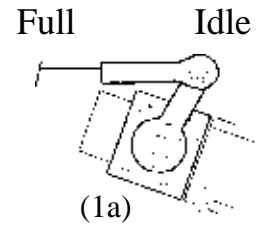


Starting the engine for the first time.

The model engine is the single most difficult part of model helicopters to the beginner, second only to learning to fly. For this reason we have taken the time to go through starting the engine the first time for you. This should help you to understand the basic operation and tuning of the engine.

Items to recheck:

1) Servo direction for the throttle channel - Turn on the transmitter switch, then the switch on the helicopter, move the throttle/collective stick to the low position, the carburetor arm should look exactly like the diagram (1a). Watch the throttle servo. As you raise (increase) the left stick the throttle pushrod will move towards the front of the helicopter. All carburetors work the same, the barrel of the carburetor rotates counter-clockwise as it opens. If this does not happen you need to reverse the servo direction and reset the throttle arm in Step 17. Starting the engine at full power will possibly damage the engine and can damaged clutch components on the helicopter.



2) Fueling the engine - Open the gallon of fuel and insert draw line from the fuel pump into the fuel, remove the fuel line at the carburetor inlet and connect to the fueling line of the fuel pump. Remove the pressure line from the muffler. Fill the tank until you start to see fuel in the pressure line. Reverse the pump for 1 second and reattach the pressure line to the muffler. Disconnect the lines starting with the fueling line and reconnect to the line to the carburetor. Recap the fuel to keep moisture out. Only fuel the model when you are setup and actually ready to start the engine, it is common for the carburetor to fill with fuel while sitting on the bench over a brief period of time. More common is the engine flooding while trying to start. In this case, as you are starting with an electric starter the engine initially turns easily but soon slows down.

3) Last pre-flight checks. Make sure that both the radio Tx and Rx have been charged overnight and the glow starter (if rechargeable). Do a range check, walk away from your helicopter with the antenna fully collapsed to 30 paces and have someone verify that all control surfaces are operating. If you do not make this distance have an experienced modeler check over your setup, do not fly until then. Be sure the throttle control stick is set to the idle position.

4) Cranking the engine over.

- Prime the engine by moving throttle stick to half (**insure the glow plug driver is not connected to the engine**) and crank the engine over for 10 to 15 seconds until you can see fuel come up the fuel line and into your carburetor. Then keep it turning over for another few seconds to insure the fuel has entered the combustion chamber. If fuel does not rise into the carb then check for blockage, proper needle valve opening and proper carburetor barrel opening (approximately 1/16 of an inch).
- Move the throttle stick to the low position with the trim in the center.
- **NOW** connect the glow plug to the 1.5V glow driver battery
- Place one hand firmly on the rotor head. **You must always hold onto the rotor head during start up.** Should the engine start anywhere above idle you will only have a few seconds to put the starter down and pull the fuel line off the carburetor line going to the engine. It is important to make sure you are standing/kneeling on the fuel line side to facilitate this.
- Place the start wand into the hex coupler and push down. Before you start, rotate the coupler counter clockwise until you feel the compression increase. Rotate the shaft past that point to insure the engine isn't flooded.
- Press the button on the electric starter to turn the engine over. There will be an initial popping sound as the engine turns over and within a few seconds the engine should start. When it does, continue to hold the rotor head, disengage the start wand as instructed on page 8 and put down the electric starter. Disconnect the glow driver and move the throttle trim down or up until the engine continues to run at the lowest speed without quitting. If the engine starts to die simply move the trim up one or two clicks. Do not move the throttle stick from the low position at this time.

5) If the engine does not start. Do not continue to crank the engine over if it does not start after a few attempts. When a brand new engine does not start there are only three major possibilities: a) the glow plug is not hot enough or already burned out b) not enough fuel is getting to the carburetor c) too much fuel is entering the carburetor. Assuming you have gone through step 1 on this page. Connect the starter to a 12Volt source and verify that the starter will turn the starting hex coupler counter-clockwise.

- a) Remove and check the glow plug, is the glow plug dry or wet? Connect the glow driver to the glow plug and verify that the element glows a bright orange color, If you get a dull orange glow then your glow starter is not supplying enough power to the glow plug or your plug is no good.
- b) If the glow plug is wet, then the engine is receiving fuel. If the glow plug is dry, no fuel is reaching the engine. Try re-priming the engine, point #1 step 4. Again verify that the engine is receiving fuel.
- c) Is the engine is very difficult to turn over, to the point that the electric starter has difficulty to turn the engine? If yes, you have filled the engine and carburetor with too much fuel. Do not force the starter as you can damage the starter or engine. This will lead to the stripping of the hex coupler on the start shaft. First, disconnect the glow starter, and pickup the helicopter. Pinch off the muffler pressure line and tip forwards and backwards with the muffler side down. This will drain the muffler of any raw fuel that may have collected there. Next turn the coupler to 90 degrees past the highest compression point. This will open the exhaust port and drain any excess raw fuel from the crankcase into the muffler. Clear the muffler and try to start again. If you have the same problem, remove the glow plug and spin the engine (without) plug and any excess fuel will be expelled, replace glow plug and try again.

If the engine still doesn't start, contact an experience modeler to help you with starting the engine, the problem may be very simple.