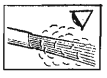
SECTION D

THE FUEL SYSTEM

	Section
General description	
†Air cleaners	D.6
†Carburetters	D.5
Fuel pump	D.4
Fuel tank	D.2
Gauge unit	D.3
Lubrication	D.1

† These operations must be followed by an exhaust emission check 

GENERAL DESCRIPTION

The fuel system comprises a fuel tank mounted below the luggage compartment, an A.C. 'Y' type mechanically operated fuel pump, and twin S.U. HS2 semi-down-draught automatic expanding choke-type carburetters.

The level of the fuel in the tank is registered electrically by a meter on the instrument panel.

The air cleaner fitted to the carburetters has a renewable paper-element filter to trap road dust and other harmful matter from the air before it reaches the carburetters.

Section D.1

LUBRICATION

Carburetter dampers

Unscrew the cap from the top of each suction chamber and refill the hollow piston rod with thin engine oil until the level is ½ in. (13 mm.) from the top. Under no circumstances must heavy-bodied lubricant be used. Failure to lubricant the piston damper will cause piston flutter and reduce acceleration.

Section D.2

FUEL TANK

Removing

From within the luggage compartment release the securing clips and draw back the hose from the fuel tank inlet. Raise the vehicle to a workable height, remove the drain plug, and drain the petrol into a container.

Disconnect the fuel outlet pipe at its union with the tank. Remove the nuts and washers securing the tank to the under side of the body; at the same time steady the tank with a jack.

Lower the tank sufficiently to allow access to the fuel tank gauge unit and remove the Lucar connector.

The fuel tank can now be removed.

Refitting

Reverse the removal procedure when refitting.

Section D.3

FUEL TANK GAUGE UNIT

Remove the fuel tank as described in Section D.2.

Remove the screws securing the gauge unit to the tank and withdraw the complete assembly, taking care not to strain or bend the float lever.

When replacing the gauge unit a new joint washer must be fitted and a suitable sealing compound employed to make a fuel-tight joint.

Section D.4

FUEL PUMP

Removing

Disconnect the pipe unions, remove the set screws securing the petrol pump to the engine crankcase, and remove the pump.

Dismantling

Remove the securing bolt and lift off the top cover. Remove the filter gauze and cork sealing washer.

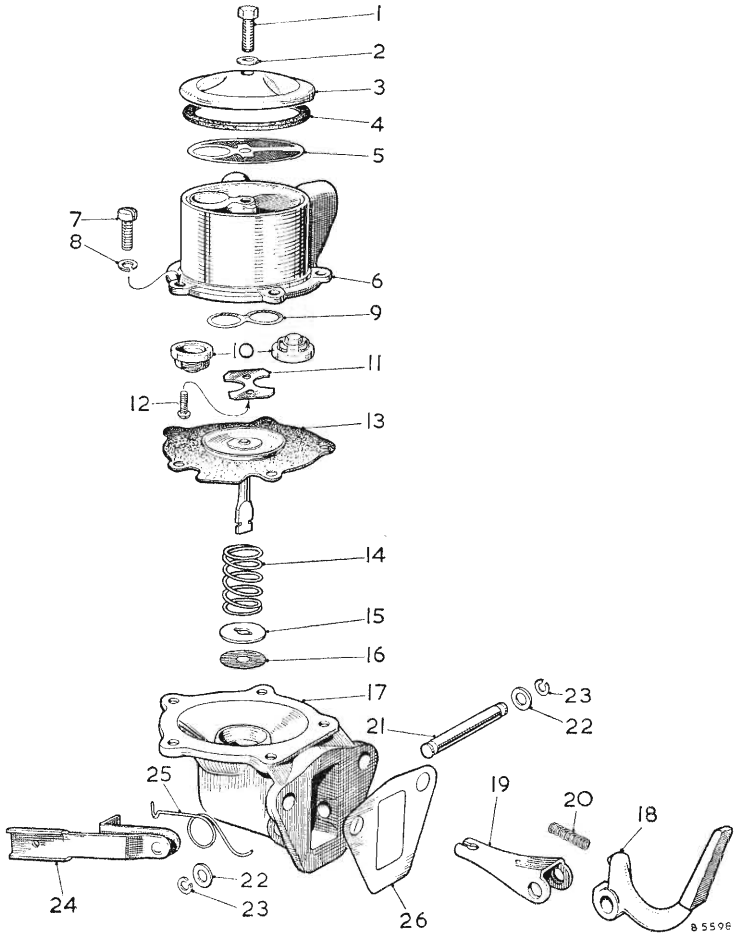


Fig. D.1

The A.C. 'Y' type fuel pump components

1. Cover screw.
2. Gasket.
3. Filter cover.
4. Filter cover gasket.
5. Filter gauze.
6. Upper casting.
7. Screw.
8. Lock washer.
9. Valve gasket.
10. Valve assembly.
11. Valve retainer.
12. Screw.
13. Diaphragm.
14. Spring.
15. Metal washer.
16. Fabric washer.
17. Pump body.
18. Rocker arm.
19. Rocker arm link.
20. Rocker arm spring.
21. Rocker arm pin.
22. Washer.
23. Clip.
24. Priming lever.
25. Spring.
26. Gasket.

Remove the upper chamber securing screws and separate the two halves of the pump body. To assist when reassembling, it is advisable to mark the two halves of the pump body before dismantling.

Remove the securing screws, valve plate, inlet and delivery valve assemblies, and gasket.

Remove the diaphragm and pull-rod assembly by rotating it through 90°. The diaphragm spring, metal washer, and fibre washer can now be removed.

Removal of the retaining circlip and washer from either side permits the rocker arm pivot pin to be drawn out, which in turn will release the rocker arm, connecting link, washers, and anti-rattle spring.

Reassembling

Reassembly is the reverse of the removal procedure, with attention being paid to the following.

The fitting of the rocker arm pin can be simplified by first inserting a piece of ·240 in. (6·1 mm.) diameter rod through the pin hole in one side of the body far enough to engage the rocker arm washers and link, then pushing in the rocker arm pin from the opposite side, removing the guide rod as the pin takes up its proper position. Under certain conditions it is possible to insert the diaphragm pull rod too far through the slot in the operating link, with the result that the connecting link, instead of engaging the two small slots in the pull rod, rides on the pull rod shoulder.

Correct assembly can be checked by measuring the distance from the top of the pump body to the upper diaphragm protector when the diaphragm is held at the top of its stroke by the return spring. A measurement

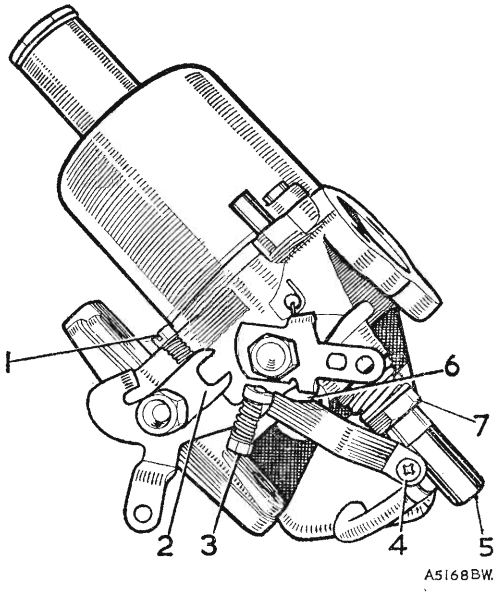


Fig. D.2

The HS2-type carburetter

1. Throttle adjusting screw.
2. Butterfly operating fork.
3. Fast-idle adjusting screw.
4. Jet link securing screw.
5. Jet head.
6. Float-chamber securing nut.
7. Jet adjusting nut.

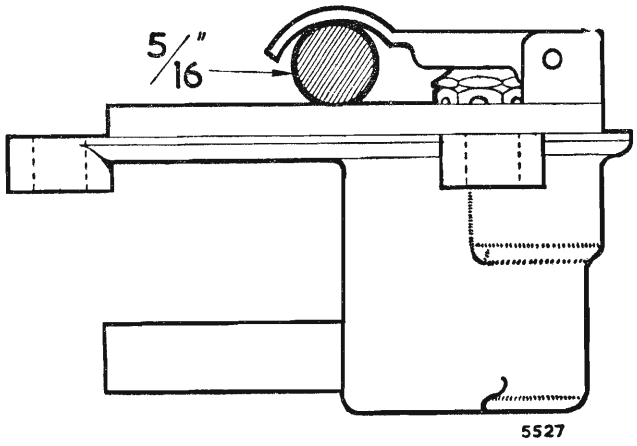


Fig. D.3

The method of checking the correct adjustment of the hinged lever (early cars)

of approximately $\frac{9}{16}$ in. (14·3 mm.) indicates correct assembly, whereas one of $\frac{3}{16}$ in. (4·8 mm.) proves that the assembly is unsatisfactory.

Push the rocker arm towards the pump until the diaphragm is level with the body flanges.

Place the upper half of the pump into the proper position, as shown by the marks made on the flanges before dismantling, and refit.

Refitting

Reverse the procedure outlined for the removal from the engine. Ensure that the rocker arm is correctly positioned against the eccentric on the camshaft, as there is a possibility of inadvertently getting the rocker arm under the eccentric or to one side, when damage will result on tightening the bolts. After refitting, the engine should be run for a short time and pipe unions and pump examined for fuel leakage.

Section D.5

CARBURETTERS

IMPORTANT. The instructions given in **this section** for adjusting, dismantling and reassembling the carburetters applies only to **cars not fitted with exhaust emission control equipment.** Carburetters fitted to **cars with exhaust emission control equipment** must be tuned and serviced in accordance with the instructions given in **Workshop Manual Supplement AKD 4957.**

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 inserted the jet needle. The suction disc, piston, and needle all have 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 part

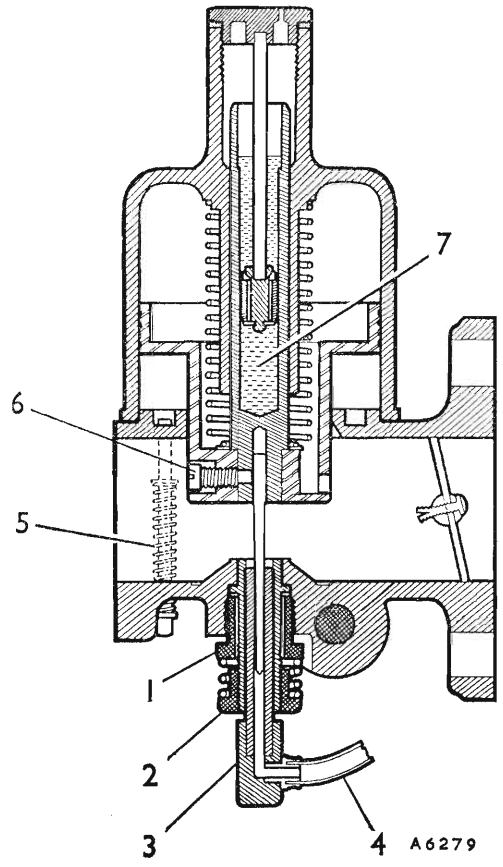


Fig. D.4

A section through the carburetter showing:

1. Jet locking nut.
2. Jet adjusting nut.
3. Jet head.
4. Nylon fuel pipe.
5. Piston lifting pin.
6. Needle securing screw.
7. Piston damper oil well.

except the piston rod. A sticking piston can be ascertained by removing the piston damper and lifting the piston with a pencil or similar instrument; the piston should come up quite freely and fall back smartly onto the jet bridge when released. On no account should the piston return spring be stretched or its tension be altered in an attempt to improve its rate of return.

Water and dirt in one of the carburetters

Should this be suspected, start the engine, open the throttle, and block up the air inlet momentarily, keeping the throttle open until the engine starts to race.

If the jet is completely blocked and the engine will not run, the jet must be removed and thoroughly cleaned.

Float-chamber flooding

This is indicated by fuel flowing from the breather hole in the top of the float-chamber lid below the main fuel feed pipe, and is generally caused by grit between the float-chamber needle and its guide. The float-chamber lid should be removed and the needle and its guide thoroughly cleaned.

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 pump to the carburetters and turn the crankshaft by operating the starter while the end of the pipe is directed onto a pad of cloth or into a container.

If fuel is delivered, starvation is almost certainly being caused by a float needle sticking to its seating, and the float-chamber lid should therefore be removed and 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 the carburetters, 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 trouble.

Adjustments

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

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

Slow-running adjustment and synchronization

When the engine is fully run in the slow running may require adjustment. This must only be carried out when the engine has reached its normal running temperature.

As the needle size is determined during engine development, tuning of the carburetters is confined to correct idling setting. Slacken the actuating arms on the throttle spindle interconnection. Close both throttles fully by unscrewing the throttle adjusting screws, then open each throttle by screwing down each idling adjustment screw one turn.

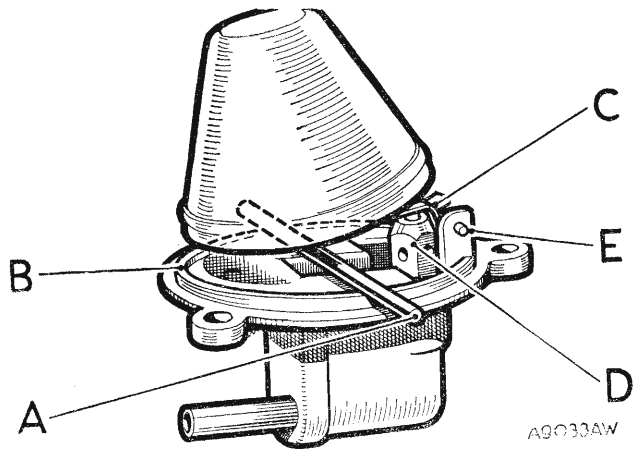


Fig. D.5

The method of checking the correct adjustment of the float lever (later cars)

A. $\frac{1}{8}$ to $\frac{3}{16}$ in. (3·18 to 4·76 mm.).
B. Machined lip.
C. Angle of float lever.
D. Float needle and seat assembly.
E. Lever hinge pin.

Remove the pistons and suction chambers and disconnect the choke control cable. Screw the jet adjusting nuts until each jet is flush with the bridge of its carburetter, or as near to this as possible (both jets being in the same relative position to the bridge of their respective carburetters). Replace the pistons and suction chamber assemblies and check that the pistons fall freely onto the bridge of the carburetters (by means of the piston lifting pins). Turn down the jet adjusting nut two complete turns (12 flats).

Restart the engine, and adjust the throttle adjusting screws to give the desired idling speed by moving each throttle adjusting screw an equal amount. By listening to the hiss in the intakes, adjust the throttle adjusting screws until the intensity of the hiss is similar on both intakes. This will synchronize the throttles.

When this is satisfactory the mixture should be adjusted by screwing each jet adjusting nut up or down by the same amount until the fastest idling speed is obtained consistent with even firing. During this adjustment it is necessary that the jets are pressed upwards to ensure that they are in contact with the adjusting nuts.

As the mixture is adjusted the engine will probably run faster, and it may therefore be necessary to unscrew the throttle adjusting screws a little, each by the same amount, to reduce the speed.

Now check the mixture strength by lifting the piston of the front carburetter by approximately $\frac{1}{32}$ in. (1 mm.), when:

(1) If the engine speed increases, this indicates that the mixture strength of the front carburetter is too rich.
(2) If the engine speed immediately decreases, this indicates that the mixture strength of the front carburetter is too weak.
(3) If the engine speed momentarily increases very slightly, then the mixture strength of the front carburetter is correct.

Repeat the operation at the rear carburetter, and after adjustment re-check the front carburetter, since both carburetters are interdependent.

When the mixture is correct the exhaust note should be regular and even. If it is irregular, with a splashy type of misfire and colourless exhaust, the mixture is too weak. If there is a regular or rhythmical type of misfire in the exhaust beat, together with a blackish exhaust, then the mixture is too rich.

Throttle linkage

The throttle on each carburetter is operated by a lever and pin, with the pin working in a forked lever attached to the throttle spindle. A clearance between the pin and fork must be maintained when the throttle is closed and the engine at rest to prevent any load from the accelerator linkage and return springs being transferred to the throttle butterfly and spindle.

To set this clearance: with the throttle shaft levers free on the throttle shaft, put a ·012 in. (·3 mm.) feeler between the throttle shaft stop at the top and the carburetter heat shield. Move the throttle shaft lever downwards until the lever pin rests lightly on the lower arm of the fork in the carburetter throttle lever. Tighten the clamp bolt of the throttle shaft lever at this position. When both carburetters have been dealt with, remove the feeler. The pins on the throttle shaft levers should then have clearance in the forks.

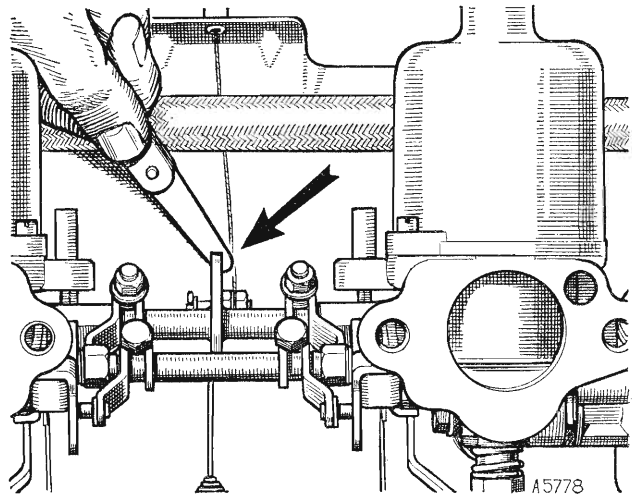


Fig. D.6

The feeler between the throttle shaft stop and the carburetter heat shield

Reconnect the choke cable, ensuring that the jet heads return against the lower face of the jet adjusting nuts when the choke control is pushed fully in.

Pull out the mixture control knob on the dash panel until the linkage is about to move the carburetter jets (a minimum of $\frac{1}{4}$ in. or 6 mm.) and adjust the fast idle adjusting screws to give an engine speed of about 1,000 r.p.m. when hot.

Float-chambers

The position of the hinged lever in the float-chamber must be such that the level of the float (and therefore the height of the fuel at the jet) is correct.

This is checked by inserting a round bar between the hinged lever and the machined lip of the float-chamber lid. The end of the lever should just rest on the bar (see Fig. D3. or D.5) when the needle is on its seating. If this is not so, the lever should be reset at the point where the end meets the shank.

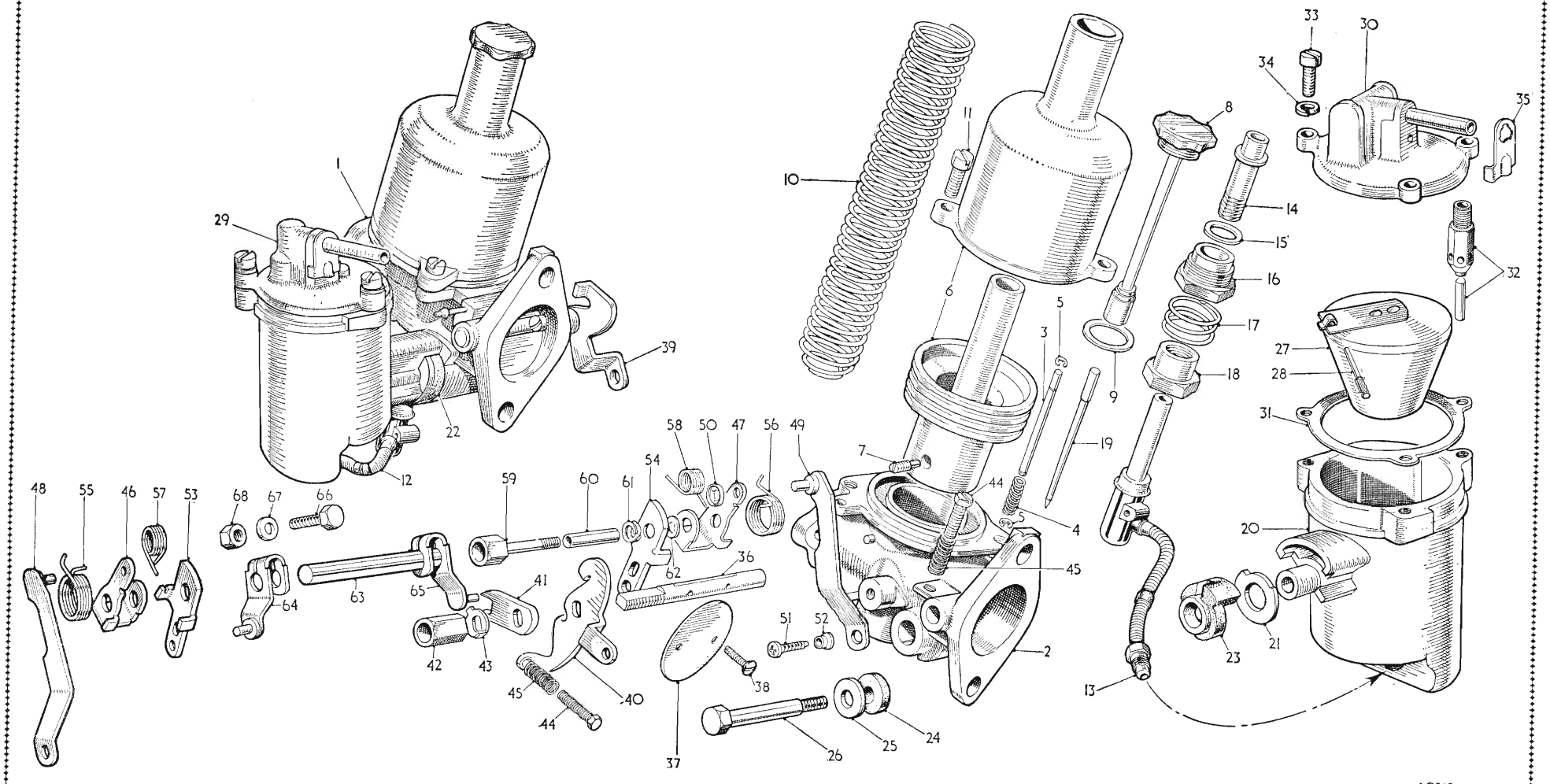
Do not bend the shank, which must be perfectly flat and at right angles to the needle when it is on its seating.

Centring the jet

When the suction piston is lifted by the spring-loaded piston lifting pin it should fall freely and hit the inside jet bridge with a soft, metallic click— that is, with the jet adjusting nut (2, Fig. D4.) in its topmost position.

If this click is not audible, but is so when the test is repeated with the jet in the fully lowered position, then the jet unit requires recentring on the needle.

THE CARBURETTER COMPONENTS



KEY TO THE CARBURETTER COMPONENTS

No.	Description
1.	Carburetter body (left).
2.	Carburetter body (right).
3.	Piston lifting pin.
4.	Spring.
5.	Circlip.
6.	Piston chamber assembly.
7.	Screw.
8.	Cap and damper assembly.
9.	Fibre washer.
10.	Piston spring.
11.	Screw.
12.	Jet assembly (left carburetter).
13.	Jet assembly (right carburetter).
14.	Bearing.
15.	Washer.
16.	Screw.
17.	Spring.
18.	Screw.
19.	Needle.
20.	Float-chamber.
21.	Support washer.
22.	Rubber grommet (left carburetter).
23.	Rubber grommet (right carburetter).
24.	Washer (rubber).
25.	Washer (steel).
26.	Bolt.
27.	Float assembly.
28.	Lever pin.
29.	Float-chamber lid (left carburetter).
30.	Float-chamber lid (right carburetter).
31.	Washer.
32.	Needle and seat assembly.
33.	Screw.
34.	Spring washer.
35.	Baffle plate.
36.	Throttle spindle.
37.	Throttle disc.
38.	Screw.
39.	Throttle return lever (left carburetter).
40.	Throttle return lever (right carburetter).
41.	Lost motion lever.
42.	Nut.
43.	Tab washer.
44.	Throttle screw stop.
45.	Spring.
46.	Pick-up lever (left carburetter).
47.	Pick-up lever (right carburetter).
48.	Link (left carburetter).
49.	Link (right carburetter).
50.	Washer.
51.	Screw.
52.	Bush.
53.	Cam lever (left carburetter).
54.	Cam lever (right carburetter).
55.	Pick-up lever spring (left carburetter).
56.	Pick-up lever spring (right carburetter).
57.	Cam lever spring (left carburetter).
58.	Cam lever spring (right carburetter).
59.	Bolt.
60.	Tube.
61.	Spring washer.
62.	Distance piece.
63.	Jet rod.
64.	Lever and pin assembly (left carburetter).
65.	Lever and pin assembly (right carburetter).
66.	Bolt.
67.	Washer.
68.	Nut.

Disconnect the rod between the jet lever and the jet head.

Unscrew the union holding the nylon feed tube into the base of the float-chamber, and withdraw the tube and jet together. Unscrew the jet adjusting nut and remove the lock spring. Replace the adjusting nut and screw it right up to its topmost position, then replace the jet and feed tube.

Slacken off the large jet locking nut (1, Fig. D.4) until the jet bearing is just free to rotate by finger pressure.

With the damper removed and using a pencil on top of the piston rod, gently press the piston and needle down onto the jet bridge.

Tighten the jet locking nut, observing that the jet head is still in its correct angular position.

Lift the piston and check that it falls freely and evenly. hitting the jet bridge with a soft, metallic click. Then fully lower the jet and re-check to see if there is any difference in the sound of the impact; if there is and the second test produces a sharper impact sound, the centring operation will have to be repeated until successful. Remove the adjusting nut and replace the lock spring after the conclusion of the operation.

Needles

Remove the piston and suction chamber assembly. Slacken the needle clamping screw, extract the needle and check its identifying mark (see GENERAL DATA). Refit the correct needle ensuring that the shoulder on the shank is flush with the piston base.

Removing

Remove the air cleaners as detailed in Section D.6. Disconnect the mixture and throttle control cables, the suction advance pipe, and the fuel delivery hose from their respective positions on the carburetters.

Release the interconnecting coupling tension springs and the throttle stop return spring.

Remove the nuts and spring washers securing the carburetters to the manifold flanges. Lift off the carburetter assemblies as one unit. The carburetter interconnecting couplings are fitted in sleeved nuts, and when the carburetter assemblies are removed the couplings can be lifted away from both carburetters.

Refitting

Reverse the removal procedure when refitting. It should be noted that the heat shield fitted between the carburetters and the manifold flanges has gaskets, which should be renewed if the shield has been removed.

Section D.6

AIR CLEANERS

Removing

Disconnect the breather pipe from the front air cleaner.

Remove the centre-securing nut and washer on the tie bracket.

Remove the through-bolts and lift away the air cleaners from the carburetter assemblies.

NOTE.—Servicing of the paper-element-type air cleaners should be carried out at regular intervals.

In countries where dusty operating conditions exist this operation should be carried out at more frequent intervals.

Refitting

Refitting is a reversal of the removal procedure.

Section Da

THE FUEL SYSTEM

The information given in this Section refers specifically to the Sprite (Mk. III and IV) and Midget (Mk. II and III) and must be used in conjunction with Section D

	Section
Fuel pump	Da.1
Fuel tank (Midget Mk. III from Car No. G–AN5–105501)	Da.2
Fuel tank gauge unit	Da.3

GENERAL DESCRIPTION

The fuel system is the same as that used on earlier cars, with the exception of the pump which is an S.U. AUF 200 electrically operated diaphragm type.

Section Da.1

FUEL PUMP

Removing and refitting

The pump is situated beneath the luggage compartment on the right-hand side. For removal: disconnect the battery earth lead and detach the earth and supply leads from the terminals on the pump.

Disconnect the inlet, outlet, and vent pipe connections.

Remove the two bolts securing the pump bracket to the rear foot-well panel.

When replacing, ensure that the outlet is vertically above the inlet port, i.e. the inlet and outlet nozzles are horizontal.

Also ensure a good earth connection.

Dismantling

Contact breaker

(1) Remove the insulated sleeve, terminal nut, and connector together with its shakeproof washer. Remove the tape seal (if fitted) and take off the end-cover.

(2) Remove the condenser (if fitted) from its clip, unscrew the 5 B.A. screw which holds the contact blade to the pedestal. This will allow the washer, the long-coil lead, and the contact blade to be removed.

Coil housing and diaphragm

(3) Unscrew the coil housing securing screws, using a thick-bladed screwdriver to avoid damaging the screw heads.

(4) Remove the earthing screw.

(5) *Roller type.* Hold the coil housing over a bench or receptacle to prevent the 11 brass rollers from being damaged or lost as they come free, unscrew the diaphragm assembly anti-clockwise until the armature spring pushes it free of the housing.
Guide plate type. Turn back the edge of the diaphragm and carefully lever the two end lobes of the armature guide plate from the recess in the coil housing, unscrew the diaphragm assembly anti-clockwise until the armature spring pushes it free of the housing. Remove the armature guide from the diaphragm assembly.

Pedestal and rocker

(6) Remove the end-cover seal washer, unscrew the terminal nut, and remove the lead washer; 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, holding the pedestal to the coil housing, remove the earth terminal tag together with the condenser clip (if fitted). Tip the pedestal and withdraw the terminal stud from the terminal tag. The pedestal may now be removed with the rocker mechanism attached.

(7) Push out the hardened steel pin which holds the rocker mechanism to the pedestal.

Body and valves

(8) Unscrew the two 2 B.A. screws securing the spring clamp plate holding the inlet and outlet nozzles. Remove the nozzles, filter, and valve assemblies.

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 spirit and then cleaned.

(1) Clean the pump and inspect for cracks, damaged joint faces, and threads.

(2) Examine the plastic valve assemblies for kinks or damage to the valve plates. They can best be checked by blowing and sucking with the mouth.

(3) Check that the narrow tongue on the valve cage, which is bent over to retain the valve and to prevent it being forced out of position, has not been distorted but allows a valve lift of approximately $\frac{1}{16}$ in. (1·6 mm.).

(4) Examine the valve recesses in the body for damage and corrosion; if it is impossible to remove the corrosion, or if the seat is pitted, the body must be discarded.

(5) Ensure that the coil housing vent tube is not blocked.

(6) Clean the filter with a brush and examine for fractures, renew if necessary.

(7) Examine the coil lead tag for security and the lead insulation for damage.

(8) Examine the contact breaker points for signs of burning and pitting; if this is evident, the rocker assembly and spring blade must be renewed.

(9) Examine the pedestal for cracks or other damage, particularly to the narrow ridge in the edge of the rectangular hole on which the contact blade rests.

(10) Examine the non-return vent valve in the end-cover (if fitted) for damage, ensure that the small ball valve is free to move.

(11) Examine the diaphragm for signs of deterioration.

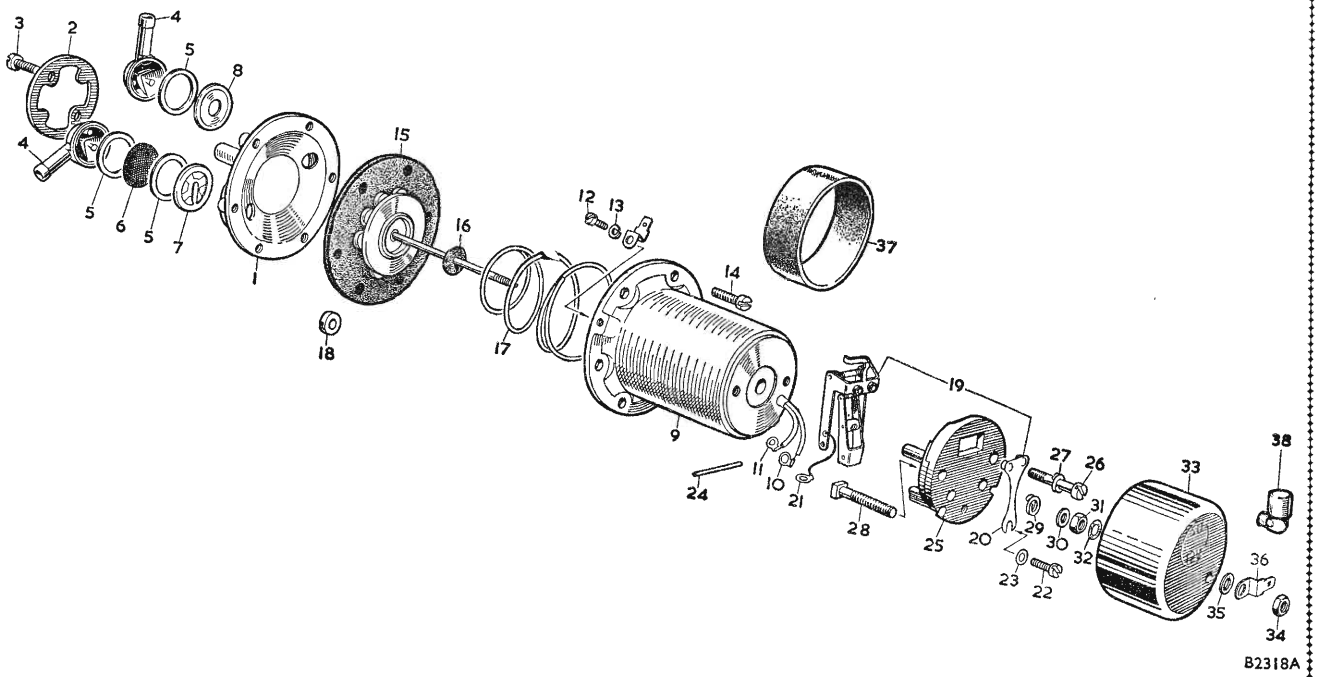
(12) Renew the following parts: all fibre and cork washers, gaskets and 'O' section sealing rings, rollers showing signs of wear on periphery, damaged bolts and unions.

Reassembling

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.

THE FUEL PUMP COMPONENTS



No.	*Description*
1.	Body.
2.	Spring clamp plate.
3.	Screw.
4.	Nozzle—inlet/outlet.
5.	Sealing washer.
6.	Filter.
7.	Valve—inlet.
8.	Valve—outlet.
9.	Housing—coil.
10.	Tag—5 B.A. terminal.
11.	Tag—2 B.A. terminal.
12.	Screw—earth.
13.	Washer—spring.
14.	Screw—housing to body.
15.	Diaphragm assembly.
16.	Impact washer.
17.	Spring.
18.	Roller.
19.	Rocker and blade.
20.	Blade.
21.	Tag—2 B.A. terminal.
22.	Screw for blade.
23.	Washer—dished.
24.	Spindle for contact breaker.
25.	Pedestal.
26.	Screw—pedestal to housing.
27.	Washer—spring.
28.	Screw for terminal.
29.	Washer—spring.
30.	Washer—lead—for screw.
31.	Nut for screw.
32.	Spacer—nut to cover.
33.	Cover—end.
34.	Nut for cover.
35.	Washer—shakeproof.
36.	Connector—Lucar.
37.	Packing sleeve.
38.	Non-return valve.

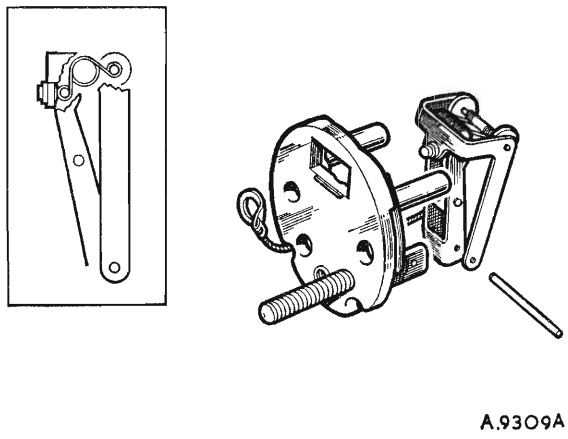


*Fig. Da.*1

Fitting the rocker assembly to the pedestal: (inset) the correct position of the centre toggle spring after assembly

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

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, rockers can be squared-up with a pair of long-nosed pliers.

(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 and put the terminal stud through the 2 B.A. terminal tag, then fit the lead washer 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.

(4) Assemble the pedestal to the coil housing by fitting the two 2 B.A. pedestal screws, ensuring that the spring washer on the left-hand screw (9 o'clock position) is between the pedestal and the earthing tag.

(5) Tighten the screws, taking care to prevent the earthing tag 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.

(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) *Roller type.* With the pump held with the rocker end downwards, turn back the edge of the diaphragm and fit the 11 brass rollers into the recess in the coil housing.

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) With the pump held horizontally, slowly unscrew the diaphragm while at the same time actuating it, until the rocker just throws over. Unscrew the diaphragm until the holes are aligned, then unscrew it a further quarter of a turn (four holes).

(12) *Roller type.* Press the centre of the armature and fit the retaining fork at the back of the rocker assembly.

Body components

(13) *Guide plate type.* Turn back the edge of the diaphragm and insert one end lobe of the armature guide plate into the recess between the armature and the coil housing. Progressively position all four lobes, then commencing in the centre and finishing with the two end ones, press the lobes firmly into the recess.

(14) Place the outlet valve assembly, tongue side uppermost, in the recess marked 'outlet', place a joint washer on top of the valve assembly, and complete by adding the outlet nozzle.

(15) Place the inlet valve assembly, tongue side downwards, in the recess marked 'inlet', follow this with a joint washer, then the filter, dome side upwards, then another joint washer, completing the assembly with the inlet nozzle.

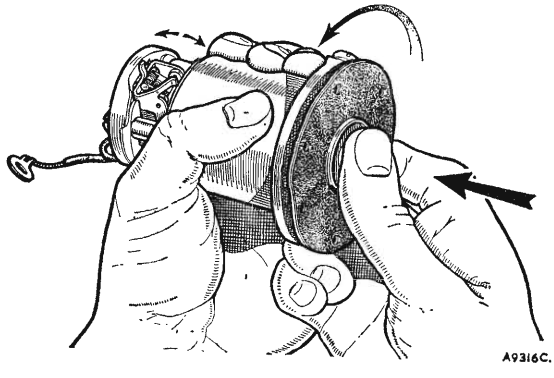


*Fig. Da.*2

Unscrew the diaphragm until the rocker just throws over

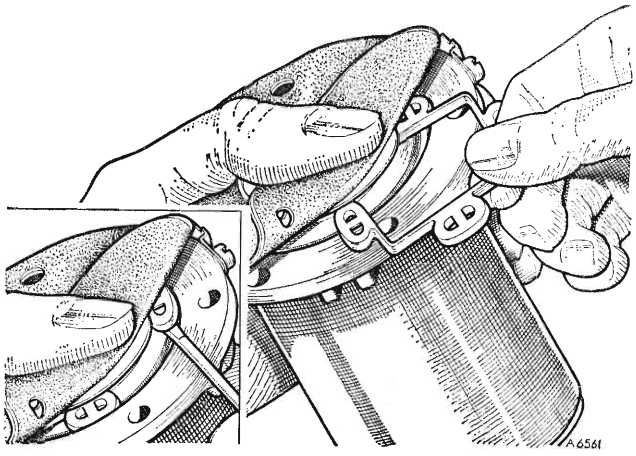


Fig. Da.3

Fitting the armature guide plate. (Inset), levering one of the end lobes from the recess

(16) Take care that both assemblies rest down evenly into their respective recesses. Position the nozzles as required, place the clamp plate on top, and tighten down firmly on to the body with the two 2 B.A. screws.

Body attachment

(19) Offer up the coil housing to the body—ensure correct seating between them.

(20) Line up the six securing holes, making sure that the cast lugs on the coil housing are at the bottom, insert the six 2 B.A. screws finger-tight. Fit the earthing screw with its Lucar connector.

(21) *Roller type.* Carefully remove the retaining fork from the rocker assembly and check that the rollers are correctly positioned.

(22) Tighten the securing screws in diagonal sequence.

Contact blade

(23) Fit the contact blade and coil lead to the pedestal with the 5 B.A. washer and screw.

(24) 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; also, that when the contact points make or break, one pair of points wipe 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.

(25) Tighten the contact blade attachment screw when the correct setting is obtained.

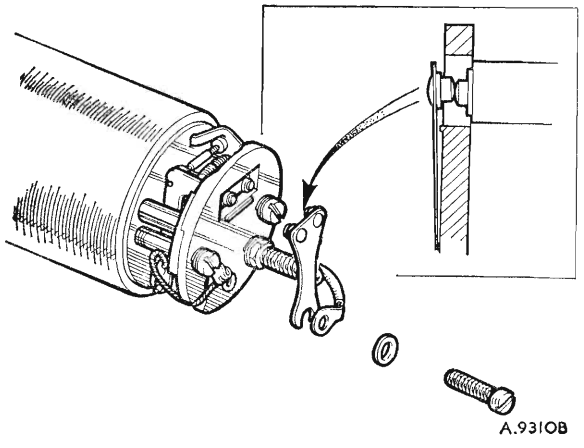


Fig. Da.4

Setting the correct relative position of blade and rocker contact points

Contact gap setting

(26) Check that when the outer rocker is pressed on to the coil housing, the contact blade rests on the narrow rib or ridge which projects slightly above the main face of the pedestal. 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 rocker travel.

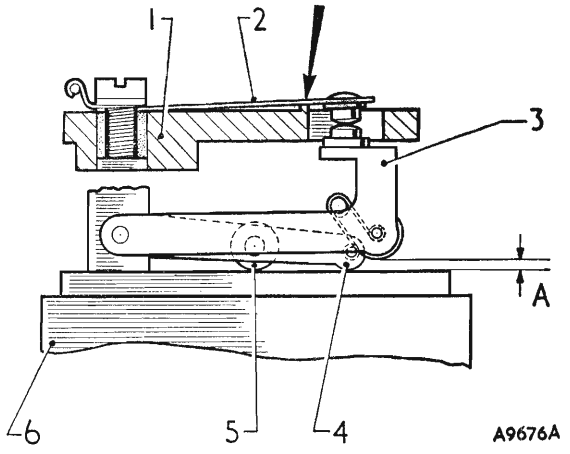


Fig. Da.5

The contact gap setting on earlier-type rocker assemblies

1. Pedestal.
2. Contact blade.
3. Outer rocker.
4. Inner rocker.
5. Trunnion.
6. Coil housing.

A = ·030 in. (·8 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. Then check if a ·030 in. (·8 mm.) feeler will pass between the fibre rollers and the face of the coil housing (A) (Fig. Da.5). If necessary, the tip of the blade can be set to correct the gap.

Modified rocker assemblies

(28) Check the lift of the contact blade tip above the top of the pedestal (A) (Fig. Da.6) with a feeler gauge, bend the stop finger beneath the pedestal, if necessary, to obtain a lift of ·035±·005 in. (·9±·13 mm.).

(29) Check the gap between the rocker finger and the coil housing with a feeler gauge (B) (Fig. Da.6), bend the stop finger, if necessary, to obtain a gap of ·070±·005 in. (1·8±1·3 mm.).

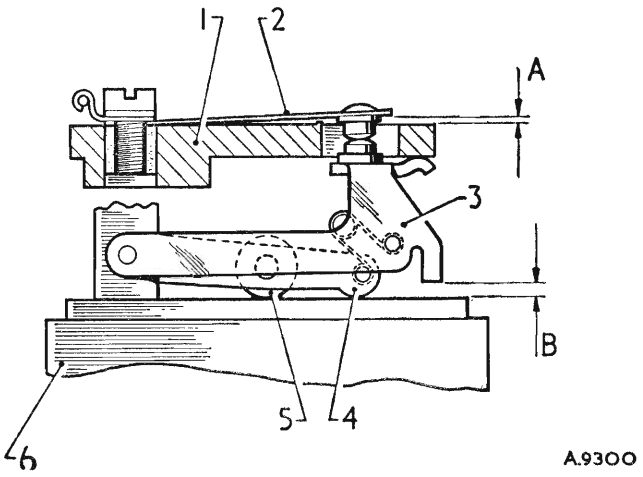


Fig. Da.6

The rocker finger settings on modified rocker assemblies

1. Pedestal.
2. Contact blade.
3. Outer rocker.
4. Inner rocker.
5. Trunnion.
6. Coil housing.

A = ·035 in. (·9 mm.). B = ·070 in. (1·8 mm.).

End-cover

(30) Ensure that the end-cover seal washer is in position on the terminal stud, fit the bakelite end-cover, secure with the brass nut, fit the terminal tag or connector, and insulated sleeve.

(31) The pump is now ready for test.

Testing on a test stand

Preparation

(1) Churchill test rig:
Secure the pump in the clamping ring with the outlet connection uppermost. Connect to a 12-volt battery, and with the switch in the 'OFF' position, clip the connector to the pump. Connect the delivery and return of the correct bore to the pump.

S.U. test rig:
Mount the pump on the test stand, using the appropriate adaptor set according to the type of pump. Connect the feed and earth terminals to the test battery and check the contact gap setting as described under that heading. Replace the end cover with a cut-away one which allows observation of the rocker assembly while retaining the pivot pin. Use paraffin (kerosene) in the test tank. Ensure an adequate supply.

Priming

(2) Unscrew the regulator valve (Churchill rig only) and switch on: the pump should prime from dry in 10 to 15 seconds. Allow the pump to run for a minute to stabilize the flow.

Air leak check

(3) When the pump is first started air bubbles will be mixed with the liquid discharged from the pipe projecting downwards into the flow-meter; these bubbles should cease after a minute or so. If they do not, an air leak is indicated either in the pump or the connecting unions, and this must be rectified.

Valve seat check

(4) Let the pump run for about 10 minutes and then test as follows: With the regulator valve (delivery tap) turned completely off the pump should stand without repeating for a minimum of 20 seconds at the correct delivery head. If it repeats, the inlet valve is not seating correctly and the cause must be investigated.

Delivery check

(5) Churchill: Obtain a delivery head reading of 4 feet (1220 mm.) on the gauge by adjusting the regulator valve on top of the flow glass. When correct, the pump flow rate may be read directly from the appropriate colour scale on the flow glass.
S.U.: The paraffin (kerosene) should rise in the glass tube until it flows over the top of the pipe in which a side hole is drilled; if the output is not up to specification, the side hole will carry off all paraffin (kerosene) pumped and none will flow over the top.
The delivery rate should be 56 pints (67 U.S. pts., 32 litres) per hour.

Minimum delivery check

(6) With the tap turned on only slightly, and by pressing gradually inwards on the tip of the contact blade, so as to reduce the effective stroke, check that the pump continues to work with an

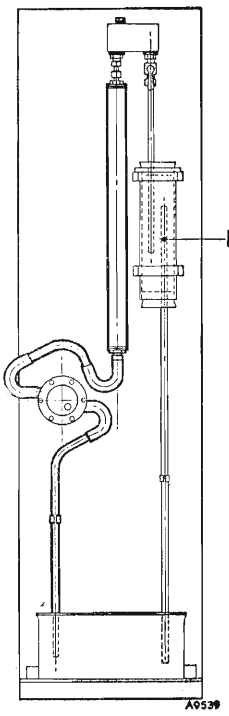


Fig. Da.7

A checking rig for the fuel pump is obtainable from the S.U. Carburetter Co. Ltd.

(1) The $\frac{5}{32}$ in. (4 mm.) dia. hole is 2 in. (50 mm.) below the top of the pipe.

increasing frequency until it eventually stops because there is no gap left between the points.

Reduced voltage

(7) Connect a resistance and voltmeter in circuit and test the pump at 9·5 volts with regulator valve open (tap full on); the pump should work satisfactorily although with reduced output.

Sparking check

(8) Check for excessive sparking at the contact points. A moderate degree is permissible; excessive sparking would indicate that the special leak wire incorporated in the coil winding has fractured, necessitating a new coil unit, or that the condenser is faulty.

Fault diagnosis

1. *Suspected fuel feed failure*

Disconnect the fuel line at the carburetter and check for flow.

(*a*) If normal, examine for obstructed float-chamber needle seating or gummed needle.

(*b*) If normal initially, but diminishing rapidly and accompanied by slow pump operation, check for correct tank venting by removing the filler cap. Inadequate venting causes a slow power stroke, with resultant excessive burning of contact points.

(*c*) If reduced flow is accompanied by slow operation of the pump, check for any restriction on the inlet side of the pump, such as a clogged filter, which should be removed and cleaned. In the case of reduced flow with rapid operation of the pump, check for an air leak on the suction side, dirt under the valves, or faulty valve sealing washers.

(*d*) If no flow, check for:

(i) *Electrical supply*

Disconnect the lead from the terminal and test for an electrical supply.

(ii) *Faulty contact points*

If electrical supply is satisfactory the bakelite cover should be removed to check that the tungsten points are in contact. The lead should then be replaced on the terminal and a short piece of bared wire put across the contacts. If the pump then performs a stroke the fault is due to dirt, corrosion, or maladjustment of the tungsten points.

(iii) *Obstructed pipeline between fuel tank and pump*

The inlet pipe should be disconnected; if the pump then operates, trouble is due to a restriction in the pipeline between the pump and the tank. This may be cleared by the use of compressed air after removing the fuel tank filler cap. It should be noted, however, that compressed air should not be passed through the pump, as this will cause serious damage to the valves.

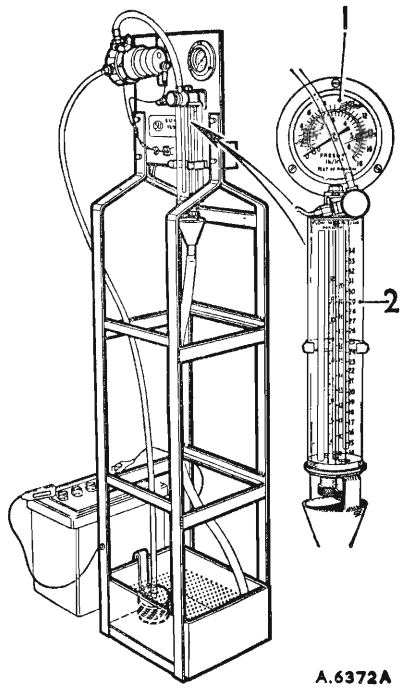


Fig. Da.8

A checking rig for S.U. fuel pumps available from V. L. Churchill and Co. Ltd. The rig measures output in gallons of paraffin (kerosene) per hour, against the required suction and delivery head

1. Pressure gauge. 2. Flow glass.

(iv) *Faulty diaphragm action*

If the previous operations fail to locate the trouble, stiffening of the diaphragm fabric or abnormal friction in the rocker 'throw-over' mechanism is to be suspected. To remedy these faults, the coil housing should be removed and the diaphragm flexed a few times, taking care not to lose any of the 11 rollers under it. Prior to reassembly, it is advisable to apply a little thin oil to the 'throw-over' spring spindles at a point where they pivot in the brass rockers. The diaphragm armature assembly should then be assembled and set in accordance with the instructions given under that heading.

2. *Noisy pump*

Air leaks. If the pump is noisy in operation, an air leak at one or other of the suction lines may be the cause. Such a leak may be checked by disconnecting the fuel pipe from the carburetter and allowing the pump to discharge into a suitable container with the end of the pipe submerged. The emission of continuous bubbles at this point will confirm the existence of an air leak. The fault should be rectified by carrying out the following procedure:

(*a*) Check that all connections from the fuel tank to the pump are in good order.

(*b*) Check that the inlet union is tight.

(*c*) Check that the coil housing securing screws are well and evenly tightened. Air leaks on the suction side cause rapid operation of the pump and are the most frequent cause of premature failure.

3. *Pump operates without delivering fuel*

If the pump operates without delivering fuel the most likely causes are:

(*a*) A serious air leak on the suction side, or,

(*b*) Foreign matter lodged under one of the valves, particularly under the inlet valve.

To remedy (*a*) see para. 2 above.

To remove any foreign matter lodged under the valves these should be removed for cleaning.

Section Da.2

FUEL TANK

(Midget Mk. III from Car No. G-AN5-105501)

Removing

(1) Disconnect the earth cable from the battery.

(2) Drain the fuel tank.

(3) Unscrew the spare wheel retaining screw and move the spare wheel away from the fuel tank filler hose.

(4) Slacken the two clips securing the filler hose to the inlet tube and the fuel tank inlet pipe.

(5) Disconnect the filler hose from the fuel tank inlet pipe.

(6) Disconnect the fuel gauge tank unit electrical connection.

(7) Disconnect the harness clips from the fuel tank.

(8) Disconnect the feed pipe from the fuel tank.

(9) Remove the six nuts securing the fuel tank, noting that the front nut on the right-hand side retains the large wiring harness clip.

(10) Remove the fuel tank.

Refitting

(11) Reverse the removing procedure in (1) to (10), ensuring that the sealing ring is fitted to the fuel tank filler neck before the tank is fitted.

Section Da.3

FUEL TANK GAUGE UNIT

Removing

(1) Remove the fuel tank.

(2) Remove the gauge unit locking ring, using 18G 1001.

(3) Remove the tank unit and the rubber sealing washer.

Refitting

(4) Reverse the removing procedure in (1) to (3).

Section Db

THE FUEL SYSTEM (EVAPORATIVE LOSS)

The information given in this Section refers specifically to service operations on, or affected by, equipment fitted to the MG Midget (GAN5) in conformity with local and territorial requirements.

	Section
Fuel tank (6 U.S. gallons, 22·7 litres)	Db.1
Fuel tank (7 U.S. gallons, 27·3 litres—Midget Mk. III from Car No. G-AN5-105501)	Db.4
Leak testing	Db.3
Vapour separator tank	Db.2

Section Db.1

FUEL TANK

Removing

(1) Remove the spare wheel.

(2) Disconnect the battery (negative earth) and drain the fuel tank.

(3) Slacken the two hose clips securing the rubber hose to the tank fuel inlet pipe and filler tube.

(4) Remove the screw, large plain washers and sealing washers securing the tank inside the boot.

(5) Underneath the car, disconnect the petrol feed pipe and gauge unit electrical connections.

(6) Remove the nuts and washer retaining the tank lip to the four studs. Release the two vapour pipe clips and move the pipe to one side.

(7) Remove the tank unit.

Refitting

(8) Reverse the removing procedure (1) to (7).

Section Db.2

VAPOUR SEPARATOR TANK

Removing

(1) Disconnect the battery.

(2) Remove the two flexible pipe connections from the tank. Remove the screw, nut and washer retaining the tank.

(3) Remove the tank. Under extreme operating conditions the tank may contain fuel.

Refitting

(4) Reverse the removing procedure (1) to (3).

Section Db.3

LEAK TESTING

If a fault in the operation of the Evaporative Loss Control System is suspected or components of the system other than the filters or canister have been removed and refitted, the system must be pressure-tested in accordance with the test procedure given in **Workshop Manual Supplement AKD 4957.**

Section Db.4

FUEL TANK

(From Commission No. 105501)

Removing

(1) Disconnect the earth cable from the battery.

(2) Drain the fuel tank.

(3) Unscrew the spare wheel retaining screw and move the wheel away from the fuel tank filler hose.

(4) Slacken the two clips securing the filler hose to the inlet tube and fuel tank inlet pipe.

(5) Disconnect the filler hose from the fuel tank inlet pipe.

(6) Disconnect the fuel gauge tank unit electrical connections.

(7) Disconnect the harness clips from the fuel tank.

(8) Disconnect the feed pipe from the fuel tank.

(9) Release the two vapour pipe clips and move the pipe to one side.

(10) Remove the six nuts securing the fuel tank noting that the front nut on the right-hand side retains the large wiring harness clip.

(11) Remove the fuel tank.

Refitting

(12) Reverse the removing procedure in (1) to (11), ensuring that the sealing ring is fitted to the fuel tank filler neck before the tank is fitted.