LPG/PROPANE

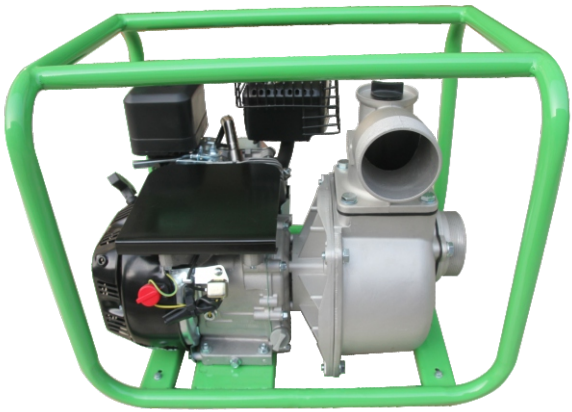
WATER PUMPS

OPERATING AND MAINTENANCE

ORIGINAL INSTRUCTIONS

Greengear Water pumps

Models: WP-2, WP-3, WP-4, WP-3S



PWP015 / Rev 1 2015

CONTENTS

1. SAFETY PRECAUTION

When using LPG/PROPANE equipment (hereinafter “Equipment”), basic safety precautions, including the following, should always be followed to reduce the risk of serious personal injury and/or damage to the Equipment and/or damage to properties. Read all these instruction before operating this product and retain these instructions for future reference. The following precautions are essential for your safety; however the list is not exhaustive. Always use the Equipment in a reasonable and responsible manner and be aware that the user is responsible for accidents involving third parties or their property.

ALL THE SYMBOLS BELOW ARE MARKED ON THE PRODUCT

Read Operator's Manual.

Caution: Engine hot

Toxic fumes do not operate in confined space

Always stop the engine and allow to cool before replacing the gas cylinder.

WARNING:

This machine produces an electromagnetic field during operation. This field may under some circumstances interfere with active or passive medical implants. To reduce the risk of serious or fatal injury, we recommend persons with medical implants to consult their physician and the medical implant manufacturer before operating this machine.

Training

-If you are tired, ill, or under the influence of alcohol, drugs or medications do not operate the Equipment
-Read the instructions carefully. Be familiar with the controls and the proper use of the Equipment;
-Never allow children or people unfamiliar with these instructions to use the Equipment. Local regulations can restrict the age of the operator;
-Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
-Only give or lend the Equipment, including any accessories to persons who are familiar with this model and know how to operate it. The instruction manual forms part of the machine and must always be provided to persons borrowing it.

Preparation
-Before use, remove any plastic bags and all other packaging materials and keep them out of children’s reach.
-Inspect the Equipment before use. Report any missing and replace damaged parts. Do not operate the unit with loose or damaged parts.

Operation

-Use this Equipment only for its intended purpose. Its use for others purpose is not permitted and may be dangerous or result in damage to the Machine.
-Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect;
-Do not change the engine governor settings or over speed the engine;
-Do not tilt the equipment when starting the engine;
-Do not touch wires while engine is running: electrical shock can cause injury.

Maintenance and storage

-Keep all nuts, bolts and screws tight to be sure the equipment are in safe working condition;
-Never store the equipment with LPG/PROPANE cylinder inside a building where fumes can reach an open flame or spark; Never leave in direct sunlight. Never store at temperature above 49 °C (120 degrees F°).
-Exhaust contains poisonous carbon monoxide gas that can build up to dangerous levels in closed areas. Breathing carbon monoxide can cause unconsciousness or death.
-Allow the engine to cool before storing in any enclosure: hot parts can cause severe burns.
-Replace worn or damaged parts for safety;
-Always keep warning and information stickers clean and readable.

WARNING: Replace the LPG/Propane cylinder in a well-ventilated area with the engine stopped.

WARNING: Read this manual carefully.

WARNING: Do not operate the water pump near petrol or gaseous fuel.

WARNING: LPG/PROPANE is highly flammable, and its vapors can explode if ignited.

WARNING: Does not smoke or use open flame near the work area.

WARNING: Always stop the engine and allow it to cool before replacing the LPG/PROPANE cylinder.

WARNING: Do not place flammable material near the water pump.

WARNING: The water pump must only be fed with high quality LPG/PROPANE mixture and with cylinder in accordance to regulations.

WARNING:

Do not operate the water pump inside an enclosed or insufficiently ventilated area. Always operate it in a well-ventilated area, otherwise the engine may become overheated, and the poisonous carbon monoxide gas contained in the exhaust gases will endanger human lives. Keep the water pump at least 1 meter (3 feet) away from any structure or building during use. If the water pump must be used indoors, the area must be well-ventilated and extreme caution must be taken regarding the discharge of exhaust gases. To avoid personal injury and damage to the pump, the tank and the fuel system, while using the operator must stand at least two meters from the pump.

WARNING:

Operate the water pump on a level surface. It is not necessary to prepare a special foundation for the pump. However, the water pump will vibrate on an irregular surface, so choose a level area without surface irregularities. If the water pump is tilted or moved during operation, it may tip, causing a hazardous situation. Proper lubrication cannot be expected if the pump is operated on a steep incline or slope. In such a case, piston seizure may occur even if the oil is above the upper level. Where necessary ensure that the pump is properly secured and anchored to prevent it moving during operation and ensure that the immediate area is kept clear.

WARNING:

Engine becomes extremely hot during and for some time after operation. Keep combustible materials well away from work area. Be very careful not to touch any parts of the hot engine especially the muffler area or serious burns may result. Keep children and all bystanders at a safe distance from work areas.

WARNING:

Stop the engine and disconnect the spark plug wire before:

-Checking and cleaning the filter element.

-Checking gas supply pipeline.

-After striking a foreign object. Inspect the pump and, in the event of damage, please contact qualified personnel.

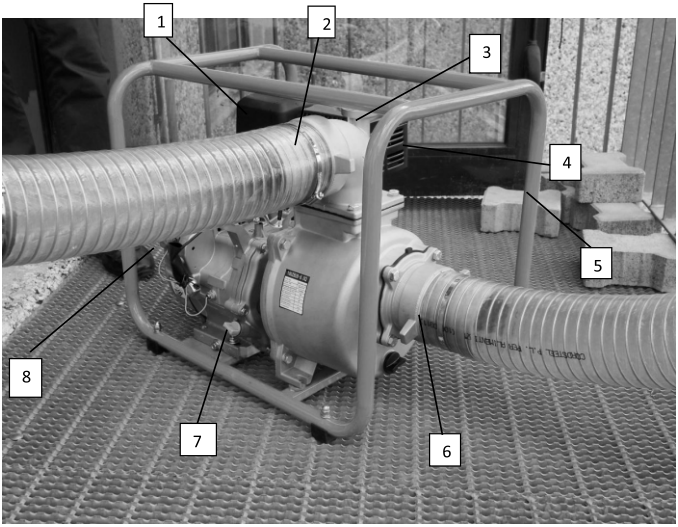
-Changing LPG/Propane cylinder.

-Transport and storage.

WARNING: Always fill the pump body with water before starting.

WARNING: This pump is designed to pump water only. Never pump flammable liquids like gasoline or diesel. Do not use for pumping water with temperature above 60 ° C.

2. DESCRIPTION



No.	Description
1	AIR FILTER
2	WATER OUTLET
3	WATER FILLER HOLE
4	MUFFLER
5	FRAME
6	WATER INLET
7	OIL DIPSTICK
8	ENGINE SWITCH

3. SPECIFICATIONS

MODEL	WP-2	WP-3	WP-3S	WP-4
Engine model	GG3GN	GG3GN	GG3GN	GG7GN
Engine technology	OHV, 25°, Single Cylinder, Forced Air Cooling, 4-storke			
Displacement (cc)	212	212	212	270
Bore x stroke (mm)	70x55	70x55	70x55	77x58
Ignition type	TCI	TCI	TCI	TCI
Fuel type	LPG/Propane			
LPG/Propane technology	ENERKIT BASIC			
Pressure range for inlet LPG	0.15-2.5Mpa / 1.5-25 bar			
Consumption(kg/h)	>0,8	>0,8	>0,8	>1
Starting system	Recoil start			
Oil volume (L/gal)	0.6/0.16	0.6/0.16	0.6/0.16	1.1/0.29
Rated output (KW)	4.2 (5.7 HP)	4.2 (5.7 HP)	4.2 (5.7 HP)	5.6 (7.5 HP)
Rated speed (rpm)	3600	3600	3600	3600
Pump type	Aluminium			
Inlet/outlet diameter (mm) (in.)	 50/50 1.96”/1.96”	 80/80 3.14”/3.14”	 80/80 3.14”/3.14”	 100/100 3.94”/3.94”
Suction (m/ ft.)	7/22	7/22	7/22	7/22
Lift (m/ ft.)	30/98.4	25/82.2	30/98,4	25/82.2
Flow (m^3/h) (gal/m)	24 110	42 185	50 220	70 308.2
Self-suction time (s)	≤180	≤180	≤180	≤180
N.W. (kg/lbs.)	26/57.3	28.8/62.8	28.8/62.8	31.5/66.9
Sound pressure lever(dB)	91	91	91	96
Sound power lever	103	103	103	108

Standard reference operating conditions:

NOTICE: Generating sets may only be loaded up to their rated power under the rated ambient conditions. The reduction in power is probably due to use in higher temperatures, altitudes and humidity than those given in the reference conditions.

The generator set can start-up and operate at ambient temperatures between -10°C and 40°C, and the standard reference conditions are:

Ambient air temperature	25°C
Ambient air pressure	100 kPa
Relative humidity	30%
Altitude	Less than 1000 m

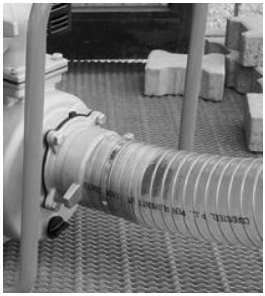
4. PRE-OPERATION CHECKS

4.1 CONNECTING WATER INLET HOSE

Use commercially available hose, hose joint and clamp. The water inlet hose must be of continuous structure and be non-folded. The length of the hose should be as the same as or not more than that required. The end of the hose should be close to the surface of the water supply to ensure optimal performance. Pumping times vary with the length of the water inlet hose in direct ratio. The filter matching with the water pump should be mounted to the end of water inlet hose with the hose clamp, shown in the image below.

Before pumping ALWAYS install the filter securely to the end of the water inlet hose to prevent stones and other debris from being drawn up, which could cause severe damage to the pump.

Make sure that all gaskets are in place and hose connections are sound and air tight. An air leak in the hose could prevent priming and reduce the capacity of the pump.



4.2 CONNECTING WATER OUTLET HOSE

Use commercially available hose, hose joint, and clamp. A short hose with a big diameter is the best. A long hose with small diameter will increase flowing resistance and decrease the power output of the water pump. Tighten the hose clamp to avoid working loose under high pressure.

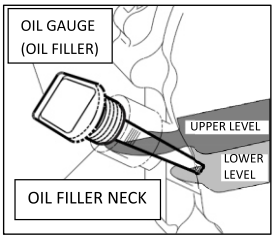
4.3 ENGINE OIL LEVEL CHECK

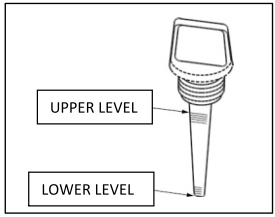
NOTE: this unit is shipped without oil in the crankcase. In order to avoid damage to the unit, put oil in the crankcase before you attempt to start the unit for the first time.

ENGINE OIL ALARM SYSTEM

The engine oil alarm system is intended to avoid engine damage due to insufficient engine oil in the crankcase. Before the engine oil level in the crankcase drops down below the safety line, the alarm system will stop the engine automatically (while the engine switch keeps at ON).

Remove oil filler cap and check the engine oil level.





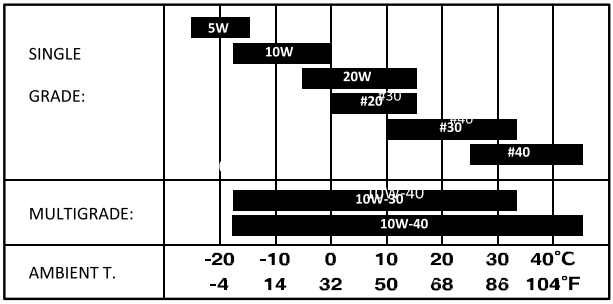
If oil level is below the lower level line, refill with suitable oil (see oil table) to upper level line.

Change oil if contaminated, see chapter 6.1.

Recommended engine oil:

Use 4-stroke automotive oil of API service class SE or higher grade (SG, SH or SJ is recommended). SAE 10W-30 or 10W-40 is recommended for general, all-temperature use. If single viscosity oil is used, select the appropriate viscosity for the average temperature in your area.

Oil table:



4.4 INSTALLING PROPANE/LPG CYLINDER

WARNING: Sulfur, water, dust, etc. are harmful for the engine. If the gas supply source (LPG/PROPANE) contains these harmful elements, the operator must use a filter to remove sulfur, water etc. and ensure a clean gas supply. Otherwise, the engine service intervals will be shortened.

Use LPG/PROPANE of only high quality mixtures to prevent engine damage. LPG/PROPANE is a combustible gas; it is colorless and thus invisible to the naked eye. LPG/PROPANE has a harmless odorant added so that it is possible to smell it. The user should be familiar with the smell of LPG/PROPANE (smells like sulfur or rotten eggs). If at any time the smell of LPG/PROPANE is identified, turn the engine off. If the leak persists, remove the LPG/PROPANE cylinder. Never attempt to operate a unit that has a suspected leak.

Burning LPG/PROPANE produces Carbon Monoxide (CO). CO is invisible, has no smell and can kill you. Operating your water pump in an enclosed area can be dangerous.
Use only in well ventilated areas. If you experience headache, drowsiness, or nausea, turn unit off and get fresh air quickly.
Never use it where people are sleeping.
Follow unit instructions for proper use.

WARNING:

- Keep out of reach of children.
-Never store in living spaces.
-Always use cylinder until it is completely empty.
-When the cylinder is empty please respect local regulations and return to supplier for re-filling or in the case of non-refillable containers contact local refuse hauler or recycle center. Never put empty containers in fire or incinerator. Do not puncture.
- LPG/Propane cylinder must be used according to suppliers instructions.

BEFORE USE

1) Check cylinder and appliance seals. Discard cylinder if dirty or rust particles are in valve area.
2) Turn unit off.
3) Attach cylinder outdoors away from pilot lights, flames, sparks or other ignition sources. These sources can ignite leaking gas.
4) If your cylinder gas connection requires a tool only use the specially designed tool. If your cylinder gas connection is designed to be hand tightened take care not to over tighten. Over tightening can damage seals.
5) Check for leaks. Put soapy water on connections. Look for bubbles. Listen for hiss of escaping gas. Feel cylinder for extreme cold. Smell for rotten egg odor. Do not use if leaking.
6) Read and follow appliance instructions.

DURING

Never use near pilot lights, flames, sparks, or other ignition sources. They can ignite leaking gas.

AFTER USE

1) Turn unit off and let cool.
2) Detach cylinder when not in use.
3) Detach outdoors away from pilot lights, flames, sparks, or other ignition sources, they can ignite leaking gas.
4) Replace cap to keep valve clean.

IN CASE OF FIRE

1) Leave area quickly and call your local fire department for help.
2) Let cylinder burn out.

Connect LPG/propane gas supply source(1):

-Keep gas supply source closed.

-Make sure the engine is off.

-Connect flexible pipe to gas inlet,

-Insert the threaded other end of the pipe onto the gas inlet and screw it anti-clockwise.

-Connect flexible pipe to the pressure regulator. Insert one of the threaded ends of pipe onto the threaded end of regulator and screw it anti- clockwise.

-Connect regulator to LPG/PROPANE cylinder.

-Use wrench to tighten the nut at each end of the gas pipeline and check the connection for leaks.

-All gas pipe joints should be tightly secured before operating the machine. Check the joints and gas hose for leakage or breaks, replace the damaged joints and hose if necessary. Check the gas pipeline for any damage every 18 months.

(1)Use only official accessories and components of Greengear Global Ltd or Cavagna Group.

4.5 CHECKING THE WATER LEVEL IN THE PUMP

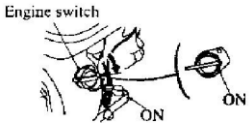
Before operating the pump, make sure to fill the pump body with enough water.
CAUTION
Do not try to run the pump without water inside; otherwise the pump will become overheated. Prolonged running of the pump without water will damage the pump gasket. If the water in the pump is used up, stop the engine at once and fill the pump once it cools down.

5. OPERATING PROCEDURES

5.1 STARTING THE ENGINE

1- Open the LPG/PROPANE cylinder by turning counter-clockwise the cylinder valve.

2- Set the engine switch to the on position.



3- Move the air throttle lever to the right on the start position,.

4-Pull the start handles gently until resistance is felt, and then pulls it up quickly. Release the start handle gently to protect the starter from being damaged.

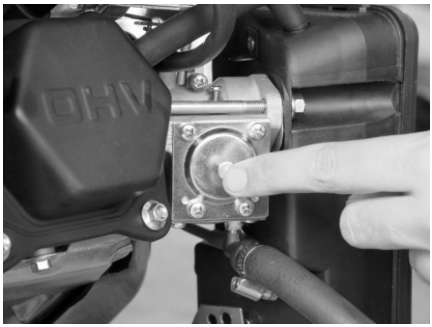
5- If engine doesn't start, press the primer button 1-3 times and try again.

6-Once the engine is running, move the air throttle lever gradually to the left.

WARNING:

-Pressing the primer button too many times when the engine is off can cause problems.

- Pressing the primer button whilst the engine is on can modify the carburation and change the air/gas mixture causing an increase in emissions and if done for too long can cause serious problems.



5.2 STARTING AT ALTITUDE

CAUTION: using the water pump in regions with lower altitude than those for which the carburetor spray nozzle is designed, will result in decreased engine performance and overheating, and over-thin mixture of fuel and air may cause severe damage to the engine.

In plateau or regions with high altitude, standard carburetors produce over-rich mixture of fuel and air, resulting in decreased engine performance and increased fuel consumption. To maintain the engine with high performance, install a carburetor main spray nozzle, and readjust the adjusting screw for idle speed. If using in plateau regions frequently with an altitude of over 1380 m (4525 ft.) contact your dealer to replace the carburetor and make adjustments in advance. Even though a proper carburetor spray nozzle is installed in the engine, the power output of the engine will drop about 3.5% with every 300m (984 ft.) increase in altitude. If carburetor replacement and adjustment is not done, the "plateau effect" will be more severe.

Ambient air temperature	25°C
Ambient air pressure	100 kPa
Relative humidity	30%
Altitude	1000 m

The water pump set can start-up and operate at ambient temperatures between -10°C and 40°C.

5.3 STOP THE ENGINE

1- Close LPG/PROPANE cylinder valve.

2- Set the engine switch to OFF.

6. MAINTENANCE

FREQUENCY / TIME		EACH	WHICHEVER COMES FIRST			
		ITEMS	First month or 20 hours	Every 3 month or 50 hours	Every 6 month or 200 hours	Every year or 300 hours
Engine oil check	OIL LEVEL	●				
	OIL CHANGE		●		●	
Air cleaner	CHECK	●				
	CLEAN					
Spark plug				●(1)		●(2)
Valve clearance adjustment						
Clean combustion chamber						
Spark eliminator		Every 100 hours running				
Gas supply pipe		Every year				
Impeller check						●(2)
Water inlet valve check						●(2)

(1)Use in extremely dusty area, the job should be done more often.

(2)Should be done by your dealer, unless you are equipped with proper repair tools, and are properly trained and are qualified mechanically.

6.1 ENGINE OIL REPLACMENT

Use clean and high quality lubricating oil to the specified level as directed on page 7 **(chapter 4.3).** If contaminated or deteriorated oil is used or the quantity of the engine oil is not sufficient, engine damage will result and its life expectancy will be greatly shortened.

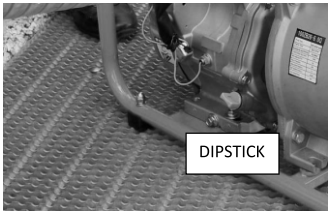
A warm engine can ensure quick oil draining.

1-Remove the dipstick and oil drain plug, and then drain the oil.

2-Reinstall the dipstick and tighten.

3-Fill specified clean engine oil to oil level index mark.

NOTE: Dispose of discarded engine oil in accordance with relative environmental protections rules in your area. If possible take it in a sealed container to your local recycling station. Do not pour at will.



6.2 AIR FILTER MAINTENANCE

A dirty air filter will decrease air flow through the carburetor. To avoid problems with the carburetor, clean the air filter regularly, in extremely dusty area, the job should be done more often.

CAUTION Do not wash elements with kerosene, gasoline or oil.

Never operate the water pump without the air filter installed. Dirt and dust can be sucked into the engine and the engine will wear out more quickly

1-Disassemble the air filter cover and filter element.

2-Clean the filter element in high flash point solvent or cleaning solvent thoroughly, and allow drying.

3- Soak the filter element in clear engine oil, and then squeeze out excessive oil.

4-Carefully re-fit the filter element.

6.3 SPARK PLUG

To keep the engine in good working order a clean sparkplug with correct clearance must be maintained.

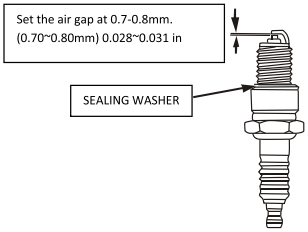
1-Disconnect the spark plug cap.

2- Check the spark plug visually. If there appear any obvious signs of wear around it or gasket is damaged, please replace with a new one. Before re-fitting a spark plug, clean it first with a wire brush.

3-Spark plug clearance should be 0.7-0.8 mm (0.03 in.).

4-Check that spark plug gasket is in a good condition, or replace with a new one. Drive it into engine with a spark plug wrench to protect thread from being damage.

CAUTION: be sure to tighten the spark plug securely, otherwise it may become very hot and possibly damage the engine. Never use spark plug with incorrect heat range.



6.4 REGULATING VALVE CLEARANCE

Due to wear of the sealing ring of the valve, the gap "A" shown in the figure decreases over time, until the contact with the cam prevents its closure. To avoid this, after a certain number of hours (see table MAINTENANCE) must restore the valve clearance initial.

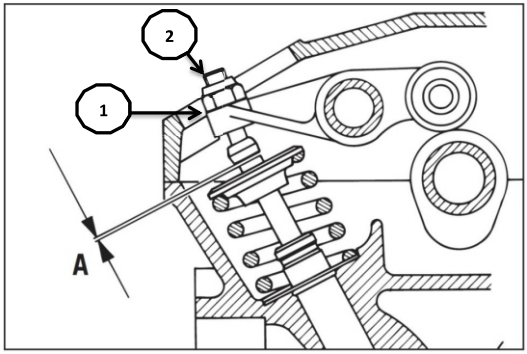
INITIAL GAP:

Intake: 20 µm

Exhaust: 30 µm

This operation should be done by your dealer, unless you are equipped with proper repair tools, and are proper trained and are qualified mechanically.

WARNING: Before adjustment of the valve clearance to make sure the engine is cold.



TOOLS NEEDED:

-Thickness Gauge

-Screwdriver

-Set of allen key

OPERATIONS

1- Remove the spark plug
2- Remove the cylinder head cover
3- Check with the thickness gauge the valve clearance, if the gap is different from the initial to proceed with the adjustment.
4- Loosen the lock nut (1)
5- Turn register (2) putting the blade thickness gauge between valve and rocker
6- Once registered the valve clearance closes the lock nut and check that the gap has not changed (if it is changed to repeat the previous steps)
7- Replace the cylinder head cover

7. STORAGE, TRANSPORTATION AND LIFTING

The following procedures should be followed prior to storage of your water pump for periods of 6 months or longer:

-Disconnect the LPG/PROPANE cylinder.

-If the water pump is used to pump water with sand or heavy debris, deposit of such may remain inside it. Before storage, operate the water pump with clean water to flush out any debris, otherwise the impeller may be damaged when next re-started. After flushing empty the water from drain plug, the empty the water from the water pump thoroughly, and re-fit the water drain plug.

-Change engine oil.

-Check for loose bolts and screws, tighten them if necessary.

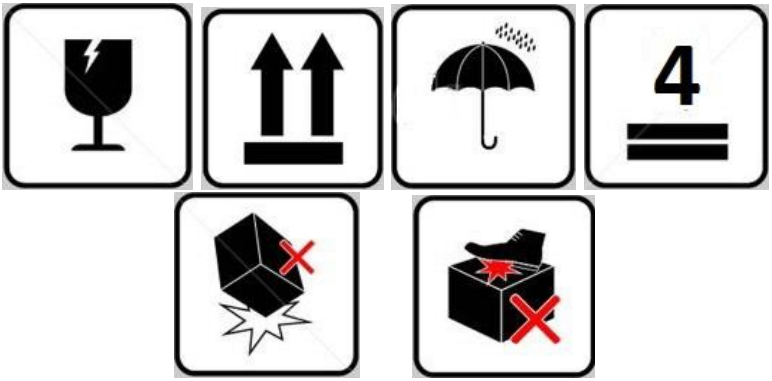
-Allow the engine to cool. Remove the spark plug and put 10 drops of high quality motor oil into the cylinder.

-Pull the handle starter towards until resistance is felt, and then continue pulling until the triangle mark on the starter wheel lines up with the starter screw hole.

-Cover the water pump to protect from dust.

-Packages pump set according factory state.

-Never store the water pump upside down.



8. TROUBLESHOOTING

If the water pump engine fails to start after several attempts please conduct the following checks:

Check if engine switch is in "OFF" position	Turn engine switch to "ON" position
	Push primer button on the carburetor
Check spark plug for loose spark plug cap.	If loose, push spark plug cap back into place
Check spark plug for contamination	Remove spark plug and clean electrode
Empty LPG/PROPANE cylinder	Change LPG/PROPANE cylinder

When water pump cannot pump, check according to the following:	Check if there is enough water
	Check if the water filter is clogged
	Check if the water hose is damaged
	Check if suction height required is too high

If the water pump still cannot pump water, please contact your dealer for help.

Limited Warranty Conditions & Product Registration

Greengear Global Ltd supports the quality and workmanship of our equipment with our 2 year limited warranty against manufacturers defects in material and wear and tear.

The limited warranty is available at www.greengearglobal.com

The registration form should be completed online at www.greengearglobal.com/productregistration and submitted online in order to receive the warranty benefits.

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PWP015 / Rev 1 2015

OPERATING AND MAINTENANCE ORIGINAL INSTRUCTIONS

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