



# GF-6 2-Stroke Electric Ignition Gasoline Engine Manual (for .30 size Aircraft)

The SH R&D team started developing the mini gasoline engine back in 2009. The purpose was to respond to the challenge between high nitro fuel costs and the difficulty of obtaining it in the market. The goal was also to improve the inconvenience of carrying bigger size engines for car, aircraft and boat applications. SH finally launched the world's first 5.1cc (GC31) high performance gasoline engine for 1/8 scale use in 2015, after years of experience and major breakthroughs.

The SH Team overcame the common problems plaguing existing gasoline engine in the RC market; including high temperature, low speed and so on, during the research and development period. Not only were exclusive designs from world patents applied, but SH also combined CNC high-tech processing. Here SH has successfully produced a small displacement CDI ignition gasoline engine with their persistent efforts and continuous improvements.

Although the GC31 CDI ignition gasoline engine series achieves the performances and effects as expected, it still couldn't get rid of the defects from the CDI igniter; such as increasing weight, space limitations during installation and high voltage interference, with some other trouble challenges. Therefore, SH continuously tested and finally made a breakthrough, officially releasing the electric ignition gasoline engine (GC31 SPEC2) in 2017. According to the demand of the aircraft market, the world's first 6cc 2-stroke electric ignition gasoline engine (GF-6) was produced in the same year, at the end of 2017.

GF-6 gasoline engine comes with great power, high speed, lasting life, operational stability, easy adjustment, excellent cooling and economic fuel consumption! That's why we strongly believe it will be the best choice for all the aircraft pilots.

- Suitable for all 2-stroke .25-.40 size model aircrafts on the market
- Proper run-in (break-in) of the engine is a very important step in ensuring that you get the highest performance and lifetime of your engine.

## ATTENTION

1. When run on the engine, please always make sure engine assembled tight on the plane or test stand. Then screw the carburetor locked, be noted do not lock too tight that will caused the carburetor body to deform

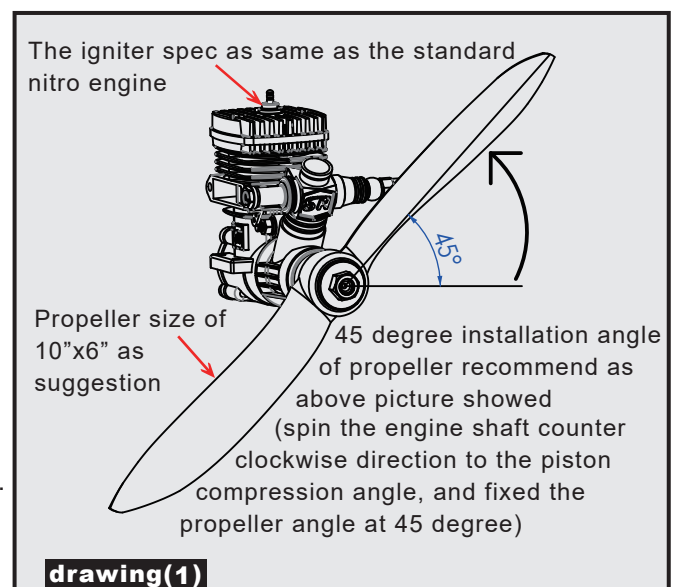
2. Use a mixture of 92 Octane gasoline and SH specified 2-cycle oil.

**Suggestion: the best gasoline and engine oil is 24:1, roughly around 4.0%**

**250ml engine oil can be mixed with 6 liters of gasoline or 80ml engine oil mixed with 1.92 liters of gasoline. (1920/80=24)**

3. Plug: The engine is equipped with an SH factory specified manufacture plug, with a 1.5A voltage applied. (the plug spec as same as the standard nitro engine).
4. Propeller: We suggest a propeller size of 10"x6" and the installation angle recommend as the below drawing (1) showed

- An inappropriate (too big) propeller may cause the engine to become overloading, and potentially shorten its life.
- Please make sure the propeller is tightly locked in case of any issues occurred by an accident.



# Carburetor Setting and Run-In Procedure

Following setting all based on the factory standard; comply with the propeller size of 10"x6" as setting. If replace others muffler, the main speed needle need to adjust at 4 1/2 turns to 5 turns from the bottom and make slight adjustments accordingly to the condition. If use propellers size smaller than 10"x6", the main speed needle need to turns much more at rich condition to avoiding any damages to engine due to high RPM or too lean condition.

1. First, adjust the idling screw to the position showed in figure (2) of mark ③, fully closed from the bottom and **open approx. 2.0mm**. Then add the 20 : 1 fuel/oil mixture into the fuel tank. For needle adjustments, image the slot in the needle is the hour band on a clock and only adjust the needle from 1-2 hour increments each change.

2. First stage of run-in:

The main needle and low speed needle are preset from the factory. Please turn the main needle see back side attached figure (2) of mark ①, Set the main needle at 4 turns from the bottom and low speed needle at 1 1/2 turns from the bottom. After that, open the carburetor about half position. block the carburetor inlet by hand and spin the engine counter-clockwise direction to help push fuel into the carburetor and inside the engine. Connect the plug igniter and apply an electric starter to start the engine; keeping the engine staying in mid-range running, and then you can remove the plug igniter.

3. Engine RPM observation:

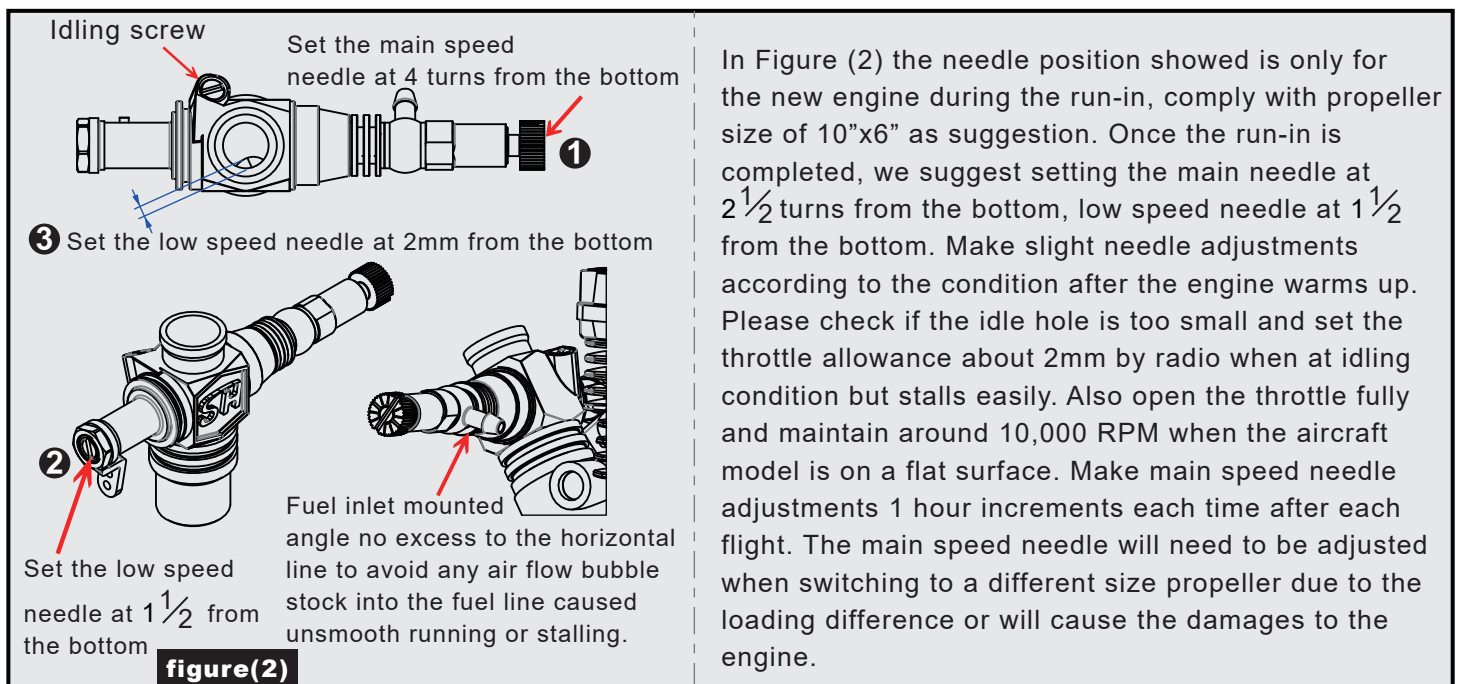
You can turn the main speed needle counter clockwise 2 hours if the engine reaches **over more than 5000 RPM's**. Adjust in 2 hour increments at a time until the engine is running rich. You can turn the main needle clockwise 2 hours if the engine is too rich and stops running. Adjust in 2 hour increments at a time, until the engine returns to a rich and smooth-running condition. **At this stage roughly required 500cc of fuel running through**

**※The exhaust should emit lots of dark blue smoke, indicating that the engine is in rich condition.**

4. Low speed needle adjustment:

Adjust the idling screw to the position showed in figure (2) of mark ③, fully closed from the bottom and open approx. 2.0mm. If the engine idle speed is high and continues to increase and not slow down, it's too lean, and the low speed needle needs to be turned counter clockwise 2 hours until idle is stable. If the engine at idle speed is too low and leads to stalling, it's too rich and the low speed needle needs to be turned clockwise about 2 hours until the idle is stable. Stay at 3000 RPM for best idle speed of this time.

**(RPM going a little lower is normal once you remove the plug igniter during idling)**



5. Second stage of run-in:

Set the throttle to fully open position for accelerating, to set the main needle adjustment. The engine needs to stay in a rich condition during the run-in procedure and the exhaust should emit a lot of fuel and white/blue smoke at the same time. You can turn the main speed needle counter clockwise 2 hours if the engine reaches over more than 8000RPM. Adjust in 2 hour increments at a time, until engine returns to stable running under 8000 RPM. You can turn the main needle clockwise 2 hours if the engine is too rich, leading to

stalling. Make adjustment in 2 hour increments at a time until the engine is back to a rich condition in mid-range running. **The run-in procedure at this second stage required at least 400cc of fuel running through.**

✘ **Always watch out for the engine speed and how much fuel is running through; make sure engine speed stays under 8000 RPM**

6. After the first and second stage run-in procedure, preliminary engine run-in is complete, but the engine is still new. At this stage, we can proceed to our first initial flight.

Make sure the receiver battery is fully charged, fuel tank is full and the servos have the correct forward and reverse direction. Then start the engine and allow a 2-minute warm up in the mid speed range of running. Put the aircraft model on a flat surface, holding tight and set the throttle position to fully open to adjust the main needle. The idle engine RPM setting is around 9,000-9,500RPM when the aircraft is on flat ground. When set the nose wheel around 70-80 degree, the RPM will increasing to 11,000 then put back to a flat surface the RPM will returning to 9,000-9,500.

After 2 flights, make slight main needle adjustments when the aircraft model is on a flat surface, and set the engine to maintain 10,000 RPM operation during flying. Finally, we have completed the run-in procedure. We hope this engine brings more flying fun and saves as much as fuel costs.

✘ **The new engine will flame out due to overheating if RPM exceeds 9,500 RPM**

## NOTES

1. Kindly check the fuel lines to ensure there is no leaking or clogged issue when the engine is running unsmooth or when you have needle setting difficulties. Installing a SH specified fuel filter SB011 into the fuel tank is suggested.

2. Please use the SH specified 2 cycle engine oil to maintain proper engine operation. Use 92 gasoline and SH specified 2 cycle oil mixed up; Gasoline and engine oil ratio is **24:1**, **roughly around 4.0%** SH specified plug of GT4 or GT5 plug is recommended and we also suggest the propeller with size 10"x6" to obtain the best performances.

**(The engine may be overloaded, leading to shorten life if you use an inappropriate, or bigger, propeller size)**

**A. Only use with SH specified gasoline spark plug to ensure the engine runs properly and has great performance.**

**B. The fuel tank and fuel line need to be made from gasoline resistance material**

**C. It is prohibited to use any nitro fuel which contains methane!**

3. The needles may need to be reset if there are any big changes to the operating flight environment. **(Hot/cold or any differences of the high altitude and low altitude)**

4. Please clean the spark plug and burn room after 1 gallon of fuel has run through the engine. If the heating screen of burn room has serious carbonated damage or the plug bottom is carbonated, Please replace with a new one (Both plug and burn room are consumables, please replace according to the use situation)

5. The fuel is flammable and dangerous; always stay away from sparks, heat or any other ignition source. Don't store the fuel in the gas tank after you have finished flying your aircraft model. Store your fuel, gasoline or mixed fuel safely in a cool, dry location.

6. Provided warranty conditions have been met, your product will be repaired or replaced free of charge. Repair or replacement decision is as the sole discretion of SH.

7. If the engine hasn't been used for a long time, the fuel may not get through the fuel line into the engine or carburetor. Please go check whether the fuel filter in the fuel tank is clogged, disassemble the carburetor and clean up. Adjust the needle setting as recommended and assembled the relative parts back. Then restart the engine.

8. When run on the test stand, please make sure engine mount on both sides need to be vertical and parallel at the same height (see right figure for reference)

