

# ***PRESSURE WASHER***

## ***PROFESSIONAL POWER EQUIPMENT***

### **OPERATION INSTRUCTION AND PARTS LIST MANUAL**

**For general direct drive gas pressure washer**



**Version: 2010-1**



**This manual contains:**  
**IMPORTANT WARNINGS** and **INSTRUCTIONS**. READ AND RETAIN FOR REFERENCE

**⚠ WARNING:** To reduce the risk of injury, the user must read and understand the operators manual before using this product.

**SAVE THIS MANUAL FOR FUTURE REFERENCE**

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## INTRODUCTION

### Thank You for Purchasing a TAHOE-Professional Power Equipment Product

This instruction manual is intended for your benefit. Please read and follow the safety, installation, maintenance and troubleshooting steps described within to ensure your safety and satisfaction. The contents of this instruction manual are based upon the latest product information available at the time of publication. The manufacturer reserves the right to make product changes at any time without notice.

## PRODUCT IDENTIFICATION

### RECORD IDENTIFICATION NUMBERS

If you need to contact an Authorized Dealer for information on servicing, always provide the product model and identification numbers.

You will need to locate the model, revision and serial number for the machine and record the information in the places provided below. You will also need the model and serial number for the engine on your machine.

See the engine operators manual for the location of these numbers.

DATE OF PURCHASE: .....

DEALER NAME: .....

DEALER PHONE: .....

### Product Identification Numbers

UNIT MODEL NAME: .....

### ENGINE

MODEL: .....

SERIAL NUMBER: .....

### PUMP

MODEL: .....

SERIAL NUMBER: .....

# IMPORTANT SAFETY INSTRUCTIONS

This manual contains information that is important for you to know and understand. This information relates to protecting **YOUR SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the symbols below. Please read the manual and pay attention to these sections.

## DANGER

**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

## CAUTION

**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

## WARNING

**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

## CAUTION

**CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



## DANGER--RISK OF EXPLOSION OR FIRE



- Fuel and its vapors are extremely flammable and explosive.
- Fire or explosion can cause severe burns or death.

- **ALWAYS** shut off engine and allow it to cool a least 2minutes before adding fuel to the tank.
- **ALWAYS** use care in filling tank to avoid spilling fuel. Move pressure washer away from fueling area before starting engine.
- **ALWAYS** Keep maximum fuel level below top of tank to allow for expansion.
- **ALWAYS** operate and fuel equipment in well ventilated areas free from obstructions. Equip areas with fire extinguishers suitable for gasoline fires.
- **NEVER** operate pressure washer in an area containing dry brush or weeds.
- **ALWAYS** keep pressure washer a minimum of four feet away from surfaces (such as houses, automobiles, or live plants) that could be damaged from muffler exhaust heat.
- **ALWAYS** Store fuel in an OSHA approved container, in a secure location away from work area.
- **NEVER** spray flammable liquids



## DANGER-- RISK TO BREATHING



- Running engine gives off carbon monoxide, an odorless, colorless, poison gas.
- Breathing carbon monoxide can cause nausea, fainting or death.
- Some chemicals or detergents may be harmful if inhaled or ingested, causing severe nausea, fainting or poisoning.

- **ALWAYS** Operate pressure washer in a well ventilated area. Avoid enclosed areas such as garages, basements ,etc.
- **ALWAYS** Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings.
- **NEVER** operate unit in a location occupied by humans or animals.
- **ALWAYS** use the only fluids specifically recommended for high pressure washers.
- **ALWAYS** follow manufacturers recommendations, use a respirator or mask whenever there is a chance that vapors may be inhaled.
- **NEVER** use chlorine bleach or any other corrosive compound.



## WARNING--RISK OF FALL HAZARD



- Use of pressure washer can create puddles and slippery surfaces.
- Kickback from spray gun can cause you to fall.

- Keep operating area clear of all persons, pets, and obstacles.
- Do not operate the product when fatigued or under the influence of alcohol or drugs. Stay alert at all times.
- Never defeat the safety features of this product.
- Do not operate machine with missing, broken, or unauthorized parts.
- Never leave wand unattended while unit is running.
- If engine does not start after two pulls, squeeze trigger of gun to relieve pump pressure. Pull starter cord slowly until resistance is felt. Then pull cord rapidly to avoid kickback and prevent hand or arm injury.
- Keep children away from the pressure washer at all times.
- Do not overreach or stand on an unstable support.
- The cleaning area should have a dequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.
- Be extremely careful if you must use the pressure washer from a ladder, scaffolding, or any other similar location.
- Firmly grasp spray gun with both hands when using high pressure spray to avoid injury when spray gun kicks back.



## WARNING--RISK OF ELECTRICAL SHOCK



- Risk of electrocution.
- Contact with power source can cause electric shock or burn.

- Unplug any electrically operated product before attempting to clean it. Direct spray away from electric outlets and switches.
- NEVER spray near power source.



## WARNING--RISK TO FLUID INJECTION



- The high pressure stream of water that this equipment produces can cut through skin and its underlying tissues, leading to serious injury and possible amputation. Spray gun traps high water pressure, even when engine is stopped and water is disconnected, which can cause injury.

- ALWAYS point spray gun in safe direction and squeeze trigger, to release high pressure, every time you stop engine.
- NEVER aim spray gun at people, animals, or plants.
- NEVER place hands in front of nozzle.
- Make sure hose and fittings are tightened and in good condition. Never hold onto the hose or fittings during operation.
- Do not allow hose to contact muffler.
- Never attach or remove wand or hose fittings while system is pressurized.
- Use only hose and high pressure accessories rated for pressure higher than your pressure washer's p.s.i.
- To relieve system pressure, shut off engine, turn off water supply, and pull gun trigger until water stops flowing.
- DO NOT allow CHILDREN to operate pressure washer.
- NEVER repair leaking connections with sealant of any kind. Replace o-ring or seal.
- NEVER connect high pressure hose to nozzle extension.
- Keep high pressure hose connected to pump and spray gun while system is pressurized.
- DO NOT secure spray gun in open position.
- DO NOT leave spray gun unattended while machine is running.
- NEVER use a spray gun which does not have a trigger lock or trigger guard in place and in working order.
- ALWAYS be certain spray gun, nozzles and accessories are correctly attached.



## DANGER-- RISK OF CHEMICAL BURN



- Use of acids, toxic or corrosive chemicals, poisons, insecticides, or any kind of flammable solvent with this product could result in serious injury or death.

- Do not use acids, gasoline, kerosene, or any other flammable materials in this product. Use only household detergents, cleaners and degreasers recommended for use in pressure washers.
- Wear protective clothing to protect eyes and skin from contact with sprayed materials.
- Do not use chlorine bleach or any other corrosive compound



## DANGER-- RISK OF HOT SURFACES



- Contact with hot surfaces, such as engines exhaust components, could result in serious burn.

- During operation, touch only the control surfaces of the pressure washer. Keep children away from the pressure washer at all times. They may not be able to recognize the hazards of this product.



## DANGER-- RISK OF MOVING PARTS



- Starter and other rotating parts can entangle hands, hair, clothing, or accessories.

- NEVER operate pressure washer without protective housing or covers.
- DO NOT wear loose clothing, jewelry or anything that may be caught in the starter or other rotating parts.
- Tie up long hair and remove jewelry.



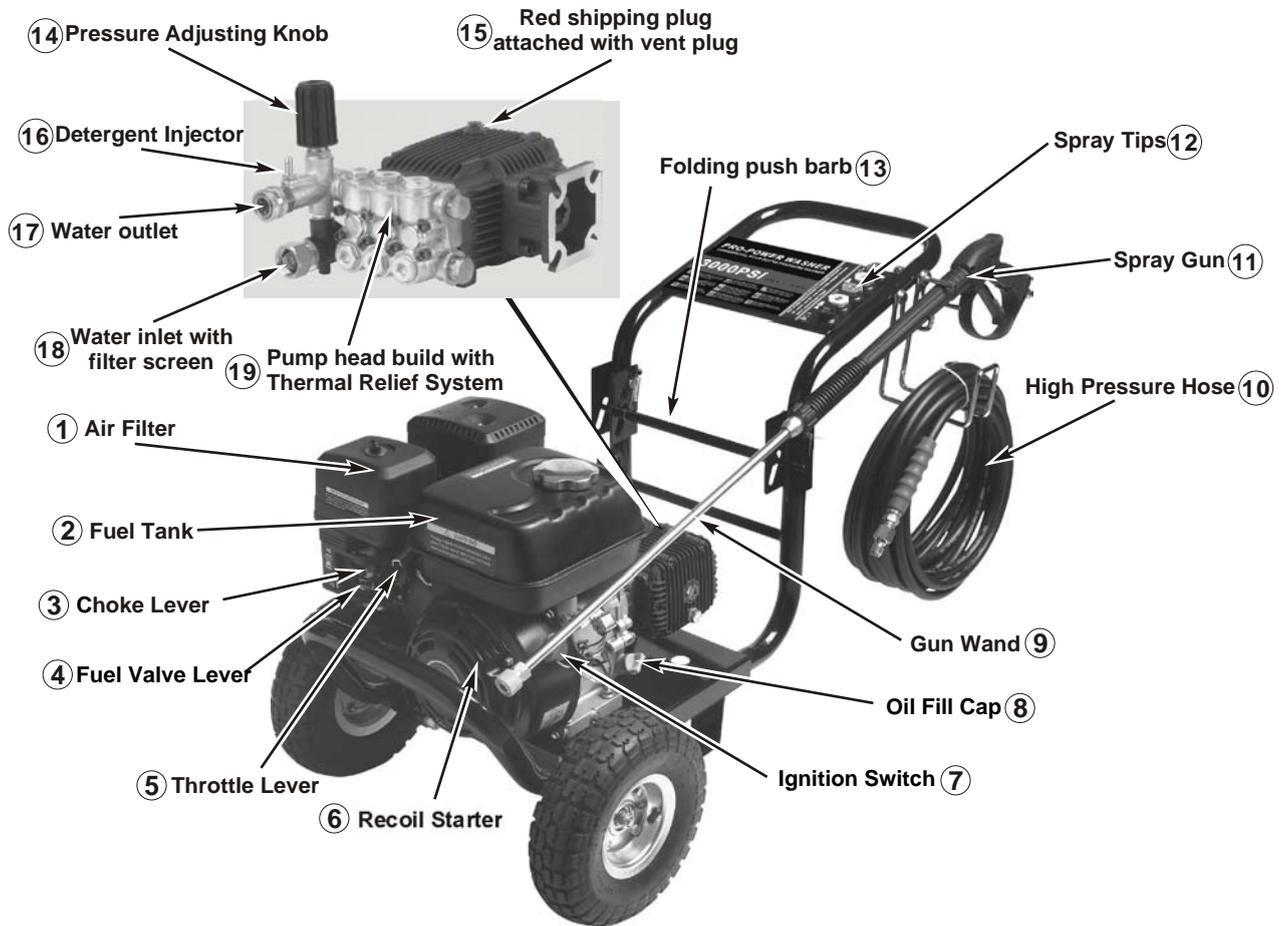
## DANGER-- RISK OF EYE INJURY



- Spray can splash back or propel objects.

- Always wear safety goggles when using this equipment or in vicinity of where equipment is in use.
- Before starting the pressure washer, be sure you are wearing adequate safety goggles.
- NEVER substitute safety glasses for safety goggles.

# KNOW YOUR PRESSURE WASHER



1. **Air Filter** -- Protects engine by filtering dust and debris out of intake air.
2. **Fuel Tank** -- Fill tank with regular unleaded fuel. Always leave room for fuel expansion.
3. **Choke Lever** -- Prepares a cold engine for starting.
4. **Fuel Valve** -- Used to turn fuel on and off to engine.
5. **Throttle Lever** -- Sets engine in starting mode for recoil starter.
6. **Recoil Starter** -- Use for starting the engine manually.
7. **Ignition Switch** -- Set this switch to "On" before using recoil starter. Set switch to "Off" to switch off engine.
8. **Oil Fill Cap** -- Fill engine with oil here.
9. **Gun wand with Quick Connect** -- To attach the spray tips on it.
10. **High Pressure Hose** -- Connect one end to the water pump and the other end to the spray gun.
11. **Spray Gun** -- Controls the application of water onto cleaning surface with trigger device. Includes safety latch.
12. **Spray Tips** -- 0/15/25/40 degree and soap nozzle for various high pressure cleaning applications.
13. **Folding push Barb** -- To push this barb to folding the frame.

14. **Pressure Adjusting Knob** -- To raise or reduce the pressure by turn the knob.

15. **Red shipping plug attached with vent plug** -- The pump is shipped with red shipping plug to prevent oil leaking during transportation. Replace with the attached vent plug before using.

16. **Detergent Injector** -- Use to siphon detergent or other pressure washer chemicals into the low pressure stream.

17. **Water outlet** -- To connect high pressure hose.

18. **Water inlet with filter screen** -- Connect garden hose here, and always have the filter screen present in it.

19. **Pump Head Build with Thermal Relief System** -- Cycles water through pump when water reaches 125--155°F. Warm water will discharge from pump onto ground. This system prevents internal pump damage.

**PSI:** Pounds per square inch -- common unit measure used for water pressure, air pressure, hydraulic pressure and pounds of force.

**GPM:** Gallons per minute (liters per minute [metric]) -- common unit measure used for flow rate of water.

**Bypass Mode:** In bypass mode, high pressure pump recirculates water because spray gun trigger is not pulled.

# ASSEMBLY

Your pressure washer requires some assembly and is ready for use after it has been properly serviced with the recommended oil and fuel. Tool need open-end wrench 10mm, 14mm, 17mm.

## 1. Unpack Pressure Washer.

- 1.1 Set carton on a rigid, flat surface. Remove all loose parts and packing. Leave pressure washer in carton.

**WARNING** Unit is heavy. Do not attempt to lift and remove the pressure washer unit from the carton.



- 1.2 Using a box cutter, open carton completely by cutting the four corners allowing the sides to lay flat. Leave pressure washer on carton while installing wheel, leg rubber bumpers.

## 2. Assembly the Wheel

- 2.1 Fit the axles into the axle ports as shown, secure with the nut, spring washer and washer
- 2.2 Fit the wheels to the axles and secure with the nut and washer.

**NOTE:** Do not over tighten the nuts, the wheels must be able to rotate freely.

## 3. Assembly the Rubber Feet.

- 3.1 Fit the rubber feet to the legs as shown.

## 4. Assembly the Gun/Hose Hook

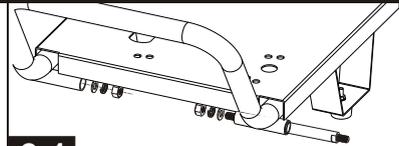
- 4.1 Fit the hook into the position shown and secure using the washers and nuts on the bracket

## 5.0 Preparing Pressure Pump

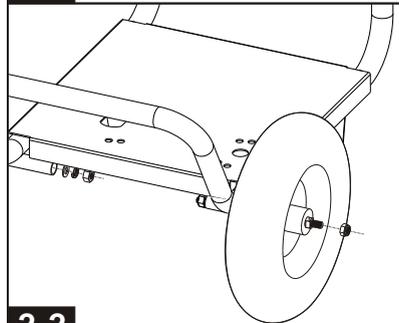
The pressure pump has a shipping plug inserted into the opening for the pump breather plug.

**WARNING** Failure to remove shipping plug and replace it with the dipstick/oil plug will damage pressure pump. Failure to add pump breather plug could void warranty

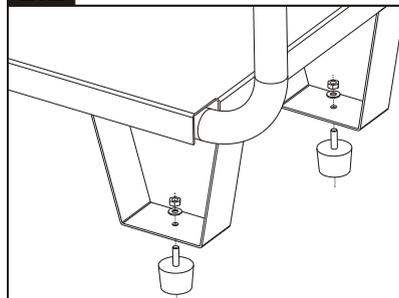
- 5.1 Using an 17mm open-end wrench or socket wrench, remove shipping plug from pressure pump. Discard shipping plug.
- 5.2 Remove pump breather plug from parts bag and insert it into pressure pump.
- 5.3 Tighten pump breather plug securely by hand. Do not use openend wrench or socket wrench to tighten. Using a wrench to tighten pump breather plug could strip threads.
- 5.4 Use sight glass on end of pressure pump to ensure pump oil is at 1/2 of the sight glass level
- 5.5 Add oil to pressure pump if level is below indicator on oil gauge. Use 30-weight non-detergent oil.
- 5.6 We recommend the use high-quality detergent oils, if classified for service SF, SG, SH, SJ or higher. DO NOT use special additives. Outdoor temperatures determine the proper oil viscosity.
  - \*\*Below 40 °F (4 °C) the use of SAE 30 will result in hard starting.
  - \*\*Above 80 °F (27 °C) the use of 10W30 may cause increased oil consumption. Check oil level more frequently.



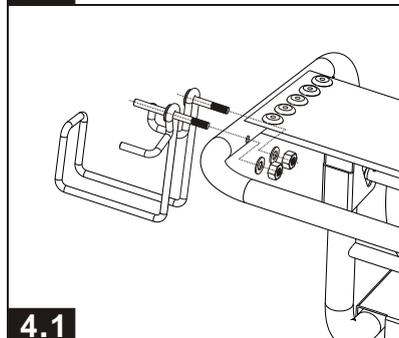
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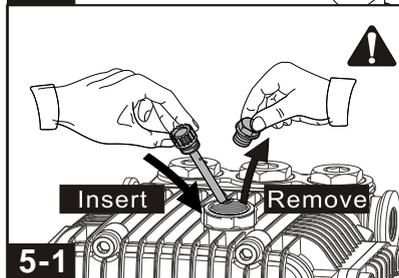
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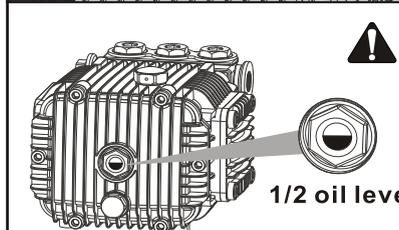
3.1



4.1



5-1



5-2

## BEFORE USE

### 1. Add Engine Oil

- 1.1 Place pressure washer on a flat, level surface.
- 1.2 Clean area around oil fill and remove yellow oil fill cap.
- 1.3 Using oil funnel (optional), slowly pour contents of provided oil bottle into oil fill opening.
- 1.4 Replace oil fill cap and fully tighten.

### NOTICE

Improper treatment of pressure washer can damage it and shorten its life.

DO NOT attempt to crank or start the engine before it has been properly serviced with the recommended oil. This may result in an engine failure.

### 2. Adding Fuel

**WARNING** Failure to use fuel as recommended in this manual will void the warranty.

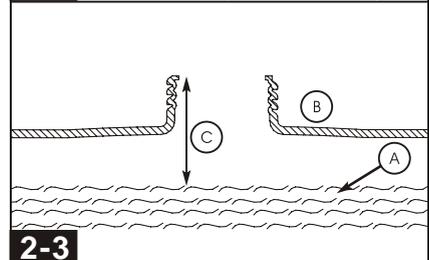
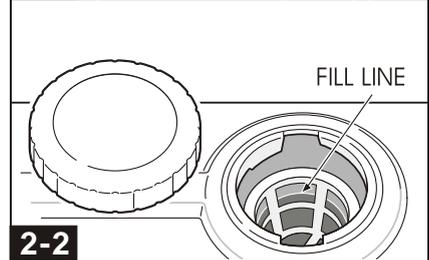
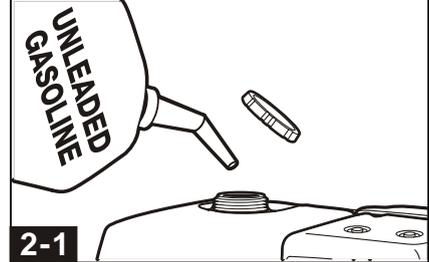
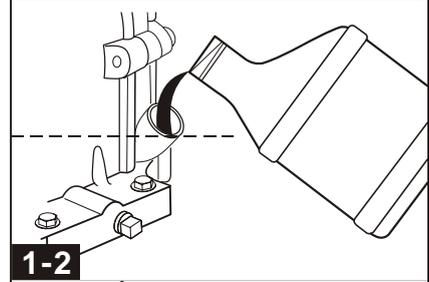
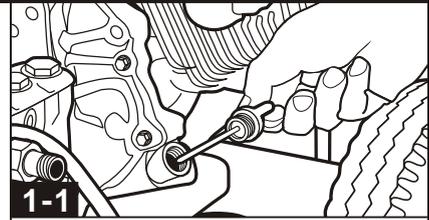
- DO NOT use unapproved gasoline such as E85 (85% ethanol/15% gasoline).
- DO NOT mix oil with gasoline.
- DO NOT modify engine to run on alternate fuels.

Mix in a fuel stabilizer when adding fuel to pressure washer to protect fuel system from forming gum deposits. If engine doesn't run properly after fueling, switch fuel brands. The engine is certified to run on gasoline. The emission control system for this engine is EM (Engine Modifications).

**WARNING** Fuel and fuel vapor are extremely flammable and explosive. Fire or explosion from misuse of fuel can cause severe burns and even death.

#### WHEN ADDING FUEL TO PRESSURE WASHER, OBSERVE THE FOLLOWING STEPS:

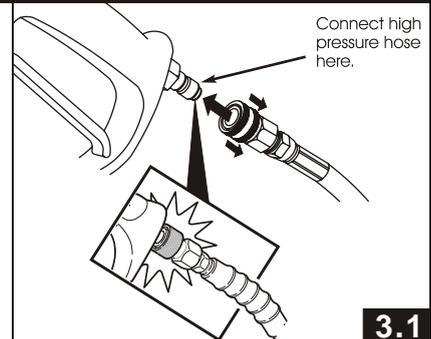
- 2.1 Turn pressure washer OFF and let it cool for at least two minutes before removing fuel cap. Loosen fuel cap slowly to release pressure.
- 2.2 Fill fuel tank outdoors.
- 2.3 DO NOT overfill fuel tank. Leave room for fuel to expand.
- 2.4 Wait for spilled fuel to evaporate before cranking engine.
- 2.5 Keep fuel away from sparks, open flames, pilot lights, heat and other ignition sources.
- 2.6 DO NOT light a cigarette or smoke near open fuel tank or container.
- 2.7 Clean area around fuel fill cap and slowly remove cap to allow any pressure to escape.
- 2.8 Slowly add unleaded gasoline (A) to fuel tank (B). Use extreme caution not to fill fuel above baffle (C). This allow appropriate space for fuel expansion.
- 2.9 Install fuel cap and allow any spilled fuel to evaporate before starting engine.



# BEFORE USE

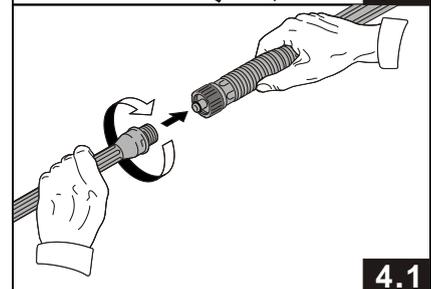
## 3. Attaching High Pressure Hose to Spray Gun

- 3.1 Pull slip ring on female quick-disconnect fitting of high pressure hose back.
- 3.2 Insert male quick-disconnect fitting on spray gun into female quick-disconnect on high pressure hose
- 3.3 Release slip ring on female quick-disconnect and twist. Listen for "click" to ensure both quick-disconnects are coupled.
- 3.4 Pull high pressure hose and spray gun in opposite direction to ensure they do not separate.



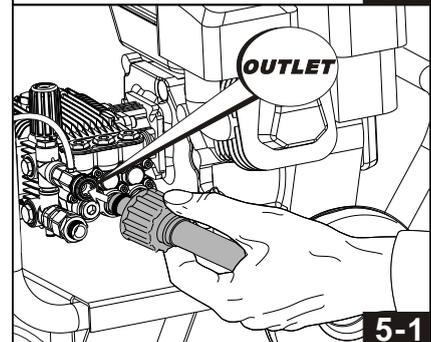
## 4. Connecting Spray Wand to Spray Gun

- 4.1 Thread spray wand onto spray gun.



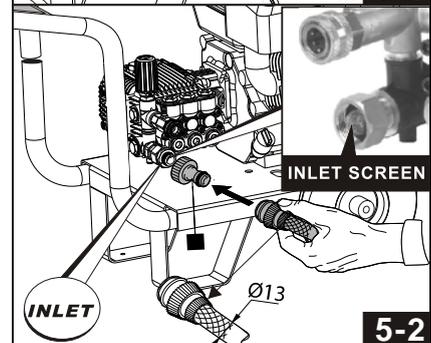
## 5. Connect Hose and Water Supply to Pump

- 5.1 Similarly, attach other end of high pressure hose to high pressure outlet on pump. Pull down on collar of quick connect, slide onto pump and let go of collar. Pull on hose to be sure of tight connection.
- 5.2 Before connecting garden hose to water inlet, inspect inlet screen . Clean screen if it contains debris or have it replaced if damaged. DO NOT run pressure washer if inlet screen is damaged.
- 5.3 Run water through your garden hose for 30 seconds to clean out any debris.



**IMPORTANT:** DO NOT siphon standing water for the water supply. Use ONLY cold water (less than 100°F).

- 5.4 Connect the garden hose (not to exceed 50 feet in length and with the ID no less than 13mm) to the water inlet. Tighten by hand.
- 5.5 Turn ON the water, squeeze the trigger to purge the pump system of air and impurities.



## NOTICE

DO NOT attempt to crank or start the engine before it has been properly serviced with the recommended oil. This may result in an engine failure.

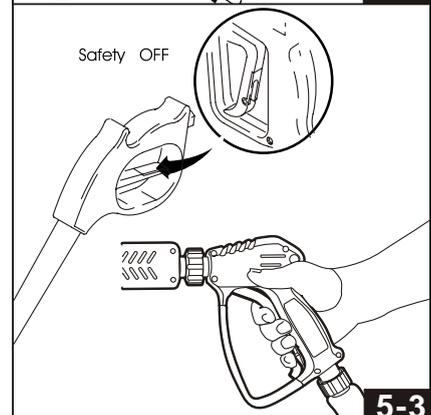
- There MUST be at least ten feet (3 m) of unrestricted garden hose between the pressure washer inlet and any device, such as a vacuum breaker or check valve.
- Damage to equipment resulting from failure to follow this instruction will void warranty.

## ⚠ WARNING

Risk of eye injury.  
Spray can splash back  
or propel objects.



- Always wear safety goggles when using this equipment or in vicinity of where equipment is in use.
- Before starting the pressure washer, be sure you are wearing adequate safety goggles.
- NEVER substitute safety glasses for safety goggles.



# PRESSURE WASHER LOCATION

## Pressure Washer Location

### Clearances and Air Movement

#### ⚠ WARNING



- Exhaust heat/gases can ignite combustibles, structures or damage fuel tank causing a fire.

- Keep at least 5 ft. (1.5 m) clearance on all sides of pressure washer including overhead.

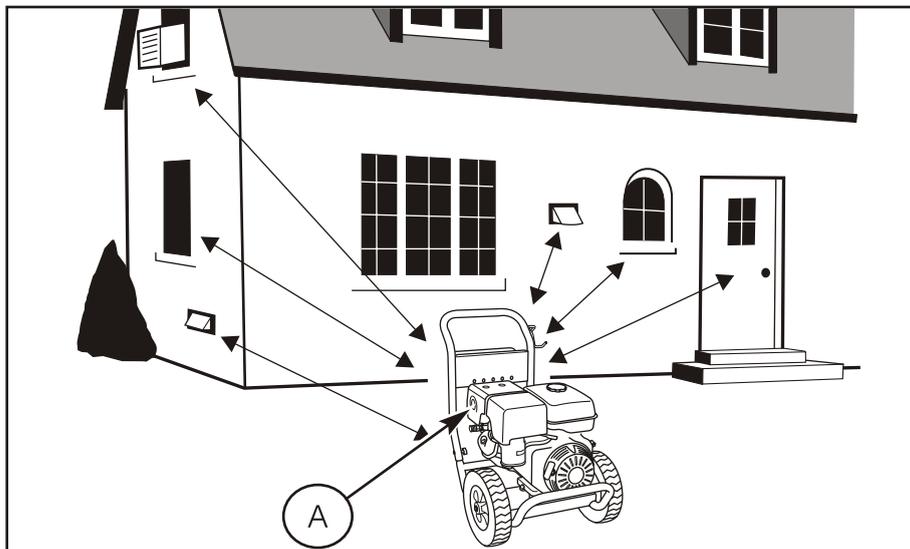
Place pressure washer in a well ventilated area, which will allow for removal of deadly exhaust gas. Do not place pressure washer where exhaust gas could accumulate and enter inside or be drawn into a potentially occupied building. Ensure exhaust gas (A) is kept away from any windows, doors, ventilation intakes, or other openings that can allow exhaust gas to collect in a confined area. Prevailing winds and air currents should be taken in

#### ⚠ WARNING



- Running engine gives off carbon monoxide, an odorless, colorless, poison gas.
- Breathing carbon monoxide can cause headache, fatigue, dizziness, vomiting, confusion, seizures, nausea, fainting or death.

- Operate pressure washer **ONLY** outdoors.
- Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings.
- **DO NOT** start or run engine indoors or in an enclosed area, even if windows and doors are open.



# START YOUR POWER WASHER

## 1. How to Start Your Pressure Washer

To start your pressure washer for the first time, follow these instructions step-by-step. This starting information also applies if you have let the pressure washer sit idle for at least a day.

- 1.1 Place pressure washer near an outside water source capable of supplying water at a flow rate greater than 3.5 gallons per minute and no less than 20 PSI at pressure washer end of garden hose.
- 1.2 Check that high pressure hose is tightly connected to spray gun and pump.
- 1.3 Make sure unit is in a level position.
- 1.4 Uncoil high pressure hose completely before using pressure washer.
- 1.5 Connect garden hose to water inlet on pressure washer pump.
- 1.6 Turn ON water, point gun in a safe direction and squeeze trigger to purge pump system of air and impurities.

### NOTICE

DO NOT run the pump without the water supply connected and turned on.

Damage to equipment resulting from failure to follow this instruction will void warranty.

- 1.7 Attach wand to spray gun. Tighten by hand.
- 1.8 Choose the nozzle you want to use, pull back on collar of quick connector, insert nozzle and release collar. Tug on nozzle to make sure it is securely in place.
- 1.9 Rotate fuel shut-off valve to "On" position
- 1.10 Move throttle control lever to "High" Position, shown on engine as a rabbit.
- 1.11 Move choke lever to "Choke" position.

**NOTE:** For a warm engine, be sure the choke lever is in the "Run" position.

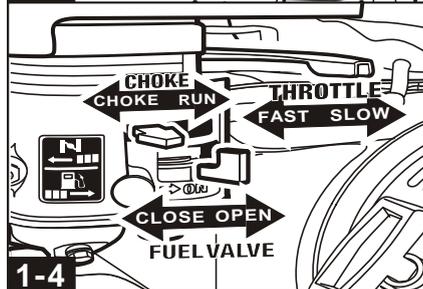
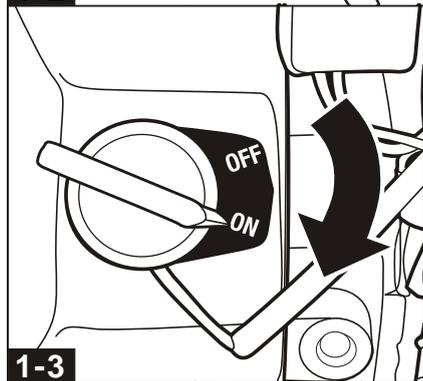
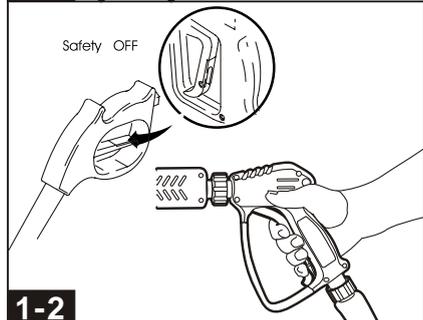
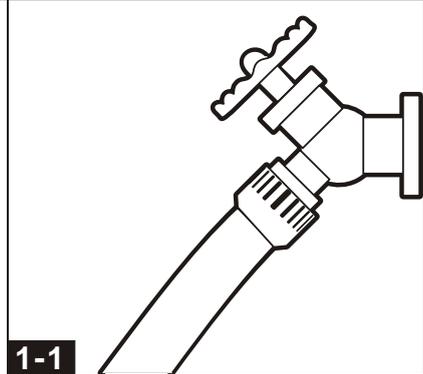
**IMPORTANT:** Before starting the pressure washer, be sure you are wearing adequate safety goggles.

- 1.12 When starting engine, position yourself as recommended below and grasp starter grip handle and pull slowly until you feel some resistance. Then pull rapidly to start engine.
- 1.13 Return starter grip handle slowly. DO NOT let rope "snap back" against starter.
- 1.14 When engine starts, slowly move choke lever to "Run" position, as engine warms. If engine falters, move choke lever to "Choke" position, then to "Run" position.
- 1.15 After each starting attempt, where engine fails to run, always point gun in safe direction and squeeze spray gun trigger to release high pressure.
- 1.16 If engine fails to start after six pulls, move choke lever to "Run" position, and repeat steps 13 through 15.

## 2. How to Stop Your Pressure Washer

- 2.1. Release spray gun trigger and let engine idle for two minutes.
- 2.2. Move throttle control lever on engine to "Stop" position.
- 2.3. ALWAYS point spray gun in a safe direction, press red button and squeeze spray gun trigger to release retained high water pressure.

**IMPORTANT:** Spray gun traps high water pressure, even when engine is stopped and water is disconnected.



# USE THE NOZZLE TIPS

## 1. Attaching Pressure Nozzles to Spray Wand

- 1.1 Pull slip ring on female quick-disconnect fitting of spray wand back.
- 1.2 Insert male quick-disconnect fitting on pressure nozzle into female quick-disconnect on spray wand.
- 1.3 Release slip ring on female quick-disconnect and twist. Listen for "lick" to ensure both quick-disconnects are coupled.
- 1.4 Pull high pressure nozzle and spray wand in opposite direction to ensure they do not separate.

### NOTE

To prevent damage to your surface and to select an appropriate nozzle size for your application, always start with lowest pressure nozzle size (White) and continue changing to the higher nozzle size until the best work result is achieved.

The pressure washer comes furnished with five spray nozzles. Each nozzle is color coded and delivers a specific spray pattern and pressure for a particular cleaning job. The size of the nozzle determines the size of the fan spray and the pressure out of the nozzle.

### WARNING

Pressure washer produces fluid pressures and velocities high enough to penetrate human and animal flesh which could result in serious injury or amputation. Do not point pressure washer in direction of people or animals. High velocity fluid spray can cause objects to break, propelling particles at high speeds.

**0° Nozzle - Red:** This nozzle delivers a pinpoint stream of pressurized water and is extremely powerful. It covers only a small area of cleaning. This nozzle should only be directed at surfaces that can withstand high pressure such as metal or concrete. Do not use this nozzle to clean wood.

**15° Nozzle - Yellow:** This nozzle delivers a powerful 15 degree spray pattern for intense cleaning of small areas. This nozzle should only be used on areas and materials that can withstand high pressure.

**25° Nozzle - Green:** This nozzle delivers a 25 degree spray pattern for intense cleaning of larger areas. This nozzle should only be used on areas that can withstand pressure from this nozzle.

**40° Nozzle - White:** This nozzle delivers a 40 degree spray pattern and a less powerful stream of water. This nozzle can cover a wide area and should be used for most general cleaning jobs.

**Chemical Nozzle - Black:** This nozzle is used to apply special chemicals and cleaning solutions. This nozzle produces the weakest pressure stream of the five nozzles.

The pressure washer nozzles are stored in receptacles on a panel mounted to the handle of the washer. Colors on the panel identify nozzle location and spray panel.

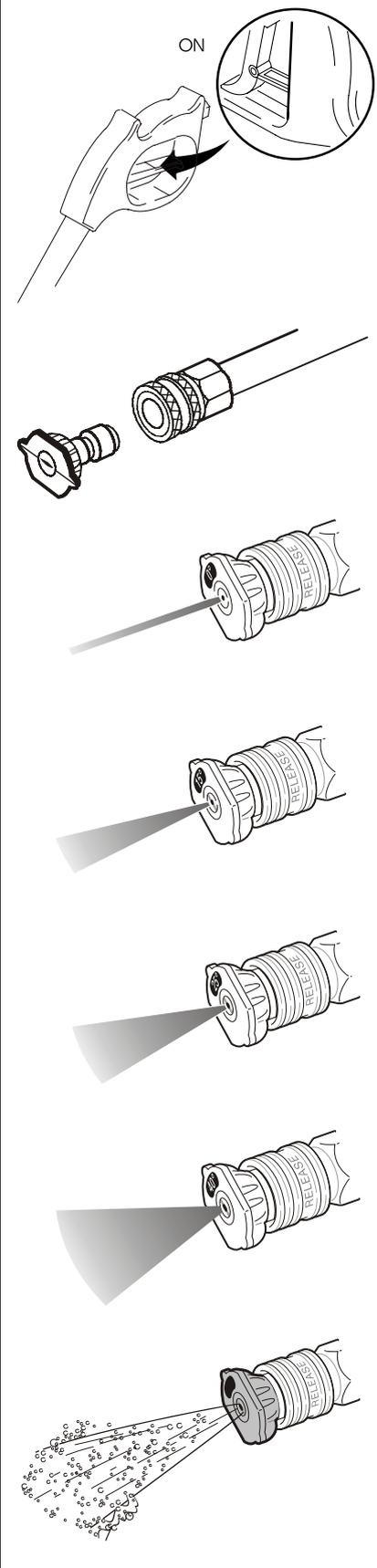
## 2. Interchanging Pressure Nozzles

Turn off pressure washer before attempting to change pressure nozzles. Follow the steps below:

- 2.1 Pull slip ring of female quick-disconnect back and remove pressure nozzle in pressure wand
- 2.2 Insert male end of new pressure nozzle into quick-disconnect. Release slip ring of quick-disconnect and twist pressure nozzle ensuring proper connection.
- 2.3 Listen for "lick" when coupling quick-disconnect and pull in opposite directions to ensure the quick-disconnect does not come apart.

### WARNING

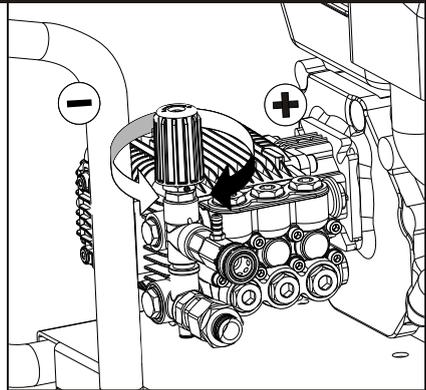
Never place hands in front of nozzle. Never grasp hose or fittings during pressure washer operation. Never attempt to attach or remove spray wand or hose fittings while pressure washer system is pressurized.



## RINSING PRESSURE

### 1. Pressure Washer Rinsing

- 1.1 Remove black spray tip from nozzle extension.
- 1.2 Select and install desired high pressure spray tip following instructions How to Use Spray Tips.
- 1.3 Keep spray gun a safe distance from area you plan to spray.
- 1.4 Increase (decrease) spray pressure by turning pressure control knob clockwise (counterclockwise). Use lower pressure to wash items such as a car or boat. Use higher pressure to strip paint and degrease driveways.
- 1.5 Apply a high pressure spray to a small area and then check surface for damage. If no damage is found, you can assume it is okay to continue rinsing.
- 1.6 Start at top of area to be rinsed, working down with same overlapping strokes as you used for cleaning.



## APPLY CHEMICAL

### 1. To Apply Chemicals:

- 1.1 Press chemical hose onto barbed fitting located near back of high pressure hose connection.
- 1.2 Press other end of chemical hose, with filter, into container holding chemicals or cleaning solutions.
- 1.3 Install chemical (black) nozzle.

### 2. After Using Chemicals:

- After using soaps and cleaning solutions, it is necessary to thoroughly clean the pressure washer.
- 2.1 Place the chemical hose in a container of clean water.
  - 2.2 Turn on pressure washer and engage spray wand to draw clean water through the system to thoroughly clean it.

### 3. Cleaning and Applying Detergent

To apply detergent, follow these steps:

- 3.1 Review use of spray tips.
- 3.2 Prepare detergent solution as required by job.
- 3.3 Place small filter end of detergent siphoning tube into detergent container.

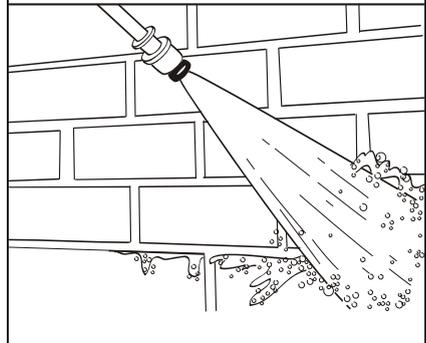
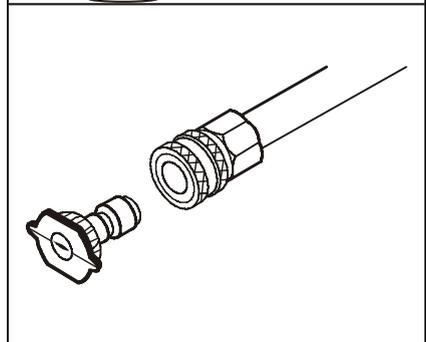
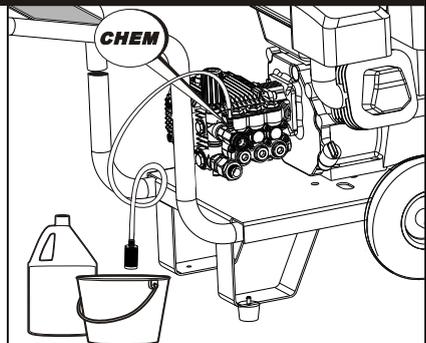
**NOTE:** Make sure the filter is fully submerged in detergent while applying detergent.

4. Make sure black spray tip is installed.

**NOTE:** Detergent cannot be applied with the high pressure spray tips (White, Green, Yellow or Red).

5. Make sure garden hose is connected to water inlet. Check that high pressure hose is connected to spray gun and pump. Turn on water.
6. Start engine following instructions How to Start Your Pressure Washer.
7. Apply detergent to a dry surface, starting at lower portion of area to be washed and work upward, using long, even overlapping strokes.
8. Allow detergent to "soak in" for 3-5 minutes before washing and rinsing. Reapply as needed to prevent surface from drying. **DO NOT** allow detergent to dry on (prevents streaking).

**IMPORTANT:** You must flush the detergent siphoning system after each use by placing the filter into a bucket of clean water, then run the pressure washer in low pressure for 1-2 minutes.



# MAINTENANCE

## General Recommendations

Regular maintenance will improve the performance and extend the life of the pressure washer.

The pressure washer's warranty does not cover items that have been subjected to operator abuse or negligence. To receive full value from the warranty, the operator must maintain the pressure washer as instructed in this manual and in the engine manual, including proper storage as detailed in Winter Storage and Long Term Storage

**NOTE:** Should you have questions about replacing components on your pressure washer, please contact dealer for assistance.

- Some adjustments will need to be made periodically to properly maintain your pressure washer. Check the spray gun and extension wand assembly for wear.
- All maintenance in this manual and the engine operator's manual should be made at least once each season.
- Once a year you should clean or replace the spark plug, clean or replace the air filter. A new spark plug and clean air filter assure proper fuel-air mixture and help your engine run better and last longer. Please refer to your engine operator's manual for more details.

## Pressure Washer Maintenance

### Clean Debris

Daily or before use, clean accumulated debris from cleaning system. Keep linkage, spring and controls clean. Keep area around and behind muffler free from any combustible debris. Inspect cooling air slots and openings on the pressure washer. These openings must be kept clean and unobstructed.

### NOTICE

Improper treatment of pressure washer can damage it and shorten its life.

- DONOT insert any objects through cooling slots.

Cleaning system parts should be kept clean to reduce the risk of overheating and ignition of accumulated debris.

Use a damp cloth to wipe exterior surfaces clean.

Use a soft bristle brush to loosen caked on dirt, oil, etc.

Use a vacuum cleaner to pick up loose dirt and debris.

### Check and Clean Inlet Screen

Examine the screen on the pump water inlet. Clean it if the screen is clogged or replace it if screen is damaged.

### Check High Pressure Hose

The high pressure hose can develop leaks from wear, kinking, or abuse. Inspect the hose each time before using it. Check for cuts, leaks, abrasions or bulging of cover, damage or movement of couplings. If any of these conditions exist, replace the hose immediately.

### ⚠ WARNING



The high pressure stream of water that this equipment produces can cut through skin and its underlying tissues, leading to serious injury and possible amputation.

- NEVER repair high pressure hose. Replace it.
- Replacement hose rating MUST exceed maximum pressure rating of unit

### Check Detergent Siphoning Tube

Examine the filter on the detergent tube and clean if clogged. The tube should fit tightly on the barbed fitting. Examine the tube for leaks or tears. Replace the filter or tube if either is damaged.

### Check Gun

Examine the hose connection to the spray gun and make sure it is secure, and make sure the "Safety Lock" is present attached on the trigger, it helps to prevent any accident jets when in operating. Replace spray gun immediately if the "Safety Lock" is damage or not works.

### Check Spray Wand

Occasionally, the spray wand can become clogged with foreign materials such as dirt. When this happens, excessive pressure can develop. Whenever the pressure nozzle becomes partially clogged, the pump pressure will pulsate. It should be immediately cleaned.

# MAINTENANCE

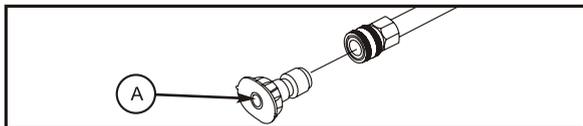
## Nozzle Maintenance

A pulsing sensation felt while squeezing the spray gun trigger may be caused by excessive pump pressure. The principal cause of excessive pump pressure is a spray tip clogged or restricted with foreign materials, such as dirt, etc. To correct the problem, immediately clean the spray tip following these instructions:

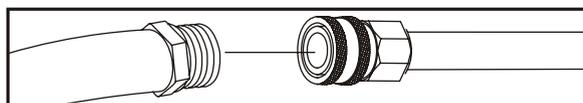
1. Shut off engine and turn off water supply.
2. ALWAYS point spray gun in a safe direction, squeeze spray gun trigger to release retained high water pressure.

 <b>WARNING</b>	
	<p>The high pressure stream of water that this equipment produces can cut through skin and its underlying tissues, leading to serious injury and possible amputation.</p> <p>Spray gun traps high water pressure, even when engine is stopped and water is disconnected, which can cause injury.</p>
<ul style="list-style-type: none"> <li>• Keep high pressure hose connected to pump and spray gun while system is pressurized.</li> <li>• ALWAYS point spray gun in safe direction squeeze spray gun trigger, to release high pressure, every time you stop engine.</li> </ul>	

3. Remove spray tip from end of nozzle extension.
4. Use a small paper clip to free any foreign material clogging or restricting spray tip (A).



5. Remove nozzle extension from spray gun.
6. Using a garden hose, remove additional debris by back flushing water through nozzle extension. Back flush between



7. Reinstall spray tip into nozzle extension.
8. Reconnect nozzle extension to spray gun.
9. Make sure garden hose is connected to water inlet. Check that high pressure hose is connected to spray gun and pump. Turn on water.
10. Start engine following instructions How to Start Your Pressure Washer
11. Test pressure washer by operating with each quick connect spray tip.

## Pump Oil Maintenance

### Changing Pump Oil

Change oil after first 50 hours of operation and then every 200 hours or 3 months, whichever occurs first.

**NOTE:** When changing pump oil, use only high quality nondetergent 30 weight oil. Use no special additives.

### Change pump oil as follows:

1. Clean area around brass oil drain plug at bottom of pump.
2. Remove oil drain plug. Drain oil completely into an approved container.
3. When oil has completely drained, install oil drain plug and tighten firmly.
4. Clean area around pump oil dipstick. Remove dipstick and fill pump with recommended oil to full mark on dipstick.
5. Install pump oil dipstick.
6. Wipe up any spilled oil.

Pump Series	Oil Type	Oil Capacity
15	10W-30	500ML
18	10W-30	600ML

## Engine Maintenance

See the engine operator's manual for instructions on how to properly maintain the engine.

 <b>CAUTION</b>	
Avoid prolonged or repeated skin contact with used motor oil.	
<ul style="list-style-type: none"> <li>• Used motor oil has been shown to cause skin cancer in certain laboratory animals.</li> <li>• Thoroughly wash exposed areas with soap and water.</li> </ul>	



**KEEP OUT OF REACH OF CHILDREN. DON'T POLLUTE. CONSERVE RESOURCES. RETURN USED OIL TO COLLECTION CENTERS.**

# STORAGE

## Long Term Storage Instructions (Fuel in tank)

Gasoline fuel can become stale when stored over 30 days. Stale fuel causes acid and gum deposits to form in the fuel system or crucial carburetor parts. To keep fuel fresh, add a fuel stabilizer liquid additive to fuel. The fuel stabilizer is available at most auto parts stores.

Draining gasoline is unnecessary if the fuel stabilizer is used according to the instructions that come with it. Run pressure washer engine for a minimum of two minutes, after stabilizer is added to fuel, to allow it to circulate throughout the engine. The engine and fuel can be stored up to 24 months.

**⚠ WARNING** Fuel and fuel vapor are extremely flammable and explosive. Fire or explosion from misuse of fuel can cause severe burns and even death.

## To Protect Against Rust Formation During Storage, Oil the Cylinder Bore:

1. Remove spark plug and pour approximately 1/2oz (15 ml) of clean engine oil into the cylinder.
2. Install spark plug and pull starter handle slowly to distribute oil. DO NOT start engine at this time.
3. Slowly pull the recoil starter 2 to 3 times to distribute and coat the cylinder bore with oil.

**⚠ WARNING** Unintentional sparking can cause fire or electrical shock. Failure to observe this warning can cause severe property damage, severe burns and even death. Disconnect spark plug wire from spark plug and cover tip of spark plug wire with insulating tape and place wire where it cannot come in contact with spark plug or pressure washer frame.

## Storage of Pressure Pump

1. Drain all water from high pressure line, coil it and store it in cradle of pressure washer handle.
2. Drain all water from spray gun and spray wand by holding spray gun in vertical position with nozzle pointed downward. Squeeze trigger to remove fluids from spray gun and spray wand. Store in spray gun/hose holder.

3. Store chemical hose, high pressure hose and spray wand so they are protected from damage, such as being run over.

It is **RECOMMENDED** that you follow these steps to protect the internal seals of pressure washer when storing unit for more than 30 days and/or when freezing temperatures are expected.

1. Obtain a funnel, six ounces of RV antifreeze and approximately 36 inches of garden hose with a male hose connector on one end.

### ⚠ CAUTION

Use only RV antifreeze. Any other type of antifreeze is corrosive and can damage pressure pump.

2. Disconnect spark plug wire. Ensure it cannot touch any metal on pressure washer.
3. Connect 36 inch length of garden hose to water inlet of pressure pump.
4. Add RV antifreeze.
5. Pull engine starter rope slowly several times until antifreeze comes out of pressure hose connection of pressure pump.
6. Remove hose from water inlet of pressure pump.
7. Reconnect spark plug wire.

## Other Storage Tips

1. DO NOT store gasoline from one season to another unless it's been treated with fuel stabilizer.
2. Replace fuel container, if metal, and it begins to rust. Rust and dirt and debris can contaminate fuel supply and components resulting in poor performance and/or internal damage to engine. Fuel should be stored in newer approved plastic storage containers.
3. Cover pressure washer with a suitable cover that does not retain moisture such as a plastic or plastic coated tarp.
4. Store pressure washer in a clean, dry area.

### ⚠ WARNING

Certain storage covers can be flammable or can melt in higher temperatures. Do not place storage cover over pressure washer unit until it has completely cooled.

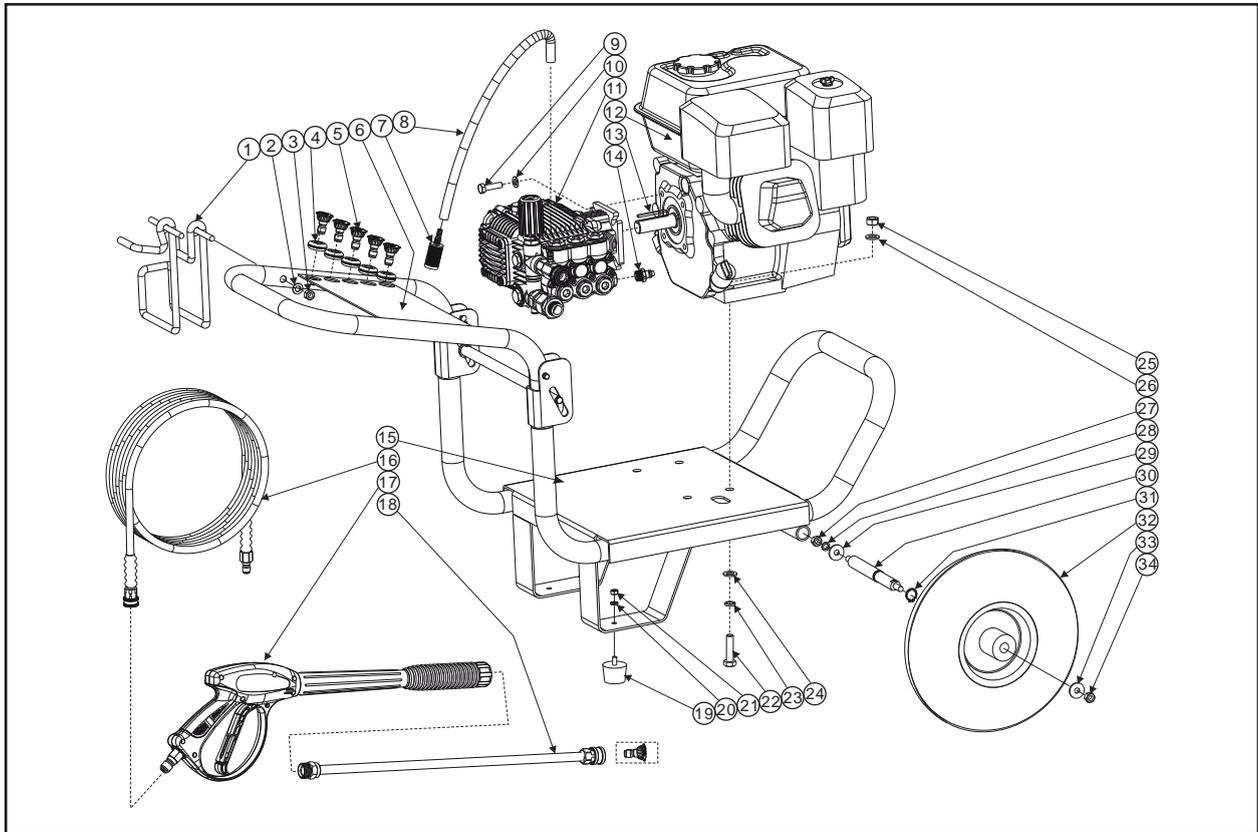
## TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Solution
<b>Engine shuts down when running.</b>	<ol style="list-style-type: none"> <li>1.Out of fuel.</li> <li>2.Low Engine Oil</li> </ol>	<ol style="list-style-type: none"> <li>1.Fill fuel tank.</li> <li>2. Add oil.</li> </ol>
<b>Engine will not start; or starts and runs rough.</b>	<ol style="list-style-type: none"> <li>1.Rocker switch set to</li> <li>2.Fuel valve is in "OFF" position.</li> <li>3.Dirty air cleaner</li> <li>4.Out of fuel.</li> <li>5. Stale fuel.</li> <li>6.Spark plug wire not connected to spark plug.</li> <li>7.Bad spark plug.</li> <li>8.Water in fuel.</li> <li>9.Flooded.</li> <li>10.Excessively rich fuel/air mixture.</li> <li>11.Intake valve stuck open or closed.</li> <li>12.Engine has lost compression.</li> <li>13.Low engine oil.</li> <li>14.Wrong Fuel.</li> <li>15.Engine is too hot</li> <li>16.Chock is in wrong position</li> <li>17.Pressure Builds up after 2 pulls on recoil starter or after initial use.</li> </ol>	<ol style="list-style-type: none"> <li>1.Set switch to "ON" position.</li> <li>2.Turn fuel valve to "ON" position.</li> <li>3.Clean or replace air cleaner</li> <li>4.Fill fuel tank.</li> <li>5.Drain fuel tank and carburetor; fill with fresh fuel.</li> <li>6.Connect wire to spark plug.</li> <li>7.Replace spark plug.</li> <li>8.Drain fuel tank and carburetor; fill with fresh fuel.</li> <li>9.Wait 5 minutes and re-crank engine.</li> <li>10.Contact authorized service facility.</li> <li>11.Contact authorized service facility.</li> <li>12.Contact authorized service facility.</li> <li>13.Add oil.</li> <li>14.Use recommended fuel.</li> <li>15.Allow engine to cool</li> <li>16.Change chock position</li> <li>17.Squeeze gun trigger to relieve pressure.</li> </ol>
<b>Engine "Hunts" or falters.</b>	<ol style="list-style-type: none"> <li>1.Carburetor Is running too rich or too lean.</li> </ol>	<ol style="list-style-type: none"> <li>1.Contact authorized service facility.</li> </ol>
<b>Engine lacks power.</b>	<ol style="list-style-type: none"> <li>1.Cylinder pressure is low.</li> <li>2.Dirty air cleaner</li> </ol>	<ol style="list-style-type: none"> <li>1.Contact authorized service facility.</li> <li>2.Replace air filter.</li> </ol>
<b>No pressure or Low pressure.</b>	<ol style="list-style-type: none"> <li>1.Spray wand not set to high pressure.</li> <li>2.Lower water supply.</li> <li>3.Hose fitting leaks during high pressure.</li> <li>4.Nozzle obstructed.</li> <li>5.Water filter screen obstructed.</li> <li>6.Defective thermal relief valve.</li> <li>7.Air in hose.</li> <li>8.Choke lever in choke position.</li> <li>9.Throttle control lever is hot in fast position.</li> <li>10.High pressure too long.</li> </ol>	<ol style="list-style-type: none"> <li>1.See "Using Spray Wand" section.</li> <li>2.Water supply must be 5 GPM @ 20 psi.</li> <li>3.Tighten hose fitting. Use thread sealant tape if necessary.</li> <li>5.Remove and clean filter.</li> <li>6.Call Customer Service:</li> <li>7.Stop engine and water source. Disconnect water source from pump inlet and turn water source to ON to remove all air from hose. When steady stream of water is present, turn water source to OFF. Re-connect water source to pump inlet and turn on water source. Squeeze trigger to remove remaining air.</li> <li>8.Move choke to NO CHOKE position.</li> <li>9.Move throttle control lever from fast position.</li> <li>10.Use High pressure hose under 100 ft (305 M).</li> </ol>

## TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Solution
<b>Pump will not draw Chemicals</b>	<ol style="list-style-type: none"> <li>1.Spray wand not set to low pressure..</li> <li>2.Chemical filter clogged.</li> <li>3.Chemical screen not in chemical.</li> <li>4.Chemical solution too thick.</li> <li>5.Pressure hose too long</li> <li>6.Chemical build-up in chemical injector.</li> </ol>	<ol style="list-style-type: none"> <li>1.See "Using Spray Wand" section.</li> <li>2.Clean Filter.</li> <li>3.Ensure end of chemical hose is fully submerged into chemicals.</li> <li>4.Dilute chemical. Chemical solutions should have same consistency as water.</li> <li>5.Lengthen water supply hose instead of pressure hose.</li> <li>6.Have parts cleaned or replaced by authorized dealer.</li> </ol>
<b>No or low pressure (after period of normal use).</b>	<ol style="list-style-type: none"> <li>1.Worn seal or packing.</li> <li>2.Worn or obstructed valves.</li> <li>3.Worn unloader piston.</li> <li>4.Worn E-Z start valve.</li> </ol>	Have parts cleaned or replaced by authorized dealer.
<b>Water leaking at spray gun/spray wand connection.</b>	<ol style="list-style-type: none"> <li>1.Worn or broken O-ring.</li> <li>2.Loose hose connection.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and replace O-ring.</li> <li>2. Tighten hose connection.</li> </ol>
<b>Water leaking at pump.</b>	<ol style="list-style-type: none"> <li>1.Loose connections.</li> <li>2.Piston packings worn.</li> <li>3.Worn or broken O-rings.</li> <li>4.Pump head or tubes damaged from freezing.</li> </ol>	<ol style="list-style-type: none"> <li>1.Check and replace O-ring</li> <li>2.Tighten hose connection.</li> <li>1.Tighten connections.</li> <li>2.Have parts cleaned or replaced by authorized dealer.</li> <li>3.Have parts cleaned or replaced by authorized dealer.</li> <li>4.Have parts cleaned or replaced by authorized dealer.</li> </ol>
<b>Oil leaking at pump</b>	<ol style="list-style-type: none"> <li>1.Oil seals worn.</li> <li>2.Loose drain plug.</li> <li>3.Worn drain plug O-ring.</li> <li>4.Worn fill plug O-ring.</li> <li>5.Pump overfilled.</li> <li>6.Incorrect oil used.</li> <li>7.Vent plug clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Have parts cleaned or replaced by authorized dealer.</li> <li>2.Tighten drain plug.</li> <li>3.Inspect and replace O-ring.</li> <li>4.Inspect and replace O-ring.</li> <li>5.Check for correct amount.</li> <li>6.Drain and refill with correct type and amount of oil.</li> <li>7.Clean vent plug. Use air hose to free it of blockage. If problem persists, replace vent plug.</li> </ol>
<b>Pump pulsates</b>	Nozzle obstructed.	See "Using Spray Wand" section.

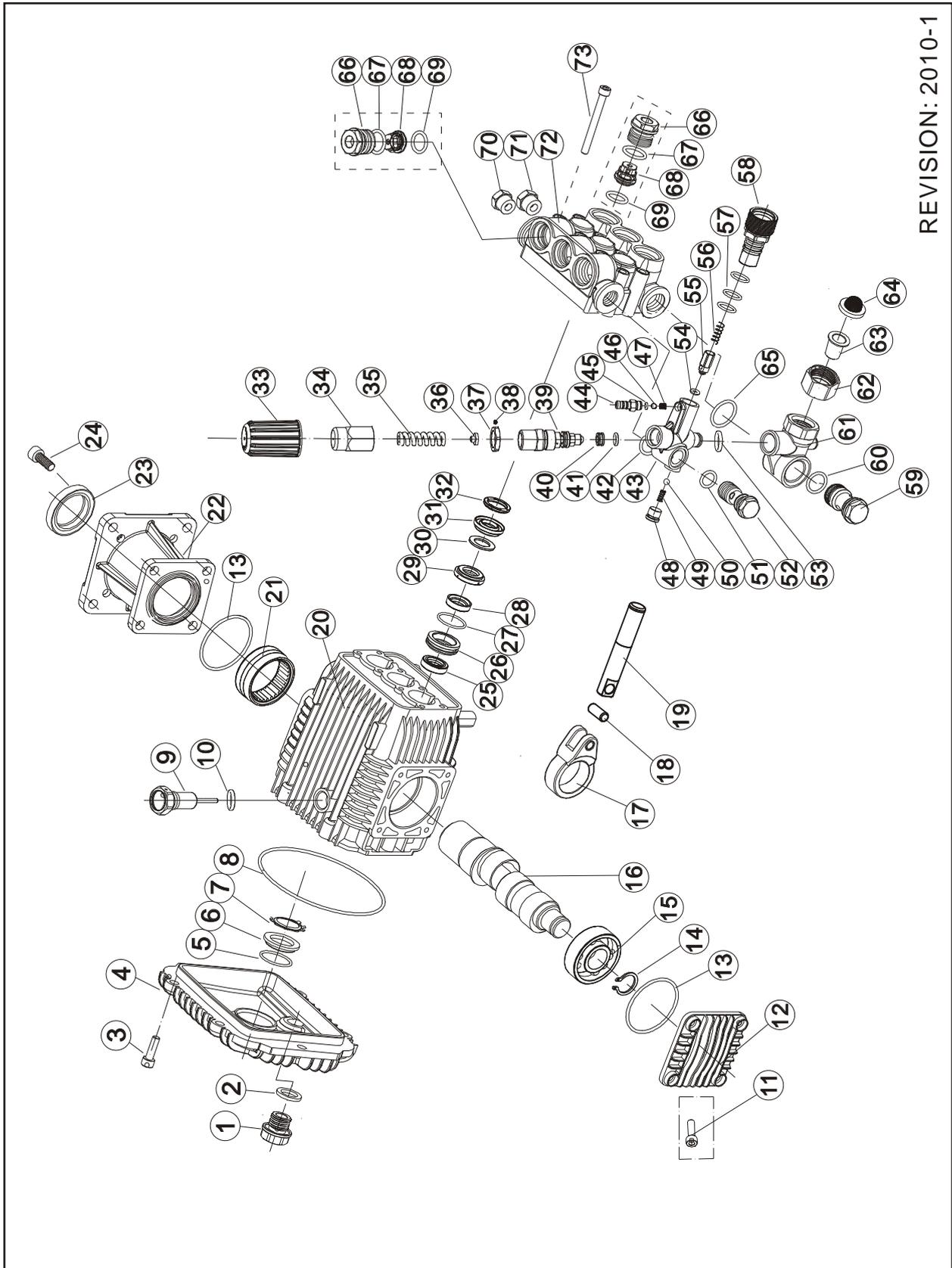
## UNIT EXPLODED VIEW AND PARTS LIST



### PARTS LIST

Ref No.	Description	Qty per pump	Ref No.	Description	Qty per pump
1	Gun holder and hose hook	1	18	Wand	1
2	Plain washer	1	19	Rubber foot	2
3	Fix nut	1	20	Plain washer	2
4	Grommet	5	21	Fix nut	2
5	Nozzle set	5	22	Engine fix bolt	4
6	Decal	1	23	Spring washer	4
7	Filter	1	24	Plain washer	4
8	Chemical inlet hose	1m	25	Fix nut	4
9	Pump fix bolt	4	26	Spring washer	4
10	Spring washer	4	27	Axile fix nut	2
11	Axial pump assy	1	28	Spring washer	2
12	Engine	1	29	Plain washer	2
13	Key	1	30	Axile	2
14	Thermal protect valve	1	31	Clip	2
15	Frame	1	32	Wheel	2
16	High-pressure hose	10m	33	Plain washer	2
17	Spray gun	1	34	Wheel fix nut	2

# PUMP EXPLODED VIEW



REVISION: 2010-1

## PUMP PARTS LIST

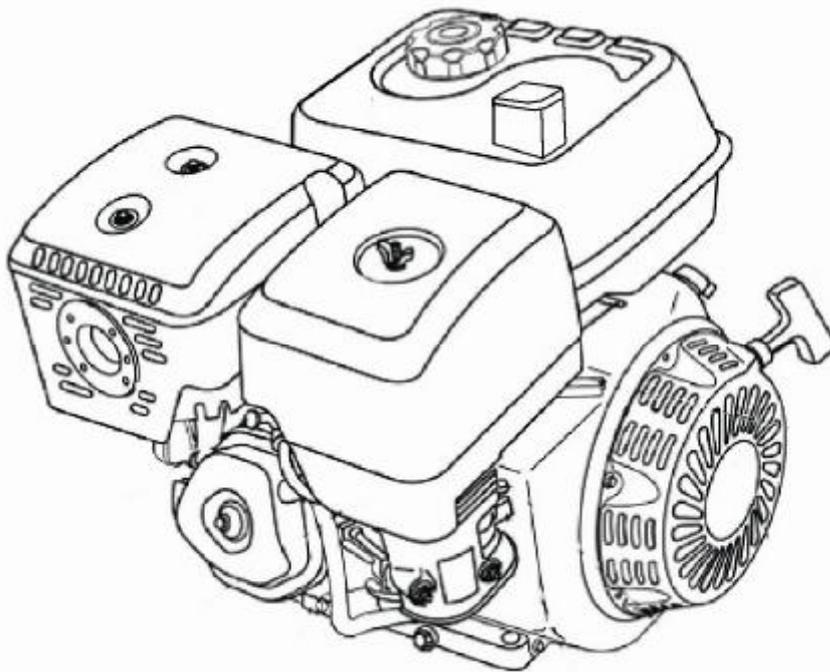
<i>Ref No.</i>	<i>Description</i>	<i>Ref No.</i>	<i>Description</i>
1	Drain plug	38	Fix screw M4x4
2	Gasket 17.5x12x2	39	Unloader Valve
3	Screw	40	Valve Seat
4	Crankcase cover	41	O-ring 9.25x1.78
5	O-ring 20.4X2.4	42	O-ring 18.2x2.4
6	Side glass	43	Valve housing
7	Fix clip	44	Soap suction nozzle
8	O-ring 104X3	45	O-ring 4.47x1.78
9	Vented oil plug	46	Steel ball
10	O-ring 11.6X2.4	47	Spring
11	Bolt M8x16	48	Valve plug
12	Crankshaft cover	49	Spring
13	O-ring 51.8x2.2	50	Steel ball
14	Snap ring	51	O-ring 18.2x2.4
15	Ball bearing 6304	52	Outlet banjo bolt
16	Crankshaft	53	O-ring 11.3x2.4
17	Connecting rod	54	O-ring 4.2x2.4
18	Fix pin	55	Checking valve
19	Ceramic plunger	56	Spring
20	Crankcase	57	O-ring 14x1.9
21	Needle bearing 4907	58	Outlet quick connector
22	Flange	59	Inlet banjo bolt
23	Oil seal 40x52x7	60	O-ring 18.2x2.4
24	Bolt M8x20	61	By-pass housing
25	Oil seal	62	Swivel nut
26	Retainer ring	63	Inlet connector
27	O-ring 26.7x1.78	64	Inlet water filter
28	Low pressure seal	65	O-ring 23.4x2.4
29	Seal compaction ring	66	Valve Plug
30	Seal Compaction flake	67	O-ring 18x2.65
31	High-pressure seal	68	Checking valve assy
32	Supporting ring	69	O-ring 15.54x2.62
33	Plastic cap	70	Outlet plug
34	Knob	71	Inlet plug
35	Spring	72	Bolt M8x60
36	Spring seat	73	Manifold head
37	Jam nut		

# **Gasoline Engine Owner's Manual**

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**168F(D)-1 168F(D)-2 173F(D) 177F(D)  
182F(D) 188F(D) 190F(D)**

**G160F(D) G200F(D) G240F(D) G270F(D)  
G340F(D) G390F(D) G420F(D)**



Thanks for purchasing our Gasoline engine.

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 engine and should remain with the engine if resold.

Our corporation follows the strategy of sustainable development, so we reserve the right to modify and improve the products described in the document without previous notice.

The copyright is reserved by our corporation, we reserve all rights.

It should be strictly prohibited to copy, transfer, distribute and save the items of the documents without our written permission.

## Safety warning

Your and other person's personal and property safety should be very important. Please carefully read the following three most important safety warnings with the symbol of , and the important safety remind with the symbol of 

 **WARNING**

Indicates serious injury or death will result if instructions are not followed.

Indicates a strong possibility that serious injury or death could result if instructions are not followed.

 **DANGER**

 **CAUTION**

Indicates a possibility that minor injury could result if instructions are not followed.

 **NOTICE**

Indicates that equipment or property damage can result if instructions are not followed.

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# SAFETY

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## 1. ENGINE SAFETY

### Owner responsibilities

- I Read and understand this owner's manual before operating the engine. Failure to do so could result in personal injury or equipment damage.
- I Know how to stop the engine quickly, and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.
- I Do not allow children to operate the engine. Keep children and pets away from the area of operation.

### Refuel With Care

- I Gasoline is extremely flammable, and gasoline vapor can explode. Refuel outdoors, in a well-ventilated area, with the engine stopped.
- I Never smoke near gasoline, and keep other flames and sparks away.
- I If any fuel is spilled, make sure the area is dry before starting the engine.

### Hot Exhaust

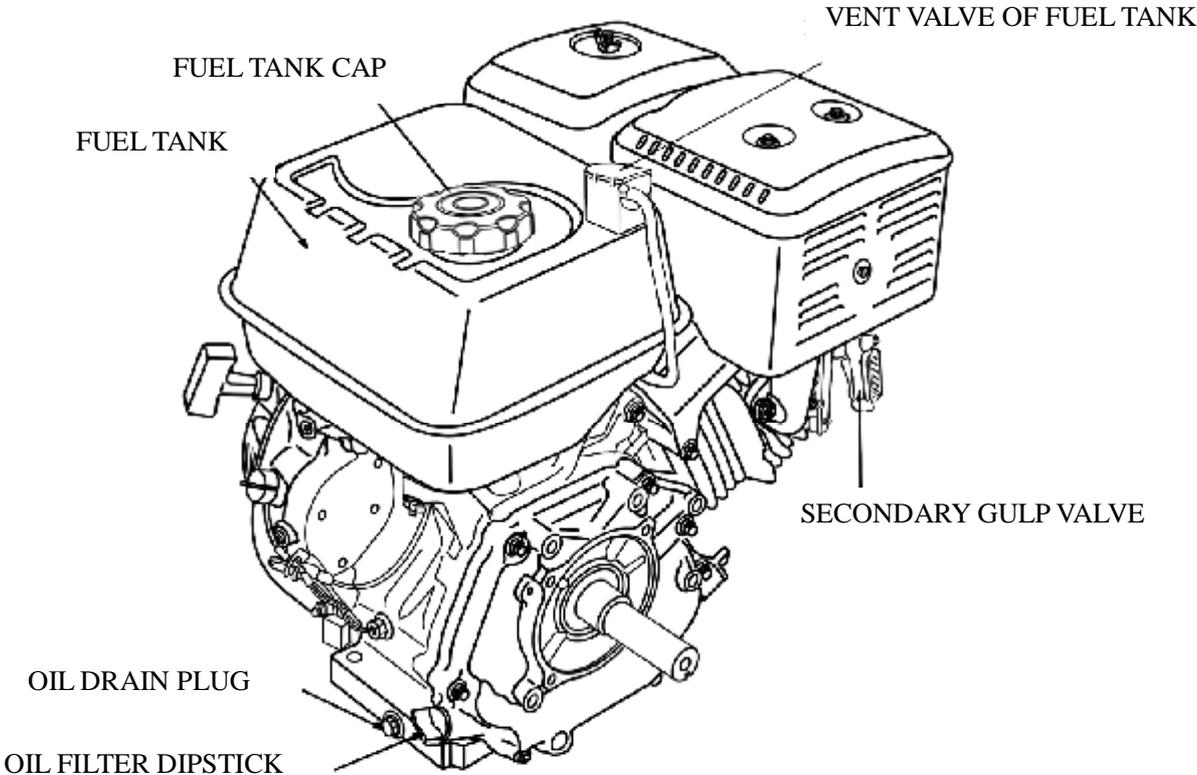
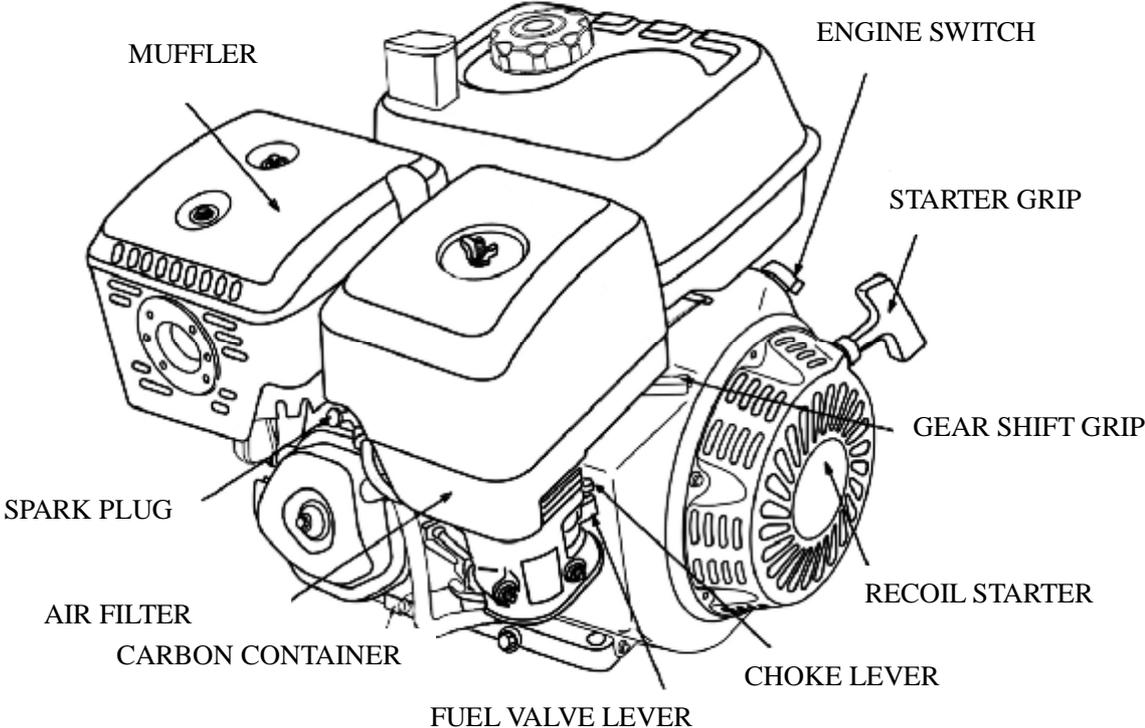
- I The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Let the engine cool before storing it indoors.
- I To prevent fire hazards and to provide adequate ventilation for stationary equipment applications, keep the engine 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

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

COMPONENT NAME

2. Components (CARB)

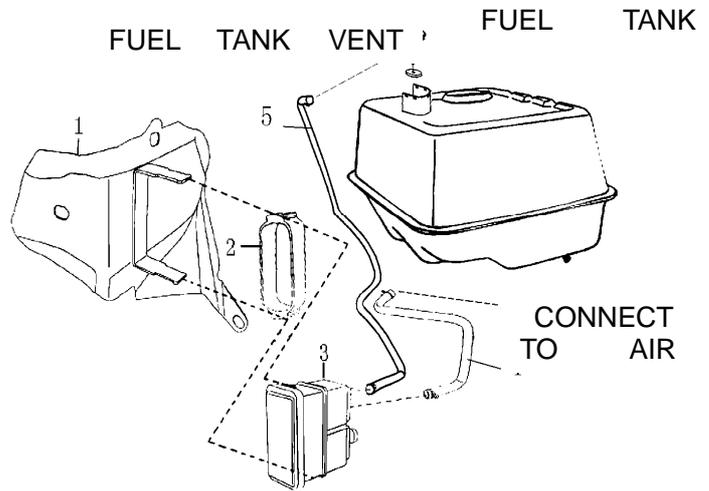


## 3. CARB fuel vapor collection system

### 1) Principle of fuel vapor collection system (CARB)

The working principle of the fuel vapor collection system is: the fuel vapor in the fuel tank should not be exhausted to the atmosphere by the filtering of the carbon container (3) (the active carbon grain in the carbon contain can absorb the oil molecule). This method can meet the CARB vapor exhaust standard.

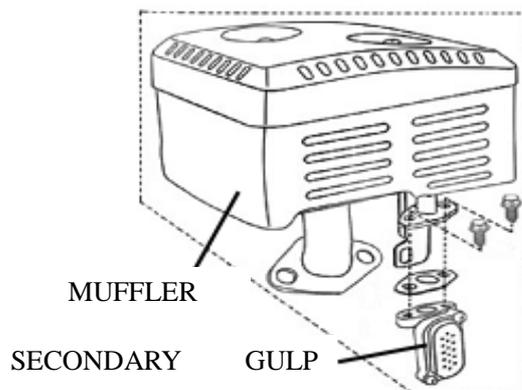
The CARB fuel tank adds a fuel tank vent valve on the original basis. The working principle is: when the engine inclines at the certain angle ( $\geq 60^\circ$ ), the vent valve should be shut off, so to prevent the gasoline in the fuel tank flowing into the carbon contain.



In the picture, the carbon contain (3) should be fit into the carbon contain casing (2) and together fixed on the fairing. The one path of the carbon contain should be connected by the vent pipe (5) and the fuel tank vent valve, and the other path should be connected by the vent pipe (4) and the air filter.

### 2 ) Muffler component ( CARB )

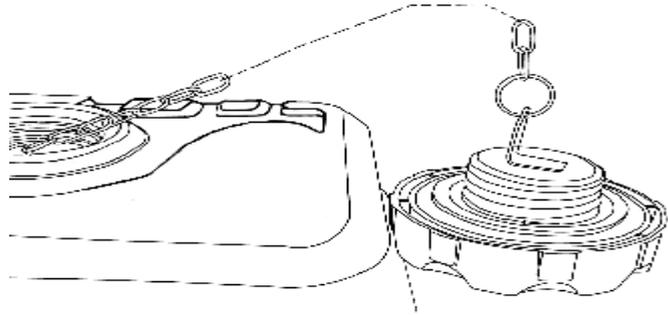
The CARB muffler adds the catalyst and secondary gulp valve on the original basis. The working principle is: the engine exhausted gas and the catalyst rapidly set off a chemical reaction with air under the action of the secondary gulp valve, so to meet the CARB off-gas exhaust regulation.



## 3 ) Fuel tank cap ( CARB )

The fuel tank cap used for the CARB engine adopts the steel wire hoop-link chain to permanently connect the fuel tank and fuel tank cap.

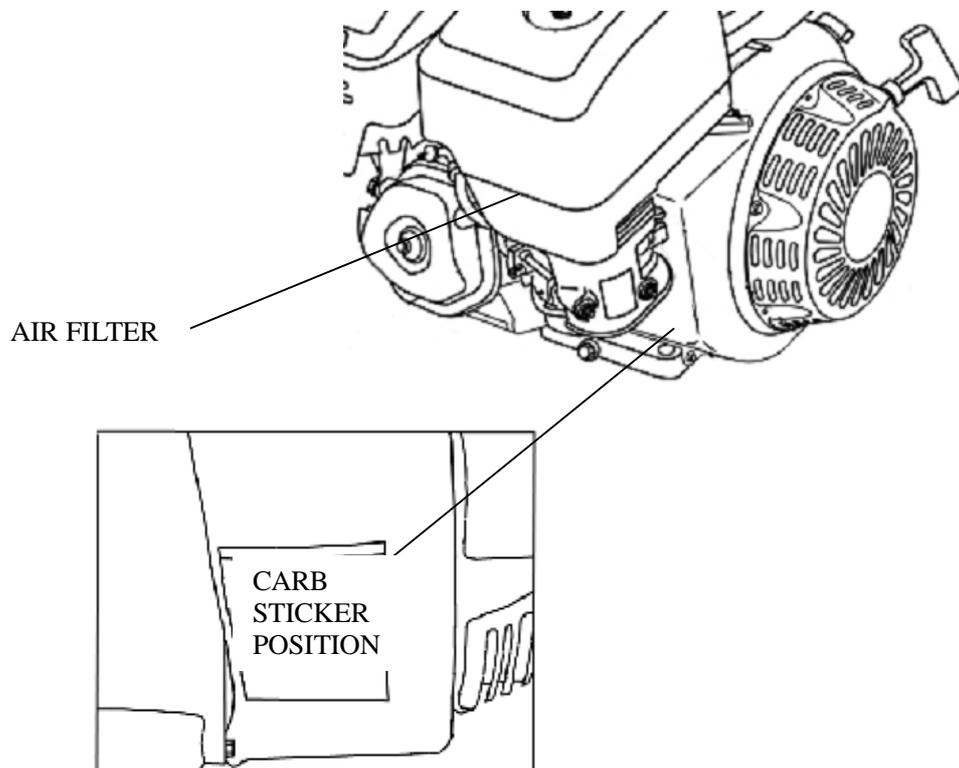
Note when fasten the fuel tank cap: completely put the steel wire hoop-link chain into the fuel tank, then tightly fasten the fuel tank cap along the thread till clacked.



## 4 ) CARB certificated identification position

Our gasoline engines that passed CARB exhaust standard should have CARB certificated identification.

The specific position is as follows:

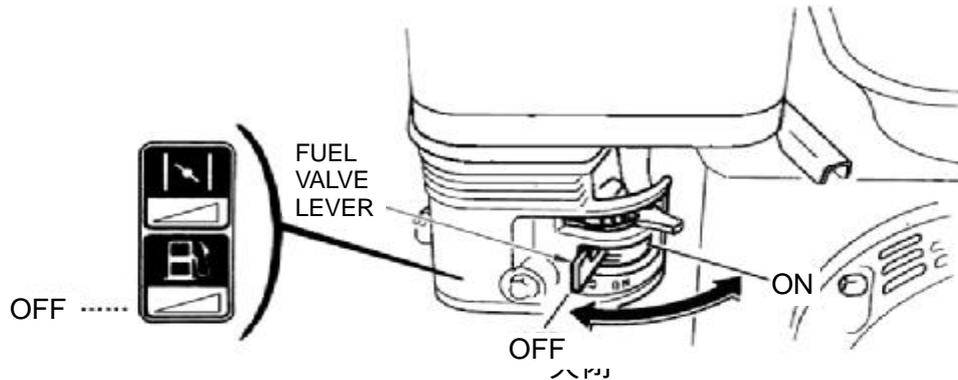


## ENGINE OPERATION

### 4. Engine operation

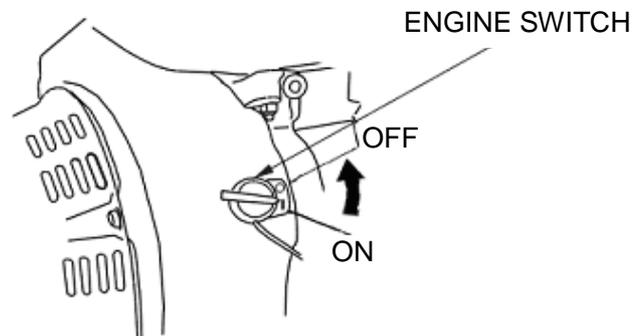
#### 1) Fuel valve lever

The fuel valve opens and closes the passage between the fuel tank and the carburetor. The fuel valve lever must be in the ON position for the engine to run. When the engine is not in use, leave the fuel valve lever in the OFF position to prevent carburetor flooding and to reduce the possibility of fuel leakage.



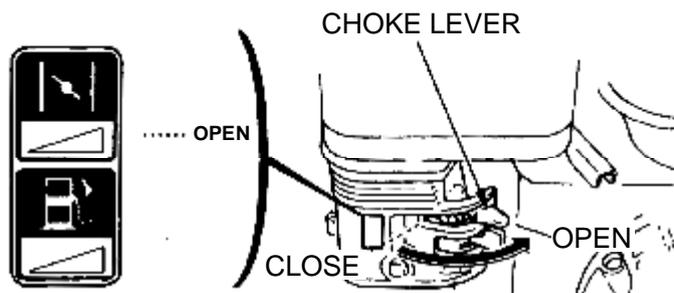
#### 2) Engine switch

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.



#### 3) Choke lever

The choke lever opens and closes the choke valve in the carburetor. The CLOSE position enriches the fuel mixture for starting a cold engine. The OPEN position provides the correct fuel mixture for operation after starting.



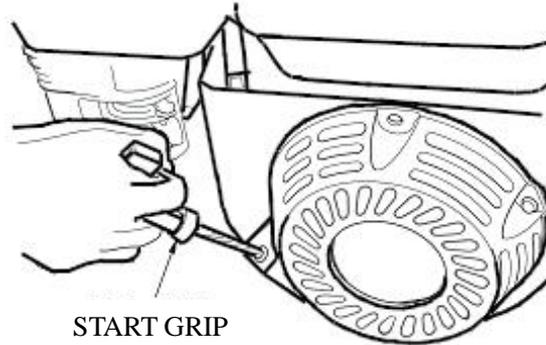
## ENGINE OPERATION

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### 4) Recoil starter grip

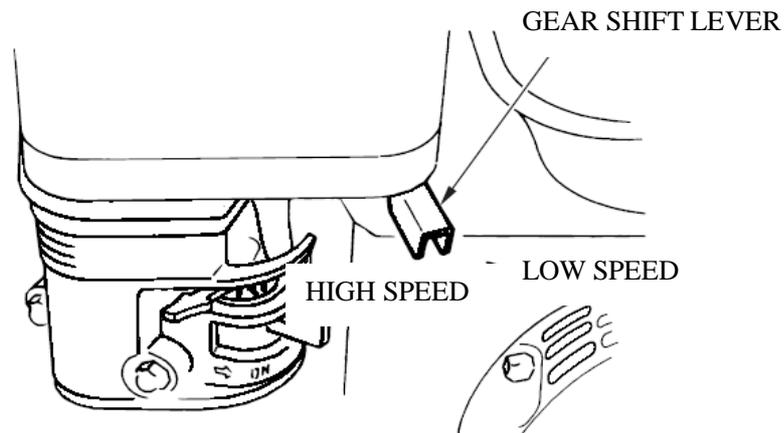
Pulling the starter grip operates the recoil starter to crank the engine.

**Notice** The starter grip should not be suddenly recoiled after started, it should be gently recoiled.



### 5) Gear shift lever

Adjust the gear shift lever to obtain the expected engine speed.



The reasonable engine speed to refer to the engine instruction.

### 6) Engine oil alert unit

The engine oil alert unit is specially designed to prevent the engine damage as oil shortage in the crankcase. When the oil level is below the safe limit, the protection system should automatically stop the engine (at this time the engine switch is still in the ON position).

If the engine automatically stops and not to be started, firstly should check the oil level, and then check other troubles.

## CHECK BEFORE OPERATION

### 5. CHECK BEFORE OPERATION

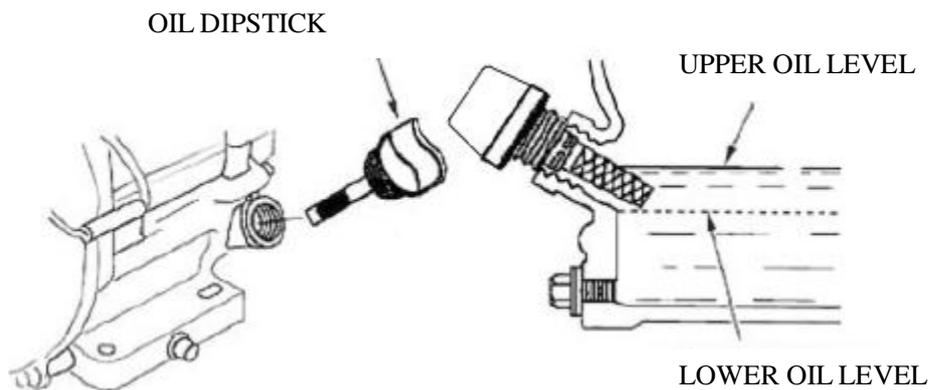
#### Normal inspection

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

#### Check engine oil

**Notice** Put the engine on the horizontal position after stopped, and then check oil level.

- 1) Remove the oil dipstick from the oil filling port and wipe it.
- 2) Insert the oil dipstick to check oil level on the condition of not fastened.
- 3) If the oil level is too low, fill the recommended oil to the upper level.
- 4) After oil filled, fasten the oil dipstick.



When the oil level is lower than the safe limit, the oil alert unit should be automatically stopped. In order to avoid the unexpected stop, the oil level should be checked before every starting.

#### Check fuel oil

Stop the engine, loose the fuel tank cap and check the fuel oil level. If the fuel level is too low, fill the fuel oil in full fuel tank. After filled, tightly screw the fuel tank cap.

**NOTICE** When fill fuel oil, the fuel level should not be higher than the shoulder of the fuel filter (that is the highest fuel oil level).

Fuel tank capacity :

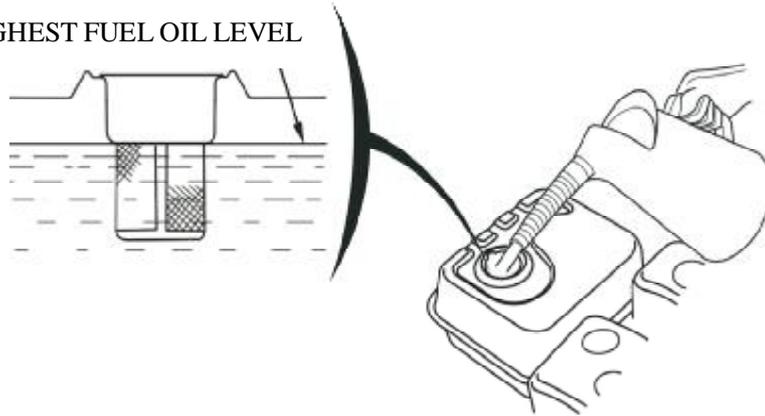
168F ( D ) -1 / 168F ( D ) -2 / G160F ( D ) / G200F ( D ) : 3.6 L

173F ( D ) / 177F ( D ) / G240F ( D ) / G270F ( D ) : 6.0 L

182F ( D ) / 188F ( D ) / 190F ( D ) / G340F ( D ) / G390F ( D ) / G420F ( D ) : 6.5 L

## CHECK BEFORE OPERATION

HIGHEST FUEL OIL LEVEL



Recommend to use the leadless gasoline which octane number is equal or larger than 90. The leadless gasoline should decrease the carbon deposit and prolong the exhaust system life.

### NOTICE

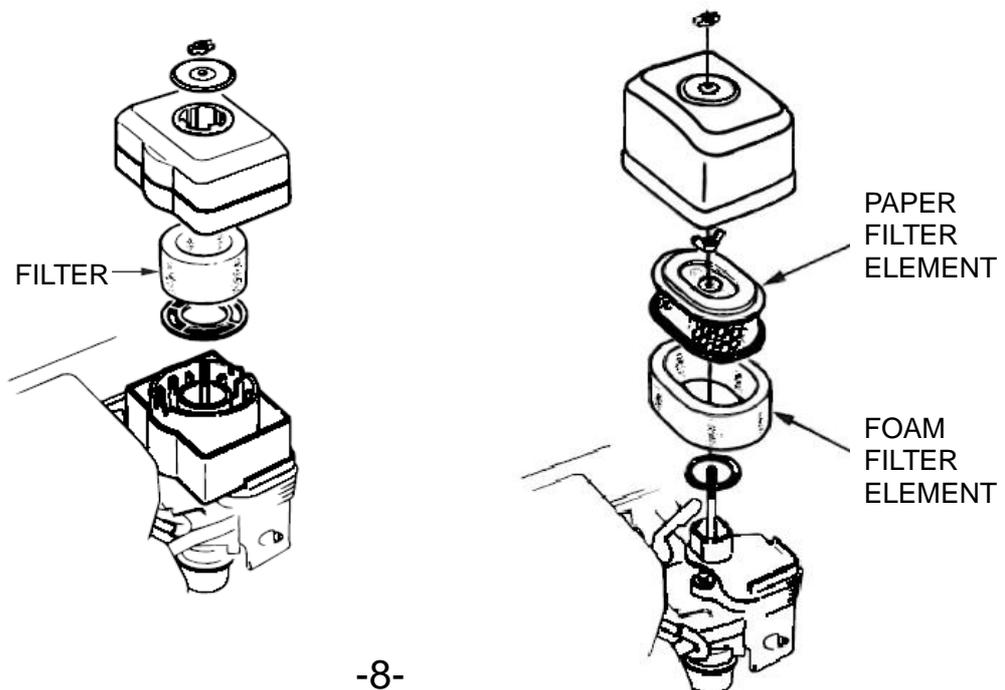
If use the gasoline containing alcohol, the octane number should not be lower than the above recommended value. There have two types alcohol gasoline, one contains ethanol, the other contains methanol. You should not use the alcohol gasoline contains ethanol larger than 10%, and should not use the alcohol gasoline which the methanol not containing cosolvent and anti-corrosion additive. If methanol contains cosolvent and anti-corrosion additive, the alcohol gasoline contains methanol larger than 5% should not be used.

### NOTICE

It should be strictly prohibited to use old, contaminated or containing machine oil gasoline, and avoid dust or water entering fuel tank.

### Check air filter

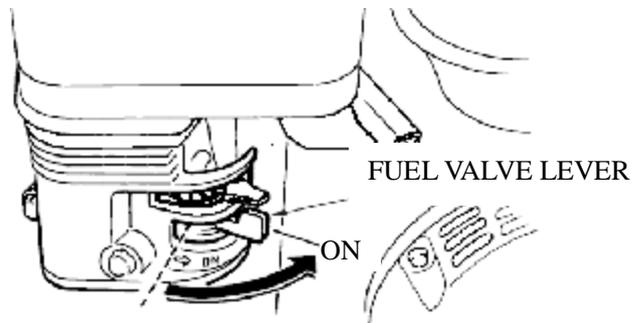
Remove the air filter cover and check the filter element. If it is dirt, clean it; if it is damaged, replace it. If it is the oil-bath air cleaner, it should need to check oil mass.



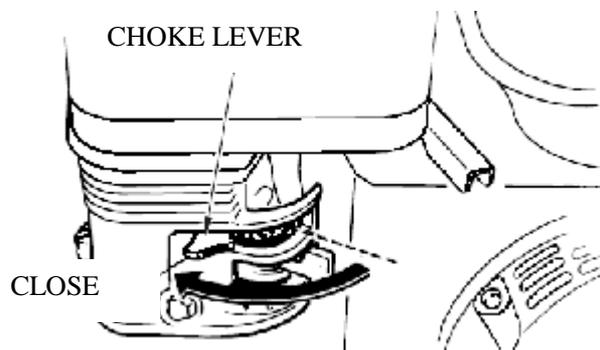
## START ENGINE

### 6. Starting the engine

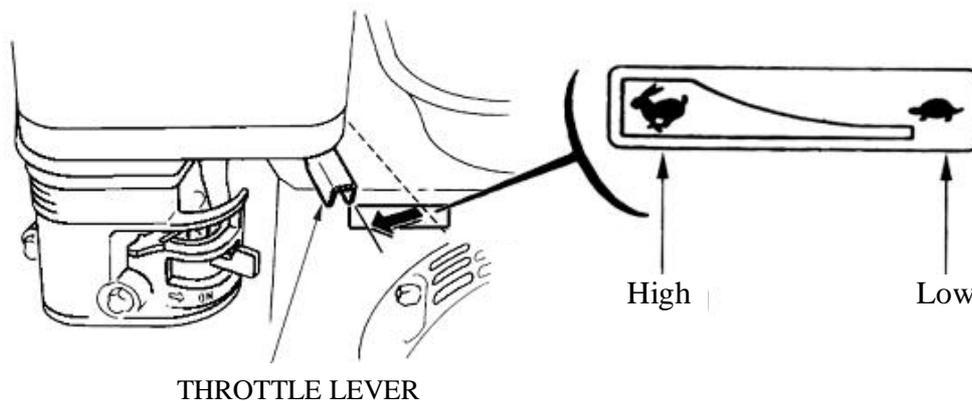
- 1) Move the fuel valve lever to the ON position.



- 2) To start a cold engine, move the choke lever to the CLOSE position. To restart a warm engine, leave the choke lever in the Open position.



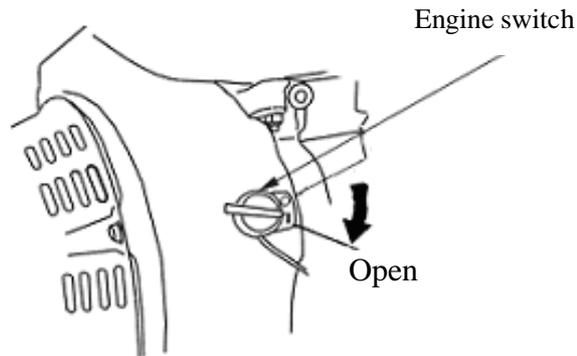
- 3) Move the throttle lever away from the SLOW position, about 1/3 of the way toward the FAST position.



## START ENGINE

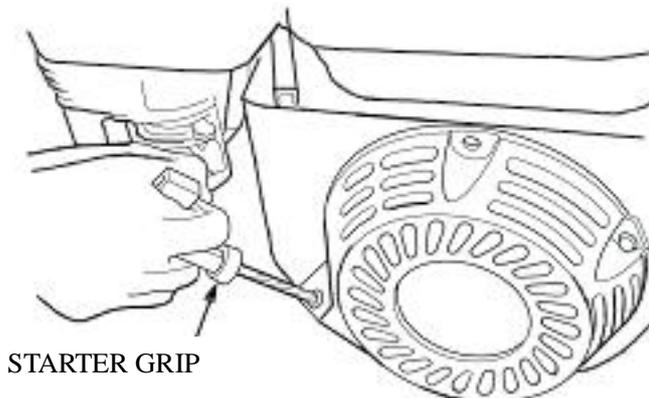
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- 4) Turn the engine switch to the ON position.

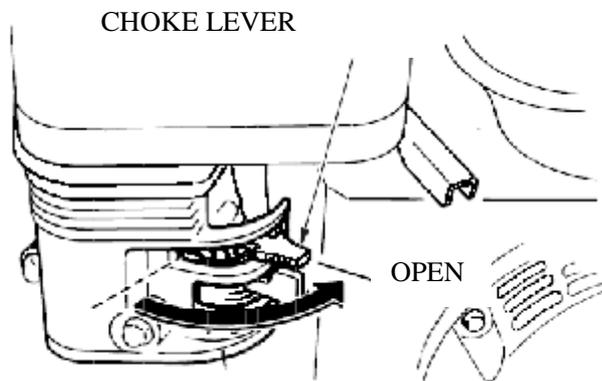


- 5) Pull the starter grip lightly until you feel resistance, then pull briskly.

**NOTICE** The starter grip should not be briskly recoiled after started, it should be lightly returned.



- 6) 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. If it is warm restart, the choke lever should be moved to the OPEN position.

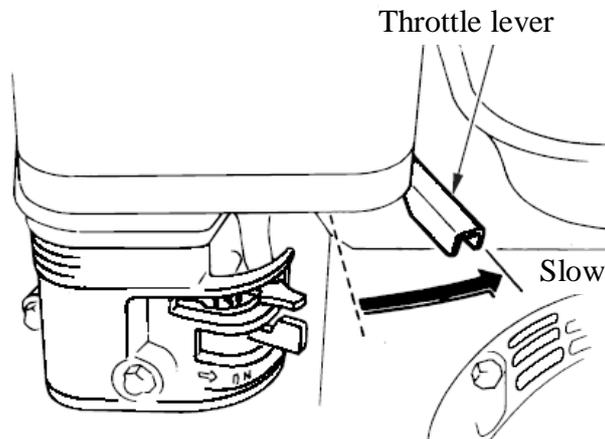


# STOP ENGINE

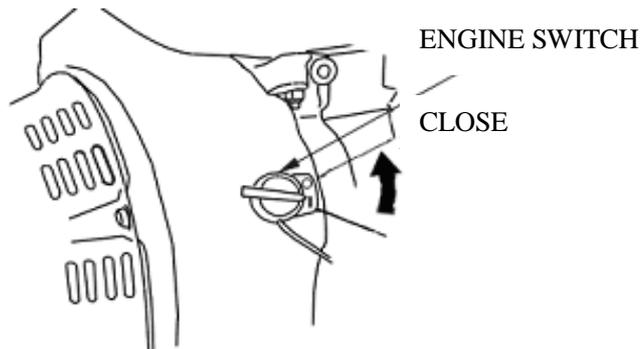
## 7. Stop engine

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

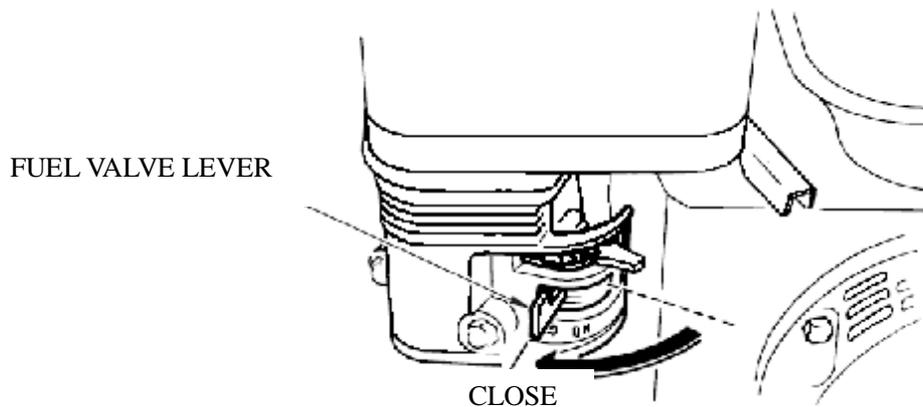
- 1) Move the throttle lever to the SLOW position.



- 2) Turn the engine switch to the OFF engine.



- 3) Turn the fuel valve lever to the OFF position.



## MAINTENANCE ENGINE

### 8. Maintenance engine

Maintenance 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	○				
	Change		○		○	
Air cleaner	Check	○				
	Clean			○(1)		
	Replace					○*
Sediment cup	Clean				○	
Battery electrolyte level	Check	○				
Spark plug	Clean				○	Replace
Valve clearance	Check-adjust					○(2)
Cylinder cover	Clean	After every 300 Hrs. (2)				
Fuel tank and strainer	Clean	Every 2 years (2)				
Fuel tube	Replace	Every 2 years (2)				

\* Replace the paper element type only.

- 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.

### Change the crankcase oil

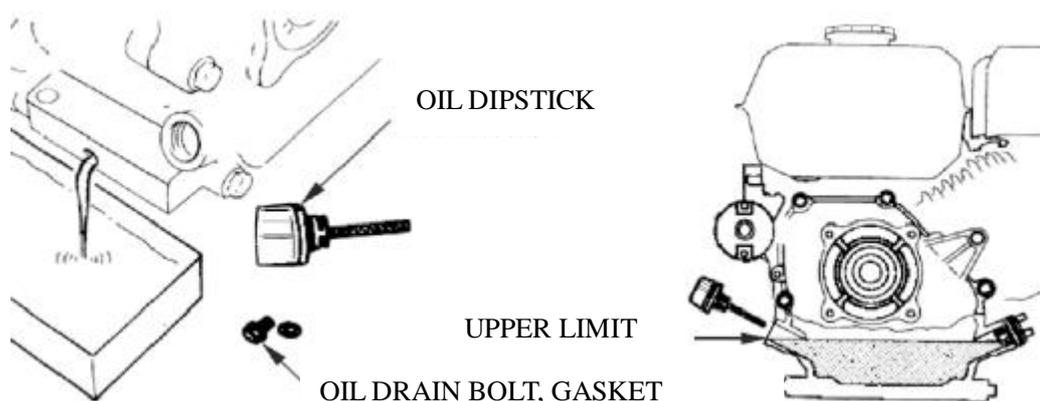
Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

1. Place a suitable container below the engine to catch the used oil, and then remove the filler cap/dipstick and the drain plug.
2. Allow the used oil to drain completely, and then reinstall the drain plug, 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 the outer edge of the oil filler hole with the recommended oil.

## MAINTENANCE ENGINE



Engine oil capacity:

168F-1 / 168F-2/ G160F / G200F: 0.60 L

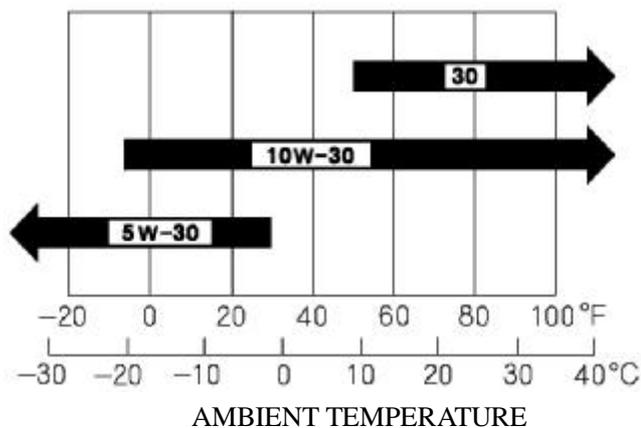
173F / 177F / G240F / G270F: 1.10 L

182F / 188F /190F-1/ G340F / G390F/G420F: 1.10 L

- 1) Screw In the dipstick securely.

Engine oil recommendations :

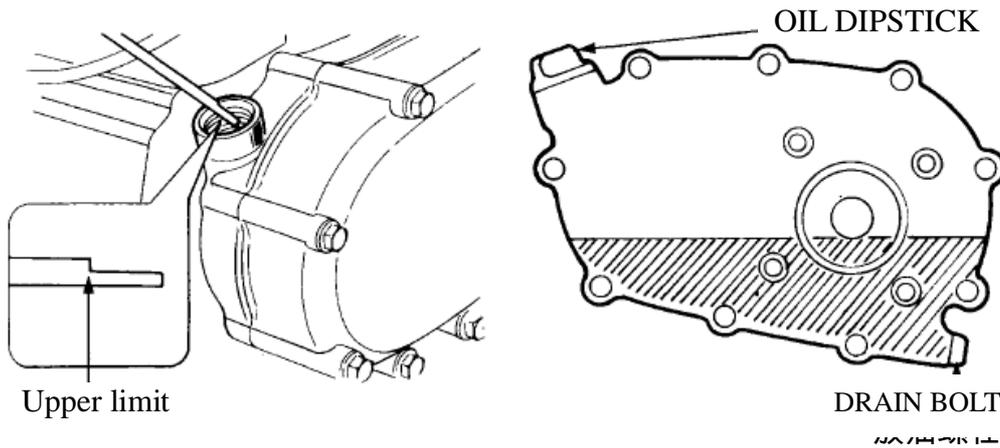
4-stroke gasoline engine oil.  
Meeting or over the requirements of  
API for service class SF, SG.  
SAE 10W-30 is recommended for  
general use.



If your area temperature change is within the correspond temperature range of one model engine oil in the figure, you should use this model engine oil.

### Change reduction gearbox oil ( 1/2 reducer type - model B )

- 1) Remove the oil dipstick from the filling port of the reduction gearbox and wipe it.
- 2) Insert oil dipstick and check oil level on the condition of unscrewed.
- 3) If the oil level is too low, fill the recommended engine oil to the upper oil level.



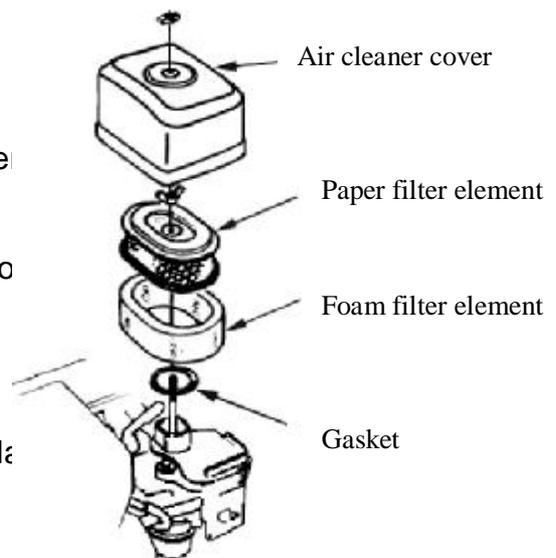
### Air cleaner service

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 an air filter, or with a damaged air filter, will allow dirt to enter the engine, causing rapid engine wear.

#### Dual-filter-element types

- 1) Remove the wing nut from the air cleaner cover.
- 2) Remove the wing nut from the air filter, and remove the air filter.
- 3) Separate paper filter and foam filter.
- 4) Check filters, if damaged, replace it. Always replace filter element at the scheduled interval.



#### Clean the paper filter element:

Tap the filter element several times, and blow compressed air (not exceeding 207kpa) through the filter element from inside. Never try to brush off dirt, brushing will force dirt into the fibers.

#### Clean foam filter element:

Clean in warm soapy water or nonflammable solvent; after drying, dip the filter element in clean engine oil and then squeeze out all excess oil.

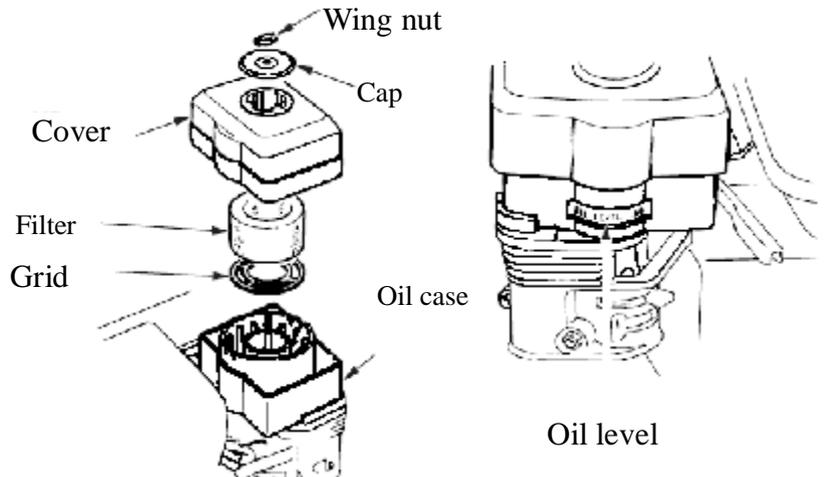
- 5) Clean the air cleaner base, cover and gasket; be careful to prevent dirt from entering the air duct that leads to the carburetor.
- 6) Place the foam air filter element over the paper element, and reinstall the assembled air filter. Be sure the gasket is in place beneath the air filter. Tighten the air filter wing nut securely.

## MAINTENANCE ENGINE

- 7) Install the air cleaner cover, and tighten the cover wing nut securely.

### Oil-bath type

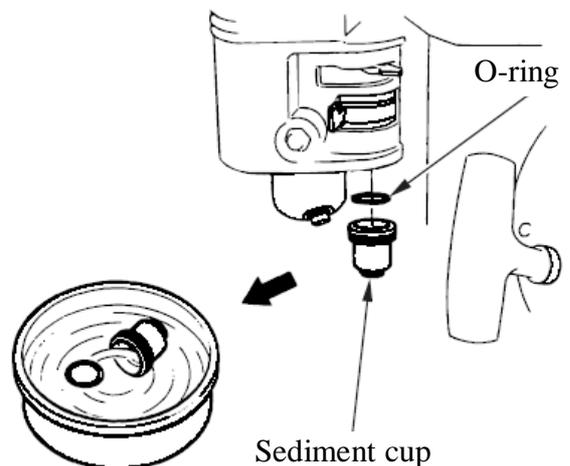
- 1) Remove the wing nut, and remove the air cleaner cap and cover, and then remove the filter element.
- 2) Wash the filter element in warm, soapy water, rinse or clean in nonflammable solvent and allow drying. Dip it in clean engine oil and then squeeze out all excess oil.
- 3) Wash the cover and cap in the warm soapy water and dry.
- 4) Empty the used oil from the air cleaner case, wash the oil case in the nonflammable solvent and dry it.
- 5) Fill the air cleaner case to the OIL LEVEL mark with the same oil that is recommended for the engine. Oil capacity: 60ml.
- 6) Reassemble the air cleaner, and tighten the wing nut securely.



### Sediment cup cleaning

Move the fuel valve to the OFF position, and then remove the fuel sediment cup and O-ring.

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



### Spark plug service

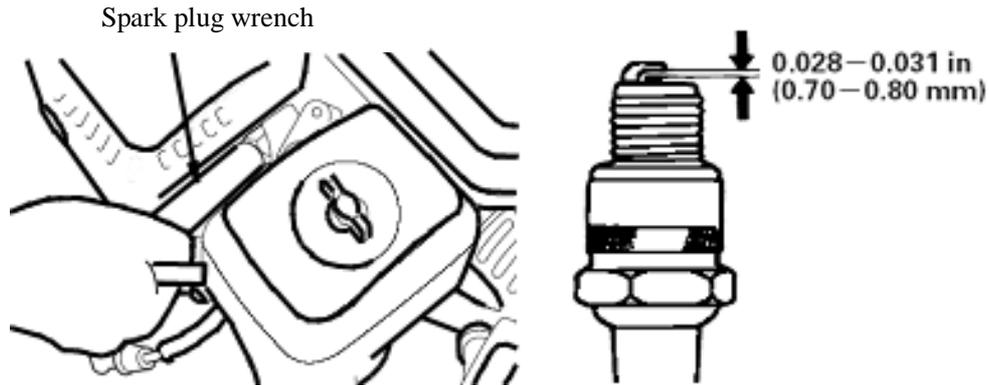
Recommended spark plugs: F7RTC or other equivalents.

#### 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.

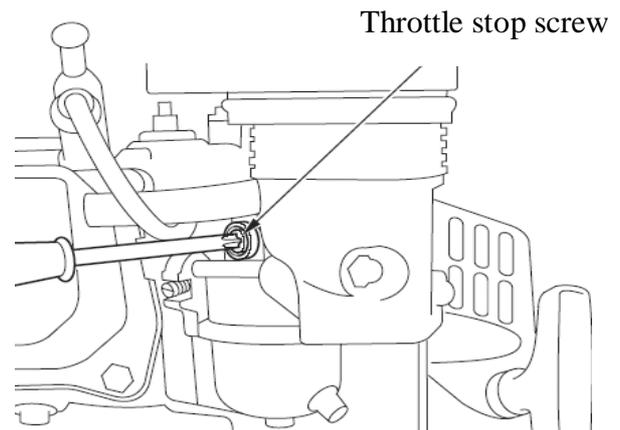
## MAINTENANCE ENGINE



- 3) Inspect the spark plug. Replace it if the electrodes are worn, or if the insulator is cracked or chipped. The spark plug electrode gap should be 0.70 mm -0.80mm. if necessary, by carefully bending the side electrode.
- 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 ring.  
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) Install spark plug cap.

### Idle speed adjustment

1. Start the engine outdoor, and allow it to warm up to operating temperature.
2. Move the throttle lever to its slowest position.
3. Turn the throttle stop screw to obtain the standard idle speed.



### Adjust for use at high altitude area

In the plateau area, the standard mixture ratio of the carburetor air and fuel oil should be too heavy, the engine running performance should be decreased and the fuel consumption should be increased.

If you want to change the engine running performance in the plateau area, you should adjust the carburetor. You can change a small bore for the main nozzle of the carburetor, and adjust the idle adjusting screw. If you always use the engine in the plateau area over altitude 1500m, please adjust it in the special service station.

Even if the carburetor is adjusted, the engine power should be reduced 3.5% for each the altitude rising 300m, the effect of the altitude height to the power is heavier than to carburetor.

After the carburetor adjusted for the high altitude, if you want to use the engine in the low altitude area, you should adjust the carburetor to the original technical

## MAINTENANCE ENGINE

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specification in the special service station.

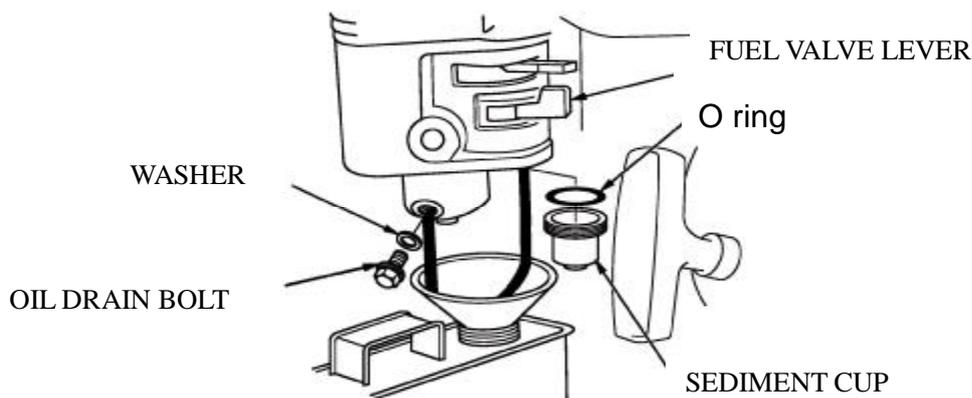
## STORE ENGINE

### 9. Storing your engine

If the engine has been running, allow it to cool for at least half an hour before cleaning. Clean all exterior surfaces, touch up any damaged paint, and coat other areas that may rust with a light film of oil.

#### NOTICE

- I 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.
  - I 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.
- 1) Place a suitable gasoline container below the carburetor, and use a funnel to avoid spilling fuel. Move the fuel valve lever to the CLOSE position.
  - 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.
- 4) Change the engine oil.
- 5) Remove the spark plugs.
- 6) Pour a tablespoon (5 ml -10 ml) of clean engine oil into the cylinder.
- 7) Pull the starter rope several times to distribute the oil in the cylinder.
- 8) Reinstall the spark plugs.
- 9) 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.
- 10) Cover the engine to keep out dust, and place in the vent and dry area.

If equipped with a battery for an electric starter, recharge the battery once a month while the engine is in storage. This will help to extend the service life of the battery.

## TROUBLESHOOTING

### 10. Troubleshooting

#### 1) Engine will not start

Troubles				Possible causes	Correction
Normal cylinder pressure	Normal spark and spark plug	Abnormal fuel system	Unsmooth fuel line	The tank has no fuel or the fuel valve lever is on the CLOSE position.	Fill fuel or move the fuel valve lever to the OPEN position.
				The vent hole of the fuel tank cap is blocked.	Unplug.
				The fuel valve lever is blocked.	Clear.
				The main orifice is not correctly adjusted or is blocked.	Readjust, clean and blow.
				The needle valve or float is locked.	Repair or replace.
			Smooth fuel line	Fuel is too dirty or bad.	Change fuel and clean the carburetor.
				The fuel contains water.	Change fuel and clean the carburetor.
				Too much fuel oil in the air cylinder.	Drain fuel, wipe spark plug.
	Normal fuel system	Normal spark	Trouble spark plug	Wrong fuel oil.	Fill specific fuel oil.
				Carbon deposit, dirt electrode.	Clear carbon deposit and dirt.
				Damaged isolator.	Replace spark plug.
				Heavily burned electrode.	Replace spark plug.
		Normal spark plug	No spark	Wrong spark plug gap.	Adjust gap.
				Damaged high voltage wire.	Replace high voltage wire.
				Damaged ignition coil.	Replace ignition coil.
				Inadequate magnetic field strength.	Charge magnetic or replace.
Abnormal cylinder pressure	Normal fuel system	Normal ignition system	Normal spark plug	Piston ring worn or break.	Replace.
				Piston ring cements.	Clear carbon deposit.
				Spark plug has no washer or not fastened.	Assemble washer or fasten.
				Air leakage between the cylinder body and the cylinder cover.	Replace washer.
				Trouble seating valve.	Grind or replace.

#### 2) Engine lacks power

Troubles	Possible cause		Correction
When accelerated, the speed lifts slowly, even reduce or flame out.	Ignition system	Wrong igniting time	Replace ignition coil.
	Fuel oil system	Mix air in the fuel line.	Exhaust air.
		Incorrect main orifice adjustment.	Readjust.
		Needle valve and main orifice are blocked.	Clean and blow.
		Fuel valve is blocked.	Clean or replace.
	Air inlet system	Carbon deposit in the combustion chamber.	Clear carbon deposit.
		Air filter is blocked.	Clean or replace filter element.
	Trouble compressing	Leakage air inlet system.	Repair or replace.
		Worn piston, air cylinder and piston ring.	Replace.
		Air leakage between cylinder body and cylinder head.	Replace head gasket.
		Wrong air valve clearance.	Readjust.
	Bad sealed air valve.	Grind or replace.	

## TROUBLESHOOTING

### 3) Sudden flame out

Troubles	Possible cause		Correction
Sudden flame out during running	Fuel system	No fuel.	Fill fuel and turn fuel valve on.
		Blocked carburetor	Check fuel line.
		Carburetor float leakage	Repair float.
		Needle valve locked.	Repair needle valve.
	Ignition system	Spark plug is breakdown, carbon deposit, and short circuit.	Replace spark plug.
		Spark plug electrode drops.	Replace spark plug.
		High voltage wire drops.	Repair or replace.
		Ignition coil is breakdown.	Replace.
	Others	Serious cylinder score or valve drops.	Repair or replace damaged parts.

### 4) Engine is too hot.

Troubles	Possible cause	Correction
Gasoline engine is too hot.	Wrong igniting time	Replace ignition coil.
	Inadequate engine oil	Fill adequate engine oil.
	Air exhaust pipe blocked.	Clean air exhaust pipe.
	Fan cowl leakage	Repair.
	Air ducting is blocked.	Clean cooling fin.
	Trouble cooling fan.	Reinstall.
	Air cylinder and crankcase blow-by as trouble poison ring.	Replace worn parts.
	Engine revolution is too fast.	Check gear shift system or replace speed control gear.
	Crank bearing burned.	Replace or repair.

### 5) Abnormal sound

Troubles	Possible cause	Correction
Strike sound	Worn piston and piston ring	Replace worn parts.
	Worn connecting rod, piston pin and pin hole	Replace worn parts.
	Worn crank bearing	Replace or repair.
	Break piston ring	Replace piston ring.
sharp knock and metal sound	Too much carbon deposit in the combustion chamber	Clear carbon deposit.
	Too small gap of the spark plug electrode	Adjust electrode gap.
	Serious rich fuel mixture	Check carburetor.
	Wrong fuel octane level	Change fuel.
	Too hot engine	Refer to the too hot trouble.
Other abnormal sound	Incorrect valve gap adjustment	Readjust valve gap.
	Loose connection of the flywheel and crank shaft.	Replace connection joint and reinstall.

## BATTERY

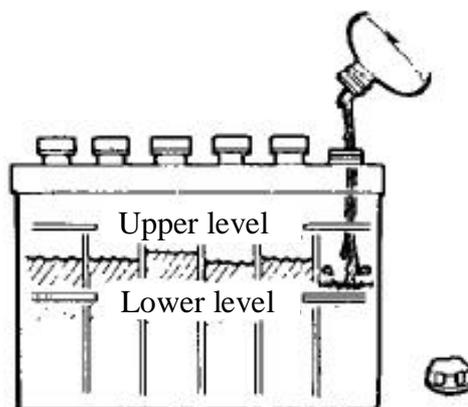
### 11. Battery ( optional part )

Please use the battery which voltage is 12V and the rated capacity is 18A.h at least.

#### NOTICE

Do not reverse polarity. Serious damage to the engine and/or battery may occur.

Check the electrolyte level to be sure that it is between the marks on the case. If the level is below the lower mark, remove the caps and add distilled water to bring the electrolyte level to the upper mark. The cells should be equally full.



#### ⚠ WARNING

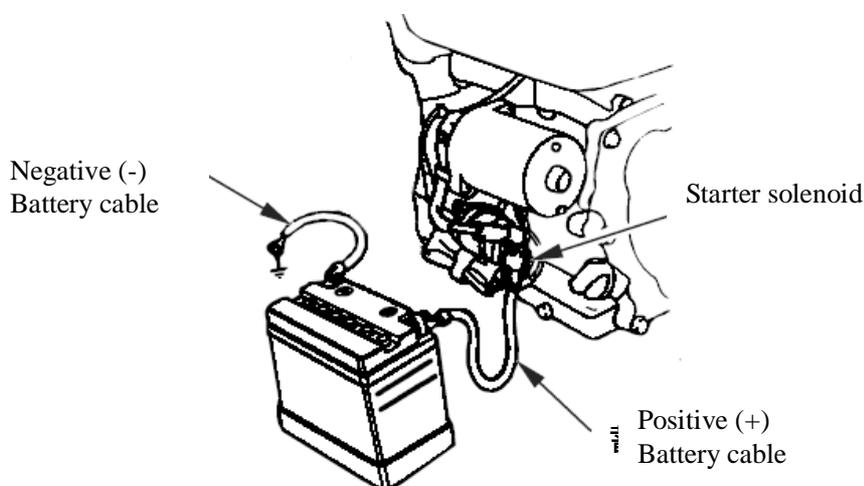
A battery can explode if you do not follow the correct procedure, seriously injuring anyone nearby.

Keep all sparks, open flames, and smoking materials away from the battery. When recharging or using, keep air ventilation.

Battery connections for electric starter

Be careful not to connect the battery in reverse polarity, as this will short circuit the battery charging system. Always connect the positive (+) battery cable to the battery terminal before connecting the negative (-) battery cable

- 1) Connect the battery positive (+) cable to the starter solenoid terminal.
- 2) Connect the battery negative (-) cable to an engine mounting bolt, frame bolt, or other good engine ground connection.
- 3) Connect the battery positive (+) cable to the battery positive (+) terminal.
- 4) Connect the battery negative (-) cable to the battery negative (-) terminal.



## ENGINE DATA

### 12. Engine data

Model	168F(D)-1 G160F(D)	168F(D)-2 G200F(D)	168F(D)-1B G160F(D)-B	168F(D)-2B G200F(D)-B	168F(D)-1C G160F(D)-C	168F(D)-2C G200F(D)-C	
Type	Single cylinder, 4-Stroke, Forced Air Cooling, OHV						
Max. power (kW/3600r/min)	3.6(5HP)	4.1 (5.5HP)	3.6(5HP)	4.1 (5.5HP)	3.6(5HP)	4.1 (5.5HP)	
Max. torque (N·m) Correspond revolution (r/min)	10.3 2500	12.4 2500	20.6 1250	24.8 1250	20.6 1250	24.8 1250	
Fuel consumption (g/kw·h)	≤395						
Idle speed (r/min)	1450±150						
Speed Fluctuating Ratio	≤10%						
Transmission Mode	-	-	Chain mode		Chain mode		
Reduction Ratio	-	-	2:1				
Noise (≤ dB(A))	70						
Bore xstroke (mm)	68×45	68×54	68×45	68×54	68×45	68×54	
Displacement (cc)	163	196	163	196	163	196	
Compression ratio	8.5:1						
Lubricating mode	Splash						
Starting mode	Recoil start (electric starting)						
Rotation	Anti-clockwise (from P.T.O. side)						
Air valve clearance (mm)	Input valve 0.10~0.15 Output valve 0.15~0.20						
Spark plug clearance (mm)	0.7~0.8						
Igniting mode	Transistorized breakless ignition						
Air filter	Dual filter element/oil-bath type						
Dimension (mm)	length	312	312	391	391	342	342
	Width	362	362	362	376	362	376
	Height	335	335	335	335	335	335
Net weight (kg)		15(18)	16(19)	19(22)	20(23)	15.5(18.5)	

## ENGINE DATA

Engine model	LC173F(D) G240F(D)	LC177F(D) G270F(D)	LC173F(D)-B G240F(D)-B	LC177F(D)-B G270F(D)-B	LC173F(D)-C G240F(D)-C	LC177F(D)-C G270F(D)-C
Engine type	Single cylinder, 4-stroke, forced air cooling, overhead valve					
Max. power (kW/3600r/min)	5.3(7HP)	6.0(8HP)	5.3(7HP)	6.0(8HP)	5.3(7HP)	6.0(8HP)
Max. torque (N·m) Correspond revolution (r/min)	15.3 2500	17.7 2500	30.6 1250	35.4 1250	30.6 1250	35.4 1250
Fuel consumption (g/kW·h)	≤374					
Idle speed (r/min)	1450±150					
Speed Fluctuating Ratio	≤10%					
Transmission Mode	-	-	Clutch mode		Chain mode	
Reduction ratio	-	-	2:1			
Noise (≤ dB(A))	80					
Bore x stroke (mm)	73x58	77x58	73x58	73x58	77x58	73x58
Displacement (cc)	242	270	242	242	270	242
Compression ratio	8.2:1					
Lubrication mode	Splash					
Starting mode	Recoil start (electric starting)					
Rotation	Anti-clockwise (from P.T.O. side)					
Air valve clearance (mm)	Input valve 0.10~0.15 Output valve 0.15~0.20					
Spark plug clearance (mm)	0.7~0.8					
Igniting mode	Transistorized breakless ignition					
Air filter	Dual filter element					
Dimension (mm)	380x430x410		440x430x410		405x430x410	
Net weight (kg)	25(28)	26(29)	29(32)	30(33)	28(31)	29(32)

## ENGINE DATA

Engine model	182F(D) G340F(D)	188F(D) G390F(D)	182F(D)-D G340F(D)-D	188F(D)-D G390F(D)-D	190F ( D ) -1 G420F ( D )
Engine type	Single cylinder, 4-stroke, forced air cooling, overhead valve				
Max. power (kW/3600r/min)	7.1(10HP)	8.2(11HP)	7.1(10HP)	8.2(11HP)	8.5(12HP)
Max. torque (N·m) Correspond revolution (r/min)	21.1 2500	25.0 2500	42.2 1250	50.0 1250	27.0 2800
Fuel consumption (g/kW·h)	≤374				
Idle speed (r/min)	1450±150				
Speed Fluctuating Ratio	≤10%				
Transmission Mode	-	-	Gear mode		
Reduction ratio	-	-	2:1		
Noise (≤ dB(A))	80				
Bore x stroke (mm)	82x64	82x64	82x64	82x64	82x64
Displacement (cc)	337	337	337	337	337
Compression ratio	8 : 1				8 : 1
Lubrication mode	Splash				
Starting mode	Recoil start (electric starting)				
Rotation	Anti-clockwise (from P.T.O. side)				
Air valve clearance (mm)	Inlet valve 0.10~0.15 Outlet valve 0.15~0.20				
Spark plug clearance (mm)	0.7-0.8				
Igniting mode	Transistorized breakless ignition				
Air filter	Dual filter element				
Dimension (length x width x height) (mm)	405x450x443		440x450x443		405X450X443
Net weight (kg)	31(34)		33(36)		33 ( 36 )

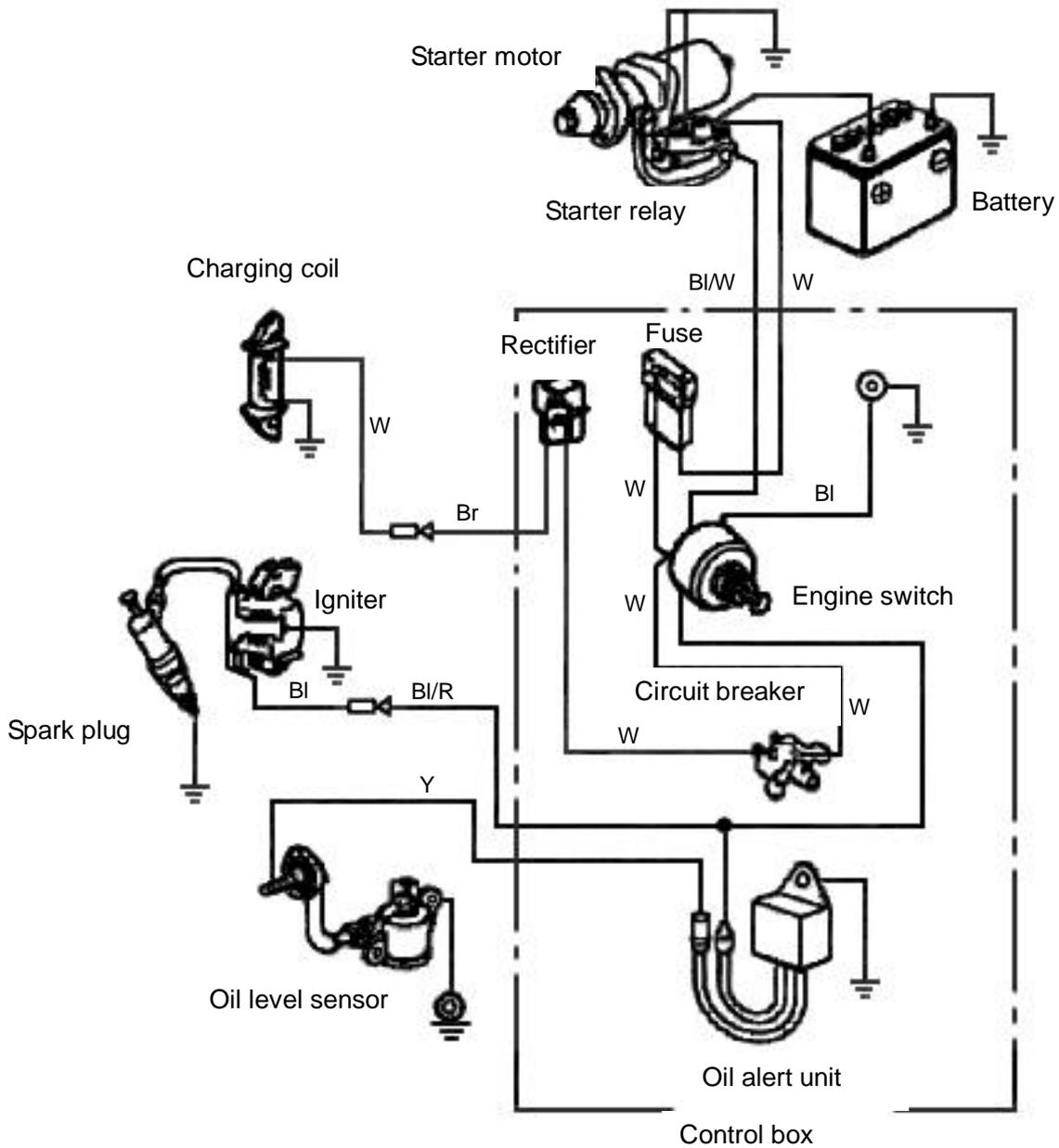
# 13. Wiring diagrams

Electric starting engine with oil alert unit

Engine switch connecting wire

	IG	E	ST	BAT
OFF	O	O		
ON				
START			O	O

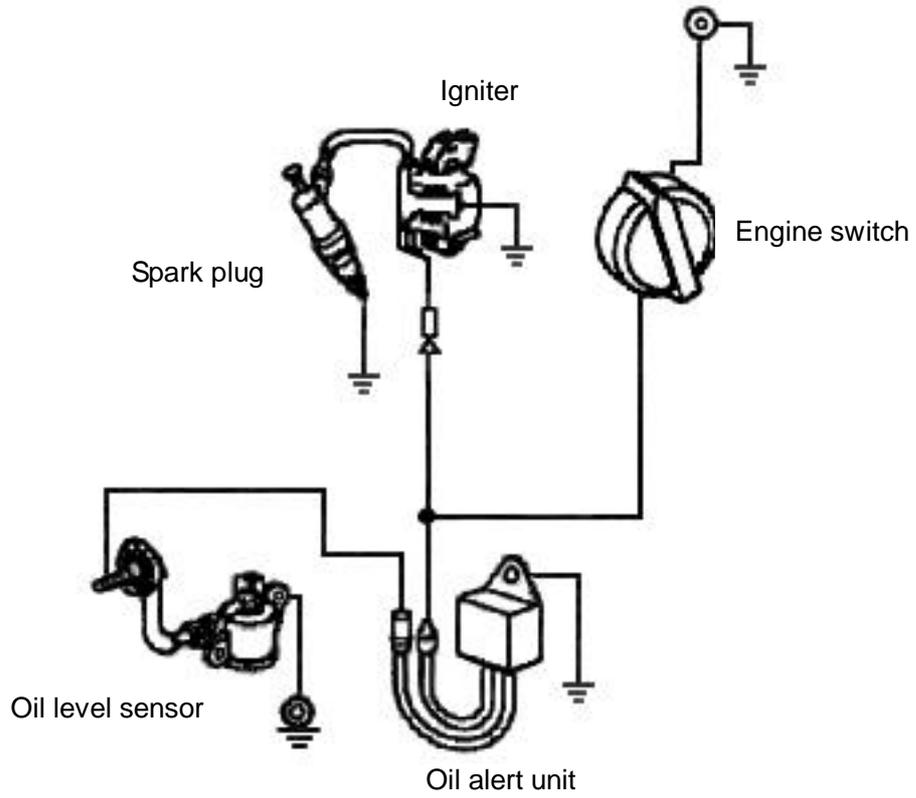
Bl	Black	Br	Brown
Y	Yellow	R	Red
W	White	G	Green



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Non-electric starting engine with oil alert unit

Bl	Black
Y	Yellow
G	Green



## 14. Emission System Warranty

Loncin Industries Ltd.  
and the California Air Resources Board (CARB)  
and the United States Environmental Protection Agency (U.S.EPA)  
Emission Control System Warranty Statement (Owner's Direct Warranty Rights and Obligations)

Emission control warranty coverage is applicable to engines purchased in California (certified for sale in California only) in 1995 and thereafter, which are used in California, and to certified model year 1997 and later engines which are purchased and used elsewhere in the United States.

### **California and United States Emission Control Defects Warranty Statement**

CARB, U.S.EPA and LONCIN INDUSTRIES LTD. are pleased to explain the Emission Control System Warranty on your model year 2009 and later spark ignited small off-road engine. In California, new spark ignited small off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. In other areas of the United States, your engine must be designed, built and equipped to meet U.S.EPA emission standards for spark ignited small off-road engines at or below 19 kilowatts.

Loncin Industries Ltd. must warrant the emission control system on your engine for the period of time listed below, provided there has been no abuse, neglect or improper maintenance on your spark ignited small off-road engine. Where a warrantable condition exists, Loncin Industries Ltd. will repair your spark ignited small off-road engine at no cost to you including diagnosis, parts and labor. Your emission control system includes parts such as carburetor, air cleaner, ignition system, muffler and catalytic converter (when present). Also include may be hoses, connectors, and other emission-related assemblies.

### **Loncin Industries Ltd. Emission Control Defects Warranty Coverage**

Spark ignited small off-road engines are warranted relative to emission control parts defects for a period of two (2) years, subject to the provisions stated below. If any emission related part on your engine is defective, the part will be repaired or replaced by Loncin Industries Ltd. The warranty period begins on the date the product is delivered to the initial owner.

### **Owner's Warranty Responsibility**

As the spark ignited small off-road engine owner, you are responsible for the performance of the require maintenance listed in the owner's manual. Loncin Industries Ltd. recommends that you retain all receipts covering maintenance on your spark ignited small off-road engine, but Loncin Industries Ltd. cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the owner of a spark ignited small off-road engine, you should however be aware that Loncin Industries Ltd. may deny you warranty coverage if your spark ignited small off-road engine or part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your spark ignited small off-road engine to an authorized service center as soon as a problem exists. The undisputed warranty repairs should be completed in a reasonable period of time, not to exceed 30 days. For the location of an authorized service center and any questions you may have regarding your warranty rights and responsibilities, you should call the authorized parts and technical support group toll free at 800-445-1805 M-F, 8:00 AM to 5:00 PM CST.

The emission warranty is a defects warranty and defects are judged on normal engine performance. The warranty is not related to an in-use emission test.

### **Emission Control System Warranted Parts**

Coverage under this warranty extends only to the parts listed below (the emission control system parts) to the extent that these parts were present on the engine purchased.

#### Fuel Metering System

Carburetor and/or internal parts  
Intake manifold

#### Evaporative System (if CARB compliant)

Fuel tank, Fuel cap, Fuel hose, Fuel strainer, Fuel cock, Fuel hose joint  
Carbon canister, canister brackets, canister purge hose joint  
Vapor hoses

#### Air Induction System

Air cleaner\*  
Intake manifold

#### Exhaust System

Exhaust manifold

#### Ignition System

Flywheel magneto  
Ignition coil assembly  
Spark plug\*

#### Crankcase Emission Control System

Crankcase breather tube  
Oil filler cap

#### Miscellaneous parts

Hoses, seals, gaskets, connectors and assemblies associated with listed parts

Note: \* Covered up to the first required replacement only. See the maintenance schedule in the Owner's Manual.

## EMISSION SYSTEM WARRANTY

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### **Length of Coverage**

Loncin Industries Ltd. warrants to the initial owner and each subsequent purchaser that the spark ignited small off-road engine is free from defects in materials and workmanship which can cause the failure of an emission warranted part for a period of two (2) years after the engine is delivered to the original retail purchaser. Warranty coverage shall extend to the failure of any engine components caused by the failure of any warranted part still under warranty.

### **Limitations**

The Emission Control System Warranty shall NOT cover any of the following:

- (a) Repair or replacement required as the result of misuse or neglect, improper maintenance or unapproved modifications, repairs improperly performed or replacement improperly installed, use of unapproved replacement parts or accessories and modifications not recommended by Loncin Industries Ltd.
- (b) Replacement parts, other services and adjustments necessary for normal maintenance.
- (c) Transportation to and from the authorized service center or retailer.

### **Limited Liability**

The liability of Loncin Industries Ltd. under this Emission Control System Warranty is limited solely to the remedy of defects in materials or workmanship. This warranty does not cover inconvenience or loss of the spark ignited small off-road engine equipment or transportation of same to an authorized service center. Loncin Industries Ltd. shall not be liable for any other expenses, loss, or damage, whether direct, incidental, consequential (except as listed) or exemplary arising in connection with the sale or use of or inability to use the spark ignited small off-road engine equipment for any other purpose.

No express Emission Control System Warranty is given by Loncin Industries Ltd. with respect to the engine except as specifically set forth in this document. Any Emission Control System Warranty implied by law, including any warranty of merchantability or fitness for a particular purpose, is expressly limited to the Emission Control System Warranty terms set forth in this document.