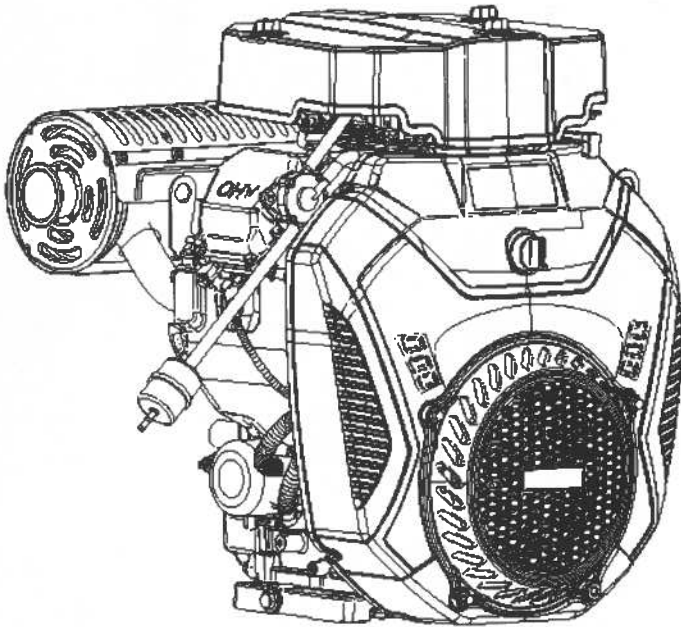


LIFAN

2V90F GENERAL GASOLINE ENGINE Owner's Manual



·Read this manual carefully before operating this generator.

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Preface

Thank you for choosing the general gasoline engine produced by our company.

Please save the manual so that you can refer to it at any time.

This instruction manual can help you use this gasoline engine more effectively and safely. All contents in the manual are only the latest product information before printing. Lifan reserves the right to change the contents of this manual without prior notice and without any responsibility.

This manual is a permanent part of the gasoline generator set and should be attached when the gasoline engine is transferred to others.

Before you use the gasoline engine, we recommend that you read the warranty conditions and understand your responsibilities.

Safety Notice

We provide safety warning notices on this manual and gasoline engine. Please read and understand the meaning to avoid harm to you and others.

The following are three safety warning notices, followed by the contents of the safety warning provided.

WARNING: Failure to follow instructions will cause death or serious personal injury.

CAUTION: Failure to follow instructions may cause death or serious personal injury.

NOTE: Failure to follow instructions may cause personal injury.

When the above information appears on the manual and gasoline engine, please read and operate carefully. Each notice will inform you the potential dangers, what will happen, and how to avoid these dangers, thereby reducing the possibility of injury.

Damage warning

You will also see the IMPORTANT sign below. The meaning is:

IMPORTANT: Failure to follow instructions may cause damage to gasoline engine or financial losses.

The above notices can help you avoid gasoline engine damage, other financial losses or environmental destruction.

Note: Different models have different legends. Please refer to the actual product as standard.

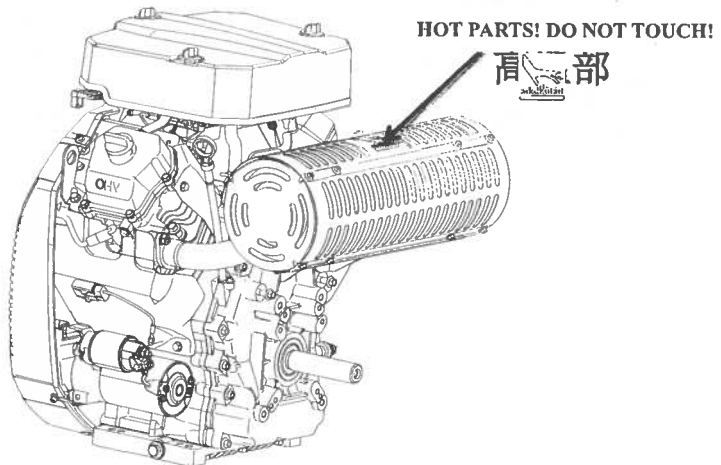
Safety Precautions

1. Learn the operation of all controls and how to shut down the gasoline engine in an emergency. Make sure the operator of the engine has been specially trained.
2. Children are prohibited from operating gasoline engines. Keep the engine out of reach of children and pets to avoid accidents.
3. Gas discharged by the gasoline engine contains toxic carbon monoxide. Ensure good ventilation and prohibit running gasoline engines in the enclosed room.
4. The temperature of engine body and discharged gas is extremely high when the gasoline engine is running. Therefore, keep it at least one meter away from buildings or other equipments and also the inflammable substances. It is forbidden to cover anything on the gasoline engine during operation.
5. This gasoline engine is suitable for general use. It is forbidden for other purposes, such as the power plant for a car or motorcycle.

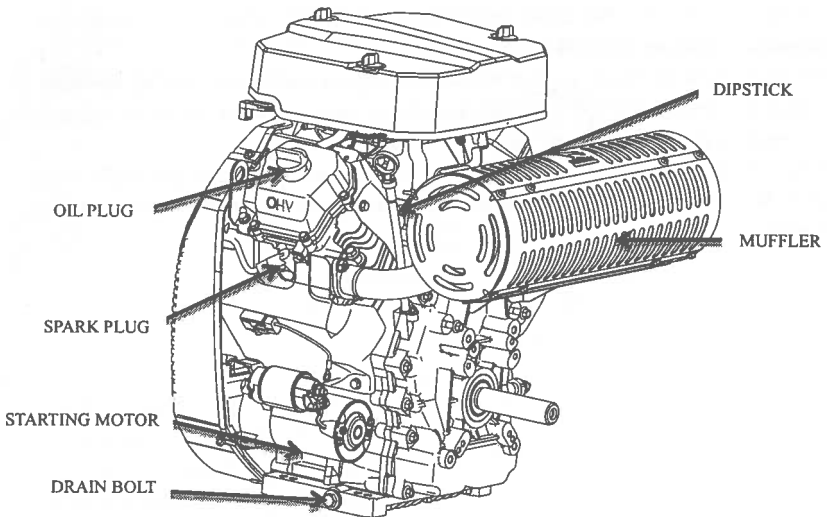
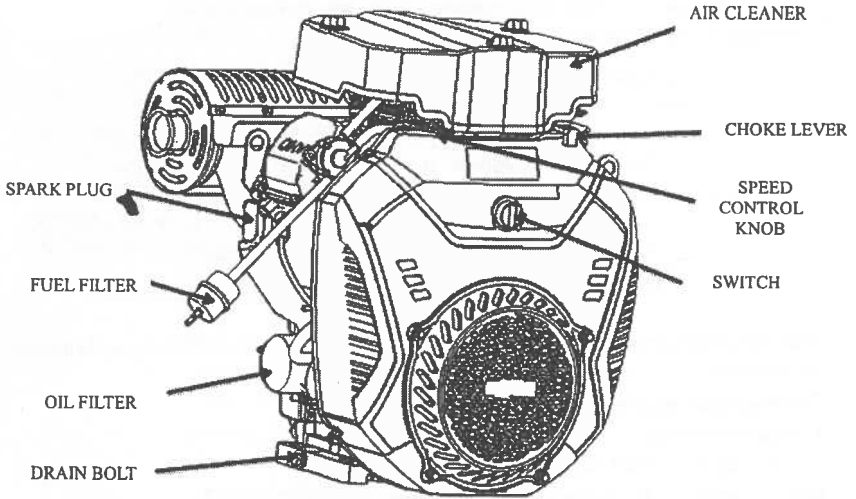
Warning Labels Location

The warning labels remind you of the potential danger that may cause serious personal injury. Please read them carefully.

Once the labels fall or get difficult to recognize, please contact your dealer for replacement.



Parts And Controls Location



Pre-use Inspection

For your safety and to make your equipment more durable, please take some time to check the condition of the gasoline engine before operation. Make sure the faults is cleared or you can contact your dealer to solve the problem.

CAUTION

Improper maintenance or operation of the gasoline engine without troubleshooting may cause serious personal injury or even death.

Before each operation, a pre-use inspection must be performed to eliminate various faults.

Make sure that the engine is placed on a level ground with the switch at "OFF" position before pre-use inspection.

Check the following points before start:

1. General conditions

- (1) Check the oil and fuel for leaks.
- (2) Clear the excess dirt or debris, especially around the muffler.
- (3) Check if there is a sign of damage.
- (4) Check the position of all hoods and covers and check the bolts, nuts and screws for fastening.

2. Gasoline engine

- (1) Check the fuel level. Full filling before operation can avoid or reduce the occurrence of interruption to operation due to the need for fueling.
- (2) Check the oil level. The low oil level will cause damage for gasoline engine during operation.
- (3) Check the air cleaner element. The filthy one will limit air to enter the carburetor and reduce the performance of gasoline engine.
- (4) Check the devices equipped with this gasoline engine. Before starting the gasoline engine, please read the instruction manual of the devices to understand the operation warning and the steps to be followed.


Operation

1. Operation warning

Before using the gasoline engine for the first time, please read the chapter of safety precautions and pre-use inspection.

In order to give full play to the performance, it is recommended that the new product should be run in for 15 minutes before use.

For your safety, do not use gasoline engines in confined areas, such as garages. The gas discharged by the gasoline engine contains toxic carbon monoxide. In a confined area, carbon monoxide can accumulate quickly, making people sick or even death.

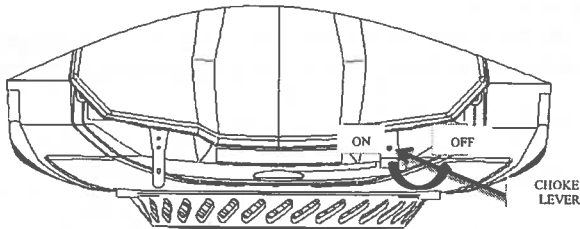
 CAUTION
<p>The toxic carbon monoxide in the exhaust gas can accumulate to dangerous concentrations in confined areas. Inhalation of carbon monoxide can cause unconsciousness and even death.</p> <p>It is forbidden to operate gasoline engines in confined areas, including the semi-ventilated areas with people on site.</p>

Read the safety warning of the device equipped with this gasoline engine regarding the start, stop or operation of the gasoline engine.

Do not use gasoline engines when the slope is greater than 20 °.

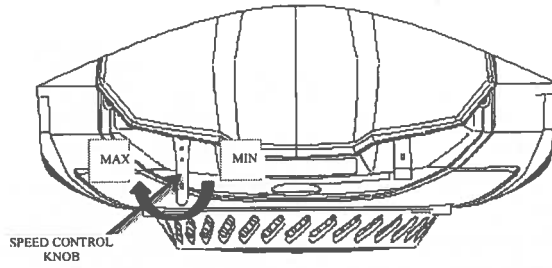
2. Start the engine

- (1) If the fuel tank is equipped with a fuel cock, make sure that the fuel cock is set to "ON" position before starting the gasoline engine.
- (2) Before cold-start the engine, turn the choke lever to the "OFF" position.
Before warm-start the engine, turn the choke lever to the "ON" position.



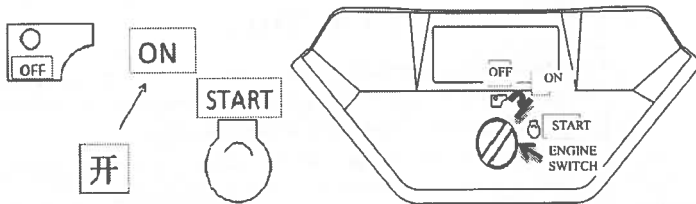
Some gasoline engines do not install the choke lever as shown in the figure, but use remote-controlled choke lever. Therefore, it needs to refer to the instructions provided by the equipment manufacturer.

- (3) Move the speed control knob from the initial position to about 1/3 in the direction shown in the figure.



Some gasoline engines do not install the speed control knob as shown in the figure, but use remote-controlled device. Therefore, it needs to refer to the instructions provided by the equipment manufacturer.

(4) Turn the gasoline engine switch to "ON" position



(5) Operate the starting motor.

Starting motor:

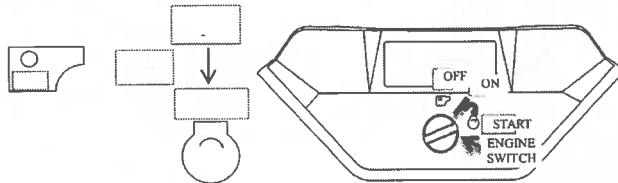
Turn the switch to "START" position and hold it until the gasoline engine starts.

If the gasoline engine does not start successfully after more than 5s, release the switch knob and wait 10s before re-operation.

IMPORTANT

Do not use the starting motor for more than 5s, or it will overheat and cause damage.

After the start of gasoline engine, release the switch knob, returning it to "ON" position.



(6) Warm up the gasoline engine for 2-3 minutes.

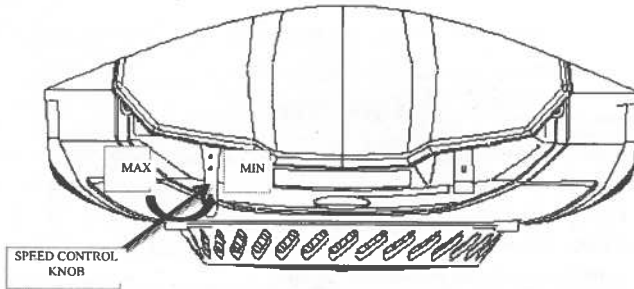
(7) If the choke lever is at "OFF" position when starting the gasoline engine, as the engine heats up, the lever should be gradually moved to "ON" position.

3. Stop the engine

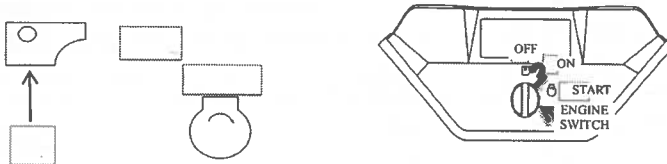
To stop the engine in an emergency, turn the engine switch to "OFF" position as below. For details, please refer to the instructions provided by the equipment manufacturer.

(1) Move the speed control knob to "MIN" position.

Some gasoline engines do not install the speed control knob as shown in the figure, but use remote-controlled device. Therefore, it needs to refer to the instructions provided by the equipment manufacturer.



(2) Turn the engine switch to "OFF" position.



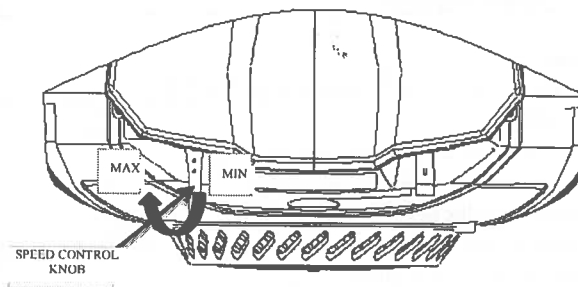
(3) If the fuel tank is equipped with a fuel cock, set the fuel cock to "OFF" position.

(4) Set the gasoline engine speed

Set the speed control knob to the expected speed position.

Some gasoline engines do not install the speed control knob as shown in the figure, but use remote-controlled device. Therefore, it needs to refer to the instructions provided by the equipment manufacturer.

For the recommended engine speed, please refer to the instructions provided by the devices equipped with this gasoline engine.



Maintenance

1. Importance

Good maintenance is very important for safety, economic fuel consumption and normal use. It also reduces pollution.

CAUTION

Improper maintenance or operation without eliminating the existing faults may cause more serious faults or even severe injury or death.

Strictly follow the inspection, maintenance items and schedule requirements in this instruction manual.

The following pages include maintenance schedules, regular inspection procedures, and simple maintenance dealt with basic hand tools, to help you properly service the gasoline engine. For other difficult or professional maintenance work, contact your dealer for help.

The maintenance schedule is applied to the normal working state of the gasoline engine. If you operate under severe cases (such as constant high-load, high-temperature operation, or under abnormally humid or dusty environment conditions), consult your dealer for maintenance suggestions according to your personal use.

Please use genuine Lifan gasoline engine parts. The use of poor substitutes will damage the gasoline engine and cannot be covered by the warranty.

2. Safety precautions

The following are some very important safety warnings. We can't list all the dangers that may occur during the maintenance process. It is up to you to decide whether you are qualified for repair work.

CAUTION

Failure to observe the maintenance instructions and warning requirements may result in serious injury or death.

Please strictly follow the steps and safety instructions in this instruction manual.

3. Safety warnings

(1) Make sure to stop the gasoline engine before any maintenance or repair as it can minimize some potential security risks:

- Carbon monoxide (in the exhaust gas) poisoning
Good ventilation for operation site is needed.
- Burns caused by hot parts
The gasoline engine and the exhaust system must be cooled before touching.
- Injuries caused by moving parts
Unless otherwise noted, do not touch the running gasoline engine.

(2) Read the manual before operation to ensure that you have complete tools and necessary skills.

(3) Be extra careful to reduce the possibility of fire or explosion when there is gasoline near the engine. Clean the parts with flame retardant solvents but not gasoline. All fuel-related parts must be kept away from cigarette butts, sparks and open flames.

Remember: The dealer is more familiar with your gasoline engine and has complete tool set for maintenance and repair. In order to ensure the best quality, safety and reliability, only new and genuine Lifan parts can be used for repair or replacement.

4. Maintenance schedule

Item		Frequency	Each time	First month or every 20 hrs	Every 6 months or 100 hrs	Every year or 300 hrs	Every 2 years or 500 hrs	See page
Engine oil	Check the oil level	Δ						
	Replace			Δ	Δ			
Oil filter	Replace		Every 200 hrs					
Air cleaner	Check	Δ						
	Clean				Δ (1)			
	Replace						Δ *	
Spark plug	Check-adjust				Δ			
	Replace					Δ		
Spark eliminator	Clean				Δ			
Idle speed	Check-adjust					Δ (2)		**
Combustion chamber	Clean		Every 1,000 hrs (2)					**
Fuel filter	Replace					Δ (2)		**
Fuel supply line	Check		Every two years (replace if necessary) (2)					**

* Replace the paper element only.

** Refer to the instruction manual

(1) Frequent maintenance is required in dusty areas.

(2) Above maintenance should be done by your dealer unless you are specially trained and well equipped with tools. Detailed steps refer to the instruction manual.

(3) When used for commercial purposes, please record the running hours to determine the appropriate maintenance cycle.

Damage caused by failure to follow this maintenance schedule is not covered by the warranty.

5. Fuel

Recommended fuel: It's recommended to use 92# or above gasoline for this engine.

Stop the engine and refuel in a well-ventilated place. If the gasoline engine has just finished running, wait for it to cool down. It is forbidden to refuel in places where there may be flames or sparks.

The unleaded gasoline with alcohol (no more than 10%) or with methanol (no more than 5%) can be used. The methanol must contain co-solvents and corrosion inhibitors. If the content of alcohol

and methanol exceeds above ratio, failure to start-up and/or operation may be occurred; also damage to the metal, rubber and plastic parts of the fuel system may be found. The gasoline engine damage and operation failure caused by excessive alcohol and methanol content in the fuel is not covered by the warranty.

 **CAUTION**

Gasoline is flammable and explosive, you may get burned or even severely hurt when you refuel.

● **Stop the engine and keep it away from open flames, sparks and heat sources.**

● **Refuel outdoors.**

● **Wipe off any spilled fuel immediately.**

IMPORTANT

Gasoline can damage the paint and plastic parts. Do not splash gasoline when refueling. Damage caused by gasoline splashing is not covered by the warranty.

Never use aged oil, contaminated oil or mixed oil and keep dust and water from entering the fuel tank. Stop the gasoline engine and put it on a flat ground. Unscrew the fuel tank cap to check the oil level. Refuel if the oil level is too low. When refueling, please refer to the instruction manual of the equipment equipped with this gasoline engine.

Fill the fuel in a well-ventilated area before starting the gasoline engine. If the gasoline engine has just finished running, wait for it to cool down. Be careful when refueling to avoid fuel splashing. Sometimes the oil level should be lower than the upper limit due to different operating conditions. After refueling, tighten the fuel tank cap. Keep gasoline away from working lights, ovens, electrical appliances, power equipment, and other objects that can produce open flames, sparks, or high temperatures.

The spilled fuel is not only a fire hazard but also a pollutant to the environment. Please wipe off the spilled gasoline immediately.

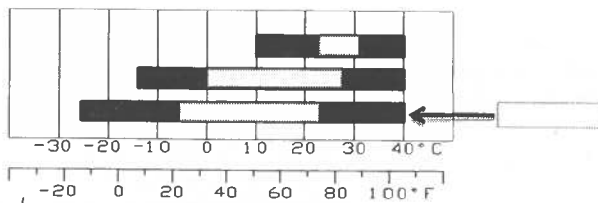
6. Engine oil

Engine oil is a key factor in deciding the engine's performance and service life. The engine oil must be suitable for 4-stroke engine.

(1) Recommended engine oil

Check the API label on the engine oil container and make sure that the engine oil reaches SE grade or above. It's recommended to use Lifan special gasoline engine oil (SJ 10W-30).

If the average ambient temperature in your area is within the temperature range shown in the figure, the engine oil with corresponding viscosity in the figure can be replaced.

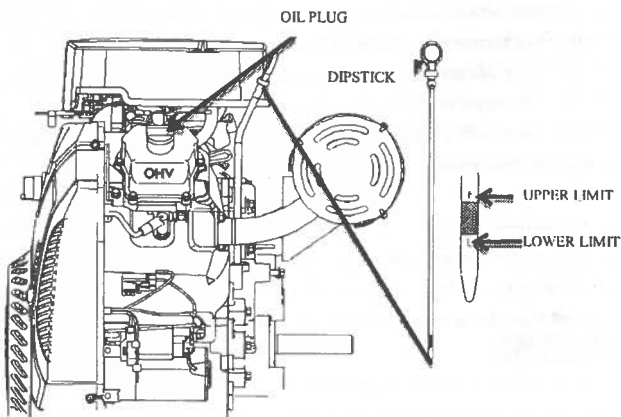


Ambient temperature

(2) Check oil level

Ensure that the engine stops and places on a level ground.

- ① Start the gasoline engine and run it at idle for 1~2 minutes. After stopping the gasoline engine, leave it for 2 to 3 minutes.
- ② Remove and clean the dipstick.
- ③ Insert the dipstick into the oil filler, and then remove it to check the oil level.
- ④ If the oil level is too low, open the oil filler cap and add the recommended engine oil until the upper limit mark of the dipstick is reached.
- ⑤ Reinstall the dipstick and oil plug.



IMPORTANT

Damage caused by running a gasoline engine with a low oil level is not covered by the warranty. When the oil level is below the lower limit, the oil alert system will stop the engine automatically. To avoid accidental flameout, the oil level should be checked before each start.

(3) Replace the oil

It's quick and thorough to change the oil when the gasoline engine is warm.

- ① Place a suitable container under the gasoline engine for the waste oil and remove the oil plug, drain bolt and sealing gasket.
- ② Drain the residual oil thoroughly, then reinstall the drain bolt and a new sealing gasket, and tighten the drain bolt.

IMPORTANT

Make sure to avoid environmental pollution when disposing of used oil. It is recommended to seal

the waste oil in a container and send it to a recycling center or a recycling shop. Do not throw it into the garbage, pour it on the ground or drain it into the sewer.

- ③ Place the gasoline engine horizontally and add the recommended oil to the upper limit mark of the dipstick.
- ④ Reinstall the oil plug and tighten it firmly.

7. Oil filter

Replacement

- (1) Drain the oil and retighten the oil drain bolt.
- (2) Remove the oil filter and drain the oil into a container. Make sure to avoid environmental pollution when disposing of residual oil and oil filters.

IMPORTANT

Use the special socket wrench to avoid damage to the oil pressure switch.

- (3) Clean the filter base and apply a layer of clean engine oil to the new gasket.

IMPORTANT

Make sure to use a genuine Lifan oil filter, or the poor one will damage the gasoline engine.

- (4) To install a new oil filter, tighten it by hand until the sealing gasket contacts the base, and then use a special socket wrench to screw the filter by 3/4 turn.

Tightening torque of oil filter: 12N·m

- (5) Fill the crankcase with the recommended amount of oil and then install the oil plug and dipstick.
- (6) Start the gasoline engine and check it for oil leaks.
- (7) Stop the gasoline engine and check the oil level. Add oil until the upper limit mark of the dipstick is reached if necessary.

8. Air cleaner

A dirty air cleaner will prevent air from entering the carburetor and reduce the performance of the gasoline engine. When using gasoline engines in dusty areas, the air cleaner element should be cleaned more frequently than specified in the maintenance schedule.

IMPORTANT

If the gasoline engine is running without a air cleaner element or with a broken one, the dust will enter it, so as to accelerate its wear. Damage caused by such reasons cannot be covered by the warranty.

Check

Remove the air cleaner vent cover and check the element. Clean or replace the air cleaner element. Replace it if it's damaged.

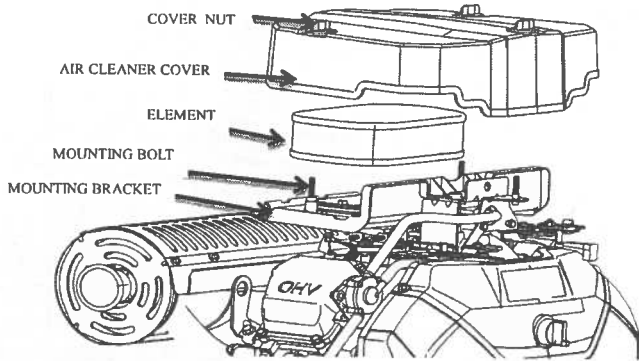
Clean

- (1) Unscrew the air cleaner cover nut and remove the cover.
- (2) Remove the element from the air cleaner mounting bracket.
- (3) Check the element and replace it if necessary. The air cleaner element must be replaced at the time recommended by the maintenance schedule.
- (4) Clean the air cleaner before you use it again.

Tap the air cleaner element on a firm surface for several times to remove the dust, or blow the dust from the side of the air cleaner mounting bracket with an air compressor ($\leq 2.1 \text{ Kg} / \text{cm}^2$).

It is forbidden to remove the dust with a brush, so as to avoid the dust into the element fibers.

Replace the element if there is too much dust.



(5) Wipe off the dust outside the air cleaner or on the cover by a damp cloth. Be careful to prevent dust from entering the carburetor through the air duct.

(6) Reinstall the air cleaner element and make sure that the element and mounting bracket fit tightly.

(7) Tighten the air cleaner cover nut.

9. Spark plug

Recommended spark plug model: F6RT1

The recommended spark plug allows general gasoline engines to work in the correct temperature range.

IMPORTANT

Using an inappropriate spark plug will damage the gasoline engine.

If the gasoline engine has just finished running, wait for it to cool down before servicing the spark plug.

In order to ensure the normal operation of the gasoline engine, the spark plug gap must be correct without sediment.

(1) Remove the spark plug cap and clean dirt around the spark plug.

(2) Remove the spark plug with a special 21mm socket wrench.

(3) Check the spark plug and replace it if it's damaged, severely clogged, the sealing gasket is aged or the electrodes are excessively worn.

(4) Measure the electrodes gap with a feeler gauge. Bend the side electrode to adjust the gap if necessary.

Spark plug gap: 0.7-0.8mm

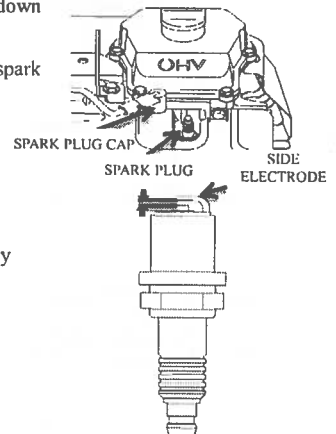
(5) Install the spark plug carefully to avoid thread misalignment.

(6) After installing the spark plug, tighten it with a 21mm spark plug socket wrench to press the gasket.

IMPORTANT

Fasten the gasket with 1/2 turn more when installing a new spark plug.

Fasten the gasket with 1/8 to 1/4 turn more when installing a used spark plug.



10. Troubleshooting

(1) DIFFICULTIES IN STARTING

TROUBLE				CAUSE	REMEDY
Normal cylinder pressure	Normal spark from spark plug	Malfunction of fuel supply system	Fuel supply is not fluent	Empty fuel tank or fuel cock is closed.	Refuel or turn the fuel cock on.
				Air vent in the fuel filler cap is clogged.	Dredge the air vent.
				Fuel cock is clogged.	Clean
				The main jet is adjusted improperly or clogged.	Readjust, clean and blow
		The needle valve or float is stuck.	Repair or replace		
		Fuel supply is fluent	Filthy or deteriorated fuel	Replace the fuel and clean the carburetor.	
			There is water in the fuel.	Replace the fuel and clean the carburetor.	
			Excessive fuel in the cylinder	Drain extra fuel, dry up spark plug	
	Wrong fuel number		Select proper fuel number according to the requirements.		
	Normal fuel supply system	Normal spark	Spark plug is defective	Too much carbon deposits and dirt around the electrodes.	Clear away
				Damaged insulators	Replace
				Electrodes are burned seriously	Replace
Improper spark plug gap				Adjust	
Normal spark plug		No spark	Damaged High pressure coil	Replace	
			Damaged ignition coil	Replace	
Improper cylinder pressure	Normal fuel supply system	Normal ignition system	Normal spark plug	Piston ring is worn excessively or broken	Replace
				Cemented piston ring	Clear up carbon deposits
				Without gasket or untight spark plug	Install a gasket or tighten it
				Air leaks between cylinder block and cylinder head	Replace the cylinder gasket
				Air leakage in valves	Grind or replace

(2) INSUFFICIENT POWER OUTPUT

TROUBLE	CAUSE		REMEDY
Engine speed increases slowly when accelerating, even decreases or engine stops running in serious condition.	Ignition system	Incorrect ignition timing	Replace the ignition coil
	Fuel supply system	Air mixed in the oil circuit	Expel the air
		Improper adjustment on the main jet	Readjust
		Clogged needle valve or main jet	Clean and blow
		Clogged fuel cock	Clean or replace
		Carbon deposits in the combustion chamber	Clear away
	Intake system	Clogged air cleaner	Clean or replace the element
		Air leaks from the intake system	Repair or replace
	Poor compression	The piston, cylinder or piston ring is worn.	Replace
		Air leaks between the cylinder block and cylinder head.	Replace the cylinder gasket
Improper valve clearance		Readjust	
Poor valve tightness		Grind or replace	

(3) SUDDEN FLAMEOUT

TROUBLE	CAUSE		REMEDY
Sudden flameout in running	Fuel supply system	The fuel is used up	Refuel and dredge
		Clogged carburetor	Check fuel circuit and dredge
		The float is leaking	Repair
		Needle valve is stuck	Repair
	Ignition system	Punctured spark plug or short circuit by carbon deposits	Replace the spark plug
		The electrode of spark plug falls off	Replace the spark plug
		The high-pressure coil falls off	Repair or replace
		Punctured ignition coil	Replace
	Oil pressure system	Insufficient oil in the crankcase	Check and refill
	Others	The cylinder is seriously scored or the valves fall off.	Repair or replace the damaged parts

(4) ENGINE OVERHEATS

TROUBLE	CAUSE	REMEDY
Gasoline engine overheats	Improper ignition timing	Replace the ignition coil
	Insufficient oil supply	Refill enough oil
	Exhaust pipe is blocked	Dredge the exhaust pipe
	Air leaks in the cowling	Repair the damaged parts
	The air ducts are blocked	Clean up the fins
	The cooling fan damaged	Reinstall
	The piston ring is worn, resulting in air flow between cylinder and crankcase	Replace the worn parts
Gasoline engine speed is too high	Troubleshoot the speed control system or replace the speed control gear	

(5) ABNORMAL NOISES

TROUBLE	CAUSE	REMEDY
Sound of knocking	Worn piston or piston rings	Replace the worn parts
	Worn conrod, piston pin or piston pin hole	Replace the worn parts
	Worn crankshaft	Repair or replace
	Broken piston rings	Replace the piston rings
Deflagration with metallic sound	Too much carbon deposits in the combustion chamber	Clear away carbon deposits
	Clearance between electrodes is small	Adjust electrode clearance properly
	Engine is flooded with fuel	Check the carburetor
	Improper fuel number	Replace the fuel
	Engine overheats	Refer to the previous table
Other abnormal noises	Improper valve clearance	Readjust the valve clearance
	The fly wheel is not connected with crankshaft tightly	Replace the connecting parts and reinstall

Tips and Suggestions

1. Storage

(1) Preparation for Storage

Proper storage preparation is essential to keep your gasoline engine from breaking down and looking good. Operation as follows to prevent rust and corrosion, keep the performance and appearance in good condition, and make restarting the gasoline engine easier.

(2) Cleansing

Cool for at least half an hour after the gasoline engine is turned off before cleaning. Clean the entire exterior, touch up paint where it has fallen off, and apply a thin layer of oil where it may rust.

NOTE

Cleaning the gasoline engine with a rubber hose or high-pressure flushing device will allow water to enter the air filter or silencer opening. Water can seep into the air filter element and

then enters the air filter or silencer, thus entering the cylinder and causing damage.

(3) Fuel


Gasoline may oxidize and deteriorate during storage. The long stored gasoline can cause difficulties in starting and produce gelatinous deposits. It is necessary to repair or replace the carburetor or other fuel system if the gasoline in the engine deteriorates during storage.

How long gasoline stored in a tank or carburetor without functional failure (storage life) is affected by a lot of factors, such as the blending ratio (oil number), the storing temperature, whether the tank is full, etc. The air in an unfilled tank can accelerate the gasoline's deterioration, also the high temperature can. Gasoline may spoil within 30 days (even less if it is aged oil).

NOTE

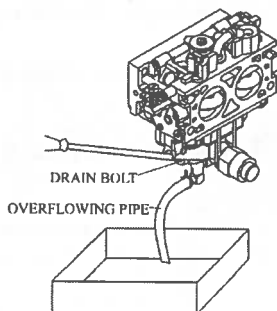
Damage to the fuel system or performance failure of the gasoline engine caused by the user's storage improperly is not covered by the warranty.

(4) Drain off gasoline in the fuel tank and carburetor.

 CAUTION
<p>Gasoline is flammable and explosive and has the potential to burn when handling.</p> <p>Turn the gasoline engine off and keep it away from the heat sources, sparks or open flames.</p> <p>Can only be handled outdoors.</p> <p>Wipe off spilled fuel immediately.</p>

① Remove the fuel hose attached to the side of the gasoline engine and drain the fuel from the tank into a special container; then turn the fuel tank switch (if available) to ON to drain the fuel. After draining the fuel completely, reconnect the fuel hose.

② Loosen the drain bolt of carburetor to drain the residual oil into a container, after that, tighten the drain bolt.



(5) Engine oil

① Replace the engine oil.

② Remove the spark plug.

③ Apply about 5-10ml new engine oil to each cylinder.

④ Turn the gasoline engine switch to START and hold it for several seconds to disperse the oil into the cylinder.

⑤ Reinstall the spark plug

(6) Storage

① Storage warning

When your gasoline engine is stored, if there is gasoline left in the fuel tank or carburetor, be careful to prevent the gasoline vapor from igniting and causing a disaster. Choose a well-ventilated storage location and keep away from all appliances that can create an open flame. For example, heaters, water heaters, clothes dryers, etc., also avoid starter motors or other operating power facilities that can produce sparks.

Avoid places with high humidity as much as possible, as they are highly susceptible to rust and corrosion.

The gasoline engine, must be horizontally placed when storing, which is tilting placed can cause fuel or oil leakage.

If fuel is not drained off from the fuel tank, the fuel switch must be turned to OFF to prevent leakage. Cover the cooled gasoline engine and exhaust system to prevent dust. Some combustible materials may be ignited or melted by the hot gasoline engine and exhaust system. Do not shelter the engine with plastic film, because the impermeable ones can condense the surrounding moisture to accelerate rust and corrosion. For the engine equipped with a battery, be sure to remove the battery and store it in a cool and dry place, charge it monthly, that will prolong the battery's life.

② Remove from Storage

Inspect the gasoline engine as per the Chapter "Pre-use Inspection".

If the fuel has been drained off in preparation for storage, fill the fuel tank with new gasoline, also make sure the fuel in the container is clean when refueling. Gasoline can oxidize or deteriorate over time, making it is difficult to start a gasoline engine.

It is a normal phenomenon when the gasoline engine may restart with smoke if preservative oil is applied to the exterior of cylinder.

(7) Transfer

The gasoline engine should be cooled for at least 15 minutes (if running not long ago) before being loaded onto the transport vehicle. Gasoline engine and exhaust system with high temperature can burn you and ignite the flammable materials.

Keep the gasoline engine level when transporting to prevent oil leaks, then turn the fuel tank switch (if available) to OFF.

Technical Information

1. S/N location

Fill in the blanks with gasoline engine S/N, model and purchase date. These data are required when ordering parts and in technical consultation or warranty consultation.

Gasoline engine S/N: _____

Gasoline engine model: _____

Purchase date: _____ / _____ / _____

2. Connection between starter motor and battery

Recommended battery: 12V-45Ah

Make sure not to connect the battery cables reversely, or short-circuit to the battery charging system may occur. Firstly connect the positive cable to the battery then the negative cable. In this way, even if the positive cable is accidentally grounded, it will not cause a short-circuit.

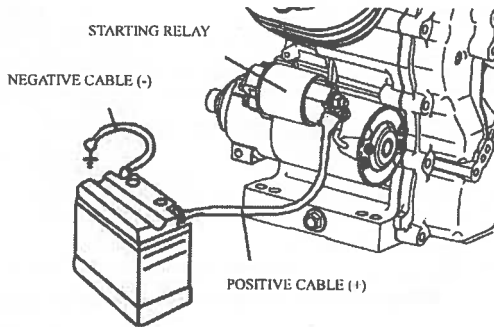
⚠ CAUTION

Incorrect operation procedure may cause a battery explosion and serious injuries to nearby people.
Keep the battery away from sparks, flames and various combustibles.

IMPORTANT

The battery cables, terminals and related accessories contain lead and lead compounds. Therefore, wash your hands after touching.

- (1) Connect the battery positive cable to the starting relay.
- (2) Connect the battery negative cable to the gasoline engine mounting bolt, the base bolt or other well-grounded connection point of the gasoline engine.
- (3) Connect the battery positive cable to the battery positive terminal as shown.
- (4) Connect the battery negative cable to the battery negative terminal.
- (5) Apply grease to the terminals and lead ends.



3. Change of carburetor for highland

At high altitude area, standard carburetor air/fuel ratio is rich, which will result in a performance reduction and an increased fuel consumption. Rich mixture also will contaminate the spark plug to cause difficulties in starting. When the gasoline engine works at different altitudes, the longer it is used, the higher the exhaust emissions get.

The performance when using gasoline engine at a high altitude area can be improved through the adjustment of carburetor. If your engine always work at a high altitude ($\geq 1500\text{m}$), please contact your dealer to adjust the carburetor. In this case, the adjusted carburetor will meet all emission standards during its service life. However, the power will decrease at a rate of 3.5% as the altitude increases every 300 meters. If the carburetor is not adjusted, the power will reduce even more.

IMPORTANT

Gasoline engine with carburetor adjusted to adapt to high altitudes cannot be used in low altitude areas ($< 1500\text{m}$) as the mixing ratio is too lean. Otherwise, the engine will overheat and cause serious damage. Therefore, it's necessary to contact your dealer to reset the carburetor to the factory setting before using in low altitude areas.

4. Main specification

Model		2V90F
Purpose		For general use
Type		4-stroke, OHV, V-type, 90°, dual cylinder
Dimension (L×W×H) (mm)		501×589×605
Net Weight (Kg)		68
Displacement (mL)		999
Bore×Stroke (mm)		90×78.5
Rated Power (kW) / (r/min)		22.5/3600(60HZ)
Max torque (N·m) / (r/min)		69.5/2600
Starting Performance (times)		12000
Speed controlling characteristics	Standard speed controlling rate	5%
	Steady engine speed fluctuation rate	5%
Fuel number		≥92#
Lubricant model		SJ 15W-30
Spark plug model		F6RTI
Lubricant Capacity (L)		2.3
Cooling System		Forced air cooling
Ignition		CDI
Start		Electric
PTO Axis Rotation Dirccion		Counterclockwise (see from the output side)

Note: The specification may be different for various types and may change at any time without notice.

5. Parameters with adjustment

Item	Parameter	Maintenance
Spark plug gap	0.7-0.8mm	See the manual
Idle	≤1800mm	Contact your dealer
Other parameters	No other adjustments needed	

Wiring Diagram

Electric starter engine with oil protection system

