Balancing HIF SU Carburettors

By Colin Jones

Not having a go at your technician but I trained many of them when I was at BL who did not really understand the tweaks. The HIF Horizontal Integral Float) is a very sensitive carb with a bi-metalic strip which trims the AFR (Air Fuel Ratio), There are no shortcuts, there are also many things that can cause EXACTLY the problem you have, here are the modifications and adjustments we used to teach, its was 30 years ago though ;-) .

1. Take off the carbs and turn them upside down, mark the lower float bowl plate to carb body position with a felt pen (its possible to mess up the reposition) and remove the 4 screws and washers, remove the lower plate, let the O ring seal dry in air as it may expand.

2. Inspect the bi-metallic strip that holds the jet in position if at room temperature its not perfectly flat discard and replace it, note its used as part of the mixture adjustment and the 'notch' must locate in the mixture screw pin, these can become dislodged.

3. Check the float arm type, early ones were cross (+) section and should be discarded as they distort, use the later (H) section which are much more rigid. Check the float height, this is critical. Look at the float from the side and you will see a U section moulded in the float, the LOWEST part of that U must be level with the aluminium body of the carb when it is held square and upside down and the float is under its own weight. Use a straight edge or a drill shank to check this, a slight difference (+/- 0.025) will mess up all other settings, adjust by bending the float needle brass strip a little at a time.

4. Rebuild the lower portion of the carb and turn to the correct way round.

5. Mark the position of the top vacuum chamber with the felt pen, you cant put these on wrong but it saves messing about later. Remove the 3 screws and carefully lift off the dashpot.

THERE ARE TWO TYPES OF HIF CARBS, THOSE WITH & THOSE WITHOUT ROLLER BEARINGS.

6. In the HIF dashpots that include a twin track ball roller bearing arrangement, this is to stop the piston sticking and should never give a problem, might be worth checking but its maintenance free.

7. If the carbs have been overhauled your just doing belt and braces here but just look for wear marks in the dashpot (should not be any with the bearing system) but give it a clean out anyway. The main reason is I want you to rebuild everything with ENGINE OIL, I know other cringe but thats what SU Butec and BL used in production, playing with oil viscosity is for later, lets just get it running!

8. Before topping the oil centralise the bearing, to do this you rebuild the vacuum chamber and leave the dashpot damper out, put a finger in the venturi and lift the piston to the max lift and drop it, it should clunk with a metallic sound, this indicates a centralised bearing.

9. Now fill with oil, to the bottom of the threaded area. You should have retaining clips on the dashpot damper, lift the piston again (not so high as to burp the oil out) and push the clips on the damper back into place. VERY careful use of a small screwdriver, do not scratch the piston. Screw on the damper.

You can now base set the carb, turn in the mixture screw (on HIF's the screw is IN to richen, OUT to weaken) and then back it off two and a half turns.

WITH THE IGNITION TIMING SET, start the car and allow to warm, turn in the mixture screw a quarter of a turn (its + section so thats easy) until the engine revs fall,

now back out a quarter of a turn at a time until the revs increase, stabilise and then fall again, from this position go IN one full turn. The mixture is now at the factory set.

For emissions you leave it just above the rpm drop off on the weak side, for performance its just above the rpm drop off on the rich side.

THIS is now critical, when carrying out any adjustments to mixture you have 2 minutes, if you can't achieve what you want in that time (its takes practice) you have to increase the rpm to 3000 for 30 seconds. This is because the fuel in the float chamber becomes warm and the bi-metalic strip weakens off the mixture. You set it to compensate and when the cooler fuel arrives the mixture is wrong. This is the main mistake mechanics make until they are taught otherwise! So its a case of tweak, rev and hold, tweak, rev and hold, etc.

A syncrocheck on the balance between carb air volumes, a recheck of mixtures and a look at the exhaust (it should be like a puppies nose, wet and dripping) and many happy hours lie ahead.

Sorry if that's an egg sucking session for your mechanic but I have seen many well qualified people struggle. Set up correctly they give years of trouble free service.

Please let me know what you find and what resulted from the above.

Good luck