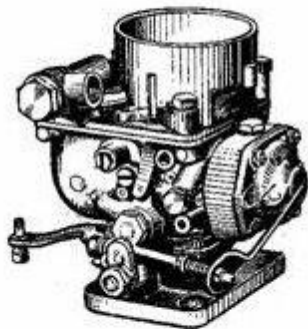


**DESCRIPTIVE  
LEAFLET**



# **SOLEX**

**Dual-Port Downdraught  
Model 30 PAAI**

Special Features:

**PROGRESSIVE STARTER**

(for cold starting)

**COMBINED**

**ACCELERATION AND ECONOMY  
DEVICE**

# GENERAL NOTES

## STARTING THE ENGINE WHEN COLD

If the engine has not been running for some days, prime the carburettor by operating the fuel pump by means of the hand stirrup provided with it. Fresh petrol in the carburettor is essential for an easy start.

Pull the dashboard control fully out.

Switch on and operate the electric starter, without touching the accelerator pedal, and the engine will start.

When the engine is running, release the dashboard control gradually, your objective being to dispense with it altogether when the engine reaches normal working temperature, i.e., sufficiently hot to "idle."

When the engine is hot, it should not be necessary to make use of the Solex Starting device. The engine will start easily on the Pilot jet output, if both the engine and the carburettor are in good mechanical condition.

## TO SET THE IDLING

It is important to ensure that the idling mixture, viz., both throttles, is correctly balanced. The following method is recommended.

Run the engine until well warmed. Then stop it and screw fully home (not using excessive force) both volume control screws (W). Then unscrew them one full turn. Start the engine. Check the idling speed of the engine adjusting the speed by means of the throttle stop screw fitted to the throttle lever abutment place.

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, and it is well to bear in mind that the timing of the ignition, condition of the plugs, valve timing, each and all have a considerable effect upon the idling.

The metering of the pump output is determined by the careful selection of the calibrated injector units or speed jets (ca) and the economy jet (Cu) and it is emphasised that no alteration should be made to these without first consulting us.

If, after prolonged use, it appears that the accelerating device is not working satisfactorily, make sure that there is no dirt lodged in the calibrating units (ca) or higher up in the injectors (i) themselves.

If the pump appears to be defective, do not try to overhaul or repair it. We supply, on request, a complete new pump assembly at a low price in part exchange for the original assembly to be sent to us when the new unit is received.

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

## RECOMMENDATIONS FOR CARBURETTOR FITMENT

Use the flange washer provided or one no thicker. A thick flange washer invites distortion of the carburettor flange. See that the petrol pipe is well clear of the engine and as far away from the exhaust pipe and manifold as possible.

Tighten the flange nuts a little at a time as you would those of a cylinder head, using for preference, split securing washers. This will safeguard against distortion when effecting fitment.

Take care in linking up throttle controls and throttle return springs. If the pull or push of either is not in the correct plane, rapid wear of the throttle spindle will result.

See that all actuating joints work freely. Check that the throttle butterflies open and close fully.

When fitting the dashboard cable to the starter unit lever, avoid sharp bends, and before clamping the wire to the lever, see that the dashboard knob is about 5 mm. out from the fully home position, when the starter lever is in the "off" position.

# Dual-Port Downdraught SOLEX Carburettor Model 30 PAAI

(With progressive starter and combined acceleration and economy device)

## DESCRIPTION . . .

The dual-port Down-draught Solex Carburettor, Model 30 PAAI is designed especially for 6 cylinder and 8 cylinder engines.

### THE PROGRESSIVE STARTER

This unit is a small auxiliary carburettor which provides a suitably enriched mixture of air / petrol for starting from cold and for warming up the engine until approximately normal running temperature is reached. It has two jets, the sizes of which can be varied, viz., the air jet (Ga) and the petrol jet (Gs). The selection of the appropriate sizes of each, dependent on cylinder capacity, controls the mixture strength for cold starting.

This device operates as follows:

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 the channel (b) and through the orifices O1 and O2 already uncovered by the movement to the left of the piston (C), operated from the driver's seat by means of a 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.

### TO START THE ENGINE FROM COLD

Pull out fully the dashboard control, and engage the starting motor, without touching the accelerator, i.e., the carburettor throttle must be kept closed in the idling position. The engine will start immediately and, as soon as its speed begins to rise, the dashboard control may be gradually released. As the engine warms up, release the control altogether, when the Solex Starter will be completely out of action.

By adhering to these directions the greatest advantage is obtained from the Progressive Starter, i.e., an amply rich mixture for immediate cold starting, even at extraordinarily low temperatures, and semi-automatic weakening off as the engine speed and temperature rises.

## FUNCTION . . .

### THE ACCELERATION DEVICE

This consists of a box-like structure situated at the side of the Carburettor, and fitted with a jet (Gu) on the exterior.

The internal components comprise a pump shaft (H) ultimately actuating the spring-loaded ball valve opposite, and externally a fulcrum lever (I) in clearance contact with the head of the pump shaft, and linked by sliding fit with a spring-loaded cross shaft, which is in turn coupled up with a short arm on the end of the throttle spindle.

Inside the box, it will be seen that the pump shaft passes through the middle of a pair of membranes (M), which are influenced in movement by the compression spring (r).

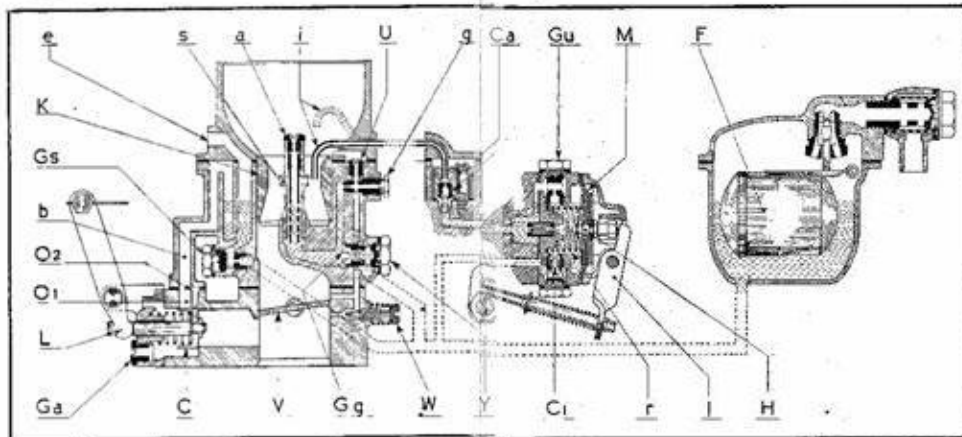


FIG. 1. Diagrammatic section of Model 30 PAAI

### PROGRESSIVE STARTER

- Ga Air Jet
- Gs Petrol Jet
- b Starter Channel
- O<sub>1</sub> Starter Feed Tracts
- O<sub>2</sub> Starter Piston
- C Starter Air Bleed
- e Starter Lever

### MAIN CARBURETTOR

- a Air Correction Jet
- K Choke Tube
- S Emulsion Egg
- Gg Main Jet
- Y Main Jet Holder
- u Pilot Jet A/Bleed
- g Pilot Jet
- W Volume Cone Screw
- V Throttle Butterfly
- F Float

### ACCELERATING AND ECONOMY DEVICE

- r Pump Spring
- M Membranes
- Cj Ball Valve (inlet)
- Ca Injector Calibration (speed jet)
- I Injector Tube
- Gu Economy Jet
- I Pump Lever

### GENERAL FUNCTION

The function of the progressive starter and means of operating it have already been described. The engine having started on the rich mixture, the car may be driven off without delay whilst the "starter" control is being released, and in depressing the foot throttle the following takes place:

Air is drawn downwards through the choke tube (K) creating depression or suction on the spraying assembly exit holes (S). The petrol, calibrated by the main jet (Gg) which is screwed into a holder (Y) is lifted from the well at the base of the spraying assembly and simultaneously is emulsified and

"corrected" by air passing through the "correction jet" (a) and out of the base holes of the emulsion tube beneath it.

The resultant emulsion emerges from the holes (S) and is finally disintegrated by the main air stream, the volume of which is controlled by the size of the choke tube (K) before passing to the engine via the throttle butterfly (V).

The process of acceleration is speeded up by the accelerating device or pump operating as follows:—

Prior to depressing the foot pedal, the lever (I) is in light contact with the head of the pump shaft, and the spring (r) expanded to full extent forces

the pump shaft, and membranes (M) to the extreme right (diagrammatic). This motion draws petrol from the float chamber via the non-return valve (Cj) filling the compartment in which the spring (r) is located.

Directly the foot throttle is fully depressed, so opening the butterfly throttle (V) the pump shaft is forced to the left, its pointed end thrusting off its seating the spring-loaded ball. The petrol content of the chamber is thus ejected via the calibrated jet (called the "speed" jet) (Ca), emerging into the central air stream via the injector tube (I), which it will be seen may be of two types according to engine requirements:

- (a) The "high" injector shows by the dotted lines, or
- (b) The "low" injector discharging at the waist of the choke tube.

The high injector speed jet (Ca) merely controls the rate at which the discharge from the accelerating device takes place. The injector itself, situated into the wide air intake of the Carburettor, is not subject to engine depression, and therefore its purpose is fulfilled when the acceleration discharge is completed.

The "low" injector, however, has an alternative function, for it will be seen that it discharges in the waist of the choke tube, and thereafter is subject to, approximately, the same depression as the main spraying orifices (S).

### ECONOMY ACTION

This is now easy to follow. At anything less than full throttle the shaft in the accelerating device is more or less remote from the spring-loaded ball opposite, i.e. the ball is on its seating.

Since, however, the injector (I) is subject to engine depression which is transmitted to the ball non-return valve (Cj) the latter lifts, allowing petrol to enter the accelerating device, so that it can continue to feed the speed jet (Ca) as the depression progressively increases via (Gu), the purpose of which is to be described shortly.

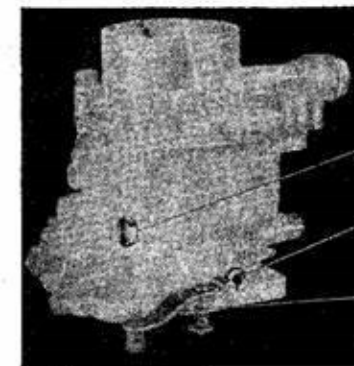
The output of the main jet (Gg) and speed jet (Ca) together is responsible for the flexibility and maximum power of the engine. It will be seen that the issue of fuel via (Ca) is retarded by the distance it has to travel, plus the weight of the ball (Cj) acting against engine depression. Thus the main jet (Gg) operates first, and advantage is taken of this to use the smallest main jet (Gg) possible, which, supplemented by the output of (Ca), will give the desired results at full throttle. At light throttle openings, therefore, i.e. cruising speeds, the main jet, chiefly responsible for the necessary fuel supply, may be much smaller than would be necessary were it entirely responsible for full power, and thus considerable economy is achieved.

Now as to the use of the jet (Gu) called the "economy" jet, since that it is its function in controlling the final stages of the economy phase. Bearing in mind that the jets (Ca) and (Gg) are chosen to produce maximum power as well as flexibility and economy, it will be appreciated that at "cruising" speeds their combined output may be unnecessarily rich.

As the final controlling factor (Gu) is introduced, and it is of such a size as will, if necessary, reduce the flow of petrol to the jet (Ca) in order to provide the most economical mixture at "cruising" speed. At full throttle of course, the shaft (H) dislodges the spring loaded ball, so allowing free passage of petrol to the speed jet (Ca).

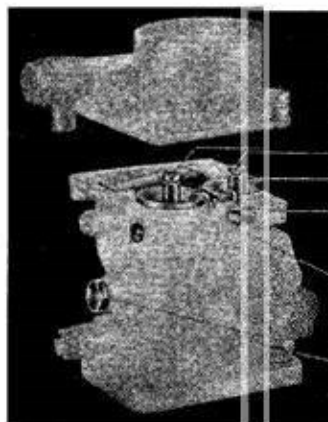
For some engines this additional refinement may not be necessary, and in such cases the jet (Gu) may appear as a blank plug, in which case (Ca) will act merely as a suitable calibration for the discharge from the accelerating device and as a supplementary supply at full throttle; or, alternatively, (Gu) may be very large in size to permit the function of (Ca) as a speed jet, to the full value of its calibration.

It will thus be seen that upon the careful selection of main jet (Gg) speed jet (Ca) and, if necessary, the economy jet (Gu), depends the final results.



### PROGRESSIVE STARTER (2 Tuning Components)

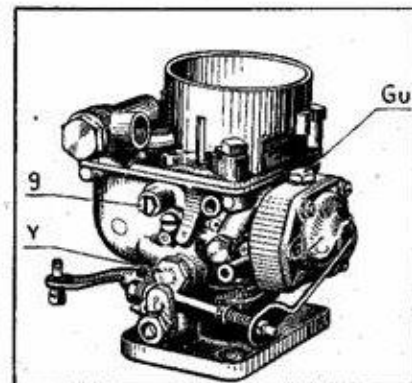
- GS Starter petrol jet
- Ga Starter air jet
- I Starter lever



### MAIN CARBURETTOR (5 Tuning Components)

- a 2 Air correction jets
- K 2 Choke tubes
- I 2 Injector tubes
- Gu Economy jet
- Y Main jet holder (containing main jet Gg)

### MODEL 30 PAAI General view





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