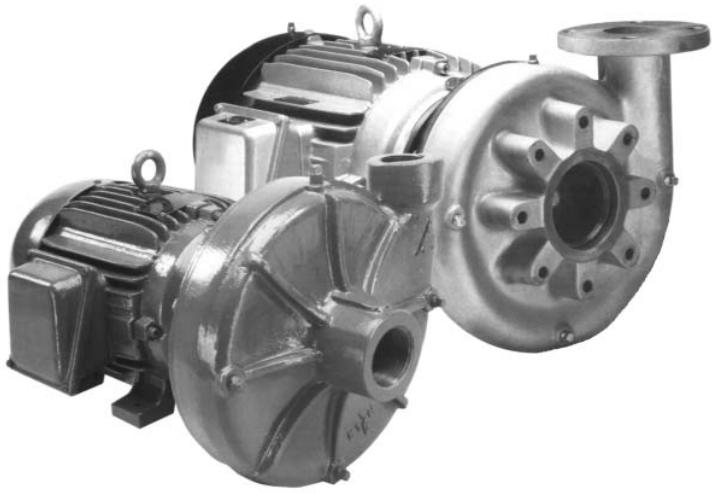
MEGGA

SERIES PC

INSTRUCTION AND OPERATION MANUAL



Models PCT and PCF

Close-coupled and frame-mounted
single-stage horizontal end-suction pumps.

WARNING: Read this manual before installing or operating this product.
Improper use may result in personal injury, property damage and may void product warranty.

Receipt of Shipment

INSPECTION: On receipt of the pump set in its shipping container, carefully check for damage. Check the contents against the shipping manifest and report any shortages or damage immediately to the carrier. This will prevent any conflict with the carrier in the event a claim is required.

UNLOADING: Handle the unit with care when removing it from its shipping crate. Lift the equipment with suitable slings around the casing and motor lifting eye bolt. On base mounted units it is recommended to lift assembly by slinging through eyebolts mounted to the baseplate foundation holes.

STORAGE: Adequate methods of storage are essential to ensure that the pump does not suffer damage from moisture, dust or damage from careless handling. Any deterioration or damage from inadequate storage will not be covered under warranty. If the equipment is not going into service, long term storage procedures should be followed.

Installation

LOCATION: Locate the pump in an accessible place so that it can be inspected during operation. Place the pump as close to the liquid supply as possible. Provide ample head room and facilities for installation and removal. The pump area should be safeguarded against flooding.

FOUNDATION: It is recommended that close coupled pumps be mounted to a sub base to facilitate a secure mounting to a foundation. Baseplate mounted pumps are normally grouted on a concrete foundation which has been poured on a solid footing. The foundation must be able to absorb any vibration and to form a permanent, rigid support for the pumping unit. Sleeved or "J" bolt foundation anchors are recommended for baseplate mounting. (See Fig. 1)
On installations where the pump is to be mounted on a steel skid, it is recommended to through bolt sub base to structure using vibration dampeners between the base and steel structure. Do not weld the baseplate as this will result in greater vibration and noise.

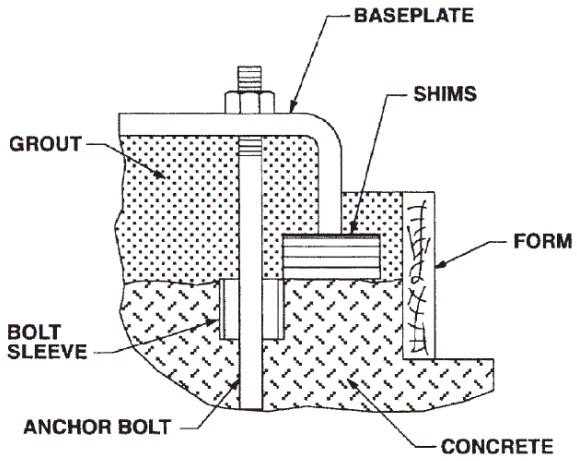


Fig. 1

LEVELING: The baseplate should be supported on leveling wedges or shims placed on each side and as close to the foundation bolts as possible. Check the setting with a level and adjust shims as necessary. The wedges or shims should be placed 24" apart around the base. A gap of ¾" to 1-1/2" should be allowed between the baseplate and foundation for grouting. (See Fig.1)

GROUTING: When the leveling is correct the foundation bolts should be tightened evenly but not too firmly.
Build a dam around the baseplate.
The consistency of grout should be such to allow free flowing of the mixture. Follow the mixing recommendations of the manufacturer.

The dam should be completely filled with grout and allowed to set. At this point the baseplate should be completely filled with grout and allowed to set before finally tightening the foundation bolts. **Note:** *Non grouted baseplates result in higher noise and vibration levels, which lead to reduced overall pump life.*

PIPING: It is important that the suction and discharge piping be correctly aligned to the pump. The weight of all piping and valves should be supported independent of the pump. Ideally, flex connections should be used at the pump suction and discharge nozzles. All piping should be flushed removing any construction debris, prior to final connection to the pump.

Suction piping should be short, direct and one or two sizes larger than the pump suction. Avoid the use of short radius elbows; there should be a minimum of two pipe diameters of straight pipe between the first elbow and the pump inlet. Suction reducers should be eccentric type with the sloping side mounted down. If suction strainers are required they should be sized to have a free area of at least 3 times that of the suction pipe area. On suction lift applications, the suction piping must slope upwards toward the pump suction to eliminate suction pockets, all joints must be air tight. On non-self-priming pumps a means of priming the pump must be provided. On flooded suction applications, an isolation valve should be installed to permit closing of the line for pump repairs. Piping should be level or sloping downward from source of supply, and no portion of the piping should extend below the pump suction flange. Discharge piping should be installed with an isolation valve and check valve. Locate the check valve between the pump and the isolation valve. If reducers are used they should be installed between the pump and check valve. Cushioning devices should be used to protect pump from surges and water hammer if quick-closing valves are installed in the system.

COUPLING ALIGNMENT: On frame mounted pumps, the coupling must be aligned as suggested by the coupling manufacturer. Check parallel alignment by placing a straight edge across the coupling flange diameters and measuring the offset at various points around the coupling. Refer to recommended tolerances and shim motor as required. Check angular alignment by measuring the back side of each coupling hub at 90 Deg. Intervals. The difference between the minimum and maximum readings must be less than the misalignment allowed by the coupling manufacturer.

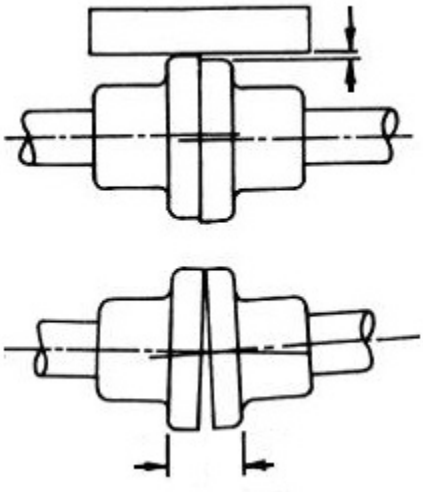


Fig 2

Operation

PRE-STARTUP CHECK: Confirm that the pump can be turned by hand before checking rotation. On close coupled pumps rotate the motor fan through the small access hole on the fan cover. Bump start the motor and verify that the rotation of the motor corresponds to the

rotation arrow located on the pump. On close coupled pumps rotation can be difficult to see, the use of a piece of black tape on the exposed part of the shaft can aid in determining rotation. **Note:** *Do not run the pump dry, see priming instructions.*

PRIMING: Ensure that the pump casing and suction piping is completely filled with liquid before starting the pump. The pump must be vented of all air through the pipe plug located on the top of the pump casing.

STARTING: Ensure that the suction line is fully open, and the discharge valve is ¼ open. Turn the starter on and off allowing the pump to rotate and coast to a stop, if the unit stops suddenly or makes any undue noise, correct the problem before proceeding. At this point bring the pump up to its rated speed and slowly open the discharge valve to permit the pump to deliver its rated flow. If there is any excessive noise or vibration shut down the motor and correct the problem. After the pump has been running for some time, check for excessive bearing heat. Temperatures up to 175 F are acceptable providing they are stable and do not continue to rise. **Note:** *Do not operate the pump below 10% of the best efficiency point or rated minimum flow, or against a closed discharge or suction valve. These conditions will lead to rapid pump failure and possible injury*

STOPPING: Close the discharge valve, quickly shutdown and lockout the power supply. Do not restart the pump until it comes to a complete stop.
Exposure to freezing conditions while the pump is idle may cause damage to the pump casing. In these conditions drain liquid from plug provided in bottom of pump casing. **Note:** *When handling toxic or corrosive fluids, precautions must be taken to prevent injury or environmental contamination. Pumpage must be handled and disposed of in accordance with applicable environmental regulations.*

OPERATION CHECKS: Inspect pump frequently during the first few hours of operation. Mechanical seals may weep slightly, but should "run-in" after a few hours of operation. Check motor bearings for excessive heat and check pump assembly for unusual noise and vibrations; correct any problems before restarting pump.

Maintenance

GENERAL: The pump and motor unit should be checked at regular intervals for any abnormal increase in noise, vibration or operating temperature. Consult the troubleshooting section of this manual for the most common occurring pump problems.

BEARINGS: All ball bearings are lubricated at the factory and only require regular maintenance as required by the motor manufacturer. On smaller motors bearings are generally sealed and greased for life and do not require maintenance. On larger motors bearings will have enough lubricant for startup and initial operation of approximately 2000 hours. Consult the motor operation and maintenance manual for proper care of your supplied motor. Frame mounted pumps are grease lubricated and will have enough lubricant for startup and initial operation of approximately 2000 hours. To properly lubricate the frame mounted pump bearings remove the grease relief plugs #113 & #113A to avoid pressurizing the grease chamber.

Repair

REMOVAL: Lock out the power supply to the motor and close off flow control valves to and from the pump. Drain liquid from the pump using the plug provided in bottom of pump casing. Disconnect suction and discharge connections. For close-coupled pumps remove the pump/motor assembly from baseplate. For frame mounted pumps remove the coupling guard, disconnect the coupling and remove the bearing frame/pump from baseplate.

DISMANTLING: Refer to relevant exploded parts view drawing for part items specified in the instructions below.
1. Remove casing bolts #370 and pull casing #100 from adapter #108.
2. Remove impeller bolt/washer assembly #198 and impeller gasket #413 and discard.
3. Remove impeller #101 by lightly prying between the impeller and adapter #108. On larger models a standard wheel puller may be required. **Note**: *When prying or pulling impeller, apply loads to the back shroud of the impeller at a point that is supported by the vane.*
4. Remove sleeve, sleeve gasket and mechanical seal assembly #126, #412 and #383 from the shaft and inspect for signs of wear. Discard gasket.
5. Remove #108 adapter from motor or bearing frame (note orientation), and push mechanical seal stationary seat from machined counter bore. Replace slinger if required.

BEARING FRAME: On frame mounted pumps the following additional repair procedure may be required.
1. Remove bearing housing bolts #370B and the bearing housing #134. Slide the shaft/bearing assembly from the bearing frame #228.
2. Remove the bearing locknut & lockwasher #136 & #382 and press the thrust bearing and radial bearing #112 & #168 off the shaft. Discard the used bearings and bearing lockwasher and replace with new components.
3. Inspect all components for signs of excessive wear and replace if required.
4. Reassembly is the reversal of the dismantling procedure. **Note**: *The bearings are installed with their shielded sides inboard and the open sides toward their respective grease chambers.*

INSPECTION: Inspect impeller and casing #100 and #101 for grooving or dimensional wear and replace if worn. Inspect lapped surfaces of seal # 383 for grooving, cracking or scratches. The mechanical seal should always be replaced or as a minimum re-lapped. Check shaft run out with a dial indicator and replace bearings if required, shaft run out should not be more than .002". Inspect the shaft sleeve for signs of wear or grooving and replace if required.

ASSEMBLY: Reversal of dismantling procedure noting the following:
1. Refer to general mechanical seal installation instructions provided by seal manufacturer. Carefully install mechanical seal stationary seat into machined bore of adapter, #108. Lightly lubricate seal cup and press with fingers or special tool into the adapter, making sure seat is square and all the way to the bottom of the adapter bore. **Note:** *Use a nonabrasive liquid hand soap to lubricate seal bellows and cup. Do not use oil or grease.*
2. Mechanical seal rotating assembly should be assembled as detailed below in Fig. 3. **Note:** *Do not use the stamped sheet metal spring holder supplied by the mechanical seal manufacturer; the spring holder is incorporated into the sleeve design.* The rotating assembly should be installed on sleeve #126 by lightly lubricating the sleeve and pushing the seal head over the shaft sleeve.

The seal #383 must be installed on the sleeve first and then the whole assembly installed on the shaft. Install a new sleeve gasket, # 412.

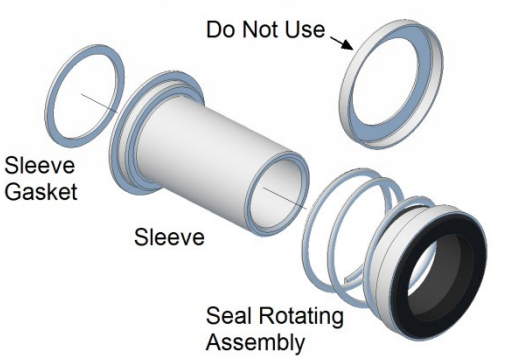


Fig. 3

3. If the impeller bolt/washer assembly, #198, has been disassembled, then the impeller bolt and washer must be reassembled using a suitable thread retaining compound such as Loctite. This will insure a liquid tight seal around the bolt/washer threads. Install a new impeller gasket, #413.
4. Install new casing gasket, #351. The use of gasket sealant (Locktite 574 or similar) is recommended. Do not use sealant on O-rings. Install and tighten casing bolts, #370, evenly. Check for free impeller rotation.

Spare Parts

RECOMMENDED SPARES:

Pump:

Item #	Description
# 123	Slinger
# 126	Shaft Sleeve
# 351	Casing Gasket
# 383	Mechanical Seal
# 412	Sleeve Gasket
# 413	Impeller Gasket

Bearing Frame:

Item #	Description
# 112	Thrust Bearing
# 168	Radial Bearing
# 382	Bearing Lock Washer

ORDERING SPARES: Spare parts can be ordered using the enclosed parts list. The pump serial number and model number should be given from the pump name plate. In the case of auxiliary equipment that may have been supplied with the pump quote the full name plate data and describe the part fully.

Troubleshooting

INSUFFICIENT CAPACITY:

1. System head is greater than pump design head.
2. Ensure the driver speed is correct.
3. Impeller is clogged.
4. Check that all valves and discharge line is fully open.
5. Check for correct rotation.
6. Suction lift is too high or insufficient submergence of the suction pipe.
7. Incorrect impeller diameter.
8. Excessive impeller clearance.
9. Fluid viscosity or specific gravity is greater than that for which the pump is capable.
10. Pump is not primed or is air-bound.
11. Air leaks in suction pipe system.
12. Insufficient NPSH available.

Loss of suction following a period of satisfactory operation:

1. Air leaks in suction pipe system
2. Mechanical seal failure, causing pump to loose prime.

3. Suction lift too high or insufficient NPSH available.
4. Entrained air or gas in pumped fluid.
5. Defective casing or flange gasket.
6. Clogged suction strainer.

PUMP OVERLOADS DRIVER:

1. Driver speed too high for pump design.
2. System head is too low and pump is delivering too much flow.
3. Liquid is of greater viscosity or specific gravity than the pump was sized for.
4. Binding or rubbing of rotating elements. Check for impeller rub, faulty bearings or a bent shaft.
5. Impeller may be oversized. Check with supplier before taking corrective action.

EXCESSIVE VIBRATION:

1. Insufficient submergence of suction.
2. Impeller clogged or out of balance.
3. Worn out bearings, from over or under greasing.
4. Bent shaft
5. Misalignment due to piping strain on pump.
6. Foundation is not sufficiently rigid.
7. Insufficient NPSH available.

Parts List & Exploded Parts View

Pump Parts List – Refer to Fig. 4

Item	Description
100	Casing - includes:
	408 Drain Plug
101	Impeller
108	Motor Adapter
122A	Stub Shaft
123	Slinger
126	Shaft Sleeve
178	Impeller Key
198	Impeller Bolt/Washer Assembly - includes:
	199 Impeller Washer
	304 Impeller Bolt
351	Casing Gasket/O-ring
370	Casing Bolt
371	Motor Bolt
383	Mechanical Seal
412	Sleeve Gasket
413	Impeller Gasket

Bearing Frame Parts List – Refer to Fig. 5

Item	Description
109	Bearing End Cover
112	Thrust Bearing
113	Plug - Grease Relief
113A	Plug - Grease Relief
122	Shaft
134	Bearing Housing
136	Bearing Locknut
168	Radial Bearing
193	Grease Fitting
193A	Grease Fitting
228	Bearing Frame
370A	Bolt - Bearing End Cover
370B	Bolt - Bearing Housing
382	Bearing Lockwasher

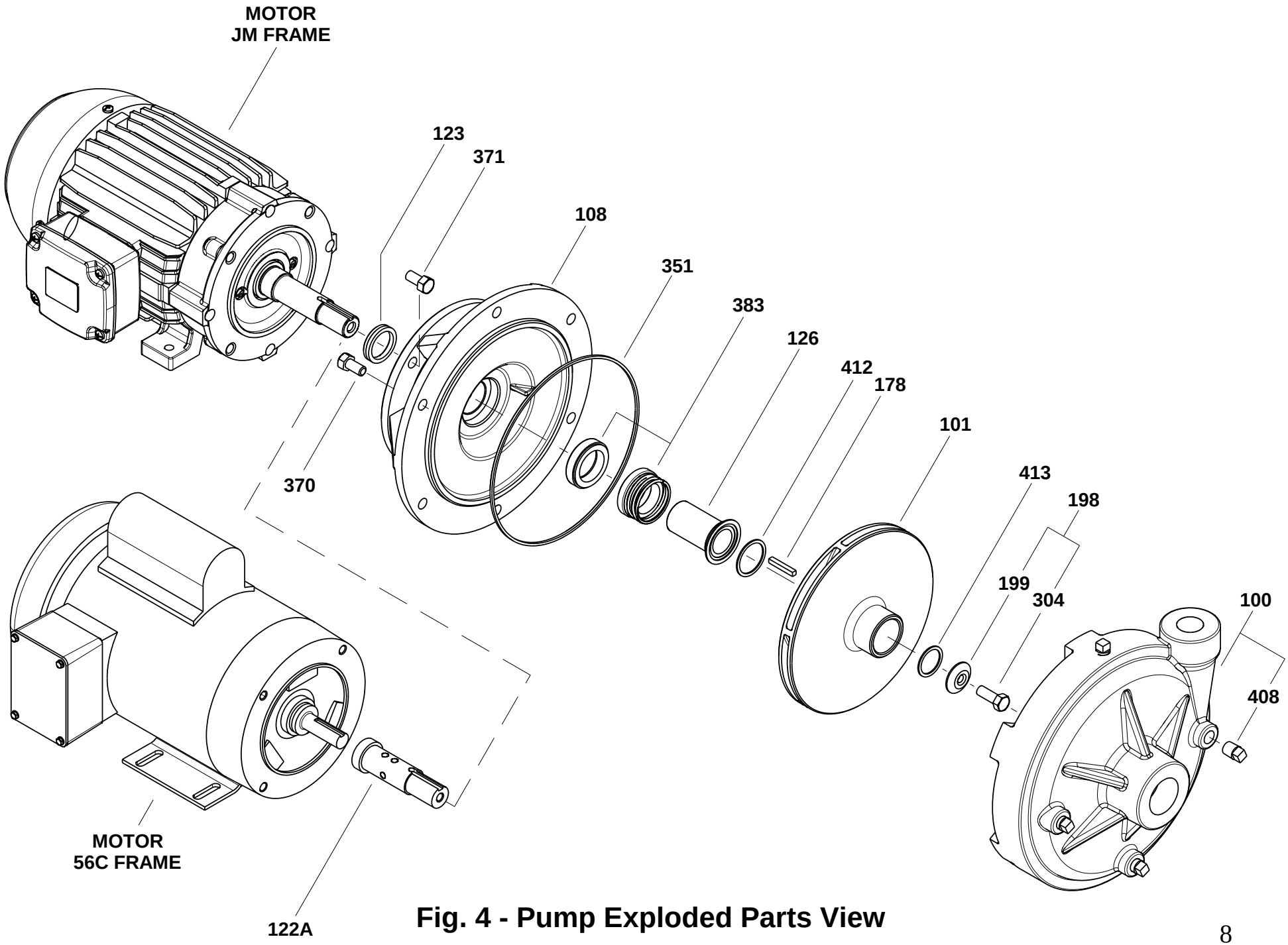


Fig. 4 - Pump Exploded Parts View

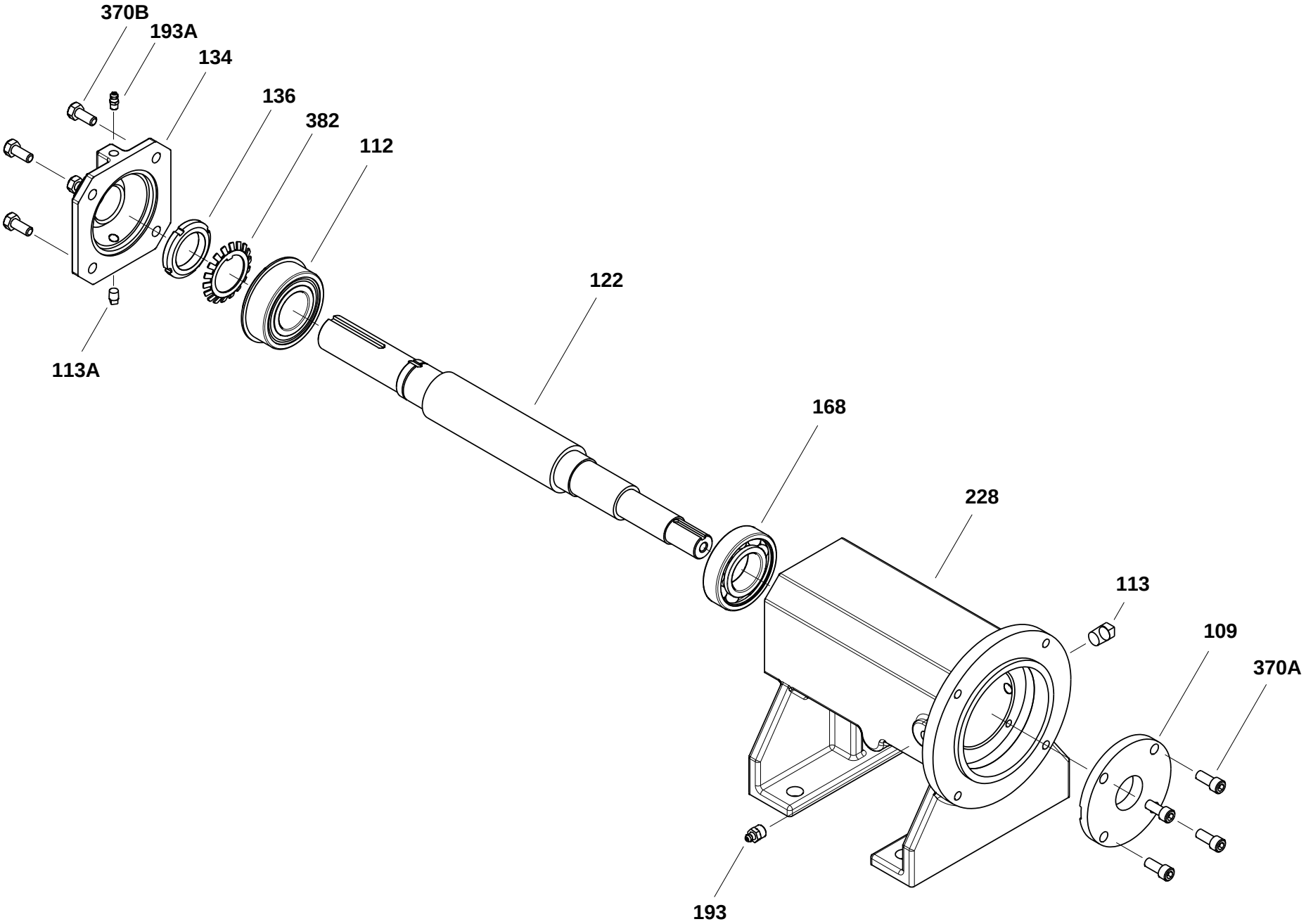


Fig. 5 - Bearing Frame Exploded Parts View

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