

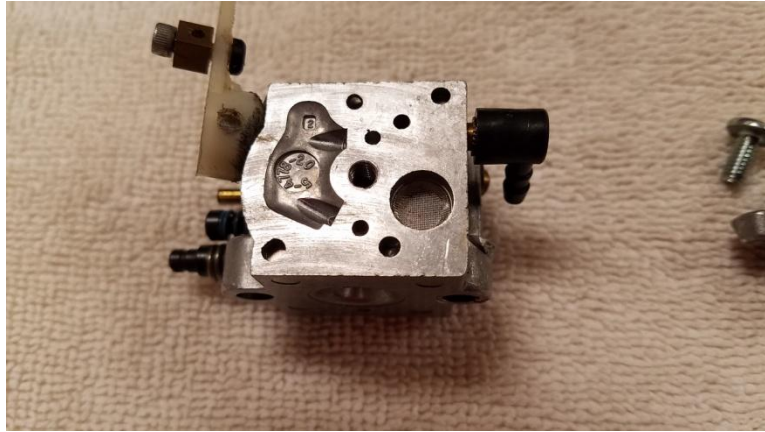
Gas Engine Tuning

Safety-Safety-Safety

- Never attempt to adjust needle valves while motor is running.
- Never stand in front or to the side of a motor when running it above idle.
- Wear hand protection when flipping the prop.
- Use of an electric starter is a great help when tuning.

Reasons for inconsistent gas engine performance

- Fuel line air leak.
- Clunk not in fuel/fell off line.
- Air leak between carb and crankcase; do not over tighten carb bolts.
- Spark plug cap not firmly attached.
- Broken wires between ignition battery, switch, ign. Module, ign. Sensor.
- Carb screen stopped up



Reasons for inconsistent gas engine performance cont'd

- Carb diaphragm/needle is bad. Carb kit!
- Bad spark plug (try cleaning it)
- Low compression (probably a bad ring).
- Faulty ignition or battery
- Changed prop size
- Engine running hot; may need baffling or larger air exit (ratio- exit must be 3 times entry size).

In the beginning

- Why are you retuning your motor?
 - New or used? New motors need 2-3 gallons of fuel to seat the rings/bearings (20-30 flights on 55CC).
 - Fine tuning or starting from scratch?
 - Gas motors get better when ran; they get worse when stored.

The Basics

- Remove and discard **idle stop screw**. Also discard all **Dubro Remote Fueling Valves**. Replace with a “T” between tank and carb.
- Check throttle linkage. Use a full size strong servo-no slack; no binding; butterfly must close/open all the way.
- Run engine 2-3 minutes at various RPM before attempting to tune. Must have access to both needles to tune.



The Basics cont'd

- Either use factory needle settings or 1.5 from closed on both needles if it will not run as is.
- **Step 1 (Low Speed Needle)** -adjust idle trim to 1400-1500 rpm. If engine loads up and dies, it is too rich; lean it 1/16 turn. If RPM increases and then it dies, it is too lean; richen it 1/16 turn. It is idles for 30 seconds without dying on the first try, buy a lottery ticket!

The Basics Cont'd

- Start the motor and keeping leaning/richening the low speed in 1/16 turns until it will idle for 30 seconds at 1400-1500 rpm. This is critical!
- **Step 2- Low Speed Accelration test-** Start and warm up 2-3 minutes. Low idle for 15-20 seconds, go to half throttle. If it dies, it is most likely lean. Open low speed needle 1/16 turn; try again.
- If it loads up, it is rich, close low speed 1/16 turn; try again.
- **Step 3 (High Speed Needle)** -Start the engine and run for 2-3 minutes at various rpm. Then run it at full throttle for “5 seconds”. Close throttle.
- If it immediately drops back to a consistent low idle, buy a lottery ticket!

The Basics cont'd

- If it drops to a very low idle and then recovers slowly, it is rich; close the high speed needle 1/16 turn and try again.
- If it drops back to a fast idle and it eventually drops to a low idle, it is lean. Open the High Speed needle 1/16 turn and try again.
- If it dies after pulling back from full throttle, go either way and see if it gets better. You may get lucky!

The Basics con't

- **Step 4- High Speed Test-** Start and warm engine at various throttle settings for 4 minutes. Check RPM-hold at full throttle for 20 seconds-does it sag or miss? Sagging means it is lean; missing normally means it is rich! Make small high speed needle(1/16 turns) to correct.
- Check RPM if you have a tach and record it.
- Check plug color-should be tan/light brown.

Next Steps

- Fly the plane; listen for sagging on uplines (probably lean), 4 stroking at level flight (probably rich).
- Land and make small High Speed Needle adjustments (1/16 turn).
- Have patience and you will be rewarded with a good running, long lastly motor.