Walbro Carburetor Troubleshooting & Tuning

by [Jeff Goin](https://www.footflyer.com/author/jeffgoin/) | May 9, 2019 | [Mx: Troubleshooting](https://www.footflyer.com/category/ppgbible_educational/12-maintenance/troubleshooting-motor-prop-carb-paraglider/)

*Adjustment and correction of problems found on Walbro Carburetors*

*See also*[*membrane carburetor overview*](https://www.footflyer.com/membrane-carburetors-for-2-stroke-paramotors/)*,*[*Buyers guide for Walbro Carbs and Rebuild Kits*](https://www.footflyer.com/walbro-buyers-guide/)

*Visit*[*http://tech.flygsw.org/walbro\_tuneup.htm*](http://tech.flygsw.org/walbro_tuneup.htm)for even more detail. The most relevant parts have been included here in case the original gets relocated.

Some basic terms (see diagrams). The *lowend* needle refers to the one that trims idle mixture mostly and affects mid-range mixture somewhat. The *highend* needle trims mixture at mid-range through full power. Unscrewing the needles on this carb increases fuel flow which richens the fuel/air mixture. Screwing them in reduces fuel flow which leans the fuel/air mixture. Don’t confuse fuel/*air* mixture with fuel/*oil*mixture which refers to how much oil gets poured into each gallon of gas.

First, screw in both lowend & highend needles all the way then unscrew to about 1 3/4 to 2 turns out each. Choke or prime the motor until the carb is wet. Start the engine and let it warm up. Let’s set the topend first since it’s the easier of the two. Go to full throttle. Adjust the topend needle for peak RPM. Leave it wide open for about a minute to see if it changes any.

Should the engine go lean, open the lowend needle slightly, if this dosen’t work you will have to adjust the needle valve inside the carb (will explain later). If the topend runs OK, then slowly pull the throttle down until the engine begins to “four cycle” hold the throttle there. Adjust the lowend needle until the “four cycling” barely stops. Now lower the throttle more until it “four cycles” again, and adjust the lowend again. Keep doing this until you reach full idle. Now, from full idle begin to throttle up until the engine starts to bog or hesitate. Open up the **lowend** needle just enough to eliminate the bog or hesitation.

When this is done right, you will be able to set the throttle in any position and it won’t four cycle, plus you will be able to transition from idle to full power without any hesitation at all. Now, for easy starting it’s best to have the lowend a little rich and it will four-stroke a little.

Pop-off Pressure

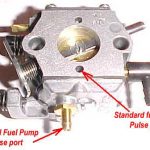
Walbro carburetors should have a pop-off pressure of between 10 and 14 psi. Go [here for how to change pop-off pressure](https://www.footflyer.com/measuring-pop-off-pressure-on-membrane-carburetor/). Below are some recommended values based on the carb/engine combination ±1 PSI:

Walbro 32 on Black Devil=10.5

Walbro 32 on Solo 210=12.0

Walbro WG8 on Top 80=14.0

Walbro WG8 on H&E 90 & 125 12.5 to 13 *(Thanks Larry Koral)*

**[](https://www.footflyer.com/membrane-carburetors-for-2-stroke-paramotors/walbro1f/)**

*Diagrams courtesy tech.flygsw.org*

**[](https://www.footflyer.com/membrane-carburetors-for-2-stroke-paramotors/walbro1e/)**

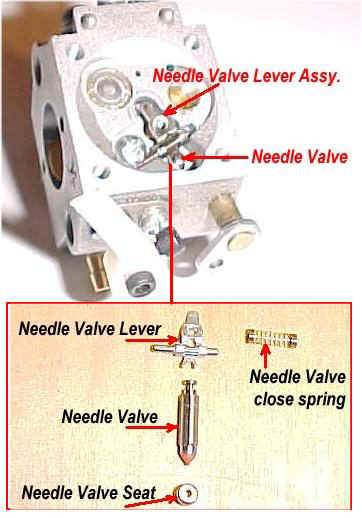
*This carb is equipped with a high speed check valve and external fuel pump pulse inlet.*

Typical Walbro Problems

They’re really quite reliable, but when problems arise, they are frequently one of these.

* The small filter on the fuel-intake side clogs. Clean it out by removing and spraying carb cleaner through in the opposite direction of normal fuel flow. Re-insert using a pencil eraser.
* The float diaphragm degrades and reap havoc on tuning, especially the low end and idle.
* The internal needle valve WILL leak when they get old or worn out. If you notice gas dripping from your carb, or if the idle gets unreliable, replace the needle valve and adjust the lever even with (or slightly below) the carb housing if you don’t have a gauge.
* The fuel pump membrane gets stretched and/or sometimes hardens from the gas. It needs to be replaced occasionally. If your pump doesn’t pump properly, (1) it will be hard to start  (2) it will tend to run lean, and opening the needles won’t help much if any.
* Erratic idle, or no idle is often traced to a bad internal needle valve, bad float diaphragm, bad pump, and most common… crap in the carb. You may also have an air leak!
* The pop-off pressure is out of the normal range. About 12 PSI is normal. Pop off pressure is how much pressure is required to pop the main-jet needle off of its seat. The fuel pump pushes fuel against a spring. Either having the wrong spring, a cut spring or stretched spring can affect this pressure.

All Walbro carbs will run in any position, but they tune “best” as a side draft carb meaning the airflow intake is horizontal. The down draft position tends to run a little rich at idle, and the updraft tends to run a little lean at idle although it’s easily tuned regardless.

**[](https://www.footflyer.com/membrane-carburetors-for-2-stroke-paramotors/walbro1h/)**

Fuel Pulse

Your ENGINE will determine which pulse inlet type you need. If the engine carb mounting surface has a hole drilled into the crankcase you will use the STANDARD pulse port and the optional (if you have it) port ***must be closed off***. If there’s no hole drilled, you will find a fitting located somewhere on your crankcase. Use a piece of fuel line to connect the crankcase fitting to the fitting on the optional pulse inlet. There’s no need to block off the standard port, as it’s already blocked off by the engine mounting.

*The carb must get a pulse signal from the engine!* This signal “pushes and pulls” on the pump diaphragm which feeds the carb fuel.

Float, Needle & Seat Setting

This critical setting is the primary way to adjust mixture on some Walbro carbs such as the WG8 used on Top 80 motors. Apparently Walbro offers a *setting gauge*to properly set the height of the lever for each model. Without that gauge you’ll have to use trial & error which is a pain since you must open up the carb for each adjustment. In general, the lever will be parallel to the carb base. If the lever is too high, the mixture will be rich, too low and it will idle ok but be lean at midrange and above. It may also run the float cavity dry at full throttle and die, regardless of your highspeed / lowspeed needle settings.

The needle valve seat is pressed into the carb base. Don’t remove it without having the correct tools and setting gauges.

Troubleshooting

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| **Problem** | **Possible Fix** |
| The engine stalls when accelerated | Highend needle way too lean, or lowend needle slightly lean |
| Four strokes as fast idle, mid RPM | Lowend needle too rich, float diaphragm needle lever slightly too high |
| Engine goes lean in flight | Highend needle slightly lean AND lowend needle is rich, float needle lever may be set  too low |
| Engine goes rich in flight | This is a special problem with cowled in engines — the float diaphragm cover vent will need work (SEE NOTE 1) |
| Engine runs good, but no idle at all | There’s crap in the idle jets, the carb will have to be removed and cleaned. You may also have an air leak at the base of the carb. The throttle butterfly could be damaged or worn out. |
| carb leaks fuel when not running | Float needle is bad or has crap stuck in it, or the float lever setting may be too high, or the float diaphragm is bad. |
| My engine four cycles momentarily when I back off the throttle, then runs normal | This is perfectly normal for carbs NOT equipped with a “check valve” highspeed jet. If you do have the check valve, then your float needle setting is slightly too high, or your float needle is leaking a little.(SEE NOTE 2) |
| the fuel leaks back into the gas tank when it isn’t running | Bad fuel pump membrane, or an air leak in the fuel line at the carb |

NOTE 1:

Cowled engines may suffer from air pressure changes in flight causing changes to the “natural” pressure on the float diaphragm making the engine run rich in flight. There are several possible fixes available. Most of the time you can simply tune your engine for flight by trial & error. However, the easiest fix is to open up the cowling around the carb area to lower the air pressure. You may also rotate the cover to different positions to see if that works. The “BEST” fix is to solder a piece of brass tubing where the vent is, and route the vent line to a better location. I normally route it into the fuse going through the firewall. It works perfectly every time! Plus, your ground tune doesn’t change in flight!

NOTE 2

Carbs equipped with the highspeed check valve are greatly superior for flying aerobatics, or flying whereby the throttle will be used extensively. The check valve prevents jet dripping when you back off the throttle. That’s all it does…  
Straight through (non-check valved) jets always drip a little fuel while the throttle is being backed off, and causes a momentary four stroking of the engine until the jet stabilizes to the new air flow rate. This is completely normal.