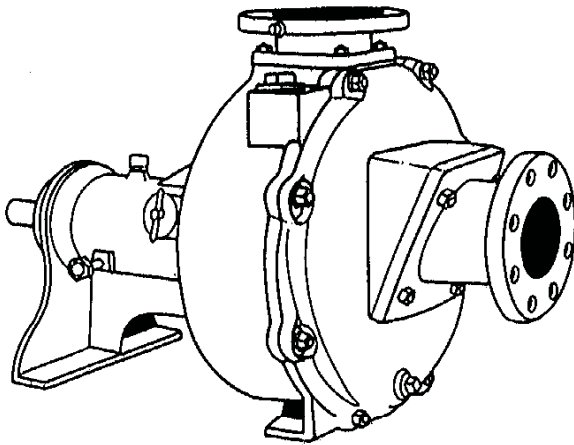
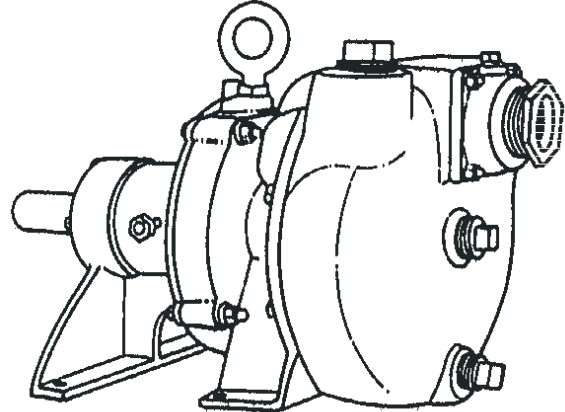


## INSTALLATION and OPERATION MANUAL Self-Priming Centrifugal Pumps



### 3" to 6" B Series & 1½" TS7 Self-Priming Centrifugal Pumps



#### **IMPORTANT!**

*Read all instructions in this manual before operating pump.  
As a result of Crane Pumps & Systems, Inc., constant product improvement program,  
product changes may occur. As such Crane Pumps & Systems reserves the right to  
change product without prior written notification.*

**CRANE**<sup>®</sup>

A Crane Co. Company

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Form No. 093513-Rev. T

# TABLE OF CONTENTS

SAFETY FIRST .....	3
A. GENERAL INFORMATION .....	4
B. INSTALLATION RECOMMENDATIONS .....	4 - 5
C. MAINTENANCE RECOMMENDATIONS .....	5 - 6
D. OPERATION RECOMMENDATIONS .....	6
E. TROUBLE SHOOTING .....	6 - 8
F. REPLACEMENT PARTS.....	8
CROSS-SECTION: TS7.....	9
PARTS LIST .....	10
CROSS-SECTION: B30.....	11
PARTS LIST .....	12
CROSS-SECTION: B40.....	13
PARTS LIST .....	14
CROSS-SECTION: B60.....	15
PARTS LIST .....	16 - 17
WARRANTY .....	18
START-UP REPORT for Electric Motor Drive .....	19 - 20
RETURNED GOODS POLICY	
WARRANTY REGISTRATION	

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# SAFETY FIRST!

Please Read This Before Installing Or Operating Pump.  
This information is provided for **SAFETY and to PREVENT EQUIPMENT PROBLEMS**. To help recognize this information, observe the following symbols:



**IMPORTANT!** Warns about hazards that can result in personal injury or Indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

**CAUTION !** Warns about hazards that can or will cause minor personal injury or property damage if ignored. Used with symbols below.

**WARNING !** Warns about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.



*Hazardous fluids can cause fire or explosions, burns or death could result.*



*Extremely hot - Severe burns can occur on contact.*



*Biohazard can cause serious personal injury.*



*Hazardous fluids can Hazardous pressure, eruptions or explosions could cause personal injury or property damage.*



*Rotating machinery Amputation or severe laceration can result.*



*Hazardous voltage can shock, burn or cause death.*



*Toxic Fumes - Breathing can cause nausea, fainting or death*



*Eye protection required*

Only qualified personnel should install, operate and repair pump. Any wiring of pumps should be performed by a qualified electrician.



**WARNING !** - To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances. Improper grounding voids warranty.

**WARNING!** - To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.



**WARNING!** Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.



**CAUTION!** Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.



**WARNING!** - **DO NOT** pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.



**CAUTION!** - Do not block or restrict discharge hose, as discharge hose may whip under pressure.



**WARNING!** - **DO NOT** wear loose clothing that may become entangled in the impeller or other moving parts. Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.



**WARNING!** - Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.



Always wear eye protection when working on pumps.  
Make sure lifting handles are securely fastened each time before lifting. **DO NOT** operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.

**DO NOT** exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.



**WARNING!** If Engine driven, never operate in an enclosed building or area where exhaust gases can accumulate. Never operate near a building where exhaust gases can seep inside. Never operate in a pit or sump without making provisions for adequate ventilation.

**WARNING!** Do not breathe exhaust fumes when working in the area of the engine. (Exhaust gases are odorless and deadly poison.)



**WARNING!** Allow exhaust system to cool before touching.



Never add fuel to the tank while the engine is running. Stop engine and allow to cool. Do not smoke while refueling the engine Do not refuel near open flame



Carefully read instruction manuals supplied by engine manufacture before attempting to assemble, operate or service the engine or any part. The "WARNING" statements indicate potentially hazardous conditions for operator or equipment.



**WARNING!** Products Returned Must Be Cleaned, Sanitized, Or Decontaminated As Necessary Prior To Shipment, To Insure That Employees Will Not Be Exposed To Health Hazards In Handling Said Material. All Applicable Laws And Regulations Shall Apply.

Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.



**IMPORTANT!** - Crane Pumps & Systems, Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

## SECTION A: GENERAL INFORMATION

### A-1) To the Purchaser:

Congratulations! You are the owner of one of the finest pumps on the market today. CROWN® Pumps are products engineered and manufactured of high quality components. Over one hundred years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest pumping projects.

This manual will provide helpful information concerning installation, maintenance, and proper service guidelines.

### A-2) Receiving:

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the crating, do not lose or misplace.

### A-3) Storage:

**Short Term** - Crown pumps are manufactured for efficient performance following long inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

**Long Term** - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be maintained between +40 deg. F and +120 deg. F.

If extended high humidity is expected to be a problem, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged, or worn should be recoated with a water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

### A-4) Service Centers:

For the location of the nearest Crown Service Center, check your Crown representative or Crane Pumps & Systems Inc., in Piqua, Ohio, telephone (937) 778-8947 or Crane Pumps & Systems Canada Inc., Brampton, Ontario (905) 457-6223.

## SECTION B: INSTALLATION RECOMMENDATIONS

1. Locate the pump as close to the source of supply as possible. Although the pump will operate on suction lifts of 25 feet, it is desirable to keep the suction lift less than 15 feet, if possible. The closer the pump can be located to the source of supply, the faster the pump will prime and a greater capacity can be pumped.

2. All pump units rotate clockwise when looking from the motor end (driven end) of the pump. Also, rotation arrows are located on the pump. On three phase units with threaded suction/discharge connections the impellers are threaded on the shaft and it is necessary to slide one half of the flexible coupling back when checking rotation in order to eliminate the possibility of unscrewing the impeller and damaging the pump. **NOTE:** Where impellers thread on pump shaft, never check the direction of electric motor rotation without first disconnecting flexible coupling.

3. Locate the pump on a firm footing to make sure the pump will not move due to vibration. Flex coupled and V-belt driven units should be permanently grouted onto a cement foundation. The pumps should be level to provide favorable operating conditions. In addition, the flexible coupling should be realigned after grouting in order to eliminate excessive wear on the coupling.

4. Allow a minimum of 18 inches in front of the pump case cover or hatch cover to permit easy removal and access to the interior of the pump. On belt driven units, allow a minimum of 10 inches at the shaft end to permit easy removal of the pedestal or rotating cartridge.

5. It is advisable to use a suction line of the same size as the pump port size. All horizontal suction lines should slope up to the pump to avoid trapped air pockets. An adjustable stand, pipe clamp or floor flange must be installed to support the weight of the suction line. On suction lifts less than 5 feet, it is sometimes possible to increase capacity slightly by oversizing the suction line, but oversized suction pipe on high suction lifts will create priming problems. Using a smaller suction line than the pump port size can cause internal damage to the pump.

6. The suction line must not have holes, even small holes. The smallest air leak in the suction line may prevent the pump from priming. Coat all threaded connections in the suction line with pipe thread compound to insure an air tight joint. In addition, suction flanges should be pulled up tight to prevent air leaks. Where fiber gaskets are used, coat them with grease.

## SECTION C: MAINTENANCE

### C-1) MECHANICAL SEAL - Grease lube (See Figure 1)

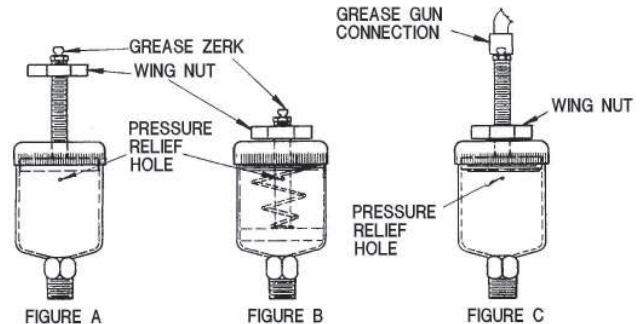


FIGURE 1

1. A self-feeding lubricator is provided to supply grease to the shaft seal of the pump on pumps with single seals. The grease cup is empty when the wing nut, positioned at the outer end of the threaded plunger shaft, recedes to the cap of the grease cup. To refill the grease cup, rotate the wing nut clockwise as far as it will go, attach a zerk gun to the zerk fitting, then fill until grease oozes from the relief hole on the side of the cup. For operation, return the wing nut to the end of the plunger. **Never force the plunger into the grease cup as this can cause seal failures.**

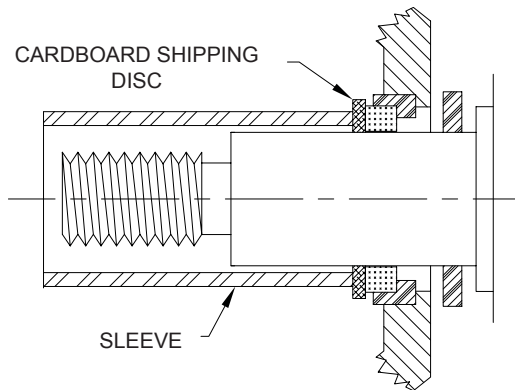
2. A #1 grease is normally recommended. However, where high ambient temperatures are encountered, such as direct sunlight, a #2 grease can be used. Use a water resistant, nonfibrous grease. Lithium base greases are excellent and molydisulfide is acceptable. Normally, the sodium soap base greases are the only non-water resistant types that are not acceptable for mechanical seal lubrication.

3. If the pump is inoperative for a long period of time, or appears not to use any grease, remove and clean the cup thoroughly. Caked grease in the cup can create a problem of non-lubrication to the seal.

4. Under normal conditions, a grease cup full of grease will last three to four months. If a grease seal requires grease every day, and it is not leaking past the outer lip seal it indicates that the seal is wearing out. The internal pressure of the pump will often force the cup plunger out when the seal leaks badly.

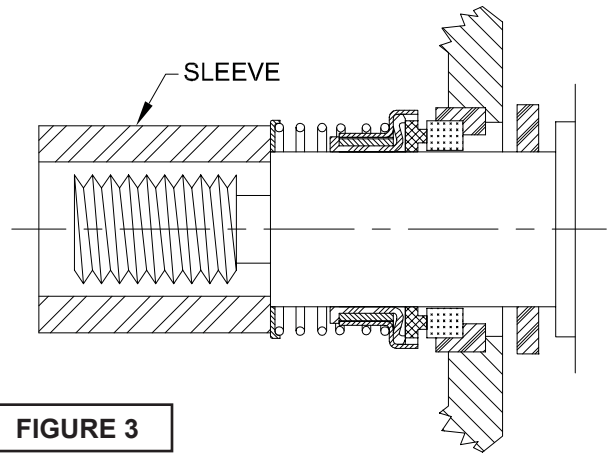
### C-1) MECHANICAL SEAL - INSTALLATION

1. Installing stationary element: A seal installation tool must be used. The seal must be seated securely in the seat ring with the lapped face out. The unlapped face is marked and correctly assembled when shipped. Oil the seat ring with light oil and seat it firmly and squarely. If this cannot be done with the fingers, use a sleeve as shown in Figure 2, inserting the cardboard shipping disc between the sleeve and the lapped face to prevent scratching sealing face.



**FIGURE 2**

2. Installing rotating element: Oil shaft with light oil. Shaft should be clean and polished smooth. Slide seal body on shaft (washer end first) and seat firmly. A sleeve as shown in Figure 3 will facilitate this operation and prevent the rubber driving ring from pulling out of place as the seal body is slid along the shaft. Assembly of impeller automatically sets the seal in the proper position. Make sure at all times, and particularly before final assembly, that both sealing faces are absolutely clean and dry. **NOTE:** Do not use petroleum based products to lubricate EPT or EPDM elastomers - use only water based lubricants.

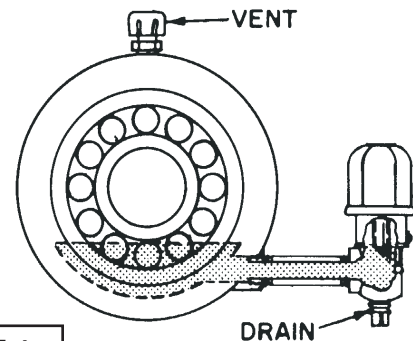


**FIGURE 3**

### C-3) BEARING LUBRICATION

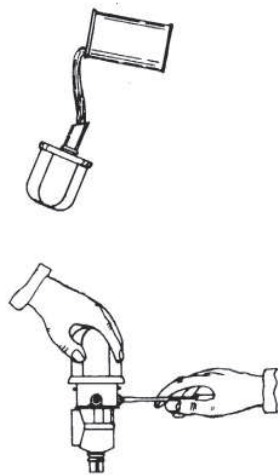
1. Grease lubricated bearings: 1½ and some 2 inch pump models are equipped with pre-lubricated bearings and have no external means of greasing. Some 2 and 3 inch pump models are equipped with a zerk fitting located on the bearing pedestal and require occasional greasing.

2. Oil lubricated bearings: Some 3 and all 4 and 6 inch units have oil lubricated bearings. On pumps where the Opto-matic constant level oiler is used, the oiler will provide an oil level to the center of the lower ball of the bearings, if the pump is sitting level and the oiler is properly filled. See Figure 4. Refill with SAE 30 non-detergent oil.



**FIGURE 4**

Fill bottle as shown in Figure 5, then invert and quickly screw into lower reservoir. Several fillings of the bottle may be required before the oil level in the bearing reservoir is equal to the level for which the oiler is set. **Never fill through the lower reservoir because there is danger of over filling and oil being thrown from the seals.** If there is ever any question about the oil level, drain the reservoir and start over.



**FIGURE 5**

If for various reasons, conditions require a higher oil level, loosen the screws as shown, adjust to the desired level and tighten screws.

Note: A vent is furnished on the top of the bearing housing and this must be clean and open so the oiler can maintain its proper oil level.

Do not clean the plastic bottle with solvents such as alcohol or laquer thinners. They will attack and destroy the plastic.

#### **C-4) GENERAL**

1. All parts of the pump are easily dismantled by simply removing nuts and screws. Rotating parts of the shaft seal grip the shaft by friction and may be frozen to the shaft thru long usage. If the mechanical shaft seal is not leaking and it is necessary to dismantle part of the pump for inspection or cleaning, **DO NOT** disturb the shaft seal other than its spring if the impeller is removed. Once a shaft seal has been in operation it cannot be reused without leaking.
2. The small pumps impellers are threaded with right hand threads.
3. When reassembling a dismantled pump, clean all parts and especially areas where gaskets and o-rings are located. Grease all gaskets and o-rings and areas where gaskets and o-rings must slide when assembling.
4. The clearance between an open faced impeller and its wear surface in the volute is set at the factory to approximately .015 inches. This clearance is readjustable on all pumps by removal of horseshoe shims located at the bearing adapter flange or on small units by relocating the shaft at the clamping arrangement.

#### **SECTION D: OPERATION RECOMMENDATIONS**

1. Fill the pump case with liquid prior to starting the pump. A self priming pump does require the liquid level in the case to at least cover the eye of the impeller. Operate at sufficient speed to prime the pump. Generally the pump will prime faster if it is operated at a faster speed.
2. Place the self-feeding grease lubricator in operation by turning the wing nut on the threaded plunger shaft counter clockwise as far as it will go. **Do not force the plunger into the grease cup as this can cause a seal failure.** See Maintenance Recommendations, paragraphs 1 and 2 for instructions on filling the grease cup.

3. In cold weather operation, the pump will not freeze as long as it is running. However, it may freeze if it is not drained while standing idle. To drain the pump, remove the drain plugs at the bottom of the pump case and rotate the impeller at least once to assure removal of all the water.

4. The discharge of a self priming centrifugal pump may be closed briefly without damaging the pump. However, the water will soon heat up and this can damage the pump seal.

5. It is not desirable to run the pump without liquid in the pump case. If the pump must be run in order to check the operation of the engine or motor, fill the case with sufficient water to keep the rotating seal wet. This will eliminate damage to the seal and other pump parts.

6. If the pump has been idle for some time, the impeller may appear to be stuck or locked in place. This is usually caused by a film of rust or dirt between the impeller and the volute. A little extra force on the shaft may break it loose. If not, the pump must be dismantled.

#### **SECTION E: TROUBLE SHOOTING:**

Locating a failure in a malfunctioning pump can be most frustrating and even futile if not approached in a systematic manner. To aid in locating the problem we recommend the permanent installation of both of the following:

1. A vacuum gauge (10), See Figure 1, to provide information from the suction side of the pump. A drilled and tapped hole has been provided in the suction flange for such a gauge.
2. A low-pressure, pressure gauge (11), See Figure 1, to supply information from the discharge side of the pump. A drilled and tapped hole has been provided on the discharge flange for such a gauge.

Always use a small valve for attaching the gauges and keep them shut off when not in use. A vacuum gauge left to flutter with pulsations will develop a crack in the internal tube causing it to leak unknowingly and give priming problems.

By using the vacuum and pressure gauges, one will be able to locate most of the problems that will occur.

Most of the problems encountered in self-priming pumps are due to air leaks on the suction side. Keeping this in mind, the following chart should help locate the trouble.

If every check fails to identify where the leak is located, it may be necessary to connect a pressure water supply to the drain hole of the pump and hydrostatically test it. Keeping the water pressure low, 5 to 10lbs. is ideal. Higher pressures may not show an o-ring leak. Also remove the cover from the grease cup to permit water to escape should the seal be leaking.

If the above shows no leaks, remove some bolts from the suction flange, insert a solid steel backing plate and tighten the flange. If, with the pump running, the vacuum gauge reads as much or more than during normal operation, then the problem is most likely in the suction pipe or sump area. Don't overlook the possibility of air entering the suction line, air that could be coming from the air bubbler control pipe.

## TROUBLE SHOOTING

**CAUTION !** Always disconnect the pump from the electrical power source before handling.  
If the system fails to operate properly, carefully read instructions and perform maintenance recommendations.

SYMPTOM	POSSIBLE CAUSE(S)	CHECK
A. Pump not primed - Vacuum gauge reading less than normal	1. Air leak in suction side of system.	a. Threaded joints in suction line for tight fit b. Gasket in suction line for tight fit c. O-rings in case cover for nicks or cuts d. Mechanical seal for air leaks e. Bottom drain plug for air leaks f. O-rings in pump side for nicks or cuts g. Vacuum gauge may be leaking internally
	2. Air bleed line blocked, or Air bleed valve closed.	a. Check line or valve
	3. Insufficient liquid in case	a. Pump case for water level b. Suction check valve for obstructions or deterioration
	4. Operating speed too low	a. Belts for proper tension b. Motor for low voltage
	5. Plugged pump	a. Impeller for lodge foreign material b. Vent line for stoppage
	6. Mechanical defects	a. Impeller - volute for proper clearance b. Impeller and volute for damage c. Pump for worn parts
B. Pump not priming - Vacuum gauge reads more than normal	1. Suction side of system clogged	a. End of suction line for obstructions b. Suction pipe for obstructions c. Suction check valve for obstructions
C. Pump primes - Vacuum gauge reads normal, discharge gauge reads lower than normal	1. Small air leak in suction side of system	a. For excessive air in discharge line b. Refer to A-1, a through g
	2. Pump speed too slow	a. Belts for proper tension b. Motor for low voltage
	3. Mechanical defects	a. Impeller - volute for proper clearance b. Impeller and volute for damage c. Pump for worn parts
D. Pump primes - Vacuum gauge reads near normal, Discharge gauge reads higher than normal	1. Plugged discharge	a. Discharge line for obstructions b. Discharge valves to insure proper operation
E. Pump loses prime when shut off - Vacuum gauge recedes to zero	1. Check valve leaking	a. Check valve for obstructions or deterioration b. Leak in suction pipe threads or flanges c. Water level bubbler control line too close to suction pipe d. The influent liquid for churning air into the sump and entering the suction pipe
F. Pump loses prime during operation - vacuum gauge recedes to zero	1. Drawdown too great	a. Automatic cut-off control for failure
	2. Pump taking air	a. Suction line for leak between cut-out and cut-off b. End of suction line for vortexing to suction pipe c. Water level bubbler control line too close to suction pipe d. The influent liquid for churning air into the sump and entering the suction pipe

## TROUBLE SHOOTING

**CAUTION !** Always disconnect the pump from the electrical power source before handling.  
If the system fails to operate properly, carefully read instructions and perform maintenance recommendations.


SYMPTOM	POSSIBLE CAUSE(S)	CHECK
G. Pump primed and pumping, but too noisy	1. Loose foundation	a. Foundation bolts for looseness b. Grouting c. For cracks
	2. Air leaks	a. Refer to A-1, a through g
	3. Cavitation	a. Drawdown too great b. Capacity too great c. Unit not operating in proper NPSH rang d. If reducing capacity quiets pump, then (c) above is cause, close discharge valve partially
	4. Bearings	a. Balls for wear b. Oil reservoir for lubrication
	5. Misalignment	a. Coupling for proper alignment b. Check base, not properly bolted down
	6. Vibration	a. Impeller for partial obstruction b. Operating in cavitation range c. Misalignment of coupling
H. Motor runing too hot	1. Low voltage	a. Voltage at motor terminals when loaded
	2. Overload	a. Amps at motor terminals when loaded b. Trash lodged in pump impeller c. Motor not large enough
I. Motor will not run	1. Overload relay kicked out	a. For one or more blown fuses b. Fuses for proper size c. For low voltage
	2. Three phase motor hums but will not rotate	a. For one of 3 blown fuses
	3. Automatic sump control failure	a. Float rod for corrosion b. Air bubbling pump not working c. Air line for stoppage

### SECTION K: REPLACEMENT PARTS

#### K-1 ORDERING REPLACEMENT PARTS:

When ordering replacement parts, ALWAYS furnish the following information:

1. Pump serial number and date code.
2. Pump model number.
3. Pump part number.
4. Part description.
5. Item part number.
6. Quantity required.
7. Shipping instructions.
8. Billing Instructions.



SERIAL NO.  1

MODEL NO.  2

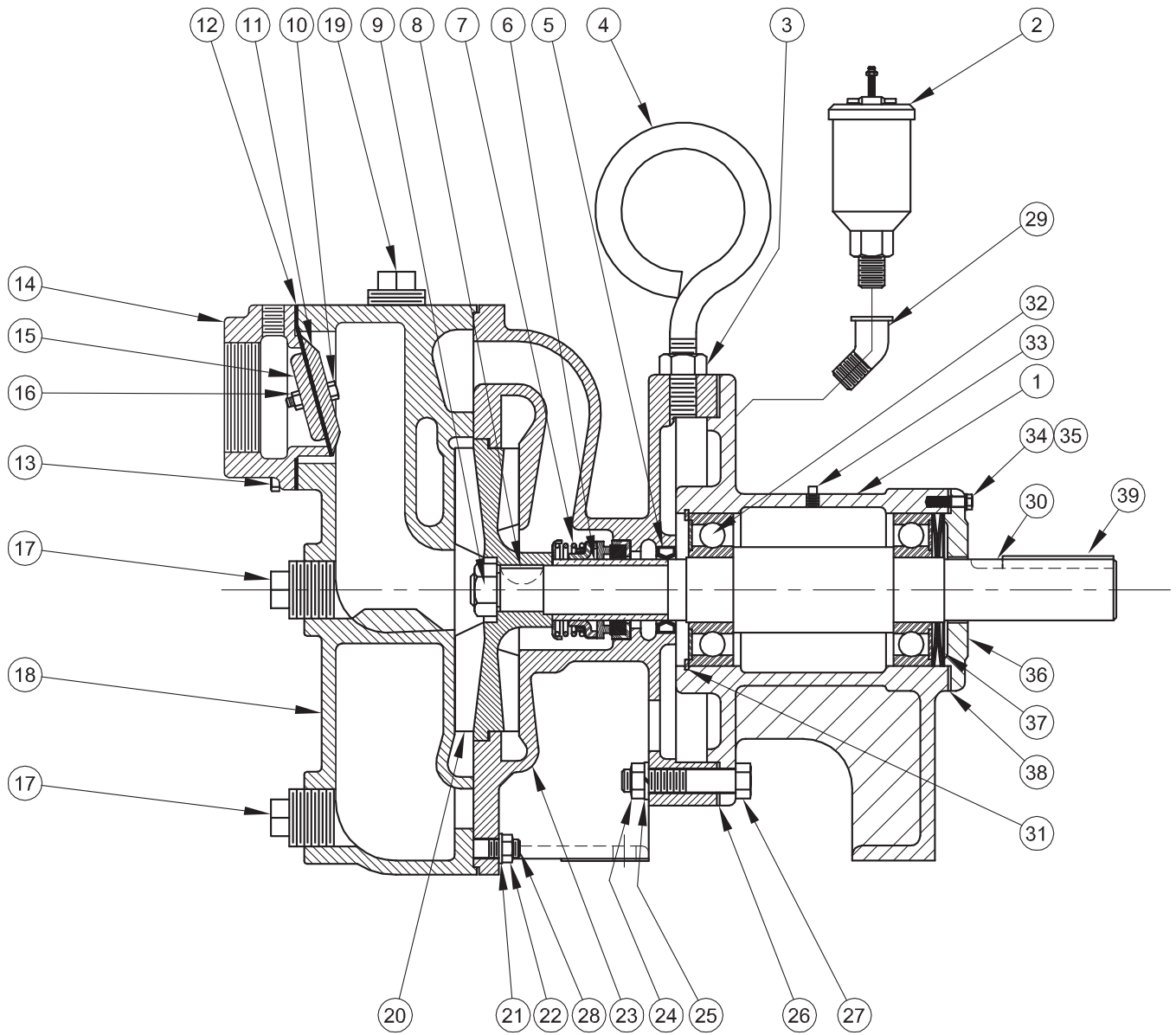
PART NO.  3

IMPELLER DIA.

**IMPORTANT !** When Ordering Parts, ALWAYS Provide The Complete Part Number, Serial Number and Model Number. Information Subject To Change Without Notice.



**MODEL: TS7 Size: 1½"**

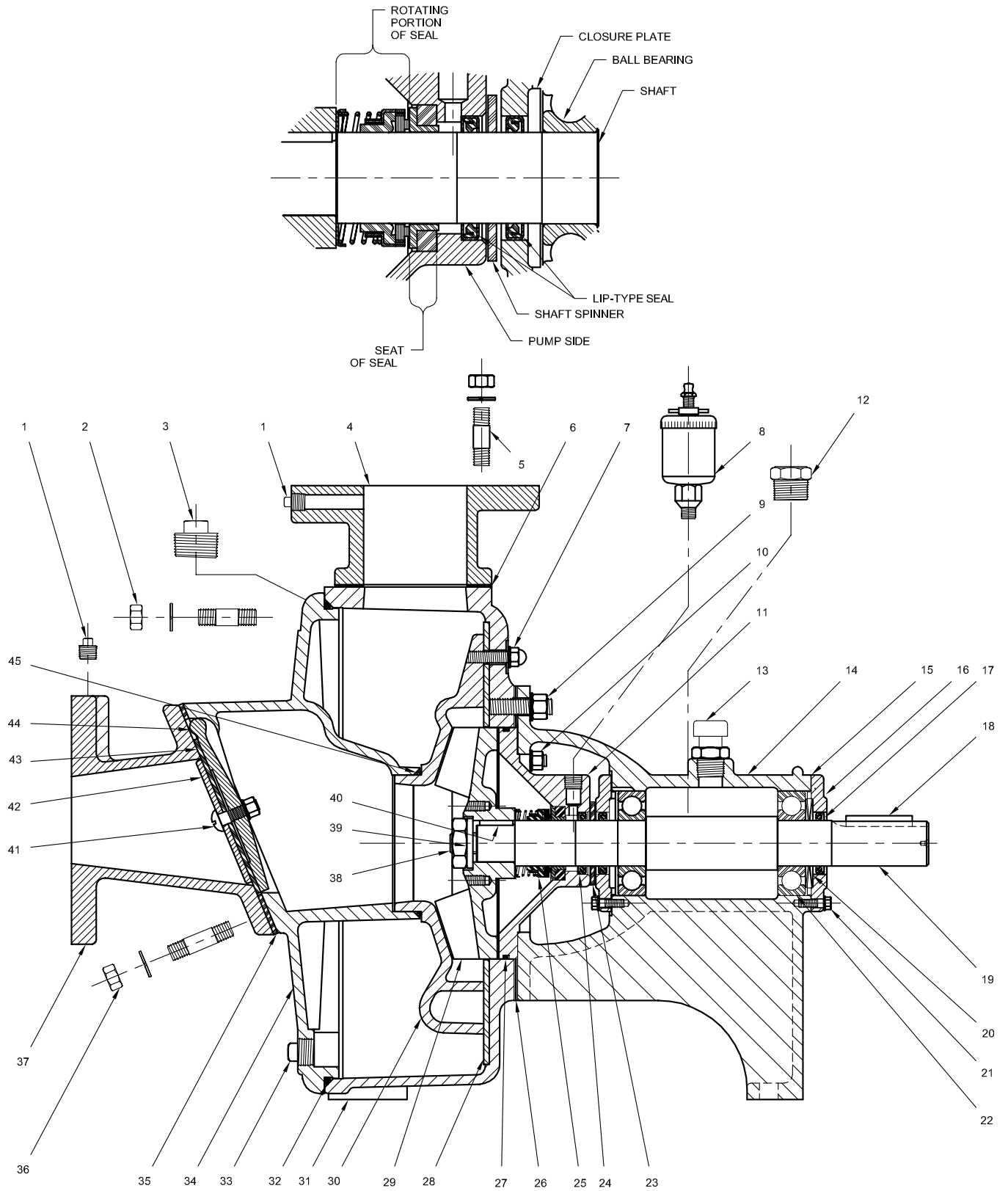


## MODEL: TS7 Size: 1½"

### PARTS LIST

ITEM	QTY.	PART NO	DESCRIPTION
1	1	500-00010-101	Pedestal
2	1	M-3415	Grease Cup
3	1	15-22-6	Hex Jam Nut
4	1	M-5087	Lifting Eye Bolt 5/8-11 x 1.375" Dia
5	1	M-3649	Lip Seal
6	1	510-00623	Shaft Sleeve
7	1	M-3957-F	Shaft Seal C/CE/B
8	1	625-02527	Woodruff Key
9	1	525-00297	Lock Nut 5/8-11
10	1	1-7-1	Hex Hd Screw 1/4-20 x 1.00" Lg, Stainless
11	1	P-3688	Flap Valve Weight
12	1	T-15907	Rubber Flap Valve
13	4	1-529-6	Hex Hd Screw 3/8-16 x 1.00" Lg
14	1	FP-3685-A	Suction Flange, 2"
15	1	FP-3478	Flap Valve Weight
16	1	15-5-6	Hex Nut 1/4-20, Zp
17	2	625-01652	Pipe Plug 1" NPT
18	1	FP-3874	Front Pump Case
19	1	625-01175	Pipe Plug 1.50" NPT
20	1	FP-3876-A	Impeller
21	8	20-14-6	Lock Washer 3/8, Zp
22	8	15-23-6	Hex Nut 3/8-16, Zp
23	1	FP-3875	Rear Pump Case
24	4	15-33-6	Hex Nut 7/16-14, Zp
25	4	20-28-6	Lock Washer 7/16, Zp
26	2	525-00254-001	Top Shim .005
	2	525-00254-002	Top Shim .012
	2	525-00255-001	Bottom Shim .005
	2	525-00255-002	Bottom Shim .012
27	4	1-142-6	Hex Hd Screw 7/16-14 x 2.50" Lg, Zp
28	8	M-2635	Stud .375 x 1.50" Lg
29	1	625-00856	St. Elbow .25" NPT
30	1	510-00447	Shaft
31	1	625-00820	Retaining Ring
32	2	M-4486	Ball Bearing
33	1	625-02816	Zerk Fitting
34	4	20-13-6	Lock Washer 1/4, Zp
35	4	1-523-6	Hex Hd Screw 1/4-20 x .75" Lg
36	1	FP-4261	Closure Plate
37	2	M-4489	Spring Disc
38	1	T-24886	Gasket
39	1	033771	Key 1/4 SQ x 2.25" Lg. Steel

# MODEL: B30 Size: 3"

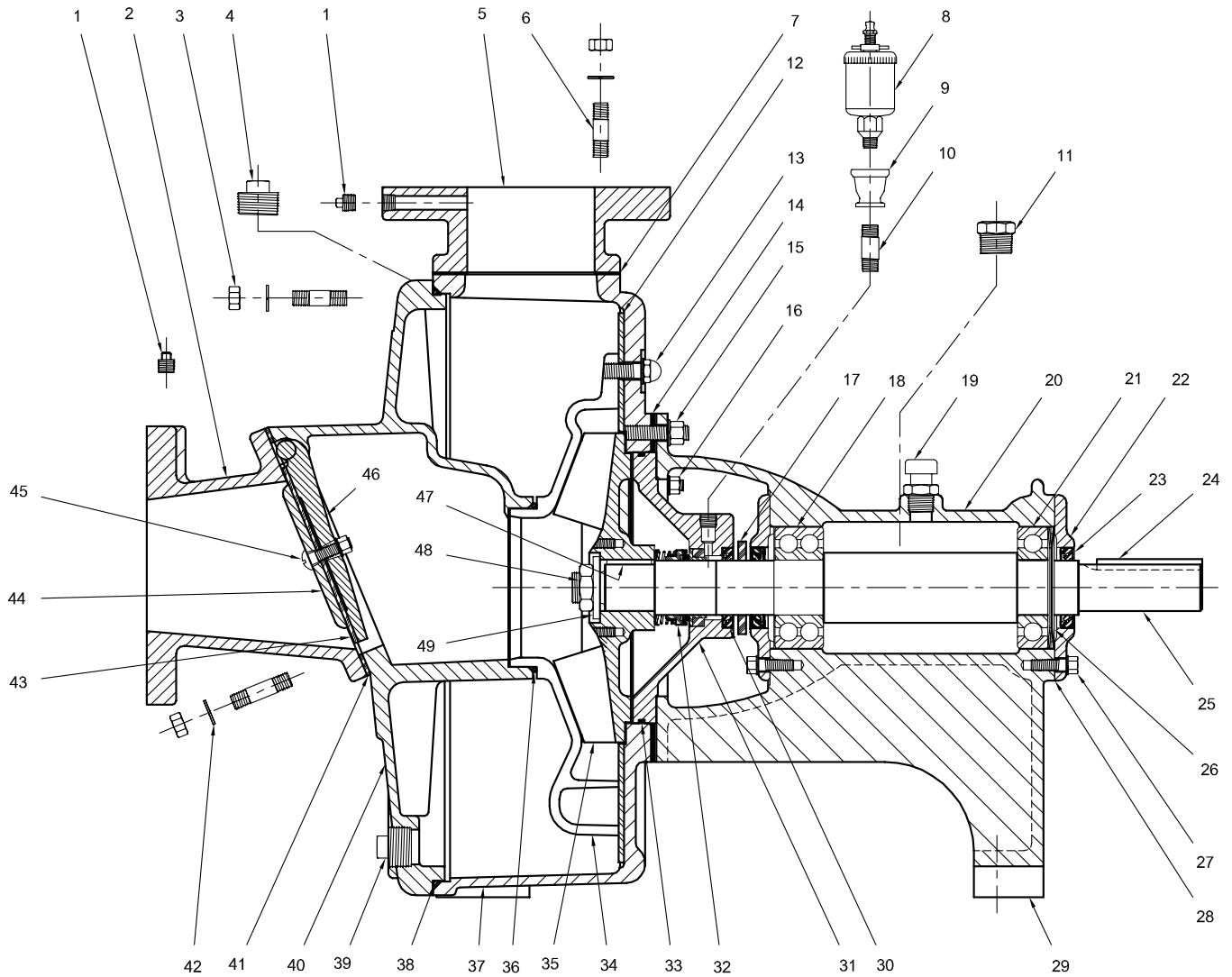
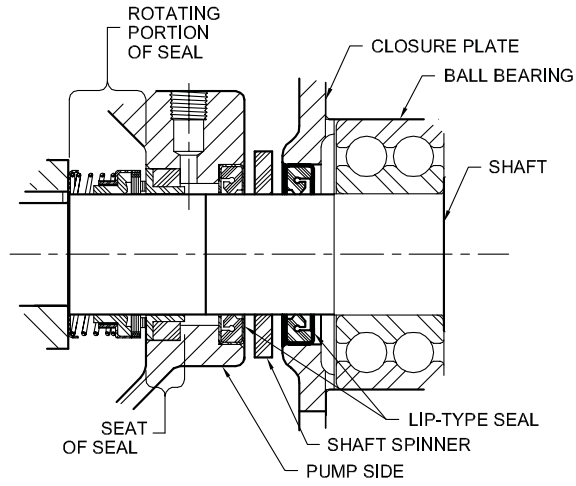


# MODEL: B30 Size: 3"

## PARTS LIST

ITEM	QTY.	PART NO	DESCRIPTION
1	2	625-00971	Plug, Pipe, Sq. 1/4" NPT
2	8	M-2771	Stud 1/2-13 x 1.75", Steel
	8	20-15-6	Washer, Lock, Split 1/2", Zinc Plated
	8	15-6-6	Nut, Hex 1/2-13, Zinc Plated
3	1	625-01175	Plug, Pipe, Sq. 1-1/2" NPT, Black
4	1	FP-4427	Flange, Discharge 3"
5	4	M-2771	Stud 1/2-13 X 1.75", Steel
	4	20-15-6	Washer, Lock, Split 1/2", Zinc Plated
	4	15-6-6	Nut, Hex 1/2-13, Zinc Plated
6	1	M-9589	Gasket, Flange, Suction
7	3	M-5479	Stud 3/8-16 x 1.75", Stainless
	3	20-6-7	Washer, Flat 3/8", Brass
	3	M-6046	Nut, Cap, Hex 3/8-16, Steel/nylock
8	1	M-3415	Cup, Grease
9	6	M-2771	Stud 1/2-13 x 1.75", Steel
	6	20-15-6	Washer, Lock, Split 1/2", Zinc Plated
	6	15-6-6	Nut, Hex 1/2-13, Zinc Plated
10	4	M-2635	Stud 3/8-16 x 1.50", Steel
	4	20-14-6	Washer, Lock, Split 3/8", Zinc Plated
	4	15-23-6	Nut, Hex 3/8-16, Zinc Plated
11	1	FP-4262-A	Side, Pump
12	1	089257	Glass, Sight
13	1	089258	Plug, Vent 1/2" NPT
14	1	FP-4263	Bracket, Support
15	2	T-24886	Gasket, Plate, Closure, Vellumoid
16	2	FP-4261	Plate, Closure
17	2	M-4080	Seal, Shaft
18	1	M-2222	Key, .31" Sq. X 2.00", Steel
19	1	T-24888-A	Shaft, Impeller
20	2	M-4489	Spring, Disc
21	8	1-5-6	Screw, Hex Hd. 1/4-20 x .75", Zinc Plated
	8	20-13-6	Washer, Lock, Split 1/4", Zinc Plated
22	2	M-6142	Bearing, Ball
23	1	M-4313	Spinner, Shaft
24	1	M-4080	Seal, Shaft
25	1	M-3983-F	Seal, Mechanical 1.375"
26	3	T-27239	Shim, Plastic, .025"
	6	T-27239-A	Shim, Plastic, .015"
27	1	2-31003-260	O-Ring Buna-N
28	1	T-24990	Plate, Seal
29	1	FP-4424-A	Impeller
30	1	FP-4330-A	Volute
31	1	FP-4331	Case, Pump
32	1	M-6680	O-Ring, Buna-N
33	3	003203	Plug, Pipe, Sq. 1/2" NPT, Black
34	1	FP-4332	Cover, Case
35	1	T-26842	Gasket, Flange, Suction
36	4	M-2614	Stud 1/2-13 x 2.00", Steel
	4	20-15-6	Washer, Lock, Split 1/2", Zinc Plated
	4	15-6-6	Nut, Hex 1/2-13, Zinc Plated
37	1	FP-4411	Flange, Suction 3"
38	1	M-7883	Nut, Lock, Hex 5/8-18, SS/Nylock
39	1	TS-24887	Washer, Impeller Stainless
40	1	M-2650	Key .25" Sq. x 1.00", Steel
41	2	1-36-1	Screw, Hex Hd. 3/8-16 x 1.25", Stainless
	2	20-14-1	Washer, Lock, Split 3/8", Stainless
	2	15-23-1	Nut, Hex 3/8-16, Stainless
42	1	T-26840	Weight, Valve
43	1	T-26841	Rubber, Valve, Check
44	1	FP-4334	Valve, Check
45	1	M-5690	O-Ring Buna-N
	1	625-01652	Plug, Pipe, Sq. 1" NPT, C.I. (Not Shown)

# MODEL: B40 Size: 4"

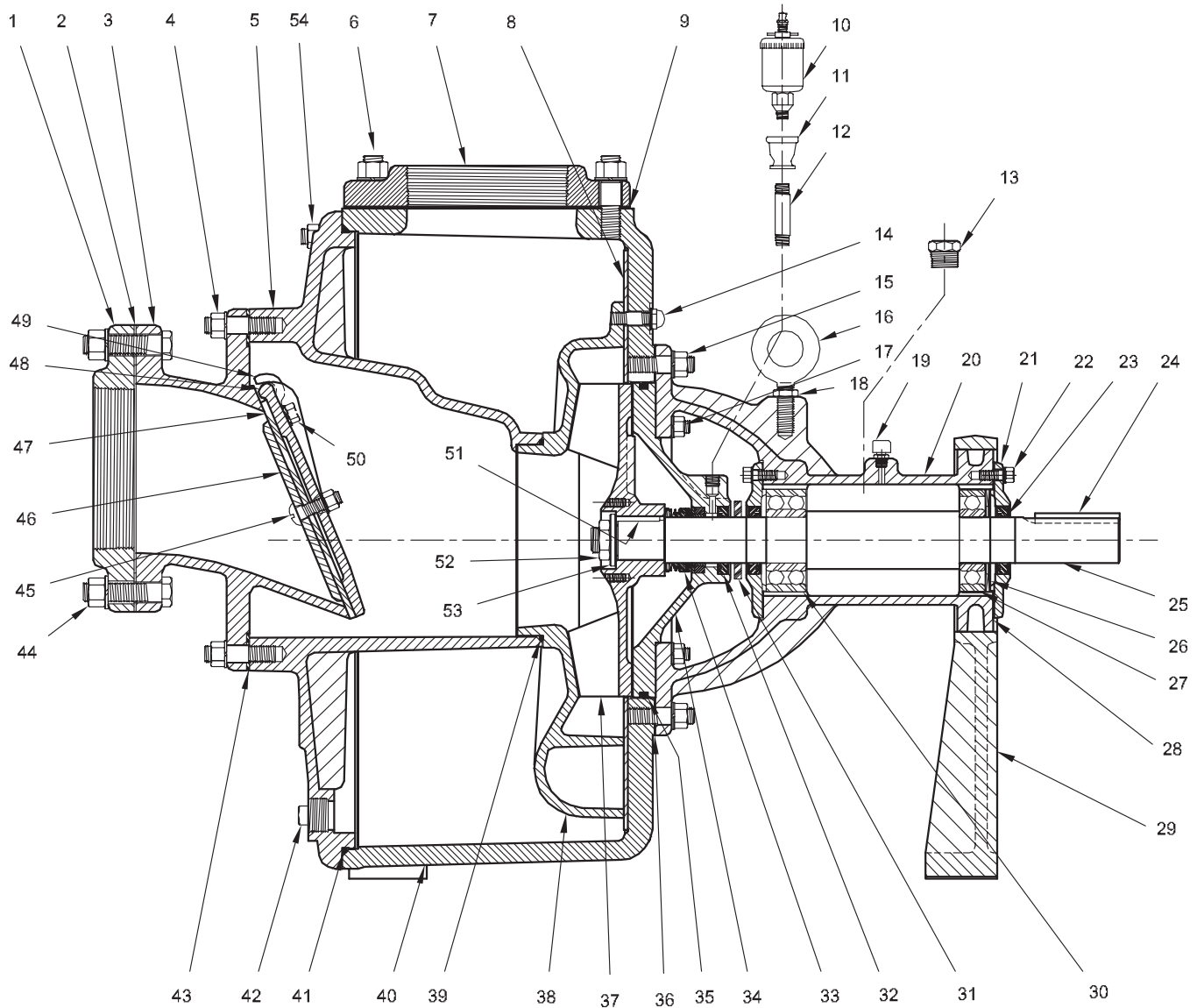
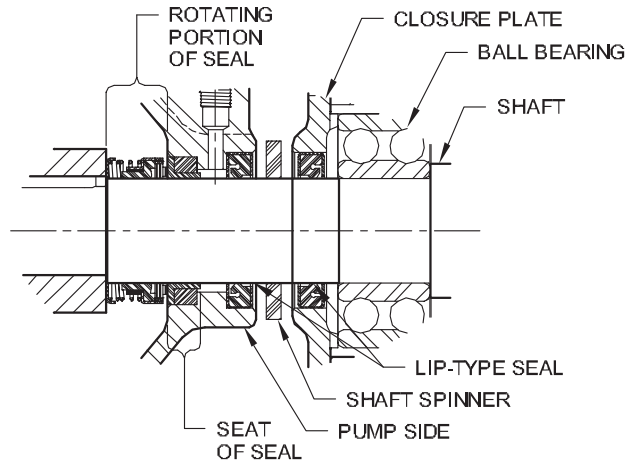


# MODEL: B40 Size: 4"

## PARTS LIST

ITEM	QTY.	PART NO	DESCRIPTION	
1	2	625-00971	Plug, Pipe, Sq.	1/4" NPT
2	1	FP-4410	Flange, Suction	4"
3	8	M-2333	Stud	5/8-11 x 2.25", Steel
	8	20-24-6	Washer, Lock, Split	5/8", Zinc Pltd.
	8	15-21-6	Nut, Hex	5/8-11, Zinc Pltd.
4	1	625-01175	Plug, Pipe, Sq.	1-1/2" NPT
5	1	FP-4428	Flange, Discharge	4"
6	4	M-2614	Stud	1/2-13x2.00", Steel
	4	20-15-6	Washer, Lock, Split	1/2", Zinc Pltd.
	4	15-6-6	Nut, Hex 1/2-13, Zinc Pltd.	
7	1	M-9590	Gasket, Flange, Suction	
8	1	M-2655	Cup, Grease	
9	1	625-02828	Coupling, Red.	1/4" x 3/8" NPT
10	1	625-01148	Nipple, Close	1/4" NPT
11	1	089257	Glass, Sight	
12	1	T-26667	Plate, Seal	(B40-10X)
	1	T-30765	Plate, Seal	(B40-9H)
	1	T-30551	Plate, Seal	(B40-9D)
	1	T-30786	Plate, Seal	(B40-8F)
13	3	M-5542	Stud	1/2-13 x 2.00", Stainless
	3	M-3543	Washer, Flat	1/2", Brass
	3	16-6-6	Nut, Acorn	1/2-13, Zinc Pltd/Nylock
14	6	T-27240	Shim, Plastic, .035"	
	6	T-27240-A	Shim, Plastic, .015"	
15	6	M-2614	Stud	1/2-13 X 1.75", Steel
	6	20-15-6	Washer, Lock, Split	1/2", Zinc Pltd.
	6	15-6-6	Nut, Hex	1/2-13, Zinc Pltd.
16	4	M-2635	Stud	3/8-16 X 1.50", Steel
	4	20-14-6	Washer, Lock, Split	3/8" Zinc Pltd.
	4	15-23-6	Nut, Hex	3/8-16, Zinc Pltd.
17	1	M-4249	Spinner, Shaft	
18	1	M-2654	Bearing, Ball	
19	1	089258	Plug, Vent	1/2" NPT
20	1	FP-4272	Bracket, Support	
21	1	M-5436	Bearing, Ball	
22	2	FP-2763-D	Plate, Closure	
23	2	M-2783	Seal, Shaft	
24	1	M-4341	Key,	.375" Sq. X 2.50", Steel
25	1	T-25043-B	Shaft, Impeller	
26	2	M-6570	Spring, Disc	
27	8	1-34-6	Screw, Hex Hd	3/8-16 x 1.00", ZP
	8	20-14-6	Washer, Lock, Split	3/8", Zinc Pltd.
28	2	T-25358	Gasket, Plate, Closure	
29	2	T-30920	Spacer, Foot	
30	1	M-2783	Seal, Shaft	
31	1	FP-4273-A	Side, Pump	
32	1	M-3842-F	Seal, Mechanical 1.75"	
33	1	M-6568	O-Ring Buna-N	
34	1	FP-4313-A	Volute (B40-10X)	
	1	FP-4313-E	Volute (B40-9H)	
	1	FP-4478-B	Volute (B40-9D)	
	1	FP-4478-A	Volute (B40-8F)	
35	1	FP-4314	Impeller (B40-10X)	
	1	FP-4314-D	Impeller (B40-9H)	
	1	FP-4472	Impeller (B40-9D)	
	1	FP-4472-A	Impeller (B40-8F)	
36	1	M-6462	O-Ring	Buna-N
37	1	FP-4311	Case, Pump	
38	1	M-6461	O-Ring	Buna-N
39	1	625-01652	Plug, Pipe, Sq.	1" NPT
40	1	FP-4312	Cover, Case	
41	1	T-26664	Gasket, Flange, Suction	
42	4	M-1784	Stud	5/8-11 X 2.50", Steel
	4	20-24-6	Washer, Lock, Split	5/8" Zinc Pltd.
	4	15-21-6	Nut, Hex	5/8-11, Zinc Pltd
43	1	T-26665	Rubber, Valve, Check	
44	1	P-4317	Weight, Valve, Check	
45	2	1-38-1	Screw, Hex Hd	3/8-16 x 1.50", Stainless
	2	20-14-1	Washer, Lock, Split	3/8", Stainless
	2	15-23-1	Nut, Hex	3/8-16, Stainless
46	1	FP-4316	Valve, Check	
47	1	525-00357	Key	3/8" Sq. X 1.375, Steel
48	1	M-7884	Nut, Lock, Hex	1-14, Stainless/Nylock
49	1	TS-13919	Washer, Impeller	Stainless
	2	003204	Plug, Pipe, Sq.	3/4" NPT, Galv.(Not Shown)

# MODEL: B60 Size: 6"



# MODEL: B60 Size: 6"

## PARTS LIST

ITEM	QTY.	PART NO	DESCRIPTION
1	1	625-02169	Flange, Companion 6"
2	1	T-9463	Gasket, Flange
3	1	FP-4402	Flange, Suction 6"
4	8	M-2333	Stud 5/8-11 x 2.25", Steel
	8	20-24-6	Washer, Lock, Split 5/8", Zinc Pltd.
	8	15-21-6	Nut, Hex 5/8-11, Zinc Pltd
5	1	FP-4400	Cover, Case
6	8	M-9711	Stud 3/4-10 x 2.75", Steel
	8	20-16-6	Washer, Lock, Split 3/4", Zinc Pltd.
	8	15-7-6	Nut, Hex 3/4-10, Zinc Pltd.
7	1	625-02169	Flange, Companion 6"
8	1	T-28581-A	Plate, Seal (B60-12X)
	1	T-30821	Plate, Seal (B60-11X)
	1	T-30820	Plate, Seal (B60-11H)
	1	T-31326	Plate, Seal (B60-10L)
9	1	T-9463	Gasket, Flange
10	1	M-2655	Cup, Grease
11	1	625-02828	Coupling, Red 1/4 x 3/8 NPT
12	1	625-01146	Nipple, Pipe 1/4" NPT x 3.00", Galv.
13	1	089257	Glass, Sight
14	3	M-5541	Stud 1/2-13 x 2.25", Stainless
	3	M-3543	Washer, Flat 1/2", Brass
	3	16-6-6	Nut, Acorn 1/2-13, Zinc Pltd/Nylock
15	6	M-1784	Stud 5/8-11 x 2.50", Steel
	6	20-24-6	Washer, Lock, Split 5/8", Zinc Pltd.
	6	15-21-6	Nut, Hex 5/8-11, Zinc Pltd
16	1	M-5087	Bolt, Eye 5/8-11, Steel
17	4	M-2614	Stud 1/2-13 x 2.00", Steel
	4	20-15-6	Washer, Lock, Split 1/2", Zinc Pltd.
	4	15-6-6	Nut, Hex 1/2-13, Zinc Pltd.
18	1	15-22-6	Nut, Hex, Jam 5/8-11, Zinc Pltd.
19	1	089258	Plug, Vent 1/2" NPT
20	1	FP-4404	Bracket, Support
21	2	FP-2763-D	Plate, Closure
22	8	1-34-6	Screw, Hex Hd 3/8-16 x 1.00", ZP
	8	20-14-6	Washer, Lock, Split 3/8", Zinc Pltd.
23	2	M-2783	Seal, Lip
24	1	M-4341	Key 3/8" Sq. X 2.50", Steel
25	1	T-27382	Shaft, Impeller
26	2	M-6570	Spring, Disc
27	1	M-5436	Bearing, Ball
28	2	T-25358	Gasket, Plate, Closure
29	1	FP-4403	Foot, Support
	2	1-96-6	Screw, Hex Hd 5/8-11 x 2.50", ZP
	2	20-24-6	Washer, Lock, Split 5/8", Zinc Pltd.
	2	15-21-6	Nut, Hex 5/8-11, Zinc Pltd
30	1	M-2654-A	Bearing, Ball
31	1	M-4249	Spinner, Shaft
32	1	M-2783	Seal, Lip
33	1	M-3842-F	Seal, Mechanical 1.75"
34	1	FP-4405	Side, Pump
35	1	M-6458	O-Ring, Buna-N
36	6	T-28554	Shim, Plastic, .030"
	6	T-28554-A	Shim, Plastic, .015"
37	1	FP-4409	Impeller (B60-12X)
	1	FP-4409-B	Impeller (B60-11X)
	1	FP-4409-A	Impeller (B60-11H)
	1	FP-4409-C	Impeller (B60-10L)
38	1	FP-4401-A	Volute (B60-12X)
	1	FP-4401-C	Volute (B60-11X)
	1	FP-4401-B	Volute (B60-11H)
	1	FP-4401-D	Volute (B60-10L)
39	1	M-7155	O-Ring Buna-N
40	1	FP-4399	Case, Pump



## MODEL: B60 Size: 6"

41	1	M-7241	O-Ring Buna-N	
42	1	625-01652	Plug, Pipe, Sq.	1" NPT, C.I.
43	1	T-28670	Gasket, Flange, Suction	
44	8	1-115-6	Screw, Hex Hd.	3/4-10 x 3.00", ZP
	8	20-16-6	Washer, Lock, Split	3/4", Zinc Pltd.
	8	15-7-6	Nut, Hex	3/4-10, Zinc Pltd.
45	2	1-71-1	Screw, Hex Hd	1/2-13 X 1.75", Stainless
	2	20-15-1	washer, Lock, Split	1/2", Stainless
	2	15-6-1	Nut, Hex	1/2-13, Stainless
46	1	P-4408	Weight, Valve, Check	
47	1	T-28570	Valve, Check	Neoprene
48	1	FP-4407	Valve, Check	
49	1	FP-4397-R	Clip, Valve, Right	
	1	FP-4398-L	Clip, Valve, Left	
50	4	1-34-6	Screw, Hex Hd	3/8-16 x 1.00", ZP
	4	20-14-6	Washer, Lock, Split	3/8", Zinc Pltd.
51	1	M-1891	Key	3/8" Sq x 1.50", Steel
52	1	M-7884	Nut, Lock, Hex	1-14, Stainless/Nylock
53	4	TS-13919	Washer, Impeller	Stainless
	1	003204	Plug, Pipe, Sq.	3/4" NPT
	2	003208	Plug, Pipe, Sq.	2" NPT
54	8	M-2333	Stud	5/8-11 x 2.25", Steel
	8	15-21-6	Nut, Hex	5/8-11, Zinc Pltd
	8	20-24-6	Washer, Lock, Split	5/8", Zinc Pltd

**BARNES®**

**BARNES®**  
PRESSURE **PS** SYSTEMS

**CROWN**

**burks®**

**WEINMAN®**

**DEMING®**

**PROSSER®**

## Limited 24 Month Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for twenty-four (24) months after manufacture date, when installed and maintained in accordance with our instructions. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply.

**THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage (c) lightning (d) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.



A Crane Co. Company

### PUMPS & SYSTEMS

420 Third Street  
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Fax (937) 773-7157  
[www.cranepumps.com](http://www.cranepumps.com)

83 West Drive  
Brampton, Ont. Canada L6T 2J6  
(905) 457-6223  
Fax (905) 457-2650

**IMPORTANT!  
WARRANTY REGISTRATION**

Your product is covered by the enclosed Warranty.  
To complete the Warranty Registration Form go to:

<http://www.cranepumps.com/ProductRegistration/>

If you have a claim under the provision of the warranty, contact your local  
Crane Pumps & Systems, Inc. Distributor.

**RETURNED GOODS**

**RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".  
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.**



**Products Returned Must Be Cleaned, Sanitized,  
Or Decontaminated As Necessary Prior To Shipment,  
To Insure That Employees Will Not Be Exposed To Health  
Hazards In Handling Said Material. All Applicable Laws  
And Regulations Shall Apply.**



A Crane Co. Company

# PUMPS & SYSTEMS

## START-UP REPORT

### General Information

Pump Owner's Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Location of Installation: \_\_\_\_\_  
 Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Purchased From: \_\_\_\_\_

### Nameplate Data

Pump Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_  
 Part #: \_\_\_\_\_ Impeller Diameter: \_\_\_\_\_  
 Voltage: \_\_\_\_\_ Phase: \_\_\_\_\_ Ø Hertz: \_\_\_\_\_ Horsepower: \_\_\_\_\_  
 Full Load Amps: \_\_\_\_\_ Service Factor Amps: \_\_\_\_\_  
 Motor Manufacturer: \_\_\_\_\_

### Controls

Control panel manufacturer: \_\_\_\_\_  
 Model/Part number: \_\_\_\_\_  
 Number of pumps operated by control panel: \_\_\_\_\_  
 Short circuit protection? YES\_\_\_ NO\_\_\_ Type: \_\_\_\_\_  
 Number and size of short circuit device(s): \_\_\_\_\_ Amp rating: \_\_\_\_\_  
 Overload Type: \_\_\_\_\_ Size: \_\_\_\_\_ Amp rating: \_\_\_\_\_  
 Do protection devices comply with pump and motor Amp rating? YES\_\_\_ NO\_\_\_  
 Are all electrical and panel entry connections tight? YES\_\_\_ NO\_\_\_  
 Is the interior of the panel dry? YES\_\_\_ NO\_\_\_  
 Liquid level Control Brand and Model: \_\_\_\_\_

### Pre-Startup

#### All Pumps

Type of equipment: NEW\_\_\_ REBUILT\_\_\_ USED\_\_\_  
 Condition of equipment at Start-Up: DRY\_\_\_ WET\_\_\_ MUDDY\_\_\_  
 Was Equipment Stored? YES\_\_\_ NO\_\_\_ Length of Storage: \_\_\_\_\_  
 Liquid being pumped: \_\_\_\_\_ Liquid Temperature: \_\_\_\_\_  
 Supply Voltage/Phase/Frequency matches nameplate? YES\_\_\_ NO\_\_\_  
 Shaft turns freely? YES\_\_\_ NO\_\_\_  
 Direction of rotation verified for 3Ø motors? YES\_\_\_ NO\_\_\_  
 Debris in piping or wet well? YES\_\_\_ NO\_\_\_  
 Debris removed in your presence? YES\_\_\_ NO\_\_\_  
 Pump case/wet well filled with liquid before startup? YES\_\_\_ NO\_\_\_  
 Is piping properly supported? YES\_\_\_ NO\_\_\_

#### Non-Submersible Pumps

Is base plate properly installed / grouted? YES\_\_\_ NO\_\_\_ N/A\_\_\_  
 Coupling Alignment Verified per I&O Manual? YES\_\_\_ NO\_\_\_ N/A\_\_\_  
 Grease Cup/Oil Reservoir Level checked? YES\_\_\_ NO\_\_\_ N/A\_\_\_

**Submersible Pumps**

Resistance of cable and pump motor (measured at pump control):

Red-Black: \_\_\_\_\_ Ohms(Ω) Red-White: \_\_\_\_\_ Ohms(Ω) White-Black: \_\_\_\_\_ Ohms(Ω)

Resistance of Ground Circuit between Control Panel and outside of pump: \_\_\_\_\_ Ohms(Ω)

MEG Ohms check of insulation:

Red to Ground: \_\_\_\_\_ White to Ground: \_\_\_\_\_ Black to Ground: \_\_\_\_\_

**Operational Checks**

Is there noise or vibration present? YES\_\_\_ NO\_\_\_ Source of noise/vibration: \_\_\_\_\_

Does check valve operate properly? YES\_\_\_ NO\_\_\_ N/A\_\_\_

Is system free of leaks? YES\_\_\_ NO\_\_\_ Leaks at: \_\_\_\_\_

Does system appear to operate at design flow rate? YES\_\_\_ NO\_\_\_

Nominal Voltage: \_\_\_\_\_ Phase: 1Ø 3Ø (select one)

Voltage Reading at panel connection, Pump OFF: L1, L2 \_\_\_\_\_ L2, L3 \_\_\_\_\_ L1, L3 \_\_\_\_\_

Voltage Reading at panel connection, Pump ON: L1, L2 \_\_\_\_\_ L2, L3 \_\_\_\_\_ L1, L3 \_\_\_\_\_

Amperage Draw, Pump ON: L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

**Submersible Pumps**

Are BAF and guide rails level / plumb? YES\_\_\_ NO\_\_\_

Is pump seated on discharge properly? YES\_\_\_ NO\_\_\_

Are level controls installed away from turbulence? YES\_\_\_ NO\_\_\_

Is level control operating properly? YES\_\_\_ NO\_\_\_

Is pump fully submerged during operation? YES\_\_\_ NO\_\_\_

**Follow up/Corrective Action Required**

YES\_\_\_ NO\_\_\_

**Additional Comments:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Startup performed by: \_\_\_\_\_ Date: \_\_\_\_\_

**Present at Start-Up**

( ) Engineer: \_\_\_\_\_ ( ) Operator: \_\_\_\_\_

( ) Contactor: \_\_\_\_\_ ( ) Other: \_\_\_\_\_

**All parties should retain a copy of this report for future trouble shooting/reference**



**PUMPS & SYSTEMS**

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