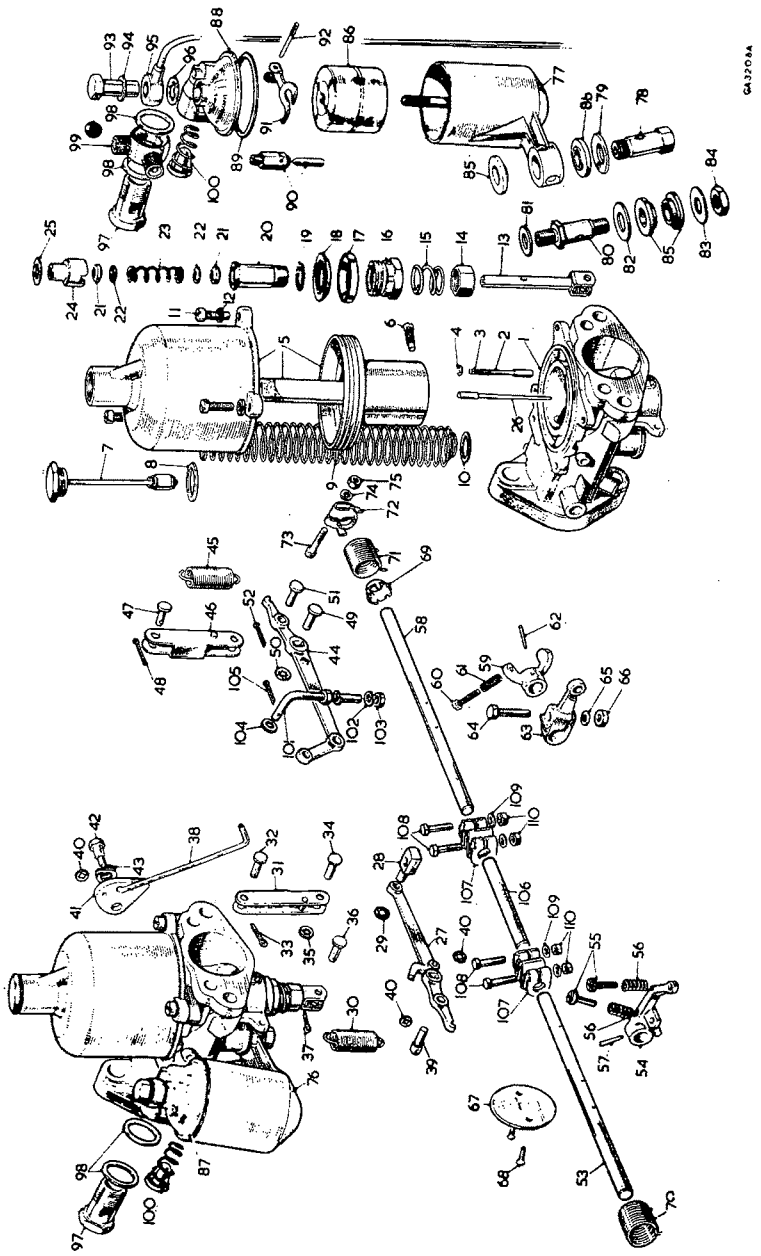
SECTION D

THE FUEL SYSTEM

THE CARBURETTER COMPONENTS



KEY TO THE CARBURETTER COMPONENTS

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

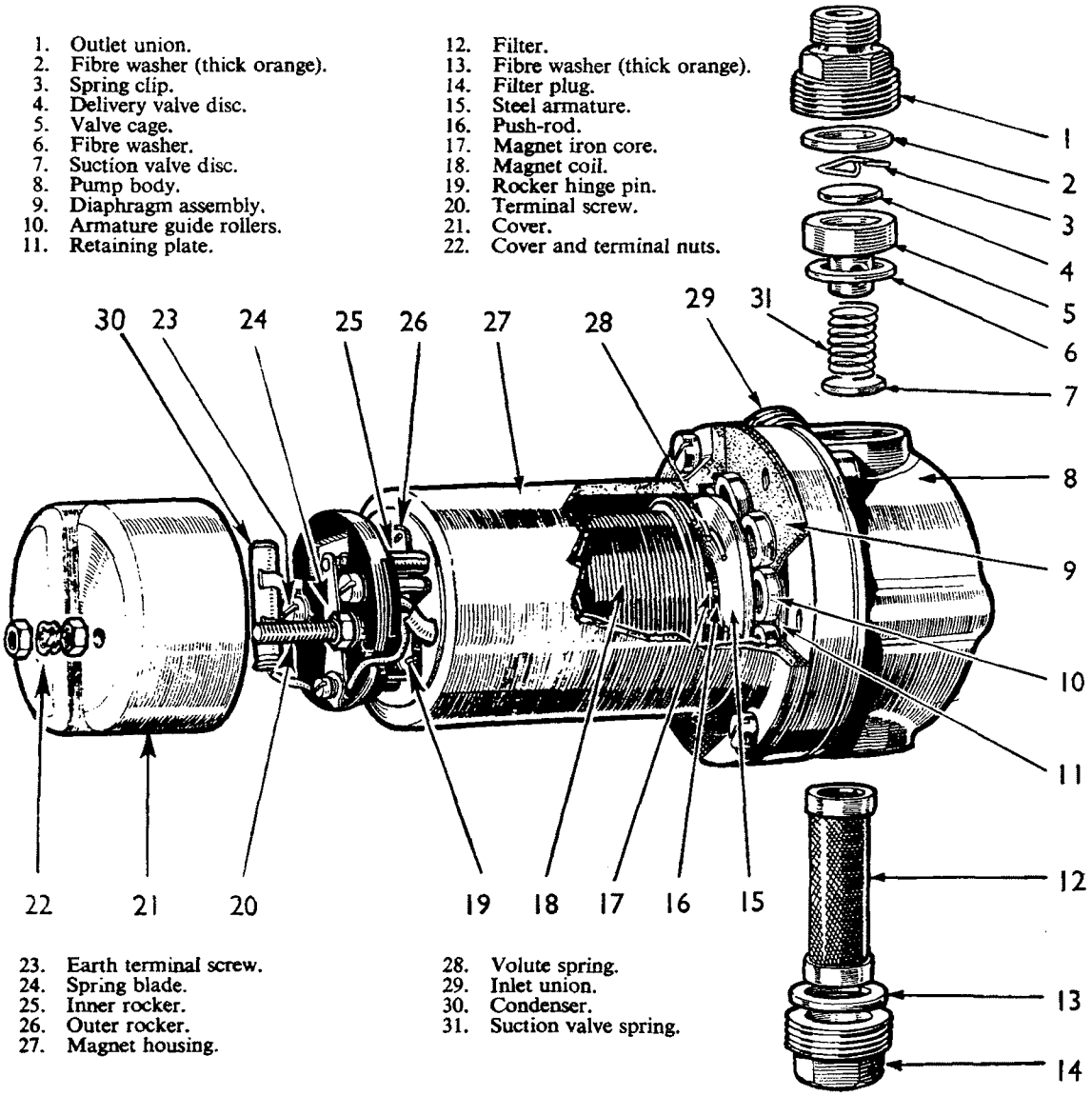


Fig. D.1.
The S.U. fuel pump.

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

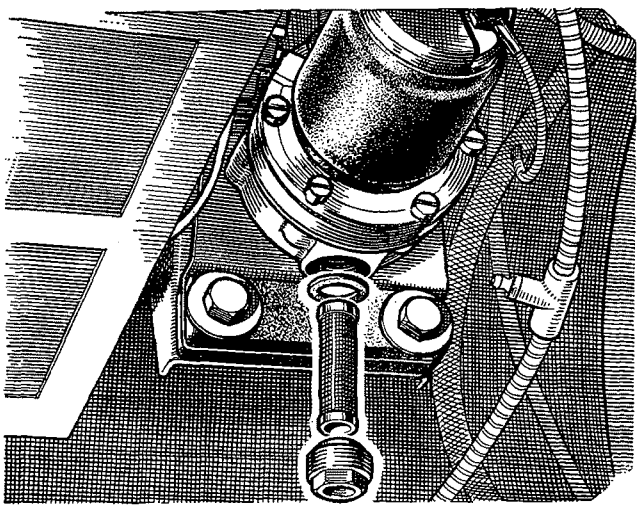


Fig. D.2.

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.