WEBER CARBURETOR, CONCLUSION

by Tom Dill

A Guide to Choke Tube Selection

4 cylinder engine, with an inlet port per cylinder. (Push rod valve operated engines in production touring or sports cars e.g. Volvo, Morgan).

STATE OF TUNE OF ENGINE

Capacity Per Cylinder in cc's	Standard Choke size in mm	High Performance. Choke Size in mm	Competition Choke Size in mm	Carburetor/s
200			27	38 DCOE X2
250	27	28	30	38 DCOE X2
	27	28	30	40 DCOE X2
300	27	29	31	40 DCOE X2
350	29	31	33	40 DCOE X2
400	30	33	36	40 DCOE X2
	30	32	35	42 DCOE X2
450	32	34	36	40 DCOE X2

Secondary or Auxiliary Venturi

Secondary venturies are supplied in the following sizes 3.0, 3.5, 4.0, 4.5, 5.0 depending on the various model DCOE and IDA carburetors. These sizes relate to the cross feed hole which delivers fuel from the main jet assembly. The feed hole is rectangular in shape having a radiused edge at feed end and tapered slightly towards the delivery point in the venturi proper.

Small secondary venturies (3.5) should be used where a large choke tube has been selected in relation to the cylinder capacity.

Main Jet, Emulsion Tube, Air correction jet Assembly.

This assembly screws into a fuel well having three delivery points.

1) Bottom - inlet hole through which the main jet draws fuel from the Float chamber.
2) Top - Air inlet through which the air correction jet supplies air to the emulsion tube.
3) Side - mixed or emulsified fuel and air outlet to the secondary or auxiliary venturi.

Function

When the air flow through the secondary venturi is of sufficient velocity fuel is drawn from the annular space in the emulsion tube well. This space can be varied by the use of emulsion tubes having the same number, size and disposition of holes but of different diameters e.g. F2 and F15; F3 and F7. Therefore to obtain a large initial flow of fuel a small diameter emulsion tube should be used. As the fuel level drops in the well, the main jet replaces it up towards its normal level subject to the volume of fuel being drawn from the emulsion tube well by the secondary venturi. The rate of fuel drawn from the emulsion tube well is governed by the air speed through the secondary venturi and this speed varies according to the engine demands, consequently as the fuel level drops, it uncovers the correction holes in the emulsion tube, resulting in a corrected mixture. So it will be seen that a number of factors control the delivery of fuel to the engine.

1) Size of the secondary Venturi.
2) Diameter of the emulsion tube.
3) Size of the main jet.
4) Size of the air correction jet.
5) Number and disposition of air bleed holes in the emulsion tube.

Dealing with above items 1 and 2 have alrady been discussed, Item 3 the main jet, usually can be calculated, as a good starting point by multiplying the choke tube size by 4 e.g. 30 choke tube multipled by 4 equals a 120 main jet.

Item 4, the air correction jet size, does not have a simple formula as the main jet. It can be classified in three basic groups.

a) Standard and high performance engines using DCOE carburettors, (but not siamese ported 4 cylinder engines) the air correction jet size is usually the main jet size plus 60 e.g. 120 main gives a 180 air correction jet.

b) DCOE carburettors used on racing engines, the air correction can be as suggested in a) or the same size as the main jet (this is usually the case when large choke tubes are used in relation to cylinder capacity and carburettor size) e.g. 2.5 litre 4 cylinder Coventry Climax engine 58 DCO 3 carburettors 47mm chokes 200 main jets and 200 air correction jets.

c) IDA carburettors only on competition vehicles, the air correction jet is usually the main jet size minus 50 to 60. A 170 main uses a 110 to 120 air correction jet.

Accelerator Pump - Power Circuit

The pump circuit is made up by several parts, listed below are the items in order of their operation.

1) Intake valve.
2) Pump well.
3) Pump rod, spring and piston assembly.
4) Exhaust orifice.
5) Pump jet.
6) High speed power device.

1) Intake valve, this is found in the bottom of the float chamber between the "jet block" and the pump well. The valve incorporates the exhaust orifice 4) which shall be explained later. The intake valve is a fixed size and therefore is not necessary to consider when tuning is being carried out; its function is to allow fuel to pass into the pump well.

2) Pump well is a fixed size store for the pump jet, but is metered by two units, the pump rod and the exhaust orifice.
3) Pump rod, spring and piston assembly, the pump rod governs the amount of fuel in the pump well. The DCOE model carburettor has varying lengths of rods available to change this volume factor while the IDA unit can be changed by the use of a collar on thepump rod to shorten its stroke. Piston spring, the speed of thrust of the pump piston can be altered by the use of springs of different pressures.
4) Exhaust orifice the feature of this unit is to control the amount of fuel at the disposal of the pump jet. Consequently there are varying sizes of this unit starting with the "closed" or type with no exhaust orifice which gives the pump jet all the fuel available in the pump well to the pump jet, whereas the others exhaust an amount in accord with their size back into the float chamber.
5) Pump jet, this does exactly as the name suggests, and that is to meter the amount of fuel available from the pump well or govern the volume and time of flow of fuel.
6) High speed power device, in the DCOE and IDA carburettors the pump jet also acts as a high speed power device. When the depression in the carburettor bodies or throats becomes great enough, the ball and rod weight is lifted off its seat in the DCOE and a ball check valve in the IDA and fuel bleeds into the system via the pump jets.

For assistance in the selection of the pump circuit parts, refer to the table listing Weber Set Setting List.

WEBER SET SETTING LIST - SUGGESTIONS ONLY

Ford English

Make	Engine Details	Carb/s	Choke	Sec. Ven.	Main Emul.	Air	Idle	Pump	Inlet Valve With Exh	Ram Tubes	Throttle Lever	Air Cleaner
105E	997cc Full comp.	2 x 40 DCOE	30	4.5	115 F 16	180	40 F9	35	Closed	52840.024	45034.042	CCL 40 or TK 2050
109E	1098cc Full comp.	2 x 40 DCOE	33	4.5	125 F 16	165	45 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
113E	1340cc Full comp.	2 x 40 DCOE	34	4.5	130 F 16	170	45 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
116E	1498cc Full comp.	2 x 40 DCOE	36	4.5	135 F 16	165	50 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
122E	1498cc G.T. Cortina Standard	2 x 40 DCOE	32	4.5	125 F 16	170	45 F9	35	Closed	52840.024	45034.042	CCL 40 or Tk 2050
122E	1598cc Full comp. (1498cc Bored out)	2 x 42 DCOE	35	4.5	135 F 16	165	50 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
122E	1650cc Full comp. (1498 cc Bored out)	2 x 42 DCOE	36	4.5	135 F 16	160	50 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
122E	1498 cc Full comp	2 x 42 DCOE	35	4.5	135 F 16	170	50 F9	40	Closed	52840.024	45034.042	CCL 40 or TK 2050
Cross Flow Head	1600cc Mild Cam	2 x 40 DCOE	32	4.5	120 F 16	180	50 F9	40	50	52840.024	45034.042	CCL 40 or TK 2050

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