

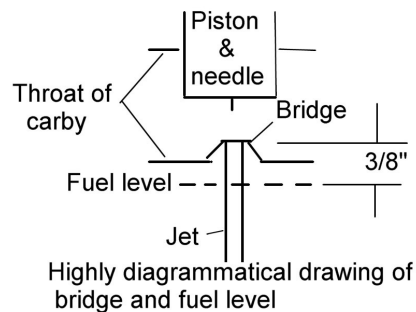
# THE IDIOT'S GUIDE TO TUNING SU CARBURETTERS

There are four distinct phases to tuning SU carburetters (carbies). The first is to set the fuel level in the float bowl, the second is to centre the needle in the jet, but only with fixed needles, not spring loaded ones, the third is to balance twin carbies. This step is not needed with a single carby, and the fourth and last is to set the air / fuel ratio.

I will discuss each phase separately.

## Setting of the fuel level.

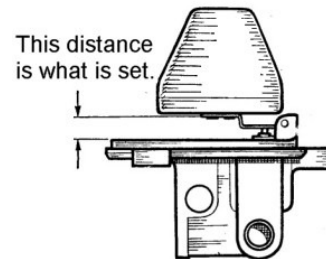
SU's specification for the fuel level in the carby is  $\frac{3}{8}$  inch below the bridge.



The level is adjusted in one of two ways. With the earlier and the latest floats the metal hinge is bent up or down to get the desired fuel level. With the all plastic floats washers are added or subtracted from under the needle valve to raise or lower the fuel level, more washers give a lower fuel level. When bending the hinge, be careful that the float doesn't hit

the inside of the bowl, when assembled.

The manuals say to use a rod of  $\frac{1}{8}$ " diameter between the float and the edge of the cover, when held upside down. SU specifies this gap as anywhere from  $\frac{1}{8}$ " to  $\frac{7}{16}$ ". I have found that  $\frac{1}{8}$ " is too rich and the best way to arrive at this distance is to remove the vacuum chamber and piston, so that you can see the top of the jet. Pull out the choke, so that the jet is  $\frac{3}{8}$ " down. Then adjust the fuel level, in one of the above ways, till the fuel is visible just below or level with the top of the jet. Now measure the gap of the float to the lid, for future reference. On my carbies I have found this to be  $\frac{7}{16}$ ". When the float has been adjusted replace the lid on the float bowl.



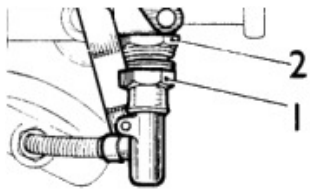
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## Centering the jet

First determine if your jet(s) need centering. To do this, remove the piston dampers and the air cleaners, so you can access the pistons. Now with your finger "flip" the piston up and let it fall back. If it lands with a clunk, the jet is correctly centered. If it doesn't then the jet needs to be centered.

I know of two ways to achieve this.

Remove the vacuum chamber and piston and lower the metering needle, in the piston, by about 2 – 3mm.

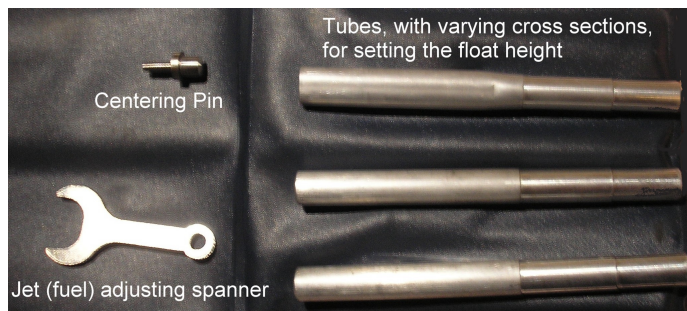


Slacken the jet locking nut, #2. With the jet fully raised, (no choke), reassemble the piston and chamber. The piston should now be slightly up from the bridge, i.e. the needle is sitting tight on the jet. Wiggle the jet assembly a bit to ensure that the needle is down as far as possible. Carefully tighten the locking nut,

return the needle to its correct position in the piston, the shoulder of the needle should be level with the bottom of the piston, and repeat the drop test. You may need to repeat this process, until the drop test is successful.

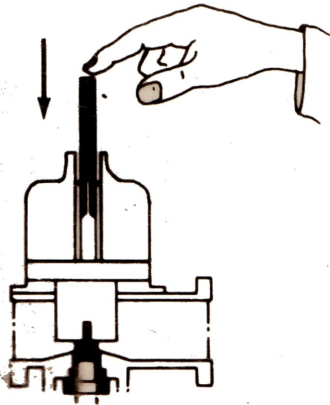
Oh, by the way the locking nut is Whitworth.

The second method is to use the centering pin from the SU tuning tool set.



Rather than labouriously typing the instructions, I will simply copy them from the tool set.

**Centering the jet:** Remove suction chamber with piston and replace the jet needle with the centering pin. Lower (or remove) the jet to the lowest position and slacken the jet locking nut. Refit the chamber and piston, slide the centering pin



into the jet bearing and tighten the locking nut. If the piston cannot be moved with the centering pin in the jet bearing, slacken the locking nut again and repeat the procedure until the centering pin can be moved in and out of the jet bearing. This insures that the jet needle is not touching the jet and that the piston is moving freely in the suction chamber.

I have never used this method, mainly because I couldn't figure out how the centering pin fitted the jet. Duhhhh! I should have read the instructions. The old motto applies:-

“When all else fails, read the manual!”

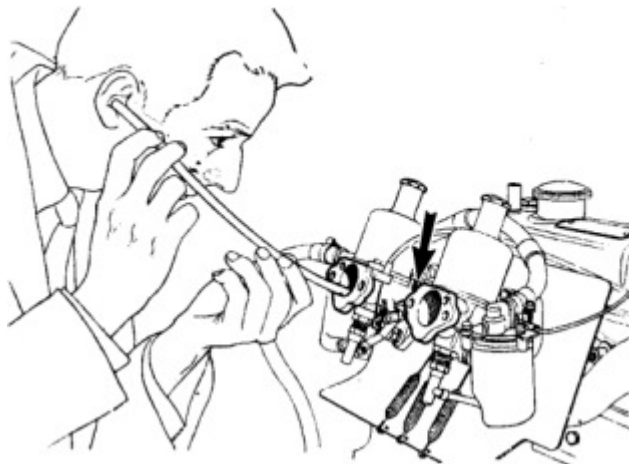
# An Idiot's Guide to tuning SU carbies

## Balancing twin carbies.

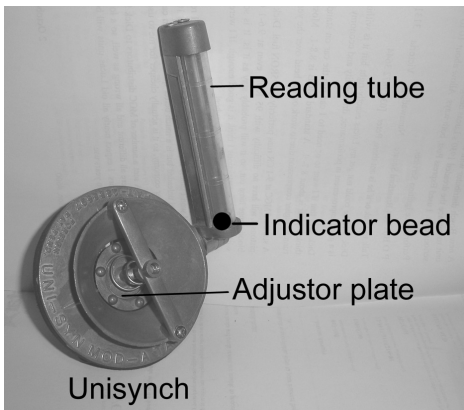
I know of at least four different ways to balance twin (more) carbies. Common with all methods is to loosen the throttle disk linkages between the carbies, so that each can be individually adjusted and remove the air filters.

The first method is probably the simplest, but with unknown accuracy. With the links "disconnected" back off the idle screws and ensure that all throttle disks are fully closed, then tighten up the linkages. I told you it was simple. Reset the idle speed by turning each idle control screw till the desired revs are reached. Note that both idle screws need to be adjusted, the same amount.

The second method is to start the engine, allow to reach operating temperature and use a small hose to listen to the suction hiss of each carbie and adjust the individual idle screws until both carbies sound the same. Good one for us oldies with compromised hearing.



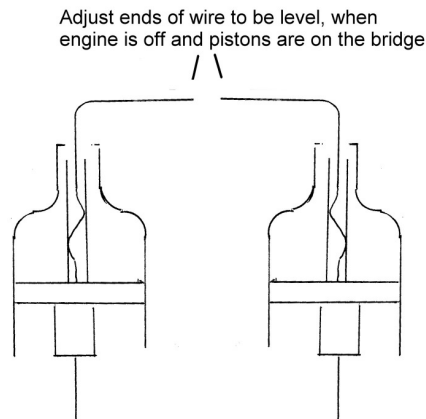
The third method is to use a device called a Unisync, which is basically an air flow meter.



How this device works is that you tightly hold it against the input throat of one of the carbies, adjust the “adjustor” plate until the indicator bead is about half way up the reading tube. Then you place it against the other carbie and adjust the idle screw until the bead is in the same place, up the tube, as on the first carbie. Repeat until both carbies remain at the same setting.

Using an airflow meter is the optimum way to set the carbies. Now if you consider the SU carbie to, inherently, be an air flow meter, after all it's job is to meter fuel into the engine, depending on the amount of air being inducted, then the fourth method becomes ideal. To my way of thinking it is one of the cheapest, most accurate and hence the best way to balance the SU carbies.

Remove the dampers from the dashpots, take two pieces of soft wire (so they don't scratch the insides) bend them, as shown, the zig zag part is so that they are tight in the tube and don't wiggle about, insert into them into the dashpot tubes and adjust till they are both level, then start the engine and allow it to reach operating temperature. Now you adjust the idle screws on the carbies, till the wire ends are again level. Lock the linkage and Bob's your uncle. You can test the engine over a wide rev range and the ends should remain level.



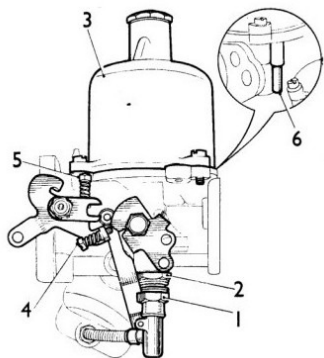
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## Part 4

Herb Adler

OK, now the mechanical side of the carbies is set up, the final step, of setting the air / fuel ratio (AFR) needs to be done. This is achieved by moving the jet up or down, up for leaner, down for richer. I don't have an AFR meter, and assume most of you don't either, so the following is how you can do it without an AFR meter.

To start with you need to remove the air cleaners, vacuum chamber(s) and piston(s).

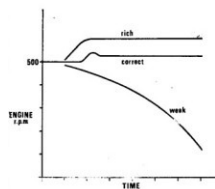


Turn the jet adjusting screw, **1**, until the top of the jet is level with the bridge. This can be determined by using the end of a steel rule, or similar, placed across the top of the jet and bridge. Now mark the adjusting screw and the carb body, to have a starting reference. I have a little bottle of white appliance touch up acrylic paint, that I use. Do this on all carbies. Now turn the adjusting screw, 12 flats or 2 full turns, to move the jet down. This is where the marking comes in handy, you count the flats

as you turn. Reassemble the piston(s) and vacuum chamber(s), making sure that you don't mix them up, with multiple carbies.

Start the engine and allow it to warm up to operating temperature. Push in the choke.

When you push up on the piston lifting pin, **6**, the engine will increase its revs, because it is rich. The correct mixture point is when the engine speeds up slightly and then drops back in revs. I used to be able to pick this point aurally, but now that my ears aren't what they were I can't, so I use a shop tachometer. A lean mix cause the engine to die.



As you adjust one carb, do it by one flat at a time, and do the same on the other carbs, so that they are in sync. When you have the correct point on the first carb, then lift the piston on the other carbs and fine tune that one. The go back to the first carb and check and adjust, if necessary.

Another method, that I use on my car, is to use a Gunson Colour Tune. This is basically a glass spark plug, that allows one to see the colour of the combustion. Yellow is rich, blue is good and light blue is lean. Colour

Tunes seem to be contrary, these days, with modern fuels. On my car they work great, but on a mate's car they showed yellow all the way to stalling the engine, by being too lean. I used the tacho method instead.

Replace the air cleaner(s) and go for a long hard drive, up and down a freeway. If there is popping from the exhaust, when you take your foot off the accelerator, the engine is a bit too lean. After you get home and the engine has cooled a bit turn the jet adjusting screws down a half flat to slightly richen the mix.

After driving the car for a while remove the spark plugs and check their colour. If they are a biscuit tan then your AFR is correct. White and it is a bit lean and grey to black too rich.

#### References

MGB workshop manuals, Haynes or Bentleys, downloadable from here:-

<http://www.bmcno.org/manuals/MGB%20Workshop%20Manual.pdf>

Tuning S.U. Carburettors, downloadable here:-

[http://mgaguru.com/mgtech/books/pdf/Tuning\\_SU\\_Carburetors.pdf](http://mgaguru.com/mgtech/books/pdf/Tuning_SU_Carburetors.pdf)