

Twin Cam – Poor choke operation, worsened by Ethanol

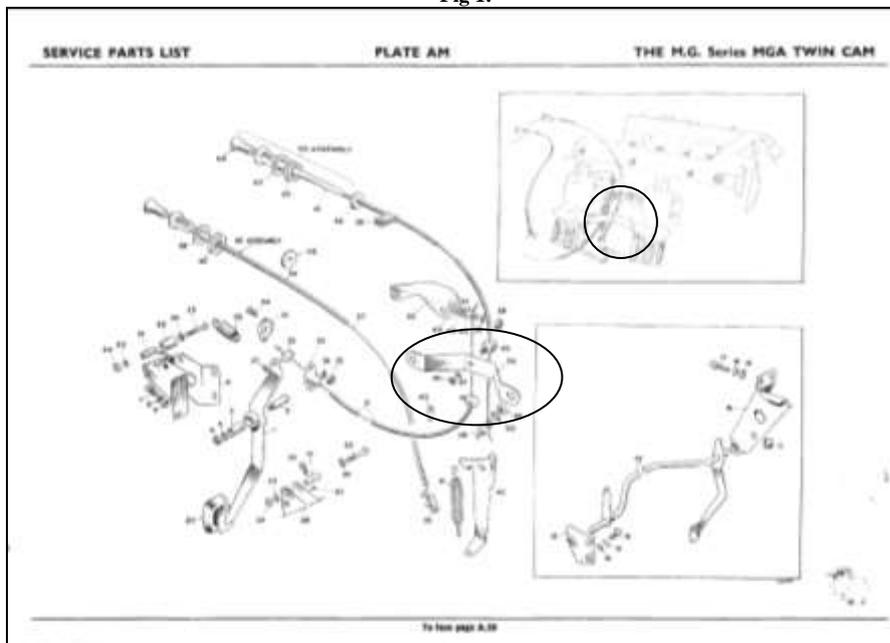
By Colin Manley

Published in “Safety fast!” November 2013

The very first cold start had always been a pig, with three or four long pulls on the Starter before spluttering up. It has got worse with Ethanol fuel. In really cold winter weather it was proportionally worse. Once started for just a few seconds and switched off, starting was great. Timing was spot on, fuel pumped merrily and electronic ignition gave a good spark. The choke knob would pull so far, then get hard, just as the choke levers were moving. A real hard pull was then needed. Looking at the choke operation whilst someone pulled the choke knob, showed how badly the ‘angle of attack’ of the choke inner cable was in relation to the direction it needed to pull the choke levers.

The choke cable enters an Abutment (ACH5112) secured to a Bracket (AHH5828) that is itself fastened to the carburettors using the air filter bolts. The bracket is not symmetrical and the abutment mounting hole is further off centre. (Refer oval in Fig 1.)

Fig 1.



The bracket was originally fitted in the orientation as shown in the SPL, Plate AM, with the hole for the abutment closest to the rear carburettor. (Refer circle in Fig 1.)

In reality, when the choke was operated and the cable ‘pulls up’, the front carburettor choke lever scribed an arc whilst moving vertically up to the abutment. At a certain point, further arc travel became impossible due to the vertical pull of the cable, long before full choke was achieved. This also exerted a side pull action on the lever making the jet tight. The 2 different jet levers appeared to be fitted to the correct carburettor, but no way were they being operated fully.

If the choke cable was presented in such a way as to pull in the same plane as the choke levers needed to move, operation would be corrected. Looking at the Bracket it became apparent that if it were rotated 180 degrees, the abutment would move closer to the front carburettor, enabling further arc travel and thus, operation of the choke on the front carburettor whilst not impeding the choke operation of the rear carburettor. The cable presentation angle would also be corrected. 5 minutes later, the bracket was rotated - the choke operation is now so smooth and full choke operation is easy. Now, just a pull on the starter results in an instant start with hardly any turning over of the engine at all.

Fig 2.

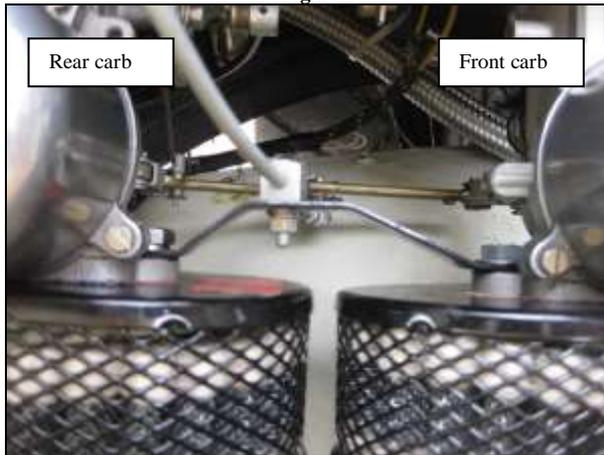


Figure 2 shows the choke cable bracket as originally fitted, supposedly correctly. This prevented full choke operation and also put a side load on the front carburettor jet preventing smooth needle movement. Hence the splutter on start up as only one carburettor was on choke and the other carburettor, the needle was tight due to the side load being applied to the jet.

Fig 3.

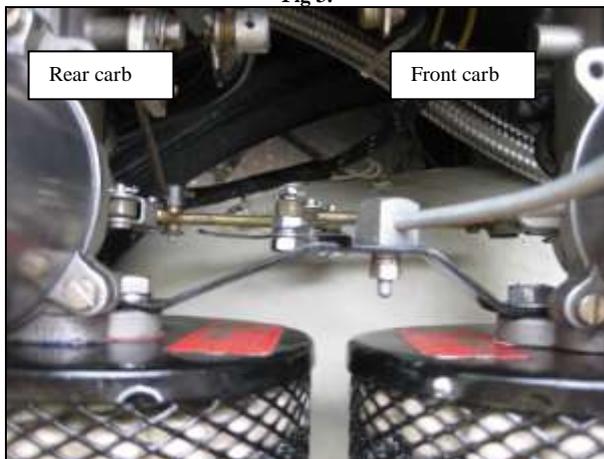


Figure 3 shows the choke cable bracket once rotated and the abutment now presenting the cable correctly. The front carburettor lever now pulls up fully, its arc of travel takes it towards the abutment. There is no side load applied to the jet and needle movement is free.

Fig 4.

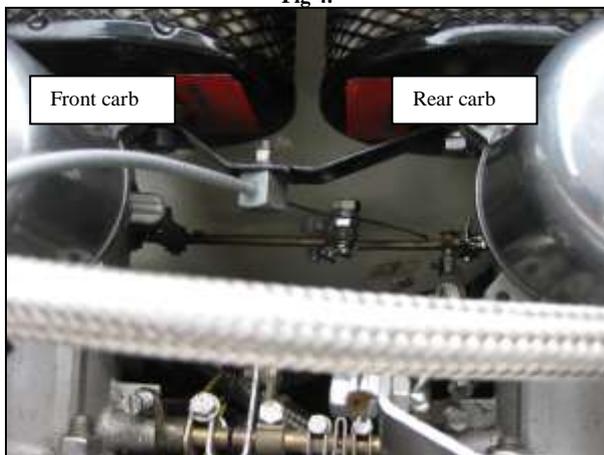


Figure 4 (taken from the other side of the engine) shows the angle of the choke cable now, with the abutment closer to the front carburettor. A final improvement will be to mount the abutment slightly further to the right (as viewed) – almost dead centre of the air filters, to give an absolutely ‘parallel pull’.

So there are a number of factors;

The original angle of the choke cable was not perfect, but on non Ethanol fuel was sufficient for a cold choke start. Ethanol in fuel has affected the fuel burn and the combination of Ethanol fuel with a poor choke operation (i.e. not full choke) as a result of poor directional alignment of the cable caused the bad cold start.

Another Twin Cam owner had started to experience similar choke starting problems and has also rotated the bracket and now has first time starting.