Setting up and Tuning SU Carburettors

Tools

- Screwdriver
- Spanner (adjustable)
- Spark plug spanner
- Jet adjusting spanner (early cars)
- Carburettor damper oil
- Length of tube or hose
- Carb Balancer - optional

The SU Carburettor is a simple design proven to be very effective. Often underrated, it offers versatility and reliability due to being analogue and the vast array of needle profiles available. In the right hands they can perform better than early versions of computer controlled systems.

Inside the carburettor is a piston which reacts to the rate of air flow to the engine. Attached to the piston is a tapered needle which alters the amount of fuel delivered as it rises and falls. This combination provides variable amounts of fuel and air to meet engine demand under changing loads. They are simple to adjust, but resist the temptation to fiddle unnecessarily.

Only adjust carburettors when satisfied that the ignition system is working correctly

Check Adjustment by inspecting spark plug electrode and exhaust tailpipe colour, an easy guide to how well the carburettors are adjusted. After an extended run to thoroughly warm the engine, remove each plug in turn and compare the colour of its electrodes.

- Brown/grey colour, engine in tune.
- Black sooty deposits, over-rich fuel/air mixture. Also visible at exhaust tailpipe.
- Very light or damaged, abnormal combustion, lean fuel/air mixture

Carburettor Adjustment is made after running up to operating temperature, disconnecting the linkages and removing air filters. Twin SU's are straightforward to set up, with three main areas of adjustment.

- synchronising the carburettors
- setting the idle speed
- adjusting the mixture

Synchronise by adjusting the idling screws on each carburettor to as low idle speed as possible but fast enough for the engine to run reasonably smoothly. Use a length of rubber tube to listen to the intake 'hiss' from each carburettor and compare the sound. Be consistent about the pipe position. Adjust the idling screws for the same sound at each carburettor. Perfect idle match may not hit the part throttle sweet-spot requiring further subtle adjustment, perhaps using a Carb Balancer.

Set Idle Speed by turning both throttle screws the same amount. Once the desired idle speed is achieved re-check the synchronising.

Adjust the Mixture if spark plug colour reveals a mixture problem. On most models, the jet adjusting nut is clearly visible beneath the body of the carburettor. Tighten the nut up to weaken the mixture and loosen to enrich it. An SU jet adjusting spanner makes the job easier. If the mixture is very badly adjusted tighten the nut up fully then loosen it 12 flats of the nut to set it approximately correct. Then continue!

On an HIF carburettor mixture adjustment is by a cross head screw situated in a recess in the base of the body, On later cars, jet adjustment is controlled by turning a screw on the side of the body. Turning screws clockwise enriches the mixture, anti-clockwise weakens it.

Carburettor Lifting Pins at the side of each carburettor enable checking piston movement. Once synchronised, these pins can be used to check the mixture adjustment. Raise the pin on one carburettor approximately 1/32 in (0.8mm).

- If engine speed increases, mixture too rich. If it immediately falls, mixture too weak.
- If engine speed momentarily rises, then returns to idle, then mixture is correct.

Repeat for second carburettor then re-check both since they are interdependent. Refit linkages and filters. If the exhaust note is irregular with a slight misfire and colourless exhaust, the mixture is too weak. If there is a regular misfire in the exhaust note and a blackish exhaust, the mixture is too rich.

Damper Oil is added by unscrewing the damper caps, withdraw the dampers, top up each reservoir with specified oil to 1/2 in (12mm) above the top of the hollow piston rod. Refit.

Float Chambers contains a float and a needle valve that work like a toilet ball valve. As the level of fuel falls, the needle valve opens to allow in more fuel. If a float sticks or is punctured, fuel continues to enter the chamber to eventually exit the overflow pipe. A needle valve can become blocked or stuck and either, not permit fuel to enter, or fail to shut off. Early versions had side mounted float chambers whereas later versions were integral.

Throttle Discs in some units are fitted with overrun depression limiting valves to clean up exhaust emissions by drawing in more air on overrun. If springs become weak and the valves fail to close properly an erratic tick over with a rising idle speed will result. This is remedied by replacing the valves, solder the valves closed or reverting to earlier discs without overrun depression valves.

Epilogue This essay was prepared after studying information gleaned from internet sources, duly acknowledged. Having no experience with the subject matter, it is open to interpretation.

Ramon

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