



Hazardous Substance Alert

Please Note: It is illegal to ship or transport any hazardous chemicals without United States Environmental Protection Agency Licensing.

1. Always drain and flush pumps before servicing or disassembling for any reason.

2. Before returning unit for repair, drain out all liquids and flush unit with neutralizing liquid. Then, drain the pump. Attach a tag or include a written notice certifying that this has been done.
3. Never store pumps containing hazardous chemicals.

Plumbing Installation

IMPORTANT

For best possible performance and continuous, satisfactory operation, read these instructions before installing your new pump. Should service be required, this manual can be a valuable guide. It should be kept near the installation for ready reference.

Preliminary to Mounting

Before setting up the pump for operation, check to see that the motor and pump turn freely by hand. If it cannot be turned over by pulling on the recoil starter, open casing to check for obstructions lodged in pump.

Basket Strainer

A basket strainer is to be used when transferring solutions that may contain debris and solids which could become lodged in the pump or damage the impeller. Because of the high flow capacity of this pump, unknown debris could be siphoned off the bottom of the tank. Install the strainer on the suction side of the pump whenever possible to avoid pump damage.

INSTALLATION

LOCATION

Place unit as close to water source as possible to minimize suction lift, obtain the best pumping performance, and aid in priming. A typical portable installation is shown in Figure A.

For permanent installation, mount unit on a foundation that will support the weight of the pump and engine and also provide stability while the pump is running. For most permanent installations, it is advisable to bolt unit directly to foundation.

NOTICE: Settling and/or shifting during operation can cause piping to place excessive strain on the pump and may damage pump case. Set pump on hard level surface. Non-level surfaces may cause the oil sensor in the engine to shut down the unit.

SUCTION CONNECTION

Connect either rigid pipe or flexible suction hose to pump suction as shown in Figure A. If hose is selected, hose must be rated to hold the suction vacuum and prevent collapse while the pump is running.

Make the suction line a continuous rise from the water source to the pump. High spots can trap air and also make priming difficult. Make sure all connections are tight and free of air leaks.

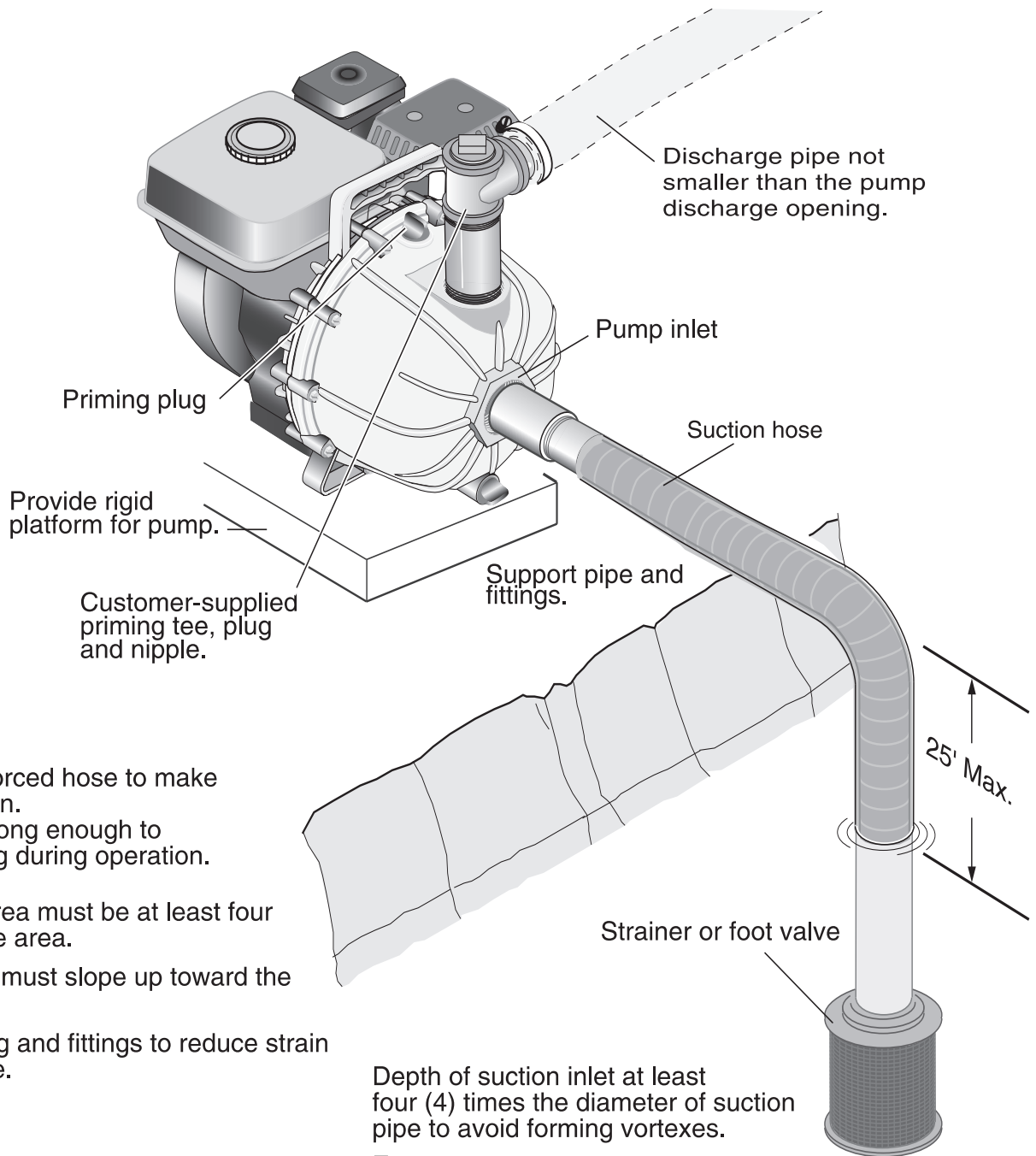
NOTICE: Suction pipe or hose must be at least as large as the pump suction inlet in order for the pump to operate properly. If the inlet line is longer than approximately 6 feet, use the next size larger line.

Minimum depth for the suction inlet is determined by the diameter of the suction line. See Figure A.

DISCHARGE CONNECTIONS

Your pump is equipped with a single port discharge. Select the appropriate size for the application. Install a "T" as shown to allow easy priming of the pump without disconnecting the piping, or by using the priming plug on the housing.

Plumbing Diagram



Use pipe or reinforced hose to make suction connection. Hose must be strong enough to prevent collapsing during operation.

Suction screen area must be at least four times suction pipe area.

All suction piping must slope up toward the pump inlet.

Support the piping and fittings to reduce strain on the pump case.

Depth of suction inlet at least four (4) times the diameter of suction pipe to avoid forming vortices.

Example:
2" Pipe x 4 = 8" minimum depth.

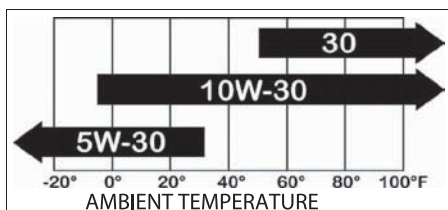
⚠ WARNING
Hazardous Suction.
Can trap persons against suction inlet.
Always use strainer on suction hose to prevent entrapment.

Figure A

Operation and Maintenance

Preparations Before Starting the Engine

1. Fuel: Check fuel level in tank, and do not over fill. Use fresh, clean automotive fuel. **Note: DO NOT FILL FUEL TANK WHEN ENGINE IS RUNNING.**
2. Engine Oil: Before checking or refilling with engine oil, make sure the engine is stopped and placed on a stable, level surface. Use oil recommended for ambient air temperatures that the engine will be running at. See chart below. Change oil after the first 20 hours and every 100 hours thereafter.



3. Priming Water: **IMPORTANT: PUMP MUST NOT BE RUN DRY.** On self-priming pumps, only the chamber needs to be filled with liquid. The pump must not run unless the priming chamber is completely filled with liquid because there is a danger of damaging the mechanical seal, which depends on the liquid for its lubrication.

Self-priming models can be primed by removing the filler cap located at the top of the pump where the discharge line is mounted to the pump, and filling the priming chamber with liquid. After use, the priming chamber should be flushed and drained to avoid chemical corrosion and damage from freezing. Drain by removing the lower drain plug located at the bottom of the casing.

Starting the Pump

IMPORTANT: Before starting engine, be sure the priming chamber is filled with liquid and the discharge hose is secure.

1. Turn engine switch located by recoil starter to ON position.
2. Turn the fuel cock to ON.
3. Push the throttle lever to a slightly open position.
4. Operation of choke lever.

When engine is cold:

In cold weather, start engine with choke in fully closed position.

In warm weather, start engine with choke in half-closed position.

When engine is warm:

Start engine with choke in fully open position.

5. Start engine by pulling recoil starter out quickly and forcefully. Repeat pulling until the engine starts.

Operation of the Pump

1. Idle the engine for 3 to 5 minutes to warm it up.
2. Open the throttle lever to the upper zone after engine has warmed up.
3. Once the pump has primed, you will note a load on the engine; adjust rpms to proper speed for your pumping application.

Stopping the Pump

1. Stop pump for a short time:
Run engine throttled all the way down (fully to the right).
Turn engine switch to OFF position.
2. Stopping pump for storage:
Turn fuel cock to OFF position instead of turning the engine switch off.
Let the engine idle for 2 to 3 minutes until fuel in carburetor is depleted and engine stops. If a valve is installed on the discharge hose, you may run pump with valve closed during this procedure.

Note: Pump must not be run dry. Make sure there is water in the priming chamber.

Storage

1. Drain pump. Flush pump after use.
One of the most common causes for faulty pump performance is gumming or corrosion inside the pump. Flush the pump and entire system with a solution that will chemically neutralize the liquid pumped. Mix according to the manufacturer's directions. This will dissolve most residues remaining in the pump, leaving the inside of the pump clean and ready for use.
2. Drain all the fuel from the fuel tank, fuel lines, and filter.
3. Store pump in a clean, dry environment.

Repair Instructions

Always flush pump with water or neutralizing agent before servicing.

PUMP HOUSING DISASSEMBLY

Seal replacement requires that the pump be fully removed from the engine. Observe carefully the disassembly process to ensure an easy assembly process. Replace all worn and eroded parts.

1. Remove spark plug wire from the spark plug for safety consideration. Remove the 10 bolts and nuts holding the pump casing to the casing cover using a 10mm socket and a 10mm open end wrench. Tap pump casing on the discharge port with a rubber hammer, if necessary, to break it loose from the casing cover. Remove o-ring from casing cover. Inspect parts for wear. (See Figure 1.)
2. Remove diffuser by removing the three screws with a Phillips screwdriver. Inspect parts for wear. (See Figure 2.)
3. Remove impeller bolt with a 13mm wrench. Pry impeller off engine shaft using two flathead screwdrivers. Inspect impeller and ceramic for wear. Ceramic surface must not be scuffed or cracked. To remove ceramic seal from impeller bore, use a small blade screwdriver to wedge the seal out. (See Figure 3.)
4. To remove mechanical seal from casing cover, first remove the casing cover from the engine by loosening the four bolts three turns each using a 13mm wrench; then rotate the casing cover 45 degrees clockwise to remove. From the engine side of the casing cover, press the mechanical seal out using a 1" diameter piece of PVC pipe 4" long. Inspect parts for wear. (See Figure 4.)
5. Inspect slinger ring on engine shaft for wear. (See Figure 5.)



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

SEAL REPLACEMENT AND PUMP HOUSING ASSEMBLY

1. Install slinger ring on engine shaft. (See Figure 5.)
2. Lubricate and install the o-ring around back side of metal portion of the seal (See Figure 6). Insert the stationary portion of the new mechanical seal by carefully pushing only on the outer metal ring as you press it into the casing cover. Use a tool with 1-1/2" ID, such as 1-1/2" diameter PVC pipe, 4" long that fits over the carbon face of the seal, but pushes only on the metal ring to insert the seal. The carbon surface of the seal must be facing you during installation. Be careful to avoid scratching the seal's carbon surface. (See Figure 7.)
3. Apply medium strength (Blue) threadlocker onto the (4) engine mounting bolts and install about (4) turns into the engine. Install the pump flange by sliding over the engine shaft 45 degrees clockwise from the up position. Once the flange has mated to the engine, rotate the flange 45 degrees counter-clockwise (CCW) to lock the flange into the slots. Tighten the (4) mounting bolts with a 13mm wrench to a torque of 10 foot pounds.
Note: Be sure to hold the pump flange in the "UP" position when tightening bolts. This will ensure that the pump bases will not be cocked off center in the final assembly. (See Figure 8.)
4. Lubricate the seal cavity of the impeller with WD-40, LPS or equivalent, and carefully press the seal's mating ceramic ring in place, seating it squarely on the bottom of the cavity. The glossy, finished side of the ceramic seal must be facing you. **IMPORTANT:** Make sure both seal surfaces are clean and lubricated. Never run seal surfaces dry. (See Figure 9.)
5. Install the impeller onto the engine shaft using the bolt, washer and seal. Bolt seal must not be worn. Tighten the impeller bolt to 10 foot pounds. (See Figure 10.)
6. Install diffuser onto the casing cover with three Phillips-head screws.
7. Install the pump casing onto the casing cover and o-ring, and secure with the 10 bolts, nuts and washers, using a 10mm socket and wrench. Torque the bolts to 45 inch pounds.
8. Once assembly is complete, pull on the engine recoil starter with engine switch in the "OFF" position to verify that the impeller rotates smoothly without catching. Connect spark plug wire. Assembly and inspection is now complete.



Fig. 6

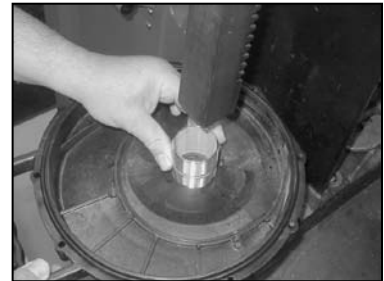


Fig. 7

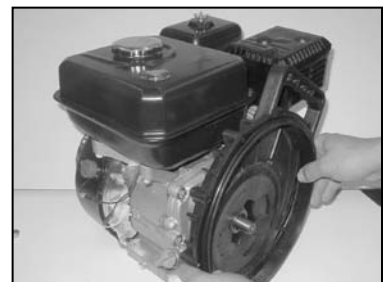


Fig. 8



Fig. 9



Fig. 10

RUNNING THE ENGINE

Refer to engine operation section of this manual for starting and operating instructions.

Pump performance varies depending on engine RPM. Refer to engine operation to adjust engine speed.

MAINTENANCE

PUMP LUBRICATION

Pump liquid end does not require any grease or oil for lubrication. The mechanical seal is lubricated by water when the pump is operating.

Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE															
	ENGINE				PUMP						SYSTEM					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
No water delivered					X	X	X				X	X	X			X
Not enough water delivered	X						X	X			X	X	X			X
Not enough pressure	X						X	X			X	X	X			
Engine heats excessively		X	X					X	X	X		X		X		
Abnormal noise and/or vibration				X	X		X			X		X	X	X		
Pump works for a while, then stops				X			X			X			X		X	X

CAUSE	CORRECTIVE ACTION
1. ENGINE	
A. Speed too low.	Refer to engine section.
B. Rotating and/or reciprocating parts drag.	Refer to engine section.
C. Speed too high.	Maximum engine speed not to exceed engine manufacturer's recommendation.
D. Loose or broken parts.	Refer to engine section.
2. PUMP	
E. Not primed.	Reprime, inspect suction system for air leaks, and/or check assembly.
F. Pump takes too long to prime.	Check for air leaks or defective check valve.
G. Flow through pump completely or partially blocked.	Locate and remove obstruction. Attach strainer.
H. Internal leakage.	Check clearances between face of vanes and case. Should not exceed 1/32".
I. Rotating parts drag.	Inspect. Repair.
J. Loose or broken parts.	Inspect. Repair.
3. SYSTEM	
K. Pressure required by system at design flow rate exceeds pressure rating of pump.	Compare pump pressure and flow rate against pump performance chart. Reduce system pressure requirement. Increase pressure capability of pump.
L. Obstruction in suction piping.	Locate and remove obstruction. Attach strainer.
M. Suction lift too high.	Check with gauge or measure vertical distance between water surface and center line of pump, allowing for friction loss in suction pipe. Reduce rate of flow to obtain desired lift. Refer to pump performance chart.
N. Discharge head too low.	Decrease rate of flow.
O. Suction inlet not immersed deep enough.	Refer to "Installation".
P. Leaky suction line or connection admitting air.	Repair or replace suction line. Tighten connections.

PUMP ENGINE OPERATION AND MAINTENANCE

Engine Safety Precautions:

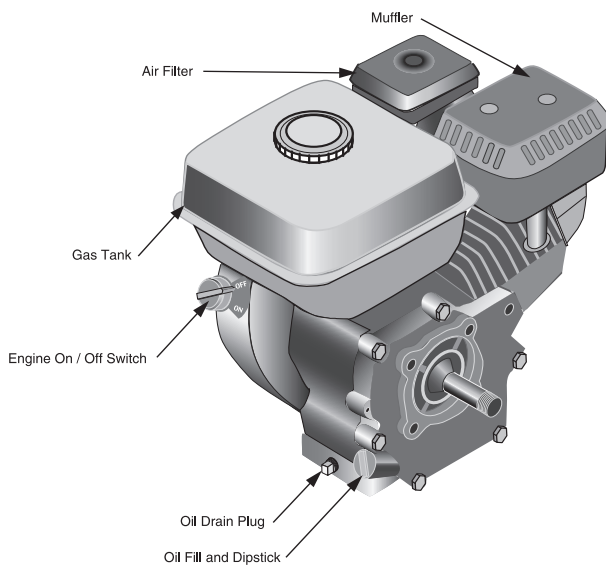
⚠️ WARNING **Fire and explosion hazard.** Gasoline can explode. Store gasoline away from the engine. Add gasoline to the engine only when the engine is off.

⚠️ WARNING **Burn hazard.** Hot surface. The engine gets very hot during operation. Do not touch the engine surfaces. Keep children away. Allow the engine to cool before moving it indoors.

⚠️ WARNING **Deadly fumes.** Carbon monoxide. Never run the engine in an enclosed space. Only use outdoors with plenty of ventilation.

Engine Operation

Before starting the engine:



Check and Fill Oil

The engine is shipped **without oil**. It must be filled before starting the engine.

Fill with oil by removing the fill cap / dipstick. Add oil until the level reaches the bottom of the opening. Check the oil level by pushing the cleaned dipstick into the oil-fill opening. **DO NOT SCREW IT IN.** Remove the dipstick and inspect it. Add oil if needed. Reinstall the cap / dipstick.

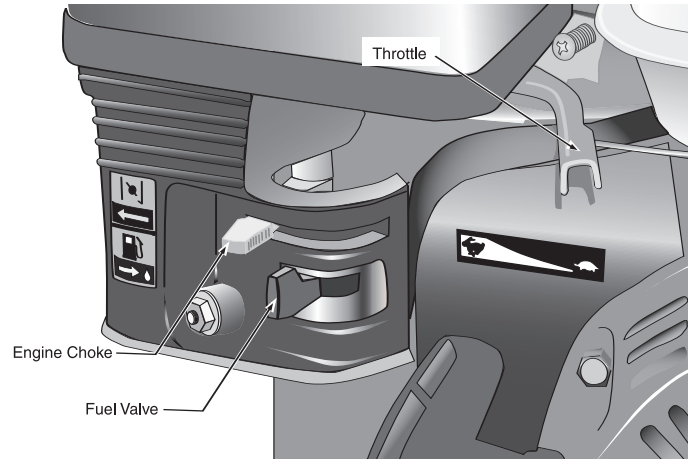
Oil capacity is 20 ounces (0.6 liter). #10W-30 oil should be used in normal conditions. Use #40W oil if the engine is to be run in temperatures over 90°F (32°C).

Note that the engine has a low-oil monitoring system. If the oil level drops too low, the system will automatically turn off the engine.

Add Gasoline

Fill gas tank with clean, fresh gasoline. This should be unleaded fuel that has an octane rating of 86 or higher.

Do not fill the tank to overflowing. Clean up any spilled gasoline before starting the engine.



Open Fuel Valve

Move the fuel valve to the right to allow fuel to the engine.

Close Choke

When starting a cold engine, move the choke control to the left (closed). As the engine warms up, move it towards the right (open). A warm engine should start with the choke open.

Position Throttle

Move the throttle (speed control) slightly to the left.

Turn Engine Switch On

The engine switch controls the ignition. Turn it to the "ON" position to start the engine. The same control is used to stop the engine.

Pull Starter

Pull the handle on the recoil starter. Adjust throttle to desired speed. Move the choke to the right as engine warms.

Stopping the Engine

Stop the engine by turning the engine switch to "OFF."

Move the fuel valve to "OFF" (left).

Engine Maintenance

Air Filter

The air filter should be checked every month for dust and dirt accumulation. Every 6 months, the filter element should be removed and cleaned. Clean the foam element with detergent and warm water. Squeeze out excess water and let it dry. Before reinstalling the filter element, soak it with engine oil and squeeze out the excess. Reinstall the filter. The engine will smoke upon start-up if too much oil is left in the filter element.

Oil Level

The oil level should be checked before each use.

Oil Change

The oil should be changed in the first month, and then every 6 months (or 100 hours of operation). To drain the oil, run the engine until warm. Turn off the engine, remove the oil drain plug, and let the the oil drain into a pan. Reinstall the plug and fill with oil. (Capacity: 20 ounces.)

NOTE: Dispose of used oil responsibly. DO NOT pour it down drains, onto the ground or put it in the trash. Most communities have collection points for used oil.

Spark Plug

The spark plug should be checked and cleaned every 6 months or 100 hours.

The spark plug should be replaced if it is damaged or excessively worn.

The spark plug is type BPR6ES (NGK) or equivalent. The plug gap should be 0.030 in. (0.75 mm).

Engine Troubleshooting

If the engine won't start:

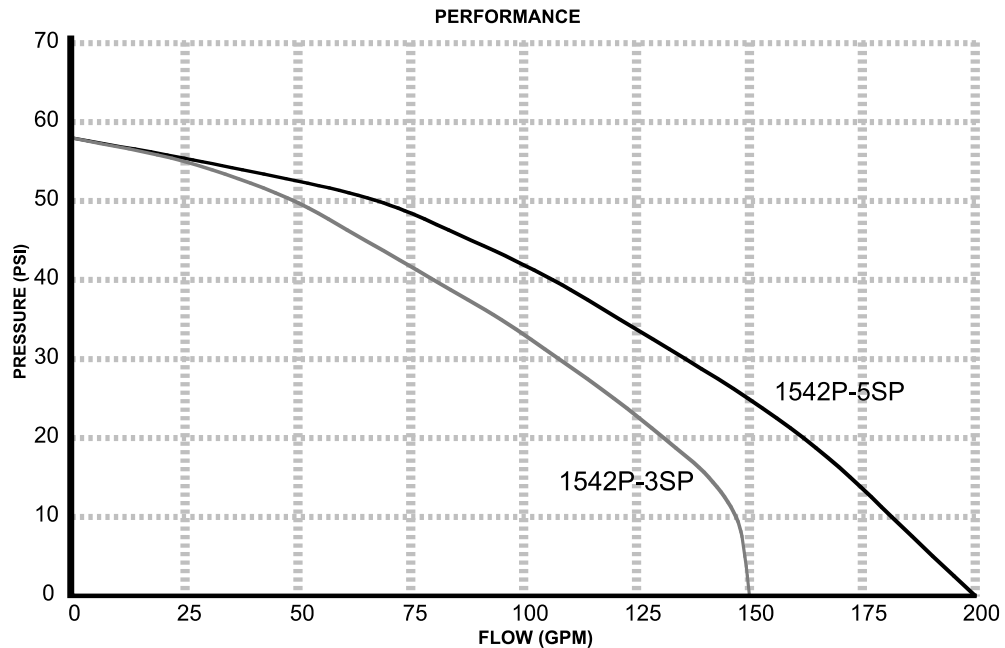
- Check that there is gas in the tank.
- Make sure the fuel valve is "ON" and that the engine switch is "ON."
- Make sure there is enough oil in the engine to reset the low-oil sensor.
- Check that fuel is getting to the carburetor.*
- Check for spark at the spark plug.*

* These checks to be done by persons with small-engine experience.

Extended Storage

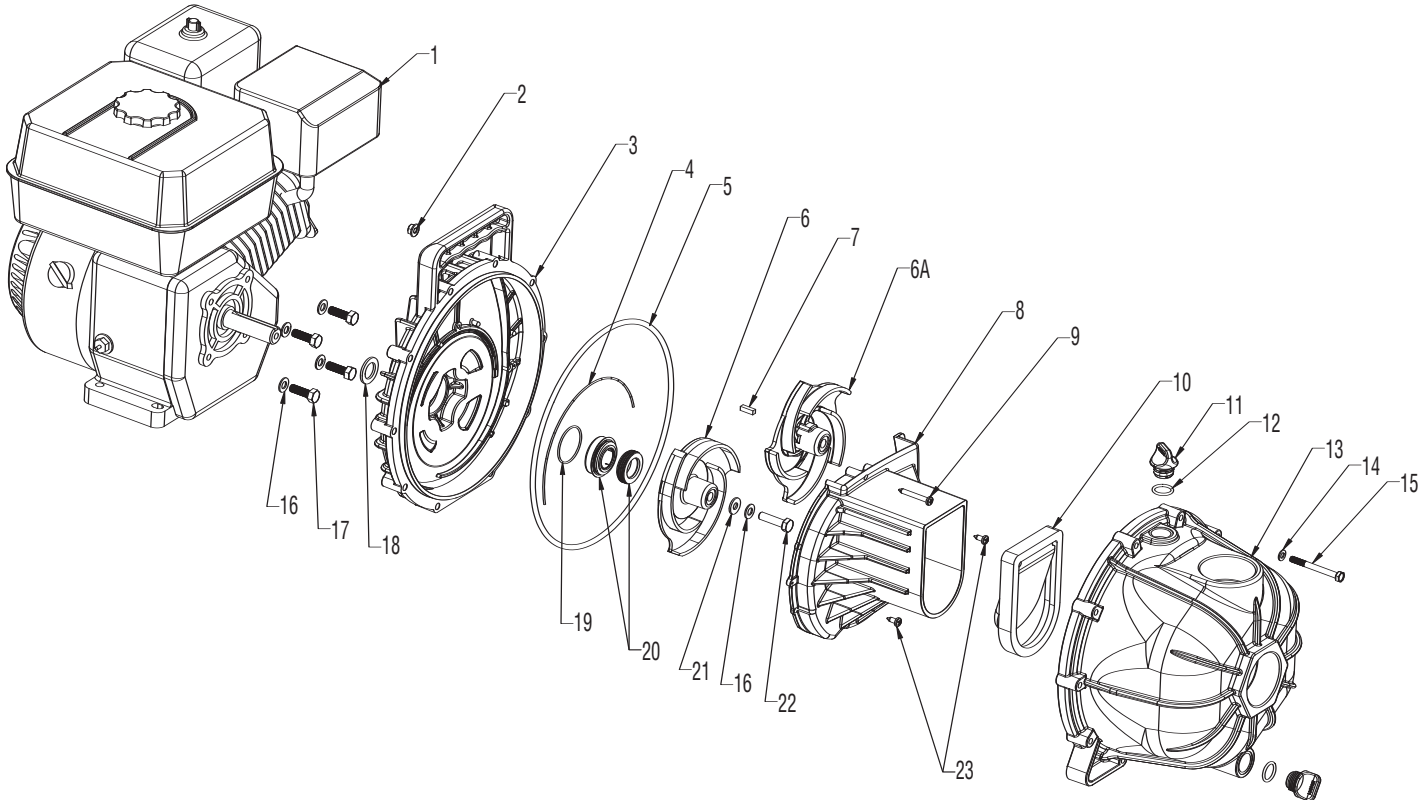
If the pump will be stored for more than a month or two, follow the steps below:

- drain gasoline.
- change oil.
- squirt oil (or a chemical made for storing engines) in the spark plug hole.
- rotate engine slowly until resistance is felt. (This indicates that both valves are closed.)
- install spark plug.
- cover engine.



	Feet	0	12	23	35	46	58	69	81	92	104	115	127	134
PERFORMANCE	PSI	0	5	10	15	20	25	30	35	40	45	50	55	58
1542P-3SP	GPM	150	149	147	141	131	120	108	95	80	65	48	25	0
1542P-5SP	GPM	200	191	182	172	162	150	136	121	106	89	65	29	0

1542P-3SP, 1542P-5SP Gasoline Engine-Driven Plastic Transfer Pump



Seal Repair Kit 3430-0635 contains:

(1) Ref. 4 Diffuser Gasket, (1) Ref. 5 Pump Body O-Ring, (1) Ref. 19 Seal O-Ring, (1) Ref. 20 Mechanical Seal, and (1) Ref. 21 Impeller Gasket

Viton Seal Repair Kit 3430-0659 contains:

(1) Ref. 4 Diffuser Gasket, (1) Ref. 5 Pump Body O-Ring, (1) Ref. 10 Flapper Valve, (1) Ref. 19 Seal O-Ring, (1) Ref. 20 Mechanical Seal, and (1) Ref. 21 Impeller Gasket

Pump Head Kit 3430-0637 (1542P-3SP) Includes all items less 1, 6A and 7.

Pump Head Kit 3430-0648 (1542P-5SP) Includes all items less 1 and 6.

Optional Viton Pump Head Kit 3430-0660 (1542P-3SP) Includes all items less 1, 6A and 7.

Optional Viton Pump Head Kit 3430-0661 (1542P-5SP) Includes all items less 1 and 6.

Ref#	Torque Spec.
#17	10 ft-lbs.
#22	10 ft-lbs.
#15	45 in-lbs.

REF. NO.	QTY.	PART NO.	DESCRIPTION
1	1	2541-0043	5.5 HP PowerPro Gas Engine (1542P-3SP)
1A	1	2541-0045	6.5 HP PowerPro Gas Engine (1542P-5SP)
2	10	2250-0087	Hex Flange Nut, M6
3	1	0750-1540P	Mounting Flange
4	1	1700-0209	Diffuser Gasket
5	1	1720-0229	Pump Body O-Ring
6	1	0400-1540P	3 Vane Impeller (1542P-3SP)
6A	1	0401-1540P	5 Vane Impeller (1542P-5SP)
7	1	1610-0044	Key 3/16 X 5/8 SS (1542P-5SP)
8	1	0150-1540P	Diffuser
9	1	2210-0144	Diffuser Mounting Screw (Long)
10	1	1700-0208	Flapper Valve
11	2	2404-0350P	Fill/Drain Plug

REF. NO.	QTY.	PART NO.	DESCRIPTION
12	2	1720-0035	Plug O-Ring
13	1	0100-1540P	Pump Housing
14	10	2270-0115	Flat Washer 6M
15	10	2210-0141	Bolt 6M X1 X 60
16	5	2270-0114	Washer 5/16 SS
17	4	2210-0143	Mounting Bolt 5/16-24 X 1
18	1	1410-0083	Slinger Ring
19	1	1720-0231	Seal O-Ring
20	1	2120-0044	Mechanical Seal
21	1	1700-0210	Impeller Gasket
22	1	2210-0142	Impeller Bolt 5/16-24 X 1-1/4
23	2	2210-0145	Diffuser Mounting Screw (Short)

Notes

Limited Warranty on Hypro Pumps and Other Hypro Products

Hypro ("Hypro") warrants to the original purchaser of its products (the "Purchaser") that such products will be free from defects in material and workmanship under normal use for the period of one (1) year for all products except: oil crankcase plunger pumps will be free from defects in material and workmanship under normal use for the period of five (5) years, and accessories will be free from defects in material and workmanship under normal use for the period of ninety (90) days. In addition, Hypro warrants to the purchaser all forged brass pump manifolds will be free from defects in material and workmanship under normal use and from damage resulting from environmental conditions for the life of the pump.

"Normal use" does not include use in excess of recommended maximum speeds, pressures, vacuums and temperatures, or use requiring handling of fluids not compatible with component materials, as noted in Hypro product catalogs, technical literature, and instructions. This warranty does not cover freight damage, freezing damage, normal wear and tear, or damage caused by misapplication, fault, negligence, alterations, or repair that affects the performance or reliability of the product.

THIS WARRANTY IS EXCLUSIVE. HYPRO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Hypro's obligation under this warranty is, at Hypro's option, to either repair or replace the product upon return of the entire product to the Hypro factory in accordance with the return procedures set forth below. **THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.**

IN NO EVENT SHALL HYPRO BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR OTHERWISE.

Return Procedures

All pumps or products must be flushed of any chemical (ref. OSHA Section 0910.1200 (d)(e)(f)(g)(h) and hazardous chemicals must be labeled before being shipped* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data sheet from the Purchaser for any pump or product Hypro deems necessary. Hypro reserves the right to "disposition as scrap" pumps or products returned which contain unknown substances, or to charge for any and all costs incurred for chemical testing and proper disposal of components containing unknown substances. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown substances.

For technical or application assistance, call the **Hypro Technical/Application number: 1-800-445-8360. To obtain service or warranty assistance, call the Hypro Service and Warranty number: 1-800-468-3428; or call the Hypro Service and Warranty FAX: (651)766-6618.**

Be prepared to give Hypro full details of the problem, including the following information:

1. Model number and the date and from whom you purchased your pump.
2. A brief description of the pump problem, including the following:
 - Liquid pumped. State the pH and any non-soluble materials, and give the generic or trade name.
 - Temperature of the liquid and ambient environment.
 - Suction lift or vacuum (measured at the pump).
 - Discharge pressure.
 - Size, type, and mesh of the suction strainer.
 - Drive type (gas engine/electric motor; direct/belt drive; tractor PTO) and rpm of pump.
 - Viscosity (of oil, or other than water weight liquid).
 - Elevation from the pump to the discharge point.
 - Size and material of suction and discharge line.
 - Type of spray gun, orifice size, unloader/relief valve.

Hypro may request additional information and may require a sketch to illustrate the problem.

Contact the factory to receive a return material authorization before sending the product. All pumps returned for warranty work should be sent shipping charges prepaid to:

Hypro
Attention: Service Department
375 Fifth Avenue NW
New Brighton, Minnesota 55112

*Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

