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Part No. 305

2m/9/54

MODELS
# VB. HF.
AND
# AH.

1954 EDITION

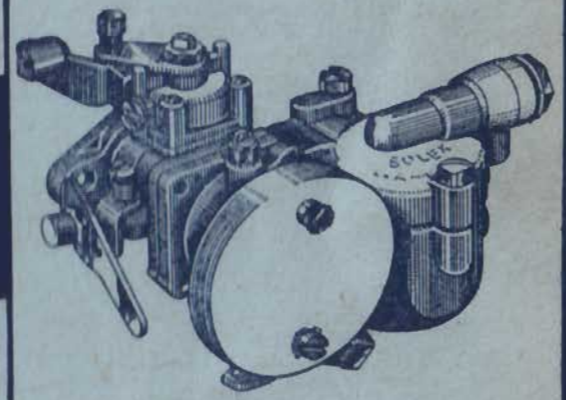
Self-Starting

# SOLEX

## CARBURETTOR

(BI-STARTER)

Descriptive Booklet



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# The Self-Starting and Bi-Starter SOLEX CARBURETTORS

MODELS

VB. (Vertical) and

HF. and AH. (Horizontal)

**INSTRUCTION BOOKLET**

Models VB. (Vertical) and
HF. and AH. (Horizontal)

## Self-Starting & Bi-Starter SOLEX Carburettors

# INSTRUCTIONS

## FOR FITTING AND ADJUSTING

## INDEX



*N.B.—To ensure correct execution of orders, the letters and numbers stamped on the float chamber must be quoted, together with the make and year of manufacture of the vehicle.*



# PROGRESS

"ASSEMBLY 20" in the Solex Carburettor is the answer to improved engine efficiency demanding perfect carburation to cover every conceivable variation of engine "characteristic."

The term "Assembly 20" is general to describe the jet assembly in vertical and horizontal carburettors.

For purposes of identification, we designate this jet assembly in vertical carburettors as "Assembly 20," and in horizontal carburettors "Assembly 22."

A feature employed in Model AH is the Solex "Bi-Starter." It covers the case where it is desired to warm up the engine with the vehicle stationary, instead of driving away immediately after starting from cold, as advocated with the original "Self-Starting" Solex.

These new carburettors can be obtained through any garage, including the official Solex Service Stations, a list of which is given in the concluding pages of this Booklet.

SOLEX LTD.

### WHAT THE SYMBOLS MEAN.

VBFD — **Self-Starting** vertical, starter on right looking at air intake.

VBFG — **Self-Starting** vertical, starter on left looking at air intake.

AHD/G — **Bi-Starter** horizontal with float chamber right (D) or left (G) looking at air intake.

DHF } — **Self-Starting** horizontal with float chamber right (D)
GHF } or left (G) looking at air intake.


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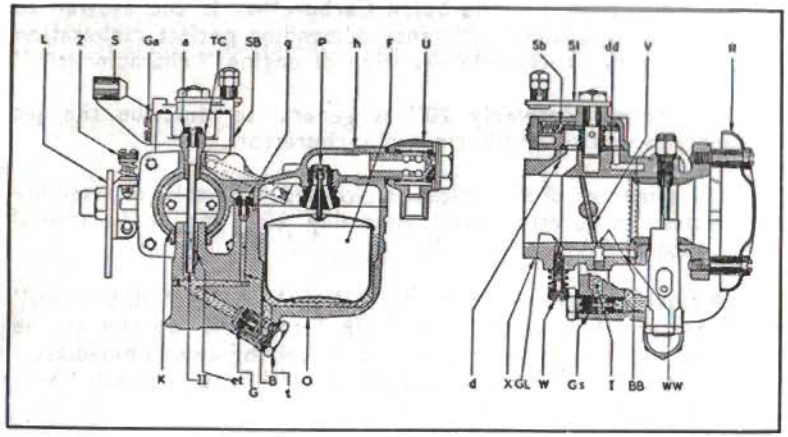
# THE HORIZONTAL "ASSEMBLY 22"

## TYPES A.H. & H.F.




SECTIONAL DIAGRAM

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L | Throttle lever | P | Needle valve | G | Main jet | V | Throttle |
| Z | Slow running adjustment screw | II | Well | t | Main jet carrier | R | Air bell |
| S | Starter cable support | B | Auxiliary jet well | O | Float chamber | d | Starter feed channel |
| Ga | Air jet (starter) | h | Float chamber cover | Sb | Bi-starter ball | X | Throttle chamber |
| a | Correction jet | F | Float | GL | Slow running orifice | W | Volume adjustment screw |
| TC | Emulsion tube carrier | U | Banjo union | BB | By-pass | Gs | Petrol jet (starter) |
| SB | Starter body | K | Choke tube | Sl | Starter lever | I | Starter well |
| g | Auxiliary jet | et | Emulsion tube | dd | Starter valve assy. | WW | Slow running passage |

SOLEX types AH and HF are the same in design except in respect of the starting device :

Type AH incorporates the " Bi-Starter " and
Type HF the " Self-Starter."

### " Bi-Starter."

The illustration shows this device in detail.
It has two operating positions.

When starting the engine from cold :

(*a*) Pull the dashboard control (connected with the bi-starter lever) fully out and **without touching the foot throttle,** close the ignition circuit and the engine will start.

(*b*) Almost immediately after starting, the dashboard control should be pushed in to the "Bi-Starter" position, i.e., approximately half way. The right hand diagram shows a spring loaded ball (Sb) which determines the half way position and which can be felt as the control is pushed in.

At this stage the mixture strength is considerably reduced, and if desired, the engine may be left to warm up on a " fast idle."

(*c*) As soon as the engine is warm enough to idle normally, the dashboard control must be pushed in fully, so putting the starter unit out of action.





### Function.

The starter unit comprises a small auxiliary carburettor integral with the main instrument. (SB) is the starter box, the interior of which forms a mixing chamber supplied with petrol calibrated by the jet (GS) and air by the jet (GA).

When the dashboard control is pulled out, a revolving disc valve (dd) with holes of suitable size is located so that the holes register with the inlet tract leading to the petrol jet (GS) and with the starter feed channel (d).

When the engine revolves, the suction created in the channel (d) draws petrol from the well fed by (GS) and air through (GA) to mix in the starter unit before making its exit via (d) to the engine.

When the dashboard control is pushed in half-way, the disc valve again rotates, a smaller hole now registering with the duct leading to (GS), thus reducing the supply of petrol to the starter unit, so weakening the mixture whilst the engine warms up on a fast idle.

### The Self-Starter (Type HF).

Functioning in the same way as above, there is no half-way position for fast idling, and the method of operation is as follows :

(*a*) Pull out the dashboard control fully. Close the ignition circuit and the engine will start.

(*b*) If desired to warm up the engine whilst the vehicle is stationary, depress slightly the foot pedal to relieve the suction on the starter unit.

**Preferably** drive away after starting and push "home" the dashboard control as soon as the engine will continue to run without the aid of the Solex starter.

## MAIN CARBURETTOR.

### Idling Circuit.

Petrol from the main well (II) gravitates via a horizontal duct to the idling well (B) into the top of which is screwed the pilot jet (g).

The engine idles with the throttle closed to the usual idling limit, and the high depression created on the engine side of the throttle lifts the petrol through the pilot jet (g) whence it passes into the slow running passage (WW) to emerge via the orifice (GL), the effective area of which is governed by the volume control screw (W).

It will be seen that screwing (W) in decreases the quantity of petrol discharged to the engine and vice versa.

Note the by-pass (BB).

This is situated on the atmospheric side of the closed throttle, and intitally functions as an air bleed to disintegrate and correct the idling fuel.

When the throttle opens and (BB) passes to the engine side, it becomes subject to engine depression and in consequence petrol



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issues therefrom to augment the output from (GL) prior to the entry of the main jet discharge. Thus, at the interjet throttle position, this small supplementary fuel supply bridges what might otherwise be a weak "flat" spot.

## MAIN SPRAYING OUTPUT.

Petrol from the float chamber is calibrated by the main jet (G) screwed into its holder (t).

Passing thence into the well (ll) it forms the basis of the ultimate mixture provided by air entering via the correction jet (a) screwed into the housing in which the emulsion tube (et) depends.

As the throttle opens, the main air stream drawn through the choke tube (K) and passing across the top of the well (ll) lifts the petrol emulsified by the air entering via (a) and passing through the holes in the lower end of the emulsion tube, so that a finely disintegrated mixture of air and petrol is drawn from this spraying assembly to the engine.

The careful selection of the size of the choke tube (K), main jet (G) and air correction jet (a) ensures an automatically balanced mixture suitable for the engine requirements.

# VERTICAL "ASSEMBLY 20"

### TYPE V.B.

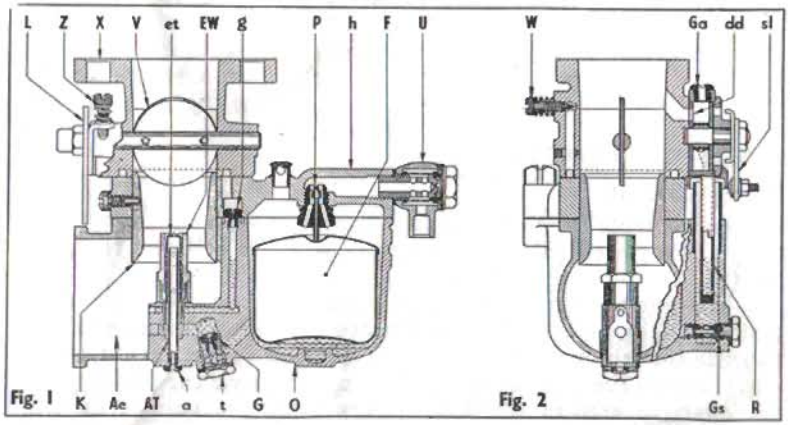

Fig. 1



Fig. 2

SECTIONAL DIAGRAM

| | | | | | |
|---|---|---|---|---|---|
| L | Throttle Lever | h | Float Chamber Cover | G | Main Jet |
| Z | Slow Running Adjustment Screw | F | Float | O | Float Chamber |
| X | Throttle Chamber | U | Banjo Union | W | Volume Control Screw |
| V | Throttle Butterfly | K | Choke Tube | Ga | Air Jet (Starter) |
| et | Emulsion Tube | Ae | Air Entry | dd | Starter Valve |
| EW | Emulsion Well | AT | Air Tube | sl | Starter Lever |
| g | Auxiliary Jet | a | Air Correction Jet | Gs | Petrol Jet (Starter) |
| P | Needle Valve | t | Main Jet Carrier | R | Starter Emulsion Tube |

This carburettor is popular for certain makes of commercial vehicles and is designed so that the Solex starter unit may be on the left or right (looking at the air intake) and are respectively designated V.B.F.G. and V.B.F.D.





## THE SELF STARTER.

Operated by a dashboard cable linked with the lever (sl), the control is pulled out fully preparatory to starting from cold, and with the throttle in the **closed** position, the engine will start directly the electric starter button is operated.

The vehicle should then be driven off at moderate speed, when after a short distance, and there is no fear of the engine stalling, the dashboard control should be pushed fully " home."

### Function.

The "Self-Starter" is an auxiliary carburettor integral with the main unit and consists of a box-like mixing chamber supplied with petrol from the jet (Gs) and air from the air jet (Ga).

A disc valve (dd) rotates when the dashboard control is pulled out, and holes of a suitable size in the disc register with ducts leading to the well above (Gs) and to the engine (see channel adjacent to (Ga) in the diagram).

With a closed throttle, when the engine is turned over, depression occurs on the top duct leading to the starter unit, is transmitted to the well above (Gs) and petrol is drawn up the depending emulsion tube (R) to the starter mixing chamber, where it is disintegrated by air drawn in through the air jet (Ga).

The resultant mixture is inspired by the engine via the top duct and with suitably selected jets (Ga) and (Gs) to ensure the correct richness and volume, the engine will start immediately.

When the engine is warm and the dashboard control pushed " home," the disc valve (dd) rotates and presents a blank face to the ducts, so putting the starter unit completely out of action.

## MAIN SPRAYING ASSEMBLY.

For normal running, petrol is provided by the main jet (G) screwed into a holder (t). Calibrated by (G) the petrol rises to a predetermined level in the spraying well (EW), whilst the engine is motionless.

With the engine running, and as the throttle opens, air passes up through the choke tube (K) with increasing velocity, creating a rising depression at the top of the main spraying assembly.

Petrol from the well (EW) rises and is emulsified by air passing via the air correction jet (a) into the air tube (AT), out of its top, and thence through the holes in the surrounding emulsion tube (et). The mixture emerges from the top of the spraying assembly and is caught up in the central air stream, where it is finally disintegrated on its way to the cylinders.

### Idling Circuit.

The reserve well of petrol above the main jet, feeds the pilot jet (g) housed in the top of the float chamber (Fig. 1).

Fig. 2 illustrates the passage of the petrol after being metred by the pilot jet, as shown by the horizontal dotted line to the vertical duct, terminating at the point where the volume control, i.e., mixture strength regulating screw (W) is housed.

With the throttle closed to the idling position, depression on the orifice, the effective area of which is governed by the adjustment of (W) is considerable, and petrol drawn from the pilot jet (g) emerges at this point, is disintegrated by the air stream passing the throttle edge to provide the mixture required by the engine for satisfactory idling.

Screwing **in** the screw (W) weakens the mixture and vice versa.

Below the screw (W) will be seen an additional exit from the pilot mixture duct, termed the ' by-pass.'

With the throttle in the idling position, the by-pass is on the atmospheric side of it, and air is drawn through to assist in emulsifying the petrol rising to (W). When the throttle opens and the edge of it passes the by-pass, so transferring the latter to the engine side of the throttle, the by-pass becomes subject to engine depression. Thus, a small supplementary supply of petrol is drawn from it and serves to bridge a possible case of flat spot which might otherwise occur before the main spraying assembly begins to function.

## GENERAL ADJUSTMENT.

### The Bi-Starter and the Self-Starter.

It is very seldom that any adjustment of the air jet (GA) or petrol jet (GS) is required, as our records enable us to establish the correct sizes to cater for engine requirements in the great majority of cases.

Occasionally, however, according to an engine characteristic which may not be "average," a change in size of (GS) may be necessary.

(i) If within a few seconds of starting from cold, the engine "hunts," the petrol jet (GS) is too large. One size smaller usually corrects this ;

(ii) If the engine starts readily, but will not continue to run, the (GS) may be too small, and a larger one should be tried.

N.B. — With both the Bi-Starter and "Self-Starting" Solex, **the accelerator pedal must not be touched when starting the engine from cold.** If this instruction is disregarded an easy start **cannot** be obtained.

A difficulty arises in this connection with those cars which are fitted with starter motors combined with the throttle pedal.

In such cases the linkage must be adjusted so that when the pedal is depressed, the motor will operate with the throttle still in the closed position.





## FAILURE

### Cause and Remedy

Failure to secure satisfactory results if the above instructions are properly observed is impossible with an engine in proper mechanical order always assuming of course, that the fitting has been properly carried out, particular attention having been paid to the correct operation of the "Starter" lever. Remember, its "travel" must be complete and from stop limit to stop limit in the fully out and fully home position of the dashboard knob.

There are, however, so many slight engine irregularities that may affect the perfect functioning of the "Starter"—and for that matter, of the main carburettor, that we will proceed to enumerate the most common.

### Revolutions necessary to start.

An engine in first class condition mechanically, will start when revolved at as low a speed as 60 r.p.m.—BUT every adjustment must be perfect—ignition (including plugs, and the gaps at their electrode extremeties), valves, compression, battery voltage —etc., etc.

In practice, an engine that may be described as "in fairly good order" will start at about 80 to 100 r.p.m.—a little higher if it is a very small engine.

A well-charged battery is capable of turning an engine over easily at these speeds, but much depends upon the nature of the engine oil used.

### The Influence of the Oil.

All oils increase in viscosity as the exterior temperature falls. Consequently, considerable resistance is offered to a turning engine, particularly when the temperature falls to or below, freezing point.

Therefore, in winter, it is advisable to "free" the engine first by giving it a few turns by hand, before employing the aid of the batteries, and *before* operating the Solex Starter.

Make sure that you are using the correct type of oil for your engine, and during the winter, always the thinnest with which you can get good results, for much damage can be done to your cylinder bores during the first ten minutes by using a viscous oil that will not "fling" readily.

### Internal Frictional Resistance.

There must necessarily be some frictional resistance in the working of an internal combustion engine.

A new engine is nearly always more difficult to "turn over" than an old one.



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At the same time, the gear box sometimes with a thick lubricant, also offers considerable resistance, and therefore when starting a "stiff" engine, it is a good plan to push out the clutch, when it will be found that the engine can be turned much more readily.

**Battery.**

To have the battery fully charged is, of course, of primary importance.

A fully charged battery will obviously turn the engine over much more rapidly than one which is half discharged.

Here again temperature has its influence. The lower the temperature, the lower the power of even a fully charged battery. Beware, therefore, of neglecting your battery in cold weather.

**Valves.**

It is not an infrequent occurrence in very cold weather for the valves to stick, due to various causes, such as congealed oil, variation in expansion coefficients, weak valve springs, etc.

A sticking valve will, of course, affect starting and should be borne in mind as an item for examination, if difficulty in starting occurs. It can always be detected by an interrupted hiss.

**Engine Efficiency.**

Under this heading, from the purely mechanical standpoint comes the question of induction leakages—a bad stumbling block to easy starting.

The points to check are as follows :

Valves (as above). If in good working order, ascertain that there is no leakage at the guides. Worn valve stems and guides (inlet) are a most frequent cause of bad starting and poor idling.

Carburettor and induction pipe joints must, of course, be tight.

Compression should be tested, for where this can leak outwards, air can, of course, leak inwards, and so upset the starting and idling mixture.

All these items have the greatest ill effects when the engine is turning slowly, *i.e.*, when you are endeavouring to start it, so that it is important to maintain the engine in good order to safeguard against starting troubles.

**Ignition.**

The battery is, of course, the primary consideration. A voltmeter will show you its condition, and is a good investment. No matter how precise your mixture, a weak spark may fail to ignite it, and if the battery is not fully charged complete failure of the spark at the plug points may occur. If you have magneto ignition, then this should throw a strong blue spark from the end of the leads to an "earth"—at least $\frac{1}{8}$-in. in length.





*An item frequently overlooked is the fact that with coil ignition and a low battery, or defective starter motor, the whole of the electrical energy may be absorbed in turning the engine, leaving none available for spark production at the plug points. Thus a complete failure to start.*

Be sure that the plugs are clean and the points correctly adjusted. The normal gap is as follows :

| | | |
|---|---|---|
| For battery ignition | ..... | 25 thous. |
| For magneto ignition | ..... | 20 thous. |

*N.B.* Very modern cars are fitted with coils having considerable voltage. In such cases the electrode gaps should be wider than above mentioned, and the directions given in the maker's brochure carefully followed (average 40 thous.).

See that your ignition is properly timed. Especially in the case of old engines which may have been "overhauled" by someone of inexperience, the ignition may be timed too late.

**Condensation.**

We give this a separate heading for it is often overlooked.

In cold weather, water condensation will sometimes occur on the plug points, so causing complete spark failure. This very often occurs with too "cool" plugs, particularly with mica insulators.

**Fuel.**

There are now very many varying grades of fuel on the market. Whilst a No. 1 spirit in all well-known makes could be accepted as beyond reproach, there are a number of low grades of obscure origin which are not at all suitable for general use.

For starting purposes, specific gravity is no guide to quality. A fuel must contain a *good proportion of volatile products*, or starting trouble is certain.

**Petrol Pipe Obstruction.**

Dirt or water in the petrol tank will find its way eventually to the petrol pipe, and a definite obstruction may result. Shortage of petrol has frequently been traced to pieces of packing material having become lodged in the petrol pipe.

Fortunately, these notes deal with conditions that seldom arise, but it is hoped that the readers of this booklet may find a solution when, as does sometime happen, there seems to be no obvious explanation of starting failure.

In case of difficulty which you cannot overcome, consult the list of official Solex Service Stations at the end of the booklet. One of them may be quite close at hand, and able to help you.

## SLOW RUNNING ADJUSTMENT

The idling or pilot jet "g" provides the necessary output for idling.

The volume control screw (W) regulates the richness of the idling mixture. By turning it in an **anti-clockwise** direction, enrichment takes place up to the limit of the pilot jet output, and conversely, by clockwise rotation, the output is weakened.

Examination of the abutment plate on which is mounted the throttle lever, will reveal a spring loaded screw which regulates the idling speed of the engine.

It actually limits the closing of the throttle, and thus fixes the idling speed. By screwing in this part the engine speed will rise, and *vice versa.*

Poverty of mixture is recognised by the irregular behaviour of the engine, and tendency to stall. Over-richness will cause the engine to "hunt" and tend to stall when the "hunt" becomes excessive.

In order to perfect the slow-running, adjust first the screw on the abutment plate so as to fix approximately the engine speed.

Then experiment with the volume control screw (W) until even running is obtained.

As this operation will generally alter the speed, it will be seen that finally a nice adjustment of both the screw on the abutment plate and the volume control screw (W) will determine the results.

*N.B.*—Do not make the mistake of trying to adjust the idling to too slow a speed. Modern engines with substantial valve overlap, light fly-wheels and mounted on rubber frame blocks, do not permit the clock-like tickover of earlier days to be obtained.

About 500 r.p.m. is the normal idling speed of to-day.





## MAKE ALL ADJUSTMENTS TO IDLING SPEED WITH A HOT ENGINE.

## ADJUSTMENT FOR NORMAL RUNNING

With carburettors supplied as replacements for older Solex or other makes of carburettor, it must be borne in mind that in such instances the instrument must be tuned to suit an engine whose characteristic may be considerably altered by wear and tear.

Thus, whilst we issue the carburettors with a "standard" setting, it follows that a little experiment may be necessary on occasion to secure maximum results.

To determine what change from "standard" is necessary, it must be understood exactly how correction of main jet output is effected.

The following details will be more easily grasped by reference to Figs. 1 and 2 illustrating the Assembly 20 in a vertical carburettor.

When the engine is at rest, the assembly is filled with petrol to a predetermined level.

The petrol output increases in virtue of the rising depression in the choke tube waist, and if not corrected would do so by a gradually rising curve. In other words, it would become automatically richer as the speed rose. It is therefore the function of the emulsion tube (et) to adjust this mixture to the needs of the engine, and it is done by varying the size of the correction jet "a."

The bigger the correction jet, the greater is the volume and velocity of correctional air which passes vertically upwards and out into the annulus or reserve well in which the petrol is rising.

Here it meets with the petrol which it emulsifies, and reduces the mixture strength by a curve which runs in direct opposition to the rising curve of an uncorrected output, in virtue partly of its relieving progressively the air depression, and partly on account of the mechanically obstructive effects which it exercises on the petrol flow.

The main virtue, however, of this layout is that, whereas by ordinary correctional means the whole of the curve is affected, the opposite directions which the fuel and air respectively follow in "Assembly 20" have the effect of making each member—*i.e.*, the main jet and the correction jet more or less independent within its own particular sphere of operation.

Thus, if we want a rich area at the lower part of the curve, we increase the main jet size without touching the correction jet.

If, on the other hand, we wish only to cut down, or increase the mixture strength at the top of the curve without interfering with the bottom end, we increase or decrease the size of the correction jet, which gives us the required results without altering the low speed mixture.

By this means, therefore, a particularly flexible method of control is obtained, and facilities are thereby given for adjusting correctly the carburation, for engines having unusual characteristics which are apt to be outside of the range of ordinary methods of carburation correction.

To give a practical illustration, let us assume we are carburetting an engine which normally takes a standard combination of

| 25 | 120 | 240 |
|---|---|---|
| (choke tube) | (main jet) | (correction jet) |

It may be found in a particular instance that all round results are good, but for bottom end performance, main jet 120 is unnecessarily large, for fitment of size 115 gives equally good results from the point of view of acceleration and flexibility.

With main jet 115, however, we note that there is a falling off in power and speed at major throttle openings, indicating of course an insufficiently rich mixture.

In such a case, reduction of the correction jet to size 220 or 200 will almost certainly give the desired results, with obviously greater economy, since a smaller main jet is now in use.

To take an opposite example :

Suppose we are catering for an engine normally requiring a setting of

| 25 | 115 | 240 |
|---|---|---|
| (choke tube) | (main jet) | (correction jet) |

It is found in this instance that acceleration is poor—there may even be a definite "flat spot", but all round performance apart from this defect is satisfactory.

We require obviously therefore a richer "bottom end" mixture, so we substitute main jet size 120.

Results are now satisfactory, but we find petrol consumption has suffered particularly at high speed running.





This means that the "top end" mixture is now too rich.

Raise the size of the correction jet to 260 or 280 and satisfactory results will be immediately forthcoming.

It will be seen from these examples that "Assembly 20" is easily handled, and that refined carburation is speedily obtained with a minimum of trouble and time.

**ALL ADJUSTMENTS TO THE IDLING AND MAIN MIXTURES MUST BE CARRIED OUT WHEN THE ENGINE IS AT NORMAL WORKING TEMPERATURE.**

**WE PARTICULARLY WARN USERS AGAINST EVER ATTEMPTING TO REAM JETS.**

***N.B.*** *A carburettor should be stripped occasionally and thoroughly cleaned. There are gummy deposits in petrol which no filter can screen.*

*After cleaning, it is well to renew all gaskets and washers - the cost is only a few shillings.*

*Under the influence of pressure and heat, the original gaskets will have lost some of their elasticity, and, even if still intact, may fail to make a hermetic seal when replaced.*

## GENERAL NOTES

During cold weather when the engine has remained at rest for a lengthy period, it is advisable to give it a few turns by hand to break the oil film **before switching on the ignition and before pulling out the dashboard knob of the Solex starting device.**

The majority of motors are fitted with a petrol pump. In that case after a long period of disuse the following may occur :

For the first few revolutions of the engine there may be no sign of starting. Then a few late explosions, and prolonged action of the starter motor will be required before normal firing takes place.

This is occasioned by the inability of the pump to supply the required amount of petrol to the carburettor.

It is well, therefore, under such conditions, to make use of the priming device, if such is fitted to the pump, to fill the carburettor float chamber before attempting to start the engine.

Similarly, if the car has been standing for some time, say two or three days, the petrol in the float chamber may have become stale. Difficult starting may result during cold weather, and it is well therefore to pump in a fresh supply before attempting to start the engine.

## DIAGNOSIS OF RESULTS

There is never any question of definite failure with the Solex carburettor. It is simply a matter of finding the mistake either of fitting or adjustment.

It is well always to approach this diagnosis systematically and avoid doing more than one thing at a time, for in that case it is impossible to ascertain from the eventual results, which was the successful factor.

## FLOODING

### Loose Joints.

It is easy to see whether any of the exterior joints are loose.

The first thing to do, therefore, when a carburettor floods is to verify these various joints.

### Grit on the Needle Setting.

This does not as a rule occur in the case of carburettors provided with a filter and generally only within the first few miles after fitting, in which case it is usually due either to stray particles of packing material or to particles of oxide or solder which are apt to get loose inside the petrol pipe. Remove the needle valve and clean same by carefully blowing it out and noting by suction test that it is hermetic, after which replace it and be sure that the washer is perfect and the tightening adequate.

*N.B.*—Never attempt to "grind in" a needle valve. In cases where damage to seating is only small, a new seating can be made by removing the complete needle valve assembly from the carburettor, placing it on a hard surface, and lightly tapping the needle " home," rotating it between every two or three taps.

### Punctured Float.

If any petrol gets into the float, its weight is of course increased, with the consequence that the level is raised and flooding occurs via the jets. In such a case one must either change the float, or locate, if possible, the point of leakage and solder same. To do this, immerse the float under boiling water, when the emergence of bubbles will disclose the puncture, and cause the petrol to evaporate. This is an emergency measure only, for the solder will unbalance and overweight the float. A new float should be obtained as soon as possible.

### Too Much Fuel Pressure.

26 and 30 m/m. carburettors are normally fitted with needle valves of which the diameter of the seating is 1.5 m/m. or 2 m/m. in the case of 35 and 40 m/m. carburettors, the needle valve is usually 2.5 m/m.

With the advent of mechanical and electrical fuel pumps, it sometimes happens that the pressure developed in them is in excess of normal, and flooding or excessive petrol consumption results.

In such cases, the correct procedure of course is to have the fuel pump tested, and adjusted if delivering at above the prescribed pressure, but the difficulty can sometimes more easily be overcome by fitting a needle valve one size smaller than standard to the carburettor. (1.5 m/m. is the smallest).





It will be realised, however, that this is merely a compromise, and that to be certain of freedom from trouble, the fuel pump should be checked.

Pressure should not exceed approximately 2½ lbs. per sq. inch.

### Stoppage in Petrol Supply.

It is advisable at the commencement to assure oneself that the petrol tap is turned on, that there is petrol in the tank, and by unscrewing the petrol pipe at its union, that the pipework is clear of obstruction.

It often happens, especially after first fitting, that an air lock occurs in the pipe. This is cured in the ordinary way either by removing and priming same or by the temporary application of air pressure to the filler cap.

Vapour locks can also be produced by a petrol pipe too near the exhaust manifold.

*A frequent cause of difficult starting is leakage at the pipe unions connecting the fuel pump with the petrol tank. Do not overlook this possibility when endeavouring to diagnose the cause of difficult starting*

### Bad Slow Running.

Ascertain that the adjustment is correct. If even then, good slow running is not obtained, air leakage is indicated at some point of the induction system, probably via worn inlet valve stems in their guides. In this case try a slightly larger auxiliary jet, but not too large, for then the engine will "hunt" when idling. Where there is any choice between two jets which give approximately the same results, always use the smaller one.

Before making any jet alterations, it is well to assure oneself in every case that the jet is clear of obstruction.

If in spite of trying various auxiliary jets, regular slow running is not possible, air leakage is certainly indicated, assuming the ignition to be in order and valve timing normal. The engine in this case will not idle regularly and when one attempts to reduce the idling speed, it will generally stall.

One must realise that slow running is in such a case impossible, for the engine is actually inspiring via various sources of leakage, a greater quantity of air than that entering via legitmate means, so that the correct slow running mixture becomes unobtainable.

## BAD ACCELERATION

### Bad Adjustment.

Assure oneself by reference to special directions for that particular engine, that the carburettor is adjusted in an average manner.

If the performance is still bad in spite of this, a larger jet than is normally necessary may, in some cases, be required, owing to the individual "characteristic" of the engine, but the choke tube as a rule should not be changed.



*To ensure correct execution of orders, the letters and numbers stamped on the carburettor float chamber must be quoted.*

### Defective Ignition.

In the case of battery ignition, note that the accumulators are in good order, but where ignition is magneto one must recollect that the spark intensity diminishes with the speed and as a rule is aggravated by retarding.

When a little weaker than normal owing to slight defects, it is well to set the plug points a little closer so as to offer slightly less electrical resistance to the passage of a weak spark.

### Complete Impossibility of Acceleration.

Assuming that starting and idling are possible, this can only be caused by obstruction of the main jet, weak ignition, or other engine irregularities.

## LACK OF MAXIMUM SPEED

### Butterfly Not Opening Fully.

Note that when the accelerator is depressed fully, the butterfly opens to its greatest extent. This can be checked by observing the position of the limit screw which should be in contact with the boss cast on the outside of the throttle chamber.

### Insufficiently Advanced Ignition Timing.

This a prevalent cause both of heavy petrol consumption and insufficient top speed. If in doubt get the timing checked by the maker's agent.

### Defective Petrol Supply.

This can always be recognised by standard acceleration up to a certain speed at which periodic hesitations and backfiring occur, curable always by a slight throttle reduction. In such a case remove the float chamber and note the rate of petrol flow from the needle valve which will frequently be sufficient indication. For confirmation, make a special test with an independent test tank placed as high as possible on the car so as to ensure a good head.

### Silencer Choked.

In certain designs of silencers this trouble can easily occur after the car has covered a fair distance. It is generally easy to recognise it by the absence of a clearly marked exhaust note at the tail pipe and instead a steady rush of hot gas. To confirm, make a test with the exhaust pipe disconnected from the silencer.





## OVERHEATING

It is seldom that the carburettor is the cause of this even in air cooled engines, and it is definitely impossible, strictly speaking, where water cooling is concerned.

Too much petrol, or on the other hand, an excessively weak mixture, can certainly raise the temperature a little, but in no case should it nearly approach the margin of cooling that should be provided by the water cooling under normal conditions.

Apart from a major examination, the most likely directions in which to work are reducing the mixture, but not to an unduly weak condition, and advancing the ignition as far as possible consistent with the avoidance of knocking.

A retarded spark will always raise appreciably the engine temperature.

A most frequent and unsuspected cause of overheating is furred radiators and water jackets.

When overheating insistently develops from no external cause that can be located, obtain from a steam engineer a supply of ordinary boiler de-furring compound with instructions how to use it, and this will almost certainly affect a cure, especially if the car has been used in a district where the supply water is very "hard."

## KNOCKING

Knocking is similarly the result of various causes which as a rule have nothing to do with carburation, such as pre-ignition due to defective plugs, excessive carbonisation, excessive ignition advance or to mechanical noises which can easily be confused therewith, such as loose bearings, worn pistons, etc.

When knocking is actually caused by carburation it can only be due to weak mixture and if not curable by one size bigger main jet, other causes must be sought.

## EXCESSIVE CONSUMPTION

Note first that there is no leakage either at the carburettor, the pipework or the petrol tank. Be sure then that the estimation of fuel consumption is correct.

To confirm this it is always advisable if possible to make a definite test over a known mileage in average country with a measured quantity of petrol, either in the main tank if it is of the type from which all the petrol can be drained, or by the use of an externally placed auxiliary test tank. The longer the test, of course, the more accurate will the reading be, assuming a non-stop run.

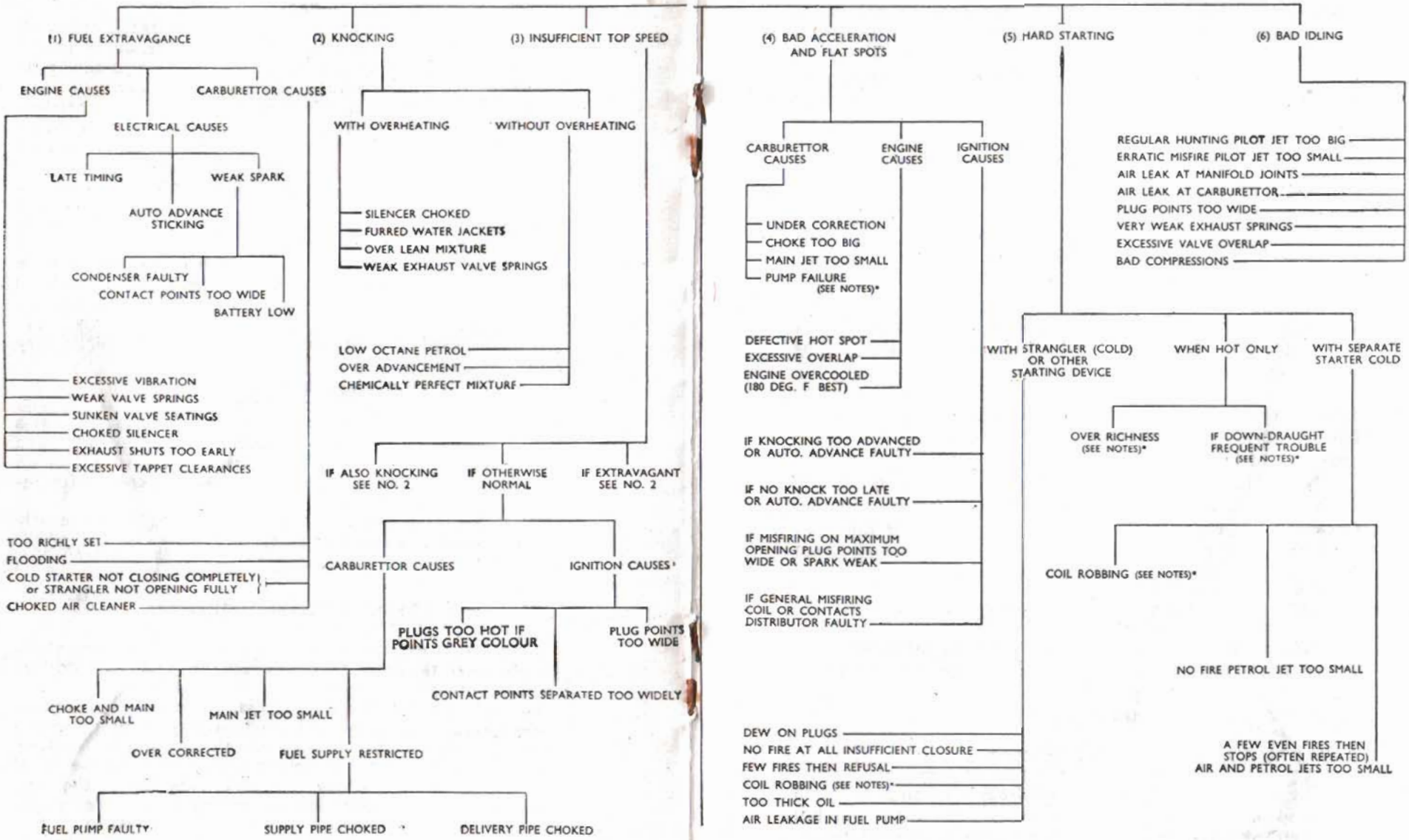
Never estimate petrol consumption either from the speedometer readings or from supposedly accurate quantities delivered from petrol pumps, either of which are subject to appreciable errors.

*continued on page 23*



*To ensure correct execution of orders, the letters and numbers stamped on the carburettor float chamber must be quoted.*

# ENGINE AND CARBURETTOR — FAULT DIAGNOSIS CHART




*This Chart is reproduced by the courtesy of Messrs. Odhams Press Ltd., from their recently published book "Practical Automobile Engineering Illustrated."*



* SEE NOTES OVERLEAF

# NOTES

This chart attempts only to give a clue to the most common troubles that motor owners may experience. So far as carburation is concerned it is our business, and pleasure, to help to the best of our ability all who are interested in the Solex Carburettor. If problems are met with not covered by the chart, send them to us to solve.

## CHART REFERENCE 5. HARD STARTING WITH HOT ENGINE.

Over-richness, when an engine is hot makes starting difficult when the downdraught induction layout is employed, because of conditions immediately preceding the attempt to start.

When a hot engine is switched off after a few minutes idling a small quantity of petrol collects in the induction pipe. The surrounding heat evaporates the petrol and the resultant vapour displaces the oxygen which is vital to combustion. Thus an incombustible vapour pervades the whole system, and the use of the starting device aggravates the condition.

Contrary to usual practice the throttle must be opened to admit the required oxygen for combustion. Opening the throttle fully and turning over the engine a number of times disperses the overdose, when an easy start is again assured.

N.B.—Most downdraught induction manifolds are fitted with drain pipes, to avoid, so far as possible, the above conditions. Occasional inspection is desirable to make sure that the small draining orifice (usually only about 1 mm. in diameter) is not blocked.

## CHART REFERENCE 5. COIL ROBBING.

When a car battery is " low," there may be sufficient energy to operate the electric starter, but its output may be fully absorbed in the process. No current is left to create a spark at the plug points, and consequently, the engine refuses to start.

## CHART REFERENCE 4. CARBURETTOR PUMP FAILURE.

The fuel entrance and exit to and from the membrane pump employed with some Solex Carburettors is controlled by two ball "non-return" valves. If a motor is not run for any length of time, a fine gummy deposit from the fuel is apt to form in the Carburettor tracts. In consequence the balls may stick. Cleaning them with methylated spirit is the cure.



**Insufficient Advancement (Ignition Timing).**

This is a most frequent cause of heavy consumption as mentioned above and it is always well to run with the spark as far forward as is consistent with the avoidance of knocking or roughness.

It is well, of course, to note that there is no sign of misfiring and that the carburettor is not flooding, or petrol being lost through other sources of leakage.

**Bad Condition of the Engine.**

The state of the motor has, of course, a very considerable effect upon economy.

It is easy to realise that if compression is lost via worn piston rings or pitted valves, quite an abnormal amount of fuel can in some cases be used to obtain a normal performance. An increase of as much as 100 per cent. in consumption can easily result from this cause.

It is, however, as a rule readily detectable, owing to the general lack of power exhibited and in such a case it is useless to attempt to remedy matters at the carburettor.

## MECHANICAL PUMPS

These are now fitted as standard on most cars and fuel waste can result if for any reason too much pressure is being developed. This trouble can generally be presumed when flooding occurs while descending a hill against the engine and causes fresh petrol to be smelt from the front seats.

If ordinary tests fail to disclose any leakage, a short run with a pint or quart test tank and the pump out of action will confirm if the latter is the cause.

There is also a possibility of air leaks between the rear tank and the pump, which will delay the delivery of petrol to the carburettor.

In such cases it is always preferable to apply to a qualified Pump Service Station.

## TROUBLES CAUSED BY AIR FILTERS

An air filter with too small a section of filtering medium will frequently raise the consumption owing to the increased vacuum imposed upon the jet thereby. If this is suspected, make a comparative test with the air filter removed. Should the cause be located here, first clean carefully the filtering medium and try again, but if the consumption is still bad it is probably the result of the filter itself being too small.

## A FINAL WORD

Statistics show that 80 per cent. of breakdowns and engine troubles are due to ignition faults. Apart from stoppage in the petrol supply, which may be due to a choked jet, it is extremely unlikely that a sudden loss of efficiency is attributable to carburation. Let the carburettor be the last item for examination, therefore, and much time will be saved.

**STUDY THE FAULT DIAGNOSIS CHART ON Page 20.**



*To ensure correct execution of orders, the letters and numbers stamped on the carburettor float chamber must be quoted.*

# CARBURETTOR and SPARE PARTS PRICE LIST

**Parts shown in italics are liable to variation**

**it is essential to quote MAKE, YEAR and HORSE POWER of vehicle concerned when ordering**

| SOLEX MODEL | MODEL 26 GHF | | MODEL 26 AHD | | MODEL 30 AHG | |
|---|---|---|---|---|---|---|
| DESCRIPTION OF PART | PART No. | Price s. d. | PART No. | Price s. d. | PART No. | Price s. d. |
| CARBURETTOR COMPLETE | — | 143 0 | — | 143 0 | — | 176 0 |
| *Throttle Chamber Bare* | 9992 | 30 0 | 9992 | 30 0 | 7662 | 33 7 |
| Throttle Butterfly | 51269 | 2 5 | 51269 | 2 5 | 51270 | 2 5 |
| Throttle Spindle | 50364 | 4 2 | 50363 | 4 2 | 50460 | 4 2 |
| Fixing Screw, Throttle Butterfly | 3947 doz. | 2 5 | 3947 doz. | 2 5 | 3947 doz. | 2 5 |
| Abutment Plate | 4019 | 3 0 | 4019 | 3 0 | 4019 | 3 0 |
| Slow Running Adjusting Screw | 4023 | – 7 | 4023 | – 7 | 4023 | – 7 |
| Spring for Slow Running Adj. Screw | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 |
| Throttle Stop Screw | 50537 | – 7 | 50537 | – 7 | 50537 | – 7 |
| Nut for Throttle Stop Screw | 3950 doz. | 1 2 | 3950 doz. | 1 2 | 3950 doz. | 1 2 |
| *Throttle Lever* | 4263 | 1 6 | 4263 | 1 6 | 4263 | 1 6 |
| Spindle End Nut | 4030 doz. | 3 7 | 4030 doz. | 3 7 | 4030 doz. | 3 7 |
| Volume Control Screw | 1171 | 1 2 | 1171 | 1 2 | 1171 | 1 2 |
| Spring for Volume Control Screw | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 |
| Gasket for Throttle Chamber | 10002 | – 11 | 10002 | – 11 | — | — |
| Fixing Screw for Throttle Chamber | 10173 | – 7 | 10173 | – 7 | 10173 | – 7 |
| Washer for T/Chamber Fixing Screw | 901 doz. | 1 2 | 901 doz. | 1 2 | 901 doz. | 1 2 |
| *Starter Valve Complete* | 50868/LIC | 11 5 | 10329 | 11 5 | 51757/LI | 11 5 |
| *Starter Body* | 51236/IC | 10 10 | 51754 | 12 7 | 51754 | 12 7 |
| *Starter Air Jet (G.A.)* | 50906/Size | 2 5 | 50906/Size | 2 5 | 50906/Size | 2 5 |
| *Starter Lever Complete* | 50872/C | 1 6 | 51758/C | 1 6 | 51758/C | 1 6 |
| Screw for Cable Swivel | — | — | 51760 | – 7 | 51760 | – 7 |
| Washer, Starter Spindle | — | — | 4031 doz. | 3 7 | 4031 doz. | 3 7 |
| Starter Spindle End Nut | 4024 doz. | 2 5 | 4024 doz. | 2 5 | 4024 doz. | 2 5 |
| Ball, Starter Valve Locating | — | — | 51728 doz. | 1 2 | 51728 doz. | 1 2 |
| Spring for Starter Valve Loc. Ball | — | — | 51762 | – 7 | 51762 | – 7 |
| *Cable Support* | — | — | 51782 | 5 5 | 51783 | 5 5 |
| Fixing Screw for Cable Support | — | — | 9698 doz. | 2 5 | 9698 doz. | 2 5 |
| Cable Locking Screw | — | — | 51760 | – 7 | 51760 | – 7 |
| Starter Fixing Screw (Normal) | 51421/3 doz. | 3 7 | 51421/3 doz. | 3 7 | 51421/3 doz. | 3 7 |
| *Float Chamber Cover Complete* | 50231/LIC | 24 0 | 9588 | 24 0 | 10056 | 27 7 |
| Screw, Float Chamber Assembly (Short) | 50239 | – 11 | 50239 | – 11 | 50239 | – 11 |
| Screw, Float Chamber Assembly (Normal) | — | — | 51015 | 1 2 | 51015 | 1 2 |
| *Float Chamber Assembly* | 60145/2C | 36 0 | 10216 | 36 0 | 10219 | 44 5 |
| *Main Jet* | 50552/6/Size | 1 10 | 50552/6/Size | 1 10 | 50552/6/Size | 1 10 |
| Main Jet Carrier Bolt | 50820 | 3 0 | 50820 | 3 0 | 50820 | 3 0 |
| Washer for Main Jet Carrier Bolt | 50815 doz. | – 7 | 50815 doz. | – 7 | 50815 doz. | – 7 |
| *Correction Jet* | 51612/Size | – 7 | 51612/Size | – 7 | 51612/Size | – 7 |
| *Emulsion Tube Assembly* | 51860/LI | 6 0 | 51860/LI | 6 0 | 51860/L2 | 6 0 |
| *Pilot Jet* | 50552/Size | 1 10 | 50552/Size | 1 10 | 50552/Size | 1 10 |
| *Air Bleed* | 51274/Size | – 7 | 51274/Size | – 7 | 51274/Size | – 7 |
| Float | 50772 | 4 10 | 50772 | 4 10 | 50772 | 4 10 |
| *Choke Tube* | 50235/1/Size | 5 5 | 50235/1/Size | 5 5 | 50268/1/Size | 6 7 |
| Choke Tube Fixing Screw | — | — | — | — | — | — |
| *Petrol Union* | 4120/8 | 3 7 | 4120/8 | 3 7 | 4120/8 | 3 7 |
| Fibre Washer for Banjo Union (large) | 4124 doz. | – 7 | 4124 doz. | – 7 | 4124 doz. | – 7 |
| Fibre Washer for Banjo Union (small) | 4124/1 doz. | – 7 | 4124/1 doz. | – 7 | 4124/1 doz. | – 7 |
| Banjo Union Bolt | 4122 | 2 5 | 4122 | 2 5 | 4122 | 2 5 |
| Filter Gauze | 4123 | – 7 | 4123 | – 7 | 4123 | – 7 |
| *Needle Valve* | 51305/7 | 6 0 | 51305/7 | 6 0 | 51305/7 | 6 0 |
| Fibre Washer for Needle Valve | 2261 doz | – 7 | 2261 doz. | – 7 | 2261 doz. | – 7 |
| *Starter Petrol Jet (G.S.)* | 50676/2/Size | 3 7 | 50676/2/Size | 3 7 | 50676/2/Size | 3 7 |
| Washer for Starter Petrol Jet | 3430 doz. | – 7 | 3430 doz. | – 7 | 3430 doz. | – 7 |
| Flange Washer | 1592/LI | – 7 | 1592/LI | – 7 | 1557/LI | – 7 |
| Starter Cover | 50862 | 6 0 | — | — | — | — |
| Starter Abutment Plate | 50740 | – 7 | — | — | — | — |
| Cable Clip | 50881 | – 7 | — | — | — | — |
| Fixing Screw for Cable Clip | 50924 | – 7 | — | — | — | — |
| Air Bell | 4957 | 2 5 | 4957 | 2 5 | 50245 | 3 0 |
| Fixing Screw for Air Bell | 50893 | – 7 | 50893 | – 7 | 50893 | – 7 |
| Bush, Air Bell Fixing Screw | 50894 doz. | 3 7 | 50894 doz. | 3 7 | 50894 doz. | 3 7 |
| Fixing Screws for Pump Blanking Plate | — | — | — | — | — | — |
| Air Entry | — | — | — | — | — | — |
| Washer for Choke Tube Fixing Screw | — | — | — | — | — | — |
| Plugs for Air Channel | — | — | — | — | — | — |
| Bush for Emulsion Tube Carrier | — | — | — | — | — | — |

**Size required should be stated when ordering**



*To ensure correct execution of orders, the letters and numbers stamped on the carburettor float chamber must be quoted.*

| MODEL 30 AHD | | MODEL 30 VBFG | | MODEL 30 VBFD | | MODEL 35 VBFD | | MODEL 40 VBFD | |
|---|---|---|---|---|---|---|---|---|---|
| PART No. | Price s. d. | PART No. | Price s. d. | PART No. | Price s. d. | PART No. | Price s. d. | PART No. | Price s. d. |
| — | 176 0 | — | 176 0 | — | 176 0 | — | 203 6 | — | 225 6 |
| 7662 | 33 7 | 7662 | 33 7 | 7662 | 33 7 | 10214 | 46 10 | 10215 | 62 5 |
| 51270 | 2 5 | 51270 | 2 5 | 51270 | 2 5 | 51271 | 3 7 | 51272 | 3 7 |
| 50461 | 4 2 | 50460 | 4 2 | 50461 | 4 2 | 50884 | 4 10 | 50886 | 4 10 |
| 3947 doz. | 2 5 | 3947 doz. | 2 5 | 3947 doz. | 2 5 | 3947 doz. | 2 5 | 3947 doz. | 2 5 |
| 4019 | 3 0 | 4019 | 3 0 | 4019 | 3 0 | 4019 | 3 0 | 4019 | 3 0 |
| 4023 | – 7 | 4023 | – 7 | 4023 | – 7 | 4023 | – 7 | 4023 | – 7 |
| 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 |
| 50537 | – 7 | 50537 | – 7 | 50537 | – 7 | 50537 | – 7 | 50537 | – 7 |
| 3950 doz. | 1 2 | 3950 doz. | 1 2 | 3950 doz. | 1 2 | 3950 doz. | 1 2 | 3950 doz. | 1 2 |
| 4263 | 1 6 | 4263 | 1 6 | 4263 | 1 6 | 4263 | 1 6 | 4263 | 1 6 |
| 4030 doz. | 3 7 | 4030 doz. | 3 7 | 4030 doz. | 3 7 | 4030 doz. | 3 7 | 4030 doz. | 3 7 |
| 1171 | 1 2 | 1171 | 1 2 | 1171 | 1 2 | 1171 | 1 2 | 1171 | 1 2 |
| 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 | 4384 doz. | 3 7 |
| — | — | 9060 | – 11 | 9060 | – 11 | 9097 | – 11 | 9097 | – 11 |
| 10173 | – 7 | 51051 | – 7 | 51051 | – 7 | 51140 | – 7 | 51140 | – 7 |
| 901 doz. | 1 2 | 901 doz. | 1 2 | 901 doz. | 1 2 | 971 doz. | 1 2 | 971 doz. | 1 2 |
| 10329 | 11 5 | 50868/L2C | 11 5 | 50868/L2C | 11 5 | 50869/C | 12 7 | 50869/C | 12 7 |
| 51754 | 12 7 | 51237/C | 10 10 | 51237/IC | 10 10 | 51241/C | 13 2 | 51241/C | 13 2 |
| 50906/Size | 2 5 | 50906/Size | 2 5 | 50906/Size | 2 5 | 50906/Size | 2 5 | 50906/Size | 2 5 |
| 51758/C | 1 6 | 50872/C | 1 6 | 50872/C | 1 6 | 50872/C | 1 6 | 50872/C | 1 6 |
| 51760 | – 7 | — | — | — | — | — | — | — | — |
| 4031 doz. | 3 7 | — | — | — | — | — | — | — | — |
| 4024 doz. | 2 5 | 4024 doz. | 2 5 | 4024 doz. | 2 5 | 4024 doz. | 2 5 | 4024 doz. | 2 5 |
| 51728 doz. | 1 2 | — | — | — | — | — | — | — | — |
| 51762 | – 7 | — | — | — | — | — | — | — | — |
| 51782 | 5 5 | — | — | — | — | — | — | — | — |
| 9698 doz. | 2 5 | — | — | — | — | — | — | — | — |
| 51760 | – 7 | — | — | — | — | — | — | — | — |
| 51421/3doz. | 3 7 | 51421/3doz. | 3 7 | 51421/3doz. | 3 7 | 51421/3doz. | 3 7 | 51421/3doz. | 3 7 |
| 10055 | 27 7 | 60060/C | 27 7 | 60060/C | 27 7 | 70021/C | 36 0 | 70021/C | 36 0 |
| 50239 | – 11 | — | — | — | — | — | — | — | — |
| 51015 | 1 2 | 50239 | – 11 | 50239 | – 11 | 50279 | 1 2 | 50279 | 1 2 |
| 10218 | 44 5 | 8279 | 49 10 | 8281 | 49 10 | 7392 | 54 7 | 7392 | 54 7 |
| 50552/6/Size | 1 10 | 50552/6/Size | 1 10 | 50552/6/Size | 1 10 | 50552/6/Size | 1 10 | 50552/6/Size | 1 10 |
| 50820 | 3 0 | 50820 | 3 0 | 50820 | 3 0 | 50820 | 3 0 | 50820 | 3 0 |
| 50815 doz. | – 7 | 50815 doz. | – 7 | 50815 doz. | – 7 | 50815 doz. | – 7 | 50815 doz. | – 7 |
| 51612/Size | – 7 | 51612/Size | – 7 | 51612/Size | – 7 | 51612/Size | – 7 | 51612/Size | – 7 |
| 51860/L2 | 6 0 | — | — | — | — | 7393 | 10 2 | 7393 | 10 2 |
| 50552/Size | 1 10 | 50552/Size | 1 10 | 50552/Size | 1 10 | 50552/Size | 1 10 | 50552/Size | 1 10 |
| 51274/Size | – 7 | — | — | — | — | — | — | — | — |
| 50772 | 4 10 | 50772 | 4 10 | 50772 | 4 10 | 50817 | 7 2 | 50817 | 7 2 |
| 50268/1/Size | 6 7 | 50267/Size | 6 7 | 50267/Size | 6 7 | 50459/Size | 7 2 | 50459/Size | 7 2 |
| — | — | 50236 | – 7 | 50236 | – 7 | 50236 | – 7 | 50236 | – 7 |
| 4120/8 | 3 7 | 4120/8 | 3 7 | 4120/8 | 3 7 | 4120/8 | 3 7 | 4120/8 | 3 7 |
| 4124 doz. | – 7 | 4124 doz. | – 7 | 4124 doz. | – 7 | 4124 doz. | – 7 | 4124 doz. | – 7 |
| 4124/1 doz. | – 7 | 4124/1 doz. | – 7 | 4124/1 doz. | – 7 | 4124/1 doz. | – 7 | 4124/1 doz. | – 7 |
| 4122 | 2 5 | 4122 | 2 5 | 4122 | 2 5 | 4122 | 2 5 | 4122 | 2 5 |
| 4123 | – 7 | 4123 | – 7 | 4123 | – 7 | 4123 | – 7 | 4123 | – 7 |
| 51305/7 | 6 0 | 51305/7 | 6 0 | 51305/7 | 6 0 | 51305/8 | 6 0 | 51305/8 | 6 0 |
| 2261 doz. | – 7 | 2261 doz. | – 7 | 2261 doz. | – 7 | 2261 doz. | – 7 | 2261 doz. | – 7 |
| 50676/2/Size | 3 7 | 50676/2/Size | 3 7 | 50676/2/Size | 3 7 | 50676/2/Size | 3 7 | 50676/2/Size | 3 7 |
| 3430 doz. | – 7 | 3430 doz. | – 7 | 3430 doz. | – 7 | 3430 doz. | – 7 | 3430 doz. | – 7 |
| 1557/LI | – 7 | 1557/LI | – 7 | 1557/LI | – 7 | 5029/1 | – 7 | 5030/2 | – 7 |
| — | — | 50862 | 6 0 | 50862 | 6 0 | 50882 | 7 2 | 50882 | 7 2 |
| — | — | 50740 | – 7 | 50740 | – 7 | 50740 | – 7 | 50740 | – 7 |
| — | — | 50881 | – 7 | 50881 | – 7 | 50881 | – 7 | 50881 | – 7 |
| — | — | 50924 | – 7 | 50924 | – 7 | 50924 | – 7 | 50924 | – 7 |
| 50245 | 3 0 | — | — | — | — | — | — | — | — |
| 50893 | – 7 | — | — | — | — | — | — | — | — |
| 50894 doz. | 3 7 | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | 60041 | 15 0 | 60041 | 15 0 | 60048 | 15 0 | 60048 | 15 0 |
| — | — | 971 doz. | 1 2 | 971 doz. | 1 2 | 971 doz. | 1 2 | 971 doz. | 1 2 |
| — | — | 5044 | – 11 | 5044 | – 11 | 5044 | – 11 | 5044 | – 11 |
| — | — | — | — | — | — | 60133/6 | 1 2 | 60133/6 | 1 2 |

**Jets, Choke Tubes and Needle Valves**



*To ensure correct execution of orders, the letters and numbers stamped on the carburettor float chamber must be quoted.*

# POSTSCRIPT

(A logical and non-technical survey of the significance of good carburation).

## THE FOOD YOU NEED

You know that the human body can function for long periods on a very restricted diet. In fact, recalcitrant members of society became accustomed to existing for many weeks at a stretch on bread and water, and there was at least one political leader in the British Empire who habitually existed for long periods with nothing other than a fanatical belief in his cause and occasional sips of water to sustain him !

This does not, however, disprove the fact that to maintain physical and mental health at the highest possible level a properly balanced diet is necessary, and, fortunately, without any particular study of the scientific principles involved, the average civilised human being instinctively chooses from the abundance of foods available, that variety and quantity which is best fitted to his individual requirements.

## THE FOOD A MOTOR NEEDS

In considering the food requirements of a petrol engine, it at once becomes apparent that its optimum efficiency depends absolutely upon the correct balance of the diet fed to it—the diet in question consisting of air and petrol—give it too much of one and too little of the other, and whilst it will continue to function—providing the unbalance of diet is not carried to an absurd extreme—its eventual reaction, could it be portrayed in terms of human reaction, would reveal deterioration demanding an immediate remedy in the form of diet revision.



The owner of a Solex equipped car or fleet of commercial vehicles may be perfectly confident that, as turned out by the maker, carburation is as nearly perfect as modern research can guarantee. Many weeks of laboratory work, tests on the engine bench and on the road ensure that the carburation of any engine on which Solex is fitted cannot be bettered, and this condition will be maintained for many thousands of miles running.

The day eventually dawns, however, when it is realised that a general engine overhaul is necessary, and it is at this point that some thought must be given to carburation—the engine's "diet"—if the expense of the overhaul is to be justified by the complete restoration of the original efficiency.

## OF WHAT IT CONSISTS

To realise the importance of this, let us consider briefly the fundamentals of carburation and how they are achieved automatically by the design and accuracy of workmanship of the Solex Carburettor, and, lest readers should visualise a spate of scientific jargon, we hasten to assure them that they will find what follows as easy to understand as the headlines of their daily newspaper.

Engines vary in the "diet" they require, but, on an average their requirements are similar ; only subtleties of design demanding the shades of variation which cost so much in time spent on research and test.

Broadly speaking, there are four distinct conditions for which the Carburettor must distribute a properly balanced "diet" or, to be specific, provide suitable mixtures of air and petrol. They are :

(1) Starting an engine from cold.

(2) "Idling" whilst warm.

(3) Economical running at normal touring speeds—say, 30 m.p.h. to 45 m.p.h.

(4) High speed running.

So, the Solex Carburettor is designed to cater for these conditions as per laboratory prescription specifying the following :

For (1) A mixture of 4 parts air to 1 part petrol (by weight).

(2) 10 parts air to 1 part petrol.

(3) $15\frac{1}{2}$ to $16\frac{1}{2}$ parts air to 1 part petrol.

(4) 12 parts air, progressively decreasing in proportion to rising speed, to 1 part petrol.

The above are approximately the limits for optimum engine efficiency throughout the range of conditions arising from Carburettor throttle manipulation as controlled by the driver when operating his throttle pedal.

## HOW IT IS PRODUCED

To obtain these varying degrees of air/petrol ratio and the subtle departures from these averages required by specific engine "characteristics" the various passages and jet orifices in the Solex must be established to the finest possible limits.

Nominally, to give a few examples, the jets used for "cold starting" are calibrated : air, to .5 mm. diameter, and the petrol jet to .05 mm. diameter. For the main spraying assembly the Air Jet is calibrated to .05 mm. and the Petrol Jet, popularly called the "main" to .005 mm. diameter.

This is not all, however, note we have used the word **nominally.** In production, jets are "flowed" by air control, and must be accurate to a minute percentage of the "master" jet employed in the Solex Air Gauge—a special machine designed for this and other fine measuring purposes.

If a "nominal" jet fails to register within limits allowed, it is scrapped !

## THE RESULT OF NEGLECT

There is a lot more we could tell in regard to the precautions taken to guarantee the accuracy of "balanced diet" for a petrol engine, but the foregoing will suffice to demonstrate the importance of the Carburettor as an agent contributing to engine efficiency. What then, happens when all this careful metering of air and petrol becomes unbalanced as the result of wear and tear ?



The engine will function, certainly, but what a deplorable loss of efficiency follows—worsening progressively if the Carburettor remains neglected.

Consider the position from the practical standpoint—and many readers will recognise the following from personal experience :

An engine is overhauled, or a reconditioned engine installed in a much prized car. At first there is a feeling of immense satisfaction arising from the improved performance, for the mere fact that the engine is now "as new" ensures that, compared with the last few hundred miles preceding the overhaul, the difference in performance will be marked.

Presently, however, the driver begins to sense that perhaps the performance is **not quite** in accordance with his recollection of what it was when the car was new. Acceleration is not so brisk, especially at high speeds, and the original maximum m.p.h. easily reached when the car was new is no longer obtainable. Worse still, somehow, it never seems possible to obtain that good figure for m.p.g. that was recorded when the first flush of enthusiasm led to careful noting of such data.

Such an experience is a common one when an overhauled engine is refitted with a Carburettor that has not been overhauled or replaced, and here is the reason :

## WHAT HAS HAPPENED WITH THE CARBURETTOR ?

After considerable usage, wear takes place in a Carburettor just as it does in the engine itself. The most obvious point of wear is in the throttle spindle and its housing in the throttle tube, and will be observable by side-play ; but there are other points of wear not so easily detected. The throttle butterfly edge will be worn, and frequently it can be seen that an indentation has occurred in the wall of the throttle tube where the butterfly throttle comes in contact with it. The rise and fall of the float in the Carburettor float chamber will have caused wear in the needle valve seating and in the needle itself.

In consequence, air in unmetered quantity enters via the throttle spindle ends, weakening the mixture throughout the whole of the throttle range. For the same reason, plus an additional volume passing the throttle butterfly edge, due to wear in the butterfly and the throttle tube wall, the "idling" mixture is weakened, and a richer output from the Pilot Jet is necessary to compensate ; and, finally the mixture is still further unbalanced at all positions of the throttle because of the change of petrol level resulting from wear in the needle valve. In short, all the original virtue of the Carburettor obtained by meticulous calibration, of days—often weeks—of patient testing, is destroyed.

You may say : " Yes, I can see now why acceleration, power and speed may have deteriorated, but it seems that the principal result of wear in my Solex is that an 'unauthorised' air supply weakens the mixture. Surely, then, with a weaker mixture I should *gain* m.p.g. not lose them?" At first sight this argument seems reasonable enough, but reflect for a moment again on the practical aspect :

It is well known that in intermediate gears the consumption of petrol at any given speed is considerably greater than in direct drive or "top" at that speed. For example, an average 12 h.p. car with 4-speed gear box, driven at 25 m.p.h. in " top," would probably yield somewhere about 40 m.p.g.—just a "whisp of throttle" is all that is required to keep it steady at this speed on a flat good road. If, however, it be driven at this speed in second gear, the m.p.g. will probably drop to about half, because the engine will be turning over at roughly, double the speed to enable the car to travel at the same rate.

Bearing this in mind, it will become apparent what happens on accelerating when a worn Carburettor is "feeding" the engine. The weak mixture necessitates prolonged use of intermediate gears compared with the period necessary with a correct mixture, before that road speed is obtained when it is customary to change to a higher ratio. Every time that intermediate gears are used, therefore, it follows that a greater quantity of petrol is inspired by the engine than should be necessary were the metering by the Carburettor correct.



"Top gear" economy is, of course, affected to a less degree, but, remember that the power loss is often such that a hill normally climbed comfortably in "top" must, with poor carburation, be negotiated in "third" ; and one originally demanding the use of third gear is now only negotiable in "second" and always the tendency is to clear the incline at the road speed to which one is normally accustomed. This means a still further increase in engine speed, thus accentuating the cost in petrol.

## THE REMEDY AND THE SERVICE WE OFFER

The remedy for this is clear. An overhauled engine should always be fitted with a reconditioned Carburettor, for otherwise disappointing results are inevitable. It will be apparent, however, from what you have read, that the overhaul of a Carburettor is a matter that takes time, and that its original efficiency cannot be restored without skilled workmanship and elaborate tests.

It is our policy never to undertake the overhaul of a Solex Carburettor unless we can **guarantee** that on completion it is equal to new, and, in order to maintain this guarantee and establish confidence with all Solex users, we have instituted the

## SOLEX RECONDITIONED CARBURETTOR SERVICE

This enables us to produce "runs" of reconditioned Solex Carburettors **guaranteed as new** to cover all makes of cars and commercial vehicles on which Solex is originally fitted. Thus, stocks can be built up which give the following advantages to the car or commercial vehicle owner.

(1) "Off the shelf" service, except in those cases where some design of exterior fitment may need a special make-up.

(2) The old Carburettor can be retained in use until the replacement arrives.

(3) At the lowest possible cost of exchange, to all intents and purposes, the purchaser acquires a brand new Carburettor guaranteed to have been rebuilt and tested for efficiency in precisely the same way as a new "production" instrument.

(4) The establishment of stocks in all the principal towns in Great Britain and Northern Ireland upon which your garage can draw, guarantees the promptest possible supply of a replacement reconditioned Solex for any make of car on which Solex was originally installed.

## WHEN TO FIT A RECONDITIONED CARBURETTOR

Arising from the foregoing, the general query naturally follows : " At what mileage does a Solex Carburettor need overhauling, or replacement ?" Generally speaking, the answer is at about 25,000 miles in the case of a private car, and at about 40,000 miles for a commercial vehicle. The reason for the difference is that in the case of the heavy duty vehicle, apart from the fact that the Carburettor in common with the vehicle itself is much more robust, it is also far less susceptible to wear and tear because of the more solid foundation to which it is affixed.

In other words, it may be taken as a good guide that when an engine needs complete overhaul, including reboring, the Carburettor needs replacing or overhauling, too. It should be remembered, however, that in many instances, whilst the engine has been carefully "nursed" and in consequence the need for overhaul may be postponed far beyond the average, the Carburettor cannot escape the normal wear and tear resulting from vibration and road shock, apart from the natural result of a frequently opening and closing throttle, and the additional physical changes occasioned by constantly varying petrol level. Hence the reason why it is advisable to give serious consideration to the question of Carburettor condition at the mileages stated.

## THE COST OF MAINTAINING CARBURETTOR EFFICIENCY

Lastly, comes the point of cost if the foregoing advice is accepted and a reconditioned Solex is fitted at approximately the prescribed mileages.



Reconditioned Solex Carburettors are priced at about half to two-thirds of the cost of a new Carburettor, according to size and type needed.

Fitment ensures the restoration of perfect carburation, so far as perfection can be obtained, and with it a substantial gain in m.p.g. It depends, therefore, on what mileage a vehicle covers and what saving in petrol consumption results, as to how much—or how little—the cost is. Many instances have been cited where the outlay has been regained in the cost of petrol saved in a period of a few months, during which **full engine efficiency has been enjoyed.**

There is no case where restored Carburettor efficiency will not yield such results ; nor is there an instance to be found where an engine in first class mechanical order fails to respond to correct carburation, but it must be borne in mind that whilst it is possible to build a Carburettor strictly within the manufacturing tolerances permitted, an engine may vary in its "characteristics" because of subtle differences that exist between one and another, having a direct influence on carburation. To mention one point only : it is not possible in the course of producing the popular car of to-day to ensure that the bore of induction manifolds is precisely the same in surface smoothness, and this alone affects distribution of the fine mixture "fed" by the Carburettor.

Thus, whilst there is a "standard setting" for a Solex Carburettor for any make of car, it may not in some cases be precisely suitable for an individual engine.

## SOLEX SERVICE

The Solex Carburettor is simple to adjust to suit an individual engine characteristic, but the direction in which to work is not always apparent. If any difficulty whatever in obtaining satisfactory results is experienced, write to us describing it fully, not forgetting to give the date of manufacture, make, and horse-power of your car. Quote also the type symbols of your Solex stamped either on the float chamber or the air intake rim, and the size of choke tube and

jets in it. We will advise you fully by return of post. Or, if you are a private owner and need immediate practical assistance, turn to the end of this booklet, where will be found a list of officially appointed Solex Service Stations. For a very modest charge any one of them will be glad to render every possible service from changing a choked jet, tuning your Carburettor especially. If you are not consulting them on any difficulty with a newly replaced Solex, they can advise you if fitment of a reconditioned Carburettor would improve performance and economy.



**If your Carburettor should need adjustment, run your car into one of the following**

# Solex Service Stations

## UNITED KINGDOM AND NORTHERN IRELAND

**BEDFORDSHIRE :**

Wilson Bros. & Humphreys Ltd.,
23, St. Mary's, BEDFORD.
Tel. : Bedford 3218

**Electrical Services of St. Albans,**
**64-66, Stuart Street, LUTON.**
Tel. : Luton 2013/4

**BERKSHIRE :**

Humphries Garage,
Bagshot Road, BRACKNELL.

Norkett's Ltd.,
High Town Road, MAIDENHEAD.
Tel. : Maidenhead 2011

NIAS (1935) Ltd.,
Herborough House,
Bartholomew St., NEWBURY.
Tel. : Newbury 1100/1/2

**Reading Garage Co. Ltd.,**
**Cork Street, READING.**
Tel. : Reading 3463/4

**Erlco,**
**North Street,**
**Winkfield, WINDSOR.**
Tel. : Winkfield Row 208

**BUCKINGHAMSHIRE :**

**The Aylesbury Battery & Electrical Co. Ltd.,**
**Havelock Street, AYLESBURY.**
Tel. : Aylesbury 321

**Phoenix Motors Ltd.,**
**Oxford Road,**
**GERRARDS CROSS.**
Tel. : Gerrards Cross 2545

**Davenport Vernon & Co. Ltd.,**
**31, 32 & 34, High Street,**
**HIGH WYCOMBE.**
Tel. : High Wycombe 446

**Erlco,**
**18, St. Mary's Street,**
**HIGH WYCOMBE.**
Tel. : High Wycombe 939

Car Electrical Repairs (Slough) Ltd.,
37a, High Street, SLOUGH.
Tel. : Slough 23401

**CAERNARVON :**

**Red Garages (North Wales) Ltd.,**
**LLANDUDNO.**
Tel. : Llandudno 6756 & 6055

**CAMBRIDGESHIRE :**

**E. F. Whybro,**
**New Street, CAMBRIDGE.**
Tel. : Cambridge 58244/5

Peck & Packer (March) Ltd.,
Dartford Road, MARCH.
Tel. : March 2226

**CARDIGAN :**

Primrose Motor Co. (Aberystwyth) Ltd.,
Central Garage,
Cambrian Place,
ABERYSTWYTH.
Tel. : Aberystwyth 461

**CARMARTHENSHIRE :**

Oscar Chess Ltd.,
Blue Street, CARMARTHEN.
Tel. : Carmarthen 7439

**CHESHIRE :**

Auto Services (Timperley) Ltd.,
Park Road, TIMPERLEY.
Tel. : Sale 3869

**CHESHIRE**—cont.

Mount Motor Co.,
Claughton Firs,
Oxton, BIRKENHEAD.
Tel. : Birkenhead 871/2

**George Taylor (Chester) Ltd.,**
**Market Square, CHESTER.**
Tel. : Chester 1212

Burgess Brothers,
46a, West Road, CONGLETON.
Tel. : Congleton 265

A. Cooke & Son,
Nantwich Road, CREWE.
Tel. : Crewe 2011

Gerrards Services Ltd.,
Gee Cross, HYDE. Tel. : Hyde 591

**H. Breeze Ltd.,**
**Leftwich Works,**
**Vearows Place,**
**NORTHWICH.**
Tel. : Northwich 2468

C. W. Eayrs Ltd.,
Mersey Square, STOCKPORT.
Tel. : Stockport 2625/6

**Hollingdrake Automobile Co. Ltd.,**
**Town Hall Square,**
**STOCKPORT.**
Tel. : Stockport 4464

**CORNWALL :**

**Marshall & Son,**
**81, Trelowarren Street,**
**CAMBORNE.**

**Wheel Garage,**
**Pran Sands, PENZANCE.**
Tel. : Germoe 3137/8

Darcroft Garage,
Launceston Road, nr. BODMIN.
Tel. : Cardingham 39

The Hayle Garage,
Hayle Terrace, HAYLE.

Maynes Garage Ltd.,
Illogan Highway, REDRUTH.
Tel. : Redruth 237

Express Electrical Services Ltd.,
61, Lemon Street, TRURO.
Tel. : Truro 2645

**CUMBERLAND :**

**Edmund Fox Ltd.,**
**19, Victoria Place,**
**CARLISLE.**
Tel. : Carlisle 2658/9

**DENBIGHSHIRE :**

Hollingdrake Automobile Co. Ltd.,
Princess Drive,
COLWYN BAY.
Tel. : Colwyn Bay 3322

**C. T. Clark (Wrexham) Ltd.,**
**King's Mills Garage,**
**WREXHAM.**
Tel. : Wrexham 2274/5

**DERBYSHIRE :**

**John S. Boldry,**
**Highfield Garage,**
**86, Hawkesley Avenue,**
**CHESTERFIELD.**
Tel. : Chesterfield 2019