

GF30 4-Stroke RC Gasoline Engines

Owner's Operating Instruction Manual

Dear customer:

Thank you for purchasing NGH GF30 4-stroke gasoline engine. The engine has been developed by NGH engineers to offer all hobbyists a new 4-stroke engine. You will be delighted with stability, fuel economy, energy saving, environmental protection, low noise, large torque output of your NGH GF30. We hope that you will enjoy with your engine, and have many fun and safe flying experiences with its use.

Safety Instruction and WARNINGS!

Please read this instruction manual carefully before operating and be familiar with features of this product. Improper operation may cause damage of the products even lead to property loss and personal injury.

GF30 engine is precision products manufactured by NGH R&D. It must be operated with caution. The operator shall master knowledge of internal combustion engine as well as basic mechanical ability. This product is not suggested for use by children without instructed by adults. Don't attempt disassembly, use with incompatible components or augment product in any way without authorized approval by our company. It is to read and follow all instructions and warnings of this manual before assembly, setup or use to ensure operate correctly and avoid damage or serious injury.

Age Recommendation: RC engine is not a toy! Forbidden for children under 15 years.

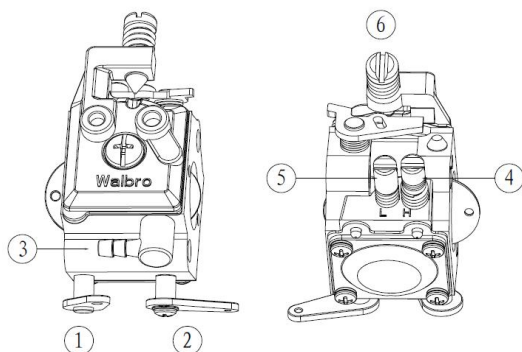
The engine is designed for use on a model radio control airplane. If it is used for any purpose, we won't be responsible for its stability and safety.

- NGH or their dealers aren't responsible for any loss, injury or damage resulting from the miss-use of RC engine.
- Keep away from the rotating propeller area while operating the engine.
- Do not wear loose clothing near the engine or the propeller.
- Do not operate the engine near loose material such as dirt, gravel, ropes, sand, etc.
- Always run your model engine in a well-ventilated area. Model engines produce possibly harmful carbon monoxide fumes.
- Always ensure that the propeller is securely attached to the engine shaft and all retaining fasteners are tightened properly before each flight.
- Always stand clear of and behind the propeller, ensure the face and body are far away from the propeller blade after trajectory. Never allow anyone, to be in front of or to the sides of the propeller when starting or running the engine.
- Always ensure that small parts in the children can't touch place to prevent children from swallowing parts;
- Always check the propeller nut tightening.
- Gasoline is extremely flammable. Be careful of any sparks from electrical contacts such as fuel pumps, battery charger, etc.
- Allow your engine stop and cool before touching or fueling. The running engine of the surface temperature is high, easy to cause burns and other personal injury.
- Be sure to check whether there are loose bolts before flying. When install a muffler, the muffler in the threads of the screw into the engine exhaust, until twist fixed, it is recommended to use screw glue.
- Ensure the engine and muffler in aircraft fairing environment with cold air, make sure the engine cooling.

Product Specifications:

Type: 4 - stroke air cooled gasoline engine (Only used for fixed-wing aircraft model)	
Bore: 36mm	Stroke: 29.4mm
Volume: 29.91cc	Carburetor: Walbro WT962
Mix Output: 3.16 HP/9000rpm	RPM Range: 1600-8500rpm
Ignition: NGH Automatic advancing angle ignition (RoHS and CE Certified)	
Ignition Power: DC 4.8V - 8.4V 1000mAH	Spark plug type: CM6
Fuel: 92# Unleaded gasoline + Fully synthetic lubricants (Non-4-stroke lubricants)	Mix ratio: Gas : Oil = 35:1
Recommended propeller: 15x10, 16x8-10, 17x6-10 (Two blades)	Weight: engine 1160g, ignition 105g, muffler 100g

Carburetor setup and adjustment:



NGH-GF30 four-stroke gasoline engine used Walbro WT carburetor is designed for NGH unique. It has the perfect stability of idle speed and acceleration sensitivity.

It's better to remove fuel from the carburetor after a set of flight to avoid carburetor rubber components deteriorating over time, which may lead to engine performance failure.

Methods: Start engine without connecting the fuel pipe until all fuel oil in the carburetor exhausted.

Setup Carburetor:

- ①—Choke: Close it before the first start the engine, and quickly rotating propeller, the fuel oil suction within the tank into the carburetor, when you start the engine should be open it.
- ②—The throttle control arm: Infinitely adjustable-speed device, control the turning speed of the engine.
- ③—Nozzle: Connect the oil tank and supply the fuel to engine.
- ④—High speed needle(H): After fully open the throttle control arm ②, adjust the high speed needle can get the best high speed.
- ⑤—Idle speed needle(L): Put ② return to the initial position, adjust the idling speed needle can obtain satisfactory low speed.
- ⑥—Idle mixture adjustment screw: Adjusting the fuel and air mixing ratio at idle, it actually control the initial position of ②, adjust ⑥ and ⑤ will obtain the better idling speed.

The initial setup of the carburetor is factory settings, the engine first start don't need to adjust.

The factory setting status:

- ④—High speed needle, Fully closed (clockwise) before exiting(anticlockwise) 1.25-1.5 rings;
- ⑤—Idle speed needle, Fully closed (clockwise) before exiting(anticlockwise) 1.5-1.75 rings;
- ⑥—Idle mixture adjustment screw, The throttle control arm at the other end of the limit pawl near the screw cone about 0.6mm.

Adjust Carburetor:

When the engine running, you want to adjust the carburetor, please adjust it based on factory Settings:

In the process of adjusting the carburetor, please use a high-quality tachometer to determine your adjusted results, the tachometer you need to buy one.

First adjust the high speed needle: Engine run time will be turned on at full throttle position, adjust the high needle and watch the change of the tachometer, make the engine rpm reach the max per minute. Engine work in a stable high speed (**please note:** do not let the engine run boundary for a long time, this is a big damage for engine).

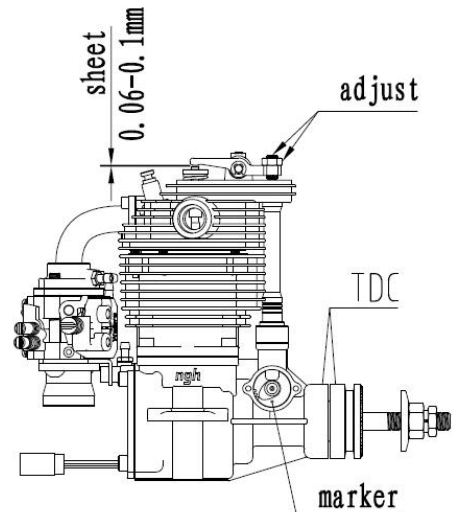
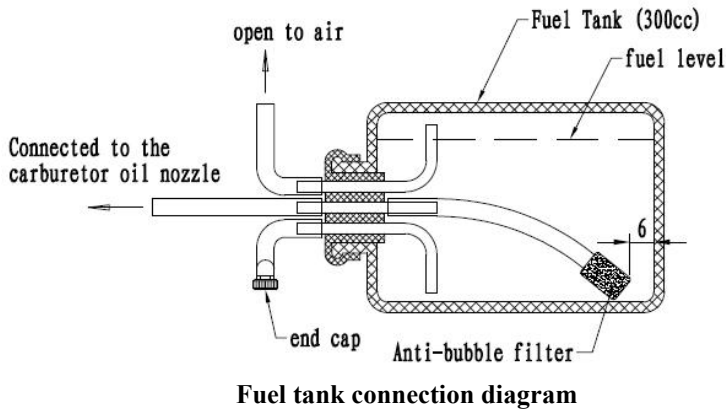
Adjust the idle speed needle: The throttle return to the idle position, adjust the idle speed needle and watch the change of the tachometer. Let the engine run in a stable state of idle speed (Advice 17x8 wooden propeller idle speed at 1800rpm).

When necessary the idle mixture adjustment screw joint adjustments to ensure the engine idle speed stability, smooth acceleration; If the engine is idling start difficult (Exclude CDI ignition power shortage, excessive fuel combustion chamber, spark plug problems and so on). This shows that air-fuel ratio (A/F) is low at idling, please adjust idle mixture adjustment screw, increase air ratio, or adjust idling needle to reduce the amount of fuel, A/F ratio to achieve appropriate proportion. (**Tip:** The larger engine propeller, the more perfect lower idle speed you will get.)

When the engine high speed and idle speed adjustment is completed, try to run the engine acceleration performance. First let the engine to run 10 seconds at idling and the quickly move the throttle control arm at full throttle position, there will be the following three situations:

- A. Engine speed is responsive and smooth transition to the highest speed, instructions for the adjustment of the engine is very good.
- B. Engine acceleration has a cough performance, gradually transition to the highest speed, illustrate the idle speed needle set relatively rich oil, the idle speed needle to make a small adjustment (clockwise rotation), and then try again, try to accelerate the reaction constant adjustment until the engine reaches your request.
- C. Rapid throttle when the engine suddenly stopped running, this shows that the idle speed needle set relatively lean oil, the idle speed needle to make a small adjustment (anticlockwise rotation), and then try again, try to accelerate the reaction constant adjustment until the engine reaches your requirements.

The Fuel Tank Connecting:



Valve clearance adjustment:

After approximately 2 hours flight, valve clearance adjustment may be necessary. Before adjusting valve clearance, should check valve body to move freely, no clamping stagnation phenomenon. Due to the thermal expansion of metal materials, valve clearance adjustment should be carried out after engine has cooled completely. Adjust the valves must be in the engine's compression stroke (Intake and exhaust valves in a fully closed position). When adjustment is completed, make sure you tighten the hexagonal nut.

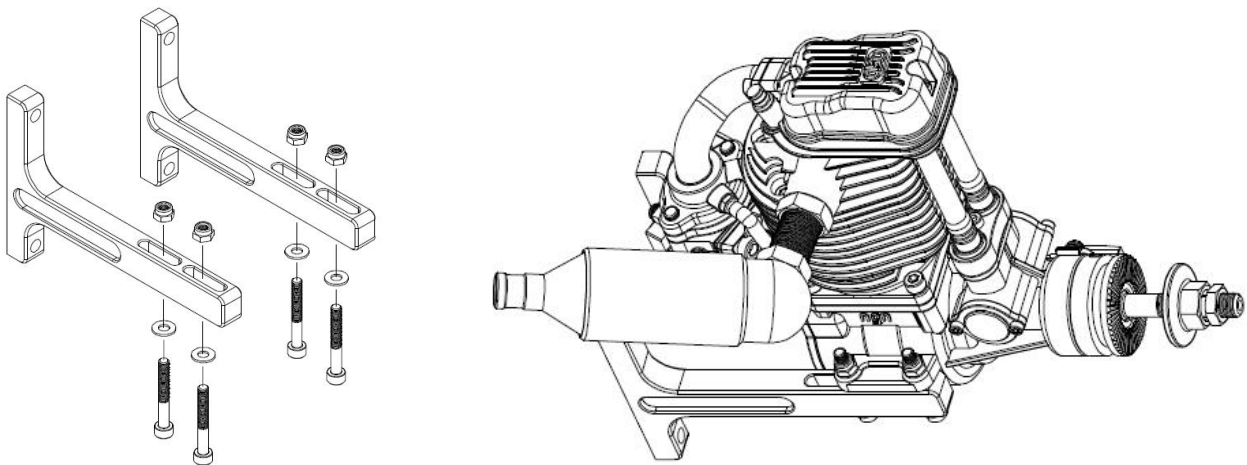
How to adjust the valve clearance:

Remove the rocker arm cover; revolve the propeller slowly by hand and align with TDC mark. Meanwhile the marker on the camshaft is directly below. In this position, take a small sheet (thickness 0.06 - 0.1mm) into between rocker and valve. With a hexagonal wrench adjustment, after that, tighten the hex nut (note the hexagonal nut should not be screwed too tight), as shown in the figure below.

The valve clearance is the most important factor in the maintenance of four-stroke engines, and operation with an excess clearance will degrade performance. In particular, a large gap aggravates abrasion of the tappet will made the cam increases the unusual sound; a small gap (or no gap) is also influence the performance of the engine, so that the valve does not close tightly resulting the compression stroke air leaks.

Engine installation:

NGH-GF30 4-stroke engine need to use rail bracket mount on a suitable RC aircraft. It can effectively reduce the high frequency vibration of four-stroke engine running at a high speed. As shown below:



Notice: Please make sure to install a firewall on the back of RC aircraft using metal flat washer or ratchet nut to prevent the pawl bolt into plywood. Be sure to check before you fly if there are loose bolts.

Starting the engine:

1. According the engine connection method, install the engine on RC airplane and lock propellers.
Made the carburetor initial setup and connect the spark plug, electronic ignition and sensors, put the fuel into the oil tank, connect the power and radio control equipment.
2. Power off the electronic igniter at this time and close the carburetor choke. Rapidly rotating the propeller of the engine and make the fuel in the tank sucked into carburetor, please pay attention to the suction of the fuel should not be too much, otherwise will drown the spark plug, the engine start difficult.
3. Please open the carburetor throttle air inlet, power on the electronic igniter, then start the engine using the motor starter, the engine will begin to work, the fans will adjust the carburetor according to your own need. According to the above steps to adjust the carburetor adjustment

Warning: Make sure all bystanders, especially children, at least 15m away from rotating engine.

Engine Break-in:

Please use high quality synthetic oils, gasoline and machine oil with mixing ratio 35:1. NGH is recommended to use smaller size propellers at first break-in and follow-up about 10 times in flight. Keep medium speed running for 15 minutes (no more than 4000rpm) after started engine, then high speed running (6500 rpm) for 3 minutes, at last medium speed running for 5 minutes, high speed running for 3 minutes, reciprocating 3-5 times complete break-in. Breaking in engine carefully will increase its life. Please make sure the engine got the complete break-in before you use the larger load propeller.

Engine cooling:

If engine being installed in the fairing, there must be enough air being pulled in to cool the engine, and it's necessary to assure enough air flowing in the faring.

Reference data: Outlet area should be 3-5 times bigger than the entrance area to ensure adequate cooling.

Engine Failure Removal:

If the engine is difficult to start, or idle speed or unstable in high speed. Please check: whether the electric circuit and oil line of engine is trouble, whether the engine leaks air, whether the electronic ignition works or its power supply is adequate, whether the spark plug flame out. If necessary, replace with a new spark plug.

Rule out engine failure:

If the engine is difficult to start, or idle speed or unstable in high speed. Please check: whether the electric circuit and oil line of engine is trouble, check if the engine leaks air, or if the electronic ignition works, or if its power supply is adequate, or if the spark plug flame out or if the cap is stick its right position. If necessary, replace with a new spark plug.

Engine Maintenance:

To reduce the fuel consumption, extend engine's life, please adjust the engine's highest speed and make engine run in the output maximum speed of 90% once the gas pedal full opened. If the load is large (Propeller's diameter and screw pitch are big), the fuel must be adequate. If the load is small, the speed will be high while the fuel consumption will be less; Please make sure to empty the carburetor after each flight, otherwise it'll cause the rubber of carburetor aging to affect the engine performance; Please clean the carbon deposition on the spark plug and keep the gap from 0.7mm to 0.8mm between the electrodes; If it's difficult to start the engine, idle speed unstable or when high speed operation flameout, please replace the spark plugs; Please clean the engine surface after used each time, it can make the engine get better cooling; The carburetor may be blocked seriously if you use different brands or types of lubricating oil together, you need select a better fuel filter; If the engine low speed work for a long time, can lead to spark plug carbon deposition; Regularly check the fuel system, make sure do not leak fuel, do not leak air.

Engine Guarantee:

If the NGH engine has performance defects caused by the defects of process, material and manufacturing, we certify that: Change for free within one year and Guarantee within two years since the date you purchased. Please note the guarantee is only for the original purchaser, not including: Normal wear for engine; damage caused by the failure of maintenance; damage for engine over speed operation caused by using small propeller; Bearing rust; Crash; Use inappropriate fuel; Damage caused by foreign bodies; Damage caused by unreasonable installation or operating environment; Damage caused by improper dismantle; Damage caused by any modification.

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