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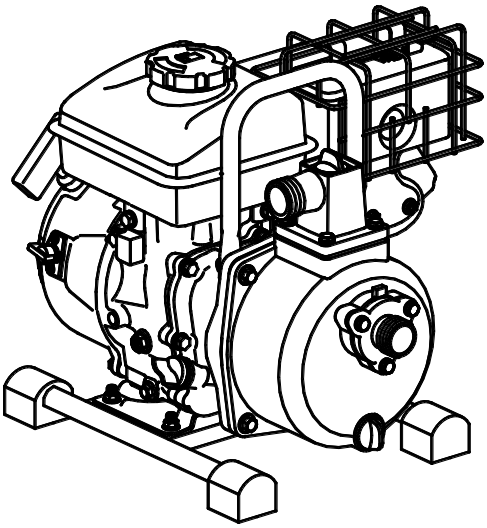
VICTOR

Water Pump
Owner's Manual

25ZB21-1.7Q

25ZB36-1.7Q



Thank you for purchasing a water pump.

This manual covers the operation and maintenance of water pump:25ZB21-1.7Q and 25ZB36-1.7Q。

The information and specifications included in this publication were in effect at the time of approval for printing.

This manual should be considered a permanent part of the pump and should remain with the pump if it is resold.

The illustration may vary according to the type.

Keep this owner′ s manual handy, so you can refer to it at any time. This owner′ s manual is considered a permanent part of the water pump and should remain with the water pump if resold.

If a problem should arise, or if you have any questions about the pump, consult an authorized dealer.

CE

CONTENTS

1. PUMP SAFETY

Your safety and the safety of others are very important. And using this water pump safely is an important responsibility.

To help you make informed decisions about safety, we have provided operating procedures and other information on labels and in this manual. This information alerts you to potential hazards that could hurt you or others.

Of course, it is not practical or possible to warn you about all the hazards associated with operating or maintaining a water pump. You must use your own good judgment.

You will find important safety information in a variety of forms, including:
Safety Labels on the pump.
Safety Messages preceded by a safety alert symbol and one of three signal words, DANGER, WARNING, or CAUTION. These signal words mean:

⚠ DANGER **You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.**

⚠ WARNING **You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.**

⚠ CAUTION **You CAN be HURT if you don't follow instructions.**

NOTICE **Your pump or other property could be damaged if you don't follow instructions.**

Safety Headings — such as IMPORTANT SAFETY INFORMATION.

Safety Section — such as PUMP SAFETY.

Instructions — how to use this pump correctly and safely.

This entire book is filled with important safety information — please read it carefully.

IMPORTANT SAFETY INFORMATION

This water pump is designed to pump only water that is not intended for human consumption, and other uses can result in injury to the operator or damage to the pump and other property.
Always make a pre-operation inspection before you start the engine. You may prevent an accident or equipment damage.

Most accidents can be prevented if you follow all instructions in this manual and on the pump. The most common hazards are discussed below, along with the best way to protect yourself and others.

Operator Responsibility

It is the operator's responsibility to provide the necessary safeguards to protect people and property. Know how to stop the pump quickly in case of emergency.
If you leave the pump for any reason, always turn the engine off. Understand the use of all controls and connections.

Be sure that anyone who operates the pump receives proper instruction. Do not let children operate the pump. Keep children and pets away from the area of operation.

Pump Operation

Pump only water that is not intended for human consumption. Pumping
flammable liquids, such as gasoline or fuel oils, can result in a fire or explosion, causing serious injury. Pumping sea water, beverages, acids, chemical solutions, or any other liquid that promotes corrosion can damage the pump or human. The water temperature is not exceed 40℃.

Refuel With Care

Gasoline is extremely flammable, and gasoline vapor can explode. Refuel outdoors, in a well-ventilated area, with the engine stopped and the pump on a level surface. Do not fill the fuel tank above the fuel strainer shoulder. Never smoke near gasoline, and keep other flames and sparks away. Always store gasoline in an approved container. Make sure that any spilled fuel has been wiped up before starting the engine. After refueling, make sure the tank cap closed properly and securely.

Hot Exhaust

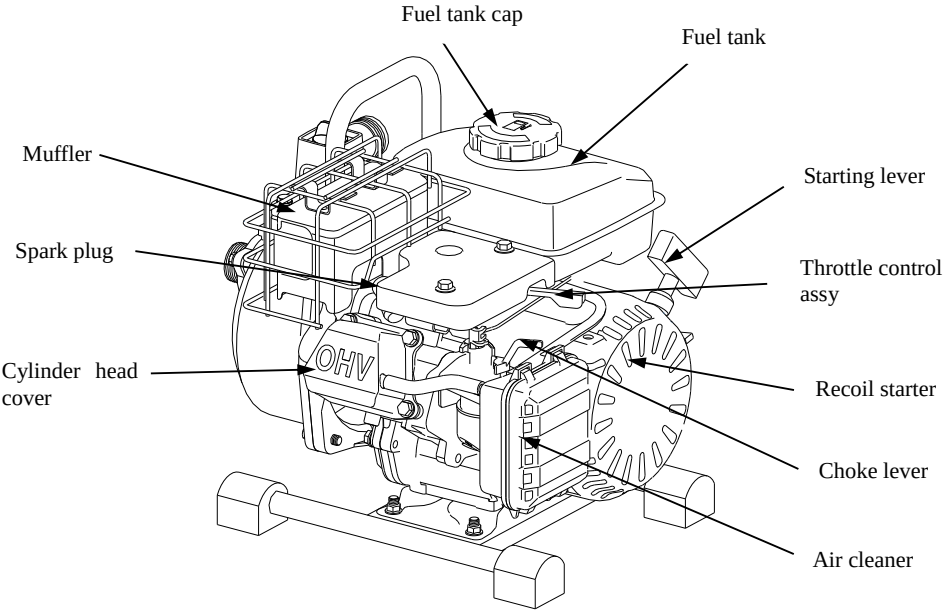
The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Let the engine cool before transporting the pump or storing it indoors.

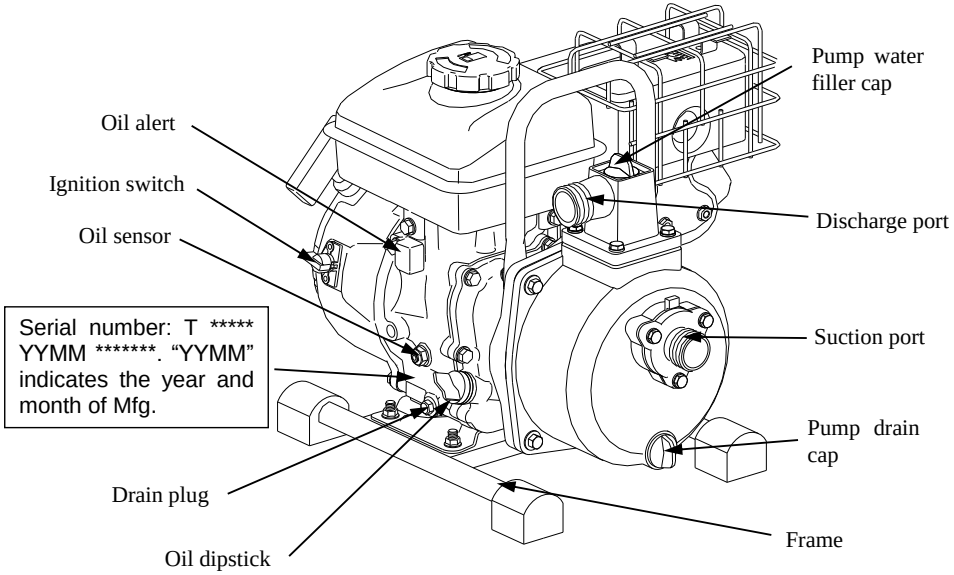
To prevent fire hazards, keep the pump at least 3 feet (1 meter) away from building walls and other equipment during operation. Do not place flammable objects close to the engine.

Carbon Monoxide Hazard

Exhaust gas contains poisonous carbon monoxide. Avoid inhalation of exhaust gas. Never run the engine in a closed garage or confined area.

2. COMPONENTS & CONTROLLOCATIONS

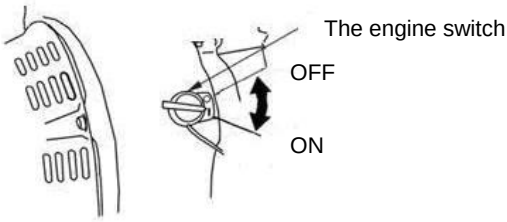




3. CONTROLS

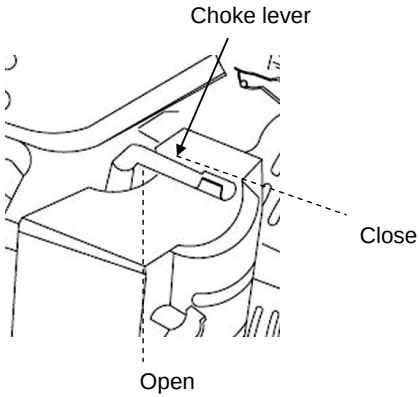
1) Engine Switch

The engine switch enables and disables the ignition system.
The engine switch must be in the ON position for the engine to run.
Turning the engine switch to the OFF position stops the engine.



2) Choke Lever

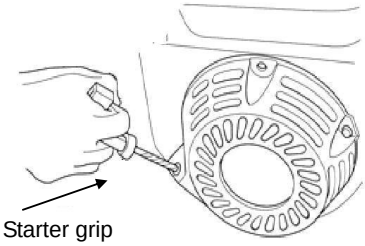
The choke lever opens and closes the choke valve in the carburetor.
Set lever “CLOSE” for starting a cold engine.
After starting, set the choke lever to “OPEN” position



3) Recoil Starter Grip

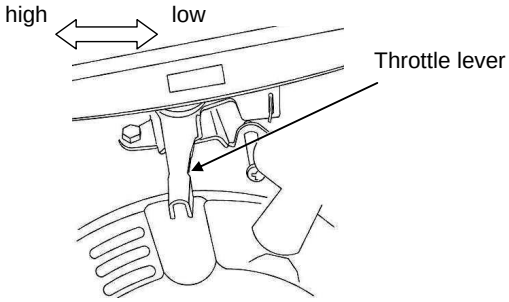
Pulling the starter grip operates the recoil starter to crank the engine.

CAUTION Don’t let the lever suddenly rebound, lightly put the lever back.



4) Governor lever

Adjust the throttle lever position to get required speed.



For proper engine speed, refer to indication provided by equipment.

5) Oil protecting system

The oil protecting system is used for preventing from oil insufficiency in the crankcase, when oil lowering lower limit, the oil protecting system will automatically make the engine stopping.(engine still keep the “OPEN” position.)

CAUTION If automatically stopping and not starting, first, check the oil lever, then, check other trouble.

4. CHECK BEFORE OPERATION

Be sure of what you are pumping. This pump is designed to pump only fresh water that is not intended for human consumption.

For your safety, and to maximize the service life of your equipment, it is very important to take a few moments before you operate the pump to check its condition. Be sure to take care of any problem you find, or have your servicing dealer correct it, before you operate the pump.

⚠ WARNING **Improperly maintaining this pump, or failing to correct a problem before operation, could cause a malfunction in which you could be seriously injured.**
Always perform a preoperation inspection before each operation, and correct any problem.

Exhaust gas contains poisonous carbon monoxide. Avoid inhalation of exhaust gas. Never run the engine in a closed garage or confined area.

To prevent fire hazards, keep the pump at least 3 feet (1 meter) away from building walls and other equipment during operation. Do not place flammable objects close to the engine.

Before beginning your preoperation checks, be sure the pump is on a level surface and the ignition switch is in the OFF position.

Check the General Condition of the Pump

Look around and underneath the pump for signs of oil or gasoline leaks.

Remove any excessive dirt or debris, especially around the engine muffler, and recoil starter.

Look for signs of damage.

Check that all nuts, bolts, screws, hose connectors and clamps are tightened.

Check the Suction and Discharge Hoses

Check the general condition of the hoses. Be sure the hoses are in serviceable condition before connecting them to the pump. Remember that the suction hose must be reinforced construction to prevent hose collapse.

Check that the sealing washer in the suction hose connector is in good condition.

Check that the hose connectors and clamps are securely installed.

Check that the strainer is in good condition and is installed on the suction hose.

ENGINE OIL LEVEL CHECK

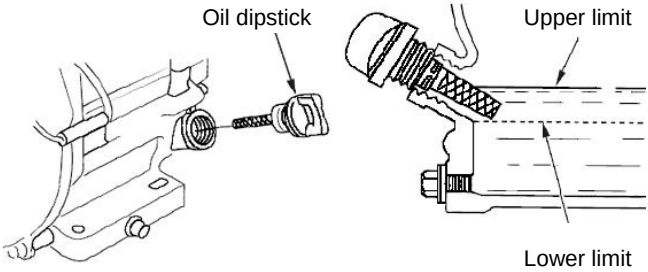
1) Check

- Look around and underneath the engine for signs of oil or gasoline leaks.
- Look for signs of damage.
- Check that all shields and covers are in place, and all nuts, bolts, and screws are tightened.

2) Check oil

CAUTION When stopping the engine at horizontal place, check the oil

1) Take the oil dipstick and clean
2) Insert the oil dipstick in and check the oil lever without screwing down.
3) If the oil is too low, add the recommenced oil in.
4) After finishing, reassemble and screw the oil dipstick down.



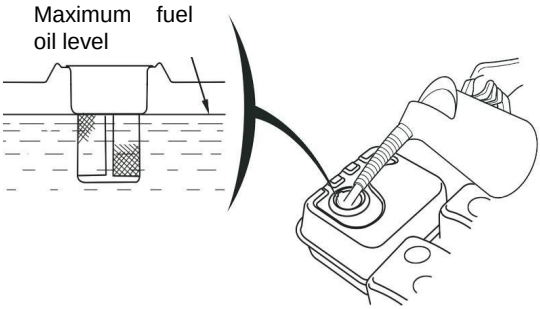
The Oil Alert system (applicable engine types) will automatically stop the engine before the oil level falls below safe limits. However, to avoid the inconvenience of an unexpected shutdown, always check the engine oil level before startup.

3) Check fuel

First stop the engine, open the fuel cover, and check oil level., if the oil level is too low, add the fuel to full, after finishing, screw the fuel cover down.
Don't add the fuel over the shoulder of the carburetor when fueling (maximum oil level).

Fuel tank volume：

148F-2：1.6 L

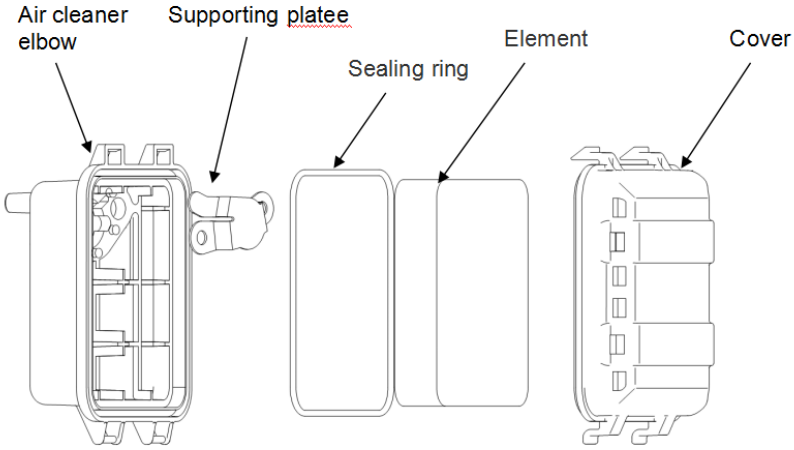


Recommended octane rating over 90 unleaded gasoline
For unleaded gasoline, can make carbon deposit muck less and enhance exhaust system service life

Don't use used and contaminated or gasoline with oil , Avoid the dirt and water entering into fuel tank.

4) Check air cleaner

Remove the air cleaner housing and check the element, if the element dirt, clean it, if damaged, renew.



5. OPERATION

SAFE OPERATING PRECAUTIONS

To safely realize the full potential of this pump, you need a complete understanding of its operation and a certain amount of practice with its controls.

Before operating the pump for the first time, please review the IMPORTANT SAFETY INFORMATION on page 1 and the chapter titled CHECK BEFORE OPERATION.

For your safety, avoid starting or operating the engine in an enclosed area, such as a garage. Your engine's exhaust contains poisonous carbon monoxide gas which can collect rapidly in an enclosed area and cause illness or death.

Pump only fresh water that is not intended for human consumption. Pumping flammable liquids, such as gasoline or fuel oils, can result in a fire or explosion, causing serious injury. Pumping sea water, beverages, acids, chemical solutions, or any other liquid that promotes corrosion can damage the pump.

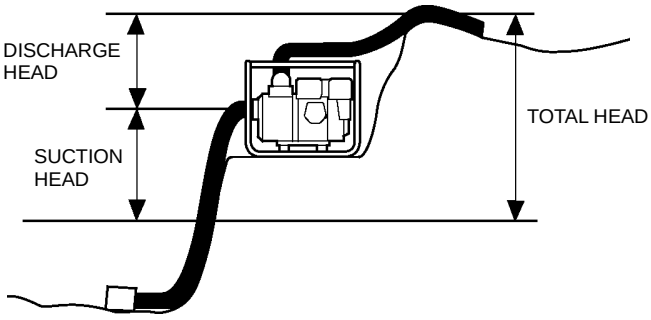
PUMP PLACEMENT

For best pump performance, place the pump near the water level, and use hoses that are no longer than necessary. That will enable the pump to produce the greatest output with the least self-priming time.

As head (pumping height) increases, pump output decreases. The length, type, and size of the suction and discharge hoses can also significantly affect pump output.

Discharge head capability is always greater than suction head capability, so it is important for suction head to be the shorter part of total head.

Minimizing suction head (placing the pump near the water level) is also very important for reducing self-priming time. Self-priming time is the time that takes the pump to bring water the distance of the suction head during initial operation.



SUCTION HOSE INSTALLATION

Use a commercially available hose and hose connector with the hose clamp provided with the pump. The suction hose must be reinforced with a non-collapsible wall or braided wire construction.

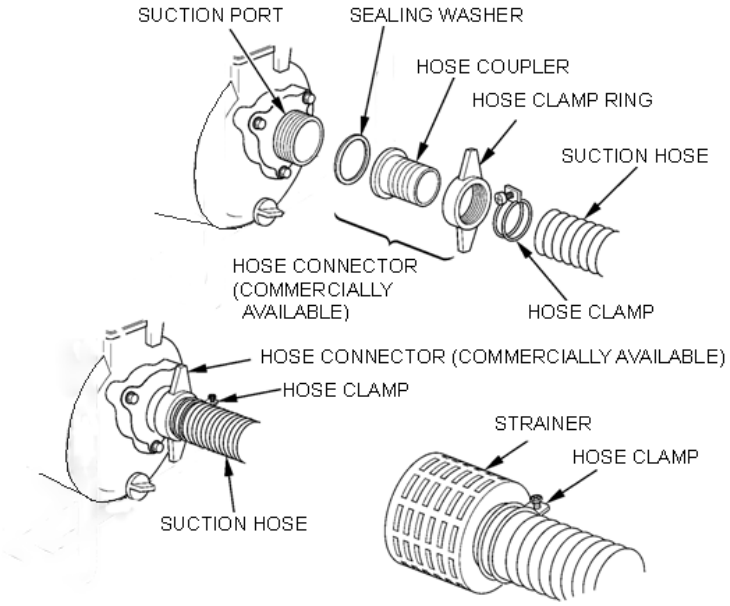
Do not use a hose smaller than the pump's suction port size. Minimum hose size: 25ZB21-1.7Q=1in（25mm）;

The suction hose should be no longer than necessary. Pump performance is best when the pump is near the water level, and the hoses are short.

Use a hose clamp to securely fasten the hose connector to the suction hose in order to prevent air leakage and loss of suction. Verify that the hose connector sealing washer is in good condition.

Install the strainer (provided with the pump) on the other end of the suction hose, and secure it with a hose clamp. The strainer will help to prevent the pump from becoming clogged or damaged by debris.

Securely tighten the hose connector on the pump suction port.

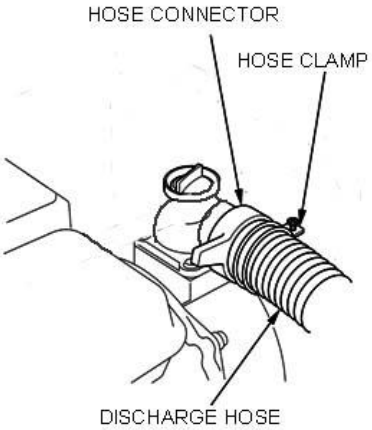


DISCHARGE HOSE INSTALLATION

Use a commercially available hose and hose connector, and clamp provided with the pump.

It is best to use a short, large-diameter hose, because that will reduce fluid friction and improve pump output. A long or small-diameter hose will increase fluid friction and reduce pump output.

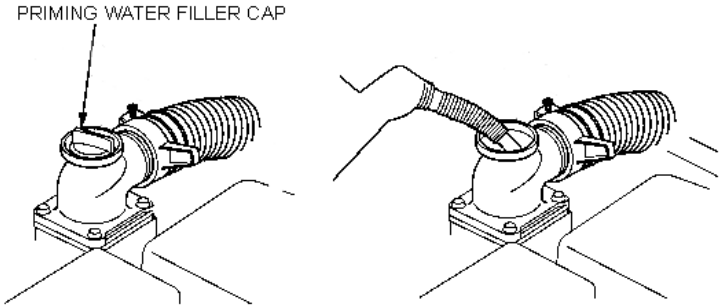
Tighten the hose clamp securely to prevent the discharge hose from disconnecting under pressure.



PRIMING THE PUMP

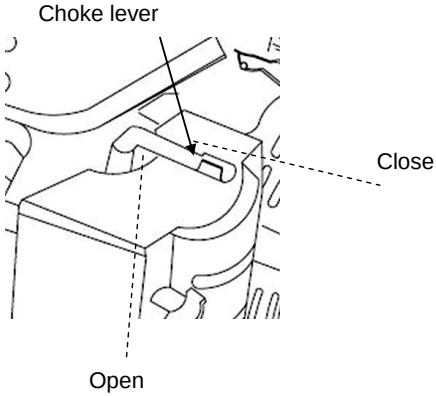
Before starting the engine, remove the filler cap from the pump chamber, and completely fill the pump chamber with water. Reinstall the filler cap, and tighten it securely.

NOTICE **Operating the pump dry will destroy the pump seal. If the pump has been operated dry, stop the engine immediately, and allow the pump to cool before priming.**

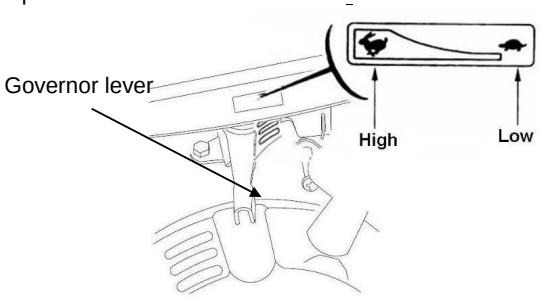


STARTING THE ENGINE

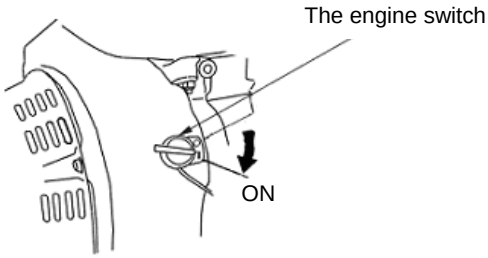
1) To start a cold engine, move the choke lever to the “CLOSE “position.
To start a warm engine, turn the choke lever to the” OPEN” position.



2) Move the throttle lever away from the “LOW” position, about 1/3 of the way toward the “HIGH” position.

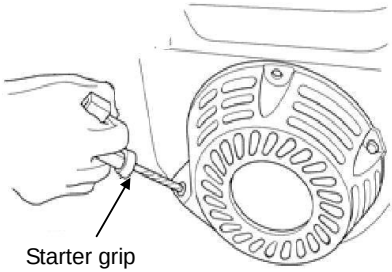


3) Turn the engine switch to the “ON “position.

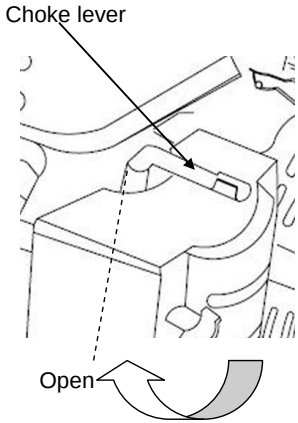


4) Pull the starter grip lightly until you feel resistance, then pull briskly.

CAUTION Don't let starting lever suddenly rebound, and lightly put the lever back.



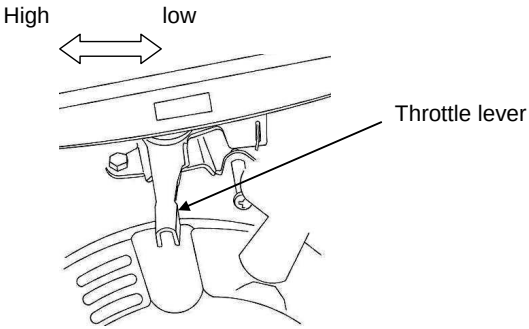
5) If the choke lever has been moved to the "CLOSE" position to start the engine, gradually move it to the" OPEN" position as the engine warms up.



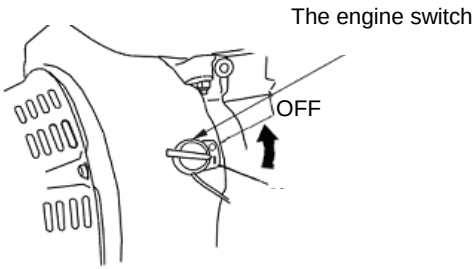
STOPPING THE ENGINE

To stop the engine in an emergency, simply turn the engine switch to the "OFF" position. Under normal conditions, use the following procedure.

1). Move the throttle lever to the “LOW” position.



2) Turn the engine switch to the “OFF” position.



6. MAINTENANCE

THE IMPORTANCE OF MAINTENANCE

Good maintenance is essential for safe, economical, and trouble-free operation. It will also help reduce pollution.

⚠WARNING

Improperly maintaining this engine, or failure to correct a problem before operation, can cause a malfunction in which you can be seriously hurt or killed.
Always follow the inspection and maintenance recommendations and schedules in this owner's manual.

To help you properly care for your engine, the following pages include a maintenance schedule, routine inspection procedures, and simple maintenance procedures using basic hand tools. Other service tasks that are more difficult, or require special tools, are best handled by professionals and are normally performed by a technician or other qualified mechanic.
The maintenance schedule applies to normal operating conditions. If you operate your engine under unusual conditions, such as sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, consult your servicing dealer for recommendations applicable to your individual needs and use.

MAINTENANCE SAFETY

Some of the most important safety precautions are as follows: However, we cannot warn you of every conceivable hazard that can arise in performing maintenance. Only you can decide whether or not you should perform a given task.

⚠WARNING

Failure to properly follow maintenance instructions and precautions can cause you to be seriously hurt or killed.
Always follow the procedures and precautions in the owner's manual.

Safety Precautions

Make sure the engine is off before you begin any maintenance or repairs. This will eliminate several potential hazards:

- **Carbon monoxide poisoning from engine exhaust.**
  Be sure there is adequate ventilation whenever you operate the engine.

- **Burns from hot parts.**
  Let the engine and exhaust system cool before touching.
- **Injury from moving parts.**
  Do not run the engine unless instructed to do so.

Read the instructions before you begin, and make sure you have the tools and skills required.

To reduce the possibility of fire or explosion, be careful when working around gasoline. Use only a nonflammable solvent, not gasoline, to clean parts. Keep cigarettes, sparks and flames away from all fuel-related parts.

Remember that your servicing dealer knows your engine best and is fully equipped to maintain and repair it.

To ensure the best quality and reliability, use only new, genuine parts or their equivalents for repair and replacement.

SCHEDULE

REGULAR SERVICE PERIOD		Each use	First month or 20 Hrs.	Every 3 months or 50 Hrs.	Every 6 months or 100 Hrs.	Every year or 300 Hrs.
Engine oil	Check level	○				
	Change		○		○	
Air cleaner	Check	○				
	Clean			○(1)		
	Replace					
Sediment Cup	Clean				○	
Spark plug	Clean				○	Replace
Valve clearance	Check-Adjust					○(2)
Cover comp head	Clean	After every 300 Hrs. (2)				
Fuel tank and fuel filter	Clean	Every 2 years (Replace if necessary) (2)				
Fuel line	Check	Every 2 years (Replace if necessary) (2)				

（1）Service more frequently when used in dusty areas.
（2）These items should be serviced by your servicing dealer unless you have the proper tools and are mechanically proficient.

RENEWING ENGINE OIL

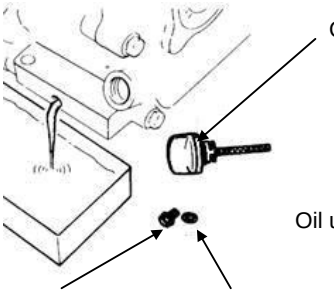
Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

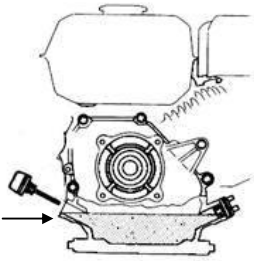
1. Place a suitable container below the engine to catch the used oil, and then remove the pad and dipstick and the drain plug.

2. Allow the used oil to drain completely, and then reinstall the drain plug and pad, and tighten it securely.

   Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash; pour it on the ground; or down a drain.

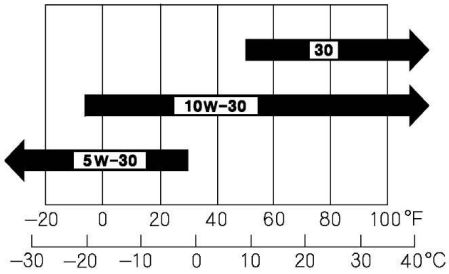
3. With the engine in a level position, fill to upper limit with the recommended oil.





Engine oil capacities：

148F-2: 0.35 L



4) Assembling oil dipstick and screwing down

Recommended oil:
Use 4-stroke automotive detergent oil.
We recommend that you use API SERVICE Category SE or SF oil or equivalent to SG grade SAE 10W-30.

You can use this brand oil if your area temperature list within some brand oil temperature range

MAINTAINING AIR CLEANER

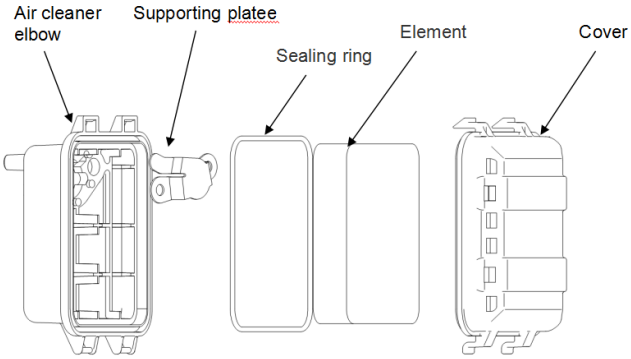
A dirty air filter will restrict air flow to the carburetor, reducing engine performance.
If you operate the engine in very dusty areas, clean the air filter more often than specified in the MAINTENANCE SCHEDULE.

NOTICE

Operating the engine without element or with a damaged element will allow dirt to enter the engine, causing rapid engine wear.

Air cleaner

1) Screw off air cleaner bolt and remove the cover.



2) Remove foam element

Check element and renew if damaged.

Wash foam element：
Wash the cover and filter in warm, soapy water, rinse, and allow drying thoroughly. Or clean in nonflammable solvent and allow drying. Dip in clean engine oil, and then squeeze out all excess oil.

1.

Empty the used oil from the air cleaner case, wash out any accumulated dirt with nonflammable solvent, and dry the case.

3) Clean the air cleaner l, cover and rubber gasket, preventing dust entering into carburetor.

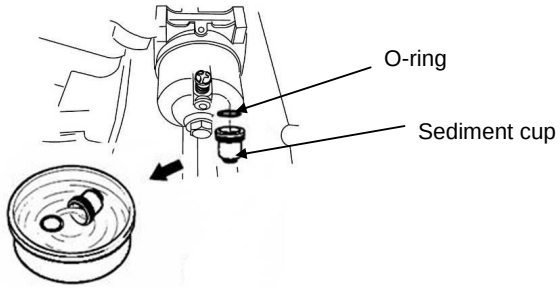
4) Reassemble the foam element, paying attention to rubber gasket underneath the element.

5) Reassemble the air cleaner, and tighten the wing nut securely.

WASHING SEDIMENT CUP

(First check fuel tank for fuel, if having, drain the fuel in the fuel tank completely.)

1. Remove the fuel sediment cup and O-ring.
2. Wash the sediment cup and O-ring in nonflammable solvent, and dry them thoroughly.
3. Place the O-ring in the fuel valve, and install the sediment cup. Tighten the sediment cup securely.
4. Move the fuel valve to the ON position, and check for leaks. Replace the O-ring if there is any leakage.



SPARK PLUG

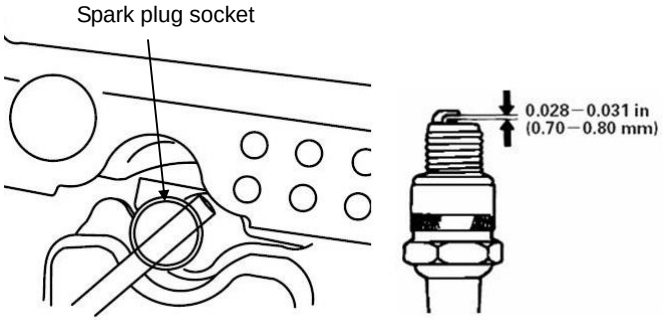
148F-2：recommended spark plugs: E6RTC or other equivalents.

NOTICE

An incorrect spark plug can cause engine damage.

1. Disconnect the spark plug cap, and remove any dirt from around the spark plug area.

2. Remove the spark plug with a spark plug wrench.



3. Inspect the spark plug. Replace it if the electrodes are worn, or if the insulator is cracked or chipped. The gap should be 0.028 -0.031 in (0.70 - 0.80 mm). Correct the gap, if necessary,

4. Install the spark plug carefully, by hand, to avoid cross-threading.

5. After the spark plug seats, tighten with a spark plug wrench to compress the water.

If reinstalling the used spark plug ， tighten 1/8 - 1/4 turn after the spark plug seats.

If installing a new spark plug, tighten 1/2 turn after the spark plug seats.

6. Assemble spark plug.

ADJUSTING IDLE SPEED

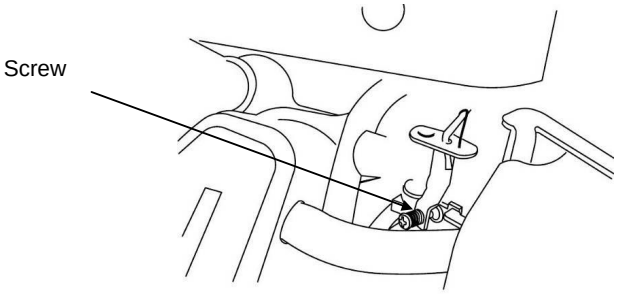
1. Start the engine outdoors, and allow it to warm up to operating temperature.

2. Move the throttle lever to its slowest position.

3. Turn the idle speed screw to obtain the standard idle speed.

Standard idle speed:

148F-2: 1800±100 rpm



7. STORAGE/ TRANSPORTING

STORAGE PREPARATION

Proper storage preparation is essential for keeping your pump troublefree and looking good. The following steps will help to keep rust and corrosion from impairing your pump's function and appearance, and will make the engine easier to start when you use the pump again.

Cleaning

1. Wash the engine and pump.

   Wash the engine by hand, and be careful to prevent water from entering the air cleaner or muffler opening. Keep water away from controls and all other places that are difficult to dry, as water promotes rust.

   NOTICE

   - **Using a garden hose or pressure washing equipment can force water into the air cleaner or muffler opening. Water in the air cleaner will soak the air filter, and water that passes through the air filter or muffler can enter the cylinder, causing damage.**
   - **Water contacting a hot engine can cause damage. If the engine has been running, allow it to cool for at least half an hour before washing.**

2. Wipe dry all accessible surfaces.

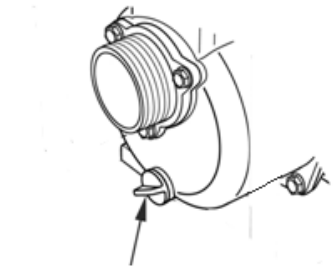
3. Fill the pump chamber with clean, fresh water, start the engine outdoors, and let it run until it reaches normal operating temperature to evaporate any external water.

NOTICE **Dry operation will damage the pump seal. Be sure the pump chamber is filled with water before starting the engine.**

4. Stop the engine, and allow it to cool.

5. Remove the pump drain plug, and flush the pump with clean, fresh water. Allow the water to drain from the pump chamber, and then reinstall the drain plug.

6. After the pump is clean and dry, touch up any damaged paint, and coat areas that may rust with a light film of oil. Lubricate controls with a silicone spray lubricant.



Fuel

Gasoline will oxidize and deteriorate in storage. Old gasoline will cause hard starting, and it leaves gum deposits that clog the fuel system. If the gasoline in your engine deteriorates during storage, you may need to have the carburetor and other fuel system components serviced or replaced.

The length of time that gasoline can be left in your fuel tank and carburetor without causing functional problems will vary with such factors as gasoline blend, your storage temperatures, and whether the fuel tank is partially or completely filled. The air in a partially filled fuel tank promotes fuel deterioration. Very warm storage/temperatures accelerate fuel deterioration. Fuel deterioration problems may occur within a few months, or even less if the gasoline was not fresh when you filled the fuel tank.

The Distributor's Limited Warranty does not cover fuel system damage or engine performance problems resulting from neglected storage preparation.

You can extend fuel storage life by adding a fuel stabilizer that is formulated for that purpose, or you can avoid fuel deterioration problems by draining the fuel tank and carburetor.

ADDING A FUEL STABILIZER TO EXTEND FUEL STORAGE LIFE

When adding a fuel stabilizer, fill the fuel tank with fresh gasoline. If only partially filled, air in the tank will promote fuel deterioration during storage. If you keep a container of gasoline for refueling, be sure that it contains only fresh gasoline.

1. Add fuel stabilizer following the manufacturer's instructions.

2. After adding a fuel stabilizer, run the engine outdoors for 10 minutes to be sure that treated gasoline has replaced the untreated gasoline in the carburetor.

NOTICE **Dry operation will damage the pump seal. Be sure the pump chamber is filled with water before starting the engine.**

3. Stop the engine, and move the fuel valve to the OFF position.

DRAINING THE FUEL TANK AND CARBURETOR

1. Place an approved gasoline container below the carburetor, and use a funnel to avoid spilling fuel.

2. Remove the carburetor drain bolt and sediment cup, and then move the fuel valve lever to the ON position.

3. After all the fuel has drain into the container, reinstall the drain bolt and sediment cup. Tighten them securely.

Storage Precautions

1. Change the engine oil.

2. Remove the spark plugs.

3. Pour a tablespoon (5-10 cc) of clean engine oil into the cylinder.
4. Pull the starter rope several times to distribute the oil in the cylinder.

5. Reinstall the spark plugs.

6. Pull the starter rope slowly until resistance is felt. This will close the valves so moisture cannot enter the engine cylinder. Return the starter rope gently.

If your engine will be stored with gasoline in the fuel tank and carburetor, it is important to reduce the hazard of gasoline vapor ignition. Select a well-ventilated storage area away from any appliance that operates with a flame, such as a furnace, water heater, or clothes dryer. Also avoid any area with a spark-producing electric motor, or where power tools are operated.

If possible, avoid storage areas with high humidity, because that promotes rust and corrosion.

Unless all fuel has been drained from the fuel tank, leave the fuel valve lever in the OFF position to reduce the possibility of fuel leakage.

Position the equipment so the engine is level. Tilting can cause fuel or oil leakage.

With the engine and exhaust system cool, cover the engine to keep out dust. A hot engine and exhaust system can ignite or melt some materials. Do not use sheet plastic as a dust cover. A nonporous cover will trap moisture around the engine, promoting rust and corrosion.

Removal from Storage

Check your engine as described in the chapter CHECK BEFORE OPERATION.

If the fuel was drained during storage preparation, fill the tank with fresh gasoline. If you keep a container of gasoline for refueling, be sure that it contains only fresh gasoline. Gasoline oxidizes and deteriorates over time, causing hard starting.

If the cylinders were coated with oil during storage preparation, the engine may smoke briefly at startup. This is normal.

TRANSPORTING

If the pump has been running, allow the engine to cool for at least 15 minutes before loading the pump on the transport vehicle. A hot engine and exhaust system can burn you and can ignite some materials.

Keep the pump level when transporting to reduce the possibility of fuel leakage.

8. TROUBLESHOOTING

ENGINE

1) Starting difficult

Phenomenon	Possible Cause				Correction
Cylinder pressure normal	Spark plug normal	Fuel system abnormal	Oil path unpassing	No fuel, oil cock closed	Add fuel, open the oil cock
				Air hole clogged	Clean clogged
				Oil cock clogged	wash
				Main jet adjusted not well, or clogged	Readjust, wash and blow
				Needle valve or float blocked.	Repair or renew
			Oil path passing	Fuel too dirt or deteriorated	Renew fuel or clear carburetor
				Water in the fuel	Renew fuel and clean carburetor
				Too much fuel in the cylinder	Drain fuel and clean spark plug
				Wrong fuel	Chang fuel
	Fuel system normal	Spark normal	Spark plug poor	Carbon deposit and dirt electrode	Clean carbon deposit and dirt
				Damaged insulator	Renew spark plug
				Electrode burn through.	Renew spark plug
				Wrong gap	Adjust gap
		Spark normal	No spark	High tension coil damaged	Renew high tension coil
				Igniter coil damaged	Renew high tension coil
				Magnetic field strength not enough	Charge magnetic or renew
Cylinder pressure abnormal	Fuel system normal	Igniter normal	Spark plug normal	Piston ring worn or broken.	Renew
				Ring cementation	Clean carbon deposit
				No washer or not tightening	Add washer or tighten
				Leaking from joint	Renew gasket
				valve sealing poor	Lap or renew

2） ENGINE LACKS POWER

Phenomenon	Possible Cause		Correction
When increasing throttle speed up slowly or speed down or stop the engine	Ignition system	Ignition time not right	Replace ignition coil
	Fuel system	Fuel path with air	Exhaust air
		Wrong adjustment of main jet	Readjustment
		Needle valve and main jet clogged	Clean and blow
		Oil cock clogged	Clean or replace
		Carbon deposit in the combustion chamber	Clean carbon deposit
	Intake system	Air cleaner clogged	Clean or replace
		Intake system clogged	Repair or replace
	Compression poor	Piston, cylinder piston ring worn	replace
		Leakage between cylinder and cylinder head	Replace cylinder head gasket
		Valve gap not right	Readjustment
		Valve sealing leakage	Grinding or replacement

PUMP

No Pump Output	Possible Cause	Correction
1. Check pump chamber.	Pump not primed.	Prime the pump (p. 11).
2. Check suction hose.	Hose collapsed, cut or punctured.	Replace suction hose (p. 10).
	Strainer not completely underwater.	Sink the strainer and the end of a suction hose completely underwater.
	Air leak at connector.	Replace sealing washer if missing or damaged. Tighten hose connector and clamp (p. 10, 11).
	Strainer clogged.	Clean debris from strainer.
3. Measure suction and discharge head.	Excessive head.	Relocate pump and/or hoses to reduce head (p. 9).
4. Check engine.	Engine lacks power.	See page 23.

Low Pump Output	Possible Cause	Correction
1. Check suction hose.	Hose collapsed, damaged, too long, or diameter too small.	Replace suction hose (p. 10).
	Air leak at connector.	Replace sealing washer if missing or damaged. Tighten hose connector and clamp (p. 10, 11).
	Strainer clogged.	Clean debris from strainer.
2. Check discharge hose.	Hose damaged, too long, or diameter too small.	Replace discharge hose (p. 10).
3. Measure suction and discharge head.	Marginal head.	Relocate pump and/or hoses to reduce head (p. 9).
4. Check engine.	Engine lacks power.	See page 23.

9. Specifications

Item	Type	25ZB21-1.7Q	25ZB36-1.7Q
Pump	Length (mm)	427	427
	Width (mm)	332	332
	High (mm)	363	363
	Weight (Kg)	13.5	13.5
	Suction port diameter	25 mm (1 in)	25 mm (1 in)
	Discharge port diameter	25 mm (1 in)	25 mm (1 in)
	Max. suction (m)	5.5	6
	Max. head (m)	21	36
	Max. capacity (m^3/h)	10	12
	Measured Sound Power Level（L_{WA}）	95 dB(A)	96 dB(A)
	Guaranteed Sound Power Lever（L_{WA}）	97 dB(A)	98 dB(A)
Engine	Model	148F-2	148F-2
	Type	Single cylinder 4-Stroke Forced air cooling OHV	
	Displacement (cc)	80	
	Rated Power (kW)	1.7kW/3600rpm	
	Fuel tank capacity (L) ※	1.6	
	Oil capacity (L) ※	0.35	

The power rating of the engine indicated in this document is the net power output tested on a production engine for the engine model and measured in accordance with SAE J1349 at 3,600 rpm (Net Power) and at 3,200 rpm(148F-2). Mass production engines may vary from this value.
Actual power output for the engine installed in the final machine will vary depending on numerous factors, including the operating speed of the engine in application, environmental conditions, maintenance, and other variables.

※ Approximate value. Actual products may vary due to different configurations.

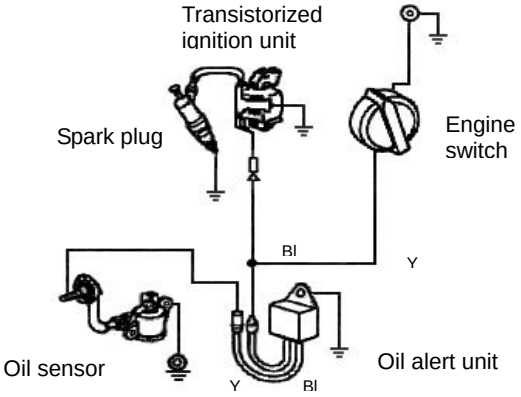
WIRING DIAGRAMS

Non-electric starting engine with oil protection system

Engine switch WIRING

	IG	E	ST	BAT
OFF	O	O		
ON				
START			O	O

Bl	black
Y	yellow
G	green



10.TECHNICAL & CONSUMER INFORMATION

Carburetor Modification for High Altitude Operation

At high altitude, the standard carburetor air-fuel mixture will be too rich. Performance will decrease, and fuel consumption will increase. A very rich mixture will also foul the spark plug and cause hard starting. Operation at an altitude that differs from that at which this engine was certified, for extended periods of time, may increase emissions.

High altitude performance can be improved by specific modifications to the carburetor. If you always operate your pump at altitudes above 5,000 feet (1,500 meters), have your servicing dealer perform this carburetor modification. This engine, when operated at high altitude with the carburetor modifications for high altitude use, will meet each emission standard throughout its useful life.

Even with carburetor modification, engine horsepower will decrease about 3.5% for each 1,000 feet (300 meters) increase in altitude. The effect of altitude on horsepower will be greater than this if no carburetor modification is made.

NOTICE

When the carburetor has been modified for high altitude operation, the air-fuel mixture will be too lean for low altitude use. Operation at altitudes below 5,000 feet (1,500meters) with a modified carburetor may cause the engine to overheat and result in serious engine damage. For use at low altitudes, have your servicing dealer return the carburetor to original factory specifications.

Oxygenated Fuels

Some conventional gasolines are being blended with alcohol or an ether compound. These gasolines are collectively referred to as oxygenated fuels. To meet clean air standards, some areas of the United States and Canada use oxygenated fuels to help reduce emissions.

If you use an oxygenated fuel, be sure it is unleaded and meets the minimum octane rating requirement.

Before using an oxygenated fuel, try to confirm the fuel's contents. Some states/provinces require this information to be posted on the pump.

The following are the EPA-approved percentages of oxygenates:

ETHANOL——(ethyl or grain alcohol) 10% by volume.
You may use gasoline containing up to 10% ethanol by volume. Gasoline containing ethanol may be marketed under the name "Gasohol".

MTBE————(methyl tertiary butyl ether) 15% by volume
You may use gasoline containing up to 15% MTBE by volume.

METHANOL——(methyl or wood alcohol) 5% by volume

You may use gasoline containing up to 5% methanol by volume as long as it also contains cosolvents and corrosion inhibitors to protect the fuel system. Gasoline containing more than 5% methanol by volume may cause starting and/or performance problems. It may also damage metal, rubber, and plastic parts of your fuel system.

If you notice any undesirable operating symptoms, try another service station, or switch to another brand of gasoline.

Fuel system damage or performance problems resulting from the use of an oxygenated fuel containing more than the percentages of oxygenates mentioned above are not covered under warranty.

Emission Control System Information

Source of Emissions

The combustion process produces carbon monoxide, oxides of nitrogen, and hydrocarbons. Control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

This utilizes lean carburetor settings and other systems to reduce the emissions of carbon monoxide, oxides of nitrogen, and hydrocarbons.

Tampering and Altering

Tampering with or altering the emission control system may increase emissions beyond the legal limit. Among those acts that constitute tampering are:

- Removal or alteration of any part of the intake, fuel, or exhaust systems.
- Altering or defeating the governor linkage or speed-adjusting mechanism to cause the engine to operate outside its design parameters.

Problems That May Affect Emissions

If you are aware of any of the following symptoms, have your engine inspected and repaired by your servicing dealer.

- Hard starting or stalling after starting.
- Rough idle.
- Misfiring or backfiring under load.
- Afterburning (backfiring).
- Black exhaust smoke or high fuel consumption.

Replacement Parts

The emission control systems on your engine were designed, built, and certified to conform with EPA and California emission regulations. We recommend the use of

genuine parts whenever you have maintenance done. These original-design replacement parts are manufactured to the same standards as the original parts, so you can be confident of their performance. The use of replacement parts that are not of the original design and quality may impair the effectiveness of your emission control system.

A manufacturer of an aftermarket part assumes the responsibility that the part will not adversely affect emission performance. The manufacturer or rebuilder of the part must certify that use of the part will not result in a failure of the engine to comply with emission regulations.

Maintenance

Follow the maintenance schedule on page 16. Remember that this schedule is based on the assumption that your machine will be used for its designed purpose. Sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, will require more frequent service.

Air Index

An Air Index Information hang tag/label is applied to engines certified to an emission durability time period in accordance with the requirements of the California Air Resources Board.

The bar graph is intended to provide you, our customer, the ability to compare the emissions performance of available engines. The lower the Air Index, the less pollution.

The durability description is intended to provide you with information relating to the engine's emission durability period. The descriptive term indicates the useful-life period for the engine's emission control system. See your Emission Control Warranty for additional information.

Descriptive Term	Applicable to Emission Durability Period
Moderate	50 hours (0－65 cc) 125 hours (greater than 65 cc)
Intermediate	125 hours (0－65 cc) 250 hours (greater than 65 cc)
Extended	300 hours (0－65 cc) 500 hours (greater than 65 cc)

The Air Index Information hang tag must remain on the pump until it is sold. Remove the hang tag before operating the pump.

11.**CONSUMER INFORMATION**

Publications

These publications will give you additional information for maintaining and repairing your pump. You may order them from your pump dealer.

Parts Catalog

This manual provides complete, illustrated parts lists.

Customer Service Information

Servicing dealership personnel are trained professionals. They should be able to answer any question you may have. If you encounter a problem that your dealer does not solve to your satisfaction, please discuss it with the dealership's management. The Service Manager or General Manager can help. Almost all problems are solved in this way.