Operating and Maintenance Manual
Gas/Diesel Engine Powered
Self-Priming Centrifugal Pumps

4700 Series

Operating Manual Contents:

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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.

Engine Power:

DO NOT: Operate in an enclosed area, as exhaust fumes are lethal.
DO NOT: Smoke while operating the pump.
DO NOT: Smoke when refueling the engine.

DO NOT: Spill fuel when refueling.
DO NOT: Refuel or operate the engine near an open flame.
DO: Replace the fuel cap after refueling.

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

Engine Power:

DO NOT: Touch hot surfaces, particularly the muffler; doing so may cause serious burns.
DO NOT: Operate without the guards in place.

DO: Read and understand the engine operator manual.

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. **Gas or Diesel Engine Pumps:** Read the engine operator manual in order to understand proper starting and stopping techniques. **Always start and stop the engine in accordance with the engine manufacturer's instructions.**
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.
- 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 twelve bolts that hold the pump case to the pump side and remove the pump case.
2. Pull the volute straight off of the dowel pins.
3. To remove the impeller, strike the tips of the vanes with a lead hammer in a counterclockwise direction.

Impeller Gap Adjustment:

1. Remove the pump case from the pump side as in item 1 above.
2. Check the radial clearance between the ‘nose’ of the impeller and the bore in the volute. It should be .015” to .018”. Replace the impeller and/or volute if badly worn.

Seal Replacement:

Removing the Seal

1. Disassemble the pump per steps 1-3 above under “Disassembling the Pump”.
2. Pull the rotating portion of the seal off the shaft.
3. Remove the pump side from the engine.
4. Push the stationary seal seat out of the pump side.

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. Push the stationary seal seat into the counter bore in the pump side.
    a. Lubricate the outside of the rubber boot with a rubber lubricant or soapy water.
    b. Push squarely on the seal. (Put a clean cloth over the seal surface when pushing the seal into place.
2. Make sure the rubber slinger is on the pump shaft next to the motor.
3. Install the pump side on the motor.
4. Lubricate the drive boot of the rotating portion of the seal with a rubber lubricant and push the seal onto the shaft until the seal faces come into contact.
5. Thread the impeller onto the pump shaft.
6. Strike the outside diameter of the impeller with a lead hammer to tighten it.
7. Reinstall the volute.
8. Install the volute gasket, pump case gasket, and pump case to the pump side.
9. Run a vacuum test:
    a. Install a 0-30” Hg Vacuum Gauge in an appropriate fitting to block the pump suction.
    b. Fill the pump case with water and run the pump for approximately two minutes.
    c. The pump should pull 18”-20” Hg vacuum.

Troubleshooting Guide:

Pump fails to prime	• Check that there is water in the pump case. • Check lift – maximum 20ft. • 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 .018” – 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 for leakage between the motor and pump side. • 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

4700 Series
2” High Pressure Centrifugal Pumps, Gas Engine Power
4712 Parts List

Ref. No.	Part No.	Description	Qty.
1	0002-1606	½” Pipe Plug (drain)	1
2	P3789	Nameplate	1
3	P3015	2” Nipple	2
4	P3025B-A1	2” Pump Case, Aluminum	1
5	0002-1573	1 ½” Pipe Plug (fill)	1
6	P3026	Pump Side Gasket	1
7	P3031	Volute Gasket	1
8	P5241	Volute	1
9	W494-1/4X5/8	¼” x 5/8” Groove Pin	2
10	P5240	Impeller	1
11	P3029	Impeller Plug	1
12	W105-2	1” Single Seal Shaft Assembly: Carbon/Ceramic/Nitrile	1
	W105-2F	Optional Seal Available: Silicon Carbide/Silicon Carbide/Viton	1
13	P3027A	Pump Side	1
14	A010.037.0150	3/8”-16 x 1 ½” Hex Screw, LW (Skid/Wheels)	3
	A010.037.0150	3/8”-16 x 1 ½” Hex Screw, (Cage)	4
15	F620.037	3/8” Lock Washer	16
16	P3040	Lifting Handle (Skid/Wheels)	1
17	P3056	Slinger	1
18	A010.037.0125	3/8”-16 x 1 ¼” hex Screw, LW (Skid/Wheels)	11
	A010.037.0125	3/8”-16 x 1 ¼” Hex Screw, LW (Cage)	12
19	A010.037.0175	3/8”-16 x 1 ¾” Hex Screw, LW (Skid/Wheels)	2
20	P5273	2” NPT Strainer	1
21	W1-D116	Briggs & Stratton 202432 Gas Engine	1

Seal Kits Available:
(Includes Seal, “O” Rings, and Gaskets used when replacing a seal)

W103-012.0 – Carbon/Ceramic Seal
W103-012.1 – Silicon Carbide Seal

#4700 SERIES - GAS ENGINE POWER

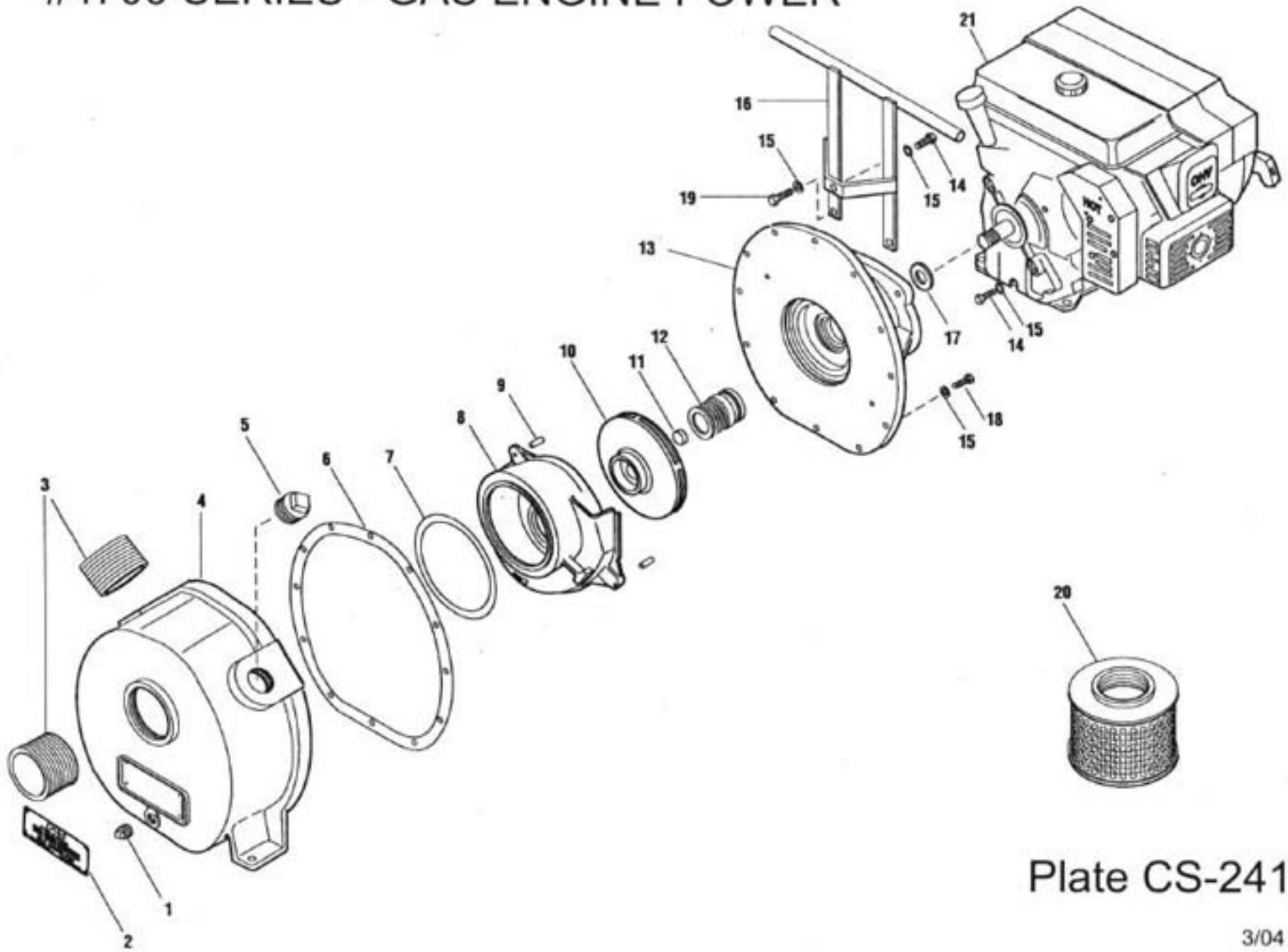


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