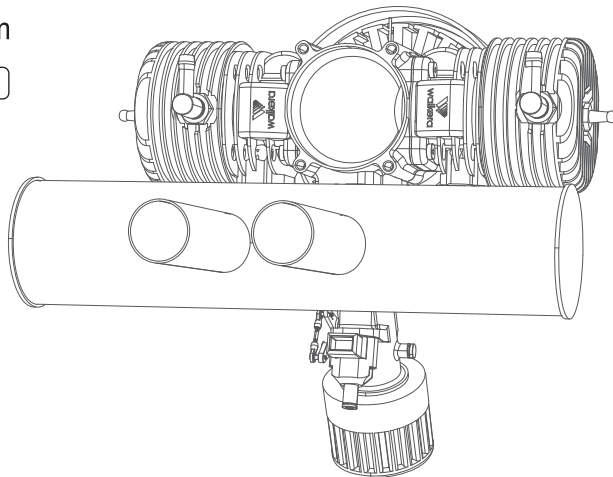


G120EFI

Control Power System

User Manual V1.0

September 20, 2019



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1.0 Product Summary

Thank you for purchasing the Walkera G120EFI control power system.

The EFI control power system has the following advantages:

- Electronic injector has accurate fuel supply control, quick response, good fuel atomization effect, reduced fuel consumption and exhaust pollution of engine.
- Electronic Control Unit (ECU) responds quickly to the change of throttle, improves the engine's handling and acceleration performance, and maintains good dynamic performance indicators; allows the engine to adopt a higher compression ratio, and improves the engine's thermal efficiency.
- Electronic Control Unit (ECU) has built-in ignition control, which directly drives the EFI igniter to achieve stronger power performance and idle speed stability.
- Stronger environmental adaptability, adaptability at different altitudes, temperatures and humidities.



The power system has certain safety risks and is not suitable for people under 18 years of age. Please read the instructions carefully before operation and use them correctly according to the instructions.

2.0 Security Summary

2.1 Environment

- Use in open spaces away from crowds.
- Recommended height below 5km above sea level.
- It is used in the environment of - 20 °C ~40 °C.
- Use in legal areas

2.2 Prechecking

- The fuel tank position needs to be higher than the oil pump position to ensure smooth oil supply.
- Check the fixing parts of the power system to ensure that the screws and nuts are not loose.
- Check oil kettle and fuel pipeline to ensure that the fuel is leak free.
- Check the water cooling kit of the power system to make sure it is connected properly and securely.
- Make sure the parts are intact. If any parts are dirty, deteriorated or damaged, please clean or replace them before use.
- Make sure the tank is filled with fuel and the cooling tank is filled with coolant.
- Make sure there are no air bubbles in the coolant circuit and the coolant will circulate normally after power on.
- Make sure that the oil pump has entered the oil after the power is turned on, the gasoline in the return pipe is flowing back to the fuel tank continuously.

2.3 Operation

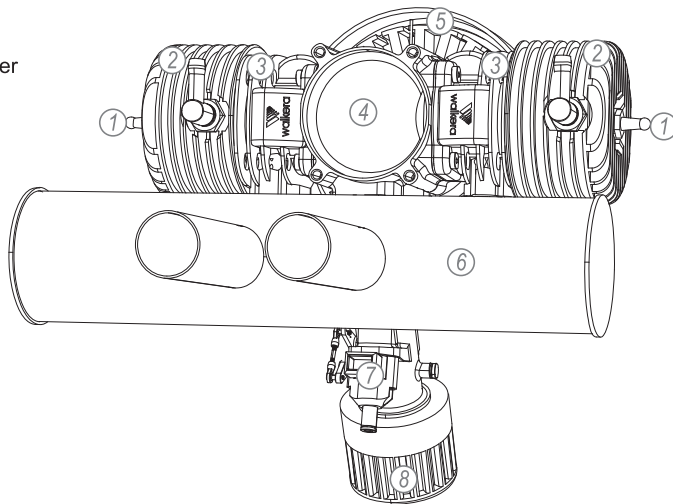
- ***It is strictly forbidden to disconnect the power battery (aircraft battery) after the engine is started.***
- Do not approach engine and propellers of aircraft that are in operating.
- The gasoline used in the engine is flammable and explosive liquid. Please keep away from open flames and prohibit smoking.

Altitude 0m	Power 100%
Altitude 1000m	Power 93%
Altitude 2000m	Power 85%
Altitude 3000m	Power 76%
Altitude 4000m	Power 64%

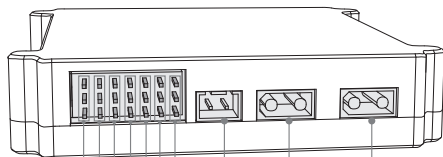
3.0 Parts Introduction

3.1 Engine Introduction

1. Spark plug
2. Cooling cylinder cover
3. Cylinder liner
4. Casing
5. Generator
6. Silencer
7. Nozzle
8. Air filter

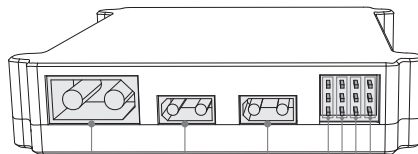


3.2 G120EFI Control Box Introduction



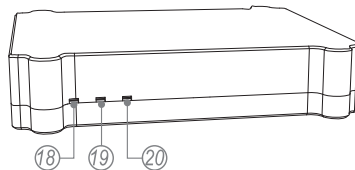
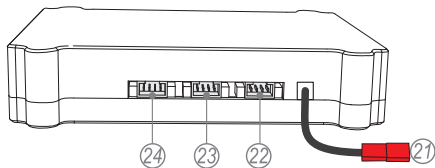
- ①
- ②
- ③
- ④
- ⑤
- ⑥
- ⑦

- | | |
|--------------------|---------------------|
| 1. SBUS | 7. CDI power supply |
| 2. Ignition signal | 8. starter |
| 3. Speed signal | 9. Oil pump |
| 4. PWM-OUT | 10. Nozzle |
| 5. Servo 1 | 11. DC-12V-IN |
| 6. Servo 2 | 12. 12V |



- ⑪
- ⑫
- ⑬
- ⑭
- ⑮
- ⑯
- ⑰

- | | |
|---------------|---------------------|
| 13. 12V | 19. LED light |
| 14. Sensor 1 | 20. LED light |
| 15. Sensor 2 | 21. Battery voltage |
| 16. PWM-IN1 | 22. UART1 |
| 17. PWM-IN2 | 23. UART2 |
| 18. LED light | 24. SWD |



4.0 Specifications

• Engine

Drive	Double Cylinder Gasoline Engine
Weight	6.15kg (including spare parts)
Size (L × W×H)	375×290×279mm
Displacement	120CC
Generator	WK-WS-150-001
Power	7.4KW
Maximum takeoff weight	53kg (flight near sea level and related to the power and structure of the aircraft)
Output voltage	DC50V
Power battery	12S (Capacity ≥ 1800mAh, discharge rate ≥ 75C)
Oil Consumption	730g/kw.H (Hover 6 L/H)
Spark plug	NGK CM-6
Fuel type	95 # above unleaded gasoline + 2T synthetic lubricant (Motorway, Motul 710, etc.)
Fuel ratio	40:1
Coolant	Car antifreeze engine coolant
Environment temperature	-20°C to 40°C
Maximum altitude	5000m

• Rectifier starter

Weight	1.9kg
Size (L × W×H)	247 x 113 x120mm

• Radiator

Weight	0.45kg
Size (L × W×H)	170 x 120 x75mm

• Cooling box

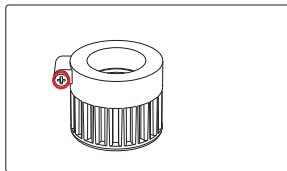
Weight	0.21kg
Size (L × W×H)	158 x 83 x179mm

• Radiator tube

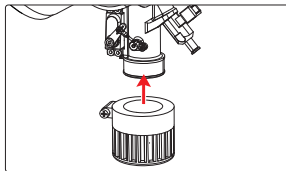
Specifications	φ8 x φ13 φ12 x φ17
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5.0 Preparations

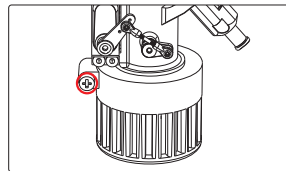
5.1 Installation Instructions



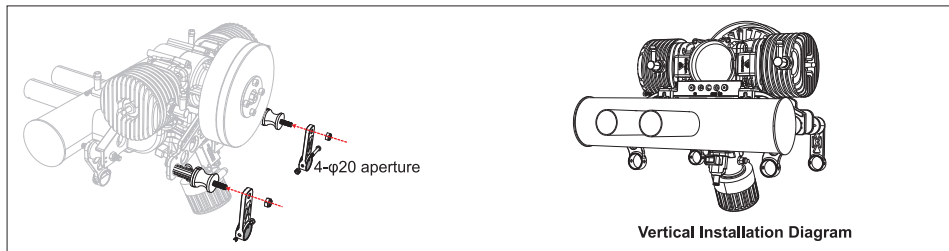
1. Pls. use the cross screwdriver to loosen the air filter screw.



2. Install the air filter into the engine intake.

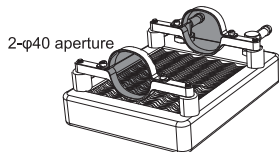


3. Tighten the air filter screw with a cross screwdriver.

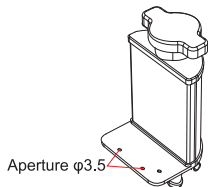


4. Install 4 supports and fix the engine. **Install the engine in the proper position of UAV, and the default is vertical installation.**

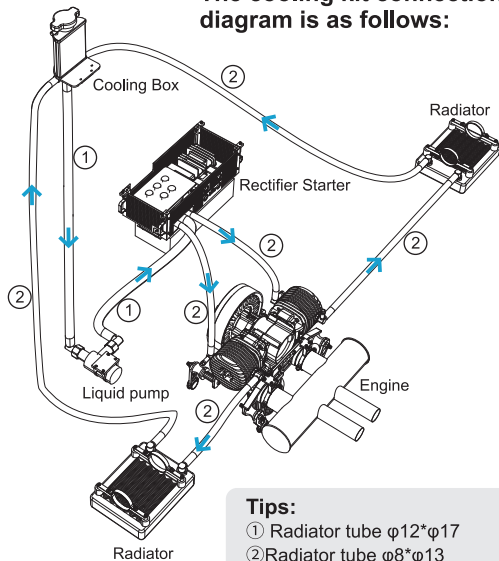
5. Fixed radiator mounting aperture $\phi 40$
 (The radiator is recommended to be installed directly on the upper arm under the propeller to ensure good heat dissipation performance.)



6. Fixed cooling box mounting screw aperture $\phi 3.5$



The cooling kit connection diagram is as follows:



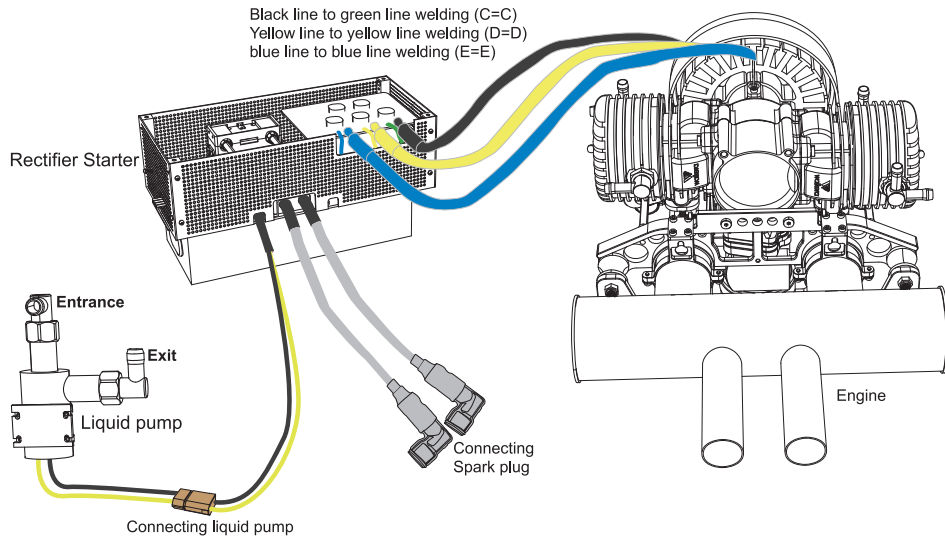
Tips:

- ① Radiator tube $\phi 12 * \phi 17$
- ② Radiator tube $\phi 8 * \phi 13$

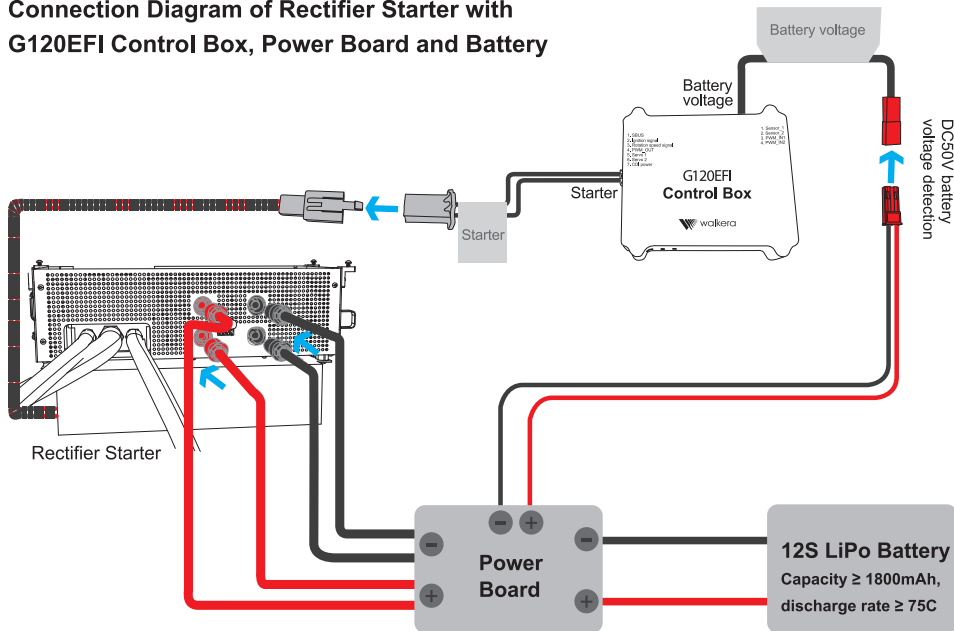
Blue arrow indicates the direction of liquid circulation

5.2 Connecting Lines

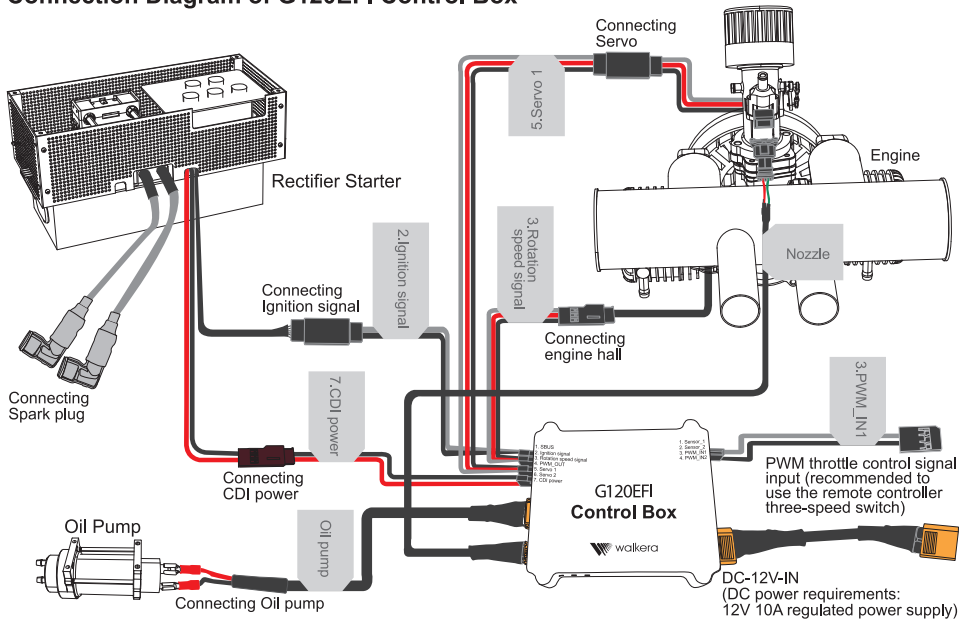
Connection Diagram of Rectifier Starter with Engine and Liquid Pump



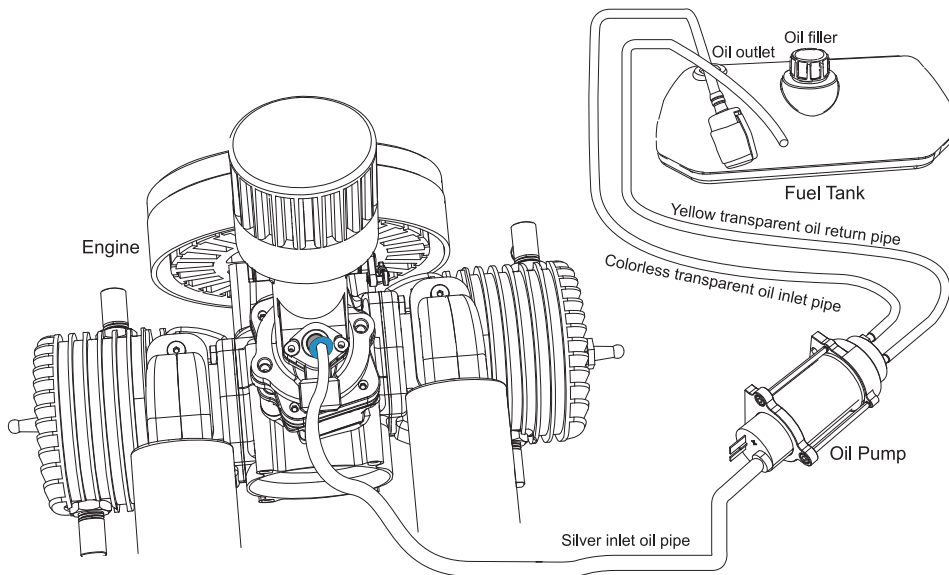
Connection Diagram of Rectifier Starter with G120EFI Control Box, Power Board and Battery



Connection Diagram of G120EFI Control Box

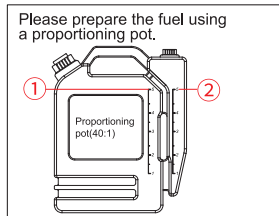


5.3 Oil circuit connection diagram

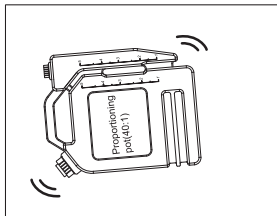


5.4 Fill In Fuel And Coolant

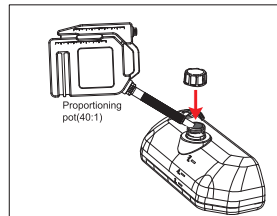
It is recommended to use 95 # or above unleaded gasoline and two-stroke full synthetic lubricant in accordance with JASO FC/FD ISO-L-EGD standard. The mixing ratio is 40:1.



1. Add more than 95 #gasoline from the big mouth to the marked area①;
Add lubricating oil from small opening to mark②.

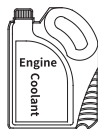


2. Shake blended fuel in an inverted proportioning pot.

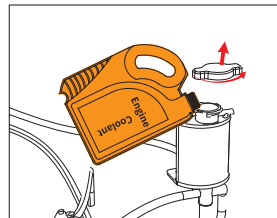


3. Pls.open the cover of the drone oil kettle, inject the blended fuel into the drone oil kettle and tighten the cover.

4. Turn 90 degrees counter-clockwise to open the coolant box cover, inject the special coolant for engine into the coolant box (**about 1 liter of injection**), and then turn 90 degrees clockwise to tighten the lid after filling.



Please use car antifreeze engine coolant



5.5 Running in

The running-in is completed before leaving the factory and can be used directly.

6.0 Description of PWM Control Signal of the Remote Controller

Engine status	PWM pulse width signal input of remote controller
Close engine	PWM pulse width < 1100us
Engine idling	1400us < PWM pulse width < 1500us
Running engine	PWM pulse width > 1900us

7.0 Operation

7.1 Engine Startup



- Before starting, check whether the intake filter element is blocked and whether the exhaust bolt is tightened.
- The remote controller switch must be self-defined according to your remote controller.

- 1) Put the **remote controller switch** to the "**Engine idling**" position for fire.
- 2) After successful lighting, turn **the remote controller switch** to the "**Running Engine**" position, and the engine is steadily operated for one minute.

7.2 Engine Operation

- 1) After successful lighting, set the **remote controller switch** to the "**Running engine**" position and observe the bus voltage (49 +1V) as normal. If it is normal, it will run steadily for about one minute to preheat the engine.
- 2) Push the remote controller or start the flight control program to take off.

7.3 Close Engine

- 1) After continuous flight, the engine system needs to be cooled. Therefore, after the landing, turn the **remote controller switch** to the "**Engine idling**" position for 30 seconds.
- 2) Turn the **remote controller switch** to the "**Close engine**" position and the engine system will automatically turn off.



Gasoline is a volatile, flammable and explosive liquid.

During the end of the day or during long-distance transportation, the fuel remaining in the fuel tank should be released and stored in the oil drum to avoid danger!

8.0 Engine Maintenance and Warranty

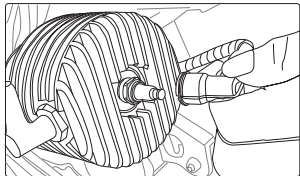
8.1 Engine Maintenance

1. The engine is a high-performance two-stroke engine, so some parts lose quickly, such as bearings, ball bearings, pistons, piston rings, spark plugs, air filters, etc. The degree of wear and tear of parts varies according to personal usage habits, environment and temperature. We recommend that you send them back to the original factory regularly to replace the wear and tear products.
2. Plug and air filter regularly with carburized oil cleaner.
3. The engine must periodically check whether there is leakage at the surface joints (Joints of cylinder, crankcase, etc). Leakage will cause fuel/air ratio error, which will affect the performance of the engine or cause damage.
4. The manufacturer suggests that the user should maintain it on his own (**altogether 100 hours**) regularly, and **return to the factory for full maintenance once altogether reach 300 hours**. The cost of maintenance for each manufacturer is **about USD500**.
5. The engine is a liquid-cooled engine. The coolant liquid tank and the liquid-cooled device must be guaranteed to flow smoothly and the pump can run normally. (**Can use car coolant liquid**)

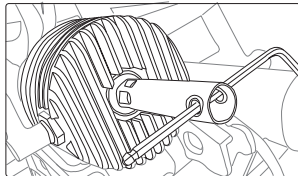
8.2 Engine Warranty

The calculation of engine warranty period is 24 months from the original purchase date. If the purchase date is not clearly provided, the factory date shall be taken as the benchmark. During the period of quality assurance, due to product quality problems or abrasion and damage of equipment under normal operation, as well as air filter and oil pipeline blockage, our company is responsible for free maintenance; if artificial or improper operation, use of other plant parts, refitting, use of inferior oil, oil mixing ratio caused by incorrect engine failure, is not within the scope of free maintenance, according to the company's damage. Relevant components, providing paid maintenance services.

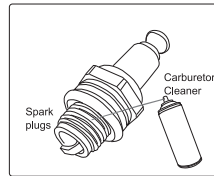
The method of cleaning spark plug is as follows:



1. Pull the spark plug igniter hard.

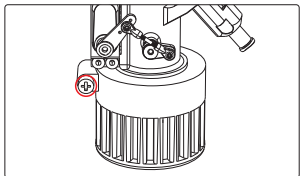


2. Unscrew the spark plug with a spark plug wrench.

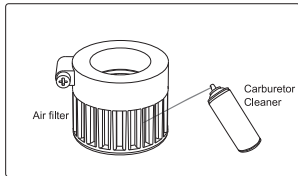


3. Clean or replace spark plugs with carburetor cleaner

The method of cleaning air filter element is as follows:



1. Unscrew the fixing screw of the air filter element and remove the air filter element



2. Clean or replace air filter element with carburetor cleaner

9.0 Common Faults

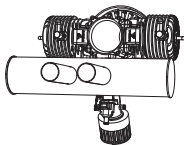
9.1 Startup Difficulty

Reason	Solution
Line connection is incorrect	Check the connection line and reconnect
Control circuit damage	Please contact the manufacturer
Air filter has oil or dust	Clean the air filter with chemical cleaner
The spark plug has carbon deposit or broken	Clean or replace spark plugs with carburetor cleaner

9.2 Performance Degradation

Reason	Solution
Poor fuel quality	Replace the fuel
Incorrect fuel ratio	Gasoline and lubricating oil are properly matched at 40:1
Air filter has oil or dust	Clean the air filter with chemical cleaner
The spark plug has carbon deposit or broken	Clean or replace spark plugs with carburetor cleaner

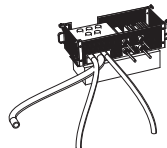
10.0 List of items



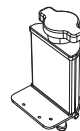
Engine x1



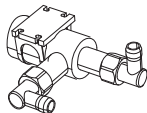
Radiator x2



Rectifier Starter x1



Cooling Box x1



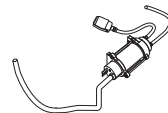
Liquid pump x1



G120EFI Control Box x1



Engine support x1



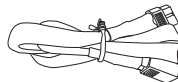
Oil Pump x1



$\phi 8 * \phi 13$ radiator tube x3m



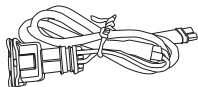
$\phi 12 * \phi 17$ radiator tube x1m



DC12V power line x1



Oil pump connection line x1



Nozzle
connection line x1



Ignition signal
connection line x1



Engine Hall
connection line x1



PWM throttle signal
connection line x1



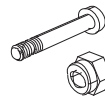
CDI Power
connection line x1



Servo
connection line x1



Starter
connection line x1



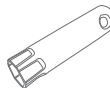
Support fixing screws x4
Support fixing nuts x4



Clamp(10~16mm) x3



Clamp(8~12mm) x10



Spark plug sleeve x1



User's Manual x1



Manufacturer: Guangzhou Walkera Technology Co.,Ltd
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Nansha Dist, Guangzhou, China.511453
Hotline: +86 20-84915115



This manual is subject to update without prior written notice. Please refer to Walkera official website for latest version.