

THE



FUEL PUMP

Type  
LCS

DISMANTLING AND REASSEMBLING  
INSTRUCTIONS

MANUFACTURED

by

**THE S.U. CARBURETTER COMPANY LIMITED**

WOOD LANE

ERDINGTON

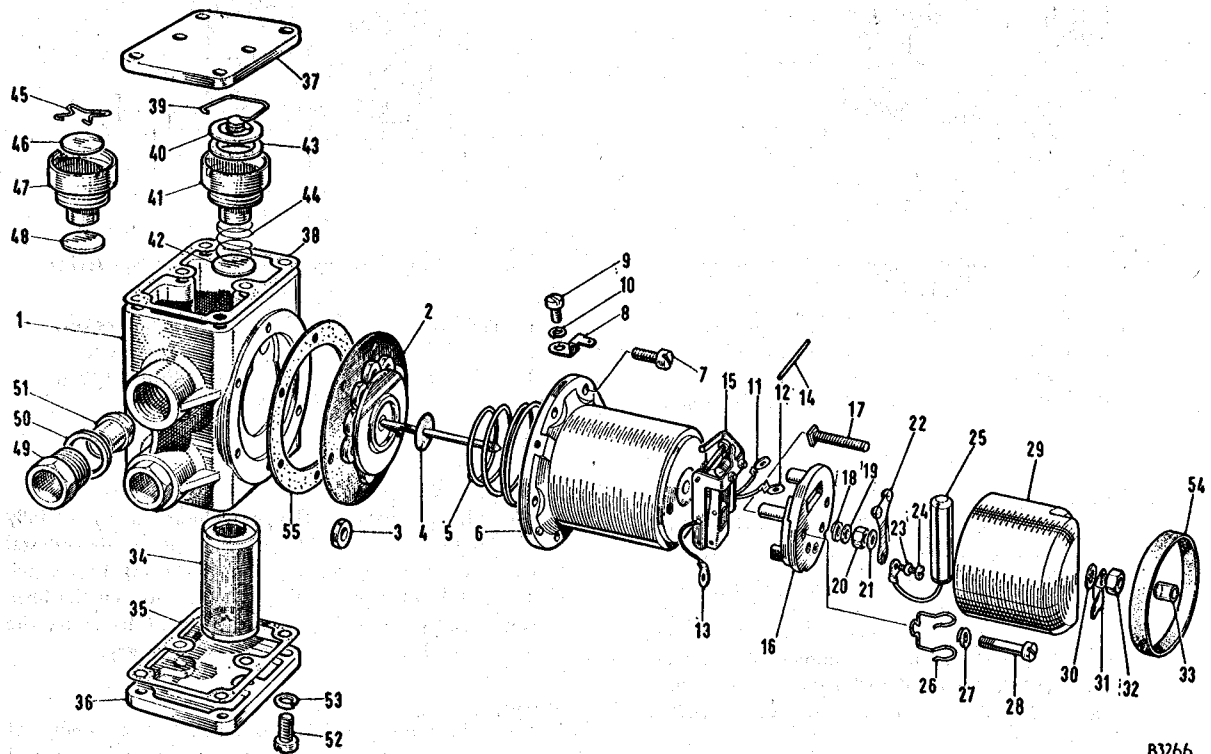
BIRMINGHAM 24

TELEPHONE: ERDINGTON 7371 (9 lines)

TELEGRAMS: CARBURFLEX, BIRMINGHAM



# THE S.U. TYPE LCS PUMP



B3266

No.	Description	No.	Description	No.	Description
1.	Pump body.	20.	Nut—terminal.	38.	Gasket—upper cover.
2.	Diaphragm and spindle assembly.	21.	Washer—end cover seal.	39.	Clip—valve
3.	Roller—armature centralizing.	22.	Contact blade.	40.	Valve—outlet
4.	Washer—Impact.	23.	Washer—5 B.A.	41.	Cage—outlet valve
5.	Spring—armature.	24.	Screw—contact blade—5 B.A.	42.	Valve—inlet
6.	Housing—coil.	25.	Condenser.	43.	Washer—cork
7.	Screw—securing housing—2 B.A.	26.	Clip—condenser.	44.	Spring—inlet valve
8.	Connector—earth.	27.	Washer—spring—2 B.A.	45.	Clip—valve
9.	Screw—4 B.A.	28.	Screw—pedestal to housing—2 B.A.	46.	Valve—outlet
10.	Washer spring—4 B.A.	29.	End cover.	47.	Cage—outlet valve
11.	Tag—terminal—5 B.A.	30.	Washer—shakeproof—2 B.A.	48.	Valve—inlet
12.	Tag—terminal—2 B.A.	31.	Connector—Lucar.	49.	Connection—outlet.
13.	Tag—earth—2 B.A.	32.	Nut—2 B.A.	50.	Washer—rubber.
14.	Pin—rocker pivot.	33.	Sleeve—insulating.	51.	Nipple—outlet.
15.	Rocker mechanism.	34.	Filter.	52.	Screw—securing cover—2 B.A.
16.	Pedestal.	35.	Gasket—lower cover.	53.	Washer—spring—2 B.A.
17.	Stud—terminal.	36.	Cover—lower.	54.	Band-sealing.
18.	Washer—spring.	37.	Cover—upper.	55.	Gasket—diaphragm.
19.	Washer—lead.				

Note.—A joint gasket .030 in. thick is fitted between the diaphragm and coil-housing when a single-layer diaphragm is used.

## DISMANTLING

### Contact breaker

1. Remove the insulated knob or sleeve (33), terminal nut (32), and connector (31), together with its shakeproof washer. Remove the tape seal (if fitted) and take off the end-cover.
2. Remove the condenser (25) (if fitted) from its clip. Unscrew the 5 B.A. screw (24) which holds the contact blade (22) to the pedestal (16), and this will allow the washer (23), the long-coil lead (11), and the contact blade to be removed.

### Coil housing and diaphragm

3. Unscrew the coil housing securing screws (7), using a thick-bladed screwdriver to avoid damaging the screw heads.
4. Remove the earthing screw (9). On earlier pumps a 2 B.A. earthing stud (Fig. 1) was fitted in the 9 o'clock position on 12-volt pumps, and in the 12 o'clock position on 6-volt pumps, looking at the front or pedestal end of the pump.
5. The coil housing (6) may now be removed from the body (1). Next remove the diaphragm and spindle assembly (2) by taking hold of the diaphragm and unscrewing it anti-clockwise until the armature spring (5) pushes the diaphragm away from the coil housing. It is advisable to hold the housing over the bench so that the 11 brass rollers (3) will not fall onto the floor. The diaphragm and its spindle are serviced as a unit and should not be separated.

### Pedestal and rocker

6. Remove the end-cover seal washer (21), unscrew the terminal nut (20), and remove the lead washer (19); this will have flattened on the terminal tag and thread and is best cut away with cutting pliers or a knife. Unscrew the two 2 B.A. screws (28), holding the pedestal to the coil housing, remove the earth terminal tag (13) together with the condenser clip (26) (if fitted). Tip the pedestal and withdraw the terminal stud (17) from the terminal tag (12). The pedestal (16) may now be removed with the rocker mechanism attached.
7. Push out the hardened steel pin (14) which holds the rocker mechanism to the pedestal and separate the two.

### Body and valves

8. Remove the body covers (36) and (37), joint washers, and filter (34).
9. Unscrew the outlet valve cage (41), in which is located a riveted outlet valve assembly (40), comprising a brass seating, a light spring, and a thin plastic valve disc; this is serviced as a unit and should not be separated. Remove the inlet valve spring (44) and disc (42) from the body.

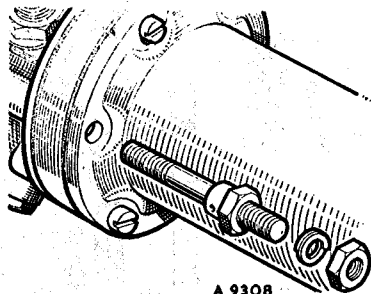
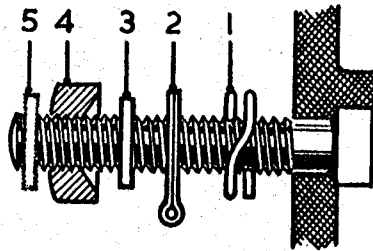


Fig. 1. The earthing stud on earlier pumps



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Fig. 2. The correct assembly of components on the terminal stud

Earlier LCS pumps have plain valve discs (46) and (48) which can be removed from the valve cage by releasing the spring clip; no inlet valve spring is fitted.

## INSPECTION

If gum formation has occurred in the fuel used in the pump, the parts in contact with the fuel will have become coated with a substance similar to varnish. This has a strong stale smell and may attack the neoprene diaphragm. Brass and steel parts so affected can be cleaned by being boiled in a 20 per cent. solution of caustic soda, dipped in a strong nitric acid solution and finally washed in boiling water. Light alloy parts must be well soaked in methylated spirits and then cleaned.

1. Clean the pump and inspect for cracks, damaged joint faces, and threads.
2. On later-type pumps examine the outlet valve for damage. Check that the centre rivet is tight and that the light spring has not unwound, but is still holding the plastic valve disc on its seating. The valve disc should be free to lift, and not be trapped under the rivet shoulder. There must be no kinks or marks which might cause it to fail to seat. On earlier pumps remove the circlip in the valve assembly and examine the discs for wear. Scrap if worn.
3. Examine the valve seat in the body and outlet valve cage for damage and corrosion; if it is impossible to remove the corrosion, or if the seat is pitted, the body must be discarded.
4. Clean the filter with a brush and examine for fractures, renew if necessary.
5. Examine the coil lead tag for security and the lead insulation for damage.
6. Examine the contact breaker points for signs of burning and pitting; if this is evident, the rocker assembly and spring blade must be renewed.
7. Examine the pedestal for cracks or other damage, particularly to the narrow ridge on the edge of the rectangular hole on which the contact blade rests.
8. Examine the diaphragm for signs of deterioration.
9. Renew the following parts: All fibre washers, gaskets, and 'O' section sealing rings, rollers showing signs of wear on periphery, damaged bolts, and unions.

## ASSEMBLY

### Pedestal and rocker

**Note.** The steel pin which secures the rocker mechanism to the pedestal is specially hardened and must not be replaced by other than a genuine S.U. part.

1. Invert the pedestal and fit the rocker assembly to it by pushing the steel pin (1) (Fig. 3) through the small holes

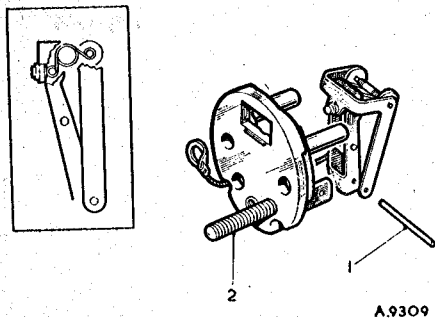


Fig. 3. Fitting the rocker assembly to the pedestal. (Inset) the correct position of the centre toggle spring

in the rockers and pedestal struts. Then position the centre toggle so that, with the inner rocker spindle in tension against the rear of the contact point, the centre toggle spring is above the spindle on which the white rollers run (see Fig. 3). This positioning is important to obtain the correct 'throw over' action; it is also essential that the rockers are perfectly free to swing on the pivot pin and that the arms are not binding on the legs of the pedestal.

If necessary the rockers can be squared up with a pair of thin-nosed pliers.

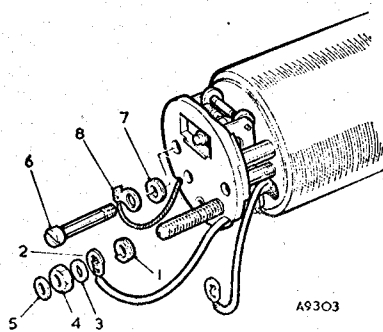


Fig. 4. Attaching the pedestal to the coil housing

2. Assemble the square-headed 2 B.A. terminal stud to the pedestal, the back of which is recessed to take the square head.
3. Assemble the 2 B.A. spring washer (1) (Fig. 4), and put the terminal stud through the 2 B.A. terminal tag (2), then fit the lead washer (3) and the coned nut with its coned face to the lead washer. (This makes better contact than an ordinary flat washer and nut.) Tighten the 2 B.A. nut and finally add the end-cover seal washer (5).

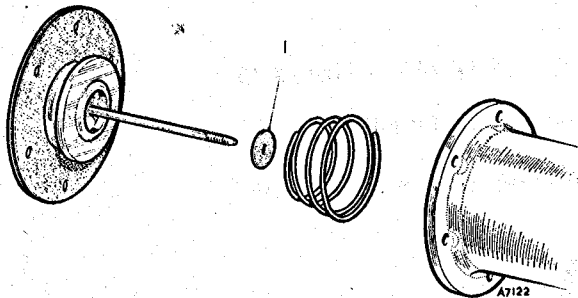


Fig. 5. Fitting the diaphragm to the coil housing. Note the impact washer (1)

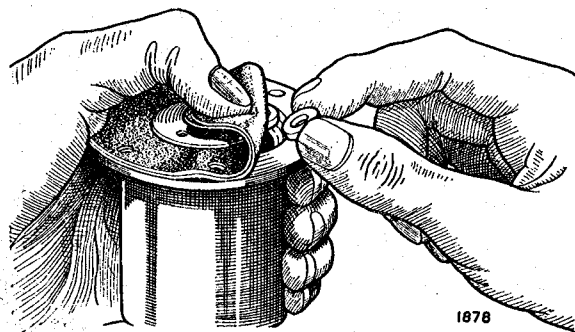


Fig. 6. Inserting the diaphragm centralizing rollers

4. Assemble the pedestal to the coil housing (Fig. 4) by fitting the two 2 B.A. pedestal screws (6), ensuring that the spring washer (7) on the left-hand screw (9 o'clock position) is between the pedestal and the earthing tag (8). When a condenser is fitted, its wire clip base is placed under the earthing tag and the spring washer is dispensed with.
5. Tighten the screws, taking care to prevent the earthing tag (8) from turning, as this will strain or break the earthing flex. Do not overtighten the screws or the pedestal will crack.  
**Do not fit the contact blade at this stage.**

#### Diaphragm assembly

6. Place the armature spring into the coil housing with its larger diameter towards the coil (Fig. 5).
7. Before fitting the diaphragm make sure that the impact washer is fitted to the armature. (This is a small neoprene washer that fits in the armature recess.) Do not use jointing compound or dope on the diaphragm.
8. Fit the diaphragm by inserting the spindle in the hole in the coil and screwing it into the threaded trunnion in the centre of the rocker assembly.
9. Screw in the diaphragm until the rocker will not 'throw over', this must not be confused with jamming the armature on the coil housing internal steps.
10. Fit the 11 brass centralizing rollers (Fig. 6) by turning back the diaphragm edge and dropping the rollers into the coil recess. The pump should be held in the left hand, rocker end downwards, to prevent the rollers from falling out.

**On later-type rocker mechanisms with adjustable fingers fit the contact blade and adjust the finger settings as described under those headings, then carefully remove the contact blade.**

11. Holding the coil housing assembly in the left hand in an

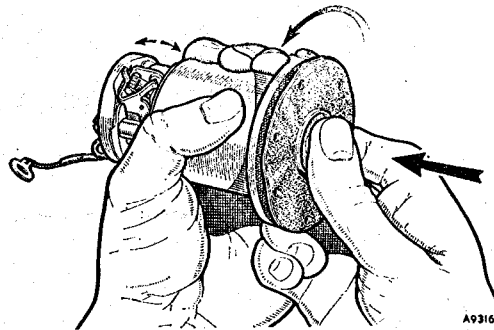


Fig. 7. Setting the diaphragm. Unscrew until the rocker just 'throws over'

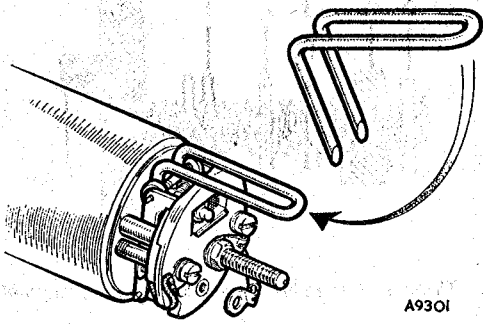


Fig. 8. Fitting the roller retaining fork

approximately horizontal position (see Fig. 7), push the diaphragm spindle in with the thumb of the right hand, pushing firmly but steadily. Unscrew the diaphragm, pressing and releasing with the thumb of the right hand until the rocker just 'throws over'. Now turn the diaphragm back (unscrew) to the nearest hole and again 4 holes (two-thirds of a complete turn). The diaphragm is now correctly set.

12. Press the centre of the armature and fit the retaining fork at the back of the rocker assembly (Fig. 8). This is done to prevent the rollers from falling out when the coil housing is placed on the bench prior to fitting the body, and is not intended to stretch the diaphragm before tightening the body screws.

#### Body components

13. On later-type pumps with plastic valves assemble the cork washer into the valve cage (Fig. 9), follow this with the plastic valve, spring side uppermost, and retain it with the circlip in its groove. Insert the inlet valve into the body of the pump, smooth face to seating, thread the inlet valve spring onto the valve cage, and tighten down firmly.
14. On earlier-type pumps assemble the brass valve disc to the valve cage, making sure that the smooth face of the disc faces the valve seat, retain it in position with the circlip which must be located in the groove in the valve cage. The valve must rattle freely when the cage is shaken. Drop the inlet valve disc, smooth face downwards into the body. Screw in the valve cage and tighten down firmly.

**Note.**—Earlier-type valve cages can be identified by the lip that forms the valve seat.

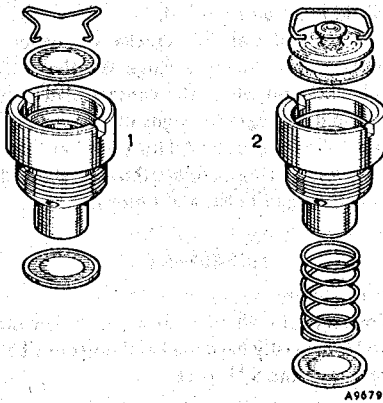


Fig. 9. The valve assembly, LCS type pump

1. Earlier type.
2. Later type

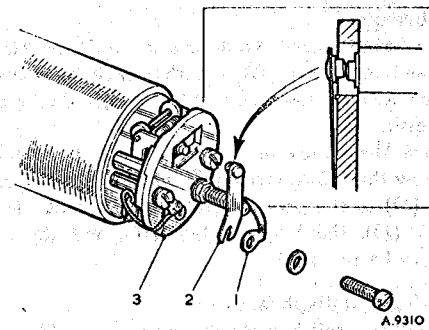


Fig. 10. Setting the correct relative position of blade and rocker contact points

15. Replace the upper cover and joint gasket.
16. Insert the filter and replace the lower cover and joint gasket.

#### Body attachment

17. Fit the diaphragm gasket, offer up the coil housing to the body, and ensure correct seating between them.
18. Line up the six securing screw holes, making sure that the two cast lugs on the coil housing are at the bottom, insert the six 2 B.A. screws finger-tight. Fit the earthing screw.
19. Remove the roller retaining fork before tightening the body securing screws, making sure that the rollers retain their position; a displaced roller will cut the diaphragm. It not necessary to stretch the diaphragm before tightening the securing screws.
20. Tighten the securing screws in sequence as they appear diametrically opposite each other.

#### Contact blade

21. Fit the contact blade (2) (Fig. 10) and coil lead (1) to the pedestal (3) with the 5 B.A. washer and screw. When a condenser is fitted the tag on it is placed under the coil lead tag.
22. Adjust the contact blade so that the contact points on it are a little above the contact points on the rocker when the points are closed (see Fig. 10), also that when the contact points make or break, one pair of points wipes over the centre line of the other in a symmetrical manner. As the contact blade is provided with a slot for the attachment screw, some degree of adjustment is possible.
23. Tighten the contact blade attachment screw when the correct setting is obtained.

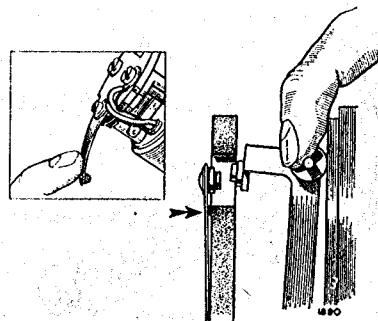
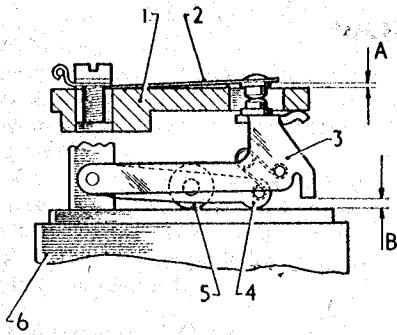


Fig. 11. Setting the contact blade to ensure contact with the pedestal ridge

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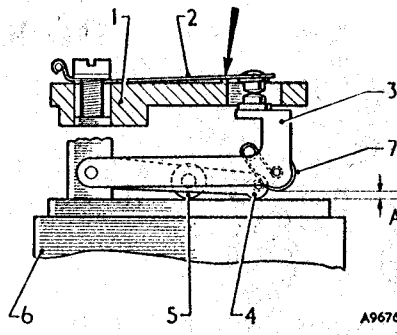
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Fig. 12. The rocker finger settings on modified rocker assemblies

- |                        |                         |
|------------------------|-------------------------|
| 1. Pedestal.           | 4. Inner rocker.        |
| 2. Contact blade.      | 5. Trunnion.            |
| 3. Outer rocker.       | 6. Coil housing.        |
| A = .035 in. (.9 mm.). | B = .070 in. (1.8 mm.). |



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Fig. 13. The contact gap setting on earlier-type rocker assemblies

- |                        |                  |
|------------------------|------------------|
| 1. Pedestal.           | 4. Inner rocker. |
| 2. Contact blade.      | 5. Trunnion.     |
| 3. Outer rocker.       | 6. Coil housing. |
| A = .030 in. (.8 mm.). |                  |

#### Contact gap settings

24. Check that when the outer rocker is pressed onto the coil housing, the contact blade rests on the narrow rib or ridge which projects slightly above the main face of the pedestal (Fig. 11). If it does not, slacken the contact blade attachment screw, swing the blade clear of the pedestal, and bend it downwards a sufficient amount so that when repositioned it rests against the rib lightly, over-tensioning of the blade will restrict the travel of the rocker mechanism.

#### Modified rocker assemblies

25. Check the lift of the contact blade tip above the top of the pedestal (A) (Fig. 12) with a feeler gauge, bending the stop-finger beneath the pedestal, if necessary, to obtain a lift of  $.035 \pm .005$  in. (.9  $\pm$  .13 mm.).
26. Check the gap between rocker finger and coil housing (B) (Fig. 12) with a feeler gauge, bending the stop-finger, if necessary, to obtain a gap of  $.070 \pm .005$  in. (1.8  $\pm$  .13 mm.).

#### Earlier-type rocker assemblies

27. Check the gap between the points indirectly by carefully holding the contact blade against the rib on the pedestal without pressing against the tip (see Fig. 13). Then check if a .030 in. (.8 mm.) feeler will pass between the fibre rollers and the face of the coil housing. If necessary the tip of the blade can be set to correct the gap.

#### End-cover

28. Tuck all spare cable into position so that it cannot foul the rocker mechanism. Ensure that the end-cover seal washer is in position on the terminal stud, fit the bakelite end-cover and lock washer, secure with the brass nut, fit the terminal tag or connector, and the insulated knob or sleeve.
29. The pump is now ready for test (see leaflet AUA 213 A). After test, replace the rubber sealing band over the end cover gap and seal with adhesive tape. This may be removed to improve ventilation when the pump is mounted internally in a moisture-free region but must be retained otherwise.

**Note.**—The technical information contained in this Service Sheet supersedes any instruction previously published or authorized on this subject by the Company.