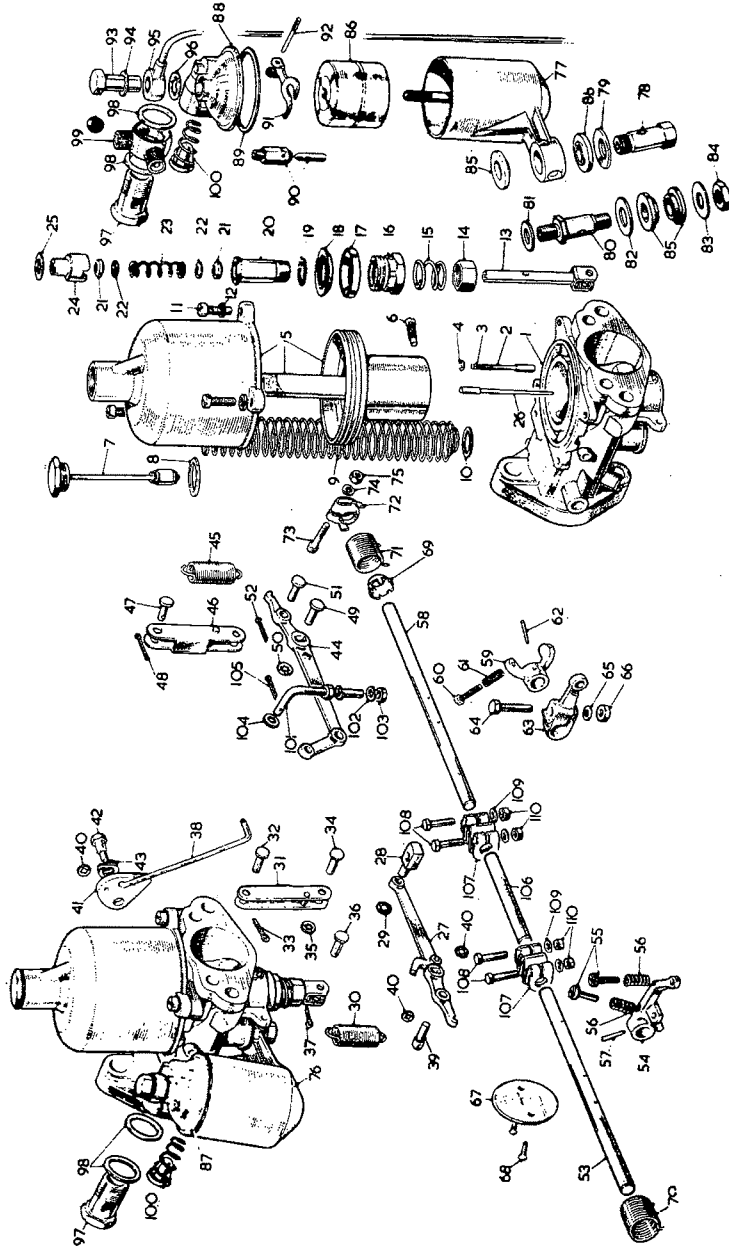


## **SECTION D**

### **THE FUEL SYSTEM**

- Section No. D.1     Removing the fuel tank.
- Section No. D.2     Removing the fuel pump.
- Section No. D.3     Construction of the fuel pump.
- Section No. D.4     Action of the fuel pump.
- Section No. D.5     Dismantling and reassembling the fuel pump.
- Section No. D.6     Resetting the diaphragm for contact breaker 'throw-over'.
- Section No. D.7     Tracing fuel pump troubles.
- Section No. D.8     Fuel pump maintenance.
- Section No. D.9     Carburetter.
- Section No. D.10    Carburetter adjustments.
- Section No. D.11    Removing the carburetters.
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- Section No. D.14    Air cleaner.
- Section No. D.15    Accelerator return spring.

THE CARBURETTOR COMPONENTS



GA320A

## KEY TO THE CARBURETTOR COMPONENTS

No.	Description	No.	Description	No.	Description
1.	Body—rear carburettor.	38.	Link tension.	75.	Nut for bolt.
2.	Pin—piston lifting.	39.	Swivel pin—link to lever.	76.	Chamber—float.
3.	Spring for pin.	40.	Washer—starlock—for link and swivel pin.	77.	Chamber—float.
4.	Circlip for pin.	41.	Cam plate.	78.	Bolt—chamber to body.
5.	Chamber and piston assembly.	42.	Bolt—pivot—for cam plate.	79.	Washer—fibre—for bolt.
6.	Screw—needle locking.	43.	Washer—spring—for bolt.	80.	Pillar—banjo.
7.	Cap and damper assembly.	44.	Lever—jet.	81.	Washer for pillar.
8.	Washer—fibre—for cap.	45.	Spring—jet lever—return.	82.	Washer—inner.
9.	Spring—red—for piston.	46.	Link assembly—jet lever.	83.	Washer—outer.
10.	Washer—plain—for spring.	47.	Pin—link to body.	84.	Nut—lock.
11.	Screw—chamber to body.	48.	Split pin for pin.	85.	Grommet—rubber.
12.	Washer—spring—for screw.	49.	Pin—link to lever.	86.	Float.
13.	Jet assembly.	50.	Washer—starlock—for pin.	87.	Lid—float-chamber.
14.	Nut—adjusting.	51.	Pin—lever to jet.	88.	Lid—float-chamber.
15.	Spring for adjusting nut.	52.	Split pin for pin.	89.	Washer for lid.
16.	Nut—gland sealing.	53.	Spindle—throttle.	90.	Needle and seat assembly.
17.	Ring—sealing aluminium.	54.	Lever—stop—throttle.	91.	Lever—hinged.
18.	Ring—sealing—cork.	55.	Screw—stop adjusting.	92.	Pin for hinged lever.
19.	Washer—bottom bearing copper.	56.	Spring for screw.	93.	Cap nut for lid.
20.	Bearing—bottom.	57.	Pin—for throttle stop lever.	94.	Washer—aluminium—for nut.
21.	Washer—gland—cork.	58.	Spindle—throttle.	95.	Banjo vent and drain pipe.
22.	Washer—gland—brass.	59.	Lever—stop—throttle.	96.	Washer—fibre.
23.	Spring—gland.	60.	Screw—stop adjusting.	97.	Bolt—banjo.
24.	Bearing—top.	61.	Spring for screw.	98.	Washer—fibre—for bolt.
25.	Washer—top bearing—copper.	62.	Pin for throttle stop lever.	99.	Union—banjo—double.
26.	Needle—M6—standard jet.	63.	Lever—throttle.	100.	Filter.
27.	Lever—jet.	64.	Bolt for lever.	101.	Rod—link.
28.	Trunnion for lever.	65.	Washer—spring—for bolt.	102.	Washer—spring—for rod.
29.	Washer—starlock—for trunnion.	66.	Nut for bolt.	103.	Nut for rod.
30.	Spring—jet lever—return.	67.	Disc—throttle.	104.	Washer—brass.
31.	Link assembly—jet lever.	68.	Screw for disc.	105.	Split pin for rod.
32.	Pin—link to body.	69.	Plate—return spring anchor.	106.	Rod—throttle connecting.
33.	Split pin for pin.	70.	Spring—return.	107.	Coupling for rod.
34.	Pin—link to lever.	71.	Spring—return.	108.	Bolt for coupling.
35.	Washer—starlock—for pin.	72.	Clip for return spring.	109.	Washer for bolt.
36.	Pin—lever to jet.	73.	Bolt for clip.	110.	Nut for bolt.
37.	Split pin for pin.	74.	Washer—plain—for bolt.		

## Section D.1

### REMOVING THE FUEL TANK

Remove the hexagon drain plug and empty the tank. Slacken the two clips on the filler neck hose and withdraw the filler extension.

Pull the hose from the tank. Take out the three screws and remove the tank filler neck seal and clamp plate.

Disconnect the fuel pipe at the union and the fuel gauge cable from the tank unit, each on the right-hand side of the tank.

Remove the two nuts from the bolts securing the rear of the tank to the anchorage brackets on the frame and remove the two bolts with spring washers which secure the front of the tank to the frame.

Withdraw the rear bolts and distance tubes.

Replacement is a reversal of the above instructions.

## Section D.2

### REMOVING THE FUEL PUMP

Raise the hood and remove the spare wheel.

Remove the hood stowage compartment floor. This is secured by five quick-release screws and each requires only a quarter turn anti-clockwise to release the cover.

Disconnect the inlet and outlet pipe unions.

Disconnect the earth lead and the supply lead from the terminals on the pump.

Remove the two set screws securing the fuel pump to the bracket on the frame cross-member.

## Section D.3

### CONSTRUCTION OF THE FUEL PUMP

The fuel pump is an S.U. Type HP high-pressure, 12-volt electric pump incorporating a radio suppressor. It is located close to the right-hand side of the fuel tank.

The pump consists of three main assemblies: the body, the magnet assembly and the contact breaker.

The body is composed of a hollow stamping or casting (8), into the bottom of which the filter (12) is screwed. The pump inlet union (29) is screwed in at an angle on one side. The outlet union (1) is screwed into the top and tightens down on the delivery valve cage (5), which is clamped between the two fibre washers (2 and 6). In the top of the delivery cage is the delivery valve, a thin brass disc (4) held in position by a spring clip (3). Inserted in the bottom of the cage is the suction valve (7), being a disc similar to (4) and held in position by a light spring on a seating machined in the body. Holes connect the space between the valves of the pumping chamber, which is a shallow depression on the forward face of the body. This space is closed by a diaphragm assembly

(9) which is clamped at its outside edge between the magnet housing (27) and body (8) and at its centre between the retaining plate (11) and the steel armature (15). A bronze rod (16) is screwed through the centre of the armature, to which the diaphragm is attached, and it passes through the magnet core to the contact breaker, which is located at the other end. A volute spring (28) is interposed between the armature and the end plate of the coil to return the armature and diaphragm.

The magnet consists of a cast-iron pot have an iron core (17), on which is wound a coil of copper wire which energizes the magnet. Between the magnet housing and the armature are fitted 11 spherical-edged brass rollers (10). These locate the armature centrally within the magnet at all times, and allow absolute freedom of movement in a longitudinal direction. The contact breaker consists of a small bakelite moulding carrying two rockers (25 and 26) which are both hinged to the moulding at one end and are connected together at the top end by two small springs, arranged to give a 'throw over' action. A trunnion is fitted into the centre of the inner rocker, and the bronze push-rod (16) connected to the armature is screwed into this. The outer rocker (26) is fitted with a tungsten point, which makes contact with a further tungsten point on a spring blade (24). This spring blade is connected to one end of the coil, and the other end of the coil is connected to the terminal (20).

A short length of flexible wire is connected to the outer rocker and to the other terminal (23), which also serves to hold the bakelite moulding onto the magnet housing.

The rocker mechanism is insulated by fibre bushes. Two fibre bushes are fitted to one of the spindles of the 'throw over' mechanism in order to silence the operation of the contact breaker.

The body is die-cast in two pieces, the joint between them being sealed by a gasket.

## Section D.4

### ACTION OF THE FUEL PUMP

The action of the pump is as follows.

When the pump is at rest, the outer rocker lies in the outer position and the tungsten points are in contact. The current passes from the terminal through the coil back to the blade, through the points and to the earth return, thus energizing the magnet and attracting the armature. This comes forward, bringing the diaphragm with it and sucking fuel through the suction valve into the pumping chamber. When the armature has advanced nearly to the end of its stroke the 'throw over' mechanism operates, and the outer rocker flies back, separating

the points and breaking the circuit. The spring (28) then pushes the armature and diaphragm back, forcing fuel through the delivery valve at a rate determined by the requirements of the engine. As soon as the armature gets near the end of this stroke the "throw over" mechanism again operates, the points again make contact, and the cycle of operations is repeated.

## Section D.5

### DISMANTLING AND REASSEMBLING THE FUEL PUMP

When a pump comes in for reconditioning the first thing to do is to determine whether it has been in contact with gum formation in the fuel, resulting in the parts

in contact with the fuel becoming coated with a substance similar to varnish. These deposits cause the eventual destruction of the neoprene diaphragm. The easiest way to identify this deposit is to smell the outlet union. If an unpleasant stale smell is noticed it indicates the presence of gum in the pump. The ordinary sharp, acrid smell of petrol (gasoline) denotes that no gum is present.

Assuming that trouble with gum formation is indicated, the whole of the parts coming into contact with fuel will have to be dismantled. Those made in brass or steel should be boiled in 20 per cent. caustic soda solution, given a dip in strong nitric acid and then washed in boiling water. Those made in aluminium should be well soaked in methylated spirits and cleaned.

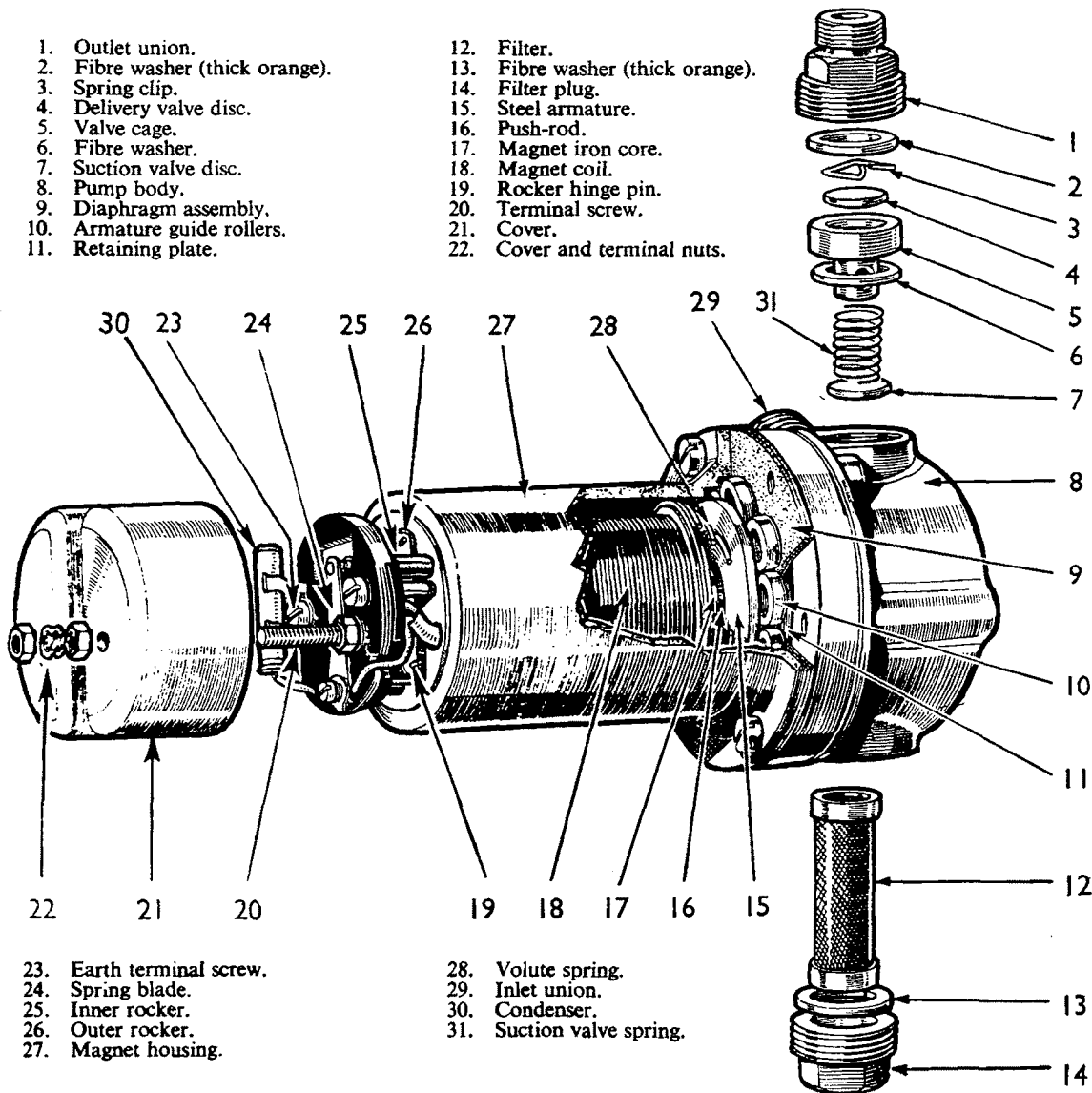


Fig. D.1.  
The S.U. fuel pump.

*To dismantle the pump*

First undo the filter plug and remove the filter plug washer and the filter. The latter may be found to be clogged completely with gum. Next the inlet union and its washer should be removed, followed by the outlet union, outlet union washer, valve cage, valve cage washer and suction valve and spring. The valve cage should then be dismantled by removing the circlip retaining the delivery valve in place, and the valve itself can then be withdrawn.

Next undo the six screws holding the two main components of the pump together. All the components of the pump body—with the exception of the washer, but including the pump body itself—should now be cleaned to remove all trace of gum. New fibre washers should be used on replacement.

If there is no evidence of gum formation, proceed as follows:—First undo the six screws holding the two parts of the pump together. The action of the valves

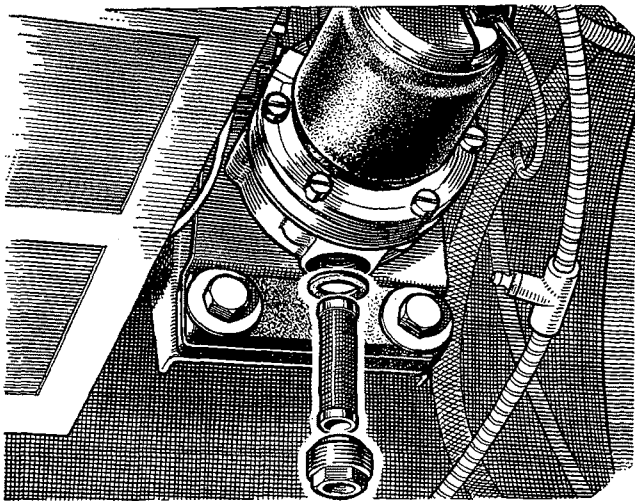


Fig. D.2.

*The pump filter should be cleaned with a brush every 6,000 miles (10000 km.).*

can then be checked by blowing and sucking in the inlet union, to check the suction valve; and the outlet union to check the delivery valve. In the former case it should be possible to blow freely but not to suck air back, and with the latter to suck and not blow.

Clean the filter in fuel with a brush and swill out the body of the pump.

Next unscrew the diaphragm assembly from its trunnion in the contact breaker. This is done by rotating the whole assembly in an anti-clockwise direction. Take care not to lose the brass rollers fitted behind the diaphragm. The easiest method is to hold the body in the left hand and to rotate the diaphragm.

Now remove the contact breaker cover by taking off

the nut which holds it in place on the terminal, and then undo the last nut on the terminal, which acts as a seating for the cover. Beneath this will be found a lead washer which is squeezed into the thread on the terminal. This should be cut away with a pocket knife, allowing the terminal to be pushed down a short way so that the tag on the coil end is free on the terminal.

Remove the 5 B.A. screw holding the contact blade in position, together with its spring washer and the contact blade.

Remove the two long 2 B.A. screws holding the bakelite pedestal in place, together with their spring washers. Take off the contact breaker assembly, using great care to get the coil end tag over the terminal without damaging the coil end.

Push out the hinge pin sideways and the pump is completely dismantled, since the rocker mechanism is supplied only as a complete assembly.

**Do not disturb** the core of the magnet; it can only be located correctly with special press tools.

*To reassemble the pump*

When reassembling, see that all parts are clean. The valves (4 and 7) should be fitted with the smooth side downwards. Care should be taken that the valve retaining clip (3) in the delivery valve cage (5) is correctly located in its groove. The thin, hard fibre washer (6) should be fitted under the valve cage and a thick one (2) above the valve cage and above the filter plug. The washer on the inlet union (29) is a thick fibre one.

The contact breaker should be assembled on its pedestal in such a manner that the rockers are free in their mountings, without appreciable side-play. Any excessive side-play on the outer rocker will allow the points to get out of line, while excessive tightness will make the action of the contact breaker sluggish. To obtain the required freedom in cases of tightness, it may be necessary to square up the outer rocker with a pair of thin-nosed pliers. **The hinge pin is case-hardened, and on no account should ordinary wire be used as a replacement. Always use the correct hardened pin.**

Should the spring contact breaker blade be removed, it must always be replaced bearing directly against the bakelite pedestal, i.e. underneath the tag.

When properly fitted the blade should rest against the ledge on the pedestal while the points are separated, and it should not be sufficiently stiff to prevent the outer rocker from coming right forward when the points are in contact. The points should make contact when the rocker is in its midway position. The simplest way to check this is to hold the blade in contact with the pedestal, taking care not to press on the overhanging portion, and see that you can get a .030 in. (.76 mm.) feeler between the white rollers and the cast-iron body of the pump.

If necessary, the tip of the blade may be set to give the correct clearance.

**Note.**—The spring washer on the B.A. screw to which the earth connection is made should be fitted between the tag and the pedestal. The spring washer is not a reliable conductor, and the brass tag must bear directly against the head of the screw.

All four connections, namely, the two ends of the earthing tag and the two ends of the coil, should be soldered. The coil end leading to the terminal should be soldered to its tag and not to the retaining nut. In the case of the terminal screw which holds the bakelite cover in position, similar considerations apply, the assembly being: spring washer (1), wiring tag (2), lead washer (3), and recessed nut (4). (See Fig. D.5.) A lead washer has been found necessary at this point as some few cases of bad connection have been found. Under no circumstances must the spring washer be omitted, or the assembly shortened in any way. Any attempt to do so is likely to lead to breakage of the pedestal when the nut retaining the cover in position is tightened up.

The armature return spring should be fitted with its larger diameter towards the coil and its smaller diameter resting against the armature. This spring must not be stretched or otherwise interfered with, or the action of the pump will be affected.

## Section D.6

### RESETTING THE DIAPHRAGM FOR CONTACT BREAKER "THROW-OVER"

If the armature and centre rod have been unscrewed it will be necessary to reset as follows:—

1. Swing to one side the spring blade which carries the contact points.
2. Fit the impact washer in the recess of the armature.
3. Screw the armature into position.
4. Place the eleven guide rollers in position around the armature. Do not use jointing compound on the diaphragm.
5. Hold the magnet assembly in the left hand, in an approximately horizontal position.
6. Screw the armature inwards until the "throw-over" ceases to operate, and then screw it back gradually, a sixth of a turn (or one hole) at a time, and press the armature in after each part of a turn until it is found that when it is pushed in slowly and firmly the "throw-over" mechanism operates. Unscrew the armature a further two-thirds of a turn (four of the six holes). When a new diaphragm is fitted it is probable that considerable pressure will be required to push the armature right home.

7. Place the cast-iron body in position on the main body, taking care to see that the drain hole in the cast-iron body is at the bottom in line with the filter plug in the main body, and all the rollers are still in their correct positions.

If a roller drops out of position it will get trapped between the two ports, and this will cut a hole in the diaphragm.

Make sure that the cast-iron body is seating properly on the main body and insert the six securing screws. **Before tightening the screws down it is essential that the diaphragm should be stretched to its outermost position.**

Do this by inserting a match-stick behind one of the white fibre rollers on the outer rocker, thus

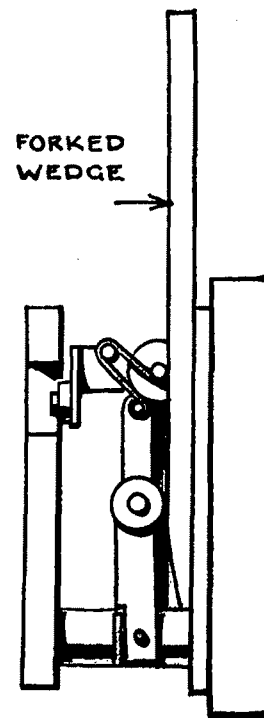


Fig. D.3.

*The use of a forked wedge to keep the armature in the correct position for fitting the diaphragm.*

holding the points in contact (after first re-positioning the spring blade into its normal position). If a current is then passed through the pump the magnet will be energised and will pull the armature and diaphragm forward, and while it is in this position the six screws should be tightened. Although the diaphragm-stretching operation can be effected by the matchstick method, a special tool for the purpose is available

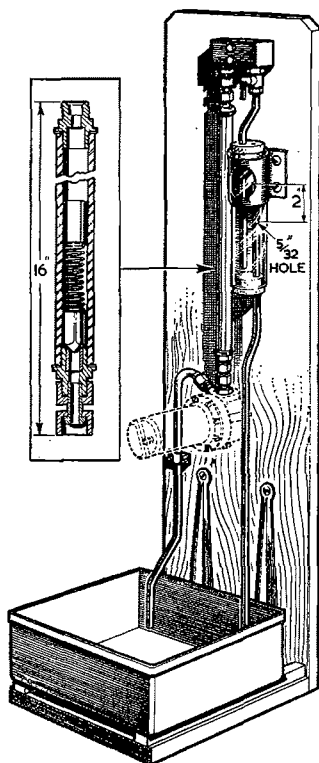


Fig. D.4.  
Checking rig.

from the S.U. Carburetter Co. or their Distributors. The tool is a steel wedge, to be inserted under the trunnion in the centre of the inner rocker in order to stretch the diaphragm to its outermost position before tightening the six flange screws.

8. Finally, check that when the spring blade is in its normal position the clearance hole in it is so positioned around the locking screw that each contact point, according to the operation of the outer rocker, **wipes over the centre line of the other contact point**, and that this action is not to one side of the centre on either contact. The width of the gap at the points is approximately .030 in. (.76 mm.).
9. The pump should now be placed on test, using a cut-away cover to enable the contact breaker action to be observed and at the same time to prevent the rocker hinge pin from falling out.

A test rig of the type illustrated in Fig. D.4 is advised; either petrol (gasoline) or paraffin (kerosene) may be used for testing purposes. Test figures are given in "General Data." The use of a glass tube and rubber connections between the sump and the test tank is advised. When the pump is switched on it should prime itself promptly, and the paraffin, which is normally used for testing, should rise in the glass container until it

flows over the top of the pipe having the  $\frac{5}{32}$  in. (4 mm.) hole drilled in it 2 in. (5 cm.) below the top of the pipe. If the output of the pump is not up to normal, the  $\frac{5}{32}$  in. (4 mm.) diameter hole will be able to deal with all the paraffin pumped and the liquid will not flow over the top of the pipe. If a time-test is used, one pint (.57 litre) of fuel per minute should be pumped.

These test rigs can be obtained complete from the Service Parts Department of the S.U. Carburetter Company or their Distributors.

This, therefore, constitutes a simple form of flow-meter which establishes in a simple manner whether the pump is giving a sufficient output or not. If there is any air leak in the pump or in its connections, bubbles will be seen coming out of the pipe projecting downwards into the flow-meter. Bubbles will certainly come through here for a short while after starting up, but they should cease after the pump has been running for a minute or so. The tap should then be turned right off and the pump should stand without repeating its action for at least fifteen seconds. If it repeats within this time, the suction valve is not seating correctly.

The tap should then be turned on slowly to see if the pump idles satisfactorily, and that the outer rocker comes forward till it makes contact with the pedestal, and while it is in this position the tip of the blade should be pressed inwards to reduce the stroke of the pump gradually. However much this stroke is reduced, the pump should go on pumping normally until it fails altogether owing to there being no gap left. If, instead of pumping, it buzzes, it usually indicates excessive flexibility in the diaphragm. This, of course, is not likely to be experienced with a new diaphragm. Then, with the tap turned on fully, the pump should be tested on 9 volts (or on  $4\frac{1}{2}$  volts if it is a 6-volt pump) and it should work satisfactorily under these conditions, although probably with a reduced output.

It is as well to let the pump run for ten minutes or so before carrying out these various tests. The cover, which is red for 12-volt, should then be fitted and held in place with two ordinary brass nuts fitted on the end of the terminal. The type of pump can always be identified by the colour of the sleeving on the coil ends, this being red for low pressure and brown for high pressure (both 12-volt.).

**Note.**—There are three important points which are repeatedly overlooked by operators. These seriously affect the functioning of the pump; they are:—

1. To keep the contact breaker blade out of contact while obtaining the correct diaphragm setting.
2. To press firmly and steadily on the armature, instead of jerking it, while obtaining the setting.
3. Omission to stretch the diaphragm to the limit of its stroke while tightening up the body screws.



## Section D.7

### TRACING FUEL PUMP TROUBLES

Should the pump cease to function, first disconnect the fuel delivery pipe from the pump. If the pump then works the most likely cause of the trouble is a sticking needle in the float-chamber of the carburetter. Should the pump not work, disconnect the lead from the terminal and strike it against the body of the pump after switching on the ignition. If a spark occurs it indicates that the necessary current is available at the terminals, and that the trouble arises with the pump mechanism. If no spark can be detected, then it is an indication that the current supply has failed and that attention should be given to the wiring and battery. If current is present, further investigation should be carried out by removing the bakelite cover which is retained by the terminal nut. Touch the terminal with the lead. If the pump does not operate and the contact points are in contact yet no spark can be struck off the terminal, it is very probable that the contact points are dirty and require cleaning. These may be cleaned by inserting a piece of card between them, pinching them together and sliding the card backwards and forwards.

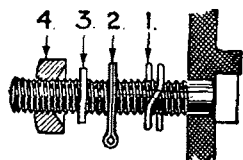


Fig. D.5.

*The correct sequence of assembly of the connecting components on the terminal screw.*

It is possible that there may be an obstruction in the suction pipe, which should be cleared by blowing air through it, or that some irregularity in the pump itself is preventing the correct movement. This may be due either to the diaphragm having stiffened, or to foreign matter in the roller assembly which supports the diaphragm, in which case the diaphragm should be removed and the whole assembly cleaned and reassembled in accordance with the instructions on page D.6.

On the other hand, if the points are not making contact, see that the tips of the inner rocker (25) are in contact with the magnet housing. If they are not, it is an indication that the armature has failed to return to the end of its normal travel.

To cure this, loosen the six screws, which attach the magnet housing to the pump body, and make sure that the diaphragm is not sticking to the face of the magnet housing by carefully passing a penknife between the

two. The hinge pin (19) should then be removed and the six retaining screws tightened up again. The tips of the inner rockers will probably now be found to be making contact with the face of the magnet housing, but if they are not, it will be necessary to remove and dismantle the whole magnet assembly in order to ascertain if an accumulation of foreign matter has caused a jam. Remember that whenever the magnet housing is removed care should be taken to see that the guide rollers (10) do not drop out.

#### *Pump noisy*

If the pump becomes noisy and works rapidly, it is usually an indication that there is an air leak on the suction side of the pump. Check the level of the fuel in the tank and see that it is not too low.

The simplest way to test for air leakage is to disconnect the fuel pipe from the carburetter and place its end in a glass jar (approximately 1 pint or half a litre) and allow the pump to deliver fuel into it. If air bubbles appear when the end of the pipe has become submerged in the fuel, it is a clear indication of an air leak on the suction side of the pump in the fuel feed pipe between the tank and the pump which should be found and cured. Check all the unions and joints, making sure that the filter union and inlet unions are all quite air-tight.

#### *Failure to deliver fuel*

Should the pump continue beating without delivering fuel, it is probable that some dirt has become lodged under one of the valves, in which case they should be dismantled by unscrewing the top or delivery union and lifting out the valve cage, when they can be cleaned and reassembled. When replacing it see that the thin, hard, red fibre washer is *below* the valve cage and the thick, orange one above.

If the pump struggles to operate and becomes very hot, it is probable that the filter has become clogged or there is an obstruction on the suction side. The filter is readily removed for cleaning by unscrewing its retaining plug at the bottom of the pump.

## Section D.8

### FUEL PUMP MAINTENANCE

Apart from keeping the contacts clean and removing the filter at regular intervals for cleaning, there is no maintenance required on the fuel pump.

The filter can be removed by unscrewing the hexagon plug at the bottom of the pump, when it can be cleaned in fuel with a stiff brush. Never use rag to clean a filter.

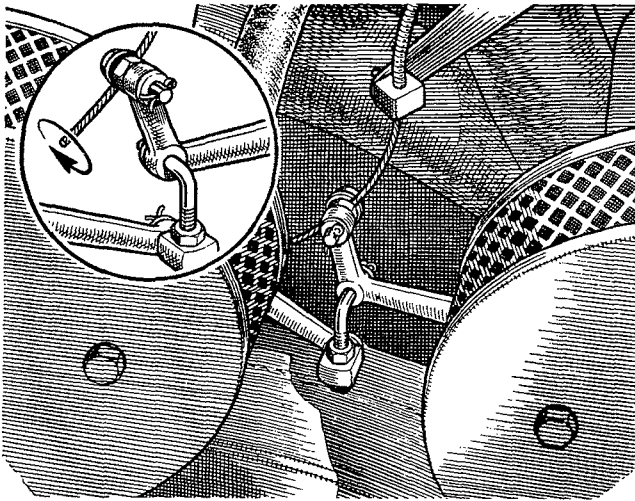


Fig. D.6.

When connecting the mixture control wire, give twist as indicated to ensure correct operation of the lock.

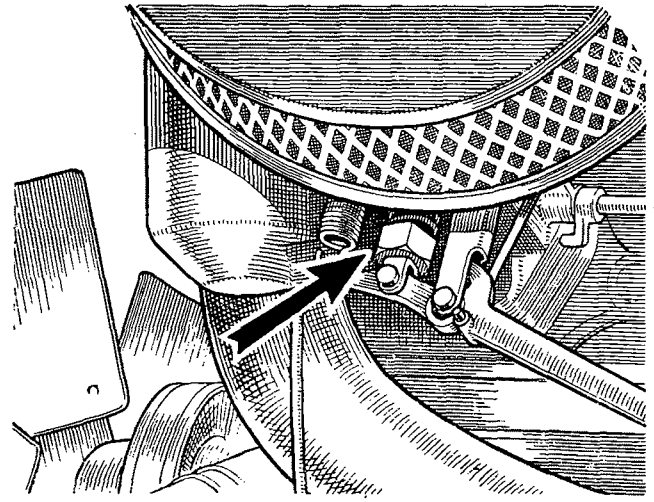


Fig. D.8.

The arrow indicates the jet adjusting nut.

## Section D.9

### THE CARBURETTERS

The S.U. carburetters are of the controllable jet type drawing air through oil-wetted air cleaners.

A damper is provided in each unit, consisting of a plunger and non-return valve attached to the oil cap nut. The damper operates in the hollow piston rod which is partly filled with oil. Its function is to give a slightly enriched mixture on acceleration by controlling the rise of the piston, and also to prevent flutter.

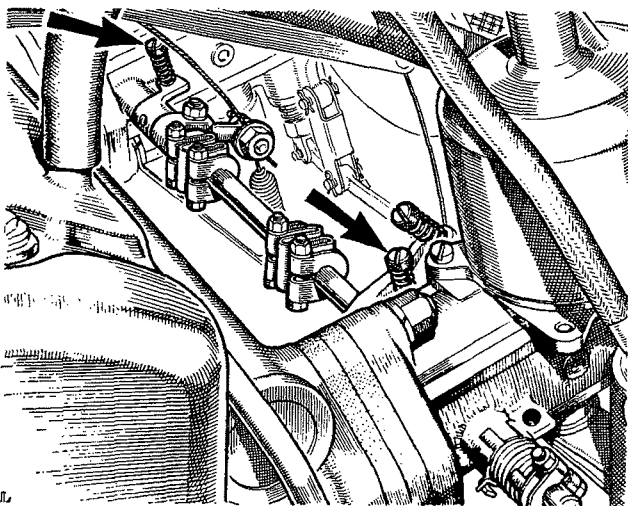


Fig. D.7.

The slow-running adjustment screws are indicated by the arrows.

## Section D.10

### CARBURETTER ADJUSTMENTS

Slow running is governed by the setting of the jet adjusting nuts and the throttle stop screws, all of which must be correctly set and synchronised if satisfactory results are to be obtained.

The two throttles are interconnected by a coupling shaft and spring coupling clips enabling them to be set and correctly synchronised when adjustments are being made.

The mixture control levers are also connected, between the carburetters, by a short adjustable link.

Before blaming the carburettor settings for bad slow running, make certain that the trouble is not caused by badly adjusted contact points, faulty plugs, incorrect valve clearance or faulty valves and springs.

#### Adjusting the jets

Run the engine until it attains its normal running temperature.

Slacken off the pinch-bolt of one of the spring coupling clips locating the carburettor inter-connecting shaft to the carburettor throttle spindles so that each carburettor can be operated independently.

Disconnect the mixture control cable and the connecting link between the two jet adjusting levers.

Unscrew both throttle lever setting screws until the throttles are completely closed. Turn the adjusting screw of the rear carburettor in a clockwise direction approximately one turn to set the throttle for fast idling; lift the piston of the front carburettor  $\frac{1}{2}$  in. (13 mm.) to leave the carburettor out of action.

With the engine running, set the jet adjusting nut of the rear carburettor so that a mixture strength is obtained

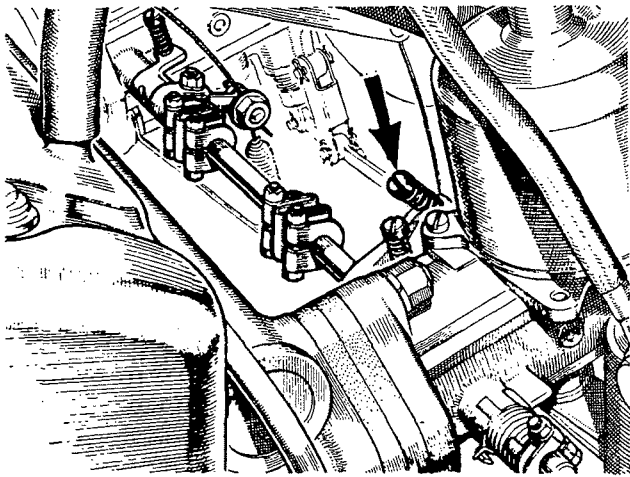


Fig. D.9

The screw indicated by the arrow is used to adjust the amount of throttle opening when the mixture control is in use

which will give the best running speed for this particular throttle opening, taking care to see that the jet head is in firm contact with the adjusting nut the whole time.

The correctness or otherwise of this setting can be checked by raising the suction piston about  $\frac{3}{8}$  in. (.8 mm.) with the piston-lifting pin. This should cause a very slight momentary increase in the speed of the engine without impairing the evenness of the running. If the engine stops, the mixture is too weak. If the speed increases and continues to increase when the piston is raised as much as  $\frac{1}{2}$  in. (6 mm.) the mixture is too rich.

When the setting of the mixture is correct for the rear carburetter, unscrew the throttle adjusting screw until the throttle is fully closed and lift the piston  $\frac{1}{2}$  in. (13 mm.) to put it out of action. Repeat the adjustment operations on the front carburetter.

When both carburetters are correctly adjusted for mixture, set the throttle adjustment screw of each to give the required slow running. Adjust the link between the mixture levers so that each lever is moved the same amount when the mixture control is used.

### Slow-running and synchronization

Turn the throttle adjustment screw of each carburetter to give a fast idling speed, taking care to turn each screw the same amount. Now unscrew each throttle lever adjustment screw an equal amount, a fraction of a turn at a time until the desired slow-running speed is obtained.

Accuracy of synchronization can be checked by listening at each carburetter air intake in turn through a length of rubber tubing and noticing if the noise produced by the incoming air is the same at both. Any variation in the intensity of the sound indicates that one throttle is set more widely open than the other.

When the same intensity of sound is given by both carburetters the coupling shaft clip should be tightened to ensure that the throttles work in unison.

Since the delivery characteristics when both carburetters are working together vary somewhat from those existing when each is working separately, it will be necessary to check again for correctness of mixture strength by lifting each piston in turn as indicated in 'Adjusting the jets', and adjusting as necessary.

## Section D.11

### REMOVING THE CARBURETTERS

Release the spring clips and detach the breather hose from the air cleaner and rocker cover.

Disconnect the fuel supply pipe at the rear carburetter banjo union.

Remove the split pin and flat washer and release the mixture cable and clevis pin from the mixture control linkage and release the mixture outer cable abutment from its bracket.

Detach the throttle return spring and release the throttle cable.

Unscrew the union nut and disconnect the ignition vacuum control pipe from the rear carburetter.

Remove the nut and flat washer to release the vent pipe from the top of each float-chamber.

Remove the four nuts securing the carburetter flanges and withdraw the carburetters and air cleaners as an assembly.

Replacement is a reversal of the above instructions.

## Section D.12

### CENTRING THE JET

First remove the clevis pin at the base of the jet which attaches the jet head to the jet operating lever; withdraw the jet completely, and remove the adjusting nut and the adjusting nut spring. Replace the adjusting nut without its spring and screw it up to the highest position. Slide the jet into position until the jet head is against the base of the adjusting nut.

When this has been done remove the dashpot piston and test for free piston movement by lifting it with a finger. If it is not perfectly free, slacken the jet holding screw and manipulate the lower part of the assembly including the projecting part of the bottom half jet bearing, adjusting nut and jet head. Make sure that the assembly is now slightly loose. The piston should rise and fall quite freely as the needle is now able to move the jet into the required central position. Tighten the jet holding screw and check the position again.

# D

## THE FUEL SYSTEM

If it is still not free, slacken the jet holding screw and repeat the operation. When the piston is completely free-moving, remove the adjusting nut and replace its spring. Replace the nut, screwing it to its original position.

Experience shows that a large percentage of the carburetters returned for correction have had jets removed and incorrectly centred on replacement.

### Section D.13

#### SOURCES OF CARBURETTER TROUBLE

##### Piston sticking

The piston assembly comprises the suction disc and the piston forming the choke, into which is inserted the hardened and ground piston rod which engages in a bearing in the centre of the suction chamber and in which is, in turn, inserted the jet needle. The piston rod running in the bearing is the only part which is in actual contact with any other part, the suction disc, piston, and needle all having suitable clearances to prevent sticking. If sticking does occur the whole assembly should be

cleaned carefully and the piston rod lubricated with a spot of thin oil. No oil must be applied to any other part except the piston rod. A sticking piston can be ascertained by removing the dashpot damper, inserting a finger in the air intake and lifting the piston, which should come up quite freely and fall back smartly onto its seating when released. On no account should the piston return spring be stretched or its tension altered in an attempt to improve its rate of return.

##### Float-chamber flooding

This is indicated by the fuel dripping from the drain pipe, and is generally caused by grit between the float-chamber needle and its guide. This is cured by removing the float-chamber, washing the valve and float-chamber components and reassembling.

##### Float needle sticking

If the engine stops, apparently through lack of fuel, when there is plenty in the tank and the pump is working properly, the probable cause is a sticking float needle. An easy test for this is to disconnect the pipe from the

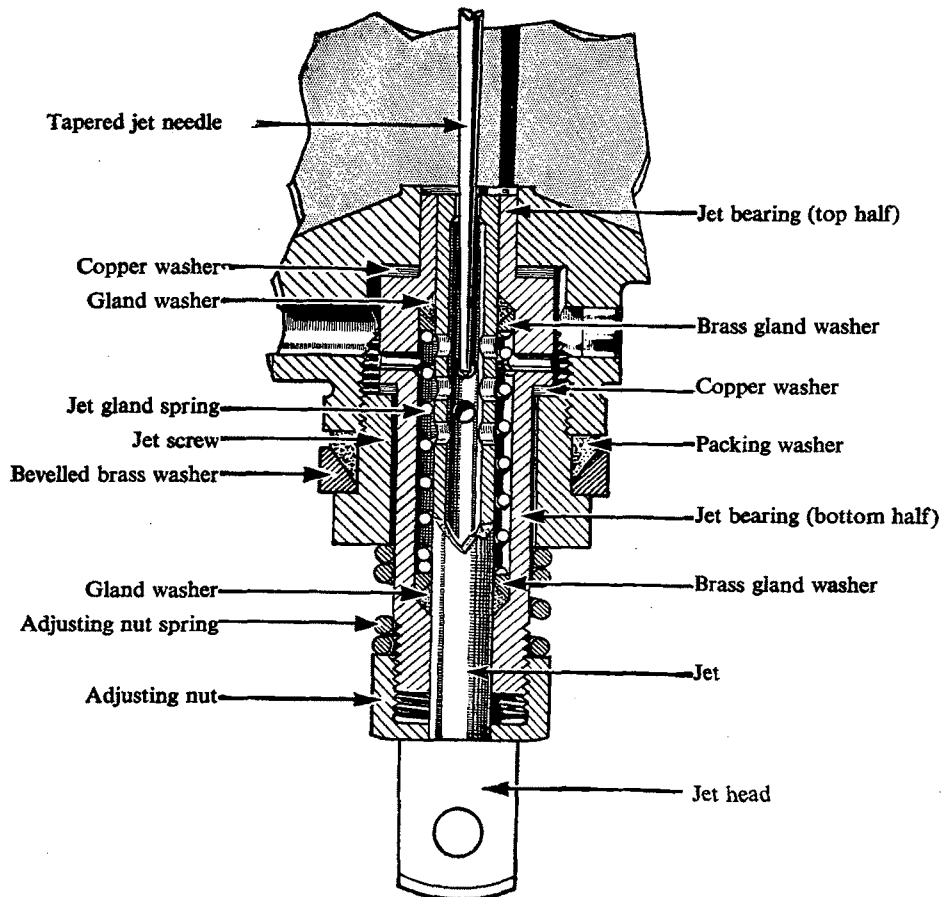


Fig. D.10

An enlarged view of the jet assembly, showing the component parts

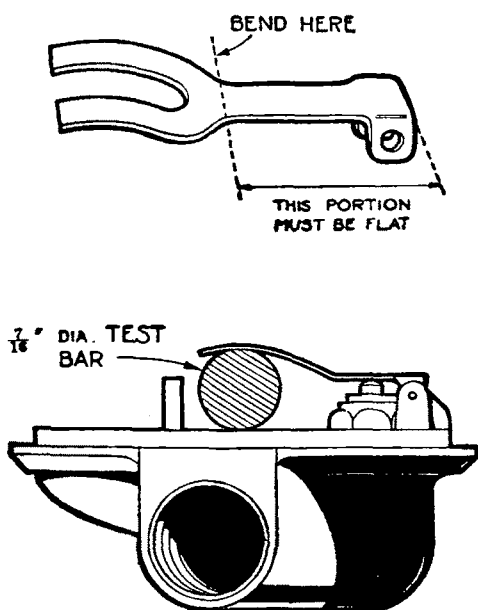


Fig. D.11

*Showing the place where the float lever should be set and the method of checking the correct adjustment of the lever*

electric pump to the carburetters and switch the ignition on and off quickly while the end of the pipe is directed onto a pad of cloth or into a container.

If fuel is delivered, starvation has almost certainly been caused by the float needle sticking to its seating, and the float-chamber lid should therefore be removed, the needle and seating cleaned and refitted. At the same time it will be advisable to clean out the entire fuel feed system, as this trouble is caused by foreign matter in the fuel and unless this is removed it is likely to recur. It is of no use whatever renewing any of the component parts of either carburetter, and the only cure is to make

sure that the fuel tank and pipe lines are entirely free from any kind of foreign matter or sticky substance capable of causing this trouble.

## Section D.14

### AIR CLEANER

Every 3,000 miles (4800 km.) or more frequently in dusty conditions the air cleaner should be serviced as follows.

Unscrew and remove the two bolts, remove the outer cover and withdraw the element from the body of each cleaner. Wash the element thoroughly in petrol (gasoline), drain and dry. Wet the element with S.A.E. 20 engine oil and allow to drain before replacing.

Reassemble the front element with the corrugations clear of the breather spigot in the filter case.

## Section D.15

### ACCELERATOR RETURN SPRING

On later cars, commencing with Car No. 24954, an additional accelerator return spring is introduced as a safety precaution and the original return spring is replaced by a new spring.

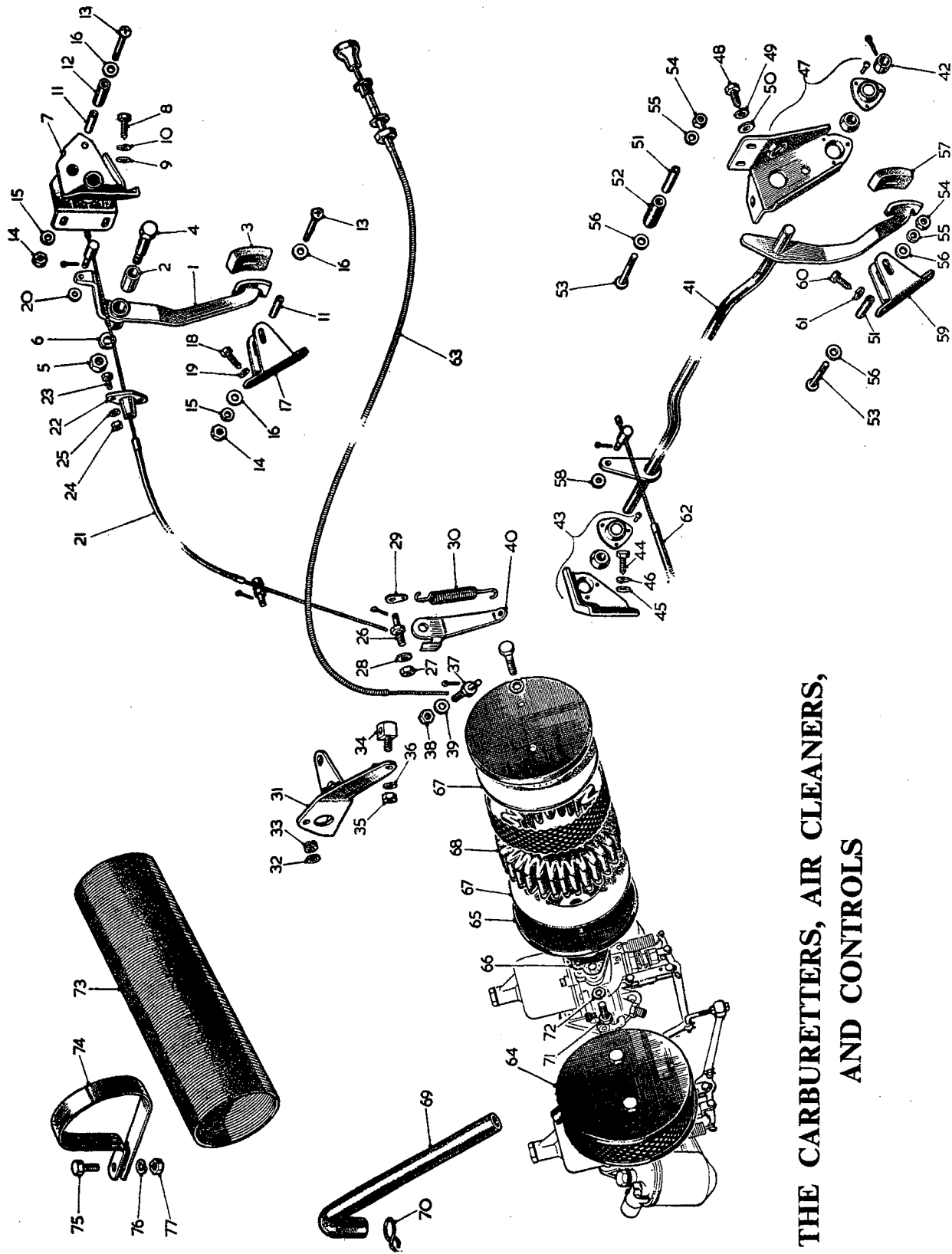
The new parts may be fitted to earlier cars as a set as follows.

Remove the original accelerator return spring and fit the new spring (Part No. AHH5621).

Remove the accelerator cable and replace the anchor pin with the new anchor pin (Part No. AHH5626), or fit the new accelerator cable (Part No. AHH5625).

Fit the anchor bracket (Part No. AHH5623) to one of the accelerator cable guide screws and fit the auxiliary return spring (Part No. AHH5624).

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**THE CARBURETTERS, AIR CLEANERS,  
AND CONTROLS**

### KEY TO THE CARBURETTERS, AIR CLEANERS AND CONTROLS

<i>No.</i>	<i>Description</i>	<i>No.</i>	<i>Description</i>
1.	Pedal—accelerator assembly.	37.	Clamp—choke control cable.
2.	Bush.	38.	Nut—cable to clamp.
3.	Pad—rubber pedal.	39.	Washer—plain—cable to clamp.
4.	Fulcrum pin—accelerator pedal.	40.	Anchor bracket—accelerator spring.
5.	Nut—fulcrum pin.	41.	Cross-shaft assembly—accelerator.
6.	Washer—spring—fulcrum pin.	42.	Locating collar—accelerator shaft.
7.	Bracket—accelerator pedal mounting.	43.	Bracket assembly—R/H—accelerator pedal shaft.
8.	Screw—bracket to goalpost inner upright.	44.	Screw—bracket to goalpost—R/H.
9.	Washer—plain—pedal bracket.	45.	Washer—plain.
10.	Washer—spring—pedal bracket.	46.	Washer—spring.
11.	Distance-tube—bracket/adjusting stop.	47.	Bracket assembly—L/H—accelerator pedal shaft.
12.	Stop—accelerator pedal bracket.	48.	Screw—bracket to goalpost—L/H.
13.	Screw—distance-tube/adjustable stop.	49.	Washer—spring.
14.	Nut—tube and stop screw.	50.	Washer—plain.
15.	Washer—spring—tube and stop screw.	51.	Distance-tube.
16.	Washer—plain—bracket/adjusting stop.	52.	Stop—accelerator pedal.
17.	Adjustable stop—accelerator pedal.	53.	Screw—distance-tube/adjustable stop.
18.	Screw—adjustable stop to goalpost.	54.	Nut—distance-tube/adjustable stop.
19.	Washer—spring—stop to goalpost screw.	55.	Washer—spring.
20.	Washer—plain—cable to pedal.	56.	Washer—plain—adjustable stop screw.
21.	Cable—accelerator.	57.	Pad—rubber—accelerator pedal.
22.	Guide—cable.	58.	Washer—plain—cable to shaft assembly.
23.	Screw—guide to toe-board plate.	59.	Adjustable stop—accelerator pedal.
24.	Nut—guide screw.	60.	Screw—adjustable stop to toe-board.
25.	Washer—spring—guide screw.	61.	Washer—spring.
26.	Clamp—accelerator cable.	62.	Cable—accelerator.
27.	Nut—cable to clamp.	64.	Cleaner—front air.
28.	Washer—plain—cable to clamp.	65.	Cleaner—rear air.
29.	Bracket—accelerator return spring.	66.	Gasket.
30.	Return spring—accelerator.	67.	Insert pad.
31.	Abutment bracket—accelerator choke cables.	68.	Element.
32.	Washer—plain—cable to abutment.	69.	Pipe—air filter.
33.	Washer—double coil spring—cable to abutment.	70.	Clips—air pipe.
34.	Abutment—choke control.	71.	Set screw—cleaner to carburetters.
35.	Nut—choke abutment.	72.	Washer—cleaner set screw.
36.	Washer—spring—choke abutment.		

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