R/C engines adjustment

R/C engines usually have two adjustments. The major adjustment is the full throttle needle valve, and the minor adjustment is the idle fuel mixture.

The first thing you have to realize is that the idle fuel mixture adjustment is heavily dependent on the full throttle adjustment. It makes no sense to adjust the idle mixture until the full throttle adjustment is set.

Tuning an engine is a matter of using your eyes and ears. I recommend you experiment with the full throttle setting first to observe the following:

1. Engines like to start rich. This is why it is often necessary to put extra fuel into the carb (priming).

2. Once the engine is started, open the needle valve slowly and observe the following: The engine slows down, making a sloppy sounding buzz as lots of excess fuel spits out of the exhaust. Don't do this too long as you may drown the glow plug, causing the engine to stop.

3. Now slowly close the needle valve and note that the engine begins to speed up as the fuel mixture gets leaner. Soon you will reach a point where the engine jumps back and forth between buzzing and howling. Now only oil is coming out of the exhaust. The buzzing is called four-cycling as the engine is probably only firing on alternate cycles.

4. As you continue to close the needle valve, the engine now settles into a increasing howl. Running in this lean mode, the engine will heat rapidly, and in the air you will lose power as the engine starves for fuel.

5. Slowly open the needle valve until you occasionally hear a buzz. Lift the plane to point straight up. Since the fuel is now fighting gravity, you will hear the engine run leaner. If the engine tries to stop, it is still too lean. Make the plane level and open the needle valve slightly, repeat the nose up test. The full throttle setting is now adjusted.

Now you can adjust the idle mixture. Once set, it will probably never need to be adjusted again unless you disassemble the engine for repairs/cleaning.

1. Slowly close the throttle and observe: Does the engine idle or does it quit? When it quit, did it speed up briefly, or did is keep on slowing down to a stop?

2. If the engine sped up, or stopped abruptly, then the idle mixture is probably too lean. Decrease the fuel, or increas the air (depending on how your carb is set up). Start the engine up, run it at full throttle, and repeat 1.

3. If the engine just kept on slowing down to a stop, it is probably too rich. Another possible problem here is that the throttle may be closed too far. Many carbs are equipped with an minimum idle stop screw, which you may adjust for minimum idle speed. If the engine still slows to a stop with the idle stop set to open the carb, then lean the idle adjustment.

The fuel mixture is correct, when the engine will idle indefinitely. However, if as you advance the throttle you hear the engine run rich, or hesitate, you may wish to lean the idle mixture slightly.

Lastly, my preference is to set up the engine so that it idles appropriately with the throttle trim set to full forward. I then back off the idle stop screw, so that I may stop the engine by going to minimum throttle, and then backing off on the throttle trim.

I hope this helps,

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