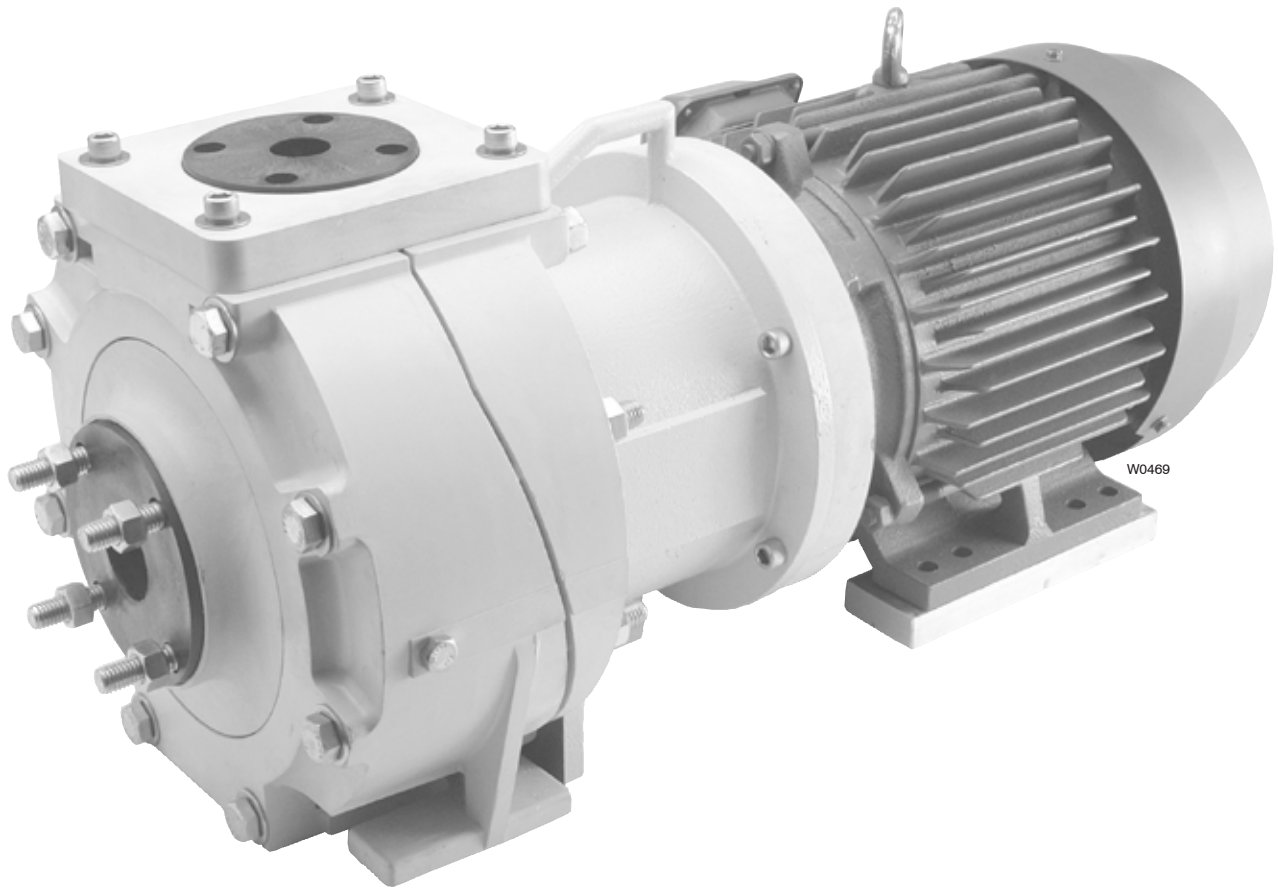


STAN-COR

*Installation and
Operation Manual
SCM-991-2400A*

“MK” Series Magnetically-Driven, Kynar, Sealless Centrifugal Pumps



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General Instructions

This Manual covers Group 1 Wanner MK Series pumps.

Upon receipt of your WANNER MK pump verify:

1. The equipment has not been damaged in transit.
2. The pump model number and serial number are stamped on the nameplate.

Model: _____

Serial No: _____

Explanation of Symbols

Work Safety Symbol



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

Attention Symbol



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

List of Tools

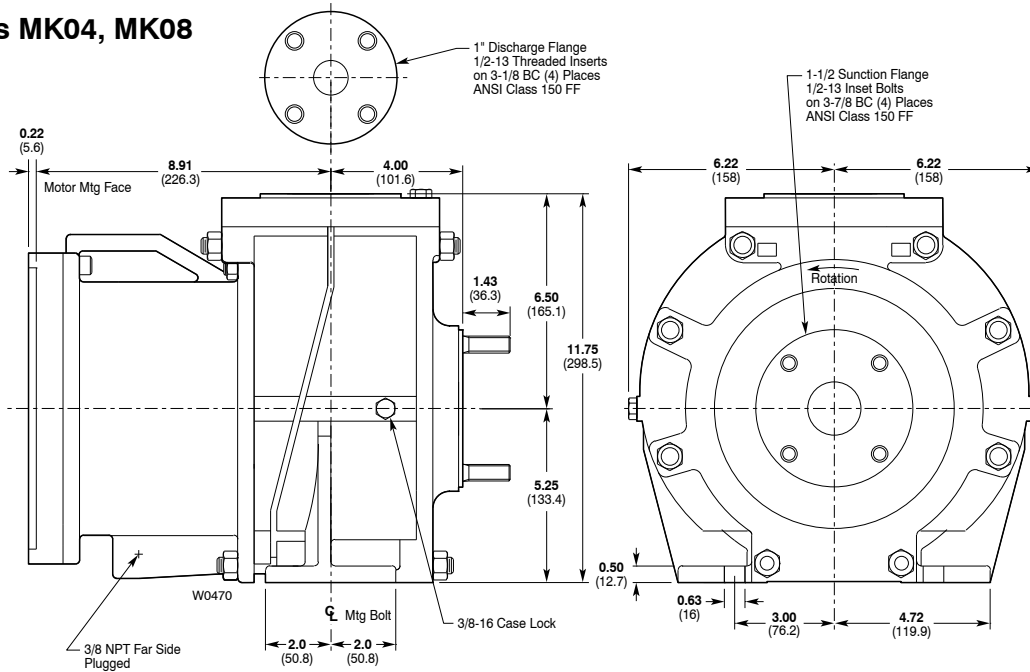
- Bearing removal/installation kit
- 9/16" wrench
- 3/4" wrench (two required)
- 15/16" wrench (two required)
- 5/16" Allen wrench
- Flat screw driver(s)



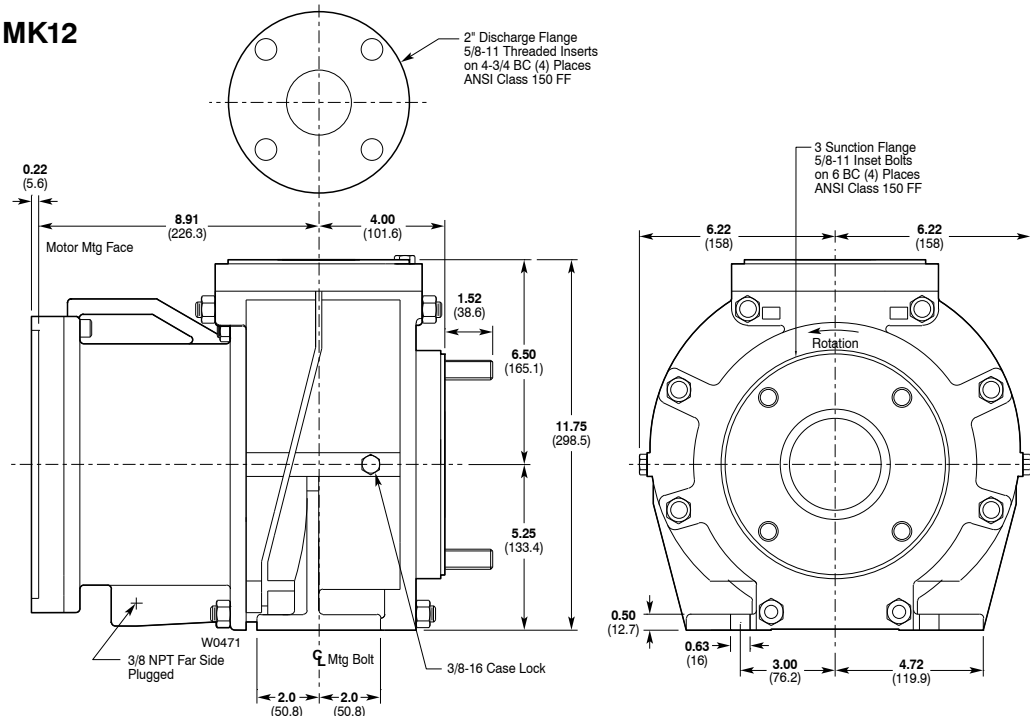
Dimensions

Pump Dimensions in (mm)

Models MK04, MK08



Model MK12

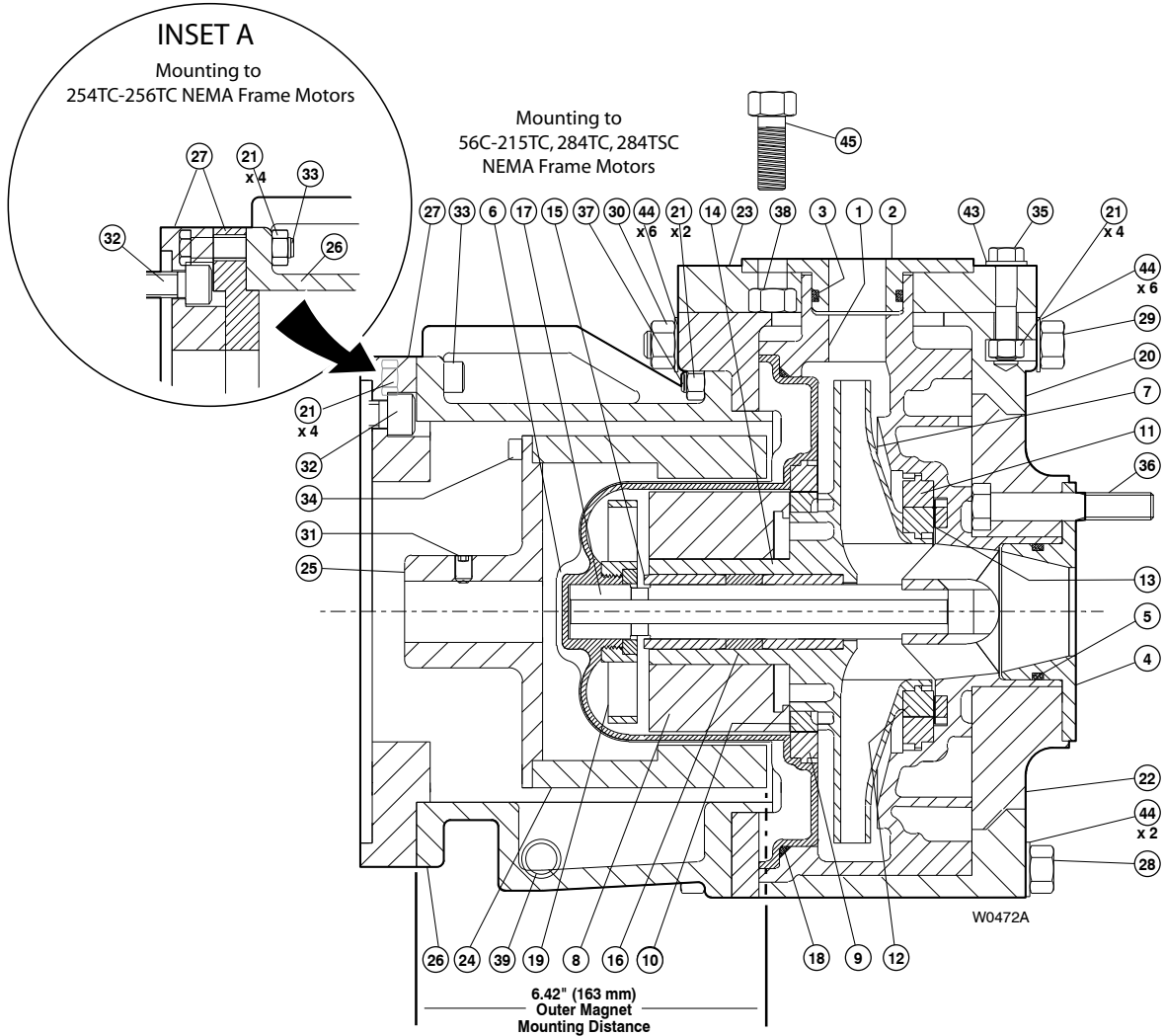


Flange Dimensions – ANSI B73.1

Model	ANSI Size	Suction 150 lb FF Flange	Discharge 150 lb FF Flange
MK04	1.5 x 1 x 6	1-1/2"	1"
MK08	1.5 x 1 x 8	1-1/2"	1"
MK12	3 x 2 x 6	3"	2"



Parts



- | | | |
|---------------------------|---------------------------------|-------------------------------|
| 1 Casing | 17 Shaft, | 33 Screw, Socket-Head Cap |
| 2 Discharge Flange | 18 O-ring, Containment Shell | (for 56C-215TC, 284TC, |
| 3 O-ring, Discharge | 19 Stator | 284TSC NEMA motors) |
| 4 Suction Flange | 20 Case Support | Screw, Hex-Head Cap (Inset A) |
| 5 O-ring, Suction | 21 Hex Nut | (for 254TC-256TC NEMA |
| 6 Containment Can | 22 Support, Suction Flange | motors) |
| 7 Impeller | 23 Support, Discharge Flange | 34 Screw, Socket-Head Cap |
| 8 Inner Magnet | 24 Outer Magnet | 35 Screw, Hex-Head Cap |
| 9 Wear Ring, Outer Rear | 25 Motor Hub | 36 Screw, Hex-Head Cap |
| 10 Wear Ring, Inner Rear | 26 Adapter | 37 Screw, Hex-Head Cap |
| 11 Wear Ring, Outer Front | 27 Motor Adapter | 38 Hex Nut |
| 12 Wear Ring, Inner Front | 28 Screw, Hex-Head Cap | 39 Pipe Plug |
| 13 Thrust Washer, Front | 29 Screw, Hex-Head Cap | 43 Washer |
| 14 Bearing, Forward | 30 Hex Nut | 44 Washer |
| 15 Bearing, Rear | 31 Screw, Socket-Head Set Screw | 45 Screw, Hex-Head Cap |
| 16 Spacer, Bearing | 32 Screw, Socket-Head Cap | |

Parts

Ref				Ref			
No.	Part Number	Description	Qty/Pump	No.	Part Number	Description	Qty/Pump
1	001S110	MK04: Casing, 1-1/2 x 1 x 6, Kynar.....	1	18	530S003-1	O-ring, Containment Shell, Viton	1
	001S111	MK08: Casing, 1-1/2 x 1 x 8, Kynar.....	1		530S003-2	O-ring, Containment Shell, Blk Chemraz.....	1
	001S112	MK12: Casing, 3 x 2 x 6, Kynar.....	1		530S003-3	O-ring, Containment Shell, EPDM.....	1
2	300S001	MK04 & MK08: Discharge Flange, 1.0", Kynar	1		530S003-4	O-ring, Containment Shell, SIMRIZ 485	1
	300S003	MK12: Discharge Flange, 2.0", Kynar	1	19	105S002	Stator, Kynar	1
3	530S001-1	MK04 & MK08: O-ring, Discharge Flange, 1", Viton	1	20	800S001	Case Support, Vinyl Ester	1
	530S001-2	MK04 & MK08: O-ring, Discharge Flange, 1", Blk Chemraz.....	1	21	D10-028-2012	Hex Nut, 3/8-16, 18-8 SST.....	10
	530S001-3	MK04 & MK08: O-ring, Discharge Flange, 1", EPDM.....	1	22	850S002	MK04 & MK08: Support, Suction Flange, 1-1/2", GF Nylon	1
	530S001-4	MK04 & MK08: O-ring, Discharge Flange, 1", SIMRIZ 485	1		850S004	MK12: Support, Suction Flange, 3", GF nylon.....	1
	530S004-1	MK12: O-ring, Discharge Flange, 2", Viton.....	1	23	850S001	MK04 & MK08: Support, Discharge Flange, 1", GF nylon	1
	530S004-2	MK12: O-ring, Discharge Flange, 2", Blk Chemraz.....	1		850S003	MK12: Support, Discharge Flange, 2", GF nylon.....	1
	530S004-3	MK12: O-ring, Discharge Flange, 2", EPDM.....	1	24	090S100	Outer Magnet, Steel	1
	530S004-4	MK12: O-ring, Discharge Flange, 2", SIMRIZ 485.....	1	25	090S004	Motor Hub, for 256TC NEMA, Steel (1.625" bore)...	1
4	300S002	MK04 & MK08: Suction Flange, 1.5", Kynar	1		090S008	Motor Hub, for 56C NEMA, Steel (0.625" bore)..	1
	300S004	MK12: Suction Flange, 3", Kynar	1		090S009	Motor Hub, for 145TC NEMA, Steel (0.875" bore)..	1
5	530S002-1	MK04 & MK08: O-ring, Suction Flange, 1-1/2", Viton	1		090S010	Motor Hub, for 182TC NEMA, Steel (1.125" bore)...	1
	530S002-2	MK04 & MK08: O-ring, Suction Flange, 1-1/2", Blk Chemraz	1		090S011	Motor Hub, for 215TC NEMA, Steel (1.375" bore)...	1
	530S002-3	MK04 & MK08: O-ring, Suction Flange, 1-1/2", EPDM.....	1		090S012	Motor Hub, for 284TC NEMA, Steel (1.875" bore)..	1
	530S002-4	MK04 & MK08: O-ring, Suction Flange, 1-1/2", SIMRIZ 485	1	26	508S001	Adapter, Close Coupled, Ductile Iron	1
	530S005-1	MK12: O-ring, Suction Flange, 3", Viton.....	1	27	560S001	Motor Adapter for 56C to 215TC, 254TC-256TC** NEMA, GF Nylon.....	1
	530S005-2	MK12: O-ring, Suction Flange, 3", Blk Chemraz..	1		560S002	Motor Adapter for 254TC-256TC** NEMA, GF Nylon.....	1
	530S005-3	MK12: O-ring, Suction Flange, 3", EPDM	1		560S003	Motor Adapter for 284TC NEMA, Steel.....	1
	530S005-4	MK12: O-ring, Suction Flange, 3", SIMRIZ 485.....	1		560S004	Motor Adapter for 284TSC NEMA, Steel	1
6	050S001	Containment Can, Kynar.....	1	28	902S007	Screw, Hex-Head Cap 1/2-13 x 6-1/2, 18-8 SST... 6	
7	031S010	MK04: Impeller, 1-1/2 x 1 x 6, Kynar.....	1	29	902S006	Screw, Hex-Head Cap 1/2-13 x 7, 18-8 SST	2
	031S012	MK08: Impeller, 1-1/2 x 1 x 8, Kynar.....	1	30	901S002	Hex Nut 1/2-13, 18-8 SST	14
	031S011	MK12: Impeller, 3 x 2 x 6, Kynar.....	1	31	904S001	Screw, Soc-Head Set Screw, 3/8-16 x 1/2, Steel..	2
8	040S002	Inner Magnet, Kynar	1	32	903S003	Screw, Soc-Head Cap, for 56C to 215TC NEMA, 1/2-13 x 1, 18-8 SST	4
9	075S012	Wear Ring, Outer Rear, Kynar/SC.....	1	33	903S002	Screw, Soc-Head Cap, for 56C to 215TC, 284TC, 284TSC NEMA, 3/8-16 x 1-1/4, 18-8 SST	4
10	075S004	Wear Ring, Inner Rear, SC.....	1		903S010	Screw, Soc-Head Cap, for 254TC-256TC NEMA, 3/8-16 x 2-1/4, 18-8 SST	4
11	075S011	Wear Ring, Outer Front, Kynar/SC.....	1	34	903S001	Screw, Soc-Head Cap, 10-32 x 3/4, 18-8 SST	8
12	075S013	Wear Ring, Inner Front, Kynar/SC.....	1	35	902S001	Screw, Hex-Head Cap, 3/8-16 x 1-3/4, 18-8 SST .	4
13	080S001	Thrust Washer, Front, SC.....	1	36	902S002	MK04 & MK08: Screw, Hex-Head Cap, 1/2-13 x 3, 18-8 SST.....	4
14	070S001	Bearing, Forward, SC.....	1		902S005	MK12: Screw, Hex-Head Cap, 5/8-11 x 3-1/4, 18-8 SST.....	4
15	070S002	Bearing, Rear, SC	1				
16	105S001	Spacer, Bearing, Kynar	1				
17	060S003	Shaft, SC.....	1				



Parts/Installation

Ref	No.	Part Number	Description	Qty/Pump
	37	902S003	Screw, Hex-Head Cap, 3/8-16 x 1-1/4, 18-8 SST..	2
	38	901S002	MK04 & MK08: Hex Jam Nut, 1/2-13, 18-8 SST....	4
		901S004	MK12: Hex Jam Nut, 5/8-11, 18-8 SST	4
	39	906S001	Pipe Plug, 3/8, Steel	1
	40*	23017	Name Plate, SST.....	1
	41*	12530	Drive Screws, Steel/Zinc Plate	4
	42*	902S004	Screw, Hex-Head Cap 3/8-16 x 1, 18-8 SST	2
	43	100-657	Washer, 3/8 flat, 18-8 SST.....	4
	44	905S001	Washer, 1/2 flat, 18-8 SST.....	14
	45	902S008	MK04 & MK08: Screw, Hex-Head Cap, 1/2-13 x 1-3/4.....	4
		902S009	MK12: Screw, Hex-Head Cap, 5/8-11 x 2-1/4	4

* Not Shown

** Items 560S001 and 560S002 are required for 254TC-256TC NEMA motors.

Pump and Motor Assembly Installation

All items included in this section.

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

1. Pump should be accessible for servicing and inspection.
2. The foundation area should be rigid .
3. The inlet should be as close to the liquid source as practical and preferably below it.
4. Piping should be supported. Do not use the pump as a pipe hanger.
5. Install valves to isolate pump during maintenance.
6. Suction and discharge piping should be the same size or larger than the pump inlet and outlet ports. Install a pressure/ vacuum gage in the suction piping a pressure gage in the discharge piping.
7. Clean piping as necessary to remove dirt, grit, weld slag, etc.
8. Provide clearance behind motor to remove motor and outer magnet (24) approximately 2 feet.
9. For further instructions on mounting or installing your pump, refer to the Hydraulic Institute Handbook.



Start-up

Start-up

Preliminary

BE CERTAIN MOTOR IS LOCKED OUT.

1. Open suction and discharge valves.
2. Check system for leaks.
3. Rotate unit by hand. On close coupled units, rotate motor fan.
4. Be certain guards are in place.
5. Remove motor lockout.
6. Jog pump to check rotation.

Running

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

Shutdown

Short Term

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

Long Term

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

Maintenance and Repair

The pump has internal bearings that will require replacement over time.

The selection of a sealless 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 risk to people and property. Based on this, the following must be observed.

1. Individuals with cardiac pacemakers should avoid repairs on these units.
2. Individuals with internal wound clips, metallic wiring, or other metallic prosthetic devices should avoid repairs on these units.
3. Strong magnetic field can cause tools and parts to slam together; injuring hands and fingers.
4. Keep magnets away from credit cards, computers, computer discs and watches.

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.

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

Maintenance

Flush the pump and drain. Use drain connection "if option has been installed".



Disassembly

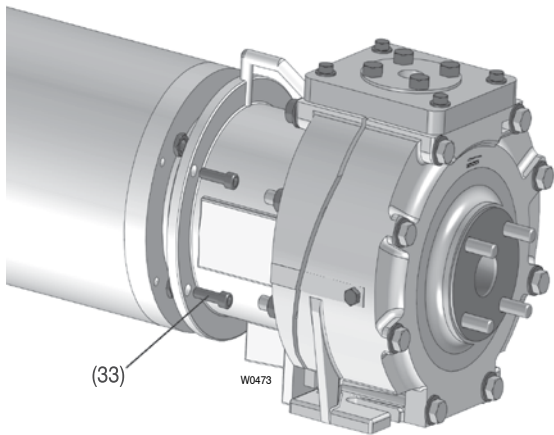


Figure 1

1. Remove socket head cap screws (33) using a 5/16" Allen wrench to detach pump assembly from motor.

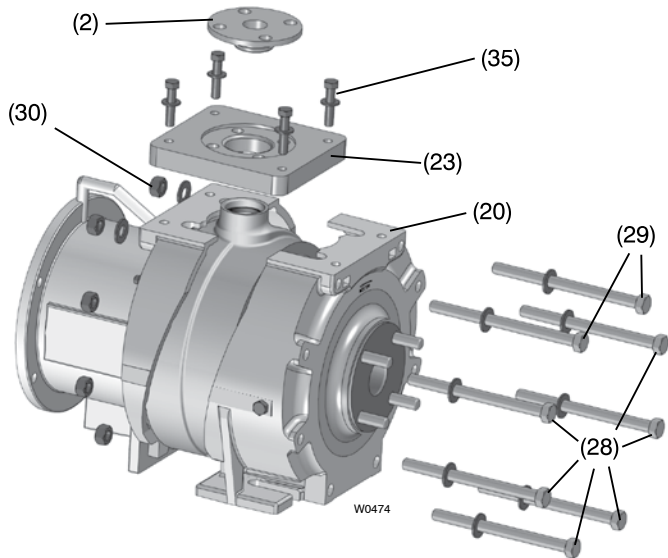


Figure 2

2. Remove hex bolts (35), and then detach flange support (23) with discharge flange (2) by lifting straight up as shown in Figure 2. Remove discharge flange (2) from flange support (23) and inspect O-ring (3). Replace if damaged.

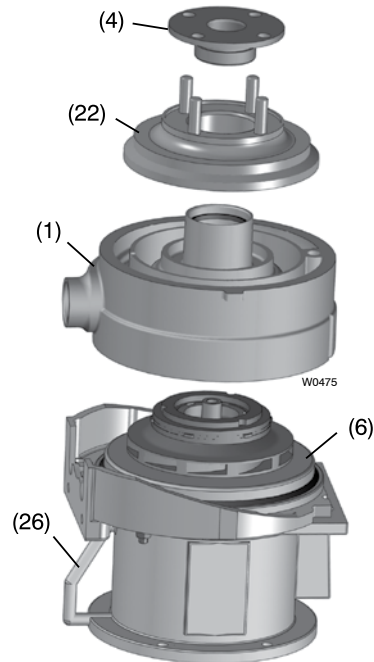


Figure 3

3. Position the pump so the suction is facing up as shown in Figure 3 while being careful not to lose the 3/8" hex nuts inserted in the bottom rear half of case support (20).
4. Remove hex bolts (28 & 29), and then remove the front half of case support (20).
5. Insert two flat screw drivers 180° from each other between case (1) and discharge flange support (22). Using the screw drivers, gently pry the flange support off the case (1). Remove suction flange (4) from support. Inspect O-ring (5) on flange (4), and replace if damaged.
- 5.1. Remove case (1) from containment can (6). It may be necessary to remove the case (1) and containment can (6) from the adapter (26). If the two are removed together, position them so the containment can (6) is up. Hold containment can while tapping the case edge around the case diameter using a small rubber hammer. Do not let case fall as the two pieces are separated.

Disassembly

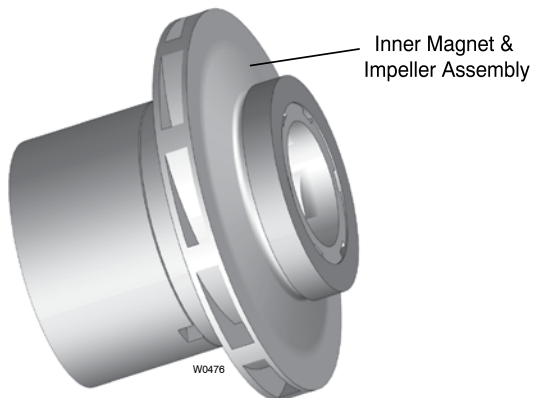


Figure 4

6. Remove inner magnet and impeller assembly from pump.
7. If the inner magnet (8) needs to be removed from the impeller, insert a flat screw driver into the slot and depress the lock by pushing in and at the same time rotate inner magnet (8) counter clockwise. A vise can be used to clamp the inner magnet.

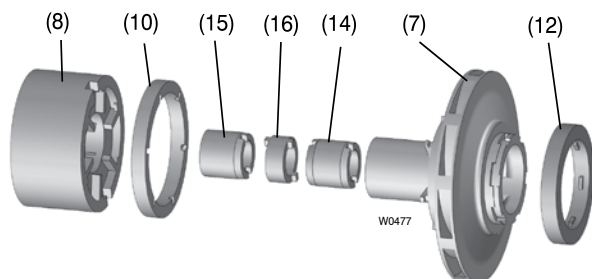


Figure 5

8. Rotate inner front wear ring (12) counter clockwise and lift.
9. Push bearings (14,15) and spacer (16) from impeller (7) using bearing removal tool and a small press. Note: the bearings can be removed with the inner magnet attached.
10. Remove inner rear wear ring (10) from impeller (7).

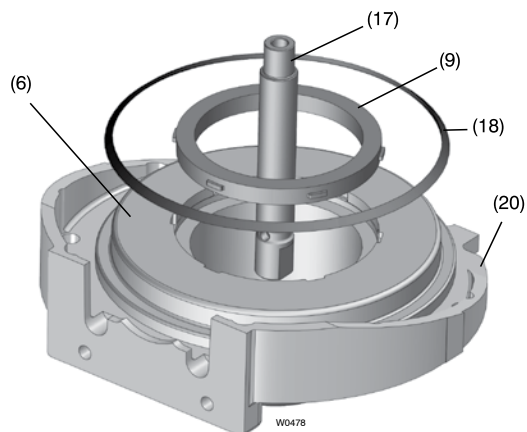


Figure 6

11. Remove shaft (17) from the containment can by lifting/pulling straight out. Do not twist.
12. Rotate outer rear wear ring (9) clockwise and lift out.
13. Inspect O-ring (18) and replace if damaged.

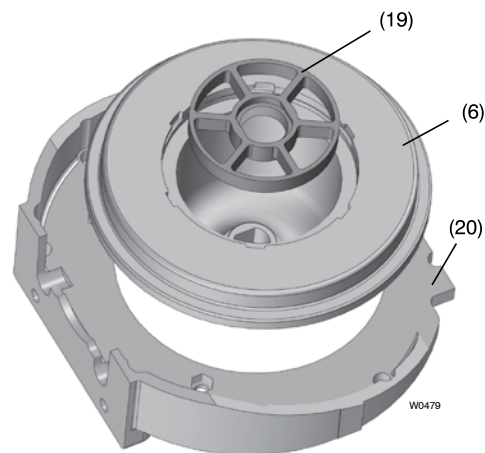


Figure 7

14. Rotate stator (19) clockwise to remove. A stator removal tool is available if the stator is stuck or damaged. (Note: the stator has left hand threads.)
15. Remove containment can (6) from adapter if it has not been removed. Inspect inside and outside of can and replace if damaged.



Assembly

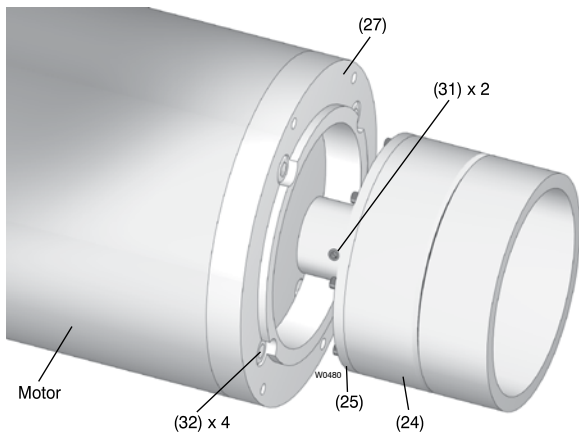


Figure 8

1. Assemble motor adapter (27) to motor and secure with socket head cap screws (32).
2. Assemble outer magnet assembly (24, 25) to motor shaft and lock with two set screws (31). Locate at 6.4 inches as shown on page 4.

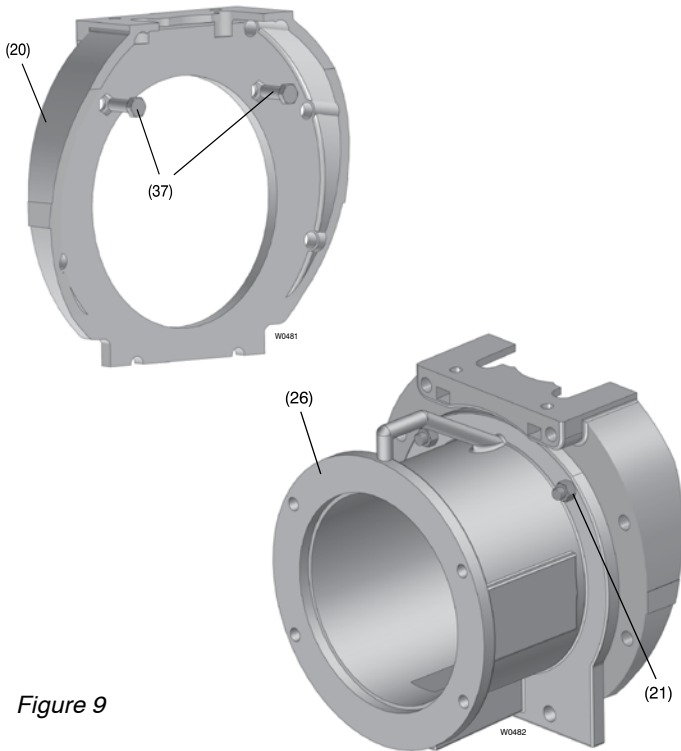


Figure 9

3. Insert two hex head cap screws (37) into back half of case support (20), and into adapter (26). Secure with hex nuts (21). Position pump vertically as shown in Figure 10.
4. Install containment can (6).
5. Install O-ring (18).

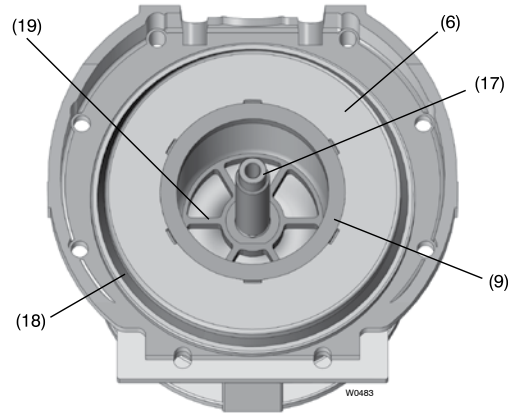


Figure 10

6. Install stator (19) into containment can (6), with counter clockwise rotation (left hand thread).
7. Install outer rear wear ring (9) into lock pockets and rotate counter clockwise. Heat stake in three places.
8. Install shaft (17).

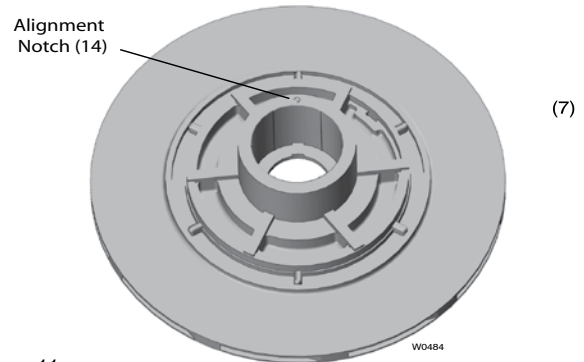


Figure 11

9. Align notch in forward bearing (14) with spot on end face of impeller (7). Press into impeller to seated position with bearing installation tool.
10. Install spacer (16) and press to seat into notch of forward bearing (14).
11. Install rear bearing (15) and press to seat into lug on spacer (16) with bearing installation tool.

Assembly

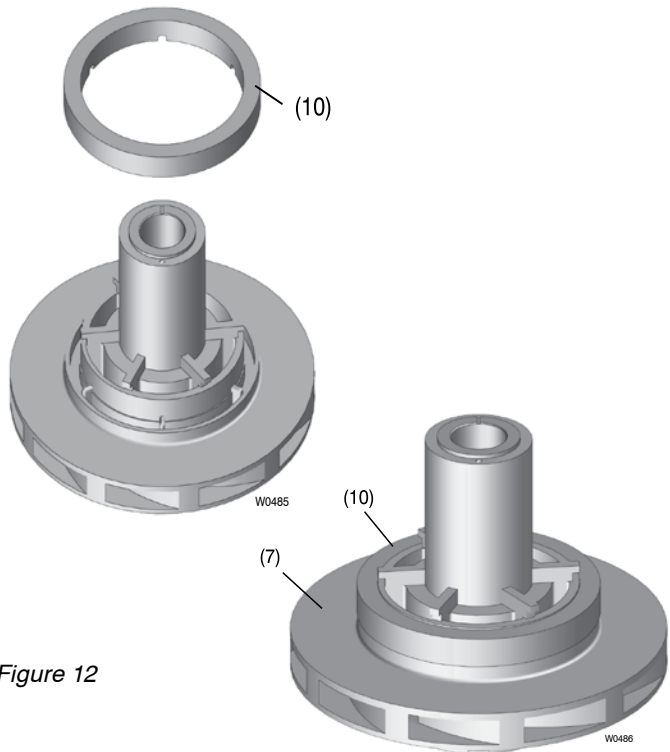


Figure 12

12. Place inner rear wear ring (10) on impeller (7). Notches on the ring are to engage drive lugs on back face of impeller.

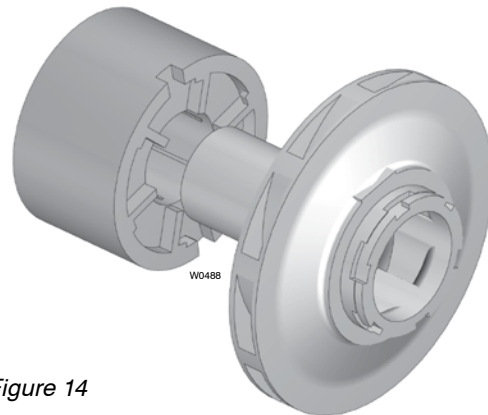


Figure 14

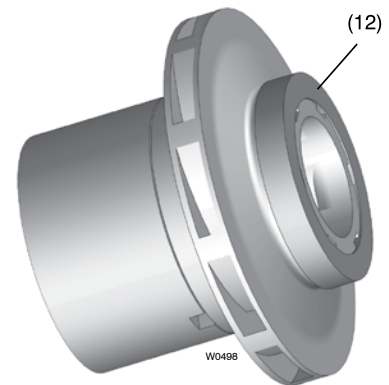


Figure 15

16. Install inner front wear ring (12) by first aligning tabs of ring with grooves on the impeller. Once aligned, press ring onto the impeller and rotate clockwise to lock. If the fit is not tight, heat stake the ring to the impeller in three places. Remove any raised plastic from heat staking process.

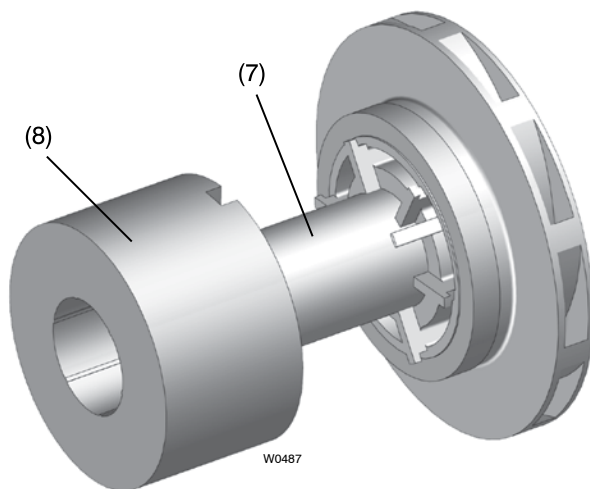


Figure 13

13. Assemble inner magnet (8) by FIRST aligning key on impeller (7) with keyway notch inside the inner magnet bore. Once the key and the keyway are aligned, press the inner magnet onto the impeller.

14. Once the inner magnet is tight against the impeller, rotate the inner magnet clockwise until the anti-rotation lock/tab is visible in the notch in the inner magnet.



Assembly

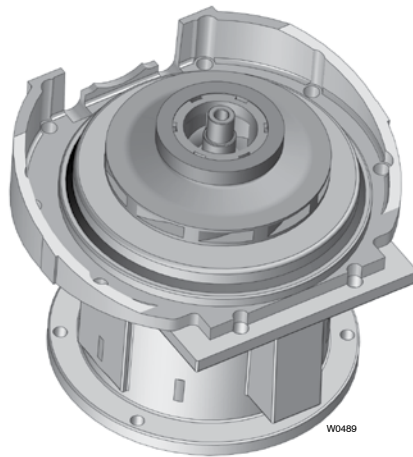


Figure 16

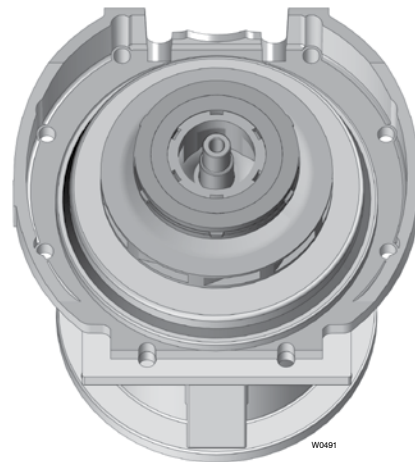


Figure 18

17. Install assembled inner magnet and impeller assembly onto shaft and lower gently into containment can.

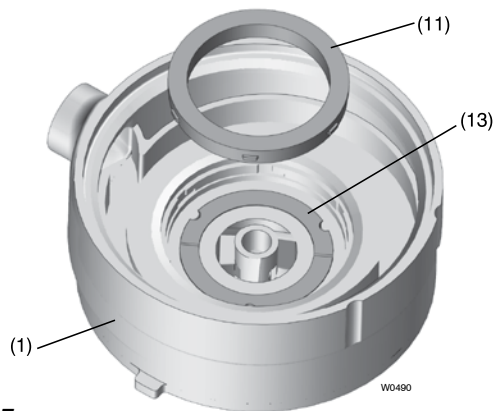


Figure 17

18. Install front thrust washer (13) into cover and engage anti rotation dogs.

19. Install outer front wear ring (11) into case lug pockets and rotate clockwise to secure and lock thrust washer tight into the case. Heat stake in three places.

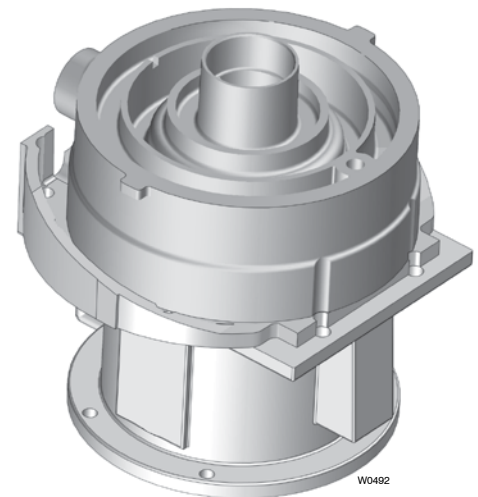


Figure 19

21. Carefully install case (1) over shaft carefully and onto containment can. Press firmly in place. The case will not seat tight over the containment can at this time during assembly because the containment can O-ring will not be compressed. See Figures 18-19.

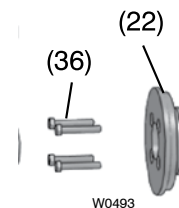


Figure 20

22. The suction flange support (22) has four pockets with raised ribs to hold the hex head bolts (36) in place after installed. Insert hex head bolts into the suction flange support (22) as shown in Figure 20.

Assembly

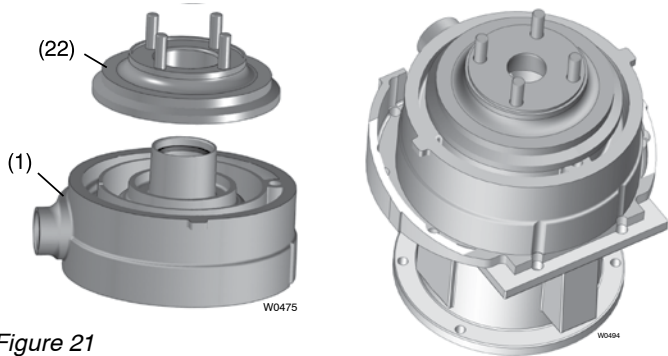


Figure 21

23. Install suction flange support (22) over the case suction port shown in Figure 21. Bolts to straddle centerlines.

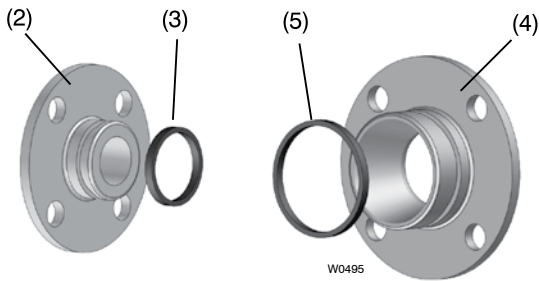


Figure 22

24. Install O-ring (3) onto discharge flange (2).
25. Install O-ring (5) onto suction flange (4).

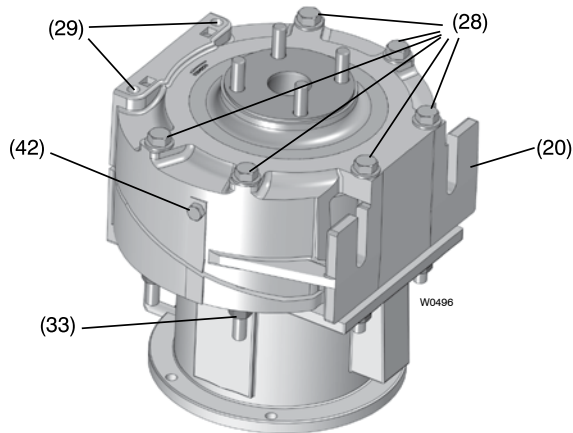


Figure 23

26. Install front half of case support (20), and secure with six bolts (28) with washers (44) and hex nuts (30). Insert two hex nuts (21) into the pockets. Install two longer bolts (29) and washers (44) in the two bolt holes near the discharge port. Snug all bolts – do not fully tighten.
27. Install two hex head cap screws (42) until they make contact with the case.

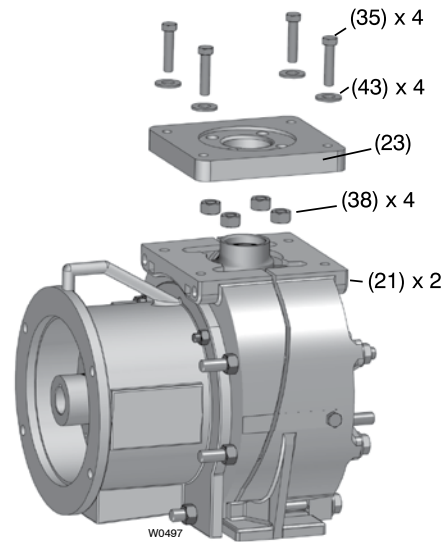


Figure 24

28. There are four nut pockets with ribs in the discharge flange support (23). Install hex nuts (38) into discharge flange support (23) using a hammer as needed to fully seat the nuts.
29. Install hex nuts (21) into the slots in the front half of casing support (20).
30. Lubricate the O-ring (3) that is inside the discharge flange (2) and press the flange into the discharge flange support (23).
32. Install two remaining hex nuts (21) into rear half of case support.
33. Install washers (43) and hex head cap screw (35) fastening the discharge flange support as shown in Figure 25. Hand tighten only.
35. Position pump vertically as shown in Figure 22 and fully tighten bolts (28) and (29) to 12-13 ft. lbs.
36. AFTER all case bolts are tight, then fully tighten discharge flange support bolts (35).
37. Lubricate O-ring (5) inside of the suction flange (4) and install suction flange support.
38. Guide assembled pump module over drive magnet.
Caution: Magnets will pull strongly. Keep fingers clear.
39. Secure pump module to motor adapter (27) with socket head cap screws (33).

Prior to start up, be certain that motor turns freely. Rotate motor fan by hand.



Troubleshooting

Problem	Possible Cause	Remedy
Pump Does Not Prime	Fluid not reaching pump	Verify suction pipe is submerged Open suction valve
	Wrong direction of rotation	Reverse motor leads
No Discharge	Valves closed	Verify valves are open
	Bypass valve open	Adjust by pass valve
	Air leak in suction	Tighten connections Apply sealant to all threads Verify suction pipe is submerged
	Clogged strainer	Clean strainer
	Pump is worn	Rebuild pump
	Magnetic coupling broken free	Stop pump. Wait until there is no rotation and restart pump
	NPSH problems	
Insufficient Discharge	Inlet pressure too low	Verify suction pipe is not too long
	Insufficient flow	Fully open suction valves
	Clogged strainer	Clean strainer
	Speed too low	Increase driver speed if possible
	Pump not sized to application	A larger pump may be required
	Bypass valve open	Adjust bypass valve
	Pump worn	Rebuild pump
Loss of Suction After Satisfactory Operation	Change in fluid properties	Verify fluid properties
	Air leak in suction	Tighten connections Verify suction pipe is submerged
Excessive Power Consumption	Head lower than rated	Reduce flow
	Liquid too heavy	Check specific gravity and viscosity
	Worn or damaged parts	Service unit
Rapid Pump Wear	Abrasives in fluid	
Erosion	Materials of construction not suitable for fluid being pumped	



Warranty

Limited Warranty

Wanner Engineering, Inc. extends to the original purchaser of equipment manufactured by it and bearing its name, a limited one-year warranty from the date of purchase against defects in material or workmanship, provided that the equipment is installed and operated in accordance with the recommendations and instructions of Wanner Engineering, Inc. Wanner Engineering, Inc. will repair or replace, at its option, defective parts without charge if such parts are returned with transportation charges prepaid to Wanner Engineering, Inc., 1204 Chestnut Avenue, Minneapolis, Minnesota 55403.

This warranty does not cover:

1. The electric motors (if any), which are covered by the separate warranties of the manufacturers of these components.
2. Normal wear and/or damage caused by or related to abrasion, corrosion, abuse, negligence, accident, faulty installation or tampering in a manner which impairs normal operation.
3. Transportation costs.

This limited warranty is exclusive, and is in lieu of any other warranties (express or implied) including warranty of merchantability or warranty of fitness for a particular purpose and of any noncontractual liabilities including product liabilities based on negligence or strict liability. Every form of liability for direct, special, incidental or consequential damages or loss is expressly excluded and denied.





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