OWNERS MANUAL

INSTALLATION AND OPERATING INSTRUCTIONS
REPAIR PARTS LIST

Engine Drive Self Priming Pump

IMPORTANT

For best possible performance and continuous, satisfactory operation, read these instructions before installing your new pump.
Should service be required, this manual can be a valuable guide.
It should be kept near the installation for ready reference.

Berkeley Pumps / 293 Wright Street / Delavan, WI 53115

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INSTALLATION

Location:

Place unit as close to water source as possible to minimize suction lift, obtain the best pumping performance, and aid in priming. A typical portable installation is shown in Figure 1.

For permanent installation, mount unit on a foundation that will support the weight of pump and engine and also provide stability while the pump is running. For most permanent installations, it is advisable to bolt unit directly to foundation.

Notice: Settling and/or shifting during operation can cause piping to place excessive strain on the pump and may damage pump case.

Suction connection:

Connect either rigid pipe or flexible suction hose to pump suction as shown in Figure 1. If hose is selected, hose must be rated to hold the suction pressure and prevent collapse while the pump is running.

Make the suction line a continuous rise from the water source to the pump. High spots can trap air and also make priming difficult. Make sure all connections are tight and free of air leaks.

NOTICE: Suction pipe or hose must be at least as large as the pump suction inlet in order for the pump to operate properly.

Minimum depth for the suction inlet is determined by the diameter of the suction line. See Figure 1.

Use a suction screen to keep debris out of pump.

OPERATION

NOTICE: Do not start or run pump dry or damage to the mechanical seal will result.

Priming the pump:

A self priming pump only needs to be manually primed at the first start-up. Once primed, under normal conditions the pump will reprime automatically at each subsequent start-up.

To prime, remove plug from top of pump case and fill case with water. Replace plug and start pump. Unit is equipped with a flapper type check valve which will open at start-up and allow pump to evacuate air from the suction line. After several minutes of operation, pump will be fully primed and pumping water. Priming time will vary depending on length and diameter of suction line.

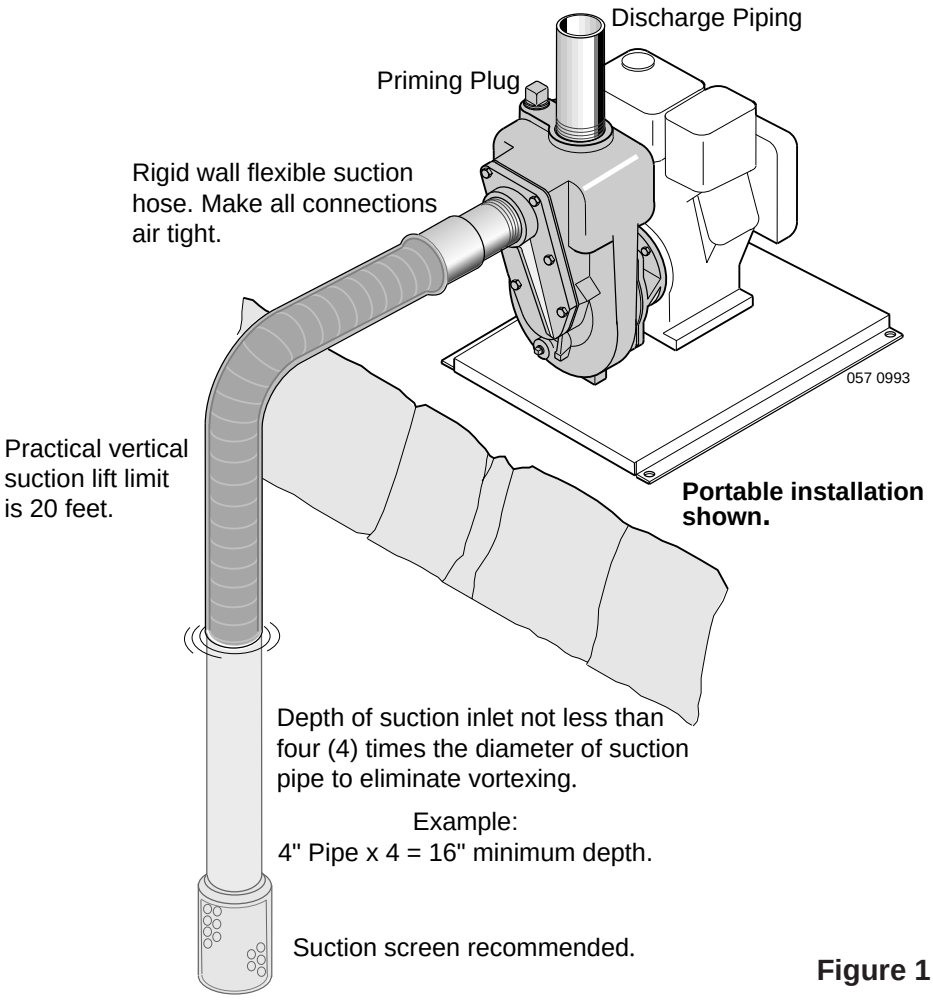


Figure 1

Running the engine:

Refer to engine owner/operator manual supplied with pump for starting and operating instructions.

Pump performance varies depending on engine R.P.M. Refer to engine operator's manual to adjust engine speed.

⚠ CAUTION Pump has the capability of overloading engine if allowed to run continuously at an RPM or flow rate that is above specified hydraulic performance.

It is important to check the engine load setting when putting the pump into operation, or after any speed change. Do this as follows.

When operating under load it must be possible to push the throttle to a full open position and hear a noticeable increase in engine RPM (Above 6%).

Upon release, throttle should return to original position and a decrease in engine speed should be noticed.

Under this condition, engine has sufficient power reserve to safely operate at continuous duty.

⚠ WARNING

Rotating parts. Can catch hands, feet, or clothing.

Stay clear of equipment and keep shields in place while pump is running.

Stop motor or engine before servicing pump.

Read owner's manual before using equipment.

MAINTENANCE

Pump Lubrication:

Pump liquid end does not require any grease or oil for lubrication. The mechanical seal is lubricated by water when the pump is operating.

Engine:

Refer to the engine manufacturer's operating manual for complete maintenance.

Seal Replacement: (Refer to Figure 2.)

1. Remove pump case from seal plate to expose impeller and mechanical seal.

   NOTICE: Gasket(s) may be damaged during disassembly. Replace with new gasket(s) at this time.

2. Hold engine shaft stationary and unscrew impeller. Remove rotating body of mechanical seal.
3. Remove seal plate from engine, then tap ceramic seat out of seal plate from the back.
4. Clean ceramic seat cavity in seal plate thoroughly before installing new seal.

   NOTICE: Make sure that seal faces are clean; do not scratch or damage new seal face during seal replacement.

5. Lubricate ceramic seat with mineral oil and press into seal plate cavity.
6. Lubricate shaft sleeve with mineral oil and slide seal body into place. If an impeller spacer was provided with pump between shaft sleeve and impeller, replace it.
7. Screw impeller back on engine shaft and re-install pump case.

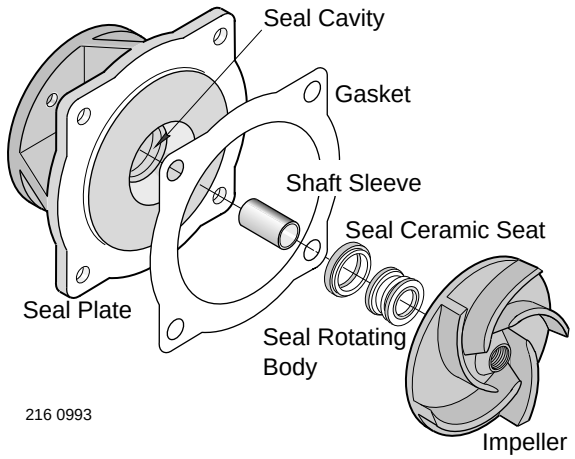


Figure 2

Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE															
	ENGINE				PUMP						SYSTEM					
	A	B	C	D	A	B	C	D	E	F	A	B	C	D	E	F
No water delivered					X	X	X				X	X	X			X
Not enough water delivered	X						X	X			X	X	X			X
Not enough pressure	X						X	X			X	X	X			
Engine heats excessively		X	X					X	X	X		X		X		
Abnormal noise and/or vibration				X	X		X			X		X	X	X		
Pump works for a while, then stops				X			X			X			X		X	X

CAUSE	CORRECTIVE ACTION
1. ENGINE	
A. Speed too low	Refer to engine manufacturer's manual
B. Rotating and/or reciprocating parts drag	Refer to engine manufacturer's manual
C. Speed too high	Maximum engine speed not to exceed engine manufacturer's recommendation.
D. Loose or broken parts	Refer to engine manufacturer's manual
2. PUMP	
A. Not primed	Reprime, inspect suction system for air leaks, and or clack assembly.
B. Pump takes too long to prime	Check for air leaks or defective check valve.
C. Flow through pump completely or partially blocked	Locate and remove obstruction. Attach strainer.
D. Internal leakage	Check clearances between face of vanes and case. Should not exceed 1/32".
E. Rotating parts drag	Inspect. Repair.
F. Loose or broken parts	Inspect. Repair.
3. SYSTEM	
A. Pressure required by system at design flow rate exceeds pressure rating of pump	Compare pump pressure and flow rate against pump performance chart. Reduce system pressure requirement. Increase pressure capability of pump.
B. Obstruction in suction piping	Locate and remove obstruction. Attach strainer.
C. Suction lift too high	Check with gauge or measure vertical distance between water surface and center line of pump, allowing for friction loss in suction pipe. Reduce rate of flow to obtain desired lift. Refer to pump performance chart.
D. Discharge head too low	Decrease rate of flow
E. Suction inlet not immersed deep enough	Refer to "Installation"
F. Leaky suction line or connection admitting air	Repair or replace suction line. Tighten connections.

Ordering Replacement Parts:

Locate the Berkeley nameplate on pump. This plate is normally on the pump case or bracket. (Seal Plate). Information found on this plate is shown in Figure 3.

To be sure of receiving correct parts, provide all nameplate data when ordering. **B.M. (Bill of Material) number** is most important.

Write the nameplate information in the spaces provided on Page 7, for later use, as nameplates can become worn or lost.

Example only

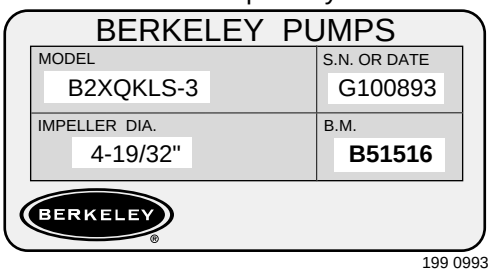
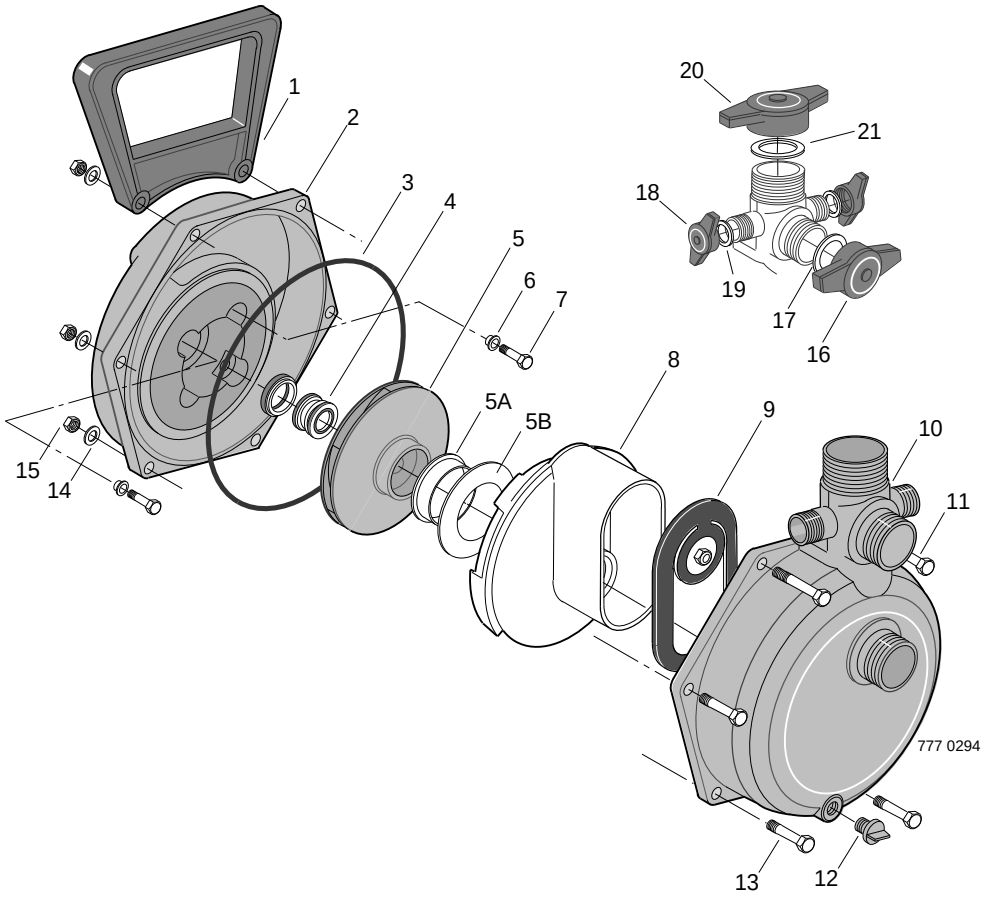


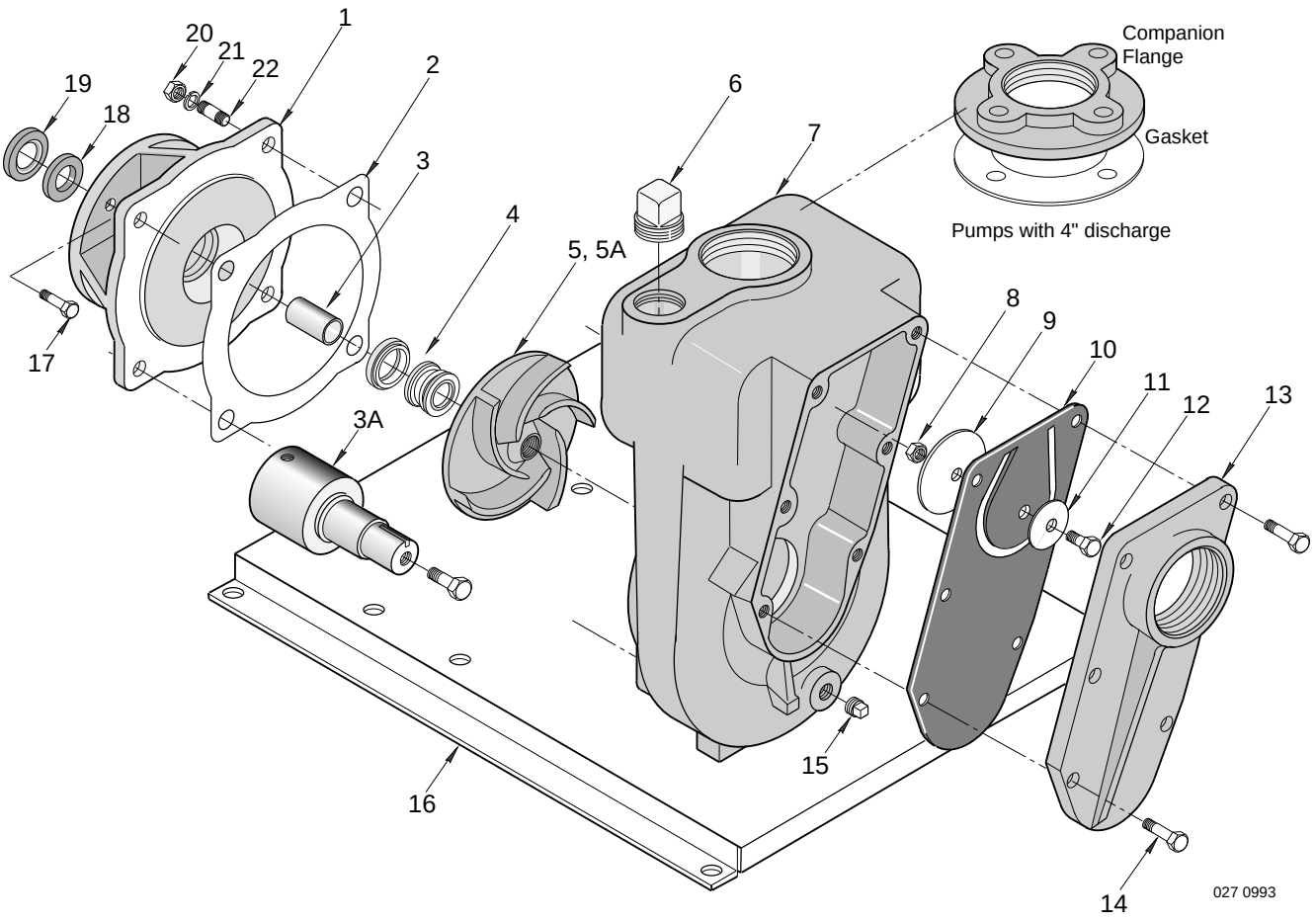
Figure 3 Provide all nameplate data when ordering repair parts.

SERIES 350/550 EXPLODED VIEW



KEY NO.	DESCRIPTION
1	Handle
2	Seal Plate
3	O-Ring
4	Mechanical Seal
5	Impeller
5A	Neck Ring
5B	Wear Washer
6	Bolt Seal
7	Capscrew (seal plate to engine)
8	Diffuser
9	Clack Assembly
10	Pump Case
11	Capscrew (pump case to seal plate)
12	Drain Plug
13	Capscrew (pump case to seal plate, short)
14	Washer
15	Hex Nut
16	Discharge Cap 1-1/2"
17	Cap Washer 1-1/2"
18	Discharge Cap 1"
19	Cap Washer 1"
20	Discharge Cap 2"
21	Cap Washer 2"

SERIES B2X, B3T, B4T, B4Z EXPLODED VIEW



Key No.	Description	Key No.	Description
1	Seal Plate	11	Clack Washer
2	Gasket (pump case to seal plate)	12	Capscrew (clack)
3	Shaft Sleeve	13	Suction Cover
3A	Shaft Extension (18, 30 HP)	14	Capscrew (suction cover to case)
4	Mechanical Seal	15	Pipe Plug
5	Impeller	16	Base (small HP shown)
•5A	Impeller Spacer	17*	Capscrew (seal plate to engine)
6	Pipe Plug	18	Slinger
7	Pump Case	19	Oil Seal
8	Hex Nut (clack)	20	Hex Nut (seal plate to case)
9	Clack Weight	21	Lockwasher
10	Clack Gasket	22	Stud (seal plate to case)

• Not shown

* Some models have stud and hex nut connections.

BERKELEY LIMITED WARRANTY

Berkeley/Wicor Canada, Inc. (“Wicor”) warrants to the original consumer purchaser (“Purchaser”) of its products that they are free from defects in material or workmanship.

If within twelve (12) months from the date of installation or twenty-four (24) months from the date of manufacture any such product shall prove to be defective, it shall be repaired or replaced at Berkeley’s/Wicor’s option, subject to the terms and conditions set forth below.

General Terms and Conditions

Purchaser must pay all labor and shipping charges necessary to replace product covered by this warranty. This warranty shall not apply to products which, in the sole judgement of Berkeley/Wicor, have been subject to negligence, abuse, accident, misapplication, tampering, alteration; nor due to improper installation, operation, maintenance or storage; nor to other than normal application, use or service, including but not limited to, operational failures caused by corrosion, rust or other foreign materials in the system, or operation at pressures in excess of recommended maximums.

Requests for service under this warranty shall be made by contacting the installing Berkeley/Wicor dealer as soon as possible after the discovery of any alleged defect. Berkeley/Wicor will subsequently take corrective action as promptly as reasonably possible. No requests for service under this warranty will be accepted if received more than 30 days after the term of the warranty.

The warranty on all three phase submersible motors is void if three-leg overload protection of recommended size is not used.

This warranty sets forth Berkeley’s/Wicor’s sole obligation and purchaser’s exclusive remedy for defective products.

BERKELEY/WICOR SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

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Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

In the U.S.: Berkeley, 293 Wright St., Delavan, WI 53115

In Canada: Wicor Canada, Inc., 4544 Fieldgate Parkway, Mississauga, Ontario L4W 3W6

Wicor Canada, Inc., 200-E, Rue St-Louis, St-Jean-Sur-Richelieu, Québec J3B 1Y1

ENGINE

Refer to engine manufacturer’s operating manual for complete maintenance and warranty.

BERKELEY PUMPS

MODEL	S.N. OR DATE
IMPELLER DIA.	B.M.

BERKELEY®

344 1093

Record your nameplate data here.