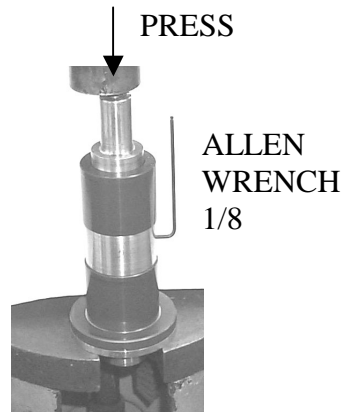
Thrust washer
replaced on shaft
for photo

12-Bearings 23 may be removed from bearing housing 5 by heating assembly to 500 deg F and driving them out with a brass rod and hammer.

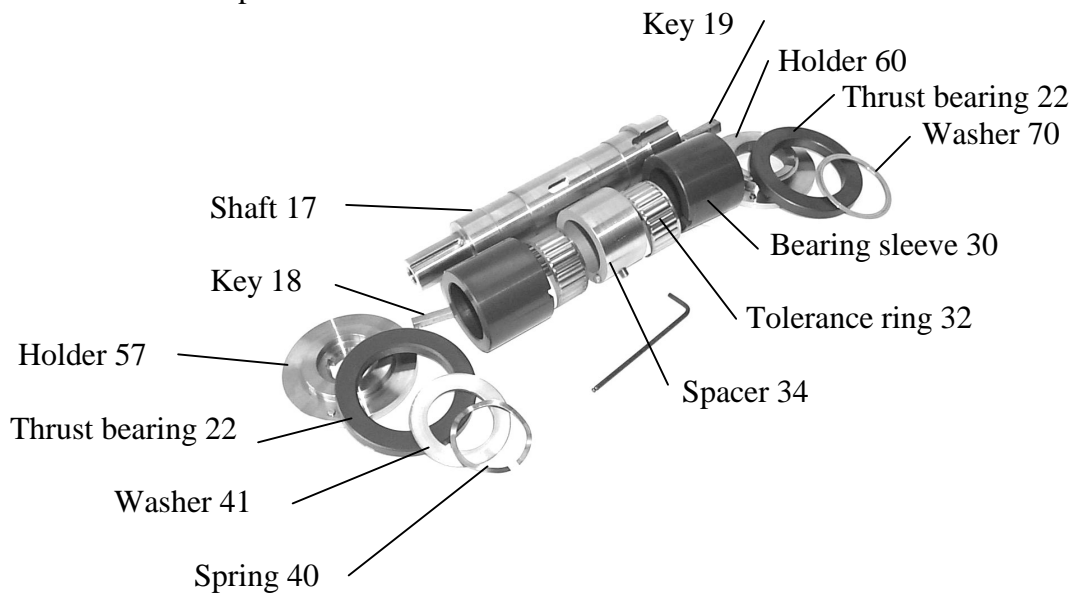
USE CAUTION WEAR EYE PROTECTION AND PROPER GLOVES

13-Remove setscrew 58 in spacer 34.

14-Press shaft 17 from bearing sleeves 30, tolerance rings 32, spacer 34 and thrust bearing 22.



15-Photo shows components of the rotor.



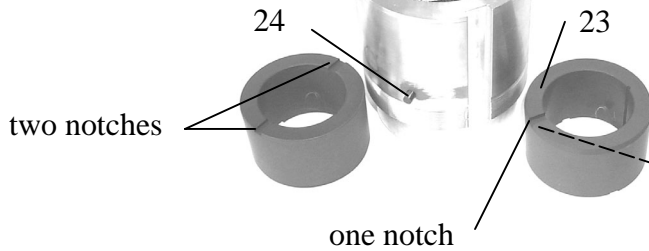
END DISASSEMBLY

ASSEMBLY

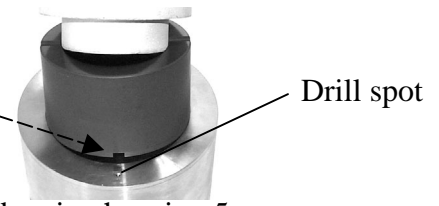
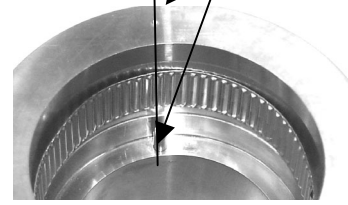
1-Begin assembly by installing pins 25 into bearing housing 5

2-Install tolerance ring 33

3-Install pin 24



NOTE pin is in line
With drill spot



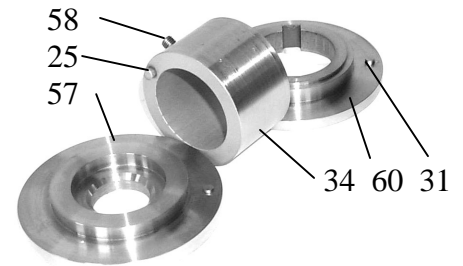
4-Align single notch end of bearing 23 with drill spot in face of bearing housing 5.

5-Press bearing 23 into place. Repeat procedure for opposite end.

6-Install setscrew 58 into spacer 34. Do not project into ID

7-Install pin 31 into holder 60.

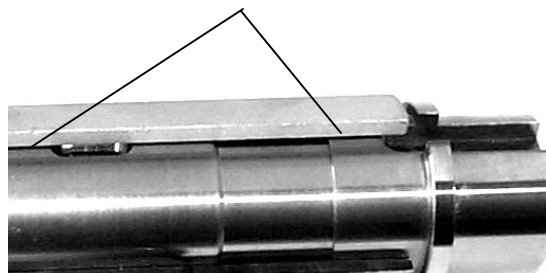
8-Install pin 31 into holder 57.



NOTE ALL PINS MUST HAVE A CLEARANCE BETWEEN ITS END AND
THE PART IT FITS INTO

9-To assist in assembling the rotor components draw a reference line along the axis
through the center of the keyway.

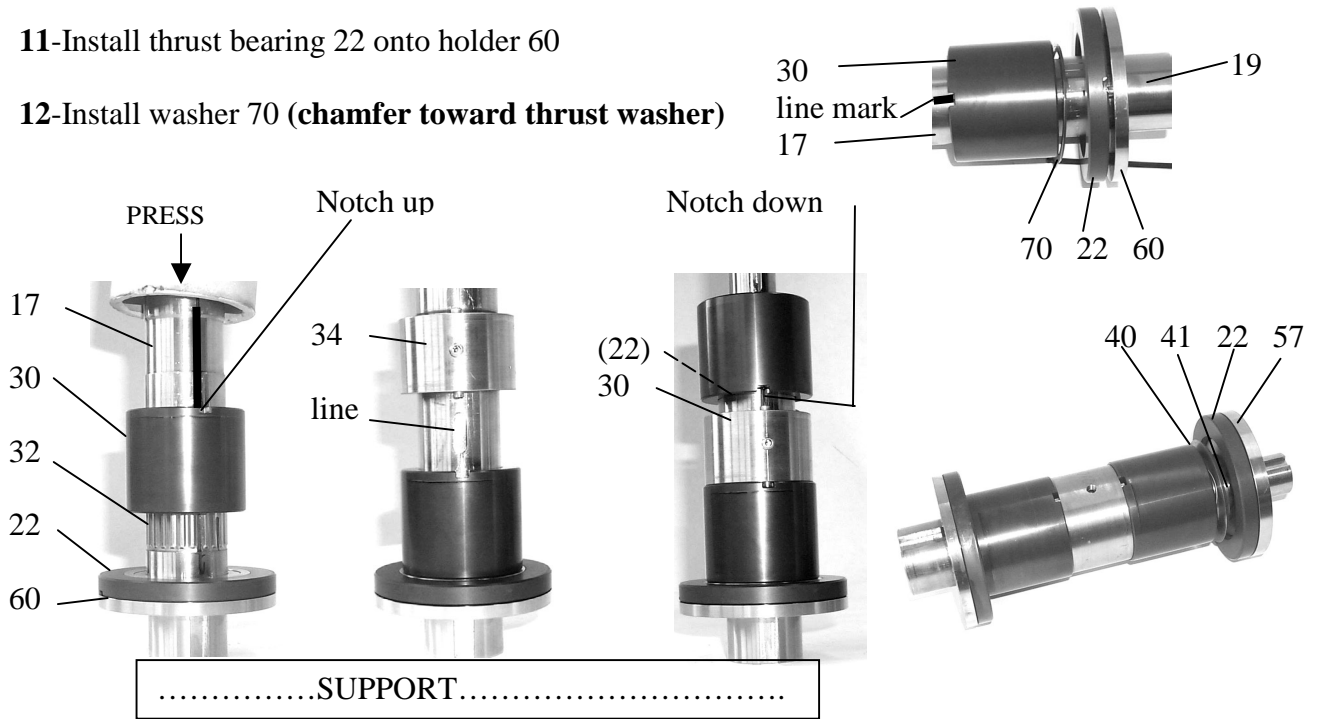
MARK A LINE ALONG EDGE OF SPECIAL TOOL



10-Insert key 19 into shaft 17 to use as a guide and install holder 60 onto shaft 17.

11-Install thrust bearing 22 onto holder 60

12-Install washer 70 (chamfer toward thrust washer)



13-Install tolerance ring 32

14-Install bearing sleeve 30, single notch up and on line

15-Install spacer 34, pins ON LINE and into notch

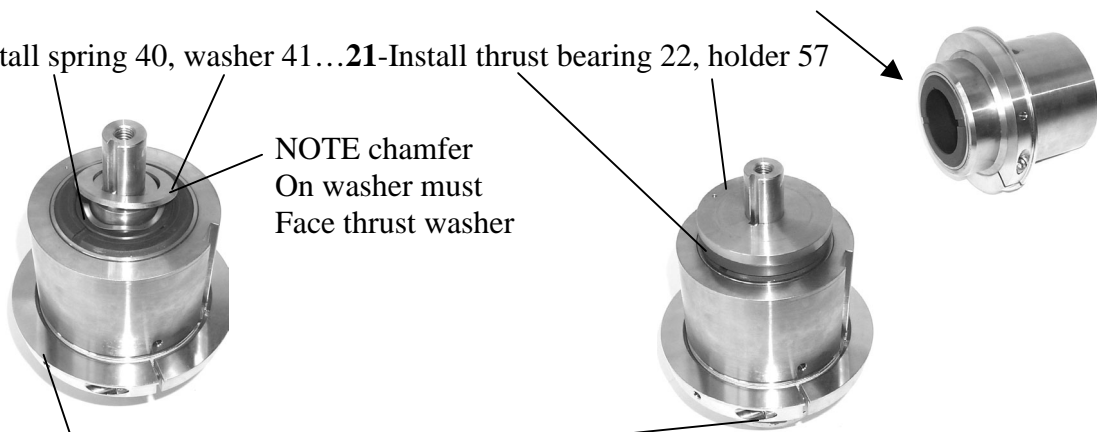
16-Install tolerance ring 32 (not shown)

17-Install bearing sleeve 30 notch over pin.

18-Spring 40, washer 41, bearing 22, and holder 57 are shown for reference.

19-Insert assembled rotor from step 17 into assembled bearing housing from step 5

20-Install spring 40, washer 41... **21-**Install thrust bearing 22, holder 57



22-Install locknut 98 and screw 92

23-Install cover 3 over assembled module.

Be certain to engage pin 24 into counterbore.

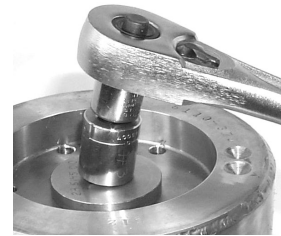


24-Insert key 18 into impeller shaft 17.



25-Attach impeller 2 with washer 55 and bolt 94.

Use $\frac{3}{4}$ socket.

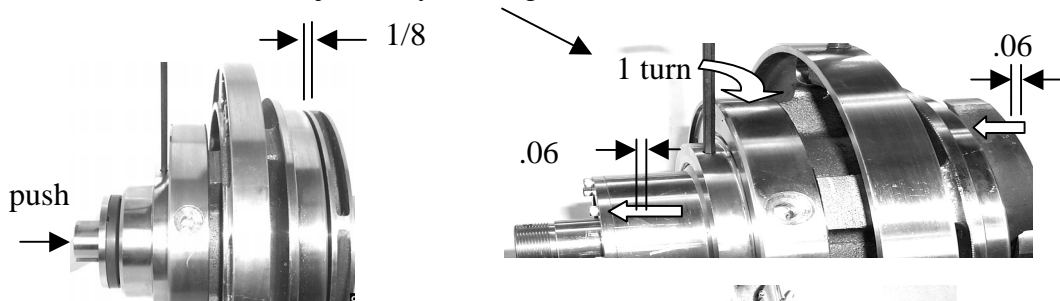


26-Install inner magnet key 19, inner magnet 16 washer 65

and secure with bolt 94. Use $\frac{3}{4}$ socket

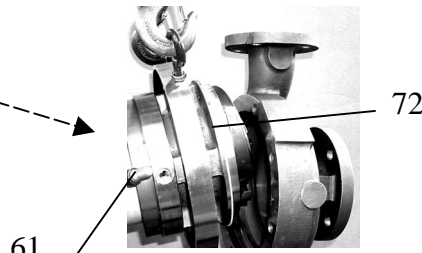
27-Push on end of shaft to remove end play and adjust impeller rear shroud clearance.

28-Rear shroud clearance is adjusted by rotating locknut 98. Secure screw 92.



29-Install gasket 72 and assembled unit into casing

Secure with bolts 61. Use $\frac{1}{2}$ Allen wrench.



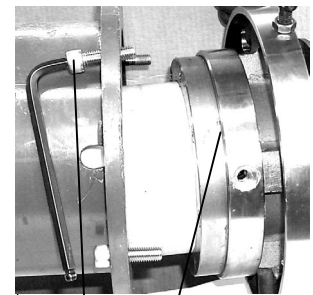
30-Install o-ring 74 into flange 73, and onto containment shell 6.

(Zirconia containment shell only)

31-Install o-ring 71 and secure containment shell to cover 3.

32-Secure bracket 10 to cover 3 with bolts 56.

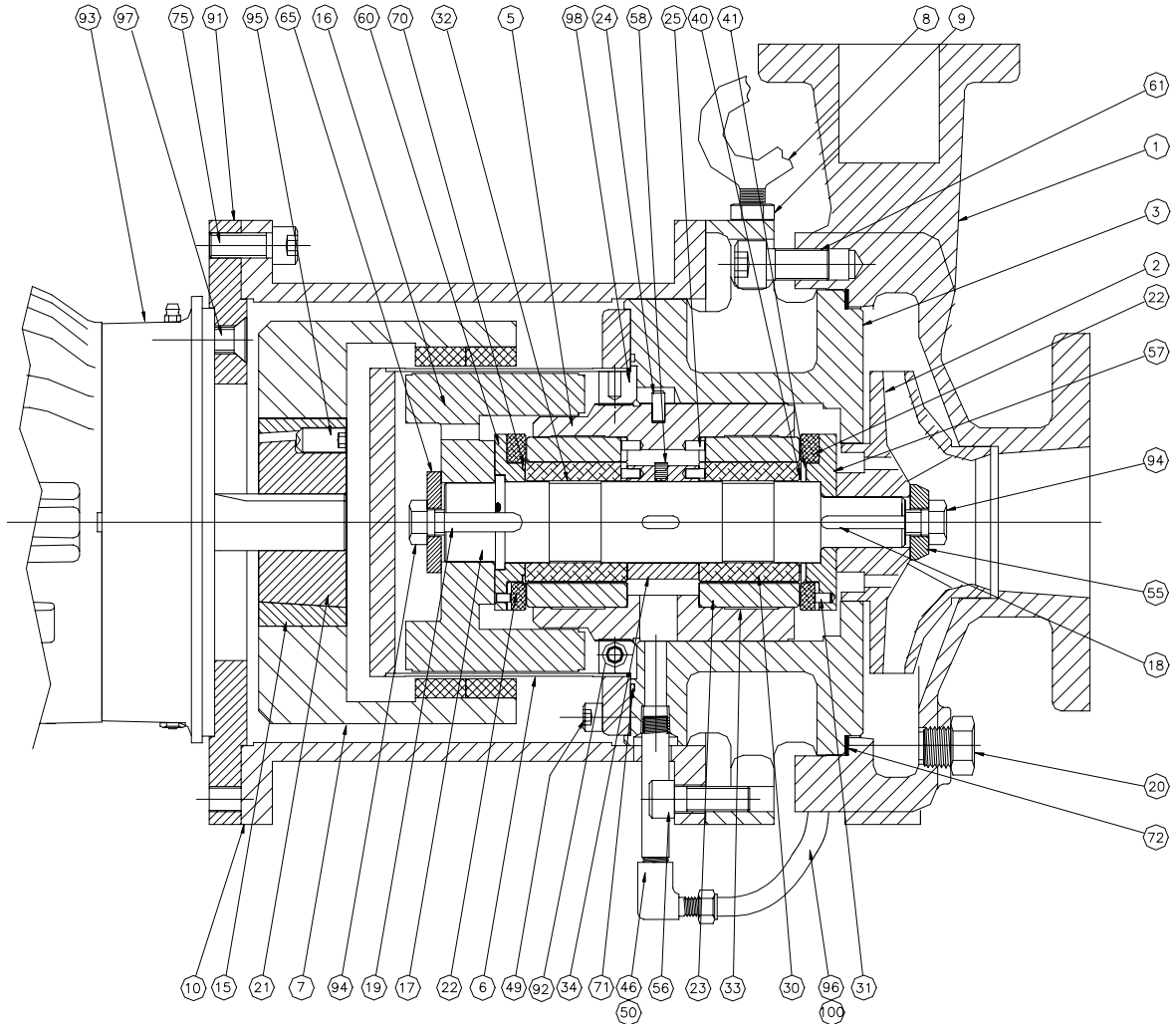
33-Replace external bearing coolant lines from casing to cover.



END ASSEMBLY

10 75 3

GROUP 2 MC SECTION



PARTS LIST (E5473CC)		
ITEM	REQD	DESCRIPTION
1	1	CASING
2	1	IMPELLER
3	1	COVER, CASING
5	1	BEARING HOUSING
6	1	CONTAINMENT SHELL
7	1	DUT. MAG.
8	2	EYEBOLT
9	2	NUT
10	1	MOUNTING BRACKET
15	1	ADAPTER, TAPER LOCK
16	1	ASS'Y, INNER MAGNET
17	1	SHAFT
18	1	KEY, IMPELLER
19	1	KEY, INNER MAGNET
20	1	PLUG, 1/2 NPT

21	1	BUSHING
22	2	BEARING, THRUST
23	2	BEARING
24	1	PIN, BRG. HSG.
25	4	PIN
30	2	BEARING, SLEEVE
31	2	PIN
32	2	TOLERANCE RING
33	2	TOLERANCE RING
34	1	SPACER
40	1	SPRING
41	1	WASHER
46	1	NIPPLE
49	8	3/8-24 X 1 1/2 SHCS
50	1	FEMALE ELBOW
55	1	WASHER, IMPELLER
56	4	1/2-13 X 1 1/2 SHCS
57	1	HOLDER, PUMP END

58	1	1/4-28 X 3/8 SHCS
60	1	HOLDER, MOTOR END
61	8	5/8-11 X 1 1/4 SHCS
65	1	WASHER, MAGNET
70	1	WASHER, THRUST BRG.
71	1	O RING, C'SHELL
72	1	GASKET
75	4	1/2-13 X 1 1/4 SHCS
91	1	ADAPTER, MOTOR
92	1	5/16-24 X 1 SHCS
93	1	MOTOR (184TC)
94	2	1/2-13 X 1 1/4 HEX BOLT
95	2	1/2 X 1 SHSS
96	1	3/8 DIA. TUBING
97	4	1/2-13 X 1 1/2 FLT. HD.
98	1	LOCKNUT, BRG. HSG.
100	1	MALE ELBOW

Trouble Shooting Guide

Problem	Possible Cause	Remedy
No Discharge	Pump not primed	Verify suction pipe is submerged Open suction valve
	Wrong direction of rotation	Reverse motor leads
	Valves closed	Verify valves are open
	Bypass valve open	Adjust bypass valve
	Air leak in suction	Tighten connections Apply sealant to all threads Verify suction pipe is submerged
	Clogged strainer	Clean strainer
	Pump worn	Rebuild pump
	Magnetic coupling broken free	Stop pump. Wait till there is no rotation restart pump
Insufficient Discharge	Inlet pressure to low	Npsh problems Verify suction piping is not to long. Fully open suction valves
	Clogged strainer	Clean strainer
	Speed to low	Increase driver speed if possible A larger size pump may be needed.
	Bypass valve open	Adjust bypass valve
	Pump worn	Rebuild pump
Loss of suction after satisfactory operation	Change in fluid properties	Verify fluid properties
	Air leaks in suction line	Tighten connections Verify suction pipe is submerged
Excessive power consumption	Head lower than rating.	Reduce flow.
	Liquid to heavy	Check specific gravity and viscosity
	Worn or damaged parts	Service unit
Rapid pump wear	Abrasives in fluid	Install suction strainer
	Corrosion wear	Materials of construction not acceptable for fluid being pumped
	Misalignment	Align pump and motor

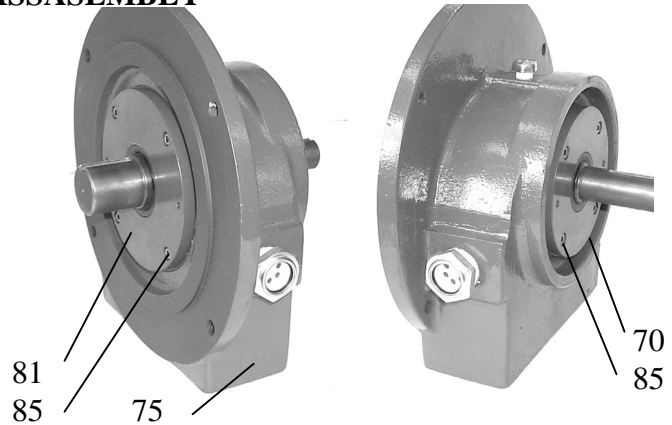
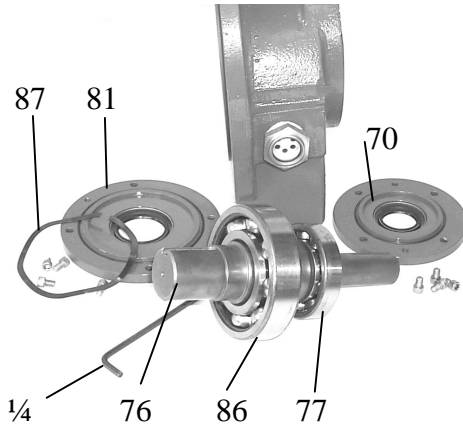
**POWER FRAME
ASSEMBLY / DISSASSEMBLY**

1-Remove screws 85

2-Remove endcaps 70,81

3-Remove rotor and spring 87 from housing 75

Remove rotor towards pump.



1-Press bearings 77,86 onto shaft 76 to shoulder.

2-Press seals 80,90 into endcaps 70,81.

3-Install endcap 70,o-ring 84 and secure with screws 85

4-Install rotor into housing 75.Install spring 87

o-ring 88 endcap 81 and secure with capscrews 81.

Install / remove outer magnet. Use 1/4 Allen wrench.

Magnet and taper lock must be flush with end of shaft.

1-DISASSEMBLY Remove screws 95. Reinstall one setscrew 95 into jackscrew location. Loosen bushing by tightening jackscrew.

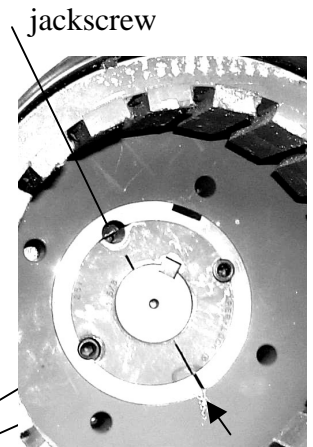
2-ASSEMBLY Do not lubricate the bushing taper, bushing bore, hub taper or the shaft. Doing so could result in breakage of the product.

Lightly oil setscrews and thread into the half threaded holes.

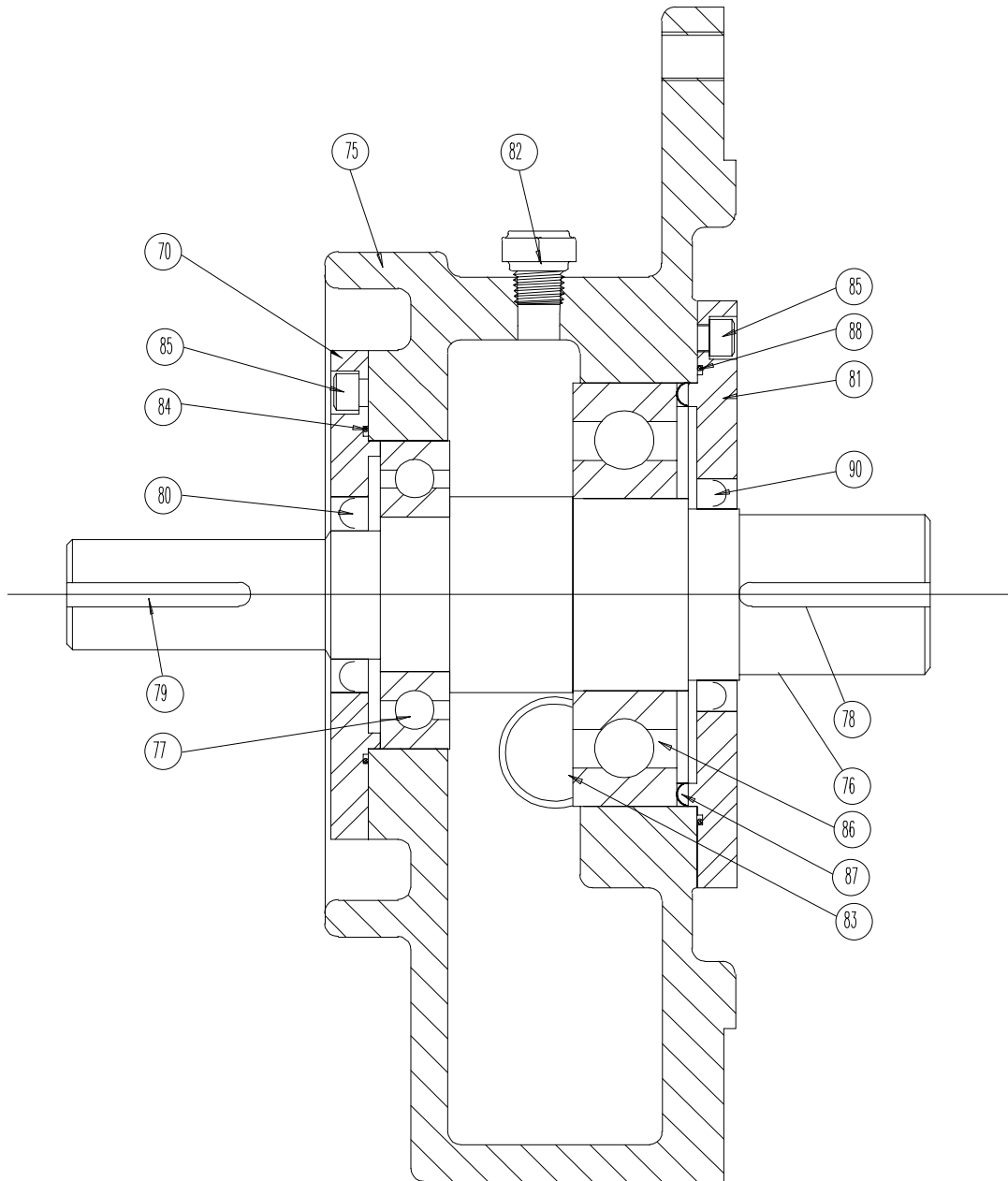
Align split in bushing, adapter and alignment mark as shown by arrow.

Install key. Alternately torque setscrews to 36 ft-lbs (unless otherwise marked)

. DO NOT USE WORN HEX WRENCHES



SECTIONAL POWER FRAME GROUP 2



PARTS LIST

ITEM	REQ'D	PART NUMBER	DESCRIPTION
70	1	5153-050	ENDCAP, POWER FRAME COUPLING END
75	1	5151-190	CASE, POWER FRAME ASSEMBLY
76	1	5160-050	SHAFT, POWER FRAME
77	1	5156-050	BEARINGS, POWER FRAME, COUPLING END
78	1	5164-050	KEY, POWER FRAME SHAFT, MAGNET END
79	1	5165-050	KEY, POWER FRAME SHAFT, COUPLING END
80	1	2671-250	SEAL, OIL, COUPLING END POWER FRAME
81	1	5154-050	ENDCAP, POWER FRAME MAGNET END
82	1	5274-050	BREATHER, POWER FRAME
83	1	3056-050	SIGHT GLASS
84	1	2665-220	O-RING (2-042), COUPLING END ENDCAP
85	8	2716-060	BOLTS, POWER FRAME ENDCAP
86	1	5157-050	BEARINGS, POWER FRAME, MAGNET END
87	1	5455-050	SPRING
88	1	5155-250	O-RING (2-047), MAGNET END ENDCAP
90	1	5158-250	SEAL, OIL, MAGNET END POWER FRAME

