

# MIGHTY ♦ QUIP

Contractor Series **IndustriesUSA**

## TRASH PUMP OWNER'S MANUAL



Quality  
Environmentally  
Responsible

# **OWNER'S MANUAL**

## **GASOLINE DISPLACEMENT PUMP**



## Pride of Ownership

Welcome to the Mighty-Quip family and we congratulate you on your smart purchase of our equipment. Might-Quip Industries is in the forefront of innovation, integrity, and personal customer service. We are a leader in the manufacturing, importing or assembling of custom complex construction equipment and supplies worldwide. We thank you for your purchase and welcome you-our customer-to our family.

Mighty-Quip, Cub Generators and EcoGreen Generators are registered trademarks of Mighty-quip Industries.

For Your Records Please Record

Date Of Purchase \_\_\_ \_\_\_ \_\_\_

Model # \_\_\_\_\_

Serial Number \_\_\_\_\_

## PREFACE

Thank you for purchasing products from us. We appreciate your business. This manual is only a guide to assist you and is not a complete or comprehensive manual of all aspects of maintaining and repairing your engine. The equipment you have purchased is a complex piece of machinery. We recommend that that you consult with a dealer if you have doubts or concerns as to your experience or ability to properly maintain or repair your engine. You will save time and the inconvenience of having to go back to the store if you choose to write or call us concerning missing parts, service questions, operating advice, and/or assembly questions. Our gasoline displacement water pumps have some of the following features:

- Lightweight construction
- High pressure aluminum alloy construction
- Hard working four-stroke gasoline internal combustion engine
- Large fuel tank
- High quality mechanical seals
- Self-priming structure

Air-cooled gasoline displacement pumps are self-priming single-stage centrifugal displacement pumps. The bodies of the displacement pumps are constructed of high quality die-cast aluminum alloy. The internal rotating rings are constructed of ceramics and the stationary rings are constructed of graphite. The water pumps are widely used in fieldwork and on construction sites. Our water pumps provide a portable mobile solution in pumping liquids from one place to another.

This manual will explain how to operate and service your engine.

If you have any questions or suggestions about this manual, please contact your local dealer or us. ***Consumers should notice that this manual might differ slightly from the actual product as more improvements are made to our products. Some of the pictures in this manual may differ slightly from the actual product as well. We reserves the right to make changes at any time without notice and without incurring any obligation.***

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## OVERVIEW OF VARIOUS MODELS OF DISPLACEMENT PUMPS

Figure 1. Overall view of the BP2C gasoline displacement pump unit

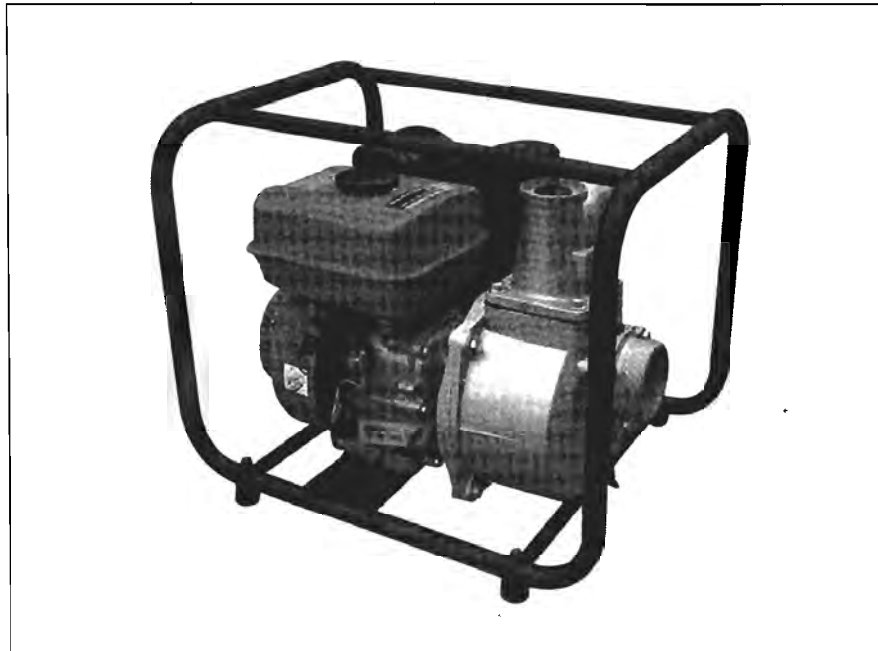
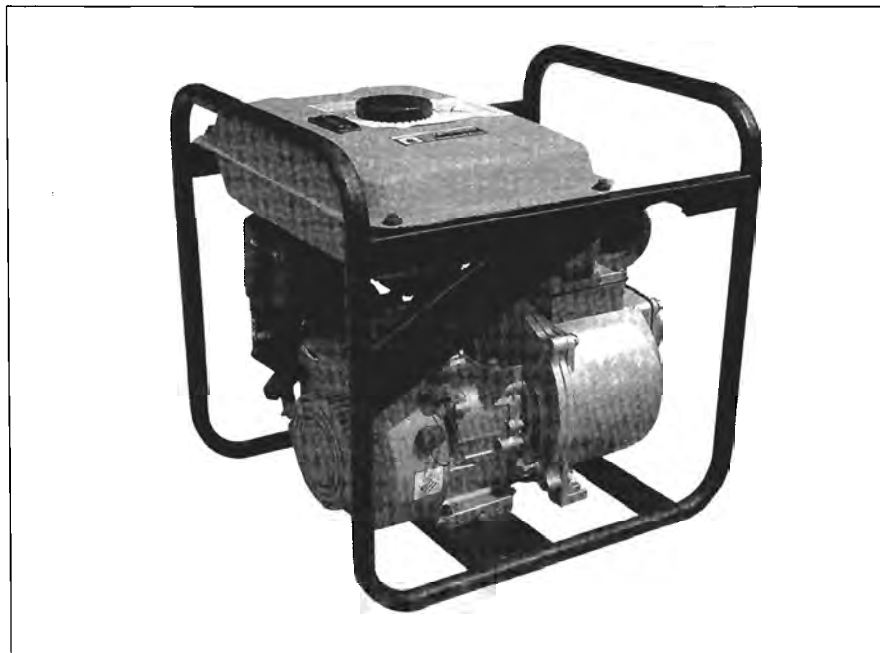


Figure 2. Overall view of the BP3L-1 gasoline displacement pump unit



## TECHNICAL SPECIFICATIONS

**Table 1. Specifications in Metric units**

	<b>Model</b>	<b>BP2C</b>	<b>BP3L-1</b>
<b>Pump</b>	Suction port diameter(mm)	50	80
	Discharge port diameter(mm)	50	80
	Max suction head(m)	8	8
	Total head(m)	26	28
	Max flow rate(L/min)	600	1000
<b>Engine</b>	Engine type	200F	
	Speed(rpm)	3600	
	Displacement(cc)	196	
	Max. Output(Kw)	4.9	
	Max. Torque(N-m)	10 N-m @ 2500 rpm	
	Cooling system	Forced Air	
	Ignition	Transistorized pointless	
	Shaft rotation	Counterclockwise	
	Length × Width × Height(mm)	457 × 559 × 533	457 × 559 × 533
	Dry Weight(kgs)	29	31

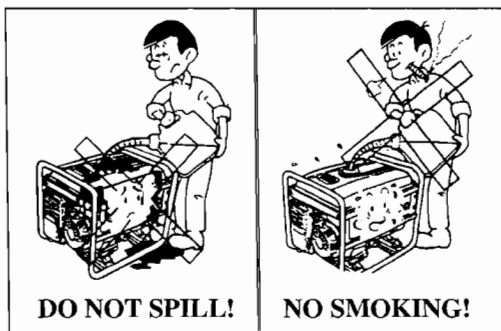
### Technical specifications in English units

	<b>Model</b>	<b>BP2C</b>	<b>BP3L-1</b>
<b>Pump</b>	Suction port diameter(in)	2	3
	Discharge port diameter(in)	2	3
	Max suction head(ft)	26.3	26.3
	Total head(ft)	85.3	91.9
	Max flow rate(US gal/min)	159	264
<b>Engine</b>	Engine type	200F	
	Speed(rpm)	3600	
	Displacement(cu.in)	11.96	
	Max. Output(HP)	6.5	
	Max. Torque(lb-ft)	7.4 lb-ft @ 2500 rpm	
	Cooling system	Forced Air	
	Ignition	Transistorized pointless	
	Shaft rotation	Counterclockwise	
	Length × Width × Height(in)	18 × 22 × 21	18 × 22 × 21
	Dry Weight(lbs)	63.9	68.3

## DISPLACEMENT PUMP SAFETY PRECAUTIONS

Below are some safety precautions to follow for safe operation of your gasoline displacement pump.

- Gasoline is extremely flammable and explosive. Do not smoke or allow flames or sparks to get near gasoline. Always refuel your engine in a well ventilated place. Do not overfill the tank and always close the filler cap securely.

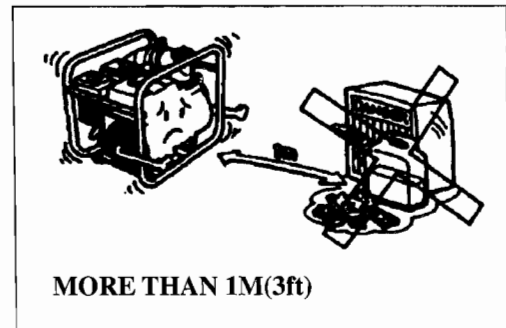


- Never run the pump indoors as the engine emits poisonous carbon monoxide.



- Never touch the muffler during or just after operation; as the engine and muffler get hot. Always let the engine fully cool before touching and storing the pump indoors.
- Always keep the pump at least 1 meter (3 feet) away from buildings and other equipment during operation. Do not place flammable

objects or liquids close to the pump.

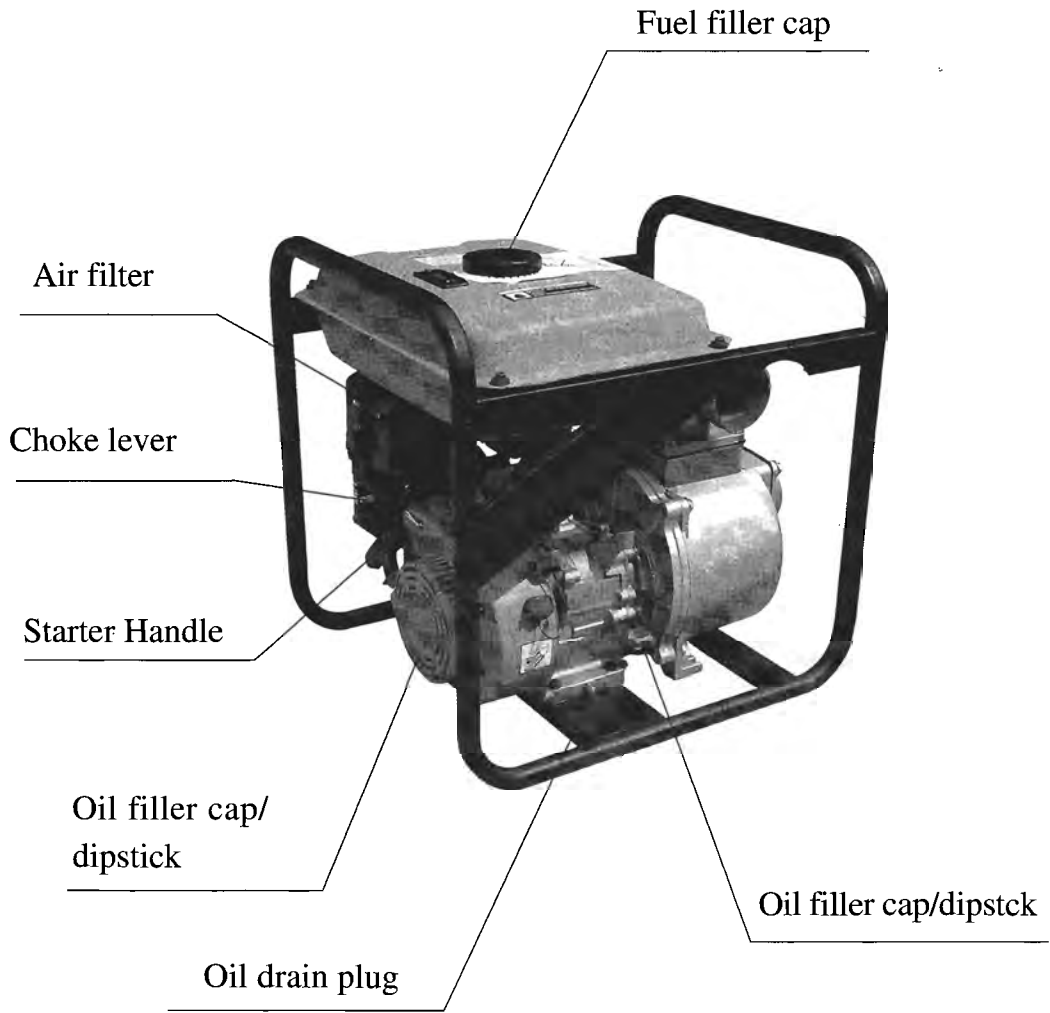


- Before operating your displacement pump, please check your local laws and regulations before operating your pump. It is illegal in some areas to operate an engine without a spark arrester; therefore, a spark arrester is available as an optional part for this pump.
- Know all the pumps controls and know how to stop the pump quickly in the event of an emergency. Do not let anyone without proper instructions operate the pump.
- Always keep children and pets away from the pump.
- Do not pump flammable or corrosive to prolong the life of your pump, avoid pumping corrosive liquids such as seawater, chemical solutions, used oil, or acidic liquids.
- Always operate your pump on a level surface. If the pump is tilted, fuel may spill and rapid wear might occur as a result of inadequate lubrication.



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## KNOWING YOUR DISPLACEMENT PUMP



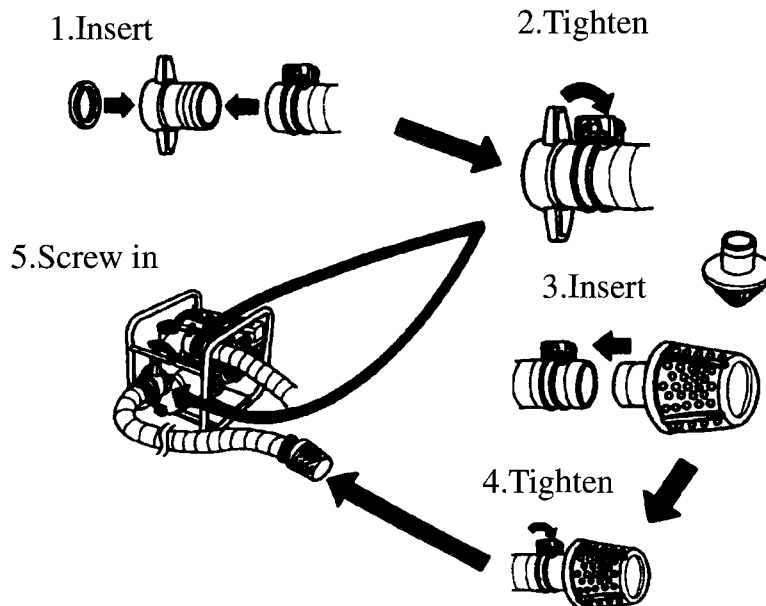
## PER-OPERATION PREPARATION

### Suction Hose

The first step in preparing the pump for operation is to install the suction hose. For the suction hose, use a reinforced-wall or wire braided hose to prevent suction collapse. A short hose is recommended over a long hose. This pumps have standard National Pipe Threads on them; therefore, any standard hose set will fit with the pump. If your hoses are metric threads or any other standard, please give our company a call we carry a full line of adapters or provide you with a possible solution.

NOTE: Always install the provided strainer on the end of the suction hose before pumping. If gravel or debris enters the pump, the impeller can be seriously damaged.

*Shown below is the pump hose utilizing a barbed connection and hose clamp. If you already have specialized hose, disregard the following diagram. When using the barbed connection setup, make sure to use a hose clamp to properly secure the hose to the barb connector.*



### Discharge hose

The second step is to install the discharge hose. The discharge hose can be fabric, just make sure to use a hose clamp to secure the hose to the barb. This will prevent the hose from disconnecting under high pressure.

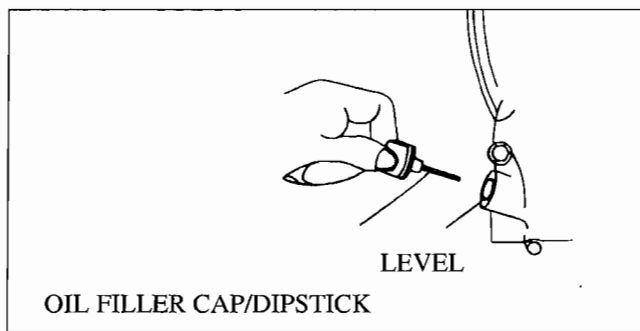
Note: A short and large-diameter hose is preferred over any other. A short and large diameter will provide lower fluid friction and improve efficiency.

## Engine oil

Engine oil is an important factor in determining the performance and life of your engine. Always make sure the oil level is within the upper and lower limits specified on the oil dipstick. Make sure to check the engine oil on a level surface or incorrect readings will result.

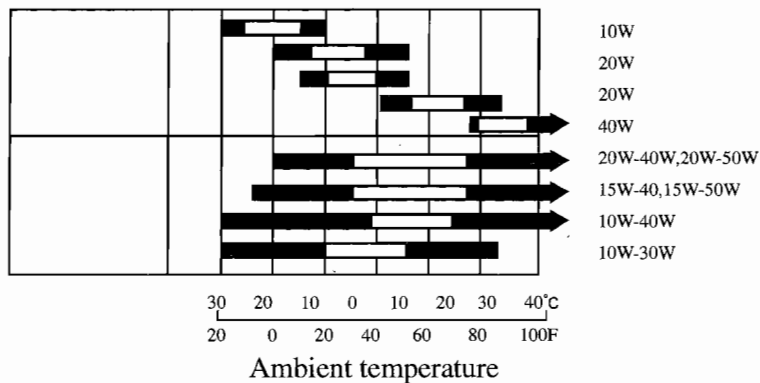
- To check the engine oil, first, remove the oil dipstick by turning counterclockwise.
- Wipe the dipstick clean and insert the dipstick back into the oil filler neck. Do not screw it in. Please refer to Fig 2-1.
- If the level is low, fill engine oil to the top of the oil filler neck with the recommended oil below.

*Fig 2-1. Illustration of checking the engine oil*



Below is a table of recommended oil grades for the engine in various weather conditions. Please use the proper oil according to the Table 2-1.

*Table 2-1. Ambient temperature versus oil grades*



Note: Using non-detergent oil or 2-stroke engine oil could shorten the engine's service life. Also, insufficient oil can cause major engine damage.

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## Fuel

Remove the fuel cap and fill the fuel tank with 86+octane fuel. The preferred fuel for the gasoline fire pump is regular unleaded, which can be easily obtained from a station. Any unleaded fuel with an octane number of 86 or our company. Uses of fuels that contain alcohol are okay with the exception that their octane numbers meet those recommended by our company or dealers. **If you decide to use alcohol-based fuels, your warranty will be void as alcohol fuels are not the perfect fuel of choice.**

**Note:** Lower octane numbers can cause your engine to knock. Knocking can lead to severe engine damage. Please use an octane of 86 or higher. Also, gasoline is extremely flammable; to avoid injury and damage to your engine, please refill your engine in a well-ventilated area free from sparks and smoking. Keep gasoline away from children and animals.

**Note:** If your engine is knocking or pinging at steady speeds, please stop the pump and change the gasoline. If knocking or pinging is still occurring after the fuel has been replace, please contact an authorized service dealer for further instructions. Failure to do so is considered misuse and is therefore not covered under warranty.

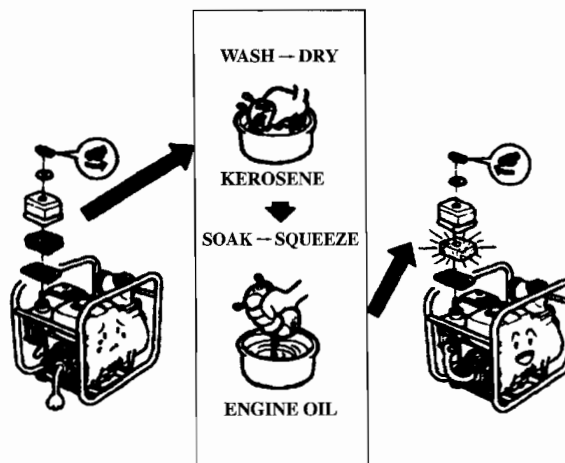
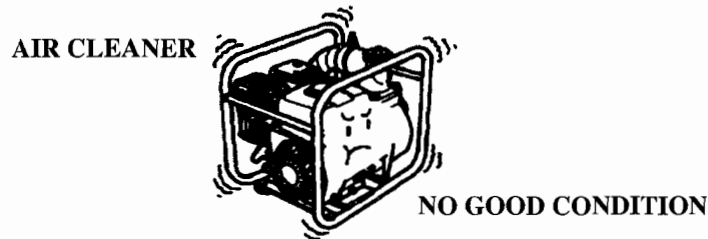
The capacity of your fuel tank is 3.6 liters or 0.95 US gallons.

Gasoline is extremely flammable and explosive. Do not smoke or allow flames or sparks to get near gasoline. Always refuel your engine in a well-ventilated place. Do not overfill the tank and always close the filler cap securely.



## Air Cleaner

Before starting your displacement pump, remove your air cleaner cover and verify that the air filter is clean and free of debris. Clean the air filter if necessary.



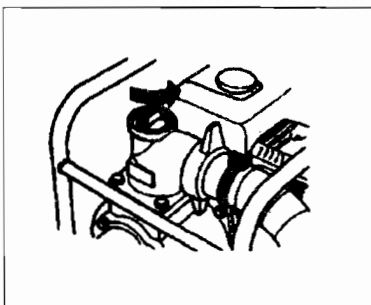
## 3-6 Priming water

The pump chamber should be completely filled before operating.

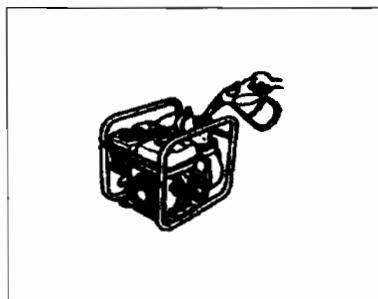
Note: Never operate the pump without priming water or the pump will overheat. Prolonged operation of the pump under these dry conditions will damage and destroy the seal.

Follow these guidelines to fill the pump with priming water.

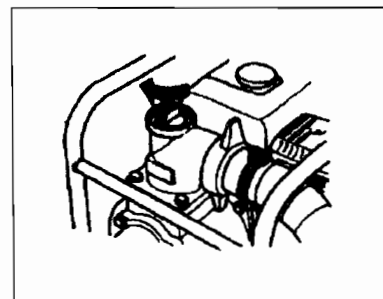
1. Remove plug



2. Fill water

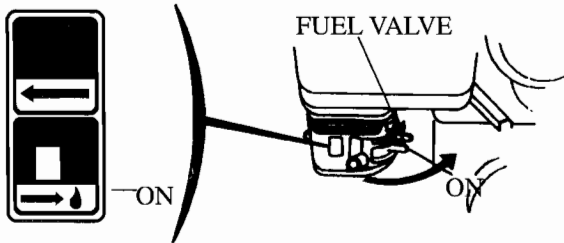


3. Install plug

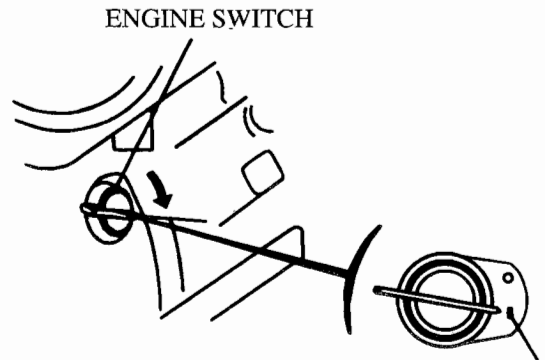


## STARTING THE ENGINE

Turn the fuel valve to the ON position.

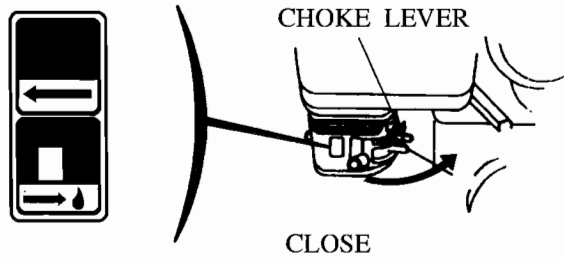


Turn the engine switch to the ON position. With the recoil starter, pull the handle fast.

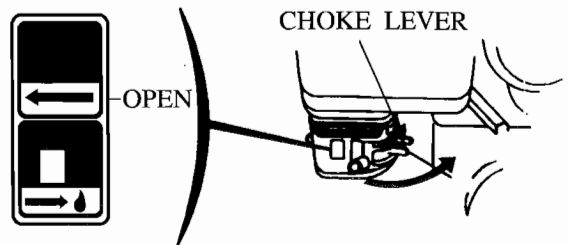


Move the choke lever to the CLOSED position.

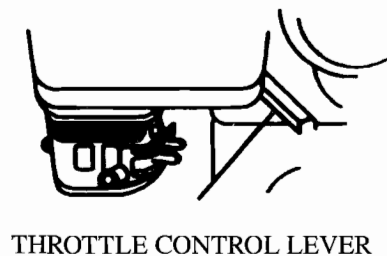
Note: If the engine is warm or the air temperature is high, do not use the choke



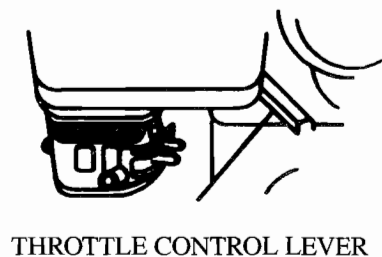
Adjust the throttle control lever until you reach the desired speed.



Move the throttle control lever slightly to the left.



Adjust the throttle control lever until you reach the desired speed.



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## OPERATION

### Oil alert system

Some engines are equipped with the oil alert system. The oil alert system's primary function is to shut down the engine before the oil in the engine falls below a safe limit. You cannot start the engine if the oil is low. The oil alert system will continue to shut down the engine as long as the oil level is low. To fix this problem, fill the oil to a suitable level before restarting the engine.

### Operating conditions

The water pumps operating range should be based upon the NPSH(net positive suction head). A more precise definition of available NPSH is "the difference between the total suction head and the vapor pressure of the liquid, in feet of liquid, at the suction flange". We can measure the total suction head of the pump and we can find vapor pressure from the liquid temperature. The difference between these two values is the available NPSH. The following equation is the mathematical expression of the definition for available NPSH:

$$h_{sv}=h_{sa} -h_{vpa} \quad \text{where:}$$

$h_{sv}$ =available net positive suction head, in feet of liquid

$h_{sa}$  =total suction head, in feet of liquid, absolute

$h_{vpa}$ =vapor pressure of liquid at suction nozzle, in feet of liquid, absolute

The approximation will be based at an altitude less than 250 meters or 820 feet. Subtracting 10 meters or 32.8 feet from the net positive suction head can approximate the suction head of the pump. When increasing the altitude of operation, the atmosphere should be decreased as well as the suction head of the pump. The amount of decrease can be estimated by subtracting 10 meters from the local atmosphere value. If you are using your pump at high altitudes and having difficulty obtaining NPSH values, please consult your local power equipment dealer.

It is better to use a straight and short pipeline when operating the fire pump. A short and straight pipeline will minimize the frictional losses in the pipeline. The pipeline should be fixed to something to avoid vibrations. Before operating the pump, you must check the connections between the pump and pipelines to verify that everything is installed properly and that there are no leaks of any kind.

The filter net should be kept at a certain distance between the river surface, river bottom, and riverbank. The net must also be submerged at least .3 meters or 1 foot below the water surface to avoid sucking air into the pipeline. The net must also be .2 meters or .7 feet above the river bottom or riverbank to avoid sucking stones or weeds into the pipeline.

If the gap between the impeller and flow guidance surface is over 1 mm, an adjustment shim can be added on the shaft shoulder to reduce the gap. This will permit continuous use of the displacement pump. Please refer to figure 2-2 for a diagram of the displacement pump and a listing of the components.

### STOPPING THE ENGINE

In the event of an emergency, turning the engine switch to the “off” position can stop the engine.

Under regular conditions, follow these procedures

- Shift the throttle lever fully to the right.
- Turn the engine switch to the off position.
- Turn the fuel valve to the off position.



1. CLOSE



2. OFF



3. OFF

Note: When operating your engine in high altitudes, the fuel air mixture may be affected by the high altitude condition. In high altitudes, performance is decreased and fuel consumption is increased. Please consult with your local dealer for details on adjusting your engine high altitude conditions.



## MAINTENANCE

### Oil check

During operation, it is a good idea to check the oil every morning to ensure the engine has sufficient oil.

### Oil change

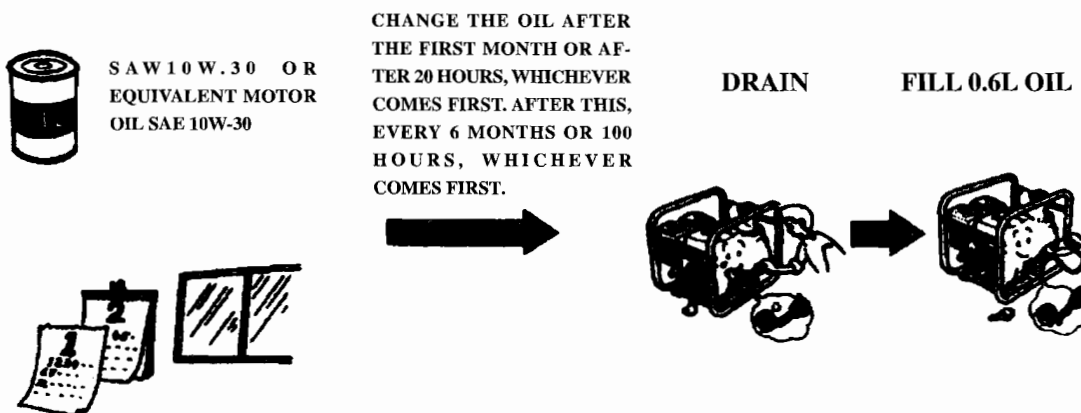
Engine oil is a critical factor in determining the life of your engine. Change the engine oil on time. Change the engine oil more frequently if the engine is used in dusty areas.

Changing the oil while the engine is still warm will yield best results for the engine. When the oil is still warm, you get rapid and complete draining of the oil.

### Oil change procedures

- Remove the oil filler cap and drain plug to drain the oil
- Install the drain plug, and tighten it securely.
- Refill with the recommended oil and check the oil level.
- Install the oil filler cap.

The engine oil capacity is .60 liters or .63 US quarts



Note: Do not touch motor oil for long periods of time. Used motor oil can cause skin cancer if it comes in contact with the skin for prolonged periods of time. Getting cancer from used motor oil is unlikely unless you handle used motor oil on a daily basis. To be safe always wash your hands thoroughly with soap and water as soon as possible after handling used oil.

Below a maintenance schedule table is provided.

REGULAR SERVICE PERIOD Performed at every indicated month or operating hour interval, whichever comes first		Each use	First month or 20 Hrs.	Every 3 month or 50 Hrs.	Every 6 month or 100 Hrs.	Every year or 300 Hrs.
ITEM						
Engine oil	Check level	0				
	Change		0		0	
Reduction gear oil (applicable models only)	Check level	0				
	Change		0			0
Air cleaner	Check	0				
	Clean			0(1)		
Sediment cup	Clean				0	
Spark plug	Check-clean				0	
Spark arrester(optional part)	Clean				0	
Valve clearance	Clean-Adjust					0(2)
Fuel tank and strainer	Clean					0(2)
Fuel line	Check (Replace if necessary)	Every 2 year(2)				

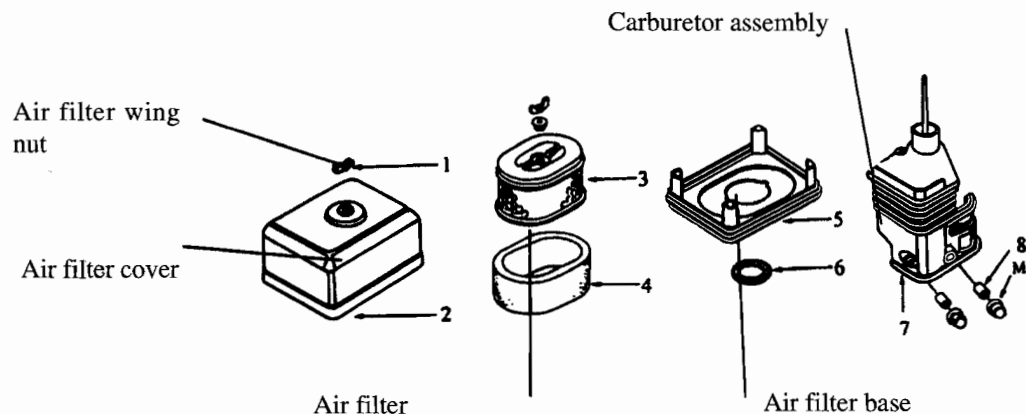
### Air filter service

A dirty or clogged air filter will prevent air from flowing freely into the carburetor assembly. Always keep the air filter clean or replace if necessary. Also, if the air filter is dirty or clogged, the performance of the engine goes down. If operating the engine in a dusty area, service the air filter more frequently as dust particles will clog the filter at a faster rate. Never run the engine without an air filter, dust particles may get into the intake system and damage the engine. Rapid engine wear will occur if the engine is run without the air filter. Do not wash the air filter if it is the paper type. Also, never use gasoline to wash air filter

elements because gasoline is highly flammable and dangerous. A fire or explosion could occur.

### Instructions on changing the air filter.

- Take the wing nut off and remove the air filter cover. Remove the elements and separate them. Check the elements for tears and holes. If holes or tears are present, replace the air filter elements.
- The foam element can be washed. Warm water and household detergent will work fine for washing the foam filter element. After washing, rinse it thoroughly with water and allow the element to dry. Soak the element in clean engine oil and squeeze the oil out. If there is too much oil left in foam element, the engine will smoke during startup.
- Tap lightly several times on a hard surface to remove excess dirt from the paper filter. Never brush on the paper element as this just forces more dirt into the paper element. Use compressed air to blow from the inside out to remove the excess dirt.



### Sediment cup cleaning

Turn the fuel valve off and remove the sediment cup with the O-ring. Wash them thoroughly in non-flammable solvent. Dry them thoroughly and reinstall them tightly. Turn the fuel valve ON and look for leaks.

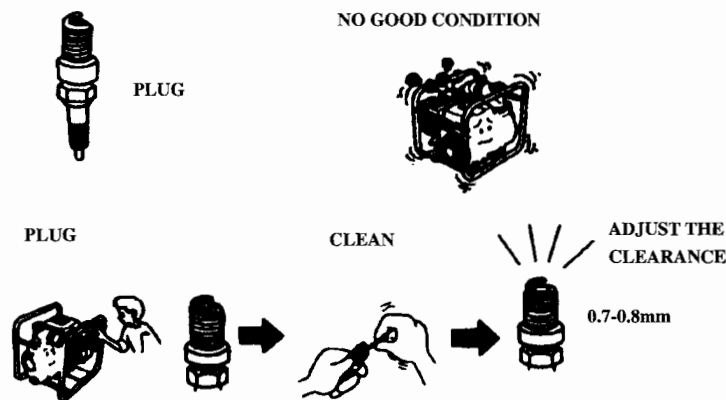
Note: Try not to spill fuel, if fuel is spilled, clean the area first before starting the engine. The engine will create a spark when started, so if there is fuel around, it may ignite the fuel causing a serious fire or explosion.

## Spark plug service

- Remove the wire from the spark plug.
- Use a deep socket or spark plug socket to remove the spark plug.
- Check for mechanical damage and or carbon buildup.
- If the spark plug is fouled, replace spark plug with new one.
- Spark plugs may come pre gapped, if not an ordinary gap of .7mm or .028 inches would do just fine. To fix a gap, bend the side of the electrode with a spark plug gapping tool.

**Note:** Make sure the replacement spark plug is in the correct heat range. An incorrect heat range spark plug can damage your engine. Also, never touch the muffler during or after the engine has been run.

- Make sure the spark plug washer is in good condition or brand-new.
- Throat the spark plug in by hand first before using a tool. This will prevent stripping the threads on the cylinder head assembly and the spark plug.
- After the spark plug has seated, tighten the spark plug with a spark plug wrench to compress the washer.



**Note:** For new spark plugs, tighten an extra 1/2 turn after the spark plug seats to compress the washer. If installing a used spark plug; tighten 1/8-1/2 turn. The spark plug must be securely tightened, or the spark plug can become very hot and damage the engine.

## Carburetor Adjustment

The carburetor is preset at the factory for optimal standard conditions. We do not recommend customers adjusting the presets for more performance out of the engine. Doing so will cause rapid wear to the engine resulting in failure of the engine. If the factory settings are changed for some reason, here are some basic guidelines to follow to reset them back.

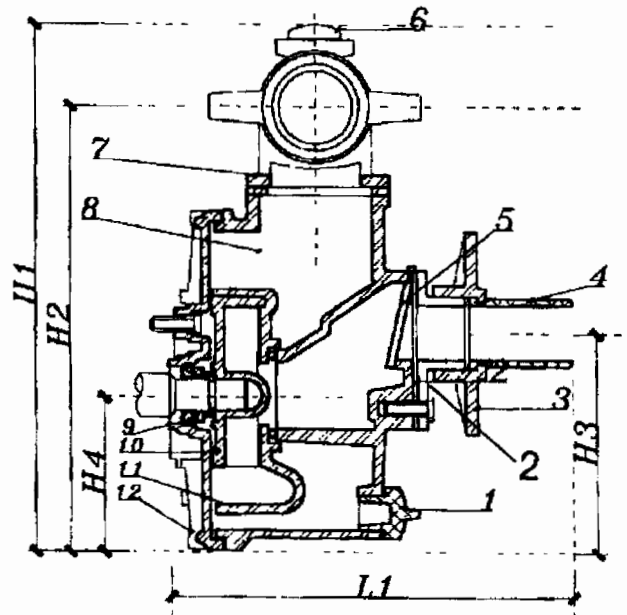
- Start the engine and allow it to warm up.
- While the engine is idling, turn the pilot screw in or out to the setting that produces the highest speed.

**Note:** Be careful not to tighten the pilot screw against its seat. Tightening the pilot screw against its seat will damage the seat.

- When the pilot screw is adjusted correctly, turn the throttle stop screw to achieve the standard idle speed; which is about  $1,400 \pm 100$  rpm.

## Pump maintenance

*Figure 2-1. Water pump diagram*



- |                        |                  |
|------------------------|------------------|
| 1.Drain screw          | 7.Outlet elbow   |
| 2.Inlet pipe connector | 8.Pump case      |
| 3.Tightening flange    | 9.Shaft seal     |
| 4.Inlet pipe           | 10.Impeller      |
| 5.Door valve           | 11.Flow guidance |
| 6.Water addition port  | 12.Pump cover    |

## DISPLACEMENT PUMP DIMENSIONS

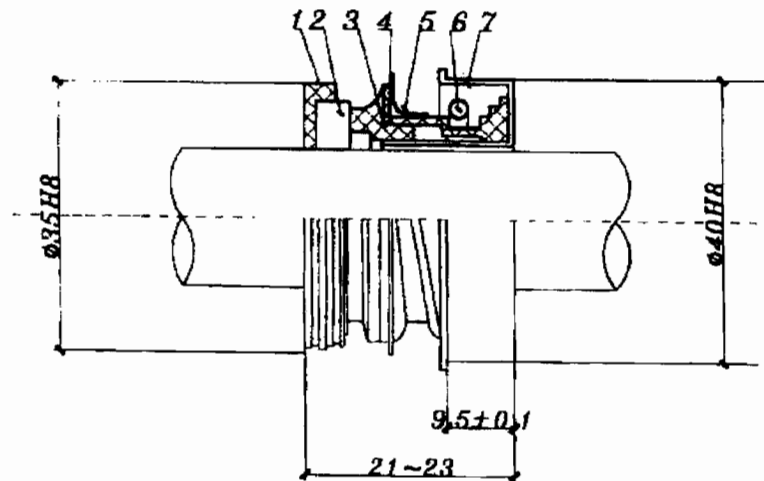
Units:mm

Type	H1	H2	H3	H4	L1
BP2L	348	297	151	106	248
BP3L	410	348	171	106	325

Units:Inches

Type	H1	H2	H3	H4	L1
BP2L	13.47	11.7	5.9	4.2	9.8
BP3L	16.1	13.7	6.7	4.2	12.8

Note: When changing the seal on the displacement pump, be sure to apply adhesive to the seal and the pump housing. This will prevent future leaks. Also while installing the seal, do not hit or apply force, as this will damage the seal. Slowly ease the seal into place. Please refer to Figure 2-3 for a cross sectional view of the housing and shaft.



1. Sealing ring
2. Ceramic ring
3. Fixed graphite ring
4. Corrugated pipe
5. Washer

Note: After operation of the pump during winter, be sure to drain all the liquid out of the pump to prevent damage to the pump. The pump may be damaged if left over liquid in the pump freezes.

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## TRANSPORTING AND STORAGE

A few guidelines need to be followed before transporting the displacement pump. Below is a list of instructions to be followed during transportation.

- When transporting the pump, turn the fuel valve off and keep the pump on a level surface to prevent fuel spillage.
- Secure the pump unit to a fixed object when transporting to prevent the pump from bouncing around. Continuous bouncing around can damage the pumps internals.

Before storing the pump for long periods of time, please follow the guidelines below.

- Clean the pump interior before stopping the pump. Remove the pump drain plug and empty all fluids from the pump. Leaving fluid in the pump will cause rapid corrosion to the impeller.
- Turn the gas tank fuel valve to the “off” position and empty all of the gasoline out of the gas tank.
- Remove the sediment cup from the engine and drain all the excess fuel from the carburetor.

Note: While dealing with gasoline, do not smoke or allow flames to come near the gasoline as gasoline is highly flammable and explosive. Failing to do so will lead to serious injuries and death.

- Change the engine oil
- Remove the spark plug and pour about a tablespoon of oil into the cylinder. Crank the engine several times and put the spark plug back into place.
- Pull the starter rope until resistance is felt. Doing this will put the cylinder on the compression stroke; where both intake and exhaust valves are closed. Having these two valves closed will prevent moisture from getting into the combustion chamber and causing corrosion.
- Cover the engine and pump and store in a dry place.

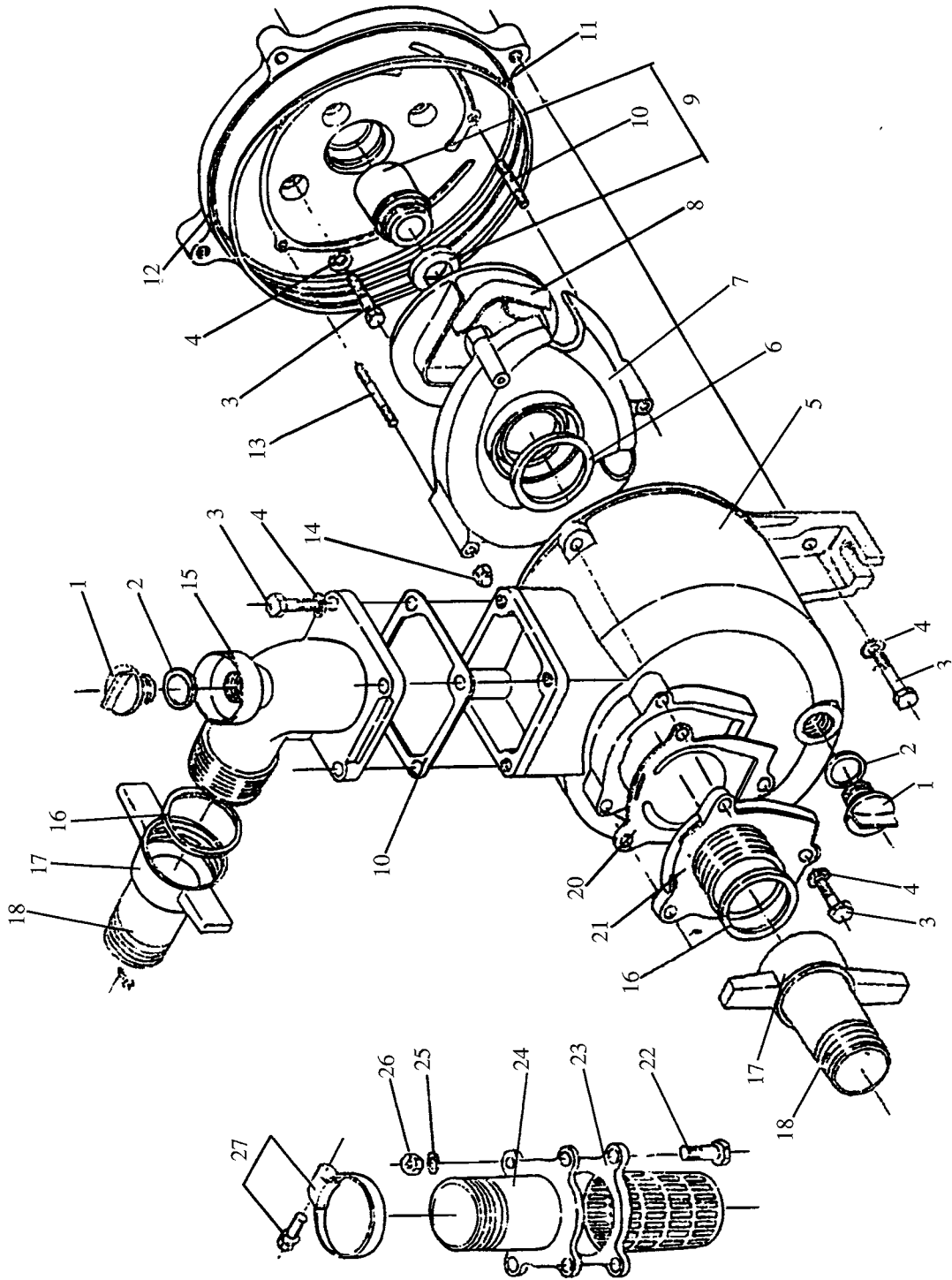
## TROUBLESHOOTING

Problem	Cause	Remedy
Pump not pumping liquid	Not enough fill water.	Refill the pump with water.
	Leaking inlet pipe.	Check the inlet pipe and connector of pipe, change pipe or tighten the clipper joint screw.
	Low pump speed.	Adjust the engine speed accordingly or find cause within the engine
	The filter net is clogged.	Check and clean the filter net.
	Capacity of the pump has been exceeded.	Check the position of the pump and fix the operating conditions as specified.
	Seal wear and leakage.	Change the seal.
Not enough water flow	The filter net, pipeline, or impeller is clogged.	Clean out the clogging matter.
	Speed is low.	Increase speed.
	Impeller or seal is seriously worn and gap is too large.	Adjust the gap or change the impeller and seal.
	Leaking inlet pipe.	Check the inlet pipe and connector of pipe, change pipe or tighten the clipper joint screw.
	Impeller damage and or serious leakage.	Change the impeller to a new one.
Flow of water is not steady or constant	The total lift is too high.	Check for the cause of the problem and adjust if necessary.
	There is air in the pump or the inlet pipe and seal are leaking.	Take the air drain cap off and release the air. Check the pipeline and or change the pump seals.
	Engine speed is not stable or constant	Adjust the speed of the engine



<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Power consumption of pump is too large	The impeller and flow guidance are rubbing each other.	Listen to the sound of the pump carefully. If there are rubbing noises, adjust the impeller until the noise is gone.
	The impeller is clogged with weeds or foreign matter.	Check and clean the pump.
No flow suddenly	The connector of the inlet pipe is loose or is leaking.	Check the inlet pipeline and fix accordingly.
	Suction head has been exceeded.	Check the suction head and lower the position of the pump.
Vibrational noises	Suction head is too high and causing cavitation.	Check the suction head and lower the position of the pump.
	Large water output.	Decrease the output of the water.
	Inlet pipe is clogged with foreign matter, so the resistance is too large.	Check the inlet pipe and filter net and clean if necessary.
	Rotary part is loose.	Listen carefully and inspect the part that causes the noise then stop the machine and adjust as necessary.
	Pump unit is loose or not installed properly.	Stop the machine and adjust the pump and engine.
	Air inside the pump unit or air inside the pipeline.	Remove the air drain screw and eliminate the air.
	Impeller damaged	Stop the machine and replace the impeller.

## PUMP DIAGRAMS AND PARTS LISTINGS



*Figure 4-1. Exploded view of the displacement pump*

**Table 4-1.** Please refer to figure 4-1 for a complete illustration of the parts

<b>No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Part Number(2 inch/3 inch)</b>
1	Drain Plug	2	BP1/BP1
2	Rubber seal	2	BP2/BP2
3	M8 × 25 bolt	15	BP3/BP3
4	Washer 8	16	BP4/BP4
5	Water pump case	1	BP5/BP5
6	Seal	1	BP6/BP6
7	Flow guidance plate	1	BP7/BP7
8	Impeller	1	BP8/BP8
9	Shaft seal	1	BP9/BP9
10	M6 × 50 bolt	2	BP10/BP10
11	Water pump seal ring	1	BP11/BP11
12	Water pump cover	1	BP12/BP12
13	M6 × 55 bolt	1	BP13/BP13
14	M6 bolt	3	BP14/BP14
15	Discharge elbow	1	BP15/BP15
16	O-ring Gasket (optional)	2	BP16/BP16
17	Flange (optional)	2	BP17/BP17
18	Barb connector (optional)	2	BP18/BP18
19	Rubber Gasket	1	BP19/BP19
20	One way valve	1	BP20/BP20
21	Suction flange	1	BP21/BP21
22	M625 bolt	4	BP22/BP22
23	Strainer	1	BP23/BP23
24	Connecting flange	1	BP24/BP24
25	Washer 6	4	BP25/BP25
26	M6 nut	4	BP26/BP26
27	Throat clip	3	BP27/BP27

### **Engine parts**

*Please refer to the 168F engine owners manual for a complete breakdown of parts and parts listings.*

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**This warranty covers engine related defective material and/or workmanship only, and not replacement or refund of the equipment to which the engine may be mounted. Nor does the warranty extend to repairs required because of:**

1. PROBLEMS CAUSED BY PARTS THAT ARE NOT ORIGINAL FACTORY PARTS.
2. Equipment controls or installations that prevent starting, cause unsatisfactory engine performance, or shorten engine life.(Contact equipment manufacturer.)
3. Leaking carburetors, clogged fuel pipes, sticking valves, or other damage, caused by using contaminated or stale fuel.(Use clean, fresh, lead-free gasoline.)
4. Parts which are scored or broken because an engine was operated with insufficient or contaminated lubricating oil, or an incorrect grade of lubricating oil ( check oil level daily or after every 8 hours of operation.Refill when necessary and change at recommended intervals.) Engine damage may occur if oil level is not properly maintained. Read Operating & Maintenance Instructions.
5. Repair or adjustment of associated parts or assemblies such as clutches, transmissions, remote controls, etc.
6. Damage or wear to parts caused by dirt, which entered the engine because of improper air cleaner maintenance, re-assembly, or use of a non-original air cleaner element or cartridge. Read Operating & Maintenance Instructions.
7. Parts damaged by over-speeding, or overheating caused by grass, debris, or dirt, which plugs or clogs the cooling fins, or flywheel area, or damage caused by operating the engine in a confined area without sufficient ventilation.
8. Engine or equipment parts broken by excessive vibration caused by a loose cutter blades unbalanced blades or loose or unbalanced impellers, improper attachment or equipment to engine crankshaft, over-speeding or other abuse in operation.
9. A bent or broken crankshaft, caused by striking a solid object with the cutter blade of a rotary lawn mower, or excessive v-belt tightness.
10. Routine tune-up or adjustment of the engine.
11. Engine or engine component failure, i.e., combustion chamber, valves, valve seats, valve guides, or burned starter motor winding, caused by the use of alternate fuels such as, liquefied petroleum, natural gas, altered gasoline's, ets.

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**Warranty is available only through distributors service dealers, Please Contact place of purchase for Service Dealer near you.**

## **CALIFORNIA & USEPA EMISSION CONTROL WARRANTY STATEMENT**

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB) are pleased to explain the Federal and California Emission Control System Warranty on your small off-road engine. In California, new small off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. Factory must warrant the emission control system on your small off-road engine for the periods of time listed above provided there has been no abuse, neglect or improper maintenance of your small off-road engine.

Your emission control system may include parts such as the carburetor, or fuel-injection system, the ignition system and catalytic converter. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, Factory will repair your small off-road engine at no cost to you including diagnosis, parts and labor.

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## List for comments from users

		Date of Manufacture	
Name of user		Model Number	
Address of user		Occupation	
Place of purchase			
Packaging conditions			
Operating conditions			
Parts conditions			
Malfunction problem			
Opinions of suggestions			