Operating and Maintenance Manual
Self-Priming Trash Pumps

2800 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.

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.

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.

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. **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. Install the appropriate nipple or quick coupling to the pump suction inlet.
    a. The inlet and discharge are female pipe threads.
    b. When using male and female couplings, the hose gasket must be in place and sealed properly.
5. Use grease or thread sealer on threaded connections to make them airtight.
6. 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 hose guard should be used on the end of the suction line to prevent pumping solids too large for the pump to handle.
7. 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.
8. Fill the pump case with water through the filler plug at the top of the flap valve housing.
    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.
9. All gaskets and joints must be airtight.
10. Check that the automatic grease cup is in the run position.
    a. The T-Bar should be turned counterclockwise to the end of the stem.
    b. If the stem recedes into the grease cup, refill the cup with soft, easy flowing lithium complex grease such as Exxon Ronex MP.
    c. Do not allow the grease cup to run dry; the seal must be lubricated at all times.
11. 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.
12. When shutting down the pump, screw the T-Bar of the automatic grease cup down to the top of the cup plus one turn.
    a. Drain the pump through the drain plug located in the bottom of the cover.
    b. Flush the pump with clean water after each use.

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.

Servicing the Pump:

Disassembling the Pump:

1. Drive the slip ring upwards until it clears the suction elbow.
2. Remove the two clamp handles that hold the cover to the pump case. Loosen clamp handles so that they still remain on the studs by two or three threads so that the cover does not fall off when removing the pump case.
3. To remove the cover, insert two ½” hex screws into the tapped holes located in the cover flange and tighten until the cover is loose.
4. To remove the volute, loosen and remove the thread sealing lock nuts and lift the volute out.
5. It is necessary to unscrew the impeller from the shaft to remove the seal. Hammer on a piece of wood held on the edge of the impeller vane to remove the impeller. Heating the center of the impeller may be required in order to loosen it.

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 and volute per steps 4 & 5 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 (engine adapter on model **2806**).
    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. Refill the seal chamber with grease.
    a. Remove the pipe plug to vent the chamber while filling.
    b. Use a Grade 2 lithium-based Exxon™ Ronex MP or equivalent.
    c. Replace the pipe plug when grease comes out of the hole.
    d. Continue filling with grease until the grease comes out of the small hole on the side of the automatic grease cup near the top.
    e. Screw the T-Bar on the automatic grease cup stem down to the top of the cup and then one more turn to take the pressure off of the grease chamber when the pump is not in use.
11. 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 25"-28" Hg vacuum.

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, if the grease cup stem retracts into the cup at a fast rate then the seal is cracked • 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

2847 Parts List

Ref. No.	Part No.	Description	Qty.
1	P3701B	Pump Case	1
2			
3	P3712TH	Volute	1
4	P5958	Stud 1/2"-13 x 2 1/2", H-L.N.	2
5	P3722	"O" Ring 4 3/8" I.D. x 3/16"	3
6	P3728	Stud 5/8"-11 x 2"	4
7	P3727	"O" Ring 18" I.D. x 3/16"	1
8	P3705	Cover	1
9	F620.037	3/8" Lock Washer	19
10	P3717	Clamp Handle	4
11	P3721	Handle	2
12	A010.037.0075	3/8"-16 x 3/4" Hex Screw, L.W.	5
13	0002-1606	1/2" Pipe Plug (drain)	1
14	P3715	Suction Elbow Gasket	1
15	P3704	Suction Elbow	1
16	A010.037.0125	3/8"-16 x 1 1/4" Hex Screw, L.W.	10
17	P3710	Slip Ring	1
18	P3716	Flap Valve Housing Gasket	1
19	P3702	Flap Valve Housing	1
20	A010.050.0150	1/2"-13 x 1 1/2" Hex Screw, L.W.	8
21	P3205	Flap Valve Weight	1
22	P3204	Flap Valve	1
23	P3206	Flap Valve Washer	1
24	P3203	Flap Valve Seat	1
25	P3097	Suction/Discharge Connection Gasket	2
26	P3096A	Suction/Discharge Connection	2
27	0002-1572	1 1/4" Pipe Plug (fill)	1
28	W300-4X2 7/8	4" x 2 7/8" Nipple	1
29	W301-4X90	4" x 90° Elbow	1
30	P3713	Impeller	1
31	P3080	Impeller Plug	1
32	P3200	Impeller Shim .005"	As req'd
	P3201	Impeller Shim .010"	
	P3202	Impeller Shim .015"	
33	P3086C	Seal Seat Support	1
34	P3087	Seal Seat Support Gasket	1
35	W105-6A	1 1/2" Double Seal Shaft Assembly, Carbon/Ceramic/Nitrile	1
	W105-6C	Optional Seal Available: Silicon Carbide/Silicon Carbide/Nitrile	
36	P3076	Pump Side Gasket	1
37			
38			
39			
40	W31E6S	#2-3/8" Automatic Grease Cup	1
41	0002-1603	1/8" Pipe Plug (air)	1
42	A010.037.0100	3/8"-16 x 1" Hex Screw, L.W.	4
43			
44	A010.050.0225	1/2"-13 x 2 1/4" Hex Screw, L.W.	4
45			
46	P4698	Seal Seat Holder	1
47	P3211	Seal Seat Holder Gasket	1
48	A010.025.0100	1/4"-20 x 1" Hex Screw, L.W.	4
49	F620.025	1/4" Lock Washer	4

Ref. No.	Part No.	Description	Qty.
50	W63-RRT354	Retaining Ring	1
51	W16-308NPP	Ball Bearing	2
52	P3210	Impeller Shaft	1
53	P3207	Bearing Support Housing	1
54	P5607	Stud 3/6”-16 x 1 3/4", Flange L.N.	6
55			
56	P4627	Adapter Plate	1
57	P3935	Coupling Hub	1
58	W69-.37SQX2.12	3/8” Sq. x 2 1/8” Key	1
59	BC091.C037.050	3/16”-16 x 1/2” Socket Set Screw	2
60			
61	P1843	Bolt Ring	1
62	P1842	Drive Plate	1
63	P5491	1/2”-13 x 1” Hex Screw Self-Locking	6
64	W4-6187A	Drive Ring	1
65	GC010.10.10030Z	M10-1.5 x 30mm Hex Screw, L.W.	12
66	GC070.10.10040	M10-1.5 x 40mm Socket Screw, L.W.	8
67			
68	E6GX	3/8”-16 Flange Lock Nut	6
69	0813NUS	1/2”-13 Hydra-Lock Nut	2
70			
71	F620.050	1/2” Lock Washer	12
72			
73	G620.10.100	M10 Lock Washer **(2844-2847)**	20

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

W103-004.0 – Carbon/Ceramic Seal
W103-004.2 – Silicon Carbide Seal

#2800-#4800 SERIES

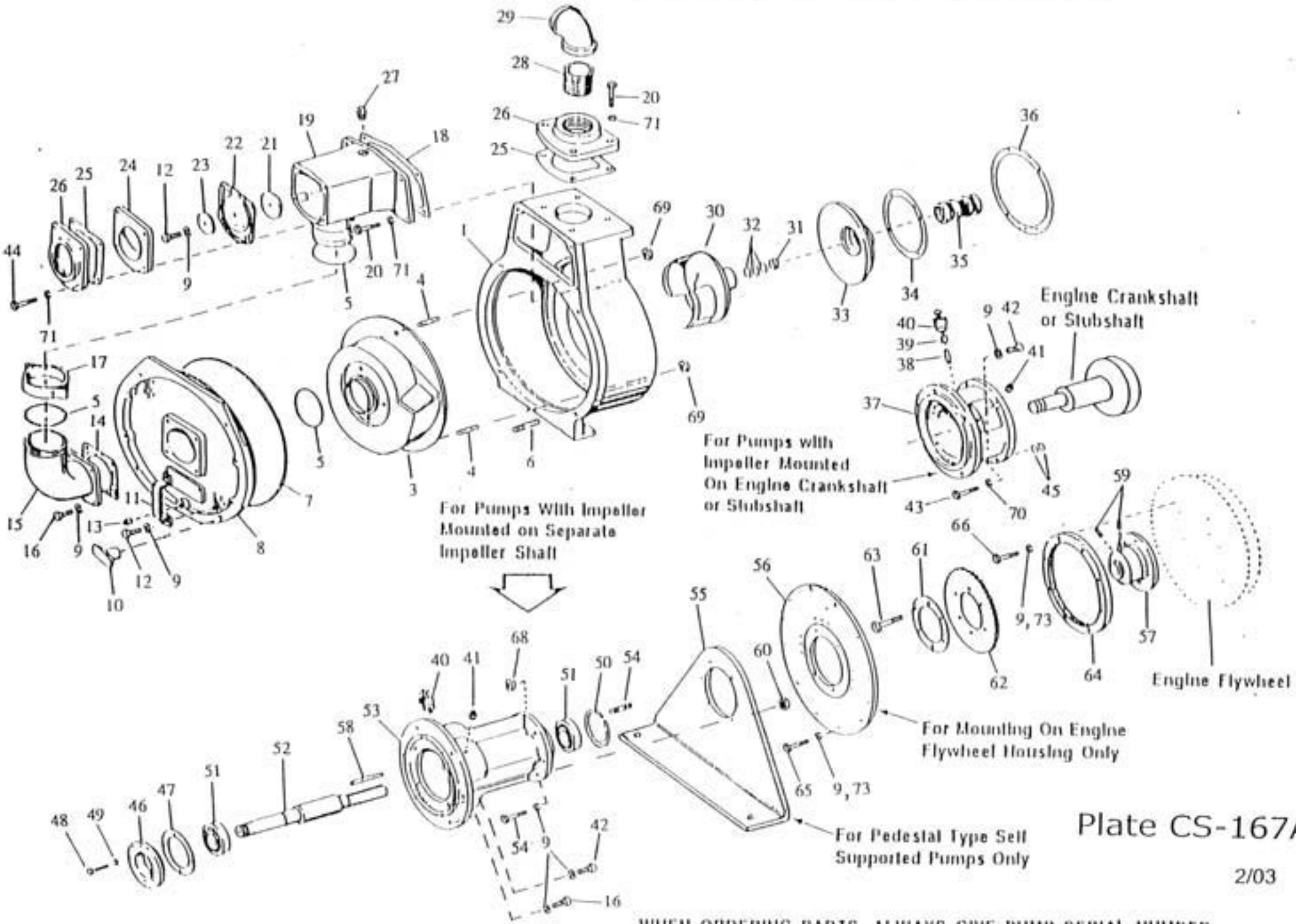

Plate CS-167A

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