

# Operating instructions

## LIFAN Engine 2 V90F 92670

# wiltec



Illustration similar, may vary depending on model

Please read and follow the operating instructions and safety information prior to initial operation.

Technical changes reserved!

Illustrations, functional steps, and technical data may deviate insignificantly due to continuous further developments.



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## Introduction

Thank you for choosing to purchase this quality product. To minimise the risk of injury, we ask you to always take some basic safety precautions when using this product. Please read this operating manual carefully and make sure that you understand it.

Keep these operation instructions in a safe place.

These instructions are an integral part of the petrol engine and should be included if the petrol engine is passed on to third parties.

## Safety instructions

You will find safety instructions in this manual and on the petrol engine itself. Please read and understand their meaning to avoid harm to yourself and others. Below you will find safety instructions, followed by the content of the respective safety instructions.

- **Danger!** Non-compliance with any of the following instructions might lead to serious injuries or even death.
- **Warning!** Non-compliance with any of the following instructions might lead to serious injuries or even death.
- **Attention!** Non-compliance with any of the following instructions might lead to injuries.
- **Important!** Failure to follow the instructions may result in damage to the petrol engine or other damage.

Whenever the above information appears in the manual and on the petrol engine, please read it carefully and observe it when operating. Each instruction informs you of the possible dangers, their consequences, and how to avoid them so that you can minimise the risk of injury.

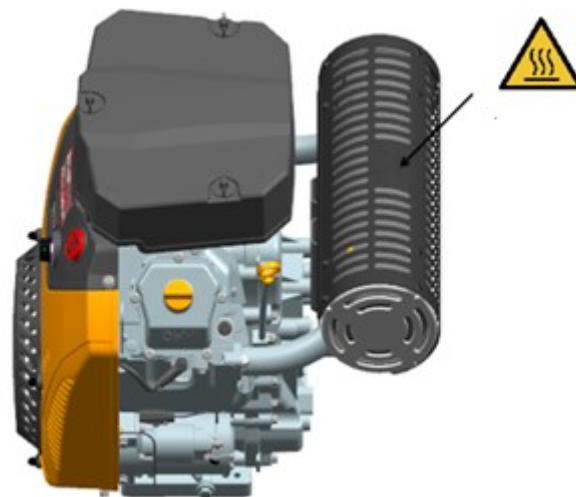
Different models have different labelling. Please take the actual product as a basis.

## Safety precautions

- Familiarise yourself with the operation of all the controls and learn how to switch off the petrol engine in an emergency. Make sure that the operator of the motor is specially trained.
- Children must not operate petrol engines. Keep the motor out of the reach of children and pets to avoid accidents.
- The exhaust gas emitted by the petrol engine contains toxic carbon monoxide. Ensure good ventilation and do not allow petrol engines to be used in a closed room.
- The temperature of the engine housing and exhaust gas emitted is very high when the petrol engine is running. Therefore, keep a minimum distance of 1 m from buildings or other facilities and keep the motor away from flammable objects. It is forbidden to cover the petrol engine during operation.
- This petrol engine is suitable for general use. It is forbidden to use it for other purposes, e.g., for a car or motorbike.

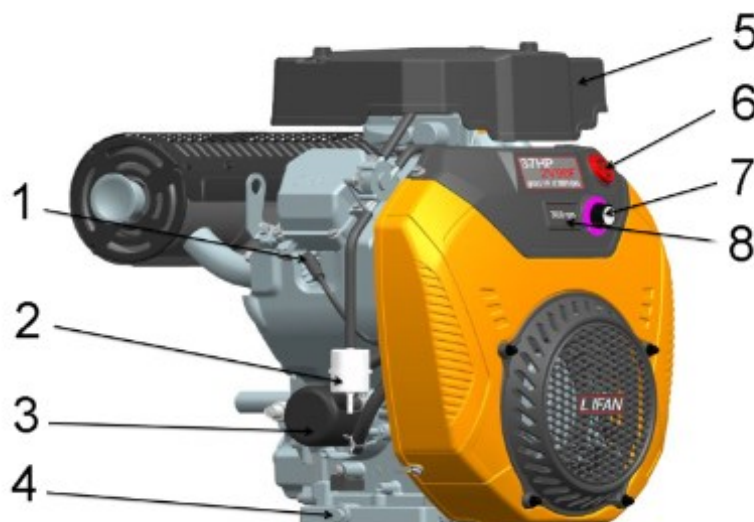
### Location of the warning signs

The warning signs draw your attention to possible dangers that could lead to serious injury. Please read and observe them carefully.

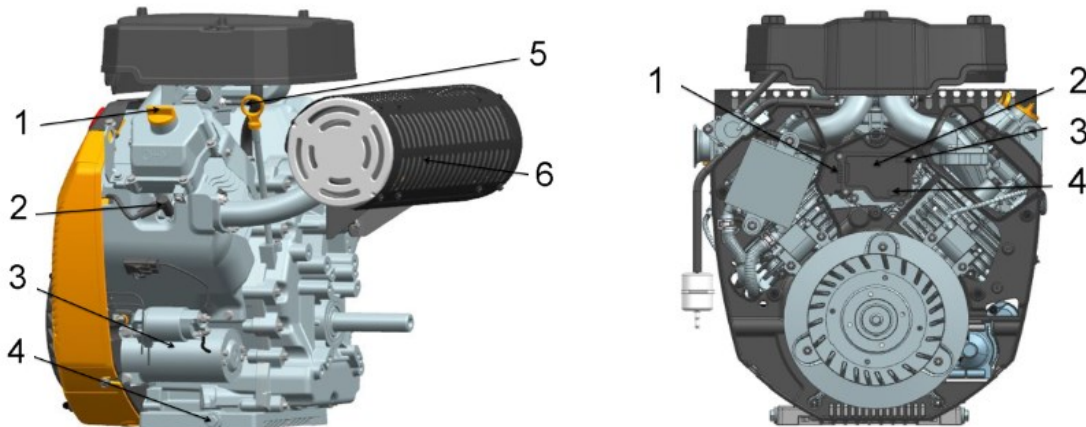


**Hot surface! Do not touch!**

### Position of parts and controls



Nº	Name	Nº	Name
1	Spark plug	5	Air cleaner
2	Fuel filter	6	On-button start switch
3	Oil filter	7	Potentiometer button
4	Drain screw	8	Tachometer



Nº	Name	Nº	Name	Nº	Name	Nº	Name
1	Oil filler plug	4	Drain screw	1	Main cable	3	Accelerating the motor
2	Spark plug	5	Dipstick	2	Electronic controller	4	Throttling the motor
3	Motor starter	6	Silencer				

### Inspection before commissioning

For your safety and to increase the service life of your device, please take some time to check the condition of the petrol engine before operation.

#### **Warning!**

- Improper maintenance or operation of the petrol engine without fault checking can lead to serious injury or even death.
- An inspection must be carried out before each operation so that various faults can be rectified.
- Ensure that the motor is on a level surface before inspection.
- Check the following points before each start:

#### *General conditions*

- Check for oil and fuel leaks.
- Remove excess dirt and deposits, especially around the silencer.
- Check if there are any signs of damage.
- Check the position of all bonnets and covers and check the fastening of the bolts, nuts, and screws.

#### *Petrol engine*

- Ensure that there is a sufficient fuel level. Prior refuelling can reduce or prevent interruptions during operation due to the need for refuelling.
- Check the oil level. A low oil level leads to damage to the petrol engine during operation.
- Check the air-filter element. A dirty air filter hinders the air supply to the carburettor and reduces the power of the motor.
- Before starting the petrol engine, check the equipment and read the operating instructions to understand the operating instructions and necessary steps.

## Operation

### Warning before starting operation

- Before using the petrol engine for the first time, be sure to read the chapter on safety measures and inspection before use.
- To achieve full performance, it is recommended that the new product is allowed to warm up for 15 min before use.
- Please read the safety instructions carefully and familiarise yourself with starting, switching off, and operating the motor.
- Do not use the petrol engine if the surface on which it is to be used is inclined at 20° or more.

**⚠ Warning!** Do not use the motor in enclosed spaces. Carbon monoxide in exhaust fumes can reach dangerous concentrations in enclosed spaces, which can lead to unconsciousness and even death. – Petrol engines must not be operated in closed rooms, not even in semi-ventilated rooms where people are present. It is important to ensure that enclosed spaces are adequately ventilated to prevent carbon monoxide poisoning.

### Starting the engine

1. If the fuel tank is equipped with a fuel tap, make sure that the fuel tap is set to “ON” before starting the petrol engine.
2. Turn the potentiometer button anti-clockwise to the starting position for the idle speed.



No	Name	No	Name
1	On-button start switch	2	Potentiometer button

3. Start the engine by pressing and holding the on-button starter switch until the petrol engine starts. If the petrol engine does not start successfully after more than 5 s, release the switch for 10 s before pressing it again.  
**Important!** Do not use the starter motor for longer than 5 s, otherwise the starter motor may overheat or be damaged.
4. Allow the petrol engine to warm up for 2–3 min.

### Turning off the engine

To switch off the engine in an emergency, please proceed as follows. Additional information is found in the user’s manual.

1. Press the on-button start switch.
2. If the fuel tank is equipped with a fuel tap, set the tap to the “OFF” position.



## Maintenance

Proper maintenance of the petrol engine is of great importance for safety, lower fuel consumption, and smooth operation. It also helps to reduce pollution. You should therefore carry out maintenance on your petrol engine as carefully as possible. On the following pages, you will find detailed maintenance schedules, regular inspection procedures, and simple maintenance work that can be carried out using ordinary hand tools. If further professional or complex maintenance work is required, we recommend that you contact a specialist.

The maintenance schedule covers the regular operation of the petrol engine. If you use the motor in harsh conditions, e.g., under constant load, at high temperatures, or in a particularly damp or dusty environment, please contact a specialist to obtain maintenance recommendations for your individual application.

Please only use original parts for your petrol engine. The use of inferior spare parts can cause damage to the petrol engine, and this damage cannot be covered by the warranty.

### **Warning!**

Improper maintenance or operation without correcting existing faults can lead to more serious faults or even serious injury or death. — Please adhere strictly to the inspection and maintenance instructions and the maintenance schedule in these operating instructions.

### *Safety precautions*

Below, you will find some very important safety instructions. We cannot list all the hazards that can occur during maintenance. You must decide for yourself if you are qualified to carry out repair work.

### **Warning!**

Failure to observe the maintenance instructions and warnings can result in serious injury or even death. Please be sure to follow the steps and safety instructions in these operating instructions.

## Safety instructions

1. The petrol engine must be switched off before any maintenance or repair work is carried out in order to minimise safety hazards. The following measures should be observed:
  - Good ventilation of the workplace is necessary to prevent carbon monoxide poisoning from exhaust fumes.
  - The petrol engine and the exhaust system must cool down before touching them to prevent burns from hot parts.
  - Injuries caused by moving parts should be avoided.
  - Do not touch the running petrol engine unless expressly stated otherwise.
2. Read the instructions before commissioning to ensure that you have complete information and knowledge.
3. Be extremely careful to reduce the risk of fire or explosion when petrol is near the engine. Use flame-retardant solvents to clean the parts and avoid using petrol. All components coming into contact with petrol must be kept away from cigarette butts, sparks, and naked flames.

Please note that a specialist is more familiar with your petrol engine and has the necessary equipment for maintenance and repair. To ensure the best quality, safety, and reliability, only new and original Lifan parts may be used for repairs or replacements.



**Maintenance schedule**

Type of intervention		Frequency				
		Every time	During the 1st month or after 40 hours	After 6 months of 100 hours	Every year or after 300 hours	Every 2 years or after 500 hours
Motor oil	Check oil level.	X				
	Replace.		X	X		
Air filter	Check.	X				
	Clean.			X <sup>(1)</sup>		
	Replace.				X*	
Spark plug	Clean, adjust.			X		
	Replace.				X	
Ignition sensor	Clean.			X		
Idling	Check, adjust.				X	
Burning chamber	Clean.	Every 1000 hours of operation				
Oil filter	Replace.	Every 200 hours of operation				
Petrol filter	Clean.				X	
Fuel supply line	Check.	After 2 years (replace if necessary)				

(1) In dusty environments, service more frequently than indicated in the table. — \* Only replace paper element

- It is recommended that an authorised specialist carries out the work unless you are specially trained and equipped with the appropriate tools.
- For commercial use, it is important to record the operating hours in order to determine the appropriate maintenance cycle.
- Damage resulting from non-compliance with this maintenance schedule is excluded from the warranty.

**Refuelling**

*Recommended fuel*

- It is recommended to use a petrol with 92 octane for this engine.
- Stop the engine and refuel in a well-ventilated area. If the petrol engine has just been running, allow it to cool down first. It is forbidden to refuel in places where there may be flames or sparks.





**Warning!**

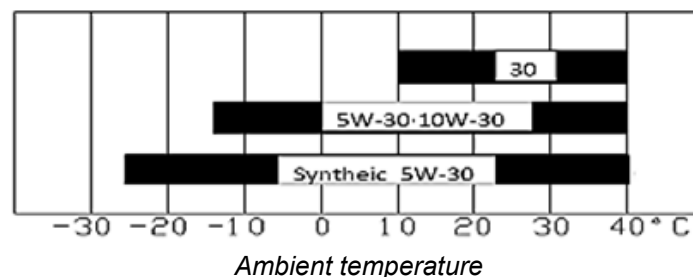
- There is a risk of burns and injury when refuelling, as petrol is flammable and explosive.
- Switch off the motor and keep it away from naked flames, sparks, and heat sources.
- Refuel outdoors and wipe up any spilt fuel immediately.

**Important!**

- Petrol can damage paint and plastic parts. Avoid spilling petrol when refuelling, as damage caused by petrol splashes is not covered under warranty.
- It is important never to use aged, contaminated, or mixed oil and to ensure that no dust or water gets into the fuel tank.
- Before checking the oil level, place the petrol engine on a level surface and unscrew the fuel filler cap. If the oil level is too low, top up the oil. Observe the operating instructions for the engine and accessories when refuelling.
- Only fill the fuel in a well-ventilated area before starting the petrol engine.
- After operating the petrol engine, wait until it has cooled down completely before operating or refuelling it again.
- Be careful when refuelling the engine to avoid fuel splashes.
- Under different operating conditions, the oil level may fall below the upper limit value.
- After refuelling, the tank cap should be firmly tightened.
- Avoid storing petrol near lights, stoves, electrical devices, power sources, and other objects that can produce open flames, sparks, or high temperatures.
- Spilt petrol is not only a potential fire hazard, but also pollutes the environment. Therefore, wipe up any spilt petrol immediately.

**Motor oil**

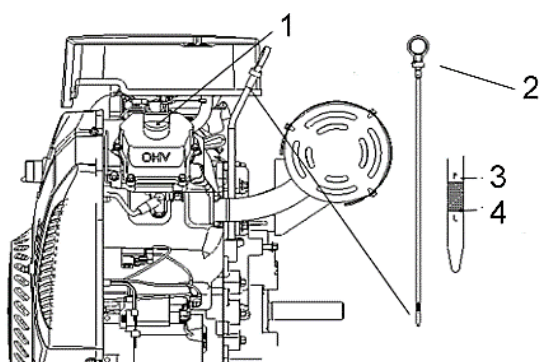
- Engine oil plays a decisive role in the performance of the engine. Please only use 4-stroke petrol engine oil.
- Check the API label on the engine oil container. Unless otherwise specified, we recommend engine oil SJ 10 W-30, which should at least correspond to class SE.
- If the average ambient temperature in your area is within the temperature range shown in the illustration, you can use the appropriate engine oil viscosity from the illustration. For ranges below  $-20^{\circ}\text{C}$ , it is recommended to use a 0 W-30 engine oil for easier starting.



**Check oil level**

Make sure that the motor is on a level surface. Make sure that the oil level is within the recommended range.

1. Start the petrol engine and let it idle for 1–2 min. Leave the motor running for a further 2–3 min after switching off.
2. Remove and clean the oil dipstick.
3. Insert the dipstick into the oil filler neck and pull it out to check the oil level.
4. If the oil level is too low, open the oil filler cap and fill with the recommended engine oil up to the upper mark on the oil dipstick.
5. Then refit the oil dipstick and the oil filler plug.



No	Name
1	Oil filler plug
2	Dipstick
3	Upper limit
4	Lower limit

### Important!

- Damage caused by operating a petrol engine with an insufficient oil level is not covered by the warranty.
- If the oil level falls below the lower safety limit, the engine may come to a standstill or even be damaged. To avoid accidental burn-out, it is important to check the oil level before every start. This should be carried out every few months to ensure the long-term protection of the engine.

### Oil change

Changing the oil is quick and easy when the petrol engine is warm.

1. Place a suitable container under the petrol engine to collect the used oil. Remove the oil pressure sensor, the drain plug, and the seal.
2. Drain the residual oil completely, then insert the drain plug and a new seal and tighten them.

**Important!** When disposing of used oil, the environment must not be polluted. We recommend collecting the used oil in a container and taking it to a recycling centre or recycling workshop. Do not dispose of it in household waste, do not pour it on the floor, do not dispose of it in the sewage system!

3. Position the petrol engine horizontally and fill with the recommended oil up to the upper mark on the dipstick.
4. Then reinsert the oil pressure sensor and tighten it.

### Replacing the oil filter

1. Drain the oil and then retighten the oil drain plug.
2. Remove the oil filter and empty the oil into the oil reservoir. Please ensure that you do not harm the environment when disposing of the residual oil and oil filter.  
**Important!** Use a special socket spanner to prevent damage to the oil pressure switch.
3. Clean the filter base and apply a layer of clean engine oil to the new washer.  
**Important!** Make sure that you use an original oil filter. If you use a bad filter, the petrol engine will be damaged.
4. To install a new oil filter, tighten it by hand until the seal touches the base, then turn it a further three-quarters of a turn using a special socket spanner (tightening torque of the oil filter: 15 Nm).
5. Fill the crankcase with the recommended amount of oil and then fit the oil filler plug and the oil dipstick.
6. Start the petrol engine and check for oil leaks.
7. Switch off the petrol engine and check the oil level. If necessary, top up the oil to the upper limit mark on the dipstick.

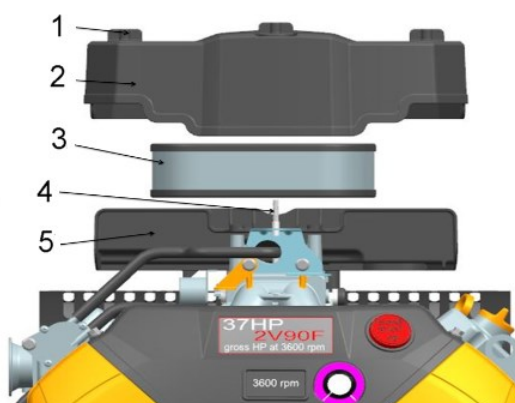
## Air filter

A dirty air filter prevents air from entering the carburettor and reduces the performance of the petrol engine. When using petrol engines in dusty conditions, the air filter should be cleaned more frequently than specified in the maintenance schedule.

**Important!** If the air filter element is missing or damaged, dust can get into the petrol engine and accelerate its wear. Damage caused for this reason is excluded from the warranty.

### Checking

Remove the air filter vent cover and check the element. Clean or replace the air filter. Replace the air filter element if it is damaged.



No	Name	No	Name
1	Nut of air-filter cover	4	Fastening screw for air filter
2	Air-filter cover	5	Bracket for air filter
3	Air filter element		

### Cleaning

1. Unscrew the nut on the air-filter cover and remove the air-filter cover.
2. Remove the air-filter element from the air-filter holder.
3. Check the element and replace it if necessary. The air-filter element must be replaced at the time recommended in the maintenance schedule.
4. Clean the air filter before reusing it.
5. Tap the air-filter insert several times on a solid surface to remove the dust or blow the dust from the side of the air-filter holder using an air compressor ( $\leq 2.1 \text{ Kg/cm}^2$ ).
6. It is forbidden to remove the dust with a brush, as it will be brushed into the fibres of the air filter. Replace the air filter if there is too much dust.
7. Wipe off the dust outside the air filter or on the cover of the air filter with a damp cloth. Make sure that the dust does not get into the carburettor through the air duct.
8. Reinsert the air-filter insert and make sure that it and the bracket are firmly seated.
9. Tighten the nut on the air-filter cover.

## Spark plug

Recommended spark-plug model: F6RTI-5. Commercially available petrol engines can be operated in the correct temperature range with the recommended spark plug.

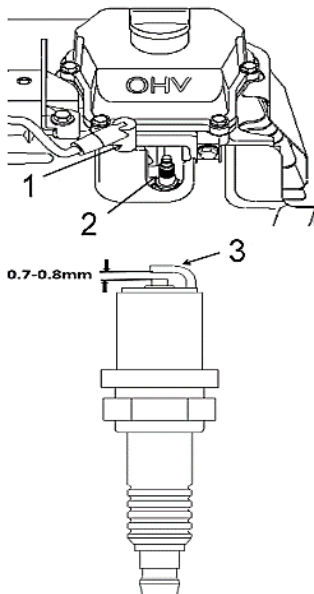
### Important!

- The use of an unsuitable spark plug will damage the petrol engine.

- If the petrol engine has just been running, wait until it has cooled down before servicing the spark plug.
  - To ensure normal operation of the petrol engine, the spark-plug gap must be set correctly and there must be no deposits.
1. Remove the spark-plug cap and remove the dirt from around the spark plug.
  2. Remove the spark plug using a special 21-mm socket spanner.
  3. Check the spark plug and replace it if it is damaged or heavily clogged, the seal is aged, or the electrodes are excessively worn.
  4. Measure the electrode gap with a feeler gauge. If necessary, bend the side electrode to adjust the distance.
  5. The spark-plug gap is **0.7–0.8 mm**.
  6. Install the spark plug carefully to avoid thread misalignment.
  7. After installing the spark plug, tighten the spark plug with the seal using a 21-mm spark-plug socket spanner.

**Important!**

- When installing a new spark plug, tighten the seal by half a turn more.
- When installing a used spark plug, tighten the seal by an eighth to a quarter of a turn more.



No	Name
1	Spark-plug connector
2	Spark plug
3	Side electrode

**Troubleshooting**

*Low motor power*

Problem	Possible cause		Proposed solution
Engine power is insufficient, engine speed drops, or engine even stops	Ignition system	Incorrect ignition timing	Replace ignition coil.
	Fuel supply system	Air mixture in the oil circuit	Release air.
		Incorrect setting of main nozzle	Set new.
		Needle valve or main nozzle clogged	Clean and blow out.
		Fuel tap blocked	Clean or replace.
	Too many carbon deposits in combustion chamber	Clean out.	



	Suction system	Air filter clogged	Clean or replace element.
		Air leakage in the suction system	Repair or replace.
	Poor compression	Piston, cylinder, or piston ring worn	Replace.
		Air outlet between cylinder block and cylinder head.	Replace cylinder gasket
		Incorrect valve clearance	Readjust.
		Poor valve tightness	Grind or replace.

*Problems starting the engine*

Problem				Possible cause	Proposed solution
Normal cylinder pressure	Normal sparking of the spark plug	Fault in the fuel-supply system	Fuel supply is not smooth	Not enough fuel in the fuel tank or fuel tap closed	Fill with fuel, open the fuel tap.
				Ventilation of fuel-filler cap blocked	Clean the vent opening.
				Fuel tap blocked	Clean.
				Main nozzle not set correctly or clogged	Readjust, clean, blow out.
				Needle valve or float jammed	Repair/replace.
	The fuel supply is smooth	Fuel too dirty or spoilt	Replace fuel, clean carburettor.		
		Water in fuel	Replace fuel, clean carburettor.		
		Too much fuel in the cylinder	Drain excess fuel, dry spark plug.		
		Wrong fuel brand	Select the correct fuel brand according to the requirements.		
	Normal fuel supply system	Normal sparking	Spark plug is damaged	Too many carbon deposits and dirt around the electrodes	Clean.
Insulators damaged				Replace spark plug	
Electrodes badly burnt				Replace spark plug.	
Wrong spark plug gap				Adjust.	
Spark plug works smoothly		No sparking	High-pressure coil damaged	Replace.	
			Ignition coil damaged	Replace.	
Abnormal cylinder pressure	Normal fuel supply system	Normal ignition system	Spark plug works smoothly	Piston ring excessively worn or broken	Replace.
			Piston ring jammed	Remove carbon deposits.	
			Spark plug not tightened or installed without gasket	Tighten with a gasket.	



				Air outlet between cylinder block and cylinder head.	Replace cylinder gas-gasket.
				Air outlet in the valves	Grind or replace.

*Sudden failure*

Problem	Possible cause		Proposed solution
Sudden failure during operation	Fuel supply system	Fuel consumed	Fill in fresh fuel.
		Carburettor clogged	Check the fuel supply and pump and clear any blockages.
		Float leaking	Repair.
		Needle valve jammed	Repair.
	Ignition system	Short circuit due to a breakdown or carbon deposit on the spark plug	Replace spark plug.
		Side electrode of the spark plug has fallen off	Replace spark plug.
		Spark-plug cable dropped	Repair or replace.
		Breakdown of the ignition coil	Replace.
	Oil-pressure system	Too little oil in the tank	Check and top up oil.
	Other	Cylinder severely damaged or valves broken	Repair or replace damaged parts.

*Abnormal noises*

Problem	Possible cause	Proposed solution
Knocking noises	Piston or piston ring worn	Replace worn parts.
	Connecting rod, piston pin, and piston-pin bore worn	Replace worn parts.
	Worn crankshaft	Repair or replace.
	Piston ring broken	Replace piston ring.
Deflagration with metallic sound	Too much carbon build-up in combustion chamber	Remove carbon deposits.
	Spark-plug-electrode gap too small	Set the electrode clearance correctly.
	Engine flooded with fuel	Check carburettor.
	Unsuitable fuel type	Replace fuel.
	Engine overheating	See table below.

*Engine overheating*

Problem	Possible cause	Proposed solution
Engine overheating	Incorrect ignition timing	Replace ignition coil.
	Insufficient oil supply	Add oil.
	Exhaust clogged	Clear obstruction.



	Air leakage in the bonnet	Repair damaged part.
	Air ducts blocked	Clean slats.
	Cooling fan damaged	Replace and reinstall.
	Piston ring worn, air flow between cylinder and crankcase	Replace worn parts.

## Hints and recommendations

### Storage

1. Preparing for storage: Proper preparation for storage is important to prevent damage to the petrol engine and to maintain its appearance. Observe the following points to prevent corrosion and rust, keep the performance and appearance of the engine in good condition, and ensure a smooth restart.
2. Cleaning: Allow the petrol engine to cool down for at least 30 min after switching it off before cleaning it. Remove dirt from the entire exterior surface, repair damage to the paint, and apply a thin layer of oil to prevent rusting.

**Important!** If you clean the petrol engine with a hose or a high-pressure cleaner, there is a possibility that water can penetrate through the openings of the air filter or the silencer. The water may get into the air-filter element and from there into the air filter or silencer, which can damage the cylinder.

### Fuel

- Petrol can oxidise and spoil during storage. Prolonged storage of petrol leads to starting difficulties and gelatine-like deposits. If the petrol in the engine deteriorates during storage, it is necessary to repair or replace the carburettor or another part of the fuel system.
- The service life of the petrol in the tank or carburettor depends on various factors, e.g., the mixing ratio, the storage temperature, and the filling level. The air in an unfilled tank can also cause the petrol to deteriorate more quickly, as can high temperatures. It is possible for petrol to spoil within 30 days or less, especially if the oil has become old.

**Important!** Any damage to the fuel system or loss of performance of the petrol engine due to improper storage by the user is not covered by the warranty.

### Draining fuel from the fuel tank and carburettor

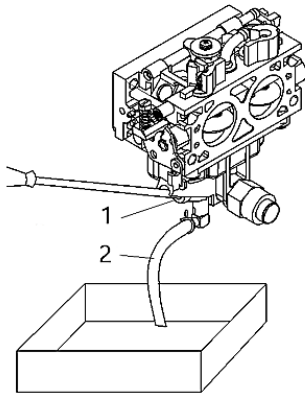
#### **Warning!**

- Petrol is highly flammable and explosive and can cause severe burns if handled incorrectly.
  - Keep the petrol away from heat sources, sparks, or naked flames.
  - In the event of spillage, remove the petrol immediately.
1. Remove the fuel line attached to the side of the petrol engine and drain the fuel from the fuel tank into a container provided for this purpose. If the fuel tank is equipped with a fuel tap, turn the fuel tap to "ON" to drain the fuel. After you have completely drained the fuel, reconnect the fuel line.
  2. Loosen the carburettor drain plug to drain the remaining oil into a container and then retighten the drain plug.

### Motor oil

1. Replace the engine oil.
2. Remove spark plug.
3. Fill about 5–10 ml of new engine oil into each cylinder.

4. Set the petrol engine switch to "ON" and hold it down for a few seconds so that the oil is distributed in the cylinder.
5. Refit the spark plug.



No	Name
1	Drain screw
2	Overflow pipe

### Storage warning

- If you store your petrol engine and there is still petrol in the fuel tank or carburettor, you must ensure that the petrol vapours do not ignite and cause a serious accident. Choose a well-ventilated storage location and keep away from all appliances that can produce an open flame, e.g., heaters, water heaters, tumble dryers. Also avoid starters or other power consumers that can generate sparks.
- Avoid places with high humidity as far as possible, as appliances located there are very susceptible to rust and corrosion.
- Store the petrol engine horizontally. Avoid tilting it to prevent fuel or oil leaks.
- If the fuel remains in the tank, set the fuel tap to "OFF" to prevent leakage.
- Cover the cooled petrol engine and the exhaust system to prevent dust deposits.
- Some flammable materials can be ignited or melt by the hot petrol engine and exhaust system. It is important not to cover the engine with plastic film, as the impermeable films allow ambient moisture to condense, which can accelerate rust and corrosion. If the engine is equipped with a battery, it is recommended that the battery is removed and stored in a cool, dry place and charged monthly to extend its service life.

### Retrieving from storage

- Check the petrol engine according to the instructions in the section "Inspection before commissioning."
- If the fuel has been drained before storage, fill the fuel tank with new petrol and check the tank to ensure that the petrol is clean. Over time, petrol can oxidise or go bad, making it difficult to start the engine.
- It is normal for a petrol engine to emit smoke when starting if preservative oil has been applied to the outside of the cylinder.

### Transport

- If the petrol engine has just been running, it should cool down for at least 15 min before it is loaded onto the transport vehicle. A hot petrol engine and a hot exhaust system can endanger people and flammable materials in the vicinity.
- The petrol engine should be kept level to prevent oil from leaking during transport. If the fuel tank has a fuel tap, this should be turned to "OFF."



## Connection between starter motor and battery

Recommended battery: 12 V/45 Ah

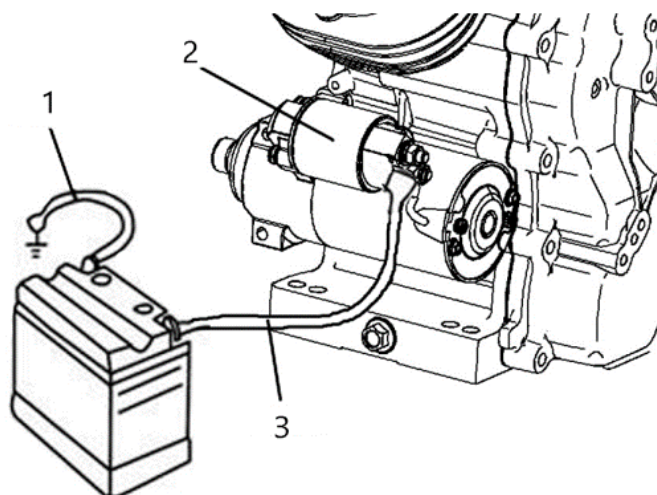
Make sure that the battery cables are not connected in reverse order, otherwise a short circuit may occur. First connect the positive cable to the battery and then the negative cables so that accidental contact between positive and earth does not cause a short circuit.

### **Warning!**

- Incorrect handling can cause the battery to explode and cause serious injury to people in the vicinity.
- Keep the battery away from sparks, flames, and other flammable materials.

**Important!** The battery terminals, clamps, and corresponding accessories contain lead and lead compounds. Wash your hands after touching them.

1. Connect the positive cable of the battery to the start relay.
2. Connect the negative cable of the battery to the fastening screw of the petrol engine, the ground screw, or another well-grounded connection point.
3. Connect the positive cable of the battery to the positive terminal of the battery as shown.
4. Connect the negative cable of the battery to the negative terminal of the battery.
5. Apply grease to the poles and cable ends.



No	Name
1	Negative pole (-)
2	Starting relay
3	Positive pole (+)

## Carburettor change for high altitudes

- At higher altitudes, the standard mixture ratio for the carburettor is too rich, which leads to a reduction in performance and increased fuel consumption. A mixture that is too rich also leads to contamination of the spark plug, which can cause starting difficulties. When operating a petrol engine at different altitudes, exhaust emissions increase with the operating time.
- The performance of a petrol engine can be improved at high altitudes by adjusting the carburettor. If the engine is operated permanently at high altitudes ( $\geq 1500$  m), please contact a specialist to adjust the carburettor. However, the output decreases by 3.5 % every 300 m above sea level. If the carburettor is not adjusted, the performance drops even more.

**Important!** The carburettor must be correctly adjusted so that it is adapted to the conditions at high altitudes. A petrol engine with an incorrectly adjusted carburettor cannot be used in areas with low altitudes ( $< 1500$  m) as the fuel mixture is too weak. This can cause the motor to overheat and cause serious damage. Please contact a specialist to have the carburettor setting adjusted before using the petrol engine at low altitudes.

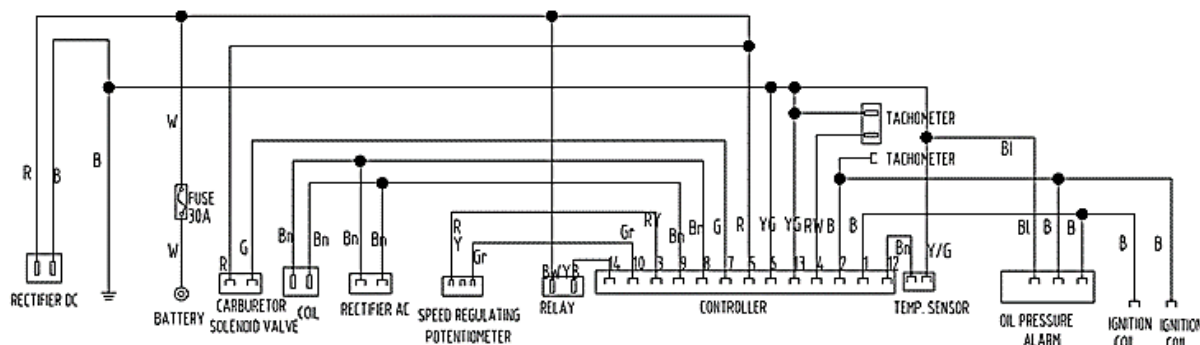
### Technical specifications

<b>Model name</b>	2 V90F
<b>Bore x stroke (mm)</b>	90 × 78.5
<b>Cubic capacity (cm<sup>3</sup>)</b>	999
<b>Fuel</b>	Unleaded petrol
<b>Max. Net torque (Nm / rpm)</b>	69.50 / 2800
<b>Max. motor power (kW / rpm)</b>	24 / 3600
<b>Motor speed (rpm)</b>	3600
<b>Motor power (hp / kW)</b>	33.31 / 24.50
<b>Motor type</b>	4-cycle 2-cylinder V-motor with air cooling
<b>Engine oil capacity (ℓ)</b>	2.4
<b>Net power (kW / rpm)</b>	24.5 / 3600
<b>Product type</b>	Motor
<b>Starter</b>	E-start
<b>Compression ratio</b>	8.9:1
<b>Ignition system</b>	Transistor/magneto ignition (TCI)
<b>Fuel</b>	Petrol ≥ 92 octane
<b>Lubricant</b>	SJ 10 W-30
<b>Amount of lubricant (ℓ)</b>	2.3
<b>Spark plug</b>	F6RTI-5
<b>Spark-plug gap (mm)</b>	0.7–0.8
<b>Cooling system</b>	Ventilation
<b>Direction of rotation of the PTO axis</b>	Anti-clockwise (viewed from the dispensing side)

**Note!** The technical data may vary for different types and may change at any time without prior notice.

### Circuit diagram

Motor with electric starter and oil protection system



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