



Villiers Generator Operation manual

EN-SERIES

**Thank you for your purchase of our
EN-series generator.**

**Upon receipt of the unit, please check
the following:**

The model is exactly as what you have ordered.

The unit did not incur any damage in transit

In case of trouble, please contact your dealer.

**Be sure to read this manual
before putting the unit into operation**



This manual has been made for familiarizing you with this product and we would like to advise you to carefully study this manual before using the generator for the first time.

Safety Precautions

Attention: In this manual we have stated several points of attention indicated by the word 'Attention:' these points imply that there is a real risk of a severe dangerous situation if the precautions are not followed as indicated.

When transporting these units, care must be taken to work in accordance with the health and safety executive guidelines and use mechanical aids for transport and lifting to avoid any injury. If in doubt seek advice from your safety officer.

A generator presents risk of electrocution. Therefore, never use this machine in the rain, snow or on humid or wet surfaces. Do not operate this machine with bare hands. Do not touch cables, which are damaged and/or exposed and are therefore not isolated. In case the generator is to be used in a humid environment, the generator should be grounded through a fuse with a minimum of 30 mA. The generator should never be connected to the electric mains network. In case the generator is to be used in public area, the installation should be done by a qualified engineer.

The generator should be placed at a correct distance outside of buildings to avoid all risks of asphyxiation of persons or animals by exhaust gasses of the engine. Never use the generator in buildings, which do not have a strong air circulation. It is further very important to know how to switch off the unit in case of emergencies and to perfectly understand the operation of this unit. Do not let anybody who has not read this manual operate the generator. Do not let children, younger than 14 years old, approach the generator.

Do not fill the fuel tank, while the generator is in use. It could ignite an explosion immediately. Gasoline is a highly flammable liquid and it is not allowed to smoke, be near open flames or to be in an area where sparks could occur when re-fueling. When the generator is in storage, it should be stored in a place where there is no risk of explosions. Never open the fuel tank, while the unit is still in operation or while the engine is still hot. The generator should be operated on a perfectly flat and stable surface to avoid leakage or spilling of fuel. Should any leakage or spilling occur, the unit should be immediately switched off and moved to a safe place, until all the fuel has evaporated and all the fuel gasses have dispersed. After the above has been done, the units should be carefully wiped to remove all traces of fuel from the engine, alternator and all other parts of the generator, which could have been contaminated with fuel. It is necessary to always systematically close the fuel cock after every use of the generator.

While in use, never touch any moving parts, any parts of the spark plug or the exhaust pipe of the generator. This could cause severe burns, Do not perform any maintenance on the engine just after usage but wait for several hours until the unit has completely cooled down. Before starting the unit every time, systematically check all points as described in this manual for the usage of this generator. Assure yourself that nobody is in close proximity of the unit before starting. Do not allow any other person, child or animal near the unit. It is necessary to respect the environment laws; In particular, the noise level could be significantly increased by a hole in the exhaust pipe. In this case, it would be required to replace the exhaust pipe with a new one.

Description and general information

Checklist before usage and preparations of the engine (Figures A, B)

- Filling the unit with engine oil

- a. Open the oil plug and remove the oil gauge from the hole.
- b. Fill the engine with oil until the side of the filling hole is reached. Preferably, use multi grade 10W40 oil.
- c. Check the level of the oil by inserting the oil level gauge into the plughole, without tightening it and pull out to check the oil level.

Attention: Using the engine without sufficient oil could severely damage the unit. The unit is equipped with an oil alert system. If the oil level is insufficient, the engine will stop or will refuse to start.

- d. Close the carter by tightening the oil plug firmly.

--Refueling the unit

Use standard gasoline as used for cars (unleaded or at some intervals leaded in order to remove some deposits left behind in the combustion chamber). Never use 2-stroke fuel (mix of gasoline and oil) or poor quality gasoline. Make sure that no dust, dirt or water enters the fuel tank.

Attention: Gasoline is a highly flammable liquid and will cause explosions under certain conditions. Refuel the unit in an area with good air circulation, with the engine switched off. Refuel the unit with great care and make sure that the fuel cap is carefully replaced and firmly closed. Do not spill gasoline during refueling. In case this should happen, make sure that you clean the unit carefully, removing all traces of gasoline from the entire unit, with a clean and well absorbing cloth.

- Air filter

Check the air filter elements to ensure that they are clean and in good condition. Clean or replace parts if required. PRECAUTION: Do not run the engine without an air filter; this will greatly reduce the lifetime of the engine.

-Grounding

In order to protect yourself from electric shocks, it is recommended that you ground the unit by attaching an electric wire to the unit and inserting it into the ground.

Starting the engine (See figures A, B, C, D, E, F)

1. Check that no electrical equipment or lamps are connected to any socket of the generator.
2. Move the fuel cock into the "ON" position, move the throttle lever to the "CLOSED" position. Do not use the choke if the engine is still hot or if the outside temperature is high.
3. Move the contact switch of the engine into the "ON" position, marked by the symbol 'I'.
4. Pull the recoil starter up to a point where you feel a slight resistance. Then pull recoil starter with one swift pull and release the rope gently.
5. If the engine starts to run, move the throttle lever gently to the opposite side.

Stopping the engine

1. Remove all electric equipment and/or lamps from the sockets of the generator.
2. Move the contact switch into the "OFF" position, represented by an 'O'.
3. Close the fuel cock.

Using the unit in a high altitude

Due to the absence of sufficient oxygen in high altitudes, the performance of the engine is reduced by 35% for every 300 M, height. From 1830 M. height, it is recommended to change the jet needle of the carburetor. This should be done by the nearest certified official LONCIN dealer.

Using the generator (Figure L)

The generator should be placed on a clean, flat and horizontal surface. This area should have sufficient air circulation, should be sheltered from bad weather and should not be in a passageway of people and animals,

To avoid an electric charge, it is necessary to check the total wattage of all the electric equipment or units, which are to be connected to the generator. In case of lamps or only resistive charges, the total of the wattage required as indicated on the lamps or equipment should not surpass the continuous rated wattage of the respective generator. (See chapter titled Characteristics, further on in this manual)

In case equipments with light or heavy inductive charges are used (equipment with rotating parts) a safety margin is to be calculated of approx. 1.3 to 2.2 times. This is due to the fact that at starting time, these machines will consume much more power than indicated on the manufacturer's label. Do not surpass the power in Amperes indicated on each socket of the generator. Check the voltage of the equipment to be used and verify that these will work with the voltage as indicated on the generator.

Using extension cables: Check in the following table for the maximum length of the extension cables according to the amperes and the diameter of the electric wires to be used.

Amperes	Cables 1 - 50m	Cables 50 -100m	Cables 100 – 150m
14A	1.5mm²	2.5mm²	4.0mm²
18A	2.5mm²	4.0mm²	6.0mm²
25A	4.0mm²	6.0mm²	10.0mm²
30A	6.0mm²	10.0mm²	10.0mm²

Attention: The oil alert mounted to the complete range of this brand generator will only operate in case the oil level is insufficient and when the contact of the engine is switched to the "ON" position.

The generators are equipped with a thermal fuse, which will operate in case of overloads. If the thermal fuse has disconnected the circuit it is necessary to wait for moments, check the cause for the overload and remove the cause for this overload. Then reset the overload by pressing down the switch. The fuse has been calibrated for each generator according to the capacity of the respective generating set and if the fuse needs to be replaced it is important that it is replaced by exactly the same unit.

Engine maintenance

Attention: Always switch the engine off and wait for the unit to cool down (approx. 15 minutes) before attempting any maintenance work on the unit To avoid any accidental damage, move the contact switch to the 'OFF' position and disconnect the spark plug. Always use original LONCIN engine parts.

Checklist and time schedule for maintenance

Frequency for checking <ul style="list-style-type: none"> Check points and time are below. Please carry out the checklist and maintenance according to the time schedule. Operations		Check before use	Standard Maintenance			
			1 months or 20 hours	3 months or 50 hours	5 months or 100 hours	1 year or 300 hours
Engine Oil	Check the oil level	O				
	Cleaning		O		O	
Air Filter	Check	O				
	Cleaning			O (1)		
Carburetor. Float room	Check, Cleaning				O	
Spark plug	Check. Cleaning				O	
Valve Clearance	Check, Adjustment					O (2)
Fuel Strainer	Cleaning					O (2)
Fuel Hose	Check or Change	O	Every 2 years			

NOTES:

(1) The air filter needs to be maintained more frequently in case the air is more polluted.

(2) These operations should be done by an official Villiers dealer, should the user not have the correct tools or the experience or qualifications to perform these operations.

Changing or removing the oil (Figure G)

Remove the oil from the engine while the engine is still warm, to ensure that all the oil is removed completely.

1. Open the oil fill plug and the oil removal plug
2. Remove the oil
3. Close the oil removal plug
4. Fill the engine with sufficient oil
5. Close the oil fill plug

Oil contents of the different models:

EN2200, EN2500, EN3500-200	0.7 Liters
EN3500-240, EN4100	0.6 Liters
EN6100	1.1 Liters

PRECAUTION: Prolonged contact with used engine oil may cause skin cancer. To avoid the risk of this happening, refrain from handling used engine oil on a day-to-day basis and carefully wash your hands with soap as soon as possible after handling used engine oil.

NOTE: To protect the environment, do not dispose of used engine oil in your environment, but collect the used oil in a suitable container and take it to your nearest recycling station or any collecting station where it will be disposed of properly.

Maintenance of the air filter (Figure H)

If the air filter is polluted the engine will function less well and therefore it is required to service or clean the air filter regularly. If the unit is used in an area where the air is more polluted; the air filter should be serviced on a more frequent basis.

Attention: Never use gasoline or any other inflammable liquids to clean the air filter elements. This could cause an explosion.

PRECAUTION: Never run the engine without an air filter. This will reduce the lifetime of the engine severely.

1. Remove the housing of the air filter by removing the butterfly screw that holds the housing in its place. Remove the paper and sponge filter elements inside the housing.
2. Check that these two elements are not clogged or obstructed or in bad state. Replace these if they are damaged.
3. The paper air element: Gently tap the element against a hard surface in order to remove the dirt from the paper surface or blow compressed air from the inside of the element towards the outside. Never wipe the element, as this will force the dirt into the fibers of the paper.
4. The sponge air element: Wash the element in a solution of water and non-harming household detergent and rinse carefully. On the other hand, wash the element in a non-flammable solvent. Let the element dry completely. After the above, submerge the element into clean engine oil and press down on the element in order to remove all excess oil. If there is too much oil left in the element the engine will smoke excessively during the next start.
5. Replace both the paper and sponge elements in the correct order (as original) and replace the housing by mounting the butterfly screw and tighten carefully

Cleaning the sediment receptacle (Figure J)

Attention: Gasoline is a highly flammable liquid, which could cause an explosion under certain conditions. Never smoke, approach with flames or sparks. After re-assembling the fuel filter, make sure that there is no leakage and that the parts and the surrounding area is completely dry and void from any traces of gasoline before starting the engine.

Close the fuel cock. Disassemble the receptacle and O-ring; wash the filter with a non-flammable solvent, until it has a clear, light coloring. Dry the parts completely and re-assemble the parts carefully. Open the fuel cock and carefully check that there is no leakage.

Maintenance of the spark plug (Figure K)

Recommended spark plugs: BPR-6ES (NGK), W2OEPR-U (NIPPON DENSO CO.)

PRECAUTION: Never use a spark plug, which has an unsuitable thermal range

1. Remove the spark plug cap and loosen the spark plug with the correct spark plug tool.
2. Carefully examine the spark plug. Replace the spark plug if the electrodes are highly contaminated or if the ceramic part is damaged or broken. Clean the spark plug with a metal brush.
3. Measure the distance between the electrodes with a correct measuring device for this purpose. The ideal distance should be between 0.7 and 0.8 mm. If an adjustment is necessary, make the adjustments on the outside electrode.
4. Check the thread on the spark plug and gently insert the spark plug into its position by hand. Do not force the spark plug into its place until the thread has found its correct position, after tightening the spark plug into its position by hand, use the tool to firmly tighten the spark plug. If the spark plug is new, tighten the spark plug with a 1/2 turn. If the spark plug is used, tighten the spark plug with 1/8 or 1/4 turn. Replace the spark plug cap.

PRECAUTION: The spark plug needs to be placed correctly. If the spark plug is not placed correctly, there is a risk of damaging the engine.

Transport and storage

Attention: During transportation of the generator, make sure that the contact of the engine is switched to the OFF position during transport, in for example a vehicle, make sure that the fuel cock is closed to avoid the risk of leakage of fuel.

Prolonged storage

1. Assure that the air is the storage room in not humid or dusty
2. Empty the fuel from the engine as follows. Close the fuel cock, remove the hose from the fuel filter and empty the fuel inside. Open the fuel cock and drain the fuel completely from the fuel tank into a suitable container. Replace the fuel filter and make sure that the 0-ring is correctly placed. To be complete, drain the fuel from the carburetor by removing the drain plug, situated under the cup of the carburetor and collect the fuel into a suitable container.
3. Change the motor oil
4. Remove the spark plug and insert a spoonful of clean engine oil into the cylinder. Gently turn the engine by pulling the recoil starter in order to remove the inserted oil and stop the cylinder in the highest position (compression) . The valves will now be in a closed position. Replace the spark plug without tightening it.
5. Cover the generator in order to protect the unit from dust. ;1

Troubleshooting

- The engine does not start after pulling the recoil starter.
- Is the contact of the engine in the "ON" position?
- Is there sufficient oil in the engine?
- Is the fuel cock switched to the "ON" position?
- Is there fuel in the fuel tank?
- Does the fuel reach the carburetor? To check this open the drain plug under the cup of the carburetor, with the fuel cock in the open position.
- Does the spark plug give enough sparks? To check this, remove the spark plug, by removing the spark plug cap and using the tool to remove the spark plug. Then replace the spark plug cap on the spark plug, touch any metal part of the generator with the outside electrode and pull on the recoil starter. Sparks should then be visible. If this is not the case. Please kindly re-adjust the electrodes if necessary or replace the spark plug.

If the engine still does not run, then bring the unit to your nearest official LONCIN dealer In order to have the engine checked.

It is difficult to start the engine.

- The air filter is dirty, check this filter and clean if necessary.
- There are impurities in the fuel or the air filter is clogged. Clean the sediment receptacle.
- The air inlet in the fuel cap is blocked. Clean the fuel cap.

There is now power from the sockets of the alternator.

- The fuse of the alternator is not armed. Arm the fuse by pressing down on the button.
- The equipment attached the socket of the generator is faulty. Replace or repair the equipment.

SPECIFICATIONS

Model (EN-)		2200	2500	3500-200	3500-240	4100	6100
Generator	Phase/Hz	Single Phase / 50Hz					
	Voltage	AC 110/230V					
	Ampere	9.1A	10.2A	14A	14A	15.4A	20.4A
	Cont. power	2000W	2250W	2500W	3200W	3800W	5000W
	Max. power	2200W	2500W	2700W	3500W	4100W	5500W
Engine	TYPE	G160F	G210FG	G210FG	G240F	G270F	G390F
	Villiers	Forced Air-cooled 4-cycle Gasoline engine, Overhead Valve (OHV)					
	Exhaust Vol.	163cm ³	193cm ³	196cm ³	242cm ³	270cm ³	389cm ³
	Fuel Cap.	3.6	3.6	3.6	6	6	6.5
Gross Weight		41Kg	44Kg	48Kg	60Kg	71Kg	86Kg

Specifications are subject to change without notice

Caution

1. With dual voltage units, please ensure that you have set the unit to provide the correct voltage and ensure that the machine is plugged into the correct socket.

STARTING THE ENGINE

FIGURE A

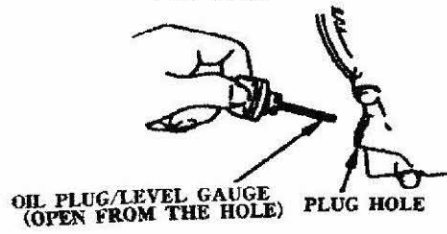


FIGURE B

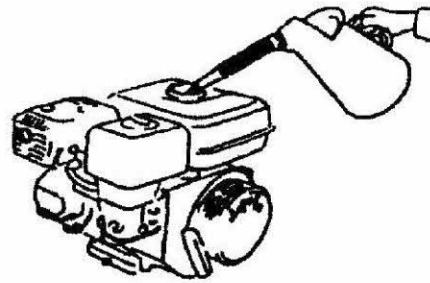


FIGURE C

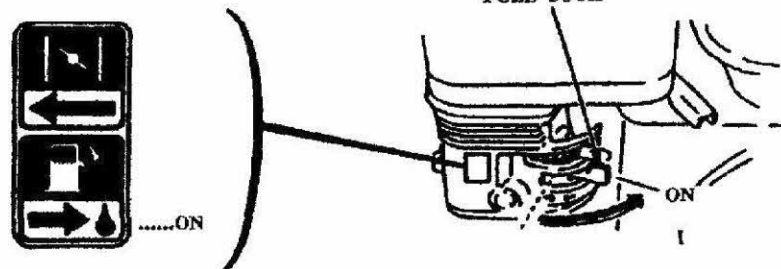


FIGURE D

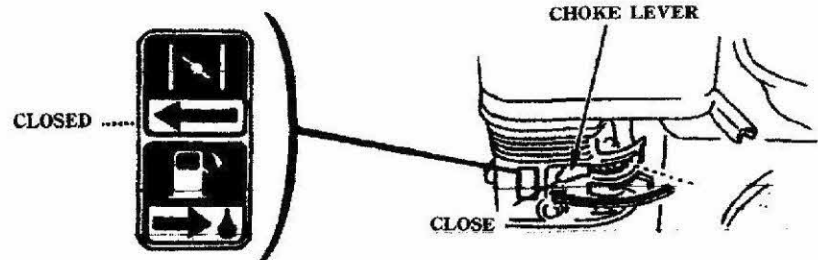


FIGURE E

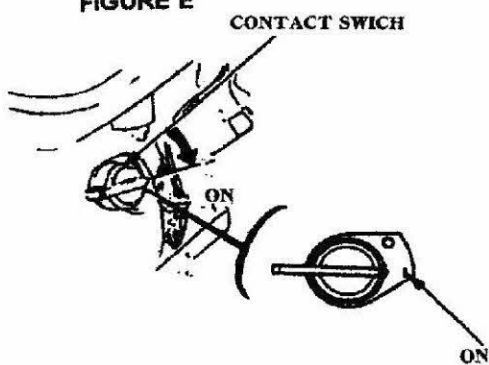
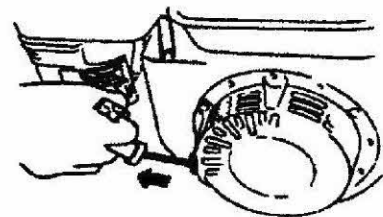


FIGURE F



ENGINE MAINTENANCE

FIGURE G

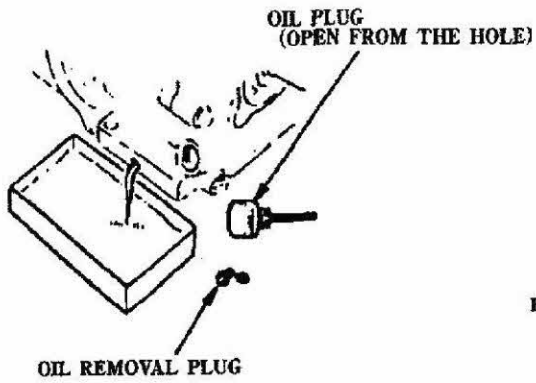


FIGURE H

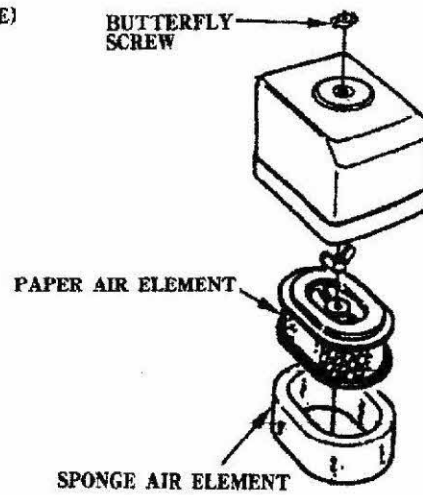


FIGURE J

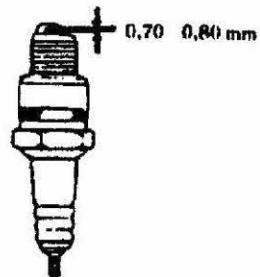
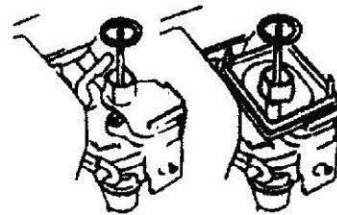
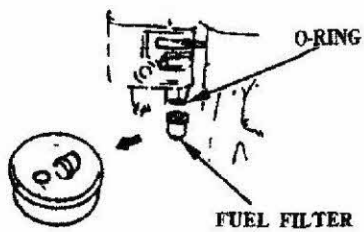


FIGURE K

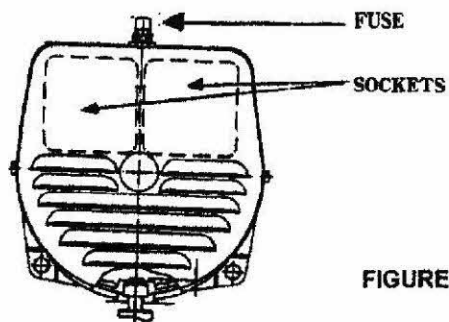


FIGURE L

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