Operating and Maintenance Manual
Electric Motor Powered
Self-Priming Centrifugal Pumps

4000 Series

Keep this information guide or a copy of it with the pump. Contact CH&E, A Division of ABS Pumps for additional copies if this manual should become lost. If you have any questions regarding operating or servicing this pump please contact CH&E, A Division of ABS Pumps at (414) 964-3400.

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Serial Number / Model Number:

A nameplate listing the Model Number and Serial Number is located on each pump. **The Model Number and Serial Number are necessary for ordering parts or requesting service; it is important that you document these numbers.**

Record Model Number and Serial Number Here:

Serial Number	**Model Number**

Safety Information:

DANGER! INDICATES AN IMMENENTLY HAZARDOUS SITUATION, FAILURE TO ABIDE BY SAFETY PRECAUTIONS WILL RESULT IN DEATH OR SERIOUS INJURY.

Electric Power

DO NOT: Operate with a frayed or damaged power cord.
DO NOT: Ground the pump to a gas line.

DO: Ground the pump.
DO: Realize there is a potential for electrocution whenever electricity is present.

WARNING! INDICATES A POTENTIALLY HAZARDOUS SITUATION; FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN DEATH OR SERIOUS INJURY.

Electric Power:

DO NOT: Allow water to accumulate around the pump.
DO NOT: Reset a circuit breaker without first investigating the cause of the problem.
DO: Install pump in accordance with the National Electrical Code and all applicable local codes.

DO: Use watertight connections.
DO: Shutdown and lockout circuit breaker before performing maintenance.

Pump Safety:

DO NOT: Pump flammable liquids.
DO NOT: Pump corrosive liquids. Contact local authorities for assistance.
DO NOT: Remove hoses, drain plug, fill plug or any access covers if the pump has not primed in ten minutes. Water in the pump will be hot and could be under high pressure. Allow pump to cool completely before attempting maintenance.
DO NOT: Operate this equipment without understanding the operating procedures.

DO NOT: Attempt to clear blockages or clean the pump while the pump is operating; rotating parts can cause serious injury.
DO: Read, understand, and follow pump and operation manual procedures.
DO: Be sure pump is on a firm, level surface and will not tip, roll or fall while in operation.
DO: operate only when guards are in place.

CAUTION! INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH, IF NOT AVOIDED, MAY RESULT IN PROPERTY DAMAGE.

DO NOT: Run pump against a closed discharge.
DO NOT: Run the pump dry.
DO: Drain the pump in freezing weather.

DO: Flush the pump with clean water after each use.
DO: Store equipment properly when it is not in use.

Operating Instructions:

1. Read the “Pump Safety” pamphlet in its entirety before operating the pump and observe safe pump operating procedures at all times.
2. Examine the pump carefully and read all instructions thoroughly before beginning pump operation.
    a. Notify the transportation company at once of any damage or loss that may have occurred during transit.
3. **Electric Pumps:** Check for correct Shaft Rotation
    a. **Clockwise –** when looking at the fan end of the motor
    b. **Counterclockwise –** when looking at the impeller end
4. Use grease or thread sealer on threaded connections to make them airtight.
    a. A hose gasket must be in place with a female-coupled hose.
    b. Suction hose must be in good condition.
5. Make sure that the hose does not leak and that the hose lining is not loose or it will collapse under suction pressure and block the hose.
    a. A strainer should be used on the end of the suction line to prevent pumping solids too large for the pump to handle.
6. A hose or pipe can be attached to the discharge connection at the top of the pump to lead water away.
    a. To pump at maximum capacity, use a hose or pipe of the same size or larger than the pump discharge.
7. Fill the pump case with water through the filler plug at the top of the pump case.
    a. Do not run the pump without liquid in the pump case.
    b. If the pump must be run for short periods of time to check the motor, fill the case with water to keep the rotating seal lubricated.
8. All gaskets and joints must be airtight.
9. Priming time depends on the height of the vertical suction lift, the length of the hose between the pump and the water level, and the speed of the pump.
    a. Maximum practical suction lift is approximately 25ft vertically from the surface of the water to the pump suction.
    b. Suction lines running long, horizontal distances from the water will reduce capacity due to the increased loss of friction.
    c. Fastest priming and greatest capacity are achieved at low suction lifts.
    d. For optimum performance, locate the pump close to water.
    e. The pump primes faster at higher speeds.

NOTE: The discharge of a self-priming centrifugal pump can be closed briefly without damaging the pump, however, the water will eventually heat up and steam my be trapped in the pump case. In this situation, allow the pump to cool completely before attempting any operation or maintenance procedures. Damage to the seal will also ensue.

Maintenance Requirements:

- Keep the suction hose connection airtight.
    - Check the suction hose for leaks and/or a loose lining frequently.
- Check all of the bolts on the pump frequently, keeping them drawn up tightly.
- Replace “O” Rings after long periods of disuse as they will become dry and lose resiliency.
- If the impeller and/or volute are badly worn, they should be replaced to regain the best pump performance.
- Check the impeller gap annually; it should be set at .015” to .030”.
- Flush out the pump after each use.
- Drain the pump after each use.
- Block the suction and discharge openings before storing the pump.
- Lubrication is not required for this pump. The shaft seal is self-lubricating and will handle clean or dirty liquids.

Servicing the Pump:

Disassembling the Pump:

1. Remove the four screws holding the case to the motor adapter and remove the case.
2. It is necessary to remove the impeller in order to remove the seal.
    - To remove the impeller, use a block of wood to drive against the outer edge of one of the vanes.
    - The impeller is removed in a counterclockwise direction.
3. If the impeller is badly worn, it should be replaced to regain best pump performance.
    - Additional shims may be added behind the impeller to take up small amounts of wear.

Impeller Gap Adjustment:

1. Disassemble the pump according to steps 1-3 above.
2. With a feeler gauge, check the gap between the impeller and volute through the center hole of the volute. The gap is set in the factory at .015" to .030". Re-shim when this gap opens up to .040" or more.
3. Remove the impeller per step 2 above.
4. Add the required shims into the thread bore of the impeller to adjust the impeller gap to .015" to .030".

Seal Replacement:

Removing the Seal

1. If the seal becomes worn and needs to be replaced, begin by disassembling the pump as described above.
2. Remove the four hex screws that hold the seal seat support in place.
3. Remove the stationary seal ring from the seal seat support.
4. Using pliers, remove the rotating portion of the seal from the shaft.
5. Remove the seal seat holder by removing the four hex screws.
6. Remove the seal stationary seat from the seal seat holder.

Installing the New Seal

* When replacing the seal, the shaft and seal surface must be clean and smooth.
* DO NOT damage the seal parts when handling.
* Both the rotating and stationary portions of the seal must be replaced when installing a new seal.

1. Clean the seal chamber and all associated parts thoroughly.
2. Push the stationary seal portions into the seats in the seal seat holder and the seal seat support.
    a. Lubricate the outside of the rubber boot only with a light oil or rubber lubricant and push squarely until the seal rings are fully seated. Do not scratch the sealing surface in any way.
3. Reinstall the seal seat holder and the seal seat holder gasket into the bearing support housing.
4. Lubricate the inside diameter of the rubber boots of the rotating portion of the seal with rubber lubricant or soapy water and install onto the shaft.
5. Put the seal seat support gasket in place and carefully install the seal seat support.
6. Tighten the hex screws in a crossing pattern to pull the seal seat support evenly into position.
7. Reinstall impeller shims and impeller.
8. Reinstall the volute – Check the impeller-volute clearance, it should be .015" to .030".
9. Grease the "O" Ring in the cover and reinstall the cover.
10. When reassembling the pump, make certain that the slinger is in place on the motor shaft.

Troubleshooting Guide:

Pump fails to prime	• Check that there is water in the pump case. • Check lift – maximum 25ft. • Check the strainer and line for blockage. • Check the hose and hose fittings for leaks. • Check pumpage for “flowability” • Check that the pump is not air-bound – air evacuated from the pump during priming must be able to move out of the discharge.
Vacuum is low or absent at the suction fitting	• Check tightness of fitting in the suction connection • On electric pumps, check for impeller rotation – clockwise when looking at the back of the motor • Check all pump “O” Ring and gasket joints • Check the impeller gap – factory setting is .015” to .030” – as parts wear, the vacuum level will go down • Check for impeller rotation – no rotation, the pump shaft is broken or the drive coupling has failed • Check the seal, leakage at the junction of the engine to the pump indicates a cracked seal. • Check for blockage • Check the pump speed
Pump fails to develop rated discharge head	• Check pump speed – need maximum speed for maximum head • Check for air leaks on the suction side of the pump • Check for blockages in the pump and impeller • Check for blockages in the suction and discharge lines • Check for impeller/volute wear

4051 E Parts
1 ½" Self-Priming
Centrifugal Pumps
Electric Power

Ref. No.	Part No.	Description	Qty.
1	0002-1605	3/8" Pipe Plug, Drain	1
2	P5302	1 ½" Pump Case	1
3	0002-1607	¾" Pipe Plug, Fill	1
4	P3229C-C2	Impeller, Cast Iron	1
5	P3238	Impeller Shim, .005"	As req'd
	P3239	Impeller Shim, .010"	As req'd
6	W105-7A	5/8" Single Seal Shaft Assembly	1
7	P3397	"O" Ring, 4 ½" ID x 1/8"	1
8	P5350	Pump Side	1
9	F620.037Z	3/8" Lock Washer	8
10	A010.037.0100ZC	3/8" – 16 x 1" Hex Screw, LW	4
11	P3241	Slinger	1
12	P3371A	Mounting Base	1
13	W95-0056	Motor: 1.5hp/3600rpm/F56J/1ph/TEFC w/ Foot	1
	W95-0057	Motor: 1.5hp/3600rpm/F56J/3ph/TEFC w/ Foot	1
14	A010.031.0075Z	5/16" – 18 x ¾" Hex Screw, HN, LW, FW	4
15	F601.031Y	5/16" Flat Washer	4
16	F620.031Z	5/16" Lock Washer	8
17	EC400.031Z	5/16" – 18 Hex Nut	4
18	A010.037.0087ZC	3/8" – 16 x 7/8" Hex Screw, LW	4

#4051 & # 4052 - ELECTRIC POWER MODELS

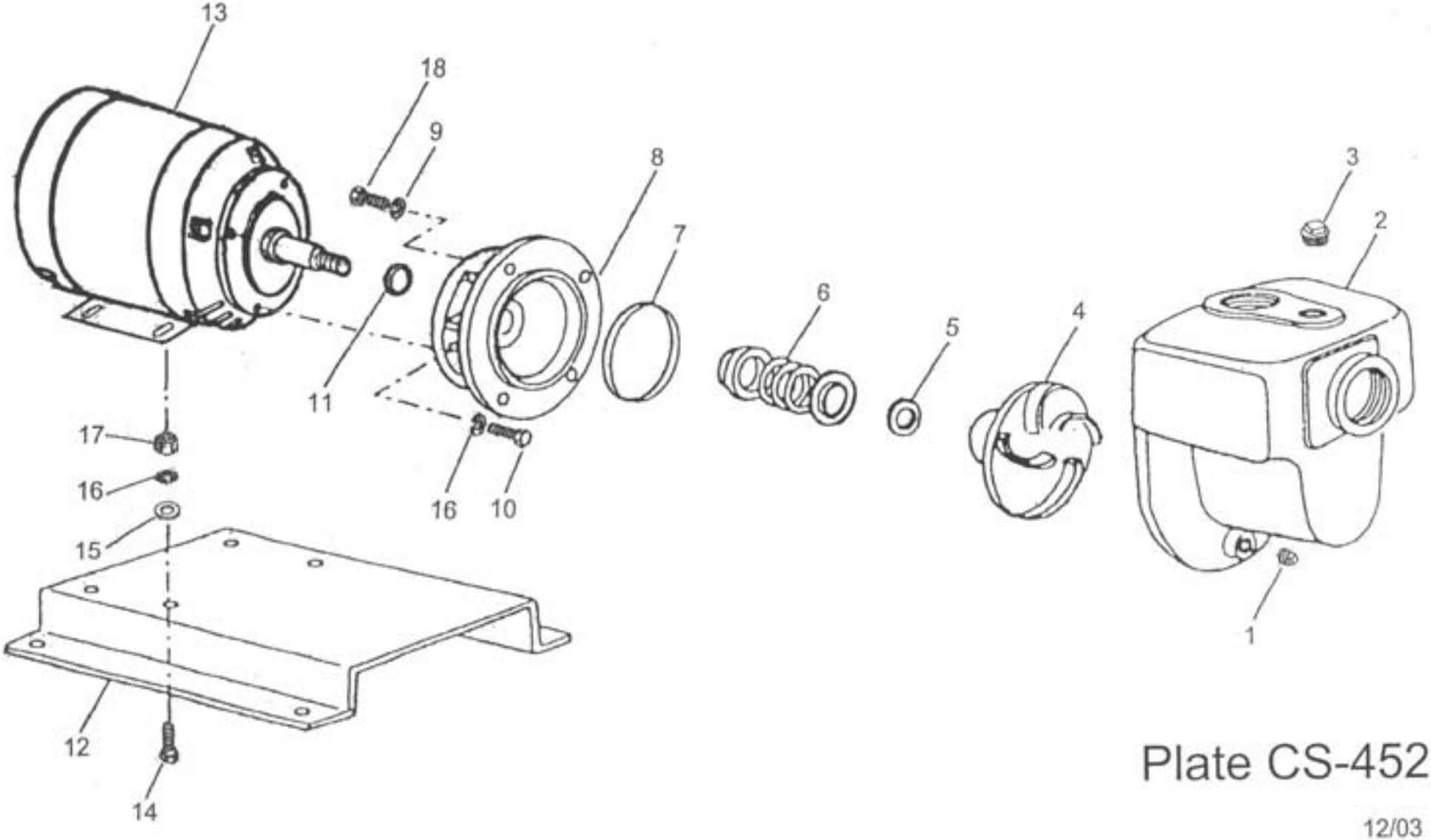


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