



'I' Pumps

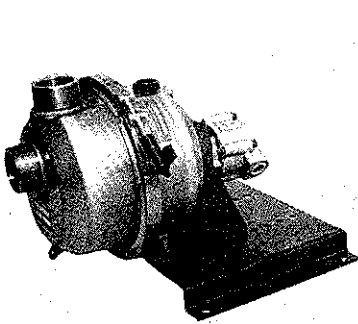
OPERATOR'S MANUAL

for Self-priming Centrifugal Pumps

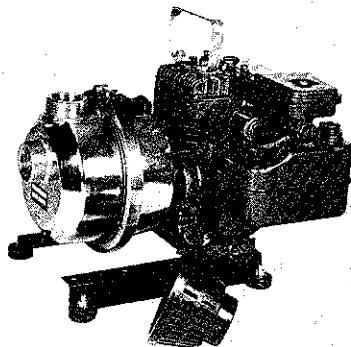
Self-priming • Corrosion Resistant • Lightweight
High Volume • High Lift

PLEASE READ SECTIONS I, II, AND III BEFORE OPERATING PUMP.

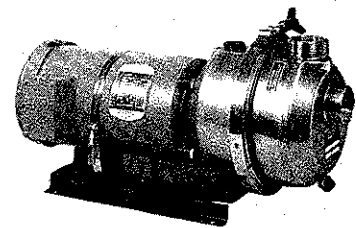
	page no.
I. Safety Precautions	2
II. Preparing the Pump for Operation	2 & 3
III. Pump Operating Instructions	3



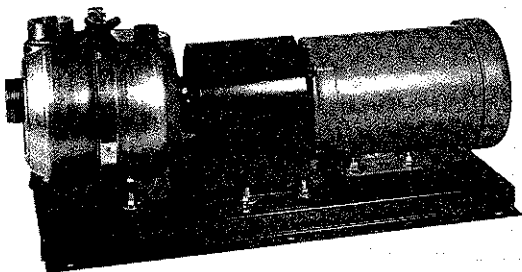
Hydraulic Drive
Close Coupled



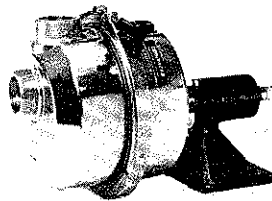
Engine Drive
Close Coupled



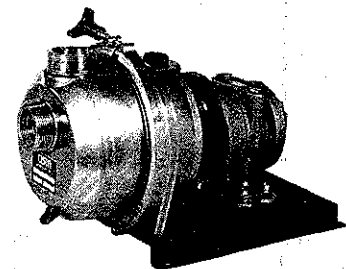
Electric Drive
Close Coupled



Electric Drive
Flexible (Long) Coupled



Pedestal Mount



Pneumatic Drive
Close Coupled

OPERATOR'S MANUAL

I. SAFETY PRECAUTIONS

WARNING:

1. Never use these pumps for pumping flammable liquids such as gasoline. An explosion and serious injury may result if this warning is ignored.
2. In pumping corrosive materials, extreme caution should be exercised. Provide safety guards, ventilation, and drains to protect people and property in case of a leak in the pump. Handling instructions from the manufacturer(s) of the liquids being pumped should be closely followed. Wear protective clothing and goggles.
3. Before starting the pump, follow all of the instructions in this manual and any supplemental instructions supplied with the pump.
4. Any person operating this pump and its power unit should be fully aware of its safe operation before they start using it.
5. Never operate an engine driven unit in an explosive atmosphere, near combustible materials, or where insufficient ventilation exists unless specific provisions have been made regarding the power unit so as to prevent possible injury and damage. Be certain any other power unit is safe for the area in which it is to be operated.
6. Always be sure that the unit is on a secure footing and keep the immediate pump and power unit area free of all unauthorized personnel. If the pump is sitting beside a pit, be sure it is well anchored so that it does not fall in.
7. Never operate the unit with any guards removed.
8. With engine driven pumps:
 - a. In refueling engine, observe all safety precautions for the handling of fuel.
 - b. Never refuel the engine while running, and care should be exercised so that no fuel is spilled on a hot engine. Always allow engine to cool at least two minutes before refueling.
9. Before working on this pump make sure that the power unit cannot inadvertently be started.
10. Be sure that the power unit, pump, wiring and piping installations are suitable for the liquid being pumped, and comply with all applicable codes and regulations.
11. Do not use torches or apply fire or flames to this pump for any reason.
12. Do not overtighten the drain or filler plugs. Hand tighten only. Excessive force may damage the threads or the pump body. Do not use metal plugs.
13. Use at least one foot of flexible hose to make plumbing connections to the pump body. Rigid piping may put stresses on the pump, causing damage. If rigid piping must be used, properly support it so as to eliminate stresses on the pump.
14. Do not tighten inlet and discharge fittings more than one turn beyond hand tight. Excessive force will damage the pump or fittings.
15. Long suction and discharge hoses must be supported so that the weight of the hose filled with liquid does not damage the pump.
16. Use replacement parts supplied by the manufacturer only.
17. Do not run the pump dry. Always fill the pump body with the liquid to be pumped before starting the pump. It is not necessary to drain the pump body after use, *unless* there is danger of freezing, settling of solids, or crystallization.
18. Do not subject pump to extreme conditions of acidity or basicity. Consult factory for specific recommendations concerning temperature and chemicals.
19. Do not restrict flow through the pump such as with a closed discharge valve or "starved" suction line. Harmful heat build up will result. If it is necessary to restrict flow through the pump for longer than 5 minutes, either the pump must be stopped or a discharge bypass line installed to keep liquid temperatures below the maximum recommended operating temperatures.
20. This pump must not be subjected to more than 65 pounds per square inch internal pressure. The pump itself, normally cannot develop more than 32 pounds per square inch pressure. The pump must *not* be used under any of the following unusual conditions which can result in excessive pressures being developed:
 - A. Pump shaft speed over 3600 RPM.
 - B. Quick closing valves in discharge line or any other device which may introduce hydraulic shock into the system.
 - C. Possible sudden obstruction of discharge line such as vehicle driving over hose.
 - D. High positive suction pressures (such as with a flooded suction) which would increase the *total system* pressure to 65 PSI or above.
 - E. Do not pump liquids with specific gravities exceeding 2.0.

II. PREPARING THE PUMP FOR OPERATION

Pump Preparation

1. Inspect unit for shipping damage immediately upon receipt and before signing for merchandise. If any visible damage exists, note damage on shipping bill of lading or receiving document(s) *before* signing. Also notify your dealer or distributor immediately of any damage to the shipment.
2. Read these instructions and the power unit instructions until you are sure you can operate it safely and correctly.
3. IMPORTANT INFORMATION ABOUT PUMP ELASTOMERS ("RUBBER PARTS").

This pump is equipped with one of the three following elastomeric materials. Please read the label on the pump for the name of the specific type of elastomer used inside the pump.

BUNA-N ELASTOMERS

This pump is equipped with Buna-N elastomers ("rubber parts"). Buna-N material is suitable for use with water (clean and dirty) and other non-hazardous liquids. Consult factory for additional specific non-hazardous application recommendations.

EPDM ELASTOMERS

This pump is equipped with EPDM shaft seal and EPDM static seals. These elastomers ("rubber parts") are suitable for use with water (clean or dirty) and many non-hazardous agricultural and industrial chemicals. Consult the factory for specific non-water application recommendations.

VITON ELASTOMERS

This pump is equipped with Viton elastomers ("rubber parts"). Viton material is suitable for use with water (clean or dirty), and many non-hazardous agricultural and industrial chemicals. However, due to the wide range of chemical solutions, it is not possible to list them all here. Consult the factory for specific non-water application recommendations.

Power unit preparation—Gasoline engine driven pumps:

1. For complete operating and maintenance information consult the engine manufacturer's instructions included with the pump.
2. Before starting, fill crankcase with oil specified by the

engine manufacturer. Use a high quality detergent oil classified for service SC, SD, SE, or MS. Do not add anything to the recommended oil.

3. Before starting, fill fuel tank with clean, fresh, lead-free or leaded "regular" grade automotive gasoline. Do Not mix oil with gasoline.

CAUTION: Always remove spark plug or spark plug wire before working on unit to prevent accidental starting.

CAUTION: The engine governor is set at the factory. Do not tamper with any part which may increase the governed engine speed.

Power unit preparation — Electric Motors:

1. Make certain the input power to your electric motor is proper, single phase or three phase, and is of the proper voltage according to the motor specification plate.

2. Be sure of the proper motor rotation. Pump impeller should rotate counterclockwise, looking from the suction inlet side. For single phase motors consult the motor manufacturer's instructions for wiring for counterclockwise rotation. Three phase motor rotation may be reversed by interchanging any two of the three power leads.

3. Make certain that wiring for your electric motor complies with all existing local codes.

Power unit preparation — Hydraulic and Pneumatic Motors:

Consult the separate instruction sheet supplied with each hydraulic or pneumatic motor powered unit.

NOTE: For liquids having specific gravities greater than 1.0, increase the rated horsepower (from catalog) by a factor equal to the specific gravity of the liquid being pumped. (Ex. Catalog HP x Specific gravity = Actual HP required)

III PUMP OPERATING INSTRUCTIONS

1. Fill the pump body with liquid before starting. Do not run the pump dry; damage to the seal may result. There are no points on the pump which need lubrication. The shaft seal is self lubricating, and designed to handle clean or dirty liquids.
2. Make certain that all hose and pipe connections are airtight. **IMPORTANT:** An air leak in the suction line may prevent priming, and will reduce the capacity of the pump.
3. Always place the pump as close to the liquid to be pumped as possible. Keep all lines as short and straight as possible. Avoid sharp bends in hoses. Keep the pump on a level foundation. See Figure #1.
4. If flexible hose must be laid across a roadway, protect it with planking. Instantaneous shut-off pressures applied when a vehicle runs across an unprotected hose will cause "hydraulic shock." This shock can damage the pump and/or damage the hose. See Figure #2.
5. When pumping dirty water or other liquids which may contain solids, always use a pump strainer specified

by the manufacturer on the end of the suction line. If the suction strainer is likely to clog with dirt and debris, do one of the following:

- (a) Prepare a bed of stones on which to rest the strainer. (see Figure #3.)
- (b) Tie the strainer so that it stays off the bottom of the the pit, excavation, etc. (see Figure #3.)
- (c) Tie the strainer inside a basket or pail. (see Figure #3.)

6. Drain the pump body whenever there is a danger of freezing.
7. Always use rubber feet under portable pump when operating on a hard surface. This will prevent damage to the pump and power unit. Order Kit P-58-0114.
8. Always flush out the pump at the end of operation if the liquid being pumped may leave a solid or sticky residue in the pump. If this is not done, damage to the pump may result.

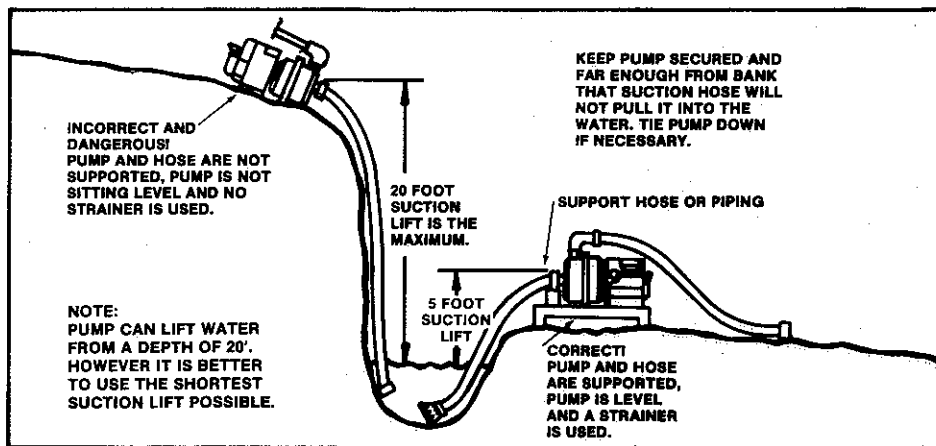


FIGURE 1.

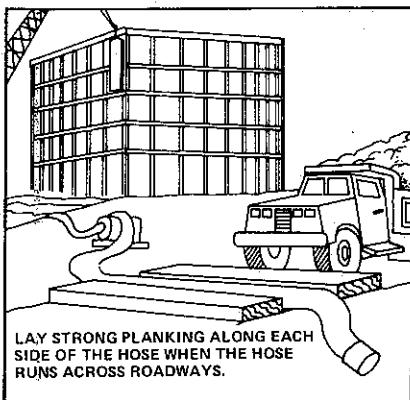


FIGURE 2.

SUGGESTED WAYS TO KEEP STRAINER OUT OF RIVER SILT.

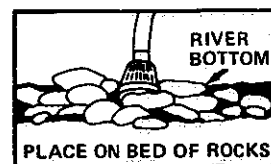
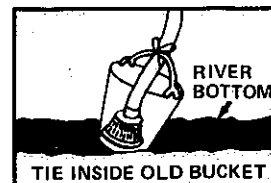


FIGURE 3.

IV. PUMP TROUBLE SHOOTING AND REPAIR

DIAGNOSIS

TREATMENT

1. Does not prime or does not pump

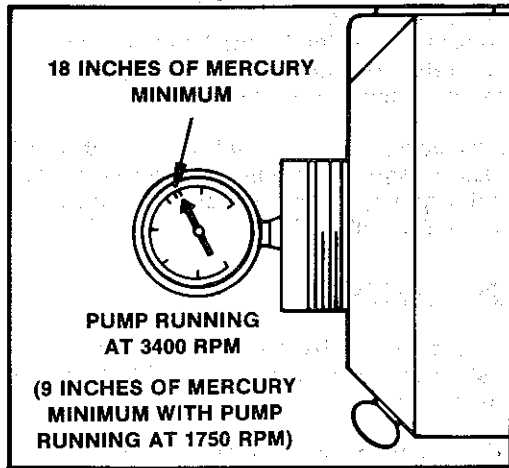


FIGURE 4.

1. Fill pump with clean liquid and try priming again.
2. Disconnect suction and discharge lines at pump. Fill pump with water and check suction with a vacuum gauge. Vacuum should exceed 18" (see figure 4) of mercury when pump shaft is rotating @ 3400 RPM. Vacuum should equal or exceed 9" of mercury when pump is running @ 1750 RPM. If vacuum is insufficient, check the following:
 - a. Leak at suction fitting
 - b. Pump rotation. Impeller should rotate counterclockwise when viewing through suction end.
 - c. Pump speed. (Maximum vacuum performance drops off rapidly with decreasing RPM).
 - d. Sealing of check valve gasket between body and volute.
 - e. Check for worn impeller and or volute. If necessary, replace these parts. (See items 14 and 15 of section V).
 - f. Worn shaft seal.
3. If pump suction tests OK, attach suction line and check suction at end of suction line. Failure to get suction here indicates leaking connections, leaking hoses, pipes, or obstructions in the lines. Liners of suction hose will occasionally collapse inside the hose.

2. Pump has insufficient flow

1. Check same items as in 1, 2, and 3 above.
2. Replace any worn or broken components; check clearance between impeller vanes and volute face. (See section V #14).

V. PUMP DISASSEMBLY AND REPAIR

1. This pump may be disassembled and repaired using only a screwdriver.
2. Unscrew plastic knob (item #24) on "V" Band clamp (item #20) and remove the "V" Band clamp and front body (item #19).
3. Remove rubber check valve (item #27) from front volute chimney and the body "O"-Ring (item #23) from the rear body "O"-Ring groove.
4. Remove the three self-tapping screws (item #16), one at the top of volute and one at each side. Remove the front volute (item #29).
5. Unscrew the impeller screw (item #15) and remove it along with the "O"-Ring (item #14) under the screw head. Slide the impeller (item #13) and key (item #10) off the shaft. (To facilitate the removal of the impeller, place two screwdrivers 180° apart under the back of impeller and gently pry the impeller off the shaft). Remove impeller shim(s) (if so fitted) from end of shaft. Remove the "O"-Ring segment (item #12), which lies in a groove in the volute (it forms an arc over the impeller).
6. One half of the shaft seal (items #22 & #25) is in the impeller hub, the other half is in the support. The impeller seal half can be carefully pried out of the impeller hub with a screwdriver. If you plan to reuse this seal, be sure not to nick or scratch either of its flat polished faces.
7. Unscrew the four self-tapping screws (item #16) in the rear volute (item #11) and remove the volute and "O"-Ring (item #28). (When reassembling this pump always align the locator boss on the support (item #6) with hole in the back side of the rear volute (item #11) to insure proper assembly).
8. Remove the four plastic round plugs (item #9) and "O"-Rings (item #8) using a pair of pliers. Unscrew the four support screws (item #7) and remove the support (item #6) and "O"-Ring (item #5). Inside the support is the stationary seal half (item #25). The seal can now be pressed out from the back of the support. Use a round wooden plug 1-3/16" in diameter and carefully press the seal out straight, if it is to be reused. Be careful not to damage the seal face. Remove "O"-Ring (item #26) from around the seal.
9. Remove the rear body (item #4) from the engine face and the four plastic spacers (item #1) at the four bolt hole locations.
10. Reassemble all parts together in reverse of the order used in disassembly.
11. When installing a new seal, always replace both halves of the seal and put the "O"-Ring (item #26) in place around the stationary half (item #25) of the seal. Protect the smooth, lapped sealing surfaces from damage when pressing in the new parts. To press the stationary portion of the seal into place, use a piece of pipe that will bear only on the flange of the metal seal case. Be sure both seal halves are fully seated and square with respect to the pump shaft.
12. During final assembly it is recommended that the impeller screw head "O"-Ring (item #14) be replaced. Lubricate this with vegetable oil only before assembly.
13. Use a thread locking compound such as Loctite #242 on the support screws (item #7) and impeller screw (item #15).
14. The clearance between the impeller vanes and the volute face should be about .015" to 0.25" for good performance. This front clearance can be attained by shimming, such that the back shroud of the impeller (item #13) just clears the face of the rear volute (item #11). To adjust properly, remove or add impeller shims (item #21) as appropriate until the impeller just rubs the rear volute. Then

add one .006" thick washer type shim (item #21). After shimming turn the impeller to ensure that the impeller is not touching the rear volute. Be sure that the impeller is completely on the shaft when checking shimming. Put pressure only on the hub when pressing impeller on shaft.

15. Check front volute face for excessive wear. (Slight scoring is acceptable.) The four support screws holding pump support to engine should be tightened securely with a large screwdriver. The screws holding the volute in place do not have to be tightened any more than needed to secure the volute during assembly. Over-tightening will cause these self-tapping screw threads to strip.

16. Lubricate the body "O"-Ring before replacing it in the pump, with a vegetable based lubricant.
17. When assembling nipples, fittings, and elbows into the pump body, wrap the male threads with teflon sealing tape, or use pipe-dope. Proper tightness is hand tight plus one full turn with a pipewrench.

NOTE: After pump is assembled and before starting, rotate the shaft and listen for possible scraping noises. A scraping noise indicates improper clearances, requiring disassembly and re-shimming.

18. With pump running and with pump body full of water, put vacuum gauge over suction opening and check suction ability according to section IV.

VI. SPECIAL INFORMATION

A. FLEXIBLE COUPLED PUMPS: COUPLING ALIGNMENT

Measure the diameter of the power unit shaft. Choose the appropriate coupling for your pump and power unit. (See flexible couplings chart number VI-A). Proper shaft and coupling alignment reduces vibration and prevents premature coupling failure. The following 8 steps help in obtaining proper shaft alignment:

1. Make sure you use a rigid base plate large enough for the assembly of the pump and the drive-unit. We offer kit 109 for this purpose. (See baseplate kit listed after couplings chart VI-A)**
2. Place the pump and drive-unit on the base plate.
3. Measure the distance between the centerline of the pump shaft and the base plate surface.
4. Measure the distance between the centerline of the drive-unit shaft and base plate.
5. Compare measurements obtained from steps 3 and 4 and use spacers and shims for height adjustment to insure alignment of both shafts.
6. Place the coupling halves over each shaft, put the "spider" between the two halves and couple the two halves together.
7. To assure parallel alignment (Figure 5) place a straight edge along the side of both coupling halves in two different locations, 90° apart. The coupling is aligned when the straight edge rests squarely on the sides of both coupling halves.

8. To avoid angular misalignment, insert a measuring device (taper gauge or feeler gauge) between the coupling faces at four locations 90° apart (See arrows in Figure 6) and measure the gap at each of the four locations. For proper alignment all four measurements should be equal. Reshimming may be required to achieve this alignment.

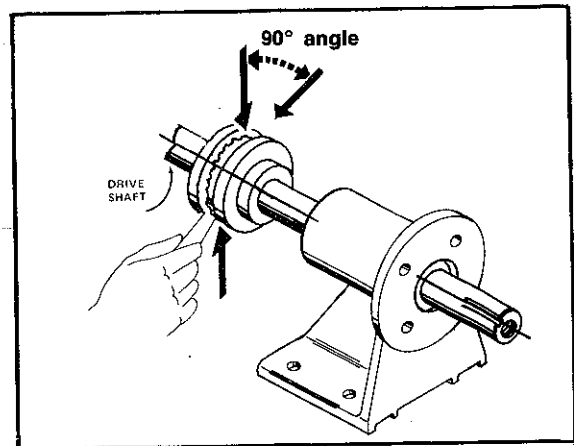


FIGURE 6

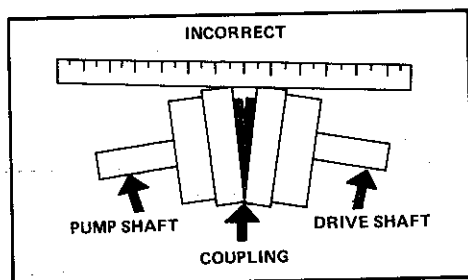
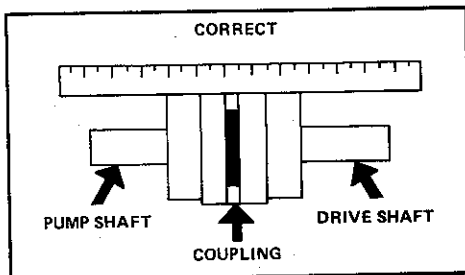


FIGURE 5.

COUPLING PART NUMBER	POWER UNIT SHAFT DIAMETER	ELECTRIC MOTOR FRAME SIZES
58-0785	.625"	56
58-0786	.875"	143T-145T 182-184
58-0787	1.125"	182T-184T

FLEXIBLE-COUPPLINGS CHART VI-A

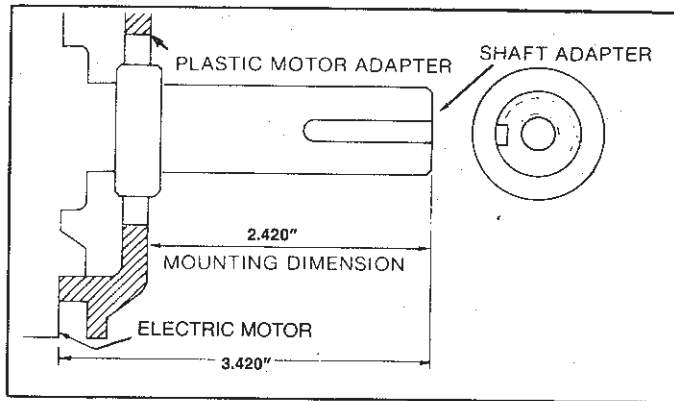
**BASEPLATE KIT

This kit contains a baseplate, coupling guard, shims and hardware for mounting a pedestal pump to the power units listed. All necessary mounting holes are provided in the baseplate.

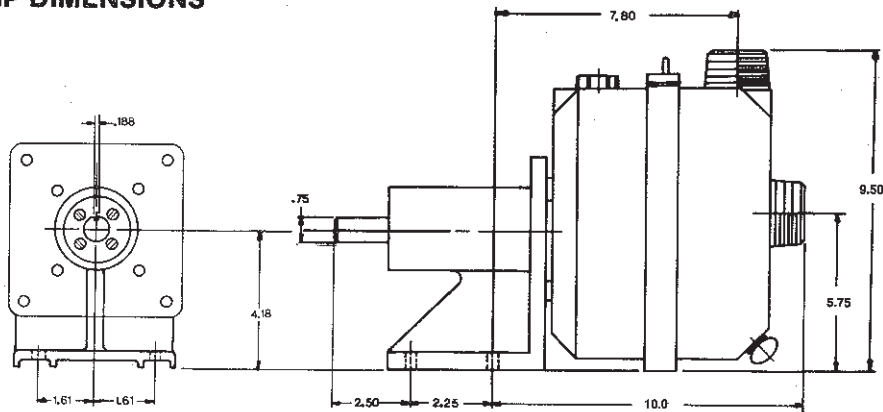
KIT 109 — Light duty baseplate for these electric motor frame sizes: 56, 143, 143T, 145, 145T, 182, 182T, 184 and 184T; also can be used to mount a 3 or 5 H.P. Briggs and Stratton engine.

B. CLOSE-COUPLED ELECTRIC AND PNEUMATIC MOTOR DRIVEN PUMPS

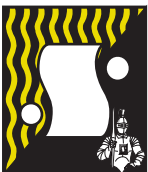
The drawing below lists the proper installation dimensions for the close-coupled motor shaft adapter.



C. PEDESTAL PUMP DIMENSIONS



Dimensions in inches



SERFILCO[®], LTD.

2900 MacArthur Blvd. 847-509-2900
Northbrook, IL 60062-2005 U.S.A. 800-323-5431
e-mail: sales@serfilco.com FAX: 847-559-1995
www.serfilco.com