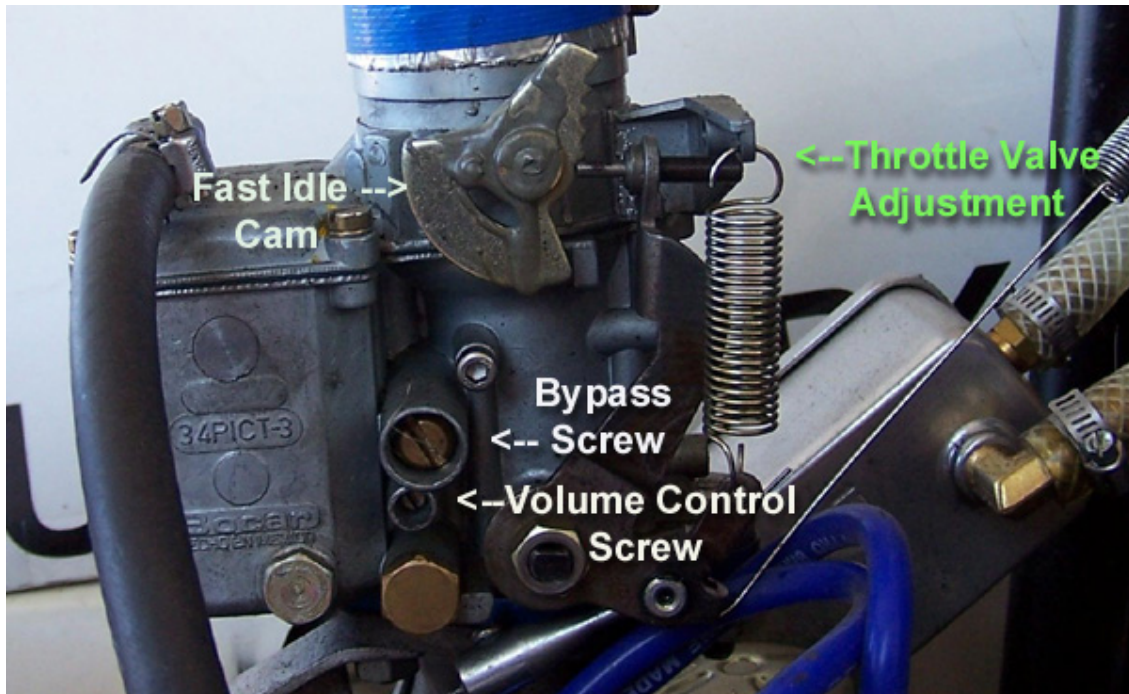


Tuning the Formula First Carburetor

Those of us who have been working with and tuning the good old Formula Vee carburetor for years may be a bit confused by the Formula First carb. Our first weekend or two with the First engine featured some hard starting and odd idling. As we learned about the carb over the rest of the season we got the First carb to run the engine quite nicely.

What's with all the adjustment screws?



On the First carb you have lots more adjustment screws than on the old FV carb. There is a *throttle valve adjustment* screw at the end of the long arm attached to the throttle pivot. There is a large adjustment screw called the *bypass screw* and a smaller screw called the *volume control screw*.

Idle air through the carb is controlled by both the *throttle valve adjustment* screw and the *bypass screw*. The carb is designed for the throttle valve to be set at a specific spot, which is basically closed. The *bypass screw* then does great job of finely adjusting the idle air, and therefore the idle speed. The *volume control screw* adjusts the fuel mixture for the idle air.

The normal mistake to make with this carb is to try to adjust the idle speed with the *throttle valve adjustment screw*. If you open the throttle valve very far you're not allowing the majority of the idle air to go through the bypass circuit in the carb. It doesn't do a good job of mixing fuel in this situation and the idle quality will be poor.

Adjustment Procedure:

1) Start adjusting the carb by warming the engine. You should do a complete adjustment in the shop at first to get it as close as possible. Repeat the procedure at the track after coming in for a session to get it just right.

2) Your race prepared carb will have the choke shaft and butterfly removed. It should still have the fast idle cam, or some kind of substitute, attached to the side of the carb. If it doesn't, find the cam and come up with a way to fasten it to the carb in the stock position. If you don't have the cam, fabricate some kind of substitute piece. It won't be hard. A couple of washers should work just fine. This piece doesn't have to be done with precision, you just need a spot for the *throttle valve adjustment screw* to push against.

3) Adjust the *screw* until the throttle is fully closed. Back off the *adjustment screw* a bit to see that it no longer contacts the fast idle cam.

4) Turn it back in to just contact the cam. Turn it in just one quarter turn further. This just barely cracks the throttle valve open.

5) Next, close the *volume control screw* until it gently bottoms out. Open it up 2 and ½ turns to provide a starting point for the adjustment.

6) Start the motor and adjust the *bypass screw* to get a decent but quick idle. With the cam we use in the First motors you'll need to set it above 1500rpm to start with.

7) Now adjust the *volume control screw* to get the fastest idle. You'll probably have to open the *screw* to achieve this. Turn it back in until the idle just starts to drop off.

8) Go back to the *bypass screw* and set the idle down to where you want it.

9) Fine adjust the *volume screw* again. Adjust for the fastest idle then back in until the idle just starts to drop.

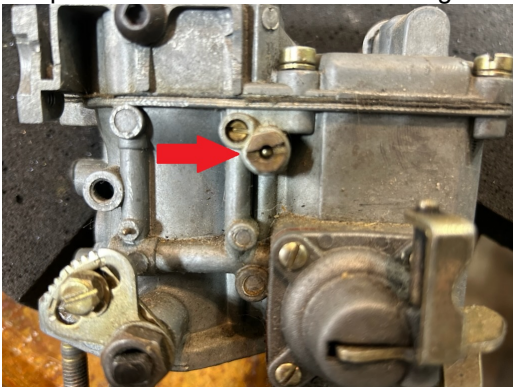
10) Iterate between the *bypass screw* and the *volume screw* until you have the engine idling where you want it with the mix where you want it.

What if the engine simply won't run with the throttle closed?

It is extremely easy for the fuel passage to the idle circuit to become plugged by debris. If that happens the mix and volume screws will seem to have no impact and the engine will only run if the throttle itself is actually open. If you run into this situation I suggest the following steps:

1) Remove the bypass screw and the volume screw. Spray carb cleaner through both.

2) On the opposite side of the carburetor you will find a fitting that usually has a steel ball pressed into it. Remove the fitting.



- 3) There is a very, very small hole in the end of that fitting. Spray carb cleaner through the hole to make sure it is open. If nothing goes through use a very fine wire to dislodge what's stuck in there followed up by another spray with carb cleaner.



- 4) Put the fitting back in the carb and repeat the idle adjustment procedure.

Using a good fuel filter is very important to avoid getting this really tiny passage clogged. Even with good filters I've seen this passage get plugged up. At least it's very easy to resolve.