CH&E

Operating and Maintenance Manual
Gas & Diesel Engine Powered Diaphragm Pumps

Series 5A

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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 IMMINENTLY HAZARDOUS SITUATION, FAILURE TO ABIDE BY SAFETY PRECAUTIONS WILL RESULT IN DEATH OR SERIOUS INJURY.

DO NOT operate in an enclosed area, as exhaust fumes are lethal.
DO NOT smoke while operating pump.
DO NOT smoke when refueling engine.
DO NOT refuel hot or running engine.

DO NOT spill fuel when refueling.
DO NOT refuel or operate 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.

DO NOT operate this equipment without fully understanding the operations procedures.
DO NOT touch hot surfaces, particularly the muffler; doing so may cause serious burns.
DO NOT attempt to clear blockages or clean the pump during operation. Rotating parts may cause serious injury.
DO NOT pump flammable liquids.
DO NOT pump corrosive liquids. Contact local authorities for assistance.

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 pump only when guards are in place.
DO store equipment properly when it is not in use. Equipment should be stored in a clean, safe location.

CAUTION! INDICATES A POTENTIALLY HAZARDOUS SITUATION, FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN A MINOR INJURY OR SEVERE DAMAGE TO THE PUMP.

DO NOT reduce the size of the discharge or try to control capacity by throttling the discharge; severe damage to the pump will result.
DO drain the pump in freezing weather by tipping the unit towards the discharge.

DO flush the pump with clean water after operation to remove any dirt and debris still in the pump.

Service Safety:

WARNING! POORLY MAINTAINED EQUIPMENT CAN BECOME A SAFETY HAZARD! IN ORDER FOR THE PUMP TO OPERATE SAFELY AND PROPERLY, PERIODIC MAINTENANCE AND OCCASIONAL REPAIRS ARE NECESSARY.

DO NOT attempt to clean or service the pump while it is running. Rotating parts can cause severe injury.
DO NOT crank a flooded engine with the spark plug removed on gasoline-powered engines.
DO NOT test for spark on gasoline-powered engines if engine is flooded or the smell of gasoline is present.
DO NOT use gasoline or other types of fuels or flammable solvents to clean parts. Fumes from these fuels and solvents can accumulate and cause an explosion.

DO operate the pump with all safety devices and guards in place and in working order.
DO keep the area around the muffler free of debris. A hot muffler may ignite the debris.
DO replace worn or damaged equipment with parts recommended by CH&E, A Division of ABS Pumps.
DO disconnect the spark plug on pumps with gasoline-powered engines before servicing the pump to avoid an accidental startup.

Operating Instructions:

1. Read the “Pump Safety” pamphlet in its entirety before operating the pump and observe safe-operating procedures at all times.
2. Read the engine operator manual in order to understand correct starting and stopping techniques.
   Always start and stop the engine in accordance with the engine manufacturer’s instructions.
   a. Maximum engine speed is 3000 RPM or 65 strokes per minute of the diaphragm.
3. Examine the pump carefully and read all instructions thoroughly before beginning pump operation.
4. Fill the fuel tank with the proper grade of fuel given in the engine manufacturer’s instructions.
5. Turn down all of the grease cups on the pump.
   a. Keep the grease cups filled with clean Mobil™ grease AA2 or similar.
6. Attach a 4” suction hose to the pump suction fitting.
   a. Make sure that the connection is airtight.
7. Set the pump as close to the water source as possible.
   a. Vertical suction lift in excess of 20 ft is not recommended.
   b. A foot valve and strainer on the suction line are recommended on high suction lifts.
8. A 4” hose or pipe can be attached to the discharge side of the pump to lead water away.
   a. Both suction and discharge lines should be supported independently of the pump to prevent excessive weight on the pump parts.
9. Adjust the engine speed for smooth operation of the pump.

Maintenance Requirements:

∗Shut the pump off and remove the spark plug wire before attempting any maintenance∗

- Refer to the engine manual for engine maintenance requirements.
- Keep the interior of the pump and the valves clean.
  - The suction valve can be reached through the suction connection or by removing the diaphragm.
  - The discharge valve can be reached through the cleanout opening in the discharge connection.
- Drain the pump in freezing weather when the pump is not in operation.
- When changing the diaphragm, make sure that it is centered with the pump water box.
  - Pull all bolts evenly and securely so that the diaphragm will not slip or pull out.
- Grease the pump drive gear and pinion when necessary with Mobile grease AA2 or similar.

Troubleshooting Guide:

Problem	Possible Reason
Pump does not prime AND/OR Pump does not operate properly.	1. Pump may be too high above or too far away from the water source. 2. There may be leaks in the suction hose or hose connection. 3. Valves may not be sealing properly due to accumulation of residue. Pour water into the suction chamber to seal the valves. 4. Valves may not seal due to distortion. Adjust the tightness of the suction and discharge connection mounting bolts. 5. Check diaphragm for breaks and/or leaks. 6. Ensure that the end of the suction line is in position to allow water to enter. The suction line may be buried or blocked. 7. Do not allow any point of the suction hose to be higher than the suction connection on the pump. A trapped air pocket can form and prevent priming. 8. The pump will not operate properly under a positive suction head condition.
Reduced Capacity.	1. The discharge line may be too small, too high or too long causing: a. Excessive bulging of diaphragm on the down stroke. b. Valves closing with a loud snap. c. Overall rough operation. d. Engine overloads and then slows down. *Diaphragm pumps will handle fluids containing a considerable amount of solids, however, if the mixture is too heavy to be pumped, liquid must be added until the mixture becomes sufficiently fluid for pumping.

5A Parts

Ref. No.	Part No.	Description	Qty.
1	P1466	Suction Hose Connection	1
2	SA-10007B	Flap Valve Assembly	2
6	A025.031.0125	Carriage Bolt 5/16" x 1 ¼" HN, LW	4
7	A010.037.0087ZC	Hex Screws 3/8" x 7/8"	4
8	P1219	Suction Valve Connection Gasket	1
9	A010.032.0125	Hex Screws 5/8" x 1 ¼"	2
10	A010.062.0350	Hex Screws 5/8" x 3 ½"	2
11	P1162	Water Box	1
12	P2197	Discharge Gasket	1
13	P5374	Discharge Spout	1
	P5512	Studs ½"-13 UNC x 1 ¾" Lg.	2
14	A010.062.0125	Hex Screws 5/8" x 3" HN, LW	6
15	A010.062.0200	Hex Screws 5/8" x 2" HN	2
16	P5376	Gasket Cleanout Cover-Dish Spout	1
17	P5375	Cleanout Cover	1
18	P3496E	Clamp Handle	2
19	0002-1604	¼" Pipe Plug (for suction connection drain)	1
20	P1157	Diaphragm Bottom	1
21	P2157R	Diaphragm Rubber #4E	1
22	P1158	Diaphragm Clamp Ring	1
23	P1874	Diaphragm Top	1
24	A010.062.0250	Hex Screws 5/8" x 2 ½"	4
25	P3844	Stud 5/8" x 2 ¾" w/ Heavy HN	2
26	P2169	Diaphragm Top Stud	1
27	EC410.100	1" Jam Nut	2
28	P1854	Connecting Rod End	1
29	P3698	1 11/16 Needle Bearing w/ Inner Ring	1
30	P1856A	Crank Pin Hub w/ Dowel Pin	1
31	P1857	Crank Pin Washer	1
32	A010.062.0150	Hex Screw 5/8" x 1 ½" LW	1
33	W30D4A	¼"-#1 Grease Cup	2
34	P2191	Bearing Support	1
35	P2192	Crankpin Shaft	1
36	SCE2420ASI	1 ½" Needle Bearing or Torr. B2420-OH	2
37	BC115.C050.150	Sq. Hd. Setscrew ½" x 1 ¼"	1
38	W68-.37SQX2.50	3/8" Sq. x 2 ½" Gib Head Key	1
39	W68-.37SQX2	3/8" Sq. x 2" Gib Head Key	1
40	P1462	110T Gear	1

For Models 5AG-5AQ & 5AZ

41	P2170	18T Pinion	1
42	W68-.25SQX2	¼" Sq. x 2" Gib Head Key	1

For Models 5AN-5AM-5AU-5A20-5A31 & 5A40

41	P722E	13T Pinion	1
42	W68-.25SQX2	¼" Sq. x 2" Gib Head Key	1

For Water Box Drain

43	0002-1605	3/8" NPT Pipe Plug	1

PUMP AND VALVE PARTS

