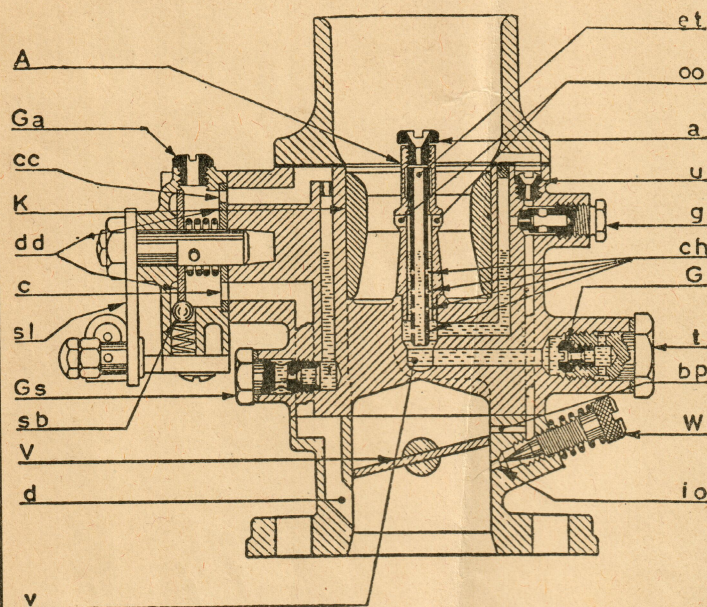


DOWN-DRAUGHT MODELS 26 AIC AND FAI



CROSS-SECTION OF 26 AIC AND FAI MODELS

BI-STARTER: Ga, Starter air jet. d, Starter mixture-delivery duct. cc, Starter valve duct. dd, Spring-loaded disc valves. c, Starter mixture-exit duct. sl, Starter lever. Gs, Starter petrol jet. sb, Spring ball (bi-starter position).

MAIN CARBURETTOR: A, Spraying well. a, Air-correction jet. et, Emulsion tube. oo, Spraying orifices. u, Pilot jet air-bleed. g, Pilot jet. ch, Emulsion holes. G, Main jet. t, Main-jet holder. K, Choke tube. bp, By-pass. W, Volume-control screw. io, Idling moisture orifice. V, Throttle butterfly. v, Reserve well.

Solex carburettor models 26 AIC and FAI (30, 35 and 40 mm.) are of the down-draught, self-starting type.

BI-STARTER

The Solex "Bi-starter" unit is a small auxiliary carburettor integral with the main carburettor to ensure easy starting from cold and to assist "get-away" until the engine is warm enough to function satisfactorily without its aid.

To start the engine when cold, the dashboard control to which the bi-starter lever is connected should be pulled out fully, thus rotating the disc valves (dd) until the hole (cc) registers with the duct leading to the starter petrol jet (Gs). Turning the engine produces a suction which lifts the petrol from the duct into the mixing chamber immediately behind the valve disc (cc). Here it meets the high-velocity air stream entering the mixing chamber via the air jet (Ga), so that a very rich mixture is drawn into the cylinders.

Almost immediately after starting the dashboard control should be pushed in to the "bi-starter" position, i.e. approximately half-way, when a marked resistance will be felt indicating that the control position has been reached as determined by the location of the spring ball (sb) in a notch in the rotating valve-disc (dd). At this stage the mixture strength is considerably reduced, for the volume of air inspired by the engine increases proportionately with the rise

in engine speed as it continues to warm up, whilst the petrol supply is restricted. Without any possibility of "overdosing," the mixture strength is thus sufficient to ensure immediate "get-away" without risk of the engine stalling as the foot pedal is depressed. As soon as the engine is warm enough the dashboard control must be pushed fully home, thus putting the starting device completely out of action.

MAIN CARBURETTOR

Normal Running.—For normal running above idling speed the engine is provided with the correct mixture for all speeds by the main spraying assembly.

Petrol from the float chamber passes through the main jet (G) into the spraying well (A) via the reserve well (v) where it meets air drawn downwards via the calibrated air-correction jet (a). This air passes out through the emulsion holes (ch) into the annulus, where an emulsion is formed with the petrol, and the resultant mixture rises to the four spraying orifices, of which two are shown (oo) in the waist of the choke tube (K). Here the emulsion is absorbed by the main air current and passes down to the induction pipe of the engine via the butterfly throttle (V).

Slow Running (Idling).—The idling is effected by petrol drawn from the reserve well (v) via a small channel. This petrol passes through the pilot jet (g) into the downwardly disposed tract communicating with the idling orifice (io) on the engine or suctional side of the throttle butterfly. The idling orifice is controlled by the spring-loaded and knurled-headed taper screw (W). A branch lead communicates with another orifice (bp) which enters the air-way slightly on the atmospheric side of the almost closed throttle. When the throttle is in the idling position, this by-pass duct (bp) acts as an air-bleed upon the idling petrol supply and therefore prevents over-richness when the engine is actually idling. Directly the throttle opens, the butterfly passes to the atmospheric side of the by-pass orifice, so that both (bp) and (io) function as petrol-delivery orifices, thereby proportionately enriching the output at the transfer position between the pilot and main supplies and preventing lean flat-spot which might otherwise occur.

ADJUSTMENTS

Bi-starter.—If an instant start is not forthcoming (and the fault is not due to other causes, such as lack of petrol, faulty plugs, low battery, etc.), remove and clean the Gs starter petrol jet. Blow through it with compressed air or a cycle pump—do not probe with a pin.

Idling Adjustment.—This adjustment is of considerable importance, and depends upon the mechanical perfection of the engine. Compressions should be equal, ignition in good order, and the induction system free from air leaks. The throttle "pull-off" spring must pull the throttle back to its stop, i.e. closed position, and all nuts, screws, etc., used in the assembly of the carburettor must be tight. Note particularly that the volume-control screw (W) has not been broken or distorted by over-tightening. If it has, a new screw must be obtained.

Normal adjustment is carried out with the engine hot, as follows:

- (1) Set the throttle-adjustment screw until the idling speed is on the high side.
- (2) Slacken the volume-control screw (W) until the engine begins to hunt.
- (3) Screw it in very gradually until the hunting just disappears.
- (4) If the engine speed is too high, reset the throttle-adjustment screw to slow it down to idling speed of about 500 r.p.m.
- (5) This may cause a resumption of slight hunting. If so, then turn the volume-control screw gently in a clockwise direction until the idling is perfect.

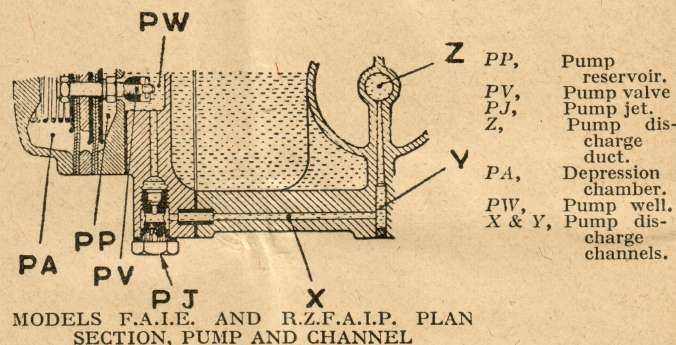
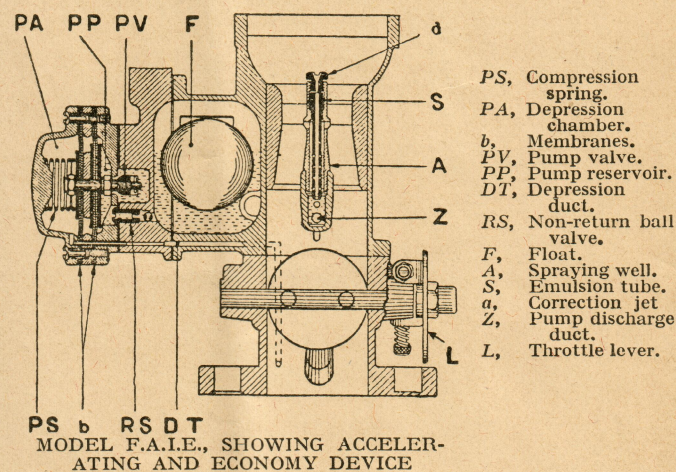
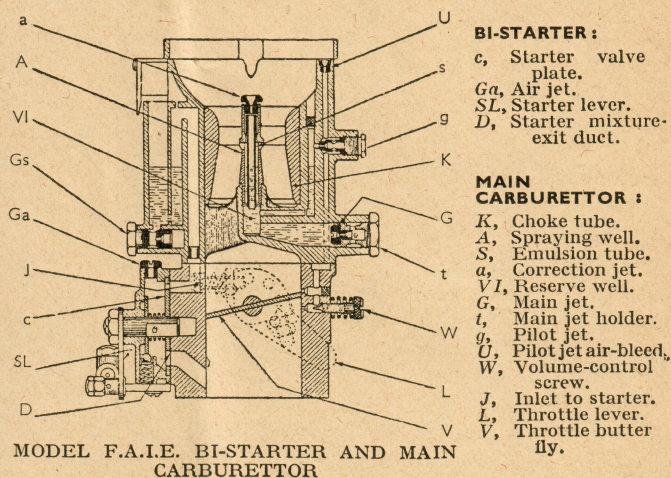
Detecting and Remedying Defects.—The carburettor should be kept in good condition. To clean it, remove the jets and blow through the channels with compressed air or a cycle pump. Make sure that all the assembly screws are tight. See that there is no side-play in the throttle spindle.

Do not forget to check and adjust, if necessary, the ignition. Plugs and valve timing are two factors which play a considerable part in the performance of an engine.

The pilot jet (g), main jet (G), starter air jet (Ga) and starter petrol jet (Gs) are all accessible from the exterior without dismantling the carburettor. Access to the air-correction jet (a) and pilot jet air-bleed (u) is obtained by removing the slot-headed screws that secure the top casting to the remainder of the carburettor.

TUNING SOLEX CARBURETTOR

DOWN-DRAUGHT MODELS F.A.I.E. AND R.Z.F.A.I.P.



The Solex down-draught, model F.A.I.E. carburettor, has the Solex Bi-starter system, and also incorporates an accelerating and economising device. The main carburettor idling and starting systems are similar in operation to the FAI and AIC carburettors, described previously.

The R.Z.F.A.I.P. model is similar to the F.A.I.E. model, but is fitted with a governor control.

ACCELERATING AND ECONOMY DEVICE

From the diagrams it will be seen that the device is assembled in a chamber having two sections (PP) and (PA). The section (PA) of the chamber is connected by the channel (DT) with the sub-throttle area, and is therefore under depression when the throttle is closed. In such circumstances, the diaphragms are sucked to the left against the thrust pressure of the spring (PS) and petrol passes via the "non-return" valve (RS) into the chamber section (PP), the valve (PV) meanwhile seating itself, and so confining the petrol in the chamber.

On accelerating, the throttle opens, of course, thereby relieving the suction in the channel (DT), and the chamber (PA). The spring then takes charge, thrusting the diaphragms to the right. The valve (PV) opens and the petrol contained in chamber (PP) displaces an equal volume of fuel in the well (PW) which is discharged via the jet (PJ) into the channels (X & Y) emerging at (Z). Releasing the throttle pedal, or partially so, allows the throttle to close, creating suction in the chamber (PA) so preparing the way for another discharge of petrol from (PP) when it is desired to accelerate.

Having fulfilled its duty in supplying auxiliary petrol output for acceleration, petrol is free to flow at full throttle from the float chamber to the reservoir and pump well (PP & PW), and via jet (PJ), to (X, Y and Z).

At full-throttle opening the combined delivery output of both main (G) and pump jet (PJ) affords a supply of petrol for maximum power, but until the predetermined point at which jet (PJ) commences to function as a supplementary static discharge orifice, only main jet (G) is in action. Whilst, therefore, the function of jet (PJ) is twofold in supplying extra petrol for acceleration and maximum speed, its operation permits the use of a much smaller main jet (G) than would be possible otherwise.

ADJUSTMENT

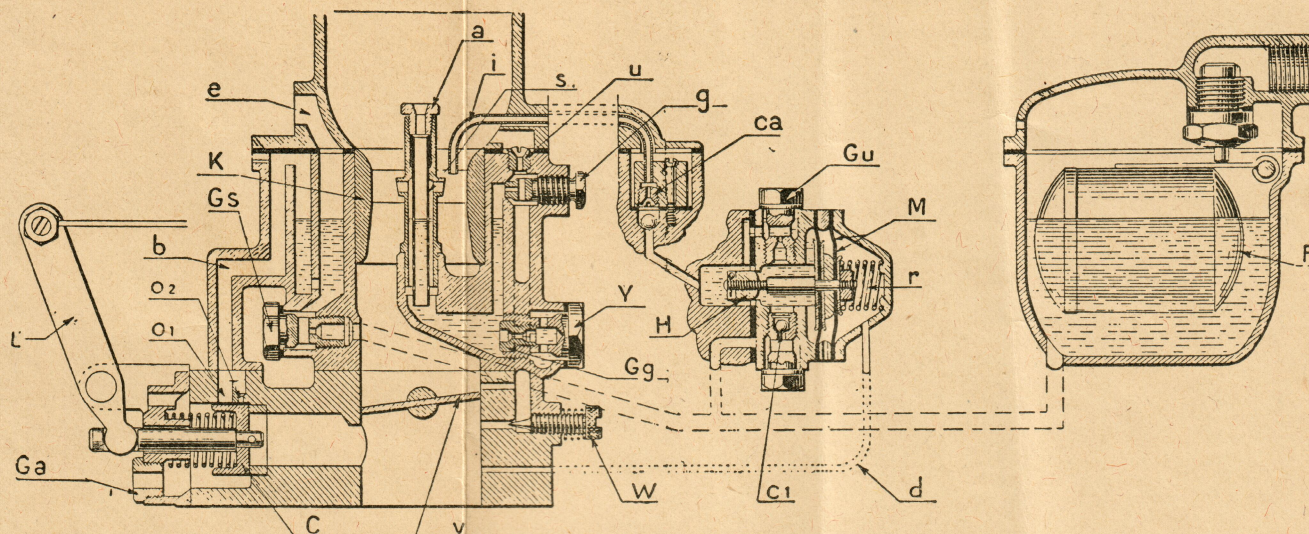
Adjustment follows the general lines of all other models, and consists in the selection of a choke tube (K) of suitable diameter, a main jet (G) of suitable size to correspond with the choke tube characteristic, a correction jet (a) to control main jet output, and a pilot jet (g) to handle the idling end of the mixture curve, which is in turn assisted in effecting a transfer by the air-bleed (U), and eventually by the volume-screw (W) which determines the idling mixture strength at all points below the actual value of the jet itself.

GOVERNOR CONTROL

The Solex R.Z.F.A.I.P. model will be found on ex-WD vehicles. It incorporates a governor for limiting the speed of the vehicle. The governor operation depends on the pressure of the airstream on the specially shaped off-set throttle. The throttle has an inclined face directed towards the ingoing air, so that as the air speed through the carburettor increases, the torque tending to close the throttle also increases. This closing action is counteracted by a spring attached to the throttle. Means are provided for adjusting the tension of the spring.

RS

DUAL-PORT DOWN-DRAUGHT MODEL 30 AAP1



DIAGRAMMATIC SECTION DUAL-PORT MODEL 30 AAP1

PROGRESSIVE STARTER : Ga, Air jet. Gs, Petrol jet. b, Starter channel. O1 & O2, Starter feed tracts. C, Starter piston. e, Starter air-bleed. L, Starter lever.

MAIN CARBURETTOR : a, Air-correction jet. K, Choke tube. S, Emulsion tube. Gg, Main jet. Y, Main jet holder. u, Pilot jet air-bleed. g, Pilot jet. W, Volume-control screw. V, Throttle butterfly. F, Float.

ACCELERATING AND ECONOMY DEVICE : r, Pump spring. d, Depression channel. M, Membranes. H, Pump valve. C1, Pump ball-valve. ca, Injector calibration. i, Injector tube. Gu, Economy jet.

The dual-port down-draught Solex Carburettor Model 30 AAP1 is designed especially for 6-cylinder and 8-cylinder engines and has a progressive starter and a combined acceleration and economy device.

The operation of the main and idling systems is the same as already described for AIC and FAI models.

THE PROGRESSIVE STARTER

When the engine is rotated the depression created in the induction manifold is communicated to the well located above the petrol jet (Gs). The petrol is lifted to the top of the well, passes down through the channel (b) and through orifices O1 and O2 already uncovered by the movement to the left of the piston (C), operated by means of the dashboard control.

As the engine warms up, its speed increases, and in consequence, so does the quantity of air drawn through the air jet (Ga). The petrol supply, however, increases much less rapidly, for once the content of the well above the petrol jet (Gs) is exhausted, the rapidity of its replenishment is controlled by the size of the jet (Gs), and is further retarded by air drawn down the channel (e), thus relieving the depression or suction on the jet (Gs).

Finally, further progressive weakening occurs until the supply from the starter unit is completely cut off, as the dashboard control is released, the result of which is that the spring-loaded piston (C) moves to the right, successively sealing the holes O1 and O2.

THE ACCELERATION DEVICE

This takes the form of a pump supplying a supplementary quantity of fuel to both spraying chambers via injector tubes, when accelerating, in the following manner :

When the throttle butterfly is nearly closed, the high depression in the manifold is transmitted via the channel (d) to the chamber to the right of the membranes (M) and containing the compression spring (r). The membranes are sucked to the right, compressing the spring, causing the chamber on the left of the membranes to fill with petrol and, at the same time, the valve (H) to close.

The petrol flows into the chamber on the left of the membranes via a ball-valve (C1) which prevents the return of the petrol to the float chamber.

When the accelerator pedal is suddenly operated, the butterfly (v) is opened, the depression in the manifold, and in consequence in the spring chamber, is relieved, and the expansion of the spring (r) forces the membranes to the left. The valve (H) opens and the petrol content of the chamber behind it is expelled.

The petrol thus suddenly ejected is discharged into the main air stream via two calibrated injector tubes (i) the location of the calibration consisting of separate units at the end (ca) shown. The length of the valve (H) controls

the quantity of petrol ejected, and the size of the injector tube calibrations controls the rapidity with which it is discharged into the main air stream in both spraying chambers.

When "cruising" the throttle butterfly is only slightly open and the depression in the manifold is high. Thus the suction on the membranes (M) is considerable, and the valve (H) is closed as previously described. However, petrol supplementary to that supplied by the main jet (Gg) may still be needed, though not to the full capacity of the injector tubes. To provide for this possible requirement, an economy jet (Gu) is installed, so that when the valve (H) is closed, the petrol is free to pass through the jet (Gu), which, of course, controls the flow to the two injector tubes. In cases where maximum performance and economy can be obtained without the economy jet (Gu) it is not fitted.

ADJUSTMENTS

To Set the Idling.—Run the engine until well warmed. Then stop it and screw home fully (not using excessive force) both volume-control screws (W). Then unscrew them one full turn. Start the engine. Check the idling speed, adjusting the speed by means of the throttle adjustment screw.

If in the attempt to obtain satisfactory idling in this way the engine "hunts," screw in both volume-control screws carefully—each the same amount.

If, on the other hand, the engine fires erratically, the mixture is too weak and the volume-control screws must be slackened still more.

The engine is very sensitive to these adjustments, and great care is necessary to adjust the volume-control screws in unison.

If by these means it is found impossible to obtain good idling, examine the carburettor carefully, checking the points of the volume-control screws to see that they have not been distorted or broken and are clean. All the carburettor assembly-screws must be tight and, of course, the flange washer intact and forming an airtight seal.

If all is well, bad idling can then be due only to some engine or ignition defect.

Replacement.—If, after prolonged use, it appears that the accelerating device is not working satisfactorily, make sure that there is no dirt lodged in the calibrated ends (ca) of the injector tubes (i) or higher up in the injectors themselves.

If the pump appears to be defective, do not try to overhaul or repair it. A complete new pump assembly is supplied in part exchange for the original assembly, which can be sent when the new unit is received.

However, actual pump deterioration is extremely unlikely to occur, and if it does, the general condition of the carburettor is such that a general overhaul or complete replacement is desirable.