

OWNER'S MANUAL

TSP SERIES Self Priming Trash Pumps



SAFETY WARNINGS

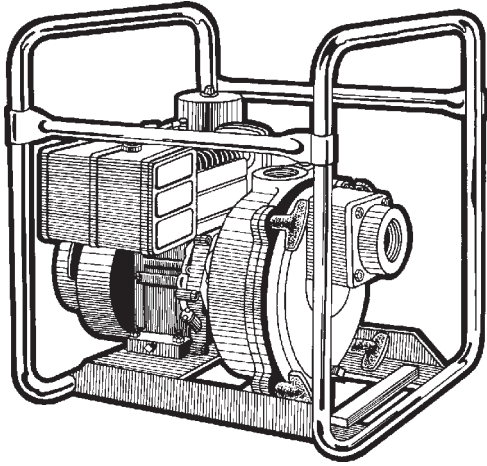


BEFORE OPERATING OR INSTALLING THIS PUMP, READ THIS MANUAL AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS.

SAFETY CAREFULLY READ THESE SAFETY MESSAGES IN THIS MANUAL AND ON PUMP.

- CAUTION**
- DO NOT OPERATE THIS PUMP DRY!**
 - Review instructions before operating.
 - Wear ear protection to reduce objectionable noise.

- WARNING**
- Turn off power before servicing.
 - If fuel is spilled, avoid creating any source of ignition until the fuel vapors have been cleaned up and removed.



APPLICATION

This pump is suitable for installations where the vertical distance from the pump to the water level does not exceed 25 ft. In off-set

installations, friction losses in the suction pipe must be taken into consideration.

PERFORMANCE

BASED ON 5' SUCTION LIFT.

Pump Model	Pump Size	Solids Handling	Total Head in Feet						
			30	40	50	60	70	80	90
			Capacity in U.S. Gallons per Minute						
TSP 2	2" x 2"	1 1/8"	198	194	180	145	110	75	40
TSP 3	3" x 3"	1 1/2"	318	265	172	98	42		
TSP 4	4" x 4"	2"	616	500	400	280	190	120	45

Pump Model	Total Head in Metres						
	9	12	15	18.5	21.5	23.5	27.5
Capacity in Litres per Minute							
TSP 2	750	735	680	550	415	285	150
TSP 3	1205	1005	650	370	160		
TSP 4	2330	1890	1515	1060	720	455	170

NOTE: This trash pump can handle pumping stones, leaves, mud and other debris of sizes up to the listed solids handling for the pump and up to 25% of the flow by volume.

INSTALLATION

- (a) **LOCATION:** The pump should be installed in a dry and well ventilated location which provides adequate drainage, room for servicing and protection from freezing temperatures. The pump should be placed on a firm and level foundation. It should be blocked and anchored, or if possible bolted down to prevent creeping due to vibration. Locating the pump as close as possible to the source of liquid supply reduces the friction losses in the suction pipe and provides maximum capacities.

⚠ CAUTION

- Always ensure there is adequate ventilation to prevent asphyxiation.
- (b) **SUCTION HOSE:** Use clean non-collapsible hose of the same diameter as the pump suction piping. Where long lengths of suction hose are used, the suction pipe diameter

should be increased by one size. This will increase the priming time. Check hose connections for leaks and the hose for cuts and cracks. Repair any leaks, cuts or cracks as they reduce pump capacity. The suction pipe must always slope upwards from the liquid source to the pumps to avoid air pockets in the line. In cases where the pump needs to be reprimed often and it is not necessary that maximum capacities be obtained, it is advisable to use a 90° or 45° elbow in the suction line. This enables the pump to prime more quickly and also prevents bending of the hose. In cases where a maximum flow is required over a prolonged period of time, the suction line should be led almost horizontally to the pump. Non-toxic thread compound should be used on all pipe joints and connections should be thoroughly tightened. A strainer should be connected to the bottom end of the suction pipe and it should be well submerged at all times.

OPERATION - PRIMING THE PUMP

⚠ WARNING: DO NOT RUN THE PUMP BEFORE PRIMING IT, SINCE THE SEAL AND IMPELLER COULD BE PERMANENTLY DAMAGED.

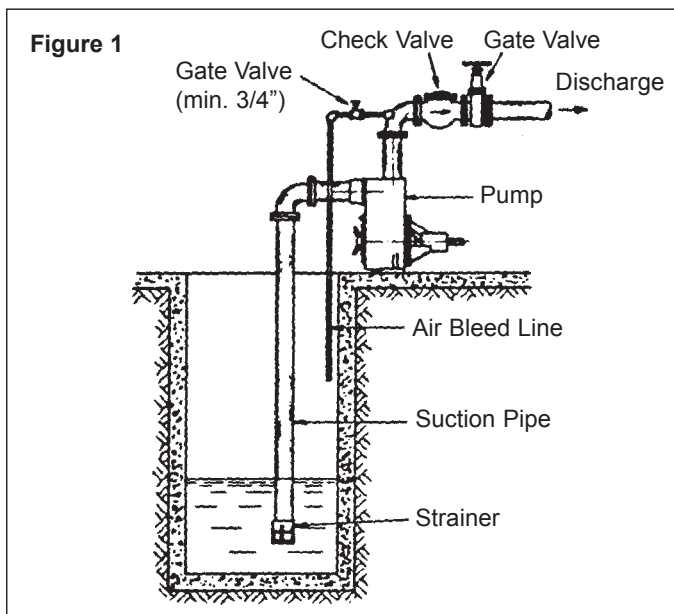
- (a) **ENGINE:** Check the engine manufacturer's owner's manual supplied with the pump for instructions on engine preparation and start-up procedures. Make sure oil is added to engine crankcase before starting the unit.
- (b) **PRIMING (NON-PRESSURIZED SYSTEM):** Never operate the pump dry as this may damage the pump seal. Remove the priming plug from the top of the pump casing. Fill the pump casing with water through the priming plug. Replace the priming plug and start the engine. The pump should prime in 1/2 to 2 1/2 minutes, depending on the suction hose. If an exceptionally long suction line is used, the water in the casing may become overheated and vapor locked. If this occurs, replace the water in the casing with cold water, using the priming and drain plugs. Continue to prime the pump.

- (c) **PRIMING (PRESSURIZED SYSTEM):** Place a check valve on the discharge line of the pump. Place a pet cock or a ball type air bleeder in place of the priming plug. Another alternative is to install an air bleed line with with gate valve onto the discharge line, see Fig. 1. Open the priming port. Fill the casing with water through the priming port. Replace the plug or bleeder into the priming port. Open pet cock or ball type air bleeder, and start engine. Once a continuous flow of liquid emerges from the bleeder line, priming is complete and the valve on pet cock can be closed off. The pump should prime in 1/2 to 1 1/2 minutes depending on suction lift and the length and diameter of the suction hose. If an exceptionally long suction line is used, the water in the casing may become overheated and vapor locked. If this occurs, replace the water in the casing with cold water using the priming and drain plugs. Continue to prime the pump.

- (d) **UNCLOGGING:** The pump is designed to enable the impeller and volute to be unclogged without disconnecting either suction or discharge hoses. Simply unbolt the four large wing nuts and remove the front cover - suction hose still attached. Remove the volute to expose the impeller. All parts can then be readily cleaned.

- (e) **DRAINING:** Should the pump be subject to freezing temperatures, it will be necessary to drain the pump completely. To drain, remove the drain plug located at the bottom of the front casing and the priming plug and make sure that the drain hold is not choked. After all of the water has been drained out, operate the pump for a few seconds to ensure that the impeller is devoid of water. Make sure that the suction line is also empty.

- (f) **STORAGE OF PUMP:** Drain liquid from pump as explained in the "Draining" section, to prevent freezing. It is recommended that a good rust inhibitor be put in the liquid end to prevent excessive corrosion. Be sure motor is kept dry and covered. When restoring the use of the pump, replace all plugs and make sure all connections are tightly sealed. After a complete check, proceed with the initial prime according to the directions under the section "Priming".



MAINTENANCE

(a) LUBRICATION:

- 1) The pump requires no lubrication.
- 2) For gasoline or diesel engines, refer to the instructions provided by the engine manufacturer.

(b) REPLACING SEALS:

To disassemble:

- 1) Remove four nuts (8) and washers (23) and dismount the front casing (1).
- 2) Remove the volute (7).
- 3) Inspect the seal (11) on the suction side of the volute. It should be replaced if damaged.
- 4) Check 'O' Ring (10) in the groove of the front casing (1). It should be replaced if damaged.
- 5) Unscrew the impeller (2) in a counter-clockwise direction.
- 6) Slip the rotating seal (12) with the sleeve (13) off of the engine shaft.
- 7) Inspect the ceramic seat (12A) fixed in the rear casing (3). If it is worn or damaged, it should be replaced. Unbolt the rear casing from the engine and push the ceramic seat out of its housing in the rear casing from the engine end. Care must be taken so that the shaft is not damaged in the process.

To reassemble:

- 1) Clean all parts thoroughly before reassembly.
- 2) Oil the rubber cup on the ceramic seat (12A) and push

it into the rear casing groove using thumbs only. Make sure that the smooth surface of the ceramic seat faces outwards.

- 3) Assemble the rear casing (3) to the engine being very careful so as not to damage the ceramic seat. Do not forget the lock washers or washer seals when assembling the rear casing to the engine.
- 4) Slide the rotating seal (12) onto the sleeve and then slide the sleeve onto the shaft.
- 5) Screw on the impeller (2).
- 6) Position the volute (7) into the rear casing so that it seats properly into the location diameter of the rear casing. The volute is prevented from rotation by its anti-rotation rib which seats into the slot on the side of the rear casing. It may be necessary to tip the pump rearwards to keep the volute in position until the front casing is in position.
- 7) Slide the seal (11) on the shoulder of the volute.
- 8) Place the 'O' Ring into the groove of the front casing.
- 9) Assemble the front casing with the rear casing.

CAUTION

- Whenever the pump is dismantled and then reassembled, always check to see that the impeller rotates freely within the volute.
- All models have a flinger on the shaft (14). This flinger must not be removed.

TROUBLESHOOTING CHART

PROBLEM	CAUSE
<ul style="list-style-type: none"> • No discharge 	<ol style="list-style-type: none"> 1) Pump not properly primed. 2) Speed too low. 3) Suction lift greater than that for which the pump was designed. 4) Discharge too high. 5) Collapsed or plugged suction hose.
<ul style="list-style-type: none"> • Reduced capacity and/or head 	<ol style="list-style-type: none"> 1) Air leaks in suction line. 2) Clogged impeller. 3) Strainer or foot valve not properly submerged. 4) Excessively worn impeller. 5) Speed too low. 6) Suction lift too great or insufficient NPSH. NPSH, Net Positive Suction Head is the total suction head in feet of liquid (absolute) less the vapor pressure of the liquid in feet (absolute). 7) Partially collapsed or plugged suction line.
<ul style="list-style-type: none"> • Pump loses prime 	<ol style="list-style-type: none"> 1) Air leaks in suction line. 2) Excessive amount of air or gas in liquid. 3) Loose seal (11) due to shrinkage or damage. 4) Suction pipe insufficiently submerged. 5) Suction lift too great. 6) Check if valve may be worn or have dirt lodged between the rubber flap and the valve seat. This prevents the valve from retaining a sufficient amount of water in the casing for proper priming.
<ul style="list-style-type: none"> • Excessive power consumption 	<ol style="list-style-type: none"> 1) Speed too high. 2) Specific gravity or viscosity of liquid too high.
<ul style="list-style-type: none"> • Noise 	<ol style="list-style-type: none"> 1) Suction and discharge piping not properly supported and anchored. 2) Cavitation - check NPSH.

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