

# IN THE WORKSHOP

Trials and tribulations with a Solex Carburettor.

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My 12/50 had of recent times developed a curious phenomenon. Very occasionally, probably only once in a day's driving, it would 'spit', for want of a better term, through the exhaust. It was not a misfire, or backfire, and there was no apparent loss of power associated with it. It was usually only momentary, but sometimes may have lasted for two or three engine cycles. There was no identifiable pattern to its occurrence, being a completely random event, sometimes happening while accelerating in an intermediate gear, sometimes when accelerating in 4<sup>th</sup> and sometimes during a steady cruise on a level road.

Mechanically, the engine is in excellent condition, and in any event the only engine-related thing that could possibly cause it would be a valve sticking occasionally, and after having a good look at stem to guide clearances this was ruled out as highly unlikely.

The chances of the ignition system causing this type of fault were considered remote, as it was not a misfire, nevertheless, the magneto, and indeed all components of the ignition system were checked and given a clean bill of health.

That left the carburettor, which on this early subframe 12/50 is a 35 mm barrel-throttle Solex, a size larger than the standard 30 mm Solex. The carburettor was dismantled and other than the usual slight wear in the rotating barrel, found to be perfectly clean and with nothing apparent that would cause the problem. The choke tube, however was incorrect, having come from a MV Solex with conventional disc throttle. The barrel throttle choke tube differs in that it is square ended where it fits against an abutment of the throttle barrel housing, and not tapered as in the MV carburettor. This, while probably not ideal in terms of efficiency, would certainly not cause an intermittent fault.

While this problem was not thought to be serious, it was nevertheless frustrating, as clearly there was something amiss. Interestingly the previous owner, Mike Williams had reported that he had experienced similar occurrences during his ownership. After consultation with other 12/50 owners the consensus was that the main jet was too small, resulting in the jet carrier being depleted of fuel causing a lean mixture. He reported that enlarging the main jet cured the problem though I rather think this was a coincidence, as the only time the jet carrier contains fuel is when the throttle is closed, and the auxiliary jet is in operation. The main jet had been re drilled, and it was difficult to measure its size accurately, but it was close to 130. (Solex jet sizes are expressed in hundredths of a millimetre). Now it's never a good idea to alter jets, as the flow characteristics of a jet are dictated by a number of factors other than just the orifice diameter; the bore length and bore surface finish as well as the entry and exit tapers all influence how much fuel will flow through a jet at any given airflow velocity through the choke tube.



Altering a jet by drilling or reaming will change the flow characteristics and may cause a jet to have a very unpredictable flow curve relative to intake air speed.

So to try and cure the problem, I firstly installed a new 130 main jet. The engine response was slightly different, and it sounded different, but it was hard to say where the difference lay, it was just... different, and the fault was still there. As the choke tube was the incorrect type for the barrel throttle carburettor, and had been opened out to 24.5 mm, I fitted a correct type, with a 24 mm bore. The smaller choke tube caused the mixture to become even richer so it simply used more fuel, and was now obviously far too rich, and the fault was still there, and if anything, slightly more pronounced. The next attempt was to drop the main jet size to 120. The result of this was very noticeable. While there was not any apparent increase in power, the engine was just smoother and more responsive right across the rev range, and for some reason even the idling was smoother. I thought I was at last getting somewhere but... it happened again, this time though it was almost imperceptible.

On my way home after an outing I stopped to refuel. For those not acquainted with the Alvis 12/50, the fuel tank is under the scuttle, and refuelling entails opening the bonnet to gain access to the filler which is very conveniently mounted directly above the exhaust manifold; fairly thought provoking when dispensing fuel with an auto-ignition temperature of around 260°C directly above extremely hot engine components! Anyway, while I was refuelling I noticed what I first thought was oil on the crankcase below the carburettor. Then I realised it was not oil, but fuel, and there was quite a lot of it. There was also fuel on the side of the bonnet and the bonnet board, and it dawned on me what the cause of the problem could foreseeably be. The carburettor needle and seat, though normally quite reliable, has on occasion leaked, but for obvious reasons, I've only noticed this when I'm not in the car. What if it was occurring when driving? The mixture would obviously get very rich and could quite feasibly create the symptoms I had been experiencing.

Not having a spare Solex needle and seat to hand at the moment, I decided I would attempt to make one. Years ago I got hold of a Viton tipped needle and seat with the intention of using it in a Carter carburettor fitted to a 1928 Chrysler Imperial, but never got around to doing it. The Viton needle is much shorter than the Solex one, but after making some measurements I decided I could make a new seat housing on the lines of the Solex original, but with a lowered seat height, and use the Viton needle. Machining a new brass housing was quite straightforward, and the needle just needed having a groove cut into it for a retention clip. The upper photograph shows the components of the new needle and seat before assembly, and the lower photograph shows it alongside the Solex original.

The outcome – well as a needle and seat it functions perfectly, and as a bonus If I do forget to turn off the fuel at the end of a day's driving, it is probably of no consequence as it almost certainly will not leak. Has it cured the problem? well it has not occurred again, so I am quite sanguine that it has, but is early days and it may just be coincidental.